

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15 (d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the quarterly period ended April 30, 2017

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15 (d) OF THE SECURITIES EXCHANGE ACT OF 1934

OR
For the transition period from ___ to ___

Commission file number 0-15451



PHOTRONICS, INC.

(Exact name of registrant as specified in its charter)

Connecticut
(State or other jurisdiction of incorporation or organization)

06-0854886
(IRS Employer Identification No.)

15 Secor Road, Brookfield, Connecticut
(Address of principal executive offices)

06804
(Zip Code)

Registrant's telephone number, including area code

(203) 775-9000

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter periods that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).

Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company", and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large Accelerated Filer

Accelerated Filer

Non-Accelerated Filer

Smaller Reporting Company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes No

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the latest practicable date.

Class
Common Stock, \$0.01 par value

Outstanding at May 26, 2017
68,872,073 Shares

Forward-Looking Statements

The Private Securities Litigation Reform Act of 1995 provides a “safe harbor” for forward-looking statements made by or on behalf of Photronics, Inc. (“Photronics”, the “Company”, “we”, “our”, or “us”). These statements are based on management’s beliefs, as well as assumptions made by, and information currently available to, management. Forward-looking statements may be identified by words like “expect,” “anticipate,” “believe,” “plan,” “project,” “could,” “should,” “would,” “estimate,” “intend,” “may,” “will” and similar expressions, or the negative of such terms, or other comparable terminology. All forward-looking statements involve risks and uncertainties that are difficult to predict. In particular, any statement contained in this quarterly report on Form 10-Q or in other documents filed with the Securities and Exchange Commission in press releases or in the Company’s communications and discussions with investors and analysts in the normal course of business through meetings, phone calls, or conference calls regarding, among other things, the consummation and benefits of transactions, joint ventures, business combinations, divestitures and acquisitions, expectations with respect to future sales, financial performance, operating efficiencies, or product expansion, are subject to known and unknown risks, uncertainties, and contingencies, many of which are beyond the control of the Company. Various factors may cause actual results, performance, or achievements to differ materially from anticipated results, performance, or achievements expressed or implied by forward-looking statements. Factors that might affect forward-looking statements include, but are not limited to, overall economic and business conditions; economic and political conditions in international markets; the demand for the Company’s products; competitive factors in the industries and geographic markets in which the Company competes; the timing of orders received from customers; the gain or loss of significant customers; competition from other manufacturers; changes in accounting standards; federal, state and international tax requirements (including tax rate changes, new tax laws and revised tax law interpretations); changes in the jurisdictional mix of our earnings and changes in tax laws and rates; interest rate and other capital market conditions, including changes in the market price of the Company’s securities; foreign currency exchange rate fluctuations; changes in technology; technology or intellectual property infringement, including cyber-security breaches, and other innovation risks; unsuccessful or unproductive research and development or capital expenditures; the timing, impact, and other uncertainties related to transactions and acquisitions, divestitures, business combinations, and joint ventures as well as decisions the Company may make in the future regarding the Company’s business, capital and organizational structures and other matters; the seasonal and cyclical nature of the semiconductor and flat panel display industries; management changes; changes in laws and government regulation impacting our operations or our products; the occurrence of arbitration, regulatory proceedings, claims or litigation; damage or destruction to the Company’s facilities, or the facilities of its customers or suppliers, by natural disasters, labor strikes, political unrest, or terrorist activity; the ability of the Company to (i) place new equipment in service on a timely basis; (ii) obtain additional financing; (iii) achieve anticipated synergies and cost savings; (iv) fully utilize its tools; (v) achieve desired yields, pricing, product mix, and market acceptance of its products or (vi) obtain necessary export licenses. Any forward-looking statements should be considered in light of these factors. Accordingly, there is no assurance that the Company’s expectations will be realized. The Company does not assume responsibility for the accuracy and completeness of the forward-looking statements and does not assume an obligation to provide revisions to any forward-looking statements, except as otherwise required by securities and other applicable laws.

PHOTRONICS, INC.
AND SUBSIDIARIES

INDEX

PART I.	FINANCIAL INFORMATION	Page
Item 1.	Condensed Consolidated Financial Statements (unaudited)	4
	Condensed Consolidated Balance Sheets at April 30, 2017 and October 30, 2016	4
	Condensed Consolidated Statements of Income for the Three and Six Months Ended April 30, 2017 and May 1, 2016	5
	Condensed Consolidated Statements of Comprehensive Income for the Three and Six Months Ended April 30, 2017 and May 1, 2016	6
	Condensed Consolidated Statements of Cash Flows for the Six Months Ended April 30, 2017 and May 1, 2016	7
	Notes to Condensed Consolidated Financial Statements	8
Item 2.	Management's Discussion and Analysis of Financial Condition and Results of Operations	20
Item 3.	Quantitative and Qualitative Disclosures about Market Risk	25
Item 4.	Controls and Procedures	26
PART II.	OTHER INFORMATION	
Item 1A.	Risk Factors	27
Item 6.	Exhibits	27

PART I. FINANCIAL INFORMATION**Item 1. CONDENSED CONSOLIDATED FINANCIAL STATEMENTS**

PHOTRONICS, INC. AND SUBSIDIARIES
Condensed Consolidated Balance Sheets
(in thousands, except per share amounts)
(unaudited)

	<u>April 30,</u> <u>2017</u>	<u>October 30,</u> <u>2016</u>
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 345,724	\$ 314,074
Accounts receivable, net of allowance of \$3,796 in 2017 and \$3,901 in 2016	91,150	92,636
Inventories	24,537	22,081
Other current assets	<u>11,044</u>	<u>12,795</u>
Total current assets	472,455	441,586
Property, plant and equipment, net	503,900	506,434
Intangible assets, net	19,152	19,854
Deferred income taxes	16,199	16,322
Other assets	<u>3,865</u>	<u>3,792</u>
Total assets	<u>\$ 1,015,571</u>	<u>\$ 987,988</u>
LIABILITIES AND EQUITY		
Current liabilities:		
Current portion of long-term borrowings	\$ 5,503	\$ 5,428
Accounts payable	58,205	51,649
Accrued liabilities	<u>28,260</u>	<u>24,240</u>
Total current liabilities	91,968	81,317
Long-term borrowings	59,147	61,860
Other liabilities	<u>19,702</u>	<u>19,337</u>
Total liabilities	170,817	162,514
Commitments and contingencies		
Equity:		
Preferred stock, \$0.01 par value, 2,000 shares authorized, none issued and outstanding	-	-
Common stock, \$0.01 par value, 150,000 shares authorized, 68,496 shares issued and outstanding at April 30, 2017 and 68,080 shares issued and outstanding at October 30, 2016	685	681
Additional paid-in capital	545,019	541,093
Retained earnings	180,004	176,260
Accumulated other comprehensive income (loss)	<u>4,171</u>	<u>(7,671)</u>
Total Photronics, Inc. shareholders' equity	729,879	710,363
Noncontrolling interests	<u>114,875</u>	<u>115,111</u>
Total equity	844,754	825,474
Total liabilities and equity	<u>\$ 1,015,571</u>	<u>\$ 987,988</u>

See accompanying notes to condensed consolidated financial statements.

PHOTRONICS, INC. AND SUBSIDIARIES
Condensed Consolidated Statements of Income
(in thousands, except per share amounts)
(unaudited)

	<u>Three Months Ended</u>		<u>Six Months Ended</u>	
	<u>April 30, 2017</u>	<u>May 1, 2016</u>	<u>April 30, 2017</u>	<u>May 1, 2016</u>
Net sales	\$ 108,297	\$ 122,923	\$ 218,128	\$ 252,879
Costs and expenses:				
Cost of sales	(88,140)	(91,636)	(174,973)	(186,156)
Selling, general and administrative	(10,894)	(11,024)	(21,764)	(23,222)
Research and development	<u>(3,726)</u>	<u>(5,447)</u>	<u>(7,212)</u>	<u>(11,148)</u>
Operating income	5,537	14,816	14,179	32,353
Other income (expense):				
Interest and other income (expense), net	(3,073)	(2,025)	(4,596)	27
Interest expense	(549)	(964)	(1,108)	(2,138)
Gain on sale of investment	<u>-</u>	<u>-</u>	<u>-</u>	<u>8,785</u>
Income before income tax benefit (provision)	1,915	11,827	8,475	39,027
Income tax benefit (provision)	<u>(431)</u>	<u>2,326</u>	<u>(2,481)</u>	<u>(1,374)</u>
Net income	1,484	14,153	5,994	37,653
Net (income) loss attributable to noncontrolling interests	<u>313</u>	<u>(2,299)</u>	<u>(2,250)</u>	<u>(4,797)</u>
Net income attributable to Photronics, Inc. shareholders	<u>\$ 1,797</u>	<u>\$ 11,854</u>	<u>\$ 3,744</u>	<u>\$ 32,856</u>
Earnings per share:				
Basic	<u>\$ 0.03</u>	<u>\$ 0.18</u>	<u>\$ 0.05</u>	<u>\$ 0.49</u>
Diluted	<u>\$ 0.03</u>	<u>\$ 0.16</u>	<u>\$ 0.05</u>	<u>\$ 0.44</u>
Weighted-average number of common shares outstanding:				
Basic	<u>68,426</u>	<u>67,372</u>	<u>68,301</u>	<u>67,090</u>
Diluted	<u>69,385</u>	<u>77,516</u>	<u>69,277</u>	<u>78,326</u>

See accompanying notes to condensed consolidated financial statements.

PHOTRONICS, INC. AND SUBSIDIARIES
Condensed Consolidated Statements of Comprehensive Income
(in thousands)
(unaudited)

	<u>Three Months Ended</u>		<u>Six Months Ended</u>	
	<u>April 30,</u> <u>2017</u>	<u>May 1,</u> <u>2016</u>	<u>April 30,</u> <u>2017</u>	<u>May 1,</u> <u>2016</u>
Net income	\$ 1,484	\$ 14,153	\$ 5,994	\$ 37,653
Other comprehensive income, net of tax of \$0:				
Foreign currency translation adjustments	18,308	23,811	17,675	2,735
Amortization of cash flow hedge	<u>32</u>	<u>32</u>	<u>64</u>	<u>64</u>
Net other comprehensive income	<u>18,340</u>	<u>23,843</u>	<u>17,739</u>	<u>2,799</u>
Comprehensive income	19,824	37,996	23,733	40,452
Less: comprehensive income attributable to noncontrolling interests	<u>4,326</u>	<u>6,983</u>	<u>8,147</u>	<u>5,870</u>
Comprehensive income attributable to Photronics, Inc. shareholders	<u>\$ 15,498</u>	<u>\$ 31,013</u>	<u>\$ 15,586</u>	<u>\$ 34,582</u>

See accompanying notes to condensed consolidated financial statements.

PHOTRONICS, INC. AND SUBSIDIARIES
Condensed Consolidated Statements of Cash Flows
(in thousands)
(unaudited)

	Six Months Ended	
	April 30, 2017	May 1, 2016
Cash flows from operating activities:		
Net income	\$ 5,994	\$ 37,653
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	42,378	40,832
Gain on sale of investment	-	(8,785)
Changes in assets and liabilities:		
Accounts receivable	4,204	6,499
Inventories	(1,506)	(256)
Other current assets	2,103	3,095
Accounts payable, accrued liabilities, and other	(6,266)	(13,899)
Net cash provided by operating activities	46,907	65,139
Cash flows from investing activities:		
Purchases of property, plant and equipment	(14,152)	(34,928)
Acquisition of business	(5,400)	-
Proceeds from sale of investment	167	8,785
Other	(462)	193
Net cash used in investing activities	(19,847)	(25,950)
Cash flows from financing activities:		
Repayments of long-term borrowings	(2,695)	(54,951)
Proceeds from share-based arrangements	2,311	3,046
Other	(23)	(19)
Net cash used in financing activities	(407)	(51,924)
Effect of exchange rate changes on cash and cash equivalents	4,997	846
Net increase (decrease) in cash and cash equivalents	31,650	(11,889)
Cash and cash equivalents at beginning of period	314,074	205,867
Cash and cash equivalents at end of period	\$ 345,724	\$ 193,978
Supplemental disclosure of non-cash information:		
Accrual for property, plant and equipment purchased during the period	\$ 11,409	\$ 3,297
Subsidiary dividend payable	\$ 8,383	\$ 11,901

See accompanying notes to condensed consolidated financial statements.

PHOTRONICS, INC. AND SUBSIDIARIES
Notes to Condensed Consolidated Financial Statements
Three Months and Six Months Ended April 30, 2017 and May 1, 2016
(unaudited)
(in thousands, except share amounts and per share data)

NOTE 1 - BASIS OF FINANCIAL STATEMENT PRESENTATION

Photronics, Inc. and its subsidiaries (“Photronics”, “the Company”, “we”, “our”, or “us”) is one of the world’s leading manufacturers of photomasks, which are high precision photographic quartz plates containing microscopic images of electronic circuits. Photomasks are a key element in the manufacture of semiconductors and flat panel displays (“FPDs”), and are used as masters to transfer circuit patterns onto semiconductor wafers and flat panel substrates during the fabrication of integrated circuits (“ICs”) and a variety of FPDs and, to a lesser extent, other types of electrical and optical components. The Company currently operates principally from nine manufacturing facilities, two of which are located in Europe, three in Taiwan, one in Korea, and three in the United States. In May 2017 the Company announced that it had entered into an agreement to form a joint venture that would be based in Xiamen, China. Please refer to Note 15 for additional information.

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America for interim financial information and with the instructions to Form 10-Q and Article 10 of Regulation S-X. Accordingly, they do not include all of the information and footnotes required by accounting principles generally accepted in the United States of America for annual financial statements. All intercompany accounts and transactions have been eliminated in consolidation. In the opinion of management, adjustments, all of which are of a normal recurring nature, considered necessary for a fair presentation have been included. The Company is typically impacted during its first fiscal quarter by the North American and European holiday periods, as some customers reduce their effective workdays and orders during these periods. Additionally, the Company can be impacted during its first or second quarter by the Asian New Year holiday period, which may also reduce customer orders. Operating results for the interim period are not necessarily indicative of the results that may be expected for the fiscal year ending October 29, 2017. For further information, refer to the consolidated financial statements and notes thereto included in the Company’s Annual Report on Form 10-K for the year ended October 30, 2016.

NOTE 2 - CHANGES IN EQUITY

The following tables set forth the Company’s consolidated changes in equity for the three and six month periods ended April 30, 2017 and May 1, 2016:

	Three Months Ended April 30, 2017						
	Photronics, Inc. Shareholders						
	Common Stock		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Non- controlling Interests	Total Equity
Shares	Amount						
Balance at January 30, 2017	68,333	\$ 683	\$ 543,116	\$ 178,207	\$ (9,530)	\$ 118,932	\$ 831,408
Net income (loss)	-	-	-	1,797	-	(313)	1,484
Other comprehensive income	-	-	-	-	13,701	4,639	18,340
Sale of common stock through employee stock option and purchase plans	148	2	982	-	-	-	984
Restricted stock awards vesting and expense	15	-	431	-	-	-	431
Share-based compensation expense	-	-	490	-	-	-	490
Subsidiary dividend payable	-	-	-	-	-	(8,383)	(8,383)
Balance at April 30, 2017	68,496	\$ 685	\$ 545,019	\$ 180,004	\$ 4,171	\$ 114,875	\$ 844,754

Three Months Ended May 1, 2016
Photronics, Inc. Shareholders

	<u>Common Stock</u>		<u>Additional Paid-in Capital</u>	<u>Retained Earnings</u>	<u>Accumulated Other Comprehensive Loss</u>	<u>Non- controlling Interests</u>	<u>Total Equity</u>
	<u>Shares</u>	<u>Amount</u>					
Balance at February 1, 2016	67,081	\$ 671	\$ 529,337	\$ 151,062	\$ (28,005)	\$ 114,398	\$ 767,463
Net income	-	-	-	11,854	-	2,299	14,153
Other comprehensive income	-	-	-	-	19,159	4,684	23,843
Sale of common stock through employee stock option and purchase plans	130	1	799	-	-	-	800
Restricted stock awards vesting and expense	15	-	313	-	-	-	313
Share-based compensation expense	-	-	663	-	-	-	663
Conversion of debt to common stock	717	7	7,431	-	-	-	7,438
Repurchase of common stock of subsidiary	-	-	(8)	-	-	8	-
Subsidiary dividend payable	-	-	-	-	-	(11,901)	(11,901)
Balance at May 1, 2016	<u>67,943</u>	<u>\$ 679</u>	<u>\$ 538,535</u>	<u>\$ 162,916</u>	<u>\$ (8,846)</u>	<u>\$ 109,488</u>	<u>\$ 802,772</u>

Six Months Ended April 30, 2017
Photronics, Inc. Shareholders

	<u>Common Stock</u>		<u>Additional Paid-in Capital</u>	<u>Retained Earnings</u>	<u>Accumulated Other Comprehensive Income (Loss)</u>	<u>Non- controlling Interests</u>	<u>Total Equity</u>
	<u>Shares</u>	<u>Amount</u>					
Balance at October 31, 2016	68,080	\$ 681	\$ 541,093	\$ 176,260	\$ (7,671)	\$ 115,111	\$ 825,474
Net income	-	-	-	3,744	-	2,250	5,994
Other comprehensive income	-	-	-	-	11,842	5,897	17,739
Sale of common stock through employee stock option and purchase plans	323	3	2,068	-	-	-	2,071
Restricted stock awards vesting and expense	93	1	728	-	-	-	729
Share-based compensation expense	-	-	1,130	-	-	-	1,130
Subsidiary dividend payable	-	-	-	-	-	(8,383)	(8,383)
Balance at April 30, 2017	<u>68,496</u>	<u>\$ 685</u>	<u>\$ 545,019</u>	<u>\$ 180,004</u>	<u>\$ 4,171</u>	<u>\$ 114,875</u>	<u>\$ 844,754</u>

Six Months Ended May 1, 2016
Photronics, Inc. Shareholders

	Common Stock		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Loss	Non- controlling Interests	Total Equity
	Shares	Amount					
Balance at November 2, 2015	66,602	\$ 666	\$ 526,401	\$ 130,060	\$ (10,572)	\$ 115,511	\$ 762,066
Net income	-	-	-	32,856	-	4,797	37,653
Other comprehensive income	-	-	-	-	1,726	1,073	2,799
Sale of common stock through employee stock option and purchase plans	514	5	2,839	-	-	-	2,844
Restricted stock awards vesting and expense	110	1	563	-	-	-	564
Share-based compensation expense	-	-	1,309	-	-	-	1,309
Conversion of debt to common stock	717	7	7,431	-	-	-	7,438
Repurchase of common stock of subsidiary	-	-	(8)	-	-	8	-
Subsidiary dividend payable	-	-	-	-	-	(11,901)	(11,901)
Balance at May 1, 2016	<u>67,943</u>	<u>\$ 679</u>	<u>\$ 538,535</u>	<u>\$ 162,916</u>	<u>\$ (8,846)</u>	<u>\$ 109,488</u>	<u>\$ 802,772</u>

NOTE 3 - INVENTORIES

Inventories are stated at the lower of cost, determined under the first-in, first-out (“FIFO”) method, or market. Presented below are the components of inventory at the balance sheet dates:

	<u>April 30, 2017</u>	<u>October 30, 2016</u>
Finished goods	\$ 74	\$ 142
Work in process	3,692	2,987
Raw materials	<u>20,771</u>	<u>18,952</u>
	<u>\$ 24,537</u>	<u>\$ 22,081</u>

NOTE 4 - PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment consist of the following:

	<u>April 30, 2017</u>	<u>October 30, 2016</u>
Land	\$ 9,732	\$ 8,036
Buildings and improvements	123,194	121,873
Machinery and equipment	1,514,409	1,475,755
Leasehold improvements	20,106	19,224
Furniture, fixtures and office equipment	13,045	12,700
Construction in progress	<u>35,443</u>	<u>23,961</u>
	1,715,929	1,661,549
Less accumulated depreciation and amortization	<u>1,212,029</u>	<u>1,155,115</u>
	<u>\$ 503,900</u>	<u>\$ 506,434</u>

Equipment under capital leases are included in above property, plant and equipment as follows:

	<u>April 30,</u> <u>2017</u>	<u>October 30,</u> <u>2016</u>
Machinery and equipment	\$ 34,917	\$ 34,917
Less accumulated amortization	<u>12,098</u>	<u>10,352</u>
	<u>\$ 22,819</u>	<u>\$ 24,565</u>

Depreciation and amortization expense for property, plant and equipment was \$20.1 million and \$39.8 million for the three and six month periods ended April 30, 2017, respectively, and \$18.9 million and \$38.0 million for the three and six month periods ended May 1, 2016, respectively.

During the three month period ended January 29, 2017, the Company acquired a business comprised of manufacturing assets and certain intellectual property, that enables the Company to expand its manufacturing capability, primarily in large area masks for IC, for approximately \$5.7 million, including a \$0.3 million holdback payable one year from the acquisition date. The transaction was accounted for in accordance with ASC 805, "Business Combinations", with substantially all of the purchase price being allocated to long-lived assets that will be depreciated over five years.

During the three month period ended January 29, 2017, the Company entered into a noncash transaction with a customer which resulted in the acquisition of equipment with a fair value of approximately \$2.8 million and \$5.0 million in the three and six month periods ended April 30, 2017, respectively.

NOTE 5 - JOINT VENTURE, TECHNOLOGY LICENSE AND OTHER AGREEMENTS WITH MICRON TECHNOLOGY, INC.

In May 2006 Photronics and Micron Technology, Inc. ("Micron") entered into the MP Mask joint venture ("MP Mask"), which developed and produced photomasks for leading-edge and advanced next generation semiconductors. At the time of the formation of the joint venture, the Company also entered into an agreement to license photomask technology developed by Micron, as well as, certain supply agreements. In May 2016 the Company sold its investment in MP Mask to Micron for \$93.1 million and recorded a gain on the sale of \$0.1 million. On that same date a supply agreement commenced between the Company and Micron, which provided that we would be the majority outsourced supplier of Micron's photomasks and related services. The supply agreement had a one year term and expired in May 2017. In addition, the Company forevermore has the right to use technology under the prior technology license agreement.

This joint venture was a variable interest entity ("VIE") (as that term is defined in ASC 810) because all costs of the joint venture were passed on to the Company and Micron through purchase agreements they had entered into with the joint venture, and it was dependent upon the Company and Micron for any additional cash requirements. On a quarterly basis the Company reassessed whether its interest in MP Mask gave it a controlling financial interest in this VIE. The purpose of this quarterly reassessment was to identify the primary beneficiary (which is defined in ASC 810 as the entity that consolidates a VIE) of the VIE. As a result of the reassessments in fiscal year 2016, the Company determined that Micron remained the primary beneficiary of the VIE, by virtue of its tie-breaking voting rights within MP Mask's Board of Managers, thereby having given it the power to direct the activities of MP Mask that most significantly impacted its economic performance, including its decision making authority in the ordinary course of business and its purchasing the majority of products produced by the VIE.

The Company utilized MP Mask for both high-end IC photomask production and research and development purposes. MP Mask charged its variable interest holders based on their actual usage of its facility. MP Mask separately charged for any research and development activities it engaged in at the requests of its owners. The Company recorded cost of sales of \$2.7 million and \$4.9 million and research and development expenses of \$0.2 million and \$0.5 million during the three and six month periods ended May 1, 2016.

The Company recorded a loss of \$0.1 million related to its investment in the six month period ended May 1, 2016. Income or loss from the VIE is included in "Interest and other income (expense), net" in the condensed consolidated statements of income.

NOTE 6 - LONG-TERM BORROWINGS

Long-term borrowings consist of the following:

	<u>April 30, 2017</u>	<u>October 30, 2016</u>
3.25% convertible senior notes due in April 2019	\$ 57,279	\$ 57,221
2.77% capital lease obligation payable through July 2018	7,371	10,067
	<u>64,650</u>	<u>67,288</u>
Less current portion	5,503	5,428
	<u>\$ 59,147</u>	<u>\$ 61,860</u>

The Company's credit facility, which expires in December 2018, has a \$50 million limit with an expansion capacity to \$75 million, and is secured by substantially all of the Company's assets located in the United States and common stock the Company owns in certain of its foreign subsidiaries. The credit facility stipulates that we may not pay cash dividends on Photronics, Inc. stock, and is subject to a minimum interest coverage ratio, total leverage ratio and minimum unrestricted cash balance financial covenants, all of which the Company was in compliance with at April 30, 2017. The Company had no outstanding borrowings against the credit facility at April 30, 2017, and \$50 million was available for borrowing. The interest rate on the credit facility (2.24% at April 30, 2017) is based on the Company's total leverage ratio at LIBOR plus a spread, as defined in the credit facility. In May 2017 the credit facility was amended to add certain covenants for our new joint venture in China and other potential investments. See Note 15 for additional discussion of our new joint venture in China.

The Company adopted Accounting Standard Update ("ASU" or "Update") 2015-03 "Simplifying the Presentation of Debt Issuance Costs" in the first quarter of its 2017 fiscal year. This ASU requires debt issuance costs related to a recognized debt liability to be presented in the balance sheet as a direct reduction from that debt liability, consistent with the presentation of a debt discount. We adopted this ASU on a retrospective basis, as a result of which our October 30, 2016, condensed consolidated balance sheet and its related long-term borrowings note have been adjusted, as necessary, to reflect this Update's adoption. The effect on our October 30, 2016, condensed consolidated balance sheet is presented below.

<u>Line Item</u>	<u>Previously Reported</u>	<u>Change Due to Adoption</u>	<u>Retrospectively Adjusted</u>
Other Assets	\$ 4,071	\$ (279)	\$ 3,792
Long-term Borrowings	\$ 62,139	\$ (279)	\$ 61,860

In January 2015 the Company privately exchanged \$57.5 million in aggregate principal amount of its 3.25% convertible senior notes with a maturity date of April 1, 2016, for new 3.25% convertible senior notes with an aggregate principal amount of \$57.5 million with a maturity date of April 1, 2019. The conversion rate of the new notes is the same as that of the exchanged notes, which were issued in March 2011 with a conversion rate of approximately 96 shares of common stock per \$1,000 note principal, equivalent to a conversion price of \$10.37 per share of common stock, and is subject to adjustment upon the occurrence of certain events, which are described in the indenture dated January 22, 2015. Note holders may convert each \$1,000 principal amount of notes at any time prior to the close of business on the second scheduled trading day immediately preceding April 1, 2019, and the Company is not required to redeem the notes prior to their maturity date. Interest on the notes accrues in arrears, and is paid semiannually through the notes' maturity date.

In August 2013 a \$26.4 million principal amount, five year capital lease commenced to fund the purchase of a high-end lithography tool. Payments under the capital lease, which bears interest at 2.77%, are \$0.5 million per month through July 2018. Under the terms of the lease agreement, the Company must maintain the equipment in good working order, and is subject to a cross default with cross acceleration provision related to certain nonfinancial covenants incorporated in its credit facility. As of April 30, 2017, the total amount payable through the end of the lease term was \$7.5 million, of which \$7.4 million represented principal and \$0.1 million represented interest.

NOTE 7 - SHARE-BASED COMPENSATION

In March 2016, shareholders approved a new equity incentive compensation plan (the “Plan”), under which incentive stock options, non-qualified stock options, stock grants, stock-based awards, restricted stock, restricted stock units, stock appreciation rights, performance units, performance stock, and other stock or cash awards may be granted. Shares to be issued under the Plan may be authorized and unissued shares, issued shares that have been reacquired by the Company (in the open-market or in private transactions), shares that are being held in the treasury, or a combination thereof. The maximum number of shares of common stock approved that may be issued under the Plan is four million shares. Awards may be granted to officers, employees, directors, consultants, advisors, and independent contractors of the Company or its subsidiaries. In the event of a change in control (as defined in the Plan), the vesting of awards may be accelerated. Total share-based compensation costs for the three and six month periods ended April 30, 2017, were \$0.9 million and \$1.9 million, respectively, and \$1.0 million and \$1.9 million for the three and six month periods ended May 1, 2016, respectively. The Company received cash from option exercises of \$1.0 million and \$2.1 million for the three and six month periods ended April 30, 2017, respectively, and \$0.9 million and \$2.8 million for the three and six month periods ended May 1, 2016, respectively. No share-based compensation cost was capitalized as part of an asset and no related income tax benefits were recorded during the periods presented.

Stock Options

Option awards generally vest in one to four years, and have a ten-year contractual term. All incentive and non-qualified stock option grants have an exercise price no less than the market value of the underlying common stock on the date of grant. The grant date fair values of options are based on closing prices of the Company’s common stock on the dates of grant using the Black-Scholes option pricing model. Expected volatility is based on the historical volatility of the Company’s stock. The Company uses historical option exercise behavior and employee termination data to estimate expected term, which represents the period of time that the options granted are expected to remain outstanding. The risk-free rate of return for the estimated term of the option is based on the U.S. Treasury yield curve in effect at the date of grant.

The weighted-average inputs and risk-free rate of return ranges used to calculate the grant date fair value of options issued during the three and six month periods ended April 30, 2017 and May 1, 2016, are presented in the following table.

	Three Months Ended		Six Months Ended	
	April 30, 2017	May 1, 2016	April 30, 2017	May 1, 2016
Volatility	31.6%	39.8%	32.2%	49.5%
Risk free rate of return	2.0%	1.4%	1.9-2.0%	1.4-1.7%
Dividend yield	0.0%	0.0%	0.0%	0.0%
Expected term	5.0 years	5.1 years	5.0 years	5.1 years

Information on outstanding and exercisable option awards as of April 30, 2017, is presented below.

Options	Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life	Aggregate Intrinsic Value
Outstanding at April 30, 2017	3,458,835	\$ 7.96	6.3 years	\$ 12,572
Exercisable at April 30, 2017	2,176,719	\$ 6.49	5.0 years	\$ 10,997

There were 10,000 share options granted during the three month period ended April 30, 2017, with a grant date fair value of \$3.35 per share and 23,000 share options granted during the three month period ended May 1, 2016, with a weighted-average grant date fair value of \$3.74 per share. There were 348,750 share options granted during the six month period ended April 30, 2017, with a weighted-average grant date fair value of \$3.59 per share and 602,250 share options granted during the six month period ended May 1, 2016, with a weighted-average grant date fair value of \$4.63 per share. As of April 30, 2017, the total unrecognized compensation cost related to unvested option awards was approximately \$4.2 million. That cost is expected to be recognized over a weighted-average amortization period of 2.5 years.

Restricted Stock

The fair value of restricted stock awards is based on the Company's closing stock price on the date of grant. The restrictions on these awards typically lapse over a service period of less-than-one to four years. There were 25,000 restricted stock awards granted during the three month period ended April 30, 2017, with a grant date fair value of \$10.75, and 285,000 restricted stock awards granted during the six month period ended April 30, 2017, with a weighted-average grant date fair value of \$11.30 per share. No restricted stock awards were granted during the three month period ended May 1, 2016 and 115,225 restricted stock awards were granted during the six month period ended May 1, 2016, with a weighted-average grant date fair value of \$12.13 per share. As of April 30, 2017, the total compensation cost not yet recognized related to unvested restricted stock awards was approximately \$3.3 million. That cost is expected to be recognized over a weighted-average amortization period of 3.0 years. As of April 30, 2017, there were 344,094 shares of restricted stock outstanding.

NOTE 8 - INCOME TAXES

The effective tax rate differs from the U.S. statutory rate of 35% in the three and six month periods ended April 30, 2017 and May 1, 2016, primarily due to earnings being taxed at lower statutory rates in foreign jurisdictions, combined with the benefit of various investment credits in a foreign jurisdiction. Valuation allowances in jurisdictions with historic losses eliminate the tax benefit of these jurisdictions.

As of May 1, 2016, the Company determined that deferred tax assets of \$2.5 million, whose realization was previously not considered to be more likely than not, are realizable and, therefore, reduced their related valuation allowance. During the three month period ended May 1, 2016, the Company realized a \$2.4 million benefit, which resulted from the reversal of a previously recorded undistributed earnings tax liability in a foreign jurisdiction. As a result of a shareholder action to approve a dividend in this jurisdiction, the Company determined that it is no longer liable for this tax. In addition, during April 2016, \$0.7 million of withholding tax was incurred upon the completion of a foreign subsidiary's share redemption.

Unrecognized tax benefits related to uncertain tax positions were \$4.2 million at April 30, 2017 and \$4.6 million at October 30, 2016, all of which, if recognized, would favorably impact the Company's effective tax rate. Accrued interest and penalties related to unrecognized tax benefits was \$0.1 million at April 30, 2017 and October 30, 2016. In the six month period ended April 30, 2017, the net reduction of unrecognized tax benefit reflects the resolution of tax issues with the foreign tax authorities including the recognition of \$0.5 million in previously unrecognized tax benefits. Although the timing of the expirations of statutes of limitations may be uncertain, as they can be dependent upon the settlement of tax audits, the Company believes that it is reasonably possible that up to \$0.8 million of its uncertain tax positions (including accrued interest and penalties, and net of tax benefits) may be resolved over the next twelve months. The resolution of these uncertain tax positions may result from either or both the lapses of statutes of limitations and tax settlements.

PKLT Co. Ltd., the Company's FPD manufacturing facility in Taiwan, has been accorded a tax holiday, which started in 2012 and expires in 2017. This tax holiday had no dollar or per share effect in the three or six month periods ended April 30, 2017 and May 1, 2016. Photronics DNP Mask Corporation ("PDMC"), the Company's IC manufacturing facility in Taiwan, was accorded a tax holiday that commenced in 2015 and expires in 2019. The Company realized \$0.1 million in tax benefits from this tax holiday in each of the three month periods ended April 30, 2017 and May 1, 2016, and \$0.2 million in the six month periods ended April 30, 2017 and May 1, 2016. This tax holiday had no per share effect in the three and six month periods ended April 30, 2017 and May 1, 2016.

NOTE 9 - EARNINGS PER SHARE

The calculation of basic and diluted earnings per share is presented below.

	Three Months Ended		Six Months Ended	
	April 30, 2017	May 1, 2016	April 30 2017	May 1, 2016
Net income attributable to Photonics, Inc. shareholders	\$ 1,797	\$ 11,854	\$ 3,744	\$ 32,856
Effect of dilutive securities:				
Interest expense on convertible notes, net of tax	-	875	-	1,946
Earnings for diluted earnings per share	<u>\$ 1,797</u>	<u>\$ 12,729</u>	<u>\$ 3,744</u>	<u>\$ 34,802</u>
Weighted-average common shares computations:				
Weighted-average common shares used for basic earnings per share	68,426	67,372	68,301	67,090
Effect of dilutive securities:				
Share-based payment awards	959	948	976	1,096
Convertible notes	-	9,196	-	10,140
Potentially dilutive common shares	<u>959</u>	<u>10,144</u>	<u>976</u>	<u>11,236</u>
Weighted-average common shares used for diluted earnings per share	<u>69,385</u>	<u>77,516</u>	<u>69,277</u>	<u>78,326</u>
Basic earnings per share	\$ 0.03	\$ 0.18	\$ 0.05	\$ 0.49
Diluted earnings per share	\$ 0.03	\$ 0.16	\$ 0.05	\$ 0.44

The table below shows the outstanding weighted-average share-based payment awards that were excluded from the calculation of diluted earnings per share because their exercise price exceeded the average market value of the common shares for the period or, under application of the treasury stock method, they were otherwise determined to be anti-dilutive. The table also shows convertible notes that, if converted, would have been anti-dilutive.

	Three Months Ended		Six Months Ended	
	April 30, 2017	May 1, 2016	April 30, 2017	May 1, 2016
Convertible notes	5,542	-	5,542	-
Share-based payment awards	1,082	2,160	1,038	1,414
Total potentially dilutive shares excluded	<u>6,624</u>	<u>2,160</u>	<u>6,580</u>	<u>1,414</u>

NOTE 10 - CHANGES IN ACCUMULATED OTHER COMPREHENSIVE INCOME BY COMPONENT

The following tables set forth the changes in the Company's accumulated other comprehensive income by component (net of tax of \$0) for the three and six month periods ended April 30, 2017 and May 1, 2016.

	Three Months Ended April 30, 2017			
	Foreign Currency Translation Adjustments	Amortization of Cash Flow Hedge	Other	Total
Balance at January 30, 2017	\$ (8,448)	\$ (145)	\$ (937)	\$ (9,530)
Other comprehensive income (loss) before reclassifications	18,382	-	(74)	18,308
Amounts reclassified from accumulated other comprehensive income	-	32	-	32
Net current period other comprehensive income (loss)	18,382	32	(74)	18,340
Less: other comprehensive (income) loss attributable to noncontrolling interests	(4,676)	-	37	(4,639)
Balance at April 30, 2017	<u>\$ 5,258</u>	<u>\$ (113)</u>	<u>\$ (974)</u>	<u>\$ 4,171</u>

	Three Months Ended May 1, 2016			
	Foreign Currency Translation Adjustments	Amortization of Cash Flow Hedge	Other	Total
Balance at February 1, 2016	\$ (27,118)	\$ (274)	\$ (613)	\$ (28,005)
Other comprehensive income (loss) before reclassifications	23,861	-	(50)	23,811
Amounts reclassified from accumulated other comprehensive income	-	32	-	32
Net current period other comprehensive income (loss)	23,861	32	(50)	23,843
Less: other comprehensive (income) loss attributable to noncontrolling interests	(4,709)	-	25	(4,684)
Balance at May 1, 2016	<u>\$ (7,966)</u>	<u>\$ (242)</u>	<u>\$ (638)</u>	<u>\$ (8,846)</u>

	Six Months Ended April 30, 2017			
	Foreign Currency Translation Adjustments	Amortization of Cash Flow Hedge	Other	Total
Balance at October 31, 2016	\$ (6,567)	\$ (177)	\$ (927)	\$ (7,671)
Other comprehensive income (loss) before reclassifications	17,768	-	(93)	17,675
Amounts reclassified from accumulated other comprehensive income	-	64	-	64
Net current period other comprehensive income (loss)	17,768	64	(93)	17,739
Less: other comprehensive (income) loss attributable to noncontrolling interests	(5,943)	-	46	(5,897)
Balance at April 30, 2017	<u>\$ 5,258</u>	<u>\$ (113)</u>	<u>\$ (974)</u>	<u>\$ 4,171</u>

	Six Months Ended May 1, 2016			
	Foreign Currency Translation Adjustments	Amortization of Cash Flow Hedge	Other	Total
Balance at November 2, 2015	\$ (9,634)	\$ (306)	\$ (633)	\$ (10,573)
Other comprehensive income (loss) before reclassifications	2,746	-	(11)	2,735
Amounts reclassified from accumulated other comprehensive income	-	64	-	64
Net current period other comprehensive income (loss)	2,746	64	(11)	2,799
Less: other comprehensive (income) loss attributable to noncontrolling interests	(1,078)	-	6	(1,072)
Balance at May 1, 2016	<u>\$ (7,966)</u>	<u>\$ (242)</u>	<u>\$ (638)</u>	<u>\$ (8,846)</u>

The amortization of the cash flow hedge is included in cost of sales in the condensed consolidated statements of income for all periods presented.

NOTE 11 - FAIR VALUE MEASUREMENTS

The accounting framework for determining fair value includes a hierarchy for ranking the quality and reliability of the information used to measure fair value, which enables the reader of the financial statements to assess the inputs used to develop those measurements. The fair value hierarchy consists of three tiers as follows: Level 1, defined as quoted market prices (unadjusted) in active markets for identical securities; Level 2, defined as inputs other than Level 1 that are observable, either directly or indirectly; and Level 3, defined as unobservable inputs that are not corroborated by market data.

The Company did not have any assets or liabilities measured at fair value, on a recurring or a nonrecurring basis, at April 30, 2017 or October 30, 2016. In connection with the acquisition discussed in Note 4, the Company recorded and measured the assets acquired at fair value.

Fair Value of Other Financial Instruments

The fair values of the Company's cash and cash equivalents (Level 1 measurements), accounts receivable, accounts payable, and certain other current assets and current liabilities (Level 2 measurements) approximate their carrying value due to their short-term maturities. The fair value of the Company's convertible senior notes is a Level 2 measurement, as they were determined using inputs that were either observable market data, or could be derived from or corroborated with observable market data. These inputs included the Company's stock price and interest rates offered on debt issued by entities with credit ratings similar to that of the Company's.

The table below presents the fair and carrying values of the Company's convertible senior notes at April 30, 2017 and October 30, 2016.

	April 30, 2017		October 30, 2016	
	Fair Value	Carrying Value	Fair Value	Carrying Value
3.25% convertible senior notes due 2019	\$ 72,663	\$ 57,279	\$ 68,230	\$ 57,221

NOTE 12 - COMMITMENTS AND CONTINGENCIES

As of April 30, 2017, the Company had commitments outstanding for capital equipment expenditures of approximately \$62 million.

The Company is subject to various claims that arise in the ordinary course of business. The Company believes such claims, individually or in the aggregate, will not have a material effect on its condensed consolidated financial statements.

NOTE 13 - SUBSIDIARY DIVIDEND

In April 2017 PDMC, the Company's majority owned IC subsidiary in Taiwan, declared a dividend of which 49.99%, or approximately \$8.4 million, is expected to be paid to the third party that owns a noncontrolling interest in PDMC.

NOTE 14 - GAIN ON SALE OF INVESTMENT

The Company had a minority interest in a foreign entity. In the first quarter of fiscal year 2016, the Company sold this investment and recognized a gain of \$8.8 million.

NOTE 15 - FORMATION OF PDMCX JOINT VENTURE

In May 2017 the Company announced that it had entered into an agreement with Dai Nippon Printing Co., Ltd. (DNP) to form a joint venture to serve semiconductor manufacturers in China. Under the agreement, PDMC will own 50.01% of the joint venture, which will be named Photronics DNP Mask Corporation Xiamen (PDMCX), and a subsidiary of DNP will own the remaining 49.99%. The financial results of the joint venture will be included in Photronics' consolidated financial statements.

Our previously announced IC investment in China of \$160 million will be based in Xiamen, China. Construction of the facility is currently underway, and production is anticipated to commence by the end of 2018. Photronics and DNP will contribute cash, in proportion to their ownership percentages, over five years to fund the equity portion of the investment. The joint venture, itself, may also fund a portion of the investment with local borrowings. The formation of the joint venture, which is subject to regulatory approvals and customary closing conditions, is expected to be completed by the end of the Company's fiscal year 2017.

NOTE 16 - RECENT ACCOUNTING PRONOUNCEMENTS

In January 2017 the Financial Accounting Standards Board ("FASB") issued ASU 2017-04 "Simplifying the Test for Goodwill Impairment", which eliminates Step 2 of the goodwill impairment test and requires entities to perform their annual or interim goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount, and to recognize an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value. In addition, this ASU eliminates the requirements for any reporting unit with a zero or negative carrying amount to perform a qualitative assessment and, in the event the reporting unit fails the qualitative test, to perform Step 2 of the goodwill impairment test. ASU 2017-04 is effective for the Company in its first quarter of its fiscal year 2021, and should be applied on a prospective basis. The impact of this ASU will depend upon the nature of future acquisitions that the Company may make.

In January 2017 the FASB issued ASU 2017-01 "Clarifying the Definition of a Business", with the objective of adding guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. ASU 2017-01 is effective for the Company in its first quarter of fiscal year 2019, and should be applied on a prospective basis. The impact of this ASU will depend upon the nature of future acquisitions or dispositions that the Company may make.

In November 2016 the FASB issued ASU 2016-18 "Restricted Cash", which requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. ASU 2016-18 is effective for the Company in its first quarter of fiscal year 2019 and should be applied on a retrospective transition basis. Early adoption is permitted, including adoption in an interim period. The Company is currently evaluating the effect this ASU will have on its consolidated financial statements.

In October 2016 the FASB issued ASU 2016-16 "Intra-Entity Transfers of Assets Other Than Inventory", which eliminates the exception of recognizing, at the time of transfer, current and deferred income taxes for intra-entity asset transfers other than inventory. ASU 2016-16 is effective for the Company in its first quarter of fiscal year 2019 and should be applied on a modified retrospective transition basis. Early adoption is permitted as of the beginning of an annual reporting period for which interim or annual financial statements have not been issued or made available for issuance. The Company is currently evaluating the effect this ASU will have on its consolidated financial statements.

In August 2016 the FASB issued ASU 2016-15 "Classification of Certain Cash Receipts and Cash Payments", which addresses eight specific cash flow issues with the objective of reducing diversity in practice. ASU 2016-15 is effective for the Company in its first quarter of fiscal year 2019 and should be applied using a retrospective transition approach. The Company is currently evaluating the effect this ASU will have on its consolidated financial statements.

In June 2016 the FASB issued ASU 2016-13 "Measurement of Credit Losses", the main objective of which is to provide more useful information about expected credit losses on financial instruments and other commitments of an entity to extend credit. In support of this objective, the ASU replaces the incurred loss impairment methodology found in current GAAP with a methodology that reflects expected credit losses and requires consideration of a broader range of reasonable and supportable information to inform credit loss estimates. This ASU requires a cumulative-effect adjustment as of the beginning of the first reporting period in which the guidance is adopted. ASU 2016-13 is effective for the Company in its first quarter of fiscal year 2021, with early adoption permitted beginning in the first quarter of fiscal year 2019. The Company is currently evaluating the effect this ASU will have on its consolidated financial statements.

In March 2016 the FASB issued ASU 2016-09 “Improvements to Employee Share-Based Payment Accounting”, which simplifies the accounting for share-based payment transactions including their income tax consequences, classification as either equity or liability awards, classification on the statement of cash flows, and other areas. The method of adoption varies with the different aspects of the Update. ASU 2016-09 is effective for the Company in its first quarter of fiscal year 2018, with early application permitted. The Company is currently evaluating the effect this ASU will have on its consolidated financial statements.

In February 2016 the FASB issued ASU 2016-02 “Leases (Topic 842)”, which requires lessees to recognize right-of-use assets and corresponding liabilities for all leases with an initial term in excess of twelve months. ASU 2016-02 is to be adopted using a modified retrospective approach, which includes a number of practical expedients, that requires leases to be measured and recognized under the new guidance at the beginning of the earliest period presented. The ASU is effective for the Company in its first quarter of fiscal year 2020, with early application permitted, and the Company is currently evaluating the effect this ASU will have on its consolidated financial statements.

In January 2016 the FASB issued ASU 2016-01 “Recognition and Measurement of Financial Assets and Financial Liabilities”, which provides targeted improvements to the recognition, measurement, presentation and disclosure of financial assets and financial liabilities. Specific accounting areas addressed include, equity investments, financial liabilities reported under the fair value option and valuation allowance assessment resulting from unrealized losses on available-for-sale securities. The ASU also changes certain presentation and disclosure requirements for financial instruments. ASU 2016-01 is to be applied by means of a cumulative effect adjustment to the balance sheet as of the beginning of the fiscal year of adoption. This ASU is effective for the Company in its first quarter of fiscal year 2019. Early adoption, with certain exceptions, is not permitted. The Company is currently evaluating the effect this ASU will have on its consolidated financial statements.

In April 2015 the FASB issued ASU 2015-03 “Simplifying the Presentation of Debt Issuance Costs”, which requires debt issuance costs related to a recognized debt liability to be presented in the balance sheet as a direct deduction from that debt liability, consistent with the presentation of a debt discount. The Company adopted this ASU, and applied it on a retrospective basis, in the first quarter of its 2017 fiscal year. See Note 6 for the effects of its adoption on the Company’s October 30, 2016, condensed consolidated balance sheet.

In May 2014 the FASB issued ASU 2014-09 “Revenue from Contracts with Customers”, which will supersede nearly all existing revenue recognition guidance under accounting principles generally accepted in the United States. The core principle of this ASU is that revenue should be recognized for the amount of consideration expected to be received for promised goods or services transferred to customers. This ASU also requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including significant judgments, and assets recognized for costs incurred to obtain or fulfill a contract. In August 2015 the FASB issued ASU 2015-14 which defers the effective date of ASU 2014-09 by one year and allows entities to early adopt, but no earlier than the original effective date. ASU 2014-09 will now be effective for the Company in its first quarter of fiscal 2019. ASU 2014-09 allows for either full retrospective or modified retrospective adoption. The Company is evaluating the transition method that will be elected and the potential effects of the adoption of ASU 2014-09 on its consolidated financial statements.

Item 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS**Overview**

Management's discussion and analysis ("MD&A") of the Company's financial condition, results of operations and outlook should be read in conjunction with its condensed consolidated financial statements and related notes. Various segments of this MD&A contain forward-looking statements, all of which are presented based on current expectations and may be adversely affected by uncertainties and risk factors (presented throughout this filing and in the Company's Annual Report on Form 10-K for the fiscal 2016 year), that may cause actual results to materially differ from these expectations.

The Company sells substantially all of its photomasks to semiconductor designers and manufacturers, and manufacturers of FPDs. Photomask technology is also being applied to the fabrication of other higher performance electronic products such as photonics, micro-electronic mechanical systems and certain nanotechnology applications. Thus, the Company's selling cycle is tightly interwoven with the development and release of new semiconductor designs and flat panel applications, particularly as it relates to the semiconductor industry's migration to more advanced design methodologies and fabrication processes. The Company believes that the demand for photomasks primarily depends on design activity rather than sales volumes from products manufactured using photomask technologies. Consequently, an increase in semiconductor or FPD sales does not necessarily result in a corresponding increase in photomask sales. However, the reduced use of customized ICs, reductions in design complexity, other changes in the technology or methods of manufacturing or designing semiconductors, or a slowdown in the introduction of new semiconductor or FPD designs could reduce demand for photomasks even if demand for semiconductors and FPDs increases. Advances in semiconductor, FPD and photomask design and semiconductor and FPD production methods could also reduce the demand for photomasks. Historically, the semiconductor industry has been volatile, with sharp periodic downturns and slowdowns. These downturns have been characterized by, among other things, diminished product demand, excess production capacity and accelerated erosion of selling prices.

The global semiconductor industry, including mobile displays, is driven by end markets which have been closely tied to consumer driven applications of high performance semiconductor devices including, but not limited to, mobile communications and computing solutions. The Company is typically required to fulfill its customer orders within a short period of time, sometimes within 24 hours. This results in the Company having a minimal level of backlog orders, typically one to two weeks for IC photomasks and two to three weeks for FPD photomasks. The Company cannot predict the timing of the industry's transition to volume production of next-generation technology nodes or the timing of up and down cycles with precise accuracy, but believes that such transitions and cycles will continue into the future, beneficially and adversely affecting its business, financial condition and operating results as they occur. The Company believes its ability to remain successful in these environments is dependent upon achieving its goals of being a service and technology leader and efficient solutions supplier, which it believes should enable it to continually reinvest in its global infrastructure.

In May 2017 the Company announced that it had entered into an agreement to form a joint venture that would be based in Xiamen, China. Please refer to Note 15 of the condensed consolidated financial statements for additional information.

Material Changes in Results of Operations
Three and Six Months ended April 30, 2017 and May 1, 2016

The following table represents selected operating information expressed as a percentage of net sales.

	Three Months Ended		Six Months Ended	
	April 30, 2017	May 1, 2016	April 30, 2017	May 1, 2016
Net sales	100.0%	100.0%	100.0%	100.0%
Cost of sales	(81.4)	(74.5)	(80.2)	(73.6)
Gross margin	18.6	25.5	19.8	26.4
Selling, general and administrative expenses	(10.1)	(9.0)	(10.0)	(9.2)
Research and development expenses	(3.4)	(4.4)	(3.3)	(4.4)
Operating income	5.1	12.1	6.5	12.8
Other income (expense), net	(3.3)	(2.5)	(2.6)	(0.8)
Gain on sale of investment	-	-	-	3.4
Income before income tax benefit (provision)	1.8	9.6	3.9	15.4
Income tax benefit (provision)	(0.4)	1.9	(1.2)	(0.5)
Net income	1.4	11.5	2.7	14.9
Net (income) loss attributable to noncontrolling interests	0.3	(1.9)	(1.0)	(1.9)
Net income attributable to Photronics, Inc. shareholders	1.7%	9.6%	1.7%	13.0%

Note: All of the following tabular comparisons, unless otherwise indicated, are for the three months ended April 30, 2017 (Q2-17) and May 1, 2016 (Q2-16) and for the six months ended April 30, 2017 (YTD-17) and May 1, 2016 (YTD-16), in millions of dollars.

Net Sales

	Three Months Ended			Six Months Ended		
	Q2-17	Q2-16	Percent Change	YTD-17	YTD-16	Percent Change
IC	\$ 82.6	\$ 90.9	(9.1)%	\$ 169.0	\$ 190.6	(11.3)%
FPD	25.7	32.0	(19.9)%	49.1	62.3	(21.1)%
Total net sales	\$ 108.3	\$ 122.9	(11.9)%	\$ 218.1	\$ 252.9	(13.7)%

Net sales for Q2-17 decreased 11.9% to \$108.3 million as compared with \$122.9 million for Q2-16. The decrease was primarily the result of lower demand for high-end products for both IC and FPD photomasks. Revenues attributable to high-end products decreased by \$19.4 million to \$38.7 million in Q2-17, as compared with \$58.1 million in Q2-16. Net sales for YTD-17 decreased to \$218.1 million as compared with \$252.9 million for YTD-16. This decrease was also the result of weakened demand for both high-end IC and FPD photomasks which, combined, decreased by \$41.8 million to \$81.4 million in YTD-17 as compared with \$123.2 million in YTD-16. High-end photomask applications include mask sets for 45 nanometer and below for IC products, and G8 and above and active matrix organic light-emitting diode (AMOLED) display screen technologies for FPD products.

We saw improving demand across the business during the quarter, and believe these positive trends will continue as we move into the second half of the year. Looking ahead, for IC photomasks, we believe growth in high-end memory products will be driven by increased foundry demand. We expect a shift in our 28 nanometer logic business, as our largest IC customer has obtained approval from the Taiwanese government to commence 28 nanometer node production in China. This customer will be the first volume producer of the High-K metal gate version of 28 nanometer IC in China. As a result, we should see improved high-end logic photomask sales. However, it is difficult to predict with certainty when we will benefit from these developments.

FPD sales increased during Q2-17 and both of our FPD facilities were near full capacity at the end of the quarter. We anticipate that we will continue to operate at or near full capacity over the next several quarters, even as we install and qualify two new writing tools at our FPD facilities. We believe the continuing transition to AMOLED displays for smartphones will be a major driver of this activity.

The Company's quarterly revenues can be affected by the seasonal purchasing of its customers. Demand for the Company's products is typically negatively impacted during the first six months of its fiscal year by the North American, European and Asian holiday periods, as some customers reduce their effective workdays and orders during this period.

The following table presents changes in net sales from Q2-16 to Q2-17 and YTD-16 to YTD-17 by geographic area:

	Q2-16 to Q2-17			YTD-16 to YTD-17		
	Net Sales in Q2-17	Percent Change	Increase (Decrease)	Net Sales in YTD-17	Percent Change	Increase (Decrease)
Taiwan	\$ 42.3	(9.5)%	\$ (4.4)	\$ 88.7	(7.1)%	\$ (6.7)
Korea	30.9	(13.1)%	(4.6)	61.2	(14.5)%	(10.4)
United States	25.9	(17.8)%	(5.6)	49.6	(27.5)%	(18.9)
Europe	8.7	1.5%	0.1	17.4	5.5%	0.9
Other	0.5	(13.2)%	(0.1)	1.2	29.3%	0.3
	<u>\$ 108.3</u>	<u>(11.9)%</u>	<u>\$ (14.6)</u>	<u>\$ 218.1</u>	<u>(13.7)%</u>	<u>\$ (34.8)</u>

Gross Margin

	Three Months Ended			Six Months Ended		
	Q2-17	Q2-16	Percent Change	YTD-17	YTD-16	Percent Change
Gross margin	\$ 20.2	\$ 31.3	(35.6)%	\$ 43.2%	\$ 66.7	(35.3)%
Percentage of net sales	18.6%	25.5%		19.8%	26.4%	

Gross margin percentage decreased to 18.6% in Q2-17 from 25.5% in Q2-16, and to 19.8% in YTD-17 from 26.4% YTD-16. Both of the decreases resulted from the declines in overall sales and sales of high-end products, as a percent of total sales, in the current year periods from their comparative prior year periods. The Company operates in a high fixed cost environment and, to the extent that the Company's revenues and utilization increase or decrease, gross margin will generally be positively or negatively impacted.

Selling, General and Administrative Expenses

	Three Months Ended			Six Months Ended		
	Q2-17	Q2-16	Percent Change	YTD-17	YTD-16	Percent Change
Selling, general and administrative expenses	\$ 10.9	\$ 11.0	(1.2)%	\$ 21.8	\$ 23.2	(6.3)%
Percentage of net sales	10.1%	9.0%		10.0%	9.2%	

Selling, general and administrative expenses did not change significantly in Q2-17 as compared to Q2-16. Year to date, selling, general and administrative expenses decreased 6.3% compared to the prior period, primarily due to lower compensation expenses and professional and other service charges.

Research and Development

	Three Months Ended			Six Months Ended		
	Q2-17	Q2-16	Percent Change	YTD-17	YTD-16	Percent Change
Research and development	\$ 3.7	\$ 5.4	(31.6)%	\$ 7.2	\$ 11.1	(35.3)%
Percentage of net sales	3.4%	4.4%		3.3%	4.4%	

Research and development expenses consist primarily of global development efforts related to high-end process technologies for advanced sub-wavelength reticle solutions for IC technologies. Research and development expenses decreased by \$1.7 million to \$3.7 million in Q2-17, as compared with \$5.4 million in Q2-16. YTD-17 research and development expenses decreased by \$3.9 million to \$7.2 million, as compared with \$11.1 million in YTD-16. These decreases were primarily the result of fewer activities at advanced nanometer technology nodes for IC photomasks, in both the U.S. and Asia.

Other Income (Expense), net

	Three Months Ended		Six Months Ended	
	Q2-17	Q2-16	YTD-17	YTD-16
Interest and other income (expense), net	\$ (3.1)	\$ (2.0)	\$ (4.6)	\$ -
Interest expense	(0.5)	(1.0)	(1.1)	(2.1)
Gain on sale of investment	-	-	-	8.8
Other income (expense), net	<u>\$ (3.6)</u>	<u>\$ (3.0)</u>	<u>\$ (5.7)</u>	<u>\$ 6.7</u>

Interest and other income (expense), net decreased in Q2-17, as compared with Q2-16, by \$1.1 million and decreased \$4.6 million in YTD-17, as compared with YTD-16, as a result of increased unfavorable foreign currency transaction results.

Interest expense decreased by \$0.5 million in Q2-17, as compared with Q2-16, and by \$1.0 million in YTD-17, as compared with YTD-16, primarily as a result of the impact of the 3.25% convertible debt that matured on April 1, 2016.

In January 2016 the Company sold a minority interest investment in a foreign entity and recognized a gain of \$8.8 million.

Income Tax Benefit (Provision)

	Three Months Ended		Six Months Ended	
	Q2-17	Q2-16	YTD-17	YTD-16
Income tax benefit (provision)	\$ (0.4)	\$ 2.3	\$ (2.5)	\$ (1.4)
Effective income tax rate	22.5%	(19.7)%	29.3%	3.5%

The Company's effective income tax rate is sensitive to the jurisdictional mix of earnings, due in part to the non-recognition of tax benefits on losses in jurisdictions with valuation allowances.

The effective income tax rate increased in Q2-17 and YTD-17, as compared with Q2-16 and YTD-16, primarily as a result of the following factors: the recognition in Q2-16 and FY-16 of \$2.5 million of previously unrecognized deferred tax assets, which resulted from the improved performance of the Company's FPD operations; the reversal of previously recognized tax expense of \$2.4 million that was eliminated by a distribution of the FY-15 earnings of a foreign subsidiary to its foreign parent; a higher percentage of income before income taxes, including the \$8.8 million gain on the sale of investment in Q1-16, generated in jurisdictions where the company previously incurred losses that, due to valuation allowances, did not result in the Company recognizing expense. These positive factors were offset in part by the accrual of \$0.7 million of withholding taxes related to a foreign subsidiary's share redemption in a foreign jurisdiction. As of each reporting date, the Company considers new evidence, both positive and negative, that could impact management's view with regards to the future realizations of deferred tax assets.

Net (Income) Loss Attributable to Noncontrolling Interests

Net (income) loss attributable to noncontrolling interests decreased \$2.6 million to \$0.3 million in Q2-17, as compared with \$(2.3) million in Q2-16, and decreased by \$2.5 million to \$(2.3) million in YTD-17, as compared with \$(4.8) million in YTD-16, as a result of decreased net income of the Company's IC manufacturing facility in Taiwan.

Liquidity and Capital Resources

The Company's working capital increased to \$380.5 million at April 30, 2017, as compared with \$360.3 million at October 30, 2016. Cash and cash equivalents increased to \$345.7 million at April 30, 2017, as compared with \$314.1 million at October 30, 2016. Both of these increases were primarily due to cash generated from operating activities. Net cash provided by operating activities was \$46.9 million for the six month period ended April 30, 2017, as compared with \$65.1 million for the six month period ended May 1, 2016, with the decrease being primarily due to decreased net income. Net cash used in investing activities for the six month period ended April 30, 2017, was \$19.8 million, which was comprised primarily of capital expenditure payments and, to a lesser extent, a payment to acquire a business. Net cash used in financing activities of \$0.4 million for the six month period ended April 30, 2017, was comprised of repayments of long-term borrowings of \$2.7 million, partially offset by proceeds of \$2.3 million received from exercises of employee stock options. The Company may use its available cash for operations, capital expenditures, debt repayments, strategic opportunities, stock repurchases or other corporate uses, any of which may be material.

As of April 30, 2017 and October 30, 2016, the Company's total cash and cash equivalents include \$184.3 million and \$141.4 million, respectively, held by its foreign subsidiaries. The majority of earnings of the Company's foreign subsidiaries are considered to be indefinitely reinvested. The repatriation of these funds to the U.S. may subject these funds to U.S. federal income taxes and local country withholding tax in certain jurisdictions. The Company's foreign subsidiaries continue to grow through the reinvestment of earnings in additional manufacturing capacity and capability, particularly in the high-end IC and FPD areas.

In April 2017 PDMC, the Company's majority owned IC manufacturing subsidiary in Taiwan, declared a dividend of approximately \$16.8 million, approximately \$8.4 million of which is expected to be paid to the third party that owns a noncontrolling interest in PDMC in the third fiscal quarter of 2017.

In April 2016 PDMC, the Company's majority owned IC manufacturing subsidiary in Taiwan, declared a dividend of approximately \$23.8 million, approximately \$11.9 million of which was paid to the third party that owns a noncontrolling interest in PDMC in the third fiscal quarter of 2016.

In April 2016 \$57.5 million of the Company's senior convertible notes matured. The Company repaid \$50.1 million to noteholders and issued approximately 0.7 million shares to noteholders that elected to convert their notes to common stock. The notes were exchanged at the rate of approximately 96 shares per \$1,000 note principle, equivalent to a conversion rate of \$10.37 per share.

The Company's credit facility, which expires in December 2018, has a \$50 million limit with an expansion capacity to \$75 million, and is secured by substantially all of the Company's assets located in the United States and common stock the Company owns in certain of its foreign subsidiaries. The credit facility is subject to a minimum interest coverage ratio, total leverage ratio and minimum unrestricted cash balance financial covenants, all of which the Company was in compliance with at April 30, 2017. The Company had no outstanding borrowings against the credit facility at April 30, 2017, and \$50 million was available for borrowing. The interest rate on the credit facility (2.24% at April 30, 2017) is based on the Company's total leverage ratio at LIBOR plus a spread, as defined in the credit facility. In May 2017 the credit facility was amended to add certain covenants for our new joint venture in China and other potential investments. See Note 15 of the condensed consolidated financial statements for further discussion of our new joint venture in China.

As of April 30, 2017, the Company had capital equipment commitments outstanding of approximately \$62 million. The Company believes that its currently available resources, together with its capacity for growth, and its access to equity and other financing sources, will be sufficient to satisfy its currently planned capital expenditures, as well as its anticipated working capital requirements for the next twelve months. However, the Company cannot assure that additional sources of financing would be available to the Company on commercially favorable terms should the Company's capital requirements exceed cash available from operations, existing cash, and cash available under its credit facility.

The Company's liquidity is highly dependent on its sales volume, cash conversion cycle, and the timing of its capital expenditures (which can vary significantly from period to period), as it operates in a high fixed cost environment. Depending on conditions in the semiconductor and FPD markets, the Company's cash flows from operations and current holdings of cash may not be adequate to meet its current and long-term needs for capital expenditures, operations and debt repayments. However, the Company believes its cash on hand, cash generated from its operations and cash committed under its credit facility will allow it to fund its operations through at least the next twelve months. Historically, in certain years, the Company has used external financing to fund these needs. Due to conditions in the credit markets, some financing instruments used by the Company in the past may not be currently available to it. The Company continues to evaluate further cost reduction initiatives. However, the Company cannot assure that additional sources of financing would be available to it on commercially favorable terms, should its cash requirements exceed cash available from operations, existing cash, and cash available under its credit facility.

Off-Balance Sheet Arrangements

In April 2014, the Company acquired a 50.01% controlling interest of PDMC, its IC manufacturing facility located in Taiwan. Under the PDMC joint venture operating agreement the shareholders of PDMC may be requested to make additional contributions to PDMC. In the event that PDMC requests additional capital from its shareholders, the Company may, in order to maintain a 50.01% ownership interest, be required to make such contributions to PDMC. The PDMC operating agreement limits the amount of contributions that may be requested during both PDMC's first four years and during any individual year within those first four years. As of April 30, 2017, the Company had not been requested to make any additional capital contributions to PDMC.

The Company leases certain office facilities and equipment under operating leases that may require it to pay taxes, insurance and maintenance expenses related to the properties. Certain of these leases contain renewal or purchase options exercisable at the end of the lease terms.

Business Outlook

A majority of the Company's revenue growth is expected to continue to come from the Asian region, predominantly in China. In response to this expectation, the Company has agreed to enter into a joint venture that will complete the construction of an IC research and development and manufacturing facility in Xiamen, China, in 2017. Production is anticipated to begin at this facility in late 2018.

The Company continues to assess its global manufacturing strategy and monitor its sales volume and related cash flows from operations. This ongoing assessment could result in future facility closures, asset redeployments, additional impairments of intangible or long-lived assets, workforce reductions, or the addition of increased manufacturing facilities, all of which would be based on market conditions and customer requirements.

The Company's future results of operations and the other forward-looking statements contained in this filing involve a number of risks and uncertainties. While various risks and uncertainties were discussed in Part I, Item 1A in the Company's Annual Report on Form 10-K for the year ended October 30, 2016, a number of other unforeseen factors could cause actual results to differ materially from the Company's expectations.

Effect of Recent Accounting Pronouncements

See "Item 1. Condensed Consolidated Financial Statements– Notes to Condensed Consolidated Financial Statements – Note 16 – Recent Accounting Pronouncements" for recent accounting pronouncements that may affect the Company's financial reporting.

Item 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Foreign Currency Exchange Rate Risk

The Company conducts business in several major international currencies through its worldwide operations and its financial performance may be affected by fluctuations in the exchange rates of these currencies. Changes in exchange rates can positively or negatively affect the Company's sales, operating margins, assets, liabilities, and equity. The functional currencies of the Company's Asian subsidiaries are the South Korean won, the New Taiwan dollar, and the Singapore dollar. The functional currencies of the Company's European subsidiaries are the British pound and the euro. In addition, the Company has transactions and balances in Japanese yen and, as a result of its investment in a facility in Xiamen, China, the construction of which is currently underway, the Company will have significant transactions in the Chinese renminbi.

The Company attempts to minimize its risk of foreign currency transaction losses by producing its products in the same country in which the products are sold (thereby generating revenues and incurring expenses in the same currency), and by managing its working capital. There can be no assurance that this approach will continue to be successful, especially in the event of a significant adverse movement in the value of any foreign currency against the U.S. dollar, the New Taiwan dollar or the South Korean won. However, in some instances, the Company sells products in a currency other than the functional currency of the country where it was produced or purchases products in a currency that differs from the functional currency of the manufacturing facility.

The Company's primary net foreign currency exposures as of April 30, 2017, included the South Korean won, the Japanese yen, the New Taiwan dollar, the Singapore dollar, the British pound and the euro. As of April 30, 2017, a 10% adverse movement in the value of these currencies against the functional currencies of the foreign subsidiaries would have resulted in a net unrealized pre-tax loss of \$13.9 million. The Company does not believe that a 10% change in the exchange rates of other non-US dollar currencies would have a material effect on its consolidated financial position, results of operations, or cash flows in the three or six month periods ended April 30, 2017.

Interest Rate Risk

At April 30, 2017, the Company did not have any variable rate borrowings. A 10% change in interest rates would not have had a material effect on the Company's consolidated financial position, results of operations, or cash flows in the three or six month periods ended April 30, 2017.

Item 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

The Company has established and currently maintains disclosure controls and procedures, as such term is defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), designed to provide reasonable assurance that information required to be disclosed in its reports filed under the Exchange Act, is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms, and that such information is accumulated and communicated to management, including the Company's chief executive officer and chief financial officer, as appropriate, to allow for timely decisions regarding required disclosure. In designing and evaluating disclosure controls and procedures, management recognized that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

The Company's management, under the supervision and with the participation of the Company's chief executive officer and chief financial officer, evaluated the effectiveness of the design and operation of the Company's disclosure controls and procedures as of the end of the period covered by this report. Based upon that evaluation the Company's chief executive officer and chief financial officer concluded that the Company's disclosure controls and procedures were effective at a reasonable assurance level as of the end of the period covered by this report.

Changes in Internal Control over Financial Reporting

There was no change in the Company's internal control over financial reporting during the Company's second quarter of fiscal year 2017 that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

PART II. OTHER INFORMATION**Item 1A. RISK FACTORS**

There have been no material changes to risks relating to the Company's business as disclosed in Part 1, Item 1A of the Company's Form 10-K for the year ended October 30, 2016.

Item 6. EXHIBITS

(a) Exhibits

<u>Exhibit Number</u>	<u>Description</u>
10.26	Operating Agreement among Photronics, Inc., Photronics Singapore Pte, Ltd., Dai Nippon Printing Co., Ltd. and DNP Asia Pacific Pte, Ltd. dated May 16, 2017. #**
10.27	Contribution Agreement among Dai Nippon Printing Co., Ltd., DNP Asia Pacific Pte, Ltd., Photronics, Inc., Photronics Singapore Pte, Ltd. and Xiamen American Japan Photronics Mask Co., Ltd. dated May 16, 2017. #**
10.28	Outsource Agreement among Photronics, Inc., Dai Nippon Printing Co., Ltd., Photronics DNP Mask Corporation and Xiamen American Japan Photronics Mask Co., Ltd. dated May 16, 2017. #**
10.29	Amended and Restated License Agreement by and between Dai Nippon Printing Co., Ltd. and Photronics DNP Mask Corporation dated May 16, 2017. #**
10.30	Amendment No. 2 dated May 15, 2017 to Third Amended And Restated Credit Agreement*
31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
#	Portions of this exhibit have been omitted pursuant to a request for confidential treatment filed with the Securities and Exchange Commission.
*	Represents an exhibit that is filed with this Quarterly Report on Form 10-Q.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Photronics, Inc.
(Registrant)

By: /s/ SEAN T. SMITH

Sean T. Smith
Senior Vice President
Chief Financial Officer
(Duly Authorized Officer and
Principal Financial Officer)

Date: June 8, 2017

JOINT VENTURE OPERATING AGREEMENT

OF

PHOTRONICS DNP MASK CORPORATION XIAMEN

among

PHOTRONICS, INC.,

PHOTRONICS SINGAPORE PTE, LTD

AND

DAI NIPPON PRINTING CO., LTD.

DNP ASIA PACIFIC PTE. LTD.

Dated as of May 16, 2017

TABLE OF CONTENTS

	<u>Page</u>
ARTICLE 1. ORGANIZATIONAL MATTERS	1
1.1 Background	1
1.2 Name	1
1.3 Principal Place of Business	2
1.4 Business Purpose	2
1.5 Term	3
1.6 Accounting Consolidation	3
1.7 Transaction Documents	5
1.8 Ratification of Organizational Actions	5
1.9 Articles of Incorporation	5
1.10 Compliance	5
1.11 Pre-Closing Liabilities	6
1.12 Affiliates	6
ARTICLE 2. DEFINITIONS	6
ARTICLE 3. SHARES AND CAPITAL CONTRIBUTIONS	13
3.1 Authorized Shares	13
3.2 Initial Capital Contributions and Share Issuance	13
3.3 Return or Redemption of Capital Contribution	13
3.4 Liability of Shareholders	14
3.5 Revenue	14
ARTICLE 4. FINANCING OF THE COMPANY	14
4.1 Types of Financing	14
ARTICLE 5. MANAGEMENT	16
5.1 Board of Directors	16
5.2 Effect of Reduction in Photonics' Percentage Interest on Photonics Directors	18
5.3 Effect of Reduction in DNP's Percentage Interest on DNP Directors	18
5.4 Procedure.	19
5.5 Chairman and Vice-Chairman	19
5.6 Meetings of Shareholders and of the Board of Directors; Quorum	20
5.7 Supervisors	22
5.8 Actions Requiring a Supermajority Vote of Shareholders	22
5.9 Actions Requiring a Supermajority Vote of Directors	22
5.10 Compensation of Directors and Supervisors	22
5.11 Other Activities	22
5.12 Accounting; Records and Reports	23
5.13 Indemnification and Liability of the Directors	25
5.14 Officer	27
5.15 Steering Committee	29
5.16 Non-Disclosure	31
5.17 Maintenance of Insurance	31
5.18 Related Party Agreements	31
ARTICLE 6. OPERATIONS	32
6.1 Headquarters	32
6.2 Operations Plan; Annual Budget	32
6.3 DPTT Employees	32

6.4	Company Employees; Seconded Employees	32
6.5	Service Provider Documents	32
6.6	Compensation and Benefits	33
ARTICLE 7. DISPOSITION AND TRANSFERS OF INTERESTS		33
7.1	Holding of Shares	33
7.2	Transfer Moratorium	34
7.3	Purchase and Sale of Remaining Interest	35
7.4	Change in Control	35
7.5	Purchase and Sale Agreement	36
ARTICLE 8. [INTENTIONALLY DELETED]		36
ARTICLE 9.		37
9.1	Term of this Agreement	37
9.2	Termination and Cross-termination	37
9.3	Right of Terminating Party	38
ARTICLE 10. DISSOLUTION, LIQUIDATION, AND TERMINATION OF THE COMPANY		39
10.1	Limitations	39
10.2	Exclusive Causes	39
10.3	Effect of Dissolution	40
10.4	Loss of the Company	40
10.5	Liquidation	41
10.6	Dissolution	41
ARTICLE 11. DISTRIBUTIONS		41
11.1	Use of Cash	41
11.2	Distributions Upon Liquidation	42
11.3	Withholding	42
11.4	Distributions in Kind	42
11.5	Limitations on Distributions	43
ARTICLE 12. MISCELLANEOUS		43
12.1	Amendments	43
12.2	No Waiver	43
12.3	Entire Agreement	43
12.4	Further Assurances	44
12.5	Notices	44
12.6	Governing Law	44
12.7	Construction; Interpretation	44
12.8	Rights and Remedies Cumulative	45
12.9	No Assignment; Binding Effect	45
12.10	Severability	45
12.11	Counterparts	46
12.12	Dispute Resolution; Arbitration	46
12.13	Third-Party Beneficiaries	47
12.14	Specific Performance	47
12.15	Consequential Damages	47
12.16	Fees and Expenses	47

SCHEDULES

<u>Schedule A</u>	List of Transaction Documents
<u>Schedule B</u>	[intentionally left blank]
<u>Schedule C</u>	Shareholders and Percentage Interest
<u>Schedule D</u>	Majority Board Control Items
<u>Schedule E</u>	Insurance Policies At Closing
<u>Schedule F</u>	List of Actions Requiring A Supermajority Vote of Shareholders
<u>Schedule G</u>	List of Actions Requiring A Supermajority Vote of Directors
<u>Schedule H</u>	Initial Business Plan
<u>Schedule I</u>	Form of Articles of Incorporation
<u>Schedule J</u>	Representative Funding Plan
<u>Schedule K</u>	Scoring Items for PDMCX Technology Partnership Proposals
<u>Schedule L</u>	Competitors

**JOINT VENTURE OPERATING AGREEMENT
OF
PHOTRONICS DNP MASK CORPORATION XIAMEN**

This **JOINT VENTURE OPERATING AGREEMENT** (together with the Schedules, as amended or otherwise modified from time to time, this "**Agreement**") is made and entered into as of the 16th day of May, 2017, by and between Photronics, Inc., a corporation organized under the laws of the State of Connecticut, with its principal place of business at 15 Secor Road, Brookfield, Connecticut, U.S.A. ("**Photronics**"), Photronics Singapore Pte, Ltd., a corporation organized under the laws of Singapore with its principal place of business at No. 33, Ubi Avenue 3 #03-09, Vertex Building Singapore 408868 ("**Photronics Singapore**") and Dai Nippon Printing Co., Ltd., a corporation organized under the laws of Japan with its principal place of business at 1-1, Ichigaya Kagacho 1-chome, Shinjuku-ku, Tokyo, Japan ("**DNP**"), and DNP Asia Pacific Pte. Ltd., a corporation organized under the laws of Singapore with its principal place of business at 4 Pandan Crescent, Singapore 128475 ("**DNP Asia Pacific**"), with respect to Xiamen American Japan Photronics Mask Co., Ltd. (the "**Company**"), a wholly owned foreign entity formed under the Company Act of the People's Republic of China (the "**Company Act**") and the Laws of the People's Republic of China on Wholly Foreign-Owned Enterprises (the "**WFOE Act**", together with the Company Act, the "**Acts**") and its implementing regulations, with its principal place of business at R203-95, South Building of Torch Square, No. 56-58 Torch Road, Gaoxin District, Xiamen, Fujian Province, China.

**ARTICLE 1.
ORGANIZATIONAL MATTERS**

1.1 Background

The Company was formed in October of 2016 as a wholly owned foreign entity in Xiamen, China, and Photronics Singapore is the sole Shareholder of the Company. Upon the closing of the Initial Capital Contribution (the "**Closing**") contemplated by the Contribution Agreement (the "**Contribution Agreement**") to be executed between the Company, Photronics, Photronics Singapore, DNP and DNP Asia Pacific in the form attached hereto as Schedule A-2, the Company will be a joint venture entity in which Photronics Singapore will own a 50.01% Interests and DNP Asia Pacific will own a 49.99% Interests. The rights and liabilities of the Shareholders shall be as provided in the Acts, except as otherwise expressly provided herein. In the event of any inconsistency between any terms and conditions contained in this Agreement and any non-mandatory provisions of the Acts, the terms and conditions contained in this Agreement shall govern. If any provision of this Agreement is prohibited or ineffective under the Acts, this Agreement will be considered amended to the smallest degree possible in order to make such provision effective under the Acts. The Shareholders and the Board of Directors shall also cause the Company to take corporate actions and make filings and recordings that are necessary or advisable to effectuate the aforesaid amendment.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

1.2 Name

The name of the Company after the completion of the Closing shall be as follows:

Chinese Name of the Company: □□□□□□□□□□

English Name of the Company: Photronics DNP Mask Co, Ltd. Xiamen or PDMCX

The Board of Directors may change the name of the Company from time to time, in accordance with this Agreement and Applicable Law.

1.3 Principal Place of Business

The principal place of business of the Company will be located in Xiamen, China.

1.4 Business Purpose

The purpose of the Company shall be, either singly or in cooperation with Photronics and DNP along with their Affiliates and PDMC, the (a) development, fabrication and sale of photolithographic integrated circuit photomasks for [***]; (d) entry into any other lawful business, purpose or activity in which a company limited by shares may be engaged under Applicable Law (including, without limitation, the Act) as the Shareholders may determine from time to time, subject to and in accordance with the terms of this Agreement; and (e) entry into any lawful transaction and engagement in any lawful activity in furtherance of the foregoing purposes and as may be necessary, incidental or convenient to carry out the business of the Company as contemplated by this Agreement. All pre-existing joint development agreement(s) and joint engineering agreement(s), which were executed by and between a customer in the Territory and Photronics or DNP before execution of this Agreement (the “**Pre-closing Agreement**”), will be disclosed to the Company. The Pre-closing Agreements must be referred to the Steering Committee at such time when the Pre-closing Agreements are reasonably expected to result in (i) an order of new photomasks by such customer to be delivered by Photronics or DNP to the customer in the Territory using a new process of record or (ii) direct photomask sales for commercial benefit to Photronics or DNP within the business scope of the Company. Each Shareholder is expected to keep the Steering Committee informed of the progress of such Pre-Closing Agreements on a regular basis to the extent that such customer consents to disclose to the other Shareholder. For the avoidance of doubt, all photomask sales derived from the Pre-closing Agreements within the business scope of the Company will be sold through the channel of the Company for the customers in the Territory after the completion of the joint development or joint engineering expected in the Pre-closing Agreements. For the purpose of further clarification, in no event shall this Section 1.4 be construed to amend or supersede the terms and conditions of the Pre-closing Agreements, and therefore, Photronics, DNP and the Steering Committee shall respect those terms and conditions therein, the relative parties’ intentions therein, and the determination of the customers.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

1.5 Term

The term of the Company (the “**Term**”) is twenty (20) years, commencing from October 21, 2016 until October 20, 2036. Notwithstanding the dissolution of the Company, the existence of the Company shall continue until termination pursuant to, and as provided in, Article 10 of this Agreement.

1.6 Accounting Consolidation

1.6.1 The Shareholders confirm and agree that, for as long as Photronics Singapore and/or an direct or indirect Affiliate of Photronics holds more than fifty percent (50%) of Percentage Interest in the Company in the aggregate, the Company is intended to be, and shall be treated as, a consolidated subsidiary of Photronics under GAAP. In the event that any term of this Agreement or any relationship, understanding or other agreement, including any Transaction Document, between or among, the Company, Photronics and DNP shall be inconsistent with any existing or future rule, principle or standard governing accounting consolidation of the Company’s financial results by Photronics and/or Photronics Singapore under GAAP, then this Agreement or such relationship, understanding or other agreement shall be modified, terminated or waived (as the case may be) (each an “**Accounting Amendment**”) to the minimum extent necessary to grant, allow or permit accounting consolidation of the Company’s financial results by Photronics in accordance with Section 1.6.2.

1.6.2 Where Photronics believes that an Accounting Amendment may be necessary due to any existing or future rule, principle or standard under US GAAP,

- (a) Photronics shall promptly notify DNP of the reasons for, and content of, any proposed Accounting Amendment in writing;

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(b) after Photronics' above notification, Photronics and DNP shall use all reasonable efforts to negotiate with each other with a view to reaching a written agreement for the Accounting Amendment or other mutually acceptable solution, provided however, that, if no such agreement or solution is reached by Photronics and DNP within thirty (30) calendar days after Photronics' above notification, (i) Photronics may, in its discretion, retroactively and/or prospectively, make the Accounting Amendment to the minimum extent reasonably deemed necessary by Photronics, and shall promptly notify the Company and DNP of the content of such Accounting Amendment in writing; and (ii) after Photronics exercises its discretionary power set forth in (i) above, if the Accounting Amendment concerned involves any change in the definition of and/or any of the actions requiring a Supermajority Vote of Directors as set forth in Schedule G hereof, the definition of and/or any of the actions requiring a Supermajority Vote of Shareholders as set forth in Schedule F hereof, and/or the number of board seats of DNP in the Company hereunder, DNP shall have [***]. DNP may, at any time after the Accounting Amendment takes effect but only after the expiration of the Initial Two-Year Term, exercise [***] by giving a written notice to Photronics (the "**Accounting Amendment Option Notice**"). Photronics agrees to use all reasonable efforts to apply for all applicable regulatory approvals or clearance within thirty (30) days after receipt of the Accounting Amendment Option Notice. The closing of the [***] (the "**Accounting Amendment Closing**") shall take place as soon as commercially practicable (taking into account the necessary funds raising arrangement by Photronics) without any undue delay and shall be within three (3) Business Days after all prior regulatory approvals or clearance have been obtained. The Accounting Amendment Closing Price shall be equal to [***] as of the last day of the Fiscal Month immediately prior to the date of the Accounting Amendment Option Notice, divided by the number of Issued and outstanding Shares of the Company as of the date of the last day of the Fiscal Month immediately prior to the date of the Accounting Amendment Option Notice, multiplied by the number of the Shares held by [***] as of the date of the Accounting Amendment Closing. The Accounting Amendment Closing Price shall be paid by [***] pursuant to the terms and conditions agreed to upon the exercise of the Accounting Amendment Option, but the Accounting Amendment Closing Price shall be fully paid within seven (7) years from the exercise of the Accounting Amendment Option. At the Accounting Amendment Closing, [***] shall transfer all of its Interests in the Company to Photronics, free and clear of any liens or encumbrances, and [***] shall pay the amount of all or part of the Accounting Amendment Closing Price that [***] will be required to pay upon the Accounting Amendment Closing to [***] by wire transfer of cash. At the Accounting Amendment Closing, DNP shall deliver to Photronics such instrument or instruments of conveyance as Photronics reasonably requests.

DNP will not be able to exercise the Accounting Amendment Option for the Initial Two-Year Term.

DNP will continue to be bound by the non-compete obligations set forth in Section 8.1 for a period of twelve (12) months following the date of the Accounting Amendment Option Notice (in which case, the one-year period surviving after the termination set forth in Section 8.1 does not apply). In the event the Accounting Amendment Closing (i.e., receipt of all necessary regulatory approvals and completion of the transfer of DNP's Interest to Photronics but not including full payment of the Accounting Amendment Closing Price) takes longer than sixty (60) days from the exercise of the Accounting Amendment Option, DNP and Photronics will agree to a delay of the commencement date of the twelve-month period of the non-compete obligations set forth in this Section, but in no event shall such commencement date be delayed for more than sixty (60) days from the date of the Accounting Amendment Option Notice.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

1.6.3 For the avoidance of doubt, for as long as Photronics Singapore and/or an Affiliate of Photronics holds more than fifty percent (50%) of Percentage Interest in the Company in aggregate, nothing contained herein is intended or shall allow DNP to (a) control the operations or assets of the Company in its sole discretion and (b) have the discretionary power to govern the financial, operating and personnel policies of the Company unless such actions as set forth in (a) and (b) immediately above are permitted under GAAP and agreed to between the parties hereto.

1.7 Transaction Documents

Contemporaneous with the execution of this Agreement, Photronics, Photronics Singapore, DNP, DNP Asia Pacific, PDMC and the Company have entered into the agreements listed on Schedules A-1 and A-2 hereto (collectively, the Transaction Documents").

1.8 Ratification of Organizational Actions

When necessary, the Shareholders will, by a resolution adopted by the Shareholders' meeting of the Company, authorize the Company, and ratify all action having been taken by or on behalf of the Company (including by its Officers) prior to the date hereof, to execute and deliver the Transaction Documents to which it is a party, including all certificates, agreements and other documents required in connection therewith.

1.9 Articles of Incorporation

The Shareholders agree that, prior to or at the Closing, the Articles of Incorporation of the Company shall be amended from the current form attached hereto as Schedule I to be in the form consistent with the terms and conditions of this Agreement and the Contribution Agreement.

1.10 Compliance

For as long as Photronics, Photronics Singapore and/or a direct or indirect Affiliate of Photronics holds more than fifty percent (50%) of Percentage Interest in the Company, the Company will comply with Photronics Singapore health and safety and environmental and corporate compliance policies, procedures, programs and standards, provided that such policies, procedures, programs and standards do not violate any mandatory laws or regulations of the PRC. In the event the Company has any concerns about any compliance matters including but not limited to antitrust concerns the Company will consult with counsel for the Company.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

1.11 Pre-Closing Liabilities

Photronics agrees to be responsible for any and all liabilities and claims arising against the Company by any third party which are attributable to events occurred prior to the Effective Date; provided however that such liabilities and claims must arise out of and be directly related to the negligent acts or lack of due care by Photronics or Photronics Singapore; and provided further that the representations and warranties of Photronics and Photronics Singapore set forth in the Contribution Agreement are true and correct in all material aspects at and as of the Effective Date. Neither Photronics nor Photronics Singapore will be liable for any and all loss or damage of the Company arising out of or in connection with (i) the design, construction, and piling agreements for an initial manufacturing facility located in Xiamen, China, (ii) the investment agreement between Xiamen Torch Hi-Tech Industrial Development Zone Management Committee and Photronics Singapore and (iii) the land purchase agreement between Xiamen Torch Hi-Tech Industrial Development Zone Management Committee and Photronics Singapore, all of which will be assumed by the Company at the Closing, provided however that such losses and damages does not arise out of and are not directly related to the negligent acts or lack of due care by Photronics or Photronics Singapore prior to the Closing.

1.12 Affiliates

Photronics and DNP hereby ensure that their respective Affiliates shall comply with the terms and conditions of this Agreement and Transaction Documents to the extent applicable to such Affiliates. Photronics and DNP hereby confirm and agree that the Shares of the Company shall be always held by either DNP or Photronics directly or by a direct or indirect wholly owned subsidiary of Photronics or DNP, as the case may be, and accordingly, Photronics and DNP may hold the Shares directly or transfer the Shares of the Company to a direct or indirect wholly owned subsidiary of Photronics or DNP, as the case may be, without the prior written consent of, but only with the prior notice to, the other party. Upon such notice, each of Photronics and DNP shall cause the Shareholders and the Company to take corporate actions and make filings and recordings that are necessary or advisable to effectuate the aforesaid transfer under Applicable Law. Any other transfers of the Shares of the Company will be subject to the terms and conditions of this Agreement.

ARTICLE 2. DEFINITIONS

Capitalized words and phrases used and not otherwise defined elsewhere in this Agreement shall have the following meanings:

“**Accounting Amendment**” is defined in Section 1.6.1.

“**Accounting Amendment Closing**” is defined in Section 1.6.2(b).

“**Accounting Amendment Closing Price**” is defined in Section 1.6.2(b).

“**Accounting Amendment Option**” is defined in Section 1.6.2(b).

“**Accounting Amendment Option Notice**” is defined in Section 1.6.2(b).

“**Acts**” is defined in the preamble.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

“Additional Contributions” is defined in Section 4.1.2(a).

“Affiliate” of a Person means any other Person which, directly or indirectly, controls, is controlled by, or is under common control with, such Person. The term “control” (including, with correlative meaning, the terms “controlled by” and “under common control with”), as used with respect to any Person, means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise. A Person shall be deemed an Affiliate of another Person only so long as such control relationship exists. Notwithstanding the foregoing, a Company Entity shall not be deemed to be an Affiliate of either DNP or Photonics, except where expressly provided in this Agreement.

“Agreement” is defined in the preamble.

“Annual Budget” is defined in Section 6.2.

“Applicable Law” means, with respect to a Person, any domestic or foreign, national, federal, territorial, state or local constitution, statute, law (including principles of common law), treaty, ordinance, rule, administrative interpretation, regulation, order, writ, injunction, legally binding directive, judgment, decree or other requirement or restriction of any arbitrator or Governmental Authority applicable to such Person or its properties, assets, officers, directors, employees, consultants or agents (in connection with such officer’s, director’s, employee’s, consultant’s or agent’s activities on behalf of such Person).

“Articles of Incorporation” means the Articles of Incorporation of the Company, as amended from time to time.

“Board of Directors” means, at any time, the Board of Directors of the Company.

“Business” means such business activities as described in Section 1.4.

“Business Day” means a full banking business day in the State of Connecticut, Japan and China.

“Business Plan” is defined in Section 6.2.

“Capital Contributions” means, with respect to any Shareholder, the total amount of cash and the initial agreed upon asset value of property and equipment (other than cash) and technology contributed to the capital of the Company by such Shareholder. **“Cash”** means cash and cash equivalents determined by the Board of Directors in good faith consistent with GAAP.

“Chairman of the Board” is defined in Section 5.5.

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

“Change in Control” shall be deemed to have occurred, with respect to a party, when:

(1) Any “Person” or “group” (as defined below) is or becomes the “beneficial owner” (as defined below) of shares representing more than fifty percent (50%) of the combined voting power of the then outstanding securities entitled to vote generally in elections of directors of a party, as the case may be (the “**Voting Stock**”); or

(2) A party (A) consolidates with or merges into any other Person or any other Person merges into a party, and in the case of any such transaction, the outstanding common stock of a party, as the case may be, is changed or exchanged into other assets or securities as a result, unless the stockholders of a party, as the case may be, immediately before such transaction own, directly or indirectly immediately following such transaction, more than fifty percent (50%) of the combined voting power of the outstanding voting securities of the corporation resulting from such transaction in substantially the same proportion as their ownership of the Voting Stock immediately before such transaction, or (B) conveys, transfers or leases all or substantially all of its assets to any Person.

For the avoidance of doubt, the delisting of Photronics from the NASDAQ Stock Market standing alone, if occurs, does not constitute a Change in Control with respect to Photronics.

For the purpose of this definition, a “group” means two or more Persons who, acting for a common purpose, which act based on their mutual consent in the form of a contract, an agreement or others; and a “beneficial owner” means any Person who owns the shares or other assets under his/her/its own name or under the name of a third party (i.e. a nominee) where: (i) such Person (a) provides said shares or assets or (b) provides the funds to acquire such shares or assets to the nominee directly or indirectly; or (ii) the principal has the right to manage, utilize or dispose of the shares or assets held by the nominee; or (iii) entire or partial profits or losses of the shares or assets held under the name of the nominee are assumed by the principal.

“Change in Control Closing” is defined in Section 7.4.2.

“Change in Control Closing Price” is defined in Section 7.4.3.

“Change in Control Notice” is defined in Section 7.4.1.

“Company” is defined in the preamble.

“Company Accountant” shall mean initially Deloitte Touche LLP or such other independent accounting firm as appointed from time to time by the Board of Directors.

“Company Act” is defined in the preamble.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

“Company Assets” means all direct and indirect rights and interests in real and personal property owned by the Company and its subsidiaries from time to time, and shall include both tangible and intangible property (including Cash). For the sake of clarity, “Company Assets” shall not be deemed to include any right or interest owned by Photonics or DNP or their respective Affiliates, including, without limitation, any rights licensed from third parties to Photonics or DNP unless authorized by such third parties.

“Company Entity” means the Company, or any of its directly or indirectly majority owned subsidiaries (whether organized as corporations, limited liability companies or other legal entities).

“Company Liabilities” means all direct and indirect liabilities and obligations of the Company and its subsidiaries from time to time including the aggregate undistributed amounts due to Shareholders to pay Chinese taxes on any income allocated to them. In determining the amount of such liabilities, any contingent liabilities, guarantees or other amounts that are not recorded on the Company’s consolidated balance sheet shall be included and reserved against at the fair probable value thereof as reasonably determined by the Board of Directors in accordance with GAAP.

“Directors” is defined in Section 5.1.3.

“DNP” is defined in the preamble.

“DNP Director” means any of the Directors nominated by DNP to serve on the Board of Directors in accordance with Section 5.1.3.

“Economic Interest” means a Person’s right to share in the pro-rata allocation of Net Profits, Net Losses and other items of income, gains, losses, deductions and credits hereunder and to receive distributions from the Company as set forth in this Agreement, but does not include any other rights of a Shareholder including, without limitation, the right to vote or to participate in the management of the Company, or, except as specifically provided in this Agreement or required under the Acts, any right to information concerning the business and affairs of the Company.

“Effective Date” means the date of the completion of the Closing by which the Company becomes a joint venture entity between Photonics Singapore and DNP Asia Pacific.

“Exchange Act” means the Securities Exchange Act of 1934 of the United States, as amended.

“Fiscal Months” is defined in Section 5.12.1.

“Fiscal Quarters” is defined in Section 5.12.1.

“Fiscal Year” is defined in Section 5.12.1.

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

“Force Majeure” means any cause or causes beyond the reasonable control of either party or the Company, including, but not limited to, acts of God, industrial disturbances, wars, terrorism, epidemics, blockages, embargoes, insurrections, riots, explosions, fires, earthquake, floods, perils of the sea.

“GAAP” means generally accepted accounting principles in the United States, as applicable, as in effect from time to time.

“GAAS” means generally accepted auditing standards in the United States, as applicable, as in effect from time to time.

“General Manager” is defined in Section 5.14.1.

“Governmental Authority” means any foreign, domestic, national, federal, territorial, state or local governmental authority, quasi-governmental authority, instrumentality, court, government, stock exchange or self-regulatory organization, commission, tribunal or organization or any regulatory, administrative or other agency, or any political or other subdivision, department or branch of any of the foregoing.

“Increasing Shareholder” is defined in Section 5.4

“Indemnified Loss” is defined in Section 5.13.1.

“Indemnitee” is defined in Section 5.13.1.

“Initial Capital Contribution” has the same meaning as defined in the Contribution Agreement.

“Initial Seven-Year Term” means a period of the initial seven (7) years from the Effective Date.

“Initial Two-Year Term” means a period of the initial two (2) years from the Effective Date.

“Interest” means the entire ownership interest of a Shareholder in the Company at any particular time, including without limitation, the Shareholder’s Shares and Economic Interest, any and all rights to vote and otherwise participate in the Company’s affairs, and the rights to any and all benefits to which a Shareholder may be entitled as provided in this Agreement, together with the obligations of such Shareholder to comply with all of the terms and provisions of this Agreement. An Interest may be expressed as a number of Shares.

“Issue” means, for the purpose of this Agreement, the corporate actions that are necessary or advisable to have Shareholders of the Company to subscribe the Shares when the registered capital of the Company is set or increased. The total Shares Issued shall amount to the 100% equity interest of the Company during any time.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

“**Liquidating Event**” is defined in Section 10.2.

“**Liquidated Committee**” is defined in Section 10.5.1.

“**Majority Shareholder**” is defined in Section 7.3.1.

“**Minority Closing**” is defined in Section 7.3.2.

“**Minority Closing Price**” is defined in Section 7.3.3.

“**Minority Shareholder**” is defined in Section 7.3.1.

“**Net Book Value**” means, with respect to (i) any assets, the value thereof, net of accumulated depreciation, amortization and other adjustments, as would be included in a consolidated balance sheet of the entity owning such assets prepared in accordance with GAAP, (ii) any liabilities, the amount thereof as would be included in a consolidated balance sheet of the entity having the liabilities prepared in accordance with GAAP and (iii) any equity security of a Company Entity or other entity, the product of (x) the value of the assets of such entity, net of accumulated depreciation, amortization or other adjustments, as would be included in a consolidated balance sheet of the entity prepared in accordance with GAAP, minus the amount of the liabilities of such entity, as would be included in a consolidated balance sheet of such entity prepared in accordance with GAAP, multiplied by (y) a percentage equal to the percentage of the equity of such entity represented by such equity security. Any determination of Net Book Value shall be consistent with the historic GAAP methods, procedures and election used by the Company.

“**Net Profits**” or “**Net Losses**” means, for each Fiscal Year or other period, an amount equal to the Company’s taxable income or loss for such year or period.

“**Officer**” is defined in Section 5.14.3.

“**PDMC**” is Photronics DNP Mask Corporation, a joint venture company of Photronics and DNP and a corporation organized under the laws of the Taiwan region with its principal place of business at 4f, #2, Li-Hsin Road, Science Park, Hsinchu, Taiwan.

“**Percentage Interest**” means, with respect to a Shareholder holding one or more Shares, its Interest in the Company as determined by dividing the number of Shares owned by such Shareholder by the total number of Shares of the Company then outstanding. For the purposes of this Agreement, the aggregate Percentage Interest of all entities directly or indirectly wholly owned by Photronics Singapore or DNP Asia Pacific, as the case may be, shall be the basis for calculating the Percentage Interest of Photronics Singapore and DNP Asia Pacific.

“**Person**” means any person or entity, whether an individual, trustee, corporation, partnership, limited partnership, limited liability company, trust, unincorporated organization, business association, firm, joint venture, other legal entity or Governmental Authority.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

“Photronics Singapore” means Photronics Singapore Pte, Ltd., a wholly owned subsidiary company of Photronics and a corporation organized under the laws of Singapore with its principal place of business at No. 33, Ubi Avenue 3 #03-09, Vertex Building Singapore 408868.

“Photronics Director” means any of the Directors nominated by Photronics Singapore to serve on the Board of Directors in accordance with Section 5.1.3.

“Reducing Shareholder” is defined in Section 5.4.

“Related Party Agreement” is defined in Section 5.18.

“Representative” is defined in Section 5.13.6(d).

“Required Funding Date” is defined in Section 4.1.2(a).

“Secoded Employees” is defined in Section 6.4.

“Service Provider Documents” is defined in Section 6.5.1

“Share” means equity interest of the Company Issued pursuant to Article 3 of this Agreement. As of the completion of the transactions contemplated under the Contribution Agreement, the Shares of the Company are to be held at the Closing by the Shareholders in accordance with Schedule C.

“Shareholder” means Photronics Singapore and DNP Asia Pacific, Photronics, DNP or any direct or indirect wholly owned subsidiary of Photronics or DNP who at any time hold the Shares of the Company.

“Shortfall” means the dollar difference between a requested Additional Contribution and the actual amount a Shareholder pays of such Additional Contribution.

“Tax” or **“Taxes”** means all goods and services taxes, levies, imposts and fees imposed by any Governmental Authority (domestic or foreign) of any nature including but not limited to federal, state, local or foreign net income tax, alternative or add-on minimum tax, profits or excess profits tax, franchise tax, gross income, adjusted gross income or gross receipts tax, employment related tax (including employee withholding or employer payroll tax), real or personal property tax or ad valorem tax, sales or use tax, excise tax, stamp tax or duty, any withholding or back up withholding tax, value added tax, severance tax, prohibited transaction tax, premiums tax, occupation tax, together with any interest or any penalty, addition to tax or additional amount imposed by any Governmental Authority (domestic or foreign) responsible for the imposition of any such tax.

“Term” is defined in Section 1.5.

“Territory” means [***].

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

“**Transaction Documents**” is defined in Section 1.7.

“**Transfer**” (including, with correlative meaning, the term “**Transferred**”) means, with respect to any Share or Economic Interest or portion thereof, a sale, conveyance, exchange, assignment, pledge, encumbrance, gift, bequest, hypothecation or a transfer or disposition by any other means, whether for value or no value and whether voluntary or involuntary (including, without limitation, by operation of law), or an agreement to do any of the foregoing.

“**Steering Committee**” is defined in Section 5.15

“**Supermajority Vote of Directors**” means the unanimous affirmative vote or consent of all Directors of the Company present at a meeting of the Board of Directors, provided that the Percentage Interest of Photronics Singapore and DNP Asia Pacific shall be at least twenty percent (20%) each.

“**Supermajority Vote of Shareholders**” means the unanimous affirmative vote or consent of all Shareholders of the Company present at a meeting of the Shareholders, provided that the Percentage Interest of Photronics Singapore and DNP Asia Pacific shall be at least twenty percent (20%) each.

“**Vice General Manager**” is defined in Section 5.14.1.

“**Voting Stock**” is defined in the definition of “Change in Control.”

“**WFOE Act**” is defined in the preamble.

ARTICLE 3. SHARES AND CAPITAL CONTRIBUTIONS

3.1 Authorized Shares

The Company is authorized to Issue the Shares. The total number of the Shares of the Company to be Issued as of the completion of the Closing shall be set forth in the Contribution Agreement.

3.2 Initial Capital Contributions and Share Issuance

The Shareholders acknowledge and agree that the names and address of each Shareholder and Percentage Interests of the Shareholders as of the completion of the Closing contemplated under the Contribution Agreement are as set forth on Schedule C.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

3.3 Return or Redemption of Capital Contribution

Except as otherwise provided in this Agreement or approved by a Supermajority Vote of Shareholders: (a) no Shareholder shall demand or be entitled to receive a return of or interest on any portion of its Capital Contributions; and (b) no Shareholder shall withdraw any portion of its Capital Contributions or receive any distributions from the Company as a return of capital on account of such Capital Contributions. Except as otherwise provided in this Agreement or approved by a Supermajority Vote of Directors, the Company shall not redeem or repurchase the Shares of any Shareholder. Provided in all these cases that any such return, distribution or redemption that is permitted hereunder shall be *pro rata* based upon the Shareholders' respective Percentage Interests and in compliance with Applicable Law. Provided further, in all these cases that any such return, distribution or redemption that is permitted hereunder do not violate any mandatory laws or regulations of the PRC.

3.4 Liability of Shareholders

Except as otherwise required by any non-waivable provision of the Acts or other Applicable Law and except as otherwise provided in this Agreement or other agreements between the Company and one or more Shareholders or their Affiliates, no Shareholder shall be liable in any manner whatsoever for any debt, liability or other obligation of the Company, whether such debt, liability or other obligation arises in contract, tort, or otherwise solely by reason of being a Shareholder.

3.5 Revenue

The Shareholders hereby agree that the Company shall be the [***] includes but is not limited to communicating with [***]) with respect to [***]. The Shareholders further agree that neither Shareholder will [***].

ARTICLE 4. FINANCING OF THE COMPANY

4.1 Types of Financing

4.1.1 General. Photronics and DNP anticipate that the total investment to be made in the Company for the initial period of five (5) years from the Effective Date will be US\$160,000,000, which consists of US\$[***] by Shareholders' equity or convertible shareholder loan as set forth in Section 4.1.2 (the "**Scheduled Contribution**") and US\$[***] by loan from a bank. The initial registered capital of the Company immediately after the Closing will be as set forth in the Contribution Agreement, and the total registered capital through the initial period of five years from the Effective Date will be no more than US\$[***]. The total investment and registered capital will be contributed in several increments over a period of five (5) years from the Effective Date by the Shareholders. It is the intention of the Shareholders to fund the Company primarily with cash distributed from PDMC through dividends and/or capital reductions with a representative funding plan indicated in Schedule J. The Shareholders will make the Initial Capital Contribution to the Company such that the Percentage Interests initially will be 50.01% and 49.99% respectively pursuant to the Contribution Agreement. In no event shall Photronics or DNP be obliged to make any kind of additional investment (including the Additional Contributions, loan to the Company and guaranteeing a loan of the Company) more than their respective Percentage Interests (i.e., 50.01% for Photronics Singapore and 49.99% for DNP Asia Pacific) of the Scheduled Contribution. The Board of Directors shall be responsible for determining the type and timing of financing required to fund the operations of the Company and will evaluate Capital Contributions from the Shareholders or incurring debt from the Shareholders or from public, private or bank markets, in each case as permitted under this Agreement; the Board of Directors will then decide on the type of funding that is in the best interests of the Company at the time of the decision. The Board of Directors of the Company will have the sole authority for deciding when a capital contribution can be made by the Shareholders.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(a) Photonics Singapore and DNP Asia Pacific shall make the Initial Capital Contribution in accordance with the Contribution Agreement for the initial 50.01% and 49.99% ownership, respectively, and the Board of Director of the Company will have authority, from time to time and when necessary, for requesting capital calls in case of any capital shortfalls that the Company may experience, and the parties agree and acknowledge that it is the intent of the parties that Photonics through Photonics Singapore will consolidate the Company and will own a minimum of 50.01%; provided, however, that DNP [***].

(b) If the Board of Directors determines that the Company requires additional funding exceeding the Scheduled Contribution via a Capital Contribution from the Shareholders to the Company and such resolution is approved by the Shareholders' meeting, the Shareholders shall have the right to make such Capital Contributions to the Company pro-rata based on such Shareholder's Percentage Interest (the "**Additional Contributions**"). Request for Additional Contributions shall be made by written notice by the Board of Directors, provided that if any of the Shareholders intends to cause the Board of Directors to approve an Additional Contributions, it shall notify the other Shareholder in writing and any such written notice shall include the amount of required Capital Contribution and the required funding date ("**Required Funding Date**") to be approved by the Board of Directors and shall be sent to the other Shareholder at least one hundred and fifty (150) calendar days prior to the relevant meeting of the Board of Directors. Such Required Funding Date shall correspond to the end of a Fiscal Month. All Additional Contributions shall be made in Renminbi or equivalent in US Dollars. Where the Applicable Law grants employees of the Company any subscription rights and no exception in the Applicable Law is available to the Company, the Shareholders agree to use their best efforts to cause the employees of the Company to waive any rights they may have under the Applicable Law to subscribe to any additional Shares to be Issued in connection with any Additional Contributions.

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(c) In the event that any Shareholder determines to contribute less than [***], such Shareholder shall provide notice of such determination specifying the amount of such [***] it intends to make, if any. Such notice shall be provided to the Company and to the other Shareholder as soon as practicable after such determination is made, but in any event not less than [***]. Any failure or delay in providing such notice shall not affect the right of any Shareholder to refrain from providing such [***], nor shall it result in any liability for damages. If a Shareholder fails to make the [***] set forth pursuant to Section 4.1.2(a), then the full funding Shareholder may elect, in its discretion and to the fullest extent permitted by Applicable Law, to do any or a combination of the following [***] without prior written consent of all existing Shareholders prior to such [***].

(d) In connection with any [***], the Board of Directors shall determine the [***], as of the date immediately prior to the date of the meeting of the Board of Directors approving the [***] immediately prior to the date of the meeting of the Board of Directors approving [***].

ARTICLE 5. MANAGEMENT

5.1 Board of Directors

5.1.1 **Powers.** Except as otherwise required by any non-waivable provision of the Acts or other Applicable Law or expressly provided in this Agreement, all management powers over the business, property and affairs of the Company are exclusively vested in a board of directors (the “**Board of Directors**”), and no Shareholder shall have any right to participate in or exercise control or management power over the business and affairs of the Company or otherwise to bind, act or purport to act on behalf of the Company in any manner. Except as otherwise required by any non-waivable provision of the Acts or other Applicable Law, the Parties hereby agree that the majority shareholder of the Company will control all such decisions that the Acts or other Applicable Law do not allow to be controlled by the Board, and all the corporate governance powers agreed to herein by the Board are also agreed to at the level of Shareholders and will be controlled by Photronics Singapore as long as it is the majority shareholder of the Company. The Parties further agree that, in the event that the Acts or Applicable Law do not allow the majority of the Board of Directors or the majority shareholder to control any increase or decrease of registered capital in its sole discretion and as long as Photronics Singapore is the majority shareholder of the Company, DNP Asia Pacific will provide Photronics Singapore with a proxy to exercise voting rights for sixteen and two thirds percent (16 2/3%) (or, depending on Photronics Singapore’s ownership interest at the time of the shareholders meeting, a proxy in the amount required to allow Photronics Singapore to exercise voting rights for sixty six and two thirds percent (66 2/3%) of the outstanding Shares of the Company or the then-current percentage required by the Acts or Applicable Law at the time of the Board of Directors or shareholders meeting) in favor of the increase or decrease in the registered capital proposed by Photronics Singapore and whatever corresponding changes need to be made to the Company’s Articles of Incorporation, provided that DNP reserves its right under section 4.1.2(a)(i) to refrain from subscribing any or all of such increased registered capital. In the event DNP Asia Pacific fails to provide Photronics Singapore with such proxy, DNP Asia shall be deemed in breach of this Agreement. Except with respect to voting for an increase or decrease in the Company’s registered capital, the above will not affect DNP’s a Supermajority Vote of Shareholders set forth in Schedule F and provided further that such proxy from DNP Asia Pacific to Photronics Singapore will not be required after the initial investment of US \$160,000,000 has been reached and an annual cash investment of greater than \$100,000,000 US Dollars is being proposed at the shareholder meeting. Subject to any non-waivable provision of Applicable Law and the limitations set forth in this Agreement, the Board of Directors shall have all the rights and powers that may be possessed by the Board of Directors under the Acts, which shall include, without limitation, the power to incur indebtedness, the power to enter into agreements and commitments of all kinds, the power to manage, acquire and dispose of Company Assets, and all ancillary powers necessary or convenient to the foregoing. Without limiting the general authority granted by the immediately preceding sentence, the majority of the Board of Directors shall have the authority set forth on Schedule D hereto. The Board of Directors may also designate one or more persons to open bank accounts and conduct other banking business on behalf of the Company. The Directors shall devote such time to the business and affairs of the Company as is reasonably necessary for the performance of their duties, but shall not be required to devote full time to the performance of such duties.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.1.2 Evaluation of General Manager. The Board of Directors will be responsible for supervision and evaluation of the Company's General Manager on an ongoing basis, including at least an annual review of his or her performance to ensure he or she is acting in accordance with prudent business practices.

5.1.3 Number of Directors; Appointment of Directors. Both parties shall cause the Company to hold an extraordinary general shareholders' meeting not later than on the [***] calendar day (or a later day agreed by both parties) after the Effective Date to elect some or all Directors and supervisors of the Company and such members shall have the same term of office as provided below. The Board of Directors shall consist of seven (7) individuals (each such individual, a "**Director**") and the term of their office shall be three (3) years. Subject to Sections 5.2 and 5.3 below, in the aforesaid extraordinary general shareholders' meeting and subsequent general shareholders' meetings of the Company in which the Directors are to be re-elected, four (4) of the representatives nominated by Photronics Singapore and three (3) of the representatives nominated by DNP Asia Pacific shall be elected as the Directors. For as long as Photronics Singapore and/or a direct or indirect Affiliate of Photronics holds more than fifty percent (50%) of Percentage Interest in the Company in the aggregate, the number of Directors to be nominated by each Shareholder and elected by the Shareholders' meeting shall remain fixed for the ***, and Sections 5.2, 5.3 and 5.4 shall only apply thereafter. For the avoidance doubt, Sections 5.2, 5.3 and 5.4 shall still apply even within the [***]. If a Director resigns (including by death or retirement) or is removed either by the Shareholder who nominated such Director as provided for under the Acts or in accordance with Section 5.2 or 5.3, each newly elected Director shall hold office for the remaining term of the replaced Director. Each Shareholder having the right to nominate a Director pursuant to this Section 5.1.3 shall have the right, in its sole discretion, to propose the removal of such Director at any time, by delivery of written notice to the Company with a copy to each of the other Shareholder and the Director(s) to be removed. All Shareholders are obligated to vote in the affirmative for such removal resolution during the Shareholders' meeting. In the case of a vacancy in the office of a Director for any reason (including by reason of death, resignation, retirement, expiration of such Director's term or removal pursuant to the preceding sentence), the vacancy shall be filled by a candidate nominated by the Shareholder that nominated the Director in question; *provided, however*, that in the case of a vacancy created due to a change in a Shareholder's Percentage Interest as described in Section 5.2 or 5.3, such vacancy shall be filled in accordance with Section 5.2 or 5.3. Each Shareholder shall notify the other Shareholder and the Company of the name, business address and business telephone, e-mail address and facsimile numbers of each Director that such Shareholder has nominated. Each Shareholder shall promptly notify the other Shareholder and the Company of any change in such Shareholder's nominated Director or of any change in their Director's address or other contact information.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.2 Effect of Reduction in Photonics Singapore's Percentage Interest on Photonics Directors

Following the Initial Seven-Year Term and subject to Sections 5.1 and 5.4, the number of Directors that Photonics Singapore can nominate to or maintain on the Board of Directors shall depend on Photonics Percentage Interest as follows:

Photonics Singapore's Percentage Interest	Number of Photonics Directors
> 80%	***
> 50% and \leq 80%	***
\geq 20% and \leq 50%	***
> 0% and < 20%	***

5.3 Effect of Reduction in DNP Asia Pacific's Percentage Interest on DNP Directors

Following the Initial Seven-Year Term and subject to Sections 5.1 and 5.4, the number of Directors that DNP Asia Pacific can nominate to or maintain on the Board of Directors shall depend on DNP Percentage Interest as follows:

DNP Asia Pacific's Percentage Interest	Number of DNP Directors
> 80%	***
> 50% and \leq 80%	***
\geq 20% and \leq 50%	***
> 0% and < 20%	***

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.4 Procedure.

Following the *** and subject to Section 5.1 above, if either Shareholder's Percentage Interest should be below any of the threshold levels set forth in Sections 5.2 or 5.3 above more than *** and if such Shareholder (the "**Reducing Shareholder**") then has more nominees serving on the Board of Directors than the number to which it is entitled, such Reducing Shareholder shall immediately identify by written notice to the Company with a copy to the other Shareholder (the "**Increasing Shareholder**") the nominee or nominees on the Board of Directors that will cease serving on the Board of Directors, and each such nominee shall thereupon cease to be a Director or member of the Board of Directors. If such Reducing Shareholder fails to make such designation within five (5) Business Days after written demand by the Increasing Shareholder, the Increasing Shareholder may for and on behalf of the Reducing Shareholder and its nominee(s) (and the Reducing Shareholder hereby, and shall cause its nominee(s) to, irrevocably authorize the Increasing Shareholder to) designate by written notice to the Company with a copy to the Reducing Shareholder one or more (as appropriate) of the Reducing Shareholder's nominees on the Board of Directors that will cease serving on the Board of Directors and each such nominee shall thereupon cease to be a Director or member of the Board of Directors. Upon the written notice described in either of the immediately preceding two sentences, the Shareholders agree to collaborate to cause the Board of Directors to convene a meeting of the Shareholders as soon as practicable to fill the vacancies created by such removals in accordance with the provisions of Sections 5.2 and 5.3. Similarly, if a Shareholder whose Percentage Interest fell below any threshold level set forth in Section 5.2 or 5.3 subsequently increases its Percentage Interest above any such level, the process shall be reversed.

5.5 **Chairman and Vice-Chairman**

A Chairman of the Board of Directors (the "**Chairman of the Board**") shall preside at all meetings of the Board of Directors. The Chairman of the Board shall be selected from and among the Directors nominated by Photronics Singapore. A Vice-Chairman of the Board of Directors (the "**Vice-Chairman of the Board**") shall be selected from and among the Directors nominated by DNP provided that [***] shall not fall below [***]. If the Percentage Interest of Photronics Singapore falls below [***], then the Chairman of the Board shall be selected from and among the Directors nominated by [***] by the Board of Directors. If a Shareholder whose Percentage Interest [***] subsequently increases its Percentage Interest [***], such Shareholder shall have the right to nominate [***]. In the case where the Chairman of the Board is selected by DNP in accordance with the foregoing, then the Vice-Chairman of the Board shall be selected from and among the Directors nominated by Photronics Singapore provided that Photronics Singapore's Percentage Interest shall not fall below [***]. If either Shareholder's Percentage Interest falls below [***], then it no longer has the right to nominate the Vice Chairman until such Shareholder's Percentage Interest increases to [***] or more again.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.6.1 Shareholder Meetings. At any time, and from time to time, the Board of Directors may call meetings of the Shareholders. Special meetings of the Shareholders for any proper purpose or purposes may be called at any time by the Board of Directors. Written notice of any such meeting shall be given to all Shareholders. No less than twenty (20) calendar days' written notice shall be given for an annual meeting of the Shareholders and no less than ten (10) calendar days' written notice shall be given for any special meetings of the Shareholders. Each meeting of the Shareholders shall be conducted by the Chairman of the Board of Directors. Where the Chairman of the Board is on leave or cannot exercise his power and authority for any cause, the meeting of the Shareholders shall be conducted by the Vice-Chairman of the Board, or any designee appointed in accordance with the Acts. Each Shareholder may authorize any Person by written proxy to act for it or on its behalf on all matters in which the Shareholder is entitled to participate. Each proxy must be signed by a duly authorized officer of the Shareholder. All other provisions governing or otherwise relating to the convening of meetings of the Shareholders shall from time to time be established in the sole discretion of the Board of Directors (acting reasonably). Each of the Shareholders shall have the obligation to attend the meeting of the Shareholders, whether in person or by proxy, for the purpose of the quorum, provided that nothing in the foregoing shall be construed to restrict any Shareholder on how to exercise its voting rights (including abstaining from voting). In the event that any of the Shareholders fails to attend a meeting of the Shareholders due to reasons other than those that are unattributable to such Shareholder or its representative(s) (including, without limitation, Force Majeure, accident and illness) and taking into account that such Shareholder should use its best efforts to issue a proxy for such meeting, resulting in a failure of reaching a quorum, it shall be deemed as a material breach of this Agreement and bad faith of such Shareholder in performing its obligations hereunder.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.6.2 Board Meetings. The Board of Directors shall hold meetings at least once every Fiscal Quarter. Unless a higher quorum is required by Applicable Law, the presence of four (4) Directors, in each case, in person or by video conference, shall be necessary and sufficient to constitute a quorum for the purpose of taking action by the Board of Directors at any meeting of the Board of Directors. Each Director may authorize any other Director by written proxy to act for or on behalf of such Director on all matters in which such Director is entitled to participate. Each Shareholder shall be responsible for the expenses of the Director(s) nominated by such Shareholder in connection with all meetings of the Board of Directors. The Chairman of the Board shall preside at all meetings of the Board of Directors and shall have such other duties and responsibilities as may be assigned to him or her by the Board of Directors. The Chairman of the Board must include any item submitted by a Shareholder or General Manager for consideration at a meeting of the Board of Directors, may not cut off debate on any matter being considered by the Board of Directors and shall call for a vote on any matter at the request of any Director or General Manager. Each of the Directors shall have the obligation to attend each of the meetings of the Board of Directors, whether in person or by proxy, for the purpose of the quorum, provided that nothing in the foregoing shall be construed to restrict any Director on how to exercise his/her voting rights (including abstaining from voting). In the event that any of the Directors fails to attend two meetings of the Board of Directors consecutively due to reasons other than those that are unattributable to such Director or its proxy (including, without limitation, Force Majeure, accident and illness) and taking into account that such Director should use his/her best efforts to issue a proxy for such meeting, resulting in failure of reaching a quorum, it shall be deemed as a material breach and bad faith of the Shareholder who nominates such Director in performing such Shareholder's obligations hereunder.

5.6.3 Notice; Waiver. Except in the case of emergency as provided under the Acts, the regular quarterly meetings of the Board of Directors described in Section 5.6.2 shall in principle be held upon not less than seven (7) Business Days' written notice. Additional meetings of the Board of Directors may be held upon the request of any Director to the Chairman of the Board, upon not less than seven (7) Business Days' written notice (which may be given, to the extent permitted by Applicable Law, via confirmed facsimile, confirmed e-mail or other manner provided for in Section 12.5). No action taken by the Directors at any meeting shall be valid unless the requisite quorum is present.

5.6.4 Voting of Directors. Except as otherwise expressly provided in this Agreement and/or Applicable Law, all actions, determinations or resolutions of the Board of Directors shall require the affirmative vote or consent of a majority of the Board of Directors present at any meeting at which a quorum is present. Each Director shall be entitled to one (1) vote, and Directors shall be entitled to cast their vote through proxies.

5.6.5 Meetings. All meetings of the Board of Directors or the Shareholders shall be conducted in English. Directors and their proxies shall have the right to participate in all meetings of the Board of Directors by means of a video conference or similar communications equipment by means of which all persons participating in the meeting can see and hear each other at the same time and participation by such means shall constitute presence in person at a meeting.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.6.6 **Reliance by Third Parties.** For convenience and subject to Applicable Laws, each party agrees that any Person dealing with the Company, Photonics Director, DNP Director, or any Officer may rely upon a certificate signed by any one Photonics Director and one DNP Director as to: (a) the identity of any Director or Officer; (b) the existence or non-existence of any fact or facts which constitute a condition precedent to acts by the Directors or Officers or in any other manner germane to the affairs of the Company; (c) the Persons who are authorized to execute and deliver any instrument or document for or on behalf of the Company; or (d) any act or failure to act by the Company or as to any other matter whatsoever involving the Company, Photonics Singapore, DNP, any Director or any Officer.

5.7 Supervisors

The Company shall have two (2) supervisors. Each of Photonics Singapore and DNP shall be entitled to nominate one (1) representative to be elected as the supervisors.

5.8 Actions Requiring a Supermajority Vote of Shareholders

Notwithstanding the provisions of Section 5.6.4 or any other provisions of this Agreement, the Company may not, and no Shareholder or Director may cause the Company to, take any of the actions specified in Schedule F (or any other action specified in this Agreement as requiring a Supermajority Vote of Shareholders) without obtaining the Supermajority Vote of Shareholders.

5.9 Actions Requiring a Supermajority Vote of Directors

Notwithstanding the provisions of Section 5.6.4 or any other provisions of this Agreement, the Company may not, and no Shareholder or Director may cause the Company to, take any of the actions specified in Schedule G (or any other action specified in this Agreement as requiring a Supermajority Vote of Directors) without obtaining the Supermajority Vote of Directors.

5.10 Compensation of Directors and Supervisors

The Directors and supervisors shall not be entitled to any compensation in their capacities as Directors and supervisors unless otherwise agreed upon in writing by all of the Shareholders.

5.11 Other Activities

Subject to Applicable Law, Article 8 hereof and the provisions of the Transaction Documents, the Shareholders, their respective Affiliates and the Directors may [***]. Neither the Company nor any Shareholder, Affiliate of a Shareholder, or Director shall [***].

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.12 Accounting; Records and Reports

5.12.1 Accounting and Fiscal Year. The books, records and accounts of the Company, including for all applicable tax purposes, will be maintained in accordance with such methods of accounting as shall be reasonably determined by the Board of Directors. The fiscal year of the Company (“**Fiscal Year**”), including each of the fiscal quarters (the “**Fiscal Quarters**”) and each of the fiscal months (“**Fiscal Months**”) thereof, shall correspond to that of calendar year, calendar quarters and calendar months, respectively.

5.12.2 Books and Records. The Board of Directors shall cause to be kept, at such location as the Board of Directors shall reasonably deem appropriate, full and proper ledgers, other books of account, and records of all receipts and disbursements and other financial activities of the Company in accordance with Photronics’ record retention policies for as long as Photronics Singapore and/or an Affiliate of Photronics Singapore hold more than fifty percent (50%) of Percentage Interest in the Company in the aggregate. The Board of Directors shall also cause to be kept at such location copies of each of the following:

- (a) a current list of the full name and last known address of each Shareholder, and the capital account, number of Shares and Percentage Interest held by each Shareholder;
- (b) a current list of the full name and last known address of each Director;
- (c) the Articles of Incorporation of the Company, including any amendments to the Articles of Incorporation;
- (d) the Company’s federal, state and local income tax returns and reports, if any, for the seven (7) most recent Fiscal Years;
- (e) this Agreement and any amendments to this Agreement;
- (f) financial statements of the Company for the five (5) most recent Fiscal Years; and
- (g) minutes of all meetings of the Board of Directors and the Shareholders.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.12.3 Reports. The Board of Directors shall also cause to be sent to each Shareholder of the Company, the following:

(a) within forty-five (45) days after the Effective Date, the Company shall provide each Shareholder with an unaudited balance sheet of the Company as of the Effective Date;

(b) within one hundred eighty (180) days following the end of each Fiscal Year, such information as may be reasonably required by the Shareholders for preparation of their respective federal, state and local income or franchise tax returns;

(c) a copy of the Company's federal, state and local income tax or information returns for each Fiscal Year, concurrent with the filing of such returns;

(d) within seventy five (75) days after the end of each Fiscal Year, the Company shall provide each Shareholder with an audited balance sheet, income statement and statement of cash flows for and as of the last day of the Fiscal Year then ended, prepared in accordance with GAAP and audited in accordance with GAAS as well as such other financial information as any Shareholder may reasonably request to enable such Shareholder and its Affiliates to prepare their consolidated quarterly and annual financial statements;

(e) within forty five (45) days after the end of each Fiscal Quarter or Fiscal Year, the Company shall provide each Shareholder with an unaudited balance sheet, income statement and statement of cash flows for and as of the last day of the year or quarter (as appropriate) then ended, prepared in accordance with GAAP, as well as such other financial information as any Shareholder may reasonably request to enable such Shareholder and its Affiliates to prepare their consolidated quarterly and annual financial statements; and

(f) within a reasonable period of time, notice of any material litigation filed against the Company or any written claim by a Governmental Authority of any material violation of any state, federal or foreign law, statute, rule or regulation.

If Japanese generally accepted accounting principles have been amended, both parties agree that; (a) the time limit set forth in this Section 5.12.3 shall be amended accordingly, and to the extent DNP deems reasonably necessary, by the notice from DNP to the Company, and (b) both parties shall cause the Company to use all reasonable efforts to send all necessary financial information as DNP may reasonably request to enable DNP and its Affiliates to prepare their consolidated quarterly and annual financial statements.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(a) To the extent not in violation of Applicable Law, the terms of the Transaction Documents and the Company's confidential obligations (statutory or contractual) to third parties, Shareholders (personally or through an authorized representative) may, for purposes reasonably related to their interests in the Company, during reasonable business hours (i) examine and copy (at their own cost and expense) the books and records of the Company, including the records listed in Section 5.12.2, and (ii) have access to the Company's management, internal and external accountants and attorneys, plans, properties and other assets to conduct investigations regarding the Business and assets of the Company at such Shareholder's sole expense, and the Company shall reasonably cooperate with such Shareholder in such investigations. Any information obtained as a result of this Section 5.12.4 shall be used by a Shareholder solely for purposes reasonably related to such Shareholder's participation in the Company and shall be subject to the confidentiality restrictions set forth in Section 12.17 of this Agreement.

(b) Any Shareholder's request for documents or request to inspect or copy documents or have access to the Company's management, plans, properties and other assets under this Section 5.12.4 (i) may be made by that Shareholder or that Shareholder's authorized representative and (ii) shall be made in writing to the General Manager and shall state the purpose of such demand. If a Shareholder is not satisfied with the response of the General Manager, the Shareholder may make such request to the Board of Directors.

5.13 **Indemnification and Liability of the Directors**

5.13.1 Indemnification. The Company shall indemnify and hold harmless each Director, the General Manager and all other Officers (individually, an "**Indemnitee**") to the fullest extent permitted by Applicable Law from and against any and all losses, claims, demands, costs, damages, liabilities, whether joint or several, expenses of any nature (including reasonable attorneys' fees and disbursements), judgments, fines, settlements and other amounts (each an "**Indemnified Loss**") arising from any and all claims, demands, actions, suits or proceedings, civil, criminal, administrative or investigative, in which the Indemnitee may be involved as a defendant, or threatened to be involved as a defendant (other than all claims, demands, actions, suits or proceedings brought by the Shareholder who nominated such Director, if applicable), relating to the performance or nonperformance of any act concerning the activities of the Company or by reason of the Indemnitee's status as a Director, General Manager or Officer, as applicable, regardless of whether the Indemnitee retains such status at the time any such Indemnified Loss is paid or incurred, if (a) the Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, the best interests of the Company and, in the case of a criminal proceeding, had no reasonable cause to believe that his or her conduct was unlawful, and (b) the Indemnitee's conduct did not constitute an act or omission which involved intentional misconduct or a knowing violation of the law or gross negligence. The termination of an action, suit or proceeding by judgment, order, or settlement shall not, in and of itself, create a presumption or otherwise constitute evidence that the Indemnitee acted in a manner contrary to that specified in clauses (a) or (b) above.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.13.2 Expenses. Expenses incurred by an Indemnitee in defending any claim, demand, action, suit or proceeding subject to this Section 5.13 shall be advanced by the Company prior to the final disposition of such claim, demand, action, suit, or proceeding.

5.13.3 Company Expenses. Any indemnification provided hereunder shall be satisfied solely out of the Company Assets, as an expense of the Company. No Shareholder shall be subject to liability by reason of these indemnification provisions.

5.13.4 No Other Rights. The provisions of this Section 5.13 are for the benefit of the Indemnitees and shall not be deemed to create any rights for the benefit of any other Person; *provided, however*, that the indemnification rights provided in this Section 5.13 will inure to the benefit of the heirs, legal representatives, successors, assigns and administrators of the Indemnitee.

5.13.5 No Liability. No Indemnitee shall be liable to the Company or to any Shareholder for any losses sustained or liabilities incurred as a result of any act or omission of any Indemnitee if (a) the Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, the best interests of the Company and, in the case of a criminal proceeding, had no reasonable cause to believe that his or her conduct was unlawful, and (b) the Indemnitee's conduct did not constitute an act or omission which involved intentional misconduct or a knowing violation of the law or gross negligence.

5.13.6 No Fiduciary Duties.

(a) In connection with the determination of any and all matters presented for action to the Shareholders, the Board of Directors or the Steering Committee, as applicable, the Shareholders acknowledge and agree that each Shareholder will be acting on its own behalf and each Representative serving on the Board of Directors or the Steering Committee will be acting on behalf of the Shareholder that appointed such Representative, to the fullest extent permitted by Applicable Law and subject to the fiduciary duties of the Representatives under the Company Act.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(b) Each Shareholder may act, and, to the fullest extent permitted by Applicable Law, will be protected for acting, in its own interest (subject to the express terms of any contract entered into by such Shareholder) without regard to the interest of the other Shareholder, and, subject to Section 5.13.6(c), each Representative may act, and, to the fullest extent permitted by Applicable Law, will be protected for acting, at the direction or control of, or in a manner that such Representative believes is in the best interest of, the Shareholder that appointed the Representative without regard to the interest of the other Shareholder.

(c) Each of the Shareholders hereby waives, and shall cause the Company to waive, on its own behalf and on behalf of each of its subsidiaries, to the fullest extent permitted by Applicable Law, any claim or cause of action against any Shareholder or Director or member of the Steering Committee appointed by a Shareholder based on the determination of any and all matters presented for action to the Shareholders, the Board of Directors or the Steering Committee, as applicable; *provided, however*, the foregoing will not limit any Shareholder's obligation under, or liability for, breach of the express terms of this Agreement, other Transaction Documents or any other agreement that they have entered into with the Company or any of its subsidiaries or the other Shareholder. Each of the Shareholders acknowledges that no Shareholder shall negotiate or enter into or request or otherwise cause the Company to negotiate or enter into any agreement or transaction that would result in such Shareholder or any of its Affiliates receiving any financial consideration or other tangible property incentive, payment or other form of financial consideration or other tangible property consideration from any Governmental Authority or Person based upon the Company's taking an action (including hiring any employees, undertaking any construction or purchasing any equipment) or entering into such agreement or transaction other than as a Shareholder of the Company pursuant to this Agreement, and any Shareholder who receives any such consideration or other tangible property incentive, payment or other form of financial consideration or other tangible property consideration from any Governmental Authority or Person in respect of the Company's activities, shall promptly convey such consideration or other tangible property incentive, payment or other form of financial consideration or other tangible property consideration from any Governmental Authority or Person to the Company as a supplemental Capital Contribution without consideration including any adjustment in the Shares or Economic Interest of, or balance of requested Additional Contribution owed by, such Shareholder.

(d) The term "**Representative**" shall mean, with respect to a Shareholder, the Directors and members of the Steering Committee appointed by such Shareholder.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.14 Officer

5.14.1 General Manager and Vice General Manager. The Company will have a general manager (the “**General Manager**”) to be nominated by Photronics Singapore with input from [***]; provided, however, that if the Percentage Interest of Photronics Singapore falls below [***], then the [***] will be nominated by [***] with input from [***] or otherwise by the Board of Directors. If a Shareholder [***], such Shareholder shall have the right to nominate the General Manager again. The Company shall have a vice general manager (the “**Vice General Manager**”) to be selected by DNP Asia Pacific with input from the [***] and Photronics Singapore; *provided, however,* that in the case where the General Manager is nominated by DNP Asia Pacific in accordance with the foregoing, then the Vice General Manager shall be selected by Photronics Singapore with input from the Board of Directors and DNP Asia Pacific. In the event the [***] is unable to [***] for any reason [***], the [***] will [***] but will only do so until the next [***] at which time [***] will be appointed [***], as the case may be, in accordance with the foregoing in this Section 5.14.1.

5.14.2 Duties and Powers of the General Manager. The General Manager shall, subject to the control of the Board of Directors, have general supervision, direction and control of the day-to-day affairs of the Company and shall report directly to the Board of Directors. Unless limited by the Board of Directors or this Agreement, he or she shall have the general powers and duties of management usually vested in the office of chief executive officer of corporations and shall have such other powers and duties as may be prescribed by the Board of Directors.

5.14.3 Other Officers; Employment; Removal. The Company may also have a chief financial officer, a secretary and such other officers as determined by the Board of Directors after input from the General Manager and the Vice General Manager, each of whom will be accountable to the General Manager (the General Manager, the Vice General Manager and any other officers elected in accordance with this Section 5.14.3, each, an “**Officer**” and collectively, the “**Officers**”). Subject to Section 5.14.1, the General Manager, the Vice General Manager and any other Officer may be removed at any time upon an affirmative vote of the majority of the Board of Directors and the consent of the Shareholder who appoints/nominates such Officer in question.

5.14.4 Duties and Powers of Chief Financial Officer. Any chief financial officer of the Company shall keep and maintain, or cause to be kept and maintained, books and records of accounts of the properties and business transactions of the Company, including accounts of its assets, liabilities, receipts, disbursements, gains, losses and capital. He or she shall disburse the funds of the Company as may be ordered by the Board of Directors and shall render to the Board of Directors at their request an account of all his or her transactions as chief financial officer and of the financial condition of the Company. Authorizations with respect to the Company’s depositories, disbursement of funds and related banking matters shall be as set forth in resolutions of the Board of Directors.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.14.5 Duties and Powers of Vice General Manager. The Vice General Manager shall assist the General Manager and shall have such other powers and duties as may be prescribed by the Board of Directors from time to time after consultation with the General Manager and DNP Asia Pacific or Photronics Singapore, who is entitled to appoint the Vice General Manager at that time.

5.14.6 Duties and Powers of Secretary.

(a) Any secretary of the Company shall attend all meetings of the Board of Directors and all meetings of the Shareholders and record all votes and the minutes of all proceedings in a book to be kept for that purpose, and shall perform like duties for any standing committees when requested by such committee.

(b) Any secretary of the Company shall keep, or cause to be kept, at the principal executive office or at the office of the Company's transfer agent or registrar, as determined by resolution of the Board of Directors, a register, or a duplicate register, showing the names of all Shareholders and their addresses, Percentage Interests, the number and date of certificates issued for the same (if any), and the number and date of cancellation of every certificate surrendered for cancellation (if any).

5.14.7 General Provisions Regarding Officers.

(a) The Board of Directors may, from time to time, designate Officers of the Company and delegate to such Officers such authority and duties as the Board of Directors may deem advisable and may assign titles (including, without limitation, president, vice-president and/or treasurer) to any such Officer. Unless the Board of Directors otherwise determines, if the title assigned to an Officer of the Company is one commonly used for Officers of a business corporation, then, subject to the terms of this Agreement, the assignment of such title shall constitute the delegation to such Officer of the authority and duties that are customarily associated with such office. Any number of titles may be held by the same Officer.

(b) Any Officer to whom a delegation is made pursuant to the foregoing shall serve in the capacity delegated unless and until such delegation is revoked by the Board of Directors for any reason or no reason whatsoever, with or without cause, or such Officer resigns.

5.15 Steering Committee

5.15.1 Scope of the Steering Committee. Immediately after the Effective Date, the Shareholders will establish a steering committee (the "**Steering Committee**") to review and discuss the following matters in relation to the Company: development of [***]. One of the key responsibilities of the Steering Committee will be to [***] Schedule K.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.15.2 Composition of the Steering Committee. The Steering Committee shall consist of four (4) members, two (2) members appointed by Photonics Singapore and two (2) members appointed by DNP Asia Pacific, and such four (4) members may include the General Manager of the Company at the discretion of the appointed Shareholder. The term of a chairman who is appointed from and among the members of the Steering Committee (the "Steering Committee Chairman") shall be one year from its election. The Steering Committee Chairman will be initially appointed by Photonics Singapore, and thereafter the position of the Steering Committee Chairman will rotate annually between the members appointed by Photonics Singapore and those appointed by DNP Asia Pacific.

5.15.3. Procedures of the Steering Committee. The items listed in Section 5.15.1 above shall be reviewed and determined between the parties in accordance with the following procedure:

(i) The Steering Committee shall convene regular meetings on a monthly basis for the first [***] after the Effective Date; thereafter the Steering Committee will determine how often it will meet. The Steering Committee shall discuss the matters listed in Section 5.15.1 above. The Steering Committee will prepare a meeting agenda for each meeting and will keep minutes of its meetings. Agenda items will include[***]. The Steering Committee will vote on specific matters within the charter of the committee and render decisions on specific proposals brought forth within the scope of the committee. The Steering Committee will use all reasonable efforts to amicably resolve all matters brought before the Steering Committee with a goal of resolving all matters prior to raising such matters with the Board of Directors.

(ii) In the event a proposal is brought to the Steering Committee and the Steering Committee cannot reach a unanimous decision in a timely matter, then, either [***] may declare the disagreement to the other Shareholder. If the disagreement continues to be unresolved within [***] from the date of declaration, either Shareholder may refer the unresolved proposal to the [***]. The meeting between these executive members shall be convened within *** after submission of either Shareholder's request made after the lapse of the *** period mentioned in the previous sentence, and they will meet together with the goal of trying to resolve obstacles causing the disagreement and decide the proposal.

(iii) In the event the proposal cannot be resolved at the meeting between the [***], then either Photonics Singapore or DNP may refer the unresolved proposal to the [***] for consideration and final voting. The meeting of Board of Directors of the Company shall be convened within [***] after submission of either Shareholder's request.

(iv) If the vote by the Board of Directors cannot be accepted by ***, *** will have the right, subject to Section 5.15.4 below, to exercise [***] whereby *** will have the obligation to purchase all of *** in the Company pursuant to the terms and conditions set forth in Section 5.15.4 (such put option being referred to as the "[***]") and *** this Agreement and the Transaction Documents to which [***] is a party without any liability; provided however that the [***] will continue to be in full force and effect notwithstanding the fact that the Company ceases to be a joint venture between Photonics Singapore and DNP Asia Pacific.

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

5.15.4 [***]. *** may exercise the *** by giving a written notice to [***] at any time after the expiration of the [***]. Photronics agrees to use all reasonable efforts to apply for all applicable regulatory approvals or clearance within *** days after receipt of the [***]. The closing of the sale and purchase [***] as a result of the [***] shall take place as soon as commercially practicable (taking into account the necessary funds raising arrangement by Photronics Singapore) without any undue delay and shall be within *** after all prior regulatory approvals or clearance have been obtained. The [***] shall be equal to the product of the difference of [***] multiplied by the number [***] shall be paid by Photronics pursuant to the terms and conditions agreed to upon the exercise of *** but the *** shall be fully paid [***]

At the [***], [***] shall transfer all of its Interests in the Company to Photronics, free and clear of any liens or encumbrances, and Photronics shall pay the amount of all or part of the [***] that Photronics will be required to pay upon the [***]. At the [***] shall deliver to Photronics such instrument or instruments of conveyance as Photronics Singapore reasonably requests.

[***]

5.16 Business Development Team [*]**

5.17 Maintenance of Insurance

The Company shall at all times be covered by insurance of the types and in the amounts set forth on Schedule E. Such insurance coverage may be provided through the coverage under one or more insurance policies maintained by the Company, Photronics or Photronics Singapore. A certificate of insurance will be provided by the Company to the Shareholders annually evidencing coverage.

5.18 Related Party Agreements

Photronics Singapore and DNP agree that (i) any contract, agreement, amendment, arrangement or understanding entered into after the date hereof between any Company Entity on the one hand, and either Shareholder (or any of their respective Affiliates) on the other hand (the “**Related Party Agreement**”), shall be on an arm’s-length basis; and (ii) Directors nominated by a Shareholder who or whose Affiliate is a party to a Related Party Agreement shall be deemed having a personal interest in such Related Party Agreement and shall refrain from voting on such Related Party Agreement at the relevant board meeting in accordance with the Acts.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

**ARTICLE 6.
OPERATIONS**

6.1 Headquarters

The Company's headquarters shall be in Xiamen, the People's Republic of China.

6.2 Operations Plan; Annual Budget

The initial business plan of the Company is attached hereto as Schedule H that covers the [***] of the Company from execution of the Transaction Documents until commencement of full operation of the Company's facilities. The initial business plan will not be substantially modified without the prior written consent of both Shareholders. After commencement of [***] of the Company's facilities, from time to time, but in no event less frequently than annually, the Board of Directors may amend or update the business plan of the Company (collectively with the initial business plan, referred to as the "**Business Plan**"). The Board of Directors will also be responsible for approving an annual budget (the "**Annual Budget**") on at least an annual basis at the beginning of each fiscal year.

6.3 Reserved [RESERVED]

6.4 Company Employees; Seconded Employees

The Company shall employ its own personnel and shall be their exclusive employer. In addition, certain other persons who are employed by a Shareholder or its Affiliates may be assigned by such Shareholder, to work for the Company ("**Seconded Employees**"). After the Effective Date, the Company will [***]. During the term of this Agreement from the Effective Date, [***] shall have [***] will be the Vice General Manager selected [***] in accordance with Section 5.14.1 [***]. [***] will pay all remuneration expenses related to such employees. [***] All Seconded Employees will be subject to stringent confidentiality obligations including executing a confidentiality agreement with the Company. All Seconded Employees will report directly to the General Manager and the Vice General Manager.

6.5 Service Provider Documents

6.5.1 The Company shall have policies applicable to, and ensure that all of its officers, employees and third-party independent contractors, third-party consultants, and other third-party service providers enter into appropriate agreements with respect to, (1) protection of confidential information of the Company, (2) compliance with Applicable Law, and (3) other matters related to the delivery of services to, or employment of such Person by, the Company or its Affiliates. The Company shall have policies applicable to, and ensure that all of its officers and employees enter into appropriate agreements with respect to intellectual property assignment, including invention disclosures, pursuant to which ownership to any intellectual property created in the course of employment with the Company or any of its Affiliates shall be assigned to the Company. The Company shall have policies applicable to, and ensure that all of its third-party independent contractors, third-party consultants, and other third-party service providers that create intellectual property in the course of performing services for the Company, enter into appropriate agreements with the Company with respect to the Company's ownership of or the Company's right to use such intellectual property. The forms referred to in this Section 6.5.1 are collectively referred to as the "**Service Provider Documents.**"

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

6.5.2 Notwithstanding any preceding provisions in this Section 6.5 or elsewhere, no Seconded Employee shall be required to sign any Service Provider Documents, except with respect to acknowledgement of an agreement regarding policies of the Company addressing conduct while performing services at the premises of the Company, such as workplace safety, but excluding matters relating to protection of confidential information of the Company and intellectual property assignment, which issues have been addressed in special Service Provider Documents. The Company shall be responsible for providing such Service Provider Documents, prepared by the Company for each Seconded Employees to the appropriate Seconded Employees, following up to make sure they are signed and for properly storing such forms; and each Shareholder shall cooperate with the Company to require their Seconded Employees to sign such special Service Provider Document when requested to do so by the Company.

6.6 Compensation and Benefits

The Company shall have compensation and benefits programs (including incentive compensation programs) for the employees of the Company (excluding, for this purpose, [***]) at its locations [***], as determined by the Board of Directors or the General Manager, as applicable, and, to the extent required by Applicable Law or this Agreement, approved by the Board of Directors.

ARTICLE 7. DISPOSITION AND TRANSFERS OF INTERESTS

7.1 Holding of Shares

For so long as Photronics Singapore or DNP, directly or indirectly, owns Shares in the Company, Photronics Singapore or DNP, as applicable, must own and hold such Shares either (a) by itself or (b) through one or more wholly owned (including indirect wholly owned) subsidiaries.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

7.2 Transfer Moratorium

7.2.1 Other than as specifically provided in this Agreement, no Shareholder may [***] of its Shares to any other [***] directly or indirectly, [***] its [***], respectively, in each case other than [***] (ii) in a [***] in connection with a [***], in compliance with the terms of Section 7.4 of this Agreement. The parties agree that the [***] shall be [***]. In the event of any [***] as permitted under this Section 7.2, the parties thereto shall agree to [***].

7.2.2 Transfer Notice. If any Shareholder proposes to Transfer any of its Shares, whether directly or indirectly (the “**Selling Shareholder**”), such Selling Shareholder shall promptly provide written notice (the “**Transfer Notice**”) to the other Shareholder (the “**Non-Selling Shareholder**”) describing in reasonable detail the proposed [***], including, without limitation, [***]. The Transfer Notice may be updated from time to time by the [***] by a further written notice to [***] shall also receive any updates to the [***] and shall have the right to obtain [***] it reasonably requests from time to time in connection with the proposed Transfer.

7.2.3 Right of First Refusal. The Non-Selling Shareholder shall have a right to [***], by giving a written response notice to [***].

7.2.4 Co-Sale Right. In the event that the Non-Selling Shareholder does not [***] shall have the right to [***].

7.2.5 The sale of all Response Shares and, if applicable, remaining Shares subject to the Transfer Notice, and full payment therefor, shall be completed within *** days after the anticipated closing date specified in the Transfer Notice (or as updated pursuant to Section 7.2.2 above). In the event that such purchase and sale is not completed within such *** day period, the Selling Shareholder shall not thereafter sell any Shares without first offering such Shares to the Non-Selling Shareholder in accordance with this Section 7.2.

7.2.6 In the event that the Non-Selling Shareholder does not exercise any right under Section 7.2.3 or 7.2.4 above, the Selling Shareholder may Transfer any of its Shares subject to the Transfer Notice at the same price and upon the terms and conditions specified in the Transfer Notice, provided that the proposed Transfer shall be completed within thirty (30) days after the anticipated closing date specified in the Transfer Notice (or as updated pursuant to Section 7.2.2 above).

7.2.7 The restrictions set forth in this Section 7.2 shall not apply to any Transfers by a Selling Shareholder to one or more of its wholly owned (including indirectly wholly owned) subsidiaries as permitted under Section 7.1.

7.2.8 Notwithstanding anything to the contrary set forth herein, no Transfer shall take place between a Shareholder and *** as identified on Schedule L.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

7.3 Purchase and Sale of Remaining Interest

7.3.1 If the Percentage Interest of a Shareholder (the “**Minority Shareholder**”) is [***], and remains at or below [***] for more than [***], the other Shareholder or a wholly owned subsidiary thereof (such other Shareholder or Affiliate thereof, the “**Majority Shareholder**”) shall have the [***] at a [***], subject to the terms and conditions set forth below. The Majority Shareholder may [***] by delivering a written notice of its intent to exercise to the Minority Shareholder. In addition, the Minority Shareholder shall have the option to [***] subject to the terms and conditions set forth below. The Minority Shareholder may exercise [***] by delivering a written notice of its intent to exercise to the Majority Shareholder. The notice delivered by the Majority Shareholder or the notice delivered by the Minority Shareholder pursuant to this Section 7.3.1 is hereinafter referred to as the “**Minority Option Notice.**”

7.3.2 The closing of the purchase and sale of the Minority Shareholder’s remaining Interest (the “**Minority Closing**”) shall take place [***] all prior [***] have been obtained. Such Minority Closing shall take place at the principal office of the Company or at such other location as the Majority Shareholder and the Minority Shareholder may mutually determine. At the Minority Closing, [***] after receipt of such notice of put option from the Minority Shareholder.

7.3.3 [***].

7.3.4 [***].

7.4 Change in Control

7.4.1 The parties will provide at least *** days but no more than *** days’ notice (the “**Change in Control Notice**”) [***].

7.4.2 If Change in Control occurs to [***].

7.4.3 [***].

7.4.4 The Change in Control Party will continue to be bound by the [***] obligations set forth in Section 8.1 for a period of [***] following the date of the Change in Control Notice (in which case, the one-year period surviving after the termination set forth in Section 8.1 does not apply). In the event the Change in Control Closing (i.e., receipt of all necessary regulatory approvals and completion of the transfer of the Change in Control Party’s Interest to the Change in Control Purchaser but not including full payment of the Change in Control Closing Price) takes longer than *** days from the date of the Change in Control Notice, DNP and Photronics will agree on a delay of the commencement date of the [***] obligations set forth in this Section, but in no event shall such commencement date be delayed for more than *** days from the date of the Change in Control Notice.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

In the event of any purchase and sale of Shares under Section 7.3 or 7.4, the parties thereto shall enter into a commercially reasonable agreement to implement such purchase and sale. The parties thereto shall also make the necessary amendments to this Agreement.

**ARTICLE 8.
NON COMPETE**

8.1 Non-Competition

8.1.1 [***].

8.1.2 During the term of this Agreement and [***] of this Agreement, the parties shall not and shall ensure that its or their Affiliates do not (either personally or through an agent or otherwise) (i) [***].

8.2 Business Scope of the Company

8.2.1. A purchase order placed by a company with [***].

8.2.2 A purchase order placed by a company [***] will be classified into the following two primary categories and interpreted as follows:

- (i) In the [***]; and
- (ii) [***].

8.3 Contact with Customers

8.3.1 The Company will be [***]

8.3.2 No [***]

Notwithstanding the foregoing,[***].

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

ARTICLE 9.
TERM AND TERMINATION OF THIS AGREEMENT

9.1 Term of this Agreement

9.1.1 This Agreement shall enter into force as of the Effective Date, and remain in force throughout the duration of the Company if not terminated earlier as provided for in Section 9.1.2 or 9.2.

9.1.2 In the event that one of the Shareholders (or its Affiliates) ceases to be a shareholder of the Company for any reason, this Agreement is automatically terminated, except that the [***] obligations of the Shareholders after such Shareholder cease to hold Shares in the Company, as mentioned under Section 1.6.2, Section 5.15.4, Section 7.3.4 and Section 7.4.4, and the [***] mentioned under Section 8.1 shall survive the termination of this Agreement..

9.2 Termination and Cross-termination

9.2.1 Notwithstanding Section 9.1, this Agreement may be terminated by either party at any time, upon notice given to the other party:

- (a) in the event of a material [***] of this Agreement by such other party, which such other party [***];
- (b) in the event of [***];
- (c) in the event of the [***]; or
- (d) in the event of such other party [***].

In the case of termination pursuant to this Section 9.2.1(a) the ***surviving after the termination set forth in Section 8.1 does not apply to the Terminating Party (defined in Section 9.3), and the Terminating Party will be immediately released from the *** set forth therein upon the termination hereunder.

9.2.2 In addition to Section 9.2.1, this Agreement may be terminated by [***]within *** years from the Effective Date, in which case, *** may exercise the same option as that given to the Requesting Shareholder set forth in Section 10.4; provided that, prior to *** exercising such option, both parties will discuss dissolution and liquidation of the Company in accordance with Section 10.4. In the case of termination pursuant to this Section 9.2.2, the *** surviving after the termination set forth in Section 8.1 does not apply, and the parties will be immediately [***] obligations set forth therein upon the termination hereunder.

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

9.2.3 The parties agree that:

(a) the termination of this Agreement shall not (unless otherwise specified in the Transaction Documents concerned) produce the automatic cross-termination of any of the Transaction Documents, unless a Transaction Document is terminated in accordance with Section 9.2.3 (c);

(b) the termination of any of the Transaction Documents shall not produce the automatic cross-termination of this Agreement;

(c) the party who terminates this Agreement in accordance with Section 9.2.1 or 9.2.2 above shall have the right to terminate any or all of the Transaction Documents, to which it is a party without any liability; provided, however, that, in the event that this Agreement is terminated by DNP in accordance with Section 9.2.2, DNP is not entitled to [***] or other agreement that requires DNP to supply, or grant a license to use, technology to the Company that is in effect at the time of termination will continue after such termination as long as any counterparty to the applicable agreement (the Company or PDMC) is not in breach of any of the terms and conditions thereof;

(d) the termination of this Agreement shall not affect the respective rights and obligations of the parties having accrued prior thereto, under this Agreement; and

(e) the termination rights, remedies and provisions arising from Applicable Laws shall, to the extent not waived or excluded hereby, cumulate with those specified under this Section 9.2.3.

9.3 Right of Terminating Party

The parties agree that the party who terminates this Agreement in accordance with Section 9.2.1 (the “**Terminating Party**”) shall have the right:

(a) to claim against the other party [***]; and

(b) by giving the notice to the other party [***].

9.4 Exceptional Exit

9.4.1 Photronics and DNP may terminate this Agreement by giving a [***] prior written notice to the other party if any of the following events occurs after the expiration of the [***] (the “**Exit Notice**”, and such party giving the Exit Notice being referred to as the “**Exiting Party**”):

(a) In the event that the occurrence of Force Majeure (including the issue(s) between [***] prevents the Exiting Party from fulfilling its obligations hereunder, and the situation [***]; or

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(b) In the event that the Exiting Party decides to [***].

9.4.2 The Exiting Party may propose a dissolution of the Company to the other party (the “**Non-Exiting Party**”), and:

(a) If the Non-Exiting Party agrees to the proposal of dissolution, the Company will be liquidated pursuant to Section 10.5; or

(b) If the Non-Exiting Party does not accept the proposal of dissolution, the Exiting Party shall have a [***] the Shares of the Company held by it to the Non-Exiting Party, and the Non-Exiting Party shall [***] such Shares from the Exiting Party. The price of the Shares to be sold by the Exiting Party hereunder (the “**Exceptional Exit Price**”) shall be [***] to the product of the difference of [***].

**ARTICLE 10.
DISSOLUTION, LIQUIDATION, AND TERMINATION OF THE COMPANY**

10.1 Limitations

The Company may be dissolved, liquidated, and terminated only pursuant to the provisions of this Article 10, and the parties hereto do hereby irrevocably waive, to the extent permitted by Applicable Law, any and all other rights they may have to cause a dissolution, liquidation or termination of the Company or a sale or partition of any or all of the Company Assets in connection with such dissolution or liquidation.

10.2 Exclusive Causes

Notwithstanding the Acts, the following and only the following events shall cause the Company to be dissolved, liquidated, and terminated (each a “**Liquidating Event**”), unless otherwise set forth in this Agreement:

(a) [***];

(b) [***];

(c) [***];

(d) the occurrence of any other event that, [***];

(e) the election by either Shareholder to [***] of the Company [***]; or

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(f) the election by a Shareholder to [***] pursuant to Section 7.4.

To the fullest extent permitted by law, [***] other than as provided in this Section 10.2 shall be a dissolution in contravention of this Agreement.

10.3 Effect of Dissolution

The dissolution of the Company shall be effective on the day on which the event occurs giving rise to the dissolution (or, if a corporate action of the Company is required by the Acts, on the day such corporate action is duly taken), but the Company shall not terminate until it has been wound up and its assets have been distributed as provided in Section 10.5.1 or 11.1 of this Agreement. Notwithstanding the dissolution of the Company, prior to the termination of the Company, the business of the Company and the affairs of the Shareholders, as such, shall continue to be governed by this Agreement.

10.4 Loss of the Company

10.4.1 In the event that the accumulated losses of the Company exceed [***], measured for a period of [***] during the term of this Agreement (the “**Measuring Period**”), Photronics and DNP shall discuss in good faith and develop a plan (the “**Recovery Plan**”) by which certain measure(s) shall be carried out so as to recover such losses within a [***] (the “**Recovery Plan Period**”), and thereafter:

(a) If Photronics and DNP agree on the Recovery Plan [***] days from the end of the Measuring Period (the “**Recovery Discussion Period**”), the parties shall cooperate to carry out such measure(s) as determined in the Recovery Plan, or

(b) If the Photronics and DNP do not agree on the Recovery Plan within the Recovery Discussion Period, a Shareholder whose Percentage Interests are more than [***] (the “**Planning Party**”) may carry out such measure(s) as determined in the Recovery Plan developed by the Planning Party.

10.4.2 In the event that the accumulated losses of the Company are still exceeding [***] of the amount of the [***] at the time of the expiration of the Recovery Plan Period from commencement of carrying out the Recovery Plan which is either agreed by the parties or developed by the Planning Party, Photronics and DNP shall repeat the procedure set forth in Section 10.4.1.

10.4.3 After the expiration of [***] may request, by giving a not less than [***] written notice (the “**Dissolution Notice**”), the other party to agree to dissolve and liquidate the Company via a shareholder meeting conducted [***] days after receipt of such written notice, unless the Recovery Plan agreed by the parties is being carried out at the time of such request. Notwithstanding the above, the Requesting Shareholder is not entitled to give the Dissolution Notice during the period while the Recovery Plan agreed to between Photronics and DNP is being carried out. [***].

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

10.5 Liquidation

10.5.1 Upon dissolution of the Company, the Liquidation Committee composed of the Shareholders shall be set up. The Liquidation Committee shall liquidate the Company Assets, and shall apply and distribute the proceeds thereof as follows unless otherwise provided by the Applicable Law:

- (a) first, to (i) the payment of the obligations of the Company to [***] and other payments to Persons other than Shareholders or their Affiliates [***] whether the whereabouts of the creditor is known or unknown, which the Board of Directors may consider necessary;
- (b) thereafter, amounts due to either [***].

10.5.2 Notwithstanding Section 10.5.1 of this Agreement, in the event that the Board of Directors determines that an [***], the Board of Directors, in order to avoid such [***] except those necessary to satisfy the [***], or, subject to Section 11.4, [***] (in accordance with the Applicable Law).

10.6 Dissolution

Where the Requesting Shareholder is entitled to give the [***] according to Section 10.4 but it does not give the Dissolution Notice within the Dissolution Notice Period, and the [***] thereafter desires to [***] the Company and notifies the [***] of the same within [***] from [***], the Requesting Shareholder shall agree to the [***] proposal to [***] the Company in accordance with Section 10.5 and shall take all relevant actions to achieve such purpose.

ARTICLE 11. DISTRIBUTIONS

11.1 Use of Cash

Subject to applicable legal and contractual restrictions and to Section 11.2 and Article 10, Company cash will be treated as follows (in the following order of priority):

- (a) *First*, cash will be [***]; and
- (b) *Second*, subject to the approval of the Board of Directors any excess cash [***].

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

11.2 Distributions Upon Liquidation

Distributions made in conjunction with the final liquidation of the Company shall be applied or distributed as provided in Article 10 hereof.

11.3 Withholding

The Company may withhold amounts in respect of allocations or distributions if it is required to do so by any Applicable Law, and each Shareholder hereby authorizes the Company to withhold from or pay on behalf of or with respect to such Shareholder such amount of federal, state, local or foreign taxes that the chief finance officer of the Company determines the Company is required to withhold or pay with respect to any amount distributable or allocable to such Shareholder pursuant to this Agreement, *provided* that the Company shall provide a Shareholder with ten (10) Business Days advance written notice of the amount of any withholding to be made in respect of allocations or distributions to such Shareholder (or any Affiliate of such Shareholder) which notice shall demonstrate the calculation thereof. Any amounts withheld pursuant to this Section 11.3 shall be treated as having been distributed to such Shareholder. Each Shareholder will from time to time provide such other forms or documents as may reasonably be required in order to establish the status of such Shareholder for purposes of the tax laws of any applicable jurisdiction. Each Shareholder agrees to indemnify and hold harmless the Company from any liability imposed on the Company for any action taken by the Company in reliance upon such representation of tax withholding status. A Shareholder's obligations hereunder shall survive the dissolution, liquidation or winding up of the Company. If a Governmental Authority asserts in writing to any Person that the Company failed to withhold Tax at the time and/or in the amounts required by Applicable Laws in respect of a Shareholder and/or its Affiliates, then such Shareholder and/or its Affiliates, as applicable, shall promptly upon receipt of a copy of such writing accompanied by a written notice from the Company specifying that a payment is required pursuant to this Section 11.3 pay to such Governmental Authority an amount in full satisfaction of the amount of Taxes so asserted by such Governmental Authority. If such Shareholder and its Affiliates do not promptly pay such amount to such Governmental Authority, then, unless such Shareholder provides satisfactory written evidence of settlement in full of the matter asserted by the Governmental Authority, the Company shall withhold such amount from the next distribution(s) to such Shareholder, shall promptly pay such withheld amounts over to such Governmental Authority in payment of such asserted liability for Taxes and shall treat the amounts so withheld and paid over as actually distributed to such Shareholder.

11.4 Distributions in Kind

Subject to Section 11.1, no right is given to any Shareholder to demand or receive any distribution of property other than cash as provided in this Agreement. Upon a vote of the Board of Directors and [***], the Board of Directors may determine (subject to the approval of the [***]) to [***], and such Company Assets shall be distributed in such fashion as to ensure that [***] (as determined by the Board of Directors and approved by [***]) is distributed, and any items of gain or loss resulting from such distribution are allocated, in accordance with this Article 11 and Applicable Laws .

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

11.5 Limitations on Distributions

Notwithstanding any provision to the contrary contained in this Agreement, neither the Company nor the Board of Directors, on behalf of the Company, shall be required to or shall knowingly make a distribution to any Shareholder or the holder of any Economic Interest on account of its Shares in the Company (as applicable) in violation of the Acts or other Applicable Law.

ARTICLE 12. MISCELLANEOUS

12.1 Amendments

Any provision of this Agreement may be amended if, and only if, such amendment is in writing and is duly executed by each Shareholder, provided however this Agreement will be amended to allow Photronics Singapore to implement an Accounting Amendment in accordance with Section 1.6,. Upon the making of any amendment to this Agreement in accordance with the previous sentence, the Board of Directors shall prepare and file such documents and certificates as may be required under the Acts and under any other Applicable Law.

12.2 No Waiver

Any provision of this Agreement may be waived if, and only if, such waiver is in writing and is duly executed by the party against whom the waiver is to be enforced. No failure or delay by any party in exercising any right, power or privilege under this Agreement shall operate as a waiver thereof nor shall any single or partial waiver or exercise thereof preclude the enforcement of any other right, power or privilege nor deemed to extend to any prior or subsequent default, breach or occurrence or affect, in any way, any rights arising by such prior or subsequent default, breach or occurrence.

12.3 Entire Agreement

This Agreement, together with the Schedules and other documents referred to herein and therein, constitute the entire agreement between the parties hereto pertaining to the subject matter hereof, and supersede any and all prior oral and written, and all contemporaneous oral, agreements or understandings pertaining thereto including the Memorandum of Understanding dated November 19, 2016, between Photronics and DNP. There are no agreements, understandings, restrictions, warranties or representations relating to such subject matter among the parties other than those set forth herein and in the Schedules and other documents referred to herein and therein.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

12.4 Further Assurances

Each of the parties hereto does hereby covenant and agree on behalf of itself, its successors and its assigns, without further consideration, to prepare, execute, acknowledge, file, record, publish, and deliver such other instruments, documents and statements, and to take such other action as may be required by law or reasonably necessary or advisable to effectively carry out the purposes of this Agreement.

12.5 Notices

Unless otherwise provided herein, all notices, requests, instructions or consents required or permitted under this Agreement shall be in writing and will be deemed given: (a) when delivered personally; (b) when sent by confirmed facsimile and followed up by delivery by overnight carrier under Clause (d) below; (c) ten (10) Business Days after having been sent by registered or certified mail, return receipt requested, postage prepaid; or (d) three (3) Business Days after deposit with an internationally recognized commercial overnight carrier specifying next-day delivery, with written verification of receipt. All communications will be sent to the addresses, email account or facsimile number listed on Schedule C (or to such other address, email account or facsimile number as may be designated by a party giving written notice to the other parties pursuant to this Section 12.5).

12.6 Governing Law

All questions concerning the construction, interpretation and validity of this Agreement and all claims or causes of action (whether in contract or tort) that may be based upon, arise out of or relate to this Agreement or the negotiation, execution or performance of this Agreement will be governed by and construed in accordance with the laws of the People's Republic of China (without reference to any choice or conflicts of laws rules or principles that would require the application of the laws of any other jurisdiction).

12.7 Construction; Interpretation

12.7.1 Certain Terms. The words "hereof," "herein," "hereto," "hereunder" and similar words refer to this Agreement as a whole and not to any particular provision of this Agreement. The term "including" or "includes" is not limited and means "including, or includes, without limitation."

12.7.2 Section References; Titles and Subtitles. Unless otherwise noted, all references to Sections and Schedules herein are to Sections and Schedules of this Agreement. The titles, captions and headings of this Agreement are inserted for convenience of reference only and are not intended to be a part of or to affect the meaning or interpretation of this Agreement.

12.7.3 Reference to Persons, Agreements, Statutes. Unless otherwise expressly provided herein, (i) references to a Person include its successors and permitted assigns, (ii) references to agreements (including this Agreement) and other contractual instruments shall be deemed to include all subsequent amendments, restatements and other modifications thereto or supplements thereof and (iii) references to any statute or regulation are to be construed as including all statutory and regulatory provisions consolidating, amending, replacing, supplementing or interpreting such statute or regulation.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

12.7.4 **Presumptions.** No party, nor its counsel, shall be deemed the drafter of this Agreement for purposes of construing the provisions of this Agreement, and all provisions of this Agreement shall be construed in accordance with their fair meaning, and not strictly for or against any party.

12.7.5 **A Party and the Other Party.** If any provision of this Agreement (including any of Sections 9.2, 9.3, 12.9, 12.15, 12.17) mentions a party, on one hand, and the other party as a counterparty to such a party, on the other hand, Photronics and Photronics Singapore are regarded as one and the same party, and DNP and DNP Asia Pacific are regarded as one and the same party, unless the context of such provision otherwise requires.

12.8 Rights and Remedies Cumulative

The rights and remedies provided by this Agreement are cumulative and the use of any one right or remedy by any party shall not preclude or waive its right to use any or all other remedies. Said rights and remedies are given in addition to any other rights the parties may have by law, statute, ordinance or otherwise.

12.9 No Assignment; Binding Effect

Except as otherwise expressly provided herein, no party may assign, delegate or otherwise transfer any of its rights or obligations hereunder to any third party, whether by assignment, transfer, Change in Control or other means, without the prior written consent of each other party. Any attempted assignment in violation of the foregoing shall be null and void. Subject to the foregoing, this Agreement shall be binding on and inure to the benefit of the Shareholders, their heirs, executors, administrators, successors and all other Persons hereafter holding, having or receiving an interest in the Company.

12.10 Severability

If any provision in this Agreement will be found or be held to be invalid or unenforceable, then the meaning of said provision will be construed, to the extent feasible, so as to render the provision enforceable, and if no feasible interpretation would save such provision, it will be severed from the remainder of this Agreement which will remain in full force and effect unless the severed provision is essential and material to the rights or benefits received by any party. In such event, the parties will use their respective best efforts to negotiate, in good faith, a substitute, valid and enforceable provision or agreement which most nearly reflects the parties' intent in entering into this Agreement.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

12.11 Counterparts

This Agreement may be executed in counterparts, each of which so executed will be deemed to be an original and such counterparts together will constitute one and the same agreement. Execution and delivery of this Agreement by exchange of facsimile copies or PDF file bearing the facsimile signature of a party shall constitute a valid and binding execution and delivery of this Agreement by such party.

12.12 Dispute Resolution; Arbitration

The parties hereby agree that any and all claims, disputes or controversies of whatever nature (the “**Dispute**”), arising out of, in connection with, or in relation to the interpretation, performance, enforcement, breach, termination or validity of this Agreement, shall be first raised in writing to the [***] of each of the parties for [***] at resolution in good faith among such [***]. If within [***] (or such shorter time if emergency or exigent circumstances exist) of first raising the issue to the [***], the parties are [***], then the parties hereby agree that such Dispute shall be submitted to [***]. The arbitral award is final and binding upon the Parties. Each party shall bear its own expenses incurred in connection with arbitration and the fees and expenses of the arbitrator shall be shared equally by the parties involved in the dispute and advanced by them from time to time as required. Any discovery in connection with such arbitration hereunder shall be limited to information directly relevant to the controversy or claim in arbitration. The arbitrator will state the factual and legal basis for the award. To the extent not amended or overturned by appeal to a court of competent jurisdiction pursuant to the Arbitration Law of the People’s Republic of China, the decision of the arbitrator in any such proceeding will be final and binding and not subject to judicial review and final judgment may be entered upon such an award in any court of competent jurisdiction, but entry of such judgment will not be required to make such award effective. The parties agree that the arbitration proceedings and decisions shall be kept confidential and that any information or documents, including any pleadings or submissions exchanged or produced in such arbitration (including, but not limited to briefs, or other documents submitted or exchanged, any testimony or other oral submissions, and any awards) shall not be disclosed beyond the arbitrator, the CIETAC, the parties, their counsel and any Person necessary to conduct the arbitration. The parties hereby irrevocably waive, to the fullest extent permitted by Applicable Law, any objection which they may now or hereafter have to the laying of venue of any action brought for enforcement of such arbitration clause or any award resulting from arbitration pursuant to this Section 12.12 or any defense of inconvenient forum for the maintenance of any such action. Each of the parties hereto agrees that an arbitration award in any such action may be enforced in other jurisdictions by suit on the arbitration award or in any other manner provided by Applicable Law. The parties agree that the arbitration proceeding described in this Section 12.12 is the sole and exclusive manner in which the parties may resolve disputes arising out of or in connection with this Agreement; provided that the parties expressly agree that nothing in this Agreement shall prevent the parties from applying to a court having jurisdiction over any of the parties to this Agreement for the limited purpose of obtaining temporary and provisional or injunctive relief necessary solely to preserve the status quo or otherwise to prevent irreparable harm to a party pending the outcome of arbitration. The parties agree that all arbitration proceeding described in this Section 12.12 shall be conducted in [***] with [***] speaking lawyer(s) and arbitrator(s), and that the number [***].

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

12.13 Third-Party Beneficiaries

None of the provisions of this Agreement shall be for the benefit of or be enforceable by any creditor of the Company or by any third-party creditor of any Shareholder. This Agreement is not intended to confer any rights or remedies hereunder upon, and shall not be enforceable by, any Person other than the parties hereto, their respective successors and permitted assigns and, solely with respect to the provision of Section 5.13, each Indemnitee and each other indemnified Person addressed therein.

12.14 Specific Performance

The parties agree that irreparable damage will result if this Agreement is not performed in accordance with its terms, and the parties agree that any damages available at law for a breach of this Agreement would not be an adequate remedy. Therefore, the provisions hereof and the obligations of the parties hereunder shall be enforceable in a court or other tribunal with jurisdiction, by a decree of specific performance, and appropriate injunctive relief may be applied for and granted in connection therewith. Such remedies and all other remedies provided for in this Agreement shall, however, be cumulative and not exclusive and shall be in addition to any other remedies that a party may have under this Agreement in accordance with Applicable Laws.

12.15 Consequential Damages

No party shall be liable to any other party under any legal theory for indirect, special, incidental, consequential or punitive damages, or any damages for loss of profits, revenue or business or damage to reputation or goodwill, even if such party has been advised of the possibility of such damages (it being understood that consequential damages arising from the breach of the confidentiality restrictions set forth in Section 12.17 shall not be considered to fall within any such category of damages).

12.16 Fees and Expenses

Except as otherwise expressly provided in this Agreement and to the extent that the Company pay fees and expenses of the Shareholders, each party hereto shall bear its own fees and expenses incurred in connection with this Agreement, the Transaction Documents and the transactions contemplated hereby and thereby, including the legal, accounting and due diligence fees, costs and expenses incurred by such party.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

12.17 Confidentiality

12.17.1 Each party shall not disclose, divulge, provide, publish or provide access to third parties, and will use reasonable efforts to cause its respective Affiliates, officers, directors, members, employees, agents, representatives and advisors (collectively, such party's "Covered Persons") not to disclose, divulge, provide, publish or provide access to third parties, unless and solely to the extent (i) compelled to disclose by judicial or administrative process or by other requirements of Applicable Law or the applicable rules of any national securities exchange or (ii) necessary to enforce claims in a judicial or administrative proceeding, (a) the existence and content of the this Agreement and Transaction Documents and any information arising from or in connection with this Agreement and the Transaction Documents and/or the transactions contemplated hereby and (b) all documents and information concerning the this Agreement and the Transaction Documents and the transactions contemplated hereby or furnished by one party and its Covered Persons (the "**Disclosing Party**"), to any other party and its Covered Persons (the "**Receiving Party**"), except to the extent that such information can be shown by written evidence to have been (A) previously known on a non-confidential basis by the Receiving Party, (B) publicly available through no fault of the Receiving Party, (C) rightfully received from a third party without a duty of confidentiality, (D) disclosed by the Disclosing Party of such information to a third party without a duty of confidentiality on such third party, (E) independently developed by the Receiving Party prior to or without reference to any such documents or information, or (F) disclosed with the prior approval of the Disclosing Party of such documents or information. If this Agreement is terminated for any reason, the confidentiality obligations required by this Section 12.17 shall survive and be maintained as set forth below, and the Receiving Party shall return to the Disclosing Party, all documents and other materials, and all copies thereof, obtained by the Receiving Party from the Disclosing Party in connection herewith that are subject to this Section 12.17. The Receiving Party shall use any information obtained herewith that are subject to this Section 12.17 only in relation to the performance of its obligations under this Agreement and the Transaction Documents and/or the transactions contemplated hereby. The confidentiality obligations required by this Section 12.17 shall not apply to disclosures permitted pursuant to Section 12.17.2 hereof, and all confidentiality obligations required by this Section 12.17 shall be terminated upon the fifth anniversary of the termination of this Agreement.

12.17.2 Except as agreed by the parties, each of the parties agrees that it shall not, directly or indirectly, make or cause any public announcement in respect of this Agreement and the Transaction Documents or the transactions contemplated hereby without the prior written consent of the other party. Notwithstanding the foregoing, each party shall be permitted to issue any public announcements or press releases solely to the extent as required by Applicable Law or the applicable rules of any national securities exchange, provided that a draft of any such public announcement or press release be first provided by the party who issues such public disclosure to the other party no later than three (3) Business Days prior to such required public disclosure.

(Signature Page Follows)

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

PHOTRONICS INC.

By: _____
Name: [***]
Title: [***]

PHOTRONICS SINGAPORE PTE, LTD.

By: _____
Name: [***]
Title: [***]

DAI NIPPON PRINTING CO., LTD.

By: _____
Name: [***]
Title: [***]

DNP ASIA PACIFIC PTE. LTD.

By: _____
Name: [***]
Title: [***]

JV Operating Agreement Signature Page

SCHEDULES A-1 and A-2

List of Transaction Documents

SCHEDULE A-1

Outsourcing Agreement
Amended and Restated License Agreement among DNP and PDMC

SCHEDULE A-2

Contribution Agreement

SCHEDULE C

Shareholders and Percentage Interest
(as of completion of the Closing)

Shareholder	Percentage Interest
Photronics Singapore	50.01%
DNP Asia Pacific	49.99%

Addresses for Notices Purposes

Photronics, Inc.
15 Secor Road
Brookfield, CT 06804
Attn: General Counsel
Tel: [***]
Fax: [***]

Dai Nippon Printing Company, Ltd
1-1, Ichigaya Kagacho 1-chome
Shinjuku-ku, Tokyo, Japan
Attn: General Manager of
Fine Electronics Operations
Tel: [***]
Fax: [***]

Photronics Singapore Pte. Ltd.
No. 33, Ubi Avenue 3 #03-09,
Vertex Building Singapore 408868
Attn: Representative Director
Tel: [***]
Fax: [***]

DNP Asia Pacific Pte. Ltd.
4 Pandan Crescent, Singapore 128475

Attn: President
Tel: [***]
Fax: [***]

SCHEDULE D

Majority Board Control Items

SCHEDULE E

[***]

[***]

SCHEDULE F

List of Actions Requiring A Supermajority Vote of Shareholders

[***]

SCHEDULE G

List of Actions Requiring A Supermajority Vote of Directors

[***]

SCHEDULE H

Initial Business Plan

SCHEDULE I

Form of Articles of Incorporation

SCHEDULE J

Representative Funding Plan

SCHEDULE K

Scoring Items for PDMCX Technology Partnership Proposals

[***]

SCHEDULE L

Competitors

[***]

CONTRIBUTION AGREEMENT

THIS CONTRIBUTION AGREEMENT (this “**Agreement**”) is made and entered into as of May 16, 2017, by and between Dai Nippon Printing Co., Ltd., a corporation organized under the laws of Japan with its principal place of business at 1-1, Ichigaya Kagacho 1-chome, Shinjuku-ku, Tokyo, Japan (“**DNP**”), DNP Asia Pacific Pte. Ltd., a corporation organized under the laws of Singapore with its principal place of business at 4 Pandan Crescent, Singapore 128475 (“**DNP Asia Pacific**”), Photronics, Inc., a corporation organized under the laws of the State of Connecticut, with its principal place of business at 15 Secor Road, Brookfield, Connecticut, U.S.A. (“**Photronics**”), Photronics Singapore Pte. Ltd., a corporation organized under the laws of Singapore with its principal place of business at No. 33, Ubi Avenue 3 #03-09, Vertex Building Singapore 408868 (“**Photronics Singapore**”) and Xiamen American Japan Photronics Mask Co., Ltd. a wholly foreign-owned limited liability company duly organized and existing under the laws of the People’s Republic of China with its principal place of business at R203-95, South Building of Torch Square, No. 56-58 Torch Road, Gaoxin District, Xiamen, Fujian Province ,China (厦门市火炬广场南楼203-95室) (“**PDMCX**” or the “**Company**”). Each of DNP, DNP Asia Pacific, Photronics, Photronics Singapore and the Company is hereinafter referred to as individually a “**Party**” and collectively the “**Parties**”).

WHEREAS, Photronics Singapore formed the Company in October, 2016, and has contributed [***] as the current registered capital of the Company. Photronics and Photronics Singapore desire to have the Company be set up as the legal entity for a joint venture (the “**Joint Venture**”) to be owned 50.01% by Photronics Singapore and 49.99% by DNP Asia Pacific for the purpose of the Business (as defined in the Operating Agreement) with an initial manufacturing facility located in Xiamen, China.

WHEREAS, Photronics, Photronics Singapore, DNP and DNP Asia Pacific have agreed to set up the Company as the Joint Venture and entered into the Joint Venture Operating Agreement as of May 16, 2017 (the “**Operating Agreement**”) to set forth the respective rights and obligations of DNP, DNP Asia Pacific, Photronics and Photronics Singapore with respect to the management and operation of the Company. Contemporaneous with the execution of this Agreement, Photronics, Photronics Singapore, DNP, DNP Asia Pacific, PDMCX and PDMC will enter into the Transaction Documents, as applicable, as set forth on Schedule A attached hereto.

WHEREAS, Photronics, Photronics Singapore, DNP and DNP Asia Pacific have agreed, pursuant to the Operating Agreement, that (i) Photronics will, through Photronics Singapore, consolidate the Joint Venture as long as Photronics Singapore owns at least 50.01% Percentage Interest of the Company, and (ii) Photronics, Photronics Singapore, DNP and DNP Asia Pacific will take all actions with the primary premise that Photronics will, through Photronics Singapore, be able to consolidate the Joint Venture as long as Photronics Singapore owns at least 50.01% Percentage Interest of the Company in accordance with the terms and conditions of the Operating Agreement.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

WHEREAS, upon the Closing, (i) Photronics Singapore will own 50.01% Percentage Interest of PDMCX represented by current Shares already owned by Photronics Singapore and new Shares to be issued to and subscribed by Photronics Singapore upon its respective Initial Capital Contribution set forth herein, and (ii) DNP Asia Pacific will own 49.99% Percentage Interest of PDMCX represented by new Shares to be issued to and subscribed by DNP Asia Pacific upon its respective Initial Capital Contribution set forth herein.

NOW, THEREFORE, in consideration of the promises set forth herein and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby agree as follows:

1. Definition

Unless otherwise defined in this Agreement, terms defined in the Operating Agreement shall have the same meanings when used in this Agreement.

2. Contribution

(a) Contribution Closing.

Subject to the satisfaction or waiver of the closing conditions set forth in Article 3 below and the terms of this Agreement, unless otherwise agreed by Photronics Singapore, DNP Asia Pacific and the Company in writing, the closing of the contribution transactions provided in Section 2.(b) of this Agreement (“**Closing**”) shall take place on the date that is set and determined by the Board of Directors but shall be no later than ten (10) Business Days after all of the conditions set forth in Article 3 have been satisfied or waived.

(b) Capitalization of PDMCX

Prior to or at the Closing, PDMCX will increase its registered capital from [***] to [***], among which Photronics Singapore will hold 50.01% of Percentage Interest in PDMCX and DNP Asia Pacific will hold 49.99% of Percentage Interest in PDMCX. Correspondingly, the registered capital in PDMCX’s business license is [***] at the Closing. For the sake of clarification, (i) Photronics Singapore has already (previous to the execution of this Agreement) contributed [***] by cash as the current registered capital and therefore Photronics Singapore will contribute [***] by cash at the Closing, and (ii) DNP Asia Pacific will contribute [***] by cash at the Closing (the contributions made by Photronics Singapore and DNP Asia Pacific at the Closing are hereinafter collectively referred to as the “**Initial Capital Contribution**”). The parties agree that PDMCX shall increase its registered capital to [***] within the [***] following the date of the Investment Agreement between Xiamen Torch Hi-Tech Industrial Development Zone Management Committee and Photronics Singapore, and the schedule of capital increase will be based on the operational needs of PDMCX, and decided by Photronics Singapore. If DNP[***]. DNP Asia Pacific shall provide any and all assistances reasonably necessary in accordance with the terms of the Operating Agreement for the capital increase procedure of PDMCX, regardless of whether DNP Asia Pacific subscribes the capital increase or not.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(c) Use of Capital of PDMCX

(i)[***]

PDMCX can also use the *** contributed by Photronics Singapore and DNP Asia Pacific to acquire [***].

(d) Obligations at the Closing

(i) At the Closing, as part of the formation of the Joint Venture, (u) Photronics Singapore will contribute to the Company its respective Initial Capital Contribution as set forth in Section 2.(b)(i) above, and (v) Photronics and Photronics Singapore will execute all endorsements, assignments and good and sufficient instruments of conveyance, transfer and assignment as are necessary, appropriate and effective to vest in the Company all of the right, title and interest of Photronics or Photronics Singapore in the material contracts listed in Schedule B (the “**Transferred Contracts**”), which relate to the Business, free and clear of all security interests, claims, liens, pledges, and encumbrances, and charges, to the extent permitted by the contents of the Transferred Contracts and by Applicable Law.

(ii) At the Closing, as part of the formation of the Joint Venture, DNP Asia Pacific will contribute to the Company its respective Initial Capital Contribution as set forth in Section 2.(b)(ii) above.

(e) Assumption of Liabilities.

At the Closing, the Company will assume the obligations to fulfill the obligations and liabilities provided in the Transferred Contracts, including, but not limited to, payments required under the construction contracts for the initial manufacturing facility of the Company which are also listed in Schedule B.

3. Closing Conditions.

(a) The obligations of Photronics Singapore to consummate the Closing under Article 2 hereof, unless otherwise waived in writing by the Parties, are subject to the fulfillment on or before the Closing of each of the following conditions:

(i) the representations and warranties of DNP and DNP Asia Pacific set forth in Article 5 hereof shall be true and correct in all material respects at and as of the date hereof and at and as of the date of Closing (the “**Closing Date**”) as though then made, except to the extent of changes caused by the transactions expressly contemplated herein;

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(ii) the agreements and covenants of DNP and DNP Asia Pacific contained in this Agreement that are required to be performed prior to or on the Closing Date shall have been performed or satisfied by DNP and DNP Asia Pacific in all material respects;

(iii) all prior approvals and consents required for the consummation of formation of the Company as the Joint Venture, or in connection with the authorization, execution and performance of this Agreement from the relevant authorities (the "**Regulatory Approvals**") shall have been duly obtained, made or given and shall be in full force and effect and shall not impose material restrictions or other material burdens on the Parties with respect to the formation of the Joint Venture or the matters contemplated in this Agreement, the Operating Agreement and the Transaction Documents;

(iv) in addition to the above Section 3(a)(iii), consummation of the transactions contemplated hereby and by the Operating Agreement and the Transaction Documents shall not have been restrained, enjoined or otherwise prohibited by Applicable Law or order of judgment or any Governmental Authority;

(v) the Parties shall have entered into the Operating Agreement and the Transaction Documents, and such agreements shall be in full force and effect; and

(vi) [***] Business Days before the Closing Date and after receipt of the Regulatory Approvals, DNP Asia Pacific shall complete all necessary procedures for its respective Initial Capital Contribution with the Governmental Authorities, if any.

(b) The obligations of DNP Asia Pacific to consummate the Closing under Article 2 hereof, unless otherwise waived in writing by the Parties, are subject to the fulfillment on or before the Closing of each of the following conditions:

(i) the representations and warranties of Photronics and Photronics Singapore set forth in Article 4 hereof shall be true and correct in all material respects at and as of the date hereof and at and as of the Closing Date as though then made, except to the extent of changes caused by the transactions expressly contemplated herein;

(ii) the agreements and covenants of Photronics and Photronics Singapore contained in this Agreement that are required to be performed prior to or on the Closing Date shall have been performed or satisfied by Photronics and Photronics Singapore in all material respects;

(iii) the Company shall have received the Transferred Contracts from Photronics and Photronics Singapore;

(iv) the **Regulatory Approvals** shall have been duly obtained, made or given and shall be in full force and effect and shall not impose material restrictions or other material burdens on the Parties with respect to the formation of the Joint Venture or the matters contemplated in this Agreement, the Operating Agreement and the Transaction Agreements;

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(v) in addition to the above Section 3(b)(iv), consummation of the transactions contemplated hereby and by the Operating Agreement and the Transaction Documents shall not have been restrained, enjoined or otherwise prohibited by Applicable Law or order of judgment or any Governmental Authority;

(vi) the Parties shall have entered into the Operating Agreement and the Transaction Documents, and such agreements shall be in full force and effect;

(vii) within *** Business Days before the Closing Date and after receipt of the Regulatory Approvals, Photronics and Photronics Singapore shall require and ensure the Company obtain a new business license reflecting the change of shareholder as contemplated hereby, file the new Articles of Association of the Company and complete all other necessary procedures including but not limited to the registration procedures for the Initial Capital Contribution with the PRC administration of industry and commerce and other government authorities, and

(viii) within *** Business Days before the Closing Date and after receipt of the Regulatory Approvals, Photronics Singapore shall complete all necessary procedures for its respective Initial Capital Contribution with the Governmental Authorities, if any.

4. Representations and Warranties of Photronics and Photronics Singapore.

Photronics and Photronics Singapore hereby jointly and severally acknowledge, represent and warrant to DNP and DNP Asia Pacific as follows:

(a) Organization. Each of Photronics, Photronics Singapore and the Company is duly organized, validly existing and in good standing (to the extent such concept exists under Applicable Law) under the laws of its jurisdiction of formation. Photronics and Photronics Singapore have all legal and corporate power and authority required to conduct its business as currently conducted and to own and lease its properties and operate its business as currently owned, leased and operated. The Company has all legal and corporate power and authority required to conduct its business as currently conducted and to own and lease its properties and operate its business as currently owned, leased and operated. Each of Photronics, Photronics Singapore and the Company is duly qualified to do business and is in good standing (to the extent such concept exists under Applicable Law) as a foreign corporation or limited liability company, as applicable, in each jurisdiction where the character of the property owned or leased or the nature of its activities makes such qualification necessary, except for those jurisdictions where the failure to be so qualified or in good standing is not reasonably likely to result in a Material Adverse Effect on Photronics, Photronics Singapore or the Company, as applicable. A “**Material Adverse Effect**” on a Person or business shall mean any facts or circumstances that, individually or in the aggregate, would, or might reasonably be expected to, result in a material adverse effect on the business, financial condition or results of operations of such Person or business.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(b) Ownership. Immediately prior to the Closing, all of the equity interests of the Company are owned by Photronics Singapore, and Photronics Singapore has good and marketable title to such equity interests free and clear of all security interests, claims, liens, pledges, options, encumbrances, charges, agreements, voting trusts, proxies and other arrangements or restrictions whatsoever. Prior to the execution of this Agreement, Photronics Singapore has fully contributed [***] by cash as the capital of the Company. Upon the Closing, DNP Asia Pacific will acquire good and valid title to its Percentage Interest in the Company, free and clear of all security interests, claims, liens, pledges, options, encumbrances, charges, agreements, voting trusts, proxies and other arrangements or restrictions whatsoever.

(c) Authorization. Each of Photronics, Photronics Singapore and the Company has all requisite legal and corporate power and corporate authority to execute and deliver this Agreement, to perform all of its obligations and undertakings hereunder and to consummate the transactions contemplated hereby. The execution and performance of this Agreement have been duly authorized by all necessary action on the part of Photronics, Photronics Singapore and the Company, as applicable, and this Agreement has been duly authorized, executed and delivered by each of Photronics, Photronics Singapore and the Company and constitutes a valid and legally binding obligation of Photronics, Photronics Singapore and the Company, enforceable in accordance with its terms, except as the enforceability thereof may be limited by applicable bankruptcy, insolvency, reorganization, moratorium or similar laws affecting the enforcement of creditors' rights generally and general equitable principles.

(d) Conflicts. The execution, delivery and performance of this Agreement by Photronics, Photronics Singapore and the Company does not conflict with, violate or result in the breach of, or create any lien or encumbrance upon the Company pursuant to any charter, agreement, instrument, order, judgment, decree, law or governmental regulation to which Photronics, Photronics Singapore or the Company is a party or is subject to. Except for the Regulatory Approvals, the execution and delivery of this Agreement does not and will not require any governmental or other third party consents or filings on the part of Photronics, Photronics Singapore or the Company.

(e) Transferred Assets. The Company will have good and valid leasehold or interest in the equipment and/or other assets transferred by Photronics and Photronics Singapore before the Closing Date. All of such assets transferred by Photronics or Photronics Singapore are in good operating condition and repair, ordinary wear and tear expected.

(f) Contracts. All material contracts or other material agreements executed by the Company before the Closing, or already or to be assigned to the Company by Photronics and Photronics Singapore solely in connection with the Business and the transactions contemplated by this Agreement, including but not limited to the Transferred Contracts are in full force and effect and constitute the valid and legally binding effect on Photronics, Photronics Singapore and/or the Company, enforceable in accordance with their terms, except as the enforceability thereof may be limited by applicable bankruptcy, insolvency, reorganization, moratorium or similar laws affecting the enforcement of creditors' rights generally and general equitable principles. Neither Photronics, Photronics Singapore or the Company are in material default under, and to Photronics's and Photronics Singapore's Knowledge, no other party is in material default under, any of such contracts and agreements.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

For the purpose of this Agreement, “**Knowledge**” means with respect to any of the representation and warranties, the actual knowledge of its chief executive officer, chief financial officer, general counsel and directors of any of Photronics and/or Photronics Singapore, DNP and/or DNP Asia Pacific, as applicable, after making such due inquiry and exercising such due diligence as a prudent business person would have made or exercised in the management of his/her business affairs, including but not limited to due inquiry of all officers, directors, employees, consultants and professional advisers (including attorneys, accountants and auditors) of such Person who could reasonably be expected to have knowledge of the matters in question, and where any statement in the representations and warranties hereunder is expressed to be given or made to a Person’s Knowledge, or so far as a Person is aware, or is qualified in some other manner having a similar effect, the statement shall be deemed to be supplemented by the additional statement that such Person has made such due inquiry and due diligence.

(g) Undisclosed Liabilities, etc. To Photronics’s and Photronics Singapore’s Knowledge, PDMCX is not subject to any material liability, whether absolute, contingent, accrued or otherwise, which is not shown or which is in excess of amounts shown or reserved for in the unaudited balance sheet of PDMCX dated as of the date hereof and the Closing Date and provided to, DNP and DNP Asia Pacific on the date hereof and the Closing, which balance sheet has been prepared from, and is consistent with, the books and records of Photronics and/or Photronics Singapore. There is no action, suit, arbitration or administrative or other proceeding or investigation pending or, to Photronics’s and Photronics Singapore’s Knowledge, threatened, against or affecting the Company or any of its properties that, if determined or resolved adversely to the Company, would reasonably be expected to have, individually or in the aggregate, Material Adverse Effect.

(h) Title; Properties. The Company has good and valid title to, or a valid leasehold interest in, all of their assets on the date hereof and will have on the Closing Date, whether real, or personal, purported to be owned by it (including but not limited to all such assets reflected in the financial statements), free and clear of any interests, claims, liens, pledges, options, and any other kind of encumbrances.

(i) Labor and Employment Matters. The Company is not a party to any contracts with any union or guild, and there are no labor unions, works council or other organizations representing any employee of the Company. No employee of the Company is owed any back wages or other compensation for services rendered. There is no, and there has not been any action relating to the violation or alleged violation of any Applicable Law by the Company pertaining to labor relations or employment matters, including any charge or complaint filed by an employee. The Company has complied in all material respects with Applicable Law relating to employment, wages, hours, overtime, working conditions, benefits, retirement, termination, taxes, and health and safety. The Company is in compliance relating to its provision of any form of social insurance and housing fund, and has paid, or made provision for the payment of, all social insurance and housing fund contributions required under Applicable Law. There has not been, and there is not now any pending or, to the Knowledge of Photronics, Photronics Singapore and the Company, threatened strike, union organization activity, lockout, slowdown, picketing, or work stoppage with respect to the employees of the Company or any unfair labor practice charge against the Company. There is no pending internal investigation related to any employee or consultant of the Company.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(j) Tax Matters. The Company (a) has timely filed all tax returns that are required to have been filed by it with any Governmental Authority, and (b) has timely paid all taxes owed by it which are due and payable (whether or not shown on any "Tax Return") and withheld and remitted to the appropriate Governmental Authority all taxes which it is obligated to withhold and remit from amounts owing to any employee, creditor, customer or third party.

5 Representations and Warranties of DNP and DNP Asia Pacific.

DNP and DNP Asia Pacific hereby jointly and severally acknowledge, represent and warrant to Photronics and Photronics Singapore as follows:

(a) Organization. Each of DNP and DNP Asia Pacific is duly organized, validly existing and in good standing (to the extent such concept exists under Applicable Law) under the laws of its jurisdiction of formation. Each of DNP and DNP Asia Pacific has all legal and corporate power and authority required to conduct its business as currently conducted and to own and lease its properties and operate its business as currently owned, leased and operated. Each of DNP and DNP Asia Pacific is duly qualified to do business and is in good standing (to the extent such concept exists under Applicable Law) as a foreign corporation or limited liability company, as applicable, in each jurisdiction where the character of the property owned or leased or the nature of its activities makes such qualification necessary, except for those jurisdictions where the failure to be so qualified or in good standing is not reasonably likely to result in a Material Adverse Effect on DNP or DNP Asia Pacific.

(b) Authorization. Each of DNP and DNP Asia Pacific has all requisite legal and corporate power and corporate authority to execute and deliver this Agreement, to perform all of its obligations and undertakings hereunder and to consummate the transactions contemplated hereby. The execution and performance of this Agreement have been duly authorized by all necessary action on the part of DNP and DNP Asia Pacific, and this Agreement has been duly authorized, executed and delivered by each of DNP and DNP Asia Pacific, as applicable, and constitutes a valid and legally binding obligation of both DNP and DNP Asia Pacific, enforceable in accordance with its terms, except as the enforceability thereof may be limited by applicable bankruptcy, insolvency, reorganization, moratorium or similar laws affecting the enforcement of creditors' rights generally and general equitable principles.

(c) Conflicts. The execution, delivery and performance of this Agreement by DNP and DNP Asia Pacific does not conflict with, violate or result in the breach of any charter, agreement, instrument, order, judgment, decree, law or governmental regulation to which DNP or DNP Asia Pacific is a party or is subject to. Except for the Regulatory Approvals, the execution and delivery of this Agreement does not and will not require any governmental or other third party consents or filings either on the part of DNP and DNP Asia Pacific.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(d) Joint Engineering Agreements. To DNP's and DNP Asia Pacific's Knowledge, all currently effective joint engineering agreements, which relate to the Business and are executed with the customer in the Territory, has been disclosed to Photronics.

6. Other Arrangements

(a) Additional Capital Contribution. The Parties anticipate that total investment by equity to be made in the Company for [***] from the Closing will be, no more than, [***] and additional capital contribution(s) in excess of the Initial Capital Contributions will be made in accordance with the Operating Agreement.

(b) License from DNP. DNP agrees to license the Company by way of [***], a non-exclusive, non-sublicensable, non-transferable and non-assignable right in accordance with the provisions and only within extent of the *** to be executed by and between [***] (the "**Amended and Restated License Agreement**"). Under the Amended and Restated License Agreement, the Company will [***] to DNP, and DNP will receive from the Company [***] pursuant to the terms and conditions of the [***] on an arm's-length basis; [***] and the *** will be paid by the Company only during *** as set forth in Section 2.1.(c) of the Amended and Restated License Agreement. DNP hereby agrees that all amounts actually received by DNP (i.e. the amount of the Royalty minus withholding tax (net of applicable withholding tax) to be levied on the Royalty payment by Governmental Authority) will be re-invested into the Company as capital contribution(s), provided that the timing of such capital contribution(s) will be (i) discussed between Photronics and DNP first, (ii) subject to the resolution and approval of the Board of Directors and shareholders' meeting of the Company, and (iii) consistent with the terms and conditions of the Operating Agreement.

(c) Commission. Photronics has negotiated and entered into an agreement with [***], and, prior to the Closing, the [***] will be transferred to the Company. As the consideration for transfer of the [***], the Company will pay, and Photronics will receive, a commission for every product manufactured and sold for [***] (the "**Commission**") on an arm's-length basis under the terms and conditions of a *** to be entered into by and between the Company and Photronics; provided however that the aggregate amount of the Commission is capped at [***] and the Commission will be paid only during *** years in accordance with such commission agreement; provided further that, considering the fact that products for [***] are to be manufactured by the Company using [***], the timing for payment of the Commission and the Royalty shall be simultaneous. Photronics hereby agrees that all amount of the Commission received by Photronics will be re-invested into the Company as capital contribution(s), provided that the timing of such capital contribution(s) will be (i) discussed between Photronics and DNP first, (ii) subject to the resolution and approval of the Board of Directors and shareholders' meeting of the Company, and (iii) consistent with the terms and conditions of the Operating Agreement.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(d) Sale of Used Equipment. If requested by PDMCX, to the extent permitted by Applicable Law, Photonics and DNP of its Affiliates will respectively sell its respective used equipment to the Company under the terms and conditions of separate agreement between the related Parties and in accordance with Section 2.(c)(i) hereof.

7. Covenants.

(a) Diligence in Pursuit of Closing. Each of the Parties hereto shall use all commercially reasonable efforts to fulfill their respective obligations hereunder and under the other Transaction Documents, and shall reasonably cooperate with the other Parties in regard to the same in order to effect the Closing.

(b) Survival of Representations and Warranties. All representations and warranties contained herein or made in writing by any Party in connection herewith shall survive the execution and delivery of this Agreement and the Closing hereunder for a period of *** years following the Closing Date.

8. Indemnification.

(a) Agreement to Indemnify.

(i) DNP and DNP Asia Pacific agree to jointly and severally indemnify and hold harmless Photonics and Photonics Singapore and each of its representatives and affiliates (including the Company) (each a “**Photonics Indemnified Party**”) against any and all liabilities, claims, demands or losses, including reasonable attorneys’ fees incurred by any Photonics Indemnified Party arising out of, or resulting from, (u) any breach of any representation or warranty made by DNP or DNP Asia Pacific in this Agreement or any other certificate delivered by DNP or DNP Asia Pacific pursuant to this Agreement, (v) any breach of any covenant made by DNP or DNP Asia Pacific in this Agreement or any other certificate delivered by DNP or DNP Asia Pacific pursuant to this Agreement.

(ii) Photonics and Photonics Singapore agree to jointly and severally indemnify and hold harmless DNP and DNP Asia Pacific and each of its representatives and affiliates (including the Company) (each a “**DNP Indemnified Party**”) against any and all liabilities, claims, demands or losses, including reasonable attorneys’ fees, incurred by any DNP Indemnified Party arising out of, or resulting from, (u) any breach of any representation or warranty made by Photonics, Photonics Singapore or the Company in this Agreement or any other certificate delivered by Photonics or Photonics Singapore pursuant to this Agreement or (v) any breach of any covenant made by Photonics or Photonics Singapore in this Agreement or any other certificate delivered by Photonics or Photonics Singapore pursuant to this Agreement.

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(b) Sole Remedy. After the Closing Date, with respect to any matter as to which indemnification is provided pursuant to this Section 8, such indemnification shall be the sole remedy available to a Photronics Indemnified Party or DNP Indemnified Party, as the case may be; *provided, however*, that this Section 8 shall not limit any Party's rights to bring a claim, action or suit for fraud or bad faith.

(c) Indemnification Procedures. In the event a Photronics Indemnified Party or a DNP Indemnified Party intends to make a claim for indemnification hereunder on behalf of himself or any Photronics Indemnified Party or DNP Indemnified Party, respectively (an "**Indemnitee**"), such Indemnitee shall notify whichever of Photronics, Photronics Singapore, DNP or DNP Asia Pacific against whom indemnity is being sought (the "**Indemnitor**") of the claim in writing promptly (but in no event later than thirty (30) days) after receiving written notice of any action, lawsuit, proceeding, investigation or other claim against the Indemnitee (if by a third party) or discovering the liability, obligation or facts giving rise to such claim for indemnification, describing the claim, the amount thereof (if known and quantifiable), and the basis thereof, provided that the failure to so notify the Indemnitor shall not relieve the Indemnitor of its obligations hereunder except to the extent such failure shall have actually prejudiced the Indemnitor. The Indemnitor shall be entitled to assume and control (with counsel of its choice) the defense of the action, lawsuit, proceeding, investigation or other claim giving rise to Indemnitee's claim for indemnification at the option and expense of the Indemnitor by sending written notice of its election to do so within fifteen (15) days after receiving written notice of such claim from the Indemnitee as aforesaid; *provided, however*, that:

(i) The Indemnitee shall be entitled to participate in the defense of such claim and to employ counsel of its choice for such purpose, the fees and expenses of such separate counsel which shall be borne by the Indemnitee;

(ii) If the Indemnitor elects to assume the defense of any such claim, the Indemnitor shall be entitled to compromise or settle such claim so long as either (x) such settlement provides an unconditional release of all Indemnitees with respect to such claim and requires the payment of monetary damages only or (y) the Indemnitor obtains the prior written consent of the Indemnitee (which consent shall not be unreasonably withheld or delayed); and

(iii) If the Indemnitor does not elect to assumed the defense of such claim within the fifteen-day period set forth above, the Indemnitee may assume the defense of such action, lawsuit, proceeding, investigation or such other claim with counsel selected by the Indemnitee (which counsel shall be reasonably acceptable to the Indemnitor) at the expense of the Indemnitor, provided that the Indemnitee shall under no circumstances settle or compromise such claim without the prior written consent of the Indemnitor (which consent shall not be unreasonably withheld or delayed).

9. Further Assurances.

After the Closing, as and when requested by DNP or DNP Asia Pacific, Photronics and Photronics Singapore shall execute and deliver all such instruments of conveyance and transfer and shall take such further actions as DNP or DNP Asia Pacific may deem reasonably necessary to carry out fulfill the provisions and purposes of this Agreement. After the Closing, as and when requested by Photronics or Photronics Singapore, DNP and DNP Asia Pacific shall take such further actions as Photronics or Photronics Singapore may deem reasonably necessary to carry out fully the provisions and purposes of this Agreement.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(a) Successors and Assigns. This Agreement is intended to bind and inure to the benefit of and be enforceable by DNP, DNP Asia Pacific, Photronics and Photronics Singapore and their respective successors and assigns. This Agreement may not be assigned by either Party hereto without the prior written consent of the other Parties to this Agreement, which consent shall not be unreasonably withheld.

(b) Amendment. This Agreement may be amended only through a writing signed by all Parties hereto.

(c) Entire Agreement and Modification. This Agreement and all agreements between DNP, DNP Asia Pacific Photronics and Photronics Singapore entered into concurrently herewith, including the Operating Agreement and the other Transaction Documents, constitute and contain the entire agreement of the Parties and supersede and preempt any and all prior negotiations, correspondence, understandings, agreements and representations, written or oral, which may have related to the subject matter hereof.

(d) Choice of Law. All questions concerning the construction, interpretation and validity of this Agreement and all claims or causes of action (whether in contract or tort) that may be based upon, arise out of or relate to this Agreement or the negotiation, execution or performance of this Agreement will be governed by and construed in accordance with the laws of the People's Republic of China (without reference to any choice or conflicts of laws rules or principles that would require the application of the laws of any other jurisdiction).

(e) Dispute Resolution. Any disputes arising from or in connection with this Agreement shall be submitted to *** for arbitration which shall be conducted in accordance with the CIETAC's arbitration rules in effect at the time of applying for arbitration. The seat of arbitration shall be Beijing. The arbitral award is final and binding upon the Parties.

(f) Enforcement. If any portion of this Agreement shall be determined to be unenforceable for any reason, it shall be adjusted rather than voided, if possible, in order to achieve the intent of the Parties to the extent possible. In any event, all other provisions of this Agreement shall be valid and enforceable to the maximum extent possible.

(g) Headings. The headings appearing in this Agreement have been inserted for identification and reference purposes and shall not by themselves determine the construction or interpretation of this Agreement.

(h) Notices. Unless otherwise provided herein, all notices, requests, instructions or consents required or permitted under this Agreement shall be in writing and will be deemed given: (a) when delivered personally; (b) when sent by confirmed facsimile; (c) ten (10) business days after having been sent by registered or certified mail, return receipt requested, postage prepaid; or (d) three (3) business days after deposit with an internationally recognized commercial overnight carrier specifying next day delivery, with written verification of receipt. All communications will be sent to the addresses set forth in Schedule C of the Operating Agreement (or to such other address or facsimile number as may be designated by a Party giving written notice to the other Parties pursuant to Section 12.5 of the Operating Agreement).

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(i) Confidentiality. Section 12.17 of the Operating Agreement shall be incorporated by reference into and form an integral part of this Agreement, *mutatis mutandis*. Each Party shall comply with such Section.

(j) Counterparts. This Agreement may be executed in five (5) or more counterparts, each of which shall be deemed to be an original, but all of which taken together shall constitute one and the same agreement.

(k) Expenses. Except as otherwise provided herein, each Party shall pay all costs and expenses that it incurs with respect to the negotiation, execution, delivery, performance and consummation of this Agreement, except that the Company shall pay any transfer Taxes, recording and filing fees, and other charges with respect to the transfer of the Transferred Assets at the Contribution Closing.

(l) Effectiveness. This Agreement shall become effective upon the execution of this Agreement by duly authorized representatives of all Parties.

(signature page follows)

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

PHOTRONICS, INC.

By: _____
Name: _____
Title: _____

PHOTRONICS SINGAPORE PTE LTD.

By: _____
Name: _____
Title: _____

DAI NIPPON PRINTING CO., LTD.

By: _____
Name: _____
Title: _____

DNP ASIA PACIFIC PTE. LTD.

By: _____
Name: _____
Title: _____

XIAMEN AMERICAN JAPAN PHOTRONICS MASK CO., LTD.

By: _____
Name: _____
Title: _____

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

Operating Agreement
Outsource Agreement
Amended and Restated License Agreement

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

OUTSOURCING AGREEMENT

This **OUTSOURCING AGREEMENT** (this “**Agreement**”) is made and entered into as of the 16th day of May, 2017, by and among

Photronics, Inc., a Connecticut corporation with its principal place of business at 15 Secor Road, Brookfield, Connecticut, U.S.A (“**Photronics**”),

Dai Nippon Printing Co., Ltd., a Japanese corporation with its principal place of business at 1-1, Ichigaya Kagacho 1-chome, Shinjuku-ku, Tokyo, Japan (“**DNP**”),

Photronics DNP Photomask Corporation, a company limited by shares organized and formed under the Company Act of the Republic of China with its principal place of business at 4f, #2, Li-Hsin Road, Science Park, Hsinchu, Taiwan, ROC (“**PDMC**”), and

Xiamen American Japan Photronics Mask Co., Ltd., a limited liability company organized and formed under the People’s Republic of China with its principal place of business at R203-95, South Building of Torch Square, No. 56-58 Torch Road, Gaoxin District, Xiamen, Fujian Province, Peoples Republic of China (the “**Company**”).

Each of Photronics and DNP is hereinafter referred to as a “**Shareholder**” and collectively as the “**Shareholders**”, each of the Shareholders and PDMC is hereinafter referred to as a “**Supplier**” and collectively as the “**Suppliers**”, and each of the Suppliers and the Company is hereinafter referred to as a “**Party**” and collectively as the “**Parties.**”

**ARTICLE 1.
BACKGROUND**

Photronics and DNP wish to participate in a joint venture, either directly or indirectly through their respective Affiliates, as equity interest owners in the Company, and to carry on the Business through the Company. ***.

The Parties hereby agree and confirm the exclusive distribution mechanism set forth in Section 10.1 hereof. ***.

1.1 Defined Terms

Unless otherwise defined in this Agreement and Schedule 1 hereof, terms defined in the China JV Operating Agreement shall have the same meanings when used in this Agreement.

1.2 Incorporation by Reference

Section 12 (Miscellaneous) of the China JV Operating Agreement shall be incorporated by reference into and form an integral part of this Agreement, *mutatis mutandis*.

**ARTICLE 2.
PURCHASE ORDERS**

2.1 Outsource and Issuance of Purchase Orders

Subject to the terms and conditions mentioned hereunder, the Parties agree to the outsource model based on *** as follows, and the Parties also agree that they may add additional Products to this Agreement through additional Purchase Orders ***.

***.

Moreover, it is acknowledged by the Parties that during the ***. Therefore, subject to the prior notification to, and the instruction and the express approval of the customers, the Steering Committee could reasonably decide or change the outsource model at its own discretion in accordance with the China JV Operating Agreement.

In any case, none of the Parties shall unreasonably *** of the Products to take advantage of the outsource relationship or***.

A. Outsource Transition Period

During the Outsource Transition Period, as for the Purchase Orders received by the Company from:

- (a) [***],
- (b) [***],
- (c) [***],
- (d) [***], and
- (e)***.

B. Post Outsource Transition Period

(a) During the Post Outsource Transition Period, the following rules for outsourcing the Purchase Orders to the Suppliers (the “**Outsource Stepdown Rules**”) will apply:

- Year 1: [***]
- Year 2: [***]
- Year 3: [***]
- Year 4 and thereafter: [***].

C. General

- (a) [***].
- (b) [***].

(c) For the avoidance of doubt, the Parties agree and confirm that, during the Outsource Transition Period and aside from the Outsource Stepdown Rules ***.

- (d) [***].

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

2.2 Purchase Orders

The Suppliers will make good faith efforts to accept all *** from the Company that comply with this Agreement including adhering to all relevant specifications of the Product as set forth in the *** entered into between the Company and the Supplier (including the *** (as defined below)). The Suppliers shall notify the Company of acceptance or rejection of a *** within *** hours of receipt of a ***. Failure of the Suppliers to accept or reject a *** within *** hours shall constitute acceptance of such ***. The lead time for the Products will be as set forth in the applicable ***. Each *** shall include the following: (a) the Company's *** number; (b) identification of the quantity and type of the Product ordered by the Company; (c) the price of each Product ordered per Schedule 2 attached hereto; (d) the requested delivery date (subject to the applicable Product Lead Time); (e) any shipping instructions, including preferred carrier and shipping destination; and (f) the specifications for the Product.

Notwithstanding anything contained in this Agreement and the China JV Operating Agreement to the contrary, and for the sake of clarity,***.

2.3 Purchase Order Terms

All *** agreed to between the Company and a Supplier shall be governed by this Agreement unless otherwise agreed by the Company and the *** which receives such *** in writing; the Parties agree that the *** submitted by the Company to any of the *** will mirror the terms and conditions of the *** with respect to specification for the Product and the end customer's requirement submitted to the Company by the Company's ***. Those terms and conditions of the *** may be discussed and agreed between the Company and any of the Suppliers prior to issuance of such *** to any of the ***.

2.4 Rescheduling and Cancellation

The Company may not *** any portion of an accepted *** unless the Supplier fails to fulfill any material term of such accepted ***. The Suppliers shall at all times use prudent material planning practices, including by way of example,***. The Company *** will be provided on a [***] basis covering a rolling [***] period. The Company will provide the Suppliers with such s*** which will be updated [***] and *** which will be updated [***] and will be used for planning purposes only. If a Supplier's ability to supply any Product is constrained for any reason, such Supplier shall immediately notify the Company of such supply constraint for the purpose of resolving the same.

2.5 End of Life

Each of the Suppliers may terminate its obligations to supply a particular Product under this Agreement by giving written notice of the end of life of such Product to the Company at least [***] before the effective date of such termination (a "**Product EOL Notice**"), provided that (a) the relevant Supplier shall supply, and the Company shall purchase, such Product ordered pursuant to this Agreement until the effective date of such termination and including any accepted Purchase Orders outstanding on the effective date of termination, and (b) the relevant Supplier is *** to its other *** with respect to such Product. When the Company becomes aware that any of its customers will finish purchasing any type of the Products, the Company shall promptly notify the Supplier(s) thereof. Notwithstanding the above, if the Company has a long term supply agreement with a customer and the Suppliers (i) has confirmed in writing its intention to *** hereunder and (ii) are actually providing Product in support of such supply agreement, neither Supplier can, to the extent of its confirmation, *** to supply the Company until ***; provided however that, if a Shareholder terminates the ***, such Shareholder can immediately terminate ***.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

2.6 Certain Claims

Notwithstanding any other provisions in this Agreement, either Supplier may *** after Suppliers' receipt of a written *** that is deemed credible by written opinion of the relevant Supplier's outside counsel, provided that the relevant Supplier also *** with respect to such Product; provided further that (i) relevant Supplier shall give the Company at *** calendar days prior written notice of its intent to discontinue ***, and (ii) at the Company's request, if the Company will *** using ***, Suppliers will provide the Company with all reasonable information and assistance necessary, *** to the relevant *** in accordance with the terms and conditions to be agreed by the relevant Supplier and the Company, to enable the Company to manufacture or have the ***.

Any such granted *** shall *** and provided information shall be destroyed or returned in the event the relevant Supplier resumes ***. The Company shall defend, indemnify and hold harmless the relevant Supplier from and against any claims, expenses and costs (including but not limited to attorney and other professional fees and expenses), settlement of third party claims (if negotiated and approved by the Company), damages and liability arising from or related to *** or the violation of the *** of any *** solely with respect to the Company's manufacture, use, sale, offering for sale, importation or distribution of any *** during the *** calendar days period specified in this Section 2.6 or manufactured by or on behalf of the Company under the license granted in this Section 2.6.

2.7 Priority for New Products

***for the Company will be reviewed and discussed by the Steering Committee. The Steering Committee role will be as defined in Section 5.15 of the China JV Operating Agreement.

ARTICLE 3. PURCHASE ORDER ALLOCATION

Notwithstanding any other provisions in this Agreement, the Parties agree that, *** hereunder by the Company to any of the Suppliers shall be at *** pursuant to the *** of the Company taking into account the *** of the Company's *** and the *** for the ***; provided however that the Company will attempt to allocate the *** with each Supplier pursuant to the *** set forth in Section 2.1 above. The Parties will review the *** of orders between Suppliers on a ***. If at the end of each *** the *** to one of the Suppliers is not consistent with the *** set forth in Section 2.1 above, the Company will attempt to *** to the Suppliers with *** for the *** until such Supplier has received *** set forth in Section 2.1 above. Notwithstanding the above, each of the Parties agrees and acknowledges that if a Supplier cannot provide Product to the Company because of *** of the Company, then the Company will be *** to seek the Product from the other Supplier without *** of Product orders between the Suppliers.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

**ARTICLE 4.
PRODUCT PRICES AND PAYMENT**

4.1 Prices

The purchase price for the Product shall be as set forth in Schedule 2.

4.2 Invoices; Payments

The Suppliers shall issue invoices to the Company for any amounts payable to the Suppliers pursuant to this Agreement upon shipment of the applicable Products to the Company. Payments for Products delivered in accordance with the Purchase Orders, and any other to be made by the Company to Suppliers hereunder, shall be made in the Applicable Currency within [***] from the shipment of the applicable Products delivered.

4.3 Taxes

All amounts payable for Product sold by the Suppliers to the Company hereunder are exclusive of any taxes. The Company shall be responsible for and shall pay any applicable sales, use, excise or similar taxes, including value added taxes and customs duties due on the importation of the Products and arising from purchases made by the Company under this Agreement, excluding any taxes based on the Suppliers' income and any applicable withholding taxes. All such taxes shall be determined based upon the final shipment designation of the items identified on the invoice.

**ARTICLE 5.
DELIVERY**

5.1 Risk of Loss and Title

Delivery of all Products shall be made pursuant to the Delivery Term. Risk of loss for the Products and title to the Products shall pass to the Company in accordance with the Delivery Term.

5.2 Delivery

Suppliers shall deliver the Product to the Company in accordance with the Delivery Term, shipping instructions in the Purchase Order issued by the Company with regard to the requested delivery date (subject to the Product Lead Time), ship-to address, and carrier. If the Company does not provide shipping instructions, the Suppliers will select the carrier on a commercially reasonable basis. Suppliers shall be responsible for paying freight, handling, shipping and/or insurance charges to the delivery point in accordance with the Delivery Term.

**ARTICLE 6.
LIMITED WARRANTIES**

6.1 Suppliers Limited Warranty

Each of the Suppliers warrants that the Products shall comply with the specifications and documentation agreed by the relevant Supplier and the Company in writing that is applicable to such Products for the Warranty Period. This warranty does not apply to any Product failures resulting from misuse, storage in or exposure to environmental conditions inconsistent with those specified in the applicable specifications or documentation, modification of the Product by anyone other than the relevant Supplier. If a Product fails to comply with the foregoing warranty, the relevant Supplier shall, at its option, either *** such Product, or, in the event the foregoing options are not commercially practicable, *** to the Company any amounts paid for the applicable Product. Without limiting the remedies specified in Article 8 and Section 9.2, this Section 6.1 states the exclusive remedy of the Company for failure of a Product to conform to the warranty provisions set forth in this Section 6.1.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

6.2 Disclaimer

EXCEPT AS EXPRESSLY SET FORTH IN THIS ARTICLE 6, THE PARTIES MAKE NO WARRANTIES OR REPRESENTATIONS TO THE OTHER PARTIES AND EACH PARTY HEREBY DISCLAIMS ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT AND FITNESS FOR A PARTICULAR PURPOSE.

ARTICLE 7. TERM AND TERMINATION

7.1 Term

This Agreement shall become effective as of the Effective Date and shall continue to be in full force and effect for so long as Photonics and DNP, or any of their Affiliates, each remains a Shareholder of the Company.

7.2 Termination for Cause

A Party shall have the right to terminate its obligations under this Agreement if the other Party materially breaches this Agreement and fails to cure such breach within thirty (30) days after its receipt of written notice of the breach specifying such default.

7.3 Survival

Article 6 (for the duration of the applicable warranty period), Article 7, Article 8 and Article 9 shall survive any termination or expiration of this Agreement.

ARTICLE 8. INDEMNIFICATION

8.1 Indemnification by the Suppliers

Each of the Suppliers shall, with respect to Products supplied by such Supplier, defend, indemnify and hold harmless the Company from and against any third party claims, expenses and costs (including but not limited to attorney and other professional fees and expenses), settlement (if negotiated and approved by the relevant Supplier), damages and liability to the extent arising from a claim (a) alleging that a Product infringes or misappropriates any Intellectual Property Rights, or (b) arising under products liability theory from a manufacturing defect, and shall pay any judgments finally awarded by a court or any amounts contained in a settlement agreed to by the relevant Supplier arising from such claims. The foregoing indemnity does not cover claims that solely arise from (i) the modification of the Product by any party other than the relevant Supplier, (ii) the combination or use of the Product with other products, processes, methods, materials or devices except as approved by the relevant Supplier, or (iii) the fault of the Company.

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

8.2 Indemnification by the Company

Other than claims for which the Suppliers are obligated to indemnify the Company under Section 8.1, the Company shall defend, indemnify and hold harmless the Suppliers from and against any third party claims, expenses and costs (including but not limited to attorney and other professional fees and expenses), settlement (if negotiated and approved by the Company), damages and liability to the extent arising from a claim (a) alleging that a Product supplied by such Supplier infringes or misappropriates any Intellectual Property Rights, or (b) arising under products liability theory from a manufacturing defect, and shall pay any judgments finally awarded by a court or any amounts contained in a settlement agreed to by the Company arising from such claims. The foregoing indemnity does not cover claims that solely arise from (i) the modification of the Product by any party other than the Company, or (ii) the combination or use of the Product with other products, processes, methods, materials or devices except as approved by the Company.

8.3 Procedure

The Party seeking indemnification hereunder (the “**Indemnified Party**”) agrees to promptly inform the other Party (the “**Indemnifying Party**”) in writing of such claim and furnish a copy of each communication, notice or other action relating to the claim and the alleged infringement. The Indemnified Party shall permit the Indemnifying Party to have sole control over the defense and negotiations for a settlement or compromise, provided that the Indemnifying Party may not settle or compromise a claim in a manner that imposes or purports to impose any liability or obligations on the Indemnified Party without obtaining the Indemnified Party’s prior written consent. The Indemnified Party agrees to give all reasonable authority, information and assistance necessary to defend or settle such suit or proceeding at the Indemnifying Party’s reasonable request and at the Indemnifying Party’s expense.

ARTICLE 9. LIABILITY AND REMEDY

9.1 Limited Liability

EXCEPT FOR LIABILITY ARISING FROM BREACHES OF A PARTY’S CONFIDENTIALITY OBLIGATIONS CONTAINED IN THE NON-DISCLOSURE CLAUSE IN SECTION 12.17 OF THE CHINA JV OPERATING AGREEMENT, BREACHES OF LICENSE GRANTS CONTAINED HEREIN, AND EXCEPT FOR AMOUNTS PAYABLE TO THIRD PARTIES TO FULFILL INDEMNITY OBLIGATIONS DESCRIBED IN ARTICLE 8, (A) IN NO EVENT SHALL ANY PARTY HAVE ANY LIABILITY TO THE OTHERS, OR TO ANY PARTY CLAIMING THROUGH OR UNDER THE OTHER, FOR ANY LOST PROFITS, ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND IN ANY WAY ARISING OUT OF OR RELATED TO THIS AGREEMENT, HOWEVER CAUSED AND UNDER ANY THEORY OF LIABILITY, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES; AND (B) IN NO EVENT SHALL A PARTY’S CUMULATIVE LIABILITY ARISING OUT OF THIS AGREEMENT EXCEED THE AMOUNTS ACTUALLY PAID, PAYABLE, RECEIVED OR RECEIVABLE BY SUCH PARTY FOR THE PRODUCTS CONCERNED THEREWITH HEREUNDER PURSUANT TO THIS AGREEMENT DURING THE TWELVE (12) MONTHS PRIOR TO THE OCCURRENCE OF THE INITIAL EVENT FOR WHICH A PARTY RECOVERS DAMAGES HEREUNDER. THESE LIMITATIONS SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY REMEDY. THE PARTIES ACKNOWLEDGE AND AGREE THAT THIS ARTICLE 9 IS AN ESSENTIAL ELEMENT OF THE BARGAIN AND ABSENT THIS ARTICLE 9 THE ECONOMIC AND OTHER TERMS OF THIS AGREEMENT WOULD BE SUBSTANTIALLY DIFFERENT.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

9.2 Remedies

Notwithstanding anything stated to the contrary in this Agreement, the Parties acknowledge that any breach of Section 2.5 *** of this Agreement and/or the non-disclosure clause in Section 12.17 of the China JV Operating Agreement by a Party would cause irreparable harm to the other Parties, and that the damages arising from any such breach would be difficult or impossible to ascertain. As such, the Parties agree that a Party shall be entitled to injunctive relief and other equitable remedies in the event of any breach or threatened breach of Section 2.5 of this Agreement and/or the non-disclosure clause in Section 12.17 of the China JV Operating Agreement. Such injunctive or other equitable relief shall be in addition to, and not in lieu of, any other remedies that may be available to that Party. The Parties shall be entitled reasonable attorney fees and costs of enforcement of this Agreement.

ARTICLE 10. OTHER ARRANGEMENT

10.1 [***]

(Signature Page Follows)

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

IN WITNESS WHEREOF, the Parties hereto have duly executed this Agreement as of the day and year first above written.

PHOTRONICS, INC.

By: _____
Name: [***]
Title: [***]

DAI NIPPON PRINTING CO., LTD.

By: _____
Name: [***]
Title: [***]

Photronics DNP Mask Corporation .

By: _____
Name: [***]
Title: [***]

Photronics DNP Mask Corporation Xiamen

By:
Name: [***]
Title: [***]

Schedule 1

Definitions

Capitalized words and phrases used and not otherwise defined elsewhere in this Agreement shall have the following meanings:

1. **"Affiliate"** of a Person means any other Person which, directly or indirectly, controls, is controlled by, or is under common control with, such Person. The term "control" (including, with correlative meaning, the terms "controlled by" and "under common control with"), as used with respect to any Person, means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise. A Person shall be deemed an Affiliate of another Person only so long as such control relationship exists.
 2. **"Applicable Currency"** means (i) for payments in relation to Photronics, U.S. Dollars, (ii) for payments in relation to DNP, U.S. Dollars, and (iii) for payments in relation to PDMC, US Dollars.
 3. **"Delivery Term"** means DDP (Incoterms 2010) at delivery point in China. The Delivery Term may be otherwise determined by the Company and the Supplier in the Purchase Order where delivery point is other place than China.
 4. ***.
 5. **"Intellectual Property Rights"** means all rights in and to (a) U.S. and foreign patents and patent applications, including all divisions, substitutions, continuations, continuations-in-part, and any reissues, re-examinations and extensions thereof, (b) copyrights and other rights in works of authorship, (c) unpatented inventions, trade secrets, data, processes, or materials, (d) mask work rights, and (e) other intellectual property or proprietary rights of any kind now known or hereafter recognized in any jurisdiction, but excluding trademarks, service marks, trade names, trade dress, domain names, logos and similar rights, and the goodwill associated therewith.
 6. ***.
 7. ***.
 8. ***.
 9. ***.
 10. ***.
 11. **"Product"** means photolithographic integrated circuit photomasks for [***] and related services.
 12. **"Purchase Order"** means any of the following (a) a written purchase order issued to the Company by third party buyers for the purchase of certain Products; (b) a written purchase order issued by the Company to a Supplier for a quantity of the Product.
 13. **"Warranty Period"** means a period of [***] from the relevant Supplier's shipment of the Product.
-

Schedule 2

Product Prices

The prices for each Product outsourced to the Suppliers shall be [***].

AMENDED AND RESTATED LICENSE AGREEMENT

This AMENDED AND RESTATED LICENSE AGREEMENT (“Agreement”) is entered into as of the 16th day of May 2017 (“**the Effective Date**”), by and between Dai Nippon Printing Co., Ltd., a corporation organized under the laws of Japan, with its principal place of business at 1-1-1, Ichigaya-Kagacho, Shinjuku-ku, Tokyo 162-8001, Japan (“DNP”) and Photronics DNP Mask Corporation (formerly known as Photronics Semiconductor Mask Corporation), a corporation organized under the laws of the Republic of China (hereinafter “ROC” or “Taiwan”), with its registered office at 1F, No. 2, Lising Road, Hsinchu City, Hsinchu Science Park, Taiwan, R.O.C (“Company”). Each of DNP and the Company is hereafter referred to as a “Party” and collectively the “Parties”.

RECITALS

WHEREAS, in order to integrate resources, reduce operating costs and expand the economic scale of each of DNP Photomask Technology Taiwan Co. Ltd. (“DPTT”) and Photronics Semiconductor Mask Corp. which was the predecessor of the Company, DPTT agreed to enter into a Merger Agreement (“Merger Agreement”) with the Company as the surviving company;

WHEREAS, after the merger of DPTT into the Company, the Company (a) became a joint venture entity directly or indirectly owned by Photronics, Inc., a corporation organized under the laws of the State of Connecticut, U.S.A. with its principal place of business at 15 Secor Road, Brookfield, Connecticut, U.S.A. (“Photronics”) and DNP as its shareholders; and (b) assumed all rights and obligations of DPTT by operation of the Business Mergers and Acquisitions Act of Taiwan, including, amongst others, the rights and obligations under the technology license agreement entered into by and between DNP and DPTT as of June 23, 2008, as amended as of June 23, 2011 and an agreed date prior to the Effective Date (collectively, the “Technology License Agreement”);

WHEREAS, in connection with the merger of DPTT into the Company, Photronics and DNP have entered into a Joint Venture Operating Agreement (“JV Operating Agreement”) dated as of 20th day of November, 2013 and Joint Venture Framework Agreement (“JV Framework Agreement”) dated as of 20th day of November, 2013.

WHEREAS, DNP who owns certain patents, patent applications, know how and invention disclosures with respect to the Licensed Products (defined below) desires to enter into this Agreement, pursuant to which DNP agrees to continue [***] subject to the terms and conditions herein;

WHEREAS, the Company wishes to continue using such license to make, use, distribute or otherwise dispose of Photomasks (as defined below);

WHEREAS, DNP and the Company are party to that certain License Agreement dated as of November 20, 2013, amended by the letter agreement dated as of March 14, 2014 and Amendment No.1 to License Agreement dated as of July 22, 2015 (the “Existing License Agreement”);

WHEREAS, in connection with the formation of a joint venture in PRC, Photronics and DNP, together with Photronics Singapore Pte, Ltd and DNP Asia Pacific Pte, Ltd., have entered into a Joint Venture Operating Agreement of Photronics DNP Mask Corporation Xiamen (“JV Operating Agreement”) dated as of the 16th day of May, 2017.

WHEREAS, DNP and the Company desire to amend and restate the Existing License Agreement in its entirety on the terms and conditions herein set forth;

NOW, THEREFORE, in consideration of the mutual covenants and conditions contained herein and intending to be legally bound, the Parties hereby agree as follows:

ARTICLE I. DEFINITIONS

Section 1.1. Certain Defined Terms. The following terms shall have the meanings set forth below:

“Affiliate” means, with respect to any Person (as hereinafter defined), any other Person that directly, or indirectly through one or more intermediaries, controls or is controlled by, or is under common control with, such Person. For the purposes of this definition, “control,” when used with respect to any specified Person, means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of equity interests in such Person, by contract or otherwise; and the terms “controlling” and “controlled” have correlative meanings to the foregoing.

“Agreement” has the meaning set forth in the introductory paragraph hereof.

“Business Day” means any day other than a Saturday, Sunday or any other day on which banks are authorized or required by law or other governmental action to close in Japan, Taiwan and the United States of America.

“Control”, “Controlled” or “Controlling”, when used in reference to Know-how or Patent Rights, means the legal authority or right of a Party hereto (or any of its Affiliates) [***], without breaching the terms of any agreement with a third party, or misappropriating the proprietary or trade secret information of a third party.

“Effective Date” means the completion date of the merger contemplated under the Merger Agreement.

“Governmental Authority” means any nation, state, territory, province, county, city or other unit or subdivision thereof or any entity, authority, agency, department, board, commission, instrumentality, court or other judicial body authorized on behalf of any of the foregoing to exercise legislative, judicial, regulatory or administrative functions of or pertaining to government, and any governmental or non-governmental self-regulatory organization.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

“Know-how” means any and all [***], provided, however, those which are of general public knowledge and/or those subject to the Patent Rights shall be excluded .

“Improvements” shall mean all [***] whether or not patented or patentable.

“License” has the meaning set forth in Section 2.1 herein.

“Licensed Know-how” means the Know-how set forth [***].

“Licensed Patents” means the Patent Rights set forth on Exhibit B attached hereto that are owned or Controlled during the Term of this Agreement by DNP as well as any Patent Rights claiming priority in whole or part to any Patent Rights set forth on Exhibit B.

“Licensed Products” means [***].

“Order” means any judicial, administrative or arbitral judgment, order, award, writ, decree, injunction, lawsuit, proceeding or stipulation of any Governmental Authority.

“Party” and “Parties” have the meaning set forth in the introductory paragraph hereof.

“Patent Rights” means patents and [***].

“Person” means any natural person, corporation, company, limited liability company, partnership (limited or general), joint venture, association, trust, unincorporated organization or other entity.

“Photomasks” means photomasks, [***].

“Photronics Xiamen” means an Affiliate of Photronics established in Xiamen, PRC.

“PRC” means the People's Republic of China (excluding Taiwan, Hong Kong Special Administrative Region and Macau Special Administrative Region).

“Term” means the period commencing upon the completion of the merger contemplated under the Merger Agreement and concluding upon termination of this Agreement pursuant to Article VII herein.

“Territory” means [***]

[***].

[***]

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

Section 1.2. Rules of Construction and Interpretation.

(a) The definitions of the terms herein shall apply equally to the singular and plural forms of the terms defined. Whenever the context may require, any pronoun shall include the corresponding masculine, feminine and neuter forms. The words “include”, “includes” and “including” shall be deemed to be followed by the phrase “without limitation”. The word “will” shall be construed to have the same meaning and effect as the word “shall”. The word “any” shall mean “any and all” unless otherwise clearly indicated by context. Where either Party’s consent is required hereunder, except as otherwise specified herein, such Party’s consent may be granted or withheld in such Party’s sole discretion.

(b) Unless the context requires otherwise, (i) any definition of or reference to any agreement, instrument or other document herein shall be construed as referring to such agreement, instrument or other document as from time to time amended, supplemented or otherwise modified (subject to any restrictions on such amendments, supplements or modifications set forth herein or therein), (ii) any reference to any laws herein shall be construed as referring to such laws as from time to time enacted, repealed or amended, (iii) any reference herein to any person shall be construed to include the person’s successors and assigns, (iv) the words “herein”, “hereof” and “hereunder”, and words of similar import, shall be construed to refer to this Agreement in its entirety and not to any particular provision hereof, and (v) all references herein to Articles, Sections or Exhibits, unless otherwise specifically provided, shall be construed to refer to Articles, Sections and Exhibits of this Agreement.

**ARTICLE II.
GRANT OF LICENSE**

Section 2.1. License. (a) In consideration for the royalty payments that have been made pursuant to the Technology License Agreement and other good and valuable consideration, (i) DNP hereby agrees to continue [***].

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

(b) In consideration for a royalty payment by the Company to DNP as set forth below in Section 2.1 (c) and other good and valuable consideration, DNP agrees to grant and hereby grants, and the Company agrees to accept and hereby accepts, a right to [***].

(c) As for Licensed Products for [***], the Company will pay to DNP a royalty of [***].

Section 2.2. Technical Documents. DNP shall furnish the Company with the technical documents containing the Licensed Know-how by the method separately agreed between the Parties.

Section 2.3. Improvements. If the Company wishes to obtain a license for any Improvements and developments relating to the Licensed Know-how or Licensed Patents which DNP obtains or comes into possession of during the Term of this Agreement in order to [***].

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

Section 2.4. Subcontracting. If the Company wishes to subcontract [***]. The Company shall enter into a [***] so as to impose upon them the same obligations as the Company shall assume under this Agreement. The breach of the obligations hereunder by any Subcontractors (other than DNP) shall be deemed as the breach by the Company, and the Company shall be fully responsible for the breach by any Subcontractors (other than DNP).

Section 2.5. Further License to Third Parties. (a) The Company acknowledges that DNP has the right to grant or not grant other licenses to [***]

(b) The Company acknowledges that DNP has the right to [***]

Section 2.6. Marking. In connection with the Company's exercise of its rights under the License during the Term hereof, the Company shall comply with applicable patent marking laws with respect to the Licensed Patents, and as otherwise reasonably instructed by DNP.

Section 2.7. Restrictions. Except as otherwise provided in this Agreement, the Company hereby agrees that the Licensed Know-how that is licensed by DNP hereunder shall remain [***]. Nothing in the foregoing should restrict the Company from developing its own technology, provided that such development shall not be in breach of any obligations of the Company hereunder.

Section 2.8. No Analysis. Without written permission from DNP, [***].

Section 2.9 Blanks. [***].

ARTICLE III. ROYALTIES

Section 3.1. The Parties acknowledge and agree that the royalties in consideration for the [***].

*** Confidential treatment has been requested by Photonics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

**ARTICLE IV.
CONFIDENTIALITY**

Section 4.1. The Company agrees that during the Term hereof and thereafter, it shall keep the Licensed Know-how strictly confidential by employing appropriate measures and shall not, without prior written consent of DNP, [***].

Section 4.2. Upon expiration or termination of this Agreement, the Company shall forthwith return or destroy in an appropriate manner, as requested by DNP, all documents and electronic data (including all copies, summaries, excerpts thereof) containing, or derived or produced partly or wholly from the Licensed Know-how.

Section 4.3. The Company agrees to take all appropriate measures to comply with Article 4.1 above, including but not limited to the following: [***].

Section 4.4. The Company agrees that in the event the Company has been conclusively proven to have [***].

**ARTICLE V.
REPRESENTATIONS, WARRANTIES AND LIMITATION OF LIABILITY**

Section 5.1. Title and Contest. DNP represents and warrants [***].

Section 5.2. Disclaimer. EXCEPT FOR THE EXPRESS LIMITED WARRANTY SET FORTH IN SECTION 5.1 ABOVE, THE LICENSED KNOW-HOW AND LICENSED PATENTS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE. DNP SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE LICENSED KNOW-HOW AND LICENSED PATENTS LICENSED BY DNP HEREUNDER.

Section 5.3. Non-contravention. Each Party represents and warrants that the execution of this Agreement and the grant of the License hereunder will not conflict with, or result in any breach of or constitute a default under any contract by which that Party is bound, or violate or conflict with any Order.

Section 5.4. No Challenge. The Company agrees that at no time shall it challenge directly or indirectly or assist anyone else in challenging directly or indirectly the validity and/or enforceability of any claim of any of the Licensed Patents at any time.

Section 5.5. Use of Licensed Patents; No Permitted Sublicensing. The Company represents and warrants that it shall only [***].

Section 5.6. Limitation of Liability. IN NO EVENT WILL DNP HAVE ANY LIABILITY FOR ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER FOR BREACH OF CONTRACT, TORT OR OTHERWISE, ARISING OUT OF OR RELATED TO THIS AGREEMENT, INCLUDING BUT NOT LIMITED TO, LOSS OF ANTICIPATED PROFITS, LOSS OF DATA, OR LOSS OF USE, EVEN IF DNP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE CUMULATIVE LIABILITY OF DNP FOR DAMAGES HEREUNDER WILL BE SUBJECT TO THE INDEMNIFICATION BASKET AND CAP ON LIABILITY AS SET FORTH IN THE JV FRAMEWORK AGREEMENT.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

**ARTICLE VI.
PROSECUTION AND MAINTENANCE AND ENFORCEMENT**

Section 6.1. Prosecution and Maintenance. DNP shall have sole responsibility and discretion with respect to prosecution, issuance and maintenance of the Licensed Patents.

Section 6.2. Enforcement. During the Term, the Company shall promptly provide written notice to DNP of any infringement of any Licensed Patents of which it becomes aware, including in such notice a reasonable level of detail regarding such infringement.

Section 6.3. Cost of Action. Unless the Parties otherwise agree, the total cost of any such action commenced by DNP, shall be borne by DNP (but excluding fees and expenses charged by separate counsel, if any, engaged by the Company). Except as the Parties may otherwise agree in writing, any damages or settlement payments resulting from any such action commenced as set forth above, whether in an out-of-court settlement or through legal adjudication of such action, and at any time, shall be retained by DNP.

Section 6.4. Cooperation. In any infringement action that DNP may institute pursuant to this Article 6 during the Term of this Agreement, the Company hereto shall, at the request of DNP and at DNP's sole cost, cooperate reasonably in the prosecution of such action.

**ARTICLE VII.
TERM; TERMINATION**

Section 7.1. Term. The term of this Agreement shall commence on the Effective Date and, shall continue unless terminated in accordance with the provisions of Section 7.2.

Section 7.2. Termination.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

- (a) DNP shall have the right to forthwith terminate this Agreement in the event of: [***].
- (b) Subject to Section 7.2(a), [***].

**ARTICLE VIII.
MISCELLANEOUS**

Section 8.1. Export Control. In relation to the grant of license herein, the Company agrees to comply fully and have Photronics Xiamen comply fully, with all relevant export laws and regulations (“Export Laws”) to ensure that neither (i) the Licensed Product are exported or re-exported directly or indirectly in violation of Export Laws; nor (ii) used Licensed Know-how and Licensed Patents for any purposes prohibited by the Export Laws, including but not limited to military purposes. The Company will provide DNP with necessary documentation it needs in order to comply with any Export Laws it is subject to.

Section 8.2. Publicity. Except as otherwise required by law, legal process or stock exchange rules, neither Party shall issue any press release or make any public announcement or disclosure related to the Agreement or the transactions contemplated hereunder without the prior agreement of the other Party, including with respect to the content of such release, announcement or disclosure (and, with respect in any legally required announcement, DNP and the Company shall use all reasonable efforts to consult and agree with each other with respect to the content of any such required press release or other publicity).

Section 8.3. Notices. All notices and other communications hereunder shall be in writing and shall be deemed given and effective (a) when delivered, if delivered in person, (b) when transmitted by telecopy (with confirmation of transmission received), (c) three (3) Business Days after mailing, if mailed by certified or registered mail (return receipt requested and obtained) or (d) one (1) Business Day after transmitted, if transmitted by a nationally recognized overnight courier to the parties at the following addresses (or at such other address for a party as shall be specified by like notice):

If to the Company

Photronics DNP Mask Corporation
1F, No. 2, Lising Road, Hsinchu City, Hsinchu Science Park,
Taiwan, R.O.C
Attention: [***]
Facsimile: [***]

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

With a copy (which shall not constitute notice) to:

Photronics, Inc.
15 Secor Rd.
Brookfield, CT 06804 USA
Attention: [***]
Facsimile: [***]

If to DNP

Dai Nippon Printing Co., Ltd.
1-1-1, Ichigaya-Kagacho, Shinjuku-ku, Tokyo 162-8001, Japan
Telephone: [***]
Fax: [***]
Attention: [***]

With a copy (which shall not constitute notice) to:

Lee and Li, Attorneys-at-Law
7F, 201 Tun Hua No. Road
Taipei, Taiwan 10508, the Republic of China
Telephone: [***]
Fax: [***]
Attention[***]

and/or to such other respective addresses and/or addressees as may be designated by notice given in accordance with the provisions of this Section 8.3.

Section 8.4. Expenses. Except as otherwise expressly set forth in this Agreement, each Party hereto shall bear all fees and expenses incurred by such Party in connection with, relating to or arising out of the execution, delivery and performance of this Agreement and the consummation of the transactions contemplated hereby and thereby, including financial advisors', attorneys', accountants' and other professional fees and expenses.

Section 8.5. Entire Agreement. This Agreement constitutes the entire agreement between the Parties with respect to the subject matter hereof and supersedes any previous agreements, arrangements or understandings between them relating to the subject matter hereof. For the avoidance of doubt, the Technology License Agreement was superseded and replaced by the Existing License Agreement upon the completion of the merger contemplated under the Merger Agreement and shall be superseded and replaced by this Agreement in accordance with Section 2.1(a) above. Each exhibit hereto shall be considered incorporated into this Agreement.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

Section 8.6. Non-Waiver. The failure in any one or more instances of a Party to insist upon performance of any of the terms, covenants or conditions of this Agreement, to exercise any right or privilege in this Agreement conferred, or the waiver by said Party of any breach of any of the terms, covenants or conditions of this Agreement, shall not be construed as a subsequent waiver of any such terms, covenants, conditions, rights or privileges, but the same shall continue and remain in full force and effect as if no such forbearance or waiver had occurred. No waiver shall be effective unless it is in writing and signed by an authorized representative of the waiving Party.

Section 8.7. Severability. Any term or provision of this Agreement which is invalid or unenforceable in any jurisdiction shall, as to that jurisdiction, be ineffective to the extent of such invalidity or unenforceability without rendering invalid or unenforceable the remaining terms and provisions of this Agreement or affecting the validity or enforceability of any of the terms or provisions of this Agreement in any other jurisdiction. If any provision of this Agreement is so broad as to be unenforceable, the provision shall be interpreted to be only as broad as is enforceable.

Section 8.8. Binding Effect; Benefit. This Agreement shall inure to the benefit of and be binding upon the Parties, and their successors and permitted assigns. Nothing in this Agreement, express or implied, is intended to confer on any Person other than the Parties, and their respective successors and permitted assigns any rights, remedies, obligations or liabilities under or by reason of this Agreement, including third party beneficiary rights.

Section 8.9. Assignability. The Company shall not assign, pledge or otherwise dispose of its rights or delegate its obligations under this Agreement in whole or in part without the prior written consent of DNP.

Section 8.10. Amendments. This Agreement shall not be modified or amended except pursuant to an instrument in writing executed and delivered on behalf of each of the Parties.

Section 8.11. Headings. The headings contained in this Agreement are for convenience of reference only and shall not affect the meaning or interpretation of this Agreement.

Section 8.12. Governmental Reporting. Anything to the contrary in this Agreement notwithstanding, nothing in this Agreement shall be construed to mean that a Party or other Person must make or file, or cooperate in the making or filing of, any return or report to any Governmental Authority in any manner that such Person or such Party reasonably believes or reasonably is advised is not in accordance with applicable laws.

Section 8.13. Survival. The terms and conditions of Article I (to the extent necessary to give effect to this Section 8.13), Section 2.1(d), Section 2.7, 2.8, Article III, Article IV, Article V and Sections 7.2, 8.1, 8.3, 8.5, 8.6, 8.7, 8.8, 8.9, 8.10, 8.11, 8.13, 8.15, 8.16, 8.17 and 8.18 of this Agreement shall survive any termination hereof.

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

Section 8.14. Relationship of Parties. Neither Party has any express or implied authority to assume or create any obligations on behalf of the other or to bind the other to any contract, agreement or undertaking with any third party.

Section 8.15. Applicable Law. This Agreement shall be governed by and construed in accordance with the laws of Taiwan without reference to the choice of law principles thereof.

Section 8.16. Arbitration. In the event of any dispute, controversy or claim arising out of or in connection with this Agreement (each, a "Dispute"), the Parties shall use their reasonable efforts to resolve such Dispute within a period of ninety (90) days commencing from either Party's receipt of a notice from the other Party stating the existence of a Dispute. In the event any such Dispute is not resolved, either Party may refer such Dispute to arbitration in Taipei, Taiwan before one (1) arbitrator appointed in accordance with the ROC Arbitration Law and the Arbitration Rules of the ROC Arbitration Association. The arbitration proceeding shall be conducted in English. The award thereof shall be final and binding upon the Parties hereto. Judgment upon such award may be entered in any court having jurisdiction thereof.

Section 8.17. Equitable Relief. The Company acknowledges and agrees that damages alone would be insufficient to compensate DNP for a breach by the Company of this Agreement and that irreparable harm would result from a breach of this Agreement. The Company hereby consents to the entering of an order for injunctive relief to prevent a breach or further breach, and the entering of an order for specific performance to compel performance of any obligations under this Agreement.

Section 8.18. Language. The official language of this Agreement exclusively shall be, and all communications and agreements between the Parties exclusively shall be made in, the English language. The Parties hereto waive any rights they may have under any other law to have this Agreement written in another language, and any translation of this Agreement will be solely for the convenience of the Parties.

Section 8.19. Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which taken together shall constitute one and the same agreement.

(Signature Page Follows)

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

IN WITNESS WHEREOF, intending to be legally bound, the Parties have executed this Agreement as of the Effective Date.

Dai Nippon Printing Co., Ltd.

By: _____

Name: [***]

Title: [***]

Photronics DNP Mask Corporation

By: _____

Name: [***]

Title: [***]

License Agreement (DNP – PSMC) Signature Page

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

EXHIBIT A-1

[***]

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

EXHIBIT B

LICENSED PATENTS

[***]

*** Confidential treatment has been requested by Photronics, Inc. for redacted portions of this exhibit. This copy omits the information subject to the confidentiality request. Omissions are designated as [***]. A complete version of this exhibit has been provided separately to the Securities and Exchange Commission.

AMENDMENT NO. 2

Dated as of May 15, 2017

to

THIRD AMENDED AND RESTATED CREDIT AGREEMENT

Dated as of December 5, 2013

THIS AMENDMENT NO. 2 ("Amendment") is made as of May 15, 2017 by and among Photronics, Inc. (the "Company"), the financial institutions listed on the signature pages hereof and JPMorgan Chase Bank, N.A., as Administrative Agent (in such capacity, the "Administrative Agent") and as Collateral Agent (in such capacity, the "Collateral Agent"), under that certain Third Amended and Restated Credit Agreement dated as of December 5, 2013 by and among the Company, the Foreign Subsidiary Borrowers party thereto from time to time, the Lenders party thereto from time to time, the Collateral Agent and the Administrative Agent (as may be further amended, supplemented or otherwise modified from time to time, the "Credit Agreement"). Capitalized terms used herein and not otherwise defined herein shall have the respective meanings given to them in the Credit Agreement.

WHEREAS, the Company has requested that the Lenders and the Administrative Agent agree to certain amendments to the Credit Agreement;

WHEREAS, the Lenders party hereto and the Administrative Agent have agreed to such amendments on the terms and conditions set forth herein;

NOW, THEREFORE, in consideration of the premises set forth above, the terms and conditions contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company, the Lenders party hereto and the Administrative Agent have agreed to enter into this Amendment.

1. Amendments to Credit Agreement. Effective as of the date of satisfaction of the conditions precedent set forth in Section 2 below, the Credit Agreement is hereby amended as follows:

(a) Section 1.01 of the Credit Agreement is amended to add the following new definitions thereto in the appropriate alphabetical order and, where applicable, replace the corresponding previously existing definitions:

“Liquidity” has the meaning assigned to such term in 6.11(c).

“Permitted Convertible Notes” means (i) the Existing Convertible Notes and (ii) any unsecured notes issued by the Company or any Subsidiary that are convertible into common stock of the Company or any Subsidiary, cash or any combination thereof and (other than in the case of intercompany Indebtedness) are permitted to be issued pursuant to the definition of Permitted Unsecured Indebtedness.

“PRC Subsidiary” means any Subsidiary that (i) is organized under the laws of the People’s Republic of China (“PRC”) or (ii) has its principal place of business in PRC.

“PRC Transactions” means the sale of up to 49.99% of the shares of any PRC Subsidiary to a third party in connection with the formation and operation of a joint venture.”

(b) Section 6.01 of the Credit Agreement is amended to (i) replace the reference to “PSMC” appearing in clause (h) therein with “the Taiwan JV”, (ii) delete “and, solely with respect to PSMC and its subsidiaries, so long as PSMC is a Subsidiary of the Company” appearing at the end of clause (h) therein, (iii) delete “and” at the end of clause (l) thereof, (iv) replace the “.” at the end of clause (m) therein with “; and” and (v) insert a new clause (n) immediately after clause (m) therein as follows:

“(n) unsecured or secured Indebtedness of PRC Subsidiaries (n) in an aggregate principal amount not exceeding \$125,000,000 at any time outstanding so long as any Liens securing such Indebtedness are only permitted by Section 6.02(g).”

(c) Section 6.02 of the Credit Agreement is amended to (i) add “and any PRC Subsidiary” immediately after the reference to “the Taiwan JV” appearing in clause (a) therein, (ii) replace “and” at the end of clause (f) therein with “;”, (iii) renumber existing clause (g) therein as a new clause (h) and (iv) insert a new clause (g) immediately after clause (f) therein as follows:

“(g) Liens on assets of PRC Subsidiaries securing Indebtedness permitted by Section 6.01(n); and”

(d) Section 6.03(a) of the Credit Agreement is amended to (i) add “the PRC Transaction and” immediately before the reference to “the Taiwan JV Transactions” appearing in subclause (iv)(D) therein and (ii) replace the reference to “PSMC Acquisition” appearing in subclause (v) therein with “PRC Transaction”.

(e) Section 6.04 of the Credit Agreement is amended to (i) delete the reference to “of PSMC” appearing in clause (j) therein, (ii) delete the reference to “PSMC Acquisition and the” appearing in clause (l) therein and (iii) amend and restate clause (m) therein in its entirety as follows:

“(m) any other investment (other than acquisitions), loan or (m) advance (including intercompany investments, loans and advances and investments made to meet minimum capital requirements of foreign jurisdictions) so long as the aggregate amount of all such investments, loans and advances during any fiscal year of the Company does not exceed \$25,000,000.; provided that such Dollar limitation shall not be applicable if at the time of the making of such investment, loan or advance and immediately after giving effect (including giving effect on a Pro Forma Basis) thereto, (i) the Total Leverage Ratio is less than 2.25 to 1.00 and (ii) Liquidity is greater than \$75,000,000.”

(f) Section 6.06(a)(iv) of the Credit Agreement is amended and restated to read as follows:

“(iv) the Company or any Subsidiary may repurchase Equity Interests in any PRC Subsidiary from the applicable joint venture partner with respect to such PRC Subsidiary so long as, at the time of making such repurchase and immediately after giving effect (including giving effect on a Pro Forma Basis) thereto, (1) the Total Leverage Ratio is less than 2.25 to 1.00 and (2) Liquidity is greater than \$75,000,000,”

(g) Section 6.09 of the Credit Agreement is amended to replace the reference to “PKL, PKLT or the Taiwan JV,” appearing in clause (d) therein with “PKL, PKLT, the Taiwan JV or any PRC Subsidiary”.

2. Conditions of Effectiveness. The effectiveness of this Amendment is subject to the conditions precedent that (a) the Administrative Agent shall have received counterparts of (i) this Amendment duly executed by the Company, the Required Lenders and the Administrative Agent and (ii) the Consent and Reaffirmation attached hereto duly executed by the Subsidiary Guarantors and (b) the Company shall have paid all of the fees of the Administrative Agent and its affiliates (including, to the extent invoiced, reasonable attorneys' fees and expenses of the Administrative Agent) in connection with this Amendment and the other Loan Documents.

3. Representations and Warranties of the Company and Acknowledgements and Confirmations. The Company hereby represents and warrants as follows:

(a) This Amendment and the Credit Agreement, as amended hereby, constitute legal, valid and binding obligations of the Company and are enforceable against the Company in accordance with their terms, subject to applicable bankruptcy, insolvency, reorganization, moratorium or other laws affecting creditors' rights generally and subject to general principles of equity, regardless of whether considered in a proceeding in equity or at law.

(b) As of the date hereof and giving effect to the terms of this Amendment, (i) no Default shall have occurred and be continuing and (ii) the representations and warranties of the Company set forth in the Credit Agreement, as amended hereby, are true and correct as of the date hereof.

4. Reference to and Effect on the Credit Agreement.

(a) Upon the effectiveness hereof, each reference to the Credit Agreement in the Credit Agreement or any other Loan Document shall mean and be a reference to the Credit Agreement as amended hereby.

(b) Except as specifically amended above, the Credit Agreement and all other documents, instruments and agreements executed and/or delivered in connection therewith shall remain in full force and effect and are hereby ratified and confirmed.

(c) The execution, delivery and effectiveness of this Amendment shall not operate as a waiver of any right, power or remedy of the Administrative Agent or the Lenders, nor constitute a waiver of any provision of the Credit Agreement or any other documents, instruments and agreements executed and/or delivered in connection therewith.

(d) This Amendment shall constitute a Loan Document.

5. Governing Law. This Amendment shall be construed in accordance with and governed by the law of the State of New York.

6. Headings. Section headings in this Amendment are included herein for convenience of reference only and shall not constitute a part of this Amendment for any other purpose.

7. Counterparts. This Amendment may be executed by one or more of the parties hereto on any number of separate counterparts, and all of said counterparts taken together shall be deemed to constitute one and the same instrument. Signatures delivered by facsimile or PDF shall have the same force and effect as manual signatures delivered in person.

[Signature Pages Follow]

IN WITNESS WHEREOF, this Amendment has been duly executed as of the day and year first above written.

PHOTRONICS, INC.,
as the Company

By: _____
Name:
Title:

Signature Page to Amendment No. 2
Photronics, Inc.
Third Amended and Restated Credit Agreement dated as of December 5, 2013

JPMORGAN CHASE BANK, N.A., individually as a Lender
and as Administrative Agent

By: _____

Name:

Title:

Signature Page to Amendment No. 2
Photronics, Inc.

Third Amended and Restated Credit Agreement dated as of December 5, 2013

CITIZENS BANK, N.A.,
as a Lender

By: _____

Name:

Title:

Signature Page to Amendment No. 2
Photronics, Inc.

Third Amended and Restated Credit Agreement dated as of December 5, 2013

TD BANK, N.A.,
as a Lender

By: _____

Name:

Title:

Signature Page to Amendment No. 2
Photronics, Inc.

Third Amended and Restated Credit Agreement dated as of December 5, 2013

CONSENT AND REAFFIRMATION

Each of the undersigned hereby acknowledges receipt of a copy of the foregoing Amendment No. 2 to the Third Amended and Restated Credit Agreement dated as of December 5, 2013 (as amended, supplemented or otherwise modified from time to time, the "Credit Agreement") by and among Photronics, Inc. (the "Company"), the Foreign Subsidiary Borrowers from time to time party thereto (together with the Company, the "Borrowers"), the financial institutions from time to time party thereto (the "Lenders") and JPMorgan Chase Bank, N.A., as Administrative Agent (the "Administrative Agent") and Collateral Agent, which Amendment No. 2 is dated as of May 15, 2017 (the "Amendment"). Capitalized terms used in this Consent and Reaffirmation and not defined herein shall have the meanings given to them in the Credit Agreement. Without in any way establishing a course of dealing by the Administrative Agent or any Lender, each of the undersigned consents to the Amendment and reaffirms the terms and conditions of the Subsidiary Guaranty and any other Loan Document executed by it and acknowledges and agrees that such agreements and each and every such Loan Document executed by the undersigned in connection with the Credit Agreement remains in full force and effect and is hereby reaffirmed, ratified and confirmed. All references to the Credit Agreement contained in the above-referenced documents shall be a reference to the Credit Agreement as so modified by the Amendment and as the same may from time to time hereafter be amended, modified or restated.

Dated: May 15, 2017

[Signature Page Follows]

PHOTRONICS IDAHO, INC.

By: _____
Name:
Title:

TRIANJA TECHNOLOGIES, INC.

By: _____
Name:
Title:

PHOTRONICS TEXAS ALLEN, INC.

By: _____
Name:
Title:

PHOTRONICS CALIFORNIA, INC.

By: _____
Name:
Title:

Signature Page to Consent and Reaffirmation to Amendment No. 2
Photronics, Inc.
Third Amended and Restated Credit Agreement dated as of December 5, 2013

EXHIBIT 31.1

I, Peter S. Kirlin, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Photronics, Inc.
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report.
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report.
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ PETER S. KIRLIN

Peter S. Kirlin
Chief Executive Officer
June 8, 2017

EXHIBIT 31.2

I, Sean T. Smith, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Photonics, Inc.
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report.
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report.
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ SEAN T. SMITH

Sean T. Smith
Chief Financial Officer
June 8, 2017

EXHIBIT 32.1

Section 1350 Certification of the Chief Executive Officer

I, Peter S. Kirlin, Chief Executive Officer of Photonics, Inc. (the “Company”), certify, to my knowledge, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C Section 1350, that:

- (1) The Quarterly Report on Form 10-Q of the Company for the quarter ended April 30, 2017, (the “Report”) fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

The foregoing certification is being furnished pursuant to 18 U.S.C. § 1350 and will not be deemed “filed” for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section. Such certification will not be deemed to be incorporated by reference into any filing under the Securities Act or the Exchange Act, except to the extent that the registrant specifically incorporates it by reference

/s/ PETER S. KIRLIN

Peter S. Kirlin
Chief Executive Officer
June 8, 2017

Section 1350 Certification of the Chief Financial Officer

I, Sean T. Smith, Chief Financial Officer of Photonics, Inc. (the "Company"), certify, to my knowledge, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C Section 1350, that:

- (1) The Quarterly Report on Form 10-Q of the Company for the quarter ended April 30, 2017, (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

The foregoing certification is being furnished pursuant to 18 U.S.C. § 1350 and will not be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section. Such certification will not be deemed to be incorporated by reference into any filing under the Securities Act or the Exchange Act, except to the extent that the registrant specifically incorporates it by reference

/s/ SEAN T. SMITH

Sean T. Smith
Chief Financial Officer
June 8, 2017
