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 August 2, 2020
OR
☐ ***TRANSITION REPORT PURSUANT TO SECTION 13 OR 15 (d) OF THE SECURITIES EXCHANGE ACT OF 1934***

For the transition period from ___ to ___

Commission file number 0-15451

PHOTRONICS, INC.

(Exact name of registrant as specified in its charter)

Connecticut	**06-0854886**
(State or other jurisdiction of incorporation or organization)	*(IRS Employer Identification No.)*
15 Secor Road, Brookfield, Connecticut	**06804**
(Address of principal executive offices)	*(Zip Code)*
Registrant’s telephone number, including area code	**(203) 775-9000**

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
COMMON	PLAB	NASDAQ Global Select Market
PREFERRED STOCK PURCHASE RIGHTS	N/A	N/A

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 every Interactive Data File required to be submitted 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 ☒

The registrant had 65,663,609 shares of common stock outstanding as of September 7, 2020.

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,” “estimate,” “intend,” “may,” “will”, “in our view” 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; pandemics affecting our labor force, customers or suppliers; 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; 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 cybersecurity 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, including laws relating to export controls and import laws, rules and tariffs; the occurrence of 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; acts of war, construction of new facilities and acquisition of new equipment; dilutive issuances of the Company’s stock; 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 and (vi) obtain necessary import and 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.

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PART I. FINANCIAL INFORMATION

Item 1. CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

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

	August 2, 2020	October 31, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 260,597	$ 206,530
Accounts receivable, net of allowance of $1,300 in 2020 and $1,334 in 2019	146,843	134,454
Inventories	54,733	48,155
Other current assets	48,468	38,388
Total current assets	510,641	427,527
Property, plant and equipment, net	623,247	632,441
Intangible assets, net	4,535	7,870
Deferred income taxes	22,261	20,779
Other assets	35,158	30,048
Total assets	$ 1,195,842	$ 1,118,665
LIABILITIES AND EQUITY		
Current liabilities:		
Short-term debt	$ 6,087	$ 8,731
Current portion of long-term debt	8,596	2,142
Accounts payable	94,530	91,379
Accrued liabilities	66,096	49,702
Total current liabilities	175,309	151,954
Long-term debt	38,183	41,887
Other liabilities	25,665	13,732
Total liabilities	239,157	207,573
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, 66,276 shares issued and 64,812 outstanding at August 2, 2020 and 65,595 shares issued and outstanding at October 31, 2019	663	656
Additional paid-in capital	531,619	524,319
Retained earnings	281,282	253,922
Treasury stock, 1,464 shares at August 2, 2020	(16,894)	-
Accumulated other comprehensive loss	(6,428)	(9,005)
Total Photronics, Inc. shareholders' equity	790,242	769,892
Noncontrolling interests	166,443	141,200
Total equity	956,685	911,092
Total liabilities and equity	$ 1,195,842	$ 1,118,665

See accompanying notes to condensed consolidated financial statements.

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

	Three Months Ended		Nine Months Ended	
	August 2, 2020	**July 28, 2019**	**August 2, 2020**	**July 28, 2019**
Revenue	$ 157,895	$ 138,112	$ 460,405	$ 394,404
Cost of goods sold	120,161	107,542	357,636	311,721
Gross profit	37,734	30,570	102,769	82,683
Operating expenses:				
Selling, general and administrative	13,306	13,124	40,792	40,186
Research and development	4,492	4,046	13,034	11,852
Total operating expenses	17,798	17,170	53,826	52,038
Operating income	19,936	13,400	48,943	30,645
Other income (expense):				
Foreign currency transaction (losses) gains, net	(1,565)	(76)	1,739	4,976
Interest expense, net	(586)	(377)	(1,609)	(1,263)
Interest income and other income (expense), net	16	105	480	979
Income before income taxes	17,801	13,052	49,553	35,337
Income tax provision	4,937	3,218	17,789	7,883
Net income	12,864	9,834	31,764	27,454
Net income attributable to noncontrolling interests	2,088	3,487	4,404	7,361
Net income attributable to Photronics, Inc. shareholders	$ 10,776	$ 6,347	$ 27,360	$ 20,093
Earnings per share:				
Basic	$ 0.17	$ 0.10	$ 0.42	$ 0.30
Diluted	$ 0.17	$ 0.10	$ 0.42	$ 0.30
Weighted-average number of common shares outstanding:				
Basic	64,780	66,313	65,090	66,386
Diluted	65,247	66,570	65,704	69,919

See accompanying notes to condensed consolidated financial statements.

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

	Three Months Ended		Nine Months Ended	
	August 2, 2020	**July 28, 2019**	**August 2, 2020**	**July 28, 2019**
Net income	$ 12,864	$ 9,834	$ 31,764	$ 27,454
Other comprehensive income (loss), net of tax of $0:				
Foreign currency translation adjustments	10,659	(8,882)	6,689	(9,364)
Other	4	28	23	72
Net other comprehensive income (loss)	10,663	(8,854)	6,712	(9,292)
Comprehensive income	23,527	980	38,476	18,162
Less: comprehensive income attributable to noncontrolling interests	3,979	2,232	8,539	7,530
Comprehensive income (loss) attributable to Photronics, Inc. shareholders	$ 19,548	$ (1,252)	$ 29,937	$ 10,632

See accompanying notes to condensed consolidated financial statements.

PHOTRONICS, INC.
Condensed Consolidated Statements of Equity
(in thousands)
(unaudited)

	Three Months Ended August 2, 2020							
	Photronics, Inc. Shareholders							
	Common Stock		Additional Paid-in Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Loss	Non-controlling Interests	Total Equity
	Shares	Amount						
Balance at May 4, 2020	66,215	$ 662	$ 530,117	$ 270,506	$ (16,894)	$ (15,200)	$ 152,467	$ 921,658
Net income	-	-	-	10,776	-	-	2,088	12,864
Other comprehensive income	-	-	-	-	-	8,772	1,891	10,663
Sale of common stock through employee stock option and purchase plans	45	1	306	-	-	-	-	307
Restricted stock awards vesting and expense	16	-	1,042	-	-	-	-	1,042
Share-based compensation expense	-	-	154	-	-	-	-	154
Contribution from noncontrolling interest	-	-	-	-	-	-	9,997	9,997
Balance at August 2, 2020	66,276	$ 663	$ 531,619	$ 281,282	$ (16,894)	$ (6,428)	$ 166,443	$ 956,685

	Three Months Ended July 28, 2019							
	Photronics, Inc. Shareholders							
	Common Stock		Additional Paid-in Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Loss	Non-controlling Interests	Total Equity
	Shares	Amount						
Balance at April 29, 2019	69,984	$ 700	$ 558,359	$ 245,144	$ (33,807)	$ (6,828)	$ 134,760	$ 898,328
Net income	-	-	-	6,347	-	-	3,487	9,834
Other comprehensive loss	-	-	-	-	-	(7,599)	(1,255)	(8,854)
Sale of common stock through employee stock option and purchase plans	38	-	169	-	-	-	-	169
Restricted stock awards vesting and expense	22	-	636	-	-	-	-	636
Share-based compensation expense	-	-	273	-	-	-	-	273
Repurchase of common stock of subsidiary	-	-	-	-	-	-	(48)	(48)
Balance at July 28, 2019	70,044	$ 700	$ 559,437	$ 251,491	$ (33,807)	$ (14,427)	$ 136,944	$ 900,338

See accompanying notes to condensed consolidated financial statements.

PHOTRONICS, INC.
Condensed Consolidated Statements of Equity
(in thousands)
(unaudited)

	Nine Months Ended August 2, 2020							
	Photronics, Inc. Shareholders							
	Common Stock							
	Shares	Amount	Additional Paid-in Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Loss	Non-controlling Interests	Total Equity
Balance at November 1, 2019	65,595	$ 656	$ 524,319	$ 253,922	$ -	$ (9,005)	$ 141,200	$ 911,092
Net income	-	-	-	27,360	-	-	4,404	31,764
Other comprehensive income	-	-	-	-	-	2,577	4,135	6,712
Sale of common stock through employee stock option and purchase plans	448	5	3,523	-	-	-	-	3,528
Restricted stock awards vesting and expense	233	2	2,869	-	-	-	-	2,871
Share-based compensation expense	-	-	653	-	-	-	-	653
Purchase of treasury stock	-	-	-	-	(16,894)	-	-	(16,894)
Contribution from noncontrolling interest	-	-	-	-	-	-	17,596	17,596
Repurchase of common stock of subsidiary	-	-	255	-	-	-	(892)	(637)
Balance at August 2, 2020	66,276	$ 663	$ 531,619	$ 281,282	$ (16,894)	$ (6,428)	$ 166,443	$ 956,685

	Nine Months Ended July 28, 2019							
	Photronics, Inc. Shareholders							
	Common Stock							
	Shares	Amount	Additional Paid-in Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Loss	Non-controlling Interests	Total Equity
Balance at November 1, 2018	69,700	$ 697	$ 555,606	$ 231,445	$ (23,111)	$ (4,966)	$ 144,898	$ 904,569
Adoption of ASU 2014-09	-	-	-	1,083	-	-	121	1,204
Adoption of ASU 2016-16	-	-	-	(1,130)	-	-	(3)	(1,133)
Net income	-	-	-	20,093	-	-	7,361	27,454
Other comprehensive (loss) income	-	-	-	-	-	(9,461)	169	(9,292)
Sale of common stock through employee stock option and purchase plans	174	2	961	-	-	-	-	963
Restricted stock awards vesting and expense	170	1	1,853	-	-	-	-	1,854
Share-based compensation expense	-	-	1,017	-	-	-	-	1,017
Contribution from noncontrolling interest	-	-	-	-	-	-	29,394	29,394
Dividends to noncontrolling interest	-	-	-	-	-	-	(44,939)	(44,939)
Repurchase of common stock of subsidiary	-	-	-	-	-	-	(57)	(57)
Purchase of treasury stock	-	-	-	-	(10,696)	-	-	(10,696)
Balance at July 28, 2019	70,044	$ 700	$ 559,437	$ 251,491	$ (33,807)	$ (14,427)	$ 136,944	$ 900,338

See accompanying notes to condensed consolidated financial statements.

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

	Nine Months Ended	
	August 2, 2020	**July 28, 2019**
Cash flows from operating activities:		
Net income	$ 31,764	$ 27,454
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	71,120	60,387
Share-based compensation	3,773	2,871
Changes in assets and liabilities:		
Accounts receivable	(9,476)	(14,185)
Inventories	(6,155)	(15,083)
Other current assets	(12,381)	(9,406)
Accounts payable, accrued liabilities, and other	(381)	(28,534)
Net cash provided by operating activities	78,264	23,504
Cash flows from investing activities:		
Purchases of property, plant and equipment	(36,693)	(160,149)
Government incentives	5,263	17,694
Other	(139)	(24)
Net cash used in investing activities	(31,569)	(142,479)
Cash flows from financing activities:		
Proceeds from debt	5,699	53,227
Contribution from noncontrolling interest	17,596	29,394
Purchase of treasury stock	(16,894)	(10,696)
Repayments of debt	(5,929)	(61,319)
Proceeds from share-based arrangements	3,869	1,314
Dividends paid to noncontrolling interest	-	(26,102)
Other	(248)	(92)
Net cash provided by (used in) financing activities	4,093	(14,274)
Effects of exchange rate changes on cash, cash equivalents, and restricted cash	3,486	1,206
Net increase (decrease) in cash, cash equivalents, and restricted cash	54,274	(132,043)
Cash, cash equivalents, and restricted cash at beginning of period	209,291	331,989
Cash, cash equivalents, and restricted cash at end of period	$ 263,565	$ 199,946
Supplemental disclosure of non-cash information:		
Accrual for property, plant and equipment purchased during the period	$ 34,356	$ 20,015
Accrual for property, plant and equipment purchased with funds receivable from government incentives	$ -	$ 11,686
Subsidiary dividend payable	$ -	$ 18,760

See accompanying notes to condensed consolidated financial statements.

PHOTRONICS, INC.
Notes to Condensed Consolidated Financial Statements
(unaudited)
(in thousands, except share amounts and per share data)

NOTE 1 - BASIS OF FINANCIAL STATEMENT PRESENTATION

Photronics, Inc. (“Photronics”, “the Company”, “we”, “our”, or “us”) is one of the world’s leading manufacturers of photomasks, which are high-precision photographic quartz or glass 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 FPD substrates during the fabrication of integrated circuits (“ICs” or “semiconductors”), a variety of FPDs and, to a lesser extent, other types of electrical and optical components. We currently have eleven manufacturing facilities, which are located in Taiwan (3), Korea, the United States (3), Europe (2), and two recently constructed facilities in China. Our FPD facility in Hefei, China, commenced production in the second quarter of fiscal 2019, and our IC facility in Xiamen, China, commenced production in the third quarter of fiscal 2019.

The accompanying unaudited condensed consolidated financial statements (“the 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. 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 financial statements include the accounts of Photronics, its wholly owned subsidiaries, and the majority-owned subsidiaries which it controls. All intercompany balances and transactions have been eliminated in consolidation.

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires us to make estimates and assumptions that affect amounts reported in them. Estimates are based on historical experience and on various assumptions that are believed to be reasonable under the circumstances. Our estimates are based on the facts and circumstances available at the time they are made. Subsequent actual results may differ from such estimates. We review these estimates periodically and reflect any effects of revisions in the period in which they are determined.

Certain reclassifications of prior period amounts have been made to conform to the current period presentation. These reclassifications included separating, as its own line item, Foreign currency transaction (losses) gains, net, from Interest income and other income (expense), net, on the condensed consolidated statements of income, and separating Share-based compensation from Accounts payable, accrued liabilities, and other, in the condensed consolidated statements of cash flows.

Our business is typically impacted during the first, and sometimes the second, quarters of our fiscal year by the North American, European, and Asian holiday periods, as some customers reduce their development and buying activities during those periods. Operating results for the interim period are not necessarily indicative of the results that may be expected for the fiscal year ending October 31, 2020. For further information, refer to the consolidated financial statements, and notes thereto, included in our Annual Report on Form 10-K for the year ended October 31, 2019.

NOTE 2 - INVENTORIES

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

	August 2, 2020	October 31, 2019
Raw materials	$ 53,455	$ 46,027
Work in process	1,278	2,122
Finished goods	-	6
	$ 54,733	$ 48,155

NOTE 3 - PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment consists of the following:

	August 2, 2020	October 31, 2019
Land	$ 12,090	$ 12,085
Buildings and improvements	173,918	172,340
Machinery and equipment	1,767,245	1,748,483
Leasehold improvements	20,660	19,921
Furniture, fixtures and office equipment	14,745	14,404
Construction in progress	61,277	28,135
	2,049,935	1,995,368
Accumulated depreciation and amortization	(1,426,688)	(1,362,927)
	$ 623,247	$ 632,441

Depreciation and amortization expense for property, plant and equipment was $22.1 million and $67.6 million for the three and nine-month periods ended August 2, 2020, respectively, and $20.7 million and $56.9 million for the three and nine-month periods ended July 28, 2019, respectively.

NOTE 4 - PDMCX JOINT VENTURE

In January 2018, Photronics, through its wholly owned Singapore subsidiary (hereinafter, within this Note "we", "Photronics", or "our"), and Dai Nippon Printing Co., Ltd., through its wholly owned subsidiary "DNP Asia Pacific PTE, Ltd." ("DNP") entered into a joint venture under which DNP obtained a 49.99% interest in our IC business in Xiamen, China. The joint venture, known as "Xiamen American Japan Photronics Mask Co., Ltd." ("PDMCX"), was established to develop and manufacture photomasks for leading-edge and advanced generation semiconductors. We entered into this joint venture to enable us to compete more effectively for the merchant photomask business in China, and to benefit from the additional resources and investment that DNP provides to enable us to offer advanced-process technology to our customers. No gain or loss was recorded upon the formation of this joint venture.

The total investment per the PDMCX operating agreement ("the Agreement") is $160 million. As of August 2, 2020, Photronics and DNP had each contributed cash of approximately $65 million, and PDMCX obtained local financing of approximately $35 million; thus both parties have fulfilled their initial investment commitments under the Agreement. As discussed in Note 5, liens were granted to the local financing entity on assets with a total carrying value of $92.8 million, as collateral for the loans.

Under the Agreement, DNP is afforded, under certain circumstances, the right to put its interest in PDMCX to Photronics. These circumstances include disputes regarding the strategic direction of PDMCX that may arise after the initial two-year term of the Agreement and cannot be resolved between the two parties. As of the date of issuance of these financial statements, DNP had not indicated its intention to exercise this right. In addition, both Photronics and DNP have the option to purchase, or put, their interest from, or to, the other party, should their ownership interest fall below twenty percent for a period of more than six consecutive months. Under all such circumstances, the sales of ownership interests would be at the exiting party's ownership percentage of the joint venture's net book value, with closing to take place within three business days of obtaining required approvals and clearance.

We recorded net losses from the operations of PDMCX of $0.8 million, and $4.8 million during the three and nine-month periods ended August 2, 2020, respectively, and losses of $1.3 million and $3.2 million during the three and nine-month periods ended July 28, 2019, respectively. General creditors of PDMCX do not have recourse to the assets of Photronics (other than the net assets of PDMCX), and our maximum exposure to loss from PDMCX at August 2, 2020, was $52.4 million.

As required by the guidance in Topic 810 - "Consolidation" of the Accounting Standards Codification ("ASC"), we evaluated our involvement in PDMCX for the purpose of determining whether we should consolidate its results in our financial statements. The initial step of our evaluation was to determine whether PDMCX was a variable interest entity ("VIE"). Due to its lack of sufficient equity at risk to finance its activities without additional subordinated financial support, we determined that it was a VIE. Having made this determination, we then assessed whether we were the primary beneficiary of the VIE, and concluded that we were the primary beneficiary during the current and prior year reporting periods; thus, as required, the PDMCX financial results have been consolidated with those of Photronics. Our conclusion was based on the facts that we held a controlling financial interest in PDMCX (which resulted from our having the power to direct the activities that most significantly impacted its economic performance) and had the obligation to absorb losses and the right to receive benefits that could potentially be significant to PDMCX. Our conclusions that we had the power to direct the activities that most significantly affected the economic performance of PDMCX during the current and prior year reporting periods were based on our right to appoint the majority of its board of directors, which has, among others, the powers to manage the business (through its rights to appoint and evaluate PDMCX's management), incur indebtedness, enter into agreements and commitments, and acquire and dispose of PDMCX's assets. In addition, as a result of the 50.01% variable interest we held during the current and prior-year periods, we had the obligation to absorb losses, and the right to receive benefits, that could potentially be significant to PDMCX.

The carrying amounts of PDMCX assets and liabilities included in our condensed consolidated balance sheets are presented in the following table, together with our exposure to loss related to these assets and liabilities.

	August 2, 2020		October 31, 2019	
Classification	**Carrying Amount**	**Photronics Interest**	**Carrying Amount**	**Photronics Interest**
Current assets	$ 64,616	$ 32,315	$ 24,142	$ 12,074
Non-current assets	140,065	70,046	114,015	57,019
Total assets	204,681	102,361	138,157	69,093
Current liabilities	61,704	30,858	16,889	8,446
Non-current liabilities	38,224	19,116	42,094	21,051
Total liabilities	99,928	49,974	58,983	29,497
Net assets	$ 104,753	$ 52,387	$ 79,174	$ 39,596

NOTE 5 - LONG-TERM DEBT

Long-term debt consists of the following:

	August 2, 2020	October 31, 2019
Project Loans	$ 33,471	$ 34,490
Working Capital Loans (value added tax component)	13,308	9,539
	46,779	44,029
Current portion of long-term debt	(8,596)	(2,142)
Long-term debt	$ 38,183	$ 41,887

At August 2, 2020, maturities of our long-term debt over the next five fiscal years and thereafter were as follows:

2020 (remainder of)	$ -
2021	8,596
2022	13,211
2023	7,123
2024	6,640
Thereafter	11,209
	$46,779

As of August 2, 2020 and October 31, 2019, the weighted-average interest rates of our short-term debt were 2.60% and 3.84%, respectively.

Project Loans

In November 2018, PDMCX was approved for credit of the equivalent of $50 million, subject to certain limitations related to PDMCX registered capital at the time of the initial approval, pursuant to which PDMCX has and will enter into separate loan agreements ("the Project Loans") for intermittent borrowings. The Project Loans, which are denominated in Chinese renminbi (RMB), are being used to finance certain capital expenditures in China. PDMCX granted liens on its interest in land, building, and certain equipment, which had a combined carrying value of $92.8 million as of August 2, 2020, as collateral for the Project Loans. As of August 2, 2020, PDMCX had outstanding borrowings of 234.4 million RMB ($33.5 million) against this approval. Payments on these borrowings are due semiannually through December 2025; an initial payment of 9.0 million RMB ($1.3 million) was made in June 2020. The table below presents, in U.S. dollars, the timing of future payments against the borrowings.

	Fiscal Year					
	2021	**2022**	**2023**	**2024**	**2025**	**2026**
Principal payments	$ 6,426	$ 5,729	$ 3,467	$ 6,640	$ 6,354	$ 4,855

The interest rates on the Project Loans are based on the loan prime rate of the National Interbank Funding Center (4.9% at August 2, 2020). Interest incurred on the loans will be reimbursed through incentives provided by the Xiamen Torch Hi-Tech Industrial Development Zone, which provide for such reimbursements up to a prescribed limit.

Working Capital Loans

In November 2018, PDMCX received approval for unsecured credit of the equivalent of $25.0 million, pursuant to which PDMCX may enter into separate loan agreements. Under this credit agreement (the "Working Capital Loans"), PDMCX can borrow up to 140.0 million RMB to pay value-added taxes ("VAT"), and up to 60.0 million RMB to fund operations; combined total borrowings are limited to the equivalent of $25.0 million. As of August 2, 2020, PDMCX had 93.2 million RMB ($13.3 million) outstanding against the approval to pay VAT. Payments on these borrowings are due semiannually, in increasing amounts, through July 2023. The table below presents, in U.S. dollars, the timing of future payments against these borrowings.

	Fiscal Year		
	2021	**2022**	**2023**
Principal payments	$ 2,170	$ 7,482	$ 3,656

As of August 2, 2020, PDMCX had 18.0 million RMB ($2.6 million) outstanding against the approval to fund operations; repayments are due one year from the borrowing dates.

At August 2, 2020, the interest rates on borrowings to fund operations are approximately 4.37% to 4.60%, and interest rates on borrowings to pay VAT are approximately 4.53% to 4.61%; both rates are based on the RMB Loan Prime Rate of the National Interbank Funding Center, plus spreads that range from 31.75 to 76.00 basis points. Interest incurred on the VAT loans will be reimbursed through incentives provided by the Xiamen Torch Hi-Tech Industrial Development Zone, which provide for such reimbursements up to a prescribed limit.

Equipment Loan

Effective July 2019, the Company entered into a Master Lease Agreement ("MLA") which enables us to request advance payments or other funds to finance equipment to be leased or purchased in the U.S. In connection with this MLA, we were approved for financing of $35 million for the purchase of a high-end lithography tool. In the fourth quarter of fiscal 2019, the financing entity, upon our request, made an advance payment of $3.5 million to the equipment vendor on our behalf. Interest on this borrowing is payable monthly at thirty-day LIBOR plus 1% (1.18% at August 2, 2020), and will continue to accrue until the borrowing is repaid or, as allowed under the MLA, we enter into a lease for the equipment. We intend to enter into a lease agreement for the related equipment in fiscal year 2020. All borrowings under the MLA are secured by the equipment to be leased or purchased.

Credit Agreement

In September 2018, we entered into a five-year amended and restated credit agreement (the "Credit Agreement"), which has a $50 million borrowing limit, with an expansion capacity to $100 million. The Credit Agreement is secured by substantially all of our assets located in the United States and common stock we own in certain foreign subsidiaries. The Credit Agreement includes minimum interest coverage ratio, total leverage ratio, and minimum unrestricted cash balance covenants (all of which we were in compliance with at August 2, 2020), and limits the amount of cash dividends, distributions, and redemptions we can pay on our common stock to an aggregate annual amount of $50 million. We had no outstanding borrowings against the Credit Agreement at August 2, 2020, and $50 million was available for borrowing. The interest rate on the Credit Agreement (1.55% at August 2, 2020) is based on our total leverage ratio at LIBOR plus a spread, as defined in the Credit Agreement.

NOTE 6 - REVENUE

We recognize revenue when, or as, control of a good or service transfers to a customer, in an amount that reflects the consideration to which we expect to be entitled in exchange for transferring those goods or services. We account for an arrangement as a revenue contract when each party has approved and is committed to perform under the contract, the rights of the contracting parties regarding the goods or services to be transferred and the payment terms are identifiable, the arrangement has commercial substance, and collection of consideration is probable. Substantially all of our revenue comes from the sales of photomasks. We typically contract with our customers to sell sets of photomasks, which are comprised of multiple layers, the predominance of which we invoice as they ship to customers. As the photomasks are manufactured to customer specifications, they have no alternative use to us and, as our contracts generally provide us with the right to payment for work completed to date, we recognize revenue as we perform, or "over time," on most of our contracts. We measure our performance to date using an input method, which is based on our estimated costs to complete the various manufacturing phases of a photomask. At the end of a reporting period, there will be a number of uncompleted revenue contracts on which we have performed; for any such contracts under which we are entitled to be compensated for our costs incurred plus a reasonable profit, we recognize revenue and a corresponding contract asset for such performance. We account for shipping and handling activities that we perform after a customer obtains control of a good as being activities to fulfill our promise to transfer the good to the customer, rather than as promised services, or performance obligations, under the contract.

As stated above, photomasks are manufactured to customer specifications in accordance with their proprietary designs; thus, they are individually unique. Due to their uniqueness and other factors, their transaction prices are individually established through negotiations with customers; consequently, our photomasks do not have standard or "list" prices. The transaction prices of the vast majority of our revenue contracts include only fixed amounts of consideration. In certain instances, such as when we offer a customer an early payment discount, an estimate of variable consideration would be included in the transaction price, but only to the extent that a significant reversal of revenue would not occur when the uncertainty related to the variability is resolved.

Contract Assets, Contract Liabilities, and Accounts Receivable

We recognize a contract asset when our performance under a contract precedes our receipt of consideration from a customer, or before payment is due, and our receipt of consideration is conditional upon factors other than the passage of time. Contract assets reflect our transfer of control to customers of photomasks that are in process or completed but not yet shipped. A receivable is recognized when we have an unconditional right to payment for our performance, which generally occurs when we ship the photomasks. Our contract assets primarily consist of a significant amount of our in-process production orders and fully manufactured photomasks which have not yet shipped, for which we have an enforceable right to collect consideration (including a reasonable profit) in the event the in-process orders are cancelled by customers. On an individual contract basis, we net contract assets with contract liabilities (deferred revenue) for financial reporting purposes. Our contract assets and liabilities are typically classified as current, as our production cycle and our lead times are both under one year. Contract assets of $5.6 million are included in Other current assets, and contract liabilities of $8.8 million and $5.2 million are included in Accrued liabilities and Other liabilities, respectively, in our August 2, 2020 condensed consolidated balance sheet. Our October 31, 2019 condensed consolidated balance sheet includes contract assets of $7.6 million, included in "Other" current assets, and contract liabilities of $11.5 million, included in Accrued liabilities. We did not impair any contract assets during the nine-month periods ended August 2, 2020 or July 28, 2019. We recognized $1.9 million and $2.3 million of revenue from the settlement of contract liabilities that existed at the beginning of the three and nine-month periods ended August 2, 2020, and recognized $0.8 million and $1.1 million of revenue in the respective prior year periods, that related to the settlement of contract liabilities that existed at the beginning of those periods.

We generally record our accounts receivable at their billed amounts. All outstanding past due customer invoices are reviewed for collectibility during, and at the end of, every reporting period. To the extent we believe a loss on the collection of a customer invoice is probable, we record the loss and credit the allowance for doubtful accounts. In the event that an amount is determined to be uncollectible, we charge the allowance for doubtful accounts and derecognize the related receivable. Credit losses incurred on our accounts receivable during the three and nine-month periods ended August 2, 2020, and July 28, 2019, were immaterial.

Our invoice terms generally range from net thirty to ninety days, depending on both the geographic market in which the transaction occurs and our payment agreements with specific customers. In the event that our evaluation of a customer's business prospects and financial condition indicate that the customer presents a collectibility risk, we modify terms of sale, which may require payment in advance of performance. We have elected the practical expedient allowed under ASC Topic 606 "Revenue from Contracts with Customers" ("Topic 606") that permits us not to adjust a contract's promised amount of consideration to reflect a financing component when the period between when we transfer control of goods or services to customers and when we are paid is one year or less.

In instances when we are paid in advance of our performance, we record a contract liability and, as allowed under the practical expedient in Topic 606, recognize interest expense only if the period between when we receive payment from the customer and the date when we expect to be entitled to the payment is greater than one year. Historically, advance payments we've received from customers have generally not preceded the completion of our performance obligations by more than one year.

Disaggregation of Revenue

The following tables present our revenue for the three and nine-month periods ended August 2, 2020 and July 28, 2019, disaggregated by product type, geographic origin, and timing of recognition. At the beginning of fiscal year 2020, we changed the threshold for the definition of high-end FPD, from G8 and above and active matrix organic light-emitting diode (AMOLED) display screens, to G10.5 and above, AMOLED, and low-temperature polysilicon display screens (LTPS), to reflect the overall advancement of technology in the FPD industry. Our definition of high-end IC products remains as 28 nanometer or smaller. The revenue by product type for the three and nine-month periods ended July 28, 2019, presented below has been reclassified to conform to the current period presentation.

	Three Months Ended		Nine Months Ended	
	August 2, 2020	July 28, 2019	August 2, 2020	July 28, 2019
Revenue by Product Type				
IC				
High-end	$ 38,665	$ 38,460	$ 117,974	$ 111,455
Mainstream	70,001	61,725	194,517	182,197
Total IC	$ 108,666	$ 100,185	$ 312,491	$ 293,652
FPD				
High-end	$ 36,670	$ 23,088	$ 108,248	$ 60,490
Mainstream	12,559	14,839	39,666	40,262
Total FPD	$ 49,229	$ 37,927	$ 147,914	$ 100,752
	$ 157,895	$ 138,112	$ 460,405	$ 394,404

	Three Months Ended		Nine Months Ended	
	August 2, 2020	July 28, 2019	August 2, 2020	July 28, 2019
Revenue by Geographic Origin				
Taiwan	$ 60,836	$ 61,273	$ 182,463	$ 175,482
Korea	39,488	37,120	116,485	110,395
United States	28,351	25,364	78,276	74,579
China	20,988	5,963	58,374	7,693
Europe	7,688	7,937	23,562	24,725
Other	544	455	1,245	1,530
	$ 157,895	$ 138,112	$ 460,405	$ 394,404
Revenue by Timing of Recognition				
Over time	$ 137,442	$ 122,938	$ 401,347	$ 362,078
At a point in time	20,453	15,174	59,058	32,326
	$ 157,895	$ 138,112	$ 460,405	$ 394,404

Contract Costs

We pay commissions to third-party sales agents for certain sales that they obtain for us. However, the bases of the commissions are the transaction prices of the sales, which are completed in less than one year; thus, no relationship is established with a customer that will result in future business. Therefore, we would not recognize any portion of these sales commissions as costs of obtaining a contract, nor do we currently foresee other circumstances under which we would recognize such assets.

Remaining Performance Obligations

As we are typically required to fulfill customer orders within a short time period, our backlog of orders is generally not in excess of one to two weeks for IC photomasks and two to three weeks for FPD photomasks. As allowed under Topic 606, we have elected not to disclose our remaining performance obligations, which represent the costs associated with the completion of the manufacturing process of in-process photomasks related to contracts that have an original duration of one year or less.

Sales and Similar Taxes

We report our revenue net of any sales or similar taxes we collect on behalf of governmental entities.

Product Warranties

Our photomasks are sold under warranties that generally range from one to twenty-four months. We warrant that our photomasks conform to customer specifications, and will typically repair, replace, or issue a refund for, at our option, any photomasks that fail to do so. The warranties do not represent separate performance obligations in our revenue contracts. Historically, customer claims under warranty have been immaterial.

NOTE 7 - LEASES

We adopted Accounting Standards Update (“ASU”) 2016-02 and all subsequent amendments, collectively codified in ASC Topic 842 “Leases” (“Topic 842”), on November 1, 2019. The guidance requires modified retrospective adoption, either at the beginning of the earliest period presented or at the beginning of the period of adoption. We elected to apply the guidance at the beginning of the period of adoption and recorded, as of November 1, 2019, right-of-use (ROU) leased assets of $6.5 million. In conjunction with this, we recorded lease liabilities, which had been discounted at our incremental borrowing rates, of $6.5 million.

The guidance allows a number of elections and practical expedients, of which we elected the following:

- Election not to recognize short-term leases on the balance sheet.
- Practical expedient to not separate lease and non-lease components in a contract.
- Practical expedient “package” for transitioning to the new guidance:
    - Not reassessing whether any expired or existing contracts are, or contain, leases.
    - Not reassessing lease classification for any existing or expired leases.
    - Not reassessing initial direct costs for any existing leases.

Our involvement in lease arrangements has typically been as a lessee. We determine if an agreement is or contains a lease on the date of the lease agreement or commitment, if earlier. Our evaluation considers whether the arrangement includes an identified asset and whether it affords us the right to control the asset. Our having the right to control the identified asset is determined by whether we are entitled to substantially all of its economic benefits and can direct its use.

We recognize leases on our consolidated balance sheet when a lessor makes an asset underlying a lease having a term in excess of twelve months available for our use. The present value of lease payments over the term of the lease, which is determined using our incremental borrowing rate for collateralized loans at the commencement date of the lease, provides the basis for the initial measurement of ROU assets and their related lease liabilities. Variable lease payments, other than those that are dependent on an index or on a rate, are not included in the measurement of ROU assets and their related lease liabilities. Lease terms will include extension periods if the lease agreement includes an option to extend the lease that we are reasonably certain to exercise.

ROU assets underlying our leases include the land and facilities of some of our operating facilities, other real property, and machinery and equipment. As of August 2, 2020, we had ROU assets under operating leases of $8.1 million, included in Other assets, and $2.2 million and $5.3 million of lease liabilities, included in Accrued liabilities and Other liabilities, respectively. The following tables present lease payments under non-cancellable leases as of August 2, 2020.

	Fiscal Year								
	2020	2021	2022	2023	2024	Thereafter	Total Lease Payments	Imputed Interest*	Total
Lease payments	$ 589	$ 2,238	$ 2,080	$ 1,130	$ 747	$ 1,138	$ 7,922	$ 385	$ 7,537

*Imputed interest represents difference between undiscounted cash flows and discounted cash flows.

The following table presents lease costs for the three and nine-month periods ended August 2, 2020.

	Three Months Ended August 2, 2020	Nine Months Ended August 2, 2020
Operating lease costs	$ 663	$ 2,459
Short-tern lease costs	$ 43	$ 255
Variable lease costs	$ 131	$ 259

Presented below is other information related to our operating leases.

Supplemental cash flows information:

	Three Months Ended August 2, 2020	Nine Months Ended August 2, 2020
Operating cash flows used for operating leases	$ 621	$ 3,008
ROU assets obtained in exchange for lease obligations	$ 2,098	$ 2,438

	As of August 2, 2020
Weighted-average remaining lease term	4.3 years
Weighted-average discount rate	2.37%

Rent expense, as calculated under guidance in effect prior to our adoption of the new leases guidance, was $3.0 million in fiscal year 2019. At October 31, 2019, future minimum lease payments under non-cancelable operating leases with initial terms in excess of one year were as presented in the table below. The amounts are undiscounted and were calculated in accordance with guidance in effect prior to our adoption of the new leases guidance.

2020	$ 1,885
2021	1,613
2022	1,535
2023	742
2024	424
Thereafter	377
	$ 6,576

NOTE 8 - 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 us (in the open-market or in private transactions) and 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 Photronics or its subsidiaries. In the event of a change in control (as defined in the Plan), the vesting of awards may be accelerated. The Plan, aspects of which are more fully described below, prohibits further awards from being issued under prior plans. Total share-based compensation costs for the three and nine-month periods ended August 2, 2020, were $1.2 million and $3.8 million, respectively, and $0.9 million and $2.9 million for the three and nine-month periods ended July 28, 2019, 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.

Restricted Stock

We periodically grant restricted stock awards, the restrictions on which typically lapse over a service period of one to four years. The fair value of the awards is determined on the date of grant, based on the closing price of our common stock. There were 527,000 restricted stock awards granted during the nine-month period ended August 2, 2020, with a grant-date fair value of $15.21 per share, and there were 435,000 restricted stock awards granted during the nine-month period ended July 28, 2019, with a weighted-average grant-date fair value of $9.80 per share. As of August 2, 2020, the total compensation cost not yet recognized related to unvested restricted stock awards was approximately $7.9 million. That cost is expected to be recognized over a weighted-average amortization period of 2.9 years. As of August 2, 2020, there were 838,616 shares of restricted stock outstanding.

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 our common stock on the dates of grant and are calculated using the Black-Scholes option pricing model. Expected volatility is based on the historical volatility of our common stock. We use historical option exercise behavior and employee termination data to estimate expected term, which represents the period of time that options 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.

There were no share options granted during the nine-month period ended August 2, 2020, or the three-month period ended July 28, 2019. There were 132,000 share options granted during the nine-month period ended July 28, 2019, with a weighted-average grant-date fair value of $3.31 per share. The Company received cash from option exercises of $0.3 million and $3.5 million for the three and nine-month periods ended August 2, 2020, respectively, and $0.2 million and $1.0 million for the three and nine-month periods ended July 28, 2019, respectively. As of August 2, 2020, the total unrecognized compensation cost related to unvested option awards was approximately $0.5 million. That cost is expected to be recognized over a weighted-average amortization period of 1.9 years.

The weighted-average inputs and risk-free rate of return ranges used to calculate the grant-date fair value of options issued during the nine-month period ended July 28, 2019, are presented in the following table.

	Nine Months Ended July 28, 2019
Volatility	33.1%
Risk free rate of return	2.5-2.9%
Dividend yield	0.0%
Expected term	5.1 years

Information on outstanding and exercisable option awards as of August 2, 2020, is presented below.

Options	Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life	Aggregate Intrinsic Value
Outstanding at August 2, 2020	1,674,582	$ 9.22	4.9 years	$ 4,523
Exercisable at August 2, 2020	1,402,704	$ 9.15	4.4 years	$ 3,909

NOTE 9 - INCOME TAXES

We calculate our provision for income taxes at the end of each interim reporting period on the basis of an estimated annual effective tax rate adjusted for tax items that are discrete to each period.

The effective tax rate of 27.7% exceeds the U.S. statutory rate of 21.0% in the three-month period ended August 2, 2020, primarily due to higher tax rates in the non-U.S. jurisdictions where we operate, combined with the non-recognition of the tax benefit of losses that, in certain jurisdictions, have been offset by valuation allowances, which were partially offset by the benefit of investment tax credits in certain foreign jurisdictions.

The effective tax rate of 35.9% exceeds the U.S. statutory rate of 21.0% in the nine-month period ended August 2, 2020, primarily due to the non-recognition of the tax benefit of losses that, in certain jurisdictions, have been offset by valuation allowances, and the establishment of a valuation allowance for a loss carryforward in a non-U.S. jurisdiction, which were partially offset by the benefits of tax holidays and investment tax credits in certain foreign jurisdictions.

Valuation allowances, in jurisdictions with historic losses, eliminate the current tax benefit of losses in these jurisdictions where, based on the weight of information available to us, we determined that it is more likely than not that the tax benefits will not be realized. In the three-month period ended February 2, 2020, as a result of the reassessment of the aforementioned available information, we established a valuation allowance of $2.1 million against a non-U.S. based loss-carryforward deferred tax asset that is not more likely than not to be realized.

Unrecognized tax benefits related to uncertain tax positions were $2.5 million at August 2, 2020, and $1.9 million at October 31, 2019, substantially all of which, if recognized, would favorably impact the Company's effective tax rate. Accrued interest and penalties related to unrecognized tax benefits was $0.2 million at August 2, 2020 and October 31, 2019. 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 $0.8 million of uncertain tax positions (including interest and penalties, and net of tax benefits) may be resolved over the next twelve months. Resolution of these uncertain tax positions may result from either or both the lapses of statutes of limitations and tax settlements. The Company is no longer subject to tax authority examinations in the U.S. and major foreign or state jurisdictions for years prior to fiscal year 2015.

We were granted a five-year tax holiday in Taiwan that expired on December 31, 2019. This tax holiday reduced foreign taxes by $0.1 million in the nine-month period ended August 2, 2020, and by $0.4 million and $1.5 million in the three and nine-month periods ended July 28, 2019, respectively. Per share impacts were immaterial in the nine-month period ended August 2, 2020, and the three-month period ended July 28, 2019; there was a one cent per share effect in the nine-month period ended July 28, 2019.

The effective tax rate of 24.7% in the three-month period ended July 28, 2019, differs from the U.S. statutory rate of 21.0%, primarily due to the elimination of tax benefits in jurisdictions, including the U.S., in which it is not more likely than not that the benefit will be realized; the effects of these eliminations were partially offset by the benefits of tax holidays and investment tax credits in certain foreign jurisdictions.

The effective tax rate of 22.3% in the nine-month period ended July 28, 2019, differs from the U.S. statutory rate of 21.0%, primarily due to the elimination of tax benefits in jurisdictions, including the U.S., in which it is not more likely than not that the benefit will be realized; the effects of these eliminations were partially offset by the benefits of the settlement of a tax audit, as well as a tax holiday and investment tax credits in certain foreign jurisdictions.

NOTE 10 - EARNINGS PER SHARE

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

	Three Months Ended		Nine Months Ended	
	August 2, 2020	July 28, 2019	August 2, 2020	July 28, 2019
Net income attributable to Photronics, Inc. shareholders	$ 10,776	$ 6,347	$ 27,360	$ 20,093
Effect of dilutive securities:				
Interest expense on convertible notes, net of tax	-	-	-	845
Earnings used for diluted earnings per share	$ 10,776	$ 6,347	$ 27,360	$ 20,938
Weighted-average common shares computations:				
Weighted-average common shares used for basic earnings per share	64,780	66,313	65,090	66,386
Effect of dilutive securities:				
Share-based payment awards	467	257	614	386
Convertible notes	-	-	-	3,147
Potentially dilutive common shares	467	257	614	3,533
Weighted-average common shares used for diluted earnings per share	65,247	66,570	65,704	69,919
Basic earnings per share	$ 0.17	$ 0.10	$ 0.42	$ 0.30
Diluted earnings per share	$ 0.17	$ 0.10	$ 0.42	$ 0.30

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 antidilutive.

	Three Months Ended		Nine Months Ended	
	August 2, 2020	July 28, 2019	August 2, 2020	July 28, 2019
Potentially dilutive shares excluded	985	1,979	723	1,415

NOTE 11 - CHANGES IN ACCUMULATED OTHER COMPREHENSIVE INCOME BY COMPONENT

The following tables set forth the changes in our accumulated other comprehensive income by component (net of tax of $0) for the three and nine-month periods ended August 2, 2020 and July 28, 2019.

	Three Months Ended August 2, 2020		
	Foreign Currency Translation Adjustments	Other	Total
Balance at May 4, 2020	$ (14,535)	$ (665)	$ (15,200)
Other comprehensive income	10,659	4	10,663
Less: other comprehensive income attributable to noncontrolling interests	1,889	2	1,891
Balance at August 2, 2020	$ (5,765)	$ (663)	$ (6,428)

	Three Months Ended July 28, 2019		
	Foreign Currency Translation Adjustments	Other	Total
Balance at April 29, 2019	$ (6,212)	$ (616)	$ (6,828)
Other comprehensive (loss) income	(8,882)	28	(8,854)
Less: other comprehensive (loss) income attributable to noncontrolling interests	(1,269)	14	(1,255)
Balance at July 28, 2019	$ (13,825)	$ (602)	$ (14,427)

	Nine Months Ended August 2, 2020		
	Foreign Currency Translation Adjustments	Other	Total
Balance at November 1, 2019	$ (8,331)	$ (674)	$ (9,005)
Other comprehensive income	6,689	23	6,712
Less: other comprehensive income attributable to noncontrolling interests	4,123	12	4,135
Balance at August 2, 2020	$ (5,765)	$ (663)	$ (6,428)

	Nine Months Ended July 28, 2019		
	Foreign Currency Translation Adjustments	Other	Total
Balance at November 1, 2018	$ (4,328)	$ (638)	$ (4,966)
Other comprehensive (loss) income	(9,364)	72	(9,292)
Less: other comprehensive income attributable to noncontrolling interests	133	36	169
Balance at July 28, 2019	$ (13,825)	$ (602)	$ (14,427)

NOTE 12 - 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 fair values of our 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 values due to their short-term maturities. The fair values of our variable rate debt instruments are a Level 2 measurement and approximates their carrying values due to the variable nature of the underlying interest rates. We did not have any assets or liabilities measured at fair value, on a recurring or a nonrecurring basis, at August 2, 2020 or October 31, 2019.

NOTE 13 - SHARE REPURCHASE PROGRAMS

In August 2019, the Company's board of directors authorized the repurchase of up to $100 million of its common stock, pursuant to a repurchase plan under Rule 10b5-1 of the Securities Act of 1933 (as amended) (the "Securities Act"). The company commenced repurchasing shares under this authorization on September 25, 2019. All of the 0.9 million shares repurchased under this authorization prior to November 1, 2019, were retired in fiscal 2019; the repurchase program was terminated on March 20, 2020. The table below presents information on this repurchase program.

	Nine Months Ended August 2, 2020	From Inception Date of September 25, 2019
Number of shares repurchased	1,464	2,460
Cost of shares repurchased	$ 16,894	$ 27,894
Average price paid per share	$ 11.54	$ 11.34

In October 2018, the Company's board of directors authorized the repurchase of up to $25 million of its common stock, to have been executed in open-market transactions or in accordance with a repurchase plan under Rule 10b5-1 of the Securities Act. The share repurchase program commenced on October 22, 2018, and was terminated on February 1, 2019. All of the shares repurchased under this program were retired in fiscal 2019. The table below presents information on this repurchase program.

	Three Months Ended January 27, 2019	From Inception Date of October 22, 2018
Number of shares repurchased	1,137	1,467
Cost of shares repurchased	$ 10,694	$ 13,807
Average price paid per share	$ 9.40	$ 9.41

NOTE 14 - COMMITMENTS AND CONTINGENCIES

As of August 2, 2020, the Company had commitments outstanding for capital expenditures of approximately $103 million, primarily for purchases of high-end equipment. See Note 7 for information on our operating lease commitments.

The Company's wholly owned subsidiary in South Korea has been involved in litigation regarding a 2016 informational tax filing for its non-South Korean bank accounts that was not timely made under a then recently issued presidential decree. A fine (based solely on the amount in such accounts) in the amount of $2.2 million was assessed against our subsidiary. Our subsidiary appealed the fine on the grounds that it was not required to make the tax filing, and such appeal was pursued up to the Supreme Court in South Korea. Under South Korean law, the tax authorities were entitled to pursue the matter in both civil and criminal courts simultaneously, with the proviso that any criminal fine imposed would act to dismiss any civil fine. The prosecutor recommended a fine of $0.03 million. The civil matter has subsequently been dismissed. Photronics was notified on March 12, 2020, that the Supreme Court rendered a decision against our subsidiary on the issue of whether our subsidiary was required to make the tax filing and remanded the case to the appellate court for determination of the fine. We are awaiting a trial date from the appellate court. Prior to the Supreme Court decision, our assessment was that the possibility of a fine was deemed remote, based on advice of local counsel and the subsequent judgments in the lower courts having been in our favor. Our estimate of the possible range of loss is $0.03 million to $2.2 million with the most likely amount being $0.03 million (based on the prosecutor's recommendation). Accordingly, during the three-month period ended May 3, 2020, we accrued a contingent loss of $0.03 million with a charge to Selling, general and administrative expense in the consolidated statements of income. It is reasonably possible that the estimated loss will change in the near term. Our maximum exposure to loss in excess of amounts accrued is $2.17 million. The imposition of the fine will not have a material impact on our financial position or financial performance.

We are subject to various other claims that arise in the ordinary course of business. We believe that our potential liability under such claims, individually or in the aggregate, will not have a material effect on the consolidated financial statements.

NOTE 15 - RECENT ACCOUNTING PRONOUNCEMENTS

Accounting Standards Updates Adopted

We adopted ASU 2016-02 and all subsequent amendments, collectively codified in ASC Topic 842 “Leases” (“Topic 842”), on November 1, 2019. The guidance requires modified retrospective adoption, either at the beginning of the earliest period presented or at the beginning of the period of adoption. We elected to apply the guidance at the beginning of the period of adoption and recorded, as of November 1, 2019, right-of-use (ROU) leased assets of $6.5 million. In conjunction with this, we recorded lease liabilities, which had been discounted at our incremental borrowing rates, of $6.5 million. Our adoption of Topic 842 did not affect our cash flows or our ability to comply with covenants under our credit agreement. Please see Note 7 for our leases disclosure.

Accounting Standards Updates to be Adopted

In March 2020, the FASB issued ASU 2020-04, “Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting”, which provides optional expedients and exceptions to applying the guidance on contract modifications, hedge accounting, and other transactions, to simplify the accounting for transitioning from the London Interbank Offered Rate, and other interbank offered rates expected to be discontinued, to alternative reference rates. The guidance in this Update was effective upon its issuance; if elected, it is to be applied prospectively through December 31, 2022. We are currently evaluating the effect the potential adoption of this ASU will have on our 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 Photronics in its first quarter of fiscal year 2021, with early adoption permitted beginning in the first quarter of fiscal year 2019. We do not expect our adoption of this ASU to have a material effect on our 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, which 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 2019 year), that may cause actual results to materially differ from these expectations.

We sell substantially all of our 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, microelectronic mechanical systems and certain nanotechnology applications. Our selling cycle is tightly interwoven with the development and release of new semiconductor and FPD designs and applications, particularly as they relate to the semiconductor industry's migration to more advanced product innovation, design methodologies, and fabrication processes. We believe 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 the demand for semiconductors and FPDs increases. Advances in semiconductor, FPD, and photomask design and semiconductor and FPD production methods that shift the burden of achieving device performance away from lithography could also reduce the demand for photomasks. Historically, the microelectronic industry has been volatile, experiencing periodic downturns and slowdowns in design activity. These downturns have been characterized by, among other things, diminished product demand, excess production capacity, and accelerated erosion of selling prices, with a concomitant effect on revenue and profitability.

We are typically required to fulfill customer orders within a short period of time after receipt of an order, sometimes within twenty-four hours. This results in a minimal level of backlog orders, typically one to two weeks of backlog for IC photomasks and two to three weeks of backlog for FPD photomasks.

The global semiconductor and FPD industries are driven by end markets which have been closely tied to consumer-driven applications of high-performance devices, including, but not limited to, mobile display devices, mobile communications, and computing solutions. While we 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, we believe that such transitions and cycles will continue into the future, beneficially and adversely affecting our business, financial condition, and operating results as they occur. We believe our ability to remain successful in these environments is dependent upon the achievement of our goals of being a service and technology leader and efficient solutions supplier, which we believe should enable us to continually reinvest in our global infrastructure.

Recent Developments

In the first quarter of fiscal 2020, we acquired the remaining 0.2% of noncontrolling interests in Photronics Cheonan, Ltd. (formerly PK, Ltd.), our South Korean subsidiary, for $0.6 million.

In the first quarter of fiscal 2020, we adopted ASU 2016-02 and all subsequent amendments, collectively codified in Accounting Standards Codification Topic 842 - "Leases" ("Topic 842"). This guidance requires modified retrospective adoption, either at the beginning of the earliest period presented or at the beginning of the period of adoption; we elected to apply the guidance at the beginning of the period of adoption, and recognized right-of-use leased assets of $6.5 million and corresponding lease liabilities which were discounted at our incremental borrowing rates, on our November 1, 2019 condensed consolidated balance sheet to reflect our adoption of the guidance. Our adoption of Topic 842 did not affect our cash flows or our ability to comply with covenants under our credit agreements.

In the fourth quarter of fiscal 2019, our board of directors declared a dividend of one preferred stock purchase right (a “Right”), payable on or about October 1, 2019, for each share of common stock, par value $0.01 per share, of the Company outstanding on September 30, 2019, to the stockholders of record on that date. In connection with the distribution of the Rights, we entered into a Section 382 Rights Agreement (the “Rights Agreement”), dated as of September 23, 2019, between the Company and Computershare Trust Company, N.A., a federally chartered trust company, as rights agent. The purpose of the Rights Agreement is to deter trading of our common stock that would result in a change in control (as defined in Internal Revenue Code Section 382), thereby preserving our future ability to use our historical federal net operating losses and other Tax Attributes (as defined in the Rights Agreement). Each Right entitles the registered holder to purchase from the Company one one-thousandth of a share of Series A Preferred Stock, par value $0.01 per share, at a price of $33.63, subject to adjustment. The Rights, which are described in the Company’s Current Report on Form 8-K filed on September 24, 2019, are in all respects subject to and governed by the provisions of the Rights Agreement. The Rights will expire at the earliest to occur of (i) the close of business on the day following the date on which our board of directors determines, in its sole discretion, that the Rights Agreement is no longer necessary for the preservation of material valuable tax attributes, or the tax attributes have been fully utilized and may no longer be carried forward or (ii) the close of business on September 22, 2022.

In the fourth quarter of fiscal 2019, PDMC, the Company’s majority-owned IC subsidiary in Taiwan, paid a dividend of which 49.99%, or approximately $18.9 million, was paid to noncontrolling interests.

In the fourth quarter of fiscal 2019, upon our request, a financing entity made an advance payment of $3.5 million to an equipment vendor. We entered into a Master Lease Agreement (“MLA”) with this financing entity, which became effective in July 2019. The MLA enables us to request advance payments or other funds to finance equipment to be leased or purchased in the U.S. In connection with this MLA, we have been approved for financing of $35 million for the purchase of a high-end lithography tool. Interest on this borrowing is payable monthly at thirty-day LIBOR plus 1% (1.18% at August 2, 2020), and will continue to accrue until the borrowing is repaid or, as allowed under the MLA, we enter into a lease for the equipment. We intend to enter into a lease agreement for the related equipment in fiscal year 2020.

In the fourth quarter of fiscal 2019, the Company’s board of directors authorized the repurchase of up to $100 million of its common stock, pursuant to a repurchase plan under Rule 10b5-1 of the Securities Act. We repurchased 2.5 million shares, at a cost of $27.9 million (an average price of $11.34 per share), under this authorization. All shares repurchased during fiscal 2019 (0.9 million) were retired in fiscal 2019; the repurchase program was terminated on March 20, 2020.

In the second quarter of fiscal 2019, we repaid, upon maturity, the entire $57.5 million principal amount of the convertible senior notes we issued in April 2016.

In the first quarter of fiscal 2019, PDMC paid a dividend, of which 49.99%, or approximately $26.1 million, was paid to noncontrolling interests.

In the first quarter of fiscal 2019, PDMCX was approved for credit of the equivalent of $50 million, subject to certain limitations related to PDMCX registered capital at the time of the initial approval, pursuant to which PDMCX has and will enter into separate loan agreements (“the Project Loans”) for intermittent borrowings. The Project Loans, which are denominated in Chinese renminbi (RMB), are being used to finance certain capital expenditures in China. PDMCX granted liens on its interest in land, building, and certain equipment as collateral for the Project Loans. As of August 2, 2020, PDMCX had outstanding borrowings of 234.4 million RMB ($33.5 million) against this approval. Payments on these borrowings are due semiannually through December 2025. See Note 5 of the condensed consolidated financial statements for additional information on these loans.

In the first quarter of fiscal 2019, PDMCX received approval for unsecured credit of the equivalent of $25.0 million, pursuant to which PDMCX may enter into separate loan agreements. Under this credit agreement, PDMCX can borrow up to 140.0 million RMB to pay value-added taxes (“VAT”) and up to 60.0 million RMB to fund operations; combined total borrowings are limited to the equivalent of $25.0 million. As of August 2, 2020, PDMCX had outstanding 18.0 million RMB ($2.6 million) to fund operations, with repayments due one year from the borrowing dates of the separate loan agreements. As of August 2, 2020, PDMCX had outstanding 93.2 million RMB ($13.3 million) borrowed to pay VAT. Payments on these borrowings are due semiannually, in increasing amounts, through July 2023. See Note 5 of the condensed consolidated financial statements for additional information on these loans.

In the fourth quarter of fiscal 2018, the Company’s board of directors authorized the repurchase of up to $25 million of its common stock, to have been executed in open-market transactions or in accordance with a repurchase plan under Rule 10b5-1 of the Securities Act. The share repurchase program commenced, under Rule 10b5-1, on October 22, 2018, and was terminated on February 1, 2019. We repurchased 1.5 million shares at a cost of $13.8 million (an average of $9.41 per share) under this authorization.

Results of Operations
Three and Nine-Months ended August 2, 2020

The following table presents selected operating information expressed as a percentage of revenue.

	Three Months Ended			Nine Months Ended	
	August 2, 2020	May 3, 2020	July 28, 2019	August 2, 2020	July 28, 2019
Revenue	100.0%	100.0%	100.0%	100.0%	100.0%
Cost of goods sold	76.1	78.7	77.9	77.7	79.0
Gross profit	23.9	21.3	22.1	22.3	21.0
Selling, general and administrative expenses	8.4	9.3	9.5	8.9	10.2
Research and development expenses	2.9	3.1	2.9	2.8	3.0
Operating income	12.6	8.9	9.7	10.6	7.8
Other (expense) income, net	(1.3)	(0.7)	(0.2)	0.2	1.2
Income before income taxes	11.3	8.2	9.5	10.8	9.0
Income tax provision	3.2	2.6	2.4	3.9	2.0
Net income	8.1	5.6	7.1	6.9	7.0
Net income attributable to noncontrolling interests	1.3	1.2	2.5 1.1	1.0	1.9
Net income attributable to Photronics, Inc. shareholders	6.8%	4.4%	4.6%	5.9%	5.1%

Note: All tabular comparisons included in the following discussion, unless otherwise indicated, are for the three months ended August 2, 2020 (Q3 FY20), May 3, 2020 (Q2 FY20) and July 28, 2019 (Q3 FY19), and for the nine months ended August 2, 2020 (YTD FY20) and July 28, 2019 (YTD FY19), in millions of dollars.

Revenue

Our quarterly revenues can be affected by the seasonal purchasing practices of our customers. As a result, demand for our products is typically reduced during the first, and sometimes the second, quarters of our fiscal year, by the North American, European, and Asian holiday periods, as some of our customers reduce their development and, consequently, their buying activities during those periods.

At the beginning of fiscal year 2020, we changed the threshold for the definition of high-end FPD, from G8 and above and active matrix organic light-emitting diode (AMOLED) display screens, to G10.5 and above, AMOLED, and low-temperature polysilicon (LTPS) display screens, to reflect the overall advancement of technology in the FPD industry. Our definition of high-end IC products remains as 28 nanometer or smaller. The following analyses of quarterly changes in revenue by product type for the periods ended July 28, 2019, have been modified to reflect this change. High-end photomasks typically have higher selling prices (ASPs) than mainstream products.

The following tables present changes in disaggregated revenue in Q3 FY20 and YTD FY20 from revenue in prior reporting periods. Columns may not total due to rounding.

Quarterly Changes in Revenue by Product Type

	Q3 FY20 from Q2 FY20			Q3 FY20 from Q3 FY19		YTD FY20 from YTD FY19		
	Revenue in Q3 FY20	**Increase (Decrease)**	**Percent Change**	**Increase (Decrease)**	**Percent Change**	**Revenue in YTD FY20**	**Increase (Decrease)**	**Percent Change**
IC								
High-end	$ 38.7	$ 0.4	1.0%	$ 0.2	0.5%	$ 118.0	$ 6.5	5.8%
Mainstream	70.0	11.4	19.5%	8.3	13.4%	194.5	12.3	6.8%
Total IC	$ 108.7	$ 11.8	12.2%	$ 8.5	8.5%	$ 312.5	$ 18.8	6.4%
FPD								
High-end	$ 36.7	$ 4.9	15.3%	$ 13.6	58.8%	$ 108.2	$ 47.8	79.0%
Mainstream	12.6	(1.6)	(11.1)%	(2.3)	(15.4)%	39.7	(0.6)	(1.5)%
Total FPD	$ 49.2	$ 3.3	7.2%	$ 11.3	29.8%	$ 147.9	$ 47.2	46.8%
Total Revenue	$ 157.9	$ 15.1	10.6%	$ 19.8	14.3%	$ 460.4	$ 66.0	16.7%

Quarterly Changes in Revenue by Geographic Origin

	Q3 FY20 from Q2 FY20			Q3 FY20 from Q3 FY19		YTD FY20 from YTD FY19		
	Revenue in Q3 FY20	**Increase (Decrease)**	**Percent Change**	**Increase (Decrease)**	**Percent Change**	**Revenue in YTD FY20**	**Increase (Decrease)**	**Percent Change**
Taiwan	$ 60.8	$ 5.3	9.6%	$ (0.4)	(0.7)%	$ 182.5	$ 7.0	4.0%
Korea	39.5	3.2	8.9%	2.4	6.4%	116.5	6.1	5.5%
United States	28.4	3.5	14.1%	3.0	11.8%	78.3	3.7	5.0%
China	21.0	3.5	20.0%	15.0	252.0%	58.4	50.7	658.8%
Europe	7.7	(0.6)	(7.7)%	(0.2)	(3.1)%	23.6	(1.2)	(4.7)%
Other	0.5	0.2	66.7%	0.1	19.4%	1.2	(0.3)	(18.6)%
	$ 157.9	$ 15.1	10.6%	$ 19.8	14.3%	$ 460.4	$ 66.0	16.7%

Revenue increased $15.1 million, or 10.6%, in Q3 FY20, compared with Q2 FY20, continuing a trend that began in the latter part of Q2 FY20, as COVID-19 related mobility restrictions on many supply chains were lifted. The greatest impacts of these restrictions were experienced in the mainstream IC and high-end FPD product lines. In Q3 FY20, strong foundry logic demand drove revenue for mainstream IC products up $11.4 million, or 19.5%. High-end FPD revenue also largely recovered from the prior quarter, increasing $4.9 million, or 15.3%, as demand nearly doubled for G10.5+ displays and demand for AMOLED and LTPS products improved, as panel makers released new designs for the next generation of smartphones. On a geographic basis, revenue generated at our Asia and U.S. based-facilities increased in the current quarter, with revenue from our China-based facilities increasing $3.5 million, or 20.0%, as our China-based FPD facility continued to ramp to full production. While our China-based IC facility also experienced growth from the prior quarter, travel restrictions had delayed the installation and certification of a tool, which resulted in concomitant delays in our fully utilizing the facility. Installation work on this tool has now commenced, and we anticipate that it will be in production by the end of the second quarter of fiscal 2021.

Revenue increased 14.3% in Q3 FY20, compared with Q3 FY19, due to increased demand for high-end FPD products, which rose 13.6 million, or 58.8%, and mainstream IC products which were up $8.3 million, or 13.4%. The increases reflected both stronger global demand and our increased ability to meet it through the commencement of production at our China-based facilities. Revenue generated at our China-based facilities increased $15.0 million, or 252%, from the prior year quarter. Revenue generated in the U.S. and Korea also grew by 11.8% and 6.4%, respectively, while revenue in Taiwan and Europe decreased moderately.

On a year-to-date basis, revenues increased $66.0 million, or 16.7%, from YTD FY19, primarily due to strong growth in demand for high-end FPD products which increased by $47.8 million, or 79.0%, and, to lesser extents, mainstream and high-end IC products which increased 6.8% and 5.8%, respectively. Revenue increased from the prior year period by over 30% in each of the G10.5+, AMOLED, and LTPS FPD product categories. Revenue from mainstream IC products was up $12.3 million, or 6.8% and, high-end IC revenue increased $6.5 million, or 5.8%, due to favorable foundry demand in Asia. On a geographic basis, approximately 77% of the increase was attributable to revenues from our two China-based sites.

Gross Margin

	Three Months Ended					Nine Months Ended		
	Q3 FY20	Q2 FY20	Percent Change	Q3 FY19	Percent Change	YTD FY20	YTD FY19	Percent Change
Gross profit	$ 37.7	$ 30.4	24.0%	$ 30.6	23.4%	$ 102.8	$ 82.7	24.3%
Gross margin	23.9%	21.3%		22.1%		22.3%	21.0%	

Gross margin increased by 2.6 percentage points in Q3 FY20, from Q2 FY20, primarily as a result of the above mentioned 10.6% increase in revenue from the prior quarter. Gross margins at our China-based IC and FPD operations increased as these facilities continue to ramp up to full production. Gross margin also increased at our Taiwan-based IC facility, primarily resulting from an 11.8% increase in revenues at that location. Total cost of goods sold increased $7.8 million, or 7.0%, from the prior quarter, with $4.3 million of the increase resulting from greater materials costs, which rose 10.1%, but remained flat as a percentage of revenue. Labor costs increased 11.2%, but were essentially flat as a percentage of revenue, while overhead costs increased 3.1%, but fell 6.8% as a percentage of revenue.

Gross margin increased by 1.8 percentage points in Q3 FY20, from Q3 FY19, primarily as a result of the 14.3% growth in revenue in the current year quarter. Gross margins at our China-based IC and FPD operations increased as they continue to ramp up to full production. Gross margin also increased in the U.S., with the increase resulting from an 11.8% increase in revenues and costs in most categories falling as a percentage of revenue. Total cost of goods sold increased $12.6 million, or 11.7%, from the prior year quarter, with $4.8 million of the increase resulting from greater materials costs, which rose 11.4%, but fell 2.6%, as a percentage of revenue. Labor costs increased 7.1%, but decreased 6.3%, as a percentage of revenue, while overhead costs increased 13.7%, as a result of greater contracted manufacturing, depreciation, and service contract costs.

Gross margin increased by 1.3 percentage points in YTD FY20, from YTD FY19, primarily as a result of the 16.7% increase in revenue from the prior year period. Gross margins at our China-based IC and FPD operations increased as these facilities continue to ramp up to full production. Gross margin also increased at our Taiwan-based FPD facility, with the increase primarily resulting from a 13.4% increase in revenues, and a decrease in the cost of materials, as a percentage of revenue, of 13.8% due to favorable product mix. Total cost of goods sold increased $45.9 million, or 14.7%, from the prior year period, with $21.5 million of the increase resulting from greater materials costs, which were up 18.4% from YTD FY19, and increased 1.4%, as a percentage of revenue. Labor costs increased 3.4%, but were down 11.4%, as a percentage of revenue, while overhead costs increased 15.8%, with increased equipment costs (which reflected our expanded installed tool base) comprising the majority of this increase.

As we operate in a high fixed cost environment, increases or decreases in our revenues and capacity utilization will generally positively or negatively impact our gross margin.

Selling, General and Administrative Expenses

Selling, general and administrative expenses were $13.3 million in Q3 FY20, essentially unchanged from Q2 FY20, and up $0.2 million from Q3 FY19. The increase from the prior year quarter was the result of increased compensation and related expenses of $0.9 million, which were partially offset by decreased travel and freight costs of $0.5 and $0.2 million, respectively. Selling, general and administrative expenses increased $0.6 million, or 1.5%, in YTD FY20, from YTD FY19, primarily as a result of increased compensation and related expenses of $1.5 million, partially offset by decreased travel expenses of $1.1 million.

Research and Development Expenses

Research and development expenses consist of development efforts generally related to process technology development for high-end IC nodes and FPD applications.

Research and development expenses were $4.5 million in Q3 FY20, essentially unchanged from Q2 FY20, and up $0.4 million from Q3 FY19, primarily as a result of increased development activities in China, where increases of $0.2 million occurred at both our IC and FPD facilities. Research and development expenses increased $1.2 million, or 10.0%, in YTD FY20, from YTD FY19, primarily due to increased development activities at the two China-based facilities, where spending increased by $1.3 million and $0.7 million, respectively, at the IC and FPD facilities; these increases were partially offset by reduced spending in the U.S. of $1.0 million.

Other Income (Expense)

	Three Months Ended			Nine Months Ended	
	Q3 FY20	**Q2 FY20**	**Q3 FY19**	**YTD FY20**	**YTD FY19**
Foreign currency (losses) gains, net	$ (1.6)	$ (1.4)	$ (0.1)	$ 1.7	$ 5.0
Interest expense, net	(0.6)	0.8	(0.4)	(1.6)	(1.3)
Interest income and other income (expense), net	-	(0.3)	0.1	0.5	1.0
Other income (expense), net	$ (2.1)	$ (1.0)	$ (0.4)	$ 0.6	$ 4.7

Other income (expense), net decreased $1.1 million, from a loss of $1.0 million in Q2 FY20, to a loss of $2.1 million in Q3 FY20, due to interest expense incurred in the current quarter and interest subsidies received in Q2 FY20. Interest expense and interest subsidies both primarily relate to our China-based debt, the majority of which is eligible for reimbursements through subsidies. Other income (expense), net decreased $1.7 million from Q3 FY19, primarily due to an unfavorable change in foreign currency transaction results of $1.5 million. Other income (expense), net decreased $4.1 million year-to-date primarily due to a decrease in foreign currency exchange gains of $3.3 million, decreased interest income of $0.4 million, and increased interest expense of $0.4 million (net of subsidies received) in YTD FY20, compared with the prior year period.

Income Tax Provision

	Three Months Ended			Nine Months Ended	
	Q3 FY20	**Q2 FY20**	**Q3 FY19**	**YTD FY20**	**YTD FY19**
Income tax provision	$ 4.9	$ 3.8	$ 3.2	$ 17.8	$ 7.9
Effective income tax rate	27.7%	32.2%	24.7%	35.9%	22.3%

The 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 decreased in Q3 FY20, compared with Q2 FY20, primarily due to changes in the jurisdictional mix of earnings. The effective income tax rate increased in Q3 FY20, compared with Q3 FY19, due to changes in the jurisdictional mix of earnings and the expiration of a tax holiday in Taiwan in December 2019.

The effective income tax rate increased in YTD FY20, compared with YTD FY19, primarily due to the YTD FY20 establishment of a valuation allowance for a loss carryforward in a non-U.S. jurisdiction, which was partially offset by a non-repetitive, one-time audit settlement benefit in YTD FY19, as well as changes in the jurisdictional mix of earnings, the expiration of a tax holiday in Taiwan, and use of investment tax credits to reduce tax expense in 2019.

Net Income Attributable to Noncontrolling Interests

Net income attributable to noncontrolling interests was $2.1 million in Q3 FY20, which represented an increase of $0.4 million from Q2 FY20, and was the result of increased net income at our Taiwan-based IC facility, and a decreased net loss at our China-based IC facility. Net income attributable to noncontrolling interests decreased $1.4 million in Q3 FY20 from $3.5 million in Q3 FY19, as decreased income at our Taiwan-based IC facility exceeded a decreased loss at our China-based IC facility. On a year-to-date basis, net income attributable to noncontrolling interests decreased $3.0 million; the decrease was the result of decreased net income at our Taiwan-based IC facility and an increased net loss at our China-based IC facility. We hold 50.01% ownership interests in both the China-based and Taiwan-based IC facilities.

Liquidity and Capital Resources

We had cash and cash equivalents of $260.6 million at the end of Q3 FY20, compared with $206.5 million at the end of fiscal 2019. The net increase of $54.1 million was primarily attributable to:

- $78.3 million provided by operating activities;
- $17.6 million contributed to our China-based IC facility by noncontrolling interests;
- $5.3 million government incentives received in China;
- $3.9 million received from exercises of employee stock options;
- $5.7 million received from borrowings in China;
- $36.7 million paid for property, plant, and equipment;
- $16.9 million used to repurchase our common stock;
- $5.9 million used to repay debt;
- $3.3 million favorable effects of currency exchange rates on cash

Our working capital at the end of Q3 FY20 was $335.3 million, compared with $275.6 million at the end of fiscal 2019. The increase is primarily attributable to the following increases (decreases) in working capital:

- Increased cash and cash equivalents of $54.1 million;
- increased accounts receivables of $12.4 million;
- Increased inventories of $6.6 million, acquired to protect against potential COVID-19 related supply chain disruptions;
- Increased recoverable value added taxes of $10.4 million, related to our China-based facilities;
- Increased liabilities for capital expenditures of $(24.4) million;
- Increased current debt of $(3.8) million;
- Increased value added taxes payable of $(7.8) million;
- Decreased compensation accruals of $2.1 million;
- Decreased other accruals and payables (net) of $10.7 million.

The net cash provided by operating activities of $78.3 million in YTD FY20 was a $54.8 million increase from $23.5 million provided in YTD FY19. The net increase was primarily due to:

- Increased net income of $4.3 million in YTD FY20;
- Increased non-cash add backs to net income, including depreciation, amortization, share-based compensation, and deferred income taxes of $13.8 million in YTD FY20;
- A comparative decrease in value added tax prepayments related to our China facilities of $17.7 million in YTD FY20. These prepayments are recoverable through future revenue transactions of the facilities;
- A comparative decrease in the build-up of inventories in YTD FY20 of $8.9 million, which was primarily the result of our initially supplying our China-based FPD facility in YTD FY19;
- A comparative increase in value added taxes payable at our two China-based facilities of $7.5 million, which is reflective of their increased revenues in YTD FY20.

Net cash used in investing activities was $31.6 million in YTD FY20, a decrease of $110.9 million from the $142.5 million used in YTD FY19. The net decrease in cash used was primarily attributable to decreased capital expenditures of $123.5 million; this was the result of a reduction in payments to equip our China-based facilities, which were in the start-up phase in the first half of fiscal year 2019. A reduction in investment incentives of $12.4 million in YTD FY20, from YTD FY19, partially offset the decrease in net cash used in investing activities realized from the reduction in capital spending.

Net cash flows from financing activities changed from $14.3 million used in YTD FY19 to $4.1 million provided in YTD FY20. Significant components of the $18.4 million net change were:

- $55.4 million less debt was repaid in YTD FY20, than in YTD FY19; the primary cause of the decrease was repayment (upon their maturity) of our convertible senior notes in YTD FY19;
- $26.1 million used to pay dividends to DNP (related to their 49.99% interest in our IC facility in Taiwan) in YTD FY19;
- $(44.0) million less received from borrowings in China in YTD FY20 than in YTD FY19;
- $(11.8) million less contributed by DNP to maintain their proportionate ownership interest in our IC joint venture in China in YTD FY20 than in YTD FY19;
- $(6.2) million more paid in YTD FY20, than in YTD FY19, to acquire our common stock.

As of August 2, 2020 and October 31, 2019, our total cash and cash equivalents included $223.8 million and $147.2 million, respectively, held by our foreign subsidiaries. The majority of earnings of our foreign subsidiaries are considered to be indefinitely reinvested. Repatriation of these funds to the U.S. may subject them to U.S. state income taxes and local country withholding taxes in certain jurisdictions. Furthermore, our 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.

Our liquidity is highly dependent on our revenue, cash conversion cycle, and the timing of our capital expenditures (which can vary significantly from period to period). We believe that our cash on hand, cash generated from operations, and amounts available to borrow will be sufficient to meet our cash requirements for the next twelve months. However, depending on conditions in the semiconductor and FPD markets, our cash flows from operations and current holdings of cash may not be adequate to meet our current and long-term needs for capital expenditures, operations and debt repayments. Historically, in certain years, we have used external financing to fund these needs. Due to conditions in the credit markets and covenant restrictions on our existing debt, some financing instruments we have used in the past may not be available to us when required. Consequently, we cannot assure that additional sources of financing would be available to us on commercially favorable terms, should our long-term cash requirements exceed our existing cash and cash available under our credit agreements (which are discussed in Note 5 to the condensed consolidated financial statements).

As of August 2, 2020, we had outstanding capital commitments of approximately $103 million. We intend to finance our capital expenditures with our working capital, contributions from our joint venture partners, borrowings under the MLA we entered into in fiscal 2019 (as discussed in Note 5 to the condensed consolidated financial statements), cash generated from operations and, if necessary, additional borrowings.

Off-Balance Sheet Arrangements

In January 2018, Photronics, through its wholly owned Singapore subsidiary, entered into the PDMCX joint venture with DNP, through its wholly owned subsidiary “DNP Asia Pacific PTE, Ltd.” under which DNP obtained a 49.99% interest in our IC business in Xiamen, China. The joint venture was established to develop and manufacture photomasks for leading edge and advanced generation semiconductors. Under the joint venture’s operating agreement, DNP is afforded, under certain circumstances, the right to put its interest in PDMCX to Photronics. These circumstances include disputes regarding the strategic direction of PDMCX that may arise after the initial two-year term of the Agreement that cannot be resolved between the two parties. As of the date of issuance of this report, DNP had not indicated its intention to exercise this right. In addition, both Photronics and DNP have the option to purchase, or put, their interest from, or to, the other party, should their ownership interest fall below 20% for a period of more than six consecutive months. Under all such circumstances, the sales of ownership interests would be at the exiting party’s ownership percentage of the joint venture’s net book value, with closing to take place within three business days of obtaining required approvals and clearance. Should DNP exercise an option to put their, or purchase our, interest in PDMCX we may, depending on the relationship of the fair and book value of PDMCX’s net assets, incur a loss. As of August 2, 2020, Photronics and DNP each had net investments in PDMCX of $52.4 million.

Business Outlook

We observe that there are significant opportunities in the FPD market, as Korea continues to transition production capacity away from LCD to OLED or AMOLED, China increases G10.5+ development and further penetrates the mobile AMOLED market, and Taiwan invests in micro-LED development. We believe our capacity additions planned for fiscal 2021 will enable us to continue to benefit from all of these factors. In addition, the last phase of our initial investment at our China-based IC facility is scheduled to be in production by the end of the second quarter of 2021, which should enable us to grow our business in this product category. It is, however, to be emphasized that our backlog is typically one to three weeks, which serves to limit our visibility. Furthermore, the demand for photomasks is inherently uneven, both due to the timing of development activities and the composition of the product mix, which may significantly affect our revenues. In addition, the high ASPs of certain high-end products can create volatility in our revenue and profitability.

The near-term effects on our business of geopolitical developments, such as trade policy or measures taken to prevent the spread of coronavirus, cannot be predicted and may have an impact on our operations. We continue to believe that a majority of the growth in the IC and FPD markets will continue to come from the Asia region, predominantly in China. We expect to meet these demands both through the utilization of our new facilities in China, and by importing photomasks into China from our other facilities. We make continual assessments of our global manufacturing strategy and monitor our revenue and related cash flows from operations. These ongoing assessments could result in future facility closures, asset redeployments, impairments of intangible or long-lived assets, workforce reductions, or the addition of manufacturing facilities, all of which would be based on market conditions and customer requirements.

Our future results of operations and the other forward-looking statements contained in this filing involve a number of risks and uncertainties, some of which are discussed in Part1, Item 1A in our Annual Report on Form 10-K for the year ended October 31, 2019, and in Part 2, Item 1A in our Quarterly Report on Form 10-Q for the quarter ended May 3, 2020; a number of other unforeseen factors could cause actual results to differ materially from our expectations.

Effect of Recent Accounting Pronouncements

See "Item 1. Condensed Consolidated Financial Statements– Notes to Condensed Consolidated Financial Statements – Note 15 – 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

We conduct business in several major international currencies throughout our worldwide operations, and our financial performance may be affected by fluctuations in the exchange rates of these currencies. Changes in exchange rates can positively or negatively affect our reported revenue, operating income, assets, liabilities, and equity. The functional currencies of our Asian subsidiaries are the South Korean won, the New Taiwan dollar, the Chinese renminbi, and the Singapore dollar. The functional currencies of our European subsidiaries are the British pound and the euro. In addition, we engage in transactions in, and have exposures to, the Japanese yen.

We attempt to minimize our risk of foreign currency transaction losses by producing products in the same country in which the products are sold (thereby generating revenues and incurring expenses in the same currency), and by managing our working capital. However, in some instances, we sell products in a currency other than the functional currency of the country where it was produced, or purchase products in a currency that differs from the functional currency of the purchasing entity. In addition, to the extent practicable, we attempt to reduce our exposure to foreign currency exchange fluctuations by converting cash and cash equivalents into the functional currency of the subsidiary which holds the cash. We may also enter into derivative contracts to mitigate our exposure to foreign currency fluctuations when we have a significant purchase obligation, or a significant receivable denominated in a currency that differs from the functional currency of the transacting subsidiary. We do not enter into derivatives for speculative purposes. There can be no assurance that this approach will protect us from the need to recognize significant foreign currency transaction gains and losses, especially in the event of a significant adverse movement in the value of any foreign currency in which we conduct business against any of our functional currencies, including the U.S. dollar.

Our primary net foreign currency exposures as of August 2, 2020, included the South Korean won, the Japanese yen, the New Taiwan dollar, the Chinese renminbi, the Singapore dollar, the British pound sterling, and the euro. As of that date, a 10% adverse movement in the value of currencies different than the functional currencies of our subsidiaries would have resulted in a net unrealized pre-tax loss of $32.9 million, which represents a decrease of $0.2 million from our exposures at May 3, 2020, and October 31, 2019. Our most significant exposures at August 2, 2020, related to the South Korean won and the Chinese renminbi to the U.S. dollar, which were, respectively, $12.1 million and $9.4 million at that date. We do not believe that a 10% change in the exchange rates of non-US dollar currencies, other than the aforementioned currencies and the Japanese Yen, would have had a material effect on our August 2, 2020, condensed consolidated financial statements.

Interest Rate Risk

A 10% adverse movement in the interest rates on our variable rate borrowings would not have had a material effect on our August 2, 2020 condensed consolidated financial statements.

Item 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We have established and currently maintain 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 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 our 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.

Our management, under the supervision and with the participation of our chief executive officer and chief financial officer, evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of the end of the period covered by this report. Based upon that evaluation, our chief executive officer and chief financial officer concluded that our 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 our internal control over financial reporting during the third fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1. LEGAL MATTERS

The Company's wholly owned subsidiary in South Korea has been involved in litigation regarding a 2016 informational tax filing for its non-South Korean bank accounts that was not timely made under a then recently issued presidential decree. A fine (based solely on the amount in such accounts) in the amount of $2.2 million was assessed against our subsidiary. Our subsidiary appealed the fine on the grounds that it was not required to make the tax filing, and such appeal was pursued up to the Supreme Court in South Korea. Under South Korean law, the tax authorities were entitled to pursue the matter in both civil and criminal courts simultaneously, with the proviso that any criminal fine imposed would act to dismiss any civil fine. The prosecutor recommended a fine of $0.03 million. The civil matter has subsequently been dismissed. Photronics was notified on March 12, 2020, that the Supreme Court rendered a decision against our subsidiary on the issue of whether our subsidiary was required to make the tax filing and remanded the case to the appellate court for determination of the fine. We are awaiting a trial date from the appellate court. Prior to the Supreme Court decision, our assessment was that the possibility of a fine was deemed remote, based on advice of local counsel and the subsequent judgments in the lower courts having been in our favor. Our estimate of the possible range of loss is $0.03 million to $2.2 million with the most likely amount being $0.03 million (based on the prosecutor's recommendation). Accordingly, during the three-month period ended May 3, 2020, we accrued a contingent loss of $0.03 million with a charge to Selling, general and administrative expense in the consolidated statements of income. It is reasonably possible that the estimated loss will change in the near term. Our maximum exposure to loss in excess of amounts accrued is $2.17 million. The imposition of the fine will not have a material impact on our financial position or financial performance.

We are subject to various other claims that arise in the ordinary course of business. We believe that such claims, individually or in the aggregate, will not have a material effect on the consolidated financial statements.

Item 1A. RISK FACTORS

Other than the below, there have been no other material changes to risks relating to our business as disclosed in Part 1, Item 1A of our Annual Report on Form 10-K for the year ended October 31, 2019, and Part 2, Item 1A of our Quarterly Report on Form 10-Q for the quarter ended May 3, 2020.

Our products and technology could be subject to and negatively impacted by the recent expansion of the foreign produced direct product rule.

In May 2019, the U.S. Department of Commerce, Bureau of Industry and Security ("BIS") amended export administration regulations by adding Huawei Technologies Co., Ltd. ("Hauwei") and certain affiliates to the "Entity List" for actions contrary to the national security and foreign policy interests of the United States, imposing significant new restrictions on export, reexport and transfer of U.S. regulated technologies and products to Huawei. On August 17, 2020, BIS issued a final rule adding additional Huawei non-U.S. affiliates to the Entity List, confirming the expiration of a temporary general license applicable to Huawei, and amended the foreign-produced direct product rule in a manner that represents a significant expansion of its application to Huawei.

Expansion of the foreign-produced direct product rule and additional companies being added to the entity list may adversely affect our business in various ways, including by: increasing the cost of regulatory compliance for the export of our products, equipment, services, and technology from the United States and abroad; increasing the time necessary to obtain required authorizations; increasing the risk of monetary fines and other penalties for non-compliance, and negatively impacting our customers who may no longer be able to supply their customers and thereby reducing demand for their or our products. Any of these effects could result in lost revenue, additional product costs, increased lead times and deployment delays that could harm our business and customer relationships.

Item 6. EXHIBITS

Exhibit Number	Description	Incorporated by Reference				Filed or Furnished Herewith
		Form	File Number	Exhibit	Filing Date	
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.					X
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.					X
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.					X
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.					X
101.INS	XBRL Instance Document					X
101.SCH	XBRL Taxonomy Extension Schema Document					X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document					X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document					X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document					X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document					X

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/ JOHN P. JORDAN
JOHN P. JORDAN
Executive Vice President,
Chief Financial Officer
(Principal Financial Officer)

Date: September 10, 2020

By: /s/ ERIC RIVERA
ERIC RIVERA
Vice President,
Corporate Controller
(Principal Accounting Officer)

Date: September 10, 2020

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
September 10, 2020

EXHIBIT 31.2

I, John P. Jordan, 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/ JOHN P. JORDAN

John P. Jordan
Chief Financial Officer
September 10, 2020

EXHIBIT 32.1

Section 1350 Certification of the Chief Executive Officer

I, Peter S. Kirlin, Chief Executive Officer of Photronics, 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 August 2, 2020 (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
September 10, 2020

EXHIBIT 32.2

Section 1350 Certification of the Chief Financial Officer

I, John P. Jordan, Chief Financial Officer of Photronics, 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 August 2, 2020 (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/ JOHN P. JORDAN

John P. Jordan
Chief Financial Officer
September 10, 2020