PDF SOLUTIONS INC
Form 10-Q
August 04, 2017

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 June 30, 2017

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 000-31311

PDF SOLUTIONS, INC.

(Exact name of Registrant as Specified in its Charter)

Delaware	**25-1701361**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)

333 West San Carlos Street, Suite 1000	
San Jose, California	**95110**
(Address of Principal Executive Offices)	(Zip Code)

(408) 280-7900

(Registrant's Telephone Number, Including Area Code)

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 Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

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

Large accelerated filer	Accelerated filer
Non-accelerated filer (Do not check if a smaller reporting company)	Smaller reporting company
Emerging growth company	

If an emerging growth company, indicated 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 number of shares outstanding of the Registrant's Common Stock as of July 27, 2017 was 32,333,162.

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PART I — FINANCIAL INFORMATION

Item 1. Financial Statements

PDF SOLUTIONS, INC.

CONDENSED CONSOLIDATED BALANCE SHEETS

(unaudited)

(in thousands, except par value)

	June 30, 2017	**December 31, 2016**
ASSETS		
Current assets:		
Cash and cash equivalents	$109,007	$116,787
Accounts receivable, net of allowance of $324 and $200, respectively	54,029	48,157
Prepaid expenses and other current assets	8,813	5,335
Total current assets	171,849	170,279
Property and equipment, net	23,068	19,341
Goodwill	215	215
Intangible assets, net	3,847	4,223
Deferred tax assets	15,815	15,640
Other non-current assets	12,263	12,631
Total assets	$227,057	$222,329
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$2,270	$2,206
Accrued compensation and related benefits	5,863	5,959
Accrued and other current liabilities	2,075	2,080
Deferred revenues – current portion	8,933	8,189
Billings in excess of recognized revenue	389	88
Total current liabilities	19,530	18,522
Long-term income taxes payable	3,174	3,354
Other non-current liabilities	2,253	1,650
Total liabilities	24,957	23,526
Commitments and contingencies (Note 9)		
Stockholders' equity:		
	—	—

Preferred stock, $0.00015 par value, 5,000 shares authorized, no shares issued and outstanding		
Common stock, $0.00015 par value, 70,000 shares authorized: shares issued 39,187 and 38,514, respectively; shares outstanding 32,162 and 31,864, respectively	5	5
Additional paid-in-capital	289,956	281,423
Treasury stock at cost, 7,025 and 6,650 shares, respectively	(61,532)	(54,882)
Accumulated deficit	(25,046)	(25,752)
Accumulated other comprehensive loss	(1,283)	(1,991)
Total stockholders' equity	202,100	198,803
Total liabilities and stockholders' equity	$ 227,057	$ 222,329

See accompanying Notes to Condensed Consolidated Financial Statements (unaudited).

PDF SOLUTIONS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME

(unaudited)

(in thousands, except per share amounts)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Revenues:				
Design-to-silicon-yield solutions	$16,500	$20,574	$36,198	$39,152
Gainshare performance incentives	7,789	6,114	12,380	12,617
Total revenues	24,289	26,688	48,578	51,769
Costs of Design-to-silicon-yield solutions:				
Direct costs of Design-to-silicon-yield solutions	11,283	10,558	22,618	20,668
Amortization of acquired technology	96	96	192	192
Total cost of Design-to-silicon-yield solutions	11,379	10,654	22,810	20,860
Gross profit	12,910	16,034	25,768	30,909
Operating expenses:				
Research and development	7,276	7,060	14,557	13,371
Selling, general and administrative	6,195	5,094	12,095	10,218
Amortization of other acquired intangible assets	92	117	184	234
Total operating expenses	13,563	12,271	26,836	23,823
Income (loss) from operations	(653)	3,763	(1,068)	7,086
Interest and other income (expense), net	27	(51)	(202)	(287)
Income (loss) before income taxes	(626)	3,712	(1,270)	6,799
Income tax provision (benefit)	(815)	1,579	(1,976)	2,605
Net income	$189	$2,133	$706	$4,194
Net income per share:				
Basic	$0.01	$0.07	$0.02	$0.13
Diluted	$0.01	$0.07	$0.02	$0.13
Weighted average common shares:				
Basic	32,111	31,276	32,051	31,222
Diluted	33,388	32,099	33,491	31,927
Net income	$189	$2,133	$706	$4,194

Other comprehensive income:				
Foreign currency translation adjustments, net of tax	435	(186)	708	173
Comprehensive income	$624	$1,947	$1,414	$4,367

See accompanying Notes to Condensed Consolidated Financial Statements (unaudited).

PDF SOLUTIONS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS

(unaudited)

(in thousands)

	Six Months Ended June 30, 2017	2016
Operating activities:		
Net income	$706	$4,194
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	2,286	1,624
Stock-based compensation expense	5,788	4,957
Amortization of acquired intangible assets	376	425
Deferred taxes	(193)	1,023
Loss on disposal of property and equipment	5	107
Provision for (reversal of) allowance for doubtful accounts	124	(99)
Unrealized loss (gain) on foreign currency forward contract	33	(34)
Changes in operating assets and liabilities:		
Accounts receivable, net of allowance	(5,996)	(1,249)
Prepaid expenses and other current assets	(3,435)	(1,057)
Accounts payable	851	610
Accrued compensation and related benefits	(223)	346
Accrued and other liabilities	(745)	(223)
Deferred revenues	726	947
Billings in excess of recognized revenues	301	(955)
Other non-current assets	377	(7,852)
Net cash provided by operating activities	981	2,764
Investing activities:		
Purchases of property and equipment	(4,964)	(5,051)
Net cash used in investing activities	(4,964)	(5,051)
Financing activities:		
Proceeds from exercise of stock options	1,808	452
Proceeds from employee stock purchase plan	910	778
Purchases of treasury stock	(4,770)	(1,843)
Payments for taxes related to net share settlement of equity awards	(1,879)	(1,075)
Net cash (used in) provided by financing activities	(3,931)	(1,688)
Effect of exchange rate changes on cash and cash equivalents	134	39
Net change in cash and cash equivalents	(7,780)	(3,936)
Cash and cash equivalents, beginning of period	116,787	126,158
Cash and cash equivalents, end of period	$109,007	$122,222
Supplemental disclosure of cash flow information:		

Cash paid during the period for:		
Taxes	$1,339	$1,336
Property and equipment received and accrued in accounts payable and accrued and other liabilities	$1,726	$1,656

See accompanying Notes to Condensed Consolidated Financial Statements (unaudited).

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PDF SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

1. BASIS OF PRESENTATION

Basis of Presentation

The interim unaudited condensed consolidated financial statements included herein have been prepared by PDF Solutions, Inc. (the “Company”) pursuant to the rules and regulations of the Securities and Exchange Commission (“SEC”), including the instructions to the Quarterly Report on Form 10-Q and Article 10 of Regulation S-X. Certain information and footnote disclosures normally included in annual financial statements prepared in accordance with accounting principles generally accepted in the United States of America have been condensed or omitted. The interim unaudited condensed consolidated financial statements reflect, in the opinion of management, all adjustments necessary (consisting only of normal recurring adjustments), to present a fair statement of results for the interim periods presented. The operating results for any interim period are not necessarily indicative of the results that may be expected for other interim periods or the full fiscal year. The accompanying interim unaudited condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and notes thereto in the Company’s Annual Report on Form 10-K for the year ended December 31, 2016.

The condensed consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries after the elimination of all intercompany balances and transactions.

The condensed consolidated balance sheet at December 31, 2016, has been derived from the audited consolidated financial statements but does not include all disclosures required by accounting principles generally accepted in the United States of America.

Use of Estimates — The preparation of financial statements in conformity with generally accepted accounting principles in the United States (“U.S. GAAP”) requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Significant estimates in these financial statements include revenue recognition for fixed-price solution implementation service contracts, accounting for goodwill and intangible assets, stock-based compensation expense and accounting for income taxes. Actual results could differ from those estimates.

Revenue Recognition — The Company derives revenue from two sources: Design-to-silicon-yield solutions and Gainshare performance incentives.

Design-to-silicon-yield solutions — Revenues that are derived from Design-to-silicon-yield solutions come from services and software and hardware licenses. The Company recognizes revenue for each element of Design-to-silicon-yield solutions as follows:

The Company generates a significant portion of its Design-to-silicon-yield solutions revenue from fixed-price solution implementation service contracts delivered over a specific period of time. These contracts require reliable estimation of costs to perform obligations and the overall scope of each engagement. Revenue under project–based contracts for solution implementation services is recognized as services are performed using percentage of completion method of contract accounting based on costs or labor-hours input method, whichever is the most appropriate measure of the progress towards completion of the contract. Losses on fixed-price solution implementation contracts are recognized in the period when they become probable. Revisions in profit estimates are reflected in the period in which the conditions that require the revisions become known and can be estimated (cumulative catch-up method). Revenue under time and materials contracts for solution implementation services are recognized as the services are performed.

On occasion, the Company licenses its software products as a component of its fixed-price service contracts. In such instances, the software products are licensed to customers over a specified term of the agreement with support and maintenance to be provided, if applicable, over the license term. The amount of product and service revenue recognized in a given period is affected by the Company’s judgment as to whether an arrangement includes multiple deliverables and, if so, the Company’s determination of the fair value of each deliverable. In general, vendor-specific objective evidence of selling price (“VSOE”) does not exist for the Company’s solution implementation services and software products and because the Company’s services and products include our unique technology, the Company is not able to determine third-party evidence of selling price (“TPE”). Therefore, in such circumstances the Company uses best estimated selling prices (“BESP”) in the allocation of arrangement consideration. In determining BESP, the Company applies significant judgment as the Company’s weighs a variety of factors, based on the facts and circumstances of the arrangement. The Company typically arrives at BESP for a product or service that is not sold separately by considering company-specific factors such as geographies, internal costs, gross margin objectives, pricing practices used to establish bundled pricing, and existing portfolio pricing and discounting. After fair value is established for each deliverable, the total transaction amount is allocated to each deliverable based upon its relative selling price. Fees allocated to solution implementation services are recognized using the percentage of completion method of contract accounting. Fees allocated to software and related support and maintenance are recognized under software revenue recognition guidance.

In some instances, the Company also licenses its DFI system as a separate component of fixed-price service contracts. The Company allocates revenue to all deliverables based on their relative selling prices. The Company currently does not have VSOE for its DFI system, thus the Company uses either TPE or BESP in the allocation of arrangement consideration.

The Company defers certain pre-contract costs incurred for specific anticipated contracts. Deferred costs consist primarily of direct costs to provide solution implementation services in relation to the specific anticipated contracts. The Company recognizes such costs as a component of cost of revenues, the timing of which is dependent upon persuasive evidence of contract arrangement assuming all other revenue recognition criteria are met. The Company also defers costs from arrangements that required us to defer the revenues, typically due to revenue recognition from multi-element arrangements or from contracts subject to customer acceptance. These costs are recognized in proportion to the related revenue. At the end of the reporting period, the Company evaluates its deferred costs for their probable recoverability. The Company recognizes impairment of deferred costs when it is determined that the costs no longer have future benefits and are no longer recoverable. Deferred costs balance was \$1.1 million and \$0.5 million as of June 30, 2017 and December 31, 2016, respectively. The balance was included in prepaid expenses and other current assets and other non-current assets in the accompanying consolidated balance sheets.

The Company also licenses its software products separately from solution implementations. For software license arrangements that do not require significant modification or customization of the underlying software, software license revenue is recognized under the residual method when (l) persuasive evidence of an arrangement exists, (2) delivery has occurred, (3) the fee is fixed or determinable, (4) collectability is probable, and (5) the arrangement does not require services that are essential to the functionality of the software. When arrangements include multiple elements such as support and maintenance, consulting (other than for fixed price solution implementations), installation, and training, revenue is allocated to each element of a transaction based upon its fair value as determined by the Company's VSOE and such services are recorded as services revenue. VSOE for maintenance is generally established based upon negotiated renewal rates while VSOE for consulting, installation, and training services is established based upon the Company's customary pricing for such services when sold separately. When software is licensed for a specified term, fees for support and maintenance are generally bundled with the license fee over the entire term of the contract. The Company is unable to establish VSOE of fair value for maintenance services that are generally bundled with term licenses. In these cases, the Company recognizes revenue ratably over the term of the contract. For multiple-element arrangements containing non-software services, the Company: (1) determines whether each element constitutes a separate unit of accounting; (2) determines the fair value of each element using the selling price hierarchy of VSOE, TPE or BESP, as applicable; and (3) allocates the total price to each separate unit of accounting based on the relative selling price method. An element constitutes a separate unit of accounting when the delivered item has standalone value and delivery of the undelivered element is probable and within our control. For multiple-element arrangements that contain both software and non-software elements, the Company allocates revenue to software or software-related elements as a group and any non-software elements separately based on the selling price hierarchy of VSOE, TPE or BESP. Once revenue is allocated to software or software-related elements as a group, we recognize revenue in conformance with software revenue accounting guidance. Revenue is recognized when revenue recognition criteria are met for each element.

Revenue from software-as-a-service (SaaS) that allow for the use of a hosted software product or service over a contractually determined period of time without taking possession of software are accounted for as subscriptions and recognized as revenue ratably over the coverage period beginning on the date the service is made available to customers. Revenue for software licenses with extended payment terms is not recognized in excess of amounts due. For software license arrangements that require significant modification or customization of the underlying software, the software license revenue is recognized as services are performed using the percentage of completion method of contract accounting, and such revenue is recorded as services revenue.

Deferred revenues consist substantially of amounts invoiced in advance of revenue recognition and is recognized as the revenue recognition criteria are met. Deferred revenues that will be recognized during the succeeding 12 month period is recorded as current deferred revenues and the remaining portion is recorded as non- current deferred revenues. Non-current portion of deferred revenue was $1.5 million and $1.5 million, respectively, as of June 30, 2017 and December 31, 2016. This balance was recorded in the other non-current liabilities in the accompanying consolidated balance sheets.

Gainshare Performance Incentives — When the Company enters into a contract to provide yield improvement services, the contract usually includes two components: (1) a fixed fee for performance by the Company of services delivered over a specific period of time; and (2) a Gainshare performance incentive component where the customer may pay a contingent variable fee, usually after the fixed fee period has ended. Revenue derived from Gainshare performance incentives represents profit sharing and performance incentives earned contingent upon the Company's customers reaching certain defined operational levels established in related solution implementation service contracts. Gainshare performance incentives periods are usually subsequent to the delivery of all contractual services and therefore have virtually no cost to the Company. Due to the uncertainties surrounding attainment of such operational levels, the Company recognizes Gainshare performance incentives revenue (to the extent of completion of the related solution implementation contract) upon receipt of performance reports or other related information from the customer supporting the determination of amounts and probability of collection.

2. RECENT ACCOUNTING PRONOUNCEMENTS

In May 2014, the FASB issued ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606) as modified by ASU No. 2015-14, Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date, ASU 2016-08, Revenue from Contracts with Customers (Topic 606): Principal versus Agent Considerations (Reporting Revenue Gross versus Net), ASU No. 2016-10, Revenue from Contracts with Customers (Topic 606): Identifying Performance Obligations and Licensing, ASU No. 2016-11, Revenue Recognition (Topic 605) and Derivatives and Hedging (Topic 815), ASU No. 2016-12, Revenue from Contracts with Customers (Topic 606): Narrow-Scope Improvements and Practical Expedients, and ASU 2016-20, Revenue from Contracts with Customers (Topic 606): Technical Corrections and Improvements. The new revenue recognition standard provides a five-step analysis of transactions to determine when and how revenue is recognized. The core principle is that a company should recognize revenue to reflect the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. This new standard is effective for annual periods beginning after December 15, 2017, including interim periods within that reporting period. The new standard also permits two methods of adoption: retrospectively to each prior reporting period presented (full retrospective method), or retrospectively with the cumulative effect of initially applying the guidance recognized at the date of initial application (the modified retrospective method). The Company has not yet selected a transition method nor has it determined the effect of the standard on its ongoing financial reporting

In February 2016, the Financial Accounting Standards Board (or FASB) issued ASU No. 2016-02, Leases (Topic 842). The update requires that most leases, including operating leases, be recorded on the balance sheet as an asset and a liability, initially measured at the present value of the lease payments. Subsequently, the lease asset will be amortized generally on a straight-line basis over the lease term, and the lease liability will bear interest expense and be reduced for lease payments. The amendments in this update are effective for public companies' financial statements issued for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. The Company is still in the process of evaluating the impact of adopting this new accounting standard on its consolidated financial statements and footnote disclosures.

In August 2016, the FASB issued ASU No. 2016-15, Classification of Certain Cash Receipts and Cash Payments. The purpose of this standard is to clarify the treatment of several cash flow categories. This update is effective for annual periods beginning after December 15, 2017, and interim periods within those fiscal years, with early adoption permitted, including adoption in an interim period. The adoption of this standard is not expected to have a material impact on our financial statements and footnote disclosures.

In January 2017, the FASB issued ASU No. 2017-01, Business Combinations : Clarifying the Definition of a Business, which narrows the existing definition of a business and provides a framework for evaluating whether a transaction should be accounted for as an acquisition (or disposal) of assets or a business.
The guidance is effective for fiscal years beginning after December 15, 2017, with early adoption permitted. The Company is currently assessing the impact that adopting this new accounting standard will have on its consolidated financial statements and footnote disclosures.

In January 2017, the FASB issued ASU No. 2017-04, Intangibles - Goodwill and Other (Topic 350) (“ASU No. 2017-04”). ASU No. 2017-04 eliminates step 2 from the annual goodwill impairment test. This update is effective for annual periods beginning after December 15, 2019, and interim periods within those fiscal years, with early adoption permitted, and is to be applied on a prospective basis. The Company is currently assessing the impact that adopting this new accounting standard will have on its consolidated financial statements and footnote disclosures.

In May 2017, the FASB issued ASU No. 2017-09, Compensation-Stock Compensation (Topic 718) Scope of Modification Accounting (“ASU No. 2017-09”). ASU No. 2017-09 clarifies which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting in Topic 718. The standard is effective for interim and annual reporting periods beginning after December 15, 2017, with early adoption permitted. The adoption of this standard will impact modifications that happen after the adoption date.

3. BALANCE SHEET COMPONENTS

Accounts receivable include amounts that are unbilled at the end of the period that are expected to be billed and collected within 12-month period. Unbilled accounts receivable are primarily determined on an individual contract basis. Unbilled accounts receivable, included in accounts receivable, totaled $21.0 million and $20.8 million as of June 30, 2017 and December 31, 2016, respectively. Unbilled accounts receivable that are not expected to be billed and collected during the succeeding 12-month period are recorded in other non-current assets and totaled $9.7 million and $9.8 million as of June 30, 2017 and December 31, 2016, respectively. Deferred costs balance was $1.1 million and $0.5 million as of June 30, 2017 and December 31, 2016, respectively. The balance was included in prepaid expense and other current assets and other non-current assets in the accompanying balance sheets.

Property and equipment, net consists of (in thousands):

	June 30, 2017	**December 31, 2016**
Property and equipment, net:		
Computer equipment	$10,735	$10,642
Software	3,341	1,679
Furniture, fixtures and equipment	1,821	1,185
Leasehold improvements	1,972	1,132
Test equipment	12,597	11,723
Construction-in-progress	11,128	9,550
	41,594	35,911
Less: accumulated depreciation	(18,526)	(16,570)
Total	$23,068	$19,341

Depreciation and amortization expense was $1.2 million and $0.9 million for the three months ended June 30, 2017 and 2016, respectively. Depreciation and amortization expense was $2.3 million and $1.6 million for the six months ended June 30, 2017 and 2016, respectively.

As of both June 30, 2017 and December 31, 2016, the carrying amount of goodwill was $0.2 million. The following is a rollforward of the Company's goodwill balance (in thousands):

	June 30, 2017
Balance as of December 31, 2016	$215
Add: Goodwill from acquisition	—
Adjustment	—
Balance as of June 30, 2017	$215

Intangible assets balance was $3.8 million and $4.2 million as of June 30, 2017 and December 31, 2016, respectively. Intangible assets as of June 30, 2017 and December 31, 2016 consist of the following (in thousands):

		June 30, 2017			**December 31, 2016**		
	Amortization	**Gross**	**Accumulated**	**Net**	**Gross**	**Accumulated**	**Net**

	Period (Years)	Carrying Amount	Amortization	Carrying Amount	Carrying Amount	Amortization	Carrying Amount
Acquired identifiable intangibles:							
Customer relationships	1 - 9	$5,920	$ (3, 964)	$ 1,956	$5,920	$ (3,825)	$ 2,095
Developed technology	4 - 6	14,100	(12,551)	1,549	14,100	(12,359)	1,741
Tradename	2 - 4	610	(608)	2	610	(583)	27
Backlog	1	100	(100)	-	100	(100)	-
Patent	7 - 10	1,800	(1,460)	340	1,800	(1,440)	360
Other acquired intangibles	4	255	(255)	-	255	(255)	-
Total		$22,785	$ (18,938)	$ 3,847	$22,785	$ (18,562)	$ 4,223

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The weighted average amortization period for acquired identifiable intangible assets was 5.97 years as of June 30, 2017. For both the three months ended June 30, 2017 and 2016, intangible asset amortization expense was $0.2 million. For both the six months ended June 30, 2017 and 2016, intangible asset amortization expense was $0.4 million. The Company expects annual amortization of acquired identifiable intangible assets to be as follows (in thousands):

Period Ending June 30,	
2017 (remaining 6 months)	$353
2018	701
2019	701
2020	701
2021	526
2022 and thereafter	865
Total future amortization expense	$3,847

Intangible assets are amortized over their useful lives unless these lives are determined to be indefinite. Intangible assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset or asset group may not be recoverable. During the three and six months ended June 30, 2017, there were no indicators of impairment related to the Company’s intangible assets.

4. STOCKHOLDERS’ EQUITY

Stock-based compensation is estimated at the grant date based on the award’s fair value and is recognized on a straight-line basis over the vesting periods, generally four years. Stock-based compensation expense before taxes related to the Company’s stock plans and employee stock purchase plan was allocated as follows (in thousands):

	Three Months Ended June 30,		**Six Months Ended June 30,**	
	2017	**2016**	**2017**	**2016**
Cost of design-to-silicon yield-solutions	$1,069	$956	$2,261	$2,041
Research and development	848	651	1,682	1,357
Selling, general and administrative	987	684	1,845	1,559
Stock-based compensation expenses	$2,904	$2,291	$5,788	$4,957

On June 30, 2017, the Company had the following stock-based compensation plans:

Stock Plans — At the annual meeting of stockholders on November 16, 2011, the Company's stockholders approved the 2011 Stock Incentive Plan, which was amended and restated (i) at the annual meeting of stockholders on May 28, 2013, when the Company's stockholders approved the First Amended and Restated 2011 Stock Incentive Plan, (ii) at the annual meeting of stockholders on May 27, 2014, when the Company's stockholders approved the Second Amended and Restated 2011 Stock Incentive Plan, (iii) at the annual meeting of stockholders on May 31, 2016, when the Company's stockholders approved the Third Amended and Restated 2011 Stock Incentive Plan, (iv) at the annual meeting of stockholders on May 31, 2017,when the Company's stockholders approved the Fourth Amended and Restated 2011 Stock Incentive Plan (as amended, the "2011 Plan"). Under the 2011 Plan, the Company may award stock options, stock appreciation rights, stock grants or stock units covering shares of the Company's common stock to employees, directors, non-employee directors and contractors. The aggregate number of shares reserved for awards under this plan is 9,050,000 shares, plus up to 3,500,000 shares previously issued under the 2001 Plan that are forfeited or repurchased by the Company or shares subject to awards previously issued under the 2001 Plan that expire or that terminate without having been exercised or settled in full on or after November 16, 2011. In case of awards other than options or stock appreciation rights, the aggregate number of shares reserved under the plan will be decreased at a rate of 1.33 shares issued pursuant to such awards. The exercise price for stock options must generally be at prices no less than the fair market value at the date of grant. Stock options generally expire ten years from the date of grant and become vested and exercisable over a four-year period.

In 2001, the Company adopted a 2001 Stock Plan (the "2001 Plan"). In 2003, in connection with its acquisition of IDS Systems Inc., the Company assumed IDS' 2001 Stock Option / Stock Issuance Plan (the "IDS Plan"). Both of the 2001Plan and the IDS Plans expired in 2011. Stock options granted under the 2001 and IDS Plans generally expire ten years from the date of grant and become vested and exercisable over a four-year period. Although no new awards may be granted under the 2001 or IDS Plans, awards made under the 2001 and IDS Plans that are currently outstanding remain subject to the terms of each such plan, respectively.

The Company estimated the fair value of share-based awards granted under the 2011 Stock Plan during the period using the Black-Scholes-Merton option-pricing model with the following weighted average assumptions, resulting in the following weighted average fair values:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Expected life (in years)	4.41	4.42	4.41	4.42
Volatility	41.63%	43.58%	41.53%	44.26%
Risk-free interest rate	1.67 %	1.30 %	1.69 %	1.25 %
Expected dividend	—	—	—	—
Weighted average fair value per share of options granted during the period	$5.98	$5.00	$6.16	$4.46

As of June 30, 2017, 9.6 million shares of common stock were reserved to cover stock-based awards under the 2011 Plan, of which 2.5 million shares were available for future grant. The number of shares reserved and available under the 2011 Plan includes 0.5 million shares that were subject to awards previously made under the 2001 Plan and were forfeited, expired or repurchased by the Company after adoption of the 2011 Plan through June 30, 2017. As of June 30, 2017, there were no outstanding awards that had been granted outside of the 2011 Plan, 2001 Plan or the IDS Plan (collectively, the " Stock Plans").

Stock option activity under the Company's Stock Plans during the six months ended June 30, 2017, was as follows:

	Number of Options (in thousands)	Weighted Average Exercise Price per Share	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value (in thousands)
Outstanding, January 1, 2017	1,364	$ 8.00		
Granted (weighted average fair value of $6.16 per share)	96	$ 17		
Exercised	(257)	$ 7.04		
Canceled	(3)	$ 17.80		
Expired	-	$ -		
Outstanding, June 30, 2017	1,200	$ 8.89	4.78	$ 9,288
Vested and expected to vest, June 30, 2017	1,182	$ 8.78	4.71	$ 9,271
Exercisable, June 30, 2017	989	$ 7.42	3.86	$ 9,010

The aggregate intrinsic value in the table above represents the total intrinsic value based on the Company's closing stock price of $16.45 per share as of June 30, 2017. The total intrinsic value of options exercised during the six months ended June 30, 2017, was $3.1 million.

As of June 30, 2017, there was $1.0 million of total unrecognized compensation cost related to unvested stock options. That cost is expected to be recognized over a weighted average period of 3.4 years. The total fair value of shares vested during the six months ended June 30, 2017, was $0.2 million.

Nonvested restricted stock units activity during the six months ended June 30, 2017, was as follows:

	Shares (in thousands)	**Weighted Average Grant Date Fair Value Per Share**
Nonvested, January 1, 2017	1,542	$ 15.50
Granted	751	$ 16.56
Vested	(317)	$ 16.36
Forfeited	(20)	$ 15.70
Nonvested, June 30, 2017	1,956	$ 15.76

As of June 30, 2017, there was $26.1 million of total unrecognized compensation cost related to nonvested restricted stock units. That cost is expected to be recognized over a weighted average period of 3 years. Restricted stock units do not have rights to dividends prior to vesting.

Employee Stock Purchase Plan — In July 2001, the Company adopted a ten-year Employee Stock Purchase Plan (as amended, the "Purchase Plan") under which eligible employees can contribute up to 10% of their compensation, as defined in the Purchase Plan, towards the purchase of shares of PDF common stock at a price of 85% of the lower of the fair market value at the beginning of the offering period or the end of the purchase period. The Purchase Plan consists of twenty-four-month offering periods with four six-month purchase periods in each offering period. Under the Purchase Plan, on January 1 of each year, starting with 2002, the number of shares reserved for issuance will automatically increase by the lesser of (1) 675,000 shares, (2) 2% of the Company's outstanding common stock on the last day of the immediately preceding year, or (3) the number of shares determined by the board of directors. At the annual meeting of stockholders on May 18, 2010, the Company's stockholders approved an amendment to the Purchase Plan to extend it through May 17, 2020.

The Company estimated the fair value of purchase rights granted under the Purchase Plan during the period using the Black-Scholes-Merton option-pricing model with the following weighted average assumptions, resulting in the following weighted average fair values:

	Six Months Ended June 30,	
	2017	**2016**
Expected life (in years)	1.25	1.25
Volatility	33.32%	44.15%
Risk-free interest rate	0.93 %	0.50 %
Expected dividend	—	—
Weighted average fair value per share of options granted during the period	$6.78	$3.56

During the three months ended June 30, 2017 and 2016, the Company did not issue any shares under the Purchase Plan. During the six months ended June 30, 2017 and 2016, a total of 100,000 and 84,000 shares, respectively, were issued at a weighted-average purchase price of $9.13 and $9.21 per share, respectively. As of June 30, 2017, there was $0.6 million of unrecognized compensation cost related to the Purchase Plan. That cost is expected to be recognized over a weighted average period of 0.89 years. As of June 30, 2017, 4.4 million shares were available for future issuance under the Purchase Plan.

Stock Repurchase Program —On October 25, 2016, the Board of Directors adopted a program, effective immediately, to repurchase up to $25.0 million of the Company's common stock both on the open market and in privately negotiated transactions over the next two years. During the three and six months ended June 30, 2017, the Company repurchased

276,279 shares under this program. As of June 30, 2017, 276,279 shares had been repurchased at an average price of $17.27 per share under this program for a total purchase of $4.8 million, and $20.2 million remained available for future repurchases.

5. INCOME TAXES

Income tax provision decreased $4.6 million for the six months ended June 30, 2017, to $2.0 million income tax benefit as compared to an income tax provision of $2.6 million for the six months ended June 30, 2016. The Company’s effective tax rate was 155.6% and 38.3% for the six months ended June 30, 2017 and 2016, respectively. The Company’s effective tax rate increased in the six months ended June 30, 2017, as compared to the same period in 2016, primarily due to the recognition of excess tax benefits related to employee stock compensation of $1.1 million as well as the decrease in income.

The Company’s total amount of unrecognized tax benefits, excluding interest and penalties, as of June 30, 2017, was $11.5 million, of which $6.9 million, if recognized, would decrease the Company’s effective tax rate. The Company’s total amount of unrecognized tax benefits, excluding interest and penalties, as of December 31, 2016, was $11.9 million, of which $7.2 million, if recognized, would affect the Company's effective tax rate. As of June 30, 2017, the Company had recorded unrecognized tax benefits of $2.6 million, including interest and penalties, as long-term taxes payable in its condensed consolidated balance sheet. The remaining $9.3 million has been recorded net of our deferred tax assets, of which $4.6 million is subject to a full valuation allowance.

The valuation allowance was approximately $6.5 million and $6.8 million as of June 30, 2017 and December 31, 2016, respectively, which was related to California R&D tax credits and California net operating losses related to our acquisition of Syntricity that we currently do not believe are more likely than not to be ultimately realized.

The Company conducts business globally and, as a result, files numerous consolidated and separate income tax returns in the U.S. federal, various state and foreign jurisdictions. Because the Company used some of the tax attributes carried forward from previous years to tax years that are still open, statutes of limitation remain open for all tax years to the extent of the attributes carried forward into tax year 2002 for federal and California tax purposes. The Company is not subject to income tax examinations in any of its major foreign subsidiaries' jurisdictions.

6. NET INCOME PER SHARE

Basic net income per share is computed by dividing net income by weighted average number of common shares outstanding for the period (excluding outstanding stock options and shares subject to repurchase). Diluted net income per share is computed using the weighted-average number of common shares outstanding for the period plus the potential effect of dilutive securities which are convertible into common shares (using the treasury stock method), except in cases in which the effect would be anti-dilutive. The following is a reconciliation of the numerators and denominators used in computing basic and diluted net income per share (in thousands except per share amount):

	Three Months Ended June 30,		**Six Months Ended June 30,**	
	2017	**2016**	**2017**	**2016**
Numerator:				
Net income	$189	$2,133	$706	$4,194
Denominator:				
Basic weighted average common shares outstanding	32,111	31,276	32,051	31,222
Dilutive effect of equity incentive plans	1,277	823	1,440	705
Diluted weighted average common shares outstanding	33,388	32,099	33,491	31,927
Net income per share:				
Basic	$0.01	$0.07	$0.02	$0.13
Diluted	$0.01	$0.07	$0.02	$0.13

The following table sets forth potential shares of common stock that are not included in the diluted net income per share calculation above because to do so would be anti-dilutive for the periods indicated (in thousands):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	**2016**	**2017**	**2016**
Outstanding options	102	230	79	264
Nonvested restricted stock units	13	348	4	798
Employee Stock Purchase Plan	27	—	29	230
Total	142	578	112	1,292

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7. CUSTOMER AND GEOGRAPHIC INFORMATION

Operating segments are defined as components of an enterprise about which separate financial information is available that is evaluated regularly by the chief operating decision maker, or group, in deciding how to allocate resources and in assessing performance.

The Company’s chief operating decision maker, the chief executive officer, reviews discrete financial information presented on a consolidated basis for purposes of regularly making operating decisions, allocation of resources, and assessing financial performance. Accordingly, the Company considers itself to be in one operating and reporting segment, specifically the licensing and implementation of yield improvement solutions for integrated circuits manufacturers.

The Company had revenues from individual customers in excess of 10% of total revenues as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
Customer	**2017**	**2016**	**2017**	**2016**
A	36%	39 %	42%	44 %
B	15%	* %	10%	* %
C	* %	* %	* %	12 %
D	* %	13 %	* %	* %

* represents less than 10%

The Company had gross accounts receivable from individual customers in excess of 10% of gross accounts receivable as follows:

Customer	**June 30, 2017**	**December 31, 2016**
A	41 %	42 %

B	19 %	13 %

* represents less than 10%

Revenues from customers by geographic area based on the location of the customers' work sites are as follows (in thousands):

	Three Months Ended June 30,			
	2017		2016	
	Revenues	Percentage of Revenues	Revenues	Percentage of Revenues
United States	$9,226	38 %	$9,518	36 %
China	4,753	20	1,499	6
Taiwan	3,643	15	5,725	21
Germany	1,794	7	3,994	15
Rest of the world	4,873	20	5,952	22
Total revenue	$24,289	100 %	$26,688	100 %

	Six Months Ended June 30,			
	2017		2016	
	Revenues	Percentage of Revenues	Revenues	Percentage of Revenues
United States	$20,860	43 %	$21,640	42 %
Taiwan	7,480	15	7,909	15
China	6,440	13	2,598	5
Germany	4,102	8	7,028	14
South Korea	3,620	7	5,497	11
Rest of the world	6,076	14	7,097	13
Total revenue	$48,578	100 %	$51,769	100 %

Long-lived assets, net by geographic area are as follows (in thousands):

	June 30, 2017	December 31, 2016
United States	$22,501	$ 18,818
Rest of the world	568	523
Total long-lived assets, net	$23,068	$ 19,341

8. FAIR VALUE MEASUREMENTS

Fair value is the exit price, or the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants as of the measurement date. The multiple assumptions used to value financial instruments are referred to as inputs, and a hierarchy for inputs used in measuring fair value is established, that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring that the most observable inputs be used when available. Observable inputs reflect assumptions market participants would use in pricing an asset or liability based on market data obtained from independent sources while unobservable inputs reflect a reporting entity's pricing based upon its own market assumptions. These inputs are ranked according to a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels.

Level 1 -	Inputs are quoted prices in active markets for identical assets or liabilities.
Level 2 -	Inputs are quoted prices for similar assets or liabilities in an active market, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable and market-corroborated inputs which are derived principally from or corroborated by observable market data.
Level 3 -	Inputs are derived from valuation techniques in which one or more significant inputs or value drivers are unobservable.

The following table represents the Company's assets measured at fair value on a recurring basis as of June 30, 2017, and the basis for that measurement (in thousands):

Assets	Total	Quoted	Significant Other	Significant Unobservable

		Prices in Active Markets for Identical Assets (Level 1)	Observable Inputs (Level 2)	Inputs (Level 3)
Money market mutual funds	$26,522	$ 26,522	$ —	$ —

The following table represents the Company's assets measured at fair value on a recurring basis as of December 31, 2016, and the basis for that measurement (in thousands):

Assets	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Money market mutual funds	$26,456	$ 26,456	$ —	$ —

The Company enters into foreign currency forward contracts to reduce the exposure to foreign currency exchange rate fluctuations on certain foreign currency denominated monetary assets and liabilities, primarily on third-party accounts payables and intercompany balances. The primary objective of the Company's hedging program is to reduce volatility of earnings related to foreign currency exchange rate fluctuations. The counterparty to these foreign currency forward contracts is a large global financial institution that the Company believes is creditworthy, and therefore, the Company believes the credit risk of counterparty nonperformance is not significant. These foreign currency forward contracts are not designated for hedge accounting treatment. Therefore, the change in fair value of these contracts is recorded into earnings as a component of other income (expense), net, and offsets the change in fair value of the foreign currency denominated assets and liabilities, which is also recorded in other income (expense), net. For the three months ended June 30, 2017 and 2016, the Company recognized a realized gain of $0.4 million and a realized loss of $0.3 million on the contracts, respectively, which was recorded in other income (expense), net in the Company's Statements of Operations and Comprehensive Income. For the six months ended June 30, 2017 and 2016, the Company recognized a realized gain of $0.5 million and $8,000 on the contracts, respectively, which was recorded in other income (expense), net in the Company's Statement of Operations and Comprehensive Income.

The Company carries these derivatives financial instruments on its Consolidated Balance Sheets at their fair values. The Company's foreign currency forward contracts are classified as Level 2 because it is not actively traded and the valuation inputs are based on quoted prices and market observable data of similar instruments. As of June 30, 2017, the Company had one outstanding forward contract with a notional amount of $7.7 million and recorded $48,000 other current liabilities associated with this outstanding forward contract. As of December 31, 2016, the Company had one outstanding forward contract with a notional amount of $6.9 million and had recorded $15,000 other current liabilities associated with the outstanding forward contract.

9. COMMITMENTS AND CONTINGENCIES

Leases

The Company leases administrative and sales offices and certain equipment under noncancelable operating leases, which contain various renewal options and, in some cases, require payment of common area costs, taxes and utilities. These operating leases expire at various times through 2024. Rent expense was $0.6 million for the both three months ended June 30, 2017 and 2016, respectively. Rent expense was $1.1 million and $1.2 million for the six months ended June 30, 2017 and 2016.

Future minimum lease payments under noncancelable operating leases at June 30, 2017, are as follows (in thousands):

Period Ending June 30,	Amount
2017 (remaining six months)	$ 936
2018	1,329
2019	448
2020	381
2021	297
2022 and thereafter	75
Total future minimum lease payments	$ 3,466

Indemnifications — The Company generally provides a warranty to its customers that its software will perform substantially in accordance with documented specifications typically for a period of 90 days following delivery of its products. The Company also indemnifies certain customers from third-party claims of intellectual property infringement relating to the use of its products. Historically, costs related to these guarantees have not been significant. The Company is unable to estimate the maximum potential impact of these guarantees on its future results of operations.

Purchase obligations — The Company has purchase obligations with certain suppliers for the purchase of goods and services entered in the ordinary course of business. As of June 30, 2017, total outstanding purchase obligations were $8.1 million, which are primarily due within the next 12 months.

Indemnification of Officers and Directors — As permitted by the Delaware general corporation law, the Company has included a provision in its certificate of incorporation to eliminate the personal liability of its officers and directors for monetary damages for breach or alleged breach of their fiduciary duties as officers or directors, other than in cases of fraud or other willful misconduct.

In addition, the Bylaws of the Company provide that the Company is required to indemnify its officers and directors even when indemnification would otherwise be discretionary, and the Company is required to advance expenses to its officers and directors as incurred in connection with proceedings against them for which they may be indemnified. The Company has entered into indemnification agreements with its officers and directors containing provisions that are in some respects broader than the specific indemnification provisions contained in the Delaware general corporation law. The indemnification agreements require the Company to indemnify its officers and directors against liabilities that may arise by reason of their status or service as officers and directors other than for liabilities arising from willful misconduct of a culpable nature, to advance their expenses incurred as a result of any proceeding against them as to which they could be indemnified, and to obtain directors' and officers' insurance if available on reasonable terms. The Company has obtained directors' and officers' liability insurance in amounts comparable to other companies of the Company's size and in the Company's industry. Since a maximum obligation of the Company is not explicitly stated in the Company's Bylaws or in its indemnification agreements and will depend on the facts and circumstances that arise out of any future claims, the overall maximum amount of the obligations cannot be reasonably estimated.

Litigation — From time to time, the Company is subject to various claims and legal proceedings that arise in the ordinary course of business. The Company accrues for losses related to litigation when a potential loss is probable and the loss can be reasonably estimated in accordance with FASB requirements. As of June 30, 2017, the Company was not party to any material legal proceedings, thus no loss was probable and no amount was accrued.

10. SUBSEQUENT EVENT

On July 11, 2017, the Company completed the transaction with Realtime Performance Europe B.V. (doing business as Kinesys Software), a Dutch provider of automation software to the semiconductor industry, to acquire certain assets from Kinesys Software for approximately $4.5 million, plus the assumption of the assumed liabilities. Further, up to an additional $0.6 million of earn-out in cash would be payable upon the completion of certain milestones. The Company is reviewing information surrounding the determination of the fair values of assets acquired and liabilities assumed.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

Forward-Looking Statements

The following discussion of our financial condition and results of operations contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. All statements other than statements of historical fact may be forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as "may," "could," "should," "expect," "plan," "anticipate," "beli "estimate," "predict," "potential", "target" or "continue," the negative effect of terms like these or other similar expressions. An statement concerning future financial performance (including future revenues, earnings or growth rates), ongoing business strategies or prospects, and possible actions taken by us or our subsidiaries, which may be provided by us are also forward-looking statements. These forward-looking statements are only predictions. Forward-looking statements are based on current expectations and projections about future events and are inherently subject to a variety of risks and uncertainties, many of which are beyond our control, which could cause actual results to differ materially from those anticipated or projected. All forward-looking statements included in this document are based on information available to us on the date of filing and we further caution investors that our business and financial performance are subject to substantial risks and uncertainties. We assume no obligation to update any such forward-looking statements. In evaluating these statements, you should specifically consider various factors, including the risk factors set forth in Item 1. "Business" and Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our Annual Report on Form 10-K for the year ended December 31, 2016, filed with the Securities and Exchange Commission on March 8, 2017. All references to "we", "us", "our", "PDF", "PDF Solutions" or "the Company" refer to PDF Solutions, Inc.

Overview

We analyze our customers' IC design and manufacturing processes to identify, quantify, and correct the issues that cause yield loss to improve our customers' profitability by improving time-to-market, increasing yield and reducing total design and manufacturing costs. We package our solutions in various ways to meet our customers' specific business and budgetary needs, each of which provides us various revenue streams. We receive a mix of fixed fees and variable, performance-based fees for the vast majority of our yield improvement solutions. The fixed fees are typically reflective of the length of time and the resources needed to characterize a customer's manufacturing process and receive preliminary results of proposed yield improvement suggestions. The variable fee, or what we call Gainshare, usually depends on our achieving certain yield targets by a deadline. Variable fees are currently typically tied to wafer volume on the node size of the manufacturing facility where we performed the yield improvement solutions. We receive license fees and service fees for related installation, integration, training, and maintenance and support services for our software that we license on a stand-alone basis.

Industry Trend

Consistent with the trend since 2010, we expect that the largest logic foundries will continue to invest significantly in leading edge nodes and capacity throughout 2017. Leading foundries continue to invest in new technologies such as multi-patterned lithography and 3-D transistor architecture. In addition, China's investment in semiconductors should accelerate the growth of the industry in the next few years. These provide opportunities to increase our business.

Capacity utilization for 28nm logic thus far in 2017 has been lower overall, and mixed across foundries. We believe that industry 28nm utilization will increase during the remainder of 2017, and additional China 28nm production. 14nm logic production is also expected to increase in 2017. We expect our Gainshare results to be consistent with those general market trends. Gainshare revenue will continue to fluctuate quarter to quarter despite these utilization trends as our Gainshare revenue depends on many factors, including the average selling price of wafers subject to Gainshare and volume.

Generally, the demand for consumer electronics and communications devices continues to drive technological innovation in the semiconductor industry as the need for products with greater performance, lower power consumption, reduced costs and smaller size continues to grow with each new product generation. In addition, advances in computing systems and mobile devices have fueled demand for higher capacity memory chips. To meet these demands, IC manufacturers and designers are constantly challenged to improve the overall performance of their ICs by designing and manufacturing ICs with more embedded applications to create greater functionality while lowering cost per transistor. As a result, both logic and memory manufacturers have migrated to more and more advanced manufacturing nodes, capable of integrating more devices with higher performance, higher density, and lower power. As this trend continues, companies will continually be challenged to improve process capabilities to optimally produce ICs with minimal random and systematic yield loss, which is driven by the lack of compatibility between the design and its respective manufacturing process. We believe that as volume production of deep submicron ICs continues to grow, the difficulties of integrating IC designs with their respective processes and ramping new manufacturing processes will create a greater need for products and services like ours that address the yield loss and escalating cost issues the semiconductor industry is facing today and will face in the future.

Customer Contracts

Although a substantial portion of our total revenues are concentrated in a small number of customers, the total revenues for each of these customers in any period is the result of Design-to-silicon-yield solutions and Gainshare performance incentives revenues recognized in the period under multiple, separate contracts, with no interdependent performance obligations. These contracts were all entered into in the ordinary course of our business and contain general terms and conditions that are standard across most of our yield improvement solutions customers, including providing services typically targeted to one manufacturing process node, for example the 28 or 20 nanometer node. Fluctuations in future results may occur if any of these customers renegotiate pre-existing contractual commitments due to adverse changes in their own business. See the additional discussion in Part I, Item 1, "Customers," on page 9 of our Annual Report on Form 10-K for the year ended December 31, 2016, and in Item 1A, "Risk Factors," on pages 13 through 20 of our Annual Report on Form 10-K for the year ended December 31, 2016, for related information on the risks associated with customer concentration and Gainshare performance incentives revenue.

Financial Highlights

Financial highlights for the three months ended June 30, 2017, were as follows:

- Total revenues for the three months ended June 30, 2017, were $24.3 million, a decrease of $2.4 million, or 9%, compared to $26.7 million for the three months ended June 30, 2016. Design-to-silicon-yield solutions revenue for the three months ended June 30, 2017, was $16.5 million, a decrease of $4.1 million, or 20%, when compared to Design-to-silicon yield solutions revenue of $20.6 million for the three months ended June 30, 2016. The decrease in Design-to-silicon-yield solutions was primarily due to a delay in purchases by new and existing customers. Gainshare performance incentives revenue for the three months ended June 30, 2017, was $7.8 million, an increase of $1.7 million, or 27%, compared to $6.1 million for the three months ended June 30, 2016. The increase in revenue from Gainshare performance incentives was primarily the result of higher Gainshare from 14nm volumes, partially offset by lower Gainshare from 28nm volumes.

- Net income for the three months ended June 30, 2017 was $0.2 million, compared to net income of $2.1 million for the three months ended June 30, 2016. The decrease in net income was primarily attributable to a $3.1 million decrease in gross margin due to the lower revenues and an increase in cost of design-to-silicon-yield solutions and a $1.3 million increase in operating expense, primarily driven by the continued activity related to our development of our Design-For-Inspection (DFI) solution, offset by a $2.4 million decrease in tax provision primarily due to the recognition of excess tax benefits related to employee stock compensation as a result of the adoption of ASU 2016-09 as well as the decrease in level of income.

- Net income per basic and diluted share was $0.01 for the three months ended June 30, 2017, as compared to net income per basic and diluted share of $0.07 for the three months ended June 30, 2016.

Financial highlights for the six months ended June 30, 2017, were as follows:

- Total revenues for the six months ended June 30, 2017, were $48.6 million, a decrease of $3.2 million, or 6%, compared to $51.8 million for the six months ended June 30, 2016. Design-to-silicon-yield solutions revenue for the six months ended June 30, 2017, was $36.2 million, a decrease of $3.0 million, or 8%, when compared to Design-to-silicon yield solutions revenue of $39.2 million for the six months ended June 30, 2016. The decrease in Design-to-silicon-yield solutions was primarily due to a delay in purchases by new and existing customers. Gainshare performance incentives revenue for the six months ended June 30, 2017, was $12.4 million, a decrease of $0.2 million, or 2%, compared to $12.6 million for the six months ended June 30, 2016. The decrease in revenue from Gainshare performance incentives was primarily the result of lower Gainshare at 28nm volumes, not yet fully offset by higher Gainshare at 14nm volumes .

- Net income for the six months ended June 30, 2017, was $0.7 million, compared to $4.2 million for the six months ended June 30, 2016. The decrease in net income was primarily attributable to a $5.1 million decrease in gross margin due to the lower revenues, an increase in cost of design-to-silicon-yield solutions, and a $3.0 million increase in operating expense, primarily driven by the continued activity related to our development of our DFI solution, offset by a $4.8 million decrease in tax provision primarily due to the recognition of excess tax benefits related to employee stock compensation as a result of the adoption of ASU 2016-09 as well as the decrease in level of income.

- Net income per basic and diluted share was $0.02 for the six months ended June 30, 2017, compared to net income per basic and diluted share of $0.13 for the six months ended June 30, 2016.

Critical Accounting Policies

There were no significant changes in our critical accounting policies. Please refer to Management's Discussion and Analysis of Financial Condition and Results of Operations contained in Part II, Item 7 of our Annual Report on Form 10-K for the year ended December 31, 2016. The following is a brief discussion of the more significant accounting policies and methods that we use.

General

Our discussion and analysis of our financial conditions, results of operations and cash flows are based on our consolidated financial statements, which have been prepared in conformity with accounting principles generally accepted in the United States of America. Our preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the dates of the financial statements and the reported amounts of revenues and expenses during the reporting periods. We based our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances. The most significant estimates and assumptions relate to revenue recognition, stock-based compensation and the realization of deferred tax assets. Actual amounts may differ from such estimates under different assumptions or conditions.

Revenue Recognition

We derive revenues from two sources: Design-to-silicon-yield Solutions and Gainshare performance incentives.

Design-to-silicon-yield solutions — Revenues that are derived from Design-to-silicon-yield solutions come from services and software and hardware licenses. We recognize revenue for each element of Design-to-silicon-yield solutions as follows:

We generate a significant portion of our Design-to-silicon-yield solutions revenue from fixed-price solution implementation service contracts delivered over a specific period of time. These contracts require reliable estimation of costs to perform obligations and the overall scope of each engagement. Revenue under project–based contracts for solution implementation services is recognized as services are performed using percentage of completion method of contract accounting based on costs or labor-hours input method, whichever is the most appropriate measure of the progress towards completion of the contract. Losses on fixed-price solution implementation contracts are recognized in the period when they become probable. Revisions in profit estimates are reflected in the period in which the conditions that require the revisions become known and can be estimated. Revenue under time and materials contracts for solution implementation services are recognized as the services are performed.

On occasion, we license our software products as a component of our fixed-price service contracts. In such instances, the software products are licensed to customers over a specified term of the agreement with support and maintenance to be provided, if applicable, over the license term. The amount of product and service revenue recognized in a given period is affected by the Company's judgment as to whether an arrangement includes multiple deliverables and, if so, our determination of the fair value of each deliverable. In general, vendor-specific objective evidence of selling price ("VSOE") does not exist for our solution implementation services and software products and because our services and products include our unique technology, we are not able to determine third-party evidence of selling price ("TPE"). Therefore, in such circumstances we use best estimated selling prices ("BESP") in the allocation of arrangement consideration. In determining BESP, we apply significant judgment as we weigh a variety of factors, based on the facts and circumstances of the arrangement. We typically arrive at BESP for a product or service that is not sold separately by considering company-specific factors such as geographies, internal costs, gross margin objectives, pricing practices used to establish bundled pricing, and existing portfolio pricing and discounting. After fair value is established for each deliverable, the total transaction amount is allocated to each deliverable based upon its relative selling price. Fees allocated to solution implementation services are recognized using the percentage of completion method of contract accounting. Fees allocated to software and related support and maintenance are recognized under software revenue recognition guidance.

In some instances, we also license our DFI system as a separate component of fixed-price service contracts. We allocate revenue to all deliverables based on their relative selling prices. We currently do not have VSOE for our DFI system, thus we use either TPE or BESP in the allocation of arrangement consideration.

We defer certain pre-contract costs incurred for specific anticipated contracts. Deferred costs consist primarily of direct costs to provide solution implementation services in relation to the specific anticipated contracts. We recognize such costs as a component of cost of revenues, the timing of which is dependent upon persuasive evidence of contract arrangement assuming all other revenue recognition criteria are met. We also defer costs from arrangements that required us to defer the revenues, typically due to revenue recognition from multi-element arrangements or from contracts subject to customer acceptance. These costs are recognized in proportion to the related revenue. At the end of reporting period, we evaluate its deferred costs for their probable recoverability. We recognize impairment of deferred costs when it is determined that the costs no longer have future benefits and are no longer recoverable.

We also license our software products separately from solution implementations. For software license arrangements that do not require significant modification or customization of the underlying software, software license revenue is recognized under the residual method when (l) persuasive evidence of an arrangement exists, (2) delivery has occurred, (3) the fee is fixed or determinable, (4) collectability is probable, and (5) the arrangement does not require services that are essential to the functionality of the software. When arrangements include multiple elements such as support and maintenance, consulting (other than for our fixed price solution implementations), installation, and training, revenue is allocated to each element of a transaction based upon its fair value as determined by our VSOE and such services are recorded as services revenue. VSOE for maintenance is generally established based upon negotiated renewal rates while VSOE for consulting, installation, and training services is established based upon the our customary pricing for such services when sold separately. When software is licensed for a specified term, fees for support and maintenance are generally bundled with the license fee over the entire term of the contract. We are unable to establish VSOE of fair value for maintenance services that are generally bundled with term licenses. In these cases, we recognize revenue ratably over the term of the contract. For multiple-element arrangements containing non-software services, the Company: (1) determines whether each element constitutes a separate unit of accounting; (2) determines the fair value of each element using the selling price hierarchy of VSOE, TPE or BESP, as applicable; and (3) allocates the total price to each separate unit of accounting based on the relative selling price method. An element constitutes a separate unit of accounting when the delivered item has standalone value and delivery of the undelivered element is probable and within our control. For multiple-element arrangements that contain both software and non-software elements, we allocate revenue to software or software-related elements as a group and any non-software elements separately based on the selling price hierarchy of VSOE, TPE or BESP. Once revenue is allocated to software or software-related elements as a group, we recognize revenue in conformance with software revenue accounting guidance. Revenue is recognized when revenue recognition criteria are met for each element.

Revenue from software-as-a-service (or SaaS) that allow for the use of a hosted software product or service over a contractually determined period of time without taking possession of software are accounted for as subscriptions and recognized as revenue ratably over the coverage period beginning on the date the service is made available to customers. Revenue for software licenses with extended payment terms is not recognized in excess of amounts due. For software license arrangements that require significant modification or customization of the underlying software, the software license revenue is recognized as services are performed using the percentage of completion method of contract accounting, and such revenue is recorded as services revenue.

Deferred revenues consist substantially of amounts invoiced in advance of revenue recognition and is recognized as the revenue recognition criteria are met. Deferred revenues that will be recognized during the succeeding 12 month period is recorded as current deferred revenues and the remaining portion is recorded as non- current deferred revenues.

Gainshare Performance Incentives — When we enter into a contract to provide yield improvement services, the contract usually includes two components: (1) a fixed fee for performance by us of services delivered over a specific period of time; and (2) a Gainshare performance incentive component where the customer may pay a contingent variable fee, usually after the fixed fee period has ended. Revenue derived from Gainshare performance incentives represents profit sharing and performance incentives earned contingent upon our customers reaching certain defined operational levels established in related solution implementation service contracts. Gainshare performance incentives periods are usually subsequent to the delivery of all contractual services and therefore have virtually no cost to us. Due to the uncertainties surrounding attainment of such operational levels, we recognize Gainshare performance incentives revenue (to the extent of completion of the related solution implementation contract) upon receipt of performance reports or other related information from the customer supporting the determination of amounts and probability of collection.

Stock-Based Compensation

Stock-based compensation is estimated at the grant date based on the award's fair value and is recognized on a straight-line basis over the vesting periods, generally four years. As stock-based compensation expense recognized is based on awards ultimately expected to vest, it has been reduced for estimated forfeitures. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates.

We have elected to use the Black-Scholes-Merton option-pricing model, which incorporates various assumptions including volatility, expected life and interest rates. The expected volatility is based on the historical volatility of our common stock over the most recent period commensurate with the estimated expected life of stock options. The expected life of an award is based on historical experience and on the terms and conditions of the stock awards granted to employees. The interest rate assumption is based upon observed Treasury yield curve rates appropriate for the expected life of stock options.

Income Taxes

We are required to assess the likelihood that our deferred tax assets will be recovered from future taxable income and if we believe that they are not likely to be realizable before the expiration dates applicable to such assets then, to the extent we believe that recovery is not likely, establish a valuation allowance. Changes in the net deferred tax assets, less offsetting valuation allowance, in a period are recorded through the income tax provision (benefit) in the condensed consolidated statements of operations. The valuation allowance was approximately $6.5 million and $6.8 million as of June 30, 2017 and December 31, 2016, respectively, which was related to California R&D tax credits and California net operating losses related to an acquisition that we currently do not believe to be more likely than not to be ultimately realized. If we conclude at a future financial reporting period that there has been a change in our ability to realize our California R&D credit and net operating loss carry forward deferred tax assets, and it is at such time no longer “more–likely-than-not” that we will realize the tax credits before applicable expiration dates, our tax provision will increase in the period in which we make such determination.

Our income tax calculations are based on application of the respective U.S. federal, state or foreign tax law. Our tax filings, however, are subject to audit by the respective tax authorities. Accordingly, we recognize tax liabilities based upon our estimate of whether, and the extent to which, additional taxes will be due when such estimates are more-likely-than-not to be sustained. An uncertain income tax position will not be recognized if it has less than a 50% likelihood of being sustained. To the extent the final tax liabilities are different than the amounts originally accrued, the increases or decreases are recorded as income tax expense or benefit in the consolidated statements of operations. At June 30, 2017, no deferred taxes have been provided on undistributed earnings of approximately $6.7 million from the Company’s international subsidiaries since these earnings have been, and under current plans will continue to be, permanently reinvested outside the United States. It is not practicable to determine the amount of the unrecognized tax liability at this time.

Software Development Costs

Internally developed software includes software developed to meet our internal needs to provide solution implementation services to our end-customers. These capitalized costs consist of internal compensation related costs and external direct costs incurred during the application development stage and are amortized over their useful lives, generally six years. The costs to develop software that is marketed externally have not been capitalized as we believe our current software development process is essentially completed concurrent with the establishment of technological feasibility. As such, all related software development costs are expensed as incurred and included in research and development expense in our consolidated statements of operations.

Goodwill and Intangible Assets

We record goodwill when the purchase consideration of an acquisition exceeds the fair value of the net tangible and identified intangible assets as of the date of acquisition. We perform an annual impairment assessment of goodwill during the fourth quarter of each calendar year or more frequently if required to determine if any events or circumstances exist, such as an adverse change in business climate or a decline in the overall industry demand, that would indicate that it would more likely than not reduce the fair value of a reporting unit below its carrying amount, including goodwill. If events or circumstances do not indicate that the fair value of a reporting unit is below its carrying amount, then goodwill is not considered to be impaired and no further testing is required. If further testing is required, we perform a two-step process. The first step involves comparing the fair value of its reporting unit to its carrying value, including goodwill. If the carrying value of the reporting unit exceeds its fair value, the second step of the test is performed by comparing the carrying value of the goodwill in the reporting unit to its implied fair value. An impairment charge is recognized for the excess of the carrying value of goodwill over its implied fair value. For the purpose of impairment testing, we have determined that we have one reporting unit. There was no impairment of goodwill for the period ended June 30, 2017.

Our long-lived assets, excluding goodwill, consist of property and equipment and intangible assets. We periodically review our long-lived assets for impairment. For assets to be held and used, we initiate our review whenever events or changes in circumstances indicate that the carrying amount of a long-lived asset group may not be recoverable. Recoverability of an asset group is measured by comparison of its carrying amount to the expected future undiscounted cash flows that the asset group is expected to generate. If it is determined that an asset group is not recoverable, an impairment loss is recorded in the amount by which the carrying amount of the asset group exceeds its fair value. During the three months ended June 30, 2017, there was no impairment related to our long-lived assets.

Recent Accounting Pronouncements and Accounting Changes

See Note 2 of “Notes to Condensed Consolidated Financial Statements (Unaudited)” of this Quarterly Report on Form 10-Q for a description of recent accounting pronouncements and accounting changes, including the expected dates of adoption and estimated effects, if any, on our consolidated financial statements.

Results of Operations

The following table sets forth, for the periods indicated, the percentage of total revenues represented by the line items reflected in our condensed consolidated statements of operations:

	Three Months Ended June 30,		**Six Months Ended June 30,**	
	2017	**2016**	**2017**	**2016**
Revenues:				
Design-to-silicon-yield solutions	68 %	77 %	74 %	76 %
Gainshare performance incentives	32	23	26	24
Total revenues	100 %	100 %	100 %	100 %
Costs of design-to-silicon-yield solutions	47	40	47	40
Amortization of acquired technology	—	—	—	—
Total cost of design-to-silicon-yield solutions	47	40	47	40
Gross profit	47	60	53	60
Operating expenses:				
Research and development	30	27	30	26
Selling, general and administrative	26	19	25	20
Amoritization of other acquired intangible assets	—	—	—	—
Total operating expenses	56	46	55	46
Income (loss) from operations	(3)	14	(2)	14
Interest and other income (expense), net	—	—	(1)	(1)
Income (loss) before taxes	(3)	14	(3)	13
Income tax provision (benefit)	(4)	6	(4)	5
Net income	1 %	8 %	1 %	8 %

Comparison of the Three Months Ended June 30, 2017 and 2016

Revenues	**Three Months Ended June 30, 2017**	**2016**	**Change**	**% Change**
(in thousands, except for percentages)				
Design-to-silicon-yield solutions	$16,500	$20,574	$(4,074)	(20)%
Gainshare performance incentives	7,789	6,114	1,675	27%
Total revenues	$24,289	$26,688	$(2,399)	(9)%

Design-to-silicon-yield solutions. Design-to-silicon-yield solutions revenue is derived from services (including services from yield solutions, design for inspection solutions, software support and maintenance, consulting, and training) and software and or system licenses, provided during our customer engagements as well as during solution product sales. Design-to-silicon-yield solutions revenue decreased $4.1 million for the three months ended June 30, 2017, compared to the three months ended June 30, 2016, primarily due to a delay in purchases by new and existing customers. Our Design-to-silicon-yield solutions revenue may fluctuate in the future and is dependent on a number of factors, including the semiconductor industry's continued acceptance of our solutions, the timing of purchases by existing and new customers, and our ability to attract new customers and penetrate new markets, and further penetration of our current customer base. Fluctuations in future results may also occur if any of our significant customers renegotiate pre-existing contractual commitments due to adverse changes in their own business or, in the case of a time and materials contract, may take advantage of contractual provisions that permit the suspension of contracted work for a period if their business experiences a financial hardship.

Gainshare Performance Incentives. Gainshare performance incentives revenues represent profit sharing and performance incentives earned contingent upon our customers reaching certain defined operational levels. Revenue derived from Gainshare performance incentives increased $1.7 million for the three months ended June 30, 2017, compared to the three months ended June 30, 2016. The increase was the result of higher Gainshare from 14nm volumes, partially offset by a decrease in Gainshare from 28nm volumes. Our Gainshare performance incentives revenue may continue to fluctuate from period to period. Gainshare performance incentives revenue is dependent on many factors that are outside our control, including among others, continued production of ICs by our customers at facilities at which we generate Gainshare, sustained yield improvements by our customers, and our ability to enter into new Design-to-silicon-yield solutions contracts containing Gainshare performance incentives.

Costs of Design-to-silicon-yield solutions	**Three Months Ended June 30, 2017**	**2016**	**Change**	**% Change**
(in thousands, except for percentages)				
Direct costs of Design-to-silicon-yield solutions	$11,283	$10,558	$ 725	7 %
Amortization of acquired technology	96	96	—	—- %
Total costs of Design-to-silicon-yield solutions	$11,379	$10,654	$ 725	7 %

Costs of Design-to-silicon-yield solutions. Costs of Design-to-silicon-yield solutions consist of costs incurred to provide and support our services, costs recognized in connection with licensing our software, and amortization of acquired technology. Direct costs of Design-to-silicon-yield solutions consist of service and software licenses costs. Service costs consist of material, employee compensation and related benefits, overhead costs, travel and facilities-related costs. Software license costs consist of costs associated with licensing third-party software used by the Company in providing services to our customers in solution engagements, or sold in conjunction with our software products. Direct costs of Design-to-silicon-yield solutions increased $0.7 million for the three months ended June 30, 2017, compared to the three months ended June 30, 2016, primarily due to a $0.5 million increase in personnel-related cost driven by hiring in Asia and world-wide merit increases, a $0.1 million increase in subcontractor expense, and a $0.3 million increase in depreciation expense of test equipment, partially offset by a $0.1 million decrease in travel expense and a $0.1 million decrease in facility costs. Amortization of acquired technology for the three months ended June 30, 2017 and 2016 remained the same at $0.1 million.

Research and Development	**Three Months Ended June 30 2017**	**2016**	**Change**	**% Change**
(in thousands, except for percentages)				
Research and development	$7,276	$7,060	$ 216	3 %

Research and Development. Research and development expenses consist primarily of personnel-related costs to support product development activities, including compensation and benefits, outside development services, travel, facilities cost allocations, and stock-based compensation charges. Research and development expenses increased $0.2 million for the three months ended June 30, 2017, compared to the three months ended June 30, 2016, primarily due to a $0.3 million personnel-related expense due to higher headcount and world-wide merit increases, offset by a $0.1 million decrease in subcontractor expense. The increased investment in research and development is primarily driven by continued development activity related to our DFI solution. We anticipate our expenses in research and development will fluctuate in absolute dollars from period to period as a result of cost control initiatives and the timing of product development projects and revenue generating activity requirements.

Selling, General and Administrative	**Three Months Ended June 30, 2017**	**2016**	**$ Change**	**% Change**
(in thousands, except for percentages)				
Selling, general and administrative	$6,195	$5,094	$ 1,101	22 %

Selling, General and Administrative. Selling, general and administrative expenses consist primarily of compensation and benefits for sales, marketing and general and administrative personnel, legal and accounting services, marketing communications, travel and facilities cost allocations, and stock-based compensation charges. Selling, general and administrative expenses increased $1.1 million for the three months ended June 30, 2017, compared to the three months ended June 30, 2016, primarily due to a $0.3 million increase in personnel-related expense due world-wide merit increases and hiring of an executive, a $0.4 million increase in accounting and legal expense, primarily a result of the new system implementation and increased legal activities related to Kinesys asset purchase transactions, a $0.3 million increase in allowance for doubtful account due to an increase in accounts receivable balance and a $0.1 million increase in travel expense. We anticipate our selling, general and administrative expenses will fluctuate in absolute dollars from period to period as a result of cost control initiatives and to support increased selling efforts in the future.

Amortization of Other Acquired Intangible Assets. Amortization of other acquired intangible assets consists of amortization of intangibles acquired as a result of certain business combinations. The amortization of other acquired intangible assets for the three months ended June 30, 2017 remained flat at $0.1 million compared to the three months ended June 30, 2016.

Interest and Other Income (expense), net. The decrease in interest and other income (expense), net from a $51,000 income for the three months ended June 30, 2016 to a $27,000 expense for the three months ended June 30, 2017 was primarily due to foreign exchange rate movements.

Income Tax Provision (benefit)	**Three Months Ended June 30, 2017**	**2016**	**$ Change**	**% Change**
(in thousands, except for percentages)				
Income tax provision (benefit)	$(815)	$1,579	$(2,394)	(152)%

Income Tax Provision (benefit). The decrease in income tax provision (benefit) from $1.6 million expense for the three months ended June 30, 2016 to $0.8 million benefit for the three months ended June 30, 2017 was primarily due to the increase in excess tax benefits related to employee stock compensation as well as the decrease in income.

Comparison of the Six Months Ended June 30, 2017 and 2016

Revenues	**Six Months Ended June 30, 2017**	**2016**	**$ Change**	**% Change**
(In thousands, except for percentages)				
Design-to-silicon-yield solutions	$36,198	$39,152	$(2,954)	(8)%
Gainshare performance incentives	12,380	12,617	(237)	(2)%
Total	$48,578	$51,769	$(3,191)	(6)%

Design-to-Silicon-Yield Solutions. Design-to-silicon-yield solutions revenue decreased $3.0 million for the six months ended June 30, 2017 compared to the six months ended June 30, 2016, primarily due to timing of purchases by new and existing customers.

Gainshare Performance Incentives. Revenue derived from Gainshare performance incentives decreased $0.2 million for the six months ended June 30, 2017 compared to the six months ended June 30, 2016, primarily due to lower Gainshare from 28nm volumes, not yet fully offset by higher Gainshare from 14nm volumes.

Costs of Design-to-silicon-yield solutions	**Six Months Ended June 30, 2017**	**2016**	**$ Change**	**% Change**
(in thousands, except for percentages)				
Direct costs of Design-to-silicon-yield solutions	$22,618	$20,668	$1,950	9 %
Amortization of acquired technology	192			