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

FORM 10-Q

(Mark One)

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

For the quarterly period ended September 30, 2019

OR

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

For the transition period from ______ to

000-32743

(Commission File Number)

DASAN ZHONE SOLUTIONS, INC.
(Exact name of registrant as specified in its charter)

Delaware	**22-3509099**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification Number)**
7195 Oakport Street Oakland, California	**94621**
(Address of principal executive offices)	**(Zip code)**

(510) 777-7000

(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock, $0.001 par value	DZSI	The Nasdaq Stock Market LLC

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter 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 every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	☐

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes☐ No ☒

As of November 12, 2019, there were 21,388,445 shares outstanding of the registrant's common stock, $0.001 par value.

TABLE OF CONTENTS

PART I. FINANCIAL INFORMATION

Item 1. Financial Statements

DASAN ZHONE SOLUTIONS, INC. AND SUBSIDIARIES
Unaudited Condensed Consolidated Balance Sheets
(In thousands, except par value)

	September 30, 2019	December 31, 2018
Assets		
Current assets:		
Cash and cash equivalents	$ 47,851	$ 27,709
Restricted cash	4,448	7,003
Accounts receivable, net		
Third parties	100,613	71,034
Related parties	252	583
Other receivables		
Suppliers and others	8,002	12,923
Related parties	1	65
Contract assets	9,351	11,381
Inventories	43,046	33,868
Prepaid expenses and other current assets	6,253	4,185
Total current assets	219,817	168,751
Property, plant and equipment, net	6,575	5,518
Right-of-use assets from operating leases	18,349	—
Goodwill	3,977	3,977
Intangible assets, net	14,539	5,649
Deferred tax assets	1,691	2,752
Long-term restricted cash	501	936
Other assets	2,784	2,424
Total assets	$ 268,233	$ 190,007
Liabilities, Stockholders' Equity and Non-controlling Interest		
Current liabilities:		
Accounts payable - trade		
Third parties	$ 43,320	$ 36,865
Related parties	96	1,743
Short-term debt - bank and trade facilities	34,606	31,762
Other payables		
Third parties	1,652	1,792
Related parties	2,711	1,281
Contract liabilities - current	3,609	8,511
Operating lease liabilities - current	3,496	—
Accrued and other liabilities	10,389	11,517
Total current liabilities	99,879	93,471
Long-term debt		
Bank and trade facilities	10,407	—
Related party	9,049	14,142
Contract liabilities - non-current	2,597	1,801
Deferred tax liabilities	1,021	—
Operating lease liabilities - non-current	15,957	—
Pension liabilities	13,269	—
Other long-term liabilities	1,658	2,739
Total liabilities	153,837	112,153
Commitments and contingencies (Note 15)		
Stockholders' equity and non-controlling interest:		
Common stock, authorized 36,000 shares, 21,388 and 16,587 shares outstanding as of September 30, 2019 and December 31, 2018, respectively, at $0.001 par value	21	16
Additional paid-in capital	138,860	93,192
Accumulated other comprehensive loss	(5,445)	(192)
Accumulated deficit	(19,040)	(15,777)
Total stockholders' equity	114,396	77,239
Non-controlling interest	—	615
Total stockholders' equity and non-controlling interest	114,396	77,854
Total liabilities, stockholders' equity and non-controlling interest	$ 268,233	$ 190,007

See accompanying notes to unaudited condensed consolidated financial statements.

DASAN ZHONE SOLUTIONS, INC. AND SUBSIDIARIES
Unaudited Condensed Consolidated Statements of Comprehensive Income (Loss)
(In thousands, except per share data)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2019	2018	2019	2018
Net revenue:				
Third parties	$ 71,292	$ 70,227	$ 227,407	$ 203,317
Related parties	232	1,687	1,870	4,358
Total net revenue	71,524	71,914	229,277	207,675
Cost of revenue:				
Products and services - third parties	48,755	46,852	151,805	135,208
Products and services - related parties	190	1,478	1,427	3,677
Amortization of intangible assets	402	153	1,216	459
Total cost of revenue	49,347	48,483	154,448	139,344
Gross profit	22,177	23,431	74,829	68,331
Operating expenses:				
Research and product development	9,898	8,655	29,512	26,346
Selling, marketing, general and administrative	15,716	11,106	45,684	35,212
Amortization of intangible assets	464	131	1,406	393
Total operating expenses	26,078	19,892	76,602	61,951
Operating income (loss)	(3,901)	3,539	(1,773)	6,380
Interest income	374	42	524	203
Interest expense	(1,124)	(447)	(3,239)	(1,330)
Other income (loss), net	944	(572)	2,517	(859)
Income (loss) before income taxes	(3,707)	2,562	(1,971)	4,394
Income tax provision	289	735	1,098	1,071
Net income (loss)	(3,996)	1,827	(3,069)	3,323
Net income attributable to non-controlling interest	37	29	194	2
Net income (loss) attributable to DASAN Zhone Solutions, Inc.	(4,033)	1,798	(3,263)	3,321
Foreign currency translation adjustments	(2,426)	391	(4,123)	(1,839)
Actuarial gain (loss)	38	–	(1,115)	–
Comprehensive income (loss)	(6,384)	2,218	(8,307)	1,484
Comprehensive income (loss) attributable to non-controlling interest	31	16	209	(3)
Comprehensive income (loss) attributable to DASAN Zhone Solutions, Inc.	$ (6,415)	$ 2,202	$ (8,516)	$ 1,487
Net income (loss) per share attributable to DASAN Zhone Solutions, Inc.				
Basic	$ (0.19)	$ 0.11	$ (0.17)	$ 0.20
Diluted	$ (0.19)	$ 0.11	$ (0.17)	$ 0.20
Weighted average shares outstanding used to compute basic net income (loss) per share	21,384	16,683	18,732	16,425
Weighted average shares outstanding used to compute diluted net income (loss) per share	21,384	16,891	18,732	16,640

See accompanying notes to unaudited condensed consolidated financial statements.

DASAN ZHONE SOLUTIONS, INC. AND SUBSIDIARIES
Unaudited Condensed Consolidated Statements of Stockholders' Equity and Non-Controlling Interest
(In thousands, except per share data)

	Common stock		Additional paid-in capital	Accumulated other comprehensive income (loss)	Accumulated deficit	Total stockholders' equity	Non-controlling interest	Total stockholders' equity and non-controlling interest
	Shares	Amount						
For the Nine-Month Period Ended September 30, 2019:								
Balance as of December 31, 2018	16,587	$ 16	$ 93,192	$ (192)	$ (15,777)	$ 77,239	$ 615	$ 77,854
Stock-based compensation	9	—	825	—	—	825	—	825
Net income (loss)	—	—	—	—	(1,638)	(1,638)	181	(1,457)
Other comprehensive loss	—	—	—	(1,124)	—	(1,124)	(1)	(1,125)
Balance as of March 31, 2019	16,596	16	94,017	(1,316)	(17,415)	75,302	795	76,097
Issuance of common stock in public offering, net of issuance costs	4,718	5	42,504	—	—	42,509	—	42,509
Exercise of stock options and restricted stock grant	55	—	473	—	—	473	—	473
Stock-based compensation	11	—	811	—	—	811	—	811
Net income (loss)	—	—	—	—	2,408	2,408	(24)	2,384
Other comprehensive income (loss)	—	—	—	(1,748)	—	(1,748)	23	(1,725)
Balance as of June 30, 2019	21,380	21	137,805	(3,064)	(15,007)	119,755	794	120,549
Purchase of non-controlling interest in subsidiary	—	—	(127)	—	—	(127)	(823)	(950)
Stock-based compensation	8	—	1,182	—	—	1,182	—	1,182
Net income (loss)	—	—	—	—	(4,033)	(4,033)	37	(3,996)
Other comprehensive loss	—	—	—	(2,381)	—	(2,381)	(8)	(2,389)
Balance as of September 30, 2019	21,388	$ 21	$ 138,860	$ (5,445)	$ (19,040)	$ 114,396	$ —	$ 114,396
For the Nine-Month Period Ended September 30, 2018:								
Balance as of December 31, 2017	16,410	$ 16	$ 90,198	$ 1,871	$ (18,852)	$ 73,233	$ 534	$ 73,767
ASC 606 opening balance adjustment	—	—	—	—	342	342	—	342
Exercise of stock options and restricted stock grant	21	—	111	—	—	111	—	111
Stock-based compensation	—	—	363	—	—	363	—	363
Net income	—	—	—	—	107	107	34	141
Other comprehensive income	—	—	—	257	—	257	30	287
Balance as of March 31, 2018	16,431	16	90,672	2,128	(18,403)	74,413	598	75,011
ASC 606 opening balance adjustment	—	—	—	—	(1)	(1)	—	(1)
Exercise of stock options and restricted stock grant	19	—	77	—	—	77	—	77
Stock-based compensation	—	—	377	—	—	377	—	377
Net income	—	—	—	—	1,416	1,416	(61)	1,355
Other comprehensive loss	—	—	—	(2,527)	—	(2,527)	(22)	(2,549)
Balance as of June 30, 2018	16,450	16	91,126	(399)	(16,988)	73,755	515	74,270
Exercise of stock options and restricted stock grant	116	—	665	—	—	665	—	665
Stock-based compensation	—	—	617	—	—	617		617
Net income (loss)	—	—	—	—	1,798	1,798	29	1,827
Other comprehensive income (loss)	—	—	—	404	—	404	(13)	391
Balance as of September 30, 2018	16,566	$ 16	$ 92,408	$ 5	$ (15,190)	$ 77,239	$ 531	$ 77,770

See accompanying notes to unaudited condensed consolidated financial statements.

DASAN ZHONE SOLUTIONS, INC. AND SUBSIDIARIES
Unaudited Condensed Consolidated Statements of Cash Flows
(In thousands)

	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
Cash flows from operating activities:		
Net income (loss)	$ (3,069)	$ 3,323
Adjustments to reconcile net income (loss) to net cash used in operating activities:		
Depreciation and amortization	4,110	2,033
Amortization of deferred financing costs	453	—
Bargain purchase gain on acquisition	(334)	—
Stock-based compensation	2,818	1,357
Provision for inventory write-down	2,289	753
Allowance for doubtful accounts	148	2
Provision for sales returns	413	839
Unrealized loss (gain) on foreign currency transactions	(2,080)	226
Deferred taxes	884	(56)
Changes in operating assets and liabilities:		
Accounts receivable	(29,724)	(15,377)
Contract assets	819	(5,984)
Inventories	(3,454)	(21,967)
Prepaid expenses and other assets	3,859	(1,958)
Accounts payable	9,275	24,790
Contract liabilities	(4,246)	—
Accrued and other liabilities	(4,049)	(3,695)
Net cash used in operating activities	(21,888)	(15,714)
Cash flows from investing activities:		
Purchases of property, plant and equipment	(1,461)	(753)
Proceeds from disposal of property and equipment and other assets	—	1
Acquisition of business, net of cash acquired	(4,697)	—
Net cash used in investing activities	(6,158)	(752)
Cash flows from financing activities:		
Proceeds from issuance of common stock in public offering, net of issuance costs	42,509	—
Proceeds from short-term borrowings and line of credit	25,884	61,419
Repayments of short-term borrowings and line of credit	(38,486)	(48,739)
Proceeds from long-term borrowings	25,000	—
Repayments of long-term borrowings	(1,250)	—
Proceeds from related party term loan	—	6,098
Repayments of related party term loan	(5,000)	(4,460)
Deferred financing costs	(1,998)	—
Purchase of non-controlling interest	(950)	—
Proceeds from exercise of stock options	473	853
Net cash provided by financing activities	46,182	15,171
Effect of exchange rate changes on cash, cash equivalents, and restricted cash	(984)	(1,417)
Net increase in cash, cash equivalents and restricted cash	17,152	(2,712)
Cash, cash equivalents and restricted cash at beginning of period	35,648	31,412
Cash, cash equivalents and restricted cash at end of period	$ 52,800	$ 28,700
Reconciliation of cash, cash equivalents and restricted cash to statement of financial position		
Cash and cash equivalents	$ 47,851	$ 20,028
Restricted cash	4,448	7,825
Long-term restricted cash	501	847
	$ 52,800	$ 28,700

See accompanying notes to unaudited condensed consolidated financial statements.

Notes to Unaudited Condensed Consolidated Financial Statements

(1) Organization and Summary of Significant Accounting Policies

(a) Description of Business

DASAN Zhone Solutions, Inc. (referred to, collectively with its subsidiaries, as "DZS" or the "Company") is a global provider of ultra-broadband network access solutions and communications platforms deployed by advanced Tier 1, 2 and 3 service providers and enterprise customers. The Company provides a wide array of reliable, cost-effective networking technologies, including broadband access, Ethernet switching, mobile backhaul, Passive Optical LAN and software-defined networks, to a diverse customer base that includes more than 900 customers in more than 80 countries worldwide.

DZS was incorporated under the laws of the state of Delaware in June 1999, under the name Zhone Technologies, Inc. On September 9, 2016, the Company acquired Dasan Network Solutions, Inc., a California corporation ("DNS"), through the merger of a wholly owned subsidiary of the Company with and into DNS, with DNS surviving as a wholly owned subsidiary of the Company (the "Merger"). At the effective time of the Merger, all issued and outstanding shares of capital stock of DNS held by DASAN Networks, Inc. ("DNI") were canceled and converted into the right to receive shares of the Company's common stock in an amount equal to 58% of the issued and outstanding shares of the Company's common stock immediately following the Merger. In connection with the Merger, the Company changed its name from Zhone Technologies, Inc. to DASAN Zhone Solutions, Inc.

The Company is headquartered in Oakland, California with flexible in-house production facilities in Seminole, Florida and Hanover, Germany (acquired as part of the Keymile Acquisition (defined below) in January 2019), and contract manufacturers located in China, India, Korea and Vietnam. The Company also maintains offices to provide sales and customer support at global locations.

(b) DNI Ownership

As of September 30, 2019, DNI owned approximately 44.4% of the outstanding shares of the Company's common stock. As a result, DNI is able to significantly influence corporate and management policies and the outcome of any corporate transaction or other matter submitted to the Company's stockholders for approval. Such transactions may include mergers and acquisitions, sales of all or some of the Company's assets or purchases of assets, and other significant corporate transactions. The interests of DNI may not coincide with the interests of the Company's other stockholders or with holders of the Company's indebtedness. See Note 11 and Note 15 to the unaudited condensed consolidated financial statements for additional information.

(c) Basis of Presentation

For a complete description of what the Company believes to be the critical accounting policies and estimates used in the preparation of its unaudited condensed consolidated financial statements, refer to the Company's Annual Report on Form 10-K for the year ended December 31, 2018.

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with U.S. GAAP for interim financial information and with the instructions to Form 10-Q and Article 8 of Regulation S-X. Accordingly, they do not include all of the information and footnotes required by U.S. GAAP for complete financial statements.

The unaudited condensed consolidated financial statements reflect all adjustments (consisting only of normal recurring adjustments) that, in the opinion of management, are necessary for a fair presentation of the results for the interim periods presented. All intercompany transactions and balances have been eliminated in consolidation. The results of operations for the current interim period are not necessarily indicative of results to be expected for the current year or any other period. These unaudited condensed consolidated financial statements should be read in conjunction with the consolidated financial statements of the Company and notes thereto included in the Company's Annual Report on Form 10-K for the year ended December 31, 2018 filed with the Securities and Exchange Commission ("SEC") on March 12, 2019.

(d) Use of Estimates

The preparation of the condensed consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenue and expenses during the reporting period. Actual results could differ materially from those estimates.

(e) Reclassifications

For the three and nine months ended September 30, 2018, certain previously reported statement of comprehensive income (loss) and statement of cash flows amounts have been adjusted for certain immaterial reclassifications to correctly reflect: (i) cost of products and services to related parties; and (ii) changes in accounts receivable and contract assets.

(f) Revenue

The following table presents the revenues by source (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2019	2018	2019	2018
Revenue by source:				
Products	$ 66,447	$ 68,787	$ 214,890	$ 198,830
Services	5,077	3,127	14,387	8,845
Total	$ 71,524	$ 71,914	$ 229,277	$ 207,675

The following summarizes required disclosures about geographical concentrations (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2019	2018	2019	2018
Revenue by geography:				
United States	$ 9,662	$ 11,125	$ 28,993	$ 41,373
Canada	1,062	1,131	2,950	3,344
Total North America	10,724	12,256	31,943	44,717
Latin America	6,273	6,841	18,829	21,713
Europe, Middle East, Africa	15,838	10,425	59,429	27,264
Korea	20,877	19,609	55,682	50,844
Other Asia Pacific	17,812	22,783	63,394	63,137
Total International	60,800	59,658	197,334	162,958
Total	$ 71,524	$ 71,914	$ 229,277	$ 207,675

Contract Balances

The Company records contract assets when it has a right to consideration and records accounts receivable when it has an "unconditional" right to consideration. Contract liabilities consist of cash payments received (or unconditional rights to receive cash) in advance of fulfilling performance obligations.

The opening and closing balances of contract assets and contract liabilities related to contracts with customers are as follows:

	Contract Assets	Contract Liabilities
Opening, January 1, 2019	$ 12,175	$ 10,312
Closing, September 30, 2019	10,328	6,206
Decrease	$ (1,847)	$ (4,106)

The amount of revenue recognized in the three months ended September 30, 2019 that was included in the prior period contract liability balance was $1.7 million. The amount of revenue recognized in the nine months ended September 30, 2019 that was included in the January 1, 2019 contract liability balance was $7.3 million. This revenue consists of services provided to customers who had prepaid for those services prior to the current year.

(g) Concentration of Risk

Financial instruments, which potentially subject the Company to concentrations of credit risk, consist primarily of cash and cash equivalents which totaled $47.9 million at September 30, 2019, including $7.4 million held by its international subsidiaries. Cash and cash equivalents consist of financial deposits and money market accounts that are principally held with various domestic and international financial institutions with high credit standing.

The Company's customers include competitive and incumbent local exchange carriers, competitive access providers, internet service providers, wireless carriers and resellers serving these markets. The Company performs ongoing credit evaluations of its customers and generally does not require collateral. Allowances are maintained for potential doubtful accounts.

For the three months ended September 30, 2019, one customer accounted for 11% of net revenue. For the nine months ended September 30, 2019, no single customer accounted for 10% or more of net revenue. For the three and nine months ended September 30, 2018, one customer accounted for 11% of net revenue.

As of September 30, 2019, two customers represented 17% and 12% of net accounts receivable, respectively. As of December 31, 2018, two customers represented 11% and 10% of net accounts receivable, respectively.

As of September 30, 2019 and December 31, 2018, receivables from customers in countries other than the United States represented 94% and 88%, respectively, of net accounts receivable.

(h) Business Combinations

The Company allocates the fair value of purchase consideration to the tangible and identifiable intangible assets acquired and liabilities assumed based on their estimated fair values. The excess of the fair value of purchase consideration over the fair values of these identifiable assets and liabilities is recorded as goodwill. When determining the fair values of assets acquired and liabilities assumed, management makes significant estimates and assumptions, especially with respect to intangible assets and certain tangible assets such as inventory.

Critical estimates in valuing certain tangible and intangible assets include but are not limited to future expected cash flows from the underlying assets and discount rates. Management's estimates of fair value are based upon assumptions believed to be reasonable, but which are inherently uncertain and unpredictable and, as a result, actual results may differ from estimates.

(i) Defined Benefit Plans and Plan Assumptions

The Company provides certain defined benefit pension plans to employees in Germany. Pension accounting is intended to reflect the recognition of future benefit costs over the employees' average expected future service to the Company based on the terms of the plans and investment and funding decisions. To estimate the impact of these future payments and the Company's decisions concerning funding of these obligations, the Company is required to make assumptions using actuarial concepts within the framework of U.S. GAAP. Two critical assumptions are the discount rate and the expected long-term return on plan assets. Other important assumptions include expected future salary increases, expected future increases to benefit payments, expected retirement dates, employee turnover, retiree mortality rates and portfolio composition. The Company evaluates these assumptions at least annually.

(j) Recent Accounting Pronouncements

Recent Accounting Pronouncements Adopted

Leases

In February 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2016-02, *Leases* as modified subsequently by ASUs 2018-01, 2018-10, 2018-11, 2018-20 and 2019-01 ("ASC 842"), which introduces the recognition of lease assets and lease liabilities by lessees for those leases classified as operating leases under previous guidance. ASC 842 requires that lease arrangements longer than 12 months' result in an entity recognizing an asset and liability, with respect to such lease arrangement, among other changes.

The Company adopted the new standard on January 1, 2019, the first day of fiscal 2019, using the modified retrospective approach whereby the cumulative effect of adoption was recognized on the adoption date and prior periods were not restated. There was no net cumulative effect adjustment to retained earnings as of January 1, 2019 as a result of this adoption. ASC 842 sets out the principles for the recognition, measurement, presentation and disclosure of leases.

The Company has elected to use a certain package of practical expedients permitted under the transition guidance within ASC 842. Those practical expedients are as follows:

- The Company did not reassess (i) whether expired or existing contracts contain leases under the new definition of a lease; (ii) lease classification for expired or existing leases; and (iii) whether previously capitalized initial direct costs would qualify for capitalization under ASC 842.
- The Company did not reassess a lease whose term is 12 months or less and does not include a purchase option that the lessee is reasonably certain to exercise.
- The Company did not elect to use hindsight for transition when considering judgments and estimates such as assessments of lessee options to extend or terminate a lease or purchase the underlying asset.
- For all asset classes, the Company elected to not recognize a right-of-use asset and lease liability for leases with a term of 12 months or less.
- For all asset classes, the Company elected to not separate non-lease components from lease components to which they relate and has accounted for the combined lease and non-lease components as a single lease component.

The Company applies significant judgment in considering all relevant factors that create an economic benefit (e.g., contract-based, asset-based, entity-based, and market-based, among others) as of the commencement date in determining the initial lease term and future lease payments. For example, the Company exercises judgment in determining whether renewal periods will be exercised during the initial measurement process. If the Company believes it will exercise the renewal option, and the lease payments associated with the renewal periods are known or calculable, such renewal lease payments would be included in the initial measurement of the lease liability. Otherwise, even if the Company believes that it will exercise the renewal period, if the renewal payments are unknown or not calculable, they would not be included until they become known or calculable at which time the Company would remeasure the remaining lease payments similar to a lease modification.

Adoption of ASC 842 resulted in the balance sheet recognition of right of use assets and lease liabilities of approximately $22.5 million as of January 1, 2019. Adoption of ASC 842 did not materially impact the Company's unaudited condensed consolidated statements of comprehensive income (loss) and cash flows. See Note 14 in the notes to unaudited condensed consolidated financial statements.

Income Tax Effects within Accumulated Other Comprehensive Income

In February 2018, the FASB issued ASU 2018-02, *Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income*. The amendments in this update allow a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act (the "Tax Act"). The adoption of this standard on January 1, 2019 did not have a material impact on the Company's condensed consolidated financial statements, since the Company did not elect to reclassify the income tax effects of the Tax Act from accumulated other comprehensive income to retained earnings.

Improving the Presentation of Net Periodic Pension Cost and Net Periodic Post-Retirement Benefit Cost

In March 2017, the FASB issued ASU 2017-07, *Improving the Presentation of Net Periodic Pension Cost and Net Periodic Post-Retirement Benefit Cost*. The ASU requires the Company to disaggregate the service cost component from the other components of net periodic benefit costs and requires the Company to present the other components of net periodic benefit cost in other income, net. The standard is effective for annual and interim periods beginning after December 31, 2017, and retrospective application is required. The Company adopted this guidance during the first quarter of 2019 without any retrospective adjustments since the underlying pension obligations were acquired through the Keymile Acquisition in 2019. The interest cost, which is the only component of net periodic post-retirement cost, is recognized in Other income (loss), net in the condensed consolidated statement of comprehensive income (loss).

Other Recent Accounting Pronouncements Not Yet Adopted

In August 2018, the FASB issued ASU 2018-15, *Intangibles - Goodwill and Other Internal-Use Software - Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement*. The update reduces complexity for the accounting for costs of implementing a cloud computing service arrangement and aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. The standard is effective for annual and interim periods beginning after December 15, 2019, and retrospective or prospective application is permitted. We are currently evaluating the impact of adoption of this ASU, but it is not expected to have a material effect on our condensed consolidated financial statements.

In June 2016, FASB issued ASU 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*, which requires the Company to measure and recognize expected credit losses for financial assets held and not accounted for at fair value through net income. In November 2018, April 2019 and May 2019, the FASB issued ASU No. 2018-19, *Codification Improvements to Topic 326, Financial Instruments - Credit Losses*, ASU No. 2019-04, *Codification Improvements to Topic 326, Financial Instruments - Credit Losses*, and ASU No. 2019-05, *Financial Instruments - Credit Losses (Topic 326): Targeted Transition Relief*, which provided additional implementation guidance on the previously issued ASU. The updated guidance is effective for the Company on January 1, 2020, and requires a modified retrospective adoption method. Early adoption is permitted. The Company is currently assessing the potential impact of adopting this new guidance on its consolidated financial statements.

In January 2017, FASB issued ASU 2017-04, *Simplifying the Test for Goodwill Impairment*, which simplifies the accounting for goodwill impairment. The updated guidance is effective for the Company on January 1, 2020, and will be adopted accordingly. Early adoption is permitted. The Company is currently assessing the potential impact of adopting this new guidance on its consolidated financial statements.

On August 28, 2018, the FASB issued ASU 2018-13, *Fair Value Measurement* (Topic 820), which removes, modifies, and adds certain disclosure requirements related to fair value measurements in ASC 820. The updated guidance is effective for annual and interim periods beginning after December 15, 2019. Early adoption is permitted. The Company is currently assessing the potential impact of adopting this new guidance on its consolidated financial statements.

In August 2018, the FASB issued ASU 2018-14, *Disclosure Framework-Changes to the Disclosure Requirements for Defined Benefit Plans*, which amends ASC 715 to add, remove, and clarify disclosure requirements related to defined benefit pension and other postretirement plans. The updated guidance is effective for the Company on January 1, 2021, with early adoption permitted. The Company is currently assessing the potential impact of adopting this new guidance on its consolidated financial statements.

(2) Business Combinations

Keymile Acquisition

On January 3, 2019, ZTI Merger Subsidiary III Inc., a Delaware corporation and a wholly owned subsidiary of the Company ("ZTI"), acquired all of the outstanding shares of Keymile GmbH ("Keymile"), a limited liability company organized under the laws of Germany, from Riverside KM Beteiligung GmbH ("Riverside"), a limited liability company organized under the laws of Germany, pursuant to a share purchase agreement (the "Keymile Acquisition").

The allocation of the purchase price was based upon a preliminary valuation, and the Company's estimates and assumptions are subject to refinement, within the measurement period (up to one year from the Acquisition Date). Measurement period adjustments, with the corresponding adjustment to the bargain purchase gain or goodwill, will be recorded in the reporting period in which the adjustment to the provisional amounts are determined based upon the final valuation.

The aggregate cash purchase price paid for all of the shares of Keymile and certain of its subsidiaries, was €10,250,000 (approximately $11.8 million), subject to adjustment for the lockbox mechanism described below. The Company also assumed pension obligations of approximately $12.7 million, net of pension assets of $3.5 million. Following the closing of the Keymile Acquisition, Keymile became the Company's wholly owned subsidiary. The Keymile Acquisition agreement also provided for a lockbox mechanism such that normal operations were observed by Keymile management and any excess cash flows generated from operating activities for the period from October 1, 2018 to December 31, 2018 remained with Keymile following the closing, with the Company as the beneficiary, as the purchaser of Keymile. At December 31, 2018, cash received from the lockbox mechanism amounted to $2.5 million.

On October 1, 2018, as a condition for the Keymile Acquisition, Riverside extended a €4.0 million ($4.4 million, which represents the cash and cash equivalents and short-term debt, in the "Allocation of Purchase Consideration" table below) working capital loan to Keymile. The working capital loan bears interest at a rate of 3.5% per annum and is scheduled for repayment in two equal installments in April and November 2019. The first payment of €2.0 million ($2.2 million) was made in April 2019 and the balance is due in November 2019. As of September 30, 2019, the outstanding balance under this working capital loan was €2.0 million ($2.2 million). Subsequently in November 2019, the Company fully repaid all the outstanding borrowings under this working capital loan.

Keymile is a leading solution provider and manufacturer of telecommunication systems for broadband access. The Company believes Keymile strengthens its portfolio of broadband access solutions, which now includes a series of multi-service access platforms for FTTx network architectures, including ultra-fast broadband copper access based on VDSL/Vectoring and G. Fast technology.

A summary of the preliminary estimated purchase price allocation to the fair value of assets acquired and liabilities assumed is as follows (in thousands):

Purchase consideration		
Cash consideration	$	11,776
Working capital adjustment: cash received from lockbox mechanism		(2,497)
Adjusted purchase consideration	$	9,279

The following summarizes the preliminary estimated fair values of the assets acquired and liabilities assumed at the date of acquisition for the Keymile Acquisition (in thousands):

Allocation of purchase consideration		
Current assets		
Cash and cash equivalents	$	4,582
Accounts receivable - trade, net		6,820
Other receivables		798
Inventories		9,943
Property, plant and equipment		983
Other assets		163
Intangible assets		12,030
Accounts payable - trade		(3,303)
Short-term debt		(4,582)
Contract liabilities		(364)
Accrued liabilities		(3,614)
Deferred tax liabilities		(1,071)
Pension obligations		(12,656)
Other long term liabilities		(116)
Bargain purchase gain		(334)
Total purchase consideration	$	9,279

The purchase price allocation resulted in the recognition of a gain on bargain purchase of approximately $0.3 million, which was included in the unaudited condensed consolidated statements of comprehensive income (loss) for the nine months ended September 30, 2019. The gain on bargain purchase was the result of the preliminary fair value of the identifiable net assets acquired exceeding the purchase price paid for the Keymile Acquisition which was reduced by the lockbox mechanism.

The estimated weighted average useful lives of the acquired property, plant and equipment is 5 years. Depreciation is calculated using the straight-line method.

The following table represents the preliminary estimated fair value and useful lives of identifiable intangible assets acquired:

		Estimated Fair Value (in thousands)	Estimated Useful Life
Intangible assets acquired			
Customer relationships	$	3,667	5 years
Trade name		3,208	5 years
Technology - developed core		5,155	5 years
Total intangible assets	$	12,030	

As of the valuation date, there was value attributable to Keymile's existing customer relationships. Keymile's key customer base is made up of independent telecommunication service providers and network operators, a base of customers that have seen growth since 2012. Keymile is seen as a market leader and historically has had low customer attrition. In addition, switching costs are considered to be high due to the disruption of switching platforms as well as the additional training necessary. The Company valued the customer relationships using the Income Approach, specifically the Multi-Period Excess Earnings Method ("MPEEM").

The Company utilized the Relief from Royalty Method ("RFRM") to value the tradename and developed technology. The RFRM assumes that the value of the asset equals the amount a third party would pay to use the asset and capitalize on the related benefits of the asset. Therefore, a revenue stream for the asset is estimated, and then an appropriate royalty rate is applied to the forecasted revenue to estimate the pre-tax income associated with the asset. The pre-tax income is then tax-effected to estimate the after-tax net income associated with the asset. Finally, the after tax net income is discounted to the present value using an appropriate rate of return that considers both the risk of the asset and the associated cash flow estimates.

Pro Forma Financial Information

The unaudited pro forma information for the periods set forth below gives effect to the Keymile Acquisition as if it had occurred as of January 1, 2018. The unaudited pro forma financial information has been prepared by management for illustrative purposes only and does not purport to represent what the results of operations, financial condition or other financial information of the Company would have been if the Keymile Acquisition had occurred on January 1, 2018 or what such results or financial condition will be for any future periods. The unaudited pro forma financial information is based on estimates and assumptions and on the information available at the time of the preparation thereof. These estimates and assumptions may change, be revised or prove to be materially different, and the estimates and assumptions may not be representative of facts existing at the time of the Keymile Acquisition. The pro forma adjustments primarily relate to acquisition related costs, amortization of acquired intangibles and interest expense related to financing arrangements. Below is the pro forma financial information (in thousands):

		Three Months Ended September 30, 2018		Nine Months Ended September 30, 2018
Pro forma net revenues	$	84,870	$	242,086
Pro forma net income attributable to DASAN Zhone Solutions, Inc.		726		2,885

Acquisition of the Non-controlling Interest in DZS Japan

On July 31, 2019, the Company acquired the remaining 30.94% non-controlling interest of DZS Japan, Inc. ("DZS Japan"), and DZS Japan became a wholly owned subsidiary of the Company. The Company acquired the remaining interest in DZS Japan for total cash consideration of $950,000, consisting entirely of payments to the former shareholder (Handysoft). This transaction resulted in a decrease to "Additional paid-in capital" of $127,000, a decrease to "Non-controlling interest" of $823,000, and a total impact of $950,000 in the unaudited condensed consolidated balance sheet as of September 30, 2019.

(3) Fair Value Measurement

The Company utilizes a fair value hierarchy that is intended to increase consistency and comparability in fair value measurements and related disclosures. The fair value hierarchy is based on inputs to valuation techniques that are used to measure fair value that are either observable or unobservable. 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 their own market assumptions. The fair value hierarchy consists of the following three 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 financial instruments are not measured at fair value on the Company's condensed consolidated balance sheet as of September 30, 2019 and the consolidated balance sheet as of December 31, 2018, but require disclosure of their fair values: cash and cash equivalents, restricted cash, accounts and other receivables, accounts payable, accrued liabilities, lease liabilities and debt. The carrying values of financial instruments such as cash and cash equivalents, restricted cash, accounts and other receivables, accounts payable and accrued liabilities approximate their fair values based on their short-term nature. The carrying value of the Company's lease liabilities and debt approximates their fair values based on the current rates available to the Company for debt of similar terms and maturities.

(4) Cash, Cash Equivalents and Restricted Cash

As of September 30, 2019 and December 31, 2018, the Company's cash and cash equivalents consisted of financial deposits and money market accounts that are principally held with various domestic and international financial institutions with high credit standing. Restricted cash consisted primarily of cash restricted for performance bonds, warranty bonds and collateral for borrowings.

(5) Balance Sheet Details

Accounts receivable, net consisted of the following (in thousands):

	September 30, 2019	December 31, 2018
Gross accounts receivable	$ 101,253	$ 71,945
Less: allowance for doubtful accounts	(388)	(328)
Total accounts receivable, net	$ 100,865	$ 71,617

Inventories consisted of the following (in thousands):

	September 30, 2019	December 31, 2018
Raw materials	$ 16,630	$ 15,688
Work in process	3,582	2,429
Finished goods	22,834	15,751
Total inventories	$ 43,046	$ 33,868

Inventories provided as collateral for borrowings from Export-Import Bank of Korea amounted to $6.5 million and $9.5 million as of September 30, 2019 and December 31, 2018, respectively.

(6) Property, Plant and Equipment

Property, plant and equipment consisted of the following (in thousands):

	September 30, 2019	December 31, 2018
Furniture and fixtures	$ 10,139	$ 8,029
Machinery and equipment	2,341	3,553
Leasehold improvements	4,063	3,715
Computers and software	1,856	922
Other	745	982
	19,144	17,201
Less: accumulated depreciation and amortization	(12,228)	(11,271)
Less: government grants	(341)	(412)
Total property and equipment, net	$ 6,575	$ 5,518

Depreciation expense associated with property and equipment for the three and nine months ended September 30, 2019 was $0.5 million and $1.5 million, respectively. Depreciation expense for the three and nine months ended September 30, 2018 was $0.4 million and $1.2 million, respectively.

The Company receives grants from various government entities mainly to support capital expenditures. Such grants are deferred and are generally refundable to the extent the Company does not utilize the funds for qualifying expenditures. Once earned, the Company records the grants as a contra amount to the assets and amortizes such amount over the useful lives of the related assets as a reduction to depreciation expense.

(7) Goodwill and Intangible Assets

Goodwill was as follows (in thousands):

	September 30, 2019	December 31, 2018
Gross carrying amount	$ 3,977	$ 3,977
Less: accumulated impairment	—	—
Net	$ 3,977	$ 3,977

The Company did not recognize impairment loss on goodwill during the nine months ended September 30, 2019 or 2018.

Intangible assets consisted of the following (in thousands):

	September 30, 2019		
	Gross Carrying Amount	Accumulated Amortization	Net
Developed technology	$ 7,972	$ (2,624)	$ 5,348
Customer relationships	8,733	(2,140)	6,593
Trade name	3,056	(458)	2,598
Total intangible assets, net	$ 19,761	$ (5,222)	$ 14,539

	December 31, 2018		
	Gross Carrying Amount	Accumulated Amortization	Net
Developed technology	$ 3,060	$ (1,428)	$ 1,632
Customer relationships	5,240	(1,223)	4,017
Total intangible assets, net	$ 8,300	$ (2,651)	$ 5,649

Intangible assets as of September 30, 2019 include the customer relationships, trade name and developed technology acquired through the Keymile Acquisition (see Note 2) as well as previously acquired intangible assets.

Amortization expense associated with intangible assets for the three and nine months ended September 30, 2019 was $0.9 million and $2.6 million, respectively. Amortization expense for the three and nine months ended September 30, 2018 was $0.3 million and $0.9 million, respectively.

The following table presents the future amortization expense of the Company's intangible assets as of September 30, 2019 (in thousands):

Remainder of 2019	$	857
2020		3,429
2021		3,225
2022		2,816
2023		2,816
Thereafter		1,396
Total	$	14,539

Weighted average remaining life:	
Developed technology	3.74 years
Customer relationships	5.72 years
Trade name	4.25 years

(8) Debt

The following tables summarize the Company's debt (in thousands):

	As of September 30, 2019		
	Short-term	Long-term	Total
PNC Bank Facility	$ 12,500	$ 11,250	$ 23,750
Working Capital Loan	2,183	—	2,183
Bank and Trade Facilities - Foreign Operations	20,625	—	20,625
Related Party	—	9,049	9,049
	$ 35,308	$ 20,299	$ 55,607
Less: unamortized deferred financing costs on the PNC Bank Facility	(702)	(843)	(1,545)
	$ 34,606	$ 19,456	$ 54,062

	As of December 31, 2018		
	Short-term	Long-term	Total
Wells Fargo Bank Facility	$ 7,000	—	$ 7,000
Bank and Trade Facilities - Foreign Operations	24,762	—	24,762
Related Party	—	14,142	14,142
	$ 31,762	$ 14,142	$ 45,904

PNC Bank Facility

On February 27, 2019, the Company and ZTI (collectively, the "Borrowers"), and certain direct and indirect subsidiaries of the Borrowers, as guarantors, entered into a Revolving Credit, Term Loan, Guaranty and Security Agreement (the "Domestic Credit Agreement") and an Export-Import Revolving Credit, Guaranty and Security Agreement (the "Ex-Im Credit Agreement," and together with the Domestic Credit Agreement, the "Credit Agreements"), in each case with PNC Bank, National Association ("PNC") and Citibank, N.A. as lenders, and PNC as agent for the lenders (the "PNC Facility"), which replaced the Company's former senior secured credit facilities with Wells Fargo Bank (the "Former WFB Facility").

The Credit Agreements provide for a $25.0 million term loan and a $15.0 million revolving line of credit (including sub-facilities for export-import transactions, letters of credit and swing loans). The amount the Company is able to borrow on the revolving line of credit at any time is based on eligible accounts receivable and other conditions, less certain reserves. Borrowings under the PNC Facility bear interest at the Company's option, at either (i) a base rate equal to the highest of the federal funds rate plus 0.50%, PNC's prime rate, or the daily LIBOR rate plus 1.00%, or (ii) the LIBOR rate for the applicable interest period, subject to a floor of 1.00% (with respect to the term loans only), plus in each case, an applicable margin. The applicable margin for term loans is 5.00% for base rate loans and 6.00% for LIBOR rate loans, and the applicable margin for borrowings under the revolving line of credit is 1.50% for base rate loans and 2.50% for LIBOR rate loans.

The Company used a portion of the funds borrowed from the term loan under the Credit Agreements to (i) repay $5.0 million in principal amount of existing related-party indebtedness with DNI plus accrued interest, (ii) repay $1.5 million in outstanding borrowings under the Company's former revolving line of credit plus accrued interest and fees and cash collateralize $3.6 million in outstanding letters of credit under the Former WFB Facility, and (iii) repay $5.6 million short-term debt in Korea and Japan. The Company intends to use the remaining funds for ongoing working capital needs. Obligations under the Credit Agreements are secured by substantially all of the personal property assets of the Borrowers and the subsidiaries that guarantee the Credit Agreements, including their intellectual property.

The maturity date under the Credit Agreements is February 27, 2022. The term loan under the Credit Agreements is repayable in eight quarterly installments of $625,000 beginning June 30, 2019, followed by quarterly installments of $937,500 beginning on June 30, 2021, with all remaining unpaid principal and accrued interest due on the maturity date.

The Credit Agreements contain certain covenants, limitations, and conditions with respect to the Borrowers and their subsidiaries, including a maximum leverage ratio, a minimum fixed charge coverage ratio, and a minimum liquidity covenant, as well as financial reporting obligations, and customary events of default. If an event of default occurs, the agent and lenders will be entitled to take various actions, including requiring the immediate repayment of all outstanding amounts under the Credit Agreements, terminating commitments to make additional advances and selling the assets of the Borrowers and their subsidiary guarantors to satisfy the obligations under the Credit Agreements. At September 30, 2019, the Company was not in compliance with the maximum leverage ratio financial covenant in the Credit Agreements, which represents an event of default thereunder. On November 8, 2019, the Company obtained a waiver of the foregoing event of default from the lenders under the Credit Agreements. As a condition for the issuance of the waiver, the Company voluntarily prepaid $10.0 million of the outstanding term loan and paid a one-time fee of $150,000. Uncertainty exists as to the Company's ability to meet these financial covenants at the respective reporting dates during the next twelve months. As a result, the Company is in the process of renegotiating these financial covenants with the banks; however, there is no assurance that the Company will be able to successfully complete such renegotiations. If the Company violates covenants in the Credit Agreements or the contemplated amended covenants, the Company could be required to repay the amounts then outstanding under the Credit Agreements.

As of September 30, 2019, the Company had $23.8 million in outstanding term loan borrowings under its PNC Facility, and no outstanding borrowings under the revolving line of credit. The interest rate on the term loan was 8.12% at September 30, 2019. Deferred financing costs of $1.5 million has been netted against the aggregate principal amount of the PNC term loan in the unaudited condensed consolidated balance sheet as of September 30, 2019. On July 2, 2019, $4.4 million in outstanding borrowings under the revolving line of credit (which represented all outstanding borrowings under the revolving line of credit) was repaid in full.

Former Wells Fargo Bank Facility

On February 27, 2019, in connection with the entry into the PNC Facility, the Company repaid $1.5 million in principal amount of outstanding borrowings plus accrued interest and fees under the Former WFB Facility and cash collateralized $3.6 million in outstanding letters of credit under the Former WFB Facility and terminated the Former WFB Facility.

Working Capital Loan

On October 1, 2018, as a condition for the Keymile Acquisition, Riverside, the former stockholder of Keymile, extended a €4.0 million ($4.4 million) working capital loan to Keymile. The working capital loan bears interest at a rate of 3.5% per annum and is scheduled for repayment in two equal installments. The first payment of €2.0 million ($2.2 million) was made in April 2019 and the balance is due in November 2019. As of September 30, 2019, the outstanding balance under this working capital loan was €2.0 million ($2.2 million). Subsequently in November 2019, the Company fully repaid all the outstanding borrowings under this working capital loan.

Bank and Trade Facilities - Foreign Operations

Certain of the Company's foreign subsidiaries have entered into various financing arrangements with foreign banks and other lending institutions consisting primarily of revolving lines of credit, trade facilities, term loans and export development loans. These facilities are renewed as they mature and are generally secured by a security interest in certain assets of the applicable foreign subsidiaries and supported by guarantees given by DNI or third parties. Payments under such facilities are made in accordance with the given lender's amortization schedules.

As of September 30, 2019 and December 31, 2018, the Company had an aggregate outstanding balance of $20.6 million and $24.8 million, respectively, under such financing arrangements. The maturity dates and interest rates per annum applicable to outstanding borrowings under these financing arrangements are listed in the tables below (amount in thousands).

		As of September 30, 2019			
		Maturity Date	**Denomination**	**Interest rate (%)**	**Amount (in U.S. dollars)**
Industrial Bank of Korea	Credit facility	10/02/2019 - 11/12/2019	USD	5.34 - 5.49	$ 512
NongHyup Bank	Credit facility	10/07/2019 - 02/24/2020	USD	3.69 - 4.49	3,097
The Export-Import Bank of Korea	Export development loan	7/1/2020	KRW	2.75	4,995
Korea Development Bank	General loan	8/8/2020	KRW	3.0	4,162
Korea Development Bank	Credit facility	10/07/2019 - 02/18/2020	USD	3.11 - 3.47	6,194
LGUPlus	General loan	6/17/2020	KRW	0	1,665
					$ 20,625

As of September 30, 2019, the Company had $10.8 million in outstanding borrowings and $9.8 million committed as security for letters of credit under the Company's $20.6 million credit facilities with certain foreign banks.

		As of December 31, 2018			
		Maturity Date	**Denomination**	**Interest rate (%)**	**Amount (in U.S. dollars)**
Industrial Bank of Korea	Credit facility	01/02/2019 - 05/15/2019	USD	3.96 - 4.36	$ 1,982
Industrial Bank of Korea	Trade finance	02/18/2019 - 02/25/2019	USD	5.31 - 6.08	1,920
Shinhan Bank	General loan	3/30/2019	KRW	6.06	2,862
NongHyup Bank	Credit facility	01/07/2019 - 04/29/2019	USD	3.71 - 4.50	2,053
The Export-Import Bank of Korea	Export development loan	07/01/2019	KRW	3.44	6,439
The Export-Import Bank of Korea	Import development loan	02/14/2019	USD	4.31	850
Korea Development Bank	General loan	08/08/2019	KRW	3.48	4,472
Korea Development Bank	Credit facility	02/07/2019 - 03/06/2019	USD	3.64 - 3.91	1,489
LGUPlus	General loan	06/17/2019	KRW	0	1,789
Shoko Chukin Bank	General loan	06/28/2019	JPY	1.33	906
					$ 24,762

As of December 31, 2018, the Company had $5.5 million in outstanding borrowings and $2.6 million committed as security for letters of credit under the Company's $19.0 million credit facilities with certain foreign banks.

See Note 11 Related-Party Transactions for a discussion of related-party debt.

(9) Defined Benefit Plans

The Company provides certain defined benefit pension plans in Germany for active and former employees of Keymile and their surviving dependents. These benefits were promised upon an employee either reaching retirement age or becoming disabled. Benefits paid depend on an employee's years of service and annual earnings. These plans were frozen as of September 30, 2003 and have not been offered to new employees after that date. Employees who were already covered by such plans ceased earning benefits under such plans from the freeze date forward. The benefit obligations are determined separately for each plan by estimating the present value of future benefits that employees have earned in prior periods. Given that all plans are frozen; the Company does not have any current service costs to recognize within its defined benefit obligation or pension expense.

The only component of pension expense relates to $0.1 million of interest expense on the defined benefit pension plans, which is recognized in Other income (loss), net in the condensed consolidated statement of comprehensive income (loss). The interest expense is determined by multiplying the defined benefit obligation by the discount rate used to determine the defined benefit obligation. Actuarial gains and losses from changes in assumptions are included in Other comprehensive loss in the condensed consolidated statement of comprehensive income (loss).

The following key actuarial assumptions were made in determining the benefit obligation:

	September 30, 2019
Discount rate	1.20%
Rate of pension increase	1.70%
Retirement age	63-67 years

As of September 30, 2019, the Company's employee benefit obligations under the defined benefit plans is approximately $13.3 million, net of pension assets of $3.4 million which is under a reinsurance contract policy. During the three and nine months ended September 30, 2019, the Company made no cash contributions to the defined benefit plans.

(10) Non-Controlling Interests

Non-controlling interests were as follows (in thousands):

	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
Beginning non-controlling interests	$ 615	$ 534
Net income (loss) attributable to non-controlling interests	194	2
Purchase of noncontrolling interest in subsidiary	(823)	—
Foreign currency translation adjustments (OCI)	14	(5)
Ending non-controlling interests	$ —	$ 531

(11) Related-Party Transactions

Related-Party Debt

In connection with the Merger, on September 9, 2016, the Company entered into a loan agreement with DNI for a $5.0 million unsecured subordinated term loan facility. The term loan was scheduled to mature in September 2021 and was pre-payable at any time by the Company without premium or penalty. The interest rate under this facility was 4.6% per annum. In February 2019, the Company repaid the term loan in full plus accrued interest in connection with the entry into the PNC Facility, thereby terminating the loan agreement.

In February 2016, DNS borrowed $1.8 million from DNI for capital investment with an interest rate of 4.6% per annum. On February 27, 2019, in connection with the entry into the PNC Facility, the Company amended the terms of this loan to extend the repayment date to May 27, 2022. As of September 30, 2019, the $1.8 million balance of the loan remained outstanding.

On December 27, 2018, the Company entered into a loan agreement with DNI, for a $6.0 million term loan with an interest rate of 4.6% per annum. On February 27, 2019, in connection with the entry into the PNC Facility, the Company amended the terms of the term loan to extend the repayment date to May 27, 2022 and to terminate any security granted to DNI with respect to such term loan. As of September 30, 2019, the $6.0 million balance of the loan remained outstanding.

In March 2018, Dasan Network Solutions, Inc., a subsidiary of the Company incorporated under the laws of Korea ("DNS Korea") borrowed KRW6.5 billion ($5.8 million) from DNI, of which KRW5.0 billion ($4.5 million) was repaid on August 8, 2018. The loan bears interest at a rate of 4.6%, and is secured by certain accounts receivable of DNS Korea. On February 27, 2019, in connection with the entry into the PNC Facility, the Company amended the terms of this loan to extend the repayment date to May 27, 2022. As of September 30, 2019, KRW 1.5 billion ($1.3 million) remained outstanding.

The modifications resulting from the amendments described above were limited to the extension of the maturity dates and removal of the collateral on the outstanding term loans with DNI. There were no fees paid to DNI or external costs otherwise incurred in connection with these modifications. Interest expense on these related-party borrowings for the three and nine months ended September 30, 2019 was $0.1 million and $0.3 million, respectively. Interest expense for the three and nine months ended September 30, 2018 was $0.1 million and $0.3 million, respectively.

Other Related-Party Transactions

Sales, cost of revenue, purchases (included in manufacturing (cost of revenue)), research and product development, selling, marketing, general and administrative, interest expense and other expenses to and from related parties were as follows (in thousands) for the three and nine months ended September 30, 2019 and September 30, 2018:

		Three Months Ended September 30, 2019						
Counterparty	**DNI ownership interest**	**Sales**	**Cost of revenue**	**Manufacturing (cost of revenue)**	**Research and product development**	**Selling, marketing, general and administrative**	**Interest expense**	**Other expenses**
DNI	N/A	$ 232	$ 190	$ —	$ —	$ 966	$ 104	$ 84
Tomato Soft Ltd.	100%	—	—	29	—	—	—	—
Tomato Soft (Xi'an) Ltd.	100%	—	—	—	137	—	—	—
Chasan Networks Co., Ltd.	100%	—	—	279	16	—	—	—
		$ 232	$ 190	$ 308	$ 153	$ 966	$ 104	$ 84

		Three Months Ended September 30, 2018						
Counterparty	**DNI ownership interest**	**Sales**	**Cost of revenue**	**Manufacturing (cost of revenue)**	**Research and product development**	**Selling, marketing, general and administrative**	**Interest expense**	**Other expenses**
DNI	N/A	$ 1,472	$ 1,270	$ —	$ —	$ 784	$ 112	$ 89
Tomato Soft Ltd.	100%	—	—	27	—	—	—	—
Tomato Soft (Xi'an) Ltd.	100%	—	—	—	119	—	—	—
Chasan Networks Co., Ltd.	100%	—	—	260	21	—	—	—
HANDYSOFT, Inc.	17.63%	215	208	—	—	2	—	—
		$ 1,687	$ 1,478	$ 287	$ 140	$ 786	$ 112	$ 89

Counterparty	DNI ownership interest	Nine Months Ended September 30, 2019 Sales	Cost of revenue	Manufacturing (cost of revenue)	Research and product development	Selling, marketing, general and administrative	Interest expense	Other expenses
DNI	N/A	$ 1,828	$ 1,346	$ —	$ —	$ 2,984	$ 349	$ 255
Tomato Soft Ltd.	100%	—	—	88	—	—	—	—
Tomato Soft (Xi'an) Ltd.	100%	—	—	—	392	—	—	—
Chasan Networks Co., Ltd.	100%	—	—	837	55	—	—	—
J-Mobile Corporation	90.47%	42	81	—	—	—	—	—
		$ 1,870	$ 1,427	$ 925	$ 447	$ 2,984	$ 349	$ 255

Counterparty	DNI ownership interest	Nine Months Ended September 30, 2018 Sales	Cost of revenue	Manufacturing (cost of revenue)	Research and product development	Selling, marketing, general and administrative	Interest expense	Other expenses
DNI	N/A	$ 3,683	$ 3,143	$ —	$ —	$ 2,950	$ 338	$ 234
Tomato Soft Ltd.	100%	—	—	84	—	—	—	—
Tomato Soft (Xi'an) Ltd.	100%	—	—	10	396	—	—	—
Chasan Networks Co., Ltd.	100%	—	—	880	57	—	—	—
Dasan France	100%	202	177	—	—	—	—	—
HANDYSOFT, Inc.	17.63%	473	357	—	—	4	—	—
		$ 4,358	$ 3,677	$ 974	$ 453	$ 2,954	$ 338	$ 234

The Company has entered into sales agreements with DNI and certain of its subsidiaries. Sales and cost of revenue to DNI and Dasan France, a wholly-owned subsidiary of DNI, represent finished goods produced by the Company that are sold to these related parties who sell the Company's products in Korea and France, respectively.

The Company has entered into an agreement with Chasan Networks Co., Ltd. to provide manufacturing and research and development services for the Company. Under the agreement with Chasan Networks., Ltd., the Company is charged a cost plus 7% fee for the manufacturing and development of certain deliverables.

The Company has entered into an agreement with Tomato Soft Ltd., a wholly owned subsidiary of DNI, to provide sourcing and inspection services for the Company. Under the agreement with Tomato Soft Ltd., the Company is charged a cost plus 7% fee for sourcing and inspection services.

The Company has entered into an agreement with Tomato Soft (Xi'an) Ltd., a wholly owned subsidiary of DNI, to provide research and development services for the Company. Under the agreement with Tomato Soft (Xi'an) Ltd., the Company is charged an expected annual fee of $0.8 million for the development of certain deliverables.

Prior to the Merger, as DNS was then a wholly owned subsidiary of DNI, DNI had sales agreements with certain customers on DNS' behalf. Since the Merger, due to these prior sales agreements, the Company has entered into an agreement with DNI pursuant to which DNI acts as a sales channel to these customers. Sales to DNI necessary for DNI to fulfill agreements with its customers are recorded net of royalty fees in related-party revenue.

The Company shares office and certain administrative functions with DNI and certain of DNI's subsidiaries. Prior to the Merger, DNS, then a wholly owned subsidiary of DNI, shared human resources, treasury and other administrative support with DNI. The Company entered into certain service sharing agreements with DNI and certain of its subsidiaries for continued use of the shared office space and shared administrative services. Expenses related to rent and administrative services are allocated to the Company based on square footage occupied and headcount, respectively.

Other expenses to related parties represent expenses to DNI for its payment guarantees relating to the Company's borrowings. See Note 15 for more information regarding such guarantees. The Company pays DNI a guarantee fee which is calculated as 0.9% of the guaranteed amount.

Balances of Receivables and Payables with Related Parties

Balances of receivables and payables arising from sales and purchases of goods and services with related parties were as follows (in thousands) as of September 30, 2019 and December 31, 2018:

		As of September 30, 2019						
Counterparty	DNI ownership interest	Account receivables	Other receivables	Deposits for lease *	Long-term debt	Accounts payable	Other payables	Accrued and other liabilities**
DNI	N/A	$ 252	1	$ 683	$ 9,049	$ —	$ 2,656	$ 90
Tomato Soft Ltd.	100%	—	—	—	—	—	10	—
Tomato Soft (Xi'an) Ltd.	100%	—	—	—	—	—	45	—
Chasan Networks Co., Ltd.	100%	—	—	—	—	96	—	—
		$ 252	$ 1	$ 683	$ 9,049	$ 96	$ 2,711	$ 90

		As of December 31, 2018						
Counterparty	DNI ownership interest	Account receivables	Other receivables	Deposits for lease*	Loan Payable	Accounts payable	Other payables	Accrued and other liabilities**
DNI	N/A	$ —	$ —	$ 735	$ 14,142	$ 1,000	$ 1,231	$ 169
Tomato Soft Ltd.	100%	—	—	—	—	—	9	—
Tomato Soft (Xi'an) Ltd.	100%	—	—	—	—	—	41	—
Dasan France	100%	280	65	—	—	—	—	—
HANDYSOFT, Inc.	14.77%	303	—	—	—	654	—	—
Chasan Networks Co., Ltd.	100%	—	—	—	—	89	—	—
		$ 583	$ 65	$ 735	$ 14,142	$ 1,743	$ 1,281	$ 169

* Included in other assets related to deposits for lease in the condensed consolidated balance sheets as of September 30, 2019 and December 31, 2018.

** Included in accrued and other liabilities in the condensed consolidated balance sheets as of September 30, 2019 and December 31, 2018.

(12) Common Stock

On May 20, 2019, the Company completed a public offering of 4,717,949 shares of its common stock, inclusive of 615,384 shares sold upon full exercise of the underwriters' option to purchase additional shares of common stock, at a price to the public of $9.75 per share. All shares of common stock were sold by the Company. The total gross proceeds from the offering, before deducting underwriting discounts, commissions and offering expenses, were approximately $46.0 million. After deducting the underwriters' discount, commissions and other offering expenses, the net proceeds were approximately $42.5 million.

(13) Net Income Per Share Attributable to DASAN Zhone Solutions, Inc.

Basic net income per share attributable to DASAN Zhone Solutions, Inc. is computed by dividing the net income attributable to DASAN Zhone Solutions, Inc. for the period by the weighted average number of shares of common stock outstanding during the period. The calculation of diluted net income per share attributable to DASAN Zhone Solutions, Inc. gives effect to common stock equivalents; however, potential common stock equivalents are excluded if their effect is antidilutive. Potential common stock equivalents are composed of incremental shares of common stock issuable upon the exercise of stock options and the vesting of restricted stock units. In periods when a net loss is reported, all common stock equivalents are excluded from the calculation because they would have an anti-dilutive effect, meaning the loss per share would be reduced. Therefore, in periods when a loss is reported, basic and dilutive loss per share are the same.

The following table is a reconciliation of the numerator and denominator in the basic and diluted net income (loss) per share calculation (in thousands, except per share data) for the three and nine months ended September 30, 2019 and September 30, 2018:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2019	2018	2019	2018
Net income (loss) attributable to DASAN Zhone Solutions, Inc.	$ (4,033)	$ 1,798	$ (3,263)	$ 3,321
Weighted average number of shares outstanding:				
Basic	21,384	16,683	18,732	16,425
Effect of dilutive securities:				
Stock options, restricted stock units and share awards	—	208	—	215
Diluted	21,384	16,891	18,732	16,640
Net income (loss) per share attributable to DASAN Zhone Solutions, Inc.:				
Basic	$ (0.19)	$ 0.11	$ (0.17)	$ 0.20
Diluted	$ (0.19)	$ 0.11	$ (0.17)	$ 0.20

(14) Leases

The Company leases certain properties and buildings (including manufacturing facilities, warehouses, and office spaces) and equipment under various arrangements which provide the right to use the underlying asset and require lease payments for the lease term. The Company's lease portfolio consists of operating leases which expire at various dates through 2027. At September 30, 2019, the Company had one outstanding finance lease.

The Company determines if an arrangement contains a lease at inception. The Company evaluates each service contract upon inception to determine whether it is, or contains, a lease. Such determination is made by applying judgment in evaluating each service contract within the context of the 5-step decision making process under ASC 842. The key concepts of the 5-step decision making process that the Company evaluated can be summarized as: (1) is there an identified physical asset; (2) does the Company have the right to substantially all the economic benefits from the asset throughout the contract period; (3) does the Company control how and for what purpose the asset is used; (4) does the Company operate the asset; and (5) did the Company design the asset in a way that predetermines how it will be used.

Assets and liabilities related to operating leases are included in the condensed consolidated balance sheet as right-of-use assets from operating leases, operating lease liabilities - current and operating lease liabilities - non-current.

Operating lease right-of-use assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. Many of the Company's lease agreements contain renewal options; however, the Company does not recognize right-of-use assets or lease liabilities for renewal periods unless it is determined that the Company is reasonably certain of renewing the lease at inception or when a triggering event occurs. Some of the Company's lease agreements contain rent escalation clauses, rent holidays, capital improvement funding or other lease concessions.

The Company recognizes minimum rental expense on a straight-line basis based on the fixed components of a lease arrangement. The Company amortizes this expense over the term of the lease beginning with the date of initial possession, which is the date lessor makes an underlying asset available for use. Variable lease components represent amounts that are not fixed in nature, are not tied to an index or rate, and are recognized as incurred.

In determining its right-of-use assets and lease liabilities, the Company applies a discount rate to the minimum lease payments within each lease agreement. ASC 842 requires the Company to use the rate of interest that a lessee would have to pay to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment. The Company determines the incremental borrowing rate for each lease based primarily on its lease term and the economic environment of the applicable country or region. When the Company cannot readily determine the discount rate implicit in the lease agreement, the Company utilizes an incremental borrowing rate based on the most recent debt facilities interest rates and applicable to the local geography and with similar term to lease.

For the measurement and classification of its lease agreements, the Company groups lease and non-lease components into a single lease component for all underlying asset classes. Variable lease payments include payments for non-lease components of maintenance costs. The components of lease expense were as follows for the three and nine months ended September 30, 2019:

	Three Months Ended September 30, 2019 (in thousands)	Nine Months Ended September 30, 2019 (in thousands)
Operating lease cost	$ 1,064	$ 3,327
Variable lease cost	194	520
Total net lease cost	$ 1,258	$ 3,847

Supplemental cash flow information related to the Company's operating leases was as follows for the three and nine months ended September 30, 2019:

	Three Months Ended September 30, 2019 (in thousands)	Nine Months Ended September 30, 2019 (in thousands)
Cash paid for amounts included in the measurement of operating lease liabilities	$ 1,265	$ 3,888
ROU assets obtained in exchange for operating lease obligations	$ 35	$ 35

The following table presents the lease balances within the Company's condensed consolidated balance sheet, weighted average remaining lease term, and weighted average discount rates related to the Company's operating leases as of September 30, 2019 (in thousands):

Lease Assets and Liabilities	
Assets:	
Right-of-use assets from operating leases	$ 18,349
Liabilities:	
Operating lease liabilities - current	$ 3,496
Operating lease liabilities - non-current	15,957
Total operating lease liabilities	$ 19,453
Weighted average remaining lease term	4.77 years
Weighted average discount rate	6.6%

The following table presents the maturity of the Company's operating lease liabilities as of September 30, 2019 (in thousands):

Remainder of 2019	$ 1,259
2020	4,197
2021	3,890
2022	3,609
2023	3,460
Thereafter	6,373
Total operating lease payments	22,788
Less: imputed interest	(3,335)
Total operating lease liabilities	$ 19,453

As of December 31, 2018, the estimated future lease payments under non-cancelable operating leases as defined under the previous lease accounting guidance of ASC Topic 840, for the following five fiscal years and thereafter are as follows (in thousands):

		Operating Leases
Year ending December 31:		
2019	$	4,100
2020		3,005
2021		2,590
2022		2,664
2023		2,494
Thereafter		5,929
Total minimum lease payments	$	20,782

On August 29, 2019, the Company cancelled a warehouse lease in Germany and recorded $0.2 million of lease cancellation expense to cover early termination costs and renovation obligations. The Company recognized the non-recurring lease cancellation expense in Selling, marketing, general and administrative in the condensed consolidated statement of comprehensive income (loss). In connection with the lease cancellation, balance sheet recognition of approximately $0.6 million right-of-use assets and operating lease liabilities are removed from the condensed consolidated balance sheets as of September 30, 2019.

New Office Lease

On July 9, 2019, the Company entered into a lease agreement (the "Lease") with Family Stations, Inc., a California corporation ("Lessor"). The Lease covers approximately 16,500 square feet of space located at 1350 South Loop Road, Alameda, California (the "Premises"). The Lease provides for a term of 63 months, commencing on November 1, 2019, with a basic monthly rent ranging from $41,273 to $47,846 per month. The Company recognized approximately $2.1 million right-of-use assets and operating lease liabilities as of the commencement date of November 1, 2019.

(15) Commitments and Contingencies

Warranties

The Company accrues warranty costs based on historical trends for the expected material and labor costs to provide warranty services. Warranty periods are generally one to five years from the date of shipment. The following table reconciles changes in the Company's accrued warranties and related costs included in accrued and other liabilities (in thousands) for the nine months ended September 30, 2019 and September 30, 2018:

	Nine Months Ended September 30,			
		2019		2018
Beginning balance	$	1,319	$	931
Assumed balance from Keymile		230		—
Charged to cost of revenue		732		1,022
Claims and settlements		(782)		(598)
Foreign exchange impact		(27)		6
Ending balance	$	1,472	$	1,361

Performance Bonds

In the normal course of operations, from time to time, the Company arranges for the issuance of various types of surety bonds, such as bid and performance bonds, which are agreements under which the surety company guarantees that the Company will perform in accordance with contractual or legal obligations. As of September 30, 2019, the Company had $13.8 million of surety bonds guaranteed by third parties.

Purchase Commitments

The Company has agreements with various contract manufacturers which include non-cancellable inventory purchase commitments. The Company's inventory purchase commitments typically allow for cancellation of orders 30 days in advance of the required inventory availability date as set by the Company at time of order. The amount of non-cancellable purchase commitments outstanding, net of reserve, was $3.2 million as of September 30, 2019.

Royalties

The Company has certain royalty commitments associated with the shipment and licensing of certain products. Royalty expense is generally based on a dollar amount per unit shipped or a percentage of the underlying revenue and is recorded in cost of revenue.

Payment Guarantees provided by Third Parties and DNI

The following table sets forth payment guarantees of the Company's indebtedness and other obligations as of September 30, 2019 (in thousands) that have been provided by third parties and DNI. DNI owns approximately 44.4% of the outstanding shares of the Company's common stock:

Guarantor	Amount Guaranteed (in thousands)	Description of Obligations Guaranteed
DNI	$ 8,400	Credit facility from Industrial Bank of Korea
DNI	1,998	Purchasing Card from Industrial Bank of Korea
DNI	8,400	Credit facility from Korea Development Bank
DNI	4,995	Borrowings from Korea Development Bank
DNI	6,000	Credit facility from NongHyup Bank
DNI	3,566	Borrowings from Export-Import Bank of Korea
DNI	3,000	Payment Guarantee from Shinhan Bank
DNI	1,598	Backed Loan from Shinhan Bank
PNC Bank, N.A.	4,550	Letter of Credit
Seoul Guarantee Insurance Co.	5,516	Performance Bond, Warranty Bond, etc. (*)
Industrial Bank of Korea	1,096	Letter of Credit
Industrial Bank of Korea	1,010	Bank Guarantee
Korea Development Bank	6,908	Letter of Credit
NongHyup Bank	3,596	Letter of Credit
Woori Bank	1,932	Bank Guarantee
Shinhan Bank	573	Purchasing Card
Shinhan Bank	683	Payment Guarantee
AXA Insurance Company	175	Guarantee for flexible retirement program
Polska Agencja Zeglugi Powietrznej	112	Performance Bond, Warranty Bond, etc. (*)
DDE 64 Ltd.	64	Guarantee Bond
	$ 64,172	

* The Company is generally responsible for warranty liabilities for a period of two years with respect to major product sales and has, therefore, contracted for surety insurance for a portion of the warranty liabilities.

Legal Proceedings

From time to time, the Company is subject to various legal proceedings, claims and litigation arising in the ordinary course of business. While the outcome of these matters is currently not determinable, the Company records an accrual for legal contingencies that it has determined to be probable to the extent that the amount of the loss can be reasonably estimated. The Company does not expect that the ultimate costs to resolve these matters will have a material adverse effect on its consolidated financial position, results of operations or cash flows. However, litigation is subject to inherent uncertainties, and unfavorable rulings could occur. If an unfavorable ruling were to occur, there exists the possibility of a material adverse impact on the results of operations of the period in which the ruling occurs, or future periods.

(16) Income Taxes

Income tax expense for the three and nine months ended September 30, 2019 was approximately $0.3 million and $1.1 million, respectively, on pre-tax loss of $3.7 million and $2.0 million, respectively. Income tax expense for the three and nine months ended September 30, 2018 was $0.7 million and $1.1 million, respectively, on pre-tax income of $2.6 million and $4.4 million, respectively.

For the three and nine months ended September 30, 2019 and 2018, the effective income tax rate varied from the United States statutory income tax rate primarily due to valuation allowances in the United States and the mix of earnings generated by the Company's wholly owned foreign subsidiaries.

The total amount of unrecognized tax benefits, including interest and penalties, at September 30, 2019 was $0.8 million. The amount of tax benefits that would impact the effective income tax rate, if recognized, is $0.1 million. There were no significant changes to unrecognized tax benefits during the three and nine months ended September 30, 2019 and 2018. The Company does not anticipate any significant changes with respect to unrecognized tax benefits within the next 12 months.

(17) Enterprise-Wide Information

The Company is a global provider of ultra-broadband network access solutions and communications platforms deployed by advanced Tier 1, 2 and 3 service providers and enterprise customers. There are no segment managers who are held accountable for operations, operating results and plans for levels or components below the Company unit level. Accordingly, the Company is considered to be in a single reporting segment and operating unit structure.

The Company's property, plant and equipment, net of accumulated depreciation, were located in the following geographical areas (in thousands) as of September 30, 2019 and December 31, 2018:

	September 30, 2019	December 31, 2018
United States	$ 2,872	$ 3,036
Korea	1,976	1,543
Japan and Vietnam	874	910
Taiwan and India	25	29
Germany	828	—
	$ 6,575	$ 5,518

(18) Subsequent Events

On November 8, 2019, the Company received a waiver from the Lenders under the Credit Agreements with respect to the Company's violation at September 30, 2019 of the maximum leverage ratio financial covenant set forth in the Credit Agreements. As a condition for the issuance of the waiver, the Company voluntarily prepaid $10.0 million of the outstanding term loan and paid a one-time fee of $150,000.

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

As used in this Quarterly Report on Form 10-Q, unless the context suggests otherwise, the terms "DZS," "we," "our" and "us" refer to DASAN Zhone Solutions, Inc. and its subsidiaries.

Forward-Looking Statements

This Quarterly Report on Form 10-Q, including "Management's Discussion and Analysis of Financial Condition and Results of Operations," contains forward-looking statements regarding future events and our future results that are subject to the safe harbors created under the Securities Act of 1933 (the "Securities Act") and the Securities Exchange Act of 1934 (the "Exchange Act"). These statements are based on current expectations, estimates, forecasts, and projections about the industries in which we operate, and reflect the beliefs and assumptions of our management as of the date hereof. We use words such as "anticipate," "believe," "continue," "could," "estimate," "expect," "forecast," "goal," "intend," "may," "plan," "project," "seek," "should," "target," "will," "would," variations of such words, and similar expressions to identify forward-looking statements. In addition, statements that refer to projections of earnings, revenue, costs, margins or other financial items in future periods; anticipated growth and trends in our business or key markets; cost synergies, growth opportunities and other potential financial and operating benefits of our acquisitions, including our acquisition of Keymile GmbH (the "Keymile Acquisition"); future growth and revenues from our products; our ability to refinance or repay our existing indebtedness prior to the applicable maturity dates; future economic conditions and performance; anticipated performance of products or services; plans, objectives and strategies for future operations; market and foreign currency exchange rate risks associated with financial instruments; the impact of interest rate changes; anticipated obligations under our non-U.S. defined benefit pension plans; future obligations under contracts and leases and other characterizations of future events or circumstances, and all other statements that are not statements of historical fact are forward-looking statements within the meaning of the Securities Act and the Exchange Act. Readers are cautioned that these forward-looking statements are only predictions and are subject to risks, uncertainties and assumptions that are difficult to predict, including those identified under the heading "Risk Factors" in Part II, Item 1A of this Quarterly Report on Form 10-Q and Part I, Item 1A of our Annual Report on Form 10-K filed with the SEC on March 12, 2019 and in our other filings with the Securities and Exchange Commission (the SEC). Our actual results may differ materially and adversely from those expressed in any forward-looking statements. Factors that might cause such a difference include, but are not limited to, our ability to realize the anticipated cost savings, synergies and other benefits of acquisitions, including the Keymile Acquisition and any integration risks relating to acquisitions, including the Keymile Acquisition; the ability to generate sufficient revenue to achieve or sustain profitability; material weaknesses or other deficiencies in our internal control over financial reporting; our ability to raise additional capital to fund existing and future operations or to refinance or repay our existing indebtedness; defects or other performance problems in our products; any economic slowdown in the telecommunications industry that restricts or delays the purchase of products by our customers; the loss of any of our large customers, further significant reductions or delays in their spending, or a material change in their networking or procurement strategies; commercial acceptance of our products; intense competition in the communications equipment market from large equipment companies as well as private companies with products that address the same networks needs as our products; higher than anticipated expenses that we may incur; any failure to comply with the periodic filing and other requirements of The Nasdaq Stock Market for continued listing; fluctuations in foreign currency exchange rates; our ability to enforce our intellectual property rights; the initiation of any civil litigation, regulatory proceedings, government enforcement actions or other adverse effects relating to the Audit Committee investigation or errors in the consolidated financial statements of Zhone Technologies, Inc. and other factors identified elsewhere in this Quarterly Report on Form 10-Q and in our most recent reports on Forms 10-K and 8-K. We undertake no obligation to revise or update any forward-looking statements for any reason.

OVERVIEW

We are a global provider of ultra-broadband network access solutions and communications platforms deployed by advanced Tier 1, 2 and 3 service providers and enterprise customers. We provide a wide array of reliable, cost-effective networking technologies to a diverse customer base that includes more than 900 customers in more than 80 countries worldwide. We research, develop, test, sell, manufacture and support platforms in five major areas: broadband access, mobile backhaul, Ethernet switching with Software Defined Networking ("SDN") capabilities, new enterprise solutions based on Passive Optical LAN ("POL"), and new generation of SDN/Network Function Virtualization ("NFV") solutions for unified wired and wireless networks.

As of September 30, 2019, we employed over 830 personnel worldwide, of which approximately half are engineers or engaged in research and development.

RECENT DEVELOPMENTS

On July 9, 2019, the Company entered into a lease agreement (the “Lease”) with Family Stations, Inc., a California corporation (“Lessor”). The Lease covers approximately 16,500 square feet of space located at 1350 South Loop Road, Alameda, California (the “Premises”). The Lease provides for a term of 63 months, commencing on November 1, 2019 (or such later date as contemplated by the Lease in the event Lessor is unable to tender possession of the Premises by such date), with a basic monthly rent ranging from $41,273 to $47,846 per month.

On July 31, 2019, the Company acquired the remaining 30.94% non-controlling interest of DZS Japan, Inc. (“DZS Japan”), and DZS Japan became a wholly owned subsidiary of the Company. The Company acquired the remaining interest in DZS Japan for total cash consideration of $950,000, consisting entirely of payments to the former shareholder (Handysoft).

On August 26, 2019, Michael Golomb, our Chief Financial Officer, resigned from such position. We have initiated a search for his replacement and Mr. Golomb has agreed to consult with us to provide advice regarding the transition of responsibilities. While the Company is pursuing a permanent replacement for Mr. Golomb, Il Yung Kim, the Company’s President and Chief Executive Officer will serve as interim Chief Financial Officer.

On November 8, 2019, the Company received a waiver from the lenders under the Credit Agreements with respect to the Company’s violation at September 30, 2019 of the maximum leverage ratio financial covenant of the Credit Agreements. As a condition for the issuance of the waiver, the Company voluntarily prepaid $10.0 million of the outstanding term loan and paid a one-time fee of $150,000.

RESULTS OF OPERATIONS

We list in the table below the historical condensed consolidated statement of comprehensive income (loss) as a percentage of total net revenue for the periods indicated.

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2019	2018	2019	2018
Net revenue:				
Third parties	100%	98%	99%	98%
Related parties	0%	2%	1%	2%
Total net revenue	100%	100%	100%	100%
Cost of revenue:				
Products and services - third parties	68%	65%	66%	65%
Products and services - related parties	0%	2%	1%	2%
Amortization of intangible assets	1%	0%	1%	0%
Total cost of revenue	69%	67%	68%	67%
Gross profit	31%	33%	32%	33%
Operating expenses:				
Research and product development	14%	12%	13%	13%
Selling, marketing, general and administrative	22%	16%	20%	17%
Amortization of intangible assets	1%	0%	1%	0%
Total operating expenses	37%	28%	34%	30%
Operating income (loss)	(6)%	5%	(2)%	3%
Interest income	1%	0%	0%	0%
Interest expense	(2)%	0%	(1)%	0%
Other income (loss), net	1%	(1)%	1%	0%
Income (loss) before income taxes	(6)%	4%	(2)%	3%
Income tax provision	—	1%	(1)%	1%
Net income (loss)	(6)%	3%	(1)%	2%
Net income (loss) attributable to non-controlling interest	0%	0%	0%	0%
Net income (loss) attributable to DASAN Zhone Solutions, Inc.	(6)%	3%	(1)%	2%

Net Revenue

Net Revenue for the three months ended September 30, 2019 of $71.5 million was slightly lower as compared to $71.9 million for the same period last year. We believe, the slight decrease in net revenue during the period was primarily attributed to softer spending from wireline carriers. For the nine months ended September 30, 2019, net revenue increased by 10% or $21.6 million to $229.3 million from $207.7 million for the same period last year. The increase in net revenue during the period was partly due to the impact of the Keymile Acquisition and increased product and services sales primarily in the Europe, Middle East and Africa ("EMEA"), and Korea regions.

Information about our net revenue for products and services is summarized below (in millions):

	Three Months Ended September 30,				Nine Months Ended September 30,			
	2019	2018	Increase/ (Decrease)	% change	2019	2018	Increase/ (Decrease)	% change
Products	$ 66.4	$ 68.8	$ (2.4)	(3)%	$ 214.9	$ 198.8	$ 16.1	8%
Services	5.1	3.1	2.0	65%	14.4	8.9	5.5	62%
Total	$ 71.5	$ 71.9	$ (0.4)	(1)%	$ 229.3	$ 207.7	$ 21.6	10%

For the three months ended September 30, 2019, product revenue decreased by 3% or $2.4 million to $66.4 million from $68.8 million in the same period last year. The decrease in product revenue during the period was primarily attributed to softer spending from wireline carriers coupled with delayed purchases from one of our major customers in Japan. For the nine months ended September 30, 2019, product revenue increased by 8% or $16.1 million to $214.9 million from $198.8 million in the same period last year. The increase in product revenue during the period was primarily due to an increase in product sales, resulting from the impact of the Keymile Acquisition, as well as our broadened geographical base and product offerings, particularly in the EMEA, and Korea regions.

Service revenue represents revenue from maintenance and other services associated with product shipments. For the three months ended September 30, 2019, service revenue increased by 65% or $2.0 million to $5.1 million from $3.1 million in the same period last year. For the nine months ended September 30, 2019, service revenue increased by 62% or $5.5 million to $14.4 million from $8.9 million in the same period last year. The increase in service revenue was due to the Keymile Acquisition and an increase in the number of products under contract for maintenance and extended warranty.

Information about our net revenue for North America and international markets is summarized below (in millions):

	Three Months Ended September 30,				Nine Months Ended September 30,			
	2019	2018	Increase/ (decrease)	% change	2019	2018	Increase/ (decrease)	% change
Revenue by geography:								
United States	$ 9.7	$ 11.2	$ (1.5)	(13)%	$ 29.0	$ 41.4	$ (12.4)	(30)%
Canada	1.1	1.1	—	0%	3.0	3.3	(0.3)	(9)%
Total North America	10.8	12.3	(1.5)	(12)%	32.0	44.7	(12.7)	(28)%
Latin America	6.3	6.8	(0.5)	(7)%	18.8	21.7	(2.9)	(13)%
Europe, Middle East, Africa	15.8	10.4	5.4	52%	59.4	27.3	32.1	118%
Korea	20.9	19.6	1.3	7%	55.7	50.9	4.8	9%
Other Asia Pacific	17.7	22.8	(5.1)	(22)%	63.4	63.1	0.3	0%
Total International	60.7	59.6	1.1	2%	197.3	163.0	34.3	21%
Total	$ 71.5	$ 71.9	$ (0.4)	(1)%	$ 229.3	$ 207.7	$ 21.6	10%

From a geographical perspective, the decrease in net revenue for the three months ended September 30, 2019 was attributable to declining revenue in North America and Other Asia Pacific regions, partially offset by increased revenues in the EMEA region due to the Keymile Acquisition. The increase in net revenue for the nine months ended September 30, 2019 was primarily attributable to increased revenues in the EMEA region due to the impact of the Keymile Acquisition, as well as increased revenues in Korea, partially offset by the decline in revenue in North America and Latin America due to changes in the buying patterns of certain customers.

Across international markets, net revenue for the three months ended September 30, 2019 increased 2% or $1.1 million to $60.7 million from $59.6 million for the same period last year, and represented 85% of total net revenue compared with 83% during the same period of 2018. The increase in international net revenue was primarily related to the Keymile Acquisition. International net revenue for the nine months ended September 30, 2019 increased 21% or $34.3 million to $197.3 million from $163.0 million for the same period last year, and represented 86% of total net revenue compared with 78% during the same period of 2018. The increase in international net revenue was partly related to the Keymile Acquisition and increased product sales in the EMEA, and Korea regions during the period.

For the three months ended September 30, 2019, one customer accounted for 11% of net revenue. For the nine months ended September 30, 2019, no single customer accounted for 10% or more of net revenue. For the three and nine months ended September 30, 2018, one customer accounted for 11% of net revenue. However, we anticipate that our results of operations in any given period may depend to a large extent on sales to a small number of large accounts. As a result, our revenue for any quarter may be subject to significant volatility based upon changes in orders from one or a small number of key customers.

Cost of Revenue and Gross Profit

Total cost of revenue increased 2% or $0.8 million to $49.3 million for the three months ended September 30, 2019, compared to $48.5 million for the three months ended September 30, 2018. Total cost of revenue was 69% of net revenue for the three months ended September 30, 2019, compared to 67% for the three months ended September 30, 2018. Total cost of revenue increased 11% or $15.1 million to $154.4 million for the nine months ended September 30, 2019, compared to $139.3 million for the nine months ended September 30, 2018. Total cost of revenue was 68% of net revenue for the nine months ended September 30, 2019, compared to 67% for the nine months ended September 30, 2018. Gross profit percentage remained substantially flat at 33% for the nine months ended September 30, 2019 and 2018. Gross profit percentage for the three months ended September 30, 2019 was slightly lower at 31% as compared to 33% for the three months ended September 30, 2018, mainly due to product mix and foreign currency exchange rate fluctuations.

We expect that in the future our cost of revenue as a percentage of net revenue will vary depending on the mix and average selling prices of products sold. In addition, continued competitive and economic pressures could cause us to reduce our prices, adjust the carrying values of our inventory, or record inventory expenses relating to discontinued products and excess or obsolete inventory.

Research and Product Development Expenses

Research and product development expenses increased 14% or $1.2 million to $9.9 million for the three months ended September 30, 2019 compared to $8.7 million for the three months ended September 30, 2018. As a percentage of sales, research and product development expenses were 14% for the three months ended September 30, 2019, compared to 12% for the three months ended September 30, 2018. Research and product development expenses increased 12% or $3.2 million to $29.5 million for the nine months ended September 30, 2019 compared to $26.3 million for the nine months ended September 30, 2018. As a percentage of sales, research and product development expenses were 13% for the nine months ended September 30, 2019 and 2018. The increase in research and product development expenses was primarily due to the Keymile Acquisition. We intend to continue to invest in research and product development to attain our strategic product development objectives while seeking to manage the associated costs through expense controls. We have grown our research and development capabilities, particularly in software development, by using lower cost centers like Vietnam.

Selling, Marketing, General and Administrative Expenses

Selling, marketing, general and administrative expenses increased 42% or $4.6 million to $15.7 million for the three months ended September 30, 2019, compared to $11.1 million for the three months ended September 30, 2018. As a percentage of sales, selling, marketing, general and administrative expenses were 22% for the three months ended September 30, 2019, compared to 16% for the three months ended September 30, 2018. Selling, marketing, general and administrative expenses increased 30% or $10.5 million to $45.7 million for the nine months ended September 30, 2019, compared to $35.2 million for the nine months ended September 30, 2018. As a percentage of sales, selling, marketing, general and administrative expenses were 20% for the nine months ended September 30, 2019, compared to 17% for the nine months ended September 30, 2018. The increase in selling, marketing, general and administrative expenses was primarily due to the impact of the Keymile Acquisition and growth in business as we continue to expand our presence internationally.

Income Tax Provision

Income tax expense for the three and nine months ended September 30, 2019 was $0.3 million and $1.1 million, respectively, on pre-tax loss of $3.7 million and $2.0 million, respectively. Income tax expense for the three and nine months ended September 30, 2018 was $0.7 million and $1.1 million, respectively, on pre-tax income of $2.6 million and $4.4 million, respectively. For the three and nine months ended September 30, 2019 and September 30, 2018, the effective income tax rate varied from the United States statutory income tax rate primarily due to valuation allowances in the United States and the mix of earnings generated by our wholly owned foreign subsidiaries.

OTHER PERFORMANCE MEASURES

In managing our business and assessing our financial performance, we supplement the information provided by our U.S. GAAP results with adjusted earnings before interest, taxes, depreciation and amortization and the impact of certain other charges or transactions, or Adjusted EBITDA, a non-GAAP financial measure. We define Adjusted EBITDA as net income (loss), as defined by GAAP, before (i) interest expense, net, (ii) provision (benefit) for income taxes, (iii) depreciation and amortization expense, (iv) stock-based compensation expenses, and (v) the impact of material transactions or events that we believe are not indicative of our core operating performance, such as merger and acquisition transaction costs, inventory step-up valuation amortization, bargain purchase gain, gain or (loss) on sale of assets or impairment of fixed assets, any of which may or may not be recurring in nature. We believe that the presentation of Adjusted EBITDA enhances the usefulness of our financial information by presenting a measure that management uses internally to monitor and evaluate our operating performance and to evaluate the effectiveness of our business strategies. We believe Adjusted EBITDA also assists investors and analysts in comparing our performance across reporting periods on a consistent basis because it excludes the impact of items that we do not believe reflect our core operating performance.

Adjusted EBITDA has limitations as an analytical tool. Some of these limitations are:

- Adjusted EBITDA does not reflect our cash expenditures, or future requirements, for capital expenditures or contractual requirements;
- Adjusted EBITDA does not reflect changes in, or cash requirements for, our working capital needs;
- Adjusted EBITDA does not reflect the interest expense, or the cash requirements necessary to service interest or principal payments, on our debts;
- Although depreciation and amortization are non-cash expenses, the assets being depreciated and amortized will often have to be replaced in the future, and Adjusted EBITDA does not reflect any cash requirements for such replacements;
- Stock-based compensation is and will remain a key element of our overall long-term incentive compensation package, although we exclude it as an expense when evaluating our ongoing operating performance for a particular period; and
- Other companies in our industry may calculate Adjusted EBITDA and similar measures differently than we do, limiting its usefulness as a comparative measure.

Because of these limitations, Adjusted EBITDA should not be considered in isolation or as a substitute for net income (loss) or any other performance measures calculated in accordance with U.S. GAAP or as a measure of liquidity. Management understands these limitations and compensates for these limitations by relying primarily on our U.S. GAAP results and using Adjusted EBITDA only as a supplemental measure.

Set forth below is a reconciliation of Adjusted EBITDA and net income, which we consider to be the most directly comparable U.S. GAAP financial measure to Adjusted EBITDA (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2019	2018	2019	2018
Net income (loss)	$ (3,996)	$ 1,827	$ (3,069)	$ 3,323
Add (less):				
Interest expense, net	750	405	2,715	1,127
Income tax expense	289	735	1,098	1,071
Depreciation and amortization	1,343	652	4,110	2,033
Stock-based compensation	1,182	617	2,818	1,357
Acquisition costs	—	139	337	139
Inventory step-up valuation amortization	175	—	577	—
Bargain purchase gain	—	—	(334)	—
Adjusted EBITDA	$ (257)	$ 4,375	$ 8,252	$ 9,050

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

For a complete description of what we believe to be the critical accounting policies and estimates used in the preparation of our unaudited condensed consolidated financial Statements, refer to Note 1, Organization and Summary of Significant Accounting Policies, in the notes to our audited consolidated financial statements in our Annual Report on Form 10-K for the year ended December 31, 2018, as supplemented by Note 1, Organization and Summary of Significant Accounting Policies, in the notes to our unaudited condensed consolidated financial statements in Part I, Item 1 of this Quarterly Report on Form 10-Q.

LIQUIDITY AND CAPITAL RESOURCES

Our operations are financed through a combination of our existing cash, cash equivalents, available credit facilities, and sales of equity and debt instruments, based on our operating requirements and market conditions.

The following table summarizes the information regarding our cash and cash equivalents and working capital (in thousands):

	September 30, 2019	December 31, 2018
Cash and cash equivalents	$ 47,851	$ 27,709
Working capital	119,938	75,280

Operating Activities

Net cash used in operating activities increased by $6.2 million to $21.9 million for the nine months ended September 30, 2019 from $15.7 million for the nine months ended September 30, 2018 primarily due to the decrease in earnings between the two periods and the net effect of changes in operating assets and liabilities during the period.

Investing Activities

Net cash used in investing activities increased by $5.4 million to $6.2 million for the nine months ended September 30, 2019 from $0.8 million for the nine months ended September 30, 2018. This increase was primarily due to the payment of the purchase price of $11.8 million, net of cash received of $7.1 million, in the Keymile Acquisition.

Financing Activities

Net cash provided by financing activities increased by $31.0 million to $46.2 million for the nine months ended September 30, 2019 from $15.2 million for the nine months ended September 30, 2018. This increase was primarily due to the public stock offering in May 2019 in which we received $42.5 million in net proceeds and the borrowing proceeds received upon entry into the PNC Facility (defined below), partially offset by repayments of short-term and long-term borrowings.

Cash Management

Our primary source of liquidity comes from our cash and cash equivalents, which totaled $47.9 million at September 30, 2019, as well as our PNC Bank Facility, under which we had aggregate revolving line availability of $12.0 million as of September 30, 2019. Our cash and cash equivalents as of September 30, 2019 included $7.4 million in cash balances held by our international subsidiaries.

PNC Bank Facility

On February 27, 2019, DZS and ZTI (collectively, the "Borrowers"), and certain direct and indirect subsidiaries of the Borrowers, as guarantors, entered into that certain Revolving Credit, Term Loan, Guaranty and Security Agreement (the "Domestic Credit Agreement") and that certain Export-Import Revolving Credit, Guaranty and Security Agreement (the "Ex-Im Credit Agreement," and together with the Domestic Credit Agreement, the "Credit Agreements"), in each case with PNC Bank, National Association ("PNC") and Citibank, N.A. as lenders, and PNC as agent for the lenders (the "PNC Facility"), which replaced our former senior secured credit facilities with Wells Fargo Bank (the "Former WFB Facility").

The Credit Agreements provide for a $25.0 million term loan and a $15.0 million revolving line of credit (including subfacilities for Ex-Im transactions, letters of credit and swing loans). The amount we are able to borrow on the revolving line of credit at any time is based on eligible accounts receivable and other conditions, less certain reserves. Borrowings under the PNC Facility bear interest at our option, at either (i) a base rate equal to the highest of the federal funds rate plus 0.50%, PNC's prime rate, or the daily LIBOR rate plus 1.00%, or (ii) the LIBOR rate for the applicable interest period, subject to a floor of 1.00% (with respect to the term loans only), plus in each case, an applicable margin. The applicable margin for term loans is 5.00% for base rate loans and 6.00% for LIBOR rate loans, and the applicable margin for borrowings under the revolving line of credit is 1.50% for base rate loans and 2.50% for LIBOR rate loans.

We used a portion of the funds borrowed from the term loan under the Credit Agreements to (i) repay $5.0 million in principal amount of existing related-party indebtedness with DNI plus accrued interest, (ii) repay $1.5 million in outstanding borrowings plus accrued interest and fees and cash collateralize $3.6 million in outstanding letters of credit under the Former WFB Facility, and (iii) repay $5.6 million in short-term debt in Korea and Japan. We intend to use the remaining funds for ongoing working capital needs. Obligations under the Credit Agreements are secured by substantially all of the personal property assets of the Borrowers and the subsidiaries that guarantee the Credit Agreements, including their intellectual property.

The maturity date under the Credit Agreements is February 27, 2022. The term loan under the Credit Agreements is repayable in eight quarterly installments of $625,000 beginning June 30, 2019, followed by quarterly installments of $937,500 beginning on June 30, 2021, with all remaining unpaid principal and accrued interest due on the maturity date.

The Credit Agreements contain certain covenants, limitations, and conditions with respect to the Borrowers and their subsidiaries, including a maximum leverage ratio, a minimum fixed charge coverage ratio, and a minimum liquidity covenant, as well as financial reporting obligations, and customary events of default. If an event of default occurs, the agent and lenders will be entitled to take various actions, including requiring the immediate repayment of all outstanding amounts under the Credit Agreements, terminating commitments to make additional advances and selling the assets of the Borrowers and their subsidiary guarantors to satisfy the obligations under the Credit Agreements. At September 30, 2019, the Company was not in compliance with the maximum leverage ratio financial covenant in the Credit Agreements, which represents an event of default thereunder. On November 8, 2019, the Company obtained a waiver of the foregoing event of default from the lenders under the Credit Agreements. As a condition for the issuance of the waiver, the Company voluntarily prepaid $10.0 million of the outstanding term loan and paid a one-time fee of $150,000. Uncertainty exists as to the Company's ability to meet these financial covenants at the respective reporting dates during the next twelve months. As a result, the Company is in the process of renegotiating these financial covenants with the banks; however, there is no assurance that the Company will be able to successfully complete such renegotiations. If the Company violates covenants in the Credit Agreements or the contemplated amended covenants, the Company could be required to repay the amounts then outstanding under the Credit Agreements.

As of September 30, 2019, we had $23.8 million in outstanding term loan borrowings and no outstanding revolving line of credit borrowings under the Credit Agreements. On July 2, 2019, $4.4 million in outstanding borrowings under the revolving line of credit (which represented all outstanding borrowings under the revolving line of credit) was paid in full.

As of September 30, 2019, the interest rate on the term loan was 8.12%. Deferred financing cost of $1.5 million as of September 30, 2019 has been netted against the aggregate principal amount of the PNC term loan in the unaudited condensed consolidated balance sheet as of September 30, 2019.

Former Wells Fargo Bank Facility

On February 27, 2019, in connection with the entry into the PNC Facility, we repaid $1.5 million in principal amount of outstanding borrowings plus accrued interest and fees under the Former WFB Facility, cash collateralized $3.6 million outstanding letters of credit under the Former WFB Facility and terminated the Former WFB Facility.

Working Capital Loan

On October 1, 2018, as a condition for the Keymile Acquisition, the former stockholder of Keymile extended a €4.0 million ($4.4 million) working capital loan to Keymile. The working capital loan bears interest at a rate of 3.5% per annum and is scheduled for repayment in two equal installments. The first payment of €2 million ($2.2 million) was made in April 2019 and the balance is due in November 2019. As of September 30, 2019, the outstanding balance under this working capital loan was €2.0 million ($2.2 million). Subsequently in November 2019, the Company fully repaid all the outstanding borrowings under this working capital loan.

Bank and Trade Facilities - Foreign Operations

Certain of our foreign subsidiaries have entered into various financing arrangements with foreign banks and other lending institutions consisting primarily of revolving lines of credit, trade facilities, term loans and export development loans. These facilities are renewed as they mature and are generally secured by a security interest in certain assets of the applicable foreign subsidiaries and supported by guarantees given by DNI or third parties. Payments under such facilities are made in accordance with the given lender's amortization schedules. As of September 30, 2019 and December 31, 2018, we had an aggregate outstanding balance of $20.6 million and $24.8 million, respectively, under such financing arrangements, and the interest rate per annum applicable to outstanding borrowings under these financing arrangements ranged from 0% to 5.49% as of September 30, 2019.

Related-Party Debt

In connection with the Merger, on September 9, 2016, we entered into a loan agreement with DNI for a $5.0 million unsecured subordinated term loan facility. The term loan was scheduled to mature in September 2021 and was pre-payable at any time by us without premium or penalty. The interest rate under this facility was 4.6% per annum. In February 2019, we repaid the term loan in full plus accrued interest in connection with the entry into the PNC Facility, thereby terminating the loan agreement.

In February 2016, DNS borrowed $1.8 million from DNI for capital investment with an interest rate of 4.6% per annum. On February 27, 2019, in connection with the entry into the PNC Facility, the parties amended the terms of this loan to extend the repayment date until May 27, 2022. As of September 30, 2019, the $1.8 million balance of the loan remained outstanding.

On December 27, 2018, we entered into a Loan Agreement with DNI for a $6.0 million term loan with an interest rate of 4.6% per annum. On February 27, 2019, in connection with the entry into the PNC Facility, the parties amended the terms of the term loan to extend the repayment date until May 27, 2022 and to terminate the security interest granted to DNI with respect to such term loan. As of September 30, 2019, the $6.0 million balance of the loan remained outstanding.

On March 27, 2018, Dasan Network Solutions, Inc., a subsidiary of the Company incorporated under the laws of Korea ("DNS Korea"), borrowed KRW6.5 billion ($5.8 million) from DNI. The loan bears interest at a rate of 4.6% and is secured by certain accounts receivable of DNS Korea. On February 27, 2019, in connection with the entry into the PNC Facility, the parties amended the terms of this loan to extend the repayment date until May 27, 2022. As of September 30, 2019, KRW1.5 billion ($1.3 million) remained outstanding.

Interest expense on these related-party borrowings was $0.1 million for each of the three months ended September 30, 2019 and 2018, and $0.3 million for each of the nine months ended September 30, 2019 and 2018.

Future Requirements and Funding Sources

Our fixed commitments for cash expenditures consist primarily of payments under operating leases, inventory purchase commitments, and payments of principal and interest for debt obligations.

From time to time, we may provide or commit to extend credit or credit support to our customers. This financing may include extending the terms for product payments to customers. Any extension of financing to our customers will limit the capital that we have available for other uses.

Our accounts receivable, while not considered a primary source of liquidity, represent a concentration of credit risk because a significant portion of the accounts receivable balance at any point in time typically consists of a relatively small number of customer account balances. As of September 30, 2019, two customers represented 17% and 12% of net accounts receivable, respectively, and receivables from customers in countries other than the United States represented 94% of net accounts receivable. We do not currently have any material commitments for capital expenditures, or any other material commitments aside from operating leases for our facilities, inventory purchase commitments and debt.

Contractual Commitments

At September 30, 2019, our future contractual commitments by fiscal year were as follows (in thousands):

		Payments due by period					
	Total	2019	2020	2021	2022	2023	Thereafter
Operating lease payments	$ 22,788	$ 1,259	$ 4,197	$ 3,890	$ 3,609	$ 3,460	$ 6,373
Other lease payments	406	145	226	35	—	—	—
Purchase commitments	3,188	3,188	—	—	—	—	—
Foreign debts	22,808	10,769	12,039	—	—	—	—
PNC debts	23,750	10,625	2,500	3,437	7,188	—	—
Long-term debt - related party	9,049	—	—	—	9,049	—	—
Royalty obligations	69	69	—	—	—	—	—
Total future contractual commitments	$ 82,058	$ 26,055	$ 18,962	$ 7,362	$ 19,846	$ 3,460	$ 6,373

Operating Leases

The operating lease amounts shown above represent leases for certain properties and buildings (including manufacturing facilities, warehouses, and office spaces) and equipment under various arrangements which provide the right to use the underlying asset and require lease payments for the lease term. For additional information regarding how leases are reported on our balance sheet, see Note 14 in the notes to our unaudited condensed consolidated financial statements in Part I, Item 1 of this Quarterly Report on Form 10-Q.

Purchase Commitments

The purchase commitments shown above represent non-cancellable inventory purchase commitments as of September 30, 2019.

Short-term Debt

Our short-term debt obligations have been recorded as liabilities on our balance sheet, and as of September 30, 2019 are comprised of $20.6 million in outstanding borrowings under the credit facilities of our foreign subsidiaries, $12.5 million in outstanding borrowings under the Credit Agreements and $2.2 million in outstanding borrowings under a working capital loan from the former stockholder of Keymile. Such amounts represent scheduled principal repayments, but not the associated interest payments which may vary based on changes in market interest rates. At September 30, 2019, the interest rate per annum applicable to outstanding borrowings under the trade facilities of our foreign subsidiaries ranged from 0% to 5.49%, was 8.12% under the PNC term loan, and was 3.5% for the Keymile working capital loan. See above under "Cash Management" for further information about these facilities.

Related-Party Debt

As of September 30, 2019, we had an aggregate of $9.1 million in outstanding borrowings from DNI, which consisted of a $6.0 million unsecured subordinated term loan facility which matures in May 2022, a $1.8 million loan for capital investment which matures in May 2022, and KRW 1.5 billion ($1.3 million) outstanding under a secured loan from DNS Korea which matures in May 2022. All three loans bear interest at a rate of 4.6% per annum.

See “Cash Management” – “Related-Party Debt” above and Note 11 in the notes to our unaudited condensed consolidated financial statements in Part I, Item 1 of this Quarterly Report on Form 10-Q for further information about our related-party debt.

Item 3. Quantitative and Qualitative Disclosures about Market Risk

Concentration of Credit Risk

We are potentially exposed to concentrations of credit risk, through our cash and cash equivalents, which totaled $47.9 million at September 30, 2019, including $7.4 million held by our international subsidiaries and our accounts and other receivables, net, which totaled $108.9 million at September 30, 2019. Cash and cash equivalents consist of financial deposit and money market accounts that are principally held with various domestic and international financial institutions with high credit standing. We perform ongoing credit evaluations of our customers and generally do not require collateral to secure our receivables. Allowances are maintained for potential doubtful accounts.

We anticipate that our results of operations in any given period may depend to a large extent on sales to a small number of large accounts. As a result, our revenue for any quarter may be subject to significant volatility based upon changes in orders from one or a small number of key customers.

For the three months ended September 30, 2019, one customer accounted for 11% of net revenue. For the nine months ended September 30, 2019, no single customer accounted for 10% or more of net revenue. For the three and nine months ended September 30, 2018, one customer accounted for 11% of net revenue.

As of September 30, 2019, two customers represented 17% and 12% of net accounts receivable, respectively. As of December 31, 2018, two customers represented 11% and 10% of net accounts receivable, respectively.

As of September 30, 2019 and December 31, 2018, receivables from customers in countries other than the United States represented 94% and 88%, respectively, of net accounts receivable.

Interest Rate Risk

Our exposure to market risk for changes in interest rates relates primarily to our variable rate outstanding debt. As of September 30, 2019, our outstanding variable-interest debt balance was $44.4 million, which consisted of principal amount of borrowings under the short-term credit facilities of our foreign subsidiaries and term loan borrowings under the Credit Agreements (all of which bear interest at a variable rate). As of September 30, 2019, amounts borrowed under our short-term credit facilities bore interest ranging from 0% to 5.49%, and amounts borrowed under the PNC term loan bore interest at 8.12%. Assuming the outstanding balance on our variable rate debt remains constant over a year, a 1% increase in the interest rate would decrease pre-tax income and cash flow by approximately $0.5 million. In addition, as of September 30, 2019, we had an aggregate of $11.2 million in outstanding borrowings from DNI and Riverside (all of which bear interest at a fixed rate of 4.6% and 3.5%, respectively).

Foreign Currency Risk

We transact business in various foreign countries, and a significant portion of our assets is located in Korea. We have sales operations throughout Asia, Europe, the Middle East and Latin America. We are exposed to foreign currency exchange rate risk associated with foreign currency denominated assets and liabilities, primarily intercompany receivables and payables. Accordingly, our operating results are exposed to changes in exchange rates between the U.S. dollar and those currencies.

We have performed a sensitivity analysis as of September 30, 2019 using a modeling technique that measures the impact on the balance sheet arising from a hypothetical 10% adverse movement in the levels of foreign currency exchange rates relative to the U.S. dollar, with all other variables held constant. The sensitivity analysis indicated that a hypothetical 10% adverse movement in foreign currency exchange rates would result in a foreign exchange loss of $3.5 million at September 30, 2019. This sensitivity analysis assumes a parallel adverse shift in foreign currency exchange rates, which do not always move in the same direction. Actual results may differ materially.

Item 4. Controls and Procedures

Disclosure Controls and Procedures

We are required to maintain disclosure controls and procedures designed to provide reasonable assurance of achieving the objective that information required to be disclosed in our reports filed or submitted pursuant to the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate to allow for timely decisions regarding required disclosures. Our disclosure controls and procedures include those components of our internal control over financial reporting intended to provide reasonable assurance that transactions are recorded as necessary to permit preparation of financials in accordance with U.S. GAAP. In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

As required by Rule 13a-15(b) under the Exchange Act, we conducted an evaluation of the effectiveness of our disclosure controls and procedures as of September 30, 2019, the end of the period covered by this Quarterly Report on Form 10-Q. The evaluation was done under the supervision and with the participation of management, including our principal executive officer and principal financial officer. In the course of the evaluation of our disclosure controls and procedures, our principal executive officer and principal financial officer concluded that, because of the unresolved material weaknesses in our internal control over financial reporting as described below, our disclosure controls and procedures were not effective as of September 30, 2019.

Material Weakness in Internal Control Over Financial Reporting

In connection with the Company's annual evaluation of its internal control over financial reporting conducted in accordance with SEC Rule 13a-15(c), the Company's management, including our Chief Executive Officer and Chief Financial Officer, identified a material weakness in the Company's internal control over financial reporting, and as a result thereof, determined that the Company's internal control over financial reporting was not effective as of December 31, 2018.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of the registrant's annual or interim financial statements will not be prevented or detected on a timely basis. Following consummation of the Merger with DNS, management identified material weaknesses in our internal control over financial reporting, which continued to exist at December 31, 2018. Specifically, management determined that we did not maintain an effective control environment as there was an insufficient complement of personnel with appropriate accounting knowledge, experience and competence, resulting in incorrect application of generally accepted accounting principles. Additionally, the Company has failed to maintain effective controls over our financial close process. Further, we did not design and maintain effective controls over the review of supporting information to determine the completeness and accuracy of the accounting for complex transactions, specifically related to the Merger, which resulted in an incorrect application of generally accepted accounting principles that resulted in material misstatements and a restatement of our unaudited condensed consolidated financial statements for the three and nine months ended September 30, 2016.

We continue to evaluate and assess the design and operation of our controls and are taking steps to modify processes related to the accounting for significant and unusual transactions as well as enhancing monitoring and oversight controls in the application of accounting guidance related to such transactions. In connection therewith, we have hired and we anticipate that we will hire additional accounting personnel with relevant skills, training and experience, and conduct further training of our accounting and finance personnel.

Changes in Internal Control over Financial Reporting

Except as described above, there were no changes in our internal control over financial reporting that occurred during our last fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. Integration activities related to the Keymile Acquisition may lead us to modify certain internal controls in future periods.

PART II. OTHER INFORMATION

Item 1. Legal Proceedings

We are subject to various legal proceedings, claims and litigation arising in the ordinary course of business. While the outcome of these matters is currently not determinable, we do not expect that the ultimate costs to resolve these matters will have a material adverse effect on our consolidated financial position or results of operations. However, litigation is subject to inherent uncertainties, and unfavorable rulings could occur. If an unfavorable ruling were to occur, there exists the possibility of a material adverse impact on the results of operations of the period in which the ruling occurs, or future periods.

Item 1A. Risk Factors

In addition to the other information set forth in this Quarterly Report on Form 10-Q, you should carefully consider the factors discussed in Part I, "Item 1A, Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2018, which could materially affect our business, financial condition or future results. Except as provided below, there have been no material changes to the risk factors described in the "Risk Factors" section in our Annual Report on Form 10-K for the year ended December 31, 2018. The risks described in our Annual Report on Form 10-K are not the only risks facing our company. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition and/or operating results.

DNI owns a significant amount of our outstanding common stock and has the ability to exert significant influence or control over any matters that require stockholder approval, including the election of directors and the approval of certain transactions, and DNI's interests may conflict with our interests and the interests of other stockholders

As of September 30, 2019, DNI owned approximately 44.4% of the outstanding shares of our common stock, representing a significant amount of the votes entitled to be cast by the holders of our outstanding common stock at a stockholder meeting. Due to its significant ownership percentage of our common stock DNI has the ability to substantially influence or control the outcome of any matter submitted for the vote of our stockholders, including the election of directors and the approval of certain transaction. The interests of DNI may conflict with the interests of our other stockholders or with holders of our indebtedness and may cause us to take actions that our other stockholders or holders of our indebtedness do not view as beneficial.

In addition, DNI's large concentration of stock ownership may make it more difficult for a third party to acquire us or discourage a third party from seeking to acquire us. A potential third party acquirer would be required to negotiate any such transaction with DNI, and the interests of DNI with respect to such transaction may be different from the interests of our other stockholders or with holders of our indebtedness.

Prior to May 20, 2019, DNI owned in excess of 50% of the outstanding shares of our common stock, which allowed us to elect to be treated as a "controlled company" under Nasdaq Marketplace Rules. As a "controlled company," we were exempt from certain corporate governance requirements under Nasdaq Marketplace Rules, including the requirement that we have a majority of independent directors on the Board of Directors and requirements with respect to compensation and nominating and corporate governance committees. Following the loss of "controlled company" status, we are required to phase in compliance with the Nasdaq corporate governance requirements over a one-year period.

Our amended and restated bylaws provide that the Court of Chancery of the State of Delaware will be the sole and exclusive forum for substantially all disputes between us and our stockholders (except for causes of action arising under the federal securities laws), which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, or employees.

Our amended and restated bylaws (our "Bylaws") provide that the Court of Chancery of the State of Delaware is the sole and exclusive forum for:

- any derivative action or proceeding brought on behalf of the Company;
- any action asserting a claim of breach of a fiduciary duty owed by any director, officer, employee or agent of the Company to the Company or the Company's stockholders;
- any action asserting a claim against the Company arising pursuant to any provision of the General Corporation Law of the State of Delaware, the Certificate of Incorporation or the Bylaws; and
- any action asserting a claim against the Corporation governed by the internal affairs doctrine, in each such case subject to said Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein;

provided, that with respect to any derivative action or proceeding brought on our behalf to enforce any liability or duty created by the Exchange Act or the rules and regulations thereunder, the exclusive forum will be the federal district courts of the United States. The exclusive forum provision in our Bylaws does not apply to resolving any complaint asserting a cause of action arising under the Securities Act.

These exclusive forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers, or other employees, which may discourage lawsuits against us and our directors, officers and other employees. If a court were to find the exclusive forum provision in our Bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving the dispute in other jurisdictions, which could seriously harm our business. For example, the Court of Chancery of the State of Delaware recently determined that the exclusive forum provision of federal district courts of the United States for resolving any complaint asserting a cause of action arising under the Securities Act is not enforceable. However, this decision may be reviewed and ultimately overturned by the Delaware Supreme Court.

Increased tariffs on products and goods that we purchase from off-shore sources (particularly Chinese sources) and changes in international trade policies and relations could have an adverse effect on our customers and operating results.

The United States has recently imposed tariffs on a wide-range of products and goods manufactured in China that are directly or indirectly imported into the United States, and it has announced plans to impose additional tariffs on products and goods manufactured in China. In response, various countries and economic regions have announced plans or intentions to impose retaliatory tariffs on a wide-range of products they import from the United States. These newly imposed, announced and threatened U.S. tariffs and retaliatory tariffs could have the effect of increasing the cost of materials we use to manufacture certain products, which could result in lower margins. The tariffs could also result in disruptions to our supply chain, as suppliers struggle to fill orders from companies trying to purchase goods in bulk ahead of announced tariffs. Although we currently believe that the incremental costs to us of these tariffs will be immaterial, if the amount of these tariffs increases or if the tariffs apply to additional categories of components used in our manufacturing activities, and if we are unable to pass on the costs of tariffs to our customers, our operating results would be harmed. In addition, changes in the political environment, governmental policies, international trade policies and relations, or U.S.-China relations could result in revisions to laws or regulations or their interpretation and enforcement, trade sanctions, or retaliatory actions by China in response to U.S. actions, which could have an adverse effect on our customers, business plans and operating results.

Until the Company hires a permanent Chief Financial Officer, our Chief Executive Officer will also be serving as our interim Chief Financial Officer, which could have an adverse impact on our business.

Following the formerly-announced resignation of our former Chief Financial Officer, Michael Golomb, Mr. Il Yung Kim, the Chief Executive Officer of the Company, was appointed to serve as our interim Chief Financial Officer. As a result of this change, Mr. Il Yung Kim has taken on substantially more responsibility for the management of our business and of our financial reporting, which has resulted in greater workload demands and could divert his attention away from certain key areas of our business. Mr. Kim's serving in a temporary dual capacity of Chief Executive Officer and interim Chief Financial Officer of the Company may have a disruptive impact on our ability to implement our strategy and could adversely affect our business, internal controls, financial condition and results of operations. Until we find and integrate a permanent Chief Financial Officer, we may be unable to successfully manage and grow our business, and our results of operations, internal controls and financial condition could suffer as a result. Leadership transitions can be inherently difficult to manage and may cause uncertainty and decreased productivity among our employees and increase the likelihood of turnover, which could result in significant disruptions to our operations. We could be adversely affected if we fail to adequately plan for the succession of members of our senior management team should we have additional departures. Finally, we continue to execute a number of significant business initiatives. Successfully managing these initiatives, including retention of key employees, is critical to our business success.

Item 5. Other Information

As noted above, at September 30, 2019, the Company was not in compliance with the maximum leverage ratio financial covenant in the Credit Agreements, which represents an event of default thereunder. On November 8, 2019, the Company obtained a waiver of the foregoing event of default from the lenders under the Credit Agreements (the "Waiver"). As a condition for the issuance of the Waiver, the Company voluntarily prepaid $10.0 million of the outstanding term loan and paid a one-time fee of $150,000. The foregoing description of the Waiver is qualified in its entirety by reference to the Waiver, a copy of which is filed as Exhibit 10.3 hereto.

Item 6. Exhibits

The exhibits required to be filed with this quarterly report on Form 10-Q are listed in the Exhibit Index attached hereto and are incorporated herein by reference.

EXHIBIT INDEX

Exhibit Number	Description
2.1	Share Transfer Agreement dated as of July 31, 2019 by and between Handysoft, Inc. and DASAN Zhone Solutions, Inc. (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed with the SEC on August 5, 2019).
10.1+	General Release of Claims and Consulting Agreement dated August 30, 2019 by and between DASAN Zhone Solutions, Inc. and Michael Golomb.
10.2	Office Lease dated July 9, 2019, by and between DASAN Zhone Solutions, Inc. and Family Stations, Inc. (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q filed with the SEC on August 14, 2019).
10.3	Letter Agreement dated November 8, 2019 by and among PNC Bank, N.A., Citibank, N.A. and DASAN Zhone Solutions, Inc.
31.1	Certification of Chief Executive Officer Pursuant to Rule 13a-14(a)/15d-14(a)
31.2	Certification of Chief Financial Officer Pursuant to Rule 13a-14(a)/15d-14(a)
32.1	Section 1350 Certification of Chief Executive Officer and Chief Financial Officer
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase
101.LAB	XBRL Taxonomy Extension Labels Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase

\+ Indicates management contract or compensatory plan, contract or arrangement.

SIGNATURES

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

DASAN ZHONE SOLUTIONS, INC.

Date: November 13, 2019

By:	/s/ IL YUNG KIM
Name:	Il Yung Kim
Title:	President and Chief Executive Officer
By:	/s/ IL YUNG KIM
Name:	Il Yung Kim
Title:	Interim Chief Financial Officer