DSP GROUP INC /DE/
Form 10-K
March 11, 2019

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TOSECTION 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934

For the Fiscal Year Ended December 31, 2018

Commission File Number 001-35256

DSP GROUP, INC.

(Exact name of registrant as specified in its charter)

Delaware	**94-2683643**
(State or other jurisdiction of incorporation and organization)	(I.R.S. Employer Identification No.)

2055 Gateway Place, Suite 480, San Jose, California 95110

(Address of principal executive offices, including zip code)

408-986-4300

(Registrant's telephone number)

Securities registered pursuant to Section 12(b) of the Act:
None

Securities registered pursuant to Section 12(g) of the Act:
Common Stock, $.001 per share
(Title of class)

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.
Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes No

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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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

Large accelerated filer	Accelerated filer
Non-accelerated filer	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 June 30, 2018, the aggregate market value of voting stock held by non-affiliates of the Registrant, based on the closing price of the Common Stock on June 30, 2018 as reported on the NASDAQ Global Select Market, was approximately $155.988.689. Shares of Common Stock held by each officer and director and by each person who owns 5% or more of the outstanding Common Stock have been excluded from this computation in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of March 6, 2019, the Registrant had outstanding 22,625,754 shares of Common Stock.

Documents incorporated by reference: Portions of the Registrant’s proxy statement to be filed pursuant to Regulation 14A within 120 days after Registrant’s fiscal year end of December 31, 2018 are incorporated herein by reference into Item 5 of Part II and Items 10, 11, 12, 13 and 14 of Part III of this annual report.

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This report and certain information incorporated herein by reference contain forward-looking statements, which are provided under the "safe harbor" protection of the Private Securities Litigation Reform Act of 1995. All statements included or incorporated by reference in this report, other than statements that are purely historical in nature, are forward-looking statements. Forward-looking statements are generally written in the future tense and/or are preceded by words such as "will," "may," "should," "could," "expect," "suggest," "believe," "anticipate," "intend," "plan," or other similar words. Forward-looking statements include statements regarding:

Our anticipation that our gross margin on an annual basis is expected to continue to increase in the foreseeable future as our product mix shifts in favor of new products, which generally have higher gross margins;

Our expectation that revenues from non-cordless products will represent approximately two-thirds of the total revenues in 2019;

Our expectation that revenues from cordless telephony will represent approximately one-third of our revenues in 2019;

Our belief that many of our past research and development investments in new technologies are paying off;

Our belief that price erosion and the decrease in the average selling prices of our cordless telephony proudcts are expected to continue;

Our belief that the traditional cordless telephony market using fixed-line telephony will continue to decline, potentially at a steeper rate than prior years, which will continue to reduce our revenues derived from, and unit sales of, cordless telephony products;and

Our belief that our available cash and cash equivalents at December 31, 2018 should be sufficient to finance our operations for the foreseeable future.

All forward looking statements included in this Annual Report on Form 10-K are made as of the date hereof, based on information available to us as of the date hereof, and we assume no obligation to update any forward-looking statement. Many factors may cause actual results to differ materially from those express or implied by the forward –looking statements contained in this report. These factors include those risks described in Part II Item 1A "Risk Factors" of this Form 10-K.

This Annual Report on Form 10-K includes trademarks and registered trademarks of DSP Group. Products or service names of other companies mentioned in this Annual Report on Form 10-K may be trademarks or registered

trademarks of their respective owners.

DSP Group, Inc. is referred to in this Annual Report as "DSP Group," "we," "us" "our" or "company."

PART I

Item 1. BUSINESS.

Introduction

DSP Group®, Inc. (NASDAQ: DSPG) is a global leader in wireless and audio chipsets for a wide range of smart-enabled devices. Delivering semiconductor system solutions with software and hardware reference designs, DSP Group enables original equipment manufacturers (OEMs), original design manufacturers (ODMs), consumer electronics (CE) manufacturers and service providers to cost-effectively develop new products with fast time to market. At the forefront of semiconductor, communication-related innovation and operational excellence for over three decades, DSP Group provides a broad portfolio of wireless chipsets integrating industry leading standards, including DECT/CAT-iq, ULE, Wi-Fi, PSTN, HDClear™, video and VoIP technologies. DSP Group is a leader in high performance low-power integrated circuits (ICs) for audio and voice signal processing applications. We enable converged voice, audio, video and data connectivity across diverse mobile, consumer and enterprise products – from mobile phones, IoT and wearable devices, connected multimedia screens and home automation and security to cordless phones, VoIP systems and home gateways. Leveraging industry-leading experience, expertise and patent portfolio, DSP Group partners with leading CE manufacturers and service providers to reshape the future of converged communications at home, office and mobile on the go devices.

2018 marks the first year during which revenues from our growth initiatives, mainly VoIP, SmartVoice and SmartHome products (SmartHome products consisting of ULE ICs and home gateway ICs), accounted for more than 50% of our total revenues. We expect that revenues from non-cordless products will represent approximately two-thirds of our 2019 total revenues for the first time.

We were incorporated in California in 1987 and reincorporated in Delaware in 1994. We completed our initial public offering in February 1994.

Industry Environment and Our Business

Our focus on the design of highly-integrated, mixed-signal devices that combine signal processing, complex RF (radio frequency), analog and digital functions enables us to address the complex challenges of integrating various technologies, platforms and processes posed by emerging trends in the industry. Our IC products are customizable, achieve high functionality and performance at reduced power consumption, especially for Internet of Things (IoT),

home automation devices, mobile and wearable products, and cordless and IP telephony that require very low power consumption, and can be manufactured in high volumes using cost-effective process technologies. Our systems' architecture provides an open design environment for ODMs to design and market their own differentiated end products.

Our expertise and investment in software development, including Board Support Package (BSP) and drivers, telephony, communication stack and application layers in Real-Time Operating System (RTOS) and Full Featured Operating System (FFOS) frameworks, enable our customers' fast time to market with cost- and performance-optimized flexible solutions. With our internally developed innovations and acquired intellectual property, we are able to deliver value to our existing market verticals and address new market verticals, including markets for IoT, office phones, mobile and wearable devices, consumer and computing devices, and voice user interface, thus expanding our market opportunities.

We offer leading wireless voice and data transmission system solutions for various connectivity applications in the home and enterprise. Since 1999, we have developed and acquired a broad set of communication technologies, including Direct Sequence Spread Spectrum (DSSS), Frequency Hopping Spread Spectrum (FHSS), Orthogonal Frequency Digital Modulation (OFDM), Digital Narrow Band, Complementary Metal Oxide Semiconductor (CMOS), Gallium Arsenide (GaAs) technology, and Silicon Germanium (SiGe) RF chips for 900MHz, 2.4GHz and 5.8GHz Industry Scientific and Medical (ISM) bands, European DECT (1.9GHz), DECT 6.0 (1.8GHz), Korean DECT (1.7GHz), Bluetooth (2.4GHz), Wi-Fi (802.11, 2.4GHz/5GHz), BiCMOS (Bipolar CMOS) and deep sub-micron CMOS technologies.

Moreover, we expanded our DECT solutions beyond cordless telephony to address the IoT market via an ultra low energy version of DECT called DECT ULE or ULE. ULE offers numerous technological benefits due to its licensed and interference-free bands, longer range, RF robustness, propagation through multiple walls, voice and visual support, while operating at very low power.

In the past decade, we have expanded from primarily delivering cordless telephony solutions serving consumers to chipses and telephony solutions for office and business applications, and have become a market leader in this growing segment. Today, DSP Group offers comprehensive systems-on-a-chip (SoC) and solution for VoIP, home, SoHo and office IP phones. VoIP is a technology that enables users to make HD voice calls via a broadband Internet connection rather than an analog phone line. Through successful penetration with tier one customers, we achieved over 11% growth in 2018 in the Office segment.

Furthermore, with speech-enabled mobile, smart assistants and IoT devices playing an increasingly significant role in peoples' lives, in February 2013, we unveiled our HDClear technology. We have incorporated this HDClear technology into our SmartVoice product family consisting of a comprehensive suite of noise suppression and voice quality enhancement products for mobile, wearables and always-on IoT devices. HDClear capitalizes on the voice user interface trend by incorporating voice command, voice activation, proprietary noise cancellation, acoustic echo cancellation, and beam forming algorithms, thereby dramatically improving user experience and delivering unparalleled voice quality and speech recognition. Our HDClear technology is both high performance and ultra-low power. This technology was conceived through internal development combined with the acquisition of BoneTone Communications Ltd. ("BoneTone") and the addition of their innovative intelligent noise cancellation algorithms to our low power SoC. In 2015, we secured our first design win for HDClear with a tier one mobile customer and started mass production shipments during the fourth quarter of 2015. In 2016, we shipped our HDClear hardware and software solution in mass production to a tier one mobile customer for one of its flagship mobile phones. In 2017, we shipped our HDClear solution to two flag ship mobile phones and eight different OEMs for non-mobile phone applications. In 2018, we shipped our solution to over a dozen smartphone, IoT, wearable and computing OEMs, and achieved over 124% year-over-year growth in the SmartVoice segment.

Committed to advancing technology across the CE and telecommunications markets, DSP Group is actively involved in prominent industry associations, including the DECT Forum, the European Telecommunications Standards Institute, ULE Alliance and the Wi-Fi Alliance. We also participate in the 3GPP and MIPI alliance. DSP Group is further deeply involved in all stages of defining DECT CAT-iq and ULE standards and is building full eco-systems to support these solutions. We are also an active member of the Home Gateway Initiative (HGI). Such industry involvements enable us to participate in the definition of standards and keep abreast of the latest innovations, and market and technology requirements. We also maintain close relationships with many world-leading telecommunication service providers, thereby providing us with insight into future plans across the industry.

Target Markets and DSP Group Products

In response to market trends, we are concentrating our development efforts on new products and opportunities to leverage our strong technology base and customer relationships to address evolving market opportunities and take advantage of the current market trends in our domain. We focus our efforts on four product areas: (i) SmartVoice products which consist of voice-enabled products targeting mobile, IoT, speakers, computing and wearable device markets that incorporate our HDClear technology, as well as other third party advanced voice processing, always on and sensor hub functionality; (ii) Office products consisting of VoIP SoC products for Enterprise, SMB and SoHo; (iii) SmartHome products consisting of ULE ICs and home gateway ICs targeting the growing markets of IoT and smart home devices; and (iv) cordless phones which consist of largely DECT SoCs for cordless telephony.

Below is a discussion of our business segments and the products within each segment.

SmartVoice - Products Targeted at Mobile Telephony, Consumer Electronics, IoT and Wearable Device Markets

Our SmartVoice product portfolio encompasses HDClear technology for intelligent voice enhancement, always-on voice trigger and control, and noise elimination. This technology is primarily targeted at devices supporting voice as a user interface. The current market trend is for mobile and IoT devices to use voice as a user interface. Our HDClear high performance and lower power solutions continue to garner important design wins with our numerous enabling technologies such as voice command, voice activation, proprietary noise cancellation, acoustic echo cancellation and beam forming algorithms, all of which dramatically improve user experience and deliver world class voice quality and speech recognition.

HDClear-based solutions offer mobile IoT voice quality and intelligibility, while minimizing background noise. Delivering clearer voice calls made from noisy environments, HDClear also maximizes accuracy of Automatic Speech Recognition (ASR) applications in noisy environments by leveraging robust and powerful noise cancellation algorithms. HDClear more effectively isolates voice from ambient noise, thereby drastically lowering Word Error Rate (WER) and dramatically improving the user experience for speech-enabled applications like virtual assistants, voice search, speakerphone conference calls and speech-to-text on mobile and wearable devices, tablets and other consumer devices.

In 2012, we taped-out the DBMD2 chip, which we believe is one of the most efficient voice enhancement processors in the market. DBMD2's low power enables an always-on voice feature for mobile devices. Always-on is a low power decisive natural voice interface for mobile and wearable devices. An average user accesses his/her device tens or hundreds of times per day by physically pressing a screen or a button. A truly always-on technology enables the user to skip this step by using natural voice to access the device even while the device is in standby mode. DBMD2 enables mobile OEMs to offload voice and audio tasks from mobile device CPUs, in addition to running HDClear to enhance automatic speech recognition (ASR) accuracy. OEM and ODM customers can leverage DBMD2's open and flexible architecture to differentiate their products to run their own voice/audio enhancement software for pre- and post-processing.

In 2015, we started commercial shipments of DBMD2 for a wearable device with a leading OEM. That year, we also taped-out DBMD4, a chip targeted for ultra-low-power, always-on voice and audio applications. DBMD4 incorporates a suite of voice enhancement algorithms, including noise suppression, that significantly improves user experience and accuracy of speech-driven applications, particularly in high noise environments. Offered in a small form factor, DBMD4 embeds a TeakLite-III DSP core, incorporates advanced connectivity options, including I2S, UART, SPI, I2C ports and SLIMbus, and is equipped with a comprehensive software framework that enables rapid development and fast time-to-market, thereby overcoming the challenges of portable design, real estate and power consumption.

In 2016, we went into production with our design win for our DBMD4 chip with a tier one mobile customer. This win led to significant year-over-year revenue growth in our SmartVoice segment. In the second half of 2016, we announced two additional design wins for our HDClear in non-smartphone applications that went into production in the second half of 2017.

In January 2017, we unveiled our latest audio and voice enhancement SoC, the DBMD5. This audio SoC is built to drive clearer human machine voice interactions in multi microphone equipped devices.

2018 was a milestone year for SmartVoice in which we shipped our SoCs to customers in six different categories – smartphones, IoT, wearables, hearables, tablets and speakers. In addition, during the year, market-leading Amazon Alexa Voice Services certified our far field 3-Mic development kit based on our DBMD5 processor. We are currently working on our next generation voice enhancement SoC which we expect to introduce in 2019.

Office Segment - Products Targeted at the Office Market

As a leading silicon vendor for enterprise voice, we offer a comprehensive portfolio of solutions for VoIP telephony solutions. Our DVF SoCs family is a comprehensive solution for developing affordable, scalable and green VoIP home and office products. DVF facilitates rapid introduction of embedded features into residential devices such as cordless IP and instant messaging (IM) phones. DVF enables development of low-power enterprise IP, analog terminal adapters (ATAs) and home VoIP phones that offer superb acoustic echo cancellation, high-quality HD voice, multi-line capabilities, and an enhanced user interface (UI). Built on an open platform with multi-ARM processors running on Linux OS, DVF includes IPfonePro™, an extensive SDK for IP phones and ATAs.

During 2010, we launched a new VoIP chipset based on the VegaFireBird SoC and our RF products combining ARM9 and VoIP processing baseband functions in a single package with a rich set of telephony features targeting corded IP phones for home and office, analog terminal adaptors and cordless IP phones. These products support multi line and multi HD voice channels, superior audio processing capabilities including acoustic echo cancellation and superior full duplex speakerphone technologies.

In 2012, we taped-out VoIP SoC DVF99xx, which commercially launched in January 2013. Built with two ARM926EJ-S™ cores, this VoIP SoC provides combined processing speed of 1.1 GHz, and is designed to support IP phone processing needs - from basic single-line IP phones to high-end multi-line gigabit Ethernet IP phones with large color display and advanced GUI. The DVF99 also integrates multiple hardware accelerators, including a hardware security engine which enables a new class of secure IP phones, an LCD controller, a 2D graphics engine, a high-speed USB 2.0 port, DDR3/DDR2 memory and minimal power consumption. This product was designed to meet the needs of the enterprise IP telephony market.

DVF101 was taped out during 2016 and provides outstanding cost/performance value for high-end IP phones. Designed specifically to meet Tier 1 requirements, DVF101 fully complements existing solutions, including DVF99 VoIP processors for mid to high-end IP phones. DVF101 is an ideal solution for high-end voice terminals, with high-resolution color display, rich 3D graphical user interface, full HD-voice and super wideband acoustical echo cancellation, as well as fully secured communication.

For the video phone product family, we offer the DVF1100, a high-end media processor, which powers advanced Android video phones and conferencing phones.

Our software and hardware offered for the enterprise telephony product family keeps expanding beyond conventional VoIP phones and ATAs to cover conferencing systems, IP intercoms, public announcement systems, as well as accessories such as key expansion modules, DECT microphones and headsets with advanced capabilities for voice

and audio.

Revenues from our VoIP segment continued on a strong growth trajectory in 2018. A number of customers successfully launched phones based on our DVF99. In addition, we secured additional design wins with our existing tier one customers for higher end products which are expected to go into production in the 2019 and 2020 timeframe, thereby contributing to further progress in this growing Office segment.

Home Segment – Our SmartHome Products, Including Home Gateways, Home Automation Products and Cordless Telephony Products

Our DECT and 2.4 GHz technologies are targeted at three broad categories of products: (a) home gateways and fixed mobile convergence, (b) home automation and IoT applications, and (c) digital cordless telephony. Gateway products and IoT applications that are supported by our ULE technology are catagorized as SmartHome.

As a market leader in DECT and next-generation CAT-iq cordless technology, we offer a wide range of cost-effective, highly integrated SoC solutions. Delivering high-quality audio with low power consumption, our field-proven chipset solutions are ideal for highly integrated digital cordless telephony, DECT-enabled gateways and home automation and security. Our chipsets provide an integrated digital solution and include all relevant digital baseband, analog interface and RF functionality.

Our Home chipset solutions enable worldwide coverage, supporting all RF bands and cordless protocols, such as:

1.7GHz -1.9GHz DECT – used in Europe, U.S. (DECT6.0), Korea, Japan and Latin America; and

2.4GHz – used in Japan, China, India and the U.S.; the dominant protocols for this RF band is our proprietary EDCT (Enhanced Digital Cordless Technology) and WDCT (Wireless Digital Cordless Technology) protocols.

This chipset portfolio combines wireless communications technology with a range of telephony features, audio and voice-processing algorithms to provide the industry a low cost, high performance and small footprint solution. Enhanced with our hardware and software technologies, these chipsets are highly versatile and enable the development of an array of cordless telephony solutions, DECT home gateways and SmartHome applications and devices that allow for faster time to market than alternative custom silicon and software offerings. This portfolio supports cordless phones, cordless headsets, remote controls, home DECT-enabled gateways, fixed-mobile convergence solutions and home security and automation devices.

In 2016, we also began to sell our DHAN-S module for the IoT market. This product offers application developers a turnkey radio solution for DECT ULE nodes, whether battery or AC-powered. This module is built around our DHX91 chipset. The module can serve as a wireless connectivity channel for an application running on an external MCU or a standalone solution using the DHX91's internal ARM926 processor.

In 2017 and 2018, our DHX91, a ULE SoC, was incorporated into end customer products for home automation and security applications. Our customers' end products integrating DHX91 went through various field trials and officially launched in the market in 2014. In 2015 and 2016, Panasonic Communications Ltd. ("Panasonic"), Sercomm Corporation, Eurotronic Technology GmbH and several other leading CE brands launched ULE based products that utilizes DECT/ULE for sensors, actuators, voice and video cameras. In 2017, Deutsche Telecom launched home automation and control services and products based on our DECT and ULE solutions. In 2018, Zipato, AwoX, Deutsche Telecom, SGW, Technicolor, Elite Computer, Bezeq and Orange all announced plans to roll out products and/or services based on ULE solutions.

Customers

We are an innovative, flexible, customer-centric company that proactively partners with our broad base of customers and service providers. As a reliable long-term industry supplier, we maintain a proven track record of operational excellence and successful on-time delivery. With offices across Asia, Europe and North America, we deliver outstanding local service and support worldwide. We sell our products through distributors and directly to OEMs and ODMs who incorporate our products into consumer products for the worldwide residential wireless communications

market and enterprise products for the worldwide office communications market.

In 2018, we continued expanding our customer base, and in some cases, increased our share of business with existing customers. Our blue-chip customer base features leading international CE manufacturers, including the world's top consumer brands, which have deployed our chipset and software solutions at prominent tier-one telecom operators across the globe, and include: Aprotech, ADB, AEG, Alcatel, Atcom, AT&T, Arris, Atlink, Arcadyan, Askey, Audiocodes, Avaya, Ayecom, Baycom, Belgacom, Binatone, British Telecom, Brother, CCT Tech, Cetis, CIG, Cisco, Climax, Comcast, Crow, Cybertan, Grandstream, Deutsche Telekom, Doro, DNI, DTS, DX Antenna, Eclogic, Escene, Eurotronic, Fanvil, Flextronics, Fujitsu, France Telecom, Freebox, Gibson (formerly Philips), Gaoxinqi, Gemtek, Goertek, GoPro, Foxconn, Huawei, Iflytek, Infinite, Innomedia, Intelbras, Invoxia, JXE, Kaonmedia, Kocom, Korea Telecom, KPN, Lenovo, LG Electronics, Libre, Logitech, Meitu, Mitac, Mitrastar, Motorola, Moimstone, Netgear, NTT, Ooma, Panasonic, Pegatron, Pioneer, Plantronics, Proximus, Sagemcom, Samsung, Sanyo, SAXA, Sercomm, SGW, Sharp, Siemens (Gigaset), SK Telecom, Sony, Spracht, Sumitomo, Sunrise, Swissvoice, Swisscom, TCL, Tecom, Telecom Italia, Telefonica, Telstra, Technicolor, Telefield (RCA), Tinno, T&W, Uniden, Unihan, Urmet, Uwin, Turkcell, Turkish Telecom, Verisure, Verizon, VTech, Vodafone, Wistron, WNC, WONDALINK, Xingtel, Yamaha, Yealink, Yeastar and ZTE.

International Sales and Operations

Export sales accounted for 95% of our total revenues for 2018, 96% of our total revenues for 2017 and 97% in 2016. As most of our sales to foreign entities are denominated in U.S. dollars, we are subject to risks of conducting business internationally. See Note 16 of the attached Notes to Consolidated Financial Statements for the year ended December 31, 2018, for a summary of the geographic breakdown of our revenues and location of our long-lived assets.

As a result of our international operations, a significant portion of our expenses in Israel is paid in the Israeli currency (New Israeli Shekel (NIS)). Our primary expenses paid in NIS are employee salaries and lease payments on our Israeli facilities. In addition, a portion of our expenses in Europe is paid in Euro. Our primary expenses paid in Euro are employee salaries and lease and operational payments on our European facility.

Sales, Marketing and Distribution

We market and distribute our products through our direct sales and marketing offices, as well as through a network of distributors. Our sales and marketing team has global reach through our sales offices in San Jose, California; Hong Kong, China; Nierenberg, Germany; Tokyo, Japan; Herzliya Pituach, Israel, Edinburgh, Scotland; Shanghai and Shenzhen, China and South Korea. In territories where we do not have sales offices, we operate either directly from our corporate headquarters or through a network of distributors and representatives.

The following table represents our sales as a percentage of our total revenues through our main distributors Nexty Electronics, Ltd. (“Nexty Electronics”) and Ascend Technology Inc. (“Ascend Technology”) for the years ended December 31, 2018, 2017 and 2016:

	Year ended December 31,		
Major Distributors	**2018**	**2017**	**2016**
Nexty Electronics (1)	11%	12%	12%
Ascend Technology	26%	23%	16%

(1) Panasonic Communications Co., Ltd. (“Panasonic”) has continually accounted for a majority of the sales of Nexty Electronics for 2018, 2017 and 2016.

We also derive a significant amount of revenues from a limited number of customers. The following table represents our sales as a percentage of our total revenues from our main customers for the years ended December 31, 2018, 2017 and 2016:

	Year ended December 31,		
Major Customers	**2018**	**2017**	**2016**
Vtech Holdings Ltd. (“Vtech”)	24%	27%	29%
Panasonic	*	10%	10%
Samsung Electronics Ltd. (“Samsung”)	*	*	12%

*Less than 10%.

Furthermore, as our products are generally incorporated into consumer products sold by our OEM customers, our revenues may be affected by seasonal buying patterns of consumer products sold by our OEM customers.

Manufacturing and Design Methodology

We are ISO9001:2015 certified. This certification is applicable for the design, development, testing and supply of our system-on-chip solutions. We also have well established methodologies and working procedures that are also regularly audited.

We contract product wafer fabrication and IC product services mostly from TSMC. We intend to continue to use independent foundries to manufacture our IC products.

We use independent subcontractors located in Asia, to package, assemble and test certain of our products. We develop detailed testing procedures and specifications for each product and require each subcontractor to use these procedures and specifications before shipping us the finished products. We test and/or assemble our products at Amkor, ASE, Giga Solutions, KYEC and SPIL. Furthermore, some of our products require an external component in the finished product, which is supplied by a third party, to provide flash memory.

Competition

The principal competitive factors in the smart audio and noise reduction market include price, performance, system integration level, range, voice quality, power consumption, customer support and the timing of product introductions. We believe that we are well positioned from a competitive position. Competitors in this market include Knowles Corporation, Cirrus Logic, Synaptics and developers of noise cancellation software running on mobile phones such as NXP and ForteMedia, and in some cases, in-house engineering teams.

Similar principal competitive factors affect the VoIP market. We also believe that we are competitive with respect to most of these factors. Our principal competitors in the VoIP market include Avago Technologies, Dialog Semiconductors, Intel, Texas Instruments and Taiwanese IC vendors.

Similar principal competitive factors affect the Home Automation (DECT ULE) market. An additional competitive factor relating to this market is that the DECT ULE technology is a newcomer in this market, and this market already has a number of dominant, well-established technologies with significant existing market share. We also believe that we are competitive with respect to most of these factors. Our principal competitors are developers of different wireless home automation technologies, including Analog, Z-wave and Zigbee. Among those, the major competitors for digital home connectivity are Microchip Technology, NXP, Texas Instruments and Silicon Labs.

Similar principal competitive factors affect the cordless telephony market. Our principal competitors in the cordless market include Lantiq and Dialog Semiconductors.

Research and Development

Timely development and introduction of new products are essential to maintain our competitive position. We currently conduct most of our product development at our facilities. As of December 31, 2018, we had a staff of 193 research and development personnel, of which 128 were located in Israel. We also employ independent contractors to assist with certain product development and testing activities. Due to various new developments in the home residential market and consistent with our strategy, we have expanded our product lines and developed products and services targeted at wider markets, including office enterprise market, the intensively competitive mobile device market and the expansive voice user interface market. We will need to continue to invest in research and development, and our research and development expenses may increase in the future, including the addition of new research and development personnel, to secure our leading position in discrete markets we operate in and keep pace with new and rapidly changing trends in our industry.

Licenses, Patents and Trademarks

We actively pursue foreign patent protection in countries of interest to us. Our policy is to apply for patents or for other appropriate statutory protection when we develop valuable technology. As of December 31, 2018, we have been granted a total of 151 patents and 33 patents are pending.

We attempt to protect our trade secrets and other proprietary information through agreements with our customers, suppliers, employees and consultants, and through other security measures. Although we intend to protect our rights vigorously, there are no assurances that these measures will be successful.

While our ability to compete may be affected by our ability to protect our intellectual property, we believe that because of the rapid pace of technological change in our industry, our technical expertise and ability to innovate on a timely basis and in a cost-effective manner will be at least as important in maintaining our competitive position than the protection of our intellectual property. In addition, we believe that due to rapid technological changes in residential telephony, computer telephony and personal computer markets, patents and trade secret protection are important but must be supported by other factors, including expanding the knowledge, ability and experience of our personnel, new product introductions and frequent product enhancements. Although we continue to implement protective measures and intend to defend our intellectual property rights vigorously, we cannot assure that these measures will be successful.

Backlog

At December 31, 2018, our backlog was approximately $22.4 million, compared to approximately $20.6 million and $23.4 million at December 31, 2017 and 2016, respectively. We include in our backlog all accepted product purchase orders with respect to which a delivery schedule has been specified for product shipment within one year and for which collectability is not considered a risk. Our business is characterized by short-term order and shipment schedules. Product orders in our current backlog are subject to change, sometimes on short notice, due to changes in delivery schedules or cancellation by a purchaser. Accordingly, although useful for scheduling production, backlog as of any particular date may not be a reliable measure of our sales for any future period.

Employees

At December 31, 2018, we had 320 employees, including 193 in research and development, 66 in sales and marketing, and 61 in corporate, administration and manufacturing coordination. Competition for personnel in the semiconductor

industry in general is intense. We believe that our future prospects will depend, in part, on our ability to continue to attract and retain sought after, highly-skilled technical, marketing and management personnel and are taking active measures to ensure we are perceived as a sought after employer. In particular, there is a limited supply of RF chip designers and highly-qualified engineers with digital signal processing, machine learning and artificial intelligence experience. We believe that we provide an excellent culture and competitive compensation to retain our valuable employees.

Web Site Access to Company's Reports

Our web site address is *www.dspg.com*. Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act are available free of charge through our web site as soon as reasonably practicable after they are electronically filed with, or furnished to, the Securities and Exchange Commission. We will also provide the reports in electronic or paper form free of charge upon request.

Our website and the information contained therein or connected thereto are not intended to be incorporated into this Annual Report on Form 10-K.

Item 1A. RISK FACTORS.

The following risk factors, among others, could in the future affect our actual results of operations and could cause our actual results to differ materially from those expressed in our forward-looking statements. These forward-looking statements are based on current expectations and we assume no obligation to update this information. Before you decide to buy, hold, or sell our common stock, you should carefully consider the risks described below, in addition to the other information contained elsewhere in this report in addition to our other public filings and presentations. The following risk factors are not the only risk factors facing our company. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our business. Our business, financial condition, and results of operation could be seriously harmed if any of the events underlying any of these risks or uncertainties actually occurs. In that event, the market price for our common stock could decline, and you may lose all or part of your investment.

In order to sustain the future growth of our business, we must penetrate new markets and our new products must achieve widespread market acceptance but such additional revenue opportunities may not be implemented and may not be achieved.

In order to expand our business and increase our revenues, we must penetrate new markets and introduce new products, especially our VoIP, HDClear and SmartHome product families. To sustain the future growth of our business, we need to introduce new products as sales of our cordless products continue to decline as expected. We have invested significant resources in pursuing potential opportunities for revenue growth in new product initaitives. We also are exploring opportunities to expand sales of our products in new geographies, including China, South Korea and South America. However, there are no assurances that we will be successful in the development, sales and marketing of our products in these competitive markets. Moreover, there are no assurances that we will recoup our investments made pursuing additional revenue opportunities. Our inability to penetrate such markets and increase our market share in those markets or lack of customer acceptance of those products may harm our business and potential growth.

Because the markets in which we compete are subject to rapid changes, our products may become obsolete or unmarketable.

The markets for our products and services are characterized by rapidly changing technology, short product life cycles, evolving industry standards, changes in customer needs, geo-political influences, demand for higher levels of integration, growing competition and new product introductions. Our future growth is dependent not only on the continued success of our existing products but also successful introduction of new products. Our ability to adapt to changing technology and anticipate future standards, and the rate of adoption and acceptance of those standards, will be a significant factor in maintaining or improving our competitive position and prospects for growth. If new industry standards emerge, our products or our customers' products could become unmarketable or obsolete, and we could lose

market share. We may also have to incur substantial unanticipated costs to comply with these new standards. If our product development and improvements take longer than planned, the availability of our products would be delayed. Any such delay may render our products obsolete or unmarketable, which would have a negative impact on our ability to sell our products and our results of operations. Morevoer, if any of our competitors implement new technologies before us, those competitors may be able to provide products that are more effective or with more user-friendly features than ours, possibly at lower prices, which could adversely impact our sales and impact our market share. Our failure to develop and introduce competitive new products that are compatible with industry standards and that satisfy customer requirements, and the failure of our products to achieve broad market acceptance, could have a negative impact on our ability to sell our products and our results of operations.

Because our quarterly operating results may fluctuate significantly, the price of our common stock may decline.

Our quarterly results of operations may vary significantly in the future for a variety of reasons, many of which are outside our control, including the following:

- fluctuations in volume and timing of product orders;
- timing, rescheduling or cancellation of significant customer orders and our ability, as well as the ability of our customers, to manage inventory;
- changes in demand for our products due to seasonal consumer buying patterns and other factors;
- timing of new product introductions by us and by our customers or competitors;
- changes in the mix of products sold by us or our competitors;
- fluctuations in the level of sales by our OEM customers and other vendors of end products incorporating our products;
- timing and size of expenses, including expenses to develop new products and product improvements, and expenses resulting from restructuring activities;
- the timing and amount of funding from Israeli Innovation Authority (“IIA”);
- entry into new geographies, including China, South Korea and South America;
- our ability to scale our operations in response to changes in demand for our existing products and services or demand for new products requested by our customers;
- Geo-political policies outside of our control;
- mergers and acquisitions by us, our competitors and our existing and potential customers; and

general economic conditions, including current economic conditions in the United States and worldwide, and the adverse effects on the semiconductor and consumer electronics industries.

Each of the above factors is difficult to forecast and could harm our business, financial condition and results of operations. Also, we sell our products to OEM customers that operate in consumer markets. As a result, our revenues are affected by seasonal buying patterns of consumer products sold by our OEM customers that incorporate our products and the market acceptance of such products supplied by our OEM customers.

Our future success is dependent on market acceptance of our SmartVoice and VoIP product families, which are intensively competitive markets with dominant and established players.

Our ability to increase our revenues and offset declining revenues from our cordless product family are substantially dependent on our ability to gain market share for our SmartVoice and VoIP product families. Moreover, we are targeting a new market with our SmartVoice product family, a market with dominant and established players selling to OEM customers with whom they have established relationships. In order to gain market share, we will need to earn the business of such customers, with whom we do not have established relationships. If we are unable to generate significant revenues from our SmartVoice product family and gain significant and sustainable market share in the mobile device market, our operating results would be adversely affected. Furthermore, our future growth is also dependent on the market acceptance of our VoIP products, a market where we also compete with existing and potential competitors, many of whom have significantly greater financial, technical, manufacturing, marketing, sales and distribution resources and management expertise than we do. In addition, our continued success and growth in the new markets in which we have recently gained market share, which markets are highly competitive, is highly dependent on our ability to be designed into future flagship products of top tier OEMs.

The market for mobile device components is highly competitive and we expect competition to intensify in the future.

The market for mobile device components is highly competitive and characterized by the presence of large companies with significantly greater resources than we have. Our SmartVoice product family relates only to the voice and audio subsystem of a mobile device and there are only a limited number of OEMs that address this market. Our main competitors include Knowles Corporation, Synaptics and Cirrus Logic. We also face competition from other companies and could face competition from new market entrants. We also compete against solutions internally developed by OEMs, as well as combined third-party software and hardware systems. Notwithstanding prior design wins with any OEM customer, our SmartVoice products may be designed out as a result of internal solutions or replacement with software systems in future products of such OEM customer. If we are unable to compete effectively, we may not succeed in achieving additional design wins and may have to lower our pricing to attempt to gain design wins, both of which would adversely impact our operating results.

Our future business growth depends on the growth in demand for mobile devices with improved sound quality and always-on capability.

Our SmartVoice product family is designed to enhance the sound quality and minimize background noise for mobile device users and to enable always-on capabilities in mobile and other wearable devices. OEMs and ODMs may decide that the costs of improving sound quality outweigh the benefits or that always-on voice technology is not a required feature, both of which could limit demand for our SmartVoice product family. Moreover, users may also be satisfied with existing sound quality or blame poor quality on phone carriers. The market that we are targeting is evolving rapidly and is technologically challenging. New mobile devices with different components or software may be introduced that provide the same functionality as SmartVoice product family. Our future business growth will depend on the growth of this market and our ability to adapt to technological changes, user preferences and OEM demands. Our business could be materially adversely affected if we fail to do so.

We generate a significant amount of our total revenues from the sale of digital cordless telephony products and our business and operating results may be materially adversely affected if we do not continue to succeed in this competitive market or if sales within the overall cordless digital market continue to decrease.

Sales of our digital cordless telephony products comprised 45% of our total revenues for 2018, 54% for 2017 and 57% for 2016. Although we historically generated a majority of our revenue from cordless telephony products, the traditional cordless telephony market using fixed-line telephony is declining and will continue to decline, potentially steeper than prior years, which reduces our revenues derived from, and unit sales of, cordless telephony products.

We rely significantly on revenue derived from a limited number of customers.

We expect that a limited number of customers, varying in identity from period-to-period, will account for a substantial portion of our revenues in any period. VTech Holdings Ltd ("VTech"), Panasonic Communications Ltd. ("Panasonic") through Nexty Electronics, Ltd. ("Nexty Electronics"), Cisco Systems, Inc. through Ascend Technology Inc. ("Ascend Technology") and Avaya through Ascend Technology, accounted for approximately 48%, 48% and 45% of our total revenues for each of 2018, 2017 and 2016, respectively. The following table represents our sales from our 10% and above customers as a percentage of our total revenues for the years ended December 31, 2018, 2017 and 2016:

	Year ended December 31,		
Major Customers	**2018**	**2017**	**2016**
VTech	24%	27%	29%
Panasonic (through Nexty Electronics)	*	10%	10%
Samsung Electronics Ltd.	*	*	12%

*Less than 10%.

Typically, our sales are made on a purchase order basis, and most of our customers have not entered into a long-term agreement requiring it to purchase our products. Moreover, we do not typically require our customers to purchase a minimum quantity of our products, and our customers can generally reschedule the delivery date of their orders on short notice without significant penalties. A significant amount of our revenues will continue to be derived from a limited number of large customers. Furthermore, the primary customers for our products are original equipment manufacturers (OEMs) and original design manufacturers (ODMs). This industry is highly cyclical and has been subject to significant economic downturns at various times. These downturns are characterized by production overcapacity and reduced revenues, which at times may affect the financial stability of our customers. Therefore, the loss of one of our major customers, or reduced demand for products from, or the reduction in purchasing capability of, one of our major customers, could have a material adverse effect on our business, financial condition and results of operations.

Because our products are components of end products, if OEMs do not incorporate our products into their end products or if the end products of our OEM customers do not achieve market acceptance, we may not be able to generate adequate sales of our products.

Our products are not sold directly to the end-user; rather, we deliver hardware and software components to OEMs and ODMs who incorporate them into their products. As a result, we rely upon OEMs and ODMs to incorporate our products into their end products at the design stage. Once an OEM designs a competitor’s product into its end product, it becomes significantly more difficult for us to sell our products to that customer because changing suppliers involves significant cost, time, effort and risk for the customer. As a result, we may incur significant expenditures on the development of a new product without any assurance that an OEM will select our product for design into its own product and without this “design win” it becomes significantly difficult to sell our products. This is especially the case for our HDClear SmartVoice product family. Moreover, even after an OEM agrees to design our products into its end products, the design cycle is long and may be delayed or discontinued due to factors beyond our control which may result in the end product incorporating our products not to reach the market until long after the initial “design win” with the OEM or not at all. From initial product design-in to volume production, many factors could impact the timing and/or amount of sales actually realized from the design-in. These factors include, but are not limited to, changes in the competitive position of our technology, our customers’ financial stability, and our ability to ship products according to our customers’ schedule and specifications. Moreover, the continued uncertainty about the sustainability of the global economic recovery and outlook may further prolong an OEM customer’s decision-making process and design cycle.

Furthermore, we rely on the end products of our OEM customers that incorporate our products to achieve market acceptance. Many of our OEM customers face intense competition in their markets. If end products that incorporate our products are not accepted in the marketplace, we may not achieve adequate sales volume of our products, which would have a negative effect on our results of operations.

Our revenues, gross margins and profitability may be materially adversely affected by the continued decline in average selling prices of our products and other factors, including increases in assembly and testing expenses, and

raw material and commodity costs.

We have experienced and will continue to experience a decrease in the average selling prices of our products. Decreasing average selling prices could result in decreased revenues even if the volume of products sold increases. Decreasing average selling prices may also require us to sell our products at much lower gross margin than in the past and reduce profitability. Although we have to date been able to partially offset on an annual basis the declining average selling prices of our products through general operational efficiencies and manufacturing cost reductions by achieving a higher level of product integration and improving our yield percentages, there is no guarantee that our ongoing efforts will be successful or that they will keep pace with the anticipated, continued decline in average selling prices of our products.

In addition to the continued decline in the average selling prices of our products, our gross profit may decrease in the future due to other factors, including the roll-out of new products in any given period and the penetration of new markets which may require us to sell products at a lower margin, our failure to introduce new engineering processes and mix of products sold.

Our gross margins also are affected by the product mix. For example, mature products typically have lower average gross margins than newer products. Therefore, increased sales of certain mature products would lower our gross margins. The pressures in the supply chain make it very difficult for us to increase or even maintain our product pricing, which further adversely affects our gross margins.

Furthermore, increases in the price of silicon wafers, testing costs and commodities such as gold and oil, which may result in increased production costs, mainly assembly and packaging costs, may result in a decrease in our gross margins. Moreover, our suppliers may pass the increase in raw materials and commodity costs onto us which would further reduce the gross margin of our products. In addition, as we are a fabless company, global market trends such as “under-capacity” problems so that there is a shortage of capacity to fulfill our fabrication needs also may increase our raw material costs and thus decrease our gross margin.

We are dependent on a small number of OEM customers, and our business could be harmed by the loss of any of these customers or reductions in their purchasing volumes.

We sell our products to a limited number of OEM customers directly or through a network of distributors. Moreover, many North American, European and Japanese OEMs are moving their manufacturing sites to Southeast Asia and China, as a result of the cyclical nature of manufacturing capacity issues and cost of silicon integrated circuits, the continued decline of average selling prices of chipsets and other industry-wide factors. In addition, OEMs located in Southeast Asia and China are growing and gaining competitive strength. As a result, the mix of our OEM customers may change in the future. However, we may not succeed in attracting new customers as these potential customers may have pre-existing relationships with our current or potential competitors. This trend also may promote the consolidation of OEMs located in North America, Europe and Japan with OEMs located in Southeast Asia, which may reduce the number of our potential customers and reduce the volume of chipsets the combined OEM customer may purchase from us. However, as is common in our industry, we typically do not enter into long term contracts with our customers in which they commit to purchase products from us. The loss of any of our OEM customers may have a material adverse effect on our results of operations. To attract new customers, we may be faced with intense price competition, which may affect our revenues and gross margins.

Because we have significant international operations, we may be subject to political, economic and other conditions relating to our international operations that could increase our operating expenses and disrupt our business.

Although the majority of end users of the consumer products that incorporate our products are located in the U.S., we are dependent on sales to OEM customers, located outside of the U.S., that manufacture these consumer and office products. Also, we depend on a network of distributors to sell our products that also are primarily located outside of the U.S. Export sales shipped to manufacturers in Europe and Asia, including Japan and Asia Pacific, represented 95%, 96% and 97% of our total revenues for 2018, 2017 and 2016, respectively. Furthermore, we have material operations in Germany, Hong Kong and India and employ a number of individuals within those foreign operations. As a result, the occurrence of any negative international political, economic or geographic events, as well as our failure to mitigate the challenges in managing an organization operating in various countries, could result in significant revenue shortfalls and disrupt our workforce within our foreign operations. These shortfalls and disruptions could cause our business, financial condition and results of operations to be harmed. Some of the risks of doing business internationally include:

unexpected changes in foreign government regulatory requirements;

- fluctuations in the exchange rate for the U.S. dollar;
- import and export license requirements;
- imposition of tariffs and other barriers and restrictions;
- burdens of complying with a variety of foreign laws, treaties and technical standards;
- uncertainty of laws and enforcement in certain countries relating to the protection of intellectual property;
- difficulty in collecting accounts receivable and longer payment cycles for international customers than existing customers;
- difficulty in staffing and managing foreign operations and maintaining the morale and productivity of employees within foreign operations;
- multiple and possibly overlapping tax structures and potentially adverse tax consequences;
- political and economic instability, including protectionist policies; and
- changes in diplomatic and trade relationships.

One or more of these factors may have a material adverse effect on our future operations and consequently, on our business, financial conditions and operating results.

Because the markets in which we compete are highly competitive, and many of our competitors may have greater resources than we do, we cannot be certain that our products will be accepted in the marketplace or capture market share.

The markets in which we operate are extremely competitive and characterized by rapid technological change, evolving standards, short product life cycles and price erosion. We expect competition to intensify as current competitors expand their product offerings and new competitors enter the market. Given the highly competitive environment in which we operate, we cannot be sure that any competitive advantages enjoyed by our current products would be sufficient to establish and sustain our new products in the market. Any increase in materials price or competition could

result in the erosion of our market share, to the extent we have obtained market share, and would have a negative impact on our financial condition and results of operations.

In each of our business activities, we face current and potential competition from competitors that may have significantly greater financial, technical, manufacturing, marketing, sales and distribution resources and management expertise than we do. These competitors may also have pre-existing relationships with our customers or potential customers. Further, in the event of a manufacturing capacity shortage, these competitors may be able to manufacture products when we are unable to do so. Our principal competitors in the cordless market include Intel and Dialog Semiconductors. Our principal competitors in the VoIP market include Avago Technologies, Dialog Semiconductors, Infineon, Texas Instruments and Taiwanese IC vendors. Our principal competitors in the smart audio and noise reduction market include Knowles Corporation, Cirrus Logic, Synaptics and developers of noise cancellation software running on mobile phones such as NXP and ForteMedia.

As discussed above, various new technological developments require us to enter into new markets with competitors that have more established presence, and significantly greater financial, technical, manufacturing, marketing, sales and distribution resources and management expertise than we do. The expenditure of greater resources to expand our current product lines may increase our operating expenses and reduce our gross profit. There are no assurances that we will succeed in developing and introducing new products that are responsive to market demands.

Our research and development expenses may increase if the grants we currently receive from the Israeli government are reduced or withheld.

We currently receive research grants from programs of the Israeli Innovation Authority ("IIA"). To be eligible for these grants, we must meet certain development conditions and comply with periodic reporting obligations. Although we have met such conditions in the past, should we fail to meet such conditions in the future our research grants may be repayable, reduced or withheld. Such reduction can also take place due to different allocation and methodology that IIA is implementing. The reduction of such research grants may increase our research and development expenses which in turn may reduce our operating income. As an example, in 2018, the amount of grants approved by the IIA was lower than prior years due to different allocation and methodology that IIA has implemented. Our research and development expenses may increase if the grants from the IIA are reduced which may negatively affect our financial results.

Because we depend on independent foundries and other third party suppliers to manufacture and test all of our integrated circuit products, we are subject to additional risks that may materially disrupt our business.

All of our integrated circuit products are manufactured and tested by independent foundries and other third party suppliers. While these foundries and other third party suppliers have been able to adequately meet the demands of our increasing business, we are and will continue to be dependent upon these foundries and third party suppliers to achieve acceptable manufacturing yields, quality levels and costs, and to allocate to us a sufficient portion of their foundry, assembly and test capacity to meet our needs in a timely manner.

While we currently believe we have access to adequate capacity to support our current sales levels pursuant to our arrangement with our foundries and other third party suppliers, we may encounter capacity shortage issues in the future. In the event of a worldwide shortage in foundry, assembly and/or test capacity, we may not be able to obtain a sufficient allocation of such capacity to meet our product needs or we may incur additional costs to ensure specified quantities of products and services. Under-capacity at the current foundries and other third party suppliers we use, or future foundries or other third party suppliers we may use, to manufacture and test our integrated circuit products may lead to increased operating costs and lower gross margins. In addition, such a shortage could lengthen our products' manufacturing and testing cycle and cause a delay in the shipment of our products to our customers. This could ultimately lead to a loss of sales of our products, harm our reputation and competitive position, and our revenues could be materially reduced. Our business could also be harmed if our current foundries or other third party suppliers terminate our relationship and we are unable to obtain satisfactory replacements to fulfill customer orders on a timely basis and in a cost-effective manner. Moreover, we do not have long term capacity guarantee agreements with our foundries and with other third party suppliers.

In addition, as TSMC produces a significant portion of our integrated circuit products and ASE tests and assembles a significant portion of our products, earthquakes, aftershocks or other natural disasters in Asia, or adverse changes in

the political situation in Taiwan, could preclude us from obtaining an adequate supply of wafers to fill customer orders. Such events could harm our reputation, business, financial condition, and results of operations.

Our operating results are affected by general economic conditions and the highly cyclical nature of the semiconductor industry.

The general worldwide economic conditions remain uncertain which continues to make it difficult for our customers, the end-product customers, our vendors and us to accurately forecast and plan future business activities. Moreover, we operate within the semiconductor industry which experiences significant fluctuations in sales, availability and profitability. Downturns in the semiconductor industry are characterized by diminished product demand, excess customer inventories, accelerated erosion of prices and excess production capacity. These factors could cause substantial fluctuations in our revenues and in our results of operations. If global economic and market conditions remain uncertain or deteriorate, we could experience a material adverse impact on our business and results of operations.

Because the manufacture of our products is complex, the foundries on which we depend may not achieve the necessary yields or product reliability that our business requires.

The manufacture of our products is a highly complex and precise process, requiring production in a highly controlled environment. Changes in manufacturing processes or the inadvertent use of defective or contaminated materials by a foundry could adversely affect the foundry's ability to achieve acceptable manufacturing yields and product reliability. If the foundries we currently use do not achieve the necessary yields or product reliability, our ability to fulfill our customers' needs could suffer. This could ultimately lead to a loss of sales of our products and have a negative effect on our gross margins and results of operations.

Furthermore, there are other significant risks associated with relying on these third-party foundries, including:

- risks due to the fact that we have reduced control over production cost, delivery schedules and product quality;
- less recourse if problems occur as the warranties on wafers or products supplied to us are limited; and
- increased exposure to potential misappropriation of our intellectual property.

As we depend on independent subcontractors, located in Asia, to assemble and test our semiconductor products, we are subject to additional risks that may materially disrupt our business.

Independent subcontractors, located in Asia, assemble and test our semiconductor products. Because we rely on independent subcontractors to perform these services, we cannot directly control our product delivery schedules or quality levels. We are dependent on these subcontractors to allocate to us a sufficient portion of their capacity to meet our needs in a timely manner. Our future success also depends on the financial viability of our independent subcontractors. If the capital structures of our independent subcontractors weaken, we may experience product shortages, production delays, quality assurance problems, increased manufacturing costs, and/or supply chain disruption. All of this could ultimately lead to a loss of sales of our products, harm our reputation and competitive position, and our revenues could be materially harmed.

Moreover, the economic, market, social, and political situations in countries where some of our independent subcontractors are located are unpredictable, can be volatile, and can have a significant impact on our business because we may not be able to obtain product in a timely manner. Market and political conditions, including currency fluctuation, terrorism, political strife, war, labor disruption, and other factors, including natural or man-made disasters, adverse changes in tax laws, tariff, import or export quotas, power and water shortages, or interruption in air

transportation, in areas where our independent subcontractors are located also could have a severe negative impact on our operating capabilities.

We are subject to order and shipment uncertainties and if we are unable to accurately predict customer demand, our business may be harmed.

We typically sell products pursuant to shorter term purchase orders rather than long-term purchase commitments. Customers can generally change or defer purchase orders on short notice without incurring a significant penalty. Given current market conditions, we have less ability to accurately predict what or how many products our customers will need in the future. In addition, we have little visibility into and no control of the demand by our customer's customers – generally consumer electronics retailers and businesses. Furthermore, based on discussions with our customers, we understand that our customers also have less visibility into their product demands. A decrease in the consumer electronics retailers' or businesses' demand or a build-up of their inventory, both of which are out of the control of our customers and us, may cause a cancellation, change or deferral of purchase orders on short notice by our customers. Anticipating demand is difficult because our customers and their customers face volatile pricing and unpredictable demand for their own products, and are increasingly focused on cash preservation and tighter inventory management. Based on these trends, our customers are reluctant to place orders with normal lead times, and we are seeing a shift to shorter lead-times and rush orders. However, we place orders with our suppliers based on forecasts of our customers' demand and, in some instances, may establish buffer inventories to accommodate anticipated demand. Our forecasts are based on multiple assumptions, each of which may introduce error into our estimates. If we overestimate our customers' demand or our customers overestimate their demand, we may allocate resources to manufacturing products that we may not be able to sell when we expect to, if at all. As a result, we could hold excess or obsolete inventory, which would reduce our profit margins and adversely affect our financial results. Conversely, if we underestimate our customers' demand or our customers underestimate their demand and insufficient manufacturing capacity is available, we could forego revenue opportunities and potentially lose market share and damage our customer relationships.

Furthermore, we maintain inventory, or hubbing, arrangements with certain of our customers. Pursuant to these arrangements, we deliver products to a customer or a designated third party warehouse based upon the customer's projected needs, but do not recognize product revenue unless and until the customer reports that it has removed our product from the warehouse to incorporate into its end products. Since we own inventory that is physically located in a third party's warehouse, our ability to effectively manage inventory levels may be impaired, causing our total inventory turns to decrease, which could increase expenses associated with excess and obsolete product and negatively impact our cash flow.

The possible emerging trend of our OEM customers outsourcing their production may cause our revenue to decline.

We believe there may be an emerging trend of our OEM customers outsourcing their production to third parties. We have invested substantial resources to build relationships with our OEM customers. However the outsourcing companies whom our OEM customers may choose to outsource production may not have prior business relationship with us or may instead have prior or ongoing relationships with our competitors. The emergence of this trend may require us to expend substantial additional resources to build relationships with these outsourcing companies, which would increase our operating expenses. Even if we do expend such resources, there are no assurances that these outsourcing companies will choose to incorporate our chipsets rather than chipsets of our competitors. Our inability to retain an OEM customer once such customer chooses to outsource production would have a material adverse effect on our future revenue.

Third party claims of infringement or other claims against us could adversely affect our ability to market our products, require us to redesign our products or seek licenses from third parties, and seriously harm our operating results and disrupt our business.

As is typical in the semiconductor industry, we and our customers have been and may from time to time be notified of claims that we may be infringing patents or intellectual property rights owned by third parties. In addition, patent infringement claims are increasingly being asserted by patent holding companies (so-called patent "trolls"), which do not use technology and whose sole business is to enforce patents against companies, such as us, for monetary gain. Because such patent holding companies do not provide services or use technology, the assertion of our own patents by way of counter-claim may be ineffective. We have received claims that our products infringe upon the proprietary rights of such patent holding companies. In addition, third parties have asserted and may in the future assert intellectual property infringement claims against our customers, which we have agreed in certain circumstances to indemnify and defend against such claims. If litigation becomes necessary to determine the validity of any third party claims, it could result in significant expense to us and could divert the efforts of our technical and management personnel, whether or not the claim has merit and notwithstanding that the litigation is determined in our favor.

If it appears necessary or desirable, we may try to obtain licenses for those patents or intellectual property rights that we are allegedly infringing. Although holders of these types of intellectual property rights commonly offer these licenses, we cannot assure you that licenses will be offered or that the terms of any offered licenses will be acceptable to us. Our failure to obtain a license for key intellectual property rights from a third party for technology used by us could cause us to incur substantial liabilities, suspend the manufacturing of products utilizing the technology or damage the relationship with our customers. Alternatively, we could be required to expend significant resources to develop non-infringing technology. We cannot assure you that we would be successful in developing non-infringing technology. The occurrence of any of these events could harm our business, financial condition or results of operations.

Because we have significant operations in Israel, we may be subject to political, economic and other conditions affecting Israel that could increase our operating expenses and disrupt our business.

Our principal research and development facilities are located in the State of Israel and, as a result, at December 31, 2018, 195 of our 320 employees were located in Israel, including 128 out of 193 of our research and development personnel. In addition, although we are incorporated in Delaware, a majority of our executive officers are residents of Israel. Although substantially all of our sales currently are being made to customers outside of Israel, we are nonetheless directly influenced by the political, economic and military conditions affecting Israel. Any major hostilities involving Israel, or the interruption or curtailment of trade between Israel and its present trading partners, could significantly harm our business, operating results and financial condition.

Israel's economy has been subject to numerous destabilizing factors, including a period of rampant inflation in the early to mid-1980s, low foreign exchange reserves, fluctuations in world commodity prices, military conflicts and civil unrest. In addition, Israel and companies doing business with Israel have been the subject of an economic boycott by the Arab countries since Israel's establishment. Although they have not done so to date, these restrictive laws and policies may have an adverse impact on our operating results, financial condition or expansion of our business.

Since the establishment of the State of Israel in 1948, a state of hostility has existed, varying in degree and intensity, between Israel and the Arab countries. Although Israel has entered into various agreements with certain Arab countries and the Palestinian Authority, and various declarations have been signed in connection with efforts to resolve some of the economic and political problems in the Middle East, hostilities between Israel and some of its Arab neighbors have recently escalated and intensified. We cannot predict whether or in what manner these conflicts will be resolved. Our results of operations may be negatively affected by the obligation of key personnel to perform military service. In addition, certain of our officers and employees are currently obligated to perform annual reserve duty in the Israel Defense Forces and are subject to being called for active military duty at any time. Although we have operated effectively under these requirements since our inception, we cannot predict the effect of these obligations on the company in the future. Our operations could be disrupted by the absence, for a significant period, of one or more of our officers or key employees due to military service.

Recently enacted tax legislation in the United States may impact our business.

We are subject to taxation in the United States, as well as a number of foreign jurisdictions. On December 22, 2017, the U.S. President signed into law federal tax legislation commonly referred to as the Tax Cuts and Jobs Act (the "Tax Act"). The Tax Act implements many new U.S. domestic and international tax provisions. A year after enactment, some aspects of the Tax Act still remains unclear, and although additional clarifying guidance has been issued (by the Internal Revenue Services and the U.S. Treasury Department), there are still some areas that may not be clarified for some time. Also, a number of U.S. states have not yet updated their laws to take into account the Tax Act. Legislation and clarifying guidance are expected to continue to be issued by the U.S. Treasury Department and various states in

2019, which could have a material adverse impact on the value of our U.S. deferred tax assets, result in significant changes to currently computed income tax liabilities for past and current tax periods, and increase our future U.S. tax expense.

The tax benefits available to us under Israeli law require us to meet several conditions, and may be terminated or reduced in the future, which would increase our taxes.

Our facilities in Israel have been granted Approved Enterprise and Beneficiary Enterprise status under the Law for the Encouragement of Capital Investments, 1959, commonly referred to as the "Investment Law," as amended. The Investment Law provides that capital investments in a production facility (or other eligible assets) designated as an Approved Enterprise or Beneficiary Enterprise receive certain tax benefits in Israel. Our investment programs that generate taxable income are currently subject to an average tax rate of up to approximately 10% based on a variety of factors, including percentage of foreign ownership and approvals for the erosion of the tax basis of our investment programs. To be eligible for tax benefits, we must meet certain conditions, relating principally to adherence to the investment program filed with the Investment Center of the Israeli Ministry of Economy and periodic reporting obligations. Although we believe we have met such conditions in the past, should we fail to meet such conditions in the future, we would be subject to corporate tax in Israel at the standard corporate tax rate (23% for 2018) and could be required to refund tax benefits (including with interest and adjustments for inflation based on the Israeli consumer price index) already received. Our average tax rate for our investment programs also may change in the future due to circumstances outside of our control, including changes to legislation. For example, in July 2013, the Investment Law was amended whereby the reduction of corporate tax rate for preferred enterprises was eliminated such that such enterprises, which are subject to the new law, would be subject to a 16% tax rate. Therefore, we cannot provide any assurances that our average tax rate for our investment programs will continue in the future at their current levels, if at all. The termination or reduction of certain programs and tax benefits or a requirement to refund tax benefits (including with interest and adjustments for inflation based on the Israeli consumer price index) already received may have a material adverse effect on our business, operating results and financial condition.

We may engage in future acquisitions that could dilute our stockholders' equity and harm our business, results of operations and financial condition.

We have pursued, and will continue to pursue, growth opportunities through internal development and acquisition of complementary businesses, products and technologies. We are unable to predict whether or when any other prospective acquisition will be completed. The process of integrating an acquired business may be prolonged due to unforeseen difficulties and may require a disproportionate amount of our resources and management's attention. There are no assurances that we will be able to successfully identify suitable acquisition candidates, complete acquisitions, integrate acquired businesses into our operations, or expand into new markets. Further, once integrated, acquisitions may not achieve comparable levels of revenues, profitability or productivity as our existing business or otherwise perform as expected. The occurrence of any of these events could harm our business, financial condition or results of operations. Future acquisitions may require substantial capital resources, which may require us to seek additional debt or equity financing. Future acquisitions by us could result in the following, any of which could seriously harm our results of operations or the price of our stock:

issuance of equity securities that would dilute our current stockholders' percentages of ownership;

large one-time write-offs;

the incurrence of debt and contingent liabilities;

difficulties in the assimilation and integration of operations, personnel, technologies, products and information systems of the acquired companies;

diversion of management's attention from other business concerns;

contractual disputes;

risks of entering geographic and business markets in which we have no or only limited prior experience; and

potential loss of key employees of acquired organizations.

We may not be able to adequately protect or enforce our intellectual property rights, which could harm our competitive position.

Our success and ability to compete is in part dependent upon our internally-developed technology and other proprietary rights, which we protect through a combination of copyright, trademark and trade secret laws, as well as through confidentiality agreements and licensing arrangements with our customers, suppliers, employees and consultants. In addition, we have filed a number of patents in the United States and in other foreign countries with respect to new or improved technology that we have developed. However, the status of any patent involves complex legal and factual questions, and the breadth of claims allowed is uncertain. Accordingly, we cannot assure you that any patent application filed by us will result in a patent being issued, or that the patents issued to us will not be infringed by others. Also, our competitors and potential competitors may develop products with similar technology or functionality as our products, or they may attempt to copy or reverse engineer aspects of our product line or to obtain and use information that we regard as proprietary. Moreover, the laws of certain countries in which our products are or may be developed, manufactured or sold, including Hong Kong, Japan, Korea, China and Taiwan, may not protect our products and intellectual property rights to the same extent as the laws of the United States. Policing the unauthorized use of our products is difficult and may result in significant expense to us and could divert the efforts of our technical and management personnel. Even if we spend significant resources and efforts to protect our intellectual property, we cannot assure you that we will be able to prevent misappropriation of our technology. Use by others of our proprietary rights could materially harm our business and expensive litigation may be necessary in the future to enforce our intellectual property rights.

Because our products are complex, the detection of errors in our products may be delayed, and if we deliver products with material defects, our credibility will be harmed, the sales and market acceptance of our products may decrease and product liability claims may be made against us.

Our products are complex and may contain errors, defects and bugs when introduced. If we deliver products with material errors, defects or bugs, our credibility and the market acceptance and sales of our products could be significantly harmed. Furthermore, the nature of our products may also delay the detection of any such error or defect. If our products contain material errors, defects and bugs, then we may be required to expend significant capital and resources to alleviate these problems. This could result in the diversion of technical and other resources from our other development efforts. Any actual or perceived problems or delays may also adversely affect our ability to attract or retain customers. Furthermore, the existence of any defects, errors or failures in our products could lead to product liability claims or lawsuits against us or against our customers. We generally provide our customers with a standard warranty for our products, generally lasting one year from the date of purchase. Although we attempt to limit our liability for product defects to product replacements, we may not be successful, and customers may sue us or claim liability for the defective products. A successful product liability claim could result in substantial cost and divert management’s attention and resources, which would have a negative impact on our financial condition and results of operations.

We are exposed to the credit risk of our customers and to credit exposures in weakened markets, which could result in material losses.

Most of our sales are on an open credit basis. Because of current conditions in the global economy, our exposure to credit risks relating to sales on an open credit basis has increased. We expect demand for enhanced open credit terms, for example, longer payment terms, to continue and believe that such arrangements are a competitive factor in obtaining business. Although we monitor and attempt to mitigate credit risks, including through insurance coverage from time to time, there can be no assurance that our efforts will be effective. Moreover, even if we attempt to mitigate credit risks through insurance coverage, such coverage may not be sufficient to cover all of our losses and we would be subject to a deductible under any insurance coverage. As a result, our future credit risk exposure may increase. Although any losses to date relating to credit exposure of our customers have not been material, future losses, if incurred, could harm our business and have a material adverse effect on our operating results and financial condition. Moreover, the loss of a customer due to its financial default also could harm our future business and potential growth.

Our executive officers and key personnel are critical to our business, and because there is significant competition for personnel in our industry, we may not be able to attract and retain such qualified personnel.

Our success depends to a significant degree upon the continued contributions of our executive management team, and our technical, marketing, sales customer support and product development personnel. The loss of significant numbers of such personnel could significantly harm our business, financial condition and results of operations. We do not have any life insurance or other insurance covering the loss of any of our key employees. Because our products are specialized and complex, our success depends upon our ability to attract, train and retain qualified personnel, including qualified technical, marketing and sales personnel. However, the competition for personnel is intense and we may have difficulty attracting and retaining such personnel.

We may have exposure to additional tax liabilities as a result of our foreign operations.

We are subject to income taxes in the United States and various foreign jurisdictions. In addition to our significant operations in Israel, we have operations in Germany, the United Kingdom, Hong Kong, China, Japan, South Korea and India. Significant judgment is required in determining our worldwide provision for income taxes and other tax liabilities. In the ordinary course of a global business, there are many intercompany transactions and calculations where the ultimate tax determination is uncertain. We are regularly under audit by tax authorities and as an example, we are now under audit for one of our subsidiaries, the outcome of which could have material adverse impact on our financial condition. Our intercompany transfer pricing may be reviewed by the U.S. Internal Revenue Service and by foreign tax jurisdictions. Although we believe that our tax estimates are reasonable, due to the complexity of our corporate structure, the multiple intercompany transactions and the various tax regimes, we cannot assure you that a tax audit or tax dispute to which we may be subject will result in a favorable outcome for us. If taxing authorities do not accept our tax positions and impose higher tax rates on our foreign operations, our overall tax expenses could increase.

We are exposed to fluctuations in currency exchange rates.

A significant portion of our business is conducted outside the United States. Export sales to manufacturers in Europe and Asia, including Japan and Asia Pacific, represented 95% of our total revenues for 2018 and 96% of our total revenues for 2017 and 97% of our total revenues in 2016. Although most of our revenue and expenses are transacted in U.S. dollars, we may be exposed to currency exchange fluctuations in the future as business practices evolve and we are forced to transact business in local currencies. Moreover, part of our expenses in Israel are paid in Israeli currency, which subjects us to the risks of foreign currency fluctuations between the U.S. dollar and the New Israeli Shekel (NIS) and to economic pressures resulting from Israel’s general rate of inflation. Our primary expenses paid in NIS are employee salaries and lease payments on our Israeli facilities. Furthermore, a portion of our expenses for our European operations are paid in the Euro, which subjects us to the risks of foreign currency fluctuations between the U.S. dollar and the Euro. Our primary expenses paid in the Euro are employee salaries, lease and operational

payments on our European facilities. As a result, an increase in the value of the NIS and Euro in comparison to the U.S. dollar could increase the cost of our technology development, research and development expenses and general and administrative expenses, all of which could harm our operating profit. From time to time, we use derivative instruments in order to minimize the effects of currency fluctuations, but our hedging positions may be partial, may not exist at all in the future or may not succeed in minimizing our foreign currency fluctuation risks. Our financial results may be harmed if the trend relating to the devaluation of the U.S. dollars continues for an extended period.

An unfavorable government review of our federal income tax returns or changes in our effective tax rates could adversely affect our operating results.

Our future effective tax rates could be adversely affected by earnings being lower than anticipated in countries where we have lower statutory rates and higher than anticipated in countries where we have higher statutory rates, by changes in the valuation of our deferred tax assets and liabilities, or by changes in tax laws, regulations, accounting principles or interpretations thereof. In addition, we are subject to the periodic examination of our income tax returns by the IRS and other tax authorities. We regularly assess the likelihood of adverse outcomes resulting from these examinations to determine the adequacy of our provision for income taxes, as an example, we are now under audit for one of our subsidiaries. The outcome from this examination may have an adverse effect on our operating results and financial condition.

Our business operations would be disrupted if the information technology systems we rely on fail to function properly.

We rely on complex information technology systems to manage our business which operates in many geographical locations. For example, to achieve short delivery lead times and superior levels of customer service while maintaining low levels of inventory, we frequently adjust our production schedules with manufacturers and subcontractors. We develop and adjust these schedules based on end customer demand as communicated by our customers and distributors and based on our inventory levels, manufacturing cycle times, component lead times, and projected production yields. We combine and distribute all of this information electronically over a complex global communications network. Our ability to estimate demand and to adjust our production schedules is highly dependent on this network. Any delay in the implementation of, or disruption in the transition to, new or enhanced processes, systems or controls, could adversely affect our ability to manage customer orders and manufacturing schedules, as well as generate accurate financial and management information in a timely manner. These systems are also susceptible to power and telecommunication disruptions and other system failures. Failure of our IT systems or difficulties in managing them could result in business disruption. Our business could be significantly disrupted and we could be subject to third party claims associated with such disruptions.

A breach of our information technology systems could subject us to liability, reputational damage or interrupt the operation of our business.

We rely upon our information technology systems and infrastructure for our business. We could experience theft of confidential information or reputational damage from industrial espionage attacks, malware or other cyber attacks, which may compromise our system infrastructure or lead to data leakage, either internally or at our third-party providers. Similarly, data privacy breaches by those who access our systems may pose a risk that sensitive data, including intellectual property, trade secrets or personal information belonging to us, our patients, employees, customers or other business partners, may be exposed to unauthorized persons or to the public. Cyber-attacks are increasing in their frequency, sophistication and intensity, and have become increasingly difficult to detect. There can be no assurance that our efforts to protect our data and information technology systems will prevent breaches in our systems (or that of our third-party providers) that could adversely affect our business and result in financial and reputational harm to us, theft of trade secrets and other proprietary information, legal claims or proceedings, liability under laws that protect the privacy of personal information, and regulatory penalties.

New tariffs and other trade measures could adversely affect our consolidated results of operations, financial position and cash flows.

General trade tensions between the U.S. and China have been escalating in 2018. While tariffs and other retaliatory trade measures imposed by other countries on U.S. goods have not yet had a significant impact on our business or results of operations, we cannot predict further developments, and such existing or future tariffs could have a material

adverse effect on our consolidated results of operations, financial position and cash flows. Furthermore, changes in U.S. trade policy could trigger retaliatory actions by affected countries, which could impose restrictions on our ability to do business in or with affected countries or prohibit, reduce or discourage purchases of our products by foreign customers, leading to increased costs of components contained in our products, increased costs of manufacturing our products, and higher prices for our products in foreign markets. For example, there are risks that the Chinese government may, among other things, require the use of local suppliers, compel companies that do business in China to partner with local companies to conduct business and provide incentives to government-backed local customers to buy from local suppliers. Changes in, and responses to, U.S. trade and tariff policy could reduce the competitiveness of our products and cause our sales and revenues to drop, which could materially and adversely impact our business and results of operations.

We may experience difficulties in transitioning to smaller geometry process technologies or in achieving higher levels of design integration, which may result in reduced manufacturing yields, delays in product deliveries and increased expenses.

A growing trend in our industry is the integration of greater semiconductor content into a single chip to achieve higher levels of functionality. In order to remain competitive, we must achieve higher levels of design integration and deliver new integrated products on a timely basis. This will require us to expend greater research and development resources, and may require us to modify the manufacturing processes for some of our products, to achieve greater integration. We periodically evaluate the benefits, on a product-by-product basis, of migrating to smaller geometry process technologies to reduce our costs. Although this migration to smaller geometry process technologies has helped us to offset the declining average selling prices of our products, this effort may not continue to be successful. Also, because we are a fabless semiconductor company, we depend on our foundries to transition to smaller geometry processes successfully. We cannot assure you that our foundries will be able to effectively manage the transition. In case our foundries or we experience significant delays in this transition or fail to efficiently implement this transition, our business, financial condition and results of operations could be materially and adversely affected.

The anti-takeover provisions in our certificate of incorporation and bylaws could prevent or discourage a third party from acquiring us.

Our certificate of incorporation and bylaws contain provisions that may prevent or discourage a third party from acquiring us, even if the acquisition would be beneficial to our stockholders. Our board of directors also has the authority to fix the rights and preferences of shares of our preferred stock and to issue such shares without a stockholder vote. Our bylaws also place limitations on the authority to call a special meeting of stockholders. Our stockholders may take action only at a meeting of stockholders and not by written consent. We have advance notice procedures for stockholders desiring to nominate candidates for election as directors or to bring matters before an annual meeting of stockholders. In addition, these factors may also adversely affect the market price of our common stock, and the voting and other rights of the holders of our common stock.

Our stock price may be volatile so stockholders may not be able to resell shares of our common stock at or above the price they paid for them.

Announcements of developments related to our business, announcements by competitors, quarterly fluctuations in our financial results, changes in the general conditions of the highly dynamic industry in which we compete or the national economies in which we do business, and other factors could cause the price of our common stock to fluctuate, perhaps substantially. In addition, in recent years, the stock market has experienced extreme price fluctuations, which have often been unrelated to the operating performance of affected companies. These factors and fluctuations could have a material adverse effect on the market price of our common stock.

Item 1B. UNRESOLVED STAFF COMMENTS.

None.

Item 2. PROPERTIES.

We are headquartered in San Jose, California, in a leased facilities of approximately 1,723 square feet pursuant to a lease agreement that terminates in December 2021. Our operations in Israel are located in leased facilities of approximately 45,359 square feet located in Herzliya Pituach, Israel. These facilities are leased through April 2019. We have signed a lease agreement for our new leased facilities, which are also located in Herzliya Pituach, Israel. The new facilities will be leased for 10 years starting in April 2019. Our subsidiary in Tokyo, Japan has a lease that terminates in October 2020. Our subsidiary in Nuremberg, Germany has a lease that terminates in December 2019. Our subsidiary in Scotland has a lease agreement for its facilities with automatic renewals on a month-to-month basis. Our subsidiary in India has a lease that terminates in August 2020. Our subsidiary in China has two lease agreements for its facilities, one in Shenzhen that terminates in September 2020, and the other in Shanghai that terminates in July 2019. Our subsidiary in Hong Kong entered into a lease agreement that is effective until November 2019. Our subsidiary in South Korea has a lease that terminates in July 2020. We believe that our existing facilities are adequate to meet our needs for the immediate future.

Item 3. LEGAL PROCEEDINGS.

From time to time, we may become involved in litigation relating to claims arising from our ordinary course of business activities. Also, as is typical in the semiconductor industry, we have been and may from time to time be notified of claims that we may be infringing patents or intellectual property rights owned by third parties. We currently believe that there are no claims or actions pending or threatened against us, the ultimate disposition of which would have a material adverse effect on us.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. MARKET FOR REGISTRANT’S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES.

Our common stock, par value $0.001, trades on the NASDAQ Global Select Market (NASDAQ symbol “DSPG”). As of March 6, 2019, there were 22,625,754 shares of common stock outstanding. As of March 6, 2019, the company had approximately 17 holders of record and we believe greater than 3.100 beneficial holders. We have never paid cash dividends on our common stock and presently intend to continue a policy of retaining any earnings for reinvestment in our business.

Equity Compensation Plan Information

Information relating to our equity compensation plans will be presented under the caption “Equity Compensation Plan Information” of our definitive proxy statement pursuant to Regulation 14A in connection with the annual meeting of stockholders to be held on June 6, 2019. The definitive proxy statement will be filed with the Securities and Exchange Commission no later than 120 days after the end of the fiscal year covered by this report. Such information is incorporated herein by reference.

Issuer Purchases of Equity Securities

Our board of directors has previously approved a number of share repurchase plans, including those in accordance with Rule 10b5-1 of the Securities Exchange Act of 1934, for the repurchase of our common stock. In August 2018, our board authorized a $10 million dollar buyback program, inclusive of the shares that remained available for repurchase from previously authorized share repurchase programs.

During the fourth quarter of 2018, we repurchased 211,005 shares of common stock at an average purchase price of $11.80 per share for approximately $2.5 million. The table below sets forth the information with respect to repurchases of our common stock during the three months ended December 31, 2018.

Period	(a) Total Number of Shares Purchased	(b) Average Price Paid per Share	(c) Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	(d) Maximum Number of Shares that May Yet Be Purchased Under the Plans or Programs)
Month #1 (October 1, 2018 to October 31, 2018)	174,189	11.65	174,189	477,438
Month #2 (November 1, 2018 to November 30, 2018)	36,816	12.55	36,816	440,622
Month #3 (December 1, 2018 to December 31, 2018)	-	-	-	440,622

At December 31, 2018, 440,622 shares of our common stock remained available for repurchase under our board authorized share repurchase program. The repurchase program is being affected from time to time, depending on market conditions and other factors, through open market purchases and privately negotiated transactions.

In February 2019, our board authorized an increase of our existing share buyback program to an aggregate of $10 million dollar, inclusive of the shares that remained available for repurchase from previously authorized share repurchase programs.

Stock Performance Graph

Notwithstanding anything to the contrary set forth in any of the Company's previous or future filings under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, that might incorporate this proxy statement or future filings made by the Company under those statutes, the Stock Performance Graph shall not be deemed filed with the United States Securities and Exchange Commission and shall not be deemed incorporated by reference into any of those prior filings or into any future filings made by the Company under those statutes.

The graph below compares the cumulative total stockholder return on our common stock with the cumulative total return on the Standard & Poor's 500 Index and Standard & Poor's Information Technology Index. The period shown commences on December 31, 2013 and ends on December 31, 2018, the end of our last fiscal year. The graph assumes an investment of $100 on December 31, 2013, and the reinvestment of any dividends.

Comparisons in the graph above are based upon historical data and are not indicative of, nor intended to forecast, future performance of our common stock.

Item 6. SELECTED FINANCIAL DATA.

The selected historical consolidated financial data presented below is derived from our consolidated financial statements. The selected consolidated financial data set forth below is qualified in its entirety by, and should be read in conjunction with, our consolidated financial statements for the year ended December 31, 2018, and the discussion of our business, operations and financial results in the section captioned, "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Year ended December 31,					
	2018	**2017**	**2016**	**2015**	**2014**
	(U.S. dollars in thousands)				
Statements of Operations Data:					
Revenues	$117,438	$124,753	$137,869	$144,271	$143,036
Cost of revenues	59,991	67,058	77,023	84,411	85,992
Gross profit	57,447	57,695	60,846	59,860	57,044
Operating expenses					
Research and development, net	36,109	36,655	34,885	35,483	33,468
General, administrative, sales and marketing	25,278	24,104	22,873	21,979	22,446
Amortization of intangible assets	1,700	1,700	1,457	1,284	1,573
Other income	-	-	(2,549)	-	-
Write-off of expired option related to investment in other company	-	-	-	400	-
Total operating expenses	63,087	62,459	56,666	59,146	57,487
Operating income (loss)	(5,640)	(4,764)	4,180	714	(443)
Financial income, net	1,815	1,669	1,227	1,175	1,204
Income (loss) before taxes	(3,825)	(3,095)	5,407	1,889	761
Income tax benefit (expense)	(1,868)	92	(594)	(327)	2,841
Net income (loss)	$(1,957)	$(3,003)	$4,813	$1,562	$3,602
Weighted average number of Common Stock outstanding during the period used to compute basic net earnings (loss) per share	22,512	22,229	21,800	21,924	21,968
Weighted average number of Common Stock outstanding during the period used to compute diluted net earnings (loss) per share	22,512	22,229	22,887	23,340	22,954
Basic net income (loss) per share	$(0.09)	$(0.14)	$0.22	$0.07	$0.16
Diluted net income (loss) per share	$(0.09)	$(0.14)	$0.21	$0.07	$0.16
Balance Sheet Data (end of year):					
Cash, cash equivalents, marketable securities and bank deposits, including restricted deposits	$123,890	$129,215	$124,945	$121,656	$124,944
Working capital	$52,617	$51,071	$52,102	$38,144	$38,817
Total assets	$179,890	$185,199	$185,944	$183,962	$191,179
Total stockholders' equity	$141,865	$146,950	$145,547	$143,318	$146,623

Year ended December 31, Fiscal Years by Quarter	2018				2017			
Quarterly Data:	4th’	3rd’	2nd’	1st’	4th’	3rd’	2nd’	1st’
	(Unaudited, U.S. dollars in thousands, except per share amount)							
Revenues	$26,057	$32,619	$30,651	$28,111	$31,242	$34,277	$31,301	$27,933
Gross profit	$12,376	$16,304	$15,053	$13,714	$14,944	$16,007	$14,497	$12,247
Net income (loss)	$(321)	$405	$(288)	$(1,753)	$(129)	$578	$(586)	$(2,866)
Net income (loss) per share — Basic	$(0.01)	$0.02	$(0.01)	$(0.08)	$(0.01)	$0.03	$(0.03)	$(0.13)
Net income (loss) per share — Diluted	$(0.01)	$0.02	$(0.01)	$(0.08)	$(0.01)	$0.02	$(0.03)	$(0.13)

Item 7. MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

The following discussion and analysis is intended to provide an investor with a narrative of our financial results and an evaluation of our financial condition and results of operations. The discussion should be read in conjunction with our consolidated financial statements and notes thereto.

Business Overview

DSP Group is a global leader in wireless and audio chipsets for a wide range of smart-enabled devices. Delivering semiconductor system solutions with software and hardware reference designs, DSP Group enables original equipment manufacturers (OEMs), original design manufacturers (ODMs), consumer electronics (CE) manufacturers and service providers to cost-effectively develop new revenue-generating products with fast time to market. DSP Group is a leader in high performance low-power integrated circuits (ICs) for audio and voice signal processing applications. We enable converged voice, audio, video and data connectivity across diverse mobile, consumer and enterprise products – from mobile phones, IoT and wearable devices, connected multimedia screens and home automation and security to cordless phones, VoIP systems and home gateways. Leveraging industry-leading experience and expertise, DSP Group partners with leading CE manufacturers and service providers to reshape the future of converged communications at home, office and mobile on the go devices.

We believe that many of our research and development investments in new technologies are paying off. Aggregate revenues derived from our non-cordless products were 55%, 46% and 43% of our total revenues for 2018, 2017 and 2016, respectively. We expect that revenues from cordless telephony will represent approximately one-third of our revenues in 2019 and that a majority of our 2019 revenues will be derived from new product initiatives.

Our revenues were $117.4 million for 2018, a decrease of 6% in comparison to 2017. The decrease for 2018 was primarily as a result of a decrease in sales of our cordless telephony and SmartHome products, partially offset by increased sales of our VoIP and SmartVoice products.

Revenues from our VoIP products represented 33% of our total revenues for 2018, as compared to 28% of our total revenues for 2017. Revenues from our SmartVoice products represented 9% of our total revenues for 2018, as compared to 4% of our total revenues for 2017. Revenues derived from the sale of cordless telephony products represented 45% of our total revenues for 2018, as compared to 54% of our total revenues for 2017. Revenues from our SmartHome products represented 12% of our total revenues in 2018, as compared to 14% of our total revenues for 2017.

Our gross margin increased to 48.9% of our total revenues for 2018 from 46.2% for 2017, primary due to (i) a change in the mix of products sold and mix of customers, mostly the shifting of revenues from cordless telephony products to new products with higher gross margins, and (ii) an improvement in production yield and direct contribution of certain of our products, offset to some extent by a decrease in our total revenues for 2018 as compared to 2017. We anticipate that our gross margin on an annual basis will continue to increase in the foreseeable future as our product mix shifts in favor of new products which generally have higher gross margins.

Our operating loss was $5.6 million for 2018, as compared to an operating loss of $4.8 million for 2017. The increase in our operating loss is attributed to (i) an increase in our operating expenses in 2018 as compared to 2017, and (ii) a decrease in total revenues in 2018 as compared to 2017, offset to some extent by an increase in our gross margins in 2018 as compared to 2017. Our operating expenses increased by 1% to $63.1 million for 2018, as compared to $62.5 million for 2017, mainly due to an increase in sales and marketing expenses in 2018 as compared to 2017, offset to some extent by a decrease in research and development expenses in 2018, as compared with 2017.

As of December 31, 2018, our principal source of liquidity consisted of cash and cash equivalents of $12.1 million and marketable securities and short and long term deposits of $111.3 million, totaling $123.4 million.

Critical Accounting policies

Our consolidated financial statements are prepared in accordance with U.S. GAAP. In connection with the preparation of the financial statements, we are required to make assumptions and estimates about future events, and apply judgment that affect the reported amounts of assets, liabilities, revenue, expenses and the related disclosure. We base our assumptions, estimates and judgments on historical experience, current trends and other factors that management believes to be relevant at the time the consolidated financial statements are prepared. On a regular basis, management reviews our accounting policies, assumptions, estimates and judgments to ensure that our financial statements are presented fairly and in accordance with U.S. GAAP. However, because future events and their effects cannot be determined with certainty, actual results could differ from our assumption and estimates, and such differences could be material.

Our significant accounting policies are discussed in Note 2, Significant Accounting Policies, of the notes to our consolidated financial statements for the year ended December 31, 2018.

Management believes that the following accounting policies require management’s most difficult, subjective and complex judgments, resulting from the need to make estimates about the effect of matters that are inherently uncertain. Management has reviewed these critical accounting policies and related disclosures with our independent auditors and audit committee.

Description	Judgments and Uncertainties	Effect if Actual Results Differ from Assumptions
Tax Contingencies:		
Like most companies, domestic and foreign tax authorities periodically audit our income tax returns. These audits include questions regarding our tax filing positions, including the timing and amount of deductions and the allocation of income among various tax jurisdictions. In evaluating the exposure associated with our various tax filing positions, including state, foreign and local taxes, we record reserves for probable exposures. A number of years may elapse before a particular matter, for which we have established a reserve, is audited and fully resolved. We report a liability for unrecognized tax benefits resulting from uncertain tax positions taken or expected to be taken in a tax return. We recognize interest and penalties, if any, related to unrecognized tax benefits in income tax expense.	The estimate of our tax contingency reserve contains uncertainty because management must use judgment to estimate the exposure associated with our various tax filing positions. According to Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC”) No. 740, “Income Taxes,” the first step is to evaluate the tax position for recognition by determining if the weight of available evidence indicates it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount which is more than 50% likely of being realized upon ultimate settlement.	Although management believes that its estimates and judgments about tax contingencies are reasonable, actual results could differ, and we may be exposed to gains or losses that could be material. To the extent we prevail in matters for which reserve has been established, or are required to pay amounts in excess of the reserve, our effective tax rate for a given financial statement period could be materially affected. An unfavorable tax settlement would require use of our cash and result in an increase in our effective tax rate for the year of resolution. A favorable tax settlement would be recognized as a reduction in our effective tax rate for the year of resolution.

Tax Valuation Allowance:

We have a valuation allowance for some of our deferred tax assets based on the determination that it is more likely than not that some of these assets will not be realized.

Our management inherently must make estimates to determine the ultimate realization of these assets. The estimate of our tax valuation allowance contains uncertainty because management must use judgment to estimate the expected results for tax purposes.

Although management believes that its estimates and judgments about expected results for tax purposes are reasonable, actual results could differ, and we may be required to record an additional valuation allowance for our deferred tax assets.

Valuation of Long-Lived Assets, Intangible Assets and Goodwill :

Goodwill represents the excess of purchase price over the fair value of identifiable net assets acquired in business combination. The goodwill on our consolidated balance sheet is a result of our acquisition of BoneTone and a private company in Asia. The identifiable intangible asset included on our consolidated balance sheet is technology acquired in the BoneTone acquisition and customer relationship in the form of a distribution agreement acquired in the acquisition of a private company in Asia.

We perform our annual impairment analysis of goodwill and indefinite-lived intangible assets in the fourth quarter of each fiscal year, or more often if there are indicators of impairment. We review intangible assets with finite useful life for potential impairment when events or changes in circumstances indicate the carrying value of those intangible assets may be impaired. We may obtain an appraisal from an independent valuation firm to determine the amount of impairment, if any. In addition to the use of an independent valuation firm, we perform internal valuation analyses and consider other publicly available market information.

We determine fair value using widely accepted valuation techniques, including discounted cash flow and market multiple analyses. These types of analyses require us to make assumptions and estimates regarding industry economic factors and the profitability of future business strategies. It is our policy to conduct impairment testing based on our current business strategy in light of present industry and economic conditions, as well as future expectations.

If management’s estimates or related assumptions change in the future, we may be required to record impairment charges for our intangible assets.

Contingencies and Other Accrued Expenses: We are from time to time involved in legal proceedings and other claims. We are required to assess the likelihood of any adverse judgments or outcomes to these matters, as well as potential ranges of probable losses.	A determination of the amount of reserve required, if any, for any contingencies and accruals is made after careful analysis of each individual issue. The required reserve may change due to future developments, such as a change in the settlement strategy in dealing with any contingencies, which may result in higher net losses.	If actual results are not consistent with management's assumptions and judgments, we may be exposed to gains or losses that could be material.
Inventory Write-Off: We value our inventory at the lower of the cost of the inventory or fair market value through the establishment of write-off and inventory loss reserve. We have not made any changes in the accounting methodology used to establish our markdown or inventory loss reserves during the past four fiscal years.	Our write-off represents the excess of the carrying value, typically cost, over the amount we expect to realize from the ultimate sale or other disposal of inventory based upon our assumptions regarding forecasted consumer demand, the promotional environment, inventory aging and technological obsolescence.	If management's estimates regarding consumer demand are inaccurate or changes in technology affect demand for certain products in an unforeseen manner, we may be exposed to losses or gains in excess of our established write-off that could be material.
Equity-Based Compensation Expense: Equity-based compensation expense is measured on the grant date based on the fair value of the award and is recognized as an expense over the requisite service periods.	Determining the fair value of equity-based awards on the grant date requires the exercise of judgment, including the amount of equity-based awards that are expected to be forfeited. We consider many factors when estimating expected forfeitures, including types of awards, employee class, and historical experience. Actual results, and future changes in estimates, may differ substantially from our current estimates.	Although management believes that their estimates and judgments about equity-based compensation expense are reasonable, actual results could differ.

We estimate the fair value of equity-based awards using a binomial option pricing model. The fair value of an award is affected by our stock price on the date of grant as well as other assumptions, including expected stock price volatility and the expected term of the equity-based award. The risk-free interest rate is based on the yield from U.S. treasury bonds with an equivalent term. Expected volatility is calculated based upon actual historical stock price movements. The expected term of the equity-based award granted is based upon historical experience and represents the period of time that the award granted is expected to be outstanding. Our expected dividend rate is zero since we do not currently pay cash dividends and do not anticipate doing so in the foreseeable future.

Marketable Securities: Management determines the appropriate classification for our investments in debt and equity securities at the time of purchase and re-evaluates such determination at each balance sheet date.	The marketable securities are periodically reviewed for impairment. If it is concluded that any of these investments are impaired, management determines whether such impairment is "other-than-temporary." Factors that are considered in making such a determination include the duration and severity of the impairment, the reason for the decline in value and the potential recovery period, and our intent to sell, or whether it is more likely than not that we will be required to sell, the investment before recovery of its cost basis. If any impairment is considered "other-than-temporary," the investment is written down to its fair value and a corresponding charge is recorded in financial income, net.	Although management believes that their considerations and judgments about fair value and whether a loss associated with a marketable security is other-than-temporary, actual results could differ. Given current market conditions and uncertainty, management's judgments could prove to be wrong, and companies with relatively high credit ratings and solid financial conditions may not be able to fulfill their obligations and thereby cause other-than-temporary losses.

Results of Operations:

Total Revenues.

The following tables represent our total revenues and our revenues by product family for the years ended December 31, 2018, 2017 and 2016 (dollars in millions):

	2018	YoY Change	2017	YoY Change	2016
Total Revenues (1,2)	$117.4	(6)%	$124.8	(10)%	$137.9
Cordless (3)	$53.2	(21)%	$67.4	(14)%	$78.6
Percentage of total revenues	45 %		54 %		57 %
SmartHome (4,5)	$14.5	(17)%	$17.6	5 %	$16.8
Percentage of total revenues	12 %		14 %		12 %
VoIP (6)	$38.8	11 %	$34.9	31 %	$26.6
Percentage of total revenues	33 %		28 %		19 %
SmartVoice (7,8)	$10.9	124 %	$4.9	(69)%	$15.9
Percentage of total revenues	9 %		4 %		12 %

1. The decrease in revenues for 2018 as compared to 2017 was primarily as a result of decreased sales of our cordless telephony and SmartHome products, offset to some extent by increased sales of our VoIP and SmartVoice products.
2. The decrease in revenues for 2017 as compared to 2016 was primarily as a result of decreased sales of our cordless telephony and SmartVoice products, offset to some extent by increased sales of our VoIP products.
3. The decrease in cordless revenues for both comparable periods was mainly attributable to decreased demand from our customers in all markets.
4. The decrease of our SmartHome product sales in 2018 as compared to 2017 is mainly attributable to lower demands for our home gateway and home automation products.
5. The increase of our SmartHome product sales in 2017 as compared to 2016 is mainly attributable to higher demands from our customers.
6. The increase in our VoIP sales for both comparable periods is mainly attributable to a growth in market demand for our VoIP products that resulted from the growth of our market share within this domain.
7. The increase in our SmartVoice revenues in 2018 as compared to 2017 is attributable to an increase in the number of customers in the segment, as well as increased demands from our customers.
8. The decrease in our SmartVoice revenues in 2017 as compared to 2016 is attributed to a decrease in demand from one of our tier one mobile customers.

The following table shows the breakdown of revenues for all product lines for the periods indicated by geographic location based on the geographic location of our customers (in thousands):

	Year ended December 31,		
	2018	**2017**	**2016**
United States	$5,876	$4,927	$4,696
Hong Kong	36,666	46,119	56,768
Japan	14,284	16,567	18,440
Europe	9,022	9,882	9,703
China	16,107	16,096	10,244
Taiwan	23,940	22,442	16,428
Korea	7,341	4,190	17,503
Other	4,202	4,530	4,087
Total revenues	$117,438	$124,753	$137,869

Sales to our customers in Hong Kong decreased for 2018 as compared to 2017, representing a decrease of 20% in absolute U.S. dollars. The decrease in our sales to Hong Kong for the comparable periods resulted mainly from a decrease in sales to VTech of 17% when comparing 2018 to 2017, a decrease in sales to CCT Technology of 66% when comparing 2018 to 2017, and a decrease of 23% in sales to Guo Wei when comparing 2018 to 2017, mostly resulting from the decline in cordless sales.

Sales to our customers in Hong Kong decreased for 2017 as compared to 2016, representing a decrease of 19% in absolute U.S. dollars. The decrease in our sales to Hong Kong for the comparable periods resulted mainly from a decrease in sales to VTech of 15% when comparing 2017 to 2016, a decrease in sales to CCT of 24% when comparing 2017 to 2016, and a decrease of 29% in sales to Guo Wei when comparing 2017 to 2016, mostly resulting from the decline in cordless sales.

The decrease in our sales to Japan in 2018 as compared to 2017 resulted mainly from a decrease in sales through our distributor, Nexty Electronics, to Panasonic of 13% in the comparable periods.

The decrease in our sales to Japan in 2017 as compared to 2016 resulted mainly from a decrease in sales to the Japanese domestic market, mostly in cordless products, representing a 13% decrease in absolute dollars and a decrease in sales through Nexty Electronics, to Panasonic of 12% in the comparable periods.

Sales to our customers in China increased in 2017 as compared to 2016, representing a 57% increase in absolute U.S. dollars. The increase in our sales to China in 2017 resulted from a 20% increase in sales through Ascend Technology, as well as increased sales to our customers, Yealink and Arrow, representing a 38% and 255% increase in sales for the

comparable periods, respectively, mostly due to sales in our Office segment.

Sales to our customers in Taiwan increased in 2018 as compared to 2017, representing a 7% increase in absolute U.S. dollars. Sales to our customers in Taiwan increased in 2017 as compared to 2016, representing a 37% increase in absolute U.S. dollars. The increase in our sales to Taiwan for both periods resulted from an increase in sales through our distributor, Ascend Technology.

Sales to our customers in South Korea increased for 2018 as compared to 2017, representing an increase of 75% in absolute U.S. dollars. The increase in our sales to South Korea in 2018 resulted mainly from an increase in demand from a tier one mobile customer.

Sales to our customers in South Korea decreased for 2017 as compared to 2016, representing a decrease of 76% in absolute U.S. dollars. The decrease in our sales to Korea in 2017 resulted mainly from a decrease in demand from a tier one mobile customer.

As our products are generally incorporated into consumer electronics products sold by our OEM customers, our revenues are affected by seasonal buying patterns of consumer electronics products sold by our OEM customers that incorporate our products.

Significant Customers. The following table represents our sales, as a percentage of our total revenues, through our main customers for the years ended December 31, 2018, 2017 and 2016:

	Year ended December 31,		
Major Customers	**2018**	**2017**	**2016**
VTech	24%	27%	29%
Panasonic	*	10%	10%
Samsung	*	*	12%

*Less than 10%.

The following table represents our sales, as a percentage of our total revenues, through our main distributors Nexty Electronics and Ascend Technology for the years ended December 31, 2018, 2017 and 2016:

	Year ended December 31,		
Major Distributors	**2018**	**2017**	**2016**
Nexty Electronics (1)	11%	12%	12%
Ascend Technolog (2)	26%	23%	16%

(1) Nexty Electronics sells our products to a limited number of customers. One customer, Panasonic, has continually accounted for a majority of the sales of Nexty Electronics. Sales to Panasonic through Nexty Electronics generated approximately 9%, 10% and 10% of our total revenues for 2018, 2017 and 2016, respectively.

(2) Ascend Technology sells our products to a limited number of customers; however none of those customers accounted for more than 10% of our total revenues for 2018, 2017 or 2016.

Significant Products. Revenues from our digital cordless telephony products represented 45%, 54% and 57% of our total revenues for 2018, 2017 and 2016, respectively. Revenues from our VoIP products represented 33%, 28% and 19% of our total revenues for 2017, 2016 and 2015, respectively. Revenues from our SmartHome products represented 12%, 14% and 12% of our total revenues for 2018, 2017 and 2016, respectively. Revenues from our

SmartVoice products represented 9%, 4% and 12% of our total revenues for 2018, 2017 and 2016, respectively.

Gross Profit. Gross profit as a percentage of revenues was 48.9% for 2018, 46.2% for 2017 and 44.1% for 2016. The increase in our gross profit for 2018 as compared to 2017 was primary due to (i) a change in the mix of products sold and mix of customers, mostly the shifting of revenues from cordless telephony products to new products with higher gross margins, and (ii) an improvement in production yield and direct contribution of certain of our products. Those factors were partially offset by a decrease in total revenues in 2018 as compared to 2017.

The increase in our gross profit for 2017 as compared to 2016 was primary due to (i) a change in the mix of products sold and mix of customers, mostly the shifting of revenues from cordless telephony products to new products with higher gross margins, (ii) an improvement in production yield and direct contribution of certain of our products, and (iii) a decrease in royalties paid in 2017, as compared to 2016, mainly in our SmartVoice segment. Those factors were partially offset by a decrease in total revenues in 2017 as compared to 2016.

Cost of goods sold consists primarily of costs of wafer manufacturing and fabrication, assembly and testing of integrated circuit devices and related overhead costs, and compensation and associated expenses related to manufacturing and testing support, inventory obsolesce and logistics personnel.

Operating Expenses. Our operating expenses were $63.1 million for 2018, $62.5 million for 2017 and $56.7 million for 2016. The increase in operating expenses for 2018 as compared to 2017 was primarily attributable to (i) an increase of $1 million in selling and marketing expenses, mostly attributable to an increase in employee-related expenses and commissions and (ii) an increase in general and administrative expenses in the amount of $0.2 million, mostly attributable to equity-based compensation expenses. These increases were partially offset by a decrease in the amount of $0.5 million in research and development expenses, mostly attributable to a decrease in subcontractors, IP and development tools expenses in 2018 as compared to 2017.

The increase in operating expenses for 2017 as compared to 2016 was primarily attributable to (i) other income of $2.5 million recorded in 2016 related to the reversal of certain provisions due to the elapse of the applicable statute of limitations, (ii) an increase in research and development expenses in the amount of $1.8 million, mostly attributable to a decrease in funding from the Israeli Innovation Authority ("IIA") in an amount of $1.2 million in 2017 as compared to 2016, (iii) an increase in sales and marketing expenses in an amount of $0.4 million, and (iv) an increase in general and administrative expenses in an amount of $0.8 million, mostly due to an increase in legal expenses in an amount of $0.4 million in 2017 as compared to 2016.

Our operating loss was $5.6 for 2018, as compared to operating loss of $4.8 million and an operating income of $4.2 million for 2017 and 2016, respectively. The increase in operating loss in 2018 as compared to 2017 is mainly due to decrease in revenues and increase in operating expenses, partially offset by increase in gross margin in 2018 as compared to 2017.

The decrease in operating income in 2017 as compared to 2016 was mainly due to a decrease in revenues and an increase in operating expenses in 2017 as compared to 2016, partially offset by an increase in gross margins in 2017 as compared to 2016.

Research and Development Expenses. Our research and development expenses, net, were $36.1 million for 2018, $36.7 million for 2017 and $34.9 million for 2016. The decrease for 2018 in research and development expenses, net, as compared to 2017, was mainly due to (i)a decrease in subcontractors and development tools expenses in amount of $0.7 million in 2018 as compared to 2017, (ii) a decrease in IP expenses in 2018 as compared to 2017 in the amount of $0.3 million, and (iii) an increase in funding from the IIA in an amount of $0.2 million in 2018 as compared to 2017. These decreases were partially offset by an increase in equity-based compensation expenses in amount of $0.5 million in 2018 as compared to 2017.

The increase for 2017 in research and development expenses, net, as compared to 2016, was mainly due to (i) a decrease in funding from the IIA in an amount of $1.2 million in 2017 as compared to 2016, (ii) an increase in development tools expenses in 2017 as compared to 2016 in an amount of $0.4 million, and (iii) an increase in salaries and related expenses in 2017 as compared to 2016, mainly due to the devaluation of the U.S dollar against the NIS. Those increases were partially offset by a decrease of $0.6 million in subcontractor, IP and tape out expenses for 2017, as compared to 2016.

The IIA funding was recognized as a deduction of our research and development expenses, net. As a result of receipt of IIA funding, royalties may be payable to the IIA in the future based on a percentage of revenues derived from sales of products whose development was facilitated by the IIA funding. The obligation to pay these royalties is contingent on actual sales of these products.

Our research and development expenses, net, as a percentage of our total revenues were 31%, 29% and 25% for the years ended on December 31, 2018, 2017 and 2016, respectively. The increase in research and development expenses, net, as a percentage of total revenues for 2018 as compared to 2017 was mainly due to a decrease in revenues for the comparable periods, partially offset by a decrease in research and development expenses in 2018 as compared to 2017.

The increase in research and development expenses, net, as a percentage of total revenues for 2017 as compared to 2016 was mainly due to an increase in research and development expenses, net and a decrease in revenues for the comparable periods.

Research and development expenses consist mainly of payroll expenses to employees involved in research and development activities, expenses related to tapeout and mask work, subcontracting, labor contractors and engineering expenses, depreciation and maintenance fees related to equipment and software tools used in research and development, and facilities expenses associated with and allocated to research and development activities.

Sales and Marketing Expenses. Our sales and marketing expenses were $15.3 million for 2018, $14.3 million for 2017 and $13.9 million for 2016. The increase in sales and marketing expenses between 2018 and 2017 was mainly attributable to (i) an increase in sales commissions in the amount of $0.4 million as compared to 2017, (ii) an increase in employee-related expenses in amount of $0.4 million as compared to 2017, and (iii) an increase in equity-based compensation expenses of $0.1 million in 2018 compared to 2017.

The increase in sales and marketing expenses between 2017 and 2016 was mainly attributable to (i) an increase in consulting services, (ii) an increase in payroll and related expenses as compared to 2016, mainly due to the devaluation of the U.S. dollar against the NIS, and (iii) an increase in equity-based compensation expenses of $0.3 million in 2017 compared to 2016. Those factors were partially offset by a decrease in sales commissions on sales of SmartVoice products in 2017 as compared to 2016 due to lower revenues from such segment.

Our sales and marketing expenses as a percentage of our total revenues were 13%, 11% and 10% for 2018, 2017 and 2016, respectively. The increase in sales and marketing expenses as a percentage of total revenues for both comparable periods was mainly due to a decrease in absolute dollars of the total revenues and an increase in sales and marketing expenses for both comparable periods.

Sales and marketing expenses consist mainly of sales commissions, payroll expenses to direct sales and marketing employees, travel, trade show expenses, and facilities expenses associated with and allocated to sales and marketing activities.

General and Administrative Expenses. Our general and administrative expenses were $10.0 million, $9.8 million and $9.0 million for 2018, 2017 and 2016, respectively. The increase in general and administrative expenses for 2018 as compared to 2017 was mainly due to an increase in equity-based compensation expenses of $0.2 million in 2018 as compared to 2017.

The increase in general and administrative expenses for 2017 as compared to 2016 was mainly due to (i) an increase in legal expenses due to the reimbursement of legal expenses in the amount of $0.4 million in 2016 as a result of the finalization of an arbitration proceeding, and (ii) an increase in equity-based compensation expenses of $0.3 million in 2017 as compared to 2016.

General and administrative expenses as a percentage of our total revenues were 8%, 8% and 7% for the three years ended December 31, 2018, 2017 and 2016, respectively. The increase in general and administrative expenses as a percentage of total revenues for 2017 as compared to 2016 was mainly due to a decrease in absolute dollars of the total revenues and an increase in general and administrative expenses for 2017 as compared to 2016.

Our general and administrative expenses consist mainly of payroll expenses for management and administrative employees, accounting and legal fees, expenses related to investor relations as well as facilities expenses associated with general and administrative activities.

Amortization of Intangible Assets. During 2018, 2017 and 2016, we recorded an expense of $1.7 million, $1.7 million and $1.5 million, respectively, relating to the amortization of intangible assets associated with prior acquisitions. The increase in 2017 compared to 2016 is attributable to additional amortization of intangible assets related to the acquisition of a private company in Asia in the second half of 2016.

Other Income. During the third quarter of 2016, we recorded other income in the amount of $2.5 million related to the reversal of certain provisions due to the elapse of the applicable statute of limitations.

Financial Income, net. Financial income, net, was $1.8 million, $1.7 million and $1.2 million for the three years ended December 31, 2018, 2017 and 2016. The increase in financial income in 2018 as compared to 2017 was mainly due to an increase of $0.4 million in marketable securities and deposits interest in 2018 as compared to 2017, resulting from an increase in interest rates. This increase was partially offset by an increase in foreign currency exchange rate expenses of $0.3 million in 2018. The increase in financial income, net, in 2017 as compared to 2016 was mainly due to an increase in foreign exchange rates income by $0.2 million and an increase of $0.2 million in marketable securities and deposits interest in 2017 as compared to 2016, resulting from an increase in interest rates.

Our total cash, cash equivalents, marketable securities and short and long term deposits, including restricted deposits, were $123.9 million as of December 31, 2018, as compared to $129.2 million as of December 31, 2017.

Provision for Income Taxes. In 2018, we had tax benefit of $1.9 million as compared to tax benefit of $0.1 million for 2017 and taxes on income of $0.6 million for 2016.

The tax benefit for 2018 was mainly attributed to (i) income from changes in deferred taxes related to equity-based compensation expenses in the amount of $0.8 million, (ii) income in the amount of $0.7 million from changes in other deferred taxes mainly related to Israeli research and development expenses that were capitalized for tax purposes and will be utilized in the future at higher tax rates less current tax expenses, and (iii) income from amortization of deferred tax liability related to intangible assets acquired in connection with prior acquisitions in the amount of $0.4 million,

Tax benefit for 2017 was mainly attributed to income from amortization of deferred tax liability related to intangible assets acquired in connection with prior acquisitions in the amount of $0.4 million, offset to some extent by current tax expenses that were recorded in the amount of $0.3 million.

Taxes on income for 2016 were mainly attributed to current tax expenses that were recorded in the amount of $1 million, offset to some extent by income from amortization of deferred tax liability related to intangible assets acquired in connection with prior acquisitions in the amount of $0.4 million.

Description of Segments.

We operate under three reportable segments.

The Company's segment information has been prepared in accordance with ASC 280, "Segment Reporting." Operating segments are defined as components of an enterprise engaging in business activities about which separate financial information is available that is evaluated regularly by the Company's chief operating decision-maker ("CODM") in deciding how to allocate resources and assess performance. The Company's CODM is its Chief Executive Officer, who evaluates the Company's performance and allocates resources based on segment revenues and operating income.

The Company's operating segments are as follows: Home, Office and SmartVoice. The classification of the Company's business segments is based on a number of factors that management uses to evaluate, view and run its business operations, which include, but are not limited to, customer base, homogeneity of products and technology.

A description of the types of products provided by each business segment is as follows:

Home - Wireless chipset solutions for converged communication at home. Such solutions include integrated circuits targeted for cordless phones sold in retail or supplied by telecommunication service providers, home gateway devices supplied by telecommunication service providers which integrate the DECT/CAT-iq functionality, integrated circuits addressing home automation applications, as well as fixed-mobile convergence solutions. We combined the home gateway and home automation products into a single product line called SmartHome. In this segment, (i) revenues from cordless telephony products mounted to 45%, 54% and 57% of our total revenues for 2018, 2017 and 2016, respectively, and (ii) revenues from our SmartHome products amounted to 12%, 14% and 12% of our total revenues for 2018, 2017 and 2016, respectively.

Office - Comprehensive solution for Voice-over-IP (VoIP) office products, including office solutions that offer businesses of all sizes low-cost VoIP terminals with converged voice and data applications. Revenues from our VoIP products represented 33%, 28% and 19% of our total revenues for 2018, 2017 and 2016, respectively. No revenues derived from other products in the office segment exceeded 10% of our total consolidated revenues for the years 2018, 2017 and 2016.

SmartVoice - Products for the SmartVoice market that provides voice activation and recognition, voice user interface, voice enhancement, always-on and far-end noise elimination targeted for mobile phone, mobile headsets and other devices that incorporate our voice recognition, noise suppression and voice quality enhancement HDClear technology. Revenues derived from all products in the SmartVoice segment represented 12% of our total revenues for 2016 but did not exceed 10% of our total revenues for 2018 or 2017. No individual product in the SmartVoice segment exceeded 10% of our total revenues for the years 2018, 2017 and 2016.

Segment data:

We derive the results of our business segments directly from our internal management reporting system and by using certain allocation methods. The accounting policies we use to derive business segment results are substantially the same as those we use for consolidation of our financial statements. Management measures the performance of each business segment based on several metrics, including earnings from operations. Management uses these results, in part, to evaluate the performance of, and to assign resources to, each of the business segments. We do not allocate to our business segments certain operating expenses, which we manage separately at the corporate level. These unallocated costs include primarily amortization of purchased intangible assets, equity-based compensation expenses and certain corporate governance costs.

We do not allocate any assets to segments and, therefore, no amount of assets is reported to management and disclosed in the financial information for segments. Selected operating results information for each business segment was as follows for the years ended December 31, 2018, 2017 and 2016:

	Year ended December 31					
	Revenues			Income (loss) from operations		
	2018	2017	2016	2018	2017	2016
Home	$67,741	$85,021	$95,388	$14,206	$16,256	$17,715
Office	$38,817	$34,879	$26,590	$12,147	$9,105	$(2,961)
SmartVoice	$10,880	$4,853	$15,891	$(21,476)	$(20,798)	$(5,190)
Total	$117,438	$124,753	$137,869	$4,877	$4,563	$9,564

Sales to our customers in the Home segment decreased for 2018 as compared to 2017, representing a decrease of 20% in absolute U.S. dollars, and decreased for 2017 as compared to 2016, representing a decrease of 11% in absolute U.S. dollars. The decrease in our Home segment sales for 2018 as compared to 2017 was mainly attributable to a decline in market demands for our cordless telephony and SmartHome products over the comparative periods. The decrease in our Home segment sales for 2017 as compared to 2016 was mainly attributable to a decline in market demands for our cordless telephony products over the comparative periods, which was partially offset by an increase in sales of our SmartHome products in 2017 as compared to 2016.

Sales to our customers in the Office segment increased for 2018 as compared to 2017, representing an increase of 11% in absolute U.S. dollars. Sales to our customers in the Office segment increased for 2017 as compared to 2016, representing an increase of 31% in absolute U.S. dollars. The increase in our Office segment sales for both comparable periods was mainly due to an increase in our market share of VoIP products.

Sales to our customers in the SmartVoice segment increased for 2018 as compared to 2017, representing an increase of 124% in absolute U.S. dollars. The increase in our SmartVoice sales in 2018 as compared to 2017 was mainly attributed to an increase in the number of customers in the segment, as well as increased demands from our customers. Sales to our customers in the SmartVoice segment decreased significantly for 2017 as compared to 2016, representing a decrease of 69% in absolute U.S. dollars. The decrease in our SmartVoice segment sales for 2017, as compared to 2016, was mainly due to a decrease in demand from one of our tier one mobile customers.

The reconciliation of segment operating results information to our consolidated financial information is included in Note 16 to our consolidated financial statements.

LIQUIDITY AND CAPITAL RESOURCES

Operating Activities. We generated $8.7, $8.5 and $16.5 million of cash and cash equivalents from our operating activities during 2018, 2017 and 2016, respectively. The increase in net cash generated by operating activities for 2018, as compared to 2017, was mainly as a result of changes in working capital such as: (i) an increase in accounts payable in the amount of $0.9 million during 2018 as compared to a decrease of $3.9 million during 2017, (ii) an increase in accrued expenses in the amount of $0.8 million during 2018 as compared to a decrease of $0.7 million during 2017, and (iii) an increase in other accounts receivable and prepaid expenses in the amount of $0.1 million during 2018 as compared to an increase of $1.1 million during 2017. The above mentioned increases were partially offset by (i) an increase in accounts receivable in an amount of $0.1 million during 2018 as compared to a decrease of $5.7 million during 2017, (ii) an increase in inventories in the amount of $0.4 million during 2018 as compared to decrease of $0.4 million during 2017, and (iii) an increase in net loss before taxes on income in 2018, as compared to 2017.

The decrease in net cash generated by operating activities for 2017, as compared to 2016, was mainly as a result of (i) a decrease in net profit in 2017 as compared to 2016, (ii) a decrease in accounts payable in an amount of $3.9 million during 2017 as compared to $0.6 million during 2016, and (iii) an increase in other accounts receivable and prepaid expenses in an amount of $1.1 million during 2017 as compared to a decrease of $1.0 million during 2016. The above mentioned factors were partially offset by (i) a decrease in accounts receivable in an amount of $5.7 million during 2017 as compared to a decrease of $0.2 million during 2016.

Investing Activities. We invest excess cash in marketable securities of varying maturities, depending on our projected cash needs for operations, capital expenditures and other business purposes. During 2018, we purchased $36.2 million of investments in marketable securities and deposits, as compared to $49.8 million during 2017 and $55.5 million during 2016. During the same periods, $20.5 million, $21.5 million and $35.1 million, respectively, of investments in marketable securities matured and were called by the issuer. During the same periods, $5.1 million, $19.2 million and $14.3 million, respectively, of investments in marketable securities were sold. Additionally, during 2018, 2017 and 2016, $5.7 million, $8.3 million and $5.6 million, respectively, of short term deposits matured.

As of December 31, 2018, the amortized cost of our marketable securities and deposits was approximately $112.9 million and their stated market value was approximately $111.3 million, representing an unrealized loss of approximately $1.6 million.

Our capital equipment purchases for 2018, consisting primarily of research and development software tools, computers and other peripheral equipment, engineering test and lab equipment, leasehold improvements, furniture and fixtures, totaled $1.2 million, as compared to $0.8 million for 2017, and $2.1 million for 2016.

Financing Activities. During 2018, we repurchased approximately 1.0 million shares of our common stock at an average purchase price of $12.14 per share for an aggregate amount of $12.3 million. In addition, during 2018, we received $0.7 million upon the exercise of employee stock options.

During 2017, we repurchased approximately 0.4 million shares of our common stock at an average purchase price of $11.54 per share for an aggregate amount of $4.5 million. In addition, during 2017, we received $1.5 million upon the exercise of employee stock options.

Our board of directors has previously approved a number of share repurchase plans, including those in accordance with Rule 10b5-1 of the Securities Exchange Act of 1934, for the repurchase of our common stock.

In August 2018, our board authorized a $10 million buyback program, inclusive of the shares that remained available for repurchase from previously authorized share repurchase plans.

At December 31, 2018, approximately 0.4 million shares of our common stock are available for repurchase under our board authorized share repurchase program.

As of December 31, 2018, we had cash and cash equivalents totaling approximately $12.1 million and marketable securities and time deposits of approximately $111.3 million. Out of total cash, cash equivalents and marketable securities of $123.4 million, $112.5 million was held by foreign entities. Our intent is to permanently reinvest earnings of our foreign operations and our current operating plans do not demonstrate a need to repatriate foreign earnings to fund our U.S. operations. However, if these funds were repatriated to the United States, we would be required to accrue and pay taxes in several countries to repatriate these funds. The determination of the amount of taxes related to the repatriation of these earnings is not practicable, as it may vary based on various factors such as the location of the cash and the effect of regulation in the various jurisdictions from which the cash would be repatriated.

Our working capital at December 31, 2018 was approximately $52.6 million, as compared to $51.1 million as of December 31, 2017. The increase in working capital was mainly due to (i) net cash of $8.7 million generated by operating activities during 2018, and (ii) the replacement of long term marketable securities and deposits with short term marketable securities and deposits. The above mentioned increases were offset to some extent by the repurchase of our common stock in the amount of $12.3 during 2018. We believe that our current cash, cash equivalents, cash deposits and market securities will be sufficient to meet our cash requirements for both the short and long term.

In addition, as part of our business strategy, we may evaluate potential acquisitions of businesses, products and technologies. Accordingly, a portion of our available cash may be used at any time for the acquisition of complementary products or businesses. Such potential transactions may require substantial capital resources, which may require us to seek additional debt or equity financing. We cannot assure you that we will be able to successfully identify suitable acquisition candidates, complete acquisitions, integrate acquired businesses into our current operations, or expand into new markets. Furthermore, we cannot assure you that additional financing will be available to us in any required time frame and on commercially reasonable terms, if at all. See the section of the risk factors entitled "*We may engage in future acquisitions that could dilute our stockholders*' *equity and harm our business, results of operations and financial condition*." for more detailed information.

Contractual Obligations

The following table aggregates our material expected obligations and commitments as of December 31, 2018 (in thousands):

	Payment Due By Period				
Contractual Obligations	**Total**	**Less Than 1 Year**	**2-3 Years**	**4-5 Years**	**More Than 5 Years**
Operating Lease Commitments (1)	$13,232	$1,946	$2,853	$2,300	$6,133
Net Pension Liability (2)	1,336	8	40	36	1,252
Development tools lease and other (3)	3,133	1,922	1,211	-	-
Total Contractual Obligations	$17,701	$3,876	$4,104	$2,336	$7,385

(1) Represents mainly operating lease payments for facilities and vehicles under non-cancelable lease agreements. See Note 13 to notes to our consolidated financial statements for the year ended December 31, 2018.

(2) Includes estimates of gross contributions and future payments required to meet the requirements of several defined benefit plans. The amounts presented in the table are not discounted and do not take into consideration staff turnover assumptions.

(3) Represents lease payments for development tools and other non-cancelable lease agreements.

At December 31, 2018, we had a liability for unrecognized tax benefits and an accrual for the payment of related interests totaling $2 million. Due to uncertainties related to those tax matters, we currently are unable to make a reasonably reliable estimate of when cash settlement with a taxing authority will occur. We believe a change in the amount of unrecognized tax benefit is reasonably possible in the next 12 months due to the examination of the tax returns of one of our subsidiaries. We currently cannot provide an estimate of the range of change in the amount of the unrecognized tax benefits due to the ongoing status of the examination.

Off-Balance Sheet Arrangements.

We do not have any off-balance sheet arrangements, as such term is defined in recently enacted rules by the Securities and Exchange Commission, that have or are reasonably likely to have a current or future effect on our financial

condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources that are material to investors.

Item 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Interest Rate Risk. It is our policy not to enter into interest rate derivative financial instruments, except for hedging of foreign currency exposures discussed below. We do not currently have any significant interest rate risk since we do not have any financial obligations.

The majority of our cash and cash equivalents are invested in high grade certificates of deposits with major U.S., European and Israeli banks. Generally, cash and cash equivalents and short term deposits may be redeemed and therefore minimal credit risk exists with respect to them. Nonetheless, cash deposits with these banks exceed the Federal Deposit Insurance Corporation ("FDIC") insurance limits in the U.S. or similar limits in foreign jurisdictions to the extent such deposits are even insured in such foreign jurisdictions. While we monitor on a systematic basis the cash balances and adjust the balances as appropriate, these balances could be impacted if one or more of the financial institutions with which we deposit our funds fails or is subject to other adverse conditions in the financial or credit markets. To date we have experienced no loss of principal or lack of access to our cash; however, we can provide no assurances that access to our cash will not be affected if the financial institutions that we hold our cash fail or if there is significant instability in the financial and credit markets.

We hold an investment portfolio of marketable securities consisting principally of debentures of U.S. and European corporations, and state and political subdivisions of the U.S. government. We intend, and have the ability, to hold investments in marketable securities with a decline in fair value until an anticipated recovery of any temporary declines in their market value. We typically do not attempt to reduce or eliminate our market exposures on our investment securities because the majority of our investments are short-term. However, we can provide no assurances that we will recover present declines in the market value of our investments.

Interest rate fluctuations relating to our cash and cash equivalents and within our investment portfolio have not had, and we do not currently anticipate such fluctuations will have, a material effect on our financial position on an annual or quarterly basis.

Foreign Currency Exchange Rate Risk. A significant part of our sales and expenses are denominated in U.S. dollars. Part of our expenses in Israel are paid in NIS, which subjects us to the risks of foreign currency fluctuations between the U.S. dollar and the NIS. Our primary expenses paid in NIS are employee salaries and lease payments on our Israeli facilities. Furthermore, a portion of our expenses for our European operations are paid in the Euro, which subjects us to the risks of foreign currency fluctuations between the U.S. dollar and the Euro. Our primary expenses paid in Euro are employee salaries, lease and operational payments on our European facilities. To partially protect the company against an increase in value of forecasted foreign currency cash flows resulting from salary and lease payments denominated in NIS during 2018, we instituted a foreign currency cash flow hedging program. The option and forward contracts used are designated as cash flow hedges, as defined by FASB ASC No. 815," Derivatives and Hedging," and are all effective as hedges of these expenses. For more information about our hedging activity, see Note 2 to our notes to our consolidated financial statements for the year ended December 31, 2018. An increase in the value of the NIS and the Euro in comparison to the U.S. dollar could increase the cost of our research and development expenses and general and administrative expenses, all of which could harm our operating profit. Although we currently are using a hedging program to minimize the effects of currency fluctuations relating to the NIS, our hedging position is partial, may not exist at all in the future and may not succeed in minimizing our foreign currency fluctuation risks.

Item 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

CONSOLIDATED FINANCIAL STATEMENTS

AS OF DECEMBER 31, 2018

IN U.S. DOLLARS

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of DSP GROUP, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of DSP GROUP, Inc. and its subsidiaries (the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income (loss), change in stockholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Company at December 31, 2018 and 2017, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated March 11, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB. We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or

fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Kost Forer Gabbay & Kasierer, a Member of Ernst & Young Global

Tel-Aviv, Israel
March 11, 2019
We have served as the Company's auditor since 1998.

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders of DSP GROUP, Inc.

Opinion on Internal Control over Financial Reporting

We have audited DSP GROUP, Inc.`s (the "Company") internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, and the related consolidated statements of income (loss), changes in stockholders' equity and cash flows for each of the three years in the period ended December 31, 2018 and the related notes, and our report dated March 11, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was

maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures, as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Kost Forer Gabbay & Kasierer, a Member of Ernst & Young Global

Tel-Aviv, Israel
March 11, 2018

DSP GROUP, INC.

CONSOLIDATED BALANCE SHEETS

U.S. dollars in thousands

	December 31,	
	2018	**2017**
ASSETS		
CURRENT ASSETS:		
Cash and cash equivalents	$12,146	$21,324
Restricted deposits	493	524
Marketable securities and short-term deposits (Note 3)	35,713	24,697
Trade receivables	13,475	13,416
Other accounts receivable and prepaid expenses (Note 4)	3,670	3,167
Inventories (Note 5)	9,819	9,422
Total current assets	75,316	72,550
PROPERTY AND EQUIPMENT, NET (Note 6)	2,748	3,184
NON-CURRENT ASSETS:		
Long-term marketable securities and long-term deposits (Note 3)	75,538	82,669
Long-term prepaid expenses and lease deposits	1,229	1,541
Deferred income taxes (Note 14)	3,580	1,043
Severance pay fund	14,158	15,190
Intangible assets, net (Note 7)	1,078	2,779
Goodwill	6,243	6,243
Total non-current assets	101,826	109,465
Total assets	$179,890	$185,199

The accompanying notes are an integral part of the consolidated financial statements.

DSP GROUP, INC.

CONSOLIDATED BALANCE SHEETS

U.S. dollars in thousands, except share and per share data

	December 31,	
	2018	**2017**
LIABILITIES AND STOCKHOLDERS' EQUITY		
CURRENT LIABILITIES:		
Trade payables	$9,579	$8,660
Accrued compensation and benefits	8,255	8,699
Income tax accruals and payables	1,404	1,232
Accrued expenses and other accounts payable (Note 9)	3,461	2,888
Total current liabilities	22,699	21,479
NON-CURRENT LIABILITIES:		
Deferred income taxes, net (Note 14)	151	424
Accrued severance pay	14,348	15,463
Accrued pensions (Note 10)	827	883
Total non-current liabilities	15,326	16,770
COMMITMENTS AND CONTINGENCIES (Note 13)		
STOCKHOLDERS' EQUITY (Note 12):		
Capital stock:		
Common stock, $0.001 par value -		
Authorized: 50,000,000 shares at December 31, 2018 and 2017; Issued and outstanding: 22,265,971 and 22,432,660 shares at December 31, 2018 and 2017, respectively	22	22
Additional paid-in capital	378,855	372,041
Treasury stock at cost	(122,325)	(118,397)
Accumulated other comprehensive loss	(2,324)	(1,874)
Accumulated deficit	(112,363)	(104,842)
Total stockholders' equity	141,865	146,950
Total liabilities and stockholders' equity	$179,890	$185,199

The accompanying notes are an integral part of the consolidated financial statements.

DSP GROUP, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

U.S. dollars and shares in thousands, except per share data

	Year ended December 31,		
	2018	**2017**	**2016**
Revenues	$117,438	$124,753	$137,869
Costs of revenues (1)	59,991	67,058	77,023
Gross profit	57,447	57,695	60,846
Operating expenses:			
Research and development, net (2)	36,109	36,655	34,885
Sales and marketing (3)	15,323	14,315	13,867
General and administrative (4)	9,955	9,789	9,006
Amortization of intangible assets	1,700	1,700	1,457
Other income (Note 10)	-	-	(2,549)
Total operating expenses	63,087	62,459	56,666
Operating income (loss)	(5,640)	(4,764)	4,180
Financial income, net (Note 11)	1,815	1,669	1,227
Income (loss) before income tax benefit (expense)	(3,825)	(3,095)	5,407
Income tax benefit (expense)	1,868	92	(594)
Net income (loss)	$(1,957)	$(3,003)	$4,813
Net earnings (loss) per share:			
Basic	$(0.09)	$(0.14)	$0.22
Diluted	$(0.09)	$(0.14)	$0.21
Weighted average number of shares used in per share computations of:			
Basic net earnings (loss) per share	22,512	22,229	21,800
Diluted net earnings (loss) per share	22,512	22,229	22,887

(1) Includes equity-based compensation expense in the amount of $428, $352 and $328 for the years ended December 31, 2018, 2017 and 2016, respectively.

(2) Includes equity-based compensation expense in the amount of $2,873, $2,349 and $2,205 for the years ended December 31, 2018, 2017 and 2016, respectively.

(3) Includes equity-based compensation expense in the amount of $1,248, $1,115 and $806 for the years ended December 31, 2018, 2017 and 2016, respectively.

(4) Includes equity-based compensation expense in the amount of $2,255, $2,045 and $1,749 for the years ended December 31, 2018, 2017 and 2016, respectively.

The accompanying notes are an integral part of the consolidated financial statements.

DSP GROUP, INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

U.S. dollars in thousands

	Year ended December 31,		
	2018	**2017**	**2016**
Net income (loss):	$(1,957)	$(3,003)	$4,813
Other comprehensive income (loss):			
Available-for-sale securities:			
Changes in unrealized losses	(465)	(158)	(617)
Reclassification adjustments for losses included in net income (loss)	41	50	17
Net change	(424)	(108)	(600)
Cash flow hedges:			
Changes in unrealized gains (losses)	(19)	163	45
Reclassification adjustments for (gains) losses (gains) included in net income (loss)	16	(172)	(1)
Net change	(3)	(9)	44
Change in unrealized components of defined benefit plans:			
Gains (losses) arising during the period	29	24	(117)
Amortization of actuarial loss and prior service benefit	19	22	14
Net change	48	46	(103)
Foreign currency translation adjustments, net	(71)	49	74
Other comprehensive loss	(450)	(22)	(585)
Comprehensive income (loss)	$(2,407)	$(3,027)	$4,228

DSP GROUP, INC.

STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY

U.S. dollars and shares in thousands

	Number of shares of common stock	Common stock amount	Additional paid-in capital	Treasury stock at cost	Accumulated other comprehensive income (loss)	Accumulated deficit	Total stockholders' equity
Balance at December 31, 2015	21,573	$ 22	$ 361,023	$ (125,697)	$ (1,267)	$ (90,763)	$ 143,318
Issuance of treasury stock upon purchase of common stock under employee stock purchase plan	233	*) -	-	2,270	-	(492)	1,778
Issuance of treasury stock upon exercise of stock options, stock appreciation rights and restricted stock units by employees and directors	1,176	1	10	11,461	-	(9,670)	1,802
Purchase of treasury stock	(1,051)	(1)	-	(10,666)	-	-	(10,667)
Equity-based compensation expenses		-	5,088	-	-	-	5,088
Net income		-	-	-	-	4,813	4,813
Change in accumulated other comprehensive income		-	-	-	(585)	-	(585)
Balance at December 31, 2016	21,931	$ 22	$ 366,121	$ (122,632)	$ (1,852)	$ (96,112)	$ 145,547

*) Represents an amount lower than $1.

The accompanying notes are an integral part of the consolidated financial statements.

DSP GROUP, INC.

STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY

U.S. dollars and shares in thousands

	Number of shares of common stock	**Common stock amount**	**Additional paid-in capital**	**Treasury stock at cost**	**Accumulated other comprehensive income (loss)**	**Accumulated deficit**	**Total stockholders' equity**
Cont.							
Balance at December 31, 2016	21,931	$ 22	$ 366,121	$ (122,632)	$ (1,852)	$ (96,112)	$ 145,547
Issuance of treasury stock upon purchase of common stock under employee stock purchase plan	227	*) -	-	2,225	-	(330)	1,895
Issuance of treasury stock upon exercise of stock options, stock appreciation rights and restricted stock units by employees and directors	663	*) -	59	6,500	-	(5,397)	1,162
Purchase of treasury stock	(389)	*) -	-	(4,490)	-	-	(4,490)
Equity-based compensation expenses		-	5,861	-	-	-	5,861
Net loss		-	-	-	-	(3,003)	(3,003)
Change in accumulated other comprehensive income		-	-	-	(22)	-	(22)
Balance at December 31, 2017	22,433	$ 22	$ 372,041	$ (118,397)	$ (1,874)	$ (104,842)	$ 146,950
Issuance of treasury stock upon purchase of common stock under employee stock purchase plan	230	*) -	-	2,275	-	(271)	2,004
Issuance of treasury stock upon exercise of stock options, stock appreciation rights and restricted stock units by	618	1	10	6,114	-	(5,387)	738

employees and directors							
Adoption of accounting standard	-	-	-	-	-	94	94
Purchase of treasury stock	(1,015)	(1)	-	(12,317)	-	-	(12,318)
Equity-based compensation expenses		-	6,804	-	-	-	6,804
Net income (loss)		-	-	-	-	(1,957)	(1,957)
Change in accumulated other comprehensive income		-	-	-	(450)	-	(450)
Balance at December 31, 2018	22,266	$ 22	$ 378,855	$ (122,325)	$ (2,324)	$ (112,363)	$ 141,865

*) Represents an amount lower than $1.

The accompanying notes are an integral part of the consolidated financial statements.

U.S. dollars in thousands, except share and per share data.

CONSOLIDATED STATEMENTS OF CASH FLOWS

U.S. dollars in thousands

	Year ended December 31,		
	2018	2017	2016
Cash flows from operating activities:			
Net income (loss)	$(1,957)	$(3,003)	$4,813
Adjustments required to reconcile net income to net cash provided by operating activities:			
Depreciation	1,593	1,781	1,704
Equity-based compensation expenses related to employees' stock options, SARs and RSUs	6,804	5,861	5,088
Capital loss from sale and disposal of property and equipment	-	19	10
Realized losses from sale of marketable securities, net	41	50	17
Amortization of intangible assets	1,700	1,700	1,457
Accrued interest and amortization of premium on marketable securities and short-term deposits	601	372	610
Change in operating assets and liabilities:			
Deferred income tax assets and liabilities, net	(2,814)	(459)	320
Trade receivables, net	(107)	5,728	168
Other accounts receivable and prepaid expenses	(76)	(1,142)	953
Inventories	(431)	363	1,702
Long-term prepaid expenses and lease deposits	(159)	(212)	(166)
Trade payables	927	(3,893)	(575)
Accrued compensation and benefits	1,598	1,878	2,566
Income tax accruals	180	39	(724)
Accrued expenses and other accounts payable	767	(704)	(1,379)
Accrued severance pay, net	(8)	117	(91)
Accrued pensions	32	18	42
Net cash provided by operating activities	8,691	8,513	16,515
Cash flows from investing activities:			
Purchase of marketable securities	(27,564)	(38,924)	(47,934)
Purchase of short-term deposits	(8,668)	(10,884)	(7,601)
Proceeds from maturity of marketable securities	20,501	21,499	35,090
Proceeds from sales of marketable securities	5,113	19,226	14,277
Proceeds from redemption of short-term deposits	5,668	8,309	5,601

Purchases of property and equipment	(1,181)	(838)	(2,103)
Other investing activities	(104)	-	-
Acquisition of initially consolidated subsidiary (1)	-	-	(494)
Proceeds from sale of fixed assets	-	-	9
Net cash used in investing activities	$(6,235)	$(1,612)	$(3,155)

The accompanying notes are an integral part of the consolidated financial statements.

U.S. dollars in thousands, except share and per share data.

CONSOLIDATED STATEMENTS OF CASH FLOWS

U.S. dollars in thousands

	Year ended December 31,		
	2018	**2017**	**2016**
Cash flows from financing activities:			
Issuance of common stock and treasury stock upon exercise of stock options	$738	$1,509	$1,457
Repayment of short-term loan	-	-	(168)
Purchase of treasury stock	(12,343)	(4,465)	(10,727)
Net cash used in financing activities	(11,605)	(2,956)	(9,438)
Increase (decrease) in cash and cash equivalents and restricted cash	(9,149)	3,945	3,922
Cash and cash equivalents and restricted cash at the beginning of the year	21,848	17,822	13,872
Cash (erosion) due to exchange rate differences	(60)	81	28
Cash and cash equivalents and restricted cash at the end of the year	$12,639	$21,848	$17,822
Supplemental disclosures of cash flows activities:			
Cash paid during the year for:			
Taxes on income	$902	$219	$1,018

(1) During the third quarter of 2016, the Company acquired the remaining 86% of the equity of a private company in Asia that it previously invested in, bringing its holding in such company to 100%. The net fair value of the assets acquired and the liabilities assumed, on the date of acquisition, was as follows:

Working capital, excluding cash and cash equivalents	$(386)
Property and equipment	4
Distribution agreement	2,086
Deferred tax liability	(377)
Goodwill	967
	2,294

The acquisition date fair value of the Company's previously held equity interest in the private company in Asia	(1,800)
	$494

The accompanying notes are an integral part of the consolidated financial statements.

U.S. dollars in thousands, except share and per share data.

NOTE 1:- GENERAL

DSP Group, Inc., a Delaware corporation, and its subsidiaries (collectively, the “Company”), are a fabless semiconductor company offering advanced chipset solutions for a variety of applications. The Company is a worldwide leader in the short-range wireless communication market, enabling home networking convergence for voice, audio, video and data.

The Company sells its products through distributors and directly to OEMs and original design manufacturers (ODMs) that incorporate the Company’s products into consumer and enterprise products. The Company expects that a limited number of customers, varying in identity from period-to-period, will account for a substantial portion of its revenues in any period. The loss of, or reduced demand for products from, any of the Company’s major customers could have a material adverse effect on the Company’s business, financial condition and results of operations.

The following table represents the Company’s sales, as a percentage of the Company’s total revenues, for the years ended December 31, 2018, 2017 and 2016:

	Year ended December 31,		
Major Customers/ Distributors	**2018**	**2017**	**2016**
VTech Holdings Ltd.	24%	27%	29%
Nexty Electronics Ltd. (“Nexty Electronics”) [1] [2]	11%	12%	12%
Ascend Technology Inc. (“Ascend Technology”) [1] [3]	26%	23%	16%
Samsung Electronics Ltd.	*	*	12%

*Less than 10%.

[1] Distributor

[2] Nexty Electronics sells the Company’s products to a limited number of customers. One customer, Panasonic Communications Co., Ltd. (“Panasonic”) has continually accounted for a majority of the sales of Nexty Electronics. Sales to Panasonic through Nexty Electronics generated approximately 9%, 10% and 10% of the Company’s total

revenues for 2018, 2017 and 2016, respectively.

[3] Ascend Technology sells the Company’s products to a limited number of customers; however none of those customers accounted for more than 10% of the Company’s total revenues for 2018, 2017 and 2016.

All of the Company’s integrated circuit products are manufactured and tested by independent foundries and test houses. While these foundries and test houses have been able to adequately meet the demands of the Company’s business, the Company is and will continue to be dependent upon these foundries and test houses to achieve acceptable manufacturing yields, quality levels and costs, and to allocate to the Company a sufficient portion of foundry and test capacity to meet the Company’s needs in a timely manner. Revenues could be materially and adversely affected should any of these foundries and test houses fail to meet the Company’s request for product manufacturing due to a shortage of production capacity, process difficulties, low yield rates or financial instability. Additionally, certain of the raw materials, components, and subassemblies included in the products manufactured by the Company’s original equipment manufacturer (OEM) customers, which incorporate the Company’s products, are obtained from a limited group of suppliers. Disruptions, shortages, or termination of certain of these sources of supply could occur and could negatively affect the Company’s financial condition and results of operations.

U.S. dollars in thousands, except share and per share data.

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES

The consolidated financial statements are prepared according to United States generally accepted accounting principles ("U.S. GAAP").

a. Use of estimates:

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates, judgments and assumptions. The Company's management believes that the estimates, judgments and assumptions used are reasonable based upon information available at the time that these estimates, judgments and assumptions are made. These estimates, judgments and assumptions can affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the dates of the financial statements, and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

b. Financial statements in U.S. dollars:

Most of the Company's revenues are generated in U.S. dollars. In addition, a substantial portion of the Company's costs are incurred in U.S. dollars. The Company's management believes that the U.S. dollar is the currency of the primary economic environment in which the Company operates. Thus, the functional and reporting currency of the Company is the U.S. dollar.

Monetary accounts maintained in currencies other than the U.S. dollar are remeasured into dollars in accordance with ASC No. 830-30, "Translation of Financial Statements." All transaction gains and losses resulting from the remeasurement of monetary balance sheet items are reflected in the consolidated statements of operations as financial income or expenses as appropriate.

The financial statements of the Company's subsidiary – DSP Group Technologies GmbH whose functional currency is in Euro, has been translated into dollars. All amounts on the balance sheets have been translated into the dollar using the exchange rates in effect on the relevant balance sheet dates. All amounts in the consolidated statements of operations have been translated into the dollar using the average exchange rate for the relevant periods. The resulting translation adjustments are reported as a component of accumulated other comprehensive income (loss) in changes in stockholders' equity.

Accumulated other comprehensive loss related to foreign currency translation adjustments, net amounted to $327 and $256 as of December 31, 2018 and 2017, respectively.

c. Principles of consolidation:

The consolidated financial statements include the accounts of the Company. Intercompany transactions and balances have been eliminated in consolidation.

U.S. dollars in thousands, except share and per share data.

d. Cash equivalents:

Cash equivalents are short-term highly liquid investments, which are readily convertible to cash with original maturity of three months or less from the date of acquisition.

e. Restricted deposits:

Restricted deposits include deposits which are used as security for lease agreements.

f. Short-term deposits:

Bank deposits with original maturities of more than three months and less than one year are presented at cost, including accrued interest.

g. Marketable securities:

The Company accounts for investments in debt securities in accordance with Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC”) No. 320-10, “Investments in Debt and Equity Securities.” Management determines the appropriate classification of the Company’s investments in debt securities at the time of purchase and reevaluates such determinations at each balance sheet date.

The Company classified all of its investments in marketable securities as available for sale.

Available-for-sale securities are carried at fair value, with the unrealized gains and losses, reported in accumulated other comprehensive income (loss) using the specific identification method. The amortized cost of marketable securities is adjusted for amortization of premiums and accretion of discounts to maturity. Such amortization is included in financial income, net. Interest and dividends on securities are included in financial income, net. The Company classifies its marketable debt securities as either short-term or long-term based on each instrument’s underlying contractual maturity date and the entity’s expectations of sales and redemptions in the following year.

The marketable securities are periodically reviewed for impairment. If management concludes that any of these investments are impaired, management determines whether such impairment is other-than-temporary. Factors considered in making such a determination include the duration and severity of the impairment, the reason for the decline in value and the potential recovery period, and the Company's intent to sell, or whether it is more likely than not that the Company will be required to sell the investment before recovery of cost basis. For debt securities, only the decline attributable to deteriorating credit of an-other-than-temporary impairment is recorded in the consolidated statement of operations, unless the Company intends, or more likely than not it will be forced, to sell the security. During the years ended December 31, 2018, 2017 and 2016, the Company did not record an-other-than-temporary impairment loss (see Note 3).

h. Fair value of financial instruments:

Cash and cash equivalents, restricted deposits, short-term deposits, trade receivables, trade payables and accrued liabilities approximate fair value due to short-term maturities of these instruments. Marketable securities and derivative instruments are carried at fair value. See Note 3 for more information.

U.S. dollars in thousands, except share and per share data.

The Company accounts for certain assets and liabilities at fair value under ASC 820, "Fair Value Measurements and Disclosures." Fair value is an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or a liability.

The hierarchy below lists three levels of fair value based on the extent to which inputs used in measuring fair value are observable in the market. The Company categorizes each of its fair value measurements in one of these three levels based on the lowest level input that is significant to the fair value measurement in its entirety.

Level 1- Observable inputs that reflect quoted prices (unadjusted) for identical assets or liabilities in active markets.

Level 2- Include other inputs that are directly or indirectly observable in the marketplace.

Level 3- Unobservable inputs which are supported by little or no market activity.

The fair value hierarchy also requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value.

i. Inventories:

Inventories are stated at the lower of cost and net realizable value. Inventory reserves are provided to cover risks arising from slow-moving items or technological obsolescence.

The Company and its subsidiaries periodically evaluate the quantities on hand relative to historical, current and projected sales volume. Based on this evaluation, an impairment charge is recorded when required to write-down inventory to its market value.

Cost is determined as follows:

Work in progress and finished products- on the basis of raw materials and manufacturing costs on an average basis.

The Company regularly evaluates the ability to realize the value of inventory based on a combination of factors, including the following: historical usage rates and forecasted sales according to outstanding backlogs. Purchasing requirements and alternative usage are explored within these processes to mitigate inventory exposure. When recorded, the reserves are intended to reduce the carrying value of inventory to its net realizable value. Inventory of $9,819, $9,422 and $9,748 as of December 31, 2018, 2017 and 2016, respectively, is stated net of inventory reserves of $508, $468 and $571 in each year, respectively. If actual demand for the Company’s products deteriorates, or market conditions are less favorable than those projected, additional inventory reserves may be required.

U.S. dollars in thousands, except share and per share data.

j. Property and equipment, net:

Property and equipment are stated at cost, net of accumulated depreciation. Depreciation is calculated using the straight-line method over the estimated useful lives of the assets, at the following annual rates:

	%	Mainly %
Computers and equipment	20 - 33	33
Office furniture and equipment	7 - 15	15
Leasehold improvements	see below	

Leasehold improvements are depreciated on a straight-line basis over the shorter of the lease term (including the extension option held by the Company and intended to be exercised) and the expected life of the improvement.

Property and equipment of the Company are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. The recoverability of assets to be held and used is measured by a comparison of the carrying amount of such assets to the future undiscounted cash flows expected to be generated by the assets. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the fair value of the assets.

During the years ended December 31, 2018, 2017 and 2016, no impairment losses were identified for property and equipment.

The Company accounts for costs of computer software developed or obtained for internal use in accordance with FASB ASC No. 350-40, “The Internal Use Software.” FASB ASC 350-40 requires the capitalization of certain costs incurred in connection with developing or obtaining internal use software. During 2018, 2017 and 2016, the Company did not capitalize internal use software.

k. Goodwill and other intangible assets:

The goodwill and certain other purchased intangible assets have been recorded as a result of the BoneTone acquisition and the acquisition of a private company in Asia. Goodwill represents the excess of the purchase price in a business combination over the fair value of net tangible and intangible assets acquired. Goodwill is not amortized, but rather is subject to an annual impairment test.

ASC 350 prescribes a two-phase process for impairment testing of goodwill. The first phase screens for impairment, while the second phase (if necessary) measures impairment. Goodwill impairment is deemed to exist if the net book value of a reporting unit exceeds its estimated fair value. In such a case, the second phase is then performed, and the Company measures impairment by comparing the carrying amount of the reporting unit's goodwill to the implied fair value of that goodwill. An impairment loss is recognized in an amount equal to the excess. ASC 350 allows an entity to first assess qualitative factors to determine whether it is necessary to perform the two-step quantitative goodwill impairment test. An entity is not required to calculate the fair value of a reporting unit unless the entity determines, based on a qualitative assessment, that it is more likely than not that its fair value is less than its carrying amount.

U.S. dollars in thousands, except share and per share data.

Alternatively, ASC 350 permits an entity to bypass the qualitative assessment for any reporting unit and proceed directly to performing the first step of the goodwill impairment test.

The Company performs an annual impairment test on December 31 of each fiscal year, or more frequently if impairment indicators are present.

The Company's reporting units are consistent with the reportable segments identified in Note 16.

Fair value is determined using discounted cash flows, market multiples and market capitalization. Significant estimates used in the methodologies include estimates of future cash-flows, future short-term and long-term growth rates, weighted average cost of capital and market multiples for the reporting unit.

For the fiscal year ended December 31, 2018, 2017 and 2016, the Company performed a quantitative assessment on its goodwill and no impairment losses were identified.

Intangible assets that are not considered to have an indefinite useful life are amortized using the straight-line basis over their estimated useful lives, which range from 5 to 6 years. The carrying amount of these assets is reviewed whenever events or changes in circumstances indicate that the carrying value of an asset may not be recoverable. Recoverability of these assets is measured by comparison of the carrying amount of the asset to the future undiscounted cash flows the asset is expected to generate.

If such asset is considered to be impaired, the impairment to be recognized is measured as the difference between the carrying amount of the assets and the fair value of the impaired asset.

During the fiscal year ended December 31, 2018, 2017 and 2016, no impairment losses were identified.

l. Severance pay:

DSP Group Ltd., the Company's Israeli subsidiary ("DSP Israel"), has a liability for severance pay pursuant to Israeli law, based on the most recent monthly salary of its employees multiplied by the number of years of employment as of the balance sheet date for such employees. DSP Israel's liability is fully provided for by monthly accrual and deposits with severance pay funds and insurance policies.

The deposited funds include profits accumulated up to the balance sheet date. The deposited funds may be withdrawn only upon the fulfillment of the obligation pursuant to Israel's Severance Pay Law or labor agreements.

The Company's Korean subsidiary has a statutory liability for severance pay pursuant to Korean law based on the most recent monthly salary of its employees multiplied by the number of years of employment of such employees as of the balance sheet date for such employees. The Korean subsidiary's liability is fully accrued.

U.S. dollars in thousands, except share and per share data.

Severance expenses for the years ended December 31, 2018, 2017 and 2016, were $1,679, $1,666 and $1,582, respectively.

m. Revenue recognition:

The Company generates its revenues from sales of products. The Company sells its products through a direct sales force and through a network of distributors.

The Company adopted Accounting Standards Codification 606, Revenue from Contracts with Customers (ASC 606), effective on January 1, 2018, using the modified retrospective method. As a result of this adoption, the Company revised its accounting policy for revenue recognition as detailed below.

The Company recognizes revenue under the core principle that transfer of control to the Company's customers should be depicted in an amount reflecting the consideration the Company expects to receive in revenue. In order to achieve that core principle, the Company applies the following five-step approach: (1) identify the contract with a customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract, and (5) recognize revenue when a performance obligation is satisfied.

1. Identify the contract with a customer

A contract is an agreement between two or more parties that creates enforceable rights and obligations. In evaluating the contract, the Company analyzes the customer's intent and ability to pay the amount of promised consideration (credit risk) and considers the probability of collecting substantially all of the consideration. The Company determines whether collectability is reasonably assured on a customer-by-customer basis pursuant to its credit review policy. The Company typically sells to customers with whom it has a long-term business relationship and a history of successful collection. A significant number of the Company's customers are also large original equipment manufacturers with substantial financial resources. For a new customer, or when an existing customer substantially expands its commitments, the Company evaluates the customer's financial position, the number of years the customer has been in business, the history of collection with the customer and the customer's ability to pay and typically assigns a credit limit based on that review. The Company increases the credit limit only after it has established a successful collection history with the customer. If the Company determines at any time that collectability is not reasonably assured under a particular arrangement based upon its credit review process, the customer's payment history or information that comes to light about a customer's financial position, it recognizes revenue under that arrangement as customer payments are

actually received.

2. Identify the performance obligations in the contract

At a contract's inception, the Company assesses the goods or services promised in a contract with a customer and identifies the performance obligations.

The Company's contracts with customers for the sale of products generally include one performance obligation.

3. Determine the transaction price

The transaction price is the amount of consideration to which the Company is entitled in exchange for transferring goods to a customer. Generally, the Company does not provide any variable consideration, including price protection, stock rotation, and/or right of return.

4. Allocate the transaction price to the performance obligations in the contract

The Company allocates the transaction price to one performance obligation.

5. Recognize revenue when a performance obligation is satisfied

Revenue is recognized at a point in time when or as performance obligation is satisfied by transferring control of a promised good to a customer. Generally, control of an asset is transferred to the customer on delivery of the products.

Under ASC 606, certain product sales through the Company's distributors where revenue was previously deferred until the distributors resold the Company's products to the end customers are now recognized when products are delivered to the distributor and control of the promised goods are transferred, in an amount that reflects the consideration that the company expects to receive in exchange for those goods or services.

U.S. dollars in thousands, except share and per share data.

In accordance with the ASC 606 requirements, the disclosure of the impact of adoption of ASC 606 on the Company's consolidated income statement and balance sheet was as follows (in thousands):

	For the year ended December 31, 2018		
	As Reported	Prior to Adoption of ASC 606	Effect of Change Higher/(Lower)
Income statement			
Revenues	$117,438	$117,127	$ 311
Cost of revenues	59,991	59,884	107
Gross margin:	57,447	57,243	204
Operating expenses:			
Research and development, net	36,109	36,109	-
Sales and marketing	15,323	15,307	16
General and administrative	9,955	9,955	-
Intangible assets amortization	1,700	1,700	-
Total operating expenses:	63,087	63,071	16
Operating loss:	(5,640)	(5,828)	188
Financial income	1,815	1,815	-
Loss before taxes on income	(3,825)	(4,013)	188
Taxes on income	1,868	1,868	-
Net income (loss)	$(1,957)	$(2,145)	$ 188

	December 31, 2018		
	As Reported	Prior to Adoption of ASC 606	Effect of Change Higher/(Lower)
Balance Sheet			
Assets			
Trade receivables	$13,475	$13,048	$ 427
Inventories	9,819	9,943	(124)
Other accounts receivable and prepaid expenses	3,670	3,691	(21)

Liabilities

Accrued expenses and other accounts payable	(3,461)	(3,461)	-
Equity			
Accumulated deficit	(112,363)	(112,645)	282

n. Warranty:

The Company warrants its products against errors, defects and bugs for generally one year. The Company estimates the costs that may be incurred under its warranty and records a liability in the amount of such costs. The Company periodically assesses the adequacy of its recorded warranty liabilities and adjusts the amounts as necessary. Warranty costs and liability were immaterial for the years ended December 31, 2018, 2017 and 2016.

o. Research and development costs, net:

Research and development costs, net of grants received, are charged to the consolidated statement of operations as incurred.

p. Government grants:

Government grants received by the Company's Israeli subsidiary relating to categories of operating expenditures are credited to the consolidated statements of income during the period in which the expenditure to which they relate is charged. Royalty and non royalty bearing grants from the Israeli Innovation Authority ("IIA") (formerly known as Office of the Chief Scientist) for funding certain approved research and development projects are recognized at the time when the Company's Israeli subsidiary is entitled to such grants, on the basis of the related costs incurred, and are included as a deduction from research and development expenses, net.

The Company recorded grants in the amount of $1,678, $1,528 and $2,687 for the year ended December 31, 2018 and 2017 and 2016, respectively. The vast majority of those grants were bearing royalties.

U.S. dollars in thousands, except share and per share data.

The Company's Israeli subsidiary is obligated to pay royalties amounting to 5% of the sales of certain products the development of which received grants from the IIA in previous years. The obligation to pay these royalties is contingent on actual sales of such products. Grants received from the IIA may become repayable if certain criteria under the grants are not met. The Israeli Research and Development Law provides that know-how developed under an approved research and development program may not be transferred to third parties without the approval of the IIA. Such approval is not required for the sale or export of any products resulting from such research or development. The IIA, under special circumstances, may approve the transfer of IIA-funded know-how outside Israel, in the following cases: (a) the grant recipient pays to the IIA a portion of the sale price paid in consideration for such IIA-funded know-how or in consideration for the sale of the grant recipient itself, as the case may be, which portion will not exceed six times the amount of the grants received plus interest (or three times the amount of the grant received plus interest, in the event that the recipient of the know-how has committed to retain the research and development activities of the grant recipient in Israel after the transfer); (b) the grant recipient receives know-how from a third party in exchange for its IIA-funded know-how; (c) such transfer of IIA-funded know-how arises in connection with certain types of cooperation in research and development activities; or (d) if such transfer of know-how arises in connection with a liquidation by reason of insolvency or receivership of the grant recipient.

q. Equity-based compensation:

At December 31, 2018, the Company had two equity incentive plans from which the Company may grant future equity awards and two expired equity incentive plans from which no future equity awards may be granted but had outstanding equity awards granted prior to expiration. The Company also had one employee stock purchase plan. See full description in Note 12.

The Company accounts for equity-based compensation in accordance with FASB ASC No. 718, "Stock Compensation" ("FASB ASC No. 718"). FASB ASC No. 718 requires companies to estimate the fair value of equity-based awards on the date of grant using an option-pricing model. The value of the portion of the award that is ultimately expected to vest is recognized as an expense over the requisite service periods in the Company's consolidated statements of operations.

The Company recognizes compensation expenses for the value of its awards granted based on the accelerated attribution method, rather than a straight-line method over the requisite service period of each of the awards, net of estimated forfeitures. FASB ASC No. 718 requires forfeitures to be estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. Estimated forfeitures are based on actual historical pre-vesting forfeitures.

The Company selected the lattice option pricing model as the most appropriate fair value method for its equity-based awards and values options and stock appreciation rights (SARs) based on the market value of the underlying shares on the date of grant. The option-pricing model requires a number of assumptions, of which the most significant are the expected stock price volatility and the expected term of the equity-based award. Expected volatility is calculated based upon actual historical stock price movements. The expected term of the equity-based award granted is based upon historical experience and represents the period of time that the award granted is expected to be outstanding. The risk-free interest rate is based on the yield from U.S. treasury bonds with an equivalent term. The Company has historically not paid dividends and has no foreseeable plans to pay dividends.

With respect to the Company's employee stock purchase plan, the Company selected the Monte Carlo pricing model as the most appropriate fair value method.

A majority of the Company's equity awards until 2012 were in the form of stock appreciation rights (SARs). Starting in 2013, a majority of the Company's equity awards were in the form of restricted stock unit ("RSU") grants.

U.S. dollars in thousands, except share and per share data.

The fair value of each restricted stock unit ("RSU") is based on the market value of the underlying share on the date of grant.

r. Basic and diluted income (loss) per share:

Basic net income (loss) per share is computed based on the weighted average number of shares of common stock outstanding during the year. Diluted net income (loss) per share further includes the dilutive effect of stock options, SARs and RSUs outstanding during the year, all in accordance with FASB ASC No. 260, "Earnings Per Share."

The total weighted average number of shares related to the outstanding stock options, SARs and RSUs excluded from the calculation of diluted net income per share due to their anti-dilutive effect was 1,317,197, 1,378,282 and 334,833 for the years ended December 31, 2018, 2017 and 2016, respectively.

s. Income taxes:

The Company accounts for income taxes in accordance with FASB ASC No. 740, "Income Taxes." This topic prescribes the use of the liability method, whereby deferred tax asset and liability account balances are determined based on differences between financial reporting and tax bases of assets and liabilities and are measured using the enacted tax rates that will be in effect when the differences are expected to reverse. The Company provides a valuation allowance, if necessary, to reduce deferred tax assets to their estimated realizable value.

Deferred tax liabilities and assets are classified as non-current based on the adopting of Accounting Standards Update ("ASU") 2015-17, "Balance Sheet Classification of Deferred Taxes." Prior to the adoption of ASU 2015-17, U.S. GAAP required an entity to separate deferred income tax liabilities and assets into current and noncurrent amounts in a classified statement of financial position. ASU 2015-17 was issued to simplify the presentation of deferred income taxes. Deferred tax liabilities and assets are now classified as noncurrent in a classified statement of financial position for all period presented.

The Company accounts for uncertain tax positions in accordance with ASC 740, which contains a two-step approach to recognizing and measuring uncertain tax positions. The first step is to evaluate the tax position taken or expected to be taken in a tax return by determining whether the weight of available evidence indicates that it is more likely than not that, on an evaluation of the technical merits, the tax position will be sustained on audit, including resolution of

any related appeals or litigation processes. The second step is to measure the tax benefit as the largest amount that is more than 50% likely to be realized upon ultimate settlement. The Company reevaluates its income tax positions periodically to consider factors such as changes in facts or circumstances, changes in or interpretations of tax law, effectively settled issues under audit, and new audit activity. Such a change in recognition or measurement would result in recognition of a tax benefit or an additional charge to the tax provision.

The Company includes interest related to tax issues as part of income tax expense in its consolidated financial statements. The Company records any applicable penalties related to tax issues within the income tax provision.

U.S. dollars in thousands, except share and per share data.

t. Concentrations of credit risk:

Financial instruments that potentially subject the Company to concentrations of credit risk consist principally of cash and cash equivalents, restricted deposits, short-term deposits, trade receivables and marketable securities.

The majority of cash and cash equivalents and short-term deposits of the Company are invested in dollar deposits with major U.S., European and Israeli banks. Deposits in U.S. banks may be in excess of insured limits and are not insured in other jurisdictions. Generally, cash and cash equivalents and these deposits may be withdrawn upon demand and therefore bear low risk.

The Company's marketable securities consist of investment-grade corporate bonds and U.S. government-sponsored enterprise ("GSE") securities. As of December 31, 2018, the amortized cost of the Company's marketable securities was $99,406, and their stated market value was $97,772, representing an unrealized net loss of $1,634.

A significant portion of the products of the Company is sold to original equipment manufacturers of consumer electronics products. The customers of the Company are located primarily in Japan, Hong Kong, Taiwan, China, Korea, Europe and the United States. The Company performs ongoing credit evaluations of their customers. A specific allowance for doubtful accounts is determined, based on management's estimates and historical experience. Under certain circumstances, the Company may require a letter of credit. The Company covers most of its trade receivables through credit insurance. As of December 31, 2018 and 2017, no allowance for doubtful accounts was provided.

The Company has no off-balance-sheet concentration of credit risk, except for certain derivative instruments as mentioned below.

u. Derivative instruments:

The Company accounts for derivatives and hedging based on FASB ASC No.815, "Derivatives and Hedging". ASC No. 815 requires companies to recognize all of their derivative instruments as either assets or liabilities on the balance sheet at fair value.

For derivative instruments that are designated and qualify as a cash flows hedge (i.e., hedging the exposure to variability in expected future cash flows that is attributable to a particular risk), the effective portion of the gain or loss on the derivative instrument is reported as a component of other comprehensive income and reclassified into earnings in the same period or periods during which the hedged transaction affects earnings. Any gain or loss on a derivative instrument in excess of the cumulative change in the present value of future cash flows of the hedged item is recognized in current earnings during the period of change.

To protect against the increase in value of forecasted foreign currency cash flows resulting from salary and rent payments in New Israeli Shekel (“NIS”) during the year, the Company instituted a foreign currency cash flow hedging program. The Company hedges portions of the anticipated payroll and rent of its Israeli facilities denominated in NIS for a period of one to 12 months with put and call options and forward contracts. These forward contracts and put and call options are designated as cash flow hedges and are all effective as hedges of these expenses.

U.S. dollars in thousands, except share and per share data.

The fair value of the outstanding derivative instruments at December 31, 2018 and 2017 is summarized below:

Derivative assets (liabilities) designated as hedging	Balance sheet location	Fair value of derivative instruments December 31, 2018	2017
Foreign exchange forward contracts and put and call options	Other accounts receivable and prepaid expenses (Accrued expenses and other accounts payable)	$ (3)	$ -
	Total	$ (3)	$ -

The effect of derivative instruments in cash flow hedging transactions on income and other comprehensive income ("OCI") for the years ended December 31, 2018, 2017 and 2016 is summarized below:

	Gains (losses) on derivatives recognized in OCI Year ended December 31, 2018	2017	2016
Foreign exchange forward contracts and put and call options	$(19)	$163	$ 45

	Location	Gains (losses) on derivatives reclassified from OCI to income Year ended December 31, 2018	2017	2016

Foreign exchange forward contracts and put and call options	Operating expenses	$(16)	$172	$ 1

As of December 31, 2018, the Company had outstanding option contracts in the amount of $3,600.

As of December 31, 2017, the Company had no outstanding option or forward contracts.

As of December 31, 2016, the Company had outstanding option contracts in the amount of $6,000.

U.S. dollars in thousands, except share and per share data.

v. Comprehensive income:

The Company accounts for comprehensive income in accordance with FASB ASC No. 220, "Comprehensive Income." Comprehensive income generally represents all changes in stockholders' equity during the period except those resulting from investments by, or distributions to, stockholders. The Company determined that its items of other comprehensive income relate to gains and losses on hedging derivative instruments, unrealized gains and losses on available-for-sale securities, unrealized gains and losses from pension and unrealized gain and losses from foreign currency translation adjustments.

The following table summarizes the changes in accumulated balances of other comprehensive income (loss) for 2018:

	Unrealized gains (losses) on available-for-sale marketable securities	**Unrealized gains (losses) on Cash Flow Hedges**	**Unrealized gains (losses) on components of defined benefit plans**	**Unrealized gains (losses) on foreign currency translation**	**Total**
January 1, 2018	$ (1,209)	$ -	$ (409)	$ (256)	$ (1,874)
Other comprehensive income (loss) before reclassifications	(465)	(19)	29	(71)	(526)
Losses (gains) reclassified from accumulated other comprehensive income (loss)	41	16	19	-	76
Net current period other comprehensive income (loss)	(424)	(3)	48	(71)	(450)
December 31, 2018	$ (1,633)	$ (3)	$ (361)	$ (327)	$ (2,324)

U.S. dollars in thousands, except share and per share data.

The following table provides details about reclassifications out of accumulated other comprehensive income (loss) for 2018:

Details about Accumulated Other Comprehensive Income (Loss) Components		Amount Reclassified from Accumulated Other Comprehensive Income (Loss)	Affected Line Item in the Statement of Income (Loss)
Losses on available-for-sale marketable securities	$	41	Financial income, net
		-	Provision for income taxes
		41	Total, net of income taxes
Losses on cash flow hedges			
		13	Research and development
		1	Sales and marketing
		2	General and administrative
		16	Total, before income taxes
		-	Provision for income taxes
		16	Total, net of income taxes
Losses on components of defined benefit plans		12	Research and development
		7	Sales and marketing
		19	Total, before income taxes
		-	Provision for income taxes
		19	Total, net of income taxes
Total reclassifications for the period		76	Total, net of income taxes

w. Treasury stock at cost

The Company repurchases its common stock from time to time on the open market or in other transactions and holds such shares as treasury stock. The Company presents the cost to repurchase treasury stock as a reduction of stockholders’ equity.

From time to time, the Company reissues treasury stock under its employee stock purchase plan and equity incentive plans, upon purchases or exercises of equity awards under the plans. When treasury stock is reissued, the Company accounts for the re-issuance in accordance with ASC No. 505-30, "Treasury Stock" and charges the excess of the purchase cost over the re-issuance price (loss) to retained earnings. The purchase cost is calculated based on the specific identification method. In case the purchase cost is lower than the re-issuance price, the Company credits the difference to additional paid-in capital.

U.S. dollars in thousands, except share and per share data.

x. Recently issued and adopted accounting pronouncements:

In May 2014, the Financial Accounting Standards Board (the “FASB”) issued Accounting Standards Update (“ASU”) 2014-09, “Revenue from Contracts with Customers (Topic 606)” (“ASU 2014-09”), which amends the existing accounting standards for revenue recognition. On January 1, 2018, the Company adopted Accounting Standards Codification (“ASC”) 606, “Revenue from Contracts with Customers” and all the related amendments (collectively “ASC 606”) using the modified retrospective method. The Company recognized the cumulative effect of initially applying ASC 606 as an adjustment to the opening balance of retained earnings. The comparative information has not been restated and continues to be reported under the revenue recognition standards in effect for those periods. The reported results for 2018 reflect the application of ASC 606 guidance while the reported results for 2017 were prepared under the guidance of ASC 605, “Revenue Recognition (ASC 605)”. The impact of the Company’s adoption of ASC 606 on the Company’s balance sheet was a decrease in accumulated deficit as of January 1, 2018 of $94.

See Note 2(m), “Revenue Recognition”, for further details.

In August 2016, FASB issued ASU 2016-15, Statement of Cash Flows (Topic 230) Classification of Certain Cash Receipts and Cash Payments. ASU 2016-15 eliminates the diversity in practice related to the classification of certain cash receipts and payments for debt prepayment or extinguishment costs, the maturing of a zero coupon bond, the settlement of contingent liabilities arising from a business combination, proceeds from insurance settlements, distributions from certain equity method investees and beneficial interests obtained in a financial asset securitization. ASU 2016-15 designates the appropriate cash flow classification, including requirements to allocate certain components of these cash receipts and payments among operating, investing and financing activities. The retrospective transition method, requiring adjustment to all comparative periods presented, is required unless it is impracticable for some of the amendments, in which case those amendments would be prospectively as of the earliest date practicable. The Company adopted the standard effective as of January 1, 2018, and the adoption of this standard did not have a material impact on our Company's consolidated financial statements.

In November 2016, FASB issued ASU 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash. This standard requires the presentation of the statement of cash flows to show the changes in the total of cash, cash equivalents, restricted cash and restricted cash equivalents. The standard is effective for fiscal years and the interim periods within those fiscal years beginning after December 15, 2017. The Company adopted the standard retrospectively to all periods presented effective as of January 1, 2018.

U.S. dollars in thousands, except share and per share data.

In March 2017, FASB issued ASU 2017-07, Improving the Presentation of Net Periodic Pension Cost and Net Periodic Post-retirement Benefit Cost under FASB ASC Topic 715, Retirement Benefits. Accordingly, as of January 1, 2017, the Company reports the current service cost component of net periodic benefit cost in Compensation and benefits on the Company's Consolidated Statements of Income, and reports the other components of net periodic benefit recovery as a separate line item outside of Operating income on the Company's Consolidated Statements of Income. These changes in presentation do not result in any changes to net income or earnings per share. Details of the components of net periodic benefit costs are provided in Note 9 (Pensions and employees benefit obligations). The ASU also prospectively restricts capitalization of net periodic benefit costs to the current service cost component when applicable. This restriction has no impact on the Company's financial statements, since the Company does not capitalize any portion of service cost.

ASC 718 – see Note 2(q).

In June 2018, the FASB issued, ASC 2018-07 “Improvement to Nonemployee Share-based Payment Accounting”. Under the new standard, companies are no longer required to value non-employee awards differently from employee awards. This standard is effective for fiscal years beginning after December 15, 2018, including interim periods within that fiscal year. The Company has adopted this standard in 2018 and determined there was no material impact on the Company’s consolidated financial statements.

y. Recently issued accounting pronouncements not yet effective:

In August 2018, the FASB issued ASU 2018-15, Intangibles—Goodwill and Other—Internal-Use Software (Subtopic 350-40): Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract. The amendments in this ASU align the requirements for capitalizing implementation costs incurred in a hosting arrangement with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. The implementation costs incurred in a hosting arrangement that is a service contract should be presented as a prepaid asset on the balance sheet and expensed over the term of the hosting arrangement to the same line item in the statement of income as the costs related to the hosting fees. The guidance in this ASU is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years, and early adoption is permitted, including adoption in any interim period. The amendments should be applied either retrospectively or prospectively to all implementation costs incurred after adoption. The Company is currently evaluating the impact that the standard will have on our consolidated financial statements and do not expect the adoption of this ASU to have a material effect on our consolidated financial statements.

In August 2018, the FASB issued ASU 2018-14—Compensation—Retirement Benefits—Defined Benefit Plans—General (Topic 715-20): Disclosure Framework—Changes to the Disclosure Requirements for Defined Benefit Plans which improves disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans.

This standard is effective for fiscal years ending after December 15, 2020, for public business entities. Early adoption is permitted for all entities. Entities are to apply the amendments in this Update on a retrospective basis for all periods presented. The Company is currently evaluating the impact that the standard will have on the Company's consolidated financial statements and related disclosures.

In February 2016, the FASB issued ASU 2016-02, Leases (ASC 842) in order to increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet for those leases classified as operating leases under current GAAP.In July 2018, the FASB issued amendments in ASU 2018-11, which provide another transition method in addition to the existing transition method, by allowing entities to initially apply the new leases standard at the adoption date and recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption, and to not apply the new guidance in the comparative periods they present in the financial statements.The new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight line basis over the term of the lease, respectively. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than twelve months regardless of their classification. Leases with a term of twelve months or less will be accounted for similar to existing guidance for operating leases. ASU 2016-02 requires that a lessee should recognize a liability to make lease payments (the lease liability) and a right-of-use asset representing its right to use the underlying asset for the lease term on the balance sheet ASU 2016-02 is effective for fiscal years beginning after December 15, 2018 (including interim periods within those periods). The Company will adopt ASU 2016-02 on January 1, 2019 utilizing the modified retrospective transition method. The Company adopted the new standard effective January 1, 2019. While the Company is continuing to assess the potential impacts of ASU 2016-02, the Company estimates that the adoption of ASU 2016-02 will result in the recognition of right-of-use assets and lease liabilities for operating leases of approximately $12.5 million on its consolidated balance sheets for operation leases and it does not expect an impact on its consolidated statements of operations or debt.

In June 2016, the FASB issued ASU 2016-13, Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments. ASU 2016-13 amends the impairment model to utilize an expected loss methodology in place of the currently used incurred loss methodology, which will result in the more timely recognition of losses. ASU 2016-13 also applies to employee benefit plan accounting, with an effective date of the first quarter of fiscal 2022. The Company is currently assessing the impact that adopting this new accounting standard will have on its consolidated balance sheets, statements of operations and cash flows.

NOTE 3: MARKETABLE SECURITIES AND TIME DEPOSITS

The following is a summary of marketable securities and time deposits at December 31, 2018 and 2017 (see also Note 8):

Amortized cost		Unrealized gains (losses), net		Fair value	
2018	**2017**	**2018**	**2017**	**2018**	**2017**

Short-term deposit	$8,349	$5,481	$-	$-	$8,349	$5,481
Long-term deposit	5,130	5,013	-	-	5,130	5,013
U.S. GSE securities	21,550	22,359	(253)	(315)	21,297	22,044
Corporate obligations	77,857	75,722	(1,382)	(894)	76,475	74,828
	$112,885	$108,575	$(1,635)	$(1,209)	$111,251	$107,366

The amortized costs of marketable debt securities at December 31, 2018, by contractual maturities or anticipated dates of sale, are shown below*:*

	Amortized cost	**Unrealized gains (losses)**		**Fair value**
		Gains	**Losses**	
Due in one year or less	$ 27,442	$-	$(78)	$27,364
Due after one year to five years	71,965	1	(1,558)	70,408
	$ 99,406	$1	$(1,636)	$97,772

The amortized cost of marketable debt securities at December 31, 2017, by contractual maturities or anticipated dates of sale, are shown below*:*

	Amortized cost	Unrealized gains (losses) Gains	Losses	Fair value
Due in one year or less	$ 19,239	$ 3	$ (26)	$ 19,216
Due after one year to six years	78,842	10	(1,196)	77,656
	$ 98,081	$ 13	$ (1,222)	$ 96,872

The actual maturity dates may differ from the contractual maturities because debtors may have the right to call or prepay obligations without penalties.

The total fair value of marketable securities with outstanding unrealized losses as of December 31, 2018 amounted to $94,550, while the unrealized losses for these marketable securities amounted to $1,636. Of the $1,636 unrealized losses outstanding as of December 31, 2018, a portion of which in the amount of $1,498 was related to marketable securities that were in a loss position for more than 12 months and the remaining portion of $138 was related to marketable securities that were in a loss position for less than 12 months.

The total fair value of marketable securities with outstanding unrealized losses as of December 31, 2017 amounted to $85,435, while the unrealized losses for these marketable securities amounted to $1,222. Of the $1,222 unrealized losses outstanding as of December 31, 2017, a portion of which in the amount of $775 was related to marketable securities that were in a loss position for more than 12 months and the remaining portion of $447 was related to marketable securities that were in a loss position for less than 12 months.

Management believes that as of December 31, 2018, the unrealized losses in the Company's investments in all types of marketable securities were temporary and no impairment loss was realized in the Company's consolidated statements of operations.

The unrealized losses related to the Company's marketable securities were primarily due to changes in interest rates. Because the Company does not intend to sell the investments and it is not more likely than not that the Company will be required to sell the investments before recovery of their amortized cost bases, which may be maturity, the Company does not consider those investments to be other-than-temporarily impaired at December 31, 2018.

Proceeds from maturity of available-for-sale marketable securities during 2018, 2017 and 2016 were $20,501, $21,499 and $35,090, respectively. Proceeds from sales of available-for-sale marketable securities during 2018, 2017 and 2016 were $5,113, $19,226 and $14,277, respectively. Realized gains from the sale of available-for sale marketable securities for 2018, 2017 and 2016 were $26, $7 and $16, respectively. Realized losses from the sale of available-for

sale marketable securities for 2018, 2017 and 2016 were $67, $57 and $33, respectively. The Company determines realized gains or losses on the sale of available-for-sale marketable securities based on a specific identification method.

NOTE 4:- **OTHER ACCOUNTS RECEIVABLE AND PREPAID EXPENSES**

	December 31,	
	2018	**2017**
Prepaid expenses	$1,836	$1,612
Tax and governmental receivables	1,468	1,019
Deposits	235	249
Others	131	287
	$3,670	$3,167

NOTE 5:- INVENTORIES

Inventories are composed of the following:

	December 31, 2018	December 31, 2017
Work-in-progress	$4,993	$3,577
Finished products	4,826	5,845
	$9,819	$9,422

Inventory write-downs amounted to $89, $51 and $151 for the years ended December 31, 2018, 2017 and 2016, respectively.

NOTE 6:- PROPERTY AND EQUIPMENT

Composition of assets, grouped by major classifications, is as follows:

	December 31, 2018	December 31, 2017
Cost:		
Computers and equipment	$22,139	$21,465
Office furniture and equipment	1,471	1,429
Leasehold improvements	5,221	5,060
	28,831	27,954
Less - accumulated depreciation	26,083	24,770
Depreciated cost	$2,748	$3,184

During 2018, the Company disposed leasehold improvements, which ceased to be used, in the amount of $109. No capital loss was recorded due to this disposal of equipment in the consolidated statement of operations.

During 2017, the Company disposed or sold equipment and leasehold improvements, which ceased to be used, in the amount of $98. Capital loss in an amount of $19 was recorded due to this disposal of equipment in the consolidated statement of operations.

Depreciation expenses amounted to $1,593, $1,781 and $1,704 for the years ended December 31, 2018, 2017 and 2016, respectively.

NOTE 7:- INTANGIBLE ASSETS

The following table shows the Company’s intangible assets for the periods presented:

	Useful life (years)	December 31, 2018	December 31, 2017
Cost:			
Technology (completion of the development of in-process R&D)	6	7,702	7,702
Distribution agreement	5	2,086	2,086
Non-competition agreement	3	519	519
		10,307	10,307
Accumulated amortization:			
Technology (completion of the development of in-process R&D)		7,702	6,418
Distribution agreement		1,008	591
Non-competition agreement		519	519
		9,229	7,528
Amortized cost		$1,078	$2,779

a. Amortization expenses amounted to $1,700, $1,700 and $1,457 for the years ended December 31, 2018, 2017 and 2016, respectively.Those expenses were included in amortization of intangible assets in the Company’s consolidated financial statements.

b. Estimated amortization expenses for the years ending:

<u>Year ending December 31,</u>	
2019	$417
2020	417
2021	244
	$1,078

NOTE 8:- FAIR VALUE MEASUREMENTS

In accordance with ASC 820, the Company measures its cash equivalents, marketable securities and foreign currency derivative contracts at fair value. Cash equivalents, marketable securities and foreign currency derivative contracts are classified within Level 1 or Level 2 value hierarchies. This is because cash equivalents, and marketable securities are valued using quoted market prices or alternative pricing sources and models utilizing market observable inputs. Foreign currency derivative contracts are classified within Level 2 value hierarchy as the valuation inputs are based on quoted prices and market observable data of similar instruments.

The following table provides information by value level for financial assets and liabilities that are measured at fair value on a recurring basis as of December 31, 2018:

Description	**Balance as of December 31, 2018**	**Fair value measurements**		
		Level 1	**Level 2**	**Level 3**
Assets				
Cash equivalents				
Money market mutual funds	$ 773	$773	-	-
Short-term marketable securities and time deposits				
U.S. GSE securities	$ 1,785	-	$1,785	-
Corporate debt securities	$ 25,579	-	$25,579	-
Long-term marketable securities				
U.S. GSE securities	$ 19,512	-	$19,512	-
Corporate debt securities	$ 50,896	-	$50,896	-
Derivative liabilities	$ 3	-	$3	-

The following table provides information by value level for financial assets and liabilities that are measured at fair value on a recurring basis as of December 31, 2017 (see also Note 3):

Description	**Balance as of December 31, 2017**	**Fair value measurements**		
		Level 1	**Level 2**	**Level 3**
Assets				
Cash equivalents				
Money market mutual funds	$ 2,998	$2,998	-	-
Short-term marketable securities and time deposits				

U.S. GSE securities	$ 786	-	$786	-
Corporate debt securities	$ 18,430	-	$18,430	-
Long-term marketable securities				
U.S. GSE securities	$ 21,258	-	$21,258	-
Corporate debt securities	$ 56,398	-	$56,398	-

In addition to the assets and liabilities described above, the Company's financial instruments also include cash and cash equivalents, restricted deposits, short term deposits, trade receivables, other accounts receivable, trade payables, accrued expenses and other payables. The fair value of these financial instruments was not materially different from their carrying value at December 31, 2018 and 2017 due to the short-term maturity of these instruments.

NOTE 9:- ACCRUED EXPENSES AND OTHER ACCOUNTS PAYABLE

	December 31,	
	2018	2017
Accrued expenses	$1,658	$896
Royalties and commission	1,089	1,369
Accrued legal, and accounting expenses	370	367
Governmental payables	341	141
Others	3	115
	$3,461	$2,888

NOTE 10:- ACCRUED PENSION LIABILITIES

As of December 31, 2018 and 2017, the defined benefits plans that are accounted for in the Company's consolidated financial statements are the pension plans in Germany and India. Consistent with the requirements of local law, the Company deposits funds for certain plans with insurance companies, third-party trustees, or into government-managed accounts, and/or accrues for the unfunded portion of the obligation.

The Company's pension obligation in Germany relating to the unvested pension claims (i.e. future obligation that will result from future service period) of the employees were outsourced in November 2010 to an external insurance company ("Nuremberger Versicherung"). From and after the outsourcing date, the Company is required to pay premiums to the external insurance company and in return the pension benefits earned by the German employees are covered by the Company's arrangement with the external insurance company. The Company legally is released from its obligations to the German employees once the premiums are paid, and it is no longer subject to any of the risks and rewards associated with the benefit obligations covered and the plan assets transferred to the external insurance company. Since the outsourcing arrangement meets the requirements of a nonparticipating annuity contract, the Company treats the costs of the outsourcing arrangement as the costs of the benefits being earned in accordance with ASC Paragraph 715-30-25-7 of ASC 715 "Compensation—Retirement Benefits."

The following tables provide a reconciliation of the changes in the pension plans' benefit obligation and the fair value of assets for the years ended December 31, 2018 and 2017, and the statement of funded status as of December 31, 2018 and 2017:

	December 31, 2018	2017
Accumulated benefit obligation	$815	$871
Change in benefit obligation		
Benefit obligation at beginning of year	$883	$803
Service cost	5	4
Interest cost	15	14
Benefits paid from the plan	(8)	(22)
Actuarial (gain) loss	(27)	(22)
Exchange rates and others	(41)	106
Benefit obligation at end of year	$827	$883

The assumptions used in the measurement of the Company's pension expense and benefit obligations as of December 31, 2018, 2017 and 2016 are as follows:

	Year ended December 31,		
	2018	**2017**	**2016**
Weighted-average assumptions			
Discount rate	1.9%	1.8 %	1.7 %
Expected return on plan assets	-	-	4.59%
Rate of compensation increase	2.5%	2.5 %	2.5 %

The amounts reported for net periodic pension costs and the respective benefit obligation amounts are dependent upon the actuarial assumptions used. The Company reviews historical trends, future expectations, current market conditions, and external data to determine the assumptions. The discount rate is determined considering the yield of government bonds. The rate of compensation increase is determined by the Company, based on its long-term plans for such increases.

The following table provides the components of net periodic benefit cost for the years ended December 31, 2018, 2017 and 2016:

	December 31,		
	2018	**2017**	**2016**
Components of net periodic benefit cost			
Service cost	$5	$ 4	$ 4
Interest cost	15	14	17
Expected return on plan assets	-	-	(3)
Amortization of net loss	19	22	15
Net periodic benefit cost	$39	$ 40	$ 33

	December 31,	
	2018	**2017**
Net amounts recognized in the consolidated balance sheets as of December 31, 2018 and 2017 consist of:		
Current liabilities	$-	$-

Noncurrent liabilities	827	883
Net amounts recognized in the consolidated balance sheets	$827	$883
Net amounts recognized in accumulated other comprehensive income as of December 31, 2018 and 2017 consist of:		
Net actuarial loss	$(361)	$(409)
Net amounts recognized in accumulated other comprehensive loss	$(361)	$(409)

The estimated amount that will be amortized from accumulated other comprehensive income (loss) into net periodic benefit cost in 2019 is as follows:

	2019
Net actuarial loss and other	$ 16

Benefit payments are expected to be paid as follows:

Year ending December 31,	
2019	$9
2020	9
2021	31
2022	26
2023	10
2024-2028	79
	$164

The Company had no pension plan assets at December 31, 2018.

Regarding the policy for amortizing actuarial gains or losses for pension and post-employment plans, the Company has chosen the “corridor” option. This option consists of recognizing in the consolidated statements of operations, the part of unrecognized actuarial gains or losses exceeding 10% of the greater of the PBO or the market value of the plan assets. If amortization is required, the minimum amortization amount is that excess divided by the average remaining service period of the active employees expected to receive benefits under the plan.

Actuarial gains were recognized in other comprehensive income (loss) in the amount of $29 for the year ended December 31, 2018. Actuarial losses were recognized in other comprehensive income (loss) in the amount of $24 for the year ended December 31, 2017. Actuarial gains were recognized in other comprehensive income (loss) in the amount of $117 for the year ended December 31, 2016.

NOTE 11:- FINANCIAL INCOME, NET

The components of financial income, net were as follows:

	Year ended December 31,		
	2018	**2017**	**2016**
Foreign exchange gains	$16	$156	$14
Interest income from marketable securities and deposits, net of amortization of premium on marketable securities	2,108	1,719	1,534
Other	2	-	-
Realized gains on marketable securities	27	7	16
Financial income	2,153	1,882	1,564
Realized losses on marketable securities	68	57	33
Foreign exchange losses	195	48	132
Interest expenses	15	14	16
Other	60	94	156
Financial expense	338	213	337
Financial income, net	$1,815	$1,669	$1,227

NOTE 12:- STOCKHOLDERS' EQUITY

a. Preferred stock:

The Company's Board of Directors has the authority, without any further vote or action by the stockholders, to provide for the issuance of up to 5,000,000 shares of preferred stock in one or more series with such designations, rights, preferences, and limitations as the Board of Directors may determine, including the consideration received, the number of shares comprising each series, dividend rates, redemption provisions, liquidation preferences, sinking fund provisions, conversion rights and voting rights. No shares of preferred stock are currently outstanding.

b. Common stock:

Currently, 50,000,000 shares of common stock are authorized. Holders of common stock are entitled to one vote per share on all matters to be voted upon by the Company's stockholders. Subject to the rights of holders of preferred stock, if any, in the event of liquidation, dissolution or winding up, holders of common stock are entitled to share ratably in all of the Company's assets. The Company's Board of Directors may declare a dividend out of funds legally available therefore and, subject to the rights of holders of preferred stock, if any, the holders of common stock are entitled to receive ratably any such dividends.

Holders of common stock have no preemptive rights or other subscription rights to convert their shares into any other securities. There are no redemption or sinking fund provisions applicable to common stock.

c. Dividend policy:

At December 31, 2018, the Company had an accumulated deficit of $112,363. The Company has never paid cash dividends on the common stock and presently intends to follow a policy of retaining earnings for reinvestment in its business.

d. Share repurchase program:

The Company's board of directors has previously approved a number of share repurchase plans, including those in accordance with Rule 10b5-1 of the Securities Exchange Act of 1934, for the repurchase of our common stock. In August 2018, the Company's board authorized a $10 million dollar buyback program, inclusive of the shares authorized for repurchase from previously authorized share repurchase plans.

In 2018, 2017 and 2016, the Company repurchased approximately 1,015,000, 389,000 and 1,051,000 shares, respectively, of common stock at an average purchase price of $12.14, $11.55 and $10.15 per share, respectively, for an aggregate purchase price of $12,318, $4,490 and $10,666, respectively. As of December 31, 2018, 440,622 shares of the Company's common stock remained authorized for repurchase under the Company's board-authorized share repurchase program.

In 2018, 2017 and 2016, the Company issued 848,000, 890,000 and 1,409,000 shares, respectively, of common stock, out of treasury stock, to employees who exercised their equity awards and had vested RSUs under the Company's equity incentive plans or purchased shares from the Company's 1993 Employee Stock Purchase Plan ("ESPP").

e. Stock purchase plan and equity incentive plans:

The Company has various equity incentive plans under which employees, officers, non-employee directors of the Company and its subsidiaries and others, including consultants, may be granted rights to purchase the Company's common stock. The plans authorize the administrator, except for the grant of RSUs, to grant equity incentive awards at an exercise price of not less than 100% of the fair market value of the common stock on the date the award is granted. It is the Company's policy to grant stock options and SARs at an exercise price that equals the fair market value

Equity awards granted under all stock incentive plans that are cancelled or forfeited before expiration become available for future grant.

Until the end of 2012, the Company granted to employees and executive officers of the Company primarily share appreciation rights ("SARs"), capped with a ceiling, under the various equity incentive plans. The SAR unit confers the holder the right to stock appreciation over a preset price of the Company's common stock during a specified period of time. When the unit is exercised, the appreciation amount is paid through the issuance of shares of the Company's common stock. The ceiling limits the maximum income for each SAR unit and the maximum number of shares to be issued. SARs are considered an equity instrument as it is a net share settled award capped with a ceiling.

Starting in 2013, the Company granted to employees and executive officers of the Company primarily restricted stock units ("RSUs") under the various equity incentive plans. An RSU award is an agreement to issue shares of our common stock at the time the award is vested. RSUs granted to employees and executive officers generally vest over a four year period from the grant date with 25% of the RSUs granted vesting on the first anniversary of the grant date and 6.25% vesting each quarter thereafter.

A summary of the various plans is as follows:

1993 Director Stock Option Plan (Directors Plan)

Upon the closing of the Company's initial public offering, the Company adopted the Directors Plan. Under the Directors Plan, which expired in January 2014, the Company was authorized to issue nonqualified stock options to the Company's outside non-employee directors to purchase up to 1,980,875 shares of common stock at an exercise price equal to the fair market value of the common stock on the date of grant. Options granted under the Directors Plan generally had a term of 10 years. One-third of the shares were exercisable after the first year and thereafter one-third at the end of each twelve-month period.

The Directors Plan expired in January 2014 and therefore no further awards may be granted thereunder. As of December 31, 2018, 2,464,933 shares of common stock had been granted under the plan and stock options to acquire 165,000 shares remained outstanding out of grants made prior to its expiration.

1998 Non-Officer Employee Stock Option Plan (1998 Plan)

In 1998, the Company adopted the 1998 Plan. Under the 1998 Plan, employees may be granted non-qualified stock options for the purchase of common stock. The 1998 Plan currently provides for the purchase of up to 5,062,881 shares of common stock. As of December 31, 2018, 14,583 shares of common stock remained available for grant under the 1998 Plan.

The exercise price of options under the 1998 Plan shall not be less than the fair market value of common stock for nonqualified stock options, as determined by the Company's Board of Directors or a committee appointed by the Company's Board of Directors.

Options under the 1998 Plan are generally exercisable over a 48-month period beginning 12 months after issuance, or as determined by the Company's Board of Directors or a committee appointed by the Company's Board of Directors. Options under the 1998 Plan expire up to seven years after the date of grant.

2012 Equity Incentive Plan (2012 Plan)

In 2012, the Company adopted the 2012 Plan, which also complies with the Israeli tax reforms. Under the 2012 Plan, employees, directors and consultants may be granted incentive or non-qualified stock options, SARs, RSUs and other awards under the plan. The exercise price for stock options under the 2012 Plan shall not be less than the fair market value of common stock at the time of grant, unless otherwise determined by the Company's Board of Directors or a committee appointed by the Company's Board of Directors. The 2012 Plan currently provides for the purchase of up to 3,750,000 shares of common stock. As of December 31, 2018, 786,031 shares of common stock remained available for grant under the 2012 Plan.

Stock options, SARs and RSUs awarded under the 2012 Plan to employees and executive officers are generally exercisable over a 48-month period beginning 12 months after issuance, or as determined by the Company's Board of Directors or a committee appointed by the Company's Board of Directors Equity awards under the 2012 Plan expire up to seven years after the date of grant.

A director subplan was established under the 2012 Plan to provide for the grant of equity awards to the Company's non-employee directors. The director subplan is designed to work automatically; however, to the extent administration is necessary, it would be provided by the Company's board of directors. Starting in 2014, non-employee directors are granted automatically under the director subplan, on January 1 of each year, 8,000 stock options and 4,000 restricted stock units, all of which would fully vest at the end of one year from the grant date. If a director is appointed for a term commencing during a calendar year, the director would be granted stock options and restricted stock units on the date of appointment and the number of stock options and restricted stock units granted would be based upon the number of days remaining in the in the calendar year following the date such person was nominated as a director.

1993 Employee Stock Purchase Plan (ESPP)

Upon the closing of the Company's initial public offering, the Company adopted the ESPP. The Company has reserved an aggregate of 4,800,000 shares of common stock for issuance under the ESPP. The ESPP provides that substantially all employees of the Company may purchase Company common stock at 85% of its fair market value on specified dates via payroll deductions. There were approximately 230,000, 227,000 and 233,000 shares of common stock issued at a weighted average purchase price of $8.71, $8.34 and $7.62 per share under the ESPP in 2018, 2017 and 2016, respectively. As of December 31, 2018, 479,000 shares of common stock were reserved under the ESPP.

Stock Reserved for Future Issuance

The following table summarizes the number of shares available for future issuance at December 31, 2018 (after giving effect to the above increases in the equity incentive plans):

ESPP	479,000
Equity awards	801,000
Undesignated preferred stock	5,000,000
	6,280,000

The following is a summary of activities relating to the Company's stock options, SARs and RSUs granted among the Company's various plans:

	Year ended December 31,								
	2018			**2017**			**2016**		
	Amount of options/ SARs/RSUs in thousands	**Weighted average exercise price**	**Aggregate intrinsic value (4)**	**Amount of options/ SARs/RSUs in thousands**	**Weighted average exercise price**	**Aggregate intrinsic value (4)**	**Amount of options/ SARs/RSUs in thousands**	**Weighted average exercise price**	**Aggregate intrinsic value (4)**
Options outstanding at beginning of year	1,992	$ 5.02	$ -	2,152	$ 5.12	$ -	3,740	$ 6.22	$ -
Changes during the year:									
Options granted	54	$ 12.42	$ -	78	$ 11.93	$ -	64	$ 9.44	$ -
SARs granted	13	$ 12.50	$ -	190	$ 10.40	$ -			
RSUs granted	563	$ -	$ -	476	$ -	$ -	573	$ -	$ -
Exercised (4)	(723)	$ 2.81	$ 6,845	(818)	$ 3.77	$ 6,699	(1,905)	$ 5.55	$ 10,344
Forfeited and cancelled	(68)	$ 5.63	$ -	(86)	$ 9.85	$ -	(320)	$ 7.16	$ -
Options/SARs/RSUs outstanding at end of year (1,2,4)	1,831	$ 4.59	$ 12,281	1,992	$ 5.02	$ 14,931	2,152	$ 5.12	$ 17,347
Options/SARs/RSUs exercisable at end of year (1,3,4)	704	$ 9.10	$ 1,576	813	$ 8.20	$ 3,499	1,132	$ 8.27	$ 5,703

(1) SAR grants made on or after January 1, 2012 are convertible for a maximum number of shares of the Company's common stock equal to 50% of the SAR units subject to the grant.

(2) Due to the ceiling imposed on the SAR grants, the outstanding amount above can be exercised for a maximum of 1,738 thousand shares of the Company's common stock as of December 31, 2018.

(3) Due to the ceiling imposed on the SAR grants, the exercisable amount above can be exercised for a maximum of 667 thousand shares of the Company's common stock as of December 31, 2018.

(4) Calculation of aggregate intrinsic value for options, RSUs and SARs outstanding and exercisable is based on the share price of the Company's common stock as of December 31, 2018, 2017 and 2016 which was $11.20, $12.50

and $13.05 per share, respectively. The intrinsic value for options and SARs exercised and RSUs vested during those years represents the difference between the fair market value of the Company's common stock on the date of exercise and vesting for RSUs and the exercise price of each option, RSU or SAR, as applicable.

The stock options, SARs and RSUs outstanding as of December 31, 2018, have been separated into ranges of exercise price as follows:

Range of exercise price $			Outstanding thousands	Remaining contractual life (years) (1)	Weighted average exercise price $	Exercisable thousands	Remaining contractual life (years)	Weighted average exercise price $
0 (RSUs)			946	-	-	-	-	-
5.21	-	7.26	157	2.21	5.94	157	2.21	5.94
7.49	-	9.71	276	4.05	8.82	276	4.05	8.82
10.15	-	15.79	452	5.39	11.16	271	4.90	11.22
			1,831	4.41	4.59	704	3.97	9.10

(1) Calculation of weighted average remaining contractual term does not include the RSUs that were granted, which have an indefinite contractual term.

As of December 31, 2018, the outstanding number of SARs was 185,000 and based on the share price of the Company's common stock as of December 31, 2018 ($11.20 per share), 154,000 of those SARs were in the money as of December 31, 2018.

The weighted average estimated fair value of employee RSUs granted during 2018, 2017 and 2016 was $11.25, $9.63 and $8.33 per share, respectively, (using the weighted average pre vest cancellation rate of 3.75%, 3.64% and 3.78% during 2018, 2017 and 2016, respectively, on an annual basis).

The weighted-average estimated fair value of employee stock options and SARs granted during the years ended December 31, 2018, 2017 and 2016 was $4.39, $2.95 and $3.97, respectively, per stock option and SAR. The Company selected the binomial model as the most appropriate model for determining the fair value for its stock options awards and SARs. The fair value of options and SARs granted in 2018, 2017 and 2016 is estimated at the date of grant using the following weighted average assumptions. (annualized percentages):

	Year ended December 31,		
	2018	2017	2016
Volatility	45.91 %	37.47 %	46.02 %
Risk-free interest rate	2.55 %	2.23 %	2.29 %
Dividend yield	0 %	0 %	0 %
Pre-vest cancellation rate *)	2.68 %	4.06 %	1.87 %
Post-vest cancellation rate **)	3.34 %	3.45 %	3.44 %
Suboptimal exercise factor ***)	1.49	1.31	1.69
Expected life	5.92	4.22	5.50

*) The pre-vest cancellation rate was calculated on an annual basis and is presented here on an annual basis.

**) The post-vest cancellation rate was calculated on a monthly basis and is presented here on an annual basis.

***) The ratio of the stock price to strike price at the time of exercise of the option.

The computation of volatility uses a combination of historical volatility and implied volatility derived from the Company's exchange traded options with similar characteristics.

The risk-free interest rate assumption is based on U.S. treasury bill interest rates appropriate for the term of the Company's employee equity-based awards.

The dividend yield assumption is based on the Company's historical and expectation of future dividend payouts and may be subject to substantial change in the future.

The expected term of employee equity-based awards represents the weighted-average period the awards are expected to remain outstanding and is a derived output of the binomial model. The expected life of employee equity-based awards is impacted by all of the underlying assumptions used in the Company's model. The binomial model assumes that employees' exercise behavior is a function of the award's remaining contractual life and the extent to which the award is in-the-money (i.e., the average stock price during the period is above the strike price of the award). The binomial model estimates the probability of exercise as a function of these two variables based on the history of exercises and cancellations on past award grants made by the Company.

As equity-based compensation expense recognized in the consolidated statement of operations is based on awards ultimately expected to vest, it should be reduced for estimated forfeitures. The forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates.

Pre and post-vesting forfeitures were estimated based on historical experience.

The Company selected the Monte Carlo model as the most appropriate model for determining the fair value of its ESPP plan. The fair value for rights to purchase shares of common stock under the Company's ESPP was estimated on each enrollment date using the risk free interest rate and the share price for those dates. In addition, the expected life was assumed to be between six to 24 months based on the contractual life of the plan, and the expected volatility was assumed to be in a range of 29.6%-32.88% in 2018, 27.42%-34.92% in 2017 and 29.60%-41.21% in 2016.

The Company's aggregate equity compensation expenses for the years ended December 31, 2018, 2017 and 2016 totaled $6,804, $5,861 and $5,088, respectively.

A summary of the status of the Company's non-vested stock options, SARs and RSUs as of December 31, 2018, and changes during the year ended December 31, 2018, is presented below:

Non-vested	**Units** **(In thousands)**	**Weighted average grant date fair value** **$**
Non-vested at December 31, 2017	1,179	7.50
Granted	630	10.52
Vested	(627)	7.54
Forfeited	(55)	9.10
Non-vested at December 31, 2018	1,127	9.09

As of December 31, 2018, equity-based compensation arrangements to purchase a maximum of approximately 1,599,000 shares of common stock were vested and expected to vest (the calculation takes into consideration 8% average forfeiture rate).

As of December 31, 2018, there was a total unrecognized compensation expense of $4,983 related to non-vested equity-based compensation arrangements granted under the Company's various equity incentive plans. That expense is expected to be recognized during the period from 2018 through 2022.

NOTE 13:- COMMITMENTS AND CONTINGENCIES

Commitments

a. The Company's headquarters is located in San Jose, California pursuant to a lease that terminates in December 2021. The Company and its subsidiaries lease certain equipment and facilities under non-cancelable operating leases. The Company has significant leased facilities in Herzliya Pituach, Israel. The lease agreement for the Israeli facilities is effective until April 2019. Starting April 2019 the Company will move to new leased facilities, which are also located in Herzliya Pituach, Israel. Those new facilities will be leased for 10 years. The Company's subsidiaries in Scotland, Germany, China (Shanghai) and Hong-Kong have lease agreements for their facilities that terminate in 2019. The Company's subsidiaries in India, South Korea, Japan and China (Shenzhen) have lease agreements for their facilities that terminate in 2020. The Company has operating lease agreements for its motor vehicles which terminate in 2019 through 2021.

At December 31, 2018, the Company is required to make the following minimum lease payments under non-cancelable operating leases for motor vehicles and facilities:

Year ended December 31,	
2019	$1,946
2020	1,581
2021	1,272
2022- and thereafter	8,433
	$13,232

Facilities rental expenses amounted to $2,328, $2,308 and $2,362 for the years ended December 31, 2018, 2017 and 2016, respectively.

b. The Company participated in programs (most of which are royalty bearing grants) sponsored by the Israeli government for the support of research and development activities. Through December 31, 2018, the Company had obtained grants from the Israeli Innovation Authority (the “IIA”) (previously the Office of the Chief Scientist) for certain of the Company’s research and development projects. The Company is obligated to pay royalties to the IIA, amounting to 5% of the sales of the products and other related revenues (based on the dollar) generated from such projects, up to 100% of the grants received. The royalty payment obligations also bear interest at the LIBOR rate. The obligation to pay these royalties is contingent on actual sales of the applicable products and in the absence of such sales, no payment is required.

c. As of December 31, 2018, the aggregate contingent liability to the IIA amounted to $10,865. The Israeli Research and Development Law provides that know-how developed under an approved research and development program may not be transferred to third parties without the approval of the IIA. Such approval is not required for the sale or export of any products resulting from such research or development. The IIA, under special circumstances, may approve the transfer of IIA-funded know-how outside Israel, in the following cases: (a) the grant recipient pays to the IIA a portion of the sale price paid in consideration for such IIA-funded know-how or in consideration for the sale of the grant recipient itself, as the case may be, which portion will not exceed six times the amount of the grants received plus interest (or three times the amount of the grant received plus interest, in the event that the recipient of the know-how has committed to retain the research and development activities of the grant recipient in Israel after the transfer); (b) the grant recipient receives know-how from a third party in exchange for its IIA-funded know-how; (c) such transfer of IIA-funded know-how arises in connection with certain types of cooperation in research and development activities; or (d) if such transfer of know-how arises in connection with a liquidation by reason of insolvency or receivership of the grant recipient.

Litigation

a. The Company is involved in certain claims arising in the normal course of business. However, the Company believes that the ultimate resolution of these matters will not have a material adverse effect on its financial position, results of operations, or cash flows.

b. From time to time, the Company may become involved in litigation relating to claims arising in the ordinary course of business activities. Also, as is typical in the semiconductor industry, the Company has been and, from time to time may be, notified of claims that it may be infringing on patents or intellectual property rights owned by third parties.

NOTE 14:- TAXES ON INCOME

a. The provision for income taxes is as follows:

	Year ended December 31,		
	2018	**2017**	**2016**
Domestic taxes			
Federal taxes:			
Current	$-	$-	$-
State taxes:			
Current	3	2	3
Foreign taxes:			
Current	$943	$368	$264
Deferred	(2,814)	(462)	327
	(1,871)	(94)	591
Taxes on income (tax benefit)	$(1,868)	$(92)	$594

b. Income (loss) before taxes is comprised as follows:

	Year ended December 31,		
	2018	2017	2016
Domestic	$(2,825)	$(4,128)	$(2,188)
Foreign	(1,000)	1,033	7,595
	$(3,825)	$(3,095)	$5,407

c. A reconciliation between the Company's effective tax rate assuming all income is taxed at statutory tax rate applicable to the income of the Company and the U.S. statutory rate is as follows:

	Year ended December 31,		
	2018	2017	2016
Income (loss) before taxes on income	$(3,825)	$(3,095)	$5,407
Theoretical tax expenses (tax benefit) at U.S. statutory tax rate (21% for 2018 and 35% for 2017 and 2016)	$(803)	$(1,083)	$1,892
State taxes, net of federal benefit	3	2	3
Foreign income taxed at rates other than the U.S. rate (including deferred taxes that were not provided, valuation allowance and current adjustment and interest on uncertain tax position liability)	(1,767)	(808)	(2,580)
Nondeductible equity-based compensation expenses	542	816	695
Valuation allowance in U.S.	157	984	583
Other	-	(2)	1
	$(1,868)	$(92)	$594

d. Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes.

	December 31,	
	2018	**2017**
Reserves and accruals	$284	$1,202
Equity-based compensation	1,621	922
Intangible assets	184	320
Carryforward tax losses	6,715	4,368
Other	858	229
Total deferred tax assets	9,662	7,041
Valuation allowance		