

RESEARCH BULLETIN

MARCH 9, 2017

Semiconductor Shipments Dominated by Opto-Sensor-Discrete Devices *Updated forecast shows total semiconductor shipments surpassing one trillion devices in 2018!*

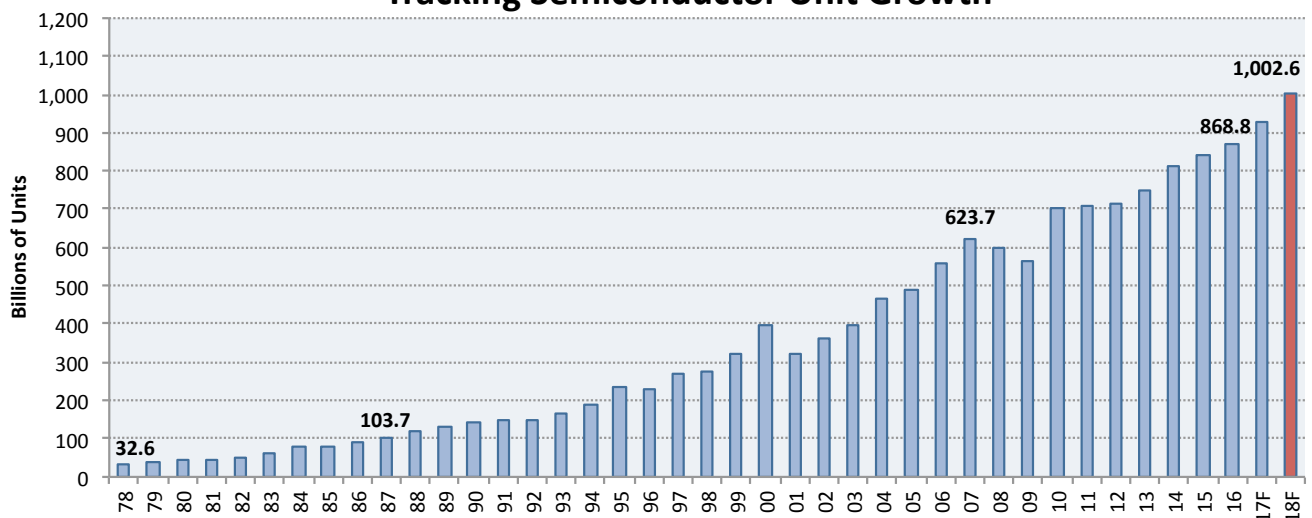
Annual total semiconductor unit shipments (integrated circuits and opto-sensor-discrete, or O-S-D, devices) are forecast to continue their upward march in the next five years and are now expected to top one trillion units for the first time in 2018, according to data presented in IC Insights' soon to be released *March Update* to the 2017 edition of *The McClean Report—A Complete Analysis and Forecast of the Integrated Circuit Industry*, and the 2017 *O-S-D Report—A Market Analysis and Forecast for the Optoelectronics, Sensors/Actuators, and Discrettes*.

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Semiconductor shipments totaled 868.8 billion in 2016 and are forecast to top one trillion units in 2018. Figure 1 shows that semiconductor unit shipments are forecast to climb to 1,002.6 billion devices in 2018 from 32.6 billion in 1978, which amounts to average annual growth of 8.9% over the 40-year period and demonstrates how dependent on semiconductors the world has become.

Tracking Semiconductor Unit Growth



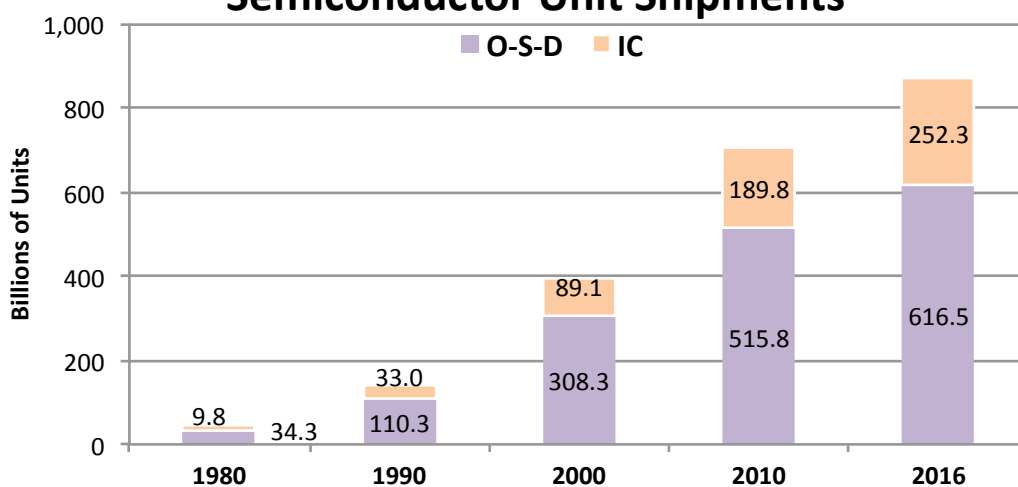
Source: IC Insights

Figure 1

The largest annual increase in semiconductor unit growth during the timespan shown was 34% in 1984, and the biggest decline was 19% in 2001 following the dot-com bust. The global financial meltdown and ensuing recession caused semiconductor shipments to fall in both 2008 and 2009; the only time that the industry experienced consecutive years in which unit shipments declined. Semiconductor unit growth then surged 25% in 2010, the second-highest growth rate across the time span.

Despite advances in integrated circuit technology and the blending of functions to reduce chip count within systems, the percentage split of IC and O-S-D shipments within total semiconductor units remains heavily weighted toward O-S-D devices. In 2016, O-S-D devices accounted for 72% of total semiconductor units compared to 28% for ICs. Thirty-six years ago in 1980, O-S-D devices accounted for 78% of semiconductor units and ICs represented 22% (Figure 2).

Opto, Sensor, Discretes Account for Bulk of Semiconductor Unit Shipments



Source: IC Insights

Figure 2

Surprisingly, shipments of commodity-filled discretes devices category (transistor products, diodes, rectifiers, and thyristors) accounted for 44% of all semiconductor unit shipments in 2016. The long-term resiliency of discretes is primarily due to their broad use in all types of electronic system applications. Consumer and communications applications remain the largest end-use segments for discretes, but increasing levels of electronics being packed into vehicles for greater safety and fuel efficiency have boosted shipments of discretes to the automotive market as well. Discretes are used for circuit protection, signal conditioning, power management, high current switching, and RF amplification. Small signal transistors are still used in and around ICs on board designs to fix bugs and tweak system performance.

Among ICs, analog products accounted for the largest number of shipments in 2016. Analog ICs represented 52% of IC unit shipments in 2016, but only 15% of total semiconductor units. Figure 3 shows the split of semiconductor unit shipments by product type in 2016.

2016 Semiconductor Unit Shipments

(868.8B)

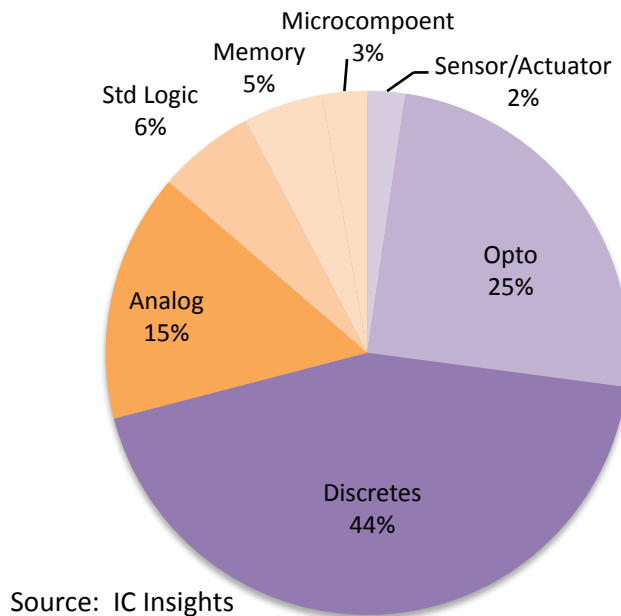


Figure 3

For 2017, semiconductor products showing the strongest unit growth rates are those that are essential building-block components in smartphones, new automotive electronics systems, and within systems that are helping to build out of Internet of Things. Some of the fast-growing IC unit categories for 2017 include Consumer—Special Purpose Logic, Signal Conversion (Analog), Auto—Application-Specific Analog, and flash memory. Among O-S-D devices, CCDs and CMOS image sensors, laser transmitters, and every type of sensor product (magnetic, acceleration and yaw, pressure, and other sensors) are expected to enjoy strong double-digit unit growth this year. More coverage about these semiconductor products and end-use applications are included in the 2017 editions of IC Insights' *McClean Report* and *O-S-D Report*.

Report Details: *The 2017 McClean Report and 2017 O-S-D Report*

Further details on IC, O-S-D, and total semiconductor unit and market trends are provided in the 2017 editions of two reports from IC Insights. *The McClean Report—A Complete Analysis and Forecast of the Integrated Circuit Industry* is IC Insights' flagship report covering the IC market. A subscription to *The McClean Report* includes **free** monthly updates from March through November (including a 250+ page *Mid-Year Update*), and **free** access to subscriber-only webinars throughout the year. An individual-user

license to the 2017 edition of *The McClean Report* is priced at \$4,090 and includes an Internet access password. A multi-user worldwide corporate license is available for \$7,090.

IC Insights expands its coverage of the semiconductor industry with its 360-page *O-S-D Report—A Market Analysis and Forecast for the Optoelectronics, Sensors/Actuators, and Discretes* (released in late March 2017). Details in this one-of-a-kind report include a detailed forecast of sales, unit shipments, and selling prices for more than 30 individual product types and categories through 2021. Also included is a review of technology trends for each of the major segments. The *2017 O-S-D Report*, with more than 240 charts and figures, is priced at \$3,590 for an individual-user license and \$6,690 for a multi-user corporate license.

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About IC Insights

IC Insights, Inc., based in Scottsdale, Arizona USA, is dedicated to providing high-quality, cost-effective market research for the semiconductor industry. Founded in 1997, IC Insights offers coverage of global economic trends, the semiconductor market forecast, capital spending and fab capacity trends, product market details, and technology trends, as well as complete IC company profiles and evaluations of end-use applications driving demand for ICs.

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