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## **Semiconductor R&D Growth Slows in 2015**

*Industry-wide R&D expenditures grew 0.5% to a record-high \$56.4 billion in 2015. Top 10 R&D spenders collectively increased expenditures by nearly 2% in the year.*

Semiconductor industry spending on research and development grew by just 0.5% in 2015, which was the smallest increase since the 2009 downturn year and significantly below the compound annual growth rate (CAGR) of 4.0% in R&D expenditures during the last 10 years, according to IC Insights' new 2016 edition of *The McClean Report*. The half-percent increase nudged worldwide R&D spending by semiconductor companies to a new record-high level of \$56.4 billion in 2015 from the previous peak of \$54.1 billion set in 2014, says IC Insights' flagship market analysis and forecast report on the IC industry.

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Growing concerns about the weak global economy, slumping sales in the second half of the year, and unprecedented industry consolidation through a huge wave of merger and acquisition agreements weighed on semiconductor R&D spending in 2015. The new 2016 *McClean Report* shows Intel continuing to lead all semiconductor companies in R&D spending in 2015, accounting for 22% of the industry's total research and development expenditures. The top 10 R&D ranking is shown in Figure 1.

Following Intel in the 2015 R&D ranking are Qualcomm, Samsung, Broadcom, and the world's largest wafer foundry, TSMC. The top five spenders were unchanged from 2014, but below that point, the rankings of most companies were shuffled. Micron Technology moved up to sixth in 2015, swapping positions with Toshiba, which fell to seventh in the new ranking. MediaTek went from ninth in 2014 to eighth place, while SK Hynix climbed from 12th to ninth in 2015. ST slid from eighth in 2014 to 10th in 2015, and Nvidia fell out of the top 10 to 11th place in 2015.

The top 10 in the R&D ranking collectively increased spending on research and development in 2015 by about 2% compared to the half-percent increase for total semiconductor R&D expenditures in the year. Combined R&D spending by the top 10 exceeded total expenditures by the rest of the semiconductor companies (about \$30.8 billion versus \$25.6 billion) in 2015—something that has continued to hold true since 2005 and probably well before that, according to *The 2016 McClean Report*, which becomes available in January 2016.

## Top Semiconductor R&D Spenders (Companies with ≥\$1B in Spending)

2015 Rank	2014 Rank	Company	Region	IDM	FABLESS	FOUNDRY	2014			2015			2015/2014 % Change in R&D
							Semi Sales (\$M)	R&D Exp (\$M)	R&D/Sales (%)	Semi Sales (\$M)	R&D Exp (\$M)	R&D/Sales (%)	
1	1	Intel	Americas	•			51,400	11,537	22.4%	50,494	12,128	24.0%	5%
2	2	Qualcomm	Americas		•		19,291	3,695	19.2%	16,032	3,702	23.1%	0%
3	3	Samsung	Asia-Pac	•			37,810	2,965	7.8%	41,606	3,125	7.5%	5%
4	4	Broadcom	Americas		•		8,428	2,373	28.2%	8,421	2,105	25.0%	-11%
5	5	TSMC	Asia-Pac			•	24,975	1,874	7.5%	26,439	2,068	7.8%	10%
6	7	Micron	Americas	•			16,720	1,598	9.6%	14,816	1,695	11.4%	6%
7	6	Toshiba	Japan	•			11,040	1,853	16.8%	9,734	1,655	17.0%	-11%
8	9	MediaTek	Asia-Pac		•		7,032	1,430	20.3%	6,699	1,460	21.8%	2%
9	12	SK Hynix	Asia-Pac	•			16,286	1,340	8.2%	16,917	1,421	8.4%	6%
10	8	ST	Europe	•			7,384	1,520	20.6%	6,840	1,409	20.6%	-7%
<b>Top 10 Total</b>							200,366	30,185	15.1%	197,998	30,768	15.5%	2%

Source: Company reports, IC Insights' *Strategic Reviews* database

**Figure 1**

Intel's R&D expenditures grew 5% in 2015, which is significantly below its 13% average increase in spending per year since 2010 and slightly under its 8% annual growth rate since 2001, the new report says. Underscoring the growing cost of developing new IC technologies, Intel's R&D-to-sales ratio has climbed significantly over the past 20 years. In 2010, Intel's R&D intensity level was 16.4% of revenue spent in research and development compared to 24.0% in 2015. Intel's R&D-to-sales ratios were 14.5% in 2005, 16.0% in 2000, and just 9.3% in 1995.

With worldwide semiconductor sales falling nearly 1% in 2015 to \$353.6 billion and R&D spending rising 0.5% to \$56.4 billion, the industry's R&D-to-sales ratio grew slightly to 16.0% from 15.8% in 2014. Since 2000, the semiconductor industry's annual R&D-to-revenue ratio has average 16.0%. The new *McClean Report* forecasts semiconductor R&D spending to grow about 4% in 2016 to \$58.9 billion and reach \$76.3 billion in 2020, which would represent a CAGR of 6.7% from 2015. By between 2016 and 2020, the semiconductor industry's R&D-to-revenue ratio is expected to average 16.4% compared to 16.2% in the 2011-2015 timeperiod.

### Report Details: *The 2016 McClean Report*

Additional details on semiconductor R&D spending and other technology trends within the IC industry are provided within the IC industry are provided in *The McClean Report—A Complete Analysis and Forecast of the Integrated Circuit Industry* (released in January 2016). 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 2016 edition of

*The McClean Report* is priced at \$3,890 and includes an Internet access password. A multi-user worldwide corporate license is available for \$6,890.

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