

ANALOG

Bob Swanson on why linear—and Linear—still rocks

By Junko Yoshida

CALL IT CULTLIKE, and Linear Technology won't take offense. The company's commitment to analog is all-consuming. Its hundreds of analog gurus give concrete form to the tenets espoused by its founders. And for the

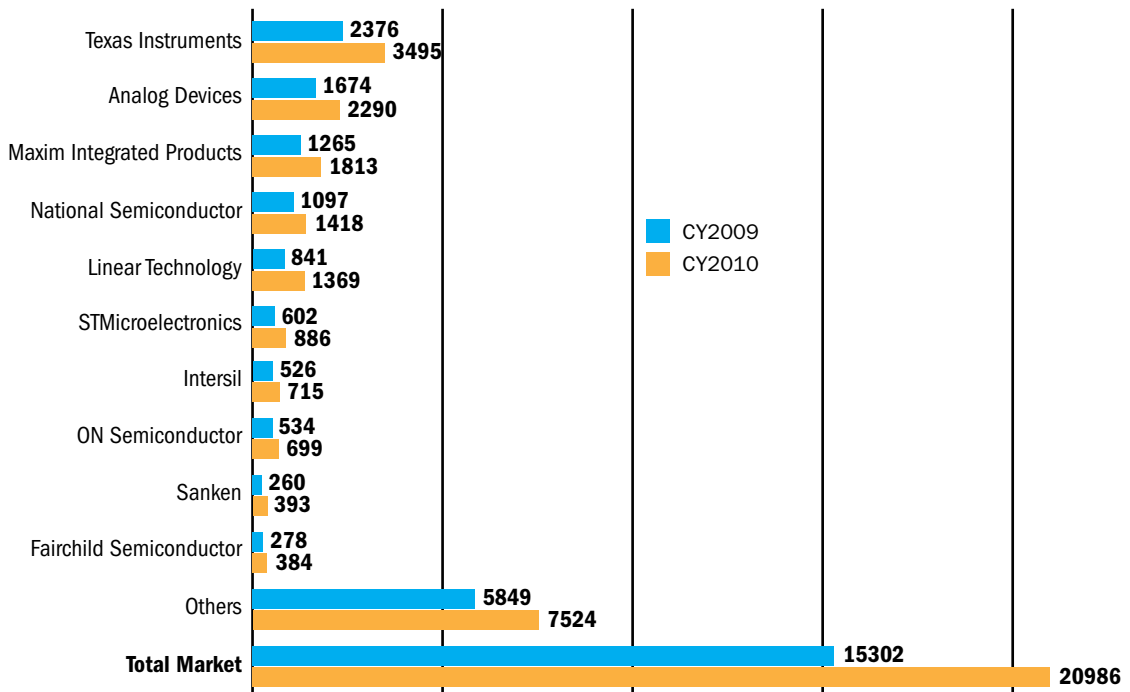
faithful who gathered at the San Jose Convention Center on Oct. 22 for Linear's 30th anniversary bash, the celebratory anthem was, "Linear Rocks."

Executive chairman Bob Swanson, who co-founded Linear in 1981 with

Bob Dobkin, was a featured speaker at the gathering. In an interview with *EE Times* before the event, Swanson said his message would be that "Linear isn't a company with a few geniuses at the core, surrounded by thousands

Market share rankings for standard analog IC suppliers, 2009-2010

Revenue, \$ millions



Source: Gartner's Annual Semiconductor Market Share Compilation, 2010, published in March 2011

of 'helpers.' This is a company with a few 'helpers,' like myself and others in the middle, surrounded by hundreds of geniuses."

It's the rare executive who publicly speaks his mind. But Swanson, who passed the CEO torch to Lothar Maier in 2005, didn't mince words during our interview, which touched on his own history, including his 30 years at Linear; the company and its competitors; and the changes that have swept the industry over the course of his career.

When Swanson and Dobkin started Linear, the so-called digital revolution was just getting under way, and digital technology was threatening to do away with all things analog. Swanson lost sleep over the thought that he'd started a company in a crowded sector—already hosting 50 or more competitors—whose best days might already be behind it.

"In the early days, I remember going into Bob [Dobkin's] office every day, asking him if the talk about the digital revolution was true. And Bob, every time, assured me that analog would not go away," Swanson recalled.

Today, nothing amuses Swanson more than an analyst or reporter who proclaims analog suddenly "hot," or a chip giant with a bloated portfolio that promises to reinvent itself as an analog powerhouse. Such pronouncements are vindication of the decisions he and Dobkin made back in 1981, when, as he put it, "all we knew was analog."

Swanson recalled the time his team did a teardown on a Hewlett-Packard lab instrument that had been touted for its digital signal processing capability. Inside the HP box, the teardown team found one DSP and 92 analog parts. By the time Swanson turned over the mantle to Maier, analog was again the industry's darling. "After 30 years, the biggest surprise for me was that the digital revolution turned out to be a friend of analog," he said.

The second surprise for Swanson—and further vindication of the choices made by Linear—was that many in the analog business today have embraced the idea of "high performance" analog.

"That was the marketing term we invented at Linear when we were developing precision analog ICs such as op

amps," Swanson said, "We had to ask ourselves what it was that we were after. We identified that we were committed to high-performance analog, and we decided to call it" what it was.

Steve Ohr, analyst for analog and power semiconductors at Gartner's Technology and Service Provider Research group, said Linear's strategy has always been "to stick with standard multimarket building blocks—amplifiers, data converters, power management ICs—but design and build the kinds of parts whose specifications (typically speed, precision and/or low power consumption) are so finely tuned that competitors find those specs difficult, if not impossible, to duplicate."

Its strategy of "skimming the very high end of the standard analog parts market" has made Linear successful and is "still valid today," Ohr added.

Rewinding the tape

Before co-founding Linear, Swanson worked for Transitron, Fairchild and National Semiconductor. "I worked for the companies when they were at their best," Swanson noted, adding that the experience had imbued him with "the spirit of winning" rather than just surviving.

In 1960, Transitron had \$60 million in sales and was the second biggest chip company, after Texas Instruments, according to Swanson. "I knew I was working for a hot company because whenever I went to a trade show, as soon as somebody noticed 'Transitron' on my name tag, he'd want to recruit me."

Several years into Swanson's tenure at Transitron, Fairchild came courting. He took Fairchild's offer, having decided that Transitron "didn't treat people right; they behaved [as if] they had an endless pool of engineers coming in to replace you."

Fairchild was "an innovative company," said Swanson, but it "wouldn't put up money fast enough to seed the growth." In 1968, as Fairchild was imploding and key personnel were leaving to found startups, Swanson landed at National, where he started out as "a manufacturing guy." After completing a tour of duty at National's fabs in Scotland and in Germany, he was put in



‘The big surprise was that the digital revolution turned out to be a friend of analog’ — Bob Swanson

charge of National’s flagship analog business. “It was an exhilarating experience,” said Swanson.

But by the late 1970s, analog was “a business to milk” at National, which had begun buying into the myth that all problems electronic would one day be solved digitally. “National started making watches, calculators and computers on a board,” Swanson said, and was “trying to take on the Japanese in memories. I didn’t like the odds.” National was also “taking on Intel in microprocessors. I didn’t like my chances there either.”

Swanson acknowledged that National’s waning interest in analog had been a factor in his decision to leave, but he also cited his disappointment with what he called the company’s “ridiculous management style.” Under a “matrix management system,” National managers had their hands on everything, but “nobody was responsible for one thing,” Swanson recalled. “They were even changing my process at a fab, driving my yield to crash.”

Swanson’s experiences at his three earlier employers have informed his management philosophy and are evident in Linear’s continued use of spe-

cialized fabrication facilities (an “unusual posture” in the fables era, Ohr noted), its emphasis on R&D investment and its commitment to its engineers.

Asked what makes Linear unique, Ohr cited its “engineering culture,” in which “individual creativity is encouraged and applauded.” And at a time when even analog companies like Inter-sil are responding to Wall Street’s prodding to dump their fabs, Ohr said, Linear’s bipolar and specialized CMOS facilities are “knobs they can turn” to extract ever more performance from such devices as “low-power 16-bit data converters with 100-MHz sampling rates; lithium-ion battery charge controllers for the automotive battery market; and the Micro-Module dc/dc converters, which provide high-current outputs for densely populated server cards.”

The Micro-Module parts, Ohr added, “address one of the sweet spots of the voltage regulator market: point-of-load converters for big computers and enterprise-level communications systems.”

Independent thinker

During Linear’s first decade, the buzz around the digital revolution made the financial community skeptical of analog. “At every analyst meeting on Wall Street, I’d spend the first 10 minutes explaining why analog was not dead, then the next 10 minutes on what the future held for Linear,” said Swanson.

He’s the first to point out that he isn’t a visionary, noting, “I didn’t have a vision for smartphones or MP3 players.” But Linear did see “the importance of portable, battery-powered products for things like medical equipment or analytical tools. This was way before portable PCs became popular.” The company capitalized on its early recognition of the significance of making standard functions more power-efficient as devices shrink and integration rises.

That’s not to say it’s all been smooth sailing. When the dotcom bubble burst in 2001, Linear’s sales sank by half, to \$500 million, triggering dramatic action to reset the company’s direction by 2005.

During that period, Linear took the

typical cost-cutting measures, but the big decision was “to unhinge ourselves from the consumer electronics business,” Swanson said. Given the CE sector’s rise in influence during the past decade, that decision might seem counterintuitive. But “what we learned is that consumer electronics manufacturers always care about price per chip; they don’t care about quality.” Put more accurately, they aren’t prepared to pay more for quality.

Say there’s consumer market demand for a complex analog chip that fits in a small space. Linear might get there first and improve its chip with each new generation, but in a few years, some competitor will field a similar chip at half the price. The race is always to the bottom, and once dragged there, “there’s no way for us to protect our IP and continue the business,” Swanson said.

So Linear left the CE market to others and refocused on the industrial and automotive segments. When the global economic crisis hit in late 2008, “we didn’t panic,” said Swanson; the com-



pany stayed the course, focusing on medium- to long-term business. By 2011, Swanson said, “we kind of made our case by maintaining a 30 percent to 40 percent profit margin.”

Between 2002 and 2010, according to Gartner numbers cited by Ohr, the compound annual growth rate of the standard analog IC market in which Linear

Sell more at lower margins, Swanson says, and 'your R&D becomes overhead that needs to be cut'

plays was 10.5 percent; Linear's CAGR was 13.1 percent.

Swanson is proud to go against Wall Street's wisdom. "We have a discipline not to take a business for the sake of growing sales," he said, adding that once you start selling more at lower margins, "you find your R&D becoming overhead that needs to be cut." Linear is the most profitable company in the analog market, said Swanson. "But we have never promised to Wall Street that we are the fastest-growing company."

Linear has also worked to keep its head count stable. "Our No. 1 goal is maintaining a healthy business," which in turn creates job security and a culture of loyalty, Swanson said.

That culture, he believes, will help

Linear battle the two-headed giant of the merged resources of Texas Instruments and National. "Innovation is not an arms race," he said. "TI may have 2,500 to 4,500 analog circuit designers now, whereas I have only 250 to 300. But at Linear, we have innovative analog designers who are truly analog gurus."

Gartner's Ohr, however, said TI's acquisition of National should be a concern for Linear. "The future of analog lies with broadline companies like Texas Instruments, with the engineering and manufacturing resources to do both standard analog and application-specific analog. This assessment includes ON Semiconductor, STMicroelectronics, even Infineon."

Further, Ohr noted, "If you don't wish to be 'big,' then you need to accept an image of yourself as a niche player, a billion-dollar-boutique."

But maybe that's what Linear wants. "We have never been committed to profitless growth," Swanson said.

If that's not a refreshing attitude, what is? ■