



Power

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*Interview with Lothar Maier
CEO of Linear Technology*

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**Ultralow-Power
Embedded Applications**

**Safe Power Supply in
Medical Apps Worldwide**

**Linear
Technology's
Products**

Drive Industry

Linear Technology's Products *Drive Industry*

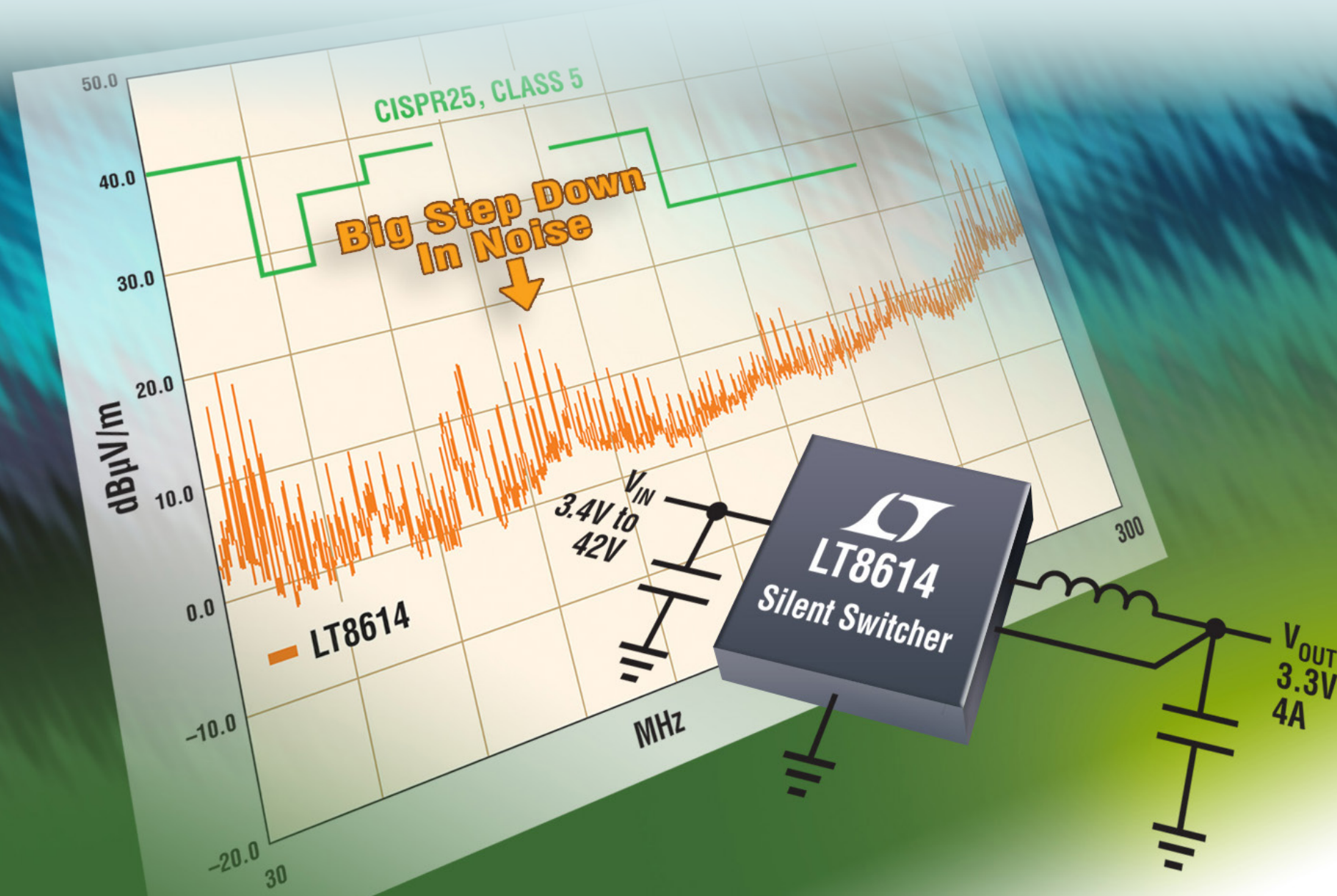


Lothar Maier
CEO of Linear Technology

Linear Technology Corporation designs, manufactures, and markets a broad line of high-performance analog integrated circuits. The company's products provide an essential bridge between the analog world and digital electronics in communications, networking, industrial, automotive, computer, medical, instrumentation, consumer, military, and aerospace systems. Linear Technology has managed to negotiate the vagary of these tech industry markets while staying committed to high-quality products.

EEWeb spoke with Lothar Maier, CEO of Linear Technology, about the company's impressive operating margin and about the evolution of automobile electronics. Maier also discussed the popularity of LTspice®.

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Linear Technology is known to have the highest operating margin in the industry. How did the company get to this point?

There is no single factor that leads to the margins that we see here at Linear. However, the most important element, from a product standpoint, is that we make new, unique products. We do not try to copy anything from our competitors or second-source another competitor's products. We come up with products that are not only technically interesting, but also compelling in terms of bringing value to the customer. This may sound easy, but is a rather tall order because it typically takes two to three years for us to develop a product. Then it takes another few years for the customer to take our product and design it into their product. We are always making decisions to develop products that customers are going to buy and find valuable five years in the future—this is tough to do, but we do it.

Another key factor that contributes to our high operating margin is product pricing. We price each product based on the value it brings to the customers, not the transistor count. Also, we recognize that we not only have to develop superior products, but we have to actually deliver them. Linear has a great industry reputation for providing products on time and with short lead times. The combination of all of these aspects results in Linear having optimal operating margins.

Which markets do you feel are the most important to target?

The best markets, historically speaking, have changed. Fifteen years ago, Linear was very concentrated in the communications market and then came the “dot-com bubble” which made that market less important. We used to have a very strong presence in consumer products with high-end analog components that were sold into digital cameras and high-functioning cellular phones. This was a significant part of our business. Around 2007, it became obvious that this consumer business, which we thought was high-performance analog, had deteriorated to just plain consumer grade. That is when we made the decision to move away from those markets and find new ones. At that time, we refocused the company on the automotive, communications, and industrial markets. That brings us to where we are today. Seven years ago, it would have seemed unwise to become so involved in the automotive and industrial markets, but these markets today have become some of the fastest-growing segments of the analog market. We believe we are in the right markets, at the right time.

What are the differences in engaging with the automotive and industrial markets as opposed to the consumer market?

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The design-in and design-out cycles are much different. In consumer markets, you can get designed in relatively quickly, so you need a treadmill of new products ready to go at any time. A few years ago, we were doing well at keeping up with the high demand of consumer products. We had great margins, and we were being designed into first-generation and second-generation devices, but it became

obvious with the third-generation products that oftentimes, cost became more important than performance. We could make products that would extend the battery life of a consumer product from 10 hours to 20 hours, but nobody was willing to pay more for that—those types of advancements were not highly valued. With the automotive market, it takes much longer to develop a product that gets designed into an automobile. We are creating designs in vehicles right now that will not show up until model-year 2018. But once the product is designed in, it's there for a long time.

In the industrial market, a product can be designed into an application for 10 to 20 years. The engineering invested into those products can be leveraged over many years, whereas in the consumer space, the product sales rise and decline quickly, and then there are no legacy sales to pay for that research and development investment.

What do you see as being the path forward for Linear, aside from automotive and industrial?

The plan for Linear over the next five years is to stay the course. We are in all the right markets, we have a huge head start, and the amount of electronics in automobiles cannot be stopped. Everything that is mechanical in a car is at some point going to become electric because this saves weight, which will ultimately improve fuel economy. Everything in a car engine that is attached to the belts will eventually become electrical. When that happens, it will become a whole new game in terms of applications because these modifications will put more demand on the internal system in the car. The command center in a car is not going to be adequate as is, so there will be more electrical components to do all of the housekeeping.

The challenge with designing for this market is that the sale of products in the automotive industry revolves around providing a part that solves a specific problem. However, as the car becomes more electrical, this becomes a suboptimal way of addressing problems. Automobile electronics are becoming

more of a system, not just a collection of mechanical components bolted together. Also, in the past, we have dealt with the suppliers to the automotive companies, and now we are dealing more closely with the car companies themselves.

Switching gears a little bit, could you talk about the philosophy behind LTspice®—why do you give it away for free, and why do you feel it is the best simulation program with integrated-circuit emphasis (SPICE) tool on the market?

The application goes back 15 years. Over the years, the original developer of our CAD tool developed the first version of LTspice®. Obviously, it is tailored to run Linear's products, but we also designed it to run some competitors' products as well. As I said before, it is one thing to provide good products, but you have to provide good service as well. LTspice® is just one of those products that hits both those marks. From an ease-of-use standpoint, it is an intuitive system, and we get much praise from our customers on the overall product. ■

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