



- Patrick Moorhead: Hi, this is Pat Moorhead and we are back for The Six Five Summit day two, talking about a topic that just warms my heart and that is semiconductors. I love semiconductors. Jim, thanks so much for coming back on the show and being back for The Six Five Summit. You've really been a wonderful fixture, walking us through the company, FPGAs, so many different things that you've brought to the table. I really appreciate it.
- Jim Anderson: Yeah, always happy to be back and always happy to chat with you, Pat. Thanks for giving me some time today. Appreciate it.
- Patrick Moorhead: Yeah, it's been incredible to chronicle the company. So you'll have been at Lattice five years in September, and it seems like just yesterday I saw you doing desktop CPUs. But no, I mean, it moves quickly and watching the companies refocus, management team, growth, I got to admit, has been really exciting. And five years ago when I went out and asked people about Lattice, like, "Who is that company?" Now, when I go out and I talk to different people like, "Oh, Lattice. Yes, yes. This is very good." So hats off to you, and I know you're going to give all the credit to your team, which-
- Jim Anderson: Yeah, I was just going to say, you beat me to it. That's exactly what I was going to say, is you know this is a team sport. This is always a team effort. I'm lucky, very, very lucky to have a great team. But honestly, I can't believe it's been five years. That five years went really fast. But I'm proud of the progress the team has made over the last five years, but we're certainly much more excited about where we're headed from here and the next five to 10 years is what we're really excited about.
- Patrick Moorhead: In one area that you have really shown the possibilities of the lowest power high performance FPGAs is on the edge. And your FPGAs seem very well suited, to address a lot of these different applications. How are you seeing this trend and what role into the future do you see FPGAs playing?
- Jim Anderson: Yeah, it's a good question. So definitely the edge is a big part of applications that we address.
- Patrick Moorhead: And real quick, when you say the edge, what does Lattice mean? What does Jim mean by the edge?
- Jim Anderson: Well, that can be different depending on the market. So for instance, in the industrial market, all sorts of industrial electronics, that could mean automation equipment in a factory. That could mean the robotics in a factory or in a warehouse. In automotive, electronics, really almost all the electronics in the auto would be considered part of the edge of the network. There could be edge devices in the computing category. Those would be kind of like client devices, PC, laptops. So it really depends on the particular market, but it really essentially is a device that's sitting at the edge of the network that's interacting with the physical world.
- Patrick Moorhead: So I'm curious, how do you see FPGAs kind of evolving in this edge play?



Jim Anderson: Well, maybe I should start with what are we seeing in terms of trends amongst our customers? Because it's really what we want is our product to be able to help our customers solve problems. So a couple of things that we're seeing that are common across our customers and actually coming across the markets that we serve is we're certainly seeing customers trying to build their systems to be as adaptable and flexible over time as possible. Because almost every customer we talk to is trying to speed up their rate and pace of innovation and to speed up that innovation. One way they can do that is they can make their hardware systems adaptable and flexible.

So if they want to change the system six or 12 months later after they've started production, they don't have to redesign all the hardware. They want to just make that flexible and adaptable. And FPGAs are a perfect fit for that because the very nature of the device allows it to be customized for their particular application and then reprogrammed and if they need that to add new features, new capabilities. So we're definitely seeing customers trying to drive a faster pace of innovation and make their systems more adaptable and future-proof. And then I would say the other trend that is pretty common across a wide set of customers is they're trying to add more intelligence, more decision making capability. They're trying to make their systems kind of aware of their surroundings and able to autonomously react to that surrounding.

And do that without a connection back into the data center because they may not be able to rely on always having a connection back to the data center. So they want those systems to be autonomous. Actually, robotics is a great example of this. We have a lot of robotics customers who're trying to make those systems autonomous. And then when they're trying to add decision making capability, variability what they're trying to add is artificial intelligence processing. And at the edge of the network, that's usually inference processing and inference algorithms just naturally mapped to FPGAs. And so we're seeing a lot of customers adopt our FPGAs for inference processing, for AI processing at the edge of the network.

Patrick Moorhead: So it's hard to generalize a market, particularly when you're looking at an edge or a set of needs. But that doesn't mean I'm not going to ask you to do this.

Jim Anderson: All that.

Patrick Moorhead: What do you see from customers and system developers? Are attributes of who they pick and how they pick them changing over the time. It seems like it would be based on how people are using FPGAs yesterday, today and what you talked a little bit about in the future.

Jim Anderson: So a few things that we're seeing in terms of what's... When we talk to customers about their system development, their system roadmap, what they're innovating on, things that are important to them. So we are always trying to make our products as flexible and adaptable, as future-proof as possible. And so that always continues to be important. But some of the other ones, power efficiency continues to be more and more important. I was just with some of our largest customers, big strategic customers last week in Europe, big industrial and automotive customers. And power efficiency was a top topic. Power efficiency because it's usually the primary design constraint of the system is the total power budget, but also for energy reasons,



for green initiatives. So power efficiency is a key... We're always focused on making our devices as power efficient as possible. And as you know, Pat, actually, Lattice has a great history around power efficiency. We've really driven innovation there for many years.

Another one is, so I mentioned the inference processing at the edge of the network. So we've been working with our customers to add into our devices specific hardware capabilities that make our devices even more efficient at doing AI and inference processing. And that's something that we see continues to be really important to customers moving forward as well. And then the other thing I would say is we're trying to make for our customers, it is absolutely as easy as possible to design Lattice chips into their systems and get to market quickly to make that process as frictionless as possible. And so we've been developing application specific solutions stacks that are for specific common usage models across our customers that make those designing Lattice solutions into the system as quick and as easy as possible. And allows those customers to get that innovation that we're offering to get that to market as quick as possible. And so we've been building out a portfolio of these application solutions stacks, and I think that's been really popular with our customers as well.

Patrick Moorhead: And Jim, are those software stacks in certain areas, certain verticals, certain use cases?

Jim Anderson: Yeah, it's not so much verticals, it's use cases. So some examples are like computer vision. We have an application stack for computer vision, and think of this as a combination of software tools, libraries, reference designs. In computer vision, we see that used across multiple different markets. Another good one is security, platform security. This is becoming more and more important to almost all of our customers, whether they're customers building servers for the data center, networking equipment for telecom or data center applications. Industrial customers are very concerned about this, making sure their industrial equipment is completely secure. So we have a solution stack for hardware platform security. We just announced a new solution stack for automotive electronics for helping our customers design our solutions into all sorts of different automotive applications. And there's about three or four others as well. So we've been building out this portfolio of those solutions stacks that, again, are focus on particular usage models of our customers. And we've got a pretty robust roadmap moving forward and plans to bring out more moving forward.

Patrick Moorhead: Yeah, Jim, I think you did a great job explaining the flexibility and adaptability that you're bringing the table, particularly when you're, your alternative might be an ASIC, right? That you just, you're not going to be able to change that design and then ASICs have a role where the standard's not going to change. You can ride that sucker for years, but there's also a time to market advantage. So can you talk a little bit about that? What do you mean by that?

Jim Anderson: Yeah, so customers are, as we said, trying to innovate as fast as possible. They're also trying to speed up their time to market. And by using a FPGA, a Lattice FPGA, basically you're using a standard product, but you're able to fully customize it for your application. And we give you the software that allows you to do that. And that can dramatically speed up your time to market versus, for instance, an ASIC development that could speed it up by a year or more.



And then again, it gives you the ability to change that, to reprogram that FPGA and change and adapt that system if the capabilities, if the features, change over time. And one example I was going to give is in artificial intelligence processing where our customers are putting inference algorithms or mapping it onto FPGAs. They know that their inference algorithm, their AI algorithm is going to evolve and change over time. And so one of the reasons that they like FPGAs is, first of all, the algorithm naturally maps onto an FPGA really well. But they know as they change the algorithm, they can just reprogram that FPGA for their new algorithm.

Patrick Moorhead: Yeah, it is amazing in this world. I mean, if I look back 30 years and looking at PPW or PPA and all the natural things that go into this, time to market has become an absolute clincher where I think it's a more mature view of the world. And I think it's funny, we see this in all as a service things. I mean, the public cloud is not cheaper than on-prem, but one of the reasons people do that is because of its flexibility and speed, the ability to get up to the speed.

And if you look at the standards, I mean last time I checked wireless standards, they change a lot, especially as you get into more Gs and more confusion. AI algorithms, it's like Azure, "Okay, which one you want to apply against that? Oh, by the way, you might want to do something different in the same device. You might not want to add a second chip. You might want to reprogram it to be able to take in that capability." And I see a lot of kind of wisdom and maturity in that. Before we get into the future, because I want to ask you about the future, Jim, and-

Jim Anderson: Of course.

Patrick Moorhead: ... really good job for seeing the future. If I look back at our conversations five years ago, what is it that Lattice knows that your competitors don't? Because the way that I look at this is your competitors are writing old designs in big geometry, in old processes, at the lower performance levels, but also in the mid-range. What do you know that they don't because you seem to be taking a vastly different approach?

Jim Anderson: Well, one of the things we've been really focused on over the past five years, and I'm actually really proud of what the team's done here, is build a tremendous amount of customer intimacy. And I think honestly, that didn't exist five years ago. We didn't have really intimate long-term roadmap discussions with our customers. And I think that's completely changed. We now with our big strategic customers, often talking about multiple generations, three, five, seven years ago. And that's helping us tune our products, design our products for exactly what our customers are looking for. And I think that that's been a big change at Lattice over the last five years, is building those really deep relationships with our big, long-term strategic customers. And I think that's helped us really drive customer-centric innovation. We've always been good at driving innovation in general, but I think really driving innovation that is specific to what our customer needs, I think we've gotten much better at that over the past years.

Patrick Moorhead: Makes a lot of sense. And listen, if I look at the charts that go on for four years forever, when you're doing quarterly earnings, they're up to the right. So I don't think anybody can argue with that approach, but I also know that you're never satisfied and your focus on the future, happy, never satisfied. Let's talk about the future. What are you most excited about when you look, and



I'm going to leave this open to choose whether it's the company, markets, technology, what are you most excited about over the next three to five years?

Jim Anderson: No, for me it's products. I mean, Pat, you and I have known each other for a long time. You know I'm a product guy. I love products.

Patrick Moorhead: And I do too. I love products too. And my analyst role gets me to see 250 different products and companies. So sorry to interrupt. I'm excited too.

Jim Anderson: So you and I are both product guys. So for me, it's always about the product. And look, Lattice is a product company, we're only as good as our product. So when I look forward five, 10 years for the company, what I'm really excited about is Lattice is going through right now the biggest product portfolio expansion we've ever done in the company's history. And actually this year, this past April, Lattice turned 40 years old. So the company's been around for four decades. And if I look at the amount of portfolio product expansion that we're driving right now, that's the biggest expansion we've ever done in our 40-year history. And actually, if you just look at the products that we have available to the customers today, either in production or that we've launched and we've given Silicon to the customer.

We have by far the strongest portfolio, the strongest set of products, well hardware and software that we've ever had in the company's history. And that's not just our opinion. I think our customers would absolutely say the same thing. They would tell you, "Pat, these are the best products we've ever seen from Lattice in its 40-year history." And so I'm really excited about that. I'm really excited about some stuff we've got on the roadmap that's not public yet, that's coming down the pipe. But for us, at the end of the day, it's all about the products and going through this huge product expansion with the team. I think that's what I'm excited about. I think it's fair to say that our customers are excited about as well.

Patrick Moorhead: Yeah. Jim, can you talk a little bit about, a little bit more about Avant, I mean...

Jim Anderson: Yeah, of course. So historically, Lattice has focused on small size FPGAs that are very, very power efficient and very easy to use. That's why Lattice is actually the highest volume FPGA maker in the world because our chips are used in so many different applications. And when we were introducing our latest small FPGA platform, which is called Nexus, when we introduced that in 2019, our customers told us, "Hey, we'd love the Nexus roadmap. We're really excited about that, but why don't you build larger capacity devices as well?" And so we kicked off an effort to do that, and that is our Avant platform, which we launched just this past December. So Avant relative to our Nexus platform increases the capacity of our devices by five X, increases our performance capabilities by 30 X, doubles, our addressable market doubles the number of applications that we can cover for our customers.

As I said, we launched that in December. By the end of this year, we'll have the first three device families launched in the market. And when we launched Avant, we showed measured competitive data. And Pat, I know you like competitive data. You and I have talked about this many times, and it's not just made up PowerPoint data, it's actual measured silicon data. And



we showed relative to competitors' devices that Avant has a up to two and a half times better power efficiency. That's two and a half X. That's not like 10 or 20%, but two and a half X better performance. And then the actual physical device size itself is up to six times smaller, which these are big advantages for our customers. These are meaningful to our customers. So we're really excited about not just the number new products that are coming out, but the competitiveness of the products is kind of off the charts, which we're really excited about.

Patrick Moorhead: So Jim, really appreciate you bringing your, well, first off, you were talking about the edge five years ago, and it's just apparent that that is where the puck is going. It doesn't mean that mega data centers and everything are not happening, they very much are. They're just operating in more of a symbiotic way. And if you really look at the history, I think as long as you and I have been working, we both seen mainframe, many clients' server, smartphones, tablets, M2M, and then IoT, and then to this glorious world of Web4.0. Where it's not necessarily about the tech, but it's about people who want to revamp transportation, warehousing, manufacturing, automotive, and all of these supportive networking that has to come in place. And that AI on the edge, that AI inferencing on the edge. I don't think we've scratched the surface yet-

Jim Anderson: I think we're just getting started.

Patrick Moorhead: ... of where we are. And one thing I really appreciate about this new generative AI buzz is that it's getting that conversation going again inside of end users on, "What am I doing with my data? How am I putting it to work? How am I getting more intelligent? How am I better serving my customers? How am I cutting costs on that?" And I feel like that's right in Lattice's bailiwick where through a few steps, my customer, of my customer, that's what you're enabling in the future. And really good time to market, particularly versus ASICs, you've kind of brought more than just a bag of parts.

You brought parts APIs, software STKs, testing environments at the table to move that forward and the ability to, "Hey, surprise, I can actually update this on the fly or when I need it." And then compared to a standard controller, I mean the low power nature of it, it's been fun to watch. So I don't normally gloat Jim, and I know you're not one who does, so I'm going to do it for you. But no, it's really exciting. The edge is very exciting and quite frankly, it's much more interesting with Lattice.

Jim Anderson: Yeah. Appreciate that, Pat. Yeah, coming up on my five-year anniversary, we're really pleased with everything we've accomplished over the last five years and really proud of the team. But like I said earlier, we're certainly much more excited about the next five, 10, 15, 20 years for Lattice. Really exciting times.

Patrick Moorhead: That's great. Thanks for coming on the show. Thanks for being part of the Summit again on this day two of semiconductors, Jim, and hopefully we'll see each other again soon.

Jim Anderson: Of course, of course. Thanks, Pat. Thanks as always for the time. I really appreciate it.



Patrick Moorhead:

This is Pat Moorhead signing off for day two of the semiconductor spotlight session here with Lattice President and CEO Jim Anderson. Tune in for some more semiconductor action. And don't forget there's day one, you can go back and peruse at your leisure, but full day two, we're talking about semiconductors and more. And then day three, we're going to be talking about some incredible innovations out there from, quite frankly, the most important executives at the most relevant companies. So stay tuned. Thanks for joining and good morning, good afternoon, goodnight, wherever you are on the planet. Take care.