

Vicor Corporation (NASDAQ:[VICR](#))

Q3 2018 Results Earnings Conference Call

October 18, 2018 5:00 PM ET

Executives

James Simms - Chief Financial Officer

Patrizio Vinciarelli - Chief Executive Officer

Dick Nagel - Chief Accounting Officer

Analysts

Quinn Bolton - Needham & Company

Alan Hicks - Ainsley Capital Management

Don McKenna - Stanton Chase International

John Dillon - D&B Capital

Peter Law – Analog Century Management

Jim Bartlett - Bartlett Investors

Operator

Very good day and welcome to the Vicor Earnings Results for the Third Quarter ended September 30, 2018. [Operator Instructions]. And now I would like to hand over to your host for today James Simms, Chief Financial Officer. Please proceed sir.

James Simms

Thank you Mark. Good afternoon everyone, and welcome to Vicor Corporation's earnings call for the third quarter of 2018. I'm Jamie Simms, CFO, and with me here in Andover are Patrizio Vinciarelli, CEO, and Dick Nagel, Chief Accounting Officer.

After the markets closed on Tuesday October 16, 2018 we issued a press release summarizing our financial results for the three and nine months period ended September 30, 2018. This press release is posted on the Investor Relations page of our website, www.vicorpower.com.

We also filed a Form 8-K on Tuesday related to the issuance of that press release. As we had completed the process of closing the quarter's financial statements we released results on Tuesday, but because we had already scheduled this conference call, we left its timing unchanged.

As always I remind listeners this conference call is being recorded and this is the copyrighted property of Vicor Corporation. I also remind you various remarks we make during this call may constitute forward-looking statements for purposes of the Safe Harbor Provisions under the Private Securities Litigation Reform Act of 1995.

Except for historical information contained in this call, the matters discussed on the call, including any statements regarding current and planned products, current and potential customers, potential market opportunities, expected events and announcements as well as forecasts sales growth, spending and profitability are forward-looking statements, involving risks and uncertainties.

In light of these risks and uncertainties, we can offer no assurance that any forward-looking statement will, in fact, proved to be correct. Actual results may differ materially from those explicitly set forth or implied by any of our remarks today. The risks and uncertainties we face are discussed in Item 1A of our 2017 Form 10-K which we filed with the SEC on March 9, 2018. Please note the information provided during this conference call is accurate only as of today Thursday, October 18, 2018. Vicor undertakes no obligation to update any statements including forward-looking statements made during this call and you should not rely upon such statements after the conclusion of this call.

A replay of today's call will be available beginning at midnight tonight through November 2, 2018. The replay dialing number is 888-286-8010 followed by the passcode 77605130. In addition a webcast replay of today's call will be available shortly on the Investor Relations page of our website.

I will start this afternoon's discussion with a review of our financial performance for the third quarter and Patrizio will follow with a few comments and take your questions.

Beginning with consolidated results, as stated in Tuesday afternoon's press release, Vicor recorded total revenue for the third quarter of \$78 million, which represented a sequential quarterly increase of 5.2% from the \$74.2 million recorded for Q2 and an increase of 37.2% over revenue recorded for the third quarter of the prior year, 2017.

On a year-to-date basis total revenue for the first nine months of this year was 28.7% higher than the level recorded for the first nine months of 2017.

Quarterly international revenue increased 2% sequentially and represented 62% of total revenue.

Turns volume, that is orders received and shipped within the quarter, was approximately 18% of third quarter revenue. Lower turns volume has been a reflection of extended lead times.

With this quarter's call we will begin providing a breakdown of revenue and bookings by legacy and advanced products. We've been working to increase the efficiency of our organization and are planning to begin reporting, with our 2018 10-K, our activities as

one business segment, rather than the three businesses (BBU, VI Chip, and Picor) we have reported to date.

Going forward, we will present results only on a consolidated basis, and product and marketing details will be provided pursuant to ASC 606, the new revenue recognition standard, in our discussion of the sources and characteristics of our revenue and through footnote disclosures.

For some time, in our filings we have characterized our products as either a “legacy” or “advanced”. Legacy products are those associated with our brick business unit, historically representing the majority of our revenue, while advanced products are more recently introduced products, reflecting advanced power conversion engines, advanced power distribution architectures, advanced control ASICs, and advanced packaging technology.

For the third quarter, legacy product revenue rose 5.5% sequentially and as a percentage of consolidated revenue was 65%, the same level as the prior quarter. Advanced product revenue increased 4.6% sequentially and on a relative basis represented 35% of total revenue.

Consolidated bookings rose 4.1% for the quarter, exceeding \$91 million and bringing total one-year backlog to \$116.1 million, a sequential increase of 12.6%. Bookings for legacy products declined 6.1% sequentially. In contrast, bookings for advanced products increased 20.6% sequentially, reflecting expansion of demand for Power-on-Package solutions, notably for AI acceleration and supercomputing applications.

We also saw incremental growth of demand for a variety of advanced ChiPs across a range of other applications.

The shift in the mix of legacy and advanced product bookings over the last year highlights the impending transition in our business. For the third quarter of 2017, a year ago, the percentages of total bookings for legacy and advanced products were 64% and 36%, respectively, but for the third quarter of 2018, these percentages were 56% and 44%, an indicator of further shift in revenue mix from legacy to advanced products for the coming quarters.

Also, listeners should keep in mind booking and delivery patterns can differ for legacy and advanced products. Legacy products generally are high mix / low volume, serving a statistical customer base of nearly 10,000 customers. Orders are generally smaller and scheduled over weeks and months, contributing to a smooth booking pattern. In contrast, advanced products are, thus far, low mix / high volume, serving a more concentrated customer base. Individual orders are generally much larger and deliveries can be scheduled over quarters. Since we are in the early stages of market penetration with many of our advanced products, particularly those ordered by OEMs and shipped to their contract manufacturers, advanced product booking patterns at any given time may be less smooth or, as I've said before, lumpy.

I'll now turn to product profitability. We achieved a milestone for Q3 in that our consolidated gross profit rose to 50% for the quarter, up from the second quarter's 48.4% and the Q3 2017 gross margin of 44.2%. This is a reflection of the scalability of our business model and, more specifically, the improving performance of the manufacturing process associated with our advanced ChiP components, which are expanding as a percentage of our total unit volume.

During the quarter, we were successful in meeting our needs for raw material inventories, despite ongoing supply chain uncertainties and long lead times. Overall, we believe our visibility has improved, but we continue to pay close attention to assuring availability of components.

The recently implemented Section 301 tariffs on Chinese imports did not have a material impact on our cost during the quarter. However, the costs going forward may not be inconsequential, given the volume of components currently sourced from China. We are seeking non-Chinese alternate vendors. In addition, we have filed requests with the U.S. government for exclusions from tariffs on a limited number of components for which no alternative vendor exists. As tariffs on Chinese imports are becoming a material percentage of our material costs, we will add a tariff surcharge to the selling price of our products until these tariffs are no longer an issue.

Turning to operating expenses, Q3's total declined sequentially 4.6%, in part because of non-recurring severance expenses incurred in Q2. On a relative basis, operating expenses again declined sequentially as a percentage of revenue, the seventh such quarterly decline, falling to 33.3% of revenue for Q3 from 36.7% for Q2 and 40.6% for Q1.

R&D expenses declined 6.2% sequentially, largely reflecting improved efficiency in the development of new products, and fell to 13.7% from 15.4% of revenue.

Sales and marketing expenses were essentially unchanged, but declined to 13.6% from 14.3% of revenue.

G&A expenses declined 10.2% largely related to lower stock compensation and personnel-related expenses and fell 6% from 7% of revenue.

Operating income rose to 16.7% of revenue for Q3, up from 11.2% of revenue for Q2.

These results are in line with the statements I made last quarter regarding spending trends. As stated then, we expect operating expenses to continue their relative decline as a percentage of revenue, while expanding on an absolute basis at low single digit percentages largely driven by compensation costs. Our long-term model is to reduce total operating expenses to 30% of revenues, as we drive gross margins towards 60%.

I'll now turn to Dick Nagel for a quick overview of our tax position.

Dick?

Dick Nagel

For the third quarter our effective tax rate was 1.7%, and we recorded a net provision of \$227,000. During last quarter's conference call we explained our perspective on the approximately \$33 million valuation allowance we had against the value of our domestic deferred tax assets at year-end. With one more quarter of positive results behind us and an outlook that remains positive, we have increasing support for the reduction or the release of this allowance.

However, management, pursuant to the requirements of ASC 740, concluded it was appropriate at quarter end to maintain the full allowance. We will assess the release of the allowance at the end of the fourth quarter.

Also note the company has been utilizing available net operating loss carry-forwards and tax credits to offset taxes due on taxable income throughout the year and, as of September 30, 2018, had consumed its federal NOL balance, leaving Federal and State R&D tax credits along with other tax credits, reserves, and other accounts as the balance of our DTAs.

If and when we decide to release the then-current valuation allowance, the amount of such release would be lower than the figure implied by our 12/31/17 balance of DTAs, other than the NOLs.

However, at the present time we cannot reasonably estimate what the balance of DTAs may be at the time of release, the amount of the allowance to be released, or the timing of the potential release.

Nevertheless, as stated last quarter, we believe it is more or likely than not we will release some portion if not all of the then-current allowance within the next three quarters.

Jamie?

James Simms

Thank you. So back to the Q3 P&L.

We recorded net income after minority interest of \$13 million, representing a 66% sequential increase in after-tax earnings. Diluted EPS totaled \$0.32, up from Q2's \$0.19 and Q1's \$0.10.

Our quarter end diluted share count was 41,124,000 shares.

Turning to the balance sheet, cash and cash equivalents sequentially increased \$14.3 million for the third quarter and ended at \$68.2 million. This increase reflects operating cash flow of \$14.3 million and \$3.4 million of proceeds from the exercise of employee stock options during the quarter offset by CapEx of \$3.2 million. On a year-to-date basis cash increased by \$24 million.

Net trade receivables were little changed for the quarter with DSOs actually declining to 41 days and no indications of portfolio risk.

Net inventories increased modestly up \$1.7 million or 4%, largely reflecting rising material and component purchases to ship our increasing backlog. Annualized inventory turns rose slightly to 3.6.

Winding up my review of the third quarter, total employee headcount as of 9/30/18 declined to 1,018 from 1,024 at the prior quarter-end, largely due to lower temporary staffing, a reflection of improved factory loading for the quarter. Total full-time employment was essentially unchanged, up two, from 972 to 974.

I'll now provide an update on our capacity expansion. The Q3 capital expenditure total of \$3.2 million does not fully capture the level of investment activity underway. We have approximately \$15 million of production equipment on order, of which \$4 million is scheduled to be placed in service during the fourth quarter. This and additional equipment to be deployed within our existing 230,000 square foot factory in Andover will increase its capacity to approximately \$500 million in annual revenue.

The next increment of capacity, from approximately this \$500 million threshold to \$750 million of revenue, will be deployed within an approximately 90,000 square foot extension of our factory to be built on land already owned by Vicor, as early as Q1, 2020.

Also, in response to the request of a large customer, we also are pursuing the possibility of establishing a manufacturing facility in Asia, possibly with an Asian partner.

Turning to our outlook, given our increased backlog and visibility into customer requirements, we are forecasting a sequential quarterly increase in consolidated revenue. This sequential increase may be relatively small pending further increases in manufacturing capacity for advanced products.

Listeners should keep the following in mind:

First, despite our planning and safety stock methodology, we remain exposed to raw material and component availability risks.

Second, we do not yet completely know what impact Section 301 import tariffs will have on near-term results.

Third, we have seen early indications that the Chinese markets may be cooling, an indirect reaction to the U.S.-China trade dispute.

And finally, our backlog, at a record high level, includes substantial deliveries in the first and second quarters of 2019, which reflects the increasing proportion of our backlog made up of orders for long-lead-time advanced products.

Accordingly, I must remind listeners, as I do each time I speak with you, our operating and financial forecasts are subject to unanticipated changes, many of which are caused

by factors and influences outside of our control. With that I'll turn the call over to Patrizio.

Patrizio Vinciarelli

As mentioned by Jamie, the third quarter 2018 was characterized by improved financial performance, notably 50% gross margins and appreciably higher profitability. These improvements reflect increasing productivity and broadening adoption of our modular power system solutions, driven by their distinctly superior performance.

In Q3, we hired a global automotive business development Vice President, Patrick Wadden, to lead sales and marketing in the automotive segment. Vicor is already supplying a high-density power system for the leading developer of Level 5 autonomous driving systems, and is developing power system solutions for other automotive applications.

With significant long-term potential for Vicor products in autonomous driving and more generally the electrification of vehicles, we've hired Patrick to expand the use of Vicor IP in the automotive 48 volt power systems market, with a mix of product sales and technology license agreements.

As always, I like to limit my prepared remarks, as I would rather answer your penetrating questions, so I will open the call.

James Simms

Mark?

Question-and-Answer Session

Operator

Thank you. [Operator Instructions] Your first question comes from the line of Quinn Bolton. Please go ahead you are live in the call.

James Simms

Hi Quinn.

Operator

Quinn, just please check you're not on mute but you are live to ask your question.

Quinn Bolton

Sorry can you hear me now?

James Simms

Yes.

Quinn Bolton

Hi, sorry about that. Hello Patrizio, hi Jamie. I wanted to start first just thank you for the color on this, both on legacy and advanced products. Obviously a lot of excitement growing around the 48-volt architectures. Do the advanced products largely or entirely consist of your 48-volt solutions or does it include other power and power delivery other than 48-volt?

Patrizio Vinciarelli

So, as of now it's primarily 48 to the point of load, but as you might have seen from the press release earlier this week, before too long it will be a mix of power delivery to the point of load and power delivery to the 48-volt bus.

Fundamentally, our strategy is to provide connectivity from the power source, whatever that may be -- high voltage DC, single-phase or three-phase, AC lines at 248 volt -- as a stepping stone to the point of load. The emphasis up to this point has been from 48 to the point of load, but we've had initial applications that leverage our advanced products soup to nuts, the power source to the load, and it is going to be more of these kinds of applications going forward.

Quinn Bolton

So I guess just a clarification there, it sounds like most of the revenue today then is from 48 volt stepping down to either 12 volt or directly to the load voltage, or is it including some of the three-phase AC to 48 volt converters that might sit sort of at the bottom of the rack?

Patrizio Vinciarelli

Well, it has involved, let's put it this way, a few millions dollars of three-phase to 48 to date, but there's going to be a lot more of that in the future. It has involved primarily, to your earlier point, 48 to the point of load, an Intel processor at 1.8 volt or an AI XPU at less than 1 volt and 100s of amperes of current draw at that low voltage, provided directly from 48 volt.

We also make and are selling, in initial quantities to a growing list of customers, bus converters that take the 48 volt down to 12 volt for intermediate bus applications and those products, themselves, are far superior, several times smaller in size and more cost-effective than alternative solutions for intermediate bus conversions, but when those products, in addition to being relevant in the datacenter space or in retrofitting 12-volt racks with advanced GPUs that are powered from 48 volt, they're also going to be seen, I think before too long, in other types application including automotive applications where the electrical infrastructure is changing.

As we all know, it's moving to 48 volt, but there are 12 volt legacy loads that are going to exist for quite some time. Those loads need to be fed at their existing operational

voltages ideally directly from a 48 volt infrastructure, without involving the heavy and expensive copper wiring that 12-volt infrastructure requires.

So part of our strategy, in summary, a special part of our strategy, is to provide connectivity from and to any intermediate voltage -- 48, 12, it doesn't matter -- so that the advantages of the technology are very comprehensively applied to each relevant load.

Quinn Bolton

Understanding it that the stepped 12-volt today just allows you to interface with some of the legacy architectures, it seems longer-term a direct conversion from 48 low voltage makes more sense.

Can you just give us some sense how Vicor is positioned against some of your leading competitors in the space -- Analog Devices, Infineon, Maxim, Monolithic Power -- in terms of the approach I think you're taking, a direct 48 volt down to the low voltage, where some of your competitors may have to do a two phase or two stage conversion with an intermediate voltage? Can you just talk about the architectures, what advantages you have relative to competitors when you look at the 48 volt space?

Thank you.

Patrizio Vinciarelli

Well, it could be a little long answer. I'll try to keep it as short as it can be in and at a high level, without getting into too much technical detail, but, to your point, the competition for 48 volt power systems has been down a number of paths, including direct 48 to the point of load. Some of the companies that you reference are on their second or third try involving, first, direct conversion, which did not work out, and then essentially, for the most part, going back to the starting point with intermediate bus architecture, where, to your point, there's an intermediate step to 12-volt, in effect a stepping stone on the way down from 48 volt infrastructures to the point of load.

There are significant handicaps that come with the two-step approach and some of them are, in effect, as fundamental as Ohm's Law. Very basic. I would say that -- and I obviously hold in extremely high regard many of the companies that you reference that have accomplished a lot of great things in their past -- but frankly, particularly semiconductor companies, they don't fully understand power.

They believe, or some of them believe, that a better switch, a better semiconductor switch like a GaN device, will provide a magic bullet to solve each and every problem. And that's really not the case, far from it, and I would say that GaN, in particular, is irrelevant at the point of load. It's irrelevant in terms of Power-on-Package solutions. It really wouldn't make any difference, even in upfront converters that provide conversion from higher voltage buses to 48 volt or from 48 volt, say, to 12 volt intermediate bus.

GaN as it stands today doesn't offer any advantage, in that it costs more money than silicon, it is still not nearly as mature as silicon, it's got a number of limitations, but most of all it doesn't really offer an appreciable, or any, efficiency advantage, if, as we do, you have the right power conversion technology and the right power distribution architecture.

So, to paraphrase a director of purchasing at one of our customers, after being asked by a person that joined the company recently, in our presence, "what is Vicor's competition," the answer was, "Vicor has no competition." And the reason why we have no competition is that we've been working at this for nearly 15 years. We have addressed all the facets of a very complex problem that again involves a lot more than a better switch, which is an element in a converter among many with many other ones providing or presenting limitations considerably more significant than the switch itself.

Let me come at it from yet another angle. As I look at one of our higher voltage converters where a relatively high voltage device such as GaN could be used, and I look at the power that we dissipate in a silicon switch that amounts to a mere fraction of 1%, so even if in that instance, the single device were replaced by perfectly ideal, mature, cost-effective GaN device, the upside in terms of reduction in loss will be negligible. But that's what a lot of the industry appears to be focused on. And I would submit, I will give you my experience in the field, that that it is a misplaced priority. There is a lot more to making high-density, high efficiency, cost-effective power converters than replacing silicon FETs with GaN FETs.

Quinn Bolton

Thank you for that.

Maybe just a quick one for Jamie. Jamie, from your prepared comments it sounds like the component availability discrete ceramic capacitors while still tight maybe incrementally getting better. Am I reading those comments correctly?

James Simms

That's correct.

Quinn Bolton

Great. Thank you.

James Simms

We're far from out of it, but we're in good shape.

Operator

Thank you. Your next question comes from the line of Alan Hicks. Please go ahead. You are live in the call.

Alan Hicks

Yes, good afternoon and congratulations on record revenues and I think it's the second highest net income quarter you ever had, but going back to gallium nitride technologies, have any of your competitors got any traction with that so far?

Patrizio Vinciarelli

None, in the power conversion field. I think there is some very minimal traction for some specialty applications, but again, we keep gauging progress with respect to GaN FETs. We benchmark them. We've done that recently again.

And it is something that's been hyped, frankly, for at least five years, and whose drive to the finish line keeps pushing out. And even when it gets there, and I've no doubt that it will get there, the impact on power conversion will be very negligible.

Alan Hicks

Okay. And then the area you talked about in the past, some of the CPUs and XPU's are coming out with very fine line width 7 nanometers to 10 nanometers. What gives you the advantage there?

Patrizio Vinciarelli

Well, so a 7 nanometer processor is fed by voltages of typically 0.6 volt, 0.7 volts. To efficiently deliver that voltage across that, in many applications now are reaching up and getting past 1,000 amperes, what you need is the unique attribute of our technology, a current multiplier. Not a device such as traditional buck converter operating from 12 volt, that takes the 12 volt and averages it down to a lower voltage. That works reasonably well when you average down from 12 volt to 1.8 volt, which is the standard voltage Intel processors operate from, largely because within those processors there is a further step down that takes place within a converter structure Intel has developed.

When you stretch that methodology all the way down to 0.6 volt, it gets that much harder. The so-called duty cycles get narrower and narrower and the dynamic performance... and I don't want to get too technical about it... Let's put it this way, the fundamental limitations to the proposition of averaging down a voltage, it's a little bit like trying to make water that is a little bit warmer than the cold water faucet by mixing it in with the hot water feed, where in effect you're trying to reach a water temperature that is closer to the cold water.

There is a much better methodology for this, which we patented and involves so-called current multipliers. They, instead of averaging down a high voltage, they divide it. And they can divide it by an arbitrary large factor. So, we have applications where we divide them by factor 48, we have other applications where we divide down by factor 64. We got so many applications we're going to be dividing down by factor 72. So, you take 48 volt or 54 volt, you divide down by 72 and you're right in the sweet spot of what the 7 nanometer processor requires.

And you get there with all of the right attributes: very fast response to low transients, very low noise characteristics such that with our Power-on-Package and our packaging technology you can integrate it within the XPU package itself or right next to it.

Alan Hicks

What point would there be a tipping point where this technology will required to enable the majority of processors?

Patrizio Vinciarelli

That point is taking place now. We just within the last six,` seven months we've been approached by half a dozen other major competitors vying for their share or the AI market opportunity. And universally they are all relying on Power-on-Package, our current multipliers, there is no GaN anywhere close to that. There is no other solution anywhere close to that.

Alan Hicks

So, there's no competitor that's even close?

Patrizio Vinciarelli

There is no competitor that's even close, because we are, I could argue, 10 years ahead of the competition. And we have really a 100 patents standing in the way of the competition. And we've been working diligently over a long time to planting a minefield for any unscrupulous competitor would want to try and chase our tracks.

Never mind the fact that there are fundamental technical challenges to doing that independently of the IP.

Alan Hicks

Okay. And on the new RFM product, how long will take that to go in to high volume production?

Patrizio Vinciarelli

Well, that's often an architectural change within the system. So, don't expect an immediate step-up in revenue. We've had a lead customer for that product. As you can see from the recent announcement, we're now broadening the offering to involve other customers, other input voltage ranges. The engagement with the first customer was for Japanese 200 volt AC mains, we've since developed broader input range capability.

By the way, we also have a whole new family of next generation technology products. Our fourth ASIC generation that will take the RFM and all these other products to yet another level of efficiency and density and cost effectiveness.

So, when it comes to RFM applications, front-end applications, I expect we're going to have some level of penetration with the RFM that's been recently announced. We're going to have much deeper penetration as we release the first 4G RFM products next year.

Alan Hicks

And then, on your announcement with hiring the manager for the automobile industry, there was a mention of licensing. Are you, do you have any prospects for licensing there?

Patrizio Vinciarelli

Yes, we've been approached by a number of parties with an interest in taking a license for certain aspects of our technology for automotive applications.

Patrick was actually at a conference in Berlin just within last couple of days. He has reported back that our NBM (or the 48 to 12 bus converter) was the talk of the show at that conference, because it represents a tremendous opportunity for eliminating wiring and simplifying and reducing the cost of the automotive systems.

So, whether it is the NBM or other products such as the Power Strip, which is a product we've developed for the complex power system of a Level 5 autonomous driving capability, our technology when it comes to automotive applications has a number of sweet spots.

Alan Hicks

So, are you in discussions already for licensing?

Patrizio Vinciarelli

Yes. We expect that these opportunities are going to expand. Obviously, hiring Patrick was a key step to a broader automotive strategy. We're going to take some time to assess all of the opportunities and prioritize our pursuits both from a product development and from a licensing / partnering opportunity perspective.

Alan Hicks

Okay. Have it both going to be automobile companies or auto parts companies or both?

Patrizio Vinciarelli

Both.

Alan Hicks

Okay, thank you very much. Congratulations on a great quarter.

Patrizio Vinciarelli

Thank you.

Operator

Thank you. Your next question comes from the line of Don McKenna. Please go ahead, you're live in the call.

Don McKenna

Hi guys, congratulations too from me. I wanted to ask you a couple of things. Jamie, first of all on the increased lead times that you were talking about with the current backlog, is that because of capacity constraints you have, or is it because some of the raw materials you've been having trouble getting.

And then the second question I wanted to ask was about the expansion. It seems like it's a turnaround from where we were three months ago with the new facility. Could you give a little more detail on that what you have your partner in Asia might be?

James Simms

Let's start with his answer.

Patrizio Vinciarelli

Okay. So, I think the first part of the answer to do with the lead and capacity constraints. So, we've had some capacity constraint within the third quarter for advanced products. No capacity constraints on legacy products. That's why we've been placing orders and starting to install additional equipment to expand that capacity.

As suggested in Jamie's prepared remarks, there's going to be a significant expansion taking place in Q4, actually next month, in November. And for the expansion taking place in Q1. This expansion in capacity for advanced products is needed to meet the forecast of demand for 2019.

So, as suggested in our prepared remarks, we are in transition from the majority of the revenues being legacy products to, come 2019, the majority of the revenues being advanced products. And we're working proactively to make sure that capacity does not stand in the way of that.

We do not let customers down, and we are very good at scaling up capacity and deploying it in time to stay ahead of demand. But the recent couple of months have been a little challenging, it's a challenge that is going to get – and we've had to add that a lot of over time, that kind of thing, to assure that we brought about the capacity that was necessary to meet the current customer needs. We're going to provide some relief with respect to that with the selection of equipment that is about to take place and then more so come the first quarter. In the second part of demand that with --.

James Simms

Real estate.

Patrizio Vinciarelli

Real estate. So yes, we have fine-tuned our strategy with respect to capacity expansion in terms of where to do it and whom to do it with. And that's come about as a result of a number of revelations. So, one has to do with the timing for breaking ground and installing capacity in a different location, away, further away from our existing manufacturing facility.

As it turns out, we have enough land to extend the existing facility to expand it and bring about nearly 50% increase in total capacity. And this is very leveraged with respect to the advanced products because, in terms of revenue per square foot, it's a much more favorable multiplier.

We've also got an input from potentially very significant customer that they would very much like to have us have a presence in Asia, for a variety of reasons. So, we stated looking at that possibility, and this is not the near term opportunity, something that will take some time to fully sort itself out and be executed upon.

We feel comfortable with the near term strategy of adding essentially 50% increment of revenue capacity as in appendix to our existing facility.

Don McKenna

Is it the idea the additional capacity of 90,000 square feet being available for first quarter 2020? Is that an indication that you will reach your \$50,000 or \$500 million, rather, capabilities at the end of 2019?

Patrizio Vinciarelli

I wouldn't draw that conclusion. I think it is an indication of the fact, as I was suggesting earlier, we want to make sure when it comes to a spending capacity with respect to brick and mortar which has got longer lead times than procuring additional equipment, that we are way ahead of our needs so that doesn't become a bottle neck. Typically purchasing and deploying additional equipment within existing walls is essentially a three to four month proposition. And obviously it takes a little longer than that to get new facilities built from the ground up.

Don McKenna

Well, thanks very much, and too congratulations on your award there recently.

Patrizio Vinciarelli

Thank you.

Operator

Thank you. Your next question comes from the line of John Dillon. Please go ahead, you're live in the call.

John Dillon

Hi, guys. Again, I want to congratulate you on a really great quarter. I love to see the gross margins up there and the cash you generated and also Patrizio on your award. That's really nice to see.

So, my first question is, has anything fundamentally changed with Vicor in the last 90 days?

Patrizio Vinciarelli

Well, I think the evidence keeps building on the major opportunity we have with respect to AI applications, as suggested earlier. There's no competition. The only way competitors looking to establish a strong competitive position powering seven nanometer processors, the only way to have a competitive solution is with our technology. So, that's something that's become abundantly clear within the last 90 days, as more and more companies that come to us, they come here or approach us, to pursue solutions for them, working with other partners, to enable advanced XPU's, sub 1 volts at 400 to 1,000 amperes.

I think that the other significant take-away in my mind within the last three months has been the validation of our fourth generation ASICs, both with the 4G PRM and the 4G VTM. We're very far along with these devices and we're making initial products with the PRM. Very close to making VTM and current multiplier products using the VTM 4G controller. These devices bring about a major advance in terms of performance, density, they eliminate a lot of the component count of earlier generation control silicon. They enable much more advanced products, including, among other things, more advanced versions of the RFM.

So, I think in my mind, those have been very significant milestones in terms of continuing to advance the state of our art. We are on track to -- we got our own version of Moore's Law. Moore's Law, which has been in effect for quite some time, so came to an end recently in terms of further advances with respect to processor technology. Our own version of Moore's Law is continuing to increase the density and efficiency of our products by about 20% every couple of years. And we keep being on track with that. And as we do that, the technological gap between Vicor and the competition gets wider, as opposed to getting narrower.

We're on that track, and our 4G silicon and the Power-on-Package technology and further advances with respect to our ChiP technology at large are continuing to build that strong competitive capability.

John Dillon

Nothing negative fundamentally has changed. All you see is positive fundamental changes and the fact that you're growing on your market. You're tracking newer customers and you're accelerating into the AI world. That's what I think I'm hearing. Is that right?

Patrizio Vinciarelli

And let me mention one more thing: the cost effectiveness. In many products, take the NBM as an example, we have by far the lowest cost structure than any competitive product. Not only are we 1/3rd the size but -- perhaps not surprisingly, being 1/3rd the size, we're not quite 1/3rd the cost -- but we're substantially lower cost than any competitive alternative.

John Dillon

That's just great to hear because I know long time in the past you used to always have the technology superiority but not always the lowest cost. So, that's really good to hear.

Patrizio Vinciarelli

Well, you might have heard me in the past saying that and it remains true that superior technology is not just superior in terms of efficiency, density, fast response, low noise. Last but not least, it's got to be superior in terms of cost.

So, when competitors say we are two or three times the cost, they're looking at Vicor from 10 years ago. They're either oblivious or purposefully ignoring the realities of today.

John Dillon

You mentioned in the preannouncement and you had a nice answer to that about GaN converters and all. But what I was wondering, has their claims with lower cost and GaN parts, has that effected your wins in the lower power CPUs that you power?

For example, the Intel chips operate, like you said, on a 1.8 volts instead of 0.7, are they starting to pick up traction in those wins or is that still consistent with you?

Patrizio Vinciarelli

Well, so they have all the traction in those wins up to the point in time in which we successfully penetrated some of that business. To be clear, and I suggested this in answer to an earlier question, our competitive advantage at 0.6 volt, that is for the AI processors, is, in one way of looking at it, several times greater than it is a 1.8 volts.

John Dillon

Right.

Patrizio Vinciarelli

So, I don't expect that our competitive position at 1.8 volt which is where Intel processors have been and may continue to be, may or may not, time will tell, that's not our strong suit, our strong suit is in powering directly 7 nanometer nodes. And doing so, whether or not competitors take an intermediate step to 12 volt.

John Dillon

Right. But you're not losing any of your Intel business?

Patrizio Vinciarelli

No.

John Dillon

Okay. So, is there any reason in the world why your company would be valued at 40% less than it was 90 days ago. Can you think of --?

Patrizio Vinciarelli

I'm not going to answer that question. I cannot think of a reason but...

John Dillon

Okay, I can't either. You didn't really talk about bookings?

Patrizio Vinciarelli

Yes, other than the general market malaise. We're all mindful of what's been going on in general. But there is no company-specific rationale whatsoever.

John Dillon

There's no fundamental reason, there's no changes or anything that would fundamentally affect you?

Patrizio Vinciarelli

I think that – our strength is growing. I can tell you that there isn't a recognized player in the either CPU space or GPU or general XPU space that is not talking to us or coming to visit us to pursue opportunities for Vicor to give them a competitive advantage.

Nobody wants to be handicapped, as ultimately the issue from the perspective of these companies is what's going to help them win against their competitors. They are very smart, right. There wouldn't be wanting to handicap their competitive stance by following a crowd that has failed to provide the level of advances in power system density, efficiency, flexibility, Power-on-Package technology, that these systems require in order to achieve a level of performance that get some more ahead of their competitors.

John Dillon

Right. You enable a higher performance computer, so of course that's something, right?

Patrizio Vinciarelli

We do. And we enable a higher performance GPU, and we're going to be enabling a lot of higher performance ASICs.

John Dillon

And if you wanted to, you can convert your designs to GaN also, correct, again but you don't need to?

Patrizio Vinciarelli

We have actually benchmarked that. We periodically do that, and there is no benefit.

John Dillon

No benefit, got you.

Patrizio Vinciarelli

There is a cost penalty.

John Dillon

Got you, cost penalty. One last question on bookings this quarter. Are they still on track, do you think you're still maybe about the same. Booking were, are that you saw last quarter?

Patrizio Vinciarelli

I'm not going to stick my neck out with respect to that. I think that we've obviously been building up the backlog. The backlog has expanded greatly. As suggested by Jamie in his prepared remarks, we see the revenues picking up at a modest rate this quarter and we'll have to wait and see with respect to the bookings.

But generally speaking as I look --.

John Dillon

I imagine some companies prime that pumped in and gave you a pretty good bookings upfront?

Patrizio Vinciarelli

Let me put it this way. As we look, you might recall me saying several quarters ago that we need to get past the stagnation of a long timeframe in which we're building up our

technological capability, but we have not translated yet in design wins and revenue growth.

And I think I mentioned back then that the key milestone was to get past or to the \$300 million level as a yearly run rate. That would open up more opportunities. It would signify the kind of traction and more widespread adoption that we're now seeing. And I think that's coming through just as expected.

By the way, in the past I think many companies has some level of hesitation with respect to doing business with Vicor and to do with the fact that we were viewed as a supplier of specialty product, a niche player that would be sort of a supplier of last resort if you needed to have higher performance.

That old perception has changed, has continued to change. Again, the calculus now is along the lines I outlined a little while ago. Vicor is gaining traction, Vicor is getting to critical mass. I've got a lot more to lose from not doing business with Vicor than the other way around.

John Dillon

Congratulations. It's really an amazing quarter and looking forward to the future. Thank you.

Patrizio Vinciarelli

Thank you.

Operator

Thank you. Your next question comes from the line of Peter Law. Please go ahead, you're live in the call.

Peter Law

Hi, thank you for taking the question. So, we're [inaudible] confusing you could say, we thought your release related to the Nvidia V100 cards which we understand are 12 volt and are plugging into 12 volt servers, but you are selling a 48 volt product. So, how does that work?

Patrizio Vinciarelli

Well, there is no claim whatsoever that we have taken all the business of any one customer. So, we don't mention any customer's names. You can imagine that any customer undergoing a transition from 12 to 48 may for a variety of reasons continue to develop some products at 12 volt.

This is not an all or none proposition, it's a progressive series of steps, whether the customer you mentioned or any other customer. I have no doubt whatsoever that before

too long it's going to be 48 volt. It's so going to be 48 volt in the datacenter space, it's going to be 48 volt in automotive.

Peter Law

Okay. So, if in the card or the product plugging into a 12 volt server then it will not use your product, but if it's going into a 48 volt server, then they would use your product. Is that fair?

Patrizio Vinciarelli

Not necessarily. Because well we also do with the NBM and we're going to be doing with more products of that kind. These are bi-directional converters that can convert 48 to 12 and convert 12 to 48. So, whether it's a datacenter requirement with a 12 volt infrastructure where a 48 volt GPU needs to be powered from 12 volt and a NBM can convert 12 to 48 to power the 48 workload, or as I suggested earlier, the automotive application, where there is an opportunity use a 48 volt battery, get rid of the 12 volt battery, instead of distributing 12 volt with heavy gauge wire, distribute 48 volt and then power a legacy 12 volt load with an NBM, we can go either way.

And fundamentally we got the best of all solutions from 48 volt direct to point of load. We also have with the NBM by far the best, highest performance, size, density, and lowest cost solution for either converting 48 to 12 for converting 12 to 48.

Peter Law

Okay. Can you give us a little more color or feel for what your ASP is for would be a total solution to you deliver power from the wall to the CPU, how much content do you have either in a number or a relative versus a more traditional product?

Patrizio Vinciarelli

Well, for competitive reasons I'm not going to mention a specific number, and obviously the number is so much dependent on the particular opportunities, volume, the revenue opportunity, and the margin opportunity as a function of revenue level that we want to achieve, but I'll go back to my earlier statement which is both in front end conversion and in point of load conversion we have the lowest cost card.

If you measure the cost of our building blocks in terms of cents per watt or cents per amp, we have the lowest cost card. The technology enables the lowest cost solution. It is densest and with that it's got less of everything that factors into the cost of the products. It's got less silicon. It's got less copper. It's got less PC board. It's got less of a packaging cost.

Now the delivery of these is to some degree dependent on volume, right, because we've had an infrastructure that we've been paying for which needs to be amortized over larger volumes. So our costs and with that the margins get better as the volume goes up, and as that happens we obviously want to leverage the reduction in cost to offer

more competitive pricing to our customers to make it more attractive for them to adopt the solution. I'm not saying that today we are selling in every application at the lowest cents per watt or the lowest cents per amp. We don't. We sell to some degree on value, but I'm saying that the cost structure of our engines and everything that goes into it is inherently the lowest cost.

Peter Law

Gotcha. Earlier in the call you talked about Chinese markets are cooling. Can you provide more color on that, what segments of the Chinese market is cooling? Are you seeing cooling anywhere else in any other geography U.S., Europe? Is it more industrial focus, server focus, datacenter focused? When did the cooling start also, please?

Patrizio Vinciarelli

So there's been some cooling taking place over the last several months.

Let me answer it this way. Getting power semiconductors FETs -- I'm not talking about GaN FETs, now I'm talking about good old silicon FETs -- getting FETs months ago it was a lot harder than as it is today. Getting ceramic capacitors several months ago was a lot harder than it is today. And that's symptomatic of the fact that the strains on the supply lines have eased, I think considerably, over the last several months.

I mean frankly from our perspective, this is a good thing. We would not want to be constrained by the availability of the components. There is plenty of opportunity for growth next year and the year after that. We don't need the most robust Chinese economy or the most robust global economy for us to deliver growth. So this environment is perfectly fine for us. I think frankly we had some level concern with respect to the component pipeline months ago and in some instances we had to pay premium prices for some of these components. So that's no longer the case. So much less of a case today.

Peter Law

Are you seeing a cooling in your own business, on probably more on the legacy side versus the advanced?

Patrizio Vinciarelli

Well, so bookings last quarter were sequentially lower for bricks in the prior quarter. And Jamie gave you some quantitative measures that I think bricks bookings declined by what percentage? It was 5% or 6% down from the prior quarter.

James Simms

It's also after a very, very strong first half.

Patrizio Vinciarelli

Yes, but it declined. However, the advanced products bookings went up I think by slightly over 20%.

So and that's really indicative of the general point that I was focused on, which is when you look at cooling Chinese economy or global demand for electronic products, and you correlate it to a legacy product which is a mature product where there is not going to be growth, right, we recognized therefore a long time ago that it's good for the bricks to hold essentially level revenues in a normal environment, well those products, guess what, they're going to be affected by a cooling Chinese economy, a cooling global economy, but when it comes to the advanced products the much bigger driver there is the traction with new customers and new applications that dwarfs the temperature already economy, right, because that's a second order effect.

Peter Law

Of course. Within that 6% decline in bookings can you isolate it to an end market? Is it server, is it auto, industrial?

Patrizio Vinciarelli

So, we sell bricks into a diverse set of customer applications, from transportation to industrial applications to some communications applications. I mean these are products mentioned in the prepared remarks that are sold to something of the order of 10,000 customers, so they're a good barometer of the general state of demand, and I think they are -- that 6% reduction from Q2 to Q3 is itself indicative, independent of the other indicators having to do with the components we use, caps and FETs, of a cooling economy, but again that's got to be contrasted with the significant growth in advanced products, which has got really nothing to do with a warming or cooling economy. It's got everything to do with traction with new customers and new applications.

Peter Law

Yes. Of course. Thank you.

Patrizio Vinciarelli

Thank you. If there's one more question we'll take it.

Operator

Thank you so much.

And the next question is coming from the line of Jim Bartlett, please proceed.

Jim Bartlett

Could you give us an idea when you see significant impact and let's say made by the halves of various things first of all on the NBM second with the RFM products and third with this is interrelated if you're on new 4G?

Patrizio Vinciarelli

Okay. So we see a significant growth in revenues next year from AI applications. I will put that at the top of the list that you just referenced. So MCD, MCMs, point of load solutions they're going to drive significant growth next year. The NBM has got design wins, a large multiplicity of design wins, but it would rank below that, the level of opportunity with point to load, the 48 volt direct to load solutions, in the near term.

Now in automotive, and longer-term with legacy 12 volt buses, the NBM has got tremendous opportunity, but because of the architectural changes that relate to that I think it's going to take time to fully develop. And a similar comment would apply to the RFM.

So 4G is going to start shipping in volume to customers in the second half of 2019. It's going to drive much further advances in performance and cost effectiveness of all of these building blocks. It's a control system that is universally applicable to high voltage buses, it could be a 1000 volts, 800 volts, or it can be 0.6 volt, it doesn't matter. We've got in a control system with 4G capability, the wherewithal to address them all and do so with extremely high performance and cost effectiveness. But, if you were to ask specifically, what is the revenue that is earmarked to 4G, that's going to start in second half of next year, and in terms of being a significant share of the business, it will have to be 2020.

Jim Bartlett

And again I was confused on the front end part of it with RFM products where does that start to have a significant impact?

Patrizio Vinciarelli

Well, so there's going to be significant RFM business, but on a lesser scale than the other two. Yes, we rank them again point of load way ahead of the other things, NBM below that in the short term. RFM below that in the short term, but longer term, the RFM type of building block represents essentially half of the pie.

One way of looking at it is that this has many cents per watt go with taking the watts from three-phase AC to 48 volt as there is taking it from 48 volt to the point of load.

So the RFM is game-changer in terms of -- the analogy I like to use is the airline analogy. So fundamentally, the strategy is to have jumbo jets that take the payload from the source to a 48 volt bus on the way to the point of load. It can take on different directions going from 48 to the point of load, but there's a common denominator need to

take power from the worldwide AC mains, single phase, three phase, to the 48/54 volt bus that's going to be at the heart of the entire point of load infrastructure. That's particularly the case in any stationary application and, to some extent, it can also be the case in automotive applications.

Jim Bartlett

And when do you see your first automotive revenue?

Patrizio Vinciarelli

Well, we've got some de minimis automotive revenue now, but with Patrick we have a target, an initial target, of \$100 million in automotive revenues. I'm not going to mention a timeframe of that. I think certainly since he has come on board, he has commented about extreme excitement, extreme opportunity from the meetings he's had with some major companies, and I think that the timeframe in which that initial \$100 million target can be achieved, I believe, has moved in relative to his expectations before joining the company.

Jim Bartlett

Speaking of timeframes, Jamie mentioned the 30% operating cost at 60% gross margins, driving towards that. Could you give some time frame on that?

Patrizio Vinciarelli

I'm not going to get pinned down on that.

I think that we obviously, we've had some very strong progression on the operating expense reduction front. We're actually closer, setting internal target of 30% early in the year, and in our internal discussions we thought it would take longer than it has taken to close to it, lower it to 30%. I think it would be easier and faster to get to 30% of revenue expenses than to get up to 60% on margins, and to some extent that's going to be a function of how aggressive we choose to go on driving business growth. So that's the level we want to keep at our disposal with respect to driving long term dominance in the marketplace.

Jim Bartlett

Would a five year timeframe be reasonable?

Patrizio Vinciarelli

Well, so if you were to draw some kind of linear extrapolation from the progression that has taken place in the last year on initial relatively modest revenue step up from \$200 to \$250 million level to \$320 million run rate of the recent quarter, you could draw the conclusion that it could happen a lot quicker than five years. I'm not going to go there because, again, to some degree, we want to retain all the flexibility we should have with respect to driving the trade-off between revenue growth, economics of scale, and short-

term gross margin and short-term profitability. I think it's safe to say that that's a good problem to have, and we're going to drive that balance in a way that may evolve over time, depending on a variety of factors.

Jim Bartlett

Got it, I want to add my congratulations, you are spending a lot of money in developing a lot of patents and strategy and some terrific technology.

Patrizio Vinciarelli

Yes, it's only taken \$400 million and a lot of sweat, but we are I think in a much better place today. Thank you, and with that we'll look forward to talking to you in a few months. Have a good night.

Operator

Thank you very much. Ladies and gentlemen that concludes your conference call for today. Thank you for joining. You may now disconnect.