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PRESENTATION

Genevieve Cunningham - *Monolithic Power Systems - Technical Writer*

Good morning, everyone, welcome. Just a few moments before we begin, just to familiarize yourselves with some of our Safe Harbor Language. My name is Genevieve Cunningham, I work in Marketing Communications as a Marketing and Technical Writer.

And on behalf of the Company, I'm absolutely delighted to welcome you all to MPS this morning. We are very, very excited to have you here. And although I know I'm biased, I am confident that once you hear all the wonderful things that we have in store for you that you are going to be just as excited about MPS as I am.

So without further ado, I'd like to introduce the Founder and CEO of our company, Mr. Michael Hsing.

Michael Hsing - *Monolithic Power Systems - CEO*

Mr. Michael Hsing. Okay. Everybody looked too serious. Okay, let me entertain you here. Okay. First of all, okay, let's start our agenda. I think it was two years ago, two years ago, June of 2013, we had our first analyst day. Some are not here, like Quinn. At that time, we felt we have a compelling reason to say something. And that was because two, three years into the program, okay, 2010, 2013, we started, we wanted to change the Company, that's not the direction we're going. Okay, we started to focus on other things.

So two years later, two or three years later, about 2013, so we start to talk about it, okay, what's the progress? And today, I think I have another compelling reason. We are at the cross point, really MPS at the cross point. And you will see the product in the pipeline, and that will significantly change the MPS direction and also I really believe will change the industry, is a new way of doing things.

So here, I don't want to read through it, and all of these. These are the topics. Some of the items we mentioned in the last meeting, and we have a lot more actually going on. And last meeting, I can't list everything here because there's too many. I don't what you to have a take away just to take away -- my brain only can only put in three things. So there's too many.

All the items, the product line I didn't talk about it, I don't talk about today, it doesn't mean we don't do well, okay? Examples, AC to DC, we have a phenomenal growth. You can check Meera what's the latest revenue and the growth.

I think last year we had 70% growth from somewhere close to $40 million this year, okay, over $40 million. And so this all started in 2011. At that time, it only had less than $1 million, 2010, we had less than $1 million revenue, now they approach to $40 million. And so I don't talk about it, this one, okay, today there are way too many things.

So focus on the new direction. So first thing, okay, this one I already talked about it, okay, so we really talk about what's next two to three years. And some new product ideas, also based on the existing ones. And so it's more than what we thought. These are the items you'll see today, we thought about two years ago. It really will be fruitful two or three years later, one to two years later. So total time is about three to four years. We start to see and generate revenues.

And so let's get to the first thing. And I started this first, the MPM module. We announced it two years ago, and we gave you update, so let me remind you, this is the slide I showed in 2003.

And so this slide I can remember the IPO road shows, a lot of people in those are still with us from IPO road shows, okay. I showed this one, and we thought from the beginning, we want to simplify everything, everything has to be simple, and everything has to be effortless design.

And so here, we thought the die size, okay, we shrink the die size, compare this, and compare, and then we come up with this solution. And by 2013, it really feels -- is a monumental achievement. We shrink it, putting the single package.

So this was the MPM module, okay. I felt at that time, we reached to finally, we got to the name, Monolithic Power System.

And so I have a dumb sales guy to tell you, okay, I have -- engineering, heavy engineering effort, and Maurice Sciammas next one in line, okay, to present this. Then I think about it from now on, it really is so simple a product. It doesn't need engineering effort. So a lot of time it's a sales marketing effort. And so I'll let the dumb sales guy, Maurice Sciammas, he's in charge of our marketing and sales, okay. And he can give you the update and what's next.

Maurice Sciammas - *Monolithic Power Systems - SVP - Worldwide Sales & Marketing*

So I'm the dumb sales guy that's going to be presenting for you guys. Luckily, I've known Michael for 25 years and I was there in the beginning, so I understand him quite well, and I'm sure many of you do too. So let's talk about modules. I'm going to give you a brief background, what we said in 2013 and then you can kind of see where we're going to go from there.

But first, let me start with why is MPS different? Now, you might remember this before, but a module, most companies, take a little PC board, they'd put some components, and then they encapsulate it. They have a controller, you have a high side FET, low side FET, the inductor, passives, this is what everybody else pretty much does.

So back in 2013, we don't want to do what everybody else does. We always want to innovate. So what did MPS do? Well, let's see, this is the PCB, just to let you guys know. So right here, the laser pointer is -- there -- so what did we do?

After they encapsulate it, they sell it, but what did MPS do? We went ahead and used the lead frame. Now a lead frame is a standard assembly process where they do ICs, been doing for years. So MPS developed a way because we're Monolithic where we can put down the die that has the controller, the high side FET, low side FET, optimize -- that means it's a one build chip, and because of that, we have minimal components. And then we put in the inductor, and we enclose it.

This makes us have higher performance, lower cost, and much modern than what the competition can offer. So we could see all the benefits, high reliability, no noise, high efficiency, and all these is because of our monolithic structure. This was what we said back in 2013, we will redefine modules. So what does that mean?

We had a few modules back then, if you remember the chart, but since then you could see we've expanded the product line to add all the current from up to 30 amps up to 60 volts. So as we keep expanding the product line, we're going to see more and more customers.

And as you remember, the target was quite a bit of different areas, from industrial, automotive, communication server, all these different places, so this was what we said before, and what we felt back then was going to be the way of the future. So what have we done since then?

Well, this is where MPS is winning. We are actually seeing our devices go because of its size in storage applications, because of its ease of design in servers, we've seen it how fast you want to go in white goods, make it very simple. So all these places, MPS has won. We haven't offered for ramping yet, but we already won there, and this is just the beginning.

So we felt that going forward, as we get more and more customers, we're going to win more and more business.

So at the time, we had key accounts, we have a sales team, we have all over the world, so we started visiting customers and start pushing our products, and they were very receptive, and that's how we started winning all these designs. But at the same time, there's a lot of small customers that want to use our parts, but we don't have enough people. So as most of you are aware, we went ahead and find some extra channel partners.

So we have Future, Avnet, DigiKey, you're all aware of that, and these channel partners have actually start generating a lot of activities. And even like DigiKey which we just signed a few months ago, we started seeing orders already with the first few months, and we were quite surprised how fast it took there. So this is one of the benefits of this. It allows us to really get to a much broader base of customers. So what does that mean in terms of results?

Well, think of the new customers. Back in 2013, we pounded the pavement, we talked to the customers, very few customers. Then 2014, look at how fast it goes because this is when we signed the guys.

In the first half of 2015, look at where we are. This just shows that with the channel partners we've introduced, we are going to -- increase our name and basically our business going forward.

So after all of this you say, thank goodness these guys are doing great, they've got a good future. But as all of you know, at MPS, we never rest on our laurels. We always want to innovate, we want to do something new. So at the time, we revolutionized, redefined what we were going to do with modules. Now, we decided to do again, what does that mean? Well, first, let me explain to you, what are the typical design cycle that engineers go through?

So here's the dumb sales guy approach of how we actually do things. A guy wants to design a system so he has the specs, here's V in, V out, I out, when I want to ramp it up, how many power rails on the board, I want to have three devices, they're all going at different times. So I've got some specs. So I'll go to the local website, type in TI or all the other guys, MPS, and start ask on these parameters. What they do is, you type in the parameters, then it gives you a list of product that are good choices for you.

So as an engineer, I'd say, okay, is this part here, looks pretty good, let me look on the parameter, this part, okay, I'm going to chose this one. So you chose a fixed solution. And it looks pretty good, so you go, okay, there is the model, look at this beautiful graph, look at this BOM, and the schematic, layout, god I'm excited. This is what engineers do. So now, they're all excited, they go, okay, let me look at the EV board.

So you send it to this guy here, and he does some bench test, he looks at the parameters and says, okay, this device does what I think it should do. Then he designs and he lays it out on to an actual system board with everything else in there. Now this is where the problems occur.

70% of the time it's going to work, and I think even -- that's on the high side especially if you've got two or three or four chips powering up solutions because sometimes one chip will turn on before the other one, you all know I didn't have enough delay time. My frequency isn't quite right, there's some ringing.

So what usually happens is, they'll have a problem. So what do they do? They call the FAE and say, "I'm in trouble I need help." And if it's a small company they aren't even going to get the help. So what happens is they go, "Okay, let me go back do this all over again. Let me type in. Let me choose a different device. Maybe it has better characteristics. Maybe the frequency's a bit better, maybe the need soft start timing is controllable, maybe the dead time." All these things so they look at another solution and they choose that.

Now, the next IC might have a different layout. So what do they do? They repeat the process. They go through the nice curves, different Gerber file. They evaluate it, and they re-layout the board with the new solution. This will keep going a few times until they finally have a solution. And that's what happens today with every designer, every way they do things. Well, this is a very laborious method. So as Michael said earlier, we want simple solutions for people, make their lives very easy.

So that's where we're introducing something called FPPM. Field Programmable Power Module. You've heard of FPGA the gate array where at the field the customers are going to go, "Okay I've got this problem, let me get the spec right."

What MPS is going to be doing is the same thing with power modules so now wouldn't it be great to say, "The delay time is too short, I need to extend it out a little bit." Okay, click, it's extended. All this dead time is way too much, I have efficiency -- is too low. Well, let me change the right time. All these parameters can change all on the fly. Now, that will be a great thing to have. Now, does anybody have it? Well, let's see.

This is what people offer now. This is what we want to do, we want to get rid of all these checks and say, "Okay, with a few different platforms they can go up to 60 volts and 30 amps, I can go ahead and order what I want, and be able to program any parameter I want and make life very easy for everybody.

So MPS has finally developed a solution and as far as I know, we are the only one, the first one to make their lives much easier. And how do we do that? Well, you've always known about MPS technology we make the smallest, most power-efficient so we said, "Okay, let's take that. Let's put in digital. Let's put in memory, analogs, let's put everything together." And then you have a very small IC because that's the key.

You don't want to make this chip and make it so big, so expensive that nobody wants to use it because then you end up going the wrong way. But with our technology which is, you might have heard of BCD5 allows it to make it very, very small and very cost-effective. So now, we have this solution and we add the GUI. They say, "Okay, type in what you want and if it turns out you were off a little bit, you want to change the frequency, let's change the frequency. You want to change the dead time? Let's change the dead time." Same exact layouts for every chip. You don't have to relay on the board anymore and to the different chip, it's the same one.

So if you think about it now all of a sudden the engineer, all he needs to do is what to plug in. He doesn't need to relay out anything. He doesn't need to go back and do everything, he can check right on the final system board the solution. And now we have a whole family of devices with programmability. That's what this will give us. It will make all the small customers, their life much quicker, much easier to do. And that's one of the most important things because the big guys have big groups. They're worried about different things. The small guys are always left stranded where FAE can support them, hopefully that will be okay. Now, we've taken all this away.

So this is the MPS future that we're going to be introducing. All you need to do now is basically get a little I2C kit and either they could do it, plug it in here, plug into the board, or they can do it for us. We can send it to them. Either way, this poor guy here now he is either out of the job, or he has a lot more time to do something else. But this is what the future is and as Michael said, simplifies one step further from putting all the different dies to a module to making the module really easy to use. Well, MPS customizes pretty much every part for every customer very easily. So that's kind of the future trend of modules.

So now, we'll go to the next step. Well, Michael wants to interject.

Michael Hsing - *Monolithic Power Systems - CEO*

I think that here is the -- okay, when we talk about it this how we customize, customize every possible, every customer. And so when I go back to here, so okay, how do we achieve this? How do we achieve this? Okay, it's a single package because it's a module. Inside this module, our customer doesn't have to know what's inside. It's actually, we have three or four chips. It's not cost-effective, but with the current technologies not cost-effective. With the BCD5, it slightly increased the die size, it doesn't really cause to change it less than a penny or a couple of pennies from lowest current to highest current or to highest voltage.

The cost doesn't change that much so we keep putting a different die in there to cover the entire thing. So now we have one package for all of them. And now you're talking about the entire DC to DC within 30 amps below 60 volts below. It's a module. So I say this is okay, this is really a compelling things to talk about it now. The analogy, the more easy to use the FPGA now is FPPM programmable modules. Now, you think about it in the early days, okay you buy digital chip. And then you put all the digital chip, put on memories, put together become a microprocessor. And then nowadays, you cannot even buy digital chip because all integrate. And you only buy microprocessor.

And in an analog site you buy some transistors and you'll put together and then you all pull it together and become op-in. Now, you buy okay, 20 years ago, 30 years ago started no more transistor only buy op-in. And I really feel this is the time that's coming, the DC to DC module is coming in a normal design. It transcended into different levels. You don't need an engineer to figure it out what is a DC to DC. And do you want a voltage in or voltage out in a different time, different turn on time, different turn off times it's all there. So now, okay your generation, the smartest guys go to Wall Street right? And the second tier engineers ended up here and not even go further on the other chips. Nobody want to take the electrical engineering task anymore.

We need to do power supply design. I do Google Search. When they do Google Search, okay now you go through this cycle, Maurice went through it. Okay, and it will be a plug-in solution. If you want to learn about it there's a GUI in and inside of GUI is entertaining system. They will talk about how this module works. How the loop compensating, how the body parts, how the space margins, all that kinds of things we do talk about. It's more educating than rather really a design effort. And we will put this GUI in a tablet, in another app, Apple's app, okay.

You can download it and then you can design it DC to DC. That's the goal, we're going to achieve that. Okay. Thanks anyway. Excellent.

Jinghai Zhou - *Monolithic Power Systems - Applications Engineering Director*

So good morning everyone, very glad to be here to talk about Cloud Computing. Two years ago, for the analyst day meeting, I was presenting the MPS modules. And like Michael said this seem so easy, so simple to use. I don't want to be a dumb engineer so since then, I've been focusing on Cloud Computing and for the last two years I've been working with my team working very, very hard on this area. And today I'm very glad to present you guys what we have done and what the future looks like.

So what is Cloud Computing? I think everyone knows the answer. If you let me bring everybody up to 10,000 feet high and look down and see the whole world, okay, and there's so many devices. So many devices connect to the Cloud, connect with the Internet and according to the data from ABI Research, last year that number, the IOT, the Internet of Things, that number reached 15 billion devices. And can you imagine in about 5, 4, 5 years, by 2020, this number is going to exceed 40 billion. Okay, so what is the backbone of this infrastructure about this Cloud Computing? The answer is servers. It's the switch, browser, and the service.

Okay, so let's zoom in to the server and here's the very interesting graph I want to show you. Actually those two curves, the blue and red curves we already presented three years ago. If we stop right at the time 2012 that time, you look at the data for the server shipment annually it's about nine close to nine million servers every year worldwide. Then for all those servers shipped how many power IC units? How many every year consumed? So here's the number, about 100 million power ICs.

Here I want to say the definition of power IC. Power IC is not just purely a MOSFET. A simple MOSFET we don't call in power IC, it is just a FET. The power IC means you have some intelligence, have some digital circuit and some analog circuit building to that package. We define that as power

IC and that is where MPS is focusing on. And on top your full block and everybody knows the name, we have MPS, IR, Infineon and Volterra. And we notice the color is different, why is the color different? The yellow one means those are the veterans. They have been in the market for quite a long time and they prove themselves they are good in this area and MPS is green. At 2012, yes we are green, we just started and I used color green to represent we've started and we are new, we are new comers.

And since then, things changed significantly. First, Volterra is gone, Volterra does not exist anymore. And earlier this year Infineon acquired IR. Okay, so there's only two guys in the market right now focusing on this huge server business. So if we let time go until 2015, and we see this server shipment to the blue line kind of steady going up, growth. They reach about 11 million this year, however we notice the red curve jump up like rocket ships like it reached 500 million total power ICs. So 5X compared to 2012. Why?

Here's the answer. Remember I said the definition of power ICs. So at 2012, because the demand of the power, the density of the server, so every server then, server manufacturer moved to a so-called packaged discrete driver MOS approach for the power delivery instead of this discrete FETs.

So instead of just selling those controllers now we have a lot more content. Not only the controllers but also the power stage with the driver and the FETs, all packaged together. That's why the content increased so much by 5X at 2015.

So if we look at - if we understand this graph correctly, we see a rapid increase power IC needs and we have fewer suppliers that means it's a huge market for MPS.

Let me further zoom in to where we are at this point. So I want to take this opportunity to give you guys the update about design win so far. Here's the table. On the left, VR Grantley, the previous generation server platform. And also VR13 Purley platform, which is starting design right now. And on the left side, left column is the POL, EFuse and CORE/DDR. The different power rails in the server board.

Okay. Customers. Tier 1 customer. Who are Tier 1 customers? Tier 1 customers are those enterprise OEM server manufacturers. Okay, designers. Design house and manufacturers. And for Grantley server, MPS has content in Tier 1 customer with POL and electronic fuse.

And we also have core design and DDR design on quite a few Tier 2 customers.

If you noticed, I purposely put the color light green here. The light green color to present we just started, we entered the market in the Grantley server, the VR12.5 and we're not touching Tier 1 customer on the CORE in the Grantley server.

All right. Move on. We're going to Purley, which is happening right now. And we do have design win in the Tier 1 customers for CORE and DDR memory, power. And you see the light getting much greener as our roots go deeper for the Tier 1, Tier 2 customers for POL and EFuse.

So in summary, we have over 100 sockets right now. And this number is continually growing. We're very happy and also extremely busy working out for those customers.

So what's next? Let's try to zoom in. Okay. Zoom in to a real server board. It's a VR12.5 Grantley server, Grantley server. And this is a two-way server, with memory. The CPU is not plug-in, but we can clearly see all the power supply rail.

The red dots are CORE and DDR memory power. And lots of POL and EFuse like I just explained earlier. MPS have power content all over the server board. And it's a Grantley server.

So let me repeat the Grantley server IP content and cost, we presented last time. For different CPU configuration, one to four, we have different number of our IPs. And also the dollar amount increased significantly when CPU number goes up.

Going to VR13. The Purley. See the different. The number almost doubled. Why is that? Well, Intel increased the power rail need for their CPU. The CPU socket going from - come from the VR12.5 it's about 2011 pings, now it's over 3000 pings. The new CPU socket require more power and needs a CORE different power rail going to that CPU. And that increased the dollar amount and also the total number of ICs significantly.

And okay. Now the real story is why we are winning? Why we are winning? Given all these targets. All these money, dollars in the cloud. So how can we grab it? Why we are winning?

I think as engineer, the answer is very simple. Very simple. It's because of the product. Because we have very different unique product, that's why we are winning. And I can list on good features of our product. I think, given the time today, I want to focus really the core technology, the key of our product in the following few slides. So, we all understand why we are winning.

Okay. So what is it? It's a bucket. It's a bucket to put a lot of water in it. It's a bucket. Okay. I always use a bucket or a tank to present in the capacitor. So a bucket and a capacitor. A capacitor is used to store the energy and a charge. And a bucket is used to store the water. Okay? And the level of the water represent the voltage in the capacitor. So you put charge in the bucket - in the capacitor, the voltage goes up. And same thing when you put water in a bucket, the water level goes up. Okay.

And why we need a bucket? Why we use this bucket? Well, the genius invented this thing, the processors. And nowadays, the processor is so power hungry.

Let me give you an example. A typical Grantley server, it will peak, it will peak the power to over 200 watts, 200 watts in this little tiny package. And also, this number would dramatically drop down to a few watts in hundreds of nanoseconds. So they change this power level up and down so rapidly. That require a capacitor full of energy to charge to this CPU. And also, when it needs to recharge it up, everything has to be really fast and is accurate. Okay?

So what does people do? For all the existing solution, people use discrete driver MOS, discrete driver MOS. And also an analog control to the fire truck and some digital engine in it. So what is this lovely fire truck here for? Okay?

So this guy has an analog water hose here. And it's controlled by an analog valve, but you can turn this valve up and down to control the water flow into that tank, to charge the capacitor. Okay? You follow me? All right. Cool.

So this guy is working really, really hard. Because he knows there's only one valve, this analog valve, and he has to control this water level very accurately. Because this guy needs an accurate voltage for it to work properly and efficiently. Not only that. Not only the accuracy, but also the speed. It needs to be fast enough to charge this up and to deplete it when the CPU needs the power. Okay.

So imagine a big fire truck with a big hose, with analog valve, it's trying to control a small bucket on the water level up and down, accurately. How difficult it is. That's why they need, that's why all the existing solutions, they need a very sophisticated digital processor. And the so-called DSP, in this whole closed-loop system. And this guy is also working extremely, because he need to lead them to the Intel CPU what to do next. And also report back everything happened here. And he's continuously monitoring this water level, in this closed-loop system. He has to watch how well the water level is regulated. And on the same time, he needs to tell this big truck to control the analog valve. And there's only command here. Turn low and turn high. There's nothing else. It's very difficult to control this thing.

Our engineers look at this diagram and they raised a question. The question is, as I mentioned earlier, this device is very powerful. And it has a lot of brain inside. And they can do a lot of computation for you.

Why do we need it? Why do we need another sophisticated digital signal processor to do all the computing? Doing computing also consumes power, which is not efficient. And not only that, it takes time for this guy to think, to do the calculation and disclose down a response to the CPU. Okay?

I just play this. This is so fun. You see the water going up and down. It flow, right? They have to - that's what we do. Okay. The question is, what we do?

All right. So now, I'm going to spend more time to explain this. All right.

Everyone here heard about QS MOD before? Called Quantum Space Modulation? QS MOS. Okay. So the first thing we noticed here is, our bucket is smaller. Everyone, every customer love that, because that means smaller capacitor, less capacitor and save the cost. And why we can do that? Okay.

So the same CPU here. And I mentioned earlier, this one has a brain. The processor knows exactly what will come next. He knows I'm going to gear up and need more power. So I'm going to take a break. I'm going to reduce the power a little bit. He knows exactly what to do. So he will send a command to our QS MOD controller. Our QS MOD controller internally, the key is a memory-based look at the table. And that table saw all the instruction there and we know when CPU tells us go here and the QS MOD knows, the controller knows how much energy needs to deliver to that capacitor. And instead of doing this delivery in that analog way, we do it digitally. That's why the name QS MOD comes from. Okay.

So here's how we deliver the energy. We deliver the quantized energy. The droplets of water to the bucket. For example, if CPU say, "I need that much of water, okay?" And the QS MOD look at the table and say, "Okay, that translate to, for example, 10,000 droplets of water." And then, he tells his gathering hose, "Okay. Please deliver 10,000 droplets to the bucket." Okay. He says, "Yes, sir." So all the droplets goes to the bucket, precisely and very accurate. And you don't have to worry about after all those droplets delivered, where is the water level? The water level monitoring is just secondary. Okay.

So we know exactly how much energy is delivered to the outlet. That's the beauty of this QS MOD control.

We can also have a different way of delivering the droplets. We can do it very slow. And this is fast. And we can have three flows go at the same time when the CPU need speed. And we can, in the extreme case, we can turn out all these and deliver at the same time. That's what the QS MOD can do. And this is our fully integrated power device that we can do. Okay.

And I know all the questions on your face. You think, why only MPS can do that? Why the other guys cannot do it? Okay. So remember I bring everyone up to 10,000 feet? Now let's land. Let's land on our foundation. What is the foundation that MPS is built upon? As our name says, it's monolithic. So that's the technology really differentiate us from all the other vendors, competitors.

And let's take a further look at this page. I think this page will eventually explain why we can do that. The difference between MPS technology and others is just a 18-wheel truck versus array of Ferrari cars. And why is that? Here's a discrete driver MOS with three dies in one package, everyone is doing that except us.

So now, imagine. This is a big device for high current, this is a big die, it is a big die for the high side, low side and with the single driver. And for this device, you only have one control gate -- one controlled gate. So every time you want to turn on the analog valve, that's the valve, that's the gate, okay? So, it's a big device. It's like a big truck. It's very hard to accelerate and it's very hard to turn. Once your gate, that's turn on, all the valve is on and it's big, okay?

For us, we do it completely differently. So we device, sorry, we divide this device, our monolithic device into many, many small amounts of cells and we call this an Intelli-phase approach. Why it's Intelli-phase? Because we can integrate the driver, the control circuit and the protection, the sensor, everything into the power device and we divide it, for example, in this particular one, we have a total of 42 MOSFET bank and each set of banks has their individual gate control.

Get it? We have many, many small FETs and they have gate attached to each little device and they're small and they're nimble. They can turn on and off much faster than the big one, okay? That's why we -- I love this picture, we have 42 Ferraris in this little, tiny device and they can run so fast and because all the gates are nicely synchronized so they can turn at the same time like there's a marching, like a marching parade. They can move very, very nicely and fast. Although, when they work all together, it's still a big force, but they are controlled individually. That's the main reason we can do this quantum phase power delivery. We know very precisely in the very fast, very nimble and it's beautiful.

Great. On top of all this, on top of all this, we still have a very nice GUI, the computer and we later on, we're going to put it on the iPhone or iPad iOS. So everyone with this device, with the GUI, they can program our QS MOD so from now on, even for a core of PDR power design. So complicated core power design. You don't need any sort of solder iron or real work station for that. All you need to do is the computer and we use this computer

to program the lookup table to match with Intel CPU wants and when Intel migrates from one generation to another generation, we keep the Ferrari. We don't change the Ferrari if we don't need to and we can just change the program according to the CPU, the Intel spec changed and everything can be programmed in this QS MOD controller. This is our Ferrari, it's the CPU and this CPU would tell exactly what you need to do on this controller.

That's the scheme we're using by now and the customer just love this. So I have a specific customer actually in the Bay Area and what they do is they take our parts and take all the components and they build a server board somewhere in China or Taiwan. The OCM, the contract manufacturer put everything together, they power up and they say okay, everything pass. They don't do any modification on the board. They don't have to do the DCR sensing, temperature correlation, the other fix, the loop, the type three compensation, all that.

When they put our device on, it satisfies the specs and everything is done. So that's all the engineers we have been working with. They love us and I think the solution is very addictive for engineers. Once they tried, they see a demo and tried and they're so into it they say wow, they can save a lot of time. That's the beauty of the solution. This shows our effortless design process and no hardware modification, only the software modification.

So, from that, let's go -- go up again and 10,000 feet. Let's look back to the curve, the same curve, the same statement. The only difference is we're yellow. We're yellow now. We've been in this market for one generation already and at some mid-generation and now we're going to the third generation. Okay. So, we got some 1, 1.5 and 2. So, very nice. So, of course we know the market is not just ours, right? There's some big gorilla coming.

But hey, you're green. We're better. So, very exciting story and to conclude my presentation, I hope everyone enjoyed my presentation. To conclude with it, I would like to make a statement and that's a pretty big statement but I think, I truly believe that nobody can ignore us now. We are in the market and we are doing extremely well. So, next time, when you guys come back to check my -- what we have done, you'll be surprised. Thank you.

Giampaolo Marino - *Monolithic Power Systems - Product Marketing Director*

Right. I'm going to leave this statement up because like it. This is a good statement. For those of you who don't know me, my name is Giampaolo Marino, Product Marketing Director for MPS-Battery Management Solution. For those of you who know me, you probably remember that three years ago, I was presenting MPS Battery Management Strategy and let's take a look at what we have done so far over the last, probably, three years.

So back in 2012, we were right here, right? So, we were pretty small in terms of revenue but as you can see over the last three years, we've been having a very steady growth. What I have here is just some examples of some of the end markets that we're in but those are not all of it. So, we have been able to grow and to grow also very rapidly and steadily. And the reason why we've been able to grow is because we've been able to really leverage MPS state-of-the-art technology, so providing three important things -- higher level of performance, integration and very accurate current sensing. This is very important in order to be successful in battery management. So, we've done that. We've executed and you see the results.

So let me give you an example of what is an existing battery management solution today. Again, this is from a very high level. I didn't want to get in to the details but you can see, it basically comprises of three ICs, a charger IC, there's a protection IC, and then there's meter IC, the meter needs to understand state of health, the state of life of the battery and providing accurate information into the micro and so forth, the charger obviously has to provide power to the battery. And so everything, it's basically comprising this ecosystem. But the thing here is that, it's three IC right? So a solution like that has some drawbacks.

So, here I listed some of the drawbacks that we believe every customer in the space right now is actually experiencing. The first one, obviously is the battery pack configuration. It's not very flexible for speed. Right? I mean, now you had three ICs, maybe two or three different vendors, they take space. You can really compress them into like a very small solution, right? So space, obviously, is an issue.

The second one, obviously, the three ICs right? High cost, large footprint and low performance. These are no-nos for every customer out there but unfortunately, they have to accept this because there isn't better. There isn't anything that is better out there, right?

And last but not least, battery life optimization -- very poor battery life. I'm sure, many of you own a cell phone or a smartphone and the lifespan of a cell phone is dictated by something inside that is called a battery. When the battery dies, you pick that cell phone, and you basically have to replace it, right? So, which means that battery life is not optimized. There is no good communication between the charger and the meter to understand how healthy is my battery? How can I prolong the battery life? How can I avoid my battery from decaying over time so that I can basically last longer?

So I like the analogy that Jinghai actually brought up about the gorilla. So we all know that this is a space that is highly dominated by a big gorilla, right? And you probably have a good idea of who the gorilla is. But the good thing is that my gorilla is sleeping right now. And a sleeping gorilla does not feel the need to innovate, right? And this is good for us. This is good for MPS because it is actually opening up the door for opportunity for us to get in and provide a technology that is as good as the gorilla. But the difference is, we are wide awake. We are small, we are nimble, we are fast and we are hungry -- hungry for growth, right?

So let me show you where we are heading in terms of battery management solutions. Actually, we're going from a three-chip solution, right, into a single-chip solution. And this is actually -- this integration is a trend that gets over and over. For me and Michael, talk about innovation, Jinghai talked about innovation. So you have single innovation in battery management. Now, we're taking this same chip solution, we're compressing everything into a single IC. So what are the benefits of doing something like that? There are many benefits but again, in this thing, the most important, I would say, is single IC to provide a complete battery management solution, right? With low BOM costs. My customer is happy now. Like it doesn't have to use a lot of components, so I'm saving money. Great.

The second one is battery pack configuration. Now, we're providing a solution that is optimized for space and flexibility. So now, they can actually -- don't have to worry about space much more because everything is so much compact with MPS solution.

The last but not least, battery life optimization, okay? Excellent with prolonged battery life. Now, just think about it, if you had the charger and battery meter into the same ecosystem and where the charger and meter are talking to each other and understanding really the state of health and the state of life of the battery and are basically making it better. They're allowing the battery to last longer because we can actually efficiently communicate among ourselves, among our solution, right? We're providing all the information for the micro, the micro understands exactly how it has to handle the battery in order to prolong the battery life.

For me, this is actually better user experienced. Now, at the end of the day, your cell phone, hopefully, is going to last a little longer than a year or a year and a half and then you have to toss that thing away, right?

So, I can say that I kind of wanted to show you guys going forward how some of the markets that we're thinking about entering and these are new markets, where we feel that there is some pretty decent opportunity for us to get into it, okay?

So the first one is the two in one solution for notebooks. I'm sure many of you have heard a lot of hype and information about the notebook market is changing and it's changing very rapidly. Two in one solutions are widely adopted today. A good example is Microsoft, right? So, Apple then goes for the same thing. So, this is a good market for us to enter and the reason why I say this is because obviously, there is some calculation into math, it's about a $50 million market. It's pretty decent, size-wise and it's actually growing very steadily in about 5% to 6% a year.

But the good thing about this market is that it's dictating a new charged technology or a new charged implementation that is not traditional or is not as traditional as what used to be used before. Now, things are changing, right? So this change, which, is very important because I'm talking about battery management here. It's opening up new opportunity for us to get in, right? And when I say changes, I call buck/boost charging. This is the main change? Traditionally, this space, the topology was buck charging, right? And it's always been like this for many, many years. But now, suddenly, you had to change your topology into something that is called buck/boost charging, okay?

So let me show you -- let me explain what buck/boost charging is. The first example here is basically the water pump, right, because water is going to flow from higher elevation to low elevation, right? No big deal. It's nature. Water flows from high elevation to low elevation.

Translated to electricity, just think of current going from high voltages to low voltages, right? No big deal about that. And that's what we call buck charging, right? So we basically push power from high voltages to low voltages. This is what we've done traditionally in the past.

And now, boost charging, it will dictate water flowing from low elevation to high elevation, pretty challenging, isn't? Against the force of nature. And this is the same thing also with battery management. Now, suddenly, you have to basically push the voltage or current from the low voltages to high voltages, not very easy to do, okay? So this is what buck/boost charging is all about. It's really changing the traditional way of doing charging for mobile application.

So the good news is this change is also dictating higher dollar content that is actually spent among all around this solution. And customers are willing to pay and that's a good news for us because they're willing to pay more a premium for a solution that is as I had described.

And last but not the least, yes, this is high barrier of entry. This is not in a market that is easy to get into it, for any player. You really need to know how to do battery management. You really need to know the ins and outs of batter management in order to be successful in this space. We do. We have been in this space for a long time. And that has helped us to really gain knowledge and understanding of how to make things better, how to differentiate and how to really win it, right?

So that's great. It's all exciting news. But for us, the two in one solution, it's more about transitional market. We like it. But we still consider this transition. And the reason why I say so is because we believe at MPS that the future of battery management lies somewhere else, okay?

So let me show you, guys, what we think the future is. Okay, so I'll start off with this very nice photovoltaic flow diagram, okay? This is basically the way power -- it is distributed today, okay? You have high power generators, supplying power to households, okay? And then from here, power is distributed to your utilities. If you have an electric vehicle, for your electric vehicles, you have to charge overnight and so forth, right?

This is a very inefficient way of distributing power. And the reason why I say that is because these power generators are running 24-hours a day, right? And do we really need them to be on 24 hours a day and night? We basically sleep and we really need minimum amount of power to really run our utilities, maybe not, right?

So whether if we had something like that, that will store power during the day, leveraging solar technology, right, and then utilizing this power at night to basically run my utilities and shutting off these guys.

The end result is cost saving for the end user. We will have a big, big cost on our utility bill if we were to do something like that. And I'm sure there have been many announcement in this space for some of the big players and presented something like that, right? And I'm not going to mention who they are. I'm sure you know.

So power banks in electric vehicles, right, these are what we believe is the future of battery management, okay? And let me show you why. So we know that battery management content in electric vehicles and power bank solutions is increasing rapidly. The beauty is also that both solution require the same battery management implementation. Whatever goes into a big power bank solution is pretty much the same as where we're doing to an electric vehicle, okay?

Now both require the employment of many lithium ion battery cells that need to be perfectly monitored, properly stacked and measured, right? It's not easy. I'm talking about many, many, many lithium ion cells, okay? Great. Because all these will dictate a larger content of battery management solution in this space, okay?

So let me give you a much better example. Let me go ahead and take these and zoom in, okay, from a circuit point of view and show you really what that solution looks like, right? So look at it, it's a solution that looks like that. You will have -- these are basically all the lithium ion cells that need to be stacked, okay? And just imagine, in every electric vehicle or in every power bank solution, you have hundreds of those stacks, okay? Every stack for every lithium ion, you need a BMS solution, a battery management system solution, okay? It monitors the cells to make sure that it's all doing it properly.

At the end of each stack, you need the fuel gauge solution, right? This is the meter, right? The monitor is basically current in each stack and reports that information to the micro, okay? So just cut and paste this circuit 100 maybe 200 times, and you get an idea of the amount of battery management content and now each require those end solutions, right?

Roughly, 7,000 BMS, batter management solution, 96 fuel gauge for every electric vehicle and power bank. That's huge. I mean it is really big. And let me tell you why. Let me leave you guys with some facts.

Well, we know that Tesla recently announced 50 GWh in annual battery production by 2020, right? This is enough for 500,000 electric vehicles, okay? That's just Tesla, I'm not talking about the others, okay?

Now, what I like is that I like that there is roughly $2,000 of battery management content for each electric vehicles and power bank solution. That's big money. That's big, big money. And you guys see why there is $2,000 worth of content, because there are a lot of lithium ion cells requiring a lot of BMS solutions, requiring a lots of fuel gauge, right?

There are only few players in this space. We don't like to play in spaces that are crowded. We like to play in spaces that where there is competition but we still feel we can provide differentiation and we still feel that we can provide advantages, right? But today, MPS is actually very well positioned to be successful in this space. We are actually developing, for this particular solution a proprietary communication interface, right, that is going to allow us to really share information between the lithium ion cells to the BMS solution to the fuel gauge. And this is something that we're doing in-house, proprietary to us, okay?

So I do hope that by now, you do believe that this is the future of battery management because we at MPS do believe this is the right way to go.

QUESTIONS AND ANSWERS

Shekhar Pramanick - *Colombia - Analyst*

(Inaudible - microphone inaccessible)

Giampaolo Marino - *Monolithic Power Systems - Product Marketing Director*

So it's basically, a lot of prismatic lithium ion cells are bigger. That means the capacity of the cell is bigger. So the amount of BMS solution is dictated by the number of cells that they actually use. So let's say they need to use 20 cells to achieve 60 gigawatts and that is just a number. And then they will have to use 20 BMS solution. They need a BMS solution for each cell [that comes into play].

Shekhar Pramanick - *Colombia - Analyst*

And this is all (inaudible - microphone inaccessible)?

Giampaolo Marino - *Monolithic Power Systems - Product Marketing Director*

Absolutely. Absolutely. Because it's now you're getting into a lot of higher power. That's it. Thank you very much.

Genevieve Cunningham - *Monolithic Power Systems - Technical Writer*

All right. We're going to take a quick 15-minute break. So please help yourselves with some refreshments. Stretch your legs. And we will see you back at about 10:25.

(break)

PRESENTATION

Genevieve Cunningham - *Monolithic Power Systems - Technical Writer*

And we'd like to introduce Keng Ly who is going to present to you on automotive.

Keng Ly - *Monolithic Power Systems - Field Applications Engineer*

Good morning, everyone. I'm Keng Ly. I'm a Field Applications Engineer based out of Detroit. I joined MPS back in January of this year. And I've been in the automotive industry for 16 years. Prior to MPS, I was at one of the largest automotive semiconductor companies for eight years. And before that, I worked at a tier one supplier. So I pretty much grew up in the Detroit area. And automotive pretty much runs through my blood.

So the reason I joined MPS early this year is I could see a significant change in the analog and power IC and into the cars. And I saw MPS as a very fast, up and coming semiconductor competitor when I was working for the other companies. And one of the things that I see MPS doing is they're offering very unique solutions that the others aren't in automotive.

So everybody can do BCD, that's not new. But MPS is doing BCD at the highest power density levels I've ever seen. It's offering the most integration I've ever seen. We're offering the most efficient parts I've ever seen. And all this is definitely taking notice in the automotive industry.

So with that, I'll start off talking about the auto industry a little bit and then explain how MPS is growing in this industry.

So if you look at the worldwide automotive market, there are 14 major OEMs. The 14 OEMs make up about 55 vehicle brands. So for example, here in the US, General Motors is the largest OEM. They sell four vehicle brands here, Cadillac, Buick, GMC and Chevrolet. There are 88.5 million vehicles sold worldwide last year. In the US alone, there are about 16.5 million that were sold.

This year, the forecast is going to be over 17 million vehicles in the US. Perhaps we may even reach the all time high of 17.8 million which is what we've achieved in 2000.

Take a look at the automotive supply chain. There's a whole network of tier one suppliers that make all the components that go into a car. So most components we have in a car, radio, speakers, doors, windows, all that is typically designed and manufactured by tier one suppliers given to the OEMs then assemble it into a vehicle. MPS is tier two supplier in this industry. We basically enable these modules, these radios, this audio, visual nav, we make the chips by going to these modules.

And there's a bunch of other competitors also doing this. What makes us different is our size. We know we're a much smaller company than the existing players. We use that to our advantage. We're very nimble and that really helps us stay up. And I worked for the largest automotive semi-conductor company before joining MPS and so MPS moves a lot faster and can bring products to market much faster.

So if we take a look at the semiconductor value in a vehicle, how much content is there? On an average midsize car, it's about $350 worth of semiconductor content in a car. For hybrid electric vehicles, we could easily double that, $600, $700 worth of content. And for high end luxury cars, it could easily be over $1,000 worth of content in a vehicle. So a lot of semiconductor content in a car.

Breaking down that semiconductor content, it's a four different categories. We have sensors, processors, analog ICs and discrete power. MPS plays in these two areas, sensors and analog ICs. We've been known to be a very high performance analog IC company for many years. But with the acquisition of Sensima last year, we're definitely entering the sensor arena.

So this represents -- if you look at just the sensor and the analog IC portion, that's about 50% of the overall TAM. If you run the numbers, the overall semiconductor TAM for automotive is about $30 billion globally. The TAM here would be roughly $15 billion. And if we refine that even further for MPS, it's about $6 billion SAM for MPS. So a lot of potential growth.

Of course, going into automotive is not easy. I mean, not everybody wants to do automotive. There are a lot of headaches in automotive, a lot of barriers to entry in automotive. It's not easy getting in. One of the first things that we recognize is our brand recognition. We're the new guy in the block. There are a lot of players who's been here a long time. Everybody knows they're much larger companies, so brand recognition is a hurdle.

And one way we're overcoming that is our products. It sounds pretty simple, but a lot of those players I've talked to, a lot of those customers I've talked to, once they re-evaluate this product, they realize all the benefits they get with efficiency, size, cost. And that's definitely winning some customers over. And it's really establishing MPS as a high performance analog automotive semiconductor company.

These existing players -- I mean if you look at the existing players on that list, they're very well known, they've been in this industry for decades, 20, 30, 40 years have been there a long time. MPS is fairly new to this industry. But like I said, we knew our size is our advantage. Being nimble allows us to bring products to market much faster.

In automotive, things move very slow. MPS moves really fast. We can change and adapt much quicker than our competitors.

The other hurdle is qualifications and approvals. So probably more than any other industry, there's so many check box that you have to do to get into an automotive design. AEC-Q100 is just one automotive qualification standard you have to pass. And everybody does that.

But then there's also customer-specific qualifications. They'll want you to pass 3,000 hours so instead of 1,000 hours of high temperature testing or they have higher ESD requirements. So every customer has their own specific qualifications they have to do.

MPS is addressing this -- we've been extremely tenacious over the last three years. We have over 50 automotive products that we'll be qualified within a year. And we have over 1,000 design wins cumulative at automotive customers. So we're extremely aggressive in this industry. And we're doing it extremely quickly.

And then of course, commercial topics always come up. We get parts designed and engineering loves it. It passes all the test and then you get to purchasing. That's kind of the last barrier. We've never lost a socket on pricing.

We add value. So we may have a higher component cost, but we provide a lower system cost. And at the end of the day, that's what matters, is the bottom line, what is the total cost? Our products provide a better value overall.

So the next part is really looking at, well, what have we done? Where do we go? And these are all the customers and there's more than this that we've engaged with in the auto industry. We have active design wins with these customers. In a matter of three years, we've ramped up from essentially zero to these customers. And these are the tier one that supplies to the OEMs.

So if you're not familiar with the auto industry in the supply chain, you may not recognize some of the names that are on the list. So this is a list of the top 20 automotive tier one suppliers in the world. Conti is number one and you go down the list. All the green boxes there, our suppliers were engaged with. So not only are engaged with a lot of the small suppliers, but we're at the top 20 guys also.

And some other interesting things, the supply chain has been evolving. So I've been in this industry 16 years and it's constantly changing. Mergers, acquisitions, bankruptcies, you name it. I just listed a few there that's happening this year. So Magna, huge, huge company, they're selling off their interiors business to Grupo, a group of small Spanish company. That makes Grupo, again, become one of the largest interior suppliers, probably top three.

Johnson Controls, they're getting out of the auto industry. It seems like they're selling -- they sold off their electronics business to Visteon and they're looking for buyers for their seating business. And then you might have heard of the biggest merger, probably this year or last year, ZF-TRW. Those two big companies merged and they'll probably be in the top three after that merger is completely added up.

So lot's of changes. If you look at the slide 10 years ago, you would have saw Delphi and Visteon probably at the top five there. But of course, they've gone through bankruptcies over the years and things have changed a lot.

So I like this slide because this is a slide that shows all the design wins in 2012 until now. So this is really probably just the half year of 2015. So we don't have a full calendar year for 2015. But you can kind of see the history of design wins. And this is a great leading indicator because this really shows how well we're going to be doing in the future. So when we have a design wins in automotive in 2012, that means revenue typically doesn't come until two to three years later because of the design cycles in automotive.

So these design wins in 2012, we'll certainly see revenue in 2014 and '15. So design wins today, 2015, that revenue won't come until 2017, 2018. But just to kind of give you an idea of what our future looks in automotive.

I like this slide too because a lot of people who aren't familiar automotive might not understand the long design cycles in automotive. But if you start at the top and look at the car, typically a car is redesigned every five years on average. So when you design your product into a car, you're in productions for typically five years on average.

But then if you go back from that, the tier ones typically takes two years to develop their module. Design, test, validate. And then the semiconductor guys, they've taken out one to two years also to fully develop. So it's roughly a nine years cycle from beginning of the IC until the end of the IC life in a vehicle. It's a very long cycle.

But the nice thing is it's a very predictable cycle. So once you're in, you could be in for a long time. You're getting that revenue consistently for five years.

So MPS started in about 2012, qualifying automotive parts, existing parts to the AEC-Q100 qualification, design them in the parts. And those parts now, essentially are ramping up in 2015 into actual vehicles.

So one of the fundamental shift in 2013 was companies started developing new ICs dedicated for automotive. And these ICs were developed in 2013. It takes about a year to a year-and-a-half then another six months to qualify them. So maybe two years of total time. They get design in, that revenue will start coming in 2017 because that's when the vehicles will start launching.

So really with this, it's really just to tell you, automotive has a very long cycle but very predictable. And it's great for our sustained growth over longer periods. Whereas the traditional consumer application, you design in for an iPhone and then you're in there for 12 months and then the next iPhone comes out. You might not be in there. So that's pretty much like a 12-month cycle. Here, you get about a five-year cycle.

So where can MPS win in automotive? If you look at the domain in our car, you can break it down to five different domains. There's networking, infotainment, powertrain, safety and body. And MPS is really positioned in three of these -- infotainment, body and safety.

So just to give you some real examples, real applications where MPS has won already, we've got LED drivers in a lot of these lighting applications. Auto light, mirror light, fog lights, these are all LED-driven. We have our drivers in these applications.

USB charging, becoming a huge, huge application for us because pretty much every new vehicle will have some kind of USB interface to support Android Auto, Apple CarPlay and charging the devices. That's become huge. And then, of course, just general DC/DCs. We make tons of DC/DCs that go into radios, telematic systems, body control modules. So just an example of all the applications we're in today.

I mentioned this earlier. Since 2013, we have over -- we released 32 products. But we have 25 in the pipeline. So within a year, we're going to have over 50 products, automotive qualified and that's extremely fast to go in two years, have over 50 products, qualified for automotive.

So really, in summary, our strategy is working in auto. You can see from the design win numbers, you will see those in future revenue numbers. It's working. We're overcoming a lot of the barriers to entry because of our product. Everybody who has been following MPS knows size, efficiency, integration, all the benefits that monolithic IC brings.

We are small. And that's really our advantage. I worked at the big guys and they're slow. MPS moves quicker. And as you could see, we've brought over 50 products that will be automotive qualified. Nobody else has gone that fast in this amount of time.

Our culture here is extremely aggressive. I mean we see in this market a couple of years ago and the tenacity has been unbelievable. Qualifying the products from the product line perspective but also the investments in the sales in FAE. Globally, we've expanded this automotive team in Europe, Asia as well as North America. So we're extremely aggressive after this market because of the huge potential.

And lastly, value. So I said before, we may be the higher component cost, but we are lower system cost. Customers see that. We add value of our power modules. It simplifies designs. We add value with our integration, reducing component count. So customers do see the value with MPS. And we have yet to lose based on price.

So what I want to say is we've had a ton of success in the last two or three years in auto. I don't see that stopping. And the strategy is working and we'll keep executing and I know we'll definitely have more future success.

Question.

QUESTIONS AND ANSWERS

Anil Doradla - *William Blair - Analyst*

You mentioned the three key products that you already qualified for autos. Can you give us an example of maybe more products to take advantage of new products through either better efficiency or higher power, higher current.

Keng Ly - *Monolithic Power Systems - Field Applications Engineer*

Yes. A great example is USB. We have a new USB part that takes advantage of the BCD process. What people used to do in USB charging, before it took two or three chips. You'd have a power supply, USB switches, and some logic handle, all the charging, the battery charging. Then you'll see an iPhone attached or Samsung phone attached. So we've taken all three of those ICs and integrated into a single IC. And that's really a new part that will be released within the next six months.

So that's one example where it's really taken advantage of this BCD process, integrating all these, taking three chips to one. And what that allows the automakers or the auto suppliers to do is really shrink their form factor. So what we're seeing is more USB ports. Now you have an maybe one or two in your car and it's typically on the front side of the console. You plug your phone in and that's great.

We're seeing it go towards -- there's going to be four or five USB ports, right. Before, you used to have cigarette lighter adapters in your cars, 12-volt cigarette light adapters, one in the front, one in the back and maybe one in the rear for tailgating. Those are being replaced with essentially USB ports. So now you might have four or five USB ports on the car, two in the front, two in the rear. Everyone can plug in their phone or tablet.

And with USB PD coming, that could eventually replace the 12-volt cigarette lighter adapter socket completely because now you're talking about a standard that can deliver up to 100 watts power, which is -- now you can power laptops and TVs and things like that. So USB is a huge growth and our technology is perfect for these types of applications.

Any other questions? All right, thank you very much.

PRESENTATION

Michael Hsing - *Monolithic Power Systems - CEO*

Well, we'll have a Q&A session a little later, okay. And also, you can raise your hand, shout at me or something. If I lose you.

The next thing is a new $2 billion expansion. And Keng talked about automotive, the $6 billion. But I'm more excited about this thing because I'm personally attached to it. I'm involved heavily into this design and into this development. And I see this is the future for our expand, it's something very new.

And the first question is, what's in common? And probably now my big mouth already leaked out everything else. But this, I figure you get it wrong. A lot of people said it's a motor, right? It's a motor driver. But if I have to, that's half right.

And really if you move something in today's world, all motor. All relate to electrical motors or gasoline motors. And all of these, all of these pictures relate to motion, position control. So that's what this one is. Not only the motor drivers and its position control.

So what's the requirement? Faster. What does it mean faster? For the robots, like a very good example is if you want to swing the robot on as fast as you can and no overshoot, no undershoot, at the right position. And so you are faster, accurate, less power, of course, and then no design effort.

And here is a revolution concept. The early days, our dumb sales guy say that it's a revolution motor. I don't call it revolution. I never use that word, revolution, in the entire MPS. I think this is first time I use it. And we call it e.Motion. It's a small e.

So what is this? It's really a sensor, plus power, plus software. I think the early -- we talk about software and power. We talk about a power, integrated power. And you see the early presentation were more into the software. And now this time we add a sensor.

So this is first time we deviate something not related to power supply. Of course we did LED lighting, in the early days with some audio chip. So this is not quite related to a power supply. But this really has nothing to do with a power supply anymore, and the first time when we wandered out outside our segment.

So what does this e.Motion apply to? So I draw in that example or that's a typical solution. They have a motor, they have a gear. And typically, the motor comes with a Hall sensor or brushless motor drive and a Hall sensor. And if you want to talk about a very accurate position control, so you need optical sensor or optical encoders. And arguably -- to use optical encoders, you don't have to use a Hall sensor but the Hall sensor comes with them already. That's a traditional event. Also, you need DSPs and discrete power drivers, all that, to drive this thing.

So this is current market. That's what they do. And I'll give you examples. So this is a servo motor. The servo motors, you have little gears and then electronics and your little motor drivers. These ones typically you find it in the refrigerators, they control the airflow. You want to cool it down the refrigerator side, you open the valve from a freezer.

And then also these ones -- I'm going to bring examples from a remote airplane. Remote control toy airplane it control the air, control the weather, they control these ones. So that's the position. These are not very accurate but there's some position controls.

And the next example is a seat position from your car. And what this thing does is it's a motor and these are axles and these have a gear on it. And there's a big giant screw, a nut. When you spin this thing, it moves this nut going by back and forth. And that's how you move your feet. You will rise your feet, you will move forward, you lean back. There's all these configurations. And your feet, they also need a memory. And now you push that button, it memorizes your seat position.

So what does it mean is that you have memorized this position. So how you remember this position is how many turns. So in automotive, it's still pretty rough, how many turns. If you have a fine teeth here, it's off the turns, doesn't really matter. And it's still relatively same position. But

automotives, it's still very accurate, plus-minus 20 degrees or so. And so that's an application. That's one of the application. Every seat, you have like three to four motors in it.

And also, the other one is a windshield wiper. And you can use that one too. So a lot of car applications. And fuel pumps, electrical fuel pumps. I'm just mentioning all these things occurred to me now. These are servo motor for industrial use and these are for conveyor belts. And then when you use, you signal the belt, whatever the things you do, you carry stuff, they have to know what exactly position is. The driver motor, they don't know the position.

So that's kind of the market segment we address to it. So how does it work, all these existing ones? So this is a diagram for a DC motor. We have some gear and then you have a position recognition and then you have a position sensor which sense how you're driving a motor. And then it feeds back into some kind of drive systems in there.

And so what is optical system? What do we replace with them? I'll give it away what we replace with it. And break me if you don't understand it. Optical encoder is a concept with a optical device. You have a LED shining through this wheel. This allow a little slot in it. So I'll give you example. This is a very expensive one.

And very coarse slot can be like this. For eight slot, it's 360 degree divide by about 40, 45 degree accuracy. And so when the lights are blocked by this one, I don't receive light. Now it turns on when it shines through it, detects it by count. So how many counts? So this example, it give you lots of slot.

And the most expensive one is like a few hundred dollars. And these are laser-cut. There's 10,000 slots on the wheel. So when the thing spins and the LED is shining through it at the other side, it detects a pulse. So you have a pulse come out. This is a lot more accurate. You have a differential pulse come out through the count circuit.

So it counts how many pulses. This is a simple one. If you have 300 pulses or 300 slot and when it spins, you count to 360 pulses, so 1 degree each. It's an optical device with some kind of slot in it. So the expensive ones well over $100. And this is the wheel and this is the electronics. And the cheaper one is something like this. You have sensors and the receivers and the wheel spins in the middle of it and you read the signal. So that's the encoder here.

And you have three Hall sensors. And this arguably, if you have the encoder, you don't need this. But that's how they do it now. And so in the motor drivers, only have three. So accuracy is 120 degrees. And if you want to drive a motor accurate without taking about motion control, we're just driving a motor have a user based on the three Hall sensors. And then your arrow of detecting the rotor is 120 degrees. There's no way you can drive it. You need a DSP to do it.

To detect where the rotor is, the best we can do, the calculation prediction is somewhere between 7 to 10 degrees. So when you're adding a power to a rotor, you waste a lot of power. So a simple example is a swing. The easiest way you're adding a power is when the swing comes to the rest. Then you push it. If you're off by a few degrees or you're pushing against it, then -- so all the brushless motors is being driven that way. They call a lot of pulse ripples.

And, yes, I'm talking about this, only motor. And so that's how they've done for that now. You also need a digital processor and discrete powers. That's existing solution if we dissect it. And here's what we do. We don't need it. We don't need this. We don't need this. Of course we don't need that one.

And this is applicable and it's really size-related. If you need a lot of torque, arguably we can use a flat motor to drive it. And other ones we can use to gear down. Because you use a gear down, you can use this size. So what we come up with this solution is this. No Hall sensor, no encoder, no DSPs, a lot more efficient. Thirty percent is a very conservative number.

And below 150 watts, even I think maybe that's too much. If it's enclosed into the motor, power has to be greatly reduced. If it's outside, 150 watts is a single chip. And greater than 150 watts, of course you have to use a discrete power device.

And that was the wrong picture. That was a car in there okay, whatever. So that will replace all of these. I said earlier, if there's a way to enclose it inside and here is -- e.Motion is a platform. And when Maurice talk about a platform, it's a solution. It's not a single chip anymore. So this is a similar way. We talk about how you program this thing and also integrate the motor driver.

There's no more external component. You can put it inside. That's where we're winning all these market, all these small motors. And our customers put it into the end of the motor. And a lot of it in the medical area, insulin pump, that kind of thing. And other one is the server motor for semi equipment. So this is a small magnet that is enclosed inside or you can just use outside. Put it outside the discrete.

So what is the trick? What's the trick? So I don't give entire credit to Sensima. We acquired -- how many people -- four people company and two PhD students from EPFL from Switzerland to work on this solution for six years. So when I met them, they tell me exactly these pictures, what is this. And I'll just show you when I see it first.

So what is this? It's a Hall sensor. It's just a simple dumb Hall sensor. And you can buy it in a very cheap, dirty ones. You can buy it expensive, the Hall sensors. So what this sensor is, when they apply voltage, measure the current, current changes according to magnetic field. That's the Hall sensor here. Same thing the magnetic fields. If I lose you, just ask me, okay.

So the same thing, vertical field and a horizontal field. And you only sense in one direction and you can't sense the other way. So what they do is that -- look at this. They put all of them. This is actually a simplified diagram. They use a software to control each contact. And when they spin it and it detects the position -- so they spin it around 2 million turns a second. So they put all these Hall sensors in, integrate it, and that's really difficult.

I'm in the semiconductor physics, the device side. What they really did is turn the Hall sensors sideways. That's where the difficulty is. Nobody else did it before. They turned it sideways, they calibrate it. Very, very difficult to do. And they used just a genius algorithm to calibrate this one. They put it all together then made all these sensors. That's how they do this thing. That's the Sensima technology.

I saw this one and said we got to have it. We've got to have the company. And there's other magnetic sensors that try to replace the optical encoder. Other company, just a few of them, AMS, but it's all German companies. And they do that kind of thing. But the accuracy is far less because they never turned the Hall sensors sideways. We can integrate a whole lot of them in there.

Go ahead.

QUESTIONS AND ANSWERS

Anil Doradla - *William Blair - Analyst*

These were some sensing devices, right?

Michael Hsing - *Monolithic Power Systems - CEO*

Yes.

Anil Doradla - *William Blair - Analyst*

Some material could be some magnetic --

Michael Hsing - *Monolithic Power Systems - CEO*

No. It's semiconductor.

Anil Doradla - *William Blair - Analyst*

Okay, so there's some piece of semiconductor.

Michael Hsing - *Monolithic Power Systems - CEO*

Yes.

Anil Doradla - *William Blair - Analyst*

But when you have all these grooves in the circle, how many grooves do they have to create? I mean, are we talking about --

Michael Hsing - *Monolithic Power Systems - CEO*

These grooves actually not many, okay. The real inside, I think that will have like 6,428 grooves.

Anil Doradla - *William Blair - Analyst*

So you've got 6,400 of these.

Michael Hsing - *Monolithic Power Systems - CEO*

Yes.

Anil Doradla - *William Blair - Analyst*

But you're talking about what the accuracy -- when you use the word 2 million --

Michael Hsing - *Monolithic Power Systems - CEO*

Turns. You spin that. You spin that.

Anil Doradla - *William Blair - Analyst*

So this is a magnetic spin or a physical spin you're talking about?

Michael Hsing - *Monolithic Power Systems - CEO*

No, it's electronic.

Anil Doradla - *William Blair - Analyst*

Electronic, right.

Michael Hsing - *Monolithic Power Systems - CEO*

Okay, I go back to the first page. Remember this? We apply voltage, measure current, right? So we apply this voltage, it spin around this voltage in a different contact. You spin around 2 million turns a second, 2 million is the same how you're measuring it. Every time you move, you really measure it. And you measure the position. So the rotor, the motor, it doesn't spin that fast. Two thousand turns, any thousand turns, the motor will be very, very high speed. And compare 2 million turns, it's nothing.

So we have a lot of samples for sensing the rotor. We can talk about the accuracy later. We're down to 0.2 degree accuracy with 80,000 rpm.

Anil Doradla - *William Blair - Analyst*

Versus competition which would be what? 5 degree?

Michael Hsing - *Monolithic Power Systems - CEO*

Yes. They couldn't even do it, this one. So optical sensors dominated everything. Optical sensors, they have a capability of doing that.

Anil Doradla - *William Blair - Analyst*

You're saying you're 50 to 100 times more accurate than competition --

Michael Hsing - *Monolithic Power Systems - CEO*

Yes, absolutely, yes. And also, we can sense in a different way.

Anil Doradla - *William Blair - Analyst*

So this cutting point between a brushless technology and brush technology, does this basically expand the whole brushless SAMstem?

Michael Hsing - *Monolithic Power Systems - CEO*

Absolutely. I don't want to talk about that one. This is the replace optically in these things. But there's a low end of a market. All the brush motor, why use a brush motor? Because it's cheap and because they can sense the rotor position. So what they do is that they use a brush, a physical brush on the axles. And that's to energize the rotor. When you spin into one position, you energize it and then you know where the rotor position is. And that's the brush.

So what's the problem with a brush? It creates a lot of sparks when that thing is moving, right? And you have a brush on it. And that wastes a lot of energy. And the second thing, it's a lifetime. And you need to take that brush away and replace it. And then that's probably most, about 80%, 90% of the motors are brush motors.

And now, I want to have a -- the other one is noisy. The brush motor is very noisy. Very noisy in terms of the noise you hear and also in terms of the electrical noise. You radiate all these sparks. And sometimes you have to use a brush motor and now you use a brush for the Hall sensor, the three Hall sensor. And the very accurate ones use 12 sensors. That's the highest that I ever see it. Twelve sensors, 360 degrees divided by 12, you still have a huge gap.

So our technology, this Sensima technology, you will replace all of these but you can have integrated drivers with them, with this sensor. Every motor can turn into a brushless motor.

Okay, go ahead. Yes.

Anil Doradla - *William Blair - Analyst*

There are people in this who have worked on kind of sensor based technologies, right?

Michael Hsing - *Monolithic Power Systems - CEO*

Yes, yes.

Anil Doradla - *William Blair - Analyst*

So what you're talking about is clearly a lot more accurate, the scope is greater. But there are players who have been working on the sensor technology. Is this a fair way to look at it?

Michael Hsing - *Monolithic Power Systems - CEO*

Yes. But there is no way -- not even close, there's no way they can replace optical encoder. It's a fine, a very accurate optical encoder. Because if you're off a few degrees, you'll cause a lot of pulse ripple.

Anil Doradla - *William Blair - Analyst*

Those sensor-based technologies, they use a concept similar to this or do they use different --

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Michael Hsing - *Monolithic Power Systems - CEO*

They still use Hall sensors but it's very different. And they don't use this kind of -- I said that earlier, so you have Hall sensors that is sideways. And we did integrate it from a vertical. That's why can put multiple sensors. It's fundamentally different in there.

And we can talk about it this way. In the printer, people use -- who want to cut cost. And they want to use a brushless motor or use a brush motor. And when they spin the motor, they still don't know where the motor is. And they have to put a DSP in it, to tackle it. And also they put in very cheap encoders. These are encoders off by 20, 30 degrees. In between that, they do a calculation. They calculate down to about 2 degrees. They use a gear, 1 to 10 ratio reduction, so down to 0.2 degrees. That's how they achieve it.

Yes, okay. We can move on to the next. Yes.

Brett Rosenbaum - *Adage Capital - Analyst*

How many dollars can you get for --

Michael Hsing - *Monolithic Power Systems - CEO*

I can answer you later. Okay, how many dollars? So the question is how many dollars we're -- yes. The price is very huge. To replace something, call it a dollar cost. We are very poor and probably, arguably, less than a dollar. These kind of things, it's $0.50 or $1. And you replace optical encoders and other ones, you replace a few hundred dollars encoders.

So that's the kind of market segment we're really addressing -- we really address towards.

Brett Rosenbaum - *Adage Capital - Analyst*

Can you give us like five examples where this is going in?

Michael Hsing - *Monolithic Power Systems - CEO*

Five examples? I give you. Hold that. If I'm just -- okay, you can ask me again. I think we have a slide. So how do we do it? Okay, this is the width of a hair. And we put together in a MPS algorithm. And you can use the integrated drivers or discrete and that's to address this market segment. So this is how our chip works. So other advantage, I think that's related to what we see earlier and it's very easy to use. Really the goal is no more these lab work.

Our product, you put it in -- we give you a board and you can hook up your motor. And you even can characterize you motor, your load, where you're swinging it. We know exactly what's the speed and what's the current input, voltage input. You have a lot of kickback current coming from the motors. And so we can characterize your entire load. Everything is programmable and we have a demo today. The good news, we have a demo so we can demonstrate all these RPMs, how do we control it. So you can see it, if we control 2,000 RPM plus-minus 0.2%. Only it can be done by optical encoder. And even with the optical encoders, it's difficult to drive the motors. In my knowledge, it's not achievable.

And then the other one is that you can tell, you think 60 turns plus 21 degrees, and what's the overshoot? Less than a degree. You can also diversify this one and it will automatically calculate if it's being in a position spot. Of course it can't done by optical encoders, this one. Okay, so all of these we integrate into the one chip. We call it a platform. This chip can be programmed in different ways to address in a different motor as long as your motor spins.

And how slow, how fast? Okay, it really doesn't matter. See, the encoders, if you do slow speed, very difficult; very, very difficult. If it's less than 1 rpm, they have a difficult time and they have to use a software to address that.

So what are the opportunities? This is a car, $30 and even for security camera you have a security link, control the focus and move around. And move around may not need it because a human feeds back this one. It may not need position sensors. We just need -- because your people control it and need a brushless motor. And zoom is definitely -- you need position controls. And these are intelligent robots. We see a lot, these things coming, the intelligent robot, elevators.

The elevators, they use optical encoders. And they're really shining the laser through it with a different part. If something dirty blocks it. Then you don't read. They put multiple of these as a redundant. It's in every elevators. This is a magnetic sensing. But you can safely use other magnetic sensing that can do it too. But this is a very simple yes or no. And I have printers. That's probably the largest market segment. We'll get into it.

And what's surprising is sewing machines -- industrial sewing machines or even consumer sewing machines. And now they're using a mechanical as a sink or to sink the needles. So the way is very difficult. It's been traditional things for hundreds of years, for at least 100 years. And there is no way not to use the mechanical sink or the mechanical linkage.

Now, with the MPS products, you put a motor in every joint. You can move the needle, control it. That's how the people are telling us -- hey, we can use that. And it's cheap and it's small, so that's all the -- yes.

Shekhar Pramanick - *Colombia - Analyst*

(Inaudible - microphone inaccessible) device?

Michael Hsing - *Monolithic Power Systems - CEO*

Existing, yes.

Shekhar Pramanick - *Colombia - Analyst*

Yes. Do they go to like a heterogeneous all or nothing type of -- or do they use that for certain parts of each?

Michael Hsing - *Monolithic Power Systems - CEO*

The certain parts of each. Like if you use a robot and if you move a arm, you move, you have a motion and you have a position. That's a homogenous. Okay, it had to be combined. And for some other applications like in elevators, you don't. You don't move anything. And it's just a sensor. And security cameras, I talk about it. If you have a zoom, you definitely use a sensor with a motor driver. But you do a sweeping the camera, then you have to use a motor driver. And I can go on.

Okay, yes, this one is a good example, in a drone. Drone is just a motor driver. But angle need position controls. And I can go on. In surgical robots and also conveyor belt. In order to assemble you use a conveyor belt, so all of these.

I'll go back to the first one. So we believe it's more than $2 billion. And I'm more excited -- I see it. I see this coming, all the robots. You have a farm -- you have strawberry pick. And then you build a little car. You have a robot and it can recognize size of the strawberry and how ripe the strawberry is. It's a very simple algorithm. They can write it, they have a pattern recognition, right? I see a whole lot of these things coming. Okay, go ahead.

Brett Rosenbaum - *Adage Capital - Analyst*

Michael, just two questions. The first question is I assume that this technology will be used mainly for new products. I mean you talked about all the applications. I don't even want to strip out the optical encoders and your solutions in there, so it will be for new ones. The second question is, this is obviously something that you and the Sensima team and probably someone who hired you need to work on, but what's the current infrastructure of this business? Do you have already someone who's going to be running it or --?

Michael Hsing - *Monolithic Power Systems - CEO*

You mean the MPS?

Brett Rosenbaum - *Adage Capital - Analyst*

Exactly, the business unit -- because obviously it's a bit different from what you currently are doing.

Michael Hsing - *Monolithic Power Systems - CEO*

Yes, yes, okay. Now, we'll let Sensima run it. The head of Sensima is two PhDs and developed these things. And one German guy, also a PhD, joined about a year and a half before we acquired them. And he is from Philips. And he run a large organization -- this medium-sized organization. And

so far, he is one of our product line. And also MPS has a motor driver. MPS has a motor segment. And so we have both teams running all together. And Sensima's team is more focused on the sensor side. And we have a motor, so now we joined together to these new things.

And so I think both teams, we don't divided the revenue yet. But ultimately, we will. These are accountable numbers. And the other thing, so your first part of the question, yes, it's an ecosystem they made up for the brush motors, the brushless motors, and also position control with encoders. It is an ecosystem. They already have it.

Brett Rosenbaum - *Adage Capital - Analyst*

(Inaudible - microphone inaccessible).

Michael Hsing - *Monolithic Power Systems - CEO*

No, content for MPS.

Brett Rosenbaum - *Adage Capital - Analyst*

Okay. So how do we convert from the motors and the sensors to the data content? So for example, take transporters, seven motors and three to seven sensors, if this thing you convert to one or how many modules to convert to for your own to get to --?

Michael Hsing - *Monolithic Power Systems - CEO*

No, it's not a motor, it's a chip. Okay, these are platform chips. Okay, I give you that. Okay, if the price varies all over the place -- the price will vary all over the place. There is no way you can get $20,000 with the same price as a printer. They pay more. So the larger the market, the more cost-competitive.

And if you use the printer as an example, so they were calculating what -- first thing, the first order they would take -- well, okay, this is good. Then they would say -- okay, hey, we're going to replace this into that. Okay, replace encoders, replace all these, even do a direct drive. And that the larger the market segment is, the slower they move because the whole manufacturing, they base on that. But they see the value. So they will pick a few motors in the design. It will take them a couple years. If you're talking about printers, only two companies or three companies occupy probably 90% of our market segment.

And let me finish, okay? And when you introduce these are our products, they all will jump on it. And potentially, you increase the paper feeding, the printing speed by 10 times. They'll recognize that. So they start to do one model or two models. So that's it. Yes.

Brett Rosenbaum - *Adage Capital - Analyst*

It seems like position and accuracy control -- position control and accuracy is more of a major development here. And then thinking about it that way, should we think about the sensor replacement as one for one or does it depend on the application? Your chip to how many sensors you're showing for these applications?

Michael Hsing - *Monolithic Power Systems - CEO*

Yes. Here's what I mean. The sensors, either a magnetic sensor or the optical sensors, that's what I'm talking about here. And so far, if you need a position control and reasonable position controls -- by the way, all the magnetic sensors, the IP sensors are way expensive. Very, very expensive. And so people see optical. Most see optical. I can get it down to below a dollar. And they still use it. And they use a DSP. DSP is cheap.

And so, here is what I said. You have a motor and just use a car. Like just an example. You have 10 motors. Our product, we can adjust 10 motors. These 10 motors, five of them use encoders on it. Other ones are not. There's other position, there's 20 sensors. The 15 sensors doesn't require motor. Most of the Sensima are focused on that.

Quinn Bolton - *Needham - Analyst*

Who are the big brushless motor companies in the world?

Michael Hsing - *Monolithic Power Systems - CEO*

You have --

Quinn Bolton - *Needham - Analyst*

I think they will be your customers, right?

Michael Hsing - *Monolithic Power Systems - CEO*

Yes, Nidec.

Quinn Bolton - *Needham - Analyst*

Nidec?

Michael Hsing - *Monolithic Power Systems - CEO*

Yes. All right. Nidec. Okay.

Quinn Bolton - *Needham - Analyst*

Mabuchi?

Michael Hsing - *Monolithic Power Systems - CEO*

Mabuchi is a little high end and that's smaller. Okay. And we have Minebea.

Quinn Bolton - *Needham - Analyst*

Okay.

Michael Hsing - *Monolithic Power Systems - CEO*

We have many German companies. And our board member is one of them, the highest in the Swiss motor, the Maxon Motor. And he is the first to introduce us to Sensima. And they are about $400 million companies, this highest quality motors. Okay.

Quinn Bolton - *Needham - Analyst*

Some of them you're working with right now, which companies --?

Michael Hsing - *Monolithic Power Systems - CEO*

We work with them, with everybody. And I visit all these customers.

Okay. Okay. Meera.

PRESENTATION

Meera Rao - *Monolithic Power Systems - CFO*

Thanks, Michael. So what I want to talk about right now is the economics of success, because you've heard a lot about products and market. But before I do that, I know one of the questions many of you have on your mind is, what's happening in the current quarter? What's happening with the macro? Are we going to revise our guidance? So before I get to anything else, I just want to take that off the table. So I know my audience, I guess.

So here's the update, right. This is what we talked about at the beginning of the quarter, right. This is what we said we'd be able to do. And remember, we have a track record of giving guidance that we feel comfortable that we can hit. There's only been two times in our history that we've ever had to revise our guidance negatively. And this is not one of the quarters.

So what we've done is basically, we have more confidence in the numbers. Obviously, there are two and a half months through the quarter. So we left some of the metrics the same but the ones that matter the most, revenue, we believe, it's going to be in the $90 million to $92 million range. Gross margin, 54.9% to 55.3%. And R&D and SG&A non-GAAP would be about $26 to $26.6.

So we do want to say that yes, we did see some macro weakness in the quarter, but we had allowed for that to happen when we gave the guidance that we did. So at this point, I'd say these are the numbers that we'd expect to be in this range. This narrower range, I guess, of guidance. And with that, I'm just going to move on to what I really want to talk about.

And then say, we heard all about these products and markets. So if you think about it, everything that we have done actually means that we have growth that's much stronger than that of our competitors. If you remember, we started on our transformation back in 2010, but then we started talking about it with the street, I'd say, late 2011. So for me, it always matters, how are we doing versus what we talked about.

If you look at our revenue CAGR in the last three years, it's more than twice that of our peers. And if look at the most recent year, you will also see that our growth -- the last full year rather, that the industry grew about 10.2%, we grew about 18.7%. This year isn't done, but I'd say that we will still be doing much better than our peers.

And one of the things that's kind of driven this change is all the newer markets that we have entered into. So if you look at this timeframe, particularly 2008, '09, '10, we were, at that point, operating largely in a market where our SAM was about $2 billion, $2.5 billion. Since then, from 2010 up to what we talked to you about at the last analyst day in June 2013, we identified an additional $4 billion of SAM in all these markets.

Since then, we talked about two additional markets. And with that, our new SAM, everything that have come in since 2010, adds another $12 billion of SAM right now. So this is driving our growth and it also drives diversification. While we track most of our revenue and talk to you about it in market segments, you can see from everything that we've talked about last analyst day, this analyst day and in all the meetings and earnings calls since then, that we have many more sub-segments within these that are also growing.

So one of our strategies that we talked about ever since 2011 is growth through diversification. This is what makes us more robust. It makes us less vulnerable to what could be happening in one or two industries. So we're never very exposed if something happens in smartphones or something happens in notebooks space. As long as the other markets are still doing well, we still have many, many growth drivers that help us.

And this was what we had in mind when we rolled out our long-term model. And if you remember, we updated it at our last analyst meeting. So at that point, the backdrop was we had grown.

In 2012, if you remember, was not a great year for the semiconductor industry. Analog was down about 7.2%. We had about 8.8% growth. So we were not happy with the absolute numbers. So we felt better, just knowing how the industry was doing. At that point, we turned around and said, with 8.8% -- the last full year, we had an 8.8% growth. Gross margin of about 53.2% non-GAAP. Operating margin non-GAAP of 16.8%. And at that point, this is the long-term model that we rolled out. And while we expected to see gross margin expansion, a fast growing top line, our big focus was on the operating margin. And I got a lot of feedback from investors, many of you here in the room saying, "Given that we we're 16.8%, 25% to 30% operating margin seems like a stretch. Could we do it?" So before I talk anything more about the model, I first want to kind of say what we have done in the time between.

If you look at 23 -- 2013, rather, we saw revenue expansion, gross margin expansion and an operating margin 18.7%. Still not the 25% to 30% that we talked about. 2014, if you look at it, our operating margin up about 21.5%. Now, this year is not done and -- but I would say, you can -- you can do math and you'd see that we are coming within striking distance of the model. And we believe that next year, all things being equal, we have a very good shot of being in the model, as far the -- as far as the operating margin is concern.

So, what next? One of the feedback we got once we announced the analyst day is that all of you are incredibly good at running up models. You don't need all these metrics to be spelled out for you, that you just need two or three key metrics and then you can crank it all out. So, that's what we are doing now.

So one of the metrics we're laying out is revenues. Yes, our target goal is to have growth of 20+% revenue, top line. So we do recognize that there'll be some years, when it's going to be well above. And some years where it's going to be less than that. And when I talk long-term, I'm not -- I don't mean next year. My definition of long-term is a longer horizon. So this is what we are building the company toward. But if you kind of take it down to a very simple level, what we're basically saying is we have outperformed out peers for years and we expect that to continue. We kind of always account for macro and the growth is going to be -- we're going to have the most profitable growth that we can have.

The next metrics that matters is gross margin. So for gross margin, this is where we have a more modest goals of mid to high 50%'s. Why? When you think about it, most of the new products that we've been talking about all the way to 2010, most of these our expectation is that they'll have gross margin profiles that are higher than corporate gross margin profile. And yet, we are kind of targeting for a slow and steady increase. And the reason is, we are trying to optimize the top line and the bottom line. So we opportunistically do take revenue that has lower margin. So the whole goal here is to have a slow and steady improvement gross margin and a faster growth in the top line and the bottom line.

The next metric that we were told everybody need is OpEx. So if you look at our history, we've had some years where we have kept very tight cost control. And then, there are other years that we have invested for future growth. So every time we spend on new product cost, some key engineers or investing in sales and marketing people for markets that we -- that we're targeting, we see the revenue growth in two or three years' time. Keng talked about automotive, how we have invested in the sales and marketing people for that. And we have done that in other markets like storage. We have done that in the server market. And we have found that this helps us. And you can go back and look at our track record. But our goal going forward is, when we look at R&D and SG&A non-GAAP, our target is that they would grow about 50% to 60% of the revenue growth.

Now, there are going to be some years when we could be less. Some years maybe we might spend more, because we are not going to walk away from a growth opportunity just because we have this. But this gives a rough idea of how we think. There are going to be times that we will be investing. For example, this is a year we're investing. Next year again, we're going to be investing in a fourth foundry. We are also going to continue to invest in sales and marketing people. Some of them for the markets that we talked about today, and some of them are for newer markets that we haven't yet talked about publicly.

So all of these is -- are going to be something that you're going to see. But the bottom line of that is, you can see that it's a possible growth, as what we are talking about. And that we will have leverage on the bottom line.

Now the other thing we focused on is what the financial strength. And here, we are a company, as you know, we don't have any debt. We have to close to $6 in cash. And we have a capitol allocation strategy that includes buyback, dividend, as well as acquisition. We did the one -- Sensima acquisition that you all know that's the one and only at the moment. But we are exploring other options too and would love to find other technology place like Sensima.

So if you look at we've done, last analyst day we've talked about it. At this point, we had done two buyback programs. And we had a onetime special bonus -- special dividend that we have done and with that, we had returned about 40% of the cash we had generated in the life of the company. If you fast forward to now, we have now initiated a third buyback program which is in play now. We started a quarterly dividend program last year. And that, combined together, we have now returned about 50% of all the cash that we have raised to investors through buyback or dividend.

I'm talking about dividend, which is a newer item for us, we started our dividend -- our quarterly dividend in the second quarter of last year. It was about $0.15 a share. And this year we've raised it up to $0.20 a share. So through all the payments that we have done right now, we are at about -- we have returned about $37 million to investors through dividend. And today, I'm very happy to announce a yet another quarterly dividend, again, $0.20. And this will be paid through shareholders of record at the end of this month and the actual payment will happen in the first half of October and with that, it will take accumulative quarterly dividends to about $43 million. And before we jump in to Q&A, Michael, is there anything that you want to add?

Michael Hsing - *Monolithic Power Systems - CEO*

Yes, okay. Let me. The last point I'm going to sell to you -- the good thing is I didn't let Maurice to sell it you because he wouldn't let you get out the door. He owned it. In my mind, we are at the crossroad, while in the 2012 or so, I feel the similar way about it but less confident.

And the reason is we wonder if we're going somewhere we never know. And 2013, we know we're there. And now we're knocking at the door, we're in the door. Now, we expanded. And this year, now, all the things that we've taken -- I think that we've taken the different direction.

So all the investment, that's the point I want to come back to in the market. The investment we make, it's 2 to 3 years before that. So that you're judging on the opex for the next year or the year after. So every year was basically your growth, is totally dis-linked. So I see it. The investment sees it or you guys, all right? Okay.

I told the hedge fund guys, okay. They go in and out, they go three, six months lucky, three months the longest doing well. Okay. And so look at MPS stock and we go very smooth. You don't have a lot of chance to go in and out, okay? It is the truth. It is the truth. So I said, I got to sell to you. You buy for a rainy day and set on the side.

The market goes up and down. If you are unlucky, MPS is still there. Okay. And for long term. For one to two years, there's a dislink. I respect our shareholders. And also, some of the shareholders are very long term, for two, three years and beyond. And if I own the entire MPS, I will go all in now.

But shareholders are like, in fiduciary duty I have to take care of all your interest. So that's where we are targeting, somewhere 50%, I mean slightly higher some years. But that's what I think. You guys keep me grounded, okay? And that's a good thing. And that MPS -- okay, I'm a little bit out there so I know that. Okay. And all the MPS people, tie me down. Okay, you can□do that, you can□do that. Okay. From an investment side, from shareholder side, but I think it too.

That's beneficial to us. I do respect that. And last night, I watched the legacy of the Walt Disney okay and that he created all these wonders, almost bankrupt the company, okay. So you guys keep me doing that. Now, let's open it up for questions.

QUESTIONS AND ANSWERS

Tore Svanberg - *Stifel - Analyst*

Michael, back to you.

Michael Hsing - *Monolithic Power Systems - CEO*

Okay.

Tore Svanberg - *Stifel - Analyst*

And maybe for Meera as well. A lot of the areas you're investing in seem to have a much longer time to money than you had before. Figure design wins, et cetera. If we look back over the last couple of years, the good news is you've outgrown your peer group. The bad news was you haven't hit that 20%-plus or 20% to 30% growth rate from before.

If I look at what you invested in and you highlighted today, over the next few years, I would think that the likelihood of hitting the target would go up or at least your visibility into hitting the target would rise. What do you think is the biggest driver to hit that target in the next couple of years? And if you don't hit it, what keeps you up at night and not macro?

Michael Hsing - *Monolithic Power Systems - CEO*

I really believe that. We really can grow in the next two or three years, really grow. And I'm in a sandbox now, okay? I can play anything, okay? So that really excites me. And so to answer you, which segment to grow, and I can't pick of any -- of course, all the market segment where we're in two years ago, we announced it. I think that these will be the main driver. e.Motions, no. Okay, that's really in the future.

And so which ones, you know, AC to DC, we didn't talk about it actually. And server side, although, I think you have a big gorilla coming when that came out. So we respect that. We can be a distant third, okay, in the big server market.

But if they ever miss that, okay, and that we can be of equal footing of them as Infineon. And there's a lot of potential there. Even the notebook side has a bad connotation. So I don't want to chase down to I call it a chicken share market, okay.

We do have a core to come out. Same core for the server core. Okay, well, slightly different. And also, we talk about battery chargers. That's a fast growth market. And there's no way we're going to chase down to the price. The bigger you'll get, the faster you get bigger, and then the next time you fell down to that. And so we're not going to chase that market. We dictate what we sell to generate revenue where we put our customers appreciate. So that's the fair market. And probably, there's a lot more stuff, okay, going on, a lot smaller, smaller things.

Tore Svanberg - *Stifel - Analyst*

What about the downside risk side of it? If it doesn't happen, which ones do you think has the lowest probability of success and why?

Meera Rao - *Monolithic Power Systems - CFO*

So basically, the way we see it is the whole point of having diversification is we're not dependent on any one driver to either make us succeed or to break the bank for us, right? So it's sort of like, with so many of these. And every market that we have entered, we start from the one product and then we introduce more and more products. We break into some customers and then we get -- we have more sockets, both are the same and then into additional.

So every one of these that they'll look that they're invested. Everyone of the market, they've already entered continues to be a growth driver for us while all the new ones, the greenfield if you will, they also start generating money for us.

So if you think about it, modules was done two years ago. And that's going to continue -- driver that's going to continue to ramp for us. And maybe we'll have some amount of money coming in from the sensor business, but the more of the e.Motions will be coming out a few years out. And then the server cycle, as you get into Purley it's a much bigger cycle for us. So we have all these investments that they've already done and then we build on that, each one. So even markets that we've entered, while we didn't talk about storage this time, but we have gone from the SATA side of the house to PCIe and SAS.

So we do that in every single market where we are. We keep coming out with more products, entering more markets. And so all that is going to help us. So when we look at the future, we don't look at any one product and say, if we don't quite hit this one, we're not going to make it, right? We don't have that. So I think that's a luxury that we have which is not common in the industry.

Michael Hsing - *Monolithic Power Systems - CEO*

Well, I'll give you a one answer to what's the most risk side question. I will say that now I will say that less than a year ago -- a year ago, I will say that definitely the server because it's a single product out there, the controller. If you screw up that one, our revenue will not be there. Okay. And we're in the market, you know, and we can do -- and one of the things -- so with this, the comment is that, over hundred plus design win, there's no hardware change, nothing changed. It's never happened in the server market. So this year, okay, I feel a lot better.

Anil Doradla - *William Blair - Analyst*

So I have two questions. One for you Michael and one for Giampaolo. First question, in the past, you've talked a lot about your process technologies. You didn't give us any update there today. I was hoping you could maybe give us an update on BCD 5 and also how you're transition to your fourth foundry is going. And then I'll have a follow for Giampaolo.

BCD5 is in production. And we can't really talk about it and I don't want these major things -- we talk about the BCD 5. Okay, it's in production. And we start to shipping products now. And foundry, we still move on to this foundry, okay, on the better equipped foundry now. Okay, have we talked about it? No, we haven't talked about it. Okay.

Anil Doradla - *William Blair - Analyst*

Well, I guess, I mean you've been building inventory for that transition. I was hoping maybe you could talk a bit about that.

Michael Hsing - *Monolithic Power Systems - CEO*

Oh yes, okay. We're building some inventory, okay. And as long as -- okay, when the news leaked out okay, you're dating somebody else, okay, and they increase the price, whatever, on the existing one. So we build some inventory. So everybody has to be behaved, okay?

Meera Rao - *Monolithic Power Systems - CFO*

It's also a couple of other reasons, right? As we have more new products, we have to have higher inventories of those. As we have now more and more strategic customers, they also require us to hold more inventories to support any upside there is.

And for us, since most of the instances it's a first or second design win that we're shipping. We want them to perceive us as a very good, reliable supplier. So we have a vested interest in holding it. Thankfully for us, we don't make custom product. Obviously, we do it very, very few. So these are products we can sell to multiple customers, maybe even multiple markets so we can hold them.

And we also responded to the tightening in foundry capacity last year. And then we look at that, combined with our outlook on this year and next year and we were like, okay, we need to start building inventory now. And then the other part is, even though the fourth foundry comes up in the second half of next year, not all our customers will have qualified it on day one. And so we need to hold enough inventory so that we products we can ship to them as our customers thought, qualifying the foundry.

So the way the I see is inventories will more probably peak either this quarter or next quarter. And then while it might come down a little bit, we'll still be carrying higher quantities of inventory than we have traditionally. And we'll do it until we see more and more customers are transitioning on to the new foundry. But to qualify it, the more comfortable investment will most probably start taking inventory down. Yes.

Anil Doradla - *William Blair - Analyst*

Question for Giampaolo. You talked a lot about power bank and it's easy as an opportunity. And I do appreciate that. But I'm also troubled over the next couple of years, there's some other things going on. So I was hoping you could update us on Monolithic Power's position in USB PD, if that's an area you're going to be participating in and, you know, you expect to have meaningful share within that technology.

Giampaolo Marino - *Monolithic Power Systems - Product Marketing Director*

Yes, I think USB PD is definitely a standard that we have been following since the inception. And I can tell you that it's something that we're watching very closely. But before USB PD, remember there is also something that is called USB type C. Both are very, very similar so we'll be following that as well.

So we're out there. We're watching it. And we're very, very close to those trends and we are making sure that we align ourselves to those specific trends and to provide solutions that are compatible with it both type C or USB PD.

Michael Hsing - *Monolithic Power Systems - CEO*

I love that new type device, okay, because as Giampaolo is a buck and a boost, all together. Like it can be either way. That really show our strength, software based. We can control this one. So we really want to play with our strength on this one.

David Wong - *Wells Fargo - Analyst*

Thanks very much. David Wong Wells Fargo. So Michael or Meera I guess, you talked about how you have high visible growth. You talked about the superiority of your BCD process and also just generally about rising margins. So you remain a fabulous company for the indefinite future. But at some point, does it make sense that you tend to have control of your own processing?

Michael Hsing - *Monolithic Power Systems - CEO*

Oh, control the processing. Okay now, let me talk about it. We do control our entire process because we don't use a foundry since inception. I'm not a me too guy, so I got to do better work. I can't use somebody else's stuff. Just not because so that it's better, we have to do better.

And we controlled all the process. We have a team to work in the foundries. And we don't own the foundries but we use similar to we are renting the equipment. And we're using their labor. And we have a team working in the fab.

And the answer is, for the long terms -- for short terms, I don't think. And the 8-inch wafers still have a lot of variability. And in China, the growth is less now. They have a lot of capacity. And Korean have a lot of capacity now. And China, you never know. Also, there's availability of the 12-inch. So I don't see in the next few years we will get that.

Meera Rao - *Monolithic Power Systems - CFO*

Once we use leading technology, process technology relative to our analog peers, it's still trailing technology in the world of semiconductors. So we always have a lot more of that wafer fab capacity out there. So I think it's going to be a long time before we get to a point of deciding whether we have to, unlike our digital semiconductor who often have the decision, can they get a foundry to move fast enough in introducing the most recent leading technology or do they have to do it themselves.

Michael Hsing - *Monolithic Power Systems - CEO*

Okay. Yes.

Quinn Bolton - *Needham - Analyst*

Thanks. Quinn Bolton with Needham. The first question is first just coming back to sort of the current business. Obviously lots of choppiness going on in China right now. Can you give us some sense, I know in the Ks and Qs you've disclosed your revenue on a ship-in in China something like 90% plus of your revenue. But do you have a sense what the end market distribution of the revenue is, what your China specific exposure is?

And then a second question on power module process. The question earlier about sort of drivers over the next one to two years versus further out and I don't think I heard power modules as a sort of revenue opportunity in the next one to two years versus, say, two plus years. Can you give us a sense how significant power modules will be in the next couple of years? Thanks.

Michael Hsing - *Monolithic Power Systems - CEO*

Maurice, you want to answer?

Maurice Sciammas - *Monolithic Power Systems - SVP - Worldwide Sales & Marketing*

Which one, sir?

Michael Hsing - *Monolithic Power Systems - CEO*

Never mind, let me try.

Maurice Sciammas - *Monolithic Power Systems - SVP - Worldwide Sales & Marketing*

The power modules right now, the programmable ones are going to be farther down the road because those were meant for the small customers who need the help but they can't get the support. So the FPPM products will take a little bit longer. The existing modules now are the ones that are starting to ramp based on the design that you saw. So we see it as going forward and is starting to initially steady growth from now on out. Does that kind of answer it? Okay. What's the second?

Meera Rao - *Monolithic Power Systems - CFO*

In terms of what you're seeing reported in the K and the Q, it's typically the markets we're shipping to. So we could be getting designs in US and Europe, various parts of Asia and ultimately it all gets manufactured in Asia. And I don't have the numbers off the top of my head but 90% of all

the products ultimately get shipped to Asia, China being a bigger part. But China, Taiwan, Korea, Singapore, Japan, altogether would equal to 90%. Not just China alone.

And so even the ones that we ship to China, some of it is for local consumption, a lot of it is for international. So we don't have a visibility into how much is for local markets and how much is for international markets, because quite often, the same ODM will build our parts for multiple customers and we don't get that breakdown from them.

Quinn Bolton - *Needham - Analyst*

That's great. So you make 90% of your products (inaudible - microphone inaccessible).

Meera Rao - *Monolithic Power Systems - CFO*

Those are manufactured -- 90% of it is manufactured in Asia. It ultimately goes into manufacturing there. How much of it gets shipped to US and Europe, the rest of the world and how much is consumed locally, that's the part we don't have a visibility. No.

Anil Doradla - *William Blair - Analyst*

Michael --

Michael Hsing - *Monolithic Power Systems - CEO*

Hold on. Hold on. Before that, I will come back to you. If I'm carried away, you remind me. Expanding on that point, the programmable -- FPPM module -- and we also have FPPC, power chip. It's all program, it's all we do now.

And those we put around and we have an app we can -- on the iOS or the Android, when we release the platform, we release all the software on it. Those remain to be for smaller customers. So how small this customer is? Linear technology, the great company's model. But they take 30 years, 40 years to build it in that way.

And I think Swanson said I built the company brick by brick. If you want to take me down, you take me brick by brick down. It's absolutely come to the market into my mind. So they have that how many years and they use an engineer, use manpower to service all these small customers. And they can't even get to all of them now.

So how do we do it then? I want to build a company like that and you have a long term visibility, you service all these small customers. So that's where the module is. We're searching a way, we will find the channel issues, and we find and develop apps for small customers. And those small customers, if you don't screw them, they're always loyal to you.

So these are long term efforts. And we want to emphasize these are long term efforts. So address to millions of these small customers. And only 10% -- we're in manufacturing US, okay, I thought it was more than that. I don't know.

Meera Rao - *Monolithic Power Systems - CFO*

In US and Europe.

Michael Hsing - *Monolithic Power Systems - CEO*

Within US and Europe and in Japan, right? Okay. And those are smaller customers. We have to figure out a way to reach them. And that's the way we can bypass them. We don't have the manpower, we don't have all these FAE to do it. And we use that as a tool.

Okay, now I'll come back to you.

Anil Doradla - *William Blair - Analyst*

Michael, coming back to the e.Motion, I mean, clearly it is something that has excited the whole company and you especially. And there's some revolutionary impacts of it, that's what we're sensing. But can you help us understand the in common, whether they're legacy or poor solutions, the Avagos, the TI, all these guys have relationships with these customers. So help us understand the state of affairs from a customer point of view, the go-to-market strategy. And more importantly, can you give us some color on actual design wins in that space?

Michael Hsing - *Monolithic Power Systems - CEO*

Okay. We have a lot of design wins in the drone area. That's the fastest adoption. In the gimbals, in some movies. And if I remember, the Hollywood movie use sets on the camera, sets on the track, the movie, they move the camera. Now, all using gimbals. And you can use a, have a camera hole in there and you can focus on one airway and when the people move, the camera still focus on them. And these are the things -- and some of the --

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Maurice Sciammas - *Monolithic Power Systems - SVP - Worldwide Sales & Marketing*

The consumer part that he's talking about e.Motion is integration running into one. But right now, the sensor itself is getting traction because customers see the benefit of just one little chip for sensing to add on to the motor to be able to get it. And that's why he talks about the drones, the windshield wiper for automotive. I mean, we have many applications that we've done from medical instrumentations where once they see the sensor solution, they say -- my god, I'm using this little thing to replace this huge encoder?

Once the mindset clicks, then all of a sudden we start going through. I mean, that's why we see this from videos where people started seeing it and then once they see it, they automatically understand it.

Michael Hsing - *Monolithic Power Systems - CEO*

Yes, another example, okay, these are knob replacement. In a car, you turn the volume and your home stereo, all these have a knob, right? And inside the knob is a potential to burn the power. And you buy the current and the knob basically is essentially where you set it and then you measure the voltage on that. You burn power.

And with this one, it doesn't burn power. We'll win some design on that. This is not -- okay, yes.

Anil Doradla - *William Blair - Analyst*

Is this clearly seen at the midpoint (inaudible - microphone inaccessible) they don't care about it?

Maurice Sciammas - *Monolithic Power Systems - SVP - Worldwide Sales & Marketing*

Well, it's not that they don't care. It's you have to have the technology to do this, that's the key.

Anil Doradla - *William Blair - Analyst*

Which they don't have.

Maurice Sciammas - *Monolithic Power Systems - SVP - Worldwide Sales & Marketing*

Which they don't have. I mean, right now these are using crude-like Hall sensors, so they're all fragmented degrees and they don't care how accurate it is. Or there are some people trying to do this by, like you mentioned, either Avago or, say, AMS, they do with brute force. They use a couple of Hall sensors, then they do calculations, saying -- if we're turning this fast at this rate, they do an arc turn analysis, they go, okay, this should be where the knob is going to be, which has a latency factor and not much processing power.

So everybody else is using some kind of method but because of this technology, we can be direct. We know exactly the angle which nobody else has. And that's what gives us the advantage.

Anil Doradla - *William Blair - Analyst*

Now, are there some markets where they don't even care about it? I mean, not a great improvement --?

Maurice Sciammas - *Monolithic Power Systems - SVP - Worldwide Sales & Marketing*

Well, not everybody wants 0.1, 0.2 degree accuracies. But that's the key. I mean, as Michael was saying earlier, the market is quite varied. Some people can take almost by 30 degrees, I don't care. So it depends on where the customer wants. And in sewing applications, they care. You're stitching needles, it has to be very accurate. But to turn up the volume, okay, it's roughly this area.

So it all depends on the customer itself. The gimbal, if the camera is going, it has to be very accurate. So that's why we're seeing such a wide variety. And joystick, plus or minus, they don't even care. They go -- as long as I can move my guy. But some gamesmanships say -- I want very, very accurate positioning so I can get my guys to win the Xbox or whatever game shooting people -- okay, I'm exactly there, I can fire my shots.

So that's what it is. It depends on the end customer what his accuracy needs are.

Anil Doradla - *William Blair - Analyst*

So your whole addressable market that you've put out there, how should I look at it? It's the market that care about it or it's just your first life? Because I mean at the end of the day, 20% of the world's power is being consumed by motor, so I'm thinking the market has to be significantly bigger than what you put out there.

Maurice Sciammas - *Monolithic Power Systems - SVP - Worldwide Sales & Marketing*

Yes, it is. And it will be as people start adopting it. So the key is for them to understand they don't have to buy an encoder to get this accuracy. If they say -- oh, my god, why am I going to spend $50 for this accuracy? Or I'm going to spend $1. Why not? So the market is actually going to change as they see this performance.

And this is what we started to see with some customers who said -- okay, my god, I can see this better, why not. Because they're paying more for worse performance. So the markets I think is going to increase even more than what we said.

Meera Rao - *Monolithic Power Systems - CFO*

It's SAM more probably north of $2 billion. But in the absence of a Gartner study, we always go back to being conservative and said call it $2 billion. That's still huge market. And if they go, we'll be happy to kind of -- once there's more traction there, then we'll be happy to talk about it a little bit more. The $2 billion is conservative.

Michael Hsing - *Monolithic Power Systems - CEO*

Anything else? Okay.

Meera Rao - *Monolithic Power Systems - CFO*

I think looks like the questions are winding down, so maybe this will be the last one or we'll take one more and then I think Michael has a demo for you. So we can walk over to the next room and look at the demo so we could go ahead.

Shekhar Pramanick - *Colombia - Analyst*

Thank you. Just a follow-up on the e.Motion. Obviously you've got the Sensima sensor out in the market already when you designed. Can you give us a timing on the integrated power plus sensor solution sort of when does that tape out or when you start to show that to customers?

Michael Hsing - *Monolithic Power Systems - CEO*

It's all demonstrated on the -- later on you'll see it on the FPGA board. And so we're refining this drive algorithm and also the calculization -- help our customer to calculize their load. So we will expect it to have a -- and then once we've done it and then once we've finished it, I think it's expected to have a -- in next February. It's a standard 0.18 micron C-MOS. And of course with some memory on it.

There's a lot of sensor in it. There's a lot of analog portion of it. Well, today I didn't talk about it. Even though you design the analog portion, before you have a mass change, all that kind of things. We expect design A and design guys call it always, most of the time B. Now I have all the program to be A.

And so the predictable is much higher now. So it will be sometime early next year. And now also you're launching it. It's not just launching a chip. You're launching a platform, you're launching a GUI, launching everything, launch a software.

Meera Rao - *Monolithic Power Systems - CFO*

All right. We're going to wrap up the Q&A and the webcast is most probably going to stop in a couple of minutes. The plan is that you'll see most of the slides that were presented today about roughly an hour after the webcast is completed. You'll see it online. So right now the plan is to move the party over next door so you can see some of the demos. And they also have lunch and everything, including boxed lunches for people who have to rush to catch a flight or to go to their next meeting.

Thank you all for coming today.
