Company Name: Cirrus Logic Inc. (CRUS)
Event: Stifel 2018 Cross Sector Insight Conference
Date: June 12, 2018

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

All right. Let's get started. So welcome to the Cirrus Logic session here at the Stifel 2018 Cross Sector Insight Conference. My name is Tore Svanberg. I'm a Senior Semiconductor analyst and I cover analog and IoT semiconductor companies. It's my pleasure to introduce Cirrus Logic. With us from the company, we had Jason Rhode, who is President and Chief Executive Officer. And the particular format for this session is going to be fireside chat and Q&A.

So with that we'll just get started. So thank you for coming Jason.

<<Jason Rhode, President and Chief Executive Officer>>

Sure. Thanks, Tore.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

Maybe I know you don't like the easy questions, but since this is a conference, we…

<<Jason Rhode, President and Chief Executive Officer>>

Start off as well.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

We give you the opportunity to just give a two, three minute overview of the – very general overview of the company and then we'll dig much deeper after that.

<<Jason Rhode, President and Chief Executive Officer>>

Sure, sounds good. So Cirrus has been around since 1984. We were founded as kind of one of the first fabless semiconductors. I don't know we were the first, but I do know we were the first company to make that model profitable. We've been a lot of different things over those many years. They can think about us as audio and voice. The vision for the company is all centered around signal processing tends to be signal processing that's at/or nearly analog to digital boundary, it can be analog or digital from a signal processing perspective.

And today that's heavily focused on audio and voice, although we're having more opportunities that are kind of adjacent to that. We're still fabulous. We're still very proud and thankful to be fabulous and about 1,500 employees worldwide, heavy R&D development in Austin as well as Edinburgh and in and around London. That's kind of the primary sites for the R&D couple of the

little ones here and there and then sales offices and whatnot around the world. That's kind of broad strokes.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

Very good. And just one more general question just from a competitive landscape perspective, so you focus on audio and voice semiconductors. There is a lot of semiconductors companies out there and very few of them actually focus on audio and voice. So first of all, why do you think that is the case and what makes you guys so different from the players that do have engagements in the audio and voice space?

<<Jason Rhode, President and Chief Executive Officer>>

Yeah. I mean I have to assume the reason that we're the only one totally focused on that is the rest of the companies are terrified of us. I assume. I think for us it's kind of something that we've evolved into a thing for our primary competitors if anything it's kind of a sideline business, some of them seem almost awkward talking about it on their earnings calls. Its – I never underestimate competition, but it is a kind of a unique time in the company. It's a little different product line by product line, but so our largest product line being the smart codecs and we really don't have a meaningful direct head to head competition there.

We do have Qualcomm, which is obviously not something you want to trivialize, but generally speaking you see Qualcomm smart codec coupled with their applications processor. And it's a perfectly reasonable solution if what you're trying to do is get to market quick and not spend a lot of time innovating around the audio. On the other hand if you're one of our type of customers where we've seen opportunity to meaningfully innovate and differentiate based on audio and voice solutions then I would argue we've got a much better solution and a much more kind of holistic here is the whole chipsets you need to make the whole audio signal chain go.

And so its – again you don't want to trivialize that particular company as a competition, but it isn't the kind of traditional head to head, okay, you've got to lower your price by $0.02 and then you win that design kind of you're in one cycle out the next cycle. Using one of our smart codecs is a pretty large investment for the first design and so it tends to be the once we win that first run company to invest in it as kind of a platform and you see it propagate across the rest of their product lines assuming like most handset companies we've got quite a number of models out there.

Amplifiers maybe little more competitive, you see NXP and Maxim reasonable product lines, but again it's not a focus for them. And so the level of investment and expertise and people that turn up on your doorstep if you design one of our devices and then do a lot of hand-holding and tuning in and so forth. We've forgotten many whisper rooms and any echo chambers and whatnot that we have around the world, but it's pretty stunning the facilities that we've got to be able to help our customers. Many of them don't have that on their own, obviously our largest customers have plenty of that capability on their own, but lot of the other folks in Android don't have the expertise, don't have the facilities and whatnot so it's a meaningful value that we add in the sales process by turning up with that.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

Very good. So with a more general backdrop, if you don't mind I'd like to maybe step back a little bit and just look at what's been happening in the last few years. And this was – this will probably give us some context though where we are, because I know you're working on a lot of new products and you probably have more products now and more categories now than ever in the company's history. But if you look at the last five years, you had three years of very strong growth, which was unpredictable.

I mean I think you guys exceeded expectations every year those three years. Then the last two years or this fiscal year well, this fiscal year supposed to be down 10% fiscal 2019, but you are guiding for growth in fiscal 2020. So maybe you could help us understand a little bit better, why there is so much volatility in your business. And is there anything that you can share with us to give us more confidence that the company is going to be back on a growth curve again.

<<Jason Rhode, President and Chief Executive Officer>>

Sure, well. I mean just in general if you follow and you know this that you follow our track record in our history 10 or 11 years ago or so. We've been $180 million company for five years in a row and our compound growth rate since then has been off the charts. But it's not a straight line up into the right. It was a period after 2012, we grew a time, we will bit of a step back after that and it's kind of an important way to think about us is heavy part of our business is just home run oriented. We're not so much the bunch a little basics company, although we are aggregating up more and more of those and I think that will be a valuable element to the business. But let's face we're targeting big giant handsets and/or big giant volume type handsets. In this particular year, actually we thought this year would be a little more flat, but handset volumes have didn't quite live up to the hype cycle this last go around.

It was just that sort of life. We're confident we're plugged in with the right customers. We've got great products. We've got great engagements. The amplifier product line in particular the team did a phenomenal job of defining this latest 55 nanometer device. So that we're – we consume less power, less board space, lower cost for the customer and good margin for us. We can embed a lot more signal processing in that device than what our competitors are able to do. And again all the focus that we've got the team just did a phenomenal job of nailing the spec for the device. And then the engineering folks are going to done a better job of having that come out really zero, very functional silicon we can put in the hands of customers and I literally I don't think we've shown that a single customer that isn't intending to buy along the way.

So we were shipping it already today, it was less than a year typically a rule of thumb for us is once we show a customer a new device and it's probably going to take about a year for it to turn up in one of their products. It just takes that long. So this is short cycle that by a good bit already and over the next 12 months, we've seen enough of a pretty good landslide of new designs coming for that product line. That said initiatives are slower than we would have expected a few years ago, but it's clearly happening a lot of the impediments to adopting a USB-C headset have

either decreased or eliminated completely. And then we've got them broader and broader product line.

As usual in any audio market, there's always going to be people to target like how do we make sound come out the cheapest possible way. That's just not our gig, again we target people that are going to differentiate in and around audio and have that be more than a checkbox in their devices. And we see really good opportunities for that in the headsets. Smart codec a lot of people asked why I was that – how are you possibly to keep growing that. And I mean more years than not it's about little things, we've made the device use a few less capacitors or inductors or eliminated and inductors, lower the passive component count, lower the power of decrease the board space by migrating to a more expensive process things like that have enabled us to grow our ASPs probably more years than we've been able to do it by adding giant new features, although we've got a pretty good history of doing that as well.

So we're very confident that that will continue to do well, but it's just a complexion of our business is not really broad and steep mile way that can be a little more statistically modeled as often to the right. But we wouldn't – and we like that we're adding that element as well with a bunch of smaller wins and a bunch of smaller customers. But at the same time, every marketing book I've ever read said you want to do business with number one or number two in whatever market you serve and we happen to be doing business with both of those in the markets that we serve and they're both big giant customers.

And so it's just that's kind of life in our business I think, which is a great source of strength frankly, but it does have the element of – we're a – it'll be a little more volatile than what you would do. It was a giant catalog of products and thousands of customers that were all sub 1% of piece.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

So just assuming in on some of the new product cycles and you mentioned boosted amplifier 55 nanometer – excuse me, I think it introduced the technology less than a year ago. Where are we really sort of in the – excuse me, in the cycle for that product offering, because my understanding is that you can also use it for haptics, with that integrated the DSP there's probably a lot of different things that you can do. So I mean do you view this is a product line that of the next five years can actually gain content in both smart and mid-tier – flagship and mid-tier phone.

<<Jason Rhode, President and Chief Executive Officer>>

Yeah. I mean that's definitely the goal. So our amplifier business we really started the revenue and that business started in about 2012 all historically by virtue of our largest customer. And the architecture that we have there makes sense if you have your own AP. And that's been a very successful model where we have an amplifier and then the lot of the boosted smart stuff. So when you boost an amplifier to get more sound out, you have to take a lot of great care to make sure you don't explode a little micro speaker under certain audio conditions. So we can gets a speaker protection and then as power levels have increased and as people gone to stereo then you

have to pay more and more attention to how much current you drawing out the battery, because you can brown out the system or damage the battery.

So that's where the signal processing comes in from an amplifier perspective. And in the case of our historical product line, which again is a very good fit for folks who have control of their own AP, we can run the speaker protection code in the AP in the tiny little transistors over there and actually it's a ineffective system solution. Android folks just don't tell him to operate that way, they'd much rather have kind of self-contained, okay, where's the amplifier. There's the amplifier. I want a monkey with running code over here and whatnot.

So they don't want a lot of finger pointing and what are anticipate that. So this new device with the 55 nanometer DSP incorporated right in with the power devices, we can incorporate all the speaker protection, all the battery protection, all the coordination for being able to do stereo across two devices and also speaker protection and battery protection at the same time. That's all built-in there. We can do it at a pretty high level and it appears to be a very, very popular solution of a customer.

So and you're right, with a bit of physics serendipity an audio amp actually a boosted audio amp in particular happens to be a great thing to drive a haptic actuator with. So many years ago, when most of you with your – most of you with the phones, which probably one or two of you have an Android out there that still has the little – its a little motor in it with an eccentric way, they spin the thing and that's the haptic feedback, it's kind of awful. That's how they all used to work. So somewhere along the way, the more innovative companies in the handset space started putting a haptic actuator, which is like a little weight on a linear rail whisperings on the end and to make that be a nice kind of tactile feel, you drive the weight really hard in one direction and then slam on the brakes and stop it from moving before it hits the stops on the other end and which would also feel by an awful.

So by doing that cleverly and with different wave forms and whatnot you can cause sensations like oh, hey, that that home button feels like it's moving, but it's not or increasingly people trying to decrease the number of buttons and switches and physical things on handsets because they're all common points of failure. And so yeah, it has happened and audio amp is a really, really good thing to drive one of those within a particular boosted amp. So you can move and then stop the weight really, really quickly.

So that is a good turns out to be a great opportunity for our audio amps and again this 55 nanometer device, we've got a variant of it which is targeted specifically haptic and you can incorporate the waveforms right in the device and offer the customer software and tuning tools, so that they can kind of customize little way that the stuff deals in their handsets. So it's a very user experience oriented saying and it's a lot of software IP from us that that can help make it a sticky socket.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

And on the topic of the smart codec you mentioned that it's little things here and there each cycle that impacts the codec, but I think the investment communities is always also worried about the

integration of the codec into something else. We all know another supplier to your largest customer, dialogue, they're suffering from some content losses and so on and so forth. So is there anything that you can share with us whether it's the architecture of the technology to feel better about the codec not being integrated into anything else on this much more.

<<Jason Rhode, President and Chief Executive Officer>>

Sure, well. Just I mean in general though as a mix signal peripheral provider some, some fraction of the digital content that's on your device is always getting integrated into whatever the big square chip in the center of the board it was true in DVD players, it's true in everything we've ever served and strew in handsets as well. Our job is just put more needed stuff on the table that is not fully mature, every year than what is likely to go away. And then at this – and then additionally, we're very careful about what we invest in and making sure that it is differentiated and it benefits from being collocated on the same piece of silicon with the analog.

It's just done this last year that you've been able to get a proper design kit for 28 nanometer from TSMC for an analog device. So if you ever see that in 7 nanometer or so, it'll be a decade from now literally.

So the ability to integrate and the motivation, frankly to integrate the analog into a device like that, it just isn't there. And then again on the digital side, yeah, sure that happens a little bit every year and some years we run faster than the bear and some years the other way around. And that can contribute to the cyclicality of the business as well, but on the whole, I see as much opportunity to add content as we've ever had which has been really pretty great.

And then the other piece of the puzzle that I think is probably under appreciated by the investment community is – on the one hand, I hear a lot about our customer diversification, which we're working on and I think we'll make good progress on over time. But even within our largest customer, our product diversification is excellent. We sell a big smart codec, but we also sell three amplifiers and headset devices and so forth. So sure in any given year, some element is at risk of going away, but we're still here everything's cool, we've got plenty of things to work on and that's one dynamic to the business.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

Sounds good. And moving on to digital headset, you said it's been a little bit slower, especially in the Android side. I think that has a lot to do with the delay of the USBC standard. But based on my observation that Mobile World Congress, most of the flagships used USBC, there's a rumor this morning, you can – I don't know what to make of it, but there's a rumor that even Apple is going to use USBC for tablets and phones next year. How do you see that market really the developing over the next few years? And if I'm not mistaken I think you said in your last show the later that you expect to sell that technology, whether it's in the form of a dongle or maybe even an inbox device. So if you could elaborate a little bit on that would be great.

<<Jason Rhode, President and Chief Executive Officer>>

Sure. I mean, in the Android space, we certainly expected what often happens is that community rushes to copy our largest customer immediately. And in the case of USBC, it just really wasn't ready. The USB that's in handsets even with the godawful old connector, the little micro USB thing that you got to like try that way and then trying that way and then flip it around and somehow goes in the third time. I mean, that was pretty awful, but even the USB that under – was underlying that connector, it wasn't really meant for streaming audio, it was about file transfer and charging.

And so then when it's like okay, we're going to get really the headphone adapter or the headphone jack, I guess we have to get audio out of thing, while there was a lot of – like the way the audio traversed the USB stack, it was not power efficient at all, it involved having a lot more the AP woken up the needs to be done.

So things like that delayed it to some degree. The connector itself, to me it was a no-brainer, they should have switched to the connector even before the standard change, because it's just, it's usable versus the micro USB one, which is utterly not. So – but anyway that's clearly happening as you said almost every handset and guy out there in the Android space is either adopted it or moving in that direction as fast as they can go. And we see those things both the – making the standard more efficient, making the chipset in Android core itself more efficient and then also adopting that connector is really unlocking a lot of the potential there.

I mean, it is usually the case – that some of our – at least one of our customers is usually thinking three to five years ahead of time, and they've got to – if they're doing something they might not be obvious why, but there's probably a really good reason and the rest of our customers for the most part are something a little close to playing checkers rather than chess. It's a little more of a fast follower model and, okay, I'm taking taken the headset adapter or headphone jack away why.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

You figure it out eventually. Good played. Good played. So moving on to the wireless earbud opportunity, obviously, wireless earbuds has been around for long time, but they seem to be getting more complicated, they seem to be starting to corporate more sort of sensing functionalities and things like that. So if you look at that category, how can Cirrus participate in the long-term and obviously with the caveat that, right now that this is not a very big percentage of your business?

<<Jason Rhode, President and Chief Executive Officer>>

Sure. It's not a big percentage of our business and it is – as you say, it's a growing percentage of the headphone market, but it's not a huge percentage of the volume today. We've see that has a great opportunity for us in the long run, obviously, the smaller the battery and gets the more people care about power. So ultra low power amplifiers, audio processing, longer term for us microphones, potentially noise canceling, lots of things that we can do for that space.

As usual for us, it's people are – I get the question why are you in that one thing right there, and it – there's just you only have so many people and you get a target your very best opportunities and there's lots of days, where I feel like my whole job is running around saying no to stuff, which is frustrating. But you're always going to have – when you've got as many clever engineers we have, you always going to way more ideas than you can possibly staff. And this definitely an art as a management team of just trying to make sure we're staff in there the right stuff and doing so in a way, where we're we know we're going to execute according to whatever we committed to customers.

So – but we've got a number of initiatives underway that relate to wireless earbuds and this can be a great opportunity for us long run and we ship things like our noise canceling chip today, if some of the models that is that devices and as in Bluetooth headphones not so much the untethered earbuds, but in some of the high quality Bluetooth headphones.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

And then shifting gears to some of the more longer term new product cycles, starting with voice biometrics, believe you said in your last show later that you are working with an Android customer on the technology right now. Help us understand a little bit, the timeframe from this technology. What it's on the hurdles they have to get through and when could this potentially be more meaningful.

<<Jason Rhode, President and Chief Executive Officer>>

This is voice biometric.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

Voice biometric.

<<Jason Rhode, President and Chief Executive Officer>>

Yeah. So just as a little bit of primary on that, we're not trying to be – number one ironically given our name is Cirrus, we're not the cloud people, we're embedded on the edge of making either the voice, inner voice out is low power and efficient effective and low latency is possible. The voice biometric initiative is around not being the guys that do the natural language processing and figured out that, okay, what is the weather outside, okay. He's in Boston, let's figure out and look up whether we're not figure out what you say we're just validating that you are an enrolled user via your voice. So similar to a fingerprint, but there's voice.

We can validate on known speech, so like a passphrase, but then we can also enhance that – enhanced that estimate of false accept and false reject. We can enhance that using the following free speech command that comes after it. We've demonstrated we can do that at roughly fingerprints and grade security, which is what we think is the missing ingredient to turn all of these voice interfaces from basically a novelty toy into something really functional.

And my best example of that is think of if all the sudden – you just whatever handset you carry, if you would let you say, hey read my e-mail without unlocking the phone physically first, your IT department would shut it down in heartbeat, right. And your industry that wouldn't go anywhere and certainly my job and just personally if I – if I could leave my phone on the bar and some of my Yahoo friends could say, hey read my e-mail, that would be bad.

So having it be fingerprint grade, yes, [indiscernible] (23:44) gets ahold of your voice and has a studio grade recording and whatever there will be a way to spoof it, just like there was some crafty German guy made a rubber thumb with a fingerprint on it, the week that the phone came out with a fingerprint. But we just – we see the use cases for voices and interface, just exponentially larger if the device is certain that you're the enrolled user. And that's the technology we've developed, that's we've got our first device out in 28 nanometer, we got that back in the fall.

It works as advertised and we're just going through the process of learning, how do we go to market with this stuff. It's by far the most complex thing, we've ever marketed. But the – we've tried to ride on the coattails of the way the fingerprint sensors were and embedded in handsets, a lot of the FIDO Security Alliance, we do want to be very careful about not subjecting our customers to class level hacks, where suddenly every device that used your component is hacked over the Internet somehow, that would be bad.

So we've integrated in a similar fashion to fingerprint, it's a standalone. This is what the device does, is it voiceprints you and then the customers can integrate that into the system in a variety of ways. It is both a complex device and also a complex sales process with a customer, because you can imagine the number of people that we get a vote in any reasonable customer or we going to adopt this. And what is it going to be able to do and how are we going to make it ebb and flow with the whole system and kind of work as an elegant part of the solution.

So great feedback from customers and it – but it – we're just picking through the complexity of, okay, we say one in ten thousand false accepts verse with a say one in ten or one in twenty false reject. Okay, how do you prove that? I have to go find 10,000 people to try my sounding like me or just as it say, just they say anything or what is that mean. And there are – we're actually part of the standards body drafting, how would you apply voice biometrics and how would you define these things like false accept and false reject and how would you measure them and under what noise conditions and so forth.

But that's kind of the stuff of the game that we're in now. But it's amaze – it is kind of close to witchcraft, when you play with it. It's really remarkable. How good it is. So we're pretty optimistic that over the long run, that'll be a great opportunity for us.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

Very good. Last question for me before I turn it to the audience for questions. MEMS microphone, I think you recently said that you moved the supply chain to Taiwan last fiscal year. This fiscal year going to be increasing capacity. So what is that really mean from sort of timing perspective and again MEMS microphone being a more material part of the business.

<<Jason Rhode, President and Chief Executive Officer>>

I mean, I would characterize it little less as capacity than just refining the high volume, reliable, productionable volume, right. So it's one thing, if you ever look around the industry, there's all these little MEMS start ups is spun out of a university and they somehow all get funded and I think the reason is – like look here's the world's best whatever it is microphone or something. It's way better and you're right that one is amazing. Now make a 100,000 million of them and have them survive slamming on the granite and doing all these things that people do torture test microphones. It's really hard. You should for sure get paid more for microphones than the market as today.

So honestly, if it was just hey let's go make microphones that would not be an interesting business to us. But in the market as it is, there's three or four in a noise canceling headset or noise canceling handset, there could be five microphones connected to the thing that we sell. And there's $1.50 content that is got a lot of benefit – that can get a lot of benefit from our audio and IP driven kind of expertise.

So it is not a short-term model for us, it is one let's perfect our ability to design these things on schedule, qualify them on schedule and produce them as reliably as we can do our silicon. And we're not there today we've made good progress over the last year. It's by no means a slam dunk, but I feel good about our probability in our likelihood of getting that to the finish line.

But the goal is to be able to do that we want to be able to make a microphone that is as predictable and reliable as the silicon we sell. And then once we're able to do that, we'll have data where we can prove to customers, hey, you can single source microphone from us in hundreds of millions of units of quantity and when we can do that. Then we can innovate and be able to "say for example" co-design the microphone with the noise canceling chip or with the voice biometric chip to be a better system solution, save the customer cost or power or whatever it is that they're trying to optimize around and then sell the whole thing as a system rather than here's a $0.30 component.

Microphones today, it tend to be in a reasonably high volume socket, it tend to be one of a couple of options that they can populate depending on who gave them the least hassle, on the way to production. And that's just not a model that that we want to be in long-term stuff. Anyway, that's kind of the microphone strategy in a nutshell. Challenging very, very difficult, but for making progress.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

Very good. So that we'll take questions.

Q&A

<Q>: [Question Inaudible]

<A – Jason Rhode>: I mean, I would say it's reasonable that we can sell some next year as usual.

<Q>: [Question Inaudible]

<A – Jason Rhode>: Yeah. Next calendar year or fiscal year, whichever you like.

<Q>: [Question Inaudible]

<A – Jason Rhode>: Yeah, sure. So well, just to cycle back on the last question just to be clear, I think we probably could ship some next year, I doubt it's a needle mover right of the gate most of the time, when customers are trend something fancy like that. So maybe try it out on a model here, see how it goes, don't expose themselves. And I should always give the same caveat, always give at these things. If we're talking about something publicly, it's not our largest customer. Does it – we may or may not have other things going on with them that are similar or different, but anything we're talking about publicly is expressly not related to them. So just file that as you will.

We're targeting handsets first, because they're the biggest and they would obviously benefit from the technology and they also care a lot about power, which again there's one of our differentiating factors, but as the other markets say connected home or automotive or other smart things with voice interfaces on them mature than we see that as a great opportunity to take this technology and migrate it to a new market. So but they'll be after handsets.

<<Tore Egil Svanberg, Analyst, Stifel, Nicolaus & Company, Inc.>>

Yeah. We've actually run out of time. Can you maybe take it – but, yeah. So thank you everyone for coming to Cirrus Logic session. Thank you, Jason for coming to the conference.

<<Jason Rhode, President and Chief Executive Officer>>

Thank you.