Dialog Semiconductor plc

Battery Management Webcast

4 June 2020

Transcript

Disclaimer
This transcript is derived from a recording of the event. Every possible effort has been made to transcribe accurately. However, neither Dialog Semiconductor nor BRR Media Limited shall be liable for any inaccuracies, errors, or omissions.

Jose:

Thank you. Good afternoon and thanks to everyone for joining us today. I hope you're all keeping well. This webcast is hosted by Dr. Jalal Bagherli Dialog CEO, and Vivek Bhan, Senior Vice President and General Manager of Custom Mixed Signal Business Group. Wissam Jabre our CFO, and David Lee, Senior Vice President and General Manager at Advanced Mixed Signal will also join the Q&A session.

Jose:

First of all, I must remind everyone in today's webcast and some of the answers to your questions may contain forward looking statements. These statements reflect management's current views, and there are risks associated with them. You could find a full explanation of these risks in page two of today's presentation. I would now like to hand over to Jalal for some opening remarks. Jalal, over to you please.

Dr. Jalal Bagherli:

Thank you Jose, and good afternoon, good morning to everyone. In support of our growth strategy over the last few years, we've invested in the development of new business opportunities both organically and inorganically, expanding our product portfolio and solidifying our position in key markets. As a result of these investments, Dialog is now poised to enter a multi year growth cycle with a diverse portfolio of mixed signal products, and lower customer concentration.

Dr. Jalal Bagherli:

Let me remind you about the main pillars of our growth and diversification strategy on slide four. First, we are leveraging our power management expertise in other end markets such as automotive, gaming and computing with custom power management products for various applications, such as automotive infotainment system, ADAS, gaming consoles, solid state drives and embedded computing.

Dr. Jalal Bagherli:

We have multiple engagements in these areas and we expect this revenue stream to build up steadily over the next three years starting this calendar year. Second, we have expanded our product portfolio in consumer IoT. In 2019, we made good progress with the introduction of our TWS audio offering, and we acquired FCI, bringing in low-power Wi-Fi to our IoT portfolio.

Dr. Jalal Bagherli:

In parallel, we continue to invest in the expansion of our BLE offering, targeting high growth opportunities in connected health. Third, we have created a new business in industrial IoT with the acquisition of creative chips and Adesto technology. And we will continue to broaden our industrial portfolio with the introduction of high voltage CMICs.

Dr. Jalal Bagherli:

Lastly, both in mobile and consumer IoT, we have been addressing market adjacencies building on our strong positioning in both sides of the charging wire. For example, we are seeing an increasing number of opportunities for next generation of products in smart cameras and new display technologies. We have been investing in charging solutions since the acquisition of iWatt in 2013, and we continue to have a commanding market share in charging for mobile phones with our AC to DC converters.

Dr. Jalal Bagherli:

We are supporting our customers with introduction of High Power Delivery and an increasing demand for higher wattage adapters. This has to be matched with an appropriate battery management system inside a wide range of devices. As a result, we have leveraged our expertise in highly integrated power efficient solutions to create next generation battery management products, which can help our customers differentiate and enable a fast go to market.

Dr. Jalal Bagherli:

I now would like to hand over to Vivek, who will share some additional insights on this significant opportunity. Vivek, over to you.

Vivek Bhan:

Thank you, Jalal. Good morning, and good afternoon. Battery management represents a significant addressable market for Dialog. Our IP and technology investments over the last 18 months are resulting in lots of opportunities for Dialog in this market. Battery management solutions enable Dialog to expand the addressable market adjacent to the existing presence and solutions and power management and AC DC adapters.

Vivek Bhan:

With differentiated battery management solutions, Dialog has been winning in mobile as well as in the IoT space. Battery management solutions utilise multiple architectures based on inductive switching or capacitive converter topologies. Battery management systems integrate inside portable devices, key functions like in-device battery charging, careful monitoring of the battery and precise control of the battery operation.

Vivek Bhan:

In recent years, we have been reminded of the safety and protection around battery operation. Such safety protective features are also integrated in Dialog's battery management solutions. The size of the addressable battery management market makes it very attractive for Dialog. There is a battery management system inside every smartphone, every tablet, every earbud, every smartwatch and every wearable.

Vivek Bhan:

The market SAM in 2019 for battery management systems is approximately $1.4 billion distributed within three key segments. Mobile including smartphones and media tablets is the biggest segment. Under others includes devices for computing industrial tablet PC. Consumer is the third segment

which includes IoT devices and wearables. The market SAM is expected to increase from 1.4 billion to 1.6 billion in 2022, with growth seen in all the segments.

Vivek Bhan:

The main market participants in battery management systems are Texas Instruments, Maxim, NXP, and the bundled solutions provided by Qualcomm. The growth of battery management systems is driven by consumer demanding expectations to reduce charge times, and extendable, usable time between charges. We expect our market share to continuously grow over the next few years in the battery management market.

Vivek Bhan:

With the recent focus and success in battery management systems Dialog silicon content will grow considerably inside lithium power devices like smartphones. Dialog is providing differentiated solutions in this space. Key areas driving innovation are: strong consumer desire to charge devices faster, ability of travel adapters plugged into the wall to deliver more power to devices like smartphones, and systems that safely and efficiently handle the higher power and energy delivered.

Vivek Bhan:

The block diagram shown in the slide shows a travel adapter connected to a smartphone. Left hand picture shows what Dialog ships today with ASP content ranging from 20 cents to 25 cents. Design wins with large OEM's in battery management systems, cap dividers, high power density TA's will result in significant content increase shown on the right hand side picture.

Vivek Bhan:

We expect ASP from a range of 20 to 25 cents to increase in the near future to $1.50 up to $2:30 per user system. Why is Dialog winning? There are multiple reasons for Dialog success, and I will cover the two primary ones here. The first one is innovation and technical. With very high efficiency conversions, Dialog offers best thermal and battery performance.

Vivek Bhan:

Dialogs innovative architectures also reduce size while upgrading overall features. We integrate mission critical safety, protective features in our products. The second one is Dialogs capability to customise. Large OEM's based on Dialogs differentiating topologies integrate complex power path and control specific to their own system. Dialog can deliver best in class, size and cost specifically optimised for end user system allowing OEMs to differentiate in different ways.

Vivek Bhan:

So Dialog offers multiple complimentary product families in the battery management space that work together inside the device. In the picture shown in the slide, the state of battery charging is controlled by the master battery manager with contribution from a complimentary cap divider to speed up charging. The picture shows charging from 0%, which is a discharged battery, to 100% which is a full battery.

Vivek Bhan:

The battery manager controls charging in the deep discharge state in a very precise way, around low levels of battery from zero to say 15% and then again controlling precisely around full charge which is 90 to 100%. In between, say 20 to 90%, the cap divider provides higher efficient energy to speed up charging, while the total system is still controlled by the master battery manager. While battery managed IC can charge the battery from zero to 100% by itself.

Vivek Bhan:

The cap divider device shown on the right hand side enables boosted power to speed up charging from 20 to 90% charge state in a highly efficient way. The next three slides highlight various application use cases that demonstrate complexity handled by the battery management IC. In the first use case shown on this slide, the travel adapter is connected to the phone.

Vivek Bhan:

The battery manager IC inside the phones powers the circuits internal to the phones, as well as charges the phone battery at the same time. This example could be a consumer downloading and watching a video while simultaneously charging the phone at very high power levels. Advanced battery management systems like Dialog, allow these high performance use cases without the smartphones experiencing heat and thermal problems.

Vivek Bhan:

This is the second use case example where the phone is not plugged into the wall adapter. The phone battery powers the phone, the battery manager IC will ensure that the phone circuits have enough power to operate. This use case example demonstrates a wearable charged by a phone, hence the consumer does not have to carry the wearable charger with them all the time.

Vivek Bhan:

The third use case shown in the slide is offer true wireless studio or a TWS charging system using battery management for IoT and wearable devices. In this example, the battery manager in the TWS case delivers power to the earbuds to charge them. Each earbud also has a battery management function integrated inside. Inside the case, a battery management system can have a Dialog battery manager, with HP ranging from 40 to 60 cents.

Vivek Bhan:

This shows a battery management system extended beyond phones and tablets into wearables in IoT, where space and thermal challenges are present. Till now, we talked about Dialog master battery management IC, working along with complimentary devices like cap dividers and direct charges. In addition, Dialog offers other products as part of the extended battery management solutions portfolio. It includes power and charging components, and configurable CMICs for smartwatches and inside tablets.

Vivek Bhan:

Also based on system requirements, Dialog offers protective switches or IPS devices that can be integrated around other ICs in the battery management system. The large breadth of portfolio and IP along with a range of products positions Dialog for offering a rich roadmap for further integration. What does all this exciting success mean for Dialog? Dialog is winning and growing in battery management systems with key design wins with the world's top five smartphone customers.

Vivek Bhan:

And we expect battery management products to contribute near term revenue growth for Dialog, growing from tens of millions of dollars to more than a quarter of billion dollars in 2023. I would now like to hand over to Jalal for some closing remarks. Jalal, over to you please.

Dr. Jalal Bagherli:

Thank you, Vivek. Before we open for Q&A, I would like to summarise the four key points of Dialog investment case on slide 15. Dialog is poised to enter a multi-year growth cycle supported by secular trends in power efficient technologies in high growth segments of our target end markets. With multiple growth drivers such as battery management, expansion of PMICs into automotive and gaming, CMICs and the increasing adoption of BLE and low power WiFi in consumer IoT.

Dr. Jalal Bagherli:

Building on our deep mixed signal expertise in IP and strong focus on low power architectures, we continue to expand our business addressing market adjacencies and with a strong foothold in IoT, both consumer and industry 4.0. Our fabless business model delivers high returns and strong cash flow generation. The low capex intensity of our model, together with the prudent management of our cost base results in an attractive long-term operating margin profile.

Dr. Jalal Bagherli:

This in turn supports the generation of strong cash flow and consistent returns to shareholders through share buybacks. Finally, the strength of our fabless model gives us the financial flexibility to support our growth strategy and invest in future opportunities and the diversification of our business. Operator, you may now open the line for questions.

Hugh:

Thank you, sir. Ladies and gentlemen, if you wish to ask a question, please press *2 on your telephone keypad. That is star and then two on your telephone keypad. And if you're viewing this webcast, please could you type your question into the Q&A box now, and there'll be a brief pause while the questions are being registered. We first go to line Francoise Bouvignies of UBS. Please go ahead. Your line is now open.

Francoise:

Hi, thank you very much for the call. It's always a very helpful. I have a quick question on your silicon content that you mentioned for smartphones going from 20 cents, 25 cents, to 1.5, 2.3. So which is obviously a big step in terms of revenue opportunity, and I struggle to reconcile with the slide just above your 5% gross CAGR from 19 to 22. So I was just wondering what is offsetting? This may be a course that you see in the fundamentals, would be interesting.

Vivek Bhan:

So, I think our presentation of the markets SAM is without our participation. So this is the battery management market as it exists today. So what we showed you in terms of opportunity for Dialog in expanding our ASP or content going from 20, 25 cents which is travel adapters into $50 to $2.30 which is all the silicon we can ship to a particular phone system is Dialog opportunity.

Vivek Bhan:

Clearly the AC/DC, the current AC/DC is not included in those battery management's sound that is shown in the sam slide because that's just focusing on in device IC's, i.e. devices that we show inside the smartphone for example. And depending on customer adoption, some customers may adopt the direct charging only. Some will adopt the battery management IC. Some will adopt both of the ones of fast in phone charging and have access to complex paths for wireless charging, etc.

Vivek Bhan:

So it depends on the customer adoption. What we're showing you is the opportunity of content, increase significant opportunity for content increase between what we shipped today just for travel adapters to travel adapters of the future which are more expensive, in addition to the in-phone battery management products. I hope that answers your question.

Francoise:

Yes, that's fair, thank you. And the other one is when you look at your assumptions for 2022, it implies in a significant market share, I guess again from a low base, from what I understand, you mentioned some differentiation. Why you are winning with end to end technology and customisation? But I mean, if we look at your competitors in the area which could be like TI, Maxim and NXP, Qualcomm and they also have some this kind of capabilities.

Francoise:

So, is there anything you could provide more or maybe some evidence case studies that could explain further? Would be good, thank you.

Dr. Jalal Bagherli:

Yes. So that's why we're having this conversation actually today to explain to a lot more about the range of solutions we have. So I'd like to comment on two, three general points. And then I will ask Vivek to expand on the technical differentiations. So at the sort of, if you like, higher level, not all of

the cost, not all the competitors you mentioned, necessarily offer all the products that we talked about.

Dr. Jalal Bagherli:

So for example, not everybody offers fast charging through AC/DC or not everybody is offering capacitive dividers. Some of the competitors only do some of the technologies. The second aspect is because of our technical innovation, we are already engaged with the top five smartphone makers. And these engagements are serious.

Dr. Jalal Bagherli:

Either they've adopted some of the IC's that we are showing here or we are in the process of developing specialises for them in terms of a customised fashion, and hence our ability to project the revenue forward in 2023. And of course, in between from now, and by the way, this is what we have already believed to have secured in terms of designs.

Dr. Jalal Bagherli:

Between now and end of next year, we still have opportunity to win extra content with softer customers and also extra new customers to add to these numbers and still be able to impact 2022 and 2023. So that's kind of the, if you like the higher level information. I'd like to ask Vivek, to talk about the technical differentiation that our technology offers versus some of the companies you mentioned.

Vivek Bhan:

Thank you Jalal. To answer your question, Dialog's innovative architectures and solutions address the growing needs to improve the battery management solutions and the customer desire to have better battery life experience. In the new architectures, we are addressing multiple input combinations, a range of power levels. We have higher enhanced monitoring and safety features integrated in our solutions.

Vivek Bhan:

And if you combine all of that, it allows OEM's to offer better efficient solutions that have better heat performance, but just safety and it is done in a smaller size and BOM. Each OEM is also looking to differentiate from the other OEM's, where they want to customise their battery management solutions around the system and the batteries and the product layout they're putting together.

Vivek Bhan:

Those customisations and optimisations are enabled by Dialog's ability to customise those solutions for those large OEMs.

Francoise:

That was great, thank you very much.

Hugh:

We now go to the line of Andrew Gardiner at Barclays. Please go ahead Andrew, your line is now open.

Andrew Gardiner:

Good afternoon gentlemen. Thanks for taking the question. And perhaps just a quick follow up to Francoise's question there on the competitive dynamics. I'm just wondering what you're seeing in the market from those established peers. Just some of them seem to have a reluctance to do that custom work that you just described here. And so is that, in particular in addition to your technology, but also your willingness to do this custom work for the OEMs.

Andrew Gardiner:

Is that enabling you to win this business? And also, I'm curious, would you describe it as more of a push or a pull from the OEMs for these parts? Have you guys been actively pitching for it and winning them over? Or was it them with RSP who are looking for this type of a part and you being front and centre?

Dr. Jalal Bagherli:

So, let me have a go at the answer and also others can comment if required. So under the dynamics or I guess different with each competitor, and also I will say different even in by region sometimes and by market segments. So to answer that question, some competitors may have the capability in some of the solutions that we discussed, but as you say, they may not be willing to do customisation.

Dr. Jalal Bagherli:

Whereas customisation model for high volume customers is a winning one, which we proven with the parts that we've done over the years in terms of fast customisation, in terms of delivering high volume to mobile customers for large number of years. So we have that track record of being able to customise mixed signal products and deliver volume to major phone type designs. And this second thing comes to focus on some costs.

Dr. Jalal Bagherli:

Some of our competitors may have technology, but they like to just sell from catalog and is not necessarily going out of their way to address mobile market. A mobile market is evolving and it has its own requirements with the fast charging, for example, with bigger screens. As you go into 5G, you have multiple radios and multiple frequency bands, which puts a lot more pressure on managing power within the phone, but also how you charge and take care of the battery through your battery management system.

Dr. Jalal Bagherli:

So all of that play a part. And in some cases, we were responding to RFI to begin with, but in other cases, we know we've shown that our technical innovation has a winning edge, and we actively push that to some of the customers. So it's not uniform. It's a combination of both.

Andrew Gardiner:

Okay, thank you. And if I could just follow up with a financial question. When you had given your longer term targets back in late 2018, you were calling for 30 to 35% growth in compound over 2018 to 2022 within the customs or the new custom mix signal product business. You also said the growth will be very front and loaded. And I think we've clearly seen that in your results for 2019 as well as into the start of this year.

Andrew Gardiner:

I'm most modelling you to a reach around $400 million in sales this year for that business. And so that's already in touching distance at the bottom of the range, the 30% CAGR, if you will. But that's already this year, not in 2022. And now given what you've described today, it feels like growth can be more consistent over this timeframe.

Andrew Gardiner:

And with significant upside, it feels like the vast majority of that $250 million you've just described for 2023 is indeed incremental to the 30 to 35% target you met two years ago.

Dr. Jalal Bagherli:

I would say that we have modelled some of this. It was part of our plans and when we presented the 2018 plan that we do a lot of, as you said, new IC's. The 30 35% was related to the new IC's for our largest customer, but we also have growth in the non top customer, right. So this encompasses both, and I would say a lot of that was shown in the ... Or modelled.

Dr. Jalal Bagherli:

However, there is opportunity for us to exceed those should we increased content and should we add new customers on top of what we've already secured. So absolutely, we see this as a big growth area. So it kind of partly falls into the new area of custom solution for our largest customer but also in the other solutions which we have penciled for up to 15% growth in the other areas of the number one customer on that chart.

Dr. Jalal Bagherli:

So it falls in both of those. What it does for us today is with the sockets have already secured, it kind of brings visibility and confidence that those numbers are not definitely achievable. But we have every opportunity over the next 12 months to exceed that for sure.

Andrew Gardiner:

Thanks very much.

Hugh:

The next question is from the line of David O'Connor, Exane bnp Paribas. Please go ahead David. Your line is now open.

David O'Connor:

Great, thanks for taking my question. Maybe Jalal firstly, with architectures as you presented here with battery management getting more complex and also on the poor management, how much IP or patent is involved here? Just trying to understand how much the lock in this can be from customers. Especially when we look at customers, a lot of them like to do this stuff themselves, the bigger guys.

David O'Connor:

I understand for the maybe the smaller customers now getting maybe that is too complex that you could probably see more rescues in that respect. But if you could just talk around the kind of locking you're seeing and any patents that are involved around here that could kind of create higher barriers to entry than poor management, than you've seen in the past. That's my first question. I have a follow up.

Dr. Jalal Bagherli:

Okay, so let me just briefly answer and then I'd like Vivek to expand on the technical parts of that as well. But I think there's a clear difference between the two areas. Power management is the way we have engaged and we continue to be involved, is more related to the powering up the processor, so it becomes very close to the ... If they have process of design of their own, it becomes very integral part of that.

Dr. Jalal Bagherli:

Battery management system is almost a separate subsystem, if you like. It's not related to the processor per se. It is defined by each model. So it's less of area where we've seen customers interest in doing their own. But in terms of the technical advances of what differentiates us, and how do we protect or differentiate our technology to make it stickier? Maybe if I can ask Vivek to expand on that please.

Vivek Bhan:

Sure Jalal. So we have been working on battery management architectures and battery management trends for about 18 months to develop the IP in-house. But the architectures that we came up with, it addressed the future complexity that the market was looking for in terms of higher efficiency and thermal performance. Large OEMs were looking for smaller size battery management solutions.

Vivek Bhan:

Large OEMs are looking for the ability to have a range of power levels which makes battery management very complex, but a lot of safety integrated, which needs a lot of smarts in the battery

management algorithms. All that IP we developed over an 18 month period and that gave us the differentiation to establish our position in this space with some of the largest OEMs in the market.

Vivek Bhan:

Yes, we have. We spend a lot of time on the architectures and we have a lot of patterns on multiple topologies that are there in play today and will be important to the market going forward. There are what are called hybrid converters, there are multistage converter topologies, there are reverse boost topologies. The ability for battery management to make decisions very quickly when a battery gets into a state that is not desired.

Vivek Bhan:

We have a lot of patents that we have filed in the last two years that covered pretty much all the complexity that we have seen or the world would see even with the introduction of 5G.

David O'Connor:

That's helpful. Thank you Vivek, and maybe one on the on gallium nitride. I didn't see it mentioned here. I know you guys have been working with in the past, where does that fit into this whole ecosystem on the poor management side?

Dr. Jalal Bagherli:

So let me just briefly take that and then I'll get Davin Lee to answer that in a more detailed or complete way. So the gallium nitride falls into the area of charging the wall charges. That's where we're working on. So that's the AC to DC part, is not to do with the battery management per se, is for the external world charges that provides the charge fast to the device like phone or tablet for it to be then processed and stored.

Dr. Jalal Bagherli:

So Davin, would you like to cover where we are with our high power density programs and gallium nitride maybe?

Davin Lee:

Yes Jalal. So if you recall over the last year or so, we have communicated our focus in AC/DC travel adapters shifting from low power to very high power. The value proposition there is offering higher throughput of charging power in a small phone factor charging case. In that implementation, our technologies and our controllers can utilize many different types of technologies on the switch side that include silicon switches FETs, and also gallium nitride and silicon carbide.

Davin Lee:

So we're agnostic to whatever power technologies you want to use on that side in order to provide higher efficiency to the end customer. So in regards to gallium nitride, our solutions are fully compatible with that technology. And it's typically up to the end user to decide which technologies to use depending on what the ultimate requirements are for that travel adapter.

Davin Lee:

Once gallium nitride becomes more prevalent, we will still be a major player in that area as our solutions are fully compatible with gallium nitride and also silicon carbide.

David O'Connor:

Thank you.

Hugh:

We now go to the line of Adithya Metuku, from Bank of America, please go ahead. Your line is now open.

Adithya Metuku:

Good afternoon guys. So, two questions. Firstly, you talked about wins with top five global smartphone vendors. Can you talk a bit about how this will affect your customer concentration? And secondly, I just wondered if you might be able to give a bit of colour on the cadence of gram in terms of the tens of millions today going to the 250 million and for circa 250 million in 2023. Thank you.

Dr. Jalal Bagherli:

Okay, hi. So we are on track with what we projected back in 2018 in terms of mid range plan to 2022. So, we said that by 2022 our number one customer would be in the area of 35, 40% range of our total revenue. So we think that that is deserved and we are in that ballpark through on track to hit that. So that's obviously covered in other parts of the top five smartphone makers and other engagements then will fall into other categories.

Dr. Jalal Bagherli:

In terms of ramps, I think I want you to think about this year we are shipping in the sort of tens of millions of dollars. So I will take between 20 to 30 million roughly as an estimate for this year. As we've indicated, probably couple of three quarters before we have a major project ramping into production in second half of 2021.

Dr. Jalal Bagherli:

So one of that project falls into the battery management category. So you can model that, which is the second half of the year new range of phones released then. And then obviously those designs

will have a full year in production the following year. And we believe we will be in the follow on models in the same way.

Dr. Jalal Bagherli:

In terms of other customers, I think we have a number of this year's revenues is primarily getting some of the standardised product like the switch capacitive converters into production primarily in the second half of this year. And we also have another customer engagement that we believe starts generating revenue at a relatively lower level than the major revenue mentioned beginning from beginning of next year.

Dr. Jalal Bagherli:

So you can model those and roughly you should get something as I say to 20 to 30 million this year. A major jump next year, I would say, maybe in the order of probably 5X. What we do this year would be next year. And then as we've said, by 2023, you get to 10X what we ship this year.

Adithya Metuku:

Understood. Would it be fair to say that the vast majority of this growth is basically going to come from your largest customer?

Dr. Jalal Bagherli:

With the current circus that we've secured and we're working on that would be true, but remember we are June 2020. And to project forward to 2022, 2023, they still got another 18 months of new design circuits that they can learn.

Adithya Metuku:

Understood, thank you.

Hugh:

Next question is the line of Mitch Steves at RBC. Please go ahead, your line is now.

Mitch Steves:

Hey guys, thanks for taking my question. So very helpful with the margin groups out there. One of the bigger stories for you guys is kind of an operating margin and gross margin expansion. I want to hear much about kind of how this impacts your margin profiles. If you can maybe walk us through the gross margin operating margin expectation or just high level from that.

Mitch Steves:

And then secondly, is ASP going to be similar products or expansion within that's driving it from let's say 20 to 25 cents to $1:50 plus. Anything there that we can help to resolve?

Dr. Jalal Bagherli:

I think I will ask you in a minute for Wissam to talk about the margins. I think in terms of the ASP I think we've shown the SP range for each of those IC's, Mitch. I'm not sure what your question was. Not all of the IC is going to every customer. As I said some customers adopt maybe the fast charging, some adopt the direct charging capacitive converters, some adopt the whole thing, or just patch management.

Dr. Jalal Bagherli:

So we're not saying everybody will have all the chips unnecessarily. If you want to expand on your question, maybe I can have a better shot at it.

Mitch Steves:

Since I guess my question is, what exactly is driving the USP? What specific? When do you guys get all [Oh] 25 cents $1:50. Is there anything you can give us so that we can get to figure out what the margin looks like after that?

Dr. Jalal Bagherli:

Okay, did you see the slides?

Mitch Steves:

Yes, I did.

Dr. Jalal Bagherli:

Okay, all right. So if you look at the travel adapter parts, right, which is the outside the phone and you can see the difference there in terms of the ASP right? Which is going from 20, 25 cents to, we've said 40 to 60 cents in the travel adapter piece alone. So that is driven by the fact that we are delivering much higher wattage of adapters and high power delivery system.

Dr. Jalal Bagherli:

So that entails more contents, more complex chips and indeed more chips. So, it's going from 20, 25 cents of just regular rapid choice to something which delivers HPD 40 to 60 cents. Inside the phone, we've shown you two products which are new. We haven't been shipping those so as we go forward and be ship those, it brings the SP up.

Dr. Jalal Bagherli:

So the capital wide is 50 To 70 cents, and the reason for the range is because of the features. It may include in terms of the amount of charge for example, that it could do. We have different features, the battery management IC also we mentioned 60 cents to $1. So, you may again ask why 60 or why a $1? The 60 cents would be doing a lot less in terms of functionality of the battery.

Dr. Jalal Bagherli:

The higher end, for example, may have many more safety features, reverse boost features. If you remember one of the use cases that Vivek showed, for example, included charging other products that you might put on top of the phone wirelessly. So we need to control the charging path. There may be multiple charging paths coming from outside into the battery both wired and wireless.

Dr. Jalal Bagherli:

So the complexities of chips are different. So when you customise depending on what the customer wants, at the low end of feature list, there will be maybe 50,60 cents. At the high end of the feature list it will be $1. Does that answer your question?

Mitch Steves:

Thank you for verifying.

Dr. Jalal Bagherli:

Okay, and then under margin maybe I can get Wissam to comment on both gross and operating margin.

Wissam Jabre:

Of course, thanks Jalal. So Mitch, from a gross margin perspective, the battery management solution is one within our company average margins, which as a reminder, our target has been for a while 50 to 53%. And so we expect that battery management solution to be well within this range. And so that basically translates also to an operating margin of the 20 to 25%, which is in-line with our long term targets.

Wissam Jabre:

In fact, when we look at the very management it gives me a bit more confidence that will be within the 20, 25% target. So, hope this answers your question.

Mitch Steves:

Okay, yeah. I just want to explore one. So within those three you guys outlaid, which is basically the cap versus the travel, versus the high end safety for battery management. I guess, is there a rank order for which the market profile in those three?

Mitch Steves:

You gave out-

Wissam Jabre:

This specific margin profile within those three, when we think of the travel adapter, it's probably on the lower end of the scale, but the others are very much within the ranges I mentioned.

Mitch Steves:

Perfect, thank you.

Wissam Jabre:

You're welcome.

Hugh:

We Now go to the line of Sandeep Deshpande for JP Morgan. Please go ahead Sandeep. Your line is now open.

Sandeep Deshpande:

Yeah, hi. I'm trying to understand what is the new intellectual property that has been acquired by Dialog which enables you to do this? And how is it different from the power management IP that Dialog has always had? I'm just trying to understand that how is the distinction between power management, what your original power management chips did? As well in the future, what your power management chips will do, and what's the differential in the IP with battery management is?

Dr. Jalal Bagherli:

Okay, so Sandeep, let me take a shot at that at the high level to define the difference between the two. And then I'm going to ask Vivek to be more specific on some of the technologies they've created for battery management. So if you think about the way the phone we have detected in the diagrams, so you have charge coming in from the, let's say USB, from the wall charger through the USB wire, into the phone.

Dr. Jalal Bagherli:

The task of the battery management is essentially to take this charge and store it in a safe way into the battery, but understanding also the battery level where it starts whether is completely empty, is it totally empty? Is it full? And how fast the user or the designer of the phone wants to charge the battery. So the management of battery is managed by the battery management.

Dr. Jalal Bagherli:

The role of power management is to take charge from a source like a battery and then distribute it to all the electronic components on the board like processors, memory, cameras, etc, right? So enable them to function. So delivery and conversion of power levels from battery to those components is what power management does, and then sequencing of how you power up. Components is also done by power management.

Dr. Jalal Bagherli:

But battery management is really focused on health and safety of the battery, the rate of charge and integrating the sources of charge. The source of charge maybe through a wireless charging or maybe to a wire charging. So those are the type of thing that the battery management does. But Vivek, can you give some technical examples of the ... Or areas where they've created IP from conversion of, for example, conversion efficiency or safety features that you mentioned earlier?

Vivek Bhan:

Sure Jalal. So, if I have to explain to your question, you should think about power management as a feed forward system where there is power coming in to the pmic ic and system synthesisers different things in that power and feature to a processor or a camera, so very feed forward system. And then different KPI's come into play, which we develop to LDO's box and booze for power management IC.

Vivek Bhan:

But fundamentally a very feed forward architecture. Chargers tend to be a closed loop architecture, so the more complex, the more a system than upcoming. They have a more system attribute to it, where you have inputs coming in wired or wireless, you synthesise those inputs, convert that from very high voltage to high current. And then you monitor the output, the load, which is the battery and make decisions around it.

Vivek Bhan:

So your feedback coming in very accurate feedback being monitored. We sense the state of the battery. That feedback goes back to the battery management IC, and it controls what it would do, makes decisions based on that feedback and becomes a complete closed loop system. It has more loops, it has more complexity, and it has more decisions to make based on the state of output that it is feeding into. So the IP is different.

Vivek Bhan:

As I said, it has a more system and algorithmic content to it on top of your components that we also utilise from our power management experience. But fundamentally, it's very different. Also, differences come from the input whether it's wireless or wired. The input voltage ranges are very different for battery management.

Vivek Bhan:

In pimic, we mostly you have a five volt system inside a smartphone, but as far as a battery management system is concerned. You may see higher levels of power, or there's 10 volts 15 volts, or even up to 20 volts because they intend to get more energy across at higher voltage and then the battery management will convert that energy into current that can be fed into the battery. So again motor system, MC is more than simple feed forward implementation.

Sandeep Deshpande:

Thank you. I mean one follow up question going back to your slide number seven where you talk about these three IC's of between 20 cents or 25 cents, and now you're talking on next generation

between $1.50 to $2.30. Is this a function of many more system chips that you just mentioned on battery management that you're selling into these different phones? Or is it that in some customers you've got a few chips but then overall that average is going to be between $1.50 to $2.30?

Vivek Bhan:

I think this is the, if you like, the content that they can deliver to the phone for a battery management system today. So in terms of customers, I will say it is a major customer they may choose one specific battery management charger for example. This is fully customised for them. They may or may not use necessarily the cap divider or the AC DC from us.

Vivek Bhan:

But we do have probably three customers that we know already that they take both the AC DC high power delivery system we've shown here, as well as the cap divider for example.

Sandeep Deshpande:

So what you're trying to say is that the $1.50 to $2.30 is the top end of what you can ship it. If somebody buys a particular smartphone has all your IP on it as such, whereas you could be just shipping one or two of them depending on how the customer has designed their phone.

Vivek Bhan:

Correct, yes. That is true, but as I say in the period ahead, we expect the increasing content in the areas where people just using one but yes, that's right. We know three of the top five that you mentioned use more than one. Two off the top, actually one of them uses two and then two of the bigger guys use the high value custom solution in the battery management.

Sandeep Deshpande:

Thank you.

Hugh:

Okay, it seems if we have a further question, which is back to the line of Adithya Metuku, Bank of America, please go ahead. Your line is open.

Adithya Metuku:

Yes, thank you. Just a quick follow up on the question earlier. So just to understand the consequences involved in designing battery management systems and Pmics. Are they significantly different? I know the systems you explained them are different. That isn't really the same engineers, the same competencies.

Adithya Metuku:

I'm trying to gauge how ... You said previously that engineers have gone to applicant design immix From 2021 I believe of course, and I'm just trying to see if they have the competency to do this in house, or whether this can be a more sustainable product for you going forward. Thank you

Dr. Jalal Bagherli:

Okay. So, I think designing any mixed signal devices, there is some special expertise. People who design system, part algorithmic part, some of the fundamental circuits are special, but maybe 70% of the general implementation can be done by similar type of engineers that could do power, or battery, or indeed any other mixed signal device.

Dr. Jalal Bagherli:

This is true of all companies, but the key differentiator is that that 30, 40% which is very specific. So, there is a special knowledge for designing those fundamental circuits which are unique. The knowledge of systems, the knowledge of safety features that you build in, the knowledge of efficiency of conversion of energy using this architecture that Vivek talked about in a multi level architectures or other architectures we've implemented.

Dr. Jalal Bagherli:

So those are unique. And those are the stuff that we've actually done a lot of patterns as he explained earlier. So you can take a power management team today, which only does time management and ask them to design a modern high efficiency battery management system, if that answers your question.

Adithya Metuku:

Understood, thank you.

Hugh:

Okay, we currently have no further questions are from the phones. Do you have any time for questions that may have come through the webcast?

Jose:

Yes we do. We do have a few. So quick one from Christian from H&A. Can you give us an idea of the markets that you're targeting in battery management?

Dr. Jalal Bagherli:

Right. So I think the ... Again, this is a projection as of now. So I think this year we will be expecting to because it's the early part of the cycle, we expect something in the order of maybe 2% market share. By the year that we projected in 2023, we expect to be roughly about 15% of the market.

Jose:

Perfect. Thanks Jalal. Well, two questions from ... I'm sorry, one question from Rob Saunders from Deutsche Bank. How does the advent of USBC and potentially port less charging affect the market opportunity?

Dr. Jalal Bagherli:

So what was the second, USBC and what charging?

Jose:

Port less charging

Dr. Jalal Bagherli:

Port less? Oh, wireless charging, okay. So maybe I'll ask Davin to answer this since we haven't ... Yeah, can you can respond to that Davin.

Davin Lee:

Yes, I'll certainly. In regards to USB type C, that is a physical connector, so it really doesn't affect the opportunity. What USB type C allows is the implementation of industry standard called USB PD or power delivery. That is a standard that a lot of the OEMs are moving to in order to expand palatability amongst the various phones.

Davin Lee:

USB PD allows a higher throughput of charging from the travel adapter to the phone. While a lot of the OEMs are moving to that standard, several of them want to still further differentiate above and beyond this industry standard of USB PD. And that's really where we come in. We work with a lot of the key OEMs to further improve the charging speed, the charging efficiency, allowing our customers to further differentiate their products from their end customers.

Jose:

Perfect, thanks, David. One question from Brian Clough, Wakmore Capital. Do you expect wireless charging to play a much more prominent role anytime soon? And how do you view Dialog's competitive position in this field?

Dr. Jalal Bagherli:

I think the BBC, a number of OEM's have implemented the standard for wireless charging, for example, Samsung but also some of the other guys in China. So it kind of gives us another source of charge that comes into the battery management and our battery management chips are designed to handle both USB and wireless charging path. So we don't see necessarily.

Dr. Jalal Bagherli:

I think with wearables and hearables coming into the market and more and more, that seem to be ways of charging those through your existing device like smartphone. So we see in that context also increase, but otherwise we don't see a massive increase in just wireless charging our phones for example today.

Jose:

Thank you Jalal. And last two questions that I can see through the webcast. These are from Ambri from BMO. The first question is higher level, what are you assuming for smartphone growth over the period you're laying out the opportunity?

Dr. Jalal Bagherli:

That's an interesting question because you need to have a crystal ball given the current situation, but I think what we've tried to not rely on is the volume growth. So, our position is this is an existing market that was there. And we are coming in taking market share in a market that obviously exists because you charge your batches today.

Dr. Jalal Bagherli:

But we will be a new participant with brand new technology. And as we say, engagement at the top five to come in and take a decent market share of up to 15% over the next few years. The volume essentially we estimate for our largest customers to be flat. So without projecting for the whole world, for the ones that you're very familiar with, our assumption is that the volume units will be flat.

Jose:

Perfect, and then the second question from Ambri is in terms of competition since you mentioned Qualcomm and we have seen over the last few years how Maxime was able to lose that teammate business to Qualcomm and to Samsung vertically integrating Pmics internally, how should we think about that risk to your new opportunity, both on bundling and vertical integration?

Dr. Jalal Bagherli:

So I think battery management again, as we said is relatively sort of differentiated, is obviously clearly directing to a battery solution. So we see bundling today. When that happens typically, it's a chipset that somebody like Qualcomm may have. So they have other parts of the system like application processor and they may bundle their battery management with that, so it's hard to break that one.

Dr. Jalal Bagherli:

The only thing I will say is for many of the larger customers, that means is a non optimised solution because that chipset is available to everybody. So it doesn't really provide differentiation on your bundle. So I don't think bundling for large customers would work, because undeniably, they want to add features, they want to have different battery structures.

Dr. Jalal Bagherli:

They have different physical challenges in the product that they're designing from thermal management, to shape, size, thinness, that only a customised solution would be able to handle that and then not offering as far as I know, custom battery management solution. So that's for the bundling. In terms of integration, the type of technologies as we explained earlier, between power and battery management is very different.

Dr. Jalal Bagherli:

So it's even more different if you're thinking about why would they not integrate everything into the application process for example, or some other chips. These are mixed signal technologies, they require larger voltages to be efficient and are typically running as several process nodes larger than say a leading edge digital chip of what Qualcomm made designed for application processor.

Dr. Jalal Bagherli:

So, it just from a real estate point of view. From a technology features point of view of analog design, it makes no sense to integrate into those. And between power and also battery as we said are very different technologies. Power tend to be concentrated near physically to be placed near a processor whereas the battery management clearly needs to be physically very, very close to where the battery is located.

Dr. Jalal Bagherli:

So, also from a physical space in a smartphone, it doesn't have for those two to be that close together. Hopefully that answers your question.

Jose:

Jalal I think the question was also in relation to vertical integration. So the risk of someone like Samsung, for example, could do it in-house.

Dr. Jalal Bagherli:

Well, that is always there. Somebody like Samsung with a foundry, etc., is always there and I don't think anybody's immune. That applies to any product.

Jose:

Perfect. That's all, there's no further questions from online. Hugh is anything else on the call?

Hugh:

Sorry, one more time. If anyone has any final questions at this stage, please press star and then two on your phone keypad now. Yes, we do have a final question and that is for the back to the line of Adithya Metuku of Bank of America. Please go ahead, your line is open.

Adithya Metuku:

Thank you. Just a quick question Jalal, just following up remotely on what's given. When I think about the whole smartphone ecosystem, we have Qualcomm, we have Media Tech. We're always having issues and Samsung, there's always a risk of internalisation. So, any additional wins? How do we get ... Sorry.

Dr. Jalal Bagherli:

What was your question?

Adithya Metuku:

I was just going to say if you could comment on how we can get comfort around these wins being sustainable drivers in the long term.

Dr. Jalal Bagherli:

Okay, so I think we do believe we are bringing advantages to the market in terms of unique technology and customisation. Those are the two things we emphasise. And the proof of the goodness of this is the engagement of the products. We have further requests for further customisation and further demand. And we're just starting and we can expand this portfolio to cover many things.

Dr. Jalal Bagherli:

And what we showed you was specifically we talked a lot about smartphones, but tablets is an area of you also supply battery management. And there's wearables like watches, like headphones, earbuds, and in the future the things like AR/VR glasses coming onto the market as part of the wearables. So the range of these things are expanding. And I think we over emphasised probably the threat of vertical integration by people like Samsung.

Dr. Jalal Bagherli:

I mean, Samsung buys a hell a lot of chips from us as well as many, many others, right/ So clearly they're not going to be designing everything in-house. They're focused on key areas for them. Most of the technologies that they are designing in-house typically are things which are established for more than 10 years or so, then they start sort of trying to build something.

Dr. Jalal Bagherli:

And quite often they're not as competitive but for many of their products, they might not matter if they can achieve a lower cost, right? So the threat is there but so long as you bring innovation and keep it ahead of the pack, I think that's manageable. In terms of the other smartphone makers in China from Huawei, to Xiaomi, to Vivo, to Oppo, to Lenovo. Many customers and not everybody has silicon design.

Dr. Jalal Bagherli:

Not everybody has a fab and they would be hungry for these products. And these parts are battery management. The technology has established this. We will expand our portfolio but also market

targets for example, as I said tablets. Beyond tablets is notebooks, glasses and potentially, we can move also to smart home type, or industrial, connected medical type applications.

Dr. Jalal Bagherli:

There's a bunch of anything with a battery lithium ion battery that needs to be charged safely and fast, would benefit from the technologies that we've invested in. Even if there's some movements in terms of insourcing by one or two customers, it doesn't mean the entire market will disappear.

Dr. Jalal Bagherli:

So we remain highly confident that this is a brand new revenue stream for Dialog which is substantial, starting this year, and the way we said, we've projected it to 2023. We can always argue what happens in 2040. Well, I may not be alive then, but I'm hoping that we will have other products that fulfill the role by then.

Adithya Metuku:

Thanks Jalal. I hope you're alive in 2040 by the way. Thank you.

Hugh:

Okay, if that was the end of the questions from both the audio and the web, Jose, can I please pass it back to you for any closing comments at this stage?

Jose:

Thank you Hugh. I just wanted to say thank you to everyone for joining us today. And as always, please if you have any questions, do not hesitate to reach out to us all. Thank you.

Hugh:

Thank you all very much for attending and you can now disconnect your lines.