

Kuehne+Nagel's Inside Semicon

Episode #7

Security & tracking in Semicon logistics

Intro (00:03)

Welcome to our podcast series Inside Semicon. In today's episode, we will be talking about security and tracking with Tom Sunicki. Thanks to those listening and watching, and we hope you enjoyed today's conversation about the semicon industry. Welcome to Inside Semicon and today we're talking about end-to-end visibility in the Semicon supply chain. Today with me, John Desmond, of course, and Tom, would you like to introduce yourself?

Hi, everyone. I'm Tom Sonecki and for the last three years I've dedicated my life to end to end supply chain visibility. So that that's very interesting Tom, because that's becoming more of an aspect that we find within supply chain, especially on the semicon side, the visibility from products, but also Capex moving from point A to point B. And I think as a result of that movement and the result of the shrinkage of the actual supply chain in terms of like speed and distance, but also the chips themselves, I think you've seen a big change in regard to how we're tracking products from their size to the capabilities of these.

Tom Sonecki & John Desmond (01.00) The different types of tracking devices

I think you have some examples there today to show. Yeah, we do actually have some examples here on the table actually starting from some of the bigger devices that can do a lot and have been in the industry for for many, many, many years. Just just on on that one, could you describe it to our listeners who may not have video, what kind of size that would be? It's like, it's like a big power bank. I would say it's a big power bank, yes. It fits into the palm of your hand. So yeah, yeah. And it's that's quite chunky. And is that from what year would that be from? That is a 2024 model, that is, that is the latest, that is latest device, but that depending on the configuration can last between 60 days and a year, right? So to the people that are not specialized in semicon logistics, what does it, what does this device do exactly? This device gives you visibility on whatever you put it on.

So that device has an E-SIM, it has a gps, it has a pressure sensor, a humidity sensor, a temperature sensor and a shock sensor and a light sensor. I think I didn't mention that one. OK. So you can measure essentially the conditions around whatever you're tracking almost anywhere in the world for well up to a year if you. Yeah, because that's quite a lot because also there you see that how as well with the semiconductor devices as well as the chips themselves.

We are being requested more and more to change and to adapt to their shipping methodologies. You know some of the substrates can't be exposed to light. So hence we'd need to know if the device

itself is exposed to light within the container. The humidity to temperature and especially I think G shock is now a big thing with the CapEx because the the equipment is getting so big. But in terms of producing smaller chips, you have very fine tolerances that are in operation.

Tom Mulders, Tom Sonecki & John Desmond (03:04) Smart Labels

So and then you have something like that, but then I see as well, you have more of a looks like a piece of paper to me, but obviously it's not Tom. It looks like it's a sticker. It's like a sticker. Yeah, it's a label. It's a label. It's a standard shipping label that we would use in the logistics industry. So this one has been printed. And for those of you just listening and on on video, if and for those of you on video, if I peel it off, you see that behind it is actually a chipset and and a set of batteries. And that is the smallest sensor we use for end to end visibility. It from the moment of activation, it can last up to three months and measure temperature. So it's not for every use, doesn't have all the sensors, but obviously due to its size, you can deploy it on a lot more. So that would really be more about tracking from point A to point B. As you said it has temperature control, but it's quite a quick way just to peel it off, attach it as opposed to the previous one. You'd have to do some configuration correct set up. Now is that disposable the, the, the ones you have in your hand? Yeah, the label is actually disposable. The batteries are tinc based, so you can really just very easily throw it away in a standard recycling manner. And yeah, the customers really, really enjoyed it because it gives really precise item level visibility. They can see every single pallet, where is it, what's happening to it, what's the condition.

John Desmond & Tom Sonecki (04:36) Why are these products better than consumer solutions like an air tag

So we have those two here. Myself and Tom have always had a lot of discussions with customers. And one of the challenges back to like I'm sure any logistics firm is, well, I can go to a local shop, I can go get an Apple Air Tag or a cheaper version. Yeah. What's the difference? Why not use that? Yeah, Well, you know, and Apple Air Tag is a consumer product, correct? So that comes with a lot of challenges.

And theoretically you could, but going on mass, that creates other challenges. The beauty of this, especially if you use the label, this actually you print on this. So they come out of the factory blank and you just put it in the standard thermal printer. You print a standard normal label on it, you peel it off and put it on your on your goods and it's perfectly weaved in into our systems. So this already connects to all your shipment data. It comes on a platform, allows you to do things that an air tag wouldn't like Geo fencing, temperature control, alerting, etcetera.

So in principle you're completely right, an air tag could do the same. But the idea of building this for the industry is building all of the value add around that data because you're just having the data, you know, you have a dot on the map, and then what do you do with that data? Yeah. And I guess that's where we can use that data to inform the customer, right? So can we also like set certain boundaries if temperature goes too low or too high, we can send automatic notifications?

John Desmond & Tom Sonecki (05:15) Key functionality such as temperature, humidity & shock control

Absolutely. So the system, because it's connected into our systems, the moment you peel it off and then you put it on your shipments, it pulls the data from our TMS says, OK, this is the temperature that it was set at and the alerts can automatically go to the customer. It's, you know, we're trying to make it as easy as possible for the customers to create as few touch points as needed and inform the customers when something really happens. Wow.

John Desmond & Tom Sonecki (06:20) How do these tools help with security

So the question for me, because early this week I did a, a webinar with Mark Green on security within the supply chain. And there was a lot of eye opening incidents there that had happened and occurred. And one of the things that we were discussing was, you know, the real time tracking. So if there is a, say, a theft or someone opens the back door of a container and there's light right, registered, are these devices real time? Will it send an alert to where and who? Who then has control of that information to ring the necessary person?

Yeah, security is a very interesting use case. And just like you did a webinar, I've recently read a report that especially in the US, the thefts are just going up and up and up and there's very little control. Now, the devices themselves will not control the fact that something might be stolen. But you're getting data, you can react. Now reacting to theft is, a momentary thing. So your first question was, is it real time? It's as real time as it can be. Depending on the setup, you can have the data maybe a minute later, a minute. So that would be what I would call the most aggressive form of tracking. Our usual setup would be every 5 minutes, right? But a theft in 5 minutes it might already be gone. So could be, could be. So these are, we know that things happen fast. So when we talk real time, we're talking about the data being with us in about a minute. I think the primary focus on security, having that data at least allows us to create a map of where things might be happening prevented in the future. And that's first and foremost our, our focus to have an understanding what happens, when did it happen? Maybe who was responsible makes the investigation a lot faster and so on. And then as we get smarter, as we have more data, we can find out, OK, how can we start preventing that?

John Desmond, Tom Sonecki & Tom Mulders (08:23) The role of sensors

So really it's a way of us, you know, analyzing the current, you know, say routes, you know, if they're going through an area where there's always going to be delaying traffic, where the best parking locations are. So you can actually then reassign and redesign the logistics, you know, routing of various devices. So and on devices, I see another item that looks kind of like for the layman, like myself, a rather enlarged air tag. What's that then?

So these are essentially sensors just like the label, but we have the use cases we have of these are to put them on assets that move around for longer. So like I said, the label, so the label lasts for about 3 months after activation. These devices depending on the conditions can last between 2 and 10 years for for the bigger device. So if you have a product that you're tracking around the world for, you know, a longer period of time, just like an air tag, you could put one of those. And then to your analogy, it is essentially from a consumer perspective like an air tag just built for the industry and fully integrated, fully integrated. I think that's the, the added value for us in logistics is that we're not using something that's made for consumers. We're using something that's fully integrated into our systems, which in most cases is also integrated with our customer systems. I mean something very simple that you might overlook. But the plastic used on this is food grade plastic. So if you use it on pharma or food that's already certified, right, It's not going to disintegrate the moment you put it with fish. Yeah, yeah. So there are certain aspects that you have to think about when you're doing things for a business to business use case.

John Desmond & Tom Sonecki (10:16) How will technology advance in the future, especially for Semicon logistics?

So in terms of technology, do you see these things getting smaller, more advanced, more, I don't know, quicker response times? Where do you see this going in terms of say, semiconductors? You know, we have, let's say the latest NVIDIA chips coming out were between 26 and €46,000 for one,

which obviously is, you know, very stealable. But then on the flip side, that's going to allow these devices to become more intelligent. Do you see anything coming in the horizon that makes these devices more intelligent?

I'm not sure about intelligent. I mean, they will always get more intelligent. I think the intelligence part comes from what we do with that data. This is just I, I look at these as an input to the logistics supply chain becoming more intelligent. So we have that, we have an input. It was here, this was the condition. And it really then, you know, if, if we pull out a buzzword from 10 years ago, big data becomes reality, right? You really have a tremendous amount of data that you can then look over and and create models and that's where the intelligence comes in. I think the next step for for any of these devices is energy efficiency. So the the better the chipsets get, the battery gets smaller. I mean, you wouldn't be able to produce this a few years back because the battery you would need to power the chipset would be too thick, too big, would not be flexible enough. And as these chipsets get more energy efficient and more and more intelligent than you can go maybe to 1 battery cell and then the label can get smaller.

I think 10 years ago, this was probably, this was probably about the smallest you could get, right? And it would last 60 days maybe and it would last 60 days, right? And to think that now we have that which looks like a general normal product label that we put on every box that will more or less do the same as it did 10 years ago. That's amazing.

John Desmond, Tom Sonecki (12:38) How is the current technology helping improve resilience in the supply chain

And on that then, since we're progressing, you know, technology, how is that impacting the resilience? Obviously the supply chain, because that's something that a lot of people are, you know, asking about and inquiring about. It's hard to tie down what is resilience, but if you could give your, you know, two cents on how does these products allow us to provide resilience in the supply chain?

Ah, resilience is a is a great word. So I tend to think of resilience as jumping forward when something adverse happens, something brings down the supply chain, you know, it becomes inefficient. It's how you move forward and having all of the data at your fingertips right away allows you to act instantaneously saying, oh, you know what, the supply chain broke here, OK, we're going to reroute it this way because we have the data, we have the knowledge. We're not guessing, we're not assuming. We're actually making data-driven decisions on the spot. I think that's the first and foremost how it becomes more resilient. And as we grow the database, as we have more data, it allows us to build supply chains for our customers that in their nature are more resilient.

And I think that ties in them with the visibility that these devices allow us to, to track from the point of movement stopping, you know, even G forces humidity, light, etcetera, etcetera. It's something that is going to continue to develop and probably even get smaller. I mean, I'm looking now at the labels and I'm still amazed at the size of the labels and the size of the devices. The actual discrete components have become so flat. You know, we can see how we really reach the apex when yes and no in terms of what we can produce to allow us to track devices with just a simple peel on and peel off label. And there's no need then for the label to come back into the supply chain. Whereas with the first, first one when I wanted the first model because it's 2024, but it's still quite but I mean, it's a, it's a version of many devices before, right?

Tom Sonecki, Tom Mulders & John Desmond (14:08) In what situations do we use each tracking device?

So it's the greatest and the latest because we still see use cases where a device like this makes a lot of

sense and that would device would be better suited for certain situations, right? Because you can reuse this, you can't reuse that label. That is correct. And I think as well the difference if you look at to say, let's take the analog version versus the digital, the analog versions with the old tip and tell, you know, yes, something happened over the 6000 kilometre trip, but we don't know where how. And I think that from tip and tell to these devices is only in my opinion is only a matter of time before we move 100% to these devices, which will give us instantaneous, you know, response times of where that problem happened. I think the tip Intel is an analog device is quite good. And I think if you think about it really long term and this becoming standard in in the industry, yes, there will be a barcode just to make sure if something happens come someone can scan it manually. But if this becomes maybe not if, when this becomes a standard in industry, you will no longer have to manually scan things in and out because the device will tell you I'm here. Yeah, Yeah. And a device will say, hey, I've left. Yeah. It's literally a game changer. It's literally a game changer. Yeah, Yeah. And it could even be that when you put it on in the warehouse, as it leaves the warehouse, it then can actually say I've left the warehouse so you can take me off stock. And then that feeds back into the system. So you've no problems with forward flushing or back flushing finished goods out of the warehousing into trucks.

John Desmond, Tom Sonecki & Tom Mulders (15:39) How Semicon has helped improved this technology in logistics

So, but All in all, I think the way it's going is quite, it's quite interesting and it does show how the again, the semiconductor and the development within semiconductors now allows us to print, to print flat smart labels. Yeah, which is mind boggling this moment in time it is. And it's only going to get better. Yeah. So I think future trends, Tom, anything future 10 trends.

Yeah. I think the first one we just started, this will, in my opinion, become an industry standard and allow us to remove some of the manual scanning work and manually checking stock and figuring out where things are. And then with such clear visibility, I know we think that our supply chains are very efficient because we've mastered them over decades and we've squeezed out every single possible efficiency out there. But it's still sometimes a black box you put things in and you trust that they go through because they've always have and you have the good connections with the data that comes through these devices. We will have a near certainty of what happens in the supply chain. And with that, I think the the next trend and it's something that's coming up is the traceability. It's not only supply chain visibility, but where did the initial item, where did the raw material for the item that's a component of the final item come through? You could have actually visibility of your entire supply chain, right, of all of your raw materials, all of your components, and all of that could tie into a database that you cannot. It's immutable.

John Desmond, Tom Sonecki & Tom Mulders (16:30) How this data helps our customers

So in a way then you're actually you're kind of talking about cradle to grave, but the proper cradle to grave. So there's any disruption in raw materials used to make a device. You already know from the beginning, you've got a six week lead time that's going to impact you. So build up the stock now because in six weeks something will kick off or there'll be some problems, you know, for whatever reason, it could be like hurricane, you know, season. It can also be the fact that by tracking the way that the trucks are moving with these devices on, there could be Road works around any one of your multiple cities in Europe and we need to avoid that. But if you can actually say, well, if we go this way, it's 40 minutes longer, but you save an hour, we're then able to, as you said, it's a moving target. We're able to constantly readjust the supply chain from that point of view.

I think as our customers, you know, we go to precision, precision engineering just in time production, not only in cars but everywhere, right. We don't want to hold large amounts of stock because that's a cost that will happen in every single industry, semicon and others. You need that data because that

it's that data that actually allows you to automate your processes. Exactly. You can only automate your processes as good as your input data is. And if your input data is sporadic and down to, you know, incomplete and, and based on human input, then your automation is going to suffer. If you have very precise and consistent data coming in, then your automation will become more efficient because it will be consistent.

Tom Mulders, Tom Sonecki & John Desmond (18:58) Episode close

Tom, thank you very much for coming here sharing your knowledge. John, thank you very much for joining the conversation. It was a very interesting conversation and I hope that our listeners and viewers enjoyed it as much as I did. Thank you again, both for coming and tune in next time for our next conversation.

Been a pleasure. Thank you, thank you.

John Desmond (19:20) Outro

Thanks for listening to today's podcast Inside Semiconductors and the Semiconductor Supply Chain. If you found any of the topics we discussed interesting and you want to find out more, you can find me on LinkedIn at John Desmond or go to Kuehne+Nagels website.