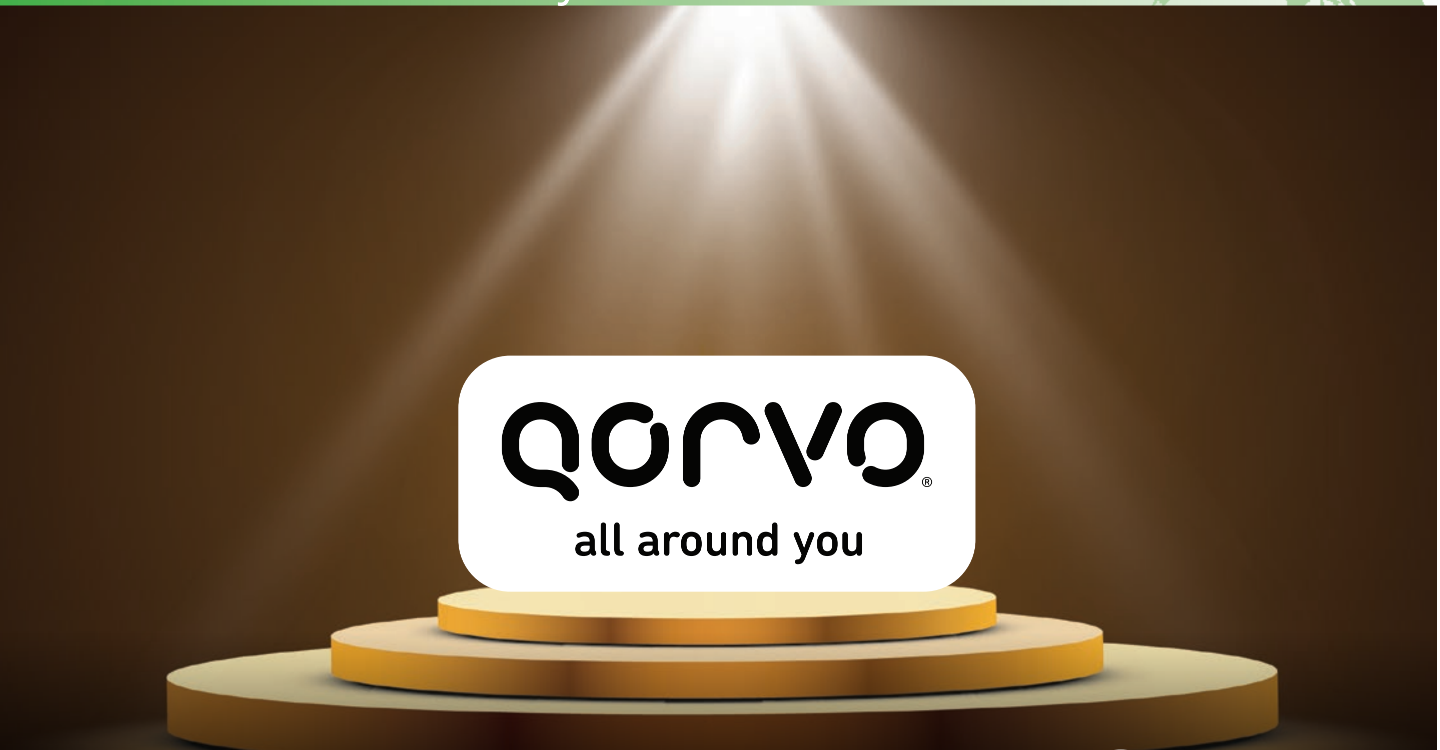


Industry Profile: Qorvo

By Melissa Cogavin, Managing Editor, SCTE

Qorvo is a global provider of semiconductor solutions that connect, protect and power our planet. Debbie Gibson, product line director for the company's CATV and Broadband Access products, spoke with us about how the pandemic-induced market disruption unexpectedly strengthened their position, and what the future might hold.

Debbie Gibson, Product Line Director - CATV and Broadband Access, Qorvo

What kind of market trends are emerging for Qorvo in broadband?

As far as high-level trends are concerned, we're seeing US operators continuing with a lot of mid-split and high-split upgrades to advance their plants to DOCSIS 3.1. From a production and volume standpoint, Qorvo is servicing those areas.

There are of course the macroeconomic concerns of a rapidly changing world, but the industry is actually very bullish, driven by continued subscriber demand for greater internet speeds. Last year I saw many private demonstrations showcasing DOCSIS 4.0 at trade shows in the US, so there's a lot of development centered on upgrading networks to DOCSIS 4.0 to further support that trend.

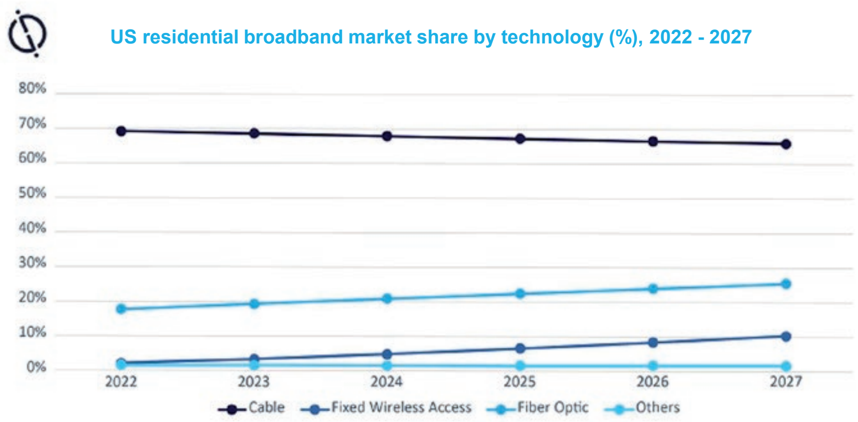
What are you seeing in the DOCSIS 3.1/4.0 market?

We are seeing good deployments and orders for DOCSIS 3.1 and a lot of design activity for DOCSIS 4.0 applications, whether that's the full duplex DOCSIS (FDX) approach or extended spectrum (ESD) DOCSIS deploying 1.8GHz spectrum. And that's to allow symmetrical data rates. We're seeing a push toward higher and higher upstream and downstream data rates and that's driving a lot of design activity among our customers. Qorvo has the widest breadth of RF products to service this market in the US and has the only production-released product portfolio of 1.8GHz devices. There is also interest in derivative products, which provide more RF power at less DC power. In Europe, there's a lot of activity around Vodafone and a lot of excitement around some of the deployments there.

What do you see as the technology focus in Europe?

In Europe, the big trend is optimising RF power and DC energy, making upgrades to allow for improvements in power

HFC will remain dominant in US home cable broadband market share



Source: GlobalData, Technology Intelligence Center

GlobalData.

- US residential broadband service revenue is expected to grow at (CAGR) of 4.56%, from $84.5 billion in 2022 to nearly $102.6 billion in 2027.
- Cable operators' hybrid-fiber coax (HFC) networks will continue to dominate the residential broadband market in the US through 2027, capturing 65% market share.
- Even as rivals expand fiber-optic availability and consumers increasingly adopt fixed wireless access (FWA) services.

and energy efficiency with all the concerns about the energy crisis. That really has been a theme and has also translated to the US. A lot of our customers are doing system-level trades around how they optimise how much RF power they can get versus DC power they're pulling out of the plant.

Tell us more about that.

You always want as much RF power as possible going through the network so that when you get a signal at home, you get a clear reception and all your data comes through. But there's a trade-off between the amount of RF power and the amount of DC power you need to generate to make that RF signal come through.

If MSOs can reduce the amount of DC power they have to buy and get the same RF performance, it's an operational expense benefit to them. Qorvo is doing just that – creating products that achieve that same RF performance at a lower DC power consumption to get better efficiency and help reduce the MSO's power bill.

What new products has Qorvo released in the 1.8GHz space?

We just released two lower-power MMIC devices for use as upstream or downstream driver amplifiers. We are also actively developing some additional hybrid, MCM and MMIC devices to support those 1.8GHz applications going forward. Qorvo has a broad number of products that are already servicing the 1.8GHz space and in the next quarter some additional, newer-generation devices will be released that further advance that application.

How do you view the difference between the US and European markets?

Buildouts to extend spectrum to 1.2GHz happened in Europe a number of years ago. Today there are only a few countries and networks that still need to be upgraded to 1.2GHz and/or will move to 1.8GHz plants. Most of the growth for us is going to be in North America.

But it's not that straightforward. One of the things we are seeing in Europe is that a lot of our customers are also supporting some of the US-based applications. So, some of the traditional companies that were focused on Europe are also looking to service the US.

What are Qorvo's unique selling points?

First, Qorvo has a very, very broad portfolio of devices, and we produce the dominant share of GaN and GaAs devices that support the cable TV application space. Second, we have an outstanding factory in Nuremberg that is well respected in the industry. It's a dedicated factory just for cable TV products. No other manufacturer in the world has that. I came from another company recently and have done a lot of module work. I'm extremely impressed with the level of quality and automation there. And it really allows us to deliver high volume at top quality, which is really what the industry needs.

Did production suffer during the pandemic with the semiconductor shortage?

I'm happy to say that we avoided having any line-down situations with any of our customers. We were able to manage the whole scenario very well. Qorvo also has the capability to 'fab' a large percentage of our GaAs and GaN devices. Therefore, we have the in-house capability, the fabs, that allowed us to mitigate issues like that. For those components that we were buying externally, we worked aggressively with our customers to ensure their needs were met.

Is Qorvo's approach unique?

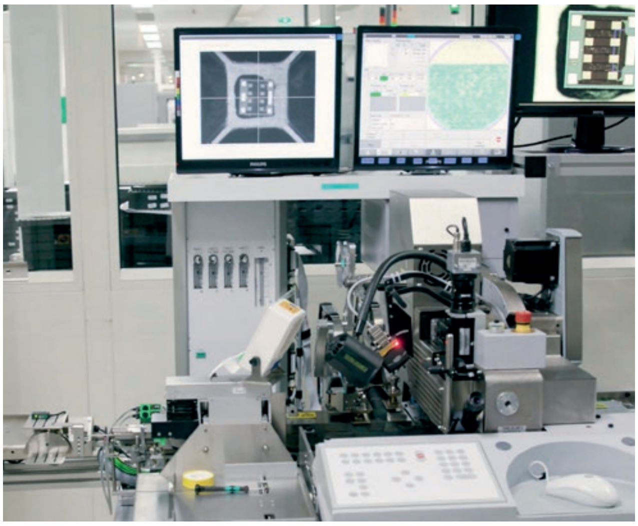
Yes, the internal capabilities that Qorvo possesses, the GaN and the GaAs fabs, are unique. We don't have to rely on other suppliers that are going to allocate us a certain amount of the product that we need. We get all that internally and that was crucial during the pandemic. We didn't have to stockpile semiconductor portions because we were able to make them ourselves. We had issues with some of the piece parts and other components, but we were able to work through that and we never really got behind.

What other qualities enabled Qorvo to succeed during the pandemic?

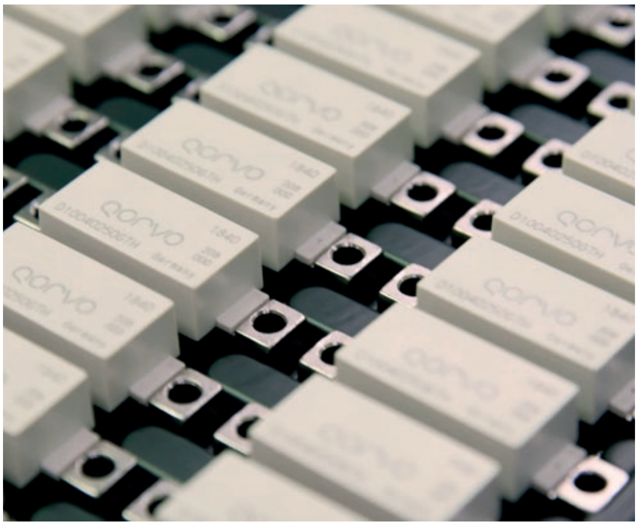
Essentially, strong communication, working with our customers and understanding their needs. I am impressed by the operational excellence of Qorvo's planning group and how they have processes to monitor the production plan and mitigate risk and be forward looking. Qorvo has in place systems that serve us well. Everything in Nuremberg, from R&D through final manufacturing, test and shipping is in one building that we own and control. So, the whole supply chain is internal.

In an industry that has seen technology evolve and business practices shift at lightning speed, large multinationals can find agility quite a challenge. As the fibre rollout continues, where does that leave the evolution of the cable industry and Qorvo itself?

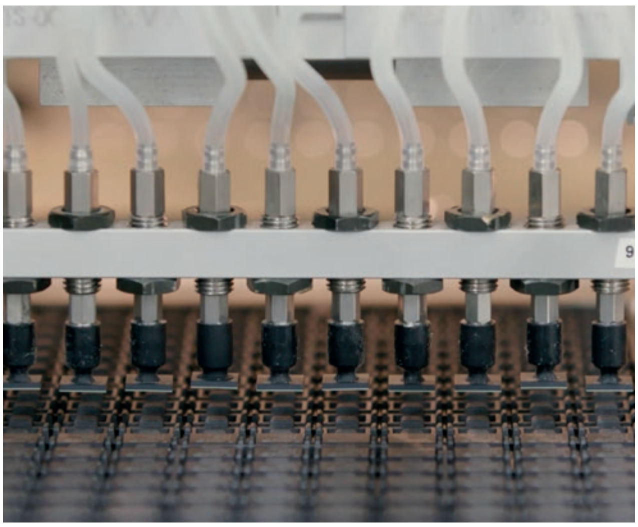
In the US, certainly with a lot of government funding, there is a focus on fibre, but there are existing cable plants in place that can provide comparable performance to fibre at a much lower capital expenditure. I think cable has a lot of runway still left with the evolution into DOCSIS 4.0 and being able to get higher and higher symmetrical data rates on the upstream and downstream sides.



Eutectic Die Bonding – Individual GaN and GaAs Die are bonded to carriers.



Hybrid tray – Finished Hybrid Power Doublers ready to be boxed and shipped.

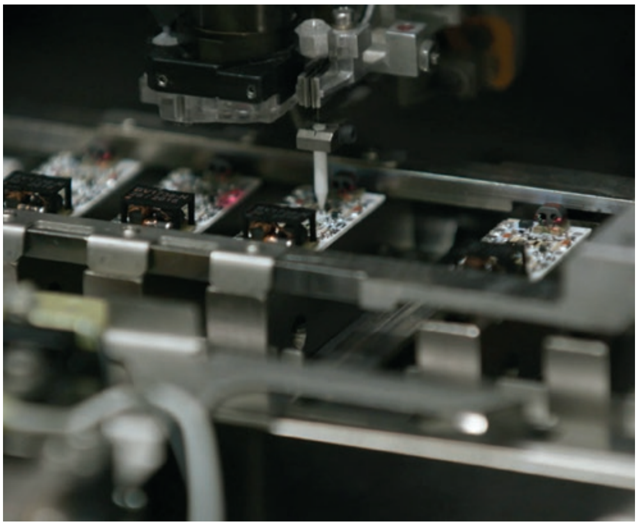


MCM Handling - Surface mount MCM devices selected for testing.

Qorvo's Nuremberg manufacturing facility delivers the highest level of design, manufacturing services and broadest portfolio, so customers can select the perfect product for their application requirements.

Qorvo has three decades of experience in the design and manufacturing of CRTV and broadband amplifiers as well as simplifying and consolidating manufacturing steps to bring products to market with speed, quality and reliability. Highly automated assembly lines are designed to manufacture products with as little manual work as possible. This includes state-of-the-art processes for assembly trimming and tuning as well as testing.

Wafer – GaAs Die being picked from Wafer for eutectic die bonding to carriers.



Wirebonding – Hybrid PCBs during wire bond operation.

Our customers are deploying fibre as well where it makes sense with their economic considerations and needs. If you look at the US broadband market by technology, cable has a 70% market share for the US today. It's only going to decline from there. But it will decline at a slow rate. They're predicting that it's going to be in the 60% to 65% market share by 2027. So, it's not a steep curve.

What do you think will be Qorvo's biggest challenge in the next two years?

Uncertainty and risk for the timing of the rollouts and deployments with the current macroeconomic situation. Also, understanding the pricing and the impact of the past couple of years on pricing is a challenge. Being able to extend the performance and the bandwidth at lower cost expectations is a big challenge. There was an expectation that as the pandemic ended, business would immediately go back to normal, but that is far from realistic. We will need to be patient.

You clearly have pride in Qorvo. Where does that come from?

It's several things: One is our high degree of customer intimacy at all levels. Especially in broadband, it's a select set of customers in a focused market. Everyone on the team feels connected to our customers. It's a motivator for people personally as well as the group. Second, I'm proud of our manufacturing capabilities and commitment to quality. Qorvo continues to innovate and provide leadership, can quickly release derivative and new products, and scale and ramp up production. That's really what our overall broadband approach and our brand promise are doing: enabling connection. Qorvo's brand is about connecting, protecting and powering the markets we serve.

For more information, visit www.qorvo.com