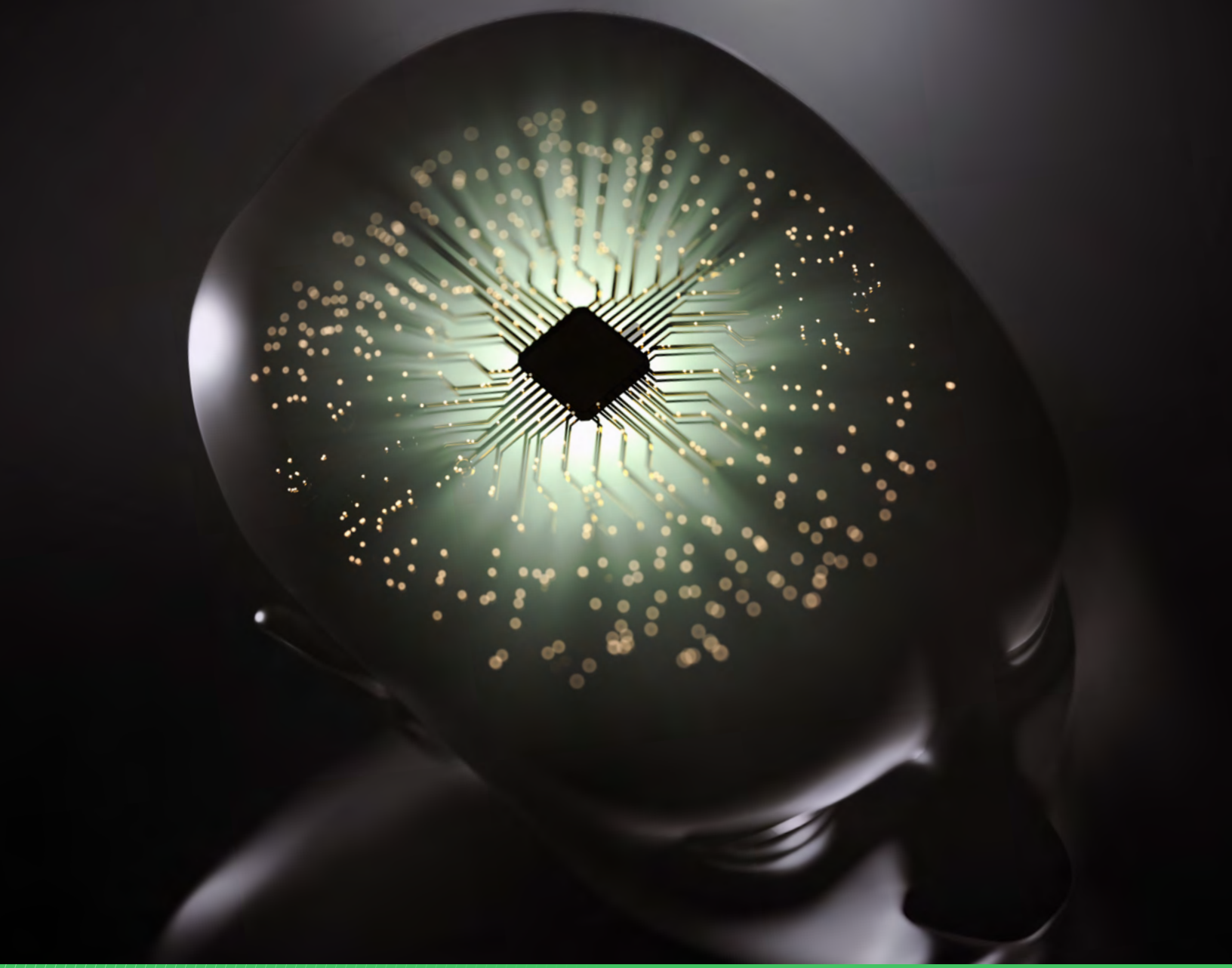
AVNET®

BEYOND THE CHIP SHORTAGE:

OEM strategies for future-proofing designs



NOVEMBER 2023

AVNET INSIGHTS

BEYOND THE CHIP SHORTAGE:

With access to most components significantly improved, OEMs stick with strategies to future-proof designs

EXECUTIVE SUMMARY

More than three years into the global chip shortage and supply chain disruptions, semiconductor component availability continues to improve, although lead times remain higher than pre-pandemic levels. Shortages are ongoing for some parts, specifically MCUs and analog.

In the third of a series, this **Avnet Insights** survey report documents how chip availability is impacting engineering, procurement and supply chain professionals who work with electronic components today and the steps they are taking in response. We surveyed 316 professionals worldwide employed by Avnet suppliers and customers who represent a wide range of companies from industrial equipment makers to aerospace OEMs.

Our survey results indicate a significantly more positive attitude than one year ago, with a big jump in the percentage of respondents reporting that the state of the component shortage is somewhat or significantly better than a year ago. Moreover, companies are beginning to shift their focus to the market as a key area of concern, though 62% of respondents say component availability remains a top priority. That's not surprising, given inventory is top of mind for most companies.

When designed-in components are not available, companies continue to rely on tried-and-true tactics including designing in standard components, seeking alternative sources for parts and going beyond the approved manufacturers' list, increasing buffer inventory, and improving relationships with manufacturers and distributors.

Forging a strong relationship with a distributor (like Avnet) gives OEMs access to actionable data, providing greater visibility and control to help them create more agile supply chain strategies for the ever-changing landscape of the global semiconductor market.

RESEARCH HIGHLIGHTS

Key takeaways from 2023:

- Nearly three-fourths of global respondents believe the severity of the component shortage has improved year over year: 73% say the shortage has gotten much better or somewhat better. Moreover, this signals a significant shift for survey takers, who feel there has been improvement compared to 2022, when 59% said the severity of the shortages had gotten worse year over year. In the first half of 2022, nearly all (98%) of respondents reported challenges in getting access to components.
- Market conditions are a rising concern. More than a quarter of respondents are more concerned about market conditions (29%) vs. component availability, up from 18% in 2022. Still, component availability remains a top concern for the majority (69%).
- Overall, respondents report they are experiencing improvements in their access to many semiconductor component types—in particular, passives (66%). However, respondents are still feeling some strain with analog (19%) and MCUs (20%), where demand is outstripping supply.
- When preferred parts are not available, respondents are seeking alternative sources for parts (32%), increasing buffer inventory (19%), and increasing the timetable of demand forecasts (17%).
- Seeking alternative sources for parts (32%) suggests an opportunity for new suppliers who frequently have difficulty getting a foot in the door on existing designs.

SURVEY METHODOLOGY

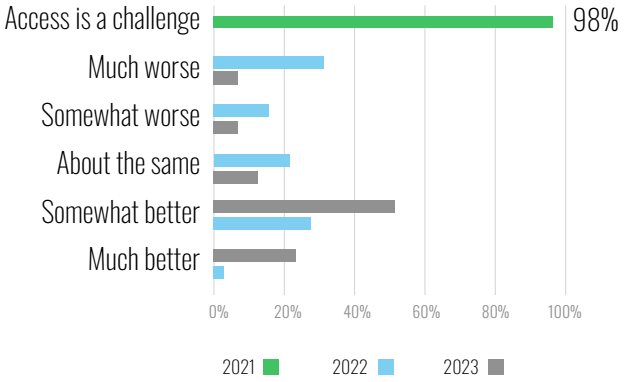
THE AVNET INSIGHTS CUSTOMER SURVEY WAS CONDUCTED AMONG N=316 ENGINEERS AND SUPPLY CHAIN PROFESSIONALS. REGIONALLY, RESPONDENTS WERE BASED IN THE AMERICAS, EMEA AND ASIA. THE SURVEY WAS FIELDED ONLINE FROM SEPT. 6-25, 2023, USING AVNET'S GLOBAL CUSTOMER DATABASE.

CHIP SHORTAGE IN REAR VIEW MIRROR, WITH A FEW EXCEPTIONS

Our latest survey confirms what OEMs everywhere have been experiencing over the past year: Component availability and lead times are on the upswing.

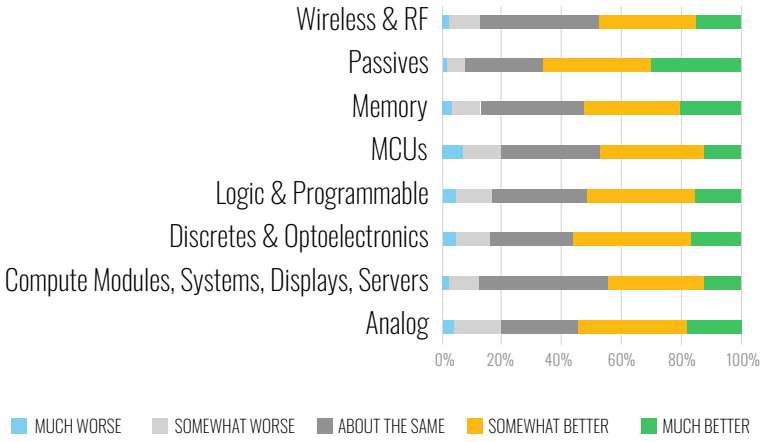
Access to components has been steadily improving. In 2021, virtually all (98%) of respondents said that access to electronic components was a challenge. Globally today, 73% of respondents say the severity of the components shortage now is either somewhat or much better year over year. That's compared to less than one-third (31%), when respondents in last year's survey were asked to compare improvement between 2021 and 2022. In some cases, improved availability may almost be too much of a good thing, with many companies seeing inventory excesses across the supply chain.

How has the severity of the components shortage changed year over year?



Across the board, approximately half of all respondents reported access is somewhat or much better than a year ago for compute modules, discretes and optoelectronics, logic and programmable, memory, passives, and wireless and RF. In September 2023, Avnet's materials team reported that lead times were flat or had come down for most part categories since the previous quarter. An exception is MCUs, where demand continues to exceed available supply.

In the following categories of components, how has availability changed over time?

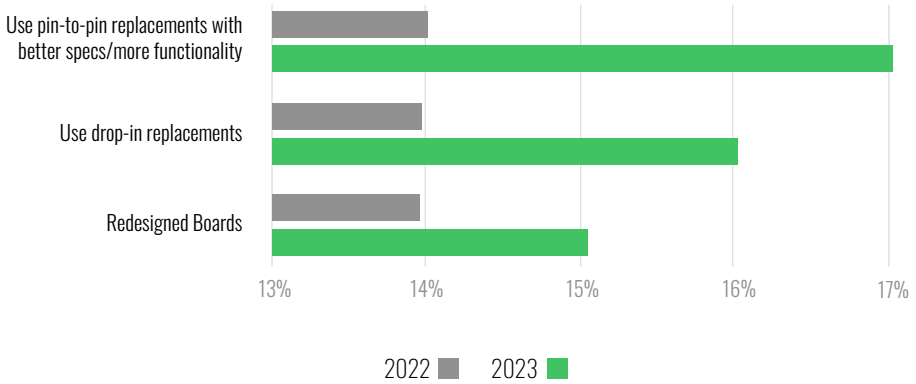


A PLAN B WHEN DESIGNED-IN COMPONENTS AREN'T AVAILABLE

If there's anything that the disruption of the past few years has taught the industry, it's the importance of having a back-up plan. Given the vagaries of supply and demand, as well as supply chains overall, the ability to manage uncertainty is likely to be the rule rather than the exception.

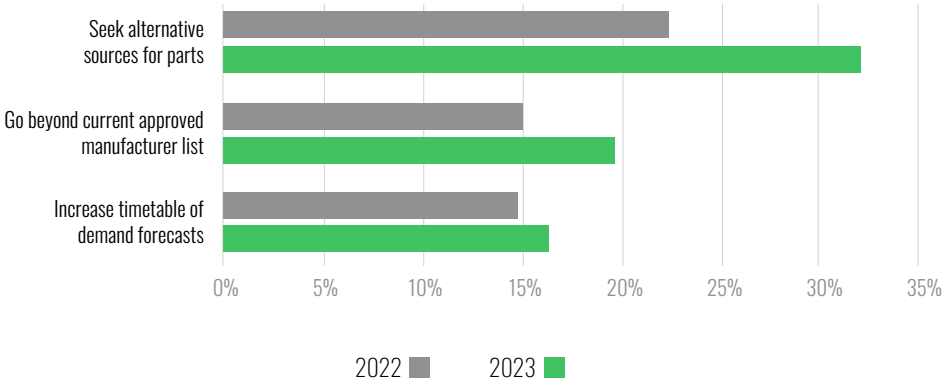
When designed-in components are not available, respondents continue to do what they've been doing: Using pin-to-pin replacements (17%), drop-in replacements (16%) and redesigning boards (15%). The later tactic, of course, is a given when engineers are forced to use alternative components.

When designed-in components are not available, which of the following design tactics has your company used?



Similarly, when it comes to supply chain tactics, seeking alternative sources is the most popular tactic (32%), followed by going beyond the approved manufacturers' list (19%) and increasing the timetable of forecasts (17%).

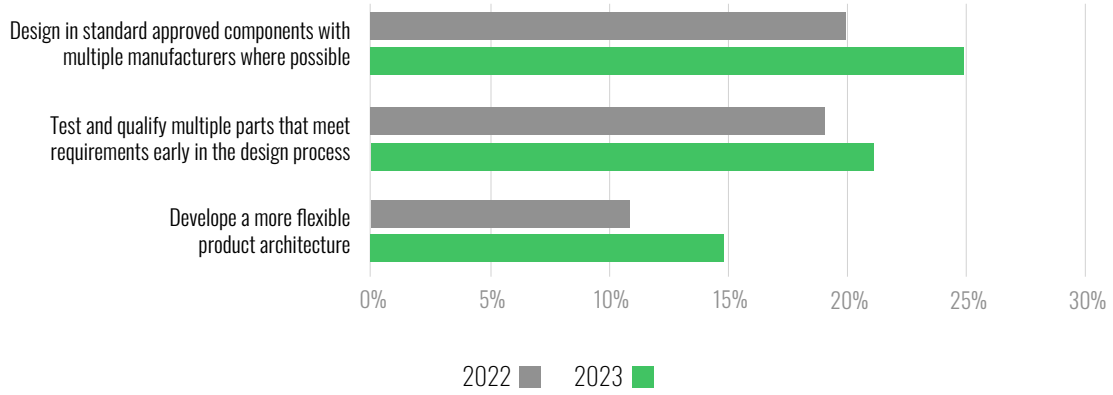
When designed-in components are not available, which of the following supply chain tactics have your company used?



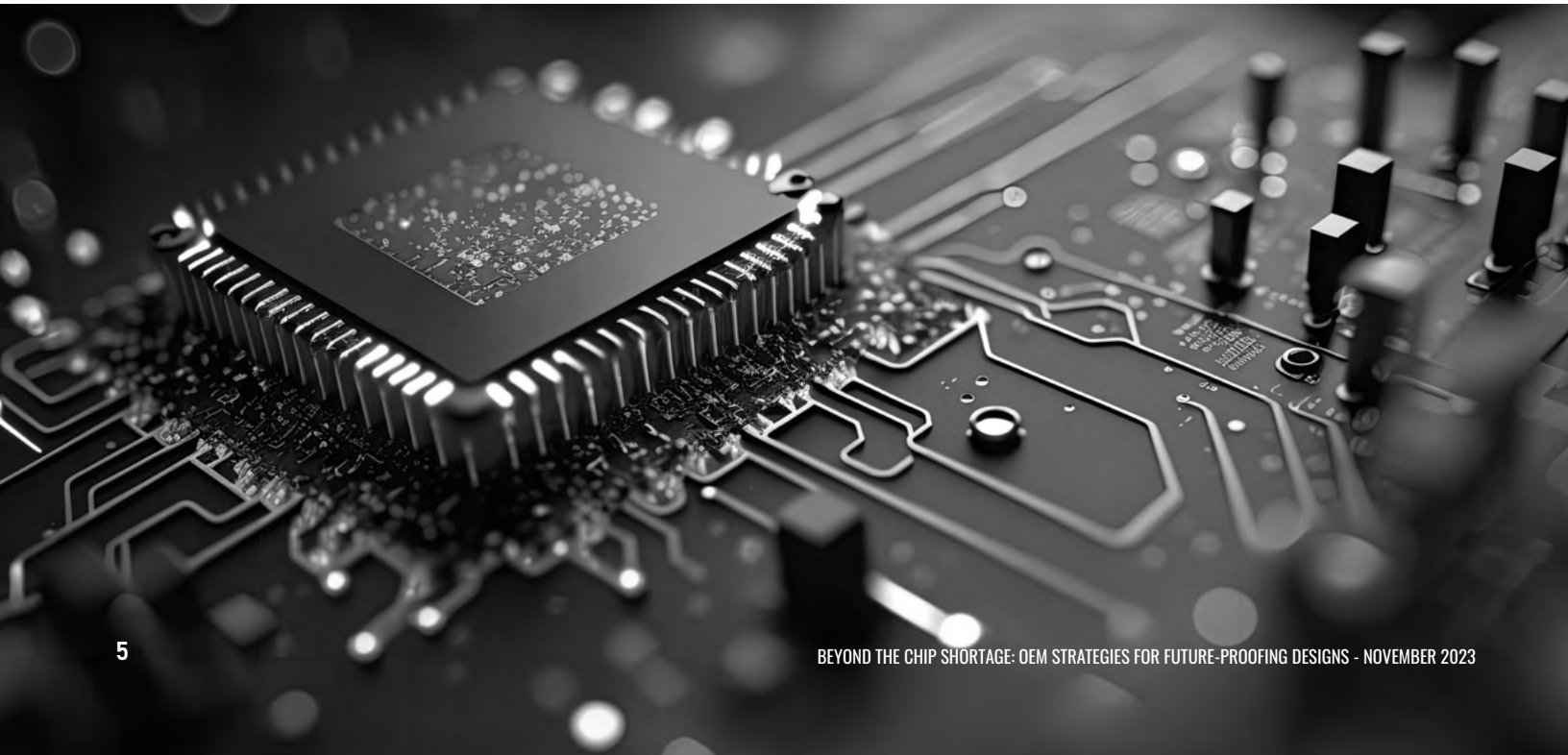
TACTICS FOR MANAGINING UNCERTAINTY

Companies are doubling down on tactics with proven success, including designing in standard components with multiple manufacturers (25%) and testing and qualifying multiple parts early in the process (22%) showing jumps from 2022. These activities are opening up new opportunities for suppliers to get into OEM supply chains, which can prove challenging otherwise.

Which of the following design strategies do you plan to implement to better manage current conditions?



Companies are also shoring up strategic collaborations with partners such as distributors and manufacturers, looking to enter into long-term supply agreements (21%) and improving relationships (distributors: 18%; manufacturers: 17%). These partnerships can help improve supply chain visibility and agility, key to managing disruption.



CONCLUSIONS AND RESOURCES

The final chapter in the recent global chip shortage may be winding down, but ongoing uncertainty over supply chain disruptions, the possibility of trade wars, regulatory challenges and the fluctuating demand for semiconductors has prompted many companies to prioritize their business continuity planning. In some cases, that means developing more flexible designs that avoid dependence on specific components. In other cases, it means investing in strategic inventory.

Our survey also shows that companies value close partnerships with distributors and manufacturers in order to achieve greater supply chain visibility and control.

Working with a distributor like Avnet is invaluable in getting access to specific global supply and demand data. This actionable data enables companies to identify trends such as potential shortages, inventory challenges or lead time extensions and make better operational decisions as a result

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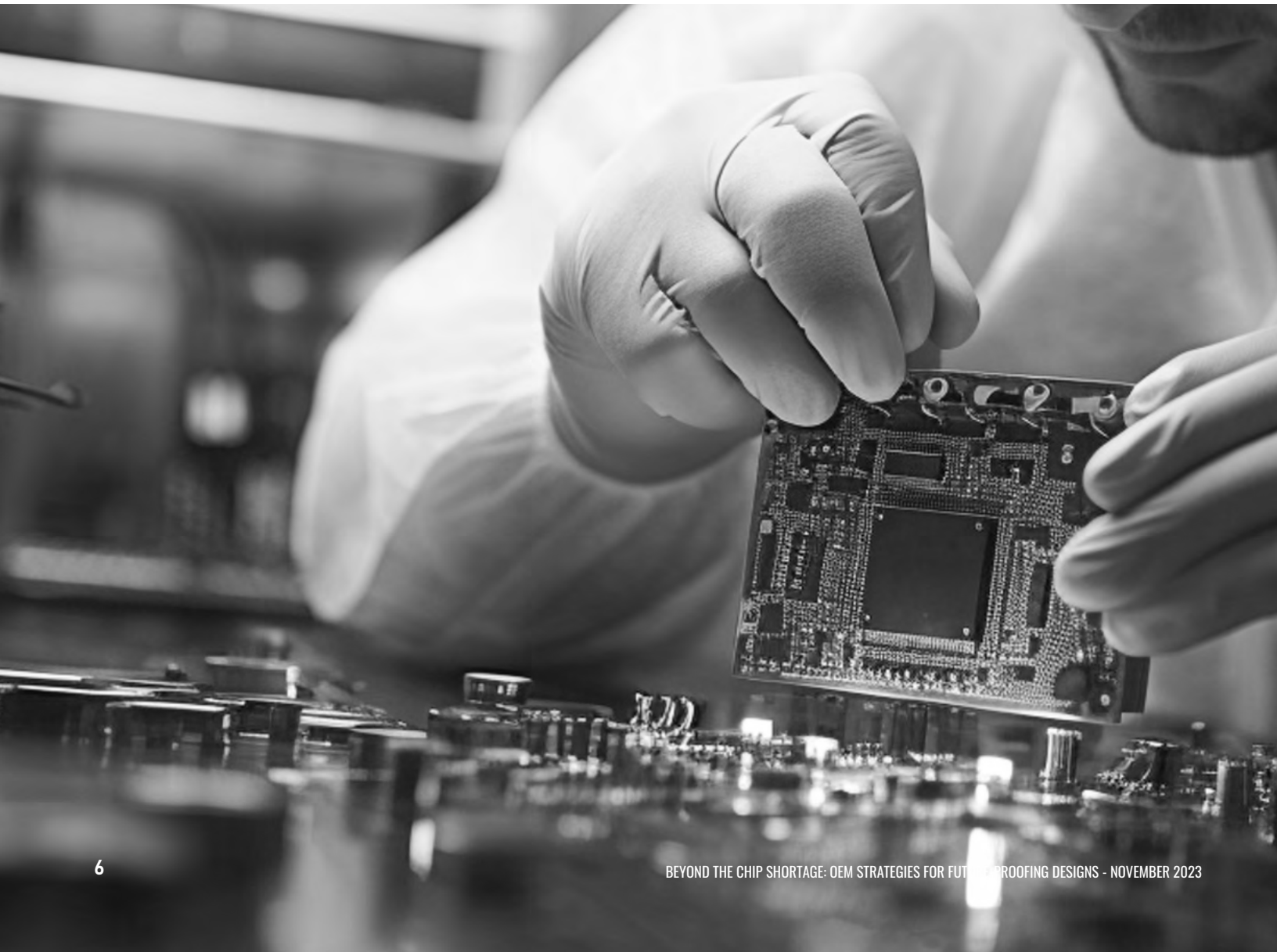


SYSTEM-ON-MODULE APPROACH IS GAINING TRACTION

A STRATEGY THAT COULD HELP OEMS BETTER MANAGE PART CONSTRAINTS

Design engineers have long been aware of the advantages of using a system-on-module (SoM), most notably the speed in time-to-market by using a pre-built, off-the-shelf computing core that's been pre-verified. Except in the case of mass market devices, cost savings is another benefit, as SoMs eliminate the need for in-house chip-down designers; OEM engineers need only worry about the carrier board, peripherals and connectors.

As SOMs get smaller and electrical designs get more complex, interest in the technology is growing, says Tim Jensen, Senior Director Embedded Product Innovation for Avnet Embedded. "We're getting more and more inquiries from OEMs who are looking to move from components to SoMs," he said.

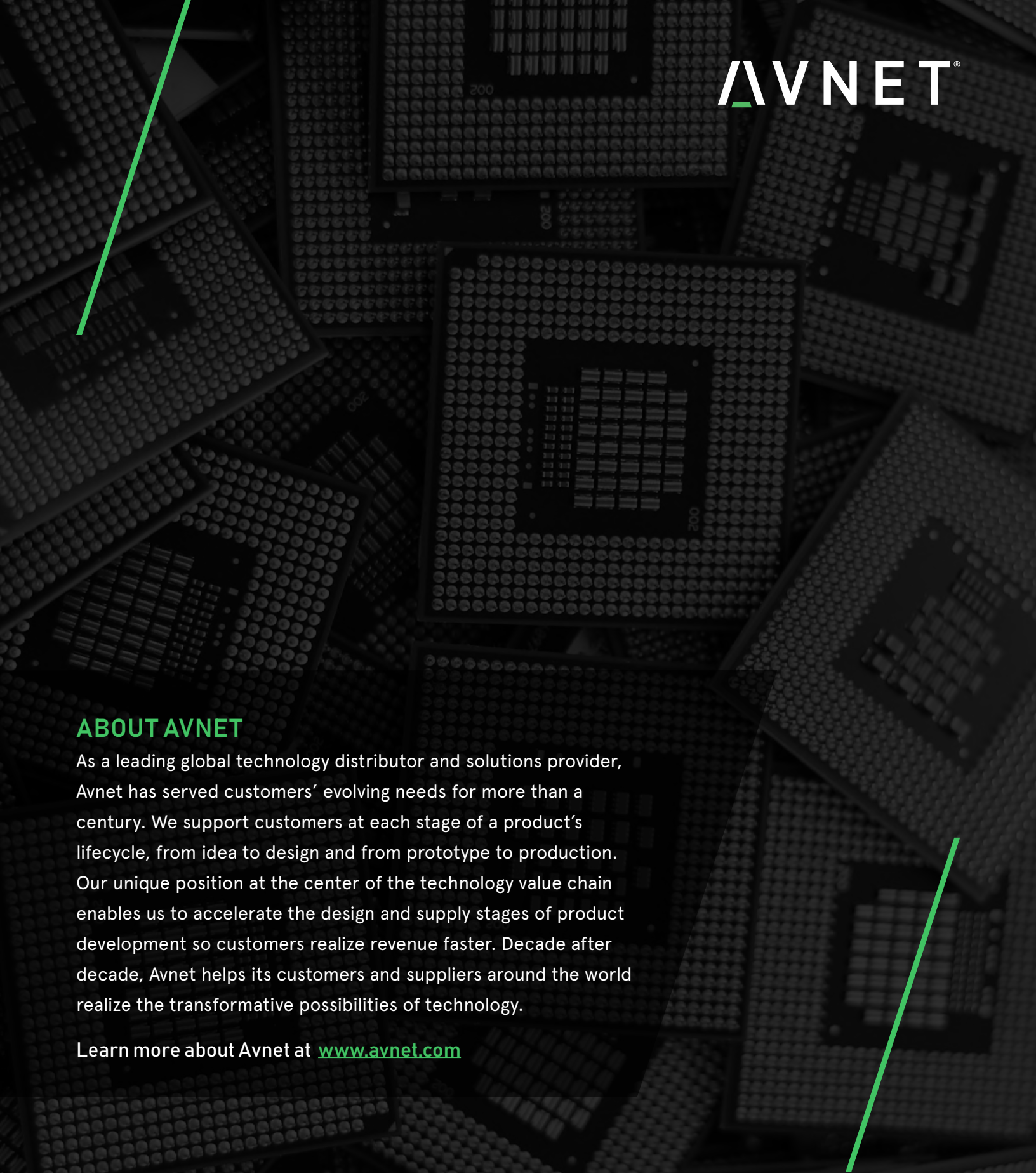
Avnet Embedded makes a variety of standardized SOMs based on the open standard Smart Mobility ARChitecture (SMARC). SMARC modules are based on the x86 and same basic power requirements and are exchangeable within the same footprint and pin-out.

Avnet Embedded took things one step further recently by introducing the **SimpleSwitch** development environment, making it possible for engineers to swap x86 and ARM-based SMARC modules without having to change any code.

Because of this interchangeability, Jensen says the technology got an extra boost during the chip shortage. "When chip-down designers couldn't get their hands on the parts they needed, they were up looking at a complete board redesign—even in the case of a replacement part within the same architecture. That's not the case with a SoM."

Chip-down design also requires an OEM to source possibly hundreds of individual components, creating big challenges when parts are constrained. With a SoM, an obvious benefit is it that requires sourcing only one component. It is the SoM supplier's responsibility to source all the parts, and as buyers of large volumes, they are likely to have better overall access to parts.

See Avnet Embedded's **products and solutions**.



ABOUT AVNET

As a leading global technology distributor and solutions provider, Avnet has served customers' evolving needs for more than a century. We support customers at each stage of a product's lifecycle, from idea to design and from prototype to production. Our unique position at the center of the technology value chain enables us to accelerate the design and supply stages of product development so customers realize revenue faster. Decade after decade, Avnet helps its customers and suppliers around the world realize the transformative possibilities of technology.

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