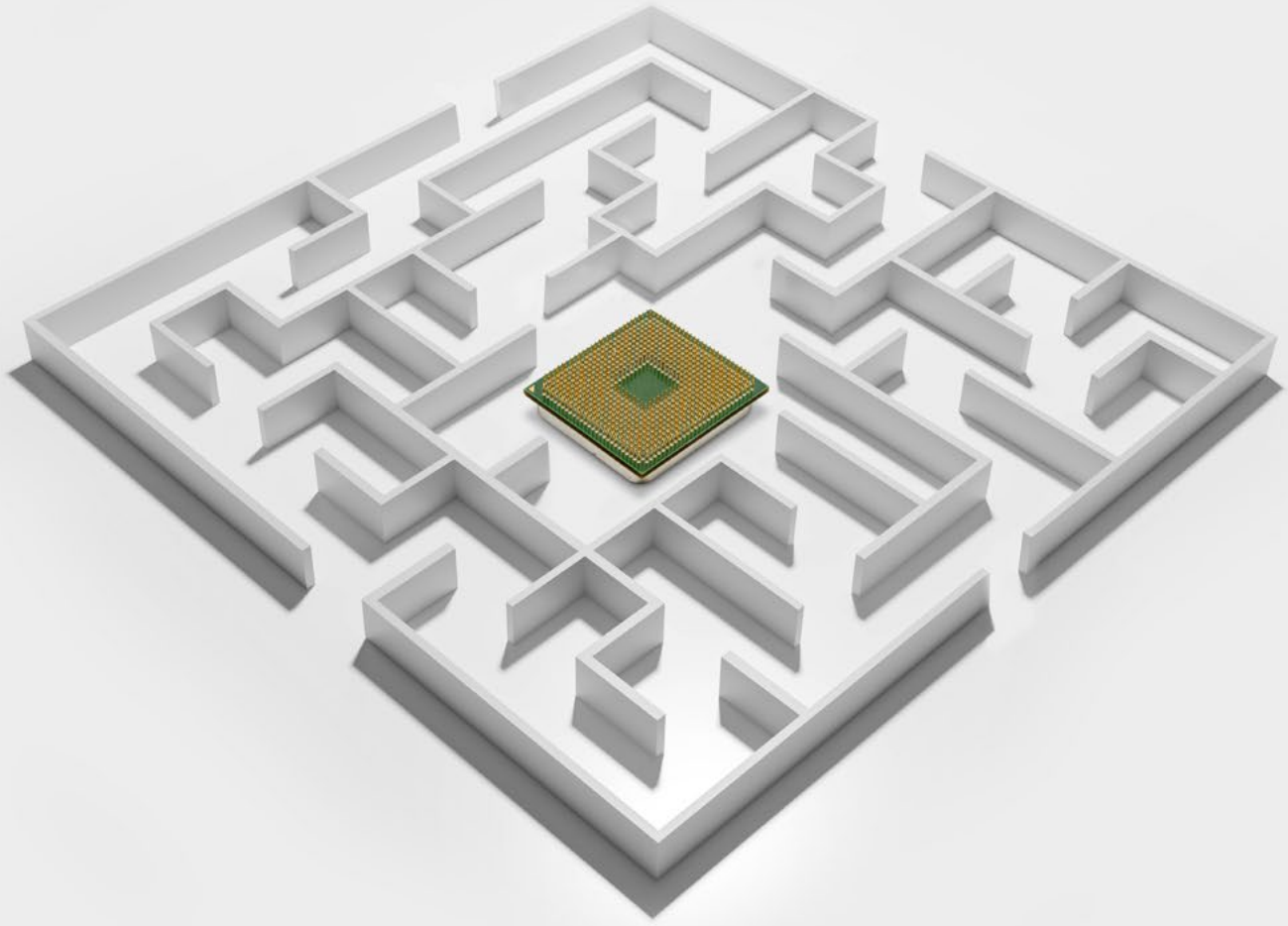
AVNET®

THE CHIP SHORTAGE:

Navigating from efficiency to resiliency



NOVEMBER 2022

AVNET INSIGHTS

THE CHIP SHORTAGE:

Navigating from efficiency to resiliency

EXECUTIVE SUMMARY

More than two years into the global chip shortage, many companies are still struggling to get the components they need. While lead times are beginning to stabilize for some parts, the market remains tight. Companies continue to grapple with the ongoing ripple effect of higher prices, longer design cycles, and delayed production schedules, while facing new challenges such as global inflation and uncertain market conditions.

Even under these difficult circumstances, there are some encouraging signs. Lead times for some part categories are stabilizing and even improving. And there's been a reported increase in production at some semiconductor manufacturers.

The response to the chip shortage is getting better, too. Some companies are beginning to implement more long-range, strategic initiatives that will help them deal with uncertainty beyond the current situation. These efforts include designing for resiliency rather than efficiency and strengthening relationships with key partners like distributors.

In the second of a series, this Avnet Insights survey report documents how the ongoing chip shortage is impacting engineering, procurement and supply chain professionals who work with electronic components today and the steps they are taking in response. We surveyed 1,605 professionals worldwide employed by Avnet suppliers and customers who represent a wide range of companies from industrial equipment makers to contract manufacturers.

RESEARCH HIGHLIGHTS

- Following more than two years of disruption caused by the global chip shortage, respondents have a cautious assessment of the semiconductor market today. More than one-third (41%) say that the situation has stabilized or improved compared to a year ago.
- Market conditions today are less concerning than the chip shortage. Over three-quarters (79%) of respondents said component availability is of most concern to them, compared to 18% who cited market conditions.
- There are signs of a slight improvement regarding lead times and pricing, particularly in APAC. Here, more than one-third (37%) are more concerned with market conditions than component availability.
- EMEA respondents are more pessimistic about the current semiconductor market, with 92% rating it terrible or poor due to the geopolitical conditions, macroeconomic strain caused by the Ukraine war, and growing concerns over an energy crisis.
- The ongoing challenges have underscored the need for and importance of more strategic design and supply chain initiatives to achieve greater resiliency. Nearly a quarter (23%) have begun testing and qualifying multiple parts that meet requirements early in the design process. Additionally, organizations are adjusting their supply chain strategies to improve relationships with manufacturers (17%) and lengthen supply agreements (21%).
- Companies are challenging conventional thinking about lean inventory, with 22% of respondents noting they are building up buffer stock.
- Looking ahead, respondents are preparing for increased prices (58%) and even longer lead times (26%).

SURVEY METHODOLOGY

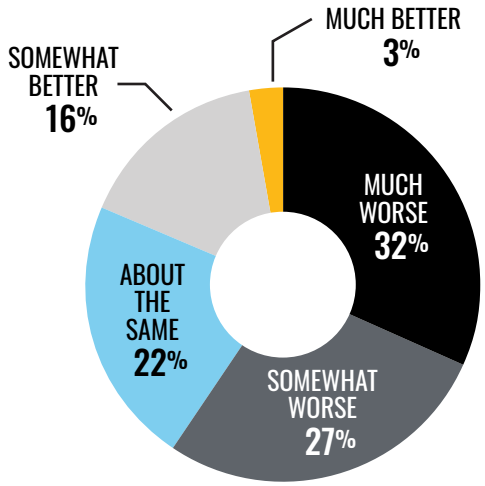
THE AVNET INSIGHTS CUSTOMER SURVEY WAS CONDUCTED AMONG N=1,605 GLOBAL ENGINEERS AND SUPPLY CHAIN AND PROCUREMENT PROFESSIONALS. REGIONALLY, RESPONDENTS WERE BASED IN THE AMERICAS (42%), EMEA (41%) AND APAC (14%). THE SURVEY WAS FIELDED ONLINE FROM SEPT. 6-23, 2022, USING AVNET'S GLOBAL CUSTOMER DATABASE.

CHIP SHORTAGE IS STABILIZING, EASING SLIGHTLY

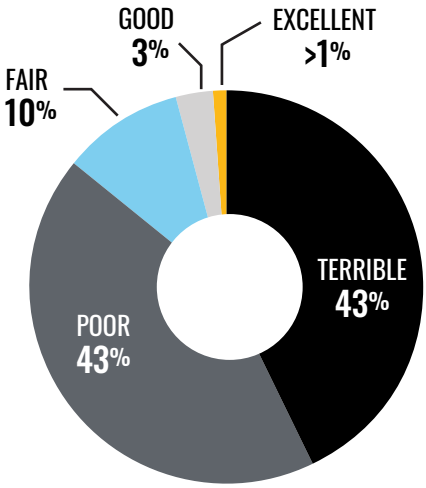
Our latest survey confirms what OEMs around the globe have been experiencing over the past year: Many are still struggling to get the parts they need and are coping with the ripple effect reverberating throughout the product development process.

That's not surprising, given the near perfect storm of rising inflation, currency exchange rates, transportation and packaging issues, raw material shortages, extreme weather conditions, container shortages, and an ongoing demand for semiconductors that is greater than the supply. So tight are the conditions that over three-fourths (86%) of survey respondents rate semiconductor market conditions today as terrible or poor.

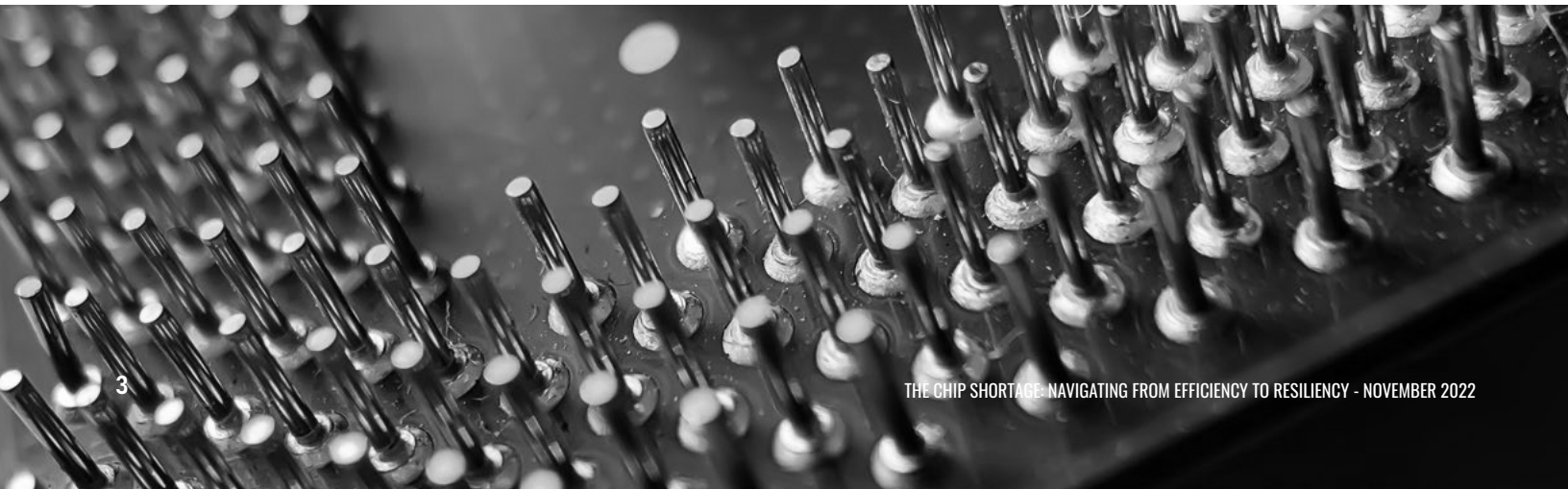
How has the severity of the components shortage changed year over year?



How would you rate current semiconductor market conditions?



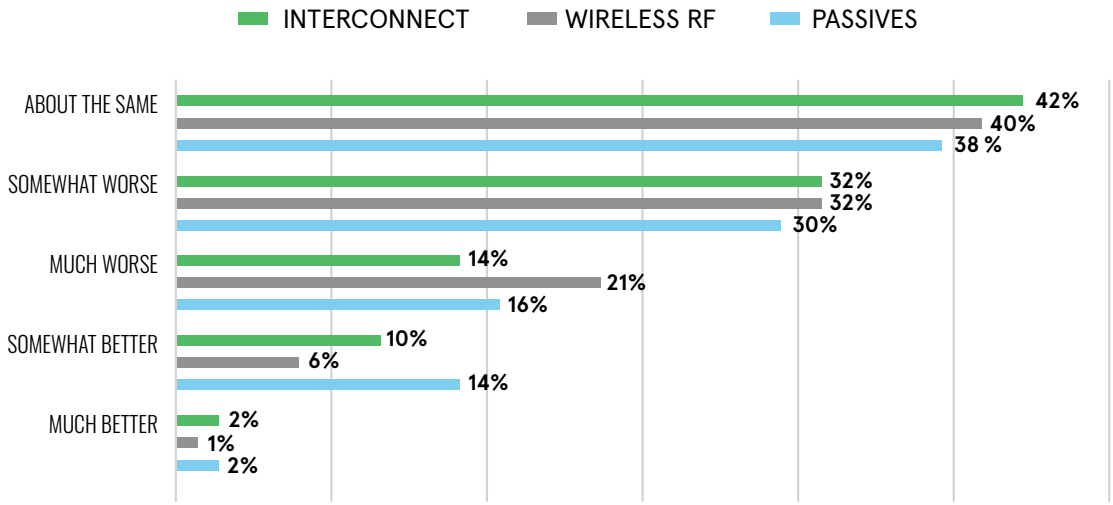
But there are signs the situation is stabilizing and even easing slightly. Globally, 41% of survey respondents report that the severity of the chip shortage is the same or better than a year ago. The supply situation in APAC is slightly improved, with over half (54%) indicating it is the same or better compared to a year ago.



CHIP SHORTAGE IS STABILIZING

Respondents also reported that access to some parts categories is stabilizing or getting better, including passives (54%), interconnect (51%), and wireless and RF (47%). In August 2022, Avnet's materials team reported that 65% of lead times were the same or slightly improved, averaging a 10-day improvement. Some categories were reported to be more constrained, including logic and programmable (74%), followed by MCUs (74%) and analog (69%).

In the following categories, how has the access changed over time?



A CASCADING EFFECT ON PRODUCT DEVELOPMENT CYCLES

Longer lead times, higher prices, longer design cycles and delayed production schedules continue to be the biggest pain points for survey respondents.

When preferred parts are not available, companies continue to employ a range of tactics, including the use of drop-in replacements (25%), pin-to-pin replacements (25%) and board redesigns (25%). Some engineers have referred to this practice as "filling the gap," taking the necessary steps to find and design in alternative parts. But that comes at a cost.

For critical parts, the PCB typically will need to be redesigned. And this is where a vicious cycle can ensue: As engineering teams redesign existing products around available components to keep production going, they're diverted from working on new products.

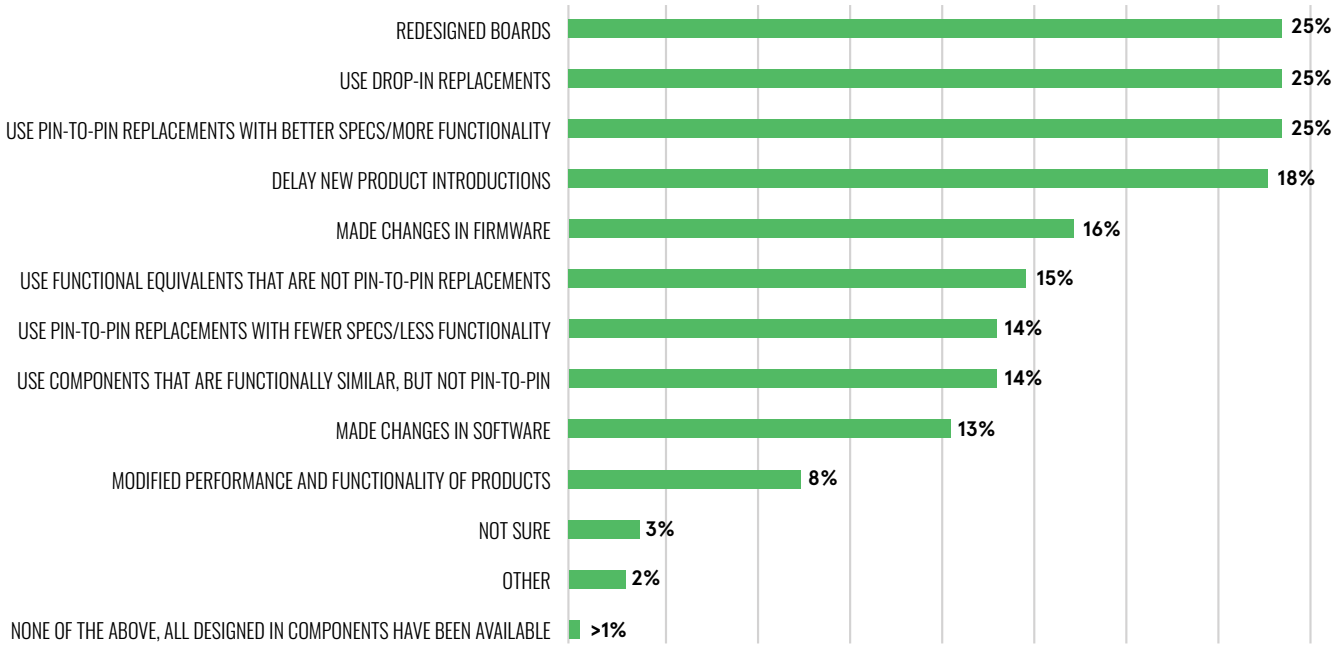
Further, developing a new board requires the engineering time to design it. Testing, approvals and recertification causes more time-to-market delays. Worse yet, some companies reported going through this process multiple times with a single board as they grappled with component availability shifting over time.

Even when teams have been able to work on new designs, the cycle time can be impacted by the inability to get even small quantities of parts to build boards that are needed for prototyping, pushing schedules even further.

One tactic to meet immediate demand is to draw down on buffer stock, which has been a lifeline for many companies. Recognizing the benefit of keeping some stock on hand, some respondents say they are now moving away from a lean inventory strategy (see "Is the principle of lean inventory dead?") and plan to build their reserve stock back up.

"The biggest impact for us is the amount of time spent doing design spins to replace one part with a functional equivalent on a different footprint." — Engineer, Semiconductor Equipment Maker

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



CHIP PRICES, LEAD TIMES SLIGHTLY REDUCED

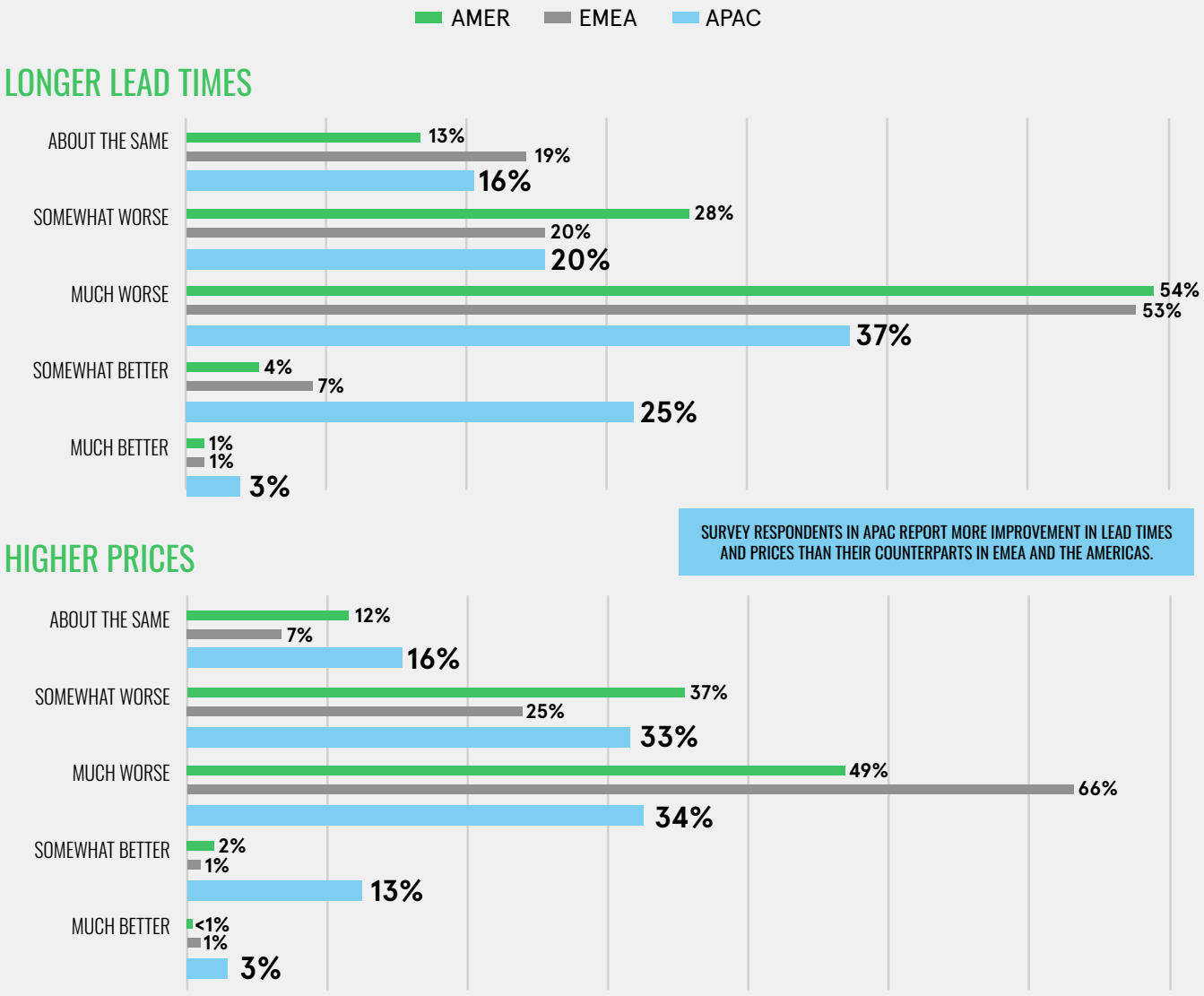
While APAC is coping with inflation, currency depreciation, and a continued impact from COVID-19, the semiconductor supply situation is slightly improved due to demand reduction and inventory ramping up.

Prices for some semiconductor product categories started to decline in May 2022, with memory for example, dropping in cost 20-25% from the peak.

In general, semiconductor availability is improving in APAC on consumer and wireless—two segments that are seeing a downturn in demand. At the same time, inventory levels at all stages of the supply chain—from foundry to supplier to distributor to contract manufacturer and OEM—are beginning to rise.

Further, companies in APAC, especially in China, have more access to Chinese suppliers because in the past few years the Chinese government has been encouraging local innovation in the semiconductor industry.

Looking at the following areas, please rate how the ongoing chip shortage has impacted your work.



SURVEY RESPONDENTS IN APAC REPORT MORE IMPROVEMENT IN LEAD TIMES AND PRICES THAN THEIR COUNTERPARTS IN EMEA AND THE AMERICAS.

MANAGING UNCERTAINTY THROUGH RESILIENCY

Until the onset of the chip shortage, efficiency was typically the top design consideration. Designs were optimized around factors like the lowest cost (that met requirements) and quickest time to market. Parts availability was rarely considered because it wasn't an issue.

Companies were caught short with the chip shortage because they had no back up plan when they couldn't get their preferred parts and were forced to "fill the gap" just to get through.

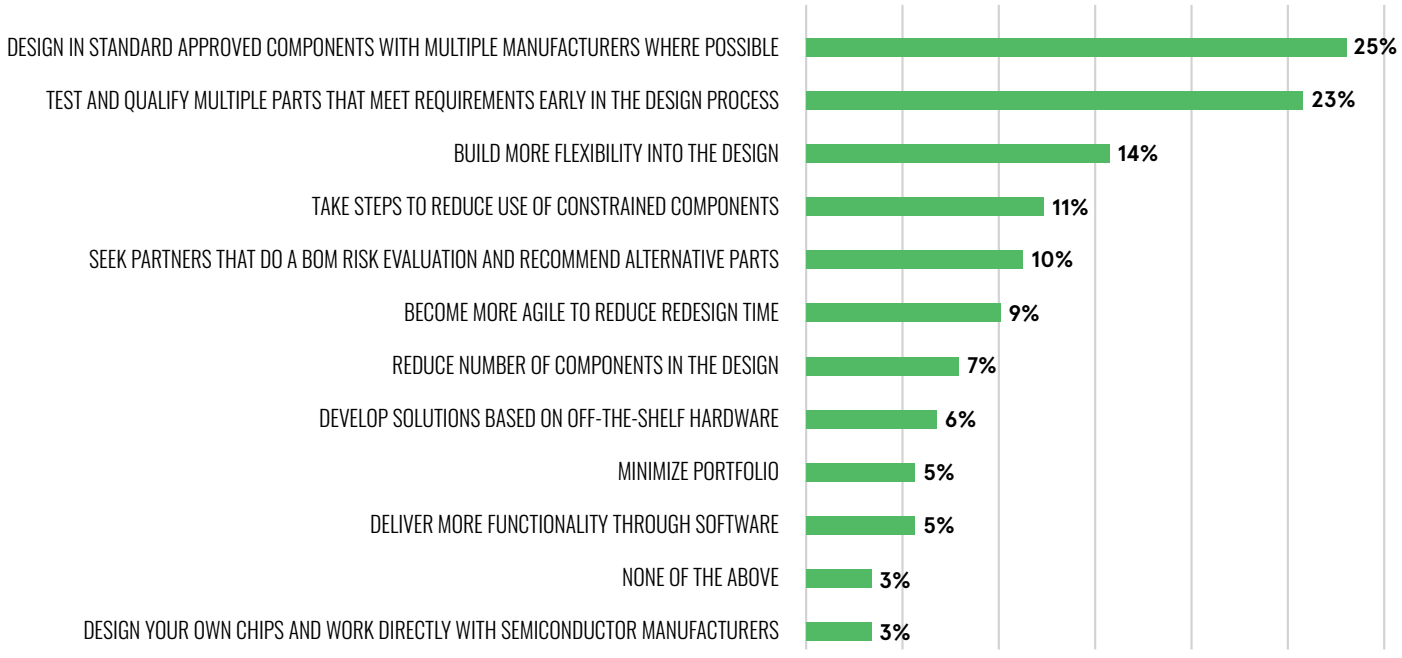
Now, they are recognizing the need to implement more strategic design and supply chain initiatives that will give them the ability to quickly adapt to changing conditions. More and more companies are citing the need for resiliency.

Nearly one-quarter of survey respondents (25%) say they are now designing in standard, approved components from multiple suppliers whenever possible, as well as testing and qualifying multiple parts that meet requirements early in the design process (22%). And 14% are developing a more flexible product architecture.

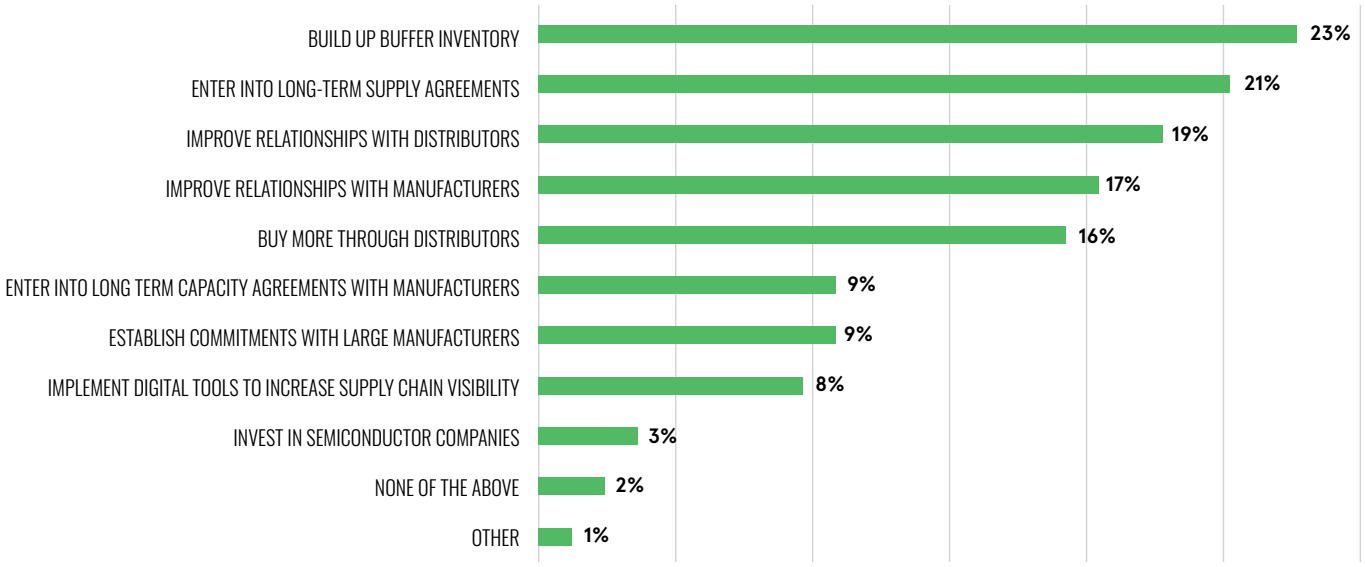
Companies are also strengthening their reliance on strategic collaborations with partners such as distributors and manufacturers, looking to enter into long-term supply agreements (21%) and improve relationships (distributors: 19%, manufacturers: 17%). These partnerships can help improve supply chain visibility and are keys to successfully managing disruption.

"I've learned which companies, distributors and manufacturers are customer centric, proactive and can be trusted. The supply chain is only as strong as its weakest link. This maxim is proven daily." – Supply Chain Professional, Voting Machine Equipment

Which of the following design strategies do you plan to implement to manage the ongoing chip shortage?



Which of the following supply chain strategies do you plan to implement to manage the ongoing chip shortage?



"The one upside of the chip shortage is that we figured out how to become more agile because we had to." — Engineer, Semiconductor Equipment Maker

IS THE PRINCIPLE OF LEAN INVENTORY MANAGEMENT DEAD?

Lean inventory management—credited to Henry Ford in the 1920s—is based on the notion of eliminating waste in materials, time and effort. That led companies to keep very small amounts of stock on hand.

While it's worked well for companies for nearly a century, the chip shortage just may be challenging the basic premise of lean inventory management.

To understand the impact, consider the typical design process under lean inventory: Engineers order parts only after the design and layout are finalized. There is no sense in ordering parts ahead of time, as there can be changes to the design right up until the last minute, and parts can usually be delivered on a quick turn of a couple of weeks.

Those assumptions about part delivery no longer apply.

The first thing engineering teams consider now when it comes to a specialized or critical part—as well as many other components—is whether there is stock available. In some cases, companies are ordering the parts even before they have completed the design to ensure that they will have the parts to build the product. That means they are holding more inventory on their shelves.

That's an acceptable trade-off for many today—23% of the survey respondents say their companies are building up buffer stock, while 16% believe all companies will increase their inventory. And almost one-fourth (23%) say their organization is moving away from the principle of lean inventory management.

Whether lean inventory management is truly going out of fashion remains to be seen. As one engineer says, "We are going to continue to order and hold inventory until we are confident that stock is being maintained for the parts we need. Even with new fabs being built, parts are just not going to magically appear overnight, so we'll probably keep doing it for a couple of years at least."

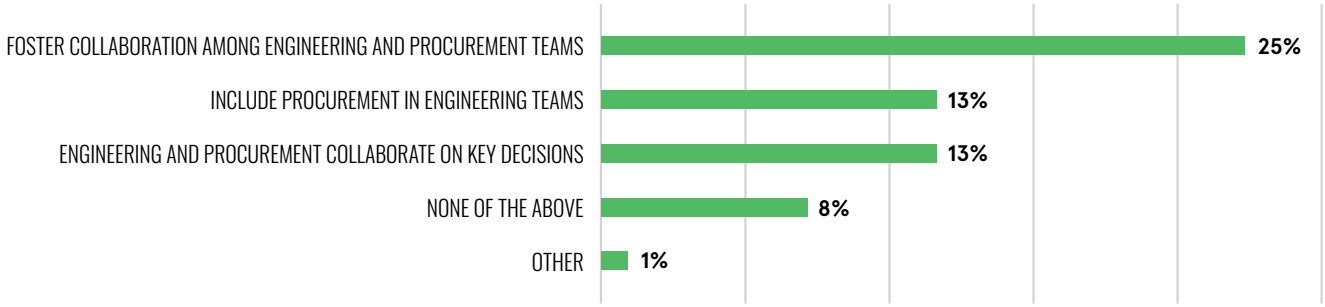
"It's critical that we have the parts when we need them and that means buying them when they are available and putting them on our shelves." – Engineer, Communications Equipment Company

ORGANIZATIONAL CHANGES THAT PROMOTE COLLABORATION

Companies are also rethinking their work practices to improve communications and agility. With chip availability now a top priority when doing a design, it's imperative that engineering engage more with procurement. Nearly half (25%) of respondents say they plan to establish stronger collaboration between procurement and engineering, 13% say they will establish cross-functional teams that include procurement, and 13% plan to establish cross-functional teams for decision making.

One company even established a liaison position that sits between engineering and procurement to facilitate communication.

Which of the following organizational strategies do you plan to implement in order to manage the ongoing chip shortage?



CONCERNS OVER INFLATION, ENERGY LEADING TO LESS POSITIVE OUTLOOK

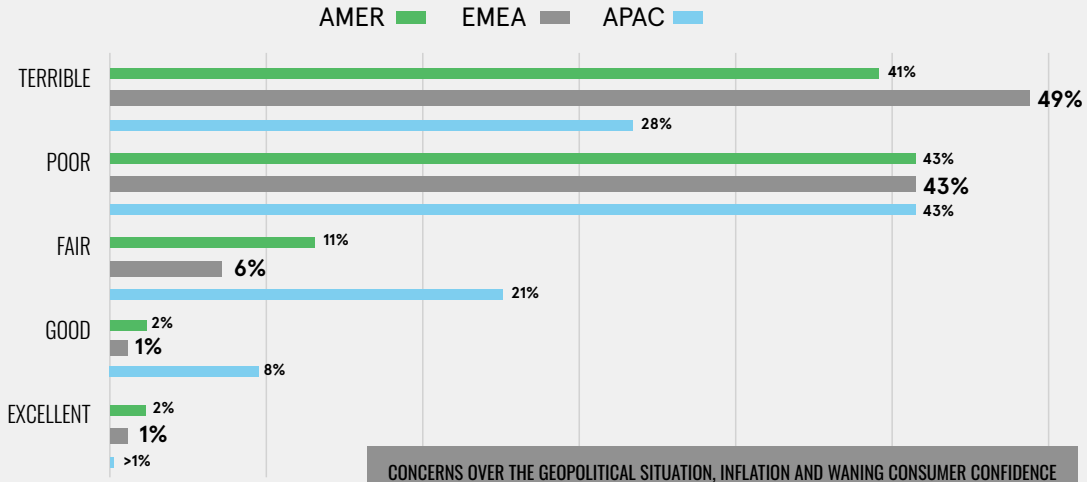
Our survey shows that respondents in EMEA are less positive about the semiconductor market and the ongoing chip shortage than their counterparts in APAC and the Americas.

That is likely largely due to the geopolitical situation, with the Ukraine war increasingly creating a macroeconomic strain in most EU countries and the UK. Since suspending business into Russia and Federation states, some of the activity has moved to APAC and supply routes out of China, which in turn has dampened demand.

Also, inflation—driven primarily by the energy crisis—is on the rise (above 10% in the UK in October 2022, for example), and that is starting to affect consumer confidence.

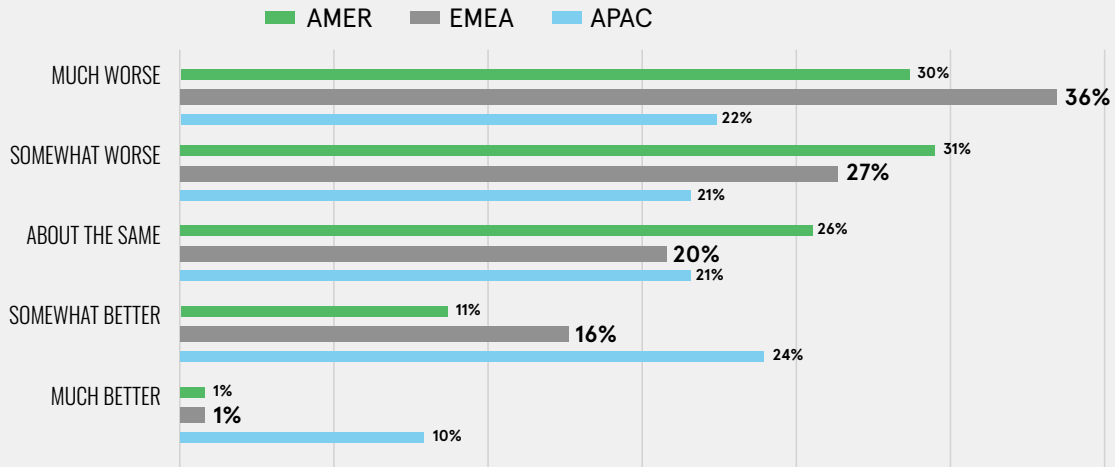
Future parts availability may ease. Due to long lead times in the consumer equipment manufacturer (CEM) sector, many companies double, triple or quadruple ordered to secure production demand. As lead times have decreased in certain component areas, replenishment orders are not being placed, which in turn is reducing the demand for components.

How would you rate current semiconductor market conditions?



CONCERNS OVER THE GEOPOLITICAL SITUATION, INFLATION AND WANING CONSUMER CONFIDENCE ARE FACTORS IN A LESS POSITIVE OUTLOOK IN EMEA COMPARED TO APAC AND THE AMERICAS.

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

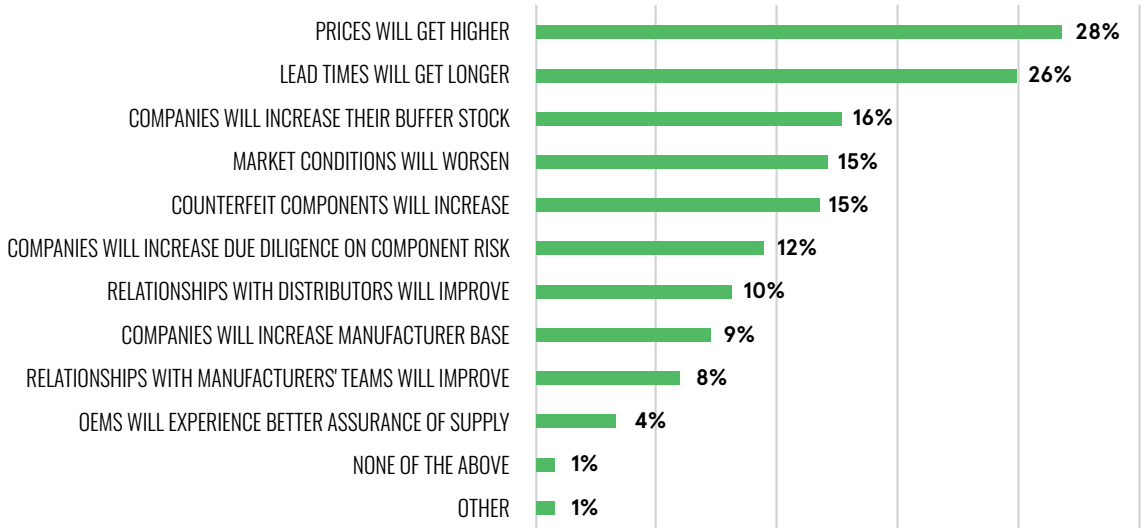


LOOKING TO THE FUTURE

Predicting when the market will turn is nearly impossible. Economic and geopolitical conditions, cyclical markets and inflation all contribute to an uncertain environment. When recovery occurs, it won't be linear, and it will depend on the industry and product mix.

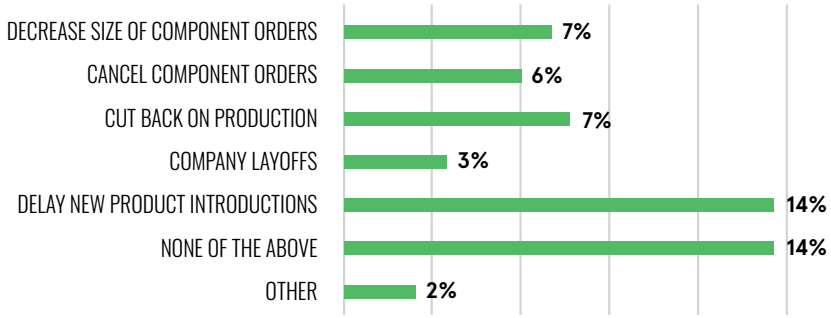
Looking ahead, more than a quarter of survey respondents are preparing for increasing prices (28%) and longer lead times (26%).

Which of the following scenarios are you preparing for?



With the market facing strong headwinds, survey respondents are also making plans to weather the storm. Some 14% plan to delay new product introductions, 7% plan to cut back on production, and—although many acknowledge the risk in exiting the queue for parts—6% plan to cancel component orders.

Regarding market conditions, which of the following steps is your organization likely to take?



CONCLUSIONS AND RESOURCES

The global chip shortage continues to have an impact on OEMs worldwide, with the supply situation slightly improved in APAC and less positive in EMEA.

To deal with the uncertainty and lack of parts availability, companies continue to apply tactics to "fill the gap"—finding alternative parts, redesigning boards, and in some cases delaying work on new products.

After almost three years of dealing with the chip shortage, companies are seeing the value in implementing more strategic design and supply chain initiatives that will improve resiliency needed to cope and respond to uncertainty.

Our survey shows that business leaders see the value in collaborating with distributors and manufacturers to manage the risk and gain greater supply chain visibility and agility.

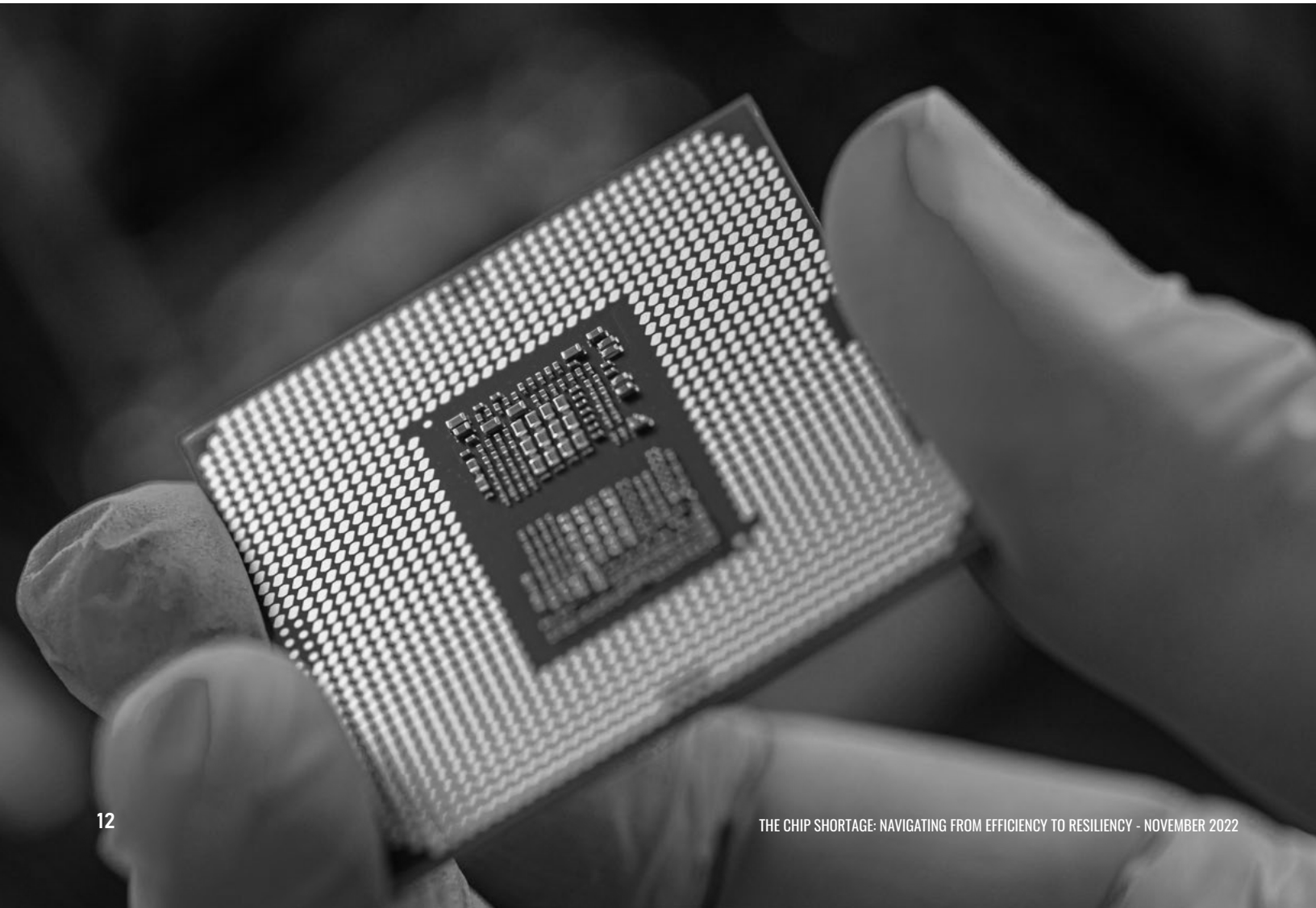
Working with a distributor like Avnet during these challenging times can be invaluable in getting information on component lead times, insight into dates for new product introductions, and mitigating supply chain risk.

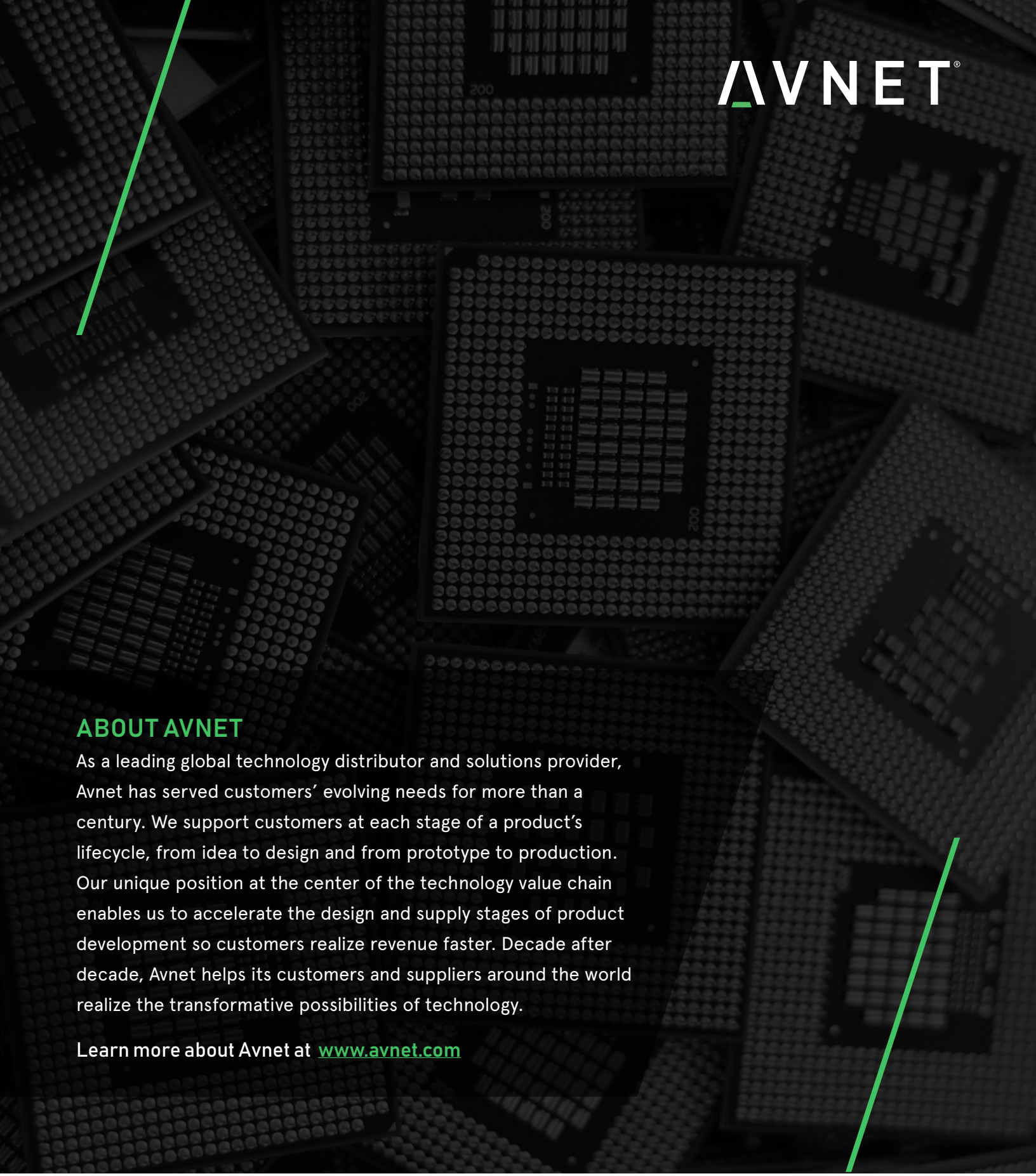
FOR MORE INFORMATION

SEE AVNET NEWS RELEASE

ARTICLES FROM AVNET ON THE SUPPLY CHAIN

SEE OUR SURVEY REPORT ON DECONSTRUCTING THE CHIP SHORTAGE





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.

Learn more about Avnet at www.avnet.com

Copyright © 2022 Avnet, Inc. The AVNET logo is a registered trademark of Avnet, Inc.
All other brands are the property of their respective owners. P23_971_KL

Avnet
2211 S. 47th Street
Phoenix, AZ 85034
1-800-332-8638
avnet.com