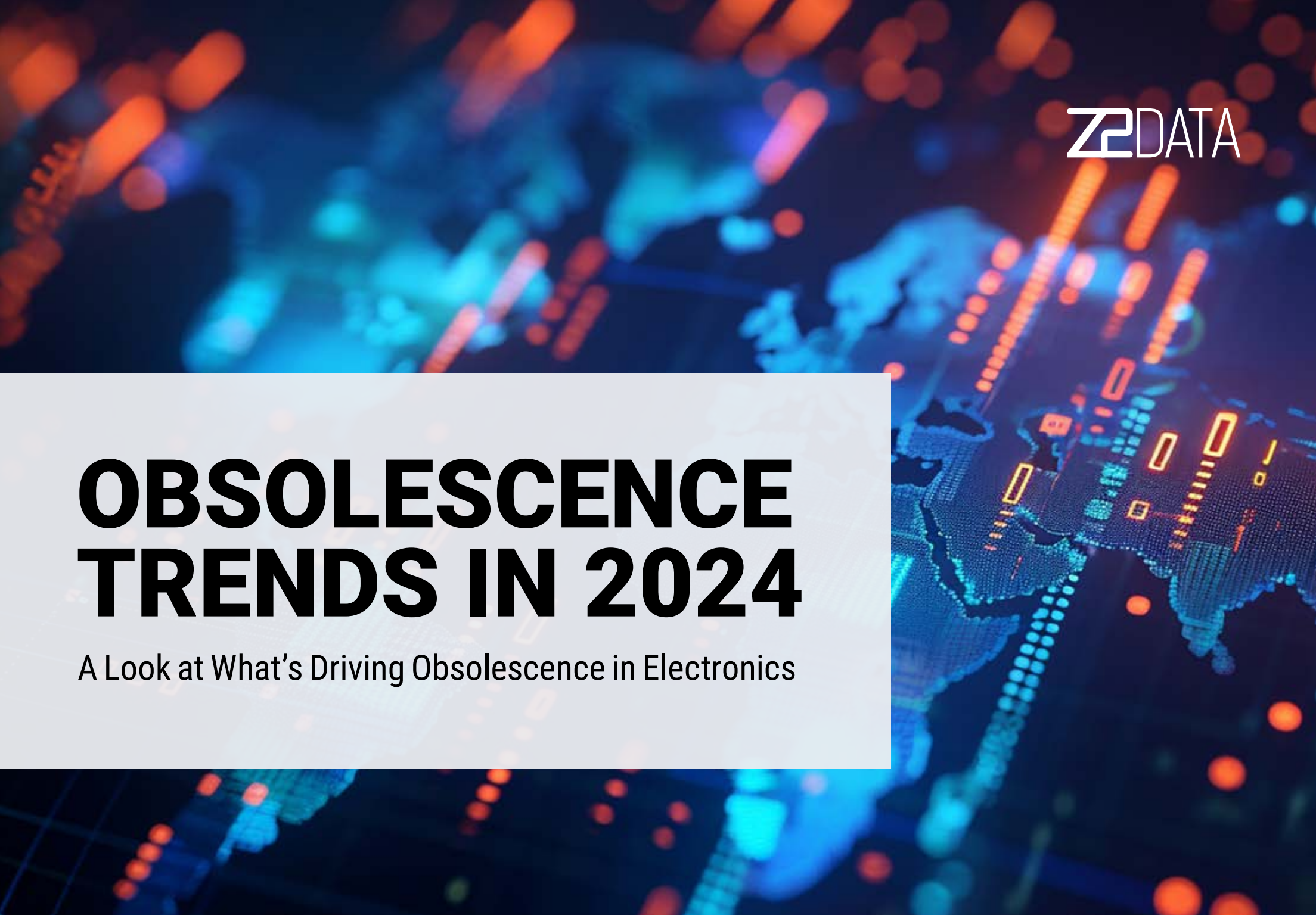


OBSOLESCENCE TRENDS IN 2024

A Look at What's Driving Obsolescence in Electronics

TABLE OF CONTENTS

ABOUT Z2DATA

Z2Data utilizes a proprietary database of over one billion components, 150,000 worldwide suppliers, and 50,000 manufacturing locations to deliver pinpoint accuracy on component design, availability, and sustainability.

Z2Data is a supply chain risk management (SCRM) platform that helps businesses like Qualcomm, Palo Alto Networks, and Rakon manage the design, supply chain, and sustainability of their products. The company is based out of Santa Clara, CA and has over 450 employees worldwide.

REPORT METHODOLOGY

To examine component obsolescence, our research team analyzed decades of data on PCNs, product discontinuation notices, lifecycle status changes, and broader patterns within the industry to identify some of the most noteworthy trends.

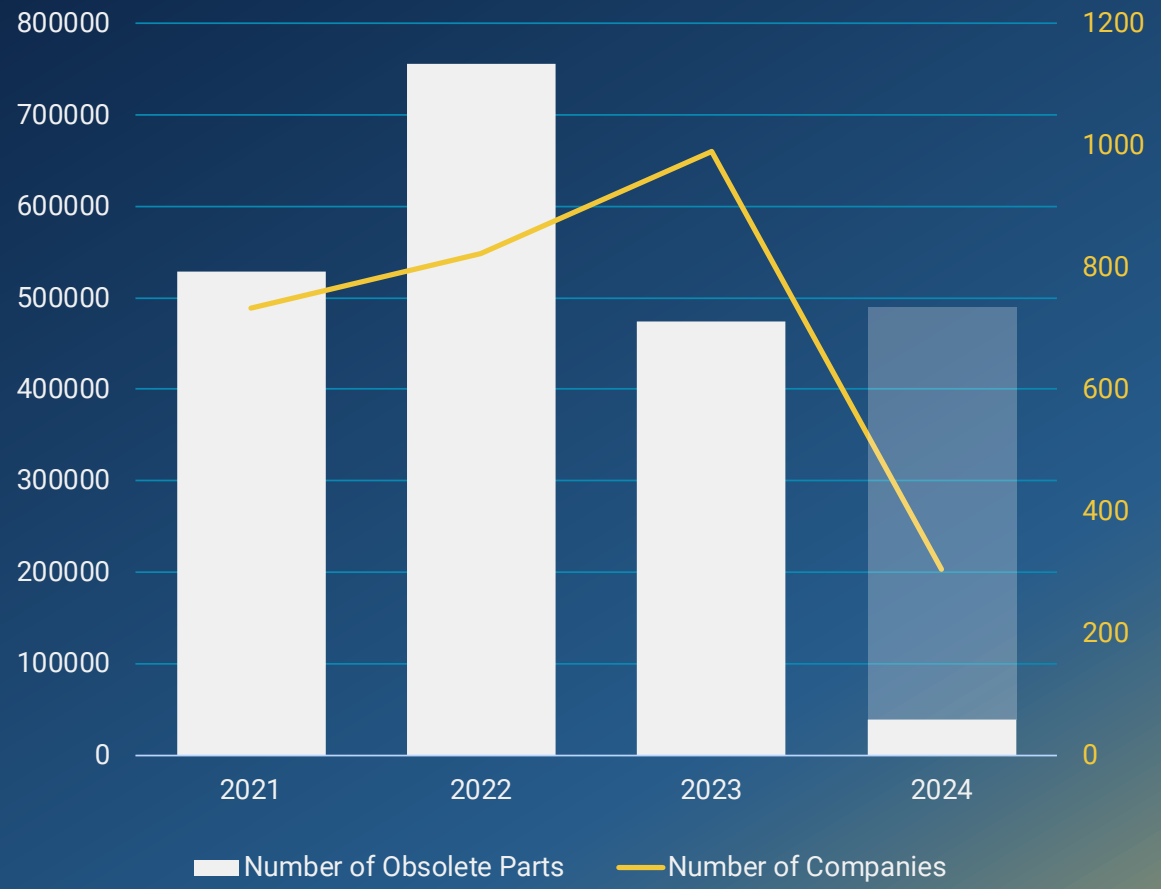
The research and data included in this report have all been drawn from Z2Data databases.

OBSOLESCENCE YEAR-OVER-YEAR

Although obsolescence is an expected part of product lifecycles, the last few years have seen a major spike in part obsolescence as a result of the pandemic. In 2021, 528,546 parts went obsolete. That number climbed even higher the following year, with 756,087 components going obsolete in 2022—a year-over-year jump of nearly 50%.

New data shows that the spike in obsolescence is beginning to level off. In 2023, only 473,910 parts reached their EOL, a 37% decrease from the year prior. Data from the first two months of 2024 show this year to be on a similar trajectory, with 39,190 EOLs issued so far.

Despite the recent drop in part obsolescence, the number of companies issuing EOLs has climbed every year since 2021, with 990 manufacturers obsoleting parts in 2023. This trend is set to continue in 2024, with 305 companies issued EOLs in the first two months of the year alone.



OBSOLESCENCE MONTH-OVER-MONTH

Looking into the history of component EOL, Z2Data found that two months saw a higher number of obsolescence events than at any other time of year: March and October.

While there's not necessarily any guarantee that these months will usher the most parts into discontinuation in any given year, they are certainly periods when design and component engineers and strategic sourcing professionals should be on high alert for notifications and changes to availability.

TRENDS IN PRODUCT CHANGE NOTIFICATIONS

Last year, 473,190 parts went obsolete. As mentioned earlier, this is hardly an outlying figure, and in line with obsolescence trends in the years leading up to the pandemic. More striking, however, is how many of these EOL events were not preceded by a product change notification (PCN) by the manufacturer. Around 30% of these obsolete components—or roughly 142,173 parts—were not accompanied by a PCN.

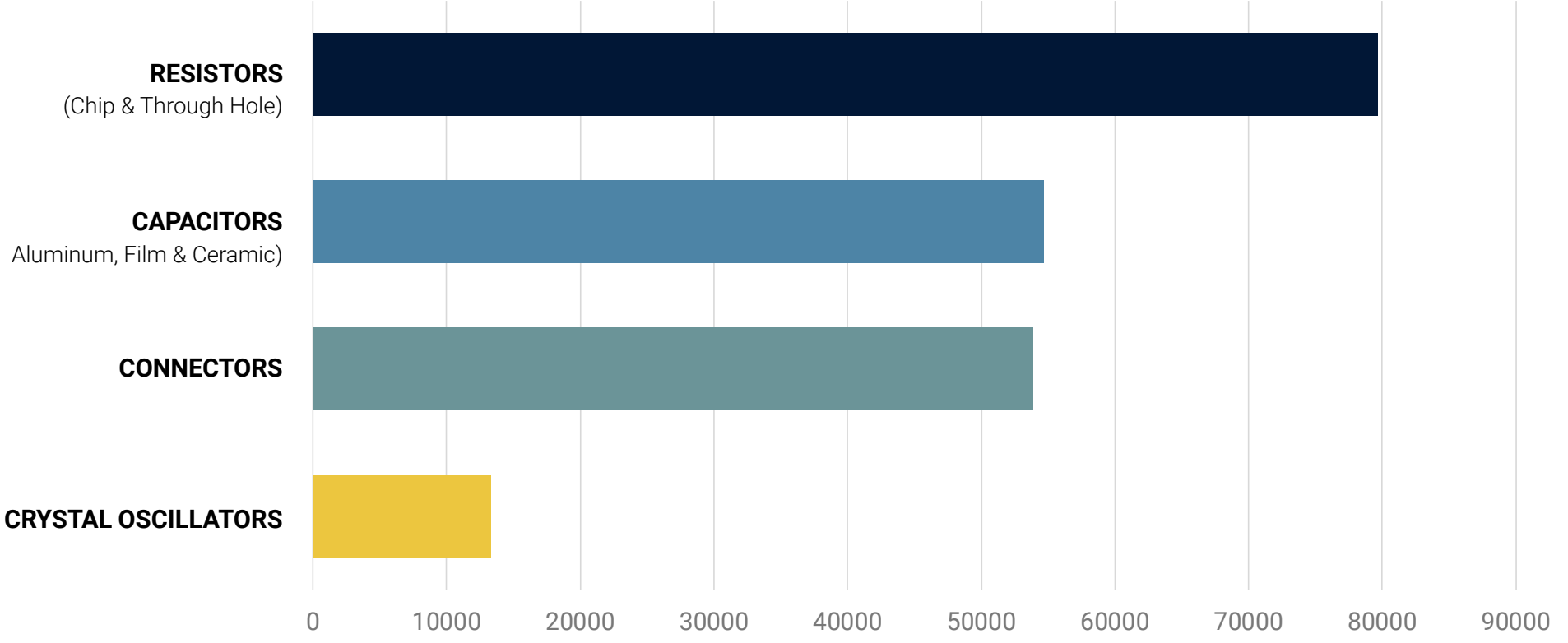
This lack of communication on the part of suppliers is part of the reason why component obsolescence can be such a challenging obstacle for manufacturers to navigate. Companies that never receive a PCN for a part going into obsolescence aren't getting sufficient lead time to make the necessary modifications to their designs, BOMs, and sourcing relationships. As a result, they're forced to carry out their contingency processes in shorter timespans, increasing the likelihood of miscalculations and rushing vital supply chain deliberations.

Knowing that nearly a third of all EOLs are happening without any forewarning makes obsolescence management and the risk mitigation strategies it entails all the more critical to achieving operational continuity.

Z2DATA

OBSOLESCENCE RATES: PASSIVES

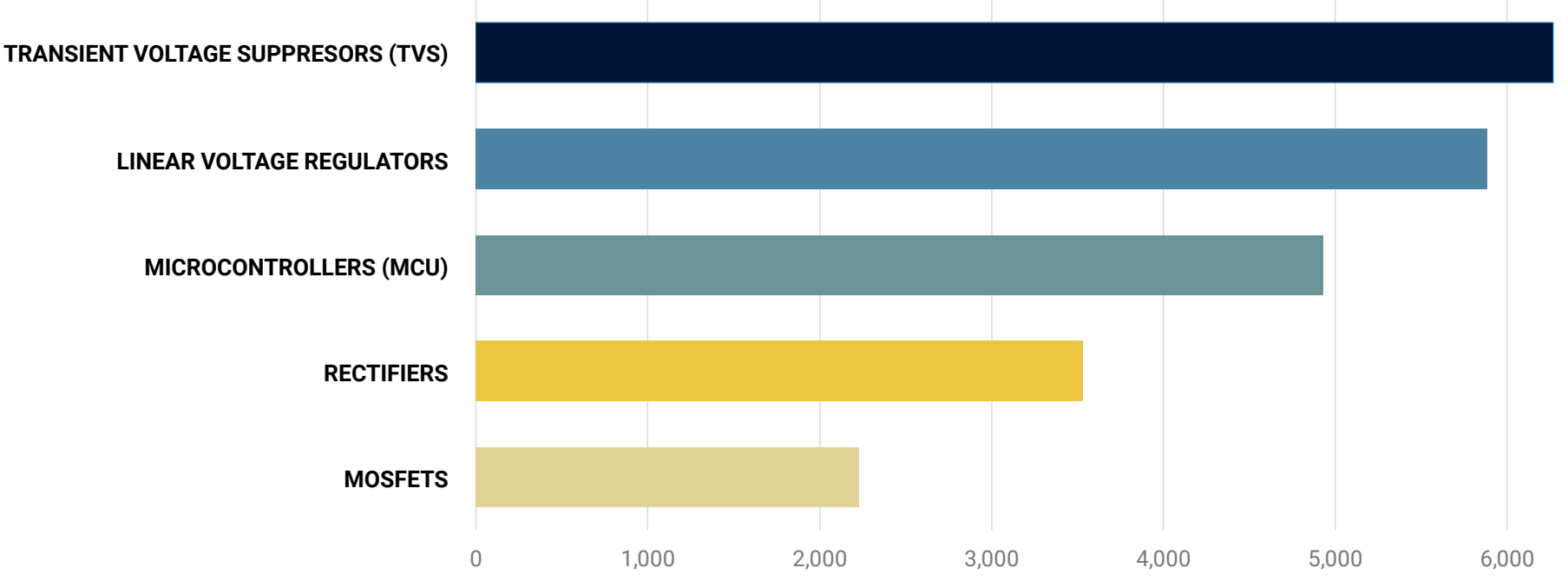
In addition to looking at obsolescence through a wide scope, Z2Data's analysis also focused on how the phenomena affected individual parts. Because of just how many of them are in distribution today, it's no surprise that passive components make up the lion's share of parts going into EOL. In 2023, 79,669 resistors went into obsolescence. This was followed by 54,663 EOLs for capacitors, 53,831 connectors, and 13,367 crystal oscillators.



TRENDS IN OBSOLESCENCE: SEMICONDUCTORS

As there are far fewer semiconductors in distribution, the EOL figures for these components are inevitably going to be substantially smaller than they are for passives. Nevertheless, data indicates that 2023 saw a significant number of semiconductors discontinued. These included over 6,268 transient voltage suppressors, 5,884 linear voltage regulators, 4,931 microcontrollers, 3,533 rectifiers, and 2,230 MOSFETs.

Because of the profound challenges inherent in semiconductor obsolescence, these figures undoubtedly resulted in major impacts on manufacturers, distributors, and other stakeholders along the electronics supply chain. The pain point of replacing a semiconductor integral to a given product's design is felt across much of a business's operation, affecting engineering, commodity management, and strategic sourcing, among other potential teams.



INDUSTRY SURVEY ON OBSOLESCENCE

We conducted a short survey to better understand how teams are feeling the impact of obsolescence.

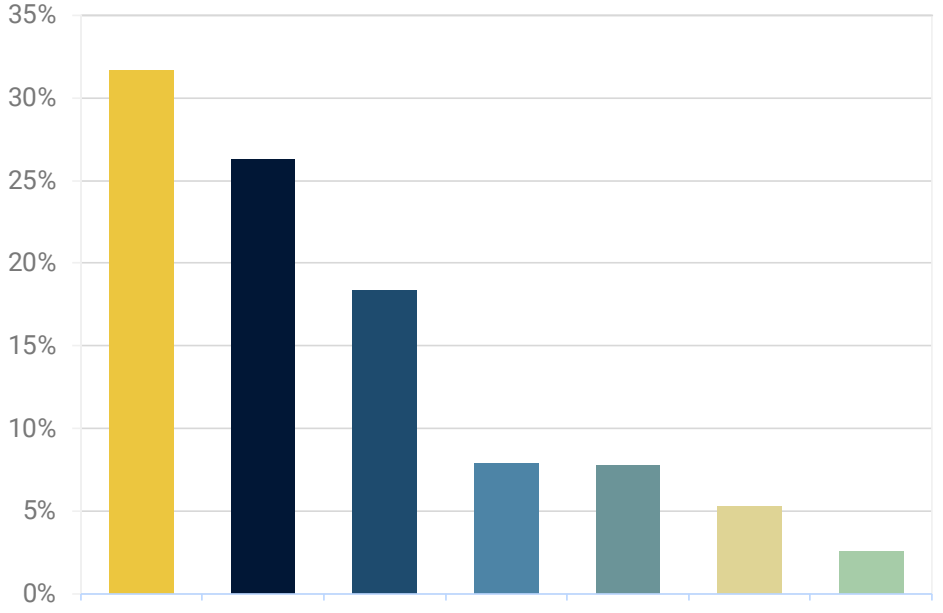
The survey polled electronics industry professionals to gauge their perspectives on the preeminent challenges associated with obsolescence management. Their responses speak to a range of difficulties companies are navigating on a recurring basis.

SURVEY QUESTION

What is the primary challenge your team faces when managing obsolescence risks?

The most frequent challenge, cited by just over 30% of respondents, was ensuring compatibility and performance with replacements. Difficulties with replacement suitability were followed by forecasting obsolescence trends accurately, a challenge referenced by roughly a quarter of those surveyed.

Other issues faced by insiders managing obsolescence risks included identifying alternative components, securing the budget necessary for obsolescence management, and never being notified of EOL changes.

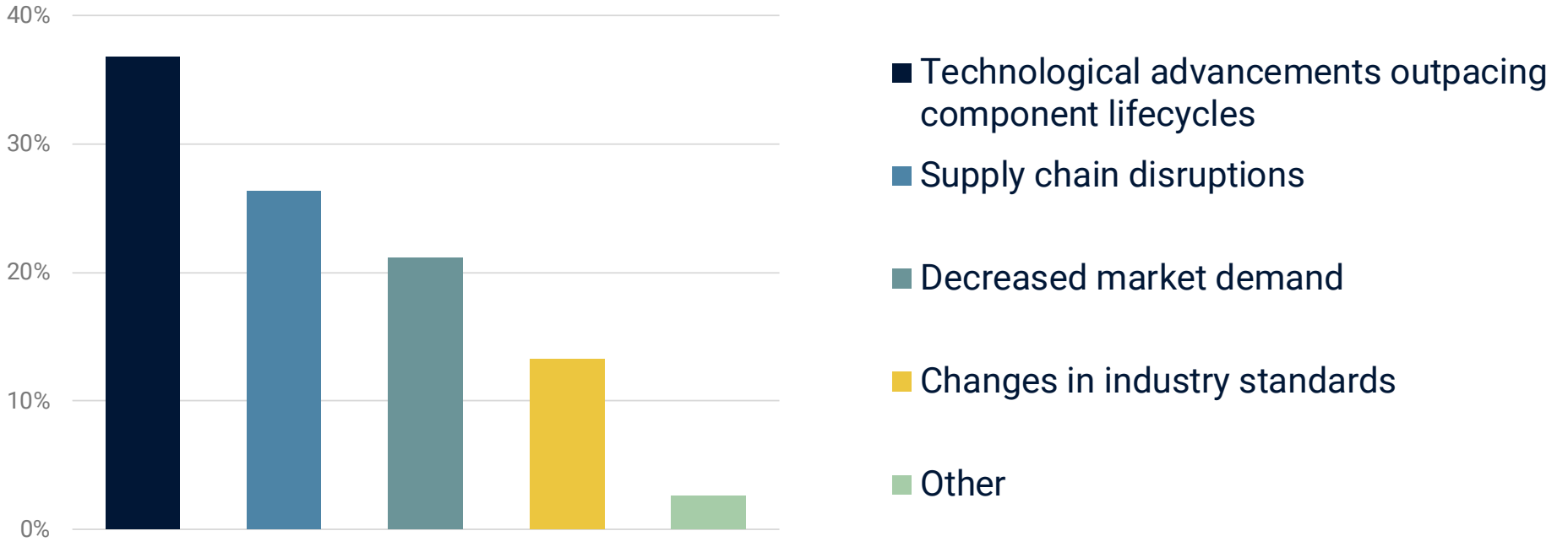


- Ensuring compatability and performance with replacements
- Forecasting obsolescence trends accurately
- Identifying alternative components
- Securing budget for obsolescence management
- Not being notified of EOL changes
- Other
- All of the above

SURVEY QUESTION

Which factor do you believe contributes the most to obsolescence risks in 2024?

In the same survey, Z2Data also asked professionals what factors they felt served as the most significant catalysts for component EOL. Most respondents (38.5%) cited technological advancements outpacing component lifecycles as the most impactful, while 25.6% pointed to supply chain disruptions. Other responses included decreased market demand (20.5%) and changes to industry standards (12.8%).



PERCEPTIONS VS. REALITY

When we compared the survey responses with the actual data on what causes parts to go obsolete, we found some notable discrepancies.

Overall, the respondents were reasonably accurate. Industry professionals correctly identified the top three reasons behind part obsolescence—they just put those reasons in the wrong order.

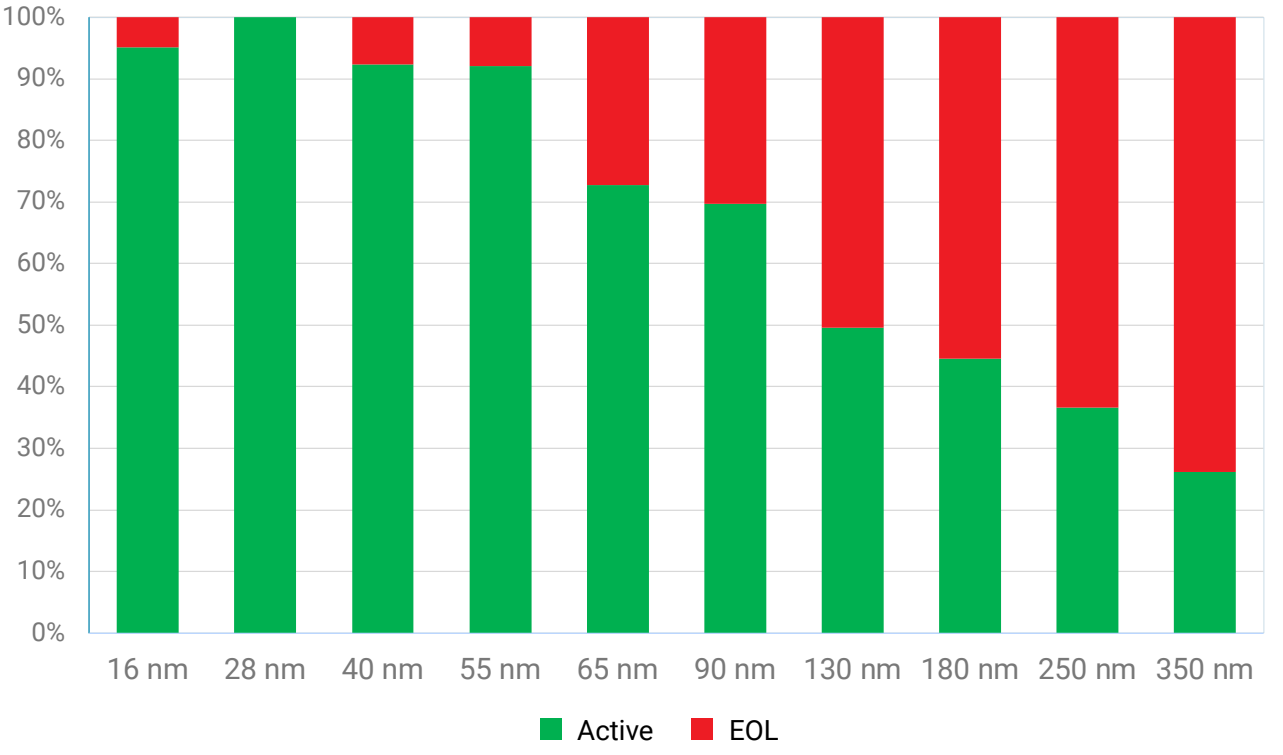
Based on Z2Data research, low market demand, which was cited by just a fifth of respondents, is the top reason for component obsolescence. Data showed that 78% of all EOL events are due to low market demand. Technology changes, meanwhile, which was the most popular choice among those surveyed, accounts for only 15% of EOLs. It's worth noting, though, that this particularly large gap may be partially attributable to the fact that technology changes often create the largest obsolescence challenges for businesses.

Supply chain disruptions—which 25% of respondents thought was the largest obsolescence culprit—are responsible for a relatively modest 7% of total EOLs.

MICROCONTROLLER OBSOLESCENCE TRENDS

In addition to the bigger-picture trends in component obsolescence, Z2Data also drilled down to look at how obsolescence is manifesting across three critical semiconductor categories: microcontrollers (MCUs), field programmable gate arrays (FPGAs), and dynamic random-access memory (DRAM).

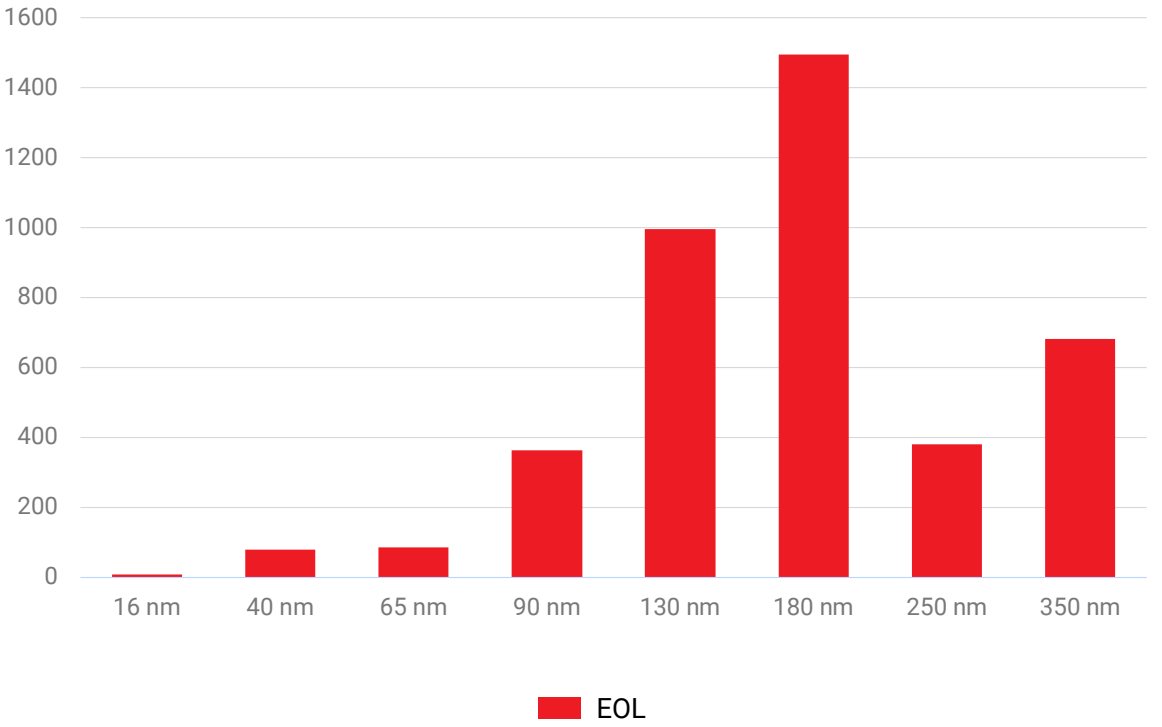
First, the team looked at MCUs obsolescence based on node technology. Unsurprisingly, 350 nanometer technology, which was pioneered in the mid-1990s, has largely fallen into obsolescence. The red portion of the bar graph, which represents EOL parts, accounts for over 70% of the total 350 nm MCUs. As the technology advances, of course, the percentage of active components increases.



The red portion of the bar graph, which represents EOL parts, accounts for over 70% of the total 350 nm MCUs.

The data for the 180 and 130 nm MCUs is worth highlighting. These nodes saw the most EOLs in 2023, a trend that illustrates the rapid shift toward the 28 and 16 nm node technologies that foundries began producing in the 2010s. Under half of the total existing MCUs at the 180 and 130 nm nodes are still in active use, and that figure is only going to trend downward from here. Commercialized at the turn of the century by semiconductor giants like Intel, Texas Instruments, and TSMC, these two technologies are gradually being phased out of the industry.

Focusing on 2023 specifically, it's clear where most of the obsolescence among MCUs is taking place. While over a thousand (1,063) 350 nm and 250 nm nodes reached EOL last year, the crux of the technological shift within the industry is happening at the 130 nm and 180 nm levels. 130 nm MCUs saw 996 components go into obsolescence last year, while 1,495 180 nm microcontrollers were discontinued. By contrast, 16 nm nodes had only nine components go obsolete, indicating a near-zero risk of obsolescence.

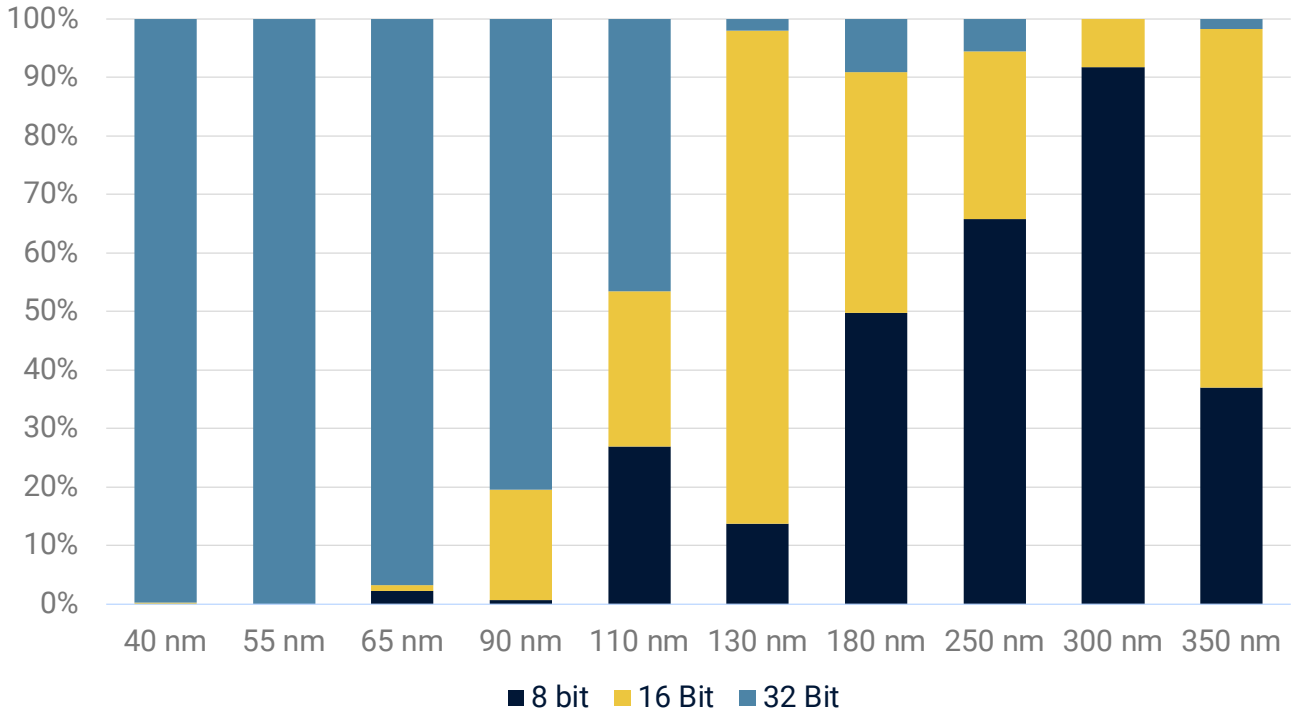


While over a thousand (1,063) 350 nm and 250 nm nodes reached EOL last year, the crux of the technological shift within the industry is happening at the 130 nm and 180 nm levels.

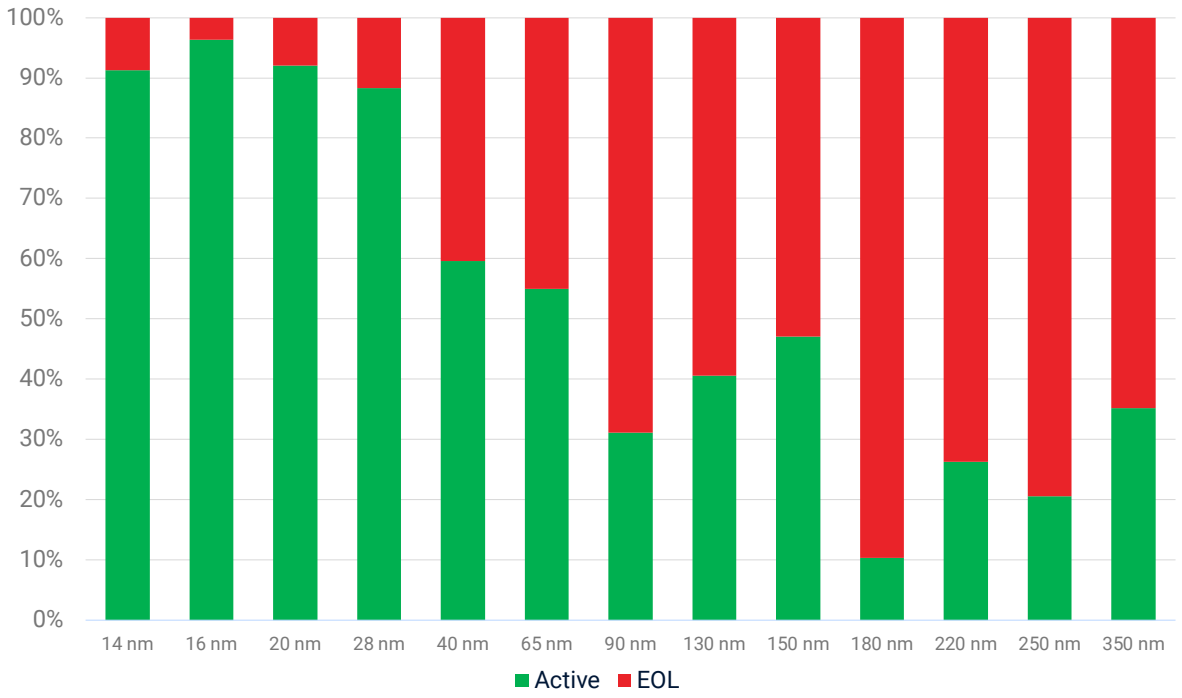
OBSOLESCENCE AT THE BIT LEVEL

Obsolescence isn't just affecting semiconductors based on node sizes; it's also ushering out older bit technologies. 110 and 130 nm MCUs have historically featured a mixture of 8, 16, and 32 bit technologies. As the industry has continued shifting toward smaller nodes, though, the 8 and 16 bit technologies have increasingly been replaced with 32 bit MCUs.

Today's landscape of 40 and 55 nm nodes is composed almost entirely of 32 bit technology—something companies and their engineering teams should be keeping at the top of their minds when considering redesigns or looking into modifications to existing BOMs.



FPGA OBSOLESCENCE TRENDS



In 2023, 65 nm FPGAs saw a major spike in obsolescence, with 215 of the semiconductors reaching EOL.

From a node obsolescence standpoint, FPGAs look reasonably similar to MCUs. The majority of FPGAs at the 90 nm size and larger have now reached EOL, with the 130 and 150 nm ICs still clinging on to rates of active use hovering between 40% and 50%. At the 28 nm size and smaller, the percentage of active FPGAs is around 90% or higher.

As the previous graph alluded to, FPGAs at the 65 nm node are now trending toward EOL. In 2023, 65 nm FPGAs saw a major spike in obsolescence, with 215 of the semiconductors reaching EOL. A number of other nodes—including 90, 150, 180, 220, and 300—saw obsolescence rates between 150-155 components in 2023.

OBSOLESCENCE TRENDS IN DRAM

Double data rate, or DDR, first emerged around 2000 as the next generation of memory technology, succeeding synchronous dynamic random access memory (SDRAM). In the two-plus decades since, it has undergone a number of evolutions, including DDR2, DDR3, DDR4, and DDR5, the latter of which was only released a few years ago, in 2020.

In today's memory technology landscape, a number of DRAM iterations are gradually shifting toward obsolescence. More than half of the DDR, DDR2, and DDR3 semiconductors are now EOL, respectively, while DDR4 and DDR5 are increasingly dominant within the memory market. Particularly noteworthy is the fact that DDR3, which was introduced in 2007, is now trending toward discontinuation.

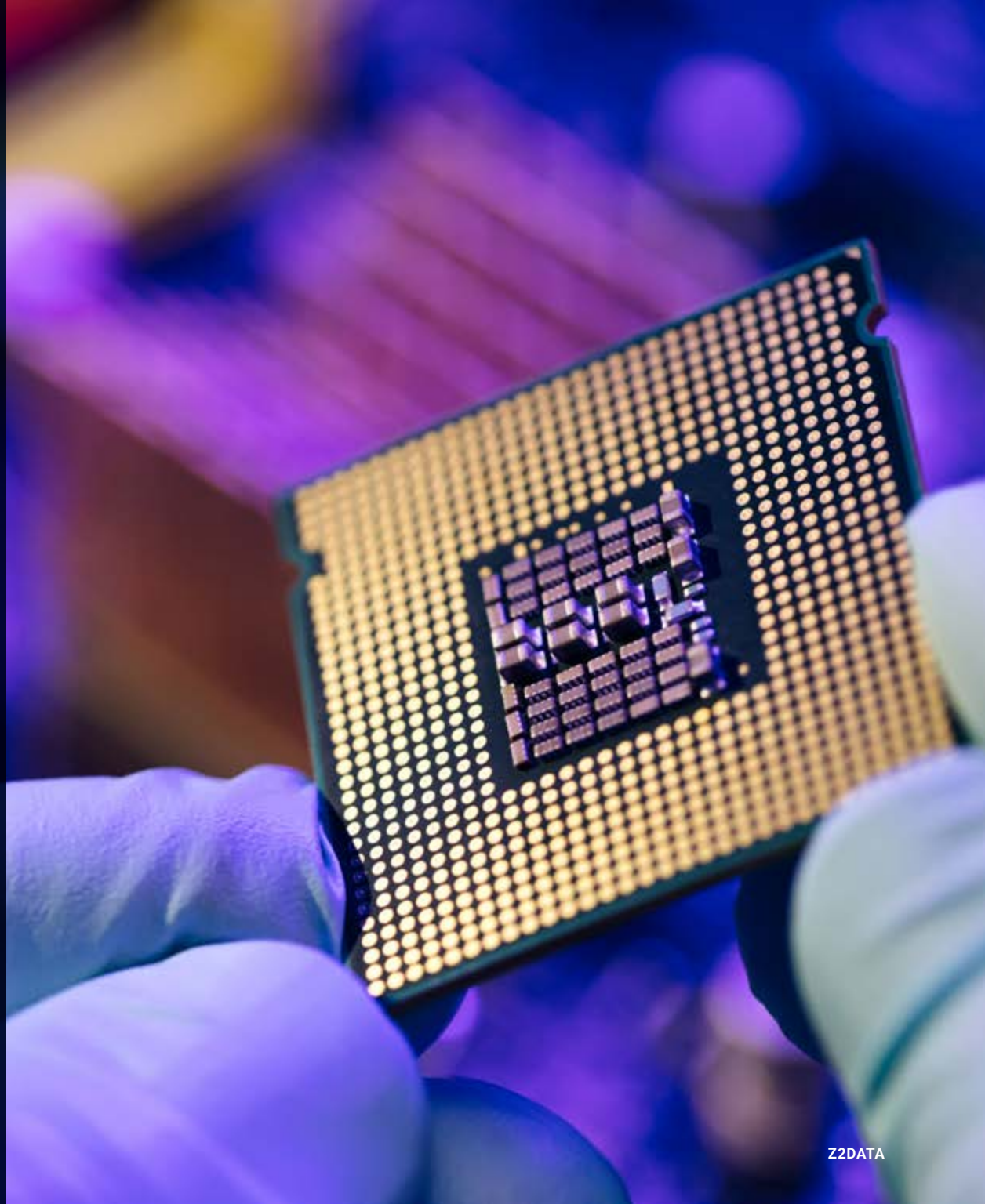
Analyzing DRAM based on node size reveals a stark shift toward more advanced wafers. Most of the DDR for nodes 40 nm or larger—going all the way to 150 nm and up—are now obsolete. The 20 to 28 nm size is the current flashpoint for obsolescence, with 74.5% of these ICs now in EOL.

DDR3, which was introduced in 2007, is now trending toward discontinuation.

STRATEGIES FOR MITIGATING OBSOLESCENCE

Obsolescence challenges can be managed by employing a variety of mitigation strategies.

By proactively addressing these issues, businesses can avoid unexpected disruptions in their supply chain. This section explores essential tactics such as effective lifecycle forecasting and multi-sourcing parts to ensure a robust and reliable product lifecycle.



TACKLING OBSOLESCENCE MANAGEMENT

Being unprepared for EOLs can reverberate across an entire company, putting immense pressure on engineers to execute redesigns under tight turnarounds.

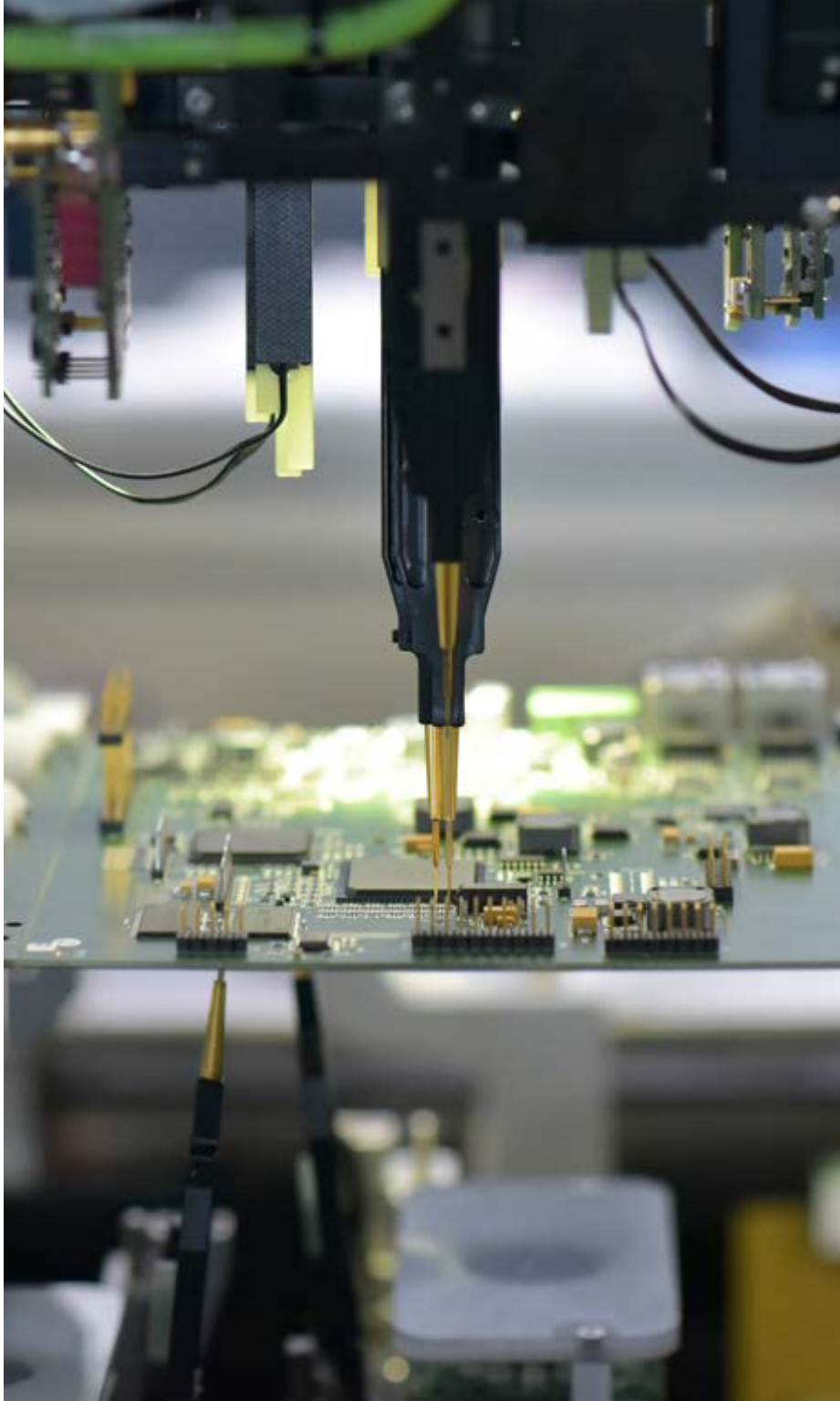
As most professionals in the electronics industry know, obsolescence management is an indispensable aspect of any business's larger risk management strategy. Being unprepared for EOLs can reverberate across an entire company, putting immense pressure on engineers to execute redesigns under tight turnarounds and creating significant pain points for commodity managers and strategic sourcing specialists.

Fortunately, there are a number of mitigation strategies organizations can utilize to enhance their resilience around obsolescence and make themselves less vulnerable to the manifold complications that can arise when a critical component goes into EOL. Consistently multi-sourcing all your parts is of the highest priority when practicing good obsolescence management. Businesses should make sure they're identifying crosses that meet the right criteria—namely form, fit, and function—and taking advantage of technology upgrades to their parts when those opportunities arise.

Good multi-sourcing entails more than just assembling a list of effective crosses. It also means leveraging comprehensive supply chain diversification to keep your organization insulated from the risks posed by chokepoints. Businesses need to examine their suppliers and make sure the crosses are being manufactured at different sites, thus ensuring that a single disruption won't wipe out multiple alternates simultaneously.

Lifecycle forecasting is another crucial way of effectively planning for impending obsolescence challenges. Being able to access and analyze the longevity of individual parts helps businesses prepare for EOL by setting up strategic roadmaps and establishing viable replacements long before doing so becomes a time crunch.

Arriving at these forecasts with any degree of precision, however, requires synthesizing a complex array of factors, including market demand, technological advancements, and industry trends. The teams behind risk management software apply expertise and sophisticated calculations to reams of historical data, producing the type of high-level lifecycle forecasting that can yield substantive insights for businesses.



Finally, fostering communication with your suppliers can help companies get a sense of how their supply chain is going to hold up in the face of different obsolescence catalysts. Strategic sourcing professionals should try to ascertain how manufacturers are preparing for imminent compliance regulations, PCNs, or sudden shifts in demand within the marketplace. Inquiring about their contingency planning, meanwhile, can help make partnerships more collaborative and synchronized, allowing both parties to respond with greater agility in times of crisis. Simply put, cultivating strong relationships with suppliers facilitates the visibility and strategic cooperation that can head off a lot of potential future problems.

Component obsolescence is both fluid and fixed. While it's firmly entrenched in the electronics industry and the supply chain that sustains it, it's also in a state of constant motion, perpetually pivoting from one generation of technology and fanning out into the next. The broad strokes of obsolescence progression are largely predictable: we can see what node size or memory technology is slipping into discontinuation, as more advanced, higher-performing successors begin to permeate the commercial and industrial landscapes. There is a great deal more unpredictability, however, at the granular level, where individual parts are subject to the whims of the market, smaller-scale innovations, and the various forces roiling supply chains.

While 2023 actually represented a return to normalcy after the obsolescence spike of the COVID-19 pandemic era, it still saw around 474,000 parts reach EOL. Through two-plus months, 2024 is on track to reach a similar figure—one that will no doubt encompass both discontinuations that businesses saw coming and those that seemingly materialized out of nowhere.

Cultivating strong relationships with suppliers facilitates the visibility and strategic cooperation that can head off a lot of potential future problems.

SEE YOUR OBSOLESCENCE RISK WITH Z2DATA

Obsolescence management is a constant hurdle for businesses. But with Z2Data's Part Risk Manager, teams can get the edge they need to navigate disruptions and pick parts that match their product needs perfectly. Powered by a database containing information on over one billion components, Part Risk Manager lets you easily search for and compare parts that meet your form, fit, and function requirements.

The platform also offers a proprietary lifecycle forecasting algorithm to help you proactively tackle obsolescence risks to your product's lifecycle. With Part Risk Manager, it's easy to view end-of-life projections, find suitable replacements, and design products that last longer—allowing you to minimize disruptions and mitigate unnecessary costs.

See data on parts—including lifecycle status, regulatory compliance, market availability, and cross-references—from a single centralized platform.

To learn more about component obsolescence and obsolescence management, **contact Z2Data to access our recent webinar on the topic.**

To see how Z2Data's integrated platform can help your business implement risk mitigation strategies and stay on top of obsolescence threats, **schedule a demo or start a free trial.**

GET A DEMO