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EXECUTIVE FORECASTS 2024



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Editor's Word



Emotion yields ground to data

My life story has been riding the economic sine wave that is the electronics design and manufacturing industry. When a crisis hits, newscasters roll out the standard response that businesses demand predictability. In reality, it depends what business you are in. If the world was predictable I imagine the insurance sector would shrink.

In the manufacturing arena, companies want the upside of unpredictability when surprising a competitor with a new product, while also seeking out predictability in their supply chains.

Four-years ago there was no supply chain. Three-years ago scarcity drove prices sky high. Two-years ago everyone was searching for the 'golden screw'. This year the worry is excess inventory. So, what about 2024? Reading through the Forecast features in this issue, three key takeaways are as follows.

Firstly, 2024 is seen as the year that inventories will 'normalize', with the pace naturally dependent on the sector. Secondly, no matter how hard governments try and suppress inflation, economies seem to want to stay hot. This is being driven by a wide range of industrial sectors that are busy introducing significant new technologies. Examples include electrification, IoT, automotive, medtech, renewables and industrial. Thirdly, as we climb our way to the next drop, words like de-risking, resilience and robustness abound.

To achieve this, one option worth exploring is allowing data driven supply chain management to gain ground on emotional decision making. To avoid unintended consequences, the secret must surely be based on the quality of the data and how it is processed and interpreted. Given the electronics industry is actually the front runner in IIoT and AI it appears to have the solutions in its own hands.

Jon Bakke

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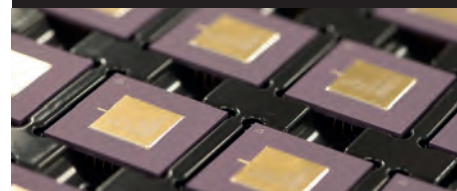
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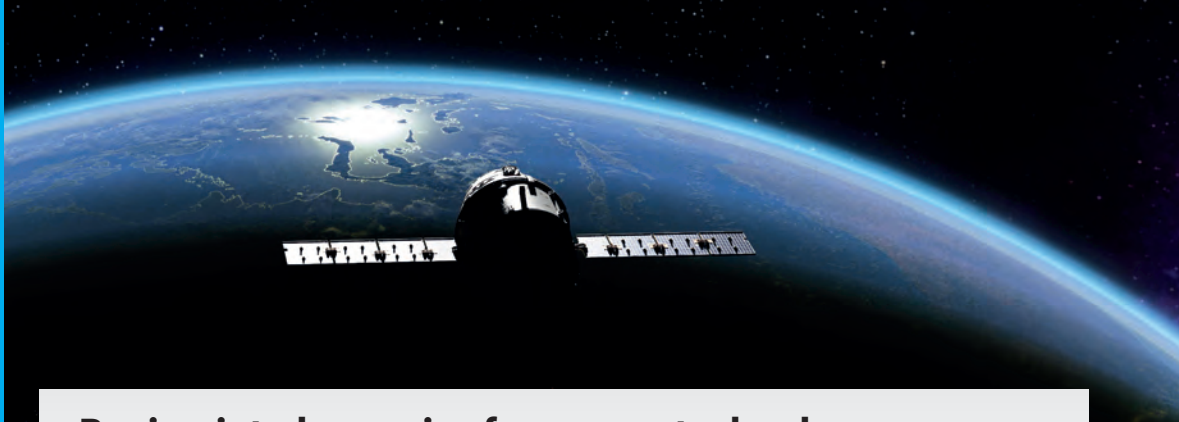
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All the facts and figures
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Buying into low-noise frequency technology

Kyocera AVX is acquiring assets of Bliley Technologies, specialist in low-noise frequency control products with over 65-years space heritage.

Kyocera AVX's senior VP, operational integrations, Kio Ariumi, said: "We are very pleased to welcome members from the Bliley Technologies team to Kyocera AVX and are very excited to further expand our crystal devices portfolio with the disruptive technologies they've developed, which will allow us to better serve sophisticated customers in the demanding military, aerospace and defense markets."

"The asset transfer acquisition provides more than 20 patents for key positioning,

navigating, and timing technologies as well as an accomplished staff and an advanced manufacturing facility with several crucial certifications and qualifications, all of which will further strengthen our presence in these essential markets."

Bliley Technologies manufactures low-noise crystal and oscillator products at its 64,000ft², ISO 9001:2008 certified manufacturing facility in Erie, Pennsylvania. It is one of the only US-based companies to manufacture both—from front end to final finishing—within the same facility.

www.kyocera-avx.com

Channel agreement drives IoT innovation

XMOS has announced a strategic channel agreement with Symmetry Electronics, promising to usher in a new era of IoT solutions.

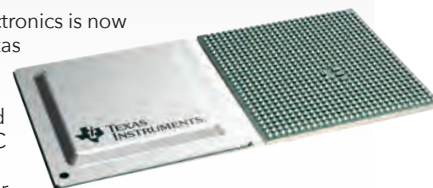
Symmetry Electronics' VP and general manager, Keenan Jeworski, said: "We are thrilled to partner with XMOS to bring their innovative technology to our customers. XMOS' commitment to simplifying embedded software engineering directly compliments our mission to help engineers accelerate their IoT designs. This collaboration will undoubtedly drive innovation and enable our customers to deliver cutting-edge IoT solutions."

XMOS' Americas sales director, Nial Van Wagner, added: "We are delighted to be partnering with Symmetry Electronics. Symmetry provides technical expertise and comprehensive design support, focusing on driving success for each and every customer. These attributes perfectly align with XMOS' values, enabling us to collectively build a strong and trusted network. We look forward to working together and bringing a new capability to the Symmetry product lines with our uniquely flexible processors for the intelligent IoT."

www.symmetryelectronics.com

ADAS processors ready to ship

Mouser Electronics is now stocking Texas Instruments' TDA4VE, TDA4AL and TDA4VL SoC processors. Designed for smart vision camera applications, they support advanced driver assistance systems (ADAS) and automatic parking. The processors also provide a solution for machine vision, industrial transport, retail automation and security/surveillance applications.



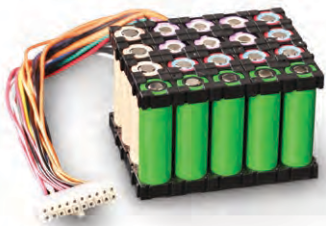
The processors are based on the Jacinto 7 architecture and include dedicated deep learning and traditional algorithm accelerators. These devices feature two C7x floating point vector DSPs, up to six Arm Cortex-R5F microcontrollers and a dual 64-bit Arm Cortex-A72 microprocessor subsystem. The integrated Matrix Match Acceleration (MMA) deep learning accelerator enables performance up to 8 TOPS within the lowest power envelope in the industry when operating at the typical automotive worst-case junction temperature of 125°C. The dedicated vision hardware accelerators provide vision pre-processing without impacting system performance.

Integrated diagnostics and safety features support operations up to ASIL-D levels, while integrated security features protect data against modern-day attacks.

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In Brief

Demand remains steady

With no major trend shifts over the last month, electronics industry sentiment was relatively unchanged from September. Product demand has held steady, with costs continuing to improve per IPC's October 2023 Global Sentiment of the Electronics Supply Chain Report. Both the Material Costs Index and the Labor Costs Index fell two points this month.

www.ipc.org

Destination for automotive clients

Microchip Technology has announced the expansion of its Detroit Automotive Technology Center in Novi, Michigan. The 24,000ft² facility includes new high-voltage and e-mobility labs, plus technical training rooms for automotive clients to develop and optimize designs. Microchip has been part of the Detroit community since 1999, opening an application and sales office.

www.microchip.com

Strategic agreement for IR emitter solutions

A new agreement unites Laser Components USA's distribution network with Infrasilid's IR product solutions offering drop-in replacements for standard infrared emitters. The agreement is a significant step in advancing availability of top-tier infrared emitter solutions in North America. Customers benefit from access to the latest advancements in IR emitter and detector technologies.

www.lasercomponents.com

Expanding line card

Waldom Electronics has added TT Electronics to its manufacturer line card, including the BI Technologies, IRC, Optek Technology and Welwyn brands. TT Electronics will be participating in Waldom's Excess Inventory Management Solution, providing increased opportunities to expand in-stock inventory and availability on a broad range of products available at reduced MOQs with same-day shipments.

www.waldom.com



Total electronic grade silicon slices. Excludes non-polished and reclaimed wafers. Shipments are for semiconductor applications only and do not include solar applications

Global silicon wafer bounce back

In its annual silicon shipment forecast, SEMI has reported that global shipments of silicon wafers are projected to decline 14 per cent in 2023, to 12,512 million square inches (MSI) from the record high of 14,565 MSI in 2022 before bouncing back in 2024 as wafer and semiconductor demand recovers and inventory levels normalize. Continuing softness in demand for semiconductors and challenging macroeconomic conditions are driving the 2023 decline.

Momentum from the 2024 rebound is expected to continue through 2026, with

wafer shipments setting new highs as silicon demand increases to support artificial intelligence, high-performance computing, 5G, automotive and industrial applications.

All data is inclusive of polished silicon wafers and epitaxial silicon wafers shipped by wafer manufacturers to end users. The data does not include non-polished or reclaimed wafers.

www.semi.org



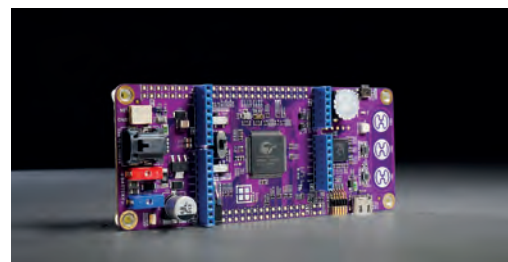
Low-load efficiency, delivered fast

Pulsiv has announced Osmium microcontrollers are available from stock through DigiKey. Using a patented switching technique, Pulsiv has developed a new method for converting AC to DC, reducing the overall energy wasted by mains powered devices or battery chargers.

Pulsiv Osmium has extended the range of conventional flyback topologies to replace more expensive LLC solutions, while achieving an unrivalled efficiency profile. It further helps manufacturers comply with the latest regulatory standards, including the EU's Ecodesign Directive.

Pulsiv's director of global sales & distribution, Nick Theodoris, said: "We're very happy to have partnered with DigiKey as a stocking distributor for our Pulsiv Osmium microcontrollers. Their global reach, easy online ordering and fast delivery enables engineers to quickly sample our ground-breaking technology for their new designs in almost any application. Pulsiv Osmium technology significantly increases low-load efficiency, improves energy waste, and saves cost, helping to reduce the impact billions of devices have on the health of our planet."

www.pulsiv.co.uk



Supporting automotive motor control units

Rutronic System Solutions' RDK4 supports the development of motor control units by combining a microcontroller, system base chip and the CAN FD and LIN automotive interfaces.

Rutronic's head of global innovation management, Stephan Menze, said: "For us, innovation always means creating something unique. We have once again achieved that with the RDK4, using state-of-the-art components such as Infineon's PSoC 4100S Max. The RDK4 is currently the only automotive qualified board available that uses this new microcontroller."

Another unique feature is that a system base chip is integrated into the base board in addition to the microcontroller. The built-in Optireg Mid-Range+ system base chip from Infineon offers a high level of integration, performance and scalability. With the help of jumpers, it is also possible to selectively measure the power consumption of the microcontroller, for example, during different power modes.

www.rutronic.com

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Industrial Automation: Moving into 2024 with Tempered Optimism

by **Eric J. Halvorson**, partnership marketing manager II – strategic programs, automation & control, **DigiKey**



It's an exciting time in the automation and control industry as the world of manufacturing is evolving at an exponential rate. As we look ahead to 2024, we can finally breathe a sigh of relief. 2022 and the first half of 2023 were difficult for procurement professionals at every point in the supply chain. We are now beginning to see an easing of factory lead times and inventory across the channel is increasing. Over the past year and a half, it wasn't uncommon to hear of lead times on drives, PLCs, HMIs and other advanced products to be well over 52 weeks. As a result, we're looking with a degree of optimism in 2024 at industrial automation across the industry. To that point, here are some trends I see continuing into 2024.

Smart Manufacturing

Smart, sustainable manufacturing will continue to lead the conversation in industrial automation. When we look at the

world's total energy consumption, we see manufacturing representing a large percentage of our total energy resources. Manufacturers are in a difficult but unique position that comes with a huge opportunity. Consumers now more than ever demand high-quality, sustainable products manufactured through smart and maintainable practices. As manufacturers look to be more competitive in getting goods in the hands of these consumers, environmental stewardship is more important than ever before. To meet the demands of consumers, manufacturers need to be nimbler and more efficient in their processes and constantly looking to improve. We see manufacturers doing this using solar powered microgrids, carbon capture projects, asset monitoring, the use of AI and cloud computing, and many other technologies to meet net-zero goals.

Artificial Intelligence (AI)

The introduction of AI has really taken the entire world by storm and has now made its way into industrial automation. We are seeing it utilized to program PLCs, robotics, make accurate forecasts on production scheduling and much more. Over the past few years, we've seen digital twins becoming more utilized across factory floors. A digital twin gives manufacturers the ability to accurately view their entire floor in a simulated environment. This allows manufacturers to see how changes in programming would affect real world production. It also reduces design cycle time, testing and improves outcome. Adding AI can enhance the accuracy and realism of digital twins by using computer vision, machine learning and deep learning to analyze data from sensors, cameras and other sources. It can enable digital twins to

run simulations and scenarios to optimize performance, efficiency and sustainability.

As we move into 2024, industrial automation will continue to be a rapidly evolving field that leverages cutting-edge technologies and components to improve the efficiency, productivity and quality of industrial processes. DigiKey helps procurement professionals keep up with the automation industry growth by offering more than one million automation parts from 400 top-tier suppliers, along with the digital tools to make the sourcing experience frictionless.

To learn more about sourcing industrial automation and control products from DigiKey visit:

www.digikey.com/automation.

DigiKey's Product Distribution Center expansion (PDCe).



Making comparisons quicker and easier

In this article, TrustedParts.com takes the opportunity to update purchasing professionals on recent platform updates, including Similar Products and other product page enhancements

TrustedParts.com has recently updated its product pages to include similar products, while making browsing faster, simpler and more informative. Enhancements include: similar products, in-page navigation and improved layout and stock/price chart enhancements.

The platform now has a Similar Products section, where users can instantly review other in-stock products with matching or very similar specifications. In the left column, buyers will find details regarding the current component for easy comparison. Each similar product has a link to its product page and a link to view a price and availability pop-up.

The Similar Products section makes comparing options simpler, listing the lifecycle and supply chain risks, stock information and important specifications of multiple

similar products—all in one concise table. This eliminates the confusion of navigating between many tabs and streamlines the comparison process.

To make viewing products more organized, product pages have been updated with in-page navigation and a floating header. As buyers scroll down the page to view more details, they will notice that valuable information about the product stays within view in a small box at the top of their screen.

Buyers can also use the new in-page navigation to quickly jump between page sections. This lets users instantly navigate to the section they wish to view.

Previously, stock and price charts were combined on one graph that displayed after opening a pop-up. To simplify how users view these



analytics, stock and price charts are now separate and displayed in the main page content. These graphs adjust to the browser window, letting users quickly view historical stock and pricing.

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Proactive approach to obsolescence

Rochester Electronics' product and technology solutions manager, EMEA, Ken Greenwood, helps readers ensure seamless operations and uninterrupted production

To remain competitive, OEMs must have a comprehensive understanding of costs associated with component obsolescence. Obsolescence cost measurement drives prioritization and risk reduction plans. Obsolescence should never be an afterthought, rather a proactive consideration ensuring seamless operations and uninterrupted production.

Component lifecycles and predicted EOL dates can be monitored and tracked using industry data tools. By integrating the project plan for end equipment, organizations can effectively forecast and simulate the costs involved in addressing obsolescence in a pre-emptive manner. The following are a few questions for any plan.

Does the project plan need to include anticipated product refresh or redesign during its life? Are resources allocated to support these plans?

These events are not one-time actions. Instead, they necessitate consistent and regular evaluations by a multi-

discipline team throughout a project's duration and life.

How will the business account for capital locked in long-term component sourcing?

For many long-term projects, money tied up in last-time-buy stock represents a significant financial investment. Moreover, uncertainty surrounding potential outcome after >five-years of storage adds an extra layer of risk.

How will component obsolescence impact after-sales service commitments?

The costs of servicing a long and uncertain after-market tail are often forgotten.

What effect would a shortened equipment life have on customers and end-users?

Prematurely ending equipment life or cutting service life short can have costly consequences, including reputational damage. Additionally, it poses an immediate risk of customers

turning to competitors to seek alternatives.

While component lifecycles are trackable, end-of-life (EOL) predictability is not infallible. Most predictions rely on algorithms. However, unpredictable events have the power to surpass mathematical calculations. Supplier consolidation, tool breakages or natural disasters can completely disrupt established rules and strategies.

Component obsolescence and the subsequent request for last-time-buys instigate a requirement for customers to predict their future equipment sales. However, these forecasts often prove to be unreliable due to unforeseen market changes that conspire to hinder re-designs or alter market conditions.

By sharing the BOM or critical parts lists for long-term programs with their component supplier, customers can gain a comprehensive understanding of project risks and proactively develop plans to mitigate them before obsolescence becomes a concern.

Authorized aftermarket distributors and manufacturers, such as Rochester Electronics, provide a risk-free long-term source for semiconductors, offering: stock to overcome market shortages or long lead times; a trusted source for obsolete components; and long-term manufacturing from wafer of selected product ranges.

Additionally, partnering with a licensed semiconductor manufacturer can mitigate component EOL risks. A licensed manufacturer can produce devices no longer supplied by the OCM. When a component is discontinued, the remaining tested wafer/die, assembly processes and original test IP are transferred to the licensed manufacturer by the OCM. This means previously discontinued components are still available newly manufactured and 100 per cent compliant with the original specifications. No additional qualifications are required or software changes.

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By investing its resources in the rapid introduction of new electronic technologies, Mouser Electronics is helping original equipment manufacturers gain competitive advantage

The rapid introduction of new products and technologies helps buyers at manufacturing companies gain a competitive edge and speeds time-to-market. Mouser works with over 1,200 semiconductor and electronic component manufacturers on their product introductions worldwide, offering customers 100 per cent certified, genuine, products fully traceable from each manufacturer.

Last quarter, Mouser launched over 16,000 part numbers ready for shipment. The following are some of the highlights.

The Nvidia Jetson Orin Nano 8GB developer kit by Seeed Studio delivers up to 40 TOPS performance for entry-level edge artificial intelligence and robotics. The kit includes a Jetson Orin Nano 8GB module, heat sink, carrier board and power supply. IOs include USB 3.2 Gen 2 ports, two M.2 Key M for SSD, a pre-installed Wi-Fi module and more.

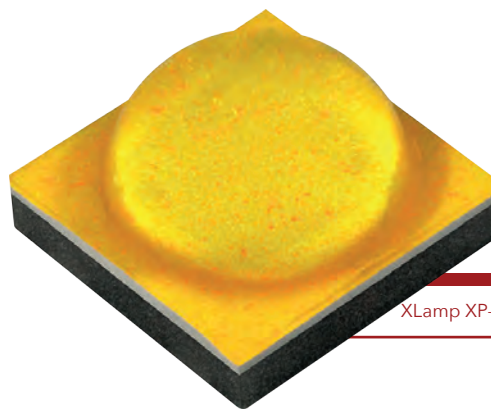
The VL53L7CH time-of-flight (ToF) sensor from STMicroelectronics features an ultrawide 90deg diagonal field-of-view and low power consumption. The compact, normalized histogram innovative data output is designed for AI applications requiring multizone raw data from a high-performance multizone ToF sensor.

XLamp XP-G4 LEDs from Cree LED incorporate the latest high-power LED technology for improved optical performance, while delivering industry-leading efficacy. The LEDs are optimized for a range of indoor and outdoor directional lighting applications requiring precise light control, good color over angle and long-term reliability.

Providing space-saving flexibility with the power capacity needed for modern Industry 4.0 innovation, the Brad M12 Power L-Code connector system by Molex meets PROFIBUS and PROFINET International standards. The IP67-sealed connectors and weld-slag and oil-resistant cables ensure durability and reliability in harsh industrial environments.

To help speed customers' designs, Mouser's website hosts a library of technical resources, including a Technical Resource Center, product data sheets, supplier-specific reference designs, application notes, technical design information, engineering tools and other helpful information.

[info.mouser.com/
new_products](https://info.mouser.com/new_products)



XLamp XP-G4 LEDs from **Cree LED**



Nvidia Jetson Orin Nano 8GB developer kit



VL53L7CH time-of-flight (ToF) sensor from **STMicroelectronics**



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AUTHORIZED DISTRIBUTION





Distribution conundrum: managing with low visibility

Distributors see opportunities mingled with challenges ahead in 2024 as they sort out customers' actual component requirements from inflated orders

Electronics component distribution executives will be greeted early in 2024 with a barrage of questions from analysts, investors, suppliers and even OEM customers. As in years past, distributors will not have sufficiently accurate answers to many of the critical questions they will be asked. As custodians of the industry's components and as the "traffic wardens" who see and direct the flow of supply chain information, customers will be looking to the industry's top players for insights into how the year will unfold and how investments should be deployed.

The questions being asked in 2024 will vary only in terms of shades but the most important ones will center on the market outlook and what kind of conditions customers and suppliers should prepare for as the new year unfolds. Just like they have done for decades, executives at companies like Arrow Electronics, Avnet, Mouser, TTI, Digi-Key, Future Electronics, WPG Holdings and others across the market will try over the next several months to attempt to answer hard-hitting questions about the industry's direction from partners and

analysts seeking leverage over competitors. At best, observers said, distributors may be able to offer "guidance" and subjective interpretations of facts they have gathered over the last year on whether 2024 will be a moderate, slow or strong growth year for customers.

That is because the electronics business remains mired in opacity, which makes efforts to forecast the growth trajectory of the industry extremely difficult, according to observers. In addition to the traditional challenges of determining likely sales ahead, the industry in 2024 faces other challenges related to the high levels of stocks in the channel and at suppliers. OEMs and suppliers are working on reducing the inventories to be better positioned to match new orders with actual consumption, but this process will only be worked out over months, lasting possibly into the second half of the year, according to industry executives.

At Micron Technology Inc., for example, inventories have been dropping as the memory supplier collaborated with customers in all its market segments to reduce stocks

with a view to gaining a better handle on demand, according to president and CEO Sanjay Mehrotra. "Most customer inventories for memory and storage in the PC and smartphone markets are now at normal levels, consistent with our prior forecasts," Mehrotra said while presenting the company's latest quarterly results. "Inventory levels are normal across most customers in the automotive market as well. Consequently, we see demand continuing to strengthen, which has led to an inflection in pricing. Some customers have made strategic purchases in DRAM and NAND to take advantage of unsustainably low pricing as the market begins its recovery."

Inventory overhang

In the second half of 2023, analysts were looking for further signs of inventory depletion. Within the distribution world itself, inventories remained elevated, however. Compared with only 3 years earlier, stocks have more than doubled at suppliers, OEM customers and distributors. Avnet Inc., for example, closed the June quarter with \$5.5 billion worth of inventory, up 100 percent

from \$2.7 billion, in the comparable quarter of 2020. By 2021 and 2022, inventories had climbed up to \$3.2 billion and \$4.2 billion, respectively. The period covered includes years when demand spiked upward, and shortages forced manufacturers to prepay for components. It has since been followed by another cyclical downcycle that appears to be ending much earlier than the industry's traditional 3-year cycle. Actions taken by distributors and suppliers since then have disrupted the market's regular inventory depletion and replenishment processes, observers said. In its outlook for the industry at the beginning of 2023, Deloitte noted that "Inventories are almost certainly to be reduced in the first half ... but will we see orders begin to flow in the second half?"

That question remains relevant today. The leading distributors are working on the assumption that a snapback in demand is certain for the first half of 2024, which they believe will help accelerate the inventory reductions on the way and lead to higher orders. That optimism is not without justification, based in part on



the history of the industry but also due to the confluence of factors that are pushing up demand across the market. First, although component stocks are higher within the distribution channel, most of the parts are either prepaid or tied to non-cancellable purchase orders from OEMs and contract manufacturers. During the recent shortages, distributors insisted on these terms to protect their profit margins. The same conditions were imposed on distributors by many of their component suppliers, as Arrow Electronics acknowledged in a filing with the Securities and Exchange Commission.

"A substantial portion of the company's inventory is purchased from suppliers with which the company has entered into non-exclusive distribution agreements," Arrow said. "These agreements are typically cancellable at any time or on short notice (generally 30 to 90 days). However, the recent global semiconductor shortages have resulted in some suppliers increasing the amount of non-cancellable orders, which limits the company's ability to adjust down its inventory levels in the event of market downturns and

could have a negative impact on the financial results of the company, particularly if the company is unable to pass such non-cancellable terms on to customers."

Arrow's current inventory exposure is larger than it has been traditionally. The company operates a low-margin business and is careful in taking on unnecessary risks. The situation changed in recent years with the last bout of extreme component shortages. It acquired components on behalf of OEM customers as usual but lost—in some cases—the typical return rights and protection clauses previously enjoyed at suppliers. The so-called non-cancellable and non-returnable orders were used by most distributors to encourage suppliers to jack up production to meet rising demand. As part of its representation of customers, Arrow also undertook "purchase obligations" with suppliers that ran into billions of dollars per year, huge chunks of which must be repaid within a defined period—usually within one year.

At the end of 2022, for example, the company



Mark Gibson, Global Head of Technology, Media & Telecommunications (TMT), KPMG Intl

"Almost two-thirds of semiconductor leaders are predicting industry revenue will increase, not contract"

reported purchase obligations of \$13.4 billion, noting that \$11 billion of the amount would have to be repaid within the next 12 months. "Non-cancellable inventory purchase orders were in line with the year-earlier period, and remain elevated above historic levels, primarily due to significant increases in prices and lead times for orders during both 2021 and 2022," the company said. "Additionally, many vendors continue to limit cancellations, although many of the company's non-cancellable purchase orders are backed by customer purchase orders with Arrow, that are also non-cancellable." Concerns about agreements like this will keep growth at a low level in the first half of 2024. It is expected that the inventory flow will be closely monitored at distribution, suppliers, and OEMs. Industry sources said this should extend through the first half of the year, but they are optimistic that rising demand for smartphones, improvements in the PC, consumer electronics, medical, industrial and transportation markets will eventually result in the industry operating at normal levels. By then, demand will

fairly equate to supply for the first time in the last several years, returning the industry to a period of steady growth. "Almost two-thirds of semiconductor leaders are predicting industry revenue will increase, not contract," said Mark Gibson, an analyst at KPMG International in a report. "That's a positive indicator for the upcoming year given the current economics and the fact the industry is almost at the point of having excess inventory." It would also be the first time the industry is beginning to feel and act normal again.



"Consequently, we see demand continuing to strengthen, which has led to an inflection in pricing."

Sanjay Mehrotra, president and CEO, Micron Technology Inc

Order with Confidence.



Growth, lead times, pricing and more

TTI's senior VP, product & supplier marketing, Lew LaFornara, explores growth sectors, component availability and question marks regarding 2024 pricing

Regarding OEM sector growth in 2024, I see mil-aero/defense, space, commercial aviation and the medical OEM market segments continuing to expand with the explosive growth in AI leading the way in the high-end computing segment. Transportation will flatten or reduce slightly, though EV and electronics content growth will offset lower demand.

I expect continued weakness well into 2024 in the general computing, communications, mobile phone and consumer markets. While underlying

trends for industrial are strong, we are seeing the weakening overall economy, higher interest rates/cost of money, continued inventory normalization and geopolitical concerns lead to a pause in spending and new investment.

Turning to component availability, lead times should come down and delivery performance improve in 2024, though component availability will remain tight in mil-aero/harsh environment sectors due to increased product demand and higher complexity. There

will also be continued tight supplies in older technologies for chips and passives, and high-power/new energy/EV products will face continued challenges.

Pricing is a big question mark for 2024. Customers are looking for price reductions/cost downs after years of high inflation, while suppliers experience cost increases as they look to recover to or maintain historical profit levels. The result will likely be a leveling or increase of prices.

www.tti.com



TTI's senior VP, product & supplier marketing, Lew LaFornara

Transport up, connected devices down

TTI's senior VP global strategic accounts, Jeff Ray, says availability of commercial products in communications/consumer markets may drive prices down

Compared to 2023, sectors yielding the most pronounced growth will be transportation/mobility, healthcare and industrial industries. Transportation/mobility sub-segment applications driving 2024 growth include drivetrain electrification, ADAS/autonomous, connectivity and EV charging. Healthcare growth will come through increases in diagnostic, test and measurement equipment, plus patient monitoring and medication management applications.

Industrial sector growth sub-segments include energy storage systems,

renewable energy generation and transmission/infrastructure, including building technology and industrial automation. I see declining performance in 2024 for connected devices, handheld/ultraportable, 5G, cloud/network and storage market sectors.

Measured in lead times and with few exceptions, electronic components have been more available in 2023 and that trend will continue in 2024. However, some more problematic products are critical to high growth sectors such as transportation, medical and industrial.

Availability of commercial grade products heavily used in the declining communications and consumer market segments may have downward pricing pressure in 2024. Today, given the amount of inventory in the channel either at distributors, OEMs or EMS providers, most component manufacturers are reluctant to offer lower prices because there are limited upside or available share gain opportunities.

www.tti.com



TTI's senior VP, global strategic accounts, Jeff Ray

Deepening relationships

Rochester Electronics' executive VP, Colin Strother, predicts the bottom of the current cycle and then explores industry trends with the potential to drive future growth

The semiconductor industry is notoriously cyclical. Average peak-to-peak of shipped units, excluding memory, over the last thirty-years is around forty-months. With the previous peak being February 2022, we can potentially expect to have been at the bottom of the current cycle in October 2023.

Every cycle is different, and recovery can be unpredictable, but we will see growth across all sectors in 2024. Based on an expected increase of global smartphone sales, the consumer market should anticipate an improvement, however this may be sluggish. We see more substantial growth potential in the hi-rel, industrial and automotive sectors.

Having traveled extensively throughout China this summer, for the first-time post-pandemic, I was amazed at the number of electric vehicles (EVs) on the road. There is no doubt we will see an acceleration in global adoption in the coming years.

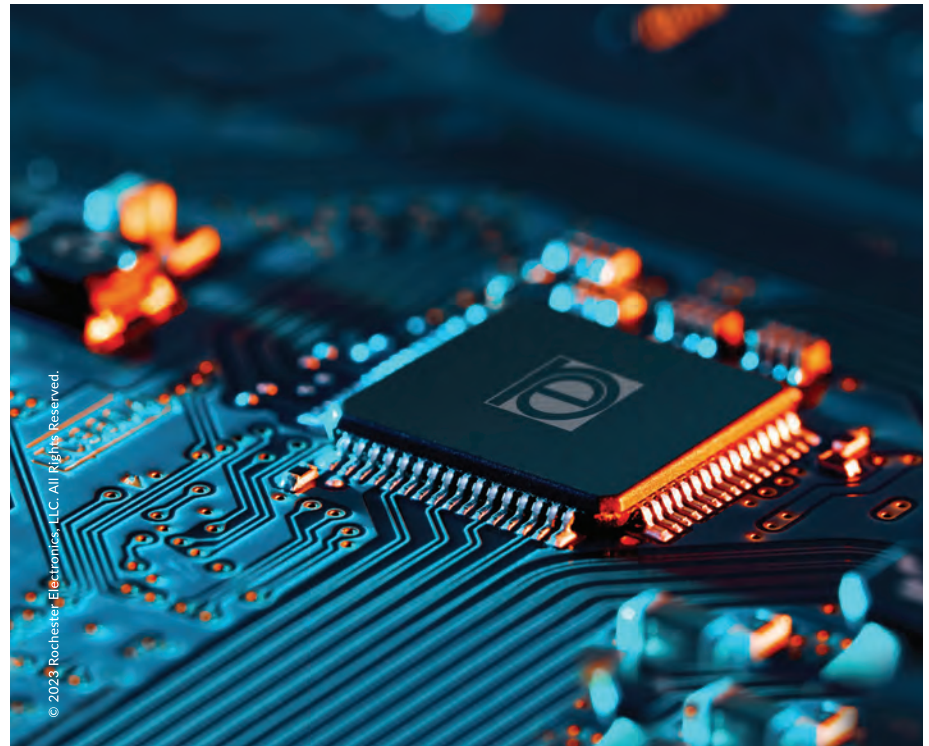
Growing discussion around AI is believed to stimulate the industry. While I think it's too early to predict the overall effect on sales, this will hopefully become another growth accelerant.

As prices and availability continue to fluctuate, it's essential customers work with authorized suppliers who genuinely have their success in mind. Authorized suppliers who practice strict price discipline and provide proactive data-driven solutions, can enable customer success throughout every aspect of the cycle.

Rochester will continue to drive customer engagement in 2024 by increasing our global physical footprint, continuing our digital transformation, building our product offerings and providing customers with a growing range of contact points, both online and offline, along with deepening our relationships to better serve all.

www.rocelec.com

Rochester Electronics' executive VP,
Colin Strother



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Innovation and growth

DigiKey's president, Dave Doherty, sees the electrification of everything as a key driver now and into the future, supported by a surge in new product introductions

DigiKey has supported a surge in new product introductions this year in every industry from automotive to medical, industrial automation to consumer devices and everything in between, driving business across the board. We are pleased and expect innovation and growth to continue into 2024.

We view the electrification of everything as a key industry trend that has driven significant growth and will continue

to drive significant growth next year. We expect wireless connectivity, smart sensors, cross architecture solutions and rapid prototyping will also be key driving trends in the year to come. DigiKey looks forward to continuing to provide all the components and services necessary to accelerate progress.

We're also keeping an eye on shifting market demands for AI and machine learning, including supercomputers and AI chips.

While the overall supply chain has improved immensely, some key suppliers—semiconductors in particular—are still short of our industry best in-stock goals. We anticipate lead times will continue to come down in 2024. Pricing is a bit trickier to call with offsetting forces between shorter lead times vs inflationary impact of material and labor.

www.digikey.com



DigiKey's president, Dave Doherty

Renewed focus on de-risking supply chain

Avnet Americas' regional president, Dayna Badhorn, believes supply chain models, whether simple or complex, can benefit from bespoke solutions

If there's anything the disruption of the past few years has taught us, it's the importance of supply chain resiliency and agility. We started the year with materials and logistics constraints and are now seeing inventory excess across the supply chain. With the market ever changing, global supply chain orchestration is more critical than ever to drive greater visibility and control.

At Avnet, we believe every supply chain model, whether simple or complex, could benefit from tailored solutions that promote business continuity and lower costs.

With our position at the center of the global technology supply chain, our experts first seek to understand our customers' needs and requirements in order to support more intentional and effective collaboration.

We can also create personalized digital experiences with custom supply chain dashboards that offer reporting and analytics for global transparency and secure, data-driven intelligence.

Another area of focus is sustainability. Our latest research indicates that initiatives around sustainable

design are further along than anticipated. We are working to help promote sustainable design efforts within our industry.

Avnet will continue to be a trusted partner and support our customers and supplier partners with our design-to-supply chain offerings to meet their business objectives in the new year and beyond.

www.avnet.com



Avnet Americas' regional president, Dayna Badhorn

/ AVNET: DELIVERING WHAT'S NEXT

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 can realize revenue faster.

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Customers often come to us to accelerate product design or streamline their supply chain, and they can plug in our capabilities to optimize their own.

To reduce complexity during the product design process, Avnet offers comprehensive design expertise and services for technology selection and prototype guidance. As products move into production, customers find scale through flexible supply chain services and global infrastructure.

Support doesn't end once a product is launched – we also extend product longevity throughout the entire lifecycle and can support with any redesign requirements.

Avnet provides global technology solutions with connected regional support. It's how we confidently deliver what's next in design, supply chain and distribution.

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Evolving supply chain strategies

Fusion Worldwide's president, Tobey Gonnerman, suggests the 2024 PC market could see an uptick as hardware purchased during the pandemic starts to be upgraded

With a myriad of factors at play, stating exact predictions for semiconductor pricing and availability for the year ahead is impossible. For example, if one sector's growth outstrips another's decline, we can expect supply chain gaps and higher prices. However, if the opposite is true, availability and pricing may be unaffected.

To effectively navigate these market ebbs and flows to support our customers, Fusion Worldwide strategically does the following:

- Aggregates information from a vetted supplier network
- Utilizes real-time market updates with its proprietary data insight tool, Scout RMS
- Provides 24/7 customer support globally to deliver insights

As we assess the 2023 market and recent trends, we anticipate the automotive sector may struggle in 2024. This is partly due to China reducing its generous EV subsidy, alongside global factors like continued inflationary pressure and EVs' lack of

cost-competitiveness with combustion engine cars.

However, we do expect an uptick in the PC market. Individuals who purchased PCs during the height of the pandemic are ready to upgrade. Additionally, the launch of AI-enabled operating systems will likely fuel demand.

We look forward to 2024 and urge manufacturers to continue evolving their strategies to thrive in a 'new' market environment.

www.fusionww.com



Fusion Worldwide's president, Tobey Gonnerman

Pushing the edge of technology

Kyocera AVX Components Corporation's AVX senior fellow, Ron Demcko, expects technical commonalities across high growth sectors will mitigate potential part shortages

Technology continues to transform our daily life and it will increasingly be relied upon to help address future challenges. Those challenges might be: global warming; smart grid/distributed power generation; advanced robotics for manufacturing; or ultra-high-speed communication.

Regardless of the exact sector, technology is being deployed as a solution. Examples of success stories range from data centers handling ever increasing data streams and private satellite constellations allowing internet for all, to EV's efficiency over ICE vehicles. To me the question isn't necessarily which sectors

will be in decline. The question might be rephrased by asking which sectors are going to accelerate at such a pace they leave traditional sectors behind. The top three sectors with the highest growth rates are probably AI, EV transportation and communications.

There are some commonalities that might help both R&D and component suppliers' manufacturing teams meet product volume goals in some sectors to alleviate part shortages. However, the end part requirements of each sector vary due to the specifics of electronic component performance

needed for optimized product performance.

The possibility of part shortages exists, especially with the uncertainty of totally new markets such as AI and what an optimized architecture might look like for the winning AI configuration.

As suppliers, these very different and fast growth sectors help push the edge of technology, challenge manufacturing for increased part counts and attract skilled engineering talent intent upon working with high impact technological solutions.

www.kyocera-avx.com



KYOCERA AVX's senior fellow, Ron Demcko

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Predicting pricing stability

Waldom Electronics' CEO, Don Akery, highlights 2024's growth markets and comments on component inventory, surpluses, availability and pricing

Waldom anticipates growth and decline in various OEM market sectors for 2024. We foresee continued stability and expansion in automotive, electric vehicles, industrial automation, military, aerospace and markets geared towards ESG initiatives.

On the other hand, we expect certain market sectors to face challenges, including the consumer sector, telecom/datacom, mobile phones and PC markets. This is primarily due to reduced demand and surplus inventory across the supply chain.

Growth and decline within the electronic component

supply chain have had significant impacts on component availability and pricing. Over the past 12-months, as market conditions have slowed, we've observed an abundant supply of inventory. Surpluses have become evident at all supply chain levels.

This situation has prompted our distributor customers to adapt their inventory strategies, reducing safety stock levels and lead times. These adjustments are in response to excessive inventory levels at their end customers, which have subsequently affected manufacturers who now

find themselves with slow-moving and excess stock.

While the surplus of inventory is gradually diminishing, we anticipate it will likely persist throughout most of 2024 before returning to more normal levels. In specific product categories, such as interconnect and electromechanical products, we may start seeing improvements by Q3 or Q4.

Interestingly, despite surplus stock, prices have remained resilient. Following a couple of years marked by price increases, we now anticipate pricing remaining stable. Early 2024 may see some

price reductions but it's important to note we do not foresee prices reverting to 2019 levels in the near future.

www.waldom.com



Waldom Electronics' CEO, Don Akery

AI is the hot driver

Flip Electronics' president, Bill Bradford, sees significant growth in AI applications but also alerts buyers to be on the lookout for increasing PDN or EOL notifications

We expect 2024 to be a good recovery year for the semiconductor industry overall, as the inventory overhang we've been experiencing this year continues to work down by the early part of the new year. The hot driver for semiconductor demand is and will continue to be AI, whether we're talking networking or computing. While the automotive market is slowing, content increases and continued EV shift will result in 2024 growth in auto electronic component sales. Industrial demand should recover well in 2024, while consumer (especially

cell phone and PC) will continue to be the laggard.

With this absorption of inventory and return to growth, we should see pricing stabilize and lead times return to more normal levels for most components. The wildcard will be the geopolitical and macro-economic uncertainty. My crystal ball can only see so much.

Finally, a trend we pay close attention to is component obsolescence. As our industry shifts to advanced nodes and manufacturers consolidate their operations, we see

the trend of increasing Product Discontinuance Notices (PDNs) or End-of-Life (EOL) notifications to continue to be a challenge to industries like industrial, medical, aerospace and defense.

www.flipselectronics.com



Flip Electronics' president, Bill Bradford

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Design, innovation and consumption

Mouser Electronics' senior VP of products, Jeff Newell, emphasizes the role of electronic technology in the modern world and sees AI and robotics as two drivers for 2024

Inventory is key to supporting our large and growing customer base and we continue to invest. Giving our customers the most choices, plus continuously adding new suppliers to our linecard lets customers make the best design decisions. This strategy of having the widest breadth of products has helped insulate us somewhat against market fluctuations and inflationary pressures.

Still, we are not immune to current challenges and there continues to be a glut of inventory which has contributed to a softer 2023. We see this

continuing into 2024. It's difficult to predict the future, given the intensifying geopolitical conflicts and economic instability occurring in the world.

One thing is certain: our modern world runs on electronic components and at a macro level we don't expect that to change. We see continued strength in the mil/aero and transportation sectors over the next few quarters. Key technology sectors, such as 5G, IoT, IIoT, AI, robotics, EVs and smart technologies will drive overall design, innovation and consumption in 2024.

Mouser is undergoing a multi-million dollar expansion at its Global Distribution Center to further expand the company's capabilities. Our focus areas of semiconductors, engineering tools and new product introductions will continue into 2024. In addition, we will continue our strategy to invest in inventory and the newest technologies from our manufacturer partners—as well as our e-commerce site, mouser.com—to serve our growing customer base of engineers and buyers.

www.mouser.com



Mouser Electronics' senior VP of products, Jeff Newell

Navigating the evolving semiconductor landscape

Perfect Parts' VP, Daniel Roca, balances the potential of AI, 5G, IoT and autonomous vehicles against the challenges of semiconductor demand and supply chain disruptions

The semiconductor industry's future holds remarkable promise. We anticipate unprecedented advancements in artificial intelligence, 5G connectivity, autonomous vehicles and IoT applications. These innovations will continue to reshape industries, enhancing productivity and transforming our daily lives.

However, the industry also faces substantial challenges, including supply chain

disruptions and increased demand for semiconductors, further exacerbated by geopolitical tensions. These challenges have underscored the importance of building robust, resilient supply chains and investing in domestic semiconductor manufacturing capabilities.

At Perfect Parts, we are dedicated to proactively addressing these challenges. Our commitment to quality, extensive global network

and access to hard-to-find components enable us to support your project's success, even in the face of industry fluctuations.

www.perfectelectronicparts.com



Perfect Parts' VP, Daniel Roca

Supporting customers building the future

ECS' VP of global technical sales and marketing, David Meany, anticipates continued growth in the IoT, automotive, medtech, renewable energy and industrial market segments

In today's rapidly changing world, keeping up with the latest trends is essential in supporting our customers and channel partners.

The integration of IoT has made an impactful transformation in a wide array of market segments worldwide. There is significant potential for enhancing efficiency in various industries such as manufacturing, healthcare, automotive, supply chain management and transportation.

In the automotive sector, we expect to continue to see trends in V2X and electronic

vehicles/accessories. The medtech industry is poised for significant growth with trends ranging from wearable devices to remote monitoring tools.

For the industrial market, we anticipate continued revolutionized transformation impacting the manufacturing, construction and logistic sectors. With an increasing focus on sustainability and environmental responsibility, the renewable energy industry is expected to continue an upward trajectory in the future.

ECS offers a wide array of passive components for simple and complex designs. Products

include features such as low power, compact sizing and AEC-Q200 automotive-grade specifications. We are excited to see what 2024 brings and look forward to supporting the customers and designs that build our future.

www.ecsxtal.com



ECS' VP of global technical sales and marketing, David Meany

Growing demand for medical and measurement

OKW Enclosures' president, Sean Bailey, forecasts growth for 2024 in two key markets: medical devices and measurement electronics

OKW's president, Sean Bailey



Both medical devices and measurement electronics have always been important sectors for the Pittsburgh-based manufacturer of standard and customized enclosures and tuning knobs. Last year OKW's work on medical electronics projects virtually doubled.

Sean said: "Medical technology is a market being driven by rapidly accelerating innovation and by global demographic changes. People are living longer and requiring more medical care in their later years. This is boosting demand for healthcare, social care and wellness electronics."

Meanwhile, OKW sees growth in measurement technology as all but inevitable due to the rise of Industry 4.0.

Sean added: "Measurement is now more important than ever because data is the lifeblood of IIoT. Smart factories create huge amounts of data, all of which must be measured and managed to optimize processes."

"IIoT will accelerate the evolution of traditional manufacturing. It's also likely to have a halo effect on other parts of the economy as greater use of data creates wider opportunities for innovation."

In recent years, electronics manufacturers have been forced to endure significant volatility in component availability. Shortages were followed by a surge in supply as the market played catch-up after Covid.

Next year is likely to be equally challenging in its own way, predicts Mr Bailey. He talks about 'pent-up demand' and foresees an 'exciting 2024'.

In recent years, judicious purchasing of raw materials ensured OKW was always able to keep customers fully supplied—even in the worst days of Covid lockdown. If demand increases next year, and component availability becomes an issue, other suppliers may have to follow OKW's prudent example.

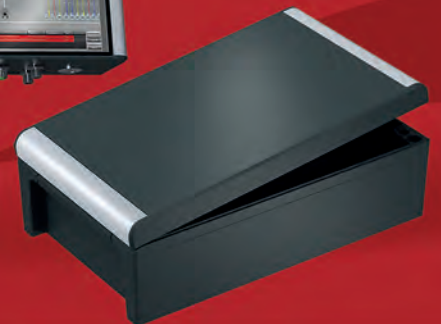
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Growth opportunities everywhere

TME US' MD, Teri Abelairas, is confident that constant improvements in electronic component technology will fuel growth across the board

We are strongly convinced that constant growth in the electronic component supply chain in 2024 will lead to higher product availability and a stabilization or even decrease in pricing. Focusing on growth in 2024, we envisage that with continuous advancements in technology and demand for efficient operations, all sectors should have steady growth in the foreseeable future, especially the industrial sector.

In our opinion, AI will play a significant role in technology development. Its ability to adapt to changing conditions in real-time and enhance machine learning capabilities can bring transformative changes to industries by optimizing processes and improving decision-making. AI's impact on manufacturing is evident in its ability to make production processes faster and more accurate. This can result

in higher quality products, reduced operational costs and increased competitiveness.

Semiconductors play a vital role in AI and technology development. They are the building blocks for many advanced technologies, making them essential for unlocking AI's full potential and overall technological growth. Devices such as CPUs, GPUs and specialized AI



TME US' MD, Teri Abelairas

chips (like TPUs or FPGAs) are essential for running AI's algorithms efficiently.

www.tme.com

Optimizing supply chain networks

When advising supply chain leaders on optimizing their supply chains, NewPower's CEO, Carleton Dufoe, advises building agility, resilience and redundancy

To ensure economic viability, supply chain leaders worldwide are assessing their strategies. They're focusing on capacity, adaptability and durability, but challenges like supply and demand imbalances, geopolitical instability, and unexpected pandemics make it difficult. Adding to the problem is electronic component demand patterns and customer expectations are always in a state of flux and the reality of what needs to be constructed will likely look vastly different over the course of the next decade.

What is the best approach for supply chain leaders to optimize their supply chains? In the supply chain landscape, a global reality exists with complex dependencies in upstream and downstream functions. Supply chain leaders must focus on optimizing strategies and building agility, resilience and redundancy. Agility helps to adapt to changing customer demands, resilience overcomes setbacks in the supply chain and redundancy mitigates damage from disruptions.

What are some concrete methods to accomplish this?

To begin strategic planning, companies should set measurable goals aligning with quantifiable output metrics. These goals should be easily measurable and connected to the fundamental aspects of the company's operations. A thorough inventory management assessment is vital for creating a comprehensive and detailed inventory strategy.

www.newpowerwww.com



NewPower's CEO, Carleton Dufoe



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Established in 1980 in Southern California, IBS Electronics has emerged as a distinguished global leader in innovative electronic components and logistics solutions. The company holds prestigious certifications including ISO 9001:2015, AS9120B, and AS6081, highlighting our commitment to quality and excellence.

With an extensive presence across Asia, Europe, and the Americas, IBS operates a formidable global sourcing network. This network serves as the foundation for providing a wide array of integrated sourcing solutions to prominent original equipment manufacturers (OEMs) and contract manufacturers (CMs) spanning various industries.



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The company's Global Procurement Network serves as the backbone for their seamless global services and product distribution. Supported by a robust suite of systems, skills, and tools, IBS efficiently manages production and services, irrespective of geographical barriers, cost considerations, technological nuances, or shifts in end-market demand.

IBS supports a network of global customers with turnkey value-added services designed to reduce response times, increase flexibility in the supply chain, reduce order delivery costs & inventory investment, and help customers to optimize their total cost of ownership.

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DISCOVER
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Closing out this five-year period

Sager Electronics' senior vice president marketing, Faris Aruri, provides detailed insight into growth sectors, plus the market purchasing professionals can expect in 2024

Forecasting next year's sales growth is always tricky, however identifying growth markets is considerably easier. We have the ultimate tailwind in demand for electronics led by IoT, EVs, robotics, medtech, renewable energy and factory automation, while data centers, AI hardware, and space exploration will be growth markets for years to come.

Regarding the market in general, it will come down to which competing market factors you believe will win out and to what degree. Short-term, we are exiting a compressed

bookings cycle—fueled by the supply chain crisis and extended lead-times—that is trying to settle back into some type of normalcy. The most obvious factors are the considerable inventory that exists throughout the channel that will need time to burn off with continuing market demand behind it. We also have a federal reserve that is determined to slow inflation, trying to restrain an economy that does not want to slowdown, a good longer-term problem.

With inventory burning off and continued demand, book-

to-bills coming back in line and a pause on interest rates, perhaps by early to mid-second quarter we could normalize and get back on a strong growth path. But that won't be before a dicey period in the first quarter if the industry-wide oversized sales backlogs are depleted. We might see some flat or negative growth up until May, steadying in the second quarter, and stronger growth by year end, averaging to low single digit growth to close out this five-year period since the onset of Covid-19.

www.sager.com



Sager Electronics' senior vice president marketing, Faris Aruri

A vision of progress through technology

IBS Electronics' CEO, Rob Tavi, imagines a fascinating future where AI fosters a world pulsing with innovation, minimizing errors and maximizing human potential

In a striking turn of events, the electronics component industry is now grappling with an excess inventory surge, contrasting the recent supply shortages. A 2023 study by Kearney pinpoints a \$250+ billion excess inventory issue in the US alone, with global ramifications scaling up to trillions. Amidst this backdrop, we find ourselves at a pivotal juncture in the industry's evolution. Such times, while challenging, present a unique opportunity for introspection and recalibration. Amidst this landscape, as we stand on the brink of 2024, we're met with

an era dawning with promise and burgeoning technological advancements and AI.

At IBS Electronics Group, our vision is firmly rooted in the transformative power of technology and AI. Beyond mere tools, we see AI as the linchpin in bridging gaps, predicting market trends and optimizing supply chains. Imagine a world where AI not only addresses inventory challenges but also fosters a global community pulsing with innovation, minimizing errors and maximizing human potential. As we embrace this technological evolution, we believe in

harnessing AI's potential not just to respond to present industry challenges, but to preemptively shape a resilient, adaptive future. As AI and technology continue to evolve, so will the ways we interact, lead and innovate. Imagine a world where language barriers are a thing of the past, and the only limit is our imagination.

www.ibselectronics.com



IBS Electronics' CEO, Rob Tavi

/AVNET: DELIVERING WHAT'S NEXT

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M12 offers versatility in industrial applications

Stewart Connector has expanded its M12 cable and connector product line for industrial applications and harsh environments. All cables and connectors in the M12 product line are designed for use in rugged spaces and are IP67 rated or above for water resistance and dust protection.

Supporting Ethernet data transfer in aerospace, industrial automation, manufacturing, and robotics, the expansion of the M12 product line can help customers who need readily available parts in a variety of length and mount features to quickly scale deployments.

The established M12 A-Code series features male and female panel mount receptacles and multiple field terminated options. The latest M12 D-Code series features panel mount female solder cup, board mount female-vertical, male with overmolded cable (1.0 and 2.0m). The new M12 K-Code series includes female with 3ft overmolded cable, panel mount male and plastic cap. The recently stocked M12 X-Code series includes panel mount female; male-to-male coiled Ethernet cord; male-to-RJ45 plug coiled Ethernet cord; and panel mount plastic cap.

www.belfuse.com/stewart-connector



Enhancing data bus integrity

Fairview Microwave has released a new series of MIL-STD-1553 dust caps, terminators and adapters. The TRB jack RFI cap features a three-lug bayonet coupling design, ensuring optimal protection for sensitive electronics against dust and other forms of foreign object damage. The cap is crafted with RoHS-compliant materials.

The new terminator is designed to bring closure to open bus lines on a 1553 data bus. They mate with any TRB three-lug or four-lug jack, which are common in standard 1553 data bus couplers and relay devices. With resistance aligning with MIL-R-39007 specifications, the terminators are available in a variety of resistance options.

The new adapter is mostly used in testing environments. They are designed for situations that necessitate one input signal to be disseminated through two output connections. The design allows for the reverse operation, overlaying two inputs into a single output.

www.fairviewmicrowave.com



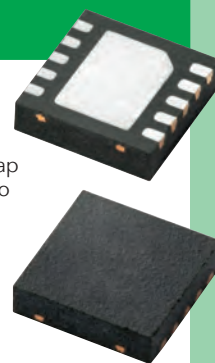
Efficient power management for high voltage systems

Littelfuse has added the LS0502SCD33 to its eFuse Protection ICs product line. In applications where backup power is crucial, the narrow temperature range of lithium-ion batteries limits their use. To address this challenge, Littelfuse's LS0502SCD33 supercapacitor-based solution offers a wide operating temperature range and high power/energy density, ensuring a safe and compact alternative.

One of the product's differentiators is its ability to handle high operating voltages (>3V) without complex power management systems. The component safeguards the system from potential damage by integrating input overvoltage and current protection, providing designers with a flexible, integrated and compact storage capacitor or capacitor bank backup solution.

Littelfuse's assistant product manager, protection semiconductor business, Bernie Hsieh, said: "The LS0502SCD33 eFuse provides electronics designers with a high-efficiency integrated SuperCap charging IC solution in a single chip. This addition to our eFuse Protection ICs product portfolio expands the line's solutions to include portable battery device protection, making Littelfuse a forerunner in the burgeoning market of management and protection for SuperCap applications."

www.littelfuse.com



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Our worldwide network includes relationships with manufacturers, franchised distributors and independent distributors. Whether difficult to find, obsolete or end of life product, Chip 1 has the contacts and sourcing to find and deliver the correct parts to our customers in a timely manner all at competitive prices.

Our successful concept is based on the following items:

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- Delivery over night or just in time.
- The purchasing department has relationships established with most of our suppliers whether domestically or internationally, this enables the best possible prices for each component.
- Due to our central location in

Europe we are able to deliver any parcel within hours, even to the remotest cities in Europe, this is also true with North America and our Asia offices.

- Own stock with a constant market value of millions of Euros.
- We offer competitive terms as well as volume purchase agreements for our customers.

Excess Management

Chip 1 Exchange offers a number of standard solutions for inventory management and reduction.

Below are four of our most popular programs, however, we are always open to designing a custom solution that better meets the requirements of your business.

Lot Buy:

This solution is for customers that would like to sell their entire excess inventory at once and remove the product from their books, warehouse etc.

Consignment inventory:

You would send us a list of the product you would like to remove from your inventory. We would then market the product worldwide through our vast network of customers and Internet based sites.

We presently have tens of thousands of customers in our database and we will market the product to this extensive list of customers. This is a slower approach than the first solution; however, in some cases it may yield a better return for you.

Line buy:

In this option you would send us a

number of items that you would like to remove from your inventory. We would then bid on each line item separately.

Customer in-house-consignment:

In this solution you would keep the inventory in your warehouse and we would market the product as we would in in option number two above.

Design and Engineering

Chip 1 Exchange guides customers through technology's most challenging issues, providing a real world solution to today's most complex and challenging designs. Additionally, Chip 1 Exchange employs many Electrical Engineers that are thoroughly trained by our manufactures to ensure they are equipped with the latest knowledge and services to assist the customer through the most difficult designs.

Services offered:

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Whether you're in quest of reducing extended lead times or to locate allocated, obsolete, and/or end-of-life electronic components, semiconductors, and other difficult-to-locate electronic components like murata multilayer ceramic capacitors, Chip 1 has the supply-chain expertise

to resolve your material shortages. An increase in production or supply delay by another supplier may lead to shortage issues and possibly the risk of a line down situation. With Chip 1's rapid response times, unmatched sourcing and experience in global logistics, we can eliminate the stress of shortage situations and deliver the solutions you require, thus removing disruption to your production lines.

Chip 1 understands the importance of shortage elimination and our team of highly qualified sales people are ready and capable to quickly source electronic components from around the world.

From the first point of contact each customer is assigned a dedicated account manager who will handle component sourcing and logistics to ensure that your production lines remain in full production mode.

We employ the identical practice for obsolete parts and End-of-Life material, therefore, providing our customers with the best solution for all of your supply chain requirements.

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CERTIFICATIONS:





John Denslinger is a former executive VP Murata, president SyChip Wireless, and president/CEO ECIA, the industry's trade association. His career spans 40 years in electronics

Forecasting by John Denslinger

Stick the landing, stick the **2024** forecast

In this article, John Denslinger takes a detailed look at the year ahead and then expands on four potential landing scenarios: soft, bumpy, hard and crash

When fiscal year 2023 closes, a majority of companies will see growth exceeding original forecasts. The outlook back then was murky at best: rampant inflation, interest rates on the rise with no apparent upper limit, supply chain disruptions and acute labor shortages. Would there be a recession or soft-landing? Despite all the conjecture, the economy just didn't contract. Contrary to historic norms, consumer spending remained consistently stronger than economists predicted. Employment actually strengthened as well triggering labor shortages across the nation.

Now the 2024 forecast period is at our doorstep but the same question remains: will there be a recession or soft-landing? Stick the landing, stick the forecast! But as we all know, nothing is completely simple. Global turmoil has increased dramatically with the ongoing war in Ukraine, Chinese aggression towards Taiwan and, most recently, the unforeseen war erupting in the Middle East. Also, 2024 is a US Presidential election year with political parties polarized on the country's economic and social direction. Obviously, the greater impact is 2025 and beyond, but the election headwinds throughout 2024 could be an added factor.

Inflation is still the foremost uncertainty heading into the new year. If the Federal Reserve holds true to its two per cent goal, the landing could be a rough one. According to a Deloitte Deep Dive assessment, four landing scenarios are possible: soft, bumpy, hard and crash.

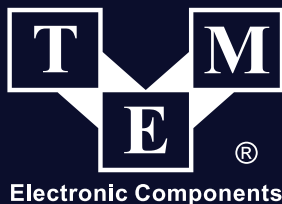
A soft landing is ideal. In this situation, inflation approaches target, the Fed holds rates or begins to moderate, consumer spending rebounds, labor markets strengthen and any disruption in the supply chain quickly evaporates owing to prior onshoring efforts. Deloitte projects 2024 inflation at 3.0 per cent and GDP at 1.5 per cent in this case. Business begins to expand again.

A bumpy landing is almost as good but there are lingering impediments to economic growth. Inflation isn't quite tamed yet and the Fed is ambivalent about further rate hikes. Consumer spending picks up, labor markets remain tight and the supply chain seems resilient and flexible despite some disruption. Deloitte projects inflation at 4.0 per cent and GDP at 1.0 per cent. Some businesses may cautiously expand while others sit on the sidelines.

A hard landing is both undesirable and a forecasting nightmare. Inflation collapses as the Fed's aggressive monetary action over-corrects. Consumer spending is restrained. Unemployment increases slightly, but wages stagnate. Supply chains suffer from mixed messages. Deloitte projects inflation at 0.5 per cent and GDP at 0.5 per cent. Businesses will likely 'wait and see' on expanding often demanding quick response to surges or push-outs.

A crash landing is obviously an economic disaster. Inflation actually increases despite Fed action. Consumer spending stagnates and labor market contracts as unemployment escalates. Supply chains face disruption and painfully absorb onshoring costs waiting for better days ahead. Deloitte projects inflation at 9.0 per cent and GDP at a dismal -1.0 per cent. Businesses will be in contraction mode.

Consider one last data point from the *Conference Board's* published economic forecast. It's quite telling. GDP dips from 2.2 per cent in 2023 to 0.8 per cent in 2024. That would say the *Conference Board* expects a bumpy to hard landing ahead. Not a glowing endorsement for growth. Add global conflicts, expensive climate initiatives, energy interruptions, a dysfunctional congress and new disruptive technologies like AI, 2024 will be a most challenging year to forecast. Sticking the landing won't be so easy this time around.



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THE PERFECT SOURCE

Today's market shortages and lead-times of over 52 weeks make it clear that no one's supply chain is safe. Given major constraints that are being experienced by both design and supply chain departments, many OEMs are realizing that partnering with the right distributor is the missing link in their supply chain. Partnering with a distributor that knows reverse logistics, has global reach, a good reputation, and third-party testing capabilities to ensure that your products meet your end user requirements is needed in order to be successful.

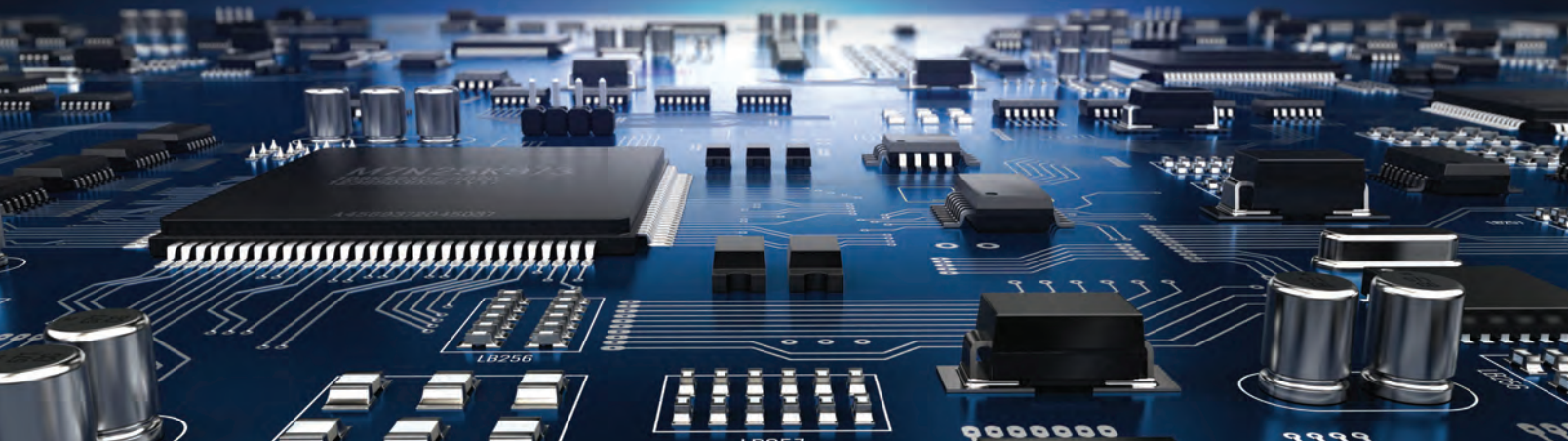
Sourcing from the open market can be daunting with counterfeit parts and sub-standard materials posing as a constant threat to your supply chain. Material procured from the open market that is improperly tested can cause loss of relationships, increased liability,

major delays, and line down situations. Many distributors test material in house or not fully leaving your supply chain exposed. Perfect Parts works with 3rd party fully accredited test labs which are specialized in performing comprehensive testing including those which are for high reliability applications. By utilizing third party laboratories you can rest assured that there is no conflict of interest when testing material for your supply chain.

With an eight-year streak of zero RMAs due to sub-standard materials, Perfect Parts is the only USA distributor that can boast zero RMAs due to a counterfeit or substandard part deliveries. When you work with Perfect Parts you can expect a level of quality that is unrivaled in the electronic component industry. Perfect Parts is a global online distributor of electronic components

that specializes in testing requirements, sourcing, and distribution. With access to over 30 million unique inventory lots from our global network of manufacturers, OEMs, contract manufacturers, authorized channels, and other vetted suppliers you will find everything you need for your builds. With a focus on providing value-added services and advanced web tools, Perfect Parts will change the way you design and procure components for your organization.

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Sager Electronics' VP supplier marketing & product management, Craig Sanderson, walks readers through sensor technology advancements and industry drivers

Sensor technology has experienced significant advancements in recent years, in response to the growing need for accurate, efficient, versatile and cost-effective sensor solutions, along with the expansion of data collection and analysis.

A key improvement is sensor manufacturers' ability to reduce costs while enhancing functionality. The following developments are seen in today's market.

Mass production: As sensors have become more common, mass production has led to economies of scale. High demand and production volumes have helped lower manufacturing costs, making sensors more affordable.

Miniaturization: Sensors are becoming smaller while maintaining or even improving their performance. Miniaturization has opened opportunities for sensor integration into wearable devices, smartphones and other compact applications. This enables personal health monitoring, fitness tracking and more.

MEMS advancements: Micro electromechanical systems (MEMS) technology has witnessed substantial growth. MEMS sensors are widely used in applications like accelerometers, gyroscopes and pressure sensors and their performance and reliability have improved.

Energy efficiency: Low-power sensor technologies have emerged, making it possible for sensors to operate for extended periods on battery power or energy harvesting. This is critical for applications in remote and wireless sensor networks.

While manufacturing advancements are contributing to sensor efficiency and effectiveness, many industries and applications are driving the increase in sensor utilization and production volumes.

Wireless and 5G connectivity: The integration of sensors with wireless technologies like 5G enables faster data transmission and real-time control. This is essential for

applications in communications systems, industrial automation and remote monitoring.

IoT integration: IoT has played a pivotal role in sensor evolution. Sensors are now integrated into a multitude of devices and systems, allowing for data collection and real-time monitoring on an unprecedented scale. These technologies are employed in smart homes, smart cities, and industrial IoT.

Environmental and gas sensors: There have been notable advancements in environmental sensors and gas sensors that monitor air quality, detect pollutants and measure gases such as CO₂ and methane. These sensors contribute to improved environmental monitoring and safety. With ozone-depleting gases in HVAC-R systems being replaced with flammable gases such as propane, State governments are mandating gas-leak detection sensors as a safety device, offering significant growth potential for deployment in home and commercial HVAC-R system applications.



Sager Electronics' VP supplier marketing & product management, **Craig Sanderson**

Electric vehicles: EVs are opening requirements for safety systems within battery electric vehicles (BEV) to address thermal runaway. With millions of electric vehicles being built every year, this has contributed significantly to the increase in sensor usage.

Medtech: Medical technology continues to move the diagnostic, drug delivery and patient care closer to home. Home care is driven by high hospital care costs, the need for more staffing and patient preference. Pressure, temperature, force and liquid/airflow sensors are heavily used in patient care systems, providing data on patient condition, drug delivery, monitoring and treatment progress.

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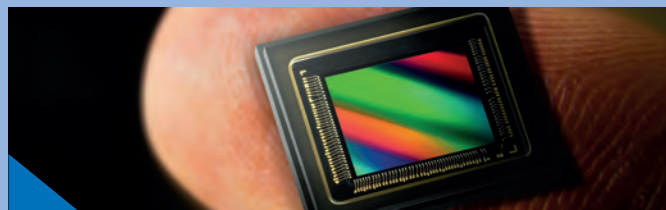
Hall-effect sensors suit industrial applications

Diodes has introduced a new portfolio of high-sensitivity Hall-effect sensors. Devices in the AH39xxQ series are designed to provide accurate speed and directional data or two independent outputs. These sensors are engineered for industrial and automotive applications such as detecting rotational and linear speed/direction and determining the angular position of a rotating shaft.

In line with automotive battery requirements, the sensors operate over a 2.7 to 27V supply voltage range. They also have a 40V absolute maximum rating, safely handling 40V load dumps. Additionally, -18V reverse voltage protection guards against incorrect battery connections. For added robustness, ESD protection provided by these devices exceeds the automotive norms of 5kV human body model (HBM) and 2kV charge device model (CDM).

The sensors are AEC-Q100 Grade 0 qualified, manufactured in IATF 16949 certified facilities and support PPAP documentation. They are supplied in TSOT25 packages. In 1,000 piece quantities, the AH396xQ and AH397xQ series are available at \$0.40 and \$0.44 respectively.

www.diodes.com



Low power image sensing for home and office

Onsemi has introduced the Hyperlux LP image sensor family suited for industrial and commercial cameras such as smart doorbells, security cameras, AR/VR/XR headsets, machine vision and video conferencing. These 1.4µm pixel sensors are designed to deliver industry-leading image quality and low power consumption, while maximizing performance to capture crisp, vibrant images even in difficult lighting conditions.

The family features a stacked architecture design to minimize footprint. Depending on use case, customers can choose between the five megapixel AR0544, eight-megapixel AR0830 or the 20-megapixel AR2020.

Onsemi's senior vice president and general manager, Intelligent Sensing Group, Ross Jatou, said: "By leveraging our superior analog design and pixel architecture, our sensors elevate the two most important elements people consider when buying a device, picture quality and battery life. Our new image sensor family delivers performance that matters with a significantly increased battery life and exquisite, highly detailed images."

www.onsemi.com

Robust operation in direct sunlight

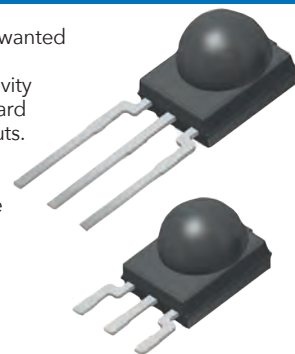
New Yorker Electronics has announced Vishay's release of two new fixed-gain infrared (IR) sensor modules designed to lower costs and increase stability for outdoor sensor applications. Offering typical irradiance of 1.3mW/m² in compact Minimold packages, the surface-mount TSSP93038DF1PZA and leaded TSSP93038SS1ZA provide robust operation in direct sunlight, while still providing enough sensitivity for light barrier applications.

Unlike high sensitivity fixed-gain IR sensor modules that require attenuators like dark panels, apertures and sunshades to protect them against sunlight—adding to overall solution costs—the controlled sensitivity of the

devices let them operate in full sunlight without unwanted pulses. In addition, for short range presence and proximity applications, the sensors' reduced sensitivity eliminates the need for extremely low emitter forward currents, which can lead to unstable intensity outputs.

The devices suit sensing distance to objects for toys, drones, robots and vicinity switches; presence detection for traffic control lights and parking lot, gateway access and water level sensors; and light barriers for sports racing and lawnmower robots.

www.newyorkerelectronics.com



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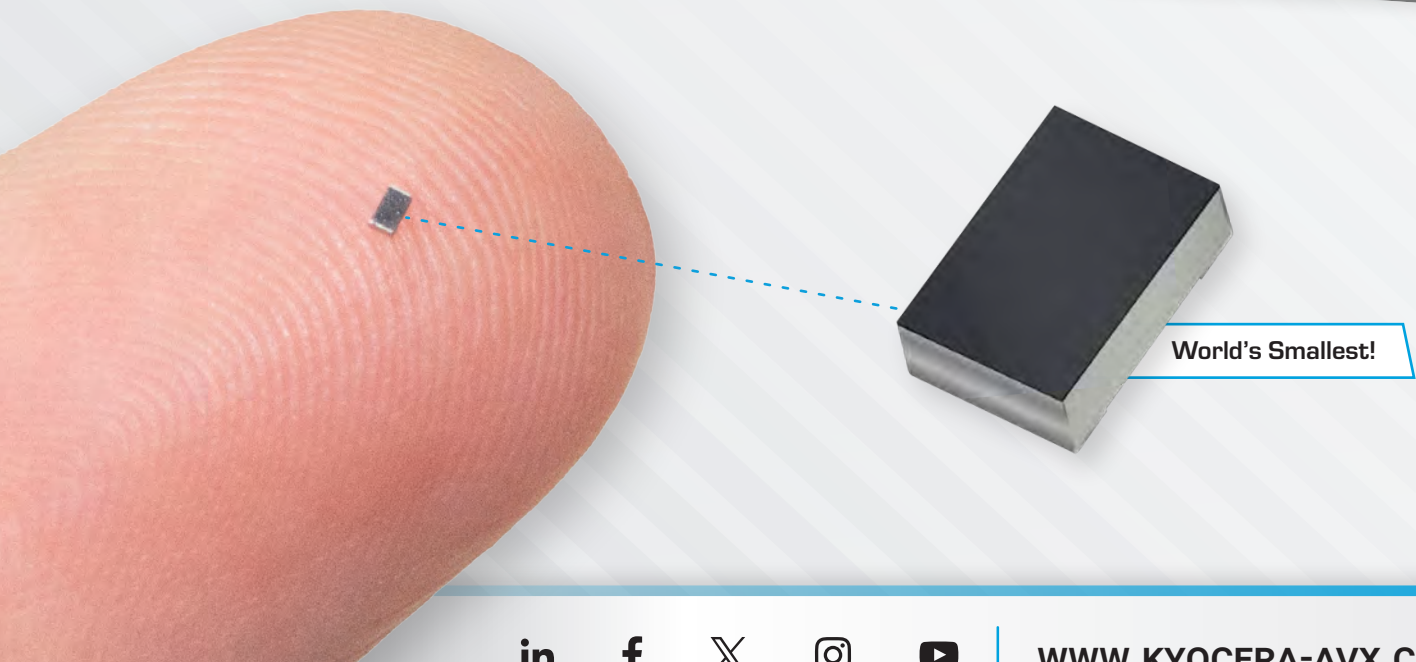


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Growth isn't assured for everyone as new chip cycle begins

The semiconductor market is set to continue its march towards \$1 trillion in revenue by the end of the decade but not all enterprises are well positioned to benefit from the new growth spurt

The impact of artificial intelligence is being felt across the global economy. In the IT and semiconductor markets, industry executives and analysts believe AI will contribute to the rapid expansion of the industry over the next several years. Aside from a handful of companies—Nvidia and AMD, for example—the full impact of AI innovations and new product innovations on chipmakers and the general IT markets, may not be immediately noticeable, however, until 2025, according to observers.

Even so, analysts and industry executives are convinced semiconductor sales will hit \$1 trillion by 2030, starting with an unexpectedly stronger recovery momentum late in 2023 that they see extending through the next several years. The \$1 trillion revenue number has been repeated by so many observers over the last several years that it has become sacrosanct. The recent downturn that clipped sales through the end of 2022 and which drove the industry into a cyclical downturn in 2023 is not expected to severely impact the achievement of the \$1 trillion goal, observers said. This is partly due to the heavy contribution they see from Generative AI, continuing recovery in the memory markets and contributions from automotive semiconductors, energy,

medical and industrial markets, they said. Generative AI's contribution to chip growth will accelerate only in later years as new products related to the sector are delivered, analysts said.

"In 2023 and 2024, very little IT spending will be tied to GenAI," said John-David Lovelock, an analyst at Gartner, in a report. "However, organizations are continuing to invest in AI and automation to increase operational efficiency and bridge IT talent gaps. The hype around GenAI is supporting this trend, as CIOs recognize that today's AI projects will be instrumental in developing an AI strategy and story before GenAI becomes part of their IT budgets starting in 2025."

Based on Gartner's timeline, by the time AI's contributions to the global economy becomes clearly visible, most semiconductor vendors should have the strong tailwind of another of the industry's expansionary cycles pushing them towards stronger sales. The momentum is already picking up. Analysts project chip sales will decline at lower-double digit rate in 2023 and then snap back into growth territory in 2024. Gartner forecasts chip revenue will fall 11 percent in 2023, dropping to \$532.2 billion, from \$599.6 billion, in 2022. In 2024, though, revenues in the

chip sector are projected to shoot up close to 20 percent, swinging to a record \$630.9 billion, the researcher said.

Surging demand for chips powering the AI market will contribute to the giddy growth forecast for the next several years. While the rest of the industry will struggle to report strong growth in 2023, sales of semiconductors headed into AI products and related services will jump 21 percent this year. Although growing from a low base, AI chips sales are projected to surge by 2023 to \$53.5 billion and then increase by 2024 to \$67.2 billion, up 26 percent sequentially. Analysts said many enterprises are only just beginning to deploy AI in the workplace, the results of which would be seen only in the next several years. In addition, electronics OEMs serving the consumer market are also exploring opportunities for adding AI capabilities to their devices, promising higher demand for semiconductors aimed at the sector.

Companies like Nvidia and AMD that are vendors of the graphics processors heavily used for AI applications will gain market share as demand surge, analysts said. "The developments in generative AI and the increasing use of a wide range of AI-based applications in data centers, edge infrastructure and

endpoint devices require the deployment of high performance graphics processing units (GPUs) and optimized semiconductor devices. This is driving the production and deployment of AI chips," said Alan Priestley, an analyst at Gartner. "For many organizations, large scale deployments of custom AI chips will replace the current predominant chip architecture—discrete GPUs—for a wide range of AI-based workloads, especially those based on generative AI techniques."

Uneven Recovery

Like in previous cycles, not all semiconductor suppliers will recover at the same pace, observers said. Market leaders in various sectors may experience a stronger and immediate upswing ahead of others in their segments. The inventory adjustment that the industry is still working through will also delay growth in sectors that ramped up production heavily to meet surging demand during the last upcycle. Inventory levels are still relatively high at many of the top chipmakers although executives say they expect a quick drawdown of the excess stocks. However, many OEMs have also signed multi-year supply contracts with chipmakers, which could reduce visibility into actual demand from the customers. Until actual consumption

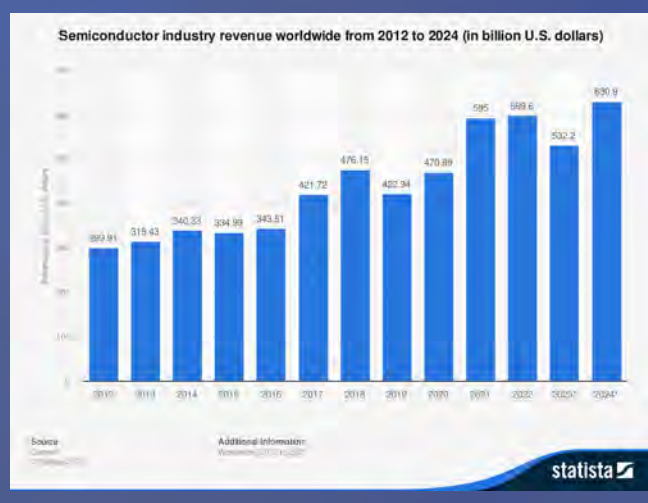


patterns—rather than inventories purchased to counter shortages—are re-established, sales projections at many chipmakers will remain unreliable, according to industry sources.

The ongoing global economic uncertainties, combined with geopolitical concerns in certain locations, will continue to impact capital expenditure planning at the leading chipmakers. The industry's biggest manufacturing equipment buyers may cut capex or delay deployment of already purchased tools, industry executives said. Taiwan Semiconductor Manufacturing Co. Ltd., (TSMC), the world's biggest contractor to other chipmakers, for example, has warned that it will further reduce capex for 2023 in response to the changing market conditions. "Given the near-term uncertainties,

we continue to manage our business prudently and have tightened up our capital spending throughout the year where appropriate," said Wendell Huang, CFO at TSMC, while presenting the company's third quarter 2023 financial results. "We now expect our 2023 capex to be approximately \$32 billion. Out of the approximately \$32 billion capex for 2023, about 70% of the capital budget will be allocated for advanced process technologies; about 20% will be spent for specialty technologies; and about 10% will be spent for advanced packaging, testing, mask-making and others."

Memory makers that suffered heavily from severe pricing erosions during the last year will see significant improvements, gaining benefits from production cutbacks, inventory reduction efforts at customers and a



Semiconductor industry revenue worldwide from 2012 to 2024
Source: statista



"We continue to manage our business prudently and have tightened up our capital spending throughout the year where appropriate"

Wendell Huang, CFO, TSMC

gradual increase in average selling prices. At Micron Technology Inc., executives believe customer inventories have "normalized" and that the next fiscal year would bring strong operational improvements. "Ongoing demand growth, customer inventory normalization, and industrywide supply reductions have set the stage for increased revenue, along with improved pricing and profitability throughout fiscal 2024," said Sanjay Mehrotra, president and CEO. "While macroeconomic factors remain a risk, we expect robust year-over-year bit demand growth in calendar 2024 for both DRAM and NAND, driven by improving end-market demand, normalized customer inventory levels, content growth across products, and ongoing growth in AI."

TSMC is also banking on similar economic dynamics and inventory reduction activities at its fabless customers. The company said sales will continue to improve through 2024 although customers are likely to remain cautious in their spending plans. In addition, the recovery promises to be broad-

based. Demand from fabless smartphone companies have improved and improvements are noticeable too from PC OEMs, said TSMC CFO Huang. The strong demand for the company's leading edge production processes will also help boost profitability, Huang noted. "We expect our business in the fourth quarter to be supported by the continuous ramp of our 3-nanometer technology, partially offset by customers' continued inventory adjustment. On the inventory side, we expect the fabless semiconductor inventory to have continuously reduced in the third quarter. We are observing some early sign of demand stabilization in the PC and smartphone end market. Together with such level of inventory control, we forecast the fabless semiconductor inventory to further reduce and exit 4Q '23 at a higher level"



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Alpha Wire	Mouser Electronics	800-346-6873	www.mouser.com	Y	8,106	N/A	\$0	93%	50	1,000+	Y
Belden Wire & Cable	Mouser Electronics	800-346-6874	www.mouser.com	Y	5,863	N/A	\$0	97%	50	1,000+	Y
Molex	ECCO	773-767-2200	www.eccoconnectors.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Molex	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
TE Connectivity	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
CIRCUIT PROTECTION											
Bel Fuse		+1 201 432 0463	belfuse.com/circuit-protection	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bourns	Mouser Electronics	800-346-6873	www.mouser.com	Y	4,462	N/A	\$0	68%	50	1,000+	Y
Eaton	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
EPCOS	Mouser Electronics	800-346-6873	www.mouser.com	Y	3,487	N/A	\$0	100%	50	1,000+	Y
KYOCERA AVX	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
KYOCERA AVX	Digi-Key	800-344-4539	www.digikey.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
Littelfuse	Mouser Electronics	800-346-6873	www.mouser.com	Y	28,790	N/A	\$0	67%	50	1,000+	Y
Schurter	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Vishay	Mouser Electronics	800-346-6873	www.mouser.com	Y	31,445	N/A	\$0	68%	50	1,000+	Y
DISPLAYS & LEDs											
BIVAR	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Broadcom	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Cree LED	Mouser Electronics	800-346-6873	www.mouser.com	Y	12,390	N/A	\$0	99%	50	1,000+	Y
Dialight	Mouser Electronics	800-346-6873	www.mouser.com	Y	6,179	N/A	\$0	84%	50	1,000+	Y
Displaytech	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Hantronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Kingbright Company, LLC	Mouser Electronics	800-346-6873	www.mouser.com	Y	301	N/A	\$0	100%	50	1,000+	Y
Lumileds	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Luminus	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Newhaven Display	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
ams OSRAM	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,690	N/A	\$0	100%	50	1,000+	Y
Tianma	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
ELECTROMECHANICAL											
ALPS	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Apem, Inc.	Mouser Electronics	800-346-6873	www.mouser.com	Y	4,326	N/A	\$0	83%	50	1,000+	Y
E-Switch	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Grayhill	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Honeywell	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Keystone Electronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Littelfuse	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Nidec	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
NKK Switches	Mouser Electronics	800-346-6873	www.mouser.com	Y	13,976	N/A	\$0	86%	50	1,000+	Y
Omron	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y

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Manufacturer	Distributor	Telephone	Website	Franchised Distributor (Y/N/M)	No. of Lines for Principle	Stock Value for Principle	Minimum Order Value	% Lead Free for Principle Range	No. of Technical Support Staff	Total No. of Staff	Pack and Hold
Panasonic	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Phoenix Contact	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
PUI Audio	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Schneider Electric	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Sensata	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
TE Connectivity	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Teledyne Relays	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
ENCLOSURES											
Bud	ECCO	773-767-2200	www.eccoconnectors.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bud Industries	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,325	N/A	\$0	80%	50	1,000+	Y
Hammond Manufacturing	Mouser Electronics	800-346-6873	www.mouser.com	Y	2,839	N/A	\$0	82%	50	1,000+	Y
METCASE Enclosures	OKW Enclosures, Inc.	(800) 965-9872	www.metcaseusa.com		322	N/A	\$0	N/A	10	20	Y
New Age Enclosures	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
OKW Gehäusesysteme GmbH	OKW Enclosures, Inc.	(800) 965-9872	www.okwendlosures.com		2,450	N/A	\$0	N/A	10	20	Y
ROLEC Gehäuse-Systeme GmbH	ROLEC Enclosures Inc	(888) 658-5774	www.rolec-usa.com		1,960	N/A	\$0	N/A	4	6	Y
FREQUENCY MANAGEMENT											
Abracon Corporation	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,780	N/A	\$0	100%	50	1,000+	Y
CTS Electronic Components	Mouser Electronics	800-346-6873	www.mouser.com	Y	3,889	N/A	\$0	100%	50	1,000+	Y
ECS Inc	Mouser Electronics	800-346-6873	www.mouser.com	Y	2,070	N/A	\$0	100%	50	1,000+	Y
Epson Toyocom	Mouser Electronics	800-346-6873	www.mouser.com	Y	178	N/A	\$0	100%	50	1,000+	Y
IQD Frequency Products	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
KYOCERA AVX	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
KYOCERA AVX	Digi-Key	800-344-4539	www.digikey.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
SiTime	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
ICs & SEMICONDUCTORS											
Analog Devices, Inc	Mouser Electronics	800-346-6873	www.mouser.com	Y	18,749	N/A	\$0	95%	50	1,000+	Y
Broadcom Limited	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Central Semiconductor	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Central Semiconductor Corp.	Future Electronics	(800) 675-1619	www.futureelectronics.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	Y
Digi International	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Diodes Incorporated	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
FTDI Chip	Mouser Electronics	800-346-6873	www.mouser.com	Y	94	N/A	\$0	100%	50	1,000+	Y
Infineon	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,580	N/A	\$0	63%	50	1,000+	Y
Intel	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
ISSI	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Lattice	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Littelfuse	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
MACOM	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Maxim Integrated	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Microchip	Mouser Electronics	800-346-6873	www.mouser.com	Y	5,800	N/A	\$0	100%	50	1,000+	Y
Monolithic Power Systems (MPS)	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Nexperia	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
NXP	Mouser Electronics	800-346-6873	www.mouser.com	Y	7,205	N/A	\$0	100%	50	1,000+	Y
onsemi	Mouser Electronics	800-346-6873	www.mouser.com	Y	7,486	N/A	\$0	96%	50	1,000+	Y
Power Integrations	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Qorvo	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Renesas Electronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
ROHM Semiconductor	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Silicon Laboratories Inc	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,141	N/A	\$0	100%	50	1,000+	Y
Skyworks	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
ST Microelectronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	8,145	N/A	\$0	96%	50	1,000+	Y
Swissbit	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Texas Instruments	Mouser Electronics	800-346-6873	www.mouser.com	Y	29,676	N/A	\$0	94%	50	1,000+	Y
Toshiba	Mouser Electronics	800-346-6873	www.mouser.com	Y	800	N/A	N/A	N/A	N/A	N/A	Y
Vishay	Mouser Electronics	800-346-6873	www.mouser.com	Y	53,781	N/A	\$0	77%	50	1,000+	Y
Wolfspeed	Mouser Electronics	800-346-6873	www.mouser.com	Y	53,781	N/A	\$0	77%	50	1,000+	Y
INTERCONNECTION											
Bel		+1 858 676 9650	belfuse.com/magnetic-solutions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3M	Mouser Electronics	800-346-6873	www.mouser.com	Y	23,235	N/A	\$0	46%	50	1,000+	Y
Aero Conesys	ECCO	773-767-2200	www.eccoconnectors.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Amphenol	ECCO	773-767-2200	www.eccoconnectors.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Amphenol	Mouser Electronics	800-346-6873	www.mouser.com	Y	165,853	N/A	\$0	31%	50	1,000+	Y
Anderson Power Products	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Apptive (Delphi)	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Bel Magnetic Solutions		+1 858 676 9650	belfuse.com/magnetic-solutions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Manufacturer	Distributor	Telephone	Website	Franchised Distributor (Y/N/M)	No. of Lines for Principle	Stock Value for Principle	Minimum Order Value	% Lead Free for Principle Range	No. of Technical Support Staff	Total No. of Staff	Pack and Hold
Cinch	ECCO	773-767-2200	www.eccoconnectors.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cinch Connectivity/Bel	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Cinch Connectivity Solutions		+1 507 833 8822	belfuse.com/cinch	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Eaton	Mouser Electronics	800-346-6873	www.mouser.com	Y	10,744	N/A	\$0	27%	50	1,000+	Y
ERNI Electronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Glenair	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Harting	Mouser Electronics	800-346-6873	www.mouser.com	Y	2,160	N/A	\$0	51%	50	1,000+	Y
Harwin	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Hirose Electric	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
ITT Cannon	ECCO	773-767-2200	www.eccoconnectors.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ITT Cannon	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
JAE Electronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	6,02	N/A	\$0	100%	N/A	N/A	Y
JST	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
KYOCERA AVX	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
KYOCERA AVX	Digi-Key	800-344-4539	www.digikey.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
LEMO	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Mill-Max	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Molex	Mouser Electronics	800-346-6873	www.mouser.com	Y	85,634	N/A	\$0	89%	50	1,000+	Y
Neutrik	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,563	N/A	\$0	100%	50	1,000+	Y
NorComp	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Phoenix Contact	Mouser Electronics	800-346-6873	www.mouser.com	Y	30,044	N/A	\$0	77%	50	1,000+	Y
Radiall	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Samtec	Mouser Electronics	800-346-6873	www.mouser.com	Y	123,613	N/A	\$0	69%	50	1,000+	Y
Stewart Connector		+ 1 717 235 7512	belfuse.com/stewart-connector	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Switchcraft Corporation	Mouser Electronics	800-346-6873	www.mouser.com	Y	300	N/A	\$0	55%	50	1,000+	Y
TE Connectivity	Mouser Electronics	800-346-6873	www.mouser.com	Y	123,613	N/A	\$0	69%	50	1,000+	Y

OBSOLESCENCE / HARD TO FIND											
Lansdale		602-438-0123	lansdale.com	Y							
Lantek Corp.		973-579-8100	www.lantekcorp.com	M	186,000	\$22M	\$0	75.00%	5	62	Y
Rochester Electronics		978-462-9332	www.rocelec.com	Y		N/A	\$250		10	400+	Y

OPTO ELECTRONICS											
Broadcom	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Cree LED	Mouser Electronics	800-346-6873	www.mouser.com	Y	582	N/A	\$0	99%	50	1,000+	Y
Finisar	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
ams OSRAM	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,927	N/A	\$0	99%	50	1,000+	Y
ROHM Semiconductor	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Vishay	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y

PASSIVES											
ABRACON	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Bourns	Mouser Electronics	800-346-6873	www.mouser.com	Y	38	N/A	\$0	78%	50	1,000+	Y
Cornell Dubilier	Mouser Electronics	800-346-6873	www.mouser.com	Y	24,145	N/A	\$0	71%	50	1,000+	Y
Coilcraft	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
EPCOS	Mouser Electronics	800-346-6873	www.mouser.com	Y	26,533	N/A	\$0	98%	50	1,000+	Y
Fair-Rite	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
KEMET	Mouser Electronics	800-346-6873	www.mouser.com	Y	77,568	N/A	\$0	66%	50	1,000+	Y
KOA Speer	Mouser Electronics	800-346-6873	www.mouser.com	Y	34,078	N/A	\$0	58%	50	1,000+	Y
KYOCERA AVX	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
KYOCERA AVX	Digi-Key	800-344-4539	www.digikey.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
Murata	Mouser Electronics	800-346-6873	www.mouser.com	Y	33,780	N/A	\$0	99%	50	1,000+	Y
Nichicon	Mouser Electronics	800-346-6873	www.mouser.com	Y	20,389	N/A	\$0	84%	50	1,000+	Y
Ohmite	Mouser Electronics	800-346-6873	www.mouser.com	Y	14,293	N/A	\$0	55%	50	1,000+	Y
Panasonic Electronic Components	Mouser Electronics	800-346-6873	www.mouser.com	Y	14,948	N/A	\$0	100%	50	1,000+	Y
Signal Transformer		+1 516 239 5777	belfuse.com/signal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Taiyo Yuden	Mouser Electronics	800-346-6873	www.mouser.com	Y	4,620	N/A	\$0	98%	50	1,000+	Y
TE Connectivity	Mouser Electronics	800-346-6873	www.mouser.com	Y	6,663	N/A	\$0	100%	50	1,000+	Y
TDK	Mouser Electronics	800-346-6873	www.mouser.com	Y	6,663	N/A	\$0	100%	50	1,000+	Y
TT Electronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
United Chemi-Con (UCC)	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Vishay	Mouser Electronics	800-346-6873	www.mouser.com	Y	102,917	N/A	\$0	64%	50	1,000+	Y
Würth	Mouser Electronics	800-346-6873	www.mouser.com	Y	934	N/A	\$0	99%	50	1,000+	Y
Yageo Corporation	Mouser Electronics	800-346-6873	www.mouser.com	Y	18,246	N/A	\$0	100%	50	1,000+	Y

POWER & BATTERIES											
Artesyn Embedded Technologies	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
B&K Precision	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Bel Power Solutions		+1 866 513 2839	belfuse.com/power-solutions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Buyers' Guide

Manufacturer	Distributor	Telephone	Website	Franchised Distributor (Y/N/W)	No. of Lines for Principle	Stock Value for Principle	Minimum Order Value	% Lead Free for Principle Range	No. of Technical Support Staff	Total No. of Staff	Pack and Hold
Cincon	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Cosel	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
CUI Inc.	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Delta Electronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
MEAN WELL	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Murata	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Phihong	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Phoenix Contact	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
RECOM	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Schaffner	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
SL Power	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Texas Instruments	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
TDK Lambda	Mouser Electronics	800-346-6873	www.mouser.com	Y	405	N/A	\$0	80%	N/A	N/A	Y
TRACO Power	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Vicor	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
XP Power	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y

SENSORS											
ams OSRAM	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Amphenol	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Analog Devices Inc.	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Bosch	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Honeywell	Mouser Electronics	800-346-6873	www.mouser.com	Y	12,059	N/A	\$0	64%	50	1,000+	Y
KYOCERA AVX	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
KYOCERA AVX	Digi-Key	800-344-4539	www.digikey.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
Littelfuse	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Melexis	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Microchip	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
NXP	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
onsemi	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Omron	Mouser Electronics	800-346-6873	www.mouser.com	Y	4,915	N/A	\$0	59%	50	1,000+	Y
Renesas	Mouser Electronics	800-346-6873	www.mouser.com	Y	4,915	N/A	\$0	59%	50	1,000+	Y
Sensirion	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
STMicroelectronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
TDK	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
TE Connectivity	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Texas Instruments	Mouser Electronics	800-346-6873	www.mouser.com	Y	914	N/A	\$0	65%	50	1,000+	Y
Vishay	Mouser Electronics	800-346-6873	www.mouser.com	Y	914	N/A	\$0	65%	50	1,000+	Y

SWITCHES & KEYBOARDS											
OTTO	ECCO	773-767-2200	www.eccoconnectors.com	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TEST & MEASUREMENT											
B&K Precision	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Fluke	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,008	N/A	\$0	94%	50	1,000+	Y
Keysight	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Lascar Electronics		814-835-0621	www.lascarelectronics.com	Y	130	\$602,000	\$0	100%	10	175	Y
Tektronix	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50	1,000+	Y
Teledyne LeCroy	Mouser Electronics	800-346-6873	www.mouser.com	Y	194	N/A	\$0	96%	50	1,000+	Y

THERMAL MANAGEMENT											
Materials Direct	Materials Direct	01908 222 211	www.materials-direct.com	N/A	N/A	£1,000,000	£0	N/A	5	55	Y
ebm-papst	Mouser Electronics	800-346-6873	www.mouser.com	Y	194	N/A	\$0	96%	50	1,000+	Y
Sanyo Denki	Mouser Electronics	800-346-6873	www.mouser.com	Y	194	N/A	\$0	96%	50	1,000+	Y
CUI Devices	Mouser Electronics	800-346-6873	www.mouser.com	Y	194	N/A	\$0	96%	50	1,000+	Y
Universal Science	Universal Science	01908 222 211	www.universal-science.com	N/A	N/A	£1,000,000	£0	N/A	5	55	Y

WIRELESS SOLUTIONS											
KYOCERA AVX	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y
KYOCERA AVX	Digi-Key	800-344-4539	www.digikey.com	Y	N/A	N/A	\$0	N/A	50+	1,000+	Y

Contract Manufacturers Buyers' Guide

Manufacturer	Telephone	Website	Turnover	Location	Employees	Number of Surface Mount Lines	Approvals	BGA Capacity	Lead Free Manufacturer	Prototyping	Design Capability	Full Turnkey	Cables and Harnessing
Alan Anderson Manufacturing Ltd	+44 (0) 333 322 7222	www.aa-manufacturing.co.uk	£21m	Hertfordshire UK	40	2	ISO9001:2015, IPC-A-610	Y	Y	Y	Y	Y	Y
Pektron	1-248-677-4838	www.pektron.com	\$66m	Michigan & UK	350	8	ISO9001, ISO14001, TS16949, BEAB, VCA, TUV, UL	Y	Y	Y	Y	Y	Y

ELECTRONICS sourcing NORTH AMERICA

FEATURES LIST 2024

Features*

Special Focus

January

Connectors, Crystals & Oscillators,
Counterfeiting, Circuit Protection

Critical Supply Chain Strategies

February

Extra distribution at
APEC, Long Beach,
CA

Diversity, Obsolescence, EMS,
Printed Circuit Boards

Marine,
EV Charging

March

Extra distribution
at APEX Expo,
Anaheim, CA

Enclosures, Power Supplies &
Batteries, Semiconductors

Aerospace

April

Extra distribution at
DEL MAR Electronics
Show, San Diego, CA

Connectors, Apps, Development
Kits, Embedded Systems

Industry Trends

May

Extra distribution at
EDS, Las Vegas, NV

Cable & Wire, EMS, Harsh
Environment, Programming

Top 50 NA Distributors Report

June

Power & Batteries, Logistics,
Obsolescence, PCBs

Transport

July

Thermal Management, Switches,
Counterfeiting, Time to Market

Defense

August

Component Comparisons, EMC,
Displays & LEDs

Automotive,
EV Charging

September

Connectors, Semiconductors,
Passives, Kits

Top 50 Global
Distributors report

October

Extra distribution
at ECIA Executive
Conference,
Chicago, IL

Power & Batteries, PCBs,
Thermal Management, Crystals &
Oscillators

Medical

November

Extra distribution at
electronica, Munich,
Germany

Enclosures, Obsolescence, EMS,
Switches

2025 Wall Planner

December

Component Comparisons, Newest
Products, Sensors

2025 Industry Forecasts

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