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sourcing
SEPTEMBER 2021
NORTH AMERICA

TOP 50
GLOBAL
DISTRIBUTORS REPORT
2021

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ECIA MEMBER
Supporting The Authorized Channel

On the cover – September 2021

Top 50 Authorized Distributor Report 2021 global edition
page 33

Editor's Word

Good times, bad times

From an electronics purchasing perspective, what has the Covid19 pandemic taught me? Mainly two things. It introduced swings in supply and demand which were outside the default limits of manufacturing resource planning (MRP) systems, including their ecommerce modules. It also taught me that some of the rock solid foundations of the global supply chain were actually built on sand.

Some MRP systems coped and some pillars held firm but not all. Electronics companies whose whole existence is based on continuity, such as suppliers to the military and energy infrastructure, turned on their disaster planning protocol and motored on. I should know, I was actually on site with just such a company when the first lockdown was announced and I witnessed them switch into disaster planning that second.

For some companies the consequences have been severe. How do I know this? Because readers are calling me, a magazine editor, for advice on where to buy parts that were available yesterday but not today.

The answer is always the same. I direct them to the advertisers and editorial contributors to this magazine who have certified systems in place to manage the sourcing of hard to find parts. I can't list all the options here, there are too many. However, they range from finding an authorised distributor who has stock in a different region to actually restarting production of an obsolete component using the original tooling and test procedures. Ultimately it all depends on cost and volume which are application specific. Ultimately, there is always an answer, and you'll find it by talking to the companies on the following pages.

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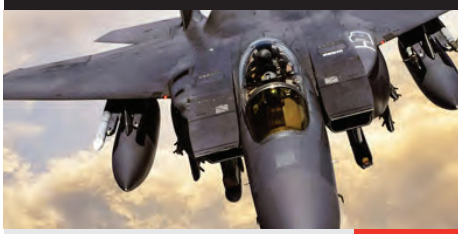
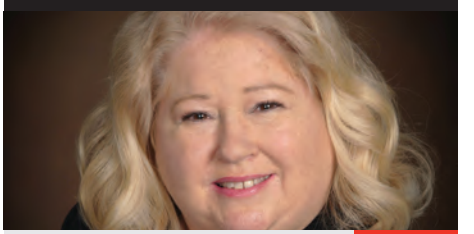
NEWS



Tough capacitors ready to ship 04

DISTRIBUTION MARKET WATCH



Buyers rely more on distributors 24

TOP 50 AUTHORISED DISTRIBUTORS

2021 Report—Global Edition 33

TOP 10 INDEPENDENT DISTRIBUTORS

2021 Report—Global Edition 75

BUYERS' GUIDE

All the facts and figures to help you buy 94

ES News

View current editions online – www.electronics-sourcing.com

Tough capacitors ready to ship

New Yorker Electronics has announced the new Mallory Sonalert Tantalum Products Group's subminiature silver case tantalum capacitors in the TS5 series. They are designed to deliver a high CV product per case size and suit high power equipment requiring a small capacitor package.

These capacitors suit consumer, industrial and military applications where a hermetic seal is not required but the application does involve high levels of shock, vibration and/or temperature. Specifications include 1µF to 1200µF and 6 to 60VDC @ 85°C. Features include high capacitance/weight ratio, low DC leakage and availability in multiple case sizes.

In addition to its silver case, the TS5 anode is sintered tantalum with embedded tantalum leads. The negative terminals are tin-lead coated copper and its positive terminals are tin-lead coated nickel. The operating temperature is between -55 to 85°C and capacitance and dissipation factor are measured at 120Hz and 25°C with an AC voltage of 0.5V rms.

www.newyorkerelectronics.com

Reduce system costs

Designed for high-end IoT applications, the iVativ NILE ultralow power module is based on Nordic's nRF52840. It supports Bluetooth 5.0, Thread/ZigBee/ANT/ANT+ and offers an integrated NFC-A tag. Measuring 10 by 15 by 1.5mm and integrating a PCB antenna or MHF4 connector, the module is design-friendly. Applications include home automation, wearables, industrial IoT and smart medical.

Thanks to integrated network and wireless stacks, plus application APIs and security features supported by ARM Trust Zone Cryptocell-310, this module helps reduce time-to-market and development costs. The integrated ARM Cortex-M4 with 1MB Flash and 256kB RAM reduces system costs.

For cost-effective implementation of high-performance devices with a long range of >1000m, low power consumption and reliable radio operation, this tuned RF module contains—in addition to the antenna—the entire analogue front-end including crystals. Operating temperature range is -40 to 85°C without restrictions.

www.rutronik24.com

Scarce memory in stock

Alliance Memory has begun receiving phase II shipments of a wide range of legacy NOR Flash devices from Micron Technology. The company is stocking select offerings from Micron's M29F 5V parallel NOR Flash, M45PE serial NOR Flash, the N25Q serial NOR Flash, the J3 parallel NOR Flash, and the P30/P33 parallel NOR Flash families, all of which Micron previously discontinued with product change notification #32163 last time buy: March 2018.

Alliance Memory's president and CEO, David Bagby, said: "We've made a major commitment to meeting our customers' legacy Micron flash component needs, and with the stock we're going to receive now through Q3, we expect to be able to support our customers through 2022 and beyond.

"At a time when so many suppliers can't take an order—much less ship—in 2021, Alliance Memory customers can count on us to have, in stock, a very wide range of the Micron flash products they need right now."

www.alliancememory.com

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N ES News

In Brief

Gasket sample packs
Stockwell Elastomerics has announced a new brochure with sample packets demonstrating the performance properties of its closed cell silicone sponge products with T62 conductive coating for ESD protection. Stockwell developed its T62 conductive surface coating process to improve yields in static sensitive industries such as aerospace and defense.
www.stockwell.com

Factory Tomorrow video series
Digi-Key Electronics has launched the Factory Tomorrow video series focused on advancements in industrial automation. Sponsored by Banner Engineering and Weidmüller, the three-part video series showcases the latest innovations in robotics, automation and connectivity, as well as cutting-edge manufacturing technologies.
digikey.com

HDMI receptacles now shipping
Sager Electronics is now stocking Switchcraft's board mount HDMI receptacles offered in four versatile designs. The robust receptacles are compatible with standard HDMI type A connectors. Vertically mounted styles offer space saving capabilities. One design offers extra RF/EMI protection, with a minimum of 10,000 insertion/withdrawal cycles.
www.sager.com

EMS industry up 1.9 per cent
IPC's June 2021 findings show book-to-bill ratio stands at 1.48. Total North American EMS shipments in June 2021 were up 14.3 per cent compared to the same month last year. Compared to the preceding month, June shipments grew 31.3 per cent. EMS bookings in June rose 61.3 per cent year-over-year and 43.8 per cent from the previous month.
www.IPC.org

Jumpers available in custom lengths

The first of NAI's new line of Steady Link interconnect products is the rugged Series-C half-inch low PIM corrugated coaxial cable assemblies. These 50ohm coax jumpers are designed to address the increasing use of mobile devices by providing interconnect solutions for radios and antennas required to service 4G LTE and 5G on cell towers and microcells.

The jumpers are used to connect transmitters, receivers, antennas and other equipment in antenna feeder systems on cell towers, cellular base stations and microcells, with simple plug and play installation. They suit connections in low loss and VSWR signal transmission at high frequency.

These new RF50 assemblies have a 0.5in outer diameter and are available in custom lengths, plus a choice of straight connectors for pre-termination at each end. NAI states they represent a cutting-edge solution for harsh outdoor environments and are engineered to withstand extreme temperatures and demanding conditions of continued outdoor exposure.

nai-group.com

Rugged vehicular antennas available now

Mouser is stocking a variety of Laird Connectivity's multiple-in multiple-out (MIMO) vehicular antennas. With several port and radiator options, the cross-horizon antennas are available for 698 to 960, 1710 to 2700, 2300 to 2700 and 4900 to 5900MHz frequency ranges, with IP67 and EN61373-rated enclosures.

These multi-port antennas feature 4G/LTE ports, dual-band Wi-Fi ports and a GNSS port. Designed for rugged applications the antennas are engineered to offer excellent cross-horizon Wi-Fi and cellular coverage.

They feature an active GNSS module that supports GPS, GLONASS and compass/Beidou navigation systems. The GNSS module covers a frequency range of 1559 to 1606MHz and offers out-of-band rejection via two-stage filtering that provides over 80dB isolation.

The antennas are housed in a low profile rugged enclosure that meets IP67, EN61373 shock/absorption and EN50155 temperature and humidity standards. Typical applications include FirstNet/public safety, passenger fleet, commercial vehicle fleet and rail transit.

www.mouser.com

Linecard gets fan boost

Newark has increased its range of AC, DC and EC fans with the addition of Orion Fans to its linecard. The addition includes IP69K and ATEX rated fans for harsh and hazardous environments.

Orion Fans' products offer thermal cooling solutions for applications including alternative energy, commercial refrigeration, food/beverage processing, marine, outdoor machinery, outdoor telecom systems and transportation.

Director, IP&E Americas, Heather Fulara' said: "We're thrilled to add Orion Fans to our extensive range of AC, DC and EC fans. Orion offers a wide range of quality products, including fans for hazardous and harsh environments and has fans designed to reduce power consumption in a variety of applications, which we know our customers will appreciate."

www.newark.com

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tti.com/api

Larger EMS providers increase purchases with distributors

Buyers at large EMS providers often purchase from distributors to achieve a lower total cost of ownership through supply chain and value-added programs

While purchasers at large global electronics manufacturing services providers buy most of their component requirements directly from component manufacturers, they also purchase a certain percentage of their requirements from electronics distributors.

In fact, some large global electronics contract manufacturers say they are buying more parts from distributors than in the past because distributors can often provide them lower cost of ownership through supply chain management services such as bonded inventory and in-plant stories and other value-added services.

In some cases, global EMS providers use distributors for tactical reasons. For instance, distributors this year have helped their EMS providers manage component shortages. Chances are that EMS providers will rely on distributors even more over the next 12 months because tight supply will not end anytime soon.

Lynn Torrel, chief procurement and supply chain officer for EMS provider Flex, recently said component manufacturers have indicated shortages will continue through mid to late 2022 and could continue to 2023. That means it will remain all-hands on deck at least for the next year as EMS buyers use every possible option to find the parts their companies need.

Large EMS providers such as Flex, Celestica, Sanmina and others often purchase parts from a range of distributors including large, global broadline distributors, specialized distributors, high-service and small, regional distributors depending on their component requirements. Their use of distributors is both strategic and tactical.

Buyers at larger contract manufacturers often achieve a lower cost of ownership by buying certain parts through distributors and taking advantage of various supply chain management programs, such as in-plants stores and bonded inventory. From a tactical standpoint, distributors can often provide EMS companies with parts that are in short supply, have long lead times or are obsolete.

Increasing distribution purchases

Vincent Cellard, vice president commodity management for Flex, said the EMS provider has increased its purchases from distributors by about 15 per cent over the last few years. “It is not shortage driven,” said Cellard. “We have always had a certain portion of our purchases that flow through the channel,” he said.

The primary reason Flex uses distributors is the value proposition that distributors offer including “terms, inventory agility programs, and in a lot of cases, a competitive total cost of ownership,” said Cellard. Other reasons include customer or manufacturer direction, which may be driven by design registrations, infrastructure limitations, volumes, or customer relationships with the distributors.

Flex uses a variety of distributors, ranging from global and catalog distributors to small regional distributors. The EMS provider also buys from non-franchised, independent distributors for parts that are in short supply

“We are particularly careful at not buying counterfeit components so we very much limit” how much is purchased from independent distributors, he said. Flex uses a “handful of preferred independent

We have always had a certain portion of our purchases that flow through the distribution channel

Vincent Cellard, vice president of commodity management for EMS provider **Flex**

partners and employs a tight process" to make sure components purchased from independent distributors are genuine parts.

"We maintain a preferred list of independent distributors who have been vetted by our global procurement teams using a strict set of criteria," said Cellard. The vetted independent distributors are required to have testing labs to screen out any questionable parts.

"Flex provides procedures, guidelines, and metrics that we expect those distributors to follow," he said. Independent distributors are audited by Flex's supplier quality and procurement teams periodically. "Additionally, those independent distributors will maintain their own risk mitigation tactics within their workstreams," he said. An example would be having a robust rating system to qualify their supply sources, said Cellard.

One advantage to using distributors rather than buying direct from component manufacturers is the service levels that distributors provide. "Our experience is that the service level from our distributors, in some cases, can be significantly better than a direct manufacturer relationship," said Cellard. For instance, distributors often buffer and pipeline inventory for Flex. Flex uses such services as IC programming, in-plant stores and bonded inventory.

Distributors can also provide design expertise with field application engineers (FAEs). "While Flex is typically known for its EMS activities, we are also growing fast with products and solutions that we design internally for customers," Cellard said. For that design activity, Flex's design centers and advance sourcing teams collaborate with its OEM customers and its distributors when the distributors have FAEs with expertise in certain technologies or product segments, he said.

Flex also uses distributors because in certain scenarios "we leverage their strong positions with a manufacturer that we may not enjoy to the same degree," said Cellard.

Over the course of a year Flex will place purchase orders with 250 different distributors worldwide. However, about 90 per cent of Flex's distribution spend is with 15 distributors and 80 per cent is with just six, he said.

While there has been consolidation in distribution in recent years, it has not impacted the number of distributors that Flex uses as much as consolidation by component manufacturers, said Cellard.

The four-channel strategy

Pierre Brossier, director, regional supply chain for Sanmina, says that Sanmina uses "four channels" to purchase parts: component manufacturers, large, franchised distributors, independent distributors and catalog distributors. "The franchised distributors and component manufacturers are ideal for larger component volumes," said Brossier.

"The preferred relationships we have with independent distributors helps Sanmina during component shortages," he said. Catalog distributors are ideal for providing low volume parts very quickly, along with services such as prototyping and new product introduction, he said.

"Due to components' shortages, we are currently purchasing a bit more from a limited number of independent distributors, in agreement with our customers," he said. However, Sanmina has procedures in place to mitigate issues when buying from this channel. The independent distributors that Sanmina uses have capabilities in place "to control their own supply and to test a component to ensure its authenticity. He said under traditional or 'normal' market conditions, Sanmina primarily sources products through the franchised distribution channel or directly through original component manufacturers.

Depending on the type of component, Sanmina balances purchases between component manufacturers and distributors. "This approach has worked very well at Sanmina, leveraging a limited number of distributors and preferred manufacturers," said Brossier.

Lowering TCO

He said Sanmina uses some distributor value-added services. "There are value-added services we receive from the franchise distribution channel including logistics, stock and the flexibility to pull parts as needed, thanks to their purchasing power," said Brossier.

He noted distributors keep

The franchised distributors and component manufacturers are ideal for larger component volumes

Pierre Brossier, director, regional supply chain for **Sanmina**

a large volume of parts available for multiple customers, so they have more stock than needed at any given moment. "We tend to use distributors that have a global presence because they have warehouses to efficiently supply parts, as well as the technical expertise to propose alternate solutions if needed," said Brossier.

Understanding the value of franchised distributors as well as their strengths "plays into the total cost of ownership (TCO) model we have deployed at Sanmina," he said.

Not all parts can be purchased from distributors. "It's important to retain some volume and leverage with direct component manufacturers," said Brossier. Certain custom parts are best purchased directly from the manufacturer even if they require a bit more logistics and provide less flexibility, according to Brossier.

Sanmina does not purchase from a large number of distributors. It uses large global distributors and "we also have strong relationships with well-known franchised and catalog distributors because of their global presence," he said.

Sanmina works with a limited number of distributors and "this approach has remained consistent over the years," said Brossier. Sanmina cultivates "long-term relationships versus taking an opportunistic approach. Our partners know that they can rely on us," Brossier said.

The same is true with independent distributors. The EMS provider has limited number of non-franchised distributors who use "proven practices and processes to prevent the purchasing of counterfeit or sub-standard components, he said.

He said during the current component shortages, distributors have been able to help Sanmina "in most situations because of the strong and collaborative relationships we've built over many years."

It's not just price

Sanmina's overall distribution strategy is to make purchasing decisions based on total cost of ownership that "involves a number of parameters, not just the price of the part itself," said Brossier. "There are some situations where distributors have parts that provide an advantage that we must consider."

However, there can be disadvantages in buying from distributors when there is a "very specific component that requires a premium price that the OEM customer may not want to cover," said Brossier. "We are constantly balancing our distributors' offerings, which are often based on the overall volume of business they will receive."

One EMS provider that has always used a lot of distributors is Benchmark Electronics, based in Angleton, Texas. The company uses about 50 different distributors for components and its MRO requirements. However, about 80 per cent of its distribution spend is with 15 distributors," said Claudia Rodillas, global commodity manager for distribution for Benchmark.

"We have global and regional strategic relationships and within the geographic regions we have adjusted key distributors based on market conditions and business needs," said Rodillas. "We have and will continue to review the business conditions and make adjustments if and when necessary. "

Valuing distributors

She said Benchmark approaches its partnerships with distribution strategically to leverage overall spend and global position. She said while there has been consolidation within distribution, it has not impacted Benchmark's key partner relationships.

"Benchmark values our direct and distributor partners," said Rodillas. "We maintain direct procurement avenues across all commodities such as semiconductors, connectors, passives" and with distributors, she said.

"There are benefits to both types of supply channels," said Rodillas. For instance, some manufacturers are more adept at dealing directly with their customers while others make better utilization of their franchised distribution channels, she said. "As the landscape of electronics supply chain evolves, Benchmark aligns its strategy with the most effective procurement model," said Rodillas.

She added in today's electronic components marketplace, it is essential to have a "diverse, reliable supply base" that includes broadline distributors with the ability to leverage global spend.

"It also makes sense to stay close to the high-service catalog suppliers that tend to fill short-term requirements," said Rodillas. Benchmark buys from "independent distributors in a very controlled way." Benchmark has clearly defined expectations of independent distributors. "We are adapting to the evolving market while safeguarding our customers and the quality of their product."

Current market conditions have exposed gaps in the supply chain and distributors have responded to the challenge

Claudia Rodillas, global commodity manager for distribution for **Benchmark Electronics**

Rodillas notes that supply conditions this year have been very challenging for all electronics companies including large OEMS and EMS providers." Current market conditions have "exposed gaps in the supply chain and distributors have responded to the challenge," she said. " While not completely successful, they have provided critical solutions," she said.

Close relationships with key partners, including distributors has been invaluable in dealing with shortages, said Rodillas.

Confident sourcing of genuine components

Electronics Sourcing invited Victor Meijers of TrustedParts.com to update readers on its latest features and functions designed to help purchasing professionals source genuine parts

Why is it so important to TrustedParts.com that buyers get genuine parts from only authorized sources?

When inventory aggregation sites first emerged, no distinction was made between authorized distributors and non-authorized sources. This opened users of these sites to the risk of unknowingly procuring components that were counterfeit or had not been handled or stored properly—and many other issues. TrustedParts.com was developed for the express purpose of giving users confidence they were sourcing genuine electronic components, fully warrantied and supported by the manufacturers from only their authorized distributors.

How do you ensure only genuine parts from authorized sources are advertised on your site?

While some inventory aggregation sites now indicate when a distributor claims to be authorized for a given product, only TrustedParts.com requires actual proof of authorization. This proof must be provided for each region a distributor participates in on Trustedparts.com. These proofs are stored in our system and are periodically re-verified. Through the Manufacturer Portal on TrustedParts.com, manufacturers can even set the authorization statuses for distributors directly themselves.

Does restricting data to authorized sources mean buyers miss out on components that are obsolete or difficult to find?

No. There is a common misconception that the authorized channel only stocks components that are currently the most popular. In fact, the TrustedParts.com database has price and availability information for over 24 million unique part numbers from over 4,000 manufacturers, ranging from the latest technologies to components that have been manufactured for decades. Several participating distributors even specialize in working directly with manufacturers to stock their end-of-life and obsolete components.

Are there any features you'd like to highlight for readers?

Our BOM tool, which allows searches of up to 100 part numbers at a time, now lets users filter the results in many different ways, configure their download, and in some cases, upload results into a distributor's shopping cart.

Registered users can store their BOMs for later use, share them with other designated users and request access to the Extended BOM tool which allows searches of up to 1,000 parts simultaneously. With an account, users can also set up stock and price alerts to monitor their most critical components. We have also put a lot of effort into data integrity and clarity. We recently reorganized and standardized how we display our pricing and availability information, with price breaks, lead times, on-order quantities and displaying the age of the data in cases where it is not real-time.

Customers also have the option to automate their quoting process by integrating our API into their ERP/quoting tool. Since TrustedParts.com is funded by the site's sponsors and other participating distributors, all these features are free to our users.

www.trustedparts.com

Connectors Sales Rose 30.7%, Semi Sales Up 24.7% in May

Ron Bishop of Bishop & Associates, contributor to TTI, Inc.'s MarketEYE Resource Center, details regional and global sales of connectors versus semiconductors and details potential challenges to the market

The Semiconductor Industry Association (SIA) reported May sales of $43.6 billion, up 24.7 percent from the prior year, and up 4.2 percent sequentially.

Regionally for May, the SIA reported that sales in the Americas grew 19.8 percent year-over-year; sales in China increased 24.5 percent; Japan sales increased 17.4 percent; Asia Pacific/Other sales increased by 29.9 percent; and sales in Europe increased 29.5 percent.

Connector industry sales in May were up 30.7 percent from the prior year and increased 7.3 percent sequentially.

Regionally, for May, year-over-year sales increased 25.2 percent in Japan, 45.1 percent in Asia Pacific, 64.4 percent in Europe, 43.7 percent in North America, 26.7 percent in China and 45.1 percent in Rest of World.

The following graph compares semiconductor sales performance to the connector industry since January 2020. (Fig.1)

Strong Performance in Connectors

Connector industry sales performance has been higher than semis for the last seven months. Sales performance for semis did not decline in early 2020 as connector sales did. The converging sales performance, however, makes more sense for the two components which are largely used in tandem.

The following table displays year-to-date performance, measured in US dollars, by geographic region for both components:

Connector sales performance surpassed semi sales performance for the last seven consecutive months due to easier comparisons. The YTD sales performance of both components, however, is converging.

Coronavirus Challenges Threaten Recovery

Many countries have started to revive their economies, but some have also seen setbacks. We do not anticipate that there will have been significant setbacks in connector industry performance in the first half of 2021.

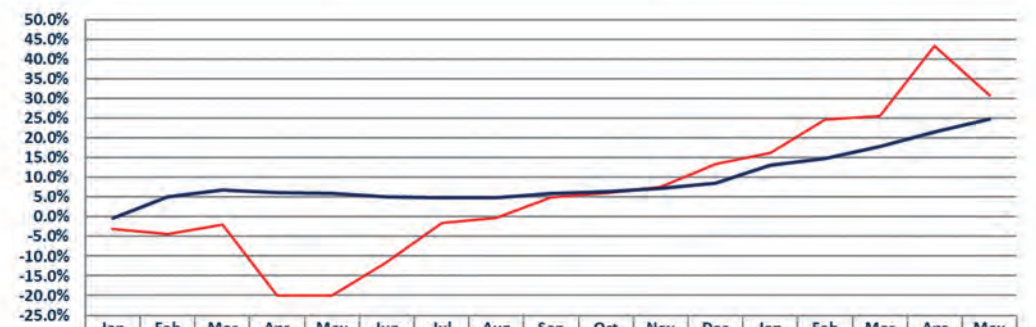
However, the surge in Covid-19 cases in recent months has picked up in some countries such as India and Brazil. An increase in industrial production around the world has resulted in spiking demand for semiconductors and other materials, with many shortages showing up from January through May. New outbreaks in Taiwan and Indonesia could further exacerbate the semi shortages.

tti.com

	Semiconductors	Connectors
North America	13.7%	25.6%
Europe	13.2%	39.0%
Japan	11.0%	21.3%
China	21.9%	30.6%
Asia Pacific/Other	21.6%	27.4%
World	18.4%	30.7%

Source SIA & Bishop

Sales Performance, 2021 YTD (through May)



	Jan 20	Feb 20	Mar 20	Apr 20	May 20	Jun 20	Jul 20	Aug 20	Sep 20	Oct 20	Nov 20	Dec 20	Jan 21	Feb 21	Mar 21	Apr 21	May 21
Conn	-3.1%	-4.3%	-2.0%	-19.9%	-20.0%	-11.6%	-1.6%	-0.3%	5.0%	6.0%	7.6%	13.4%	16.2%	24.6%	25.5%	43.4%	30.7%
Semi	-0.3%	5.0%	6.8%	6.1%	5.8%	5.0%	4.9%	4.9%	5.8%	6.3%	7.3%	8.5%	13.1%	14.8%	17.8%	21.6%	24.7%

Monthly Sales Performance Year-Over-Year (Fig.1)

EXECUTIVE CONFERENCE

CHARTING THE COURSE *FORWARD*

This year's Executive Conference theme **Charting the Course Forward** captures the industry's main challenge: to imagine and prepare for post-pandemic business conditions where continued volatility and supply chain disruption are bound to be the new normal. The program reflects the enormous task companies face as they map their strategic plan for 2022. The scarcity of skilled labor, component shortages, inflation and continued global geopolitical uncertainty will require leaders to take full advantage of the most current forecast data and innovative thinking.

Lynn Torrel

Kari Janavitz

Bob Evans

Dean Kamen

Steve McClatchy

Ross Bernstein

Cliff Waldman

Monica Highfill

October 24-26, 2021 – Loews Chicago O'Hare Hotel

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ecia
Electronic Components Industry Association

Beat shortages with a diversified supplier base

NewPower Worldwide explains how manufacturers are overcoming component shortages by partnering with distributors who have access to multiple supply routes

There's no denying the global electronics industry is facing all-out shortages. Supply chains have always been relatively volatile and susceptible to bottlenecks but the pandemic has created new challenges resulting in unexpectedly high demand coinciding with shortages. Product availability has created unprecedented scarcity which is some way from correcting.

Manufacturers have shifted their component procurement strategies to keep production lines running and meet market demands. In an environment where components are scarce and time is tight, manufacturers must build relationships with alternative distributors who have access to multiple supply routes.

The global supply chain shortage isn't showing signs of letting up, as shortages and allocation cycles consistently appear on the horizon. New pandemic realities, like the delta variant, continue to throw wrinkles into the logistics world, further exacerbating manufacturing supply issues. To compete in the global supply chain war, inventory flexibility is a must—regardless of its conflict with just-in-time and lean manufacturing principles.

NewPower Worldwide is structured to offer the resources, expertise and people required to help manufacturers locate vital parts when conventional supply sources are dried up. The company uses Empower, a proprietary, data-driven sourcing technology which provides real-time insight into component availability. The technology provides access to billions of products, helping the company reliably find and deliver parts when required.

A dedicated team offers real-time quotes and assistance, 24/7, in 22 languages, with offices around the globe. When it comes to execution, no deal is too big. NewPower's $150M committed credit facility underpins deals large or small, providing manufacturers with added security during times of market volatility.

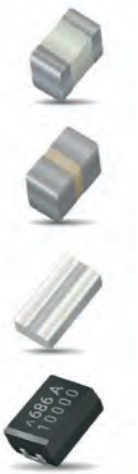
Building a more flexible supply chain starts with manufacturers diversifying their supplier base, approaching multiple sources for their supply needs and using low-risk suppliers. Those who adapt will thrive now and in the future.

www.newpowerww.com

Harnessing passive innovations

AVX, Fellow, **Ron Demcko**

AVX Fellow, Ron Demcko, explains how passive component technologies are underpinning the rapid growth of electronic systems across all industries



As all electronics sectors continue to grow, from aerospace to industrial and consumer, the increasing use of semiconductors is driving demand for passive support components. Interestingly, IC and circuit efficiency is becoming more dependent on the correct selection and individual efficiency of passive components. From a high-level view, the right passive component can help the IC operate at peak performance.

There are many examples of this, occurring across all sectors. For example, low inductance capacitors, traditionally used only in high-speed decoupling, have expanded their use in supplying fast current pulses in RF modules, radars and laser drivers.

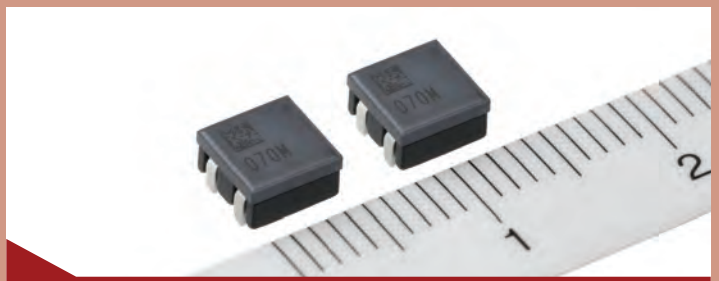
Tantalum polymer capacitors have reduced parasitic losses that continue to dominate miniature onboard power conversion and even drive their conversion efficiency higher. Also, they are fast becoming the capacitor of choice in GaN bias capacitor banks and FPGA power trees.

Ultra-broad band capacitors and resistors have such low loss across frequency that they are fueling direct RF conversion, laser communication and software defined radio design trends.

Miniature SMT heat pipes exhibit such low parasitic loading that they are now used on active pins of digital and RF semiconductors and provide supplemental heat flow paths, allowing these semiconductors to operate at higher speeds and power levels.

Regardless of the sector, advanced ICs require higher performance passives to deliver peak performance. This demand is rising and advanced performance passive components continue to evolve and offer designers' disruptive solutions.

www.avx.com



High current power inductors suit automotive circuits

TDK's new HPL505032F1 power inductors enable level 5 ADAS applications for cameras by offering high-current and low-inductance for power circuits in central and graphic processing units, such as advanced driver-assistance systems.

The products achieve their efficiency by adopting a low-resistance frame for the highly permeable and low-loss ferrite made of high BS material and low-RDC developed in-house. Its rated current is 1.5 times higher than TDK's existing product, accommodating currents up to 40 to 50A. The proprietary structural design generates magnetic flux cancelling effects contributing to noise control, while the frame integrates internal with external electrodes and reduces the risk of an open/short circuit.

Demand for high-speed, large-capacity camera footage in ADAS is increasing as vehicles become more autonomous. Cameras are an essential part of cars with ADAS capabilities, ensuring everything is aligned within a vehicle and preventing dangerous situations.

product.tdk.com

Supercapacitors ideal for SWaP-optimized battery powered products

AVX has launched a new series of standard and custom supercapacitors engineered to provide peak performance in an array of SWaP-optimized, battery-powered products. The SCP series PrizmaCap supercapacitors can be used alone or in conjunction with primary or secondary batteries to extend backup time, improve battery life and provide instantaneous power pulses

End applications include wearable and handheld devices, industrial equipment, wireless keyboards, power peripherals, tablets and e-readers.

The supercapacitors are currently available in three standard form factors with a 48 by 45mm footprint and one of three height profiles: 0.8mm, 1.3mm or 2.0mm.

AVX's global product manager supercapacitors, Eric DeRose, said: "Our new SCP Series PrizmaCap supercapacitors have a revolutionary new design in terms of form, fit and function compared to other AVX supercapacitors, and they leverage this innovative design to deliver the highest capacitance and energy density of any currently available, small form factor, prismatic, EDLC supercapacitor rated for more than one Farad."

www.avx.com

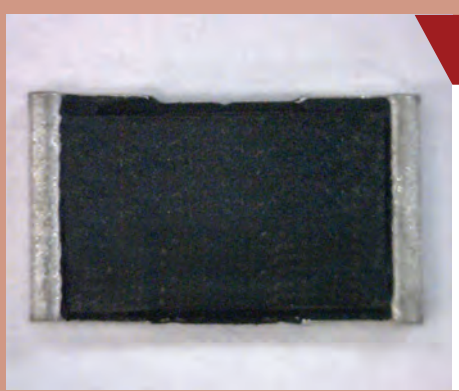
Wet tantalum capacitors save board space

Vishay has introduced a new series of HI-TMP surface-mount wet tantalum capacitors with operating temperatures to 200°C in the compact C case code. Offering a smaller size and footprint than equivalent through-hole and overmolded high temperature devices, the T24 series is designed to utilize board space more efficiently and deliver increased reliability for oil exploration and military and aerospace radar applications.

Measuring 9 by 7.1 by 7.4mm, the capacitors feature a tantalum metal case with a glass to tantalum hermetic seal. Optimized for timing, filtering, energy hold-up and pulse power applications, the devices offer improved thermal shock capability to 300 cycles and provide a longer life of 2,000 hours at 200°C, eliminating the need to utilize larger through-hole devices in demanding environments.

The T24 series features 200°C derated voltage ratings of 45 and 75VDC, with capacitance values of 33 and 10µF respectively.

www.vishay.com



3.5W high power chip resistors in stock

Stackpole's CSRT2512-UP is a 2512 size chip resistor with 3.5W power rating It is in stock in a range of popular values. The device is a thin film based chip resistor with TCR of 50ppm, has tolerances as low as 0.5% and is AEC-Q200/RoHS compliant and halogen/lead free. The CSRT is said to have exceptional electrical and environmental performance, with resistance shifts of less than one per cent for many industry standard stress tests.

The high power capability, stability and accuracy of the device suit applications including power modules, frequency converters, home appliances, solid state power supplies, portable battery management, hybrid power control and automotive power and control.

www.seielect.com

Matchmaker

0402DC Series Designer's Kit (C472-2):
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The 0402DC also features wirewound construction for extremely high self resonance – up to 28.8 GHz – and offers DCR as low as 25 mΩ, significantly lower than other inductors this size.

Equip your lab with the ultimate impedance matching resource. Our C472-2 Designer's Kit has 20 samples of all 112 values! Purchase one online at **www.coilcraft.com/0402DC.**

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Current sense resistor line offers smaller package sizes

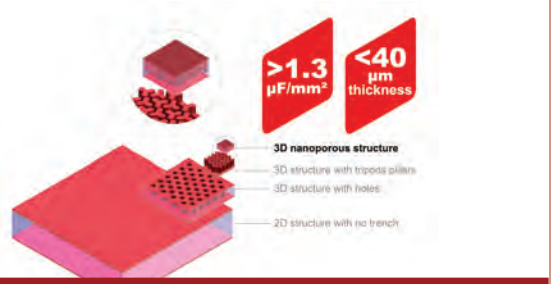
Bourns has announced smaller package sizes and feature options in its CFN metal foil current sense resistor series. New 0402 and 0603 packages were introduced, as well as a lower TCR option of ±50ppm/°C in the 0603 and larger package sizes.

Bourns states its metal foil technology construction lets the resistors provide low TCR, low inductance, low noise, excellent reliability and very low resistance values. These attributes suit power supply, stepper motor drive and input amplifier applications. The new smaller sizes meet the space requirements of mobile devices.

The company explained it has leveraged metal foil technology to achieve lower resistance values, ranging from 5 to 40milliohms while providing power ratings of 0.25 to 1W in components small enough for mobile applications.

The structure and mounting style also offer benefits. Placing a metal foil resistive element on the bottom side of the ceramic substrate shortens the thermal pathway and improves heat dissipation characteristics. The rear mount style helps prevent surface damage during assembly that otherwise could cause a short.

www.bourns.com



Silicon capacitors support power networks

Murata has extended its product offering for the mobile and high-performance computing markets with its latest silicon process technology to fabricate silicon capacitors with a density of 1.3µF/mm². The device's low ESL and low ESR support high performance power distribution networks that require low impedance over a wide frequency bandwidth.

As digital ICs evolve to offer more features at lower voltages, resolving issues like noise and voltage fluctuation is critical. Its <40µm profile enables chip engineers to embed the silicon capacitor into the package as close to the active die as possible, minimizing the current's effective path length and thus minimizing parasitics.

These multi-terminal devices satisfy the various SoC and microprocessor design requirements for multiple terminal capacitor networks. Replacing conventional monolithic ceramic capacitors with multi-terminal silicon devices reduces the total quantity of capacitors required on the board significantly, which improves compactness. Fewer capacitors also reduces BoM and mounting costs.

www.murata.com

Power DC-Link film capacitors extend lifetime

Kemet's new C4AK high temperature, power film DC-Link capacitor is designed for continuous use up to 1,000 hours at 135°C. Applications include solar, fuel cells, inverters, storage energy systems, automotive on-board chargers, heaters and welding equipment.

Design features include a radial box style for PCB mounting, miniaturization, low profile, 2-4 leads, and fewer capacitors needed in parallel to meet the required peak and ripple current.

It surpasses the extreme conditions of the standard automotive (AEC-Q200) requirements for film technology in severe humidity/temperature conditions. Compared to competitor technologies, the C4AK series is said to have greater performance with a lifetime of 4,000 hours at 125°C and 1,000 hours at 135°C in harsh environmental conditions.

The capacitor's extended life at high temperatures provides designers a miniaturized, reduced component count solution over conventional film capacitors, particularly in wide band gap high frequency, high current systems.

www.kemet.com

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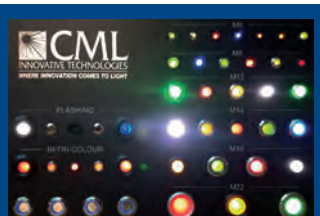

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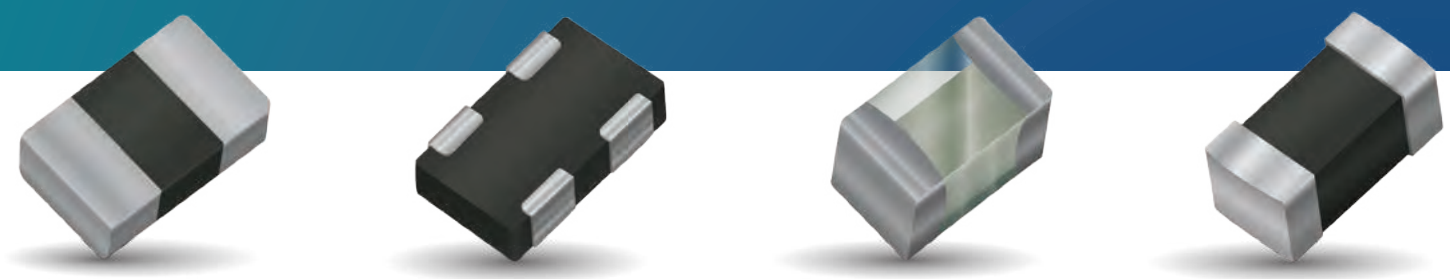

Bipartisan infrastructure bill and record silicon shipments

IPC president and CEO, John Mitchell, has issued the following statement on the expected passage of the bipartisan infrastructure bill in the US Senate: "Electronics manufacturers welcome the prospect of historic infrastructure investments in America's roads, ports, electric grids, and digital networks. Our members' supply chains depend on modern, resilient infrastructure and in today's high-tech world America's infrastructure depends on cutting-edge, reliable electronics. We also appreciate the inclusion of smart manufacturing investments. This bipartisan infrastructure bill will help drive growth in the overall economic recovery, including the electronics industry.

"We commend the tireless efforts of Senators Rob Portman and Kyrsten Sinema, along with the bipartisan Group of 22, who labored arduously to produce this compromise."

In other industry news, the SEMI Silicon Manufacturers Group's quarterly analysis of the silicon wafer industry reported that silicon wafer shipments reached a new high in Q2 2021. Worldwide silicon wafer area shipments increased six per cent to 3,534 million square inches in the second quarter of 2021, surpassing the historical high set in the first quarter. Second quarter 2021 silicon wafer shipments grew 12 per cent from the 3,152 million square inches recorded during the same quarter last year.

Chairman SEMI SMG and vice president product development and applications engineering at Shin Etsu Handotai America, Neil Weaver, said: "Demand for silicon continues to see strong growth driven by multiple end-applications. The supply of silicon for both 300mm and 200mm applications is tightening as demand continues to outstrip supply."

www.ipc.org
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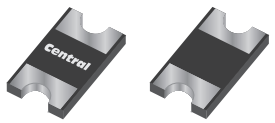

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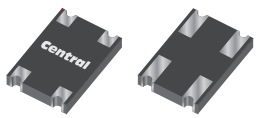

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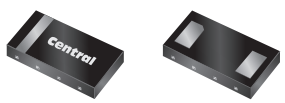
CMJA5050



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Fifty years of business, one enduring legacy

Mike Morton, CEO of TTI, Inc., reflects on the company's 50th anniversary and how hard work grew a small business into a global industry stalwart

Over a span of 50 years, Paul Andrews built TTI on hard work, strong partnerships and a simple axiom: Do what you say you'll do.

We were heartbroken when Paul passed away unexpectedly in February, just as we were beginning to celebrate the company's 50th anniversary. We said goodbye, too soon, to a man we knew as a leader, a mentor and a friend.

Many have heard the story of how Paul founded the business that became TTI at his kitchen table in Fort Worth, Texas in 1971. Before that, while working for General Dynamics in a purchasing role, Paul built a reputation for honesty and integrity. Those who worked with him respected him because he worked hard to keep his commitments and deliver what he promised.

But at the age of 28, and after being married for only four months, Paul was one of many people laid off from General Dynamics as the industry went through a downturn. Even so, Paul knew that he had the market knowledge of passive components that could help companies avoid downtime. He also understood a buyer's role to help him continue building strong relationships.

Without loans or funding, and without an office of his own, Paul started his business selling those specialized components. That business grew over the next four years into TTI, a franchised components distributor with over $1 million in annual sales by 1975.

At the heart of all the successes that followed in the decades afterward was a work ethic that set the tone and example for TTI's employees. Many of our employees, including myself, have been with the company for decades and have grown in roles and responsibilities along the way.

The work ethic that built TTI can be summed up in a simple phrase he quoted often: "If a task is once begun, never leave it till it's done. Be the labor great or small, do it well or not at all."

Paul's lesson to each of us is to follow through on the promises we make. Through lean times and success, these weren't just words he said. They were a philosophy he lived by, and it was evident in the decisions he and his company made.

Today, we are all facing new global challenges—not only electronic components distributors, but the customers we serve. While we celebrate our growth and success, we also carry on doing what Paul Andrews did to bring us here. Each day, our people help deliver the parts that keep the world's industries running. Many of these components are quite literally saving lives in medical devices and other critical designs.

And, each day, our people put their knowledge to work to build relationships and find solutions to those challenges—one step at a time, one order at a time, one customer at a time.

Technology is changing. The world is changing. Sometimes those are changes for the better, and other times they are changes that disrupt the world we live in. But the value of hard work, honesty and integrity do not change. These are the principles that let relationships and businesses not only profit but stand the test of time.

tti.com

Paul Andrews with TTI's early product offerings

TTI's birthplace, the Andrews home in Fort Worth, Texas

TTI's late founder, **Paul Andrews**

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Buyers rely more on distributors during component shortages

Some buyers are using more distributors while others are depending on a few distributors for hard-to-find components

James Carbone

Distribution strategies employed by electronics buyers are being tested this year as lead times have stretched to 50 weeks for many semiconductors and 26 weeks for some passives.

Many buyers at small to medium size electronics manufacturers are struggling to find semiconductors, passives and other components their companies need for production and are scouring the global market. Some are buying primarily from authorized distributors or buying alternative parts that can substitute for scarce components. Many are doing more business with more distributors and are turning to independent distributors to varying degrees for hard-to-find parts.

While buyers may take different paths to find shortage parts their companies need, they all agree that current supply conditions have never been worse. "Sourcing is a nightmare right now with no end in sight. Supply conditions are the worst I have ever seen," says one supply chain vice president who has worked in purchasing for 30 years.

In the past there were shortages of a limited number of product types at a given time. For instance, in the mid-1990s there were shortages of memory ICs and tantalum capacitors. Several years ago, multilayer ceramic capacitors were in short supply. Most supply constraints would last 12-18 months.

"Today's market cycle consists of allocations across all semiconductors, passive components, plastic resins, logistics, and many more," said Jamey Mann, director of global purchasing for EMS provider Kimball Electronics, based in Jasper, Ind. "This cycle started in early 2020 and is projected to last into 2023. This is sort of a perfect storm of events," he said.

While component shortages are impacting all OEMs and EMS providers, buyers at small and medium-sized electronics manufacturers, who purchase parts through distributors, seem to be affected more than purchasers at larger companies who purchased directly from component manufacturers.

Concentrating spend

In some cases, buyers at smaller contract manufacturers have tried to forge close relationships with distributors. They have reduced the number of distributors that they use, concentrating more spend with fewer distributors. The idea is to become more important to a handful of distributors in order to get better prices, more favorable terms and be in line to get parts when component shortages and allocations hit.

"We are in high-mix business so we pretty much use all of the distributors"

Stephanie Martin, senior vice president global supply chain for EMS provider **Vexos**

One example is SMTC, an EMS provider in Tempe, Ariz. About three years ago SMTC used about 20 distributors. Since then, it has reduced its number of distributors to three for most of its component purchases. Now, about 80 per cent of the EMS provider's spend is with the top three distributors: Arrow, Avnet and Future, said Phil Wehrli, senior vice president global supply chain for SMTC.

The EMS provider also buys components from TTI. "We look at them as a specialty distributor. We use them for interconnect," he said. SMTC also buys from Mouser, Sager and Master "on an as-needed basis," said Wehrli. It also started to buy more parts from Digi-Key when supply conditions turned tight.

"We've negotiated deals with distributors for extended terms, volume purchase agreements and in-plant stores," said Wehrli. "So, we look at it as a service model. The total cost and what we get buying through distribution is advantageous to us," he said.

Wehrli said SMTC does not use too many independent

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distributors. Most of our business is with authorized distributors. That's where Digi-Key picked up some slack during the shortages. SMTC also has IPO offices in China and Hong Kong. "They help us scour the market for parts as well," said Wehrli.

Some electronics buyers have added more distributors to their supplier rosters or turned to distributors that they did not use before. "We are in a high-mix business so we pretty much use all of the distributors," said Stephanie Martin, senior vice president global supply chain for EMS provider Vexos, based in New York. "We have added some particularly out of Europe."

Buying in gray market

Vexos is also using more non-franchised independent distributors and brokers than it did in the past because Vexos cannot buy all the parts it needs from authorized distributors. "We are hitting the gray market really, really hard right now," said Martin. The EMS provider had used several independent distributors in the past but decided it needed to expand its roster of brokers and distributors because supply issues are so acute.

Martin said Vexos joined ERAI, which gives members access to the association's database of available inventory of genuine parts. Members can buy and sell from other ERAI companies. "It has helped," said Martin. Vexos has been able to find parts that were in short supply from distributors and brokers that Vexos had not done business with before. The downside is prices sold by brokers and independent distributors are high.

"The prices are outrageous," said Martin. "We buy a Xilinx part that normally costs $15.50. In the broker world, a 'good' price for the part is $169. "We are also finding inventory of the part that costs $211. We buy it," she said. There are less expensive components that are normally in the $.38 range from different manufacturers. Those parts may cost $15-$16 from independent distributors, she said.

Kimball Electronics has four major distribution partners and a "handful of secondary partners," said Mann. "We have been focusing on consolidating our spend with these select partners for the last decade," he said. "We feel the partners we have aligned with are sufficient to support our needs."

Jamey Mann, director of global purchasing for EMS provider **Kimball Electronics**

"Today's market cycle consists of allocations across all semiconductors, passive components, plastic resins, logistics, and many more"

Reality check

Mann said Kimball services medical, automotive, industrial and public safety OEMs. He said because those segments have high reliability and durability requirements of the four markets, Kimball's "core strategy" is to not use the independent distribution base. "However, in reality, due to market changes and demand fluctuations, we at times do have to utilize independent distributors," he said. Kimball has a select group of independent distributors that can support "our very rigid requirements of assuring the delivery of authenticated original components to ensure we do not introduce suspect materials into our supply chain. "

Mann said "for the most part" Kimball's distributors have been able to supply the parts it needs. "Of course, as these are nontypical times, not every need is met," he said. "In those cases, we work closely with their leadership teams, the manufacturer, and our customer to devise an action plan to recover any loss in supply."

Kimball uses distributors that offer competitive pricing as well as a low total cost. "Total cost is important. You can have the best price in the world, but if you can't deliver an effectively costed supply solution to your customer, then are you really adding value?" he said.

Buyers say that for the most part, distributors are doing their best to help them get the parts that they need. Often distributors will go to bat for the EMS provider with component manufacturers in order to secure more supply.

Because supply is so tight and many companies are clamoring for parts, component manufacturers "don't even want to talk with us anymore, said Wehrli. Component manufacturers say 'your orders are with the distributor. Work through your distributor.' So, I have to go back to my distributor. I expect them to be my voice."

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What is semiconductor sovereignty worth?

The push and pull for sovereignty and semiconductor dominance globally will continue to unfold over time as countries spend billions of dollars to develop secure supply chains

The EU, US and Asia have one thing in common when it comes to semiconductors—all are willing to invest billions in research and production to claim a stronger stake in global market share. While the global supply chain for electronic components faces a consistent string of obstacles from material shortages, natural disasters and other cataclysmic events, the disruptions do not halt chipmakers' plans for extensive growth. For the EU and US, this growth is a means to reach semiconductor sovereignty, while Asia pushes to continue its current dominance.

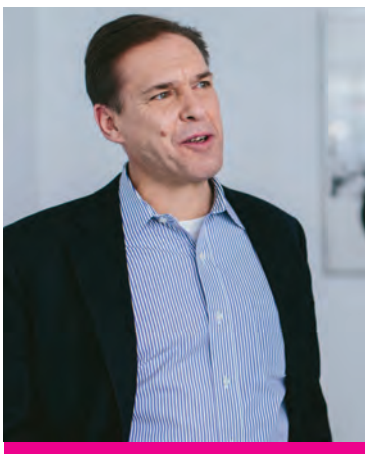
Currently, Asian countries produce more than 70 per cent of global semiconductors with plans to expand supply chain control in locations ranging from South Korea to Japan, Taiwan and China.

South Korea plans to spend roughly $450 billion in its endeavor to build the world's biggest chipmaking base. The country's major semiconductor manufacturers, Samsung and SK Hynix, are the leading manufacturers of memory chips, but South Korea's push for additional production and research will attempt to extend its reach in other sectors.

Japan dwarfs other countries in its number of chip factories but struggles to meet sales and is not producing enough high-end products to stay competitive with other countries. This may change as it plans to re-initiate growth in a 'national project' supported by the government to drive chip manufacturing. The plan includes cooperation with Taiwanese semiconductor company, TSMC, and a $337 million research facility.

Taiwan dominates advanced semiconductor manufacturing as home of the world's largest chip foundry, TSMC. The company plans to build on its growth by spending $100 billion in the next three years to expand capacity, plus R&D of semiconductor technologies. In addition to cooperating with Japan, TSMC is building multiple semiconductor fabs in the US with construction already underway.

China imports $300 billion worth of semiconductors and is experiencing ongoing pushback in its chip manufacturing. Its greatest obstacle has been US sanctions on the country's main manufacturer, SMIC, which was blacklisted by the US in 2020—restrictions include bans on technology China was using to make its chips. Since then, additional restrictions have also affected China's manufacturing relation with the EU, which has found itself vulnerable amid the US-China trade war.



Fusion Worldwide's COO, **Paul Romano**

> **South Korea plans to spend roughly $450 billion in its endeavor to build the world's biggest chipmaking base**

While building its own sovereignty in the semiconductor market will take time for China, it plans to invest $155 billion in the next five to 10-years with focus on R&D. In the meantime, China will depend on emerging local contract chipmakers.

The US produces the world's most advanced chips, but the increased cost of production and materials, global supply chain obstacles amid Covid-19 and geopolitical tensions regarding trade policy have proven difficult to navigate. To maintain its lead in the semiconductor industry in innovative technology and keep its competitive edge in global chipmaking, the US heavily invests in design, R&D and capital expenditure. However, while its chip design is superior, Asia still dominates the manufacturing aspect. The US currently relies on Taiwan for 90 per cent of its chip manufacturing.

After an assessment of its supply chain weaknesses, the US government will allocate $52 billion to the national semiconductor sector, which is a small effort to increase domestic manufacturing. International semiconductor manufacturers TSMC and Samsung both plan to build factories in the US along with Intel, which is investing $23 billion to improve and build facilities in the US. These domestic manufacturing facilities will improve US self-sufficiency.

The EU is motivated to claim self-sufficiency in its semiconductor production to reduce its reliance on the US and Asia. Its plan includes an alliance with EU-based companies like ST Microelectronics, NXP, Infineon and ASML to move away from foreign dependence. This alliance has the potential to bring companies together to fund the efforts to increase EU semiconductor market share to 20 per cent by 2030 (it currently holds 10 per cent).

German chipmaking company, Bosch, recently opened a $1.2 billion factory that it hopes will help ease semiconductor supply constraints in the automotive sector, but the company will still rely on Asia for the packaging and assembly.

Since separating from the EU in 2020, the United Kingdom has been grappling with its stake in semiconductor production, but rather than investing in expansion, local chipmakers have taken the opportunity to sell fabs to foreign buyers. Reports state that $42 billion worth of the UK's semiconductor business has been sold since 2010.

The worldwide reliance on chip manufacturing continues to grow as consumer demand increases amid advancements in technology. As semiconductor shortages persist, the EU and US will expand efforts to claim more market share and self-sufficiency in the industry, while Asia will build off its existing manufacturing dominance in the global market and improve its chip technology. The billions of dollars countries will spend to develop secure supply chains to lead the industry appears limitless with the multi-year plans governments and companies have outlined. The push and pull for sovereignty and semiconductor dominance globally will continue to unfold over time as countries navigate the volatile space.

www.fusionww.com

Electronic connector segment: mid-year check

ECCO's president, Bernard Gizzi, looks at factors and trends impacting the interconnect product segment and offers tips for staying ahead of the market

During 2020 most of us would not have predicted the wild swings in the electronic components industry that were to come, with the connector segment—usually a trailing indicator—languishing in slow bookings and unknown forecasts. How times have changed. Today, connector manufacturers are enjoying high bookings and strong profits. In fact, recent earning calls from TE and Amphenol were extremely positive, with executives commenting that Y/Y sales grew 35 per cent or more, exceeding the high end of their financial guidance. So, what's happening to fuel strong growth in the connector segment specifically.

Commercial air is bouncing back in North America but remains choppy globally given Covid variants and lack of widespread vaccinations. Medical equipment demand remains high driving a continued need for safety and reliability. More blind mating connectors and push pull technology is emerging.

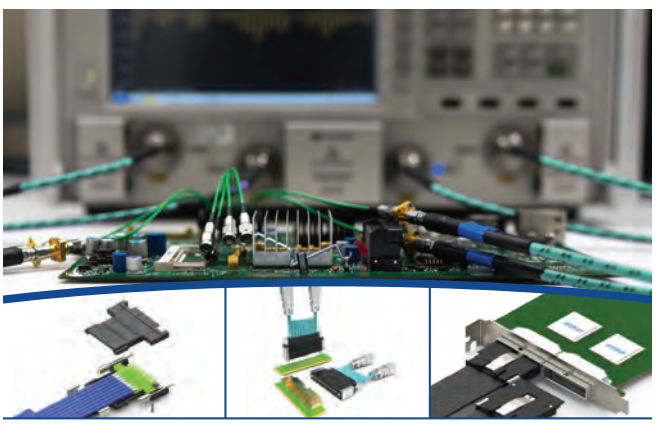
The severity of supply chain disruptions worldwide has caused pre and/or double ordering in the interconnect commodity category, which usually only occurs in active electronics. There are examples of ships being delayed up to six-weeks due to port closures, labor shortages and air/rail delays due to lack of equipment and personnel.

A connector manufacturer with a factory in Vietnam closed in July without notice, sending all employees home and shutting down production indefinitely. According to a recent TTI MarketEYE report, up to 10 per cent of the world's shipping capacity is currently unavailable due to port congestion, lockdowns and other logistics issues. The report comes as shipping traffic at Vietnam's ports queues up following a coronavirus lockdown, while 328 ships sit idle at ports from south China to Long Beach USA.

Rocket-ships, robotics, drones and 5G IoT are all using more surface mount lightweight composite connector materials for their durability and efficiency.

ECCO's president, **Bernard Gizzi**

> **Commercial air is bouncing back in North America but remains choppy globally given Covid variants and lack of widespread vaccinations**



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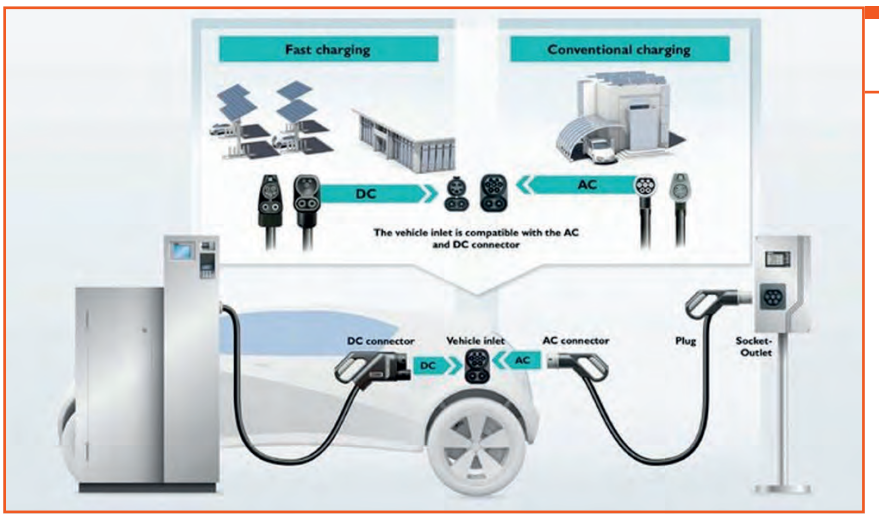

Combined Charging System overview, courtesy Phoenix Contact

The automotive and EV sectors continue to accelerate giving rise to technologies such as USB-C, FAKRA and optical style connectors, with ruggedized high current SAE J1772 connectors being used in local parking lots and charging stations.

Military and defense spending remains high, keeping the strong single digit growth going. An infrastructure bill is pending that could add to industrial and construction segment growth in 2H 2021 and into 2022. Many suppliers are invoking 'force majeure' on contractual clauses and inflationary pricing is likely to continue to move higher for the remainder of 2021.

Raw materials like resins and precious metals have become scarce causing less than 30-day price notices and sometimes order cancellations or backlog re-pricing.

What does all this mean for buyers of electronic connectors for the remainder of 2021? Firefighting is the new normal. Phrases like 'stuck on a boat or in a container in customs' is a common note on late material line items. So, get a grip on your supply chain and forecasts so you don't become the chokepoint for your company's revenue growth because suppliers let you down. Order early and often.

Also, spend time with your engineers and product teams making sure multiple sources exist for key connectors and cable assemblies. Finally, increase communications with suppliers. Share more information on legacy, core and new product development, bringing them closer to your company's data and decision making.

eccoconnectors.com

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No excuse for counterfeit

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

John Denslinger reminds buyers there are many systems in place to help avoid counterfeit components regardless of the Covid induced supply chain disruptions

Counterfeits • By John Denslinger

Among the many benefits of connectivity, perhaps e-commerce stands at the forefront of technological achievement. It provides users with convenience, options, tracking and buying power with astonishing simplicity. For procurement, the story is much the same: e-commerce is the new DIY norm for sourcing components, specs, cross references, test documents, product availability, shipping information and, of course, pricing. DIY does have risk though, so one must understand caveat emptor—the principle that the buyer alone is responsible for checking the quality and suitability of goods before a purchase is made.

Sourcing components isn't always easy. Procurement must constantly manage a complicated supply chain, challenging specs and just-in-time delivery, rarely with senior management involvement. Have a major shipping delay, a product failure or cause a line to go down and suddenly procurement is the epicenter of everyone's attention. The pressure to find the quick-fix is powerful.

Caution, caution! Panic sourcing makes you a prime target for bad actors promoting counterfeit products as authentic. These bad guys are back again in full force thanks to an unfortunate sequence of industry disruptions: tariffs, Covid and semiconductor shortages.

Tariffs under the previous administration were employed to pressure reforms in global trade and promote IP integrity. The actual rhetoric was probably more damaging by creating supply chain uncertainty and an expensive restructuring of long-established supply lines.

Covid was the next unknown to hit and its variants still are. During the vaccine development phase, consumers curtailed spending, industries suspended production and governments limited basic commerce. In the next phase as vaccines were administered, re-opening became inconsistent and prone to quick policy shifts by all levels of government. Manufacturers geared up but labor shortages and lingering doubts about demand strength persisted.

Most recently, there was the global semiconductor shortage that seemingly surprised the world. As recovery accelerated, it's now obvious capex spending during the Covid years did not keep pace with actual demand. In hindsight, the fiscal uncertainty surrounding tariffs and Covid ultimately played a major role derailing normal investment, planning and execution. Worse yet, the chip supply gap to America's industries is now projected to last well into 2023.

All this to say, there's no excuse for counterfeits entering your operations. Buying product directly from the manufacturer is your most secure avenue. Sourcing authorized distribution is an equivalent alternative. Both offer JIT positioned inventory, bonded stock options and immediate product engineering/quality support on any field problems.

Also, consider searching www.TrustedParts.com. This website is hosted by ECIA and itemizes 24M unique part numbers from 4,000 manufacturers thru 77 authorized distributors. Unlike other product search platforms, TrustedParts only allows authorized distributors to list on hand products policed by the very manufacturers authorizing them. It's very secure and ECIA offers API options to your ERP for easier daily sourcing.

Lastly and perhaps one of the toughest sourcing tasks may be EOL products. Be sure to check out companies specifically authorized and licensed by manufacturers. Rochester Electronics and Flip Electronics are two prominent ones offering their own unique end of life components and services. Again, the key word is 'authorized'.

If your component is not sourced from one or more of the above, beware. Odds are, it could be counterfeit. There really is no excuse for fake product entering a manufacturing environment.

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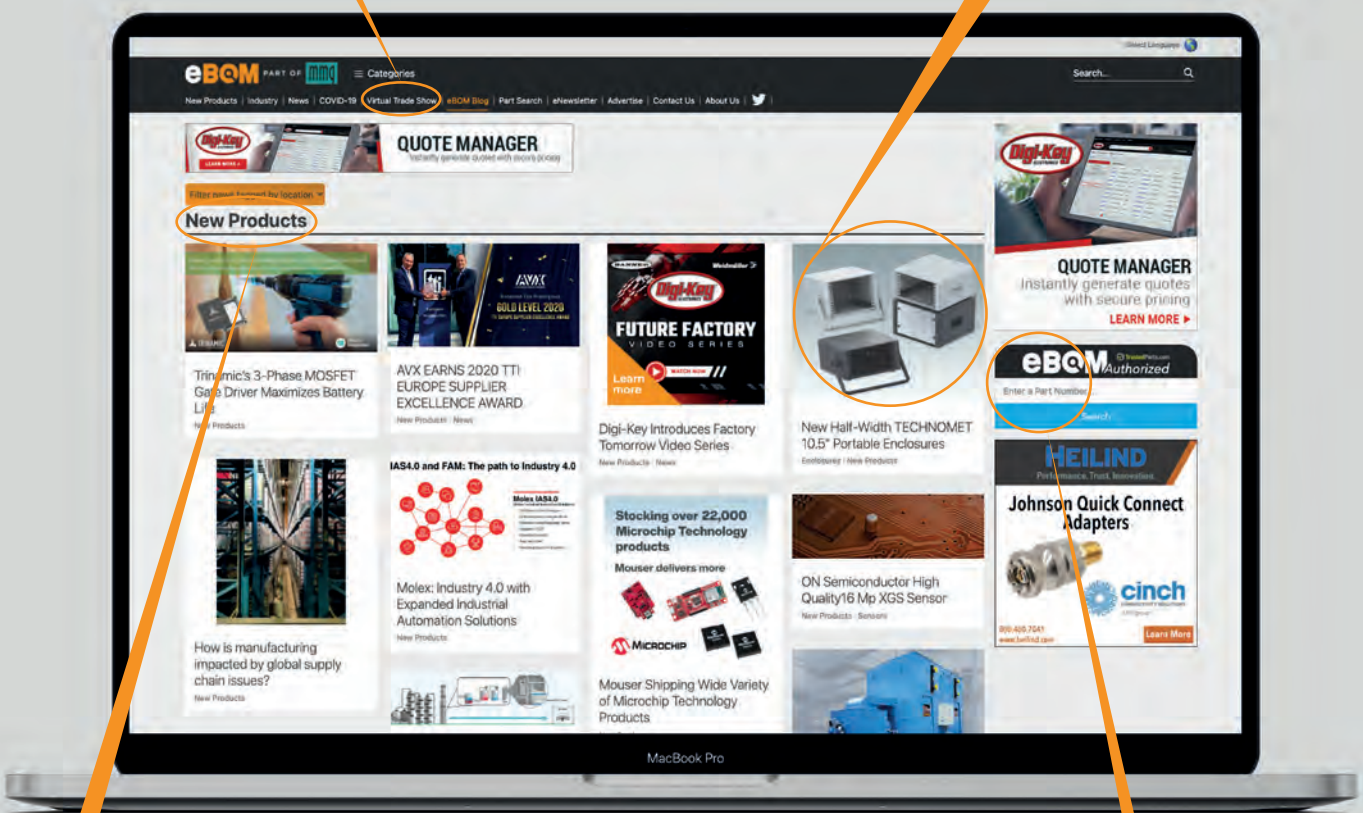

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Planning for and minimizing EOL costs

Rochester Electronics' technical sales manager EMEA, Ken Greenwood, steps readers through the process of planning for component end-of-life

The electronic component product lifecycle—or time between market introduction and end-of-life (EOL)—is getting shorter. For manufactured products with lifecycles extending far beyond the active availability of devices, long-term component availability is vital. Manufacturers need to ensure a reliable source is in place, even after components become obsolete. This means planning and managing obsolescence strategically.

If your equipment has a long qualification, production or in-service life you will face component obsolescence. Best-in-class organizations devote skilled multi-disciplined resources to the task of obsolescence management. Preventative planning by purchasing, component engineering, design and program management can reduce or eliminate the cost and risk.

Regular component monitoring lets a user anticipate problems before they occur. There are excellent component monitoring databases available from Z2Data, IHS and Silicon Expert, which track a component's life cycle, lead-time and specification changes during its life. Such tools provide a lifecycle prediction and alerts when changes occur.

Component management databases can provide a PDN notification service. Users are shown all PDN data or can load BoM structures into the database to receive matched PDNs specifically affecting them.

Forecasting is not an exact science and unfortunately most forecasts will be wrong. Underestimate needs and you risk prematurely discontinuing a product and losing sales. Overestimate your needs and you will tie-up unnecessary capital in stock, while paying excessive storage costs. Should you plan a redesign in the future to limit your LTB? The design and requalification costs, plus the opportunity costs of using precious engineering resources looking backwards rather than forwards, need to be considered.

There is a common misconception that once the original manufacturer stops producing a component, unauthorized or grey market sources are the only recourse. This is not true. The risk-free option of an authorized after-market supplier, such as Rochester Electronics, should always be the first choice.

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www.rocelec.com

Rochester Electronics' technical sales manager EMEA, **Ken Greenwood**

Top tips

- Obsolescence management begins with design
- Poor component selection during development can lead to premature product redesign and requalification
- Choosing the right component technology and supplier can have a dramatic impact on long-term availability. Lowest cost may not be best long-term. Ask suppliers about long-term availability
- Should the project plan include anticipated product redesigns?
- How will capital, locked in long-term component storage, be accounted?
- What will the impact of obsolescence be on after-sales service?

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TOP 50 GLOBAL DISTRIBUTOR REPORT 2021

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Global distribution view reveals major role of Asia and China

Presenting a complete view of the Top 50 authorized electronic component distributors worldwide is a daunting challenge. From a review of available published research, I have not been able to identify a "Top 50" list of worldwide distributors that includes the major distributors from the Americas, EMEA and Asia. While there are lists presented as "Top 50" worldwide distributors they all appear to only include a subset of companies that is strongly oriented to Americas and EMEA companies. The companies headquartered in Asia are commonly overlooked even though they play a large role in the global distribution industry.

The goal of the research conducted to develop the data presented in this article was to include the major authorized distributors from all three regions. Given, the dominating presence of Asia as a distribution market, a second goal was to provide total revenue data for the top electronics component country markets in Asia. According to the research presented in this article, Asia accounted for over 75% of the Top 50 authorized distributor global revenues in 2020. The Americas and EMEA distribution markets come in far behind at 13.4% and 11.4% respectively. In addition, 39 out of the top 50 authorized distributors are headquartered in Asia and account for over 63% of distribution revenues in this analysis.

With this foundation now established, we plan to continue to develop additional research in the future in pursuit of the goal of providing improved and expanded visibility into the global electronics components authorized distribution market. ECIA provides its members and the industry with a wide range of highly valuable research including detailed sizing of component total available market (TAM) and distribution total available market (DTAM) for the Americas, EMEA and Asia for selected key categories. In addition, it provides data on component lead times, bookings trends, electronics component industry sentiment, workplace disruption due to COVID-19, best practices for key distribution activities and more.

Produced by **Dale Ford**, Chief Analyst at **Electronic Components Industry Association (ECIA)**

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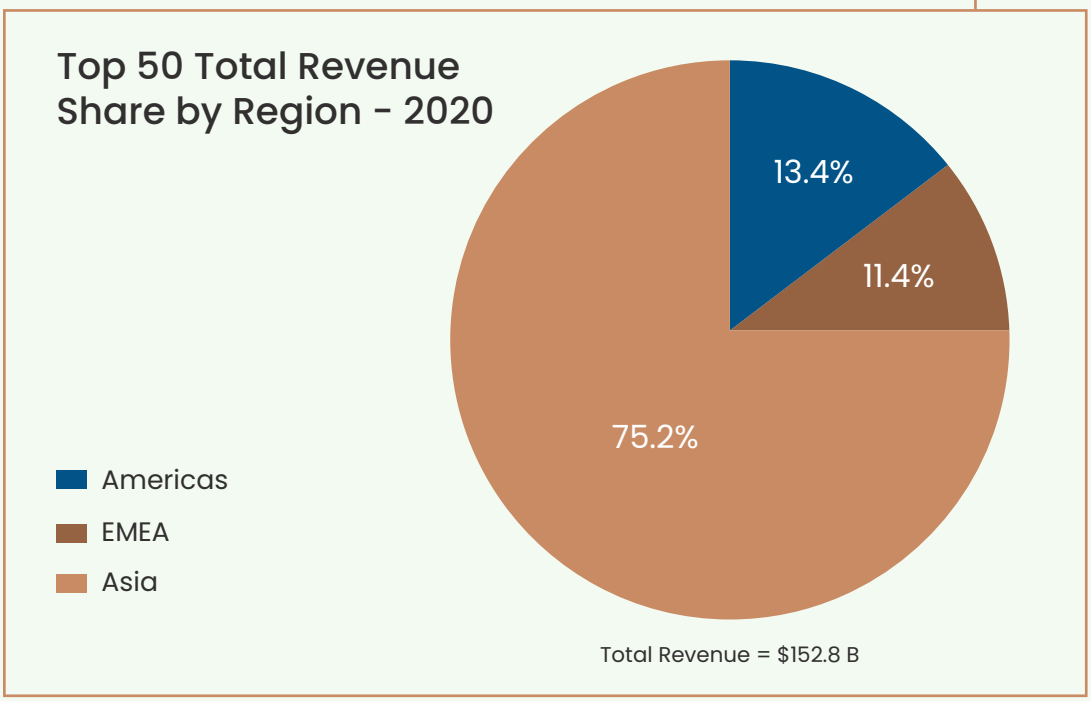
The top 50 worldwide authorized distributor research methodology and results

As noted, the task of identifying and sizing the top authorized distributors around the world presents significant challenges beyond the research developed for the North America Authorized Distributor data. For example, while participation in surveys by industry companies is a well understood practice (if not always supported) by Americas and European companies. The same is not true in Asia where personal relationships and communication are key to gathering helpful information. Surveys have a very low participation rate in Asia. In addition, most companies headquartered in China are private and not easily accessible for communication. Given these and other issues, the methodology pursued for this new research needs to be briefly explained.

1. Surveys were used to gather information for this research and every effort was made to identify contacts at all companies to invite participation in the survey. As anticipated, the level of participation by companies headquartered in Asia was low.

Continue on page 38 >



2. To expand the data captured in this report extensive research of published financial data for all public companies was pursued. A number of private companies also provide extremely helpful top-level financial data.

3. Inputs from major manufacturers and distributors was solicited to both identify top distributors and provide guidance on the revenues of private companies. Roughly 100 companies were identified for consideration in the top 50. Companies were excluded both for falling below the top 50 and because they were engaged as a broker instead of authorized distribution.

4. Finally, web-based secondary research was a source of additional data that supported modeling and analysis used to create estimates in areas where survey or published data was not available.

The tables and figures presented in this report have been created based on the methodology described above.

Top Level Results Summary

The early recovery by manufacturers in Asia drove a stronger distribution revenue growth environment than the Americas and EMEA experienced. Building on this strength in Asia, the combined global revenues for the Top 50 Worldwide Authorized Distributors grew by 6.4% in 2020. By comparison, the Top 50 Authorized North America

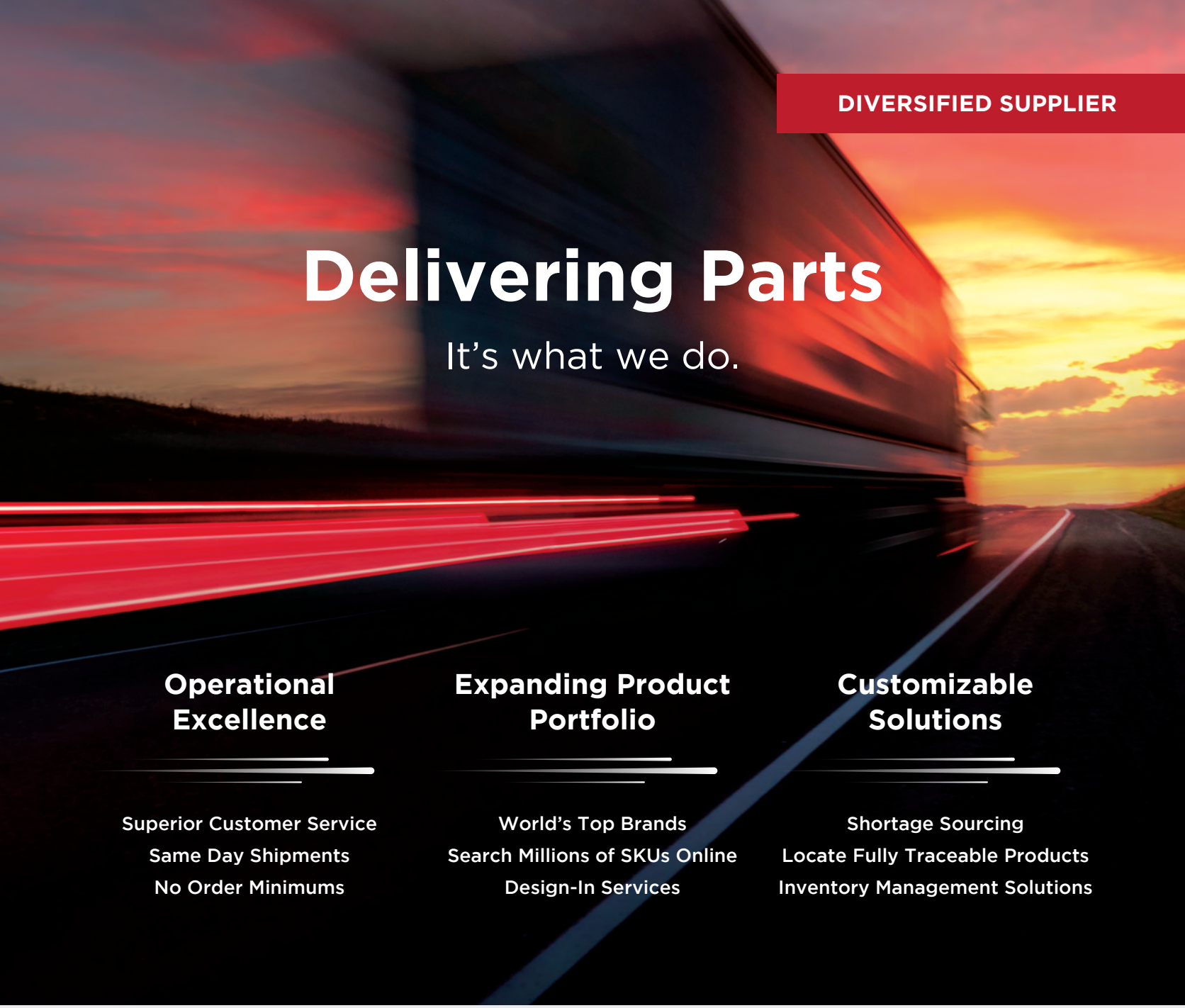
Continue on page 42 >

Top 10 Americas sales

Rank 2020	Company	2020 Americas ($ Millions)	Share of Top 50 Total Sales (Percent)
1	Arrow Electronics, Inc.	6,183.1	30.11
2	Avnet	4,660.1	22.69
3	Future Electronics	2,000.0	9.74
4	Digi-Key Electronics	1,700.1	8.28
5	TTI Inc	1,450.0	7.06
6	Mouser Electronics	942.6	4.59
7	DAC / Heilind	796.0	3.88
8	RS Components/Allied Electronics	661.1	3.22
9	Macnica	478.9	2.33
10	Sager Electronics	313.0	1.52

Top 10 EMEA sales

Rank 2020	Company	2020 EMEA ($ Millions)	Share of Top 50 Total Sales (Percent)
1	Avnet	5,683.7	32.65
2	Arrow Electronics, Inc.	4,987.5	28.65
3	RS Components/Allied Electronics	1,623.5	9.33
4	Future Electronics	1,250.0	7.18
5	TTI Inc	1,007.0	5.79
6	Rutronik Electronics Worldwide	904.7	5.20
7	Digi-Key Electronics	690.0	3.96
8	Mouser Electronics	568.9	3.27
9	Macnica	383.1	2.20
10	Nexty Electronics	211.1	1.21



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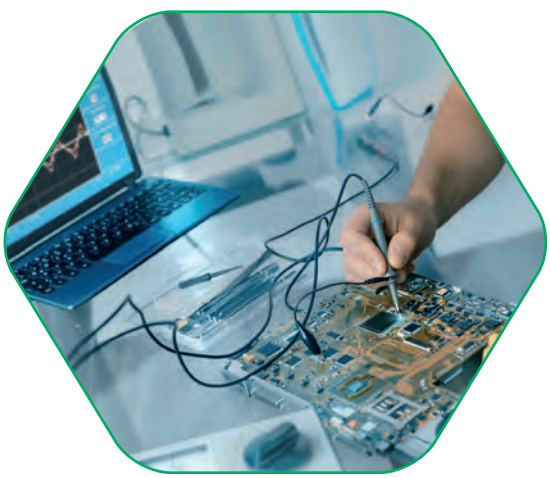

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Distributors experienced a decline of 5.9 % in North American sales. However, this same group of Top 50 North America distributors combined to achieve worldwide sales growth of 4.5% as demand in Asia more than compensated for losses in the North America market.

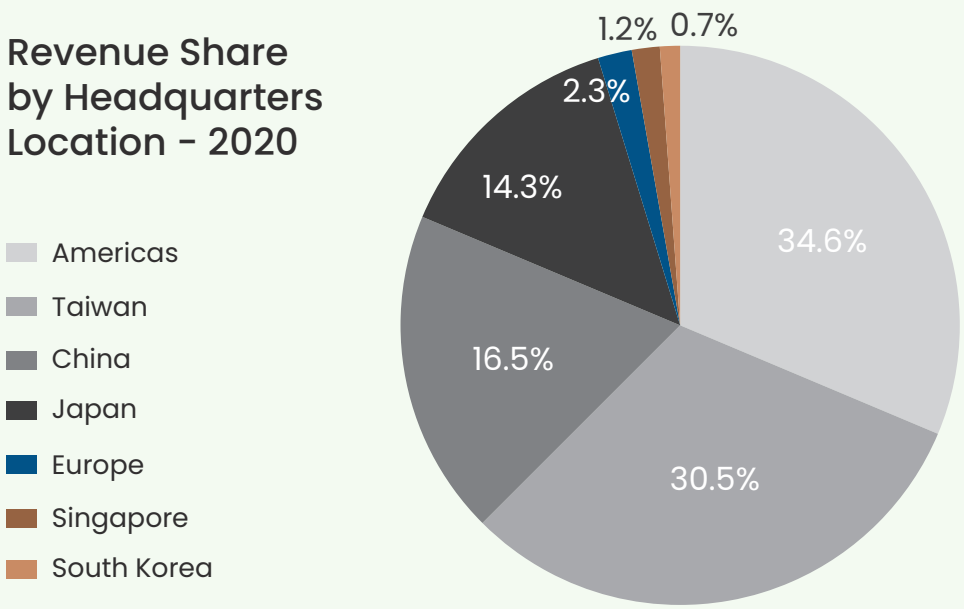
Total worldwide revenue for the Top 50 authorized distributors in 2020 grew to $152.8 B from $143.5 B in 2019. Thirty-seven of the top 50 distributors achieved revenue growth in 2020 with the highest growth from Nanjing Sunlord Electronics at 36% growth and the steepest decline at Restar Group with -16.4%. On a worldwide basis, semiconductors drive an even larger share of overall electronic component distribution revenues, accounting for nearly 78% of total revenues, than what they account for in North America, 53%. The strongest demand for revenues is generated by the mobile communications market at $32.2 B (21%) followed by Industrial Automation - $24.7 B; Computers/Data Processing/Peripherals - $23.9 B; and Consumer Electronics - $23.5 B.

Continue on page 44 >

Top 10 Asian sales

Rank 2020	Company	2020 Asia ($ Millions)	Share of Top 50 Total Sales (Percent)
1	WPG Holdings	20,466.1	17.83
2	WT Microelectronics	11,990.1	10.44
3	Arrow Electronics, Inc.	9,332.0	8.13
4	Avnet	7,517.0	6.55
5	Macnica	5,938.0	5.17
6	Supreme Electronics	4,546.7	3.96
7	CECport	3,900.0	3.40
8	Nexty Electronics	3,804.0	3.31
9	EDOM Technology	3,638.5	3.17
10	Techtronics	3,200.0	2.79

Revenue Share by Headquarters Location - 2020



Total Revenue = $152.8 B

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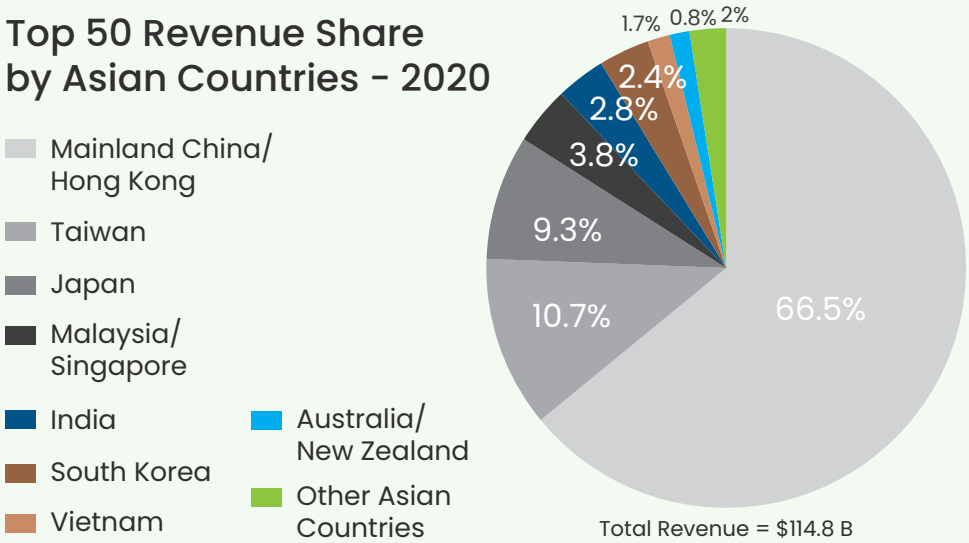
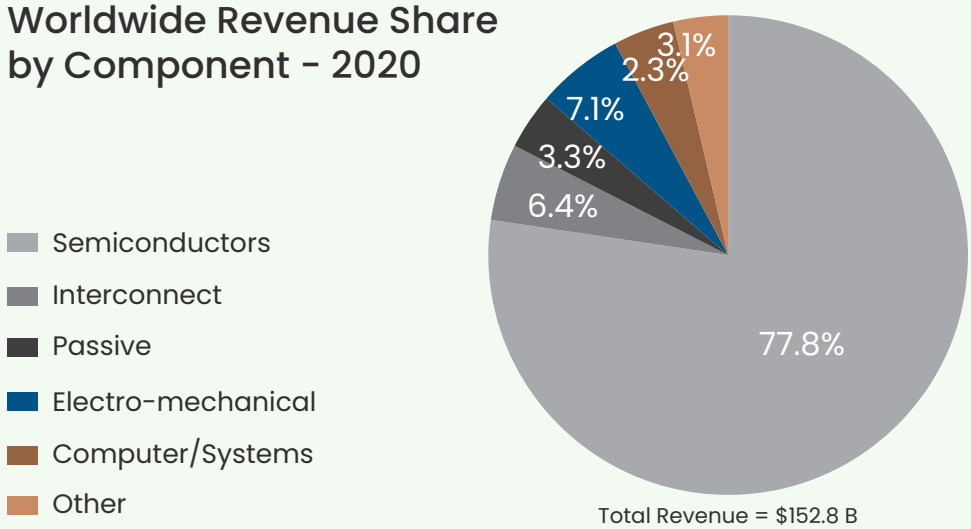
Top 50 Revenue Share by Asian Countries - 2020



Worldwide Revenue Share by Component - 2020



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From its headquarters in Fort Worth, Texas, TTI, Inc. has built a global reputation as a distribution specialist of connectors, passives, discrete semiconductors and electromechanical components. Today, five decades after the company was founded by the late Paul Andrews, TTI has grown to become the distributor of choice to industrial, military, aerospace and transportation manufacturers around the world.

TTI fosters close relationships with customers that allow the company to understand and solve their supply chain challenges. This specialized knowledge of the industry has given TTI the insight to build a distribution network that achieves greater than 98 percent on-time delivery – and a reputation for quality and service that consistently earns awards and recognition from customers and suppliers alike.

The Americas Distribution Center is the heart of TTI's operations in North America. Over 1.7 miles of conveyers tie together this facility's one million square feet of shipping, inventory and receiving sections housing over 850,000 component part numbers. Multi-story carousels filled with bins of tiny components and racks of palletized cases of larger parts are picked for distribution.

A dedicated space serves cut reel fulfillment, while another specialty area provides value added customization of various circular and D-Sub connectors for the military and aerospace market, as well as commercial off-the-shelf product. To meet consistently growing demand, the facility continues upgrades in automation technology and expansion in anticipation of customer needs.

This fast-moving production environment is measured by a quality program that ensures TTI provides the right parts to the right place, at the right time. Not only does TTI have a quality goal for its customers, but for every department within the company (sales, product, finance, operations, etc.)

TTI maintains an industry-leading broad and deep inventory of components to buffer customers from swings in lead times and other supply chain events.

Globally, TTI services customers through warehouse locations in Asia, Europe, and the Middle East.

TTI's core goal has remained the same since its founding: to be the best, rather than the biggest, distributor of interconnect, passive, electromechanical and discrete components. This goal is achieved every day by hardworking, knowledgeable people who are committed to this philosophy.

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THE SEMICONDUCTOR LIFECYCLE SOLUTION™

Rochester Electronics is the world's largest continuous source of semiconductors–100% Authorized by over 70 leading semiconductor manufacturers. Headquartered in Newburyport, MA. USA, Rochester has facilities in every major market around the globe.

As an original manufacturer stocking distributor, Rochester has over 15 billion devices in stock encompassing more than 200,000-part numbers, providing the world's most extensive range of end-of-life (EOL) semiconductors and broadest range of active semiconductors.

Rochester provides a continuous source of supply of both active components, to solve supply chain disruption, and EOL semiconductors, to meet long-term customer needs. With direct sales and support staff in all major markets, complemented by a network of regional and global authorized channel partners, we aim to meet our customer's needs over the phone or via our e-commerce platforms anytime, anywhere.

During component shortages and long lead-times, when products may be harder to find and customers may be faced with line-down situations, it is important to know that customers can quickly identify and obtain product risk-free from Rochester Electronics.

Over 10 billion of our in-stock devices are classed as EOL by the original component manufacturer. Rochester supports applications where the product lifecycle extends beyond the active availability of a device. Our factory-direct offering negates the need for expensive testing. We are AS6496 compliant.

As a licensed semiconductor manufacturer, Rochester has manufactured over 20,000 device types. With over 12 billion die in stock, we have the capability to manufacture over 70,000 device types. We are licensed to manufacture devices no longer produced by the original component manufacturer.

Manufacturing Spotlight

- Products are manufactured using information transferred directly to Rochester from the original component manufacturer (OCM).
- Offering ongoing manufacturing of stock products.
- Offer build-to-order products.
- Process flows include Commercial, Industrial, and Military Temperature, MIL-STD-883, SMD/QML, and Space-Level S/V.
- Offer a range of industry-standard packaging with a variety of lead finishes including Sn, SnPb, and RoHS.

Rochester offers a full range of manufacturing services including Design, Wafer Processing, Assembly, Test, Reliability, and IP Archiving providing single solutions through to full turnkey manufacturing, enabling faster time-to-market.

Our Design Services can replicate the original device avoiding lengthy expensive system requalification, recertification, or redesign. The end-product is a form, fit, and functional replacement guaranteed to the original data sheet performance.

We offer a full range of assembly services including Open Cavity Packages (OCPs) Hermetic assembly, Plastic Assembly, component lead finishing, package, substrate, and leadframe replication.

Our Test Services offer a wide variety of capabilities across multiple test platforms to solve customer and supplier challenges. Our 30,000 square feet Test facilities include Automated Test Equipment (ATE), full Computer-Aided Design (CAD), Burn In, and Yield Management capabilities

For 40 years Rochester has provided our valued customers with a continuous source of critical semiconductors. We are the Semiconductor Lifecycle Solution; no other company compares to the breadth of our product selection, value-added services, and manufacturing solutions.

www.rocelec.com

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WE KEEP YOUR BUSINESS MOVING.

The world's largest continuous source of semiconductors.

100% AUTHORIZED AND GUARANTEED

Rochester Electronics®

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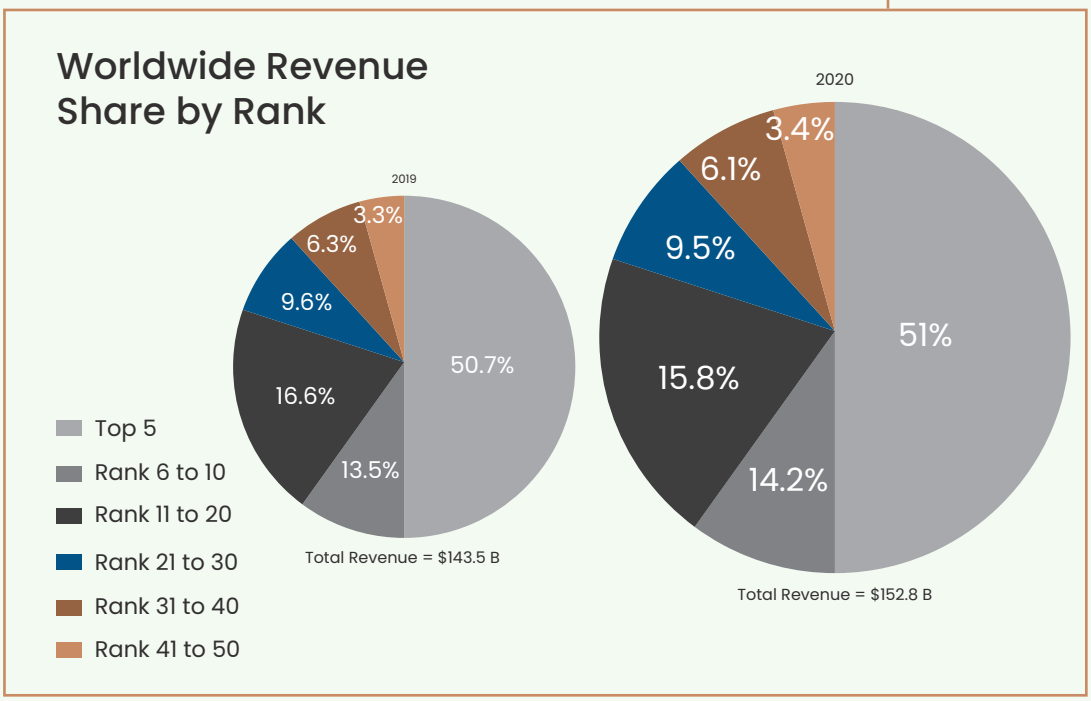
Authorized Distribution | Licensed Manufacturing | Manufacturing Services

The top five worldwide distributors maintained a stable 51% share of total worldwide revenues among the Top 50. However, the strongest growth as a group came from the companies ranked from 6 through 10 with combined growth of 11.5%. The strongest growth among the Top 5 came from WPG with 21.2% growth followed by Macnica with 13.3% growth. Avnet experienced a -3.7% decline in 2020. There are a notable number of electronic component distributors with significant revenues that did not achieve ranking in the Top 50. If it is estimated that the Top 50 account for 90% of all worldwide revenue, the global electronic component authorized distributor market would be estimated at $170 B.



> There are a notable number of electronic component distributors with significant revenues that did not achieve ranking in the Top 50

Continue on page 51 >

SAGER ELECTRONICS, 135 YEARS OF INNOVATION AND SERVICE

Sager Electronics is a North American electronic component distributor of interconnect, power, electromechanical, and thermal products from leading manufacturers worldwide, and a provider of custom design and manufacturing solutions. Grounded in 135 years of innovation and service, Sager provides customers and suppliers a unique combination of operational excellence and innovative business solutions through its Distributing Confidence® business model.

Proud Tradition of Innovation and Service

Sager Electronics began in 1887 as a single storefront in downtown Boston that serviced the growing interest in radio technology. Under the vision and leadership of Joe Sager, the company rapidly established a statewide distribution system for home radios and related components. Despite the onset of the Great Depression, Sager continued to grow by bringing new electrical products to Massachusetts' consumers.

From Retailer to Distributor

At the onset of WWII, Sager reacted to the critical demand for electronic components. The company refocused its operations to supply electromechanical components to the U.S. military. This transition positioned Sager to emerge as the leading regional electronic component distributor at the beginning of the consumer electronics market in the 1950s and 60s.

From Regional to National Prominence

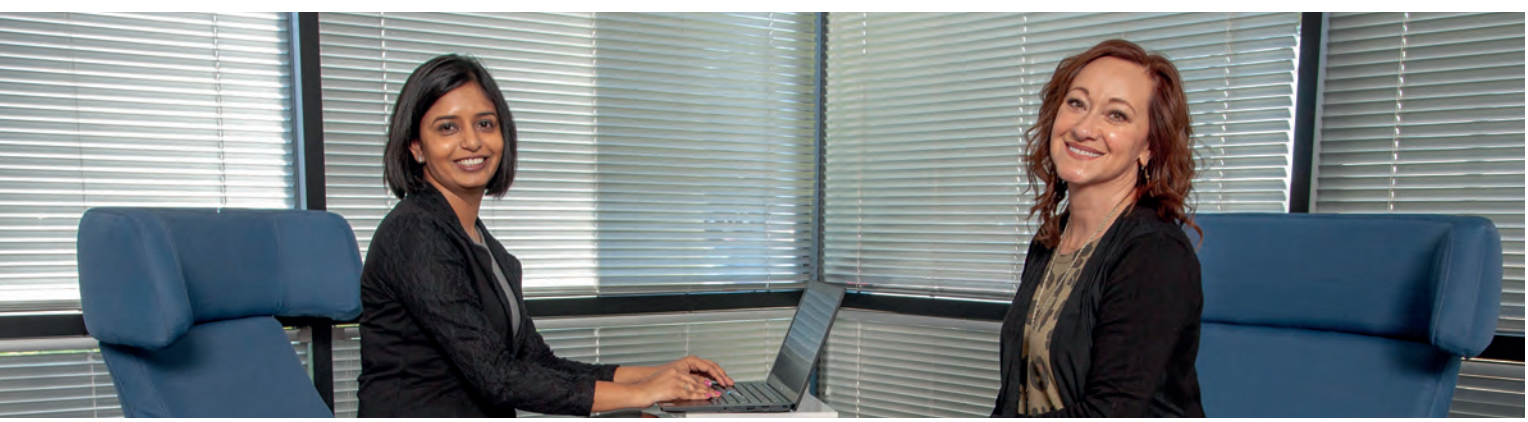
Anticipating the explosive growth in electronics, in 1977, Sager relocated headquarters to Hingham, MA and began building a national network and infrastructure. This included the prudent acquisition of smaller regional distributors and the creation of regional support facilities to service an expanding network of customers and suppliers.

In 2012, Sager Electronics was acquired by TTI Inc., a Berkshire Hathaway Inc. company. As a wholly owned subsidiary of TTI Inc., Sager operates independently and has made a number of acquisitions to support its business. In June 2014, Sager acquired PowerGate LLC, a premier North American power specialist distributor. This acquisition preceded Sager's 2015 purchase of Norvell Electronics, a North American power products distributor with extensive design and value-add capabilities. Sager acquired Power Sources Unlimited Inc. in 2017, and in 2019 completed the acquisition of Technical Power Systems, a battery custom solutions provider.

Headquartered in Middleborough, MA, Sager operates a network of field sales representatives and power systems sales engineers, strategically located service centers across North America, two state-of-the-art distribution centers (a 100,000 SF facility in MA and a 40,000 SF facility in TX), and two custom design and manufacturing facilities in Carrollton, TX, and Lisle, IL.

From National Prominence to Distributing Confidence®

Since 1887, the key to Sager's success has been the commitment to exceeding customer expectations. Sager's Distributing Confidence® business model puts customers' needs front and center. From services like bonded inventory, VMI, BOM quoting, and credit, to custom design and manufacturing capabilities to a branded line card of authorized manufacturers, Sager Electronics is a trusted advisor and partner with customers.



THE BEST RESOURCE FOR DESIGNERS AND BUYERS ALIKE

Digi-Key Electronics, a global Internet-based distributor of electronic components and automation products, is an authorized distributor of more than 11.7 million components from over 1,900 trusted suppliers. The company's reputation extends worldwide as the provider of the widest selection of electronic components in the industry, ready for immediate shipment. With products available in both design and production quantities, Digi-Key is the best resource for designers and buyers alike.

Broad product availability distinguishes Digi-Key from other electronic component distributors. New products are added every day in a continuous effort to offer the full range of electronic components and automation products required by customers. From semiconductor to passive and interconnect, electromechanical to wireless and lighting components, Digi-Key carries the parts you need when you need them.

Digi-Key is finalizing construction of a 2.2 million square foot Product Distribution Center expansion in Thief River Falls, Minnesota that will enable the company to broaden inventory even further to meet the current and future demands of customers. It will also empower the company to search out new and innovative technologies and products from both existing and new supplier partners, allowing Digi-Key to continue being a one-stop-shop for customers in all industries.

Digi-Key's Marketplace gives customers access to even more products and services, including bare PCB boards and industrial robotics. This added solution provides a singular shopping experience to serve customers in applications such as industrial automation, test and measurement, IoT solutions, and virtually all things related to technology innovation.

The company offers a vast selection of online resources including a range of EDA and design tools, reference design library, product selectors, parametric search, on-demand multimedia library, comprehensive article library, community forums, conversion calculators, and more. Digi-Key also provides numerous Supply Chain solutions such as APIs, EDI, and Punchout eProcurement options, bonded inventory, and just-in-time shipping. The website is updated regularly with new features in response to customer feedback and industry needs.

Digi-Key recently launched myLists, merging the features and capabilities from several previous list management tools into a single solution. New features include the ability to incorporate up to 1,000 parts, in-line suggestions of alternative parts when available, and an attrition calculator to plan for overages needed for parts lost or damaged during manufacturing.

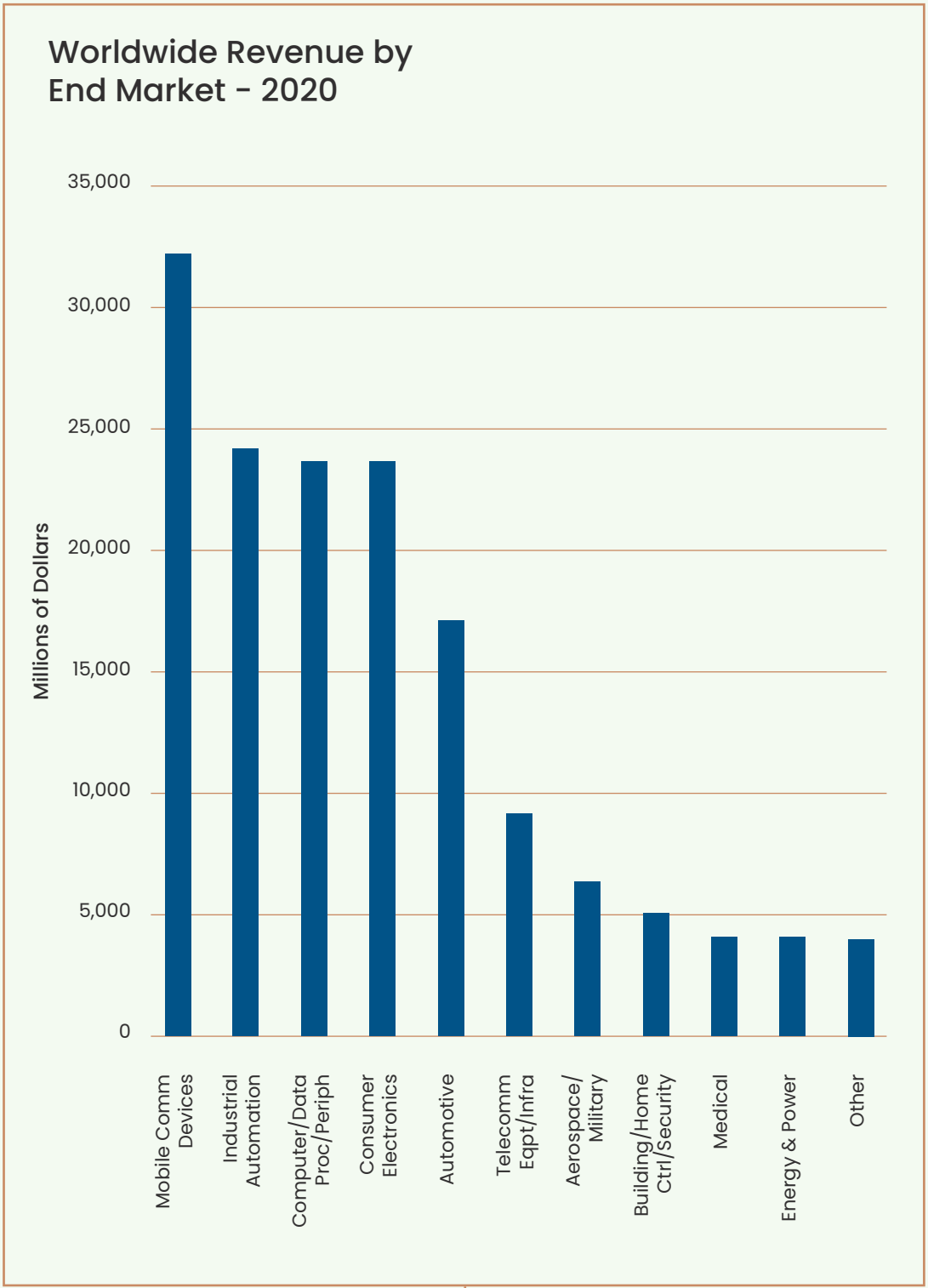
Digi-Key prides itself on its ability to provide the best possible service to customers, who can order electronic components and automation products or reach the talented Digi-Key customer support team 24 hours a day, seven days a week, 365 days a year, by phone, fax, e-mail, or webchat.

From prototype to production, Digi-Key has the resources and products to fuel innovation and take your design to the next level!

www.digikey.com

Digi-Key recently launched myLists

Thief River Falls, MN 56701
800-344-4539
sales@digikey.com
www.digikey.com



Continue on page 54 >

Pictured: Anaheim, CA. 1 of 7 strategically placed North American distribution centers

Company Overview:

- Founded in 1973
- 500+ Employees
- 350+ Sales Account Managers
- 3.8 Million Products
- 7 Distribution Centers
- AS9100/AS9120/ISO9001 Certified

ABOUT BISCO

Since 1973, bisco industries has been a premier distributor of Electronic Components and Fasteners used for production in the Aerospace, Communication, Computer, Fabrication, Industrial Equipment, Instrumentation, Marine, and Military Industries.

UNSURPASSED CUSTOMER SERVICE

bisco helps their customers reduce cost and increase efficiency in their supply chain by maintaining a local sales team, providing customized services, and housing a robust inventory across thousands of product categories.

bisco's 350+ sales representatives are located throughout 49 strategically placed offices to best serve their local markets. While other distributors refer smaller customers to call centers, bisco industries understands that every customer deserves personalized service. That is why every inquiry is directed to a local sales professional, specialized in an industry vertical, who will be able to quote, provide feedback, or recommend an alternative item within four hours. When you contact bisco, you can count on speaking with an account manager who will assist you with anything from finding the right part number to tracking your shipped order. That's the bisco difference!

A VALUABLE PARTNER TO YOUR SUPPLY CHAIN

bisco's approach to supply chain management analyzes stock levels and usage trends to ensure strategic inventory in their 7 distribution centers, shorter lead times, and reduced costs to the entire chain. bisco's distribution centers have been tactically placed so customers have the inventory they need without the use of expedited shipping. These warehouses can be found in San Jose, CA, Anaheim, CA, Irving, TX, Chicago, IL, Atlanta, GA, Boston, MA and Toronto, Canada.

EQUIPPED FOR CONTINUED GROWTH

The recent relocation of their corporate headquarters in Anaheim, CA completed a multiyear initiative to more than double their warehousing space and make room for their ever-expanding sales and operations teams. In a year filled with challenges, bisco managed to increase their headcount in 2020 adding several knowledgeable and experienced team members to an already industry-leading group.

Customers depend on bisco's expert sales and supply chain teams to help mitigate risks in their production processes including material shortages and increased costs for raw goods which have recently been affecting several verticals. Bisco brings value by partnering with their customers to stock inventory and forecast shortages.

With two additional North American sales offices scheduled to open in 2021 and their first International sales office on the horizon, bisco is advantageously positioned to continue their path onward and upward. Contact your local sales office or visit bisco industries online today to see how the bisco difference can help your organization grow.

bisco industries
Headquarters: Anaheim, CA
www.biscoind.com
info@biscoind.com
US: 800.323.1232
Canada: 800.258.2693

7

Distribution Centers

600+

Industries Served

350+

Local Sales Reps

150+

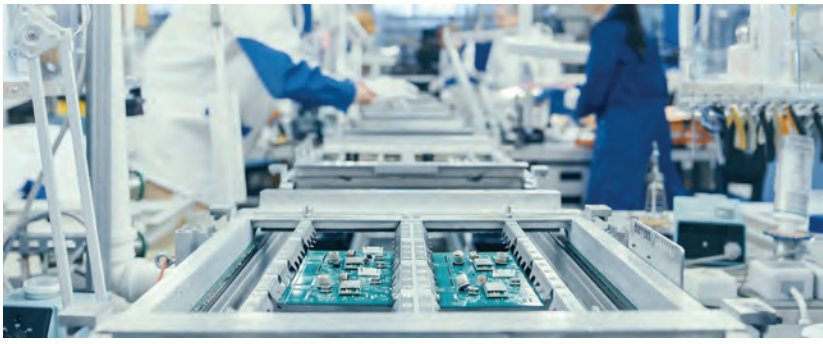
Authorized Lines

49

North American Sales Offices

48

Years of Continued Success



The inventory you need, where you need it

Call Us Today!

bisco INDUSTRIES®

Top 10 semiconductor (active) sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 50 Total Sales (Percent)
1	WPG Holdings	19,112.8	16.08
2	Arrow Electronics, Inc.	15,582.0	13.11
3	Avnet	13,574.2	11.42
4	WT Microelectronics	11,990.1	10.09
5	Supreme Electronics	4,574.6	3.85
6	Macnica	4,488.0	3.78
7	EDOM Technology	3,684.5	3.10
8	Nexty Electronics	3,661.8	3.08
9	Future Electronics	3,570.0	3.00
10	CECport	3,393.0	2.85

Top 10 passive component sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 50 Total Sales (Percent)
1	TTI Inc	1,516.2	15.58
2	WPG Holdings	1,122.3	11.53
3	Avnet	910.9	9.36
4	Arrow Electronics, Inc.	688.9	7.08
5	Digi-Key Electronics	614.0	6.31
6	Macnica	408.0	4.19
7	Nanjing Sunlord Electronics	404.6	4.16
8	Mouser Electronics	386.1	3.97
9	Shenzhen Huaxinke Technology (HXK)	381.0	3.91
10	Future Electronics	367.2	3.77

Top 10 electro-mechanical sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 50 Total Sales (Percent)
1	Avnet	607.3	12.11
2	Arrow Electronics, Inc.	488.0	9.73
3	RS Components/Allied Electronics	357.4	7.13
4	Macnica	340.0	6.78
5	Techtronics	320.0	6.38
6	Xiamen Holder Electronics	270.3	5.39
7	Digi-Key Electronics	261.2	5.21
8	Future Electronics	260.1	5.19
9	Ryosan	223.4	4.46
10	Mouser Electronics	203.2	4.05

Top 10 interconnect sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 50 Total Sales (Percent)
1	Avnet	2,054.0	18.91
2	Arrow Electronics, Inc.	1,693.5	15.59
3	TTI Inc	1,231.1	11.34
4	Future Electronics	902.7	8.31
5	DAC / Heilind	825.7	7.60
6	Macnica	680.0	6.26
7	Digi-Key Electronics	612.1	5.64
8	RS Components/Allied Electronics	421.2	3.88
9	Mouser Electronics	386.1	3.55
10	Xiamen Holder Electronics	317.3	2.92

Top 10 computer/system/other product sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 50 Total Sales (Percent)
1	Arrow Electronics, Inc.	2,050.3	24.76
2	RS Components/Allied Electronics	1,442.3	17.42
3	Macnica	884.0	10.68
4	WISEWHEEL	830.0	10.02
5	Avnet	714.4	8.63
6	Digi-Key Electronics	338.1	4.08
7	SaMT	231.4	2.79
8	WPG Holdings	227.2	2.74
9	Promate	208.6	2.52
10	Sager Electronics	200.3	2.42

Top 10 distributors by sales growth

Rank 2020	Company	Sales Growth 2020/2019 (Percentage)	2020 Worldwide ($ Millions)	2019 Worldwide ($ Millions)
1	Nanjing Sunlord Electronics	36.0	476.0	350.0
2	Zenitron	33.7	1,167.8	873.2
3	Herewin	28.2	1,667.0	1,300.0
4	Supreme Electronics	28.1	4,668.7	3,644.5
5	WeiKeng	27.0	1,983.2	1,561.1
6	ROAD WELL	26.7	735.0	580.0
7	Promate	22.7	906.9	738.8
8	WPG Holdings	21.2	20,706.6	17,079.0
9	Smart-Core Holdings	17.5	714.4	607.8
10	EDOM Technology	17.5	3,684.5	3,136.0

Continue on page 56 >

RUTRONIK – THE FAMILY-OWNED GLOBAL BROADLINER

Founded in 1973 by Helmut Rudel in Ispringen, Germany, Rutronik has developed from a "one-man-company" into one of the worldwide leading broadline distributors for electronic components. The company employs more than 1.800 people worldwide. In the electronic components market, Rutronik currently ranks 10th worldwide and is the third-largest European distributor, according to the Source Today ranking. The Rutronik product range includes semiconductors, passive and electromechanical components as well as embedded boards, storage technologies, displays, and wireless products. In addition to its comprehensive line of components, Rutronik delivers consulting services for technical, commercial, and logistical issues for its customers, as well as unparalleled service and technical support with a consistently high level of quality to its customers worldwide. Rutronik operates as an independent, family-owned company from its German headquarters.

Rutronik has a dense pan-European network of sales offices to guarantee all-encompassing customer support. Rutronik Inc. with headquarters in Plano, TX serves the North American market with a warehouse in Austin, TX. Regional sales offices and Field Application Engineers throughout the country support our customers in the US and Mexico locally. Rutronik will support its customers wherever they are in the world. Our Asian subsidiaries with seven offices in China, Hong Kong, Taiwan, and Thailand support customers in the Asian market.

After more than 48 years in distribution, Rutronik is not done growing. Guided by our philosophy "committed to excellence" we are further expanding in North America, Asia, and Europe while consistently offering a high level of support. We are excited about the future ahead and are working tirelessly to stay the trusted solution provider for our customers and partners.

Rutronik is an ECIA Authorized distributor

For more information, please visit www.Rutronik.com
Contact us at: sales-na@rutronik.com
Phone: +1 469-782-0900

Rutronik, CEO, Thomas Rudel

Top 50 Asian Authorized Distributors

Rank 2020	Company	2020 Asia Total ($ Millions)	Share of Top 50 Total Sales (%)	2020 Revenue ($ Millions)								
				Mainland China / Hong Kong	Taiwan	Japan	South Korea	India	Vietnam	Malaysia / Singapore	Australia / New Zealand	Other Asian Countries
1	WPG Holdings	20,466.1	17.83	16,282.4	2,928.1	72.4	48.3	362.2	220.8	331.1	-	220.8
2	WT Microelectronics	11,990.1	10.44	7,881.6	1,854.1	-	592.1	273.3	435.7	675.5	-	277.8
3	Arrow Electronics, Inc.	9,332.0	8.13	4,786.0	875.4	724.3	204.4	946.5	408.8	426.6	515.5	444.4
4	Avnet	7,517.0	6.55	4,072.4	1,067.7	851.4	191.0	364.2	306.8	313.0	156.5	194.1
5	Macnica	5,938.0	5.17	2,585.9	287.3	2,011.3	95.8	383.1	-	383.1	-	191.5
6	Supreme Electronics	4,546.7	3.96	3,416.3	1,099.6	-	-	-	-	30.8	-	-
7	CECport	3,900.0	3.40	3,432.0	312.0	-	-	-	-	156.0	-	-
8	Nexty Electronics	3,804.0	3.31	1,277.6	321.4	1,218.6	131.2	372.5	-	279.4	-	203.3
9	EDOM Technology	3,638.5	3.17	2,146.7	1,164.3	-	-	-	181.9	109.2	-	36.4
10	Techtronics	3,200.0	2.79	3,104.0	-	-	-	-	-	96.0	-	-
11	S.A.S. Dragon	2,533.0	2.21	2,437.8	46.8	-	-	2.5	21.0	19.6	-	5.2
12	Marubun	2,306.4	2.01	634.1	184.5	967.6	336.0	-	-	115.3	-	68.8
13	WISEWHEEL	2,075.0	1.81	2,075.0	-	-	-	-	-	-	-	-
14	WeiKeng	1,983.2	1.73	1,665.1	190.6	-	-	-	-	-	-	127.5
15	Restar Group	1,877.0	1.63	646.4	163.2	683.9	207.3	-	69.4	62.8	-	44.1
16	Ryosan	1,861.8	1.62	539.0	64.8	999.5	27.6	46.2	-	138.6	-	46.2
17	Future Electronics	1,850.0	1.61	1,110.0	92.5	74.0	74.0	74.0	74.0	277.5	74.0	-
18	Herewin	1,667.0	1.45	1,667.0	-	-	-	-	-	-	-	-
19	Gain Hero	1,650.0	1.44	990.0	247.5	165.0	-	82.5	-	165.0	-	-
20	Wuhan P&S Information Technology	1,501.8	1.31	1,351.6	75.1	-	-	-	-	45.1	-	30.0
21	Kanematsu	1,461.5	1.27	248.5	87.7	847.7	73.1	58.5	58.5	43.8	-	43.8
22	Alltek Technology Corp	1,424.3	1.24	1,253.4	113.9	-	-	-	-	57.0	-	-
23	Xiamen Holder Electronics	1,175.0	1.02	1,175.0	-	-	-	-	-	-	-	-
24	Zenitron	1,167.8	1.02	939.3	184.0	-	-	-	-	-	-	44.4
25	SIIX	1,144.5	1.00	366.3	206.0	404.8	-	-	45.8	68.7	-	53.0
26	YITOA	1,132.9	0.99	1,132.9	-	-	-	-	-	-	-	-
27	Excelpoint	1,105.3	0.96	852.2	-	-	-	35.4	44.2	78.5	33.2	61.9
28	SaMT	1,052.0	0.92	399.7	-	-	652.2	-	-	-	-	-
29	Ryoden	978.4	0.85	225.0	78.3	587.0	-	-	19.6	48.9	-	19.6
30	Cogobuy.com	896.6	0.78	857.7	-	-	-	-	-	38.9	-	-
31	Promate	830.2	0.72	278.2	286.4	224.2	-	-	-	41.5	-	-
32	Best of Best Holdings (BoB)	780.0	0.68	733.2	31.2	-	-	-	-	15.6	-	-
33	SUNRAY	752.5	0.66	752.5	-	-	-	-	-	-	-	-
34	ROAD WELL	735.0	0.64	698.3	-	-	-	-	-	36.8	-	-
35	Smart-Core Holdings	714.4	0.62	714.4	-	-	-	-	-	-	-	-
36	CoreStaff	710.0	0.62	49.7	-	639.0	-	-	-	-	-	21.3
37	Serial Microelectronics	685.3	0.60	380.1	57.2	-	32.6	41.1	27.4	82.2	-	64.7
38	Shenzhen Huaxinke Technology (HXK)	635.0	0.55	635.0	-	-	-	-	-	-	-	-
39	Mouser Electronics	520.5	0.45	234.2	36.4	62.5	52.1	31.2	5.2	52.1	26.0	20.8
40	Digi-Key Electronics	479.9	0.42	177.5	24.0	67.2	38.4	28.8	4.8	62.4	33.6	43.2
41	Nanjing Sunlord Electronics	476.0	0.41	395.1	42.8	-	-	-	-	28.6	-	9.5
42	Willas-Array	438.5	0.38	429.3	9.2	-	-	-	-	-	-	-
43	Upstar Technology	438.0	0.38	438.0	-	-	-	-	-	-	-	-
44	TTI Inc	436.1	0.38	282.6	21.8	0.9	8.7	11.8	0.4	75.4	0.9	33.6
45	Glorison	435.0	0.38	369.8	39.2	-	-	26.1	-	-	-	-
46	RS Components/Allied Electronics	268.0	0.23	-	-	-	-	-	-	-	-	-
47	Rutronik Electronics Worldwide	163.5	0.14	106.3	19.6	-	-	8.2	-	19.6	-	9.8
48	DAC / Heilind	100.0	0.09	75.0	12.0	-	0.4	5.0	0.4	7.0	-	0.2
49	Master Electronics	57.0	0.05	39.9	-	-	-	-	-	17.1	-	-
50	Sager Electronics	-	-	-	-	-	-	-	-	-	-	-
	TOTAL TOP 50		100.00	114,816.4	76,390.4	12,242.7	10,634.2	2,780.3	3,160.7	1,929.8	4,413.9	915.7

Continue on page 58 >

TOP 50
DISTRIBUTORS
REPORTS
FROM 2021

BE SURE TO RESERVE YOUR SPACE FOR 2022

Top 50 Worldwide Authorized Distributors

Rank 2020	Rank 2019	Company	Type*	Headquarters	2020 Worldwide ($ Millions)	Growth 2020/2019 (Percent)	Share of Top 50 Total Sales (Percent)	Sales Share by Region (Percent)			Semiconductor (Active)
								Americas	EMEA	Asia	
1	3	WPG Holdings	1	Taiwan	20,706.6	21.2	13.56	1.0	0.2	98.8	92.3
2	1	Arrow Electronics, Inc.	1	USA	20,502.7	1.2	13.42	30.2	24.3	45.5	76.0
3	2	Avnet (1)	1	USA	17,860.8	-3.7	11.69	26.1	31.8	42.1	76.0
4	4	WT Microelectronics	1	Taiwan	11,990.1	10.5	7.85	0.0	0.0	100.0	100.0
5	5	Macnica	1	Japan	6,800.0	13.3	4.45	7.0	5.6	87.3	66.0
6	6	Future Electronics	1	Canada	5,100.0	2.0	3.34	39.2	24.5	36.3	70.0
7	8	Supreme Electronics	1	Taiwan	4,668.7	28.1	3.06	2.6	0.0	97.4	98.0
8	7	Nexty Electronics (2)	1	Japan	4,308.0	6.4	2.82	6.8	4.9	88.3	85.0
9	9	CECport 中电港	1	China	3,900.0	8.3	2.55	0.0	0.0	100.0	87.0
10	10	EDOM Technology	1	Taiwan	3,684.5	17.5	2.41	1.0	0.2	98.8	100.0
11	11	Techtronics 泰科源	1	China	3,200.0	6.7	2.09	0.0	0.0	100.0	82.0
12	12	TTI Inc	2	USA	2,893.1	-2.3	1.89	50.1	34.8	15.1	-
13	13	Digi-Key Electronics	3	USA	2,870.0	3.6	1.88	59.2	24.0	16.7	36.4
14	16	S.A.S. Dragon	1	China	2,572.5	11.9	1.68	1.5	0.0	98.5	85.0
15	14	RS Components/Allied Electronics	1	U.K.	2,552.7	1.4	1.67	25.9	63.6	10.5	10.0
16	15	Marubun	2	Japan	2,317.8	-8.1	1.52	0.3	0.1	99.5	100.0
17	18	WISEWHEEL 唯时信	2	China	2,075.0	3.8	1.36	0.0	0.0	100.0	50.0
18	20	Mouser Electronics	3	USA	2,032.0	9.8	1.33	46.4	28.0	25.6	48.0
19	23	WeiKeng	1	Taiwan	1,983.2	27.0	1.30	0.0	0.0	100.0	94.0
20	17	Restar Group (3)	2	Japan	1,878.9	-16.4	1.23	0.1	0.0	99.9	95.0
21	21	Ryosan	1	Japan	1,861.8	8.1	1.22	0.0	0.0	100.0	63.8
22	25	Herewin 海盈科技集团	2	China	1,667.0	28.2	1.09	0.0	0.0	100.0	90.0
23	24	Gain Hero 蓝源实业	1	China	1,650.0	17.0	1.08	0.0	0.0	100.0	81.0
24	19	Wuhan P&S Information Technology 力源信息	1	China	1,501.8	-21.0	0.98	0.0	0.0	100.0	93.0
25	22	Kanematsu	2	Japan	1,461.5	-12.5	0.96	0.0	0.0	100.0	95.0
26	27	Alltek Technology Corp	1	Taiwan	1,424.3	11.2	0.93	0.0	0.0	100.0	93.0
27	29	SIIX	1	Japan	1,407.7	14.7	0.92	14.6	4.1	81.3	100.0
28	31	Xiamen Holder Electronics 信和达 (Xiamen Xinheda Electronics)	4	China	1,175.0	8.3	0.77	0.0	0.0	100.0	20.0
29	35	Zenitron	4	Taiwan	1,167.8	33.7	0.76	0.0	0.0	100.0	87.6
30	26	YITOA 英唐智控	2	China	1,132.9	-12.7	0.74	0.0	0.0	100.0	100.0
31	30	Ryoden	1	Japan	1,013.9	-12.7	0.66	2.5	1.0	96.5	58.0
32	33	Excelpoint	1	Singapore	1,108.6	13.5	0.73	0.3	0.0	99.7	90.0
33	28	Rutronik Electronics Worldwide	1	Germany	1,090.0	-11.4	0.71	2.0	83.0	15.0	65.0
34	32	SaMT	2	South Korea	1,052.0	1.3	0.69	0.0	0.0	100.0	78.0
35	34	DAC / Heilind	2	USA	962.4	-0.3	0.63	82.7	6.9	10.4	-
36	39	Promate	1	Taiwan	906.9	22.7	0.59	5.8	2.7	91.5	77.0
37	36	Cogobuy.com 科通芯城	1	China	896.6	6.0	0.59	0.0	0.0	100.0	82.0
38	40	CoreStaff	1	Japan	800.0	11.1	0.52	10.0	1.3	88.8	55.8
39	38	Best of Best Holdings (4) - BoB Holdings 好上好控股	1	China	780.0	5.3	0.51	0.0	0.0	100.0	80.0
40	41	SUNRAY 新雷科技	1	China	752.5	8.3	0.49	0.0	0.0	100.0	65.0
41	44	ROAD WELL 路必康	1	China	735.0	26.7	0.48	0.0	0.0	100.0	85.0
42	42	Smart-Core Holdings 芯智控股	1	China	714.4	17.5	0.47	0.0	0.0	100.0	100.0
43	37	Serial Microelectronics	1	Singapore	685.3	-9.5	0.45	0.0	0.0	100.0	79.0
44	43	Shenzhen Huaxinke Technology (HXK) 华信科	1	China	635.0	8.5	0.42	0.0	0.0	100.0	25.0
45	48	Nanjing Sunlord Electronics 南京商络	2	China	476.0	36.0	0.31	0.0	0.0	100.0	15.0
46	45	Willas-Array	2	China	438.5	4.4	0.29	0.0	0.0	100.0	75.0
47	46	Upstar Technology 博思达	2	China	438.0	9.5	0.29	0.0	0.0	100.0	100.0
48	47	Glorison 荣采集团	2	China	435.0	14.5	0.28	0.0	0.0	100.0	50.0
49	50	Master Electronics	1	USA	342.0	15.5	0.22	83.3	0.0	16.7	73.0
50	49	Sager Electronics	2	USA	313.0	-2.2	0.20	100.0	0.0	0.0	-
		TOTAL TOP 50			**152,757.1**	**6.4**	**100.00**	**13.4**	**11.4**	**75.2**	**77.8**

*Type of Distributor: 1 = Broadline; 2 = Specialized; 3 = High Service/E-Catalog; 4 = Limited Line

(1) Avnet includes Farnell (2) Nexty Electronics includes Toyota Tsusho and Tomen (3) Restar Group includes UKC Electronics and Restar Electronics (4) Best of Best Holdings includes Honestar & AsiaCom Technology Alliance

Sales Share by Component (Percent)						
Passive Component	Electro-Mechanical	Interconnect	Computer / Systems	Other	Offer design services?	Website allows purchase of parts?
5.4	0.4	0.7	0.6	0.5	Y	Y
3.4	2.4	8.3	8.0	2.0	Y	Y
5.1	3.4	11.5	2.5	1.5	Y	Y
–	–	–	–	–	Y	N
6.0	5.0	10.0	12.0	1.0	Y	N
7.2	5.1	17.7	–	–	Y	Y
–	–	–	–	2.0	N	N
4.0	3.0	5.0	1.0	2.0	Y	N
6.0	2.0	5.0	–	–	Y	Y
–	–	–	–	–	Y	Y
8.0	10.0	–	–	–	Y	N
52.4	5.0	42.6	–	–	N	Y
21.4	9.1	21.3	3.4	8.4	Y	Y
3.0	4.0	2.0	–	6.0	Y	N
3.0	14.0	16.5	–	56.5	Y	Y
–	–	–	–	–	Y	N
10.0	–	–	–	40.0	N	N
19.0	10.0	19.0	–	4.0	N	Y
5.0	–	0.9	–	0.1	Y	N
4.0	–	1.0	–	–	Y	N
8.0	12.0	9.8	–	6.4	Y	N
–	3.0	7.0	–	–	Y	N
4.0	–	3.0	5.0	7.0	Y	N
5.0	–	2.0	–	–	N	Y
–	–	–	–	5.0	Y	N
7.0	–	–	–	–	N	N
–	–	–	–	–	Y	N
30.0	23.0	27.0	–	–	N	Y
12.4	–	–	–	–	N	N
–	–	–	–	–	N	N
8.0	10.0	14.0	–	10.0	Y	N
7.0	3.0	–	–	–	Y	N
6.0	7.0	5.0	5.0	12.0	Y	Y
–	–	–	–	22.0	N	N
–	14.2	85.8	–	–	Y	Y
–	–	–	–	23.0	Y	N
5.0	6.0	3.0	–	4.0	N	Y
30.5	6.3	7.5	–	–	Y	Y
7.0	8.0	5.0	–	–	Y	N
20.0	–	–	–	15.0	Y	N
–	–	–	–	15.0	Y	N
–	–	–	–	–	Y	N
9.0	–	12.0	–	–	Y	N
60.0	–	15.0	–	–	N	N
85.0	–	–	–	–	N	Y
13.0	8.0	–	–	4.0	Y	N
–	–	–	–	–	Y	N
13.0	10.0	–	–	27.0	N	N
4.0	6.0	9.0	5.0	3.0	Y	Y
–	14.0	22.0	–	64.0	Y	Y
6.4	**3.3**	**7.1**	**2.3**	**3.1**		

Continue on page 62 >

Average exchange rates used to convert to a common us dollar basis

Curency	2019	2020
Chinese Yuan (¥)	6.904	6.898
Hong Kong Dollar (HK$)	7.836	7.756
Taiwan Dollar (NT$)	30.892	29.454
Japanese Yen (¥)	109.02	106.78
Korean Won (₩)	1,165.7	1,179.2

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Top 10 mainland China / Hong Kong sales

Rank 2020	Company	2020 Mainland China / Hong Kong ($ Millions)	Share of Top 50 Total Sales (Percent)
1	WPG Holdings	16,282.4	21.31
2	WT Microelectronics	7,881.6	10.32
3	Arrow Electronics, Inc.	4,786.0	6.27
4	Avnet	4,072.4	5.33
5	CECport	3,432.0	4.49
6	Supreme Electronics	3,416.3	4.47
7	Techtronics	3,104.0	4.06
8	Macnica	2,585.9	3.39
9	S.A.S. Dragon	2,437.8	3.19
10	EDOM Technology	2,146.7	2.81

Top 10 Taiwan sales

Rank 2020	Company	2020 Taiwan ($ Millions)	Share of Top 50 Total Sales (Percent)
1	WPG Holdings	2,928.1	23.92
2	WT Microelectronics	1,854.1	15.14
3	EDOM Technology	1,164.3	9.51
4	Supreme Electronics	1,099.6	8.98
5	Avnet	1,067.7	8.72
6	Arrow Electronics, Inc.	875.4	7.15
7	Nexty Electronics	321.4	2.62
8	CECport	312.0	2.55
9	Macnica	287.3	2.35
10	Promate	286.4	2.34

Top 10 Japan sales

Rank 2020	Company	2020 Japan ($ Millions)	Share of Top 50 Total Sales (Percent)
1	Macnica	2,011.3	18.91
2	Nexty Electronics	1,218.6	11.46
3	Ryosan	999.5	9.40
4	Marubun	967.6	9.10
5	Avnet	851.4	8.01
6	Kanematsu	847.7	7.97
7	Arrow Electronics, Inc.	724.3	6.81
8	Restar Group	683.9	6.43
9	CoreStaff	639.0	6.01
10	Ryoden	587.0	5.52

Top 10 Malaysia / Singapore sales

Rank 2020	Company	2020 Malaysia / Singapore ($ Millions)	Share of Top 50 Total Sales (Percent)
1	WT Microelectronics	675.5	15.30
2	Arrow Electronics, Inc.	426.6	9.67
3	Macnica	383.1	8.68
4	WPG Holdings	331.1	7.50
5	Avnet	313.0	7.09
6	Nexty Electronics	279.4	6.33
7	Future Electronics	277.5	6.29
8	Gain Hero	165.0	3.74
9	CECport	156.0	3.53
10	Ryosan	138.6	3.14

Top 10 India sales

Rank 2020	Company	2020 India ($ Millions)	Share of Top 50 Total Sales (Percent)
1	Arrow Electronics, Inc.	946.5	29.95
2	Macnica	383.1	12.12
3	Nexty Electronics	372.5	11.79
4	Avnet	364.2	11.52
5	WPG Holdings	362.2	11.46
6	WT Microelectronics	273.3	8.65
7	Gain Hero	82.5	2.61
8	Future Electronics	74.0	2.34
9	Kanematsu	58.5	1.85
10	Ryosan	46.2	1.46

Top 10 South Korea sales

Rank 2020	Company	2020 South Korea ($ Millions)	Share of Top 50 Total Sales (Percent)
1	SaMT	652.2	23.46
2	WT Microelectronics	592.1	21.30
3	Marubun	336.0	12.09
4	Restar Group	207.3	7.46
5	Arrow Electronics, Inc.	204.4	7.35
6	Avnet	191.0	6.87
7	Nexty Electronics	131.2	4.72
8	Macnica	95.8	3.44
9	Future Electronics	74.0	2.66
10	Kanematsu	73.1	2.63

Top 10 Vietnam sales

Rank 2020	Company	2020 Vietnam ($ Millions)	Share of Top 50 Total Sales (Percent)
1	WT Microelectronics	435.7	22.58
2	Arrow Electronics, Inc.	408.8	21.18
3	Avnet	306.8	15.90
4	WPG Holdings	220.8	11.44
5	EDOM Technology	181.9	9.43
6	Future Electronics	74.0	3.83
7	Restar Group	69.4	3.59
8	Kanematsu	58.5	3.03
9	SIIX	45.8	2.37
10	Excelpoint	44.2	2.29

Top 7 Australia /New Zealand sales

Rank 2020	Company	2020 Australia /New Zealand ($ Millions)	Share of Top 50 Total Sales (Percent)
1	Arrow Electronics, Inc.	515.5	61.39
2	Avnet	156.5	18.64
3	Future Electronics	74.0	8.81
4	Digi-Key Electronics	33.6	4.00
5	Excelpoint	33.2	3.95
6	Mouser Electronics	26.0	3.10
7	TTI Inc	0.9	0.11

Top 50 Directory

Alltek Technology Corp
Rank: 26
Distributor Type: Broadline
Headquarters: Taiwan
Address: 9/F, 360 Jui-Kuang Road Neihu District Taipei Taiwan
Website: www.alltek.com
Number: +886-2-2627-5859

Arrow Electronics, Inc.
Rank: 2
Distributor Type: Broadline
Headquarters: USA
Address: 9201 E Dry Creek Rd, Centennial, CO 80112
Website: www.arrow.com
Number: +1-855-326-4757

Avnet (1)
Rank: 3
Distributor Type: Broadline
Headquarters: USA
Address: 2211 South 47th Street, Phoenix, AZ USA 85034
Website: www.avnet.com
Number: +1-480-643-2000

Best of Best Holdings (4) - BoB Holdings 好上好控股
Rank: 39
Distributor Type: Broadline
Headquarters: China
Address: Rm.1502,FIYTA Tech Building,#002 No.1 Southern Rd,Hi-Tech,Nanshan District,Shenzhen 518057,P.R.China
Website: www.bobholdings.com
Number: +86-755-86018818

CECport 中电港
Rank: 9
Distributor Type: Broadline
Headquarters: China
Address: 23rd Floor, Block A, Tanglang City Plaza (West District), 3333 Liuxian Avenue, Taoyuan Street, Nanshan District, Shenzhen, Guangdong Province
Website: www.cecport.com
Number: +(0755) 82583664

Cogobuy.com 科通芯城
Rank: 37
Distributor Type: Broadline
Headquarters: China
Address: 11F, Microsoft Comtech Tower, No.55 Gaoxin South 9th Road, Nanshan District, Shenzhen, China
Website: www.cogobuy.com
Number: +86 400 8830 393

CoreStaff
Rank: 38
Distributor Type: Broadline
Headquarters: Japan
Address: DaiyaGate Ikebukuro Bldg. 8F, 1-16-15 Minami Ikebukuro,Toshima-ku,Tokyo 171-0022 JAPAN
Website: corestaff.co.jp
Number: +81-3-5954-1377

DAC / Heilind
Rank: 35
Distributor Type: Specialized
Headquarters: USA
Address: 58 Jonspin Road, Wilmington, MA 01887
Website: www.heilind.com
Number: +1 (978) 657-4870

Digi-Key Electronics
Rank: 13
Distributor Type: High Service/E-Catalog
Headquarters: USA
Address: 701 Brooks Avenue South, Thief River Falls, MN 56701 USA
Website: www.digikey.com
Number: (+1) 800-344-4539

EDOM Technology
Rank: 10
Distributor Type: Broadline
Headquarters: Taiwan
Address: 8F., No. 50, Ln. 10, Jihu Rd., Neihu Dist., Taipei City 114, Taiwan
Website: www.edomtech.com
Number: +886-2-2657-8811

Excelpoint
Rank: 32
Distributor Type: Broadline
Headquarters: Singapore
Address: 15 Changi Business Park Central 1 #06-00 Singapore 486057
Website: www.excelpoint.com
Number: +65 6741 8966

Future Electronics
Rank: 6
Distributor Type: Broadline
Headquarters: Canada
Address: 237 Hymus Boulevard, Pointe Claire, Quebec, Canada H9R 5C7
Website: www.futureelectronics.com
Number: (+1) 514-694-7710

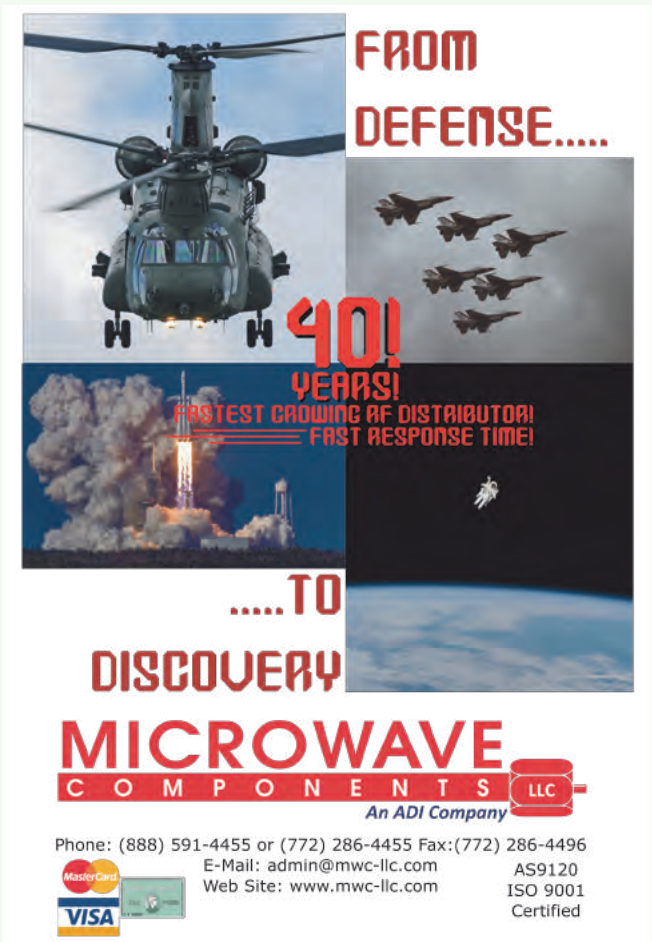
Gain Hero 蓝源实业
Rank: 23
Distributor Type: Broadline
Headquarters: China
Address: Room 1602-1603, Shenzhen Central Business Building, Mintian Road, Futian District, Shenzhen
Website: www.gainhero.cc
Number: 0755-82033405

Glorison 荣采集团
Rank: 48
Distributor Type: Specialized
Headquarters: Hong Kong
Address: Room. 7, 12/F., Block B, Hoi Luen Industrial Centre,55 Hoi Yuen Road, Kwun Tong, Kowloon, Hong Kong.
Website: www.glorison.com.hk
Number: 852-2330 2892

Herewin 海盈科技集团
Rank: 22
Distributor Type: Specialized
Headquarters: China
Address: 17th Floor, Block A, Jingji Binhe times Building, No. 9289 Binhe road, Futian district, Shenzhe
Website: www.herewinhk.com
Number: 0755-83251389

Kanematsu
Rank: 25
Distributor Type: Specialized
Headquarters: Japan
Address: 2-1, Shibaura 1-chome, Minato-ku, Tokyo 105-8005, Japan
Website: www.kanematsu.co.jp
Number: +81 (03)5440-8111

Continue on page 68 >



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Macnica
Rank: 5
Distributor Type: Broadline
Headquarters: Japan
Address: Macnica Bldg. No.1, 1-6-3 Shin-Yokohama, Kohoku-ku, Yokohama, 222-8561 JAPAN
Website: www.macnica.co.jp
Number: +81-45-470-9870

Marubun
Rank: 16
Distributor Type: Specialized
Headquarters: Japan
Address: 8-1, Nihonbashi Odenmacho, Chuo-ku, Tokyo 103-8577
Website: www.marubun.co.jp
Number: +81-(3)-3639-9801

Master Electronics
Rank: 49
Distributor Type: Broadline
Headquarters: USA
Address: 2425 South 21st Street, Phoenix, AZ, 85034
Website: www.masterelectronics.com
Number: (+1) 888-473-5297

Mouser Electronics
Rank: 18
Distributor Type: High Service/E-Catalog
Headquarters: USA
Address: 1000 North Main Street, Mansfield, TX 76063, USA
Website: www.mouser.com
Number: +1 (800) 346-6873

Nanjing Sunlord Electronics 南京商络
Rank: 45
Distributor Type: Specialized
Headquarters: China
Address: C3-9 Floor of Green Window No.4 Yupan West Street, Yuhua District, Nanjing
Website: www.jssunlord.com
Number: 025-83677676

Nexty Electronics (2)
Rank: 8
Distributor Type: Broadline
Headquarters: Japan
Address: 3-13, Konan 2-chome, Minato-ku, Tokyo, 108-8510 Japan
Website: www.nexty-ele.com
Number: +81-3-5462-9611

Promate
Rank: 36
Distributor Type: Broadline
Headquarters: Taiwan
Address: 4F, No. 32, Section 1, Huan Shan Road, Nei Hu District, Taipei 11442, Taiwan
Website: www.promate.com.tw
Number: +886-2-2659-0303

Restar Group (3)
Rank: 20
Distributor Type: Specialized
Headquarters: Japan
Address: 3-6-5 Higashi-Shinagawa, Shinagawa-ku, Tokyo, Japan 140-0002
Website: www.en.restargp.com
Number: +81-3-3458-4618

ROAD WELL 路必康
Rank: 41
Distributor Type: Broadline
Headquarters: China
Address: Shenzhen Shennan Avenue, 20th Floor Hailrun Centre 6021
Website: www.road-well.com
Number: 86-0755-83479990

RS Components/Allied Electronics
Rank: 15
Distributor Type: Broadline
Headquarters: U.K.
Address: 2 Pancras Rd, London N1C 4AG

Website: uk.rs-online.com
Number: (+44) 020 8983 3233

Rutronik Electronics Worldwide
Rank: 33
Distributor Type: Broadline
Headquarters: Germany
Address: Industriestraße 2, 75228 Ispringen, Germany
Website: www.rutronik.com
Number: +49 (0)7231 801-0

Ryoden
Rank: 31
Distributor Type: Broadline
Headquarters: Japan
Address: 3-15-15 Higashi-Ikebukuro, Toshima-ku, Tokyo 170-8448
Website: www.ryoden.co.jp
Number: 03-5936-6111

Ryosan
Rank: 21
Distributor Type: Broadline
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Distributor Type: Broadline
Headquarters: China
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Website: www.huaxinke.cn
Number: +86-0755-27063662

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Website: www.siix.co.jp
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Website: www.smart-core.com.hk
Number: 852-2755 1101

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Website: szsunray.com
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The All Tech founders are all lifetime students of the electronics industries they serve, having witnessed always evolving innovations during the last 40 years. Their combined knowledge and key relationships with important suppliers have driven a successful business model in the DAS market they serve. Specialization and an experienced staff monitor key market metrics to assure All Tech's customers have a thorough understanding of current market trends.

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- IPC/ANSI J-STD-001 — For trim and forming and hot solder dip
- IPC/ANSI J-STD-002 — For Solderability Test
- ANSI STANDARD EIA-481 — For Tape and Reeling

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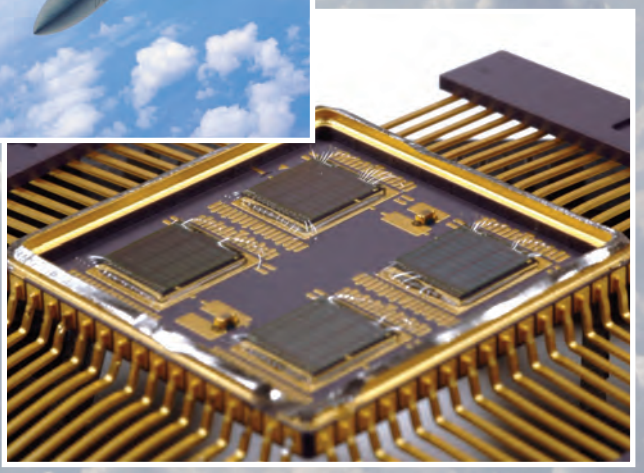

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OVERVIEW

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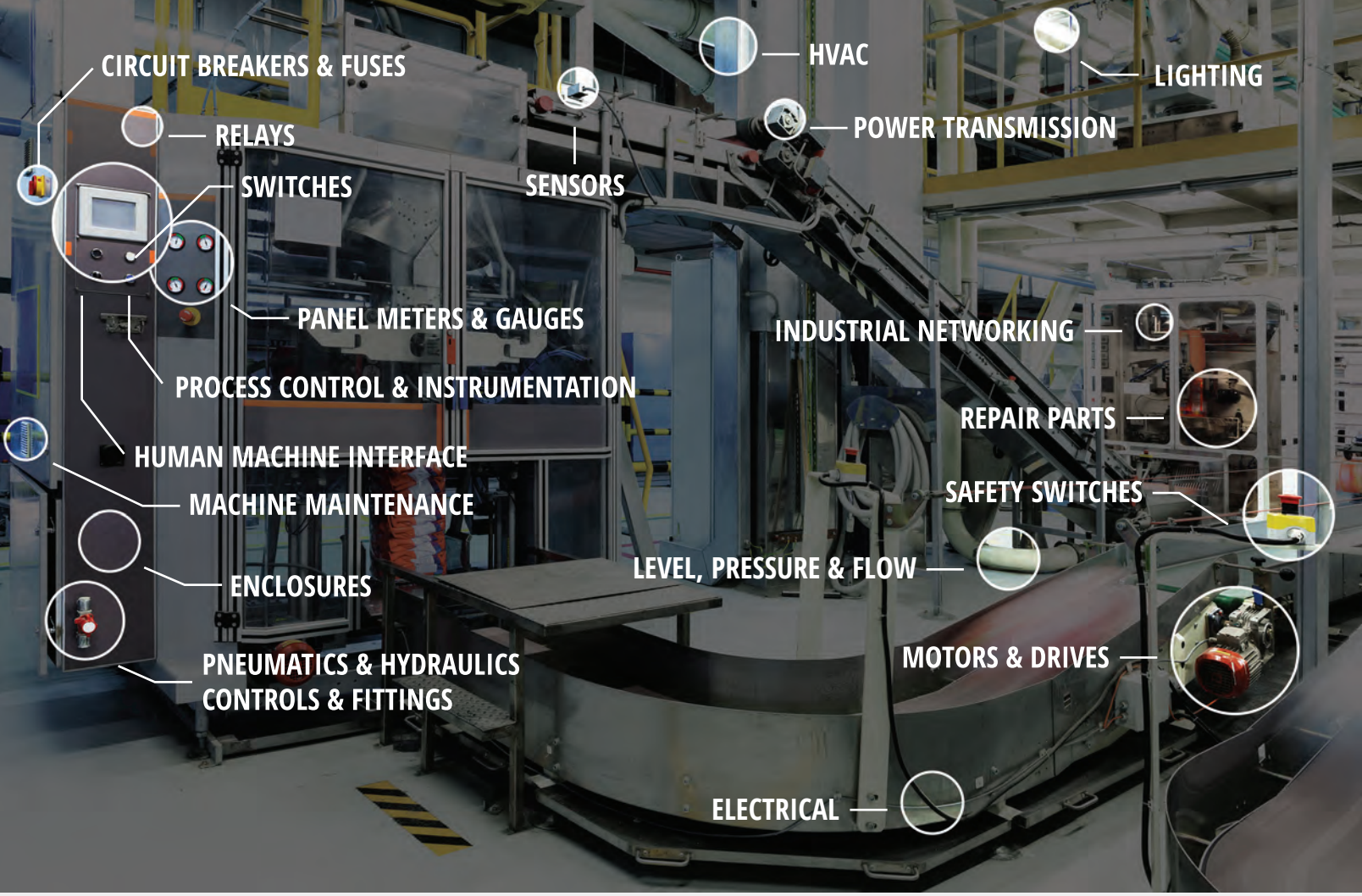

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Standard logic market grows as OEMs and EMS providers increase inventories

The average price will rise this year as unit shipments increase 17 percent

James Carbone

Growing demand and increasing prices will drive revenue growth for standard logic chips as the market rises 21 per cent from $1.26 billion in 2020 to $1.58 billion in 2021, according to researcher IC Insights.

The strong growth rate will follow a year of more modest growth. In 2020, standard logic sales grew just 3 per cent as the average selling price fell about 9 per cent to 6 cents, the researcher said. In 2021 the average price is expected to increase to 7 cents which will contribute to robust 21 per cent sales growth.

Standard logic will have the second highest growth rate of logic product families, according to IC Insights. For instance, gate array sales will decline 33 per cent; standard cell and programmable logic device revenue will rise 10 per cent and display drivers will increase 31 per cent.

"There is some interesting stuff going on with standard logic. Units were up 13.5 per cent in 2020," said Jim Feldhan, president of Semico Research. "That seems to be more than what the end markets grew." At the same time, the average selling price (ASP) fell. He noted in the first half of 2021, prices were "creeping up" and will rise through the rest of the year and the ASP should increase to 6.6 cents as unit shipments grow 22.7 per cent to 24.3 billion units.

"My hypothesis is that OEMs and electronics manufacturing services (EMS) providers are building inventory," said Feldhan. "There is really no good reason why standard logic is growing 22.7 per cent in units. Companies must be adding some inventory just so their production lines don't run the risk of being shut down" for lack of a part that costs less than 7 cents, he said.

Buyers at some companies may be adding inventory for standard logic because prices are still low despite the increases so far this year. In 2015 the average price was about 11 cents and then fell for several years reaching 8.2 cents in 2017 and then 6.3 cents last year, said Feldhan.

Inventory replenishment

Feldhan said inventories are being replenished after an inventory correction in 2019 when unit shipments fell 13.8 per cent and revenue fell 15.8 per cent. But last year during the pandemic demand increased as electronics OEMs built more computers, tablets and video game consoles that needed more parts including standard logic. "It seems like now we are in a two-year inventory build," he said.

Standard logic parts include transistor to transistor (TTL) devices such as basic logic gates, flip-flops, registers and latches among others. "General-purpose logic is a lot like small-signal transistors in that these commodity ICs can be found on many boards—between larger and more expensive ICs," said Ron Lineback, senior analyst for researcher IC Insights.

Standard logic is often used by engineers and assembly houses to quickly fix bugs or tweak performance. In many applications, standard logic chips, which are mostly made with MOS technology, have been replaced by PC logic chipsets, microcontrollers, gate arrays, field programmable gate arrays and special purpose logic ICs, he said.

However, standard logic chips are still needed. Feldhan said standard logic is often used "to fill in some logic gates that don't work on a system on chip (SoC)." Standard

By the Numbers

Source: IC Insights

21%
The growth rate of the standard logic market in 2021

$1.81 billion
The forecasted size of the standard logic market in 2025

$0.07 cents
The average price of a standard logic chip in 2021

$1.5 billion
The forecasted size of the standard logic market in 2021

30.2 billion
The number of standard logic units that are expected to ship in 2025

1%
The average annual rate of decline of standard logic prices from 2020-2021

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logic is "scattered throughout all the applications. Nothing is ever designed perfectly," he said, If an engineer designs something, a year or two later he or she may decide that "another 100k of logic is needed" to enhance the design, he said. "Standard logic is often used primarily to fix missing glitches in the system design."

Avoiding shortages

While standard logic parts are inexpensive, a shortage of TTL chips or other logic parts can shut down production resulting in lost revenue for an OEM.

As with virtually all other semiconductors, lead times for standard logic have stretched. Normal lead times are in the six-to eight-week range . "Lead times now are more than 26 weeks which basically means, they are on allocation," said Robby Ferdinandus, global head of marketing for Nexperia. "That is for all packages," he said. Other manufacturers have similar lead times, according to Ferdinandus.

One reason that lead times may be long is that there aren't as many standard logic manufacturers as there once were. Nexperia, Texas Instruments and ON Semiconductor are the main manufacturers and there are several other smaller ones, he said.

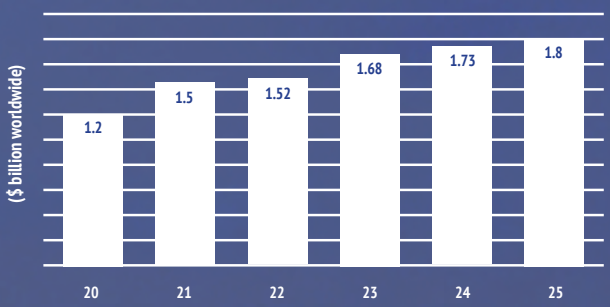
Motorola's standard logic business was sold to ON Semiconductor and Philips spun off its chip business to NXP, which sold the bulk of its standard logic to Nexperia, said Lineback. "ON Semi and NXP have very little sales from general purpose logic," he said.

There are some smaller Chinese and Japanese companies that are also making standard logic. Standard logic ICs are mostly made on 150mm and 200mm wafers and production capacity of such wafer sizes is limited.

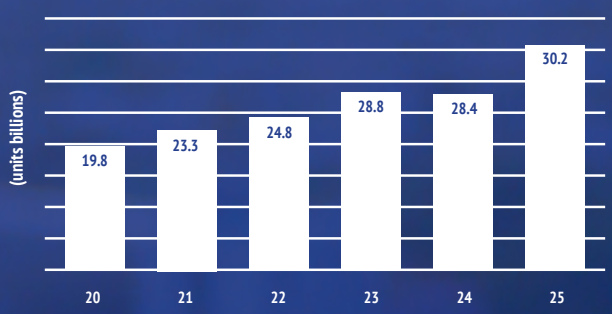
One company that makes rad-hard standard logic products is STMicroelectronics. The IC manufacturer builds high-reliability standard logic for telecommunications applications such as satellites. "Standard logic has been a steady business for years and is geared towards the satellite market which is cyclical," said Thibault Brunet, marketing manager aerospace and special products business unit for ST Microelectronics. ST supplies high-rel logic for telecommunication applications for commercial and government satellites.

The standard logic market will grow an average of 7 percent through 2025.*Source: IC Insights*

Standard logic to post steady growth through 2025



Logic unit shipments to rise 9 percent per year



Unit shipments of standard logic will rise from about 19.9 billion in 2020 to more than 30.2 billion by 2025. *Source: IC Insights*

A marginal impact

Its high-reliability standard logic business was "marginally impacted" by the pandemic, according to Brunet. He noted the space industry suffered a strong downturn before the pandemic which affected ST's high-rel logic business. "Starting in 2018 we had a downturn and it deepened in 2019 and 2020. We suffered a downturn but to me the impact of the pandemic was minor," he said.

The pandemic may have delayed the recovery by a few months but it came on strong in the fourth quarter 2020," said Brunet. The telecom industry boomed with "remote working" and an overall greater need for telecommunications services.

Brunet added 2021 is going to be a strong year overall for the space industry, which will help drive ST's sales of high-rel standard logic chips. Satellite operators are replacing old satellites. For instance, the European Space Agency (ESA) has signed two contracts totaling €1.47 billion, to design and build the first batch of the second generation of Galileo navigation satellites. Contracts have been approved for six new Copernicus satellite missions. Each mission will involve two satellites.

While unit shipments and sales revenue for standard logic will grow over the next five years, buyers can expect other integrated circuits to replace some standard logic ICs in the near future. "We expect the new generation of rad-hard FPGAs, microprocessors and the appearance of rad-tolerant microcontrollers, would likely replace some standard logic, both in traditional space and "new space" applications in the future," said Brunet. New space refers to the recent commercialization of the space sector by companies such as SpaceX and Blue Origin.

He added, however, while some rad-had logic functions could be replaced, others such as bus buffers, level shifters, Schmidt triggers, 18V gates, will be difficult to integrate.

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Future of 5G and the IoT to drive growth in 2022

Thomas Smart, Special Projects Editor at **Electronics Sourcing**

5G is a leap not step forward in the progression of mobile communication, 5G promises a large increase in the data rates it can provide as well as a greater number of connections. Key drivers for the implementation of 5G include the construction of infrastructure to support driverless vehicles (smart highways) and an increase in factory automation facilitated by a greater level of detail being able to be communicated to and from factory systems. Remote asset tracking and monitoring applications can also be expanded due to the large-scale numbers 5G could enable.

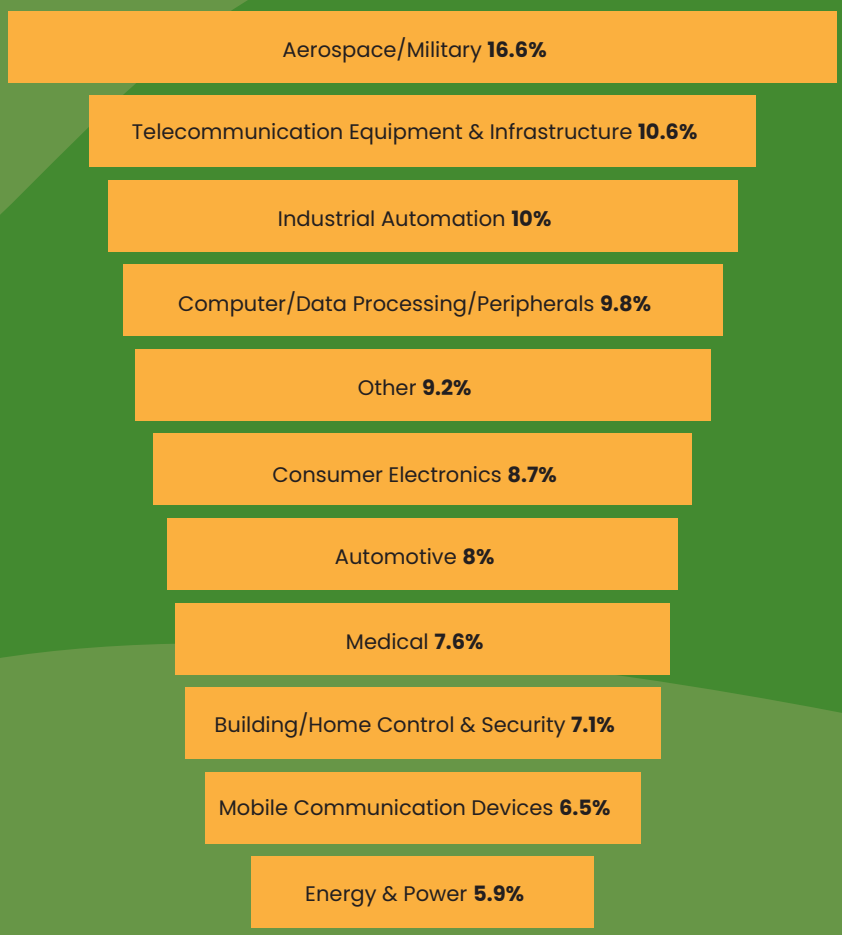
5G's low latency connectivity and high reliability means connected sensors can be deployed in bigger numbers than previously and feed real-time information back instantly. Companies can then analyse and action this data to optimise different aspects of its business and ultimately drive greater efficiency. As this is scaled up, it will become more economically viable for companies to monitor and track a larger range of assets in real time. Predictive maintenance can also be employed to reduce unexpected downtime.

The expectation of what can be achieved using 5G technology has not diminished, but with the arrival of COVID-19 the time in which it will be fully implemented is now uncertain. Despite these setbacks COVID-19 has revealed new dynamics which will have a major impact on some elements of 5G development and they may actually begin to accelerate significantly.

As seen in our North American report independent distributors looking into 2021 have also highlighted the Automotive sector as a key sales growth driver. Advances in autonomous vehicles and the increased prominence of electric vehicles have seen increased demand in automotive components in 2020 which is expected to increase further going into the later stages of 2021. Distributors remain wary of semiconductor shortages and place it as their key issue to navigate.

Independent Distributor Worldwide Revenue Share by End Market – 2020

The biggest end market for distributors was Aerospace/Military 16.6%, followed by Telecommunication Equipment & Infrastructure 10.6%, Industrial Automation 10%, Computer/Data Processing/Peripherals 9.8% and Other 9.2% making up the top five.



Total Revenue = $8596.5 M

Diversify, diversify, diversify

A2 Global Electronics' CEO, Frank Cavallaro, offers buyers a five-point guide to managing their electronics supply chains during this challenging period

America II and Advanced MP Technology merged in 2018 to form A2 Global Electronics. How have purchasers benefitted from this merger?

Combining over 70 years' industry knowledge, expertise and resources of two leading global distribution organizations into one platform significantly expanded the product offerings, services and geographic presence. Customers are benefitting from enhanced customer support and an extended worldwide supplier network in these challenging times.

Extending lead times, increasing component costs and allocation are some of the supply chain concerns readers are facing. How is A2 Global Electronics helping buyers manage these challenges?

Since the start of the pandemic, we adapted our business practices to ensure employee safety while continuing essential operations to support customers. At the beginning of 2021, we relocated and expanded our Asia headquarters and distribution in Singapore to improve customer support and enhance our sourcing network. We also added staff to the procurement, sales and customer service teams to meet growing demand.

Lastly, we have invested in our technology infrastructure, improving quote response times.

How has the distribution sector advanced over recent years and what will the industry look like post-pandemic?

One trend is digital transformation which will drive demand for electronic components across many industries, creating opportunities and challenges for distributors. Internally, since the pandemic we have digitized our business model enabling our organization to work more efficiently across the globe.

The electronic distribution sector is evolving into more than just the distribution of parts. Providing supply chain programs and solutions, such as inventory and end-of-life management, that enable customers to balance over-supply and gain an advantage in their end markets will be critical going forward. This is true for both OEM and EMS companies.

Finally, what advice would you give to readers managing their supply chain in today's challenging climate?

As the electronics industry works to mitigate market shifts, I recommend following the five best practices detailed below.

Automate supply chain activities—Shifting your operations to an 'exception-based model' where you automate routine tasks and handle the exceptions can speed up processes and improve efficiency. Technology can also enhance visibility across the supply chain allowing for better market forecasting.

Reduce supplier risk—Become familiar with your suppliers at a deeper level. This will allow procurement professionals to handle potential sub-standard component hazards better and help mitigate shortages. Also, organizations should measure partners on a broad array of metrics, including internal data, supplier/market data and external data on supplier performance.

Diversify, diversify, diversify—Diversifying your supplier base allows for a more resilient supply chain and creates value during shortages.

Build a buffer—Supply chain uncertainty does not appear to be going away any time soon. Building additional inventory capacity buffers will be needed going forward.

Build strong distributor relationships—Distributors work with customers to mitigate lead time demands and support supply chain disconnects.

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A2 Global Electronics + Solutions, CEO, **Frank Cavallaro**

> **The electronic distribution sector is evolving into more than just the distribution of parts**

Perfect Parts CORPORATION

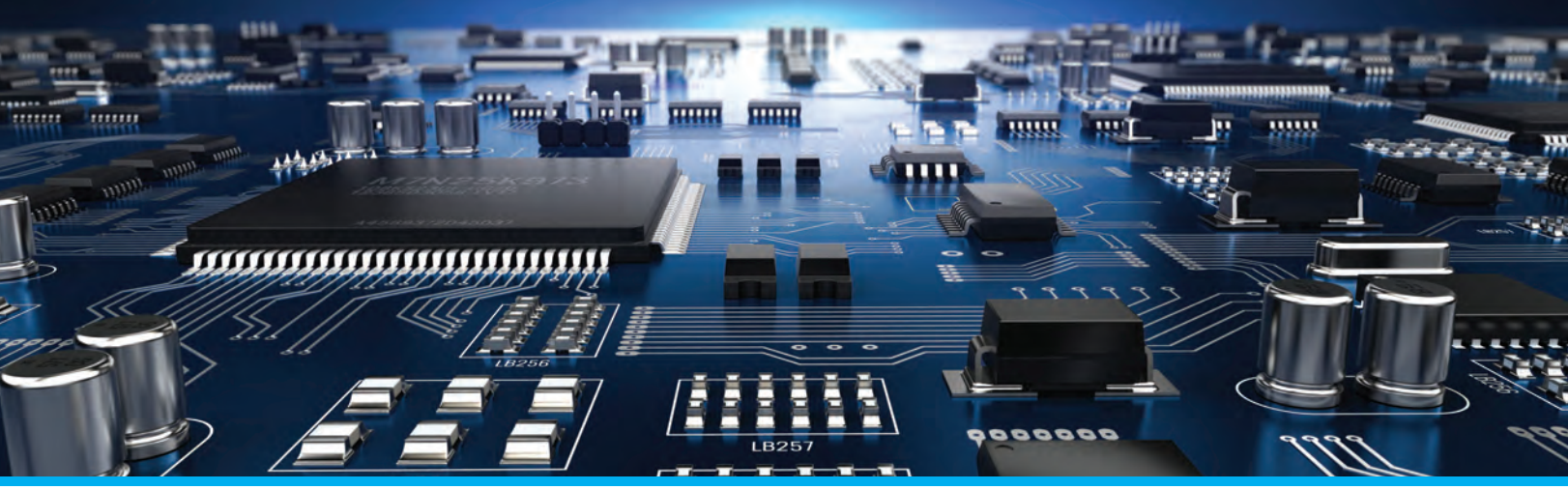
THE PERFECT SOURCE

Today's market shortages and lead-times of over 52 weeks make it is 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.

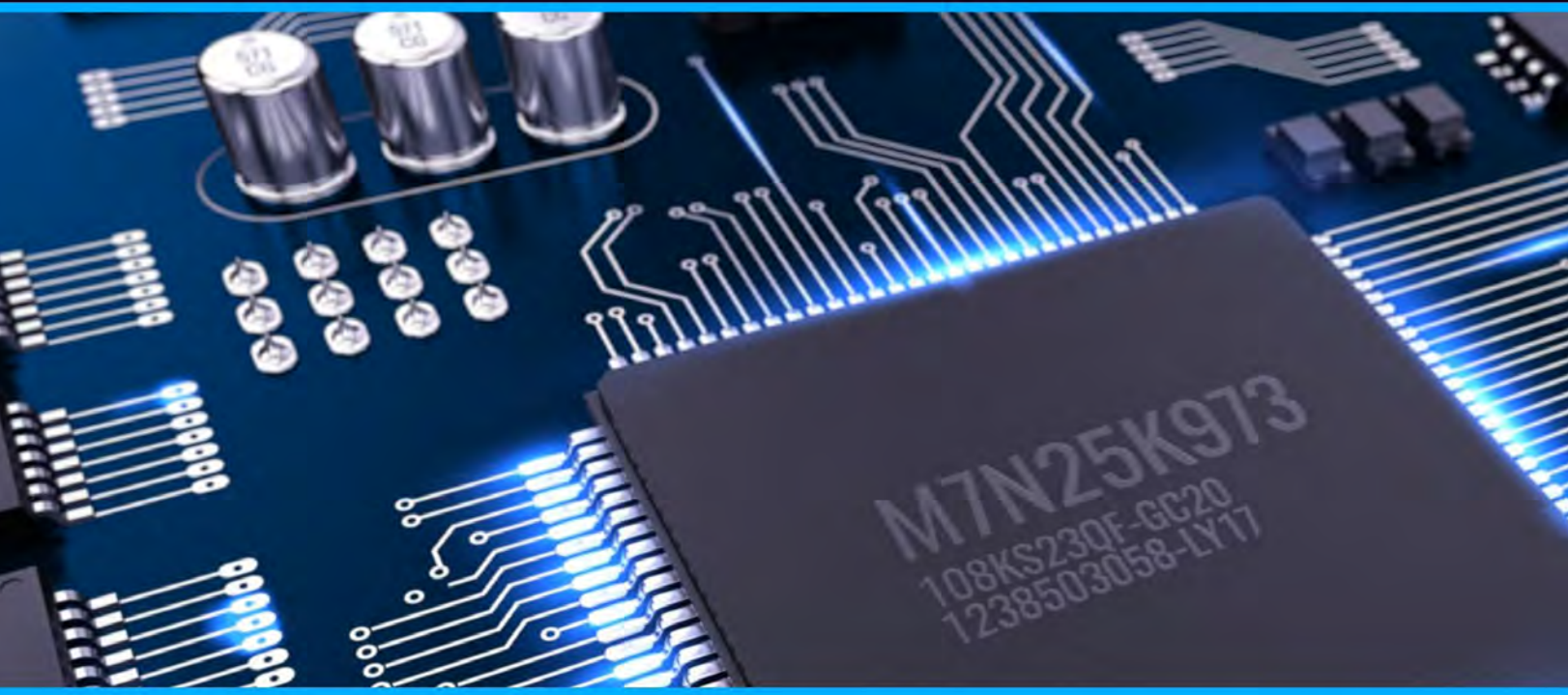
Sourcing from the open market can be daunting with counterfeit parts and sub-standard materials posing as a constant threat to your supply chain. Material procured from the open market that is improperly tested can cause loss of relationships, increased liability, major delays, and line down situations.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

www.perfectelectronicparts.com



Perfect Parts
CORPORATION



100% Quality Driven 100% Of The Time

The Only Distributor With A Perfect Track Record

Velocity Electronics

A superior electronic components distributor

Trust your supply chain with us. Our reputation for reliability and value surpasses the rest.

Do not risk your supply chain to a broker offering a low price when your company depends on reliability, value, and trusted industry knowledge.

Velocity is the clear choice for counterfeit avoidance, customer service, and continuity of supply.

Partner with us and see the

change in velocity

We take pride in being

S.A.F.E.

- Secure
- Flexible
- Aligned
- Ethical

Velocity ELECTRONICS

Global Reach

26 Offices **16** Countries

Strategically located in the Americas, APAC, and EMEA.

We are where you need us to be.

Exceptional Quality

Quality is a top priority for our partners – that is why every aspect of what we do, from our real-time vendor rating system to our order accuracy guarantee is so valuable. Utilizing three global Inspection and Distribution Centers, Velocity is certified to more standards in more regions, than any other distributor:

- AS6081 certified in Austin, Amsterdam, and Singapore.
- AS9120 and ISO 9001 certified in Austin, Amsterdam, and Singapore.
- Velocity's inspection protocol is accredited to ISO/IEC 17020:2012.
- ANSI/ESD S20.20 certified in Austin, Amsterdam, and Singapore.

Inventory Solutions

Our in-stock and bonded inventory, global sourcing resources, and integrated solutions are vital to Velocity's competitive advantage in component procurement and management. **Count on seeing reduced costs across the board with our streamlined processes.**

Our collaborative approach and commitment to building long-term partnerships includes every aspect of our innovative supply chain services. **Velocity will reduce your overall cost of procurement** and keep your production lines running with continuity of supply.

Our Trusted Solutions

- Shortage
- Obsolete
- PPV
- EOL/LTB
- Bonded Programs

Values

Velocity is committed to providing Exceptional Experiences and Outcomes to our customers, supply partners, and to each other. We insist on adhering to a set of internal core values and a code of business conduct emphasizing honesty and integrity in everything we do.

Independent Distributor Revenue Share by Headquarters Location - 2020

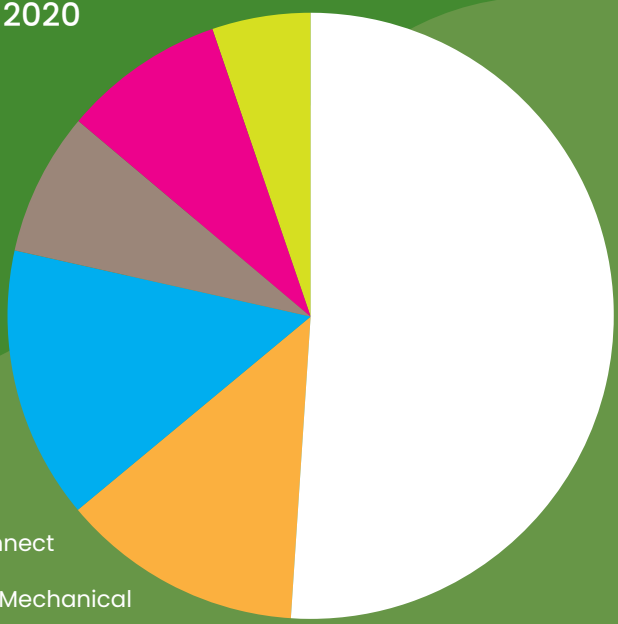
The headquarter location taking the majority share of revenue is the USA with 52.5%, followed by China with 27.5% and lastly Japan with 20%. Despite Shenzhen Huaqiang 深圳华强 (China) and Kaga Electronics (Japan) occupying rank 1 and 2 respectively the remaining distributors combined constitutes over half of the revenue.

USA China Japan

Total Revenue = $8596.5 M

Independent Distributor Worldwide Revenue Share by Component Type - 2020

With the ongoing semiconductor shortage it's not a surprise that they comprise the majority of revenue by component type at 52.1%, trailed by Computer/Systems 14.5%, Passive Components 12.5%, Interconnect 7.5%, Electro-Mechanical 7.3% and Other 6.1%.



Semiconductors
Computer / Systems
Passive Components
Interconnect
Electro-Mechanical
Other

Total Revenue = $8596.5 M

YOUR GO-TO RESOURCE FOR SOURCING ELECTRONIC COMPONENTS

SHORTAGE MITIGATION

GLOBAL SOURCING

OBSOLESCENCE MANAGEMENT

EXCESS INVENTORY SOLUTIONS

COST-REDUCTION SERVICES

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Contact us today to learn more

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A2 GLOBAL®
electronics + solutions

DISCOVER THE POWER

EMPOWERING SUPPLY CHAIN™

FULLY TRACEABLE/DFARS COMPLIANT

- **$150 Million Committed Credit Facility**
- **Global** Footprint
- **Trusted Relationships:** MFGs & Distributors
- Creative & Customizable **Procurement Strategies**
- **$15M E&O Insurance**
- Unique & Timely **Market Insights**
- Industry Leading Quality & **Full Transparency**
- ISO 9001, AS 6081, AS 9120, ESD S20.20, ISO 14001, ISO 45001 **Certified**

Fastest-Growing Global Distributor

Our team is focused on what matters most - **our customers** - delivering industry-leading results by investing in technology and talent.

EMPOWER™ Proprietary Platform

A cloud-based platform designed solely for the electronic component industry. EMPOWER™ streamlines the challenges of global sourcing and supply chain.

On-Demand Products & Services

Procurement and inventory management services that deliver cost-saving opportunities, constrained products, and most importantly - solutions you can trust.

NEWPOWER
Empowering Supply Chain™

800.985.9279 | **www.newpowerww.com** | **info@newpowerww.com**

USA MEXICO NETHERLANDS HUNGARY HONG KONG SINGAPORE INDIA

HAVING SUPPLY CHAIN ISSUES?

NEWPOWER
Empowering Supply Chain™

NewPower provides supply chain solutions for all types of businesses. Everything at NewPower has been designed to deliver fast and efficient results for our customers. We have strategically positioned our offices globally to provide uninterrupted 24x7 expert service. Our proprietary trading platform, EMPOWER™, allows our team to react fast and with precise accuracy by providing real-time market data at the click of a button. Our **$150M committed credit facility** is in place to guarantee our customers we can execute, and our end-to-end sourcing solution is all bound together by our relentless pursuit of process and quality.

Discover the NewPower Difference

Global Expertise

Operating 24x7 with eight offices located throughout the Americas, APAC, and EMEA, our expert commodity teams speak 22 languages and operate with a laser focus on being prepared to find products when you need them.

Powered By Technology

EMPOWER™, our proprietary trading platform, provides real-time access to billions of parts worldwide. Our global sourcing teams are armed with data-driven analytics allowing them to perform at unprecedented speed and precision, delivering quotes in real-time 24x7.

Quality First

NewPower has decades of experience, disciplined audit procedures, and industry certifications that ensure product authenticity and functionality.

Our uniformed global processes make us a worldwide leader in counterfeit avoidance, ensuring all parts meet form, fit, and function.

Financial Transparency

At NewPower, we set financial standards for the rest of the independent distribution industry. With a **$150M committed credit facility** and $15M in E&O insurance, we provide peace of mind in a volatile market. This financial stability allows organizations to plan and forecast for years in advance.

Partner with NewPower today to help with your supply chain shortages. The future is uncertain, but our commitment to excellence is always guaranteed.

www.newpowerww.com
800.985.9279

Accreditations

nqa AS9120 AEROSPACE & DEFENSE
nqa AS6081 COUNTERFEIT PARTS PROGRAM
nqa ISO 9001 QUALITY MANAGEMENT
nqa ESD S20.20 ESD CONTROL PROGRAM
TÜV SÜD ISO 9001
TÜV SÜD ISO 14001
IDEA QMS-9000 CERTIFIED
erai MEMBER
GIDEP GOVERNMENT-INDUSTRY DATA EXCHANGE PROGRAM
THE 50

"We have access to the parts you need – We stock and deliver without the lead-time!"

FROM PARTS TO PARTNERSHIPS™

At CTG (Crestwood Technology Group), we believe in a safe landing for every take-off, a secure transmission for every signal, a reliable return for every departure and a successfully completed mission. It's why we do what we do.

The systems that keep our families, neighborhoods and nation safe are only as dependable as the parts they're made of. From parts to partnerships, we take pride in keeping fleets and systems operational, ready and safe.

What We Do

CTG provides supply chain solutions designed to keep fleets and systems operational, ready and safe. We are a leading supplier of parts, materiel and obsolescence management solutions to the Department of Defense and its contractors, as well as many of the world's largest airlines, MRO's and aircraft manufacturers. We offer testing and inspection services through our IDEA-certified lab for risk mitigation and counterfeit avoidance, and we are recognized for our award-winning quality and customer service.

CTG specializes in sourcing obsolete and hard-to-find parts. Our obsolescence solutions are designed to help meet cost, schedule and performance goals. CTG supports multi-domain operations, including air, ground, sea, cyber and space domains.

CTG maintains one of the largest on-site inventories of parts for fixed-wing, rotorcraft, power plant and ground-support equipment. We specialize in expendables, rotables, and consumables sourcing, kitting and tooling, inventory management and AOG services.

Companies like Sikorsky, Boeing and Lockheed Martin have recognized CTG's commitment to quality and customer service as award-winning. CTG is AC7402-CAAP certified (Counterfeit Avoidance Accreditation Program), a certification recognized by both customers and industry in setting the highest Aerospace quality management and inspections standards for suppliers and distributors.

www.ctgnow.com

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Technology Group
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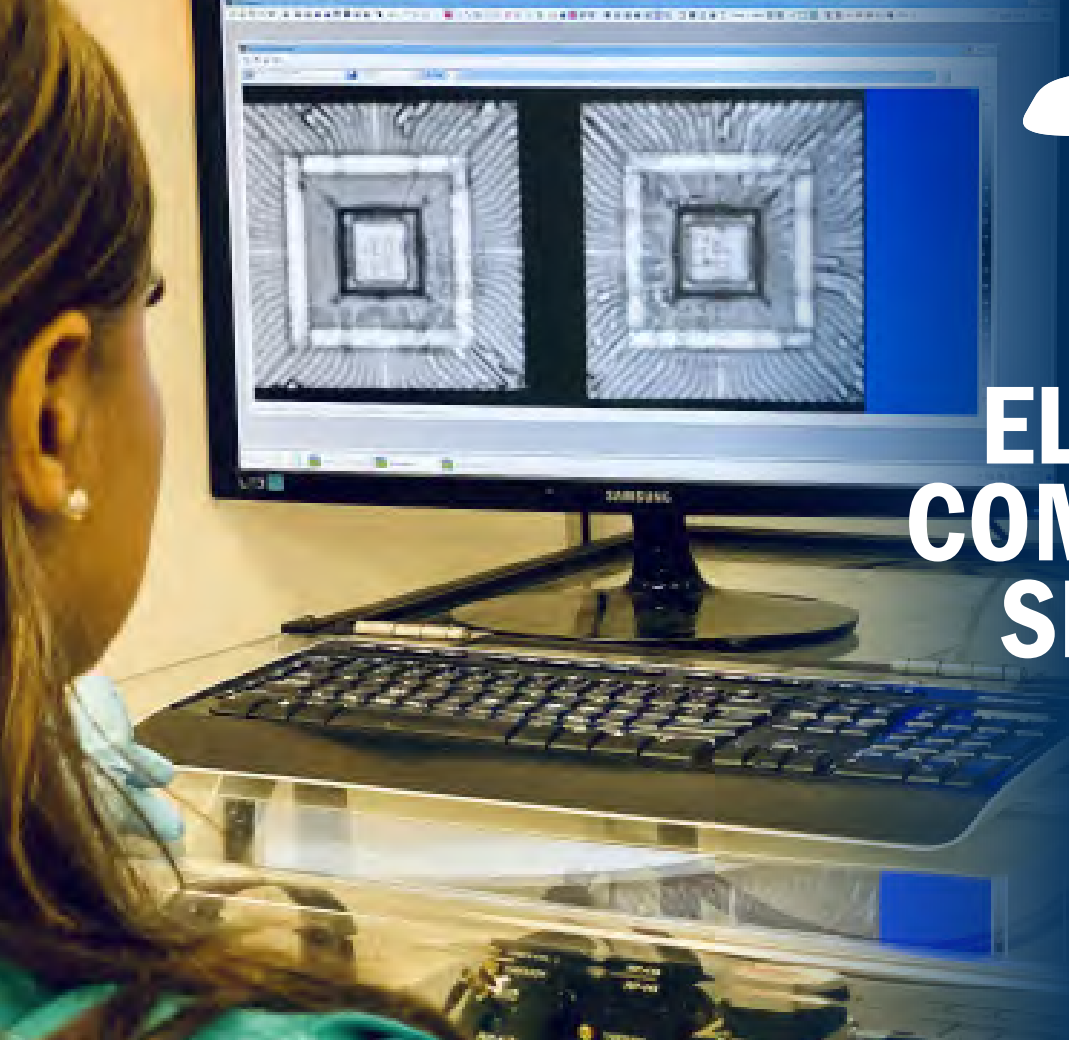
Yonkers, New York 10701
Phone: 914-779-3500



CTG®

ELECTRONIC COMPONENTS SHORTAGE?

WE CAN HELP.

CTG (Crestwood Technology Group) is your trusted supplier with unequaled certifications and standards for quality assurance and counterfeit prevention.

We stock long lead time parts and have access to a global inventory of heavily allocated parts for quick delivery.

What Sets Us Apart

- Global Parts Inventory and Supplier Network
- First-Class Counterfeit Detection Lab and Testing Facility
- CTG Leads the Industry in Certifications

COUNTERFEIT PREVENTION

PRI CAAP — COUNTERFEIT AVOIDANCE ACCREDITATION PROGRAM — ACCREDITED DISTRIBUTOR

CCAP-101 CERTIFIED — COUNTERFEIT COMPONENTS AVOIDANCE PROGRAM

nqa AS6081 — COUNTERFEIT PARTS PROGRAM

QUALITY ASSURANCE

nqa ISO 9001 AS9100 — INTEGRATED MANAGEMENT

nqa ISO 9001 AS9120 — INTEGRATED MANAGEMENT

ASA — AVIATION SUPPLIERS ASSOCIATION

ESD ASSOCIATION ANSI/ESD-S20.20

ID EA QMS-9090 CERTIFIED

DLA QTSL/QSLD QUALIFIED TESTING SUPPLIER

CTPAT

ID EA IDEA-STD-1010

MEMBERSHIPS

IPC

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iiom

GIDEP

CTG®

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The Top 10 Global Independent Distributors

Rank 2020	Company	Type*	Headquarters	2020 Worldwide ($ Millions)	Share of Top 10 Total Sales (Percent)	Sales Share by Region (Percent)			Sales Share by Component (Percent)						Offer design services?	Website allows purchase of parts?
						Americas	EMEA	Asia	Semiconductor (Active) %	Passive Component %	Interconnect %	Electro-Mechanical %	Computer / Systems %	Other %		
1	Shenzhen Huaqiang 深圳华强	3	China	2367.6	27.54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	N
2	Kaga Electronics	1	Japan	1719.9	20.01	5.60	3.50	90.90	100	0	0	0	0	0	Y	N
3	Smith	1	USA	1380	16.05	79.00	8.00	13.00	64	9	7	7	8	5	Y	N
4	Fusion Worldwide	1	USA	1264	14.70	44.70	15.30	40.00	35	14	1	2	48	0	N	N
5	CoreStaff America Inc.	1	USA	800	9.31	10.00	1.25	88.75	56	30	6	8	0	0	Y	Y
6	NewPower Worldwide	1	USA	456.5	5.31	N/A	N/A	N/A	34	11	1	1	10	43	N	N
7	A2 Global Electronics + Solutions	1	USA	258	3.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N	N
8	CTG (Crestwood Technology Group)	1	USA	203	2.36	97.54	2.46	0.00	85	1	5	1	7	1	N	Y
9	Velocity Electronics	1	USA	125	1.45	48.00	20.00	32.00	65	15	5	5	10	0	N	N
10	Perfect Parts Corporation	2	USA	22.5	0.26	35.56	26.67	37.78	35	15	10	40	0	0	Y	N

The Top 5 Independent Distributors by catergory

Top 5 Passive Component Sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 10 Total Sales (Percent)
1	Shenzhen Huaqiang 深圳华强**	447.168	42.21
2	CoreStaff America Inc.	240	22.66
3	Fusion Worldwide	176.96	16.71
4	Smith	124.2	11.72
5	NewPower Worldwide	50.215	4.74

Top 5 Electro-Mechanical Sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 10 Total Sales (Percent)
1	Shenzhen Huaqiang 深圳华强**	405.168	69.22
2	Smith	96.6	16.50
3	CoreStaff America Inc.	50	8.54
4	Fusion Worldwide	12.64	2.16
5	CTG (Crestwood Technology Group)	10.15	1.73

Top 5 Interconnect Sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 10 Total Sales (Percent)
1	Shenzhen Huaqiang 深圳华强**	438.168	69.23
2	Smith	96.6	15.26
3	CoreStaff America Inc.	60	9.48
4	Fusion Worldwide	25.28	3.99
5	Velocity Electronics	6.25	0.99

Top 5 Computer/System Product Sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 10 Total Sales (Percent)
1	Fusion Worldwide	606.72	50.41
2	Shenzhen Huaqiang 深圳华强**	414.168	34.41
3	Smith	110.4	9.17
4	NewPower Worldwide	45.65	3.79
5	CTG (Crestwood Technology Group)	14.21	1.18

Top 5 Semiconductor (Active) Sales

Rank 2020	Company	2020 Worldwide ($ Millions)	Share of Top 10 Total Sales (Percent)
1	Kaga Electronics	1719.9	39.75
2	Smith	883.2	20.41
3	CoreStaff America Inc.	446	10.31
4	Fusion Worldwide	442.4	10.22
5	Shenzhen Huaqiang 深圳华强**	426.168	9.85

*Type of Distributor: 1 = Broadline; 2 = High Service/E-Catalog; 3 = Other | ** Percentage breakdown based on estimate

North America Editorial features list for 2022

	Features*	Special Focus	Show Previews	Deadlines (MM/DD/YY)
January	Connectors, Crystals & Oscillators, Counterfeiting, Circuit Protection	Critical Supply Chain Strategies		Editorial: 12/04/21 Advert: 12/09/21 On Desk: 01/05/22
February *Extra distribution at APEX, San Diego, CA*	Diversity, Obsolescence, EMS, Printed Circuit Boards	Marine, EV Charging	APEX Show Preview	Editorial: 01/06/22 Advert: 01/11/22 On Desk: 02/03/22
March *Extra distribution at APEC, Phoenix, AZ*	Enclosures, Power Supplies & Batteries, Semiconductors	Aerospace	APEC Show Preview	Editorial: 02/05/22 Advert: 02/09/22 On Desk: 03/03/22
April *Extra distribution at DEL MAR Electronics Show, San Diego, CA*	Connectors, Apps, Development Kits, Embedded Systems	Industry Trends	EDS Preview DEL MAR Electronics Show Preview	Editorial: 03/05/22 Advert: 03/09/22 On Desk: 04/03/22
May *Extra distribution at EDS, Las Vegas, NV*	Cable & Wire, EMS, Harsh Environment, Programming	Top 50 NA Distributors Report		Editorial: 04/08/22 Advert: 04/12/22 On Desk: 05/04/22
June	Power & Batteries, Logistics, Obsolescence, PCBs	Transport		Editorial: 05/06/22 Advert: 05/10/22 On Desk: 06/03/22
July	Thermal Management, Switches, Counterfeiting, Time to Market	Defense		Editorial: 06/04/22 Advert: 06/09/22 On Desk: 07/02/22
August	Component Comparisons, EMC, Displays & LEDs	Automotive, EV Charging		Editorial: 07/06/22 Advert: 07/09/22 On Desk: 08/03/22
September *Extra distribution at ECIA Executive Conference, Chicago, IL*	Connectors, Semiconductors, Passives, Kits	Top 50 Global	ECIA Executive Conference Preview	Editorial: 08/05/22 Advert: 08/09/22 On Desk: 09/02/22
October	Power & Batteries, PCBs, Thermal Management, Crystals & Oscillators	Medical	Sensors Expo Preview	Editorial: 09/06/22 Advert: 09/10/22 On Desk: 10/04/22
November *Extra distribution at Sensors Expo, San Jose, CA*	Enclosures, Obsolescence, EMS, Switches	2023 Wall Planner		Editorial: 10/05/22 Advert: 10/08/22 On Desk: 11/03/22
December	Component Comparisons, Newest Products, Sensors	2023 Industry Forecasts		Editorial: 11/05/22 Advert: 11/09/22 On Desk: 12/02/22

*Editorial content subject to changes. It can be changed or shifted without prior announcement. Semiconductor Market Watch and Distribution Market Watch are published in each issue

WHAT DIFFERENTIATES SMITH FROM OTHER DISTRIBUTORS?

"What sets Smith apart from other distributors starts at the top with our ownership's vision and commitment to quality and the continued investment in our people, world-class operations facilities, and innovative trading and operations platforms. Our employees are our most valuable asset – we have the most experienced trading management team, along with the most knowledgeable traders in the business. Additionally, our financial strength allows us to carry out any deal, even as demand for our services has reached unprecedented heights."

On average, have order values for Smith increased or decreased in recent years?

"We've seen order values grow steadily over the years but have seen especially high increases over the past 18 months. Technology's rapidly evolving nature often puts hardware in high demand, which causes pricing to trend upward. Additionally, the unprecedented challenges caused by COVID-19 have put severe constraints on many supply chains around the globe. Many customers in industries such as automotive and consumer electronics are challenged with key components being in short supply, so they are aggressively sourcing for parts in the open market."

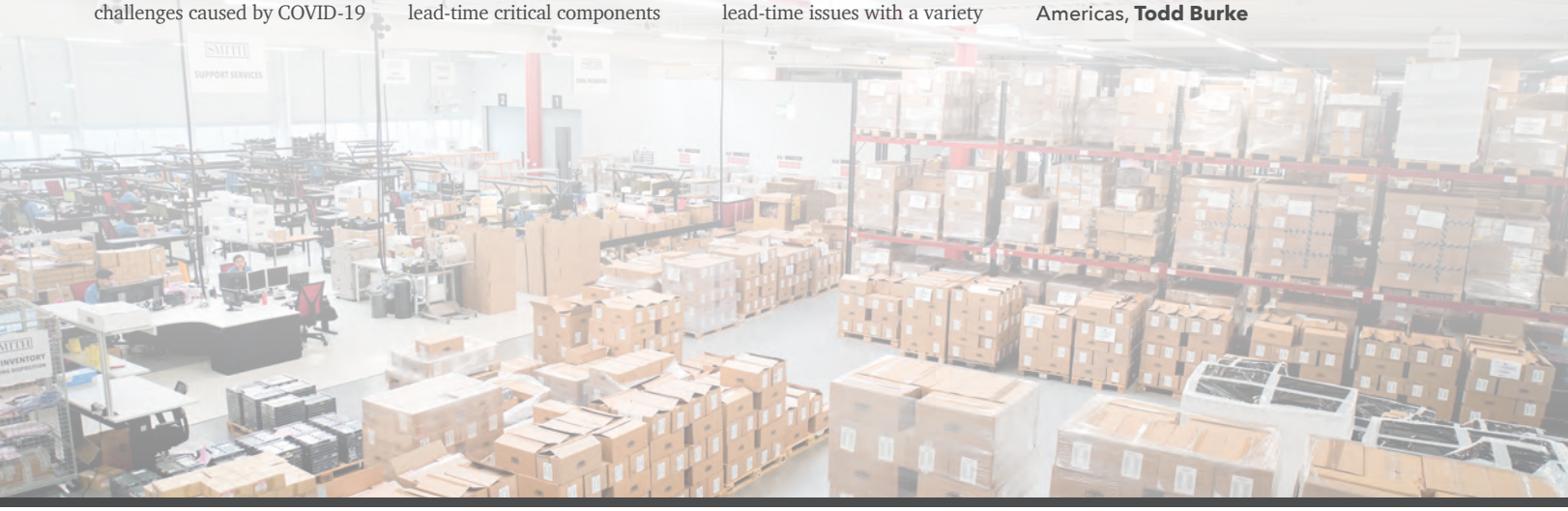
Have there been any other purchasing-related trends over the last few years?

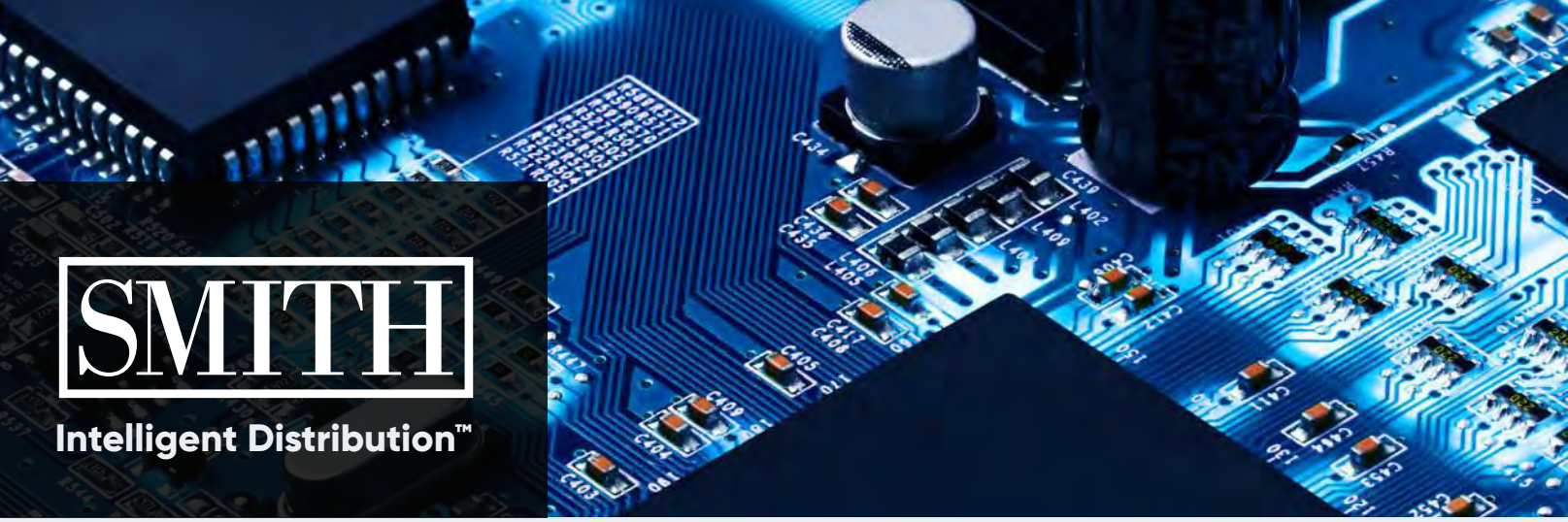
"Over the last several months, we've seen a tremendous jump in the number of companies looking for help from Smith on lead-time and shortage issues. We've also noticed much more direct engagement with OEM customers who would otherwise leave component sourcing to their subcons; they are getting considerably more involved in the sourcing and procurement process. We're seeing customers set up emergency task force teams to help navigate the market situation. They are also looking more and more at inventory-management programs for long lead-time critical components as a type of insurance policy to keep production lines active."

Our readers have confirmed in the latest reader research that obsolescence and lead times are their biggest challenges to avoid downtime on the production lines. How do you relay and forewarn this information back to your clients to avoid last-time buys?

"The Smith market intelligence team does a great job of producing a monthly report that we make available to our top customers. It's highly anticipated and contains a wealth of information on the latest industry trends, from lead times to notable dynamics we're pinpointing and tracking. As the world's leading independent distributor, we provide reliable, actionable market information that our customers have come to depend on. We have a unique vantage point in the market, and our customers value that insight. Additionally, we help many of our customers stay ahead of obsolescence and lead-time issues with a variety of customizable inventory programs. Successfully solving supply chain management issues like obsolescence and long lead times is at the core of Smith's business."

Smith's President, Americas, **Todd Burke**





SMITH

Intelligent Distribution™

Smith sources, manages, and distributes the components that power everything from mobile phones and computers to automobiles and appliances.

Customizable supply chain services

Experts in electronic component sourcing since 1984

Four consecutive years of over a billion dollars in sales

Leading independent electronic component distribution around the world.

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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
ACOUSTIC COMPONENTS											
BeStar Electronics Ind. Co. Ltd.	BeStar Technologies Inc.	520-439-9204	www.bestartech.com	Y	N/A	$250,000	N/A	100.00%	50	900	Y
CABLE & WIRING											
3M	Mouser Electronics	800-346-6873	www.mouser.com	Y	23235	N/A	$0	0.46	50	1,000+	Y
Alpha Wire	Mouser Electronics	800-346-6873	www.mouser.com	Y	8,106	N/A	$0	93.00%	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	Bel Fuse	+1 201 432 0463	belfuse.com/circuit-protection	Y	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	68.00%	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
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	Mouser Electronics	800-346-6873	www.mouser.com	Y	12,390	N/A	$0	99.00%	50	1,000+	Y
Dialight	Mouser Electronics	800-346-6873	www.mouser.com	Y	6,179	N/A	$0	84.00%	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
Electronic Assembly	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	100.00%	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
Newhaven Display	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	$0	N/A	50	1,000+	Y
Osram Opto Semiconductors	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,690	N/A	$0	100.00%	50	1,000+	Y
VCC	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
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	83.00%	50	1,000+	Y
C&K Switches	Mouser Electronics	800-346-6873	www.mouser.com	Y	27,230	N/A	$0	90.00%	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
IXYS	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

Advert Index

Advert	Page	Advert	Page
A2 Global Electronics + Solutions	85	Galco	70 & 71
All Tech Electronics	69	IBS Electronics Group	60 & 61
AVX Corporation	19	Master Electronics	36 & 37
Bisco Industries	52 & 53	Microwave Components	63
Brevan Electronics	39	Mouser Electronics	24, 25, 33, 34, 35, 72, 73, 95 & IBC
Carlisle Interconnect Technology	28	Newark	43
Central Semiconductor Corp	21	NewPower Worldwide	86
CML Innovative Technologies, Inc.	18	NorComp	23
Coilcraft	17	NTE Electronics	66
Component Sourcing	74	OKW Enclosures Inc	27
Crestwood Technology Group (CTG)	89	Perfect Parts	81
Digi-Key Electronics	FC, IFC, 30	Projections Unlimited, Inc (PUI)	48
Dove Electronics	20	Rochester Electronics	47
eBOM.com	31	ROLEC Enclosures Inc	59
Electronic Connector Company (ECCO)	29	Rutronik Inc.	BC
ECIA (Trusted Parts)	13	Sager Electronics	5
ECS, Inc International	26	Smith	93
Electronics Sourcing	57 & 91	Sourcengine	15
Falcon Electronics, Inc.	64 & 65	TTI Inc	7
Fusion Worldwide	76 & 77	Velocity Electronics	82 & 83
Future Electronics	40 & 41	Wycom Corp	44

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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
ELECTROMECHANICAL *(Continued)*											
NKK Switches	Mouser Electronics	800-346-6873	www.mouser.com	Y	13,976	N/A	$0	86.00%	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
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	80.00%	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.okwenclosures.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	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	$0	N/A	50	1,000+	Y
Silicon Labs	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
Cree, Inc.	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	$0	N/A	50	1,000+	Y
Cypress Semiconductor Corp	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,325	N/A	$0	81.00%	50	1,000+	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	Mouser Electronics	800-346-6873	www.mouser.com	Y	94	N/A	$0	100%	50	1,000+	Y
IDT (Integrated Device Technology)	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	$0	N/A	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
IXYS	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
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
Microsemi	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	$0	N/A	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
ON Semiconductor	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
SanDisk	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	100.00%	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	96.00%	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

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
INTERCONNECTION											
3M	Mouser Electronics	800-346-6873	www.mouser.com	Y	23,235	N/A	$0	46.00%	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
Aptive (Delphi)	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	$0	N/A	50	1,000+	Y
Bel Magnetic Solutions	Bel Fuse	+1 858 676 9650	belfuse.com/magnetic-solutions	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
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	Bel Fuse	+1 507 833 8822	+1 507 833 8822	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ERNI Electronics	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	$0	N/A	50	1,000+	Y
FCI	Mouser Electronics	800-346-6873	www.mouser.com	Y	3,394	N/A	$0	73.00%	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	51.00%	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
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	77.00%	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
Souriau	Mouser Electronics	800-346-6873	www.mouser.com	Y	10,744	N/A	$0	27%	50	1,000+	Y
Stewart Connector	Bel Fuse	+ 1 717 235 7512	belfuse.com/stewart-connector	Y	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	Mouser Electronics	800-346-6873	www.mouser.com	Y	582	N/A	$0	99.00%	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
Osram Opto Semiconductors	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
AVX	Mouser Electronics	800-346-6873	www.mouser.com	Y	42,454	N/A	$0	72%	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	98.00%	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
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	84.00%	50	1,000+	Y
Ohmite	Mouser Electronics	800-346-6873	www.mouser.com	Y	14,293	N/A	$0	55.00%	50	1,000+	Y
Panasonic Electronic Components	Mouser Electronics	800-346-6873	www.mouser.com	Y	14,948	N/A	$0	100.00%	50	1,000+	Y
Signal Transformer	Bel Fuse	+1 516 239 5777	belfuse.com/signal	Y	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	98.00%	50	1,000+	Y

Buyers' Guide

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
PASSIVES *(Continued)*											
TDK	Mouser Electronics	800-346-6873	www.mouser.com	Y	6,663	N/A	$0	100.00%	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	64.00%	50	1,000+	Y
Wurth	Mouser Electronics	800-346-6873	www.mouser.com	Y	934	N/A	$0	99.00%	50	1,000+	Y
Yageo Corporation	Mouser Electronics	800-346-6873	www.mouser.com	Y	18,246	N/A	$0	100.00%	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
Bel Power Solutions	Bel Fuse	Power & Batteries	belfuse.com/power-solutions	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A
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
Mornsun	+1-978-567-9610/+1-978-293-3923		www.mornsunamerica.com		N/A	N/A	$0	100%	N/A	2000+	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
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	80.00%	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
TRACO Power	Mouser Electronics	800-346-6873	www.mouser.com	Y	N/A	N/A	$0	N/A	50	1,000+	Y
REED SWITCHES											
HSI Sensing	HSI Sensing	405-224-4046	www.hsisensing.com	M	75	N/A	$200	100.00%	15	275	N
SENSORS											
ams	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 Sensing and Control	Mouser Electronics	800-346-6873	www.mouser.com	Y	12,059	N/A	$0	64.00%	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
Maxim Integrated	Mouser Electronics	800-346-6873	www.mouser.com	Y	1,379	N/A	$0	45.00%	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
ON Semiconductor	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	59.00%	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	65.00%	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	94.00%	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	96.00%	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
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

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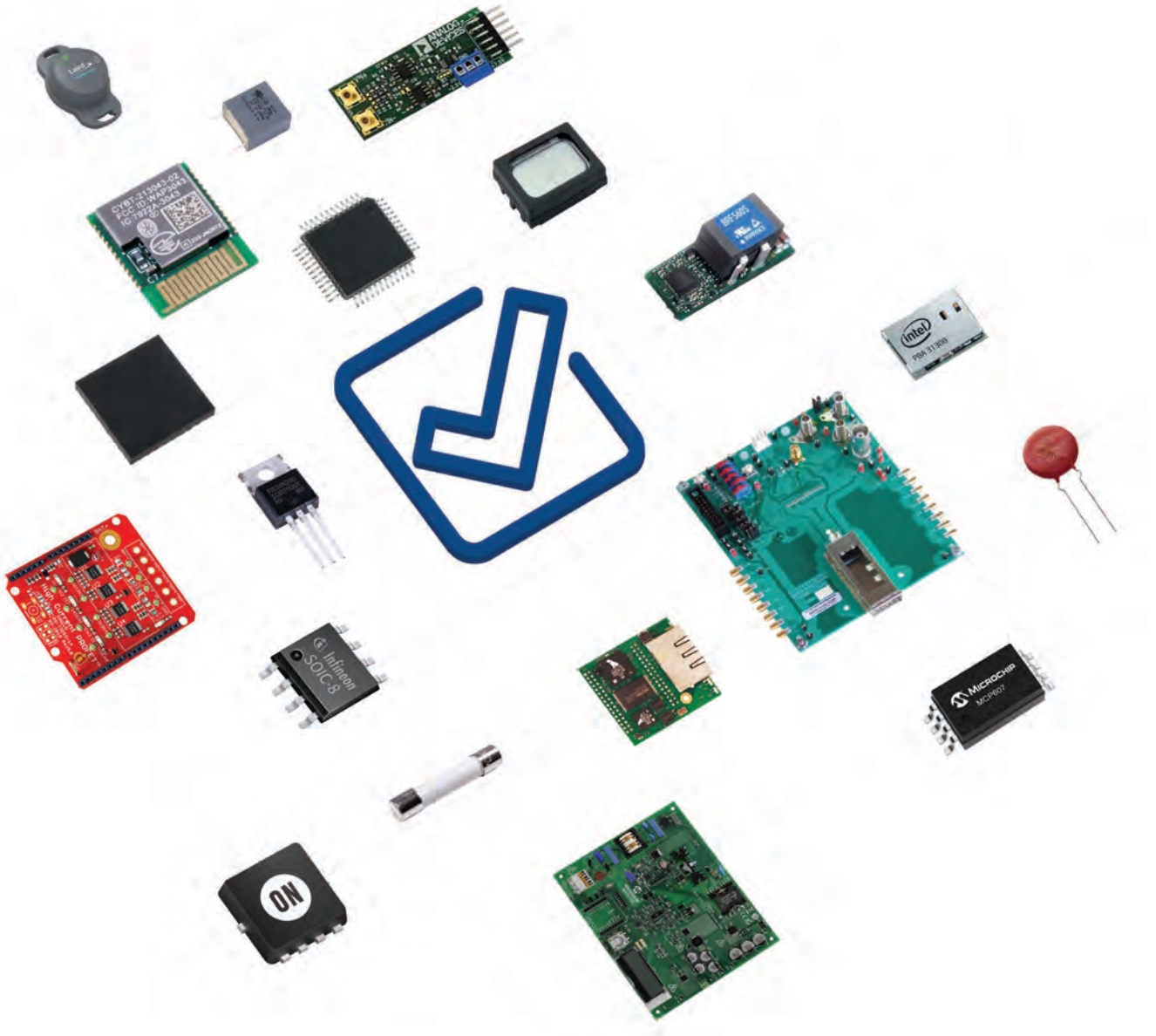

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