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ECIA MEMBER
Supporting The Authorized Channel



On the cover – September 2022

Best of British
from page 12

Editor's Word



Energetic decades ahead

I have an odd side hobby which involves regularly checking electrical energy demand and generation around the world using a variety of real-time analytics websites and apps. Their graphical nature helps me visualise the numbers and make meaningful comparisons. Normally, this hobby simply makes me the number one bore at parties. However, with global energy in 'crisis' my fun observations are suddenly in demand.

I have no academic qualifications or practical experience in power generation (bicycle dynamo aside) so I class myself as a complete amateur. However, I think I'm reasonably observant and can do basic math.

Firstly, if you live in a large country, with a small population and access to unlimited geothermal or hydroelectric energy, you are looking good. Likewise, if you live in a country that committed to nuclear 30 or 40-years ago and stuck with the decision, you are also looking OK.

However, if you live in a landlocked country in the northern hemisphere that hasn't invested in nuclear, things might look a little different. I have no doubt the technologies required to generate, store and distribute more environmentally sound energy will evolve but I'm measuring this in decades and centuries.

Why am I bothering to discuss this in a magazine dedicated to sourcing electronic components. Well, I think its worth remembering that every component represents a 'claim on future energy'.

In my fantasy future, Thorium reactors will cover base load and hydrogen production, with wind, solar, hydro and geo filling the demand gaps.

Jon Barrett

NEWS



Distribution deal secures
sensor supply

04

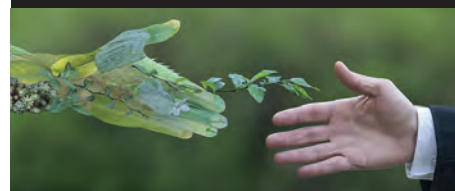
BEST OF BRITISH



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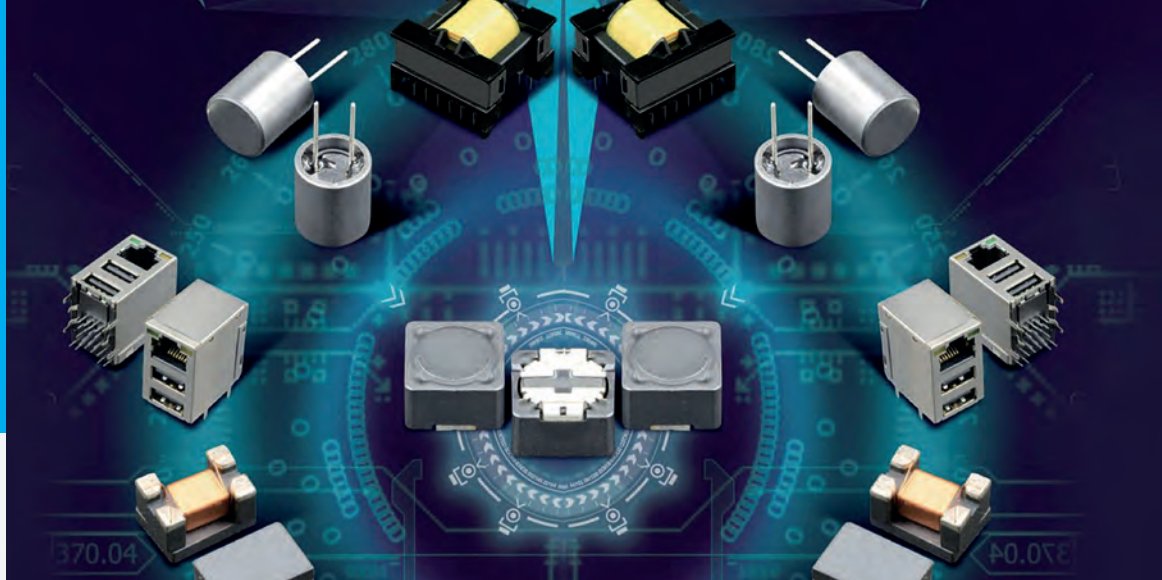
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www.electronics-sourcing.co.uk



High Q radial inductor alternatives

Bourns PT121 series high Q radial inductors are now on last-time-buy with no replacements. BEC Distribution is now offering alternatives on five to seven-weeks lead time. The inductors are part of BEC's Select range of passive alternatives, available on short lead times. Samples and spec sheets are now available.

The inductors are lead free and RoHS compliant. BEC states they offer excellent temperature stability and high current rating. Other components in the BEC Select

inductor range include SMT power, high current shielded power, chip, common mode chokes and LAN magnetics.

BEC is a franchised distributor and can offer alternatives to brands, believed to cover up to 95 per cent of passive components including TOKO/Murata, Sumida, TDK, Coilcraft, Cooper, Molex, Bourns, Tyco, Vishay, Würth, Panasonic and more.

www.bec.co.uk

Distribution deal secures sensor supply

Mouser Electronics has announced a new global distribution agreement to supply Allegro MicroSystems' products including switches and latches, position sensors, current sensors, and magnetic speed sensors.

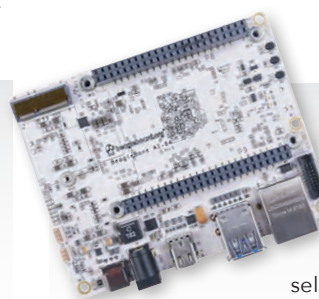
For example, the ACS72981 linear Hall effect current sensor ICs offer AC or DC sensing solutions with response times of less than 2µs to enable overcurrent fault detection for safety-critical applications.

The A31315 3D magnetic position sensor ICs feature on-chip angle calculation, supporting a wide range of non-contact rotary and linear position measurement for automotive, industrial, and consumer applications.

Mouser Electronics' VP of supplier management, Kristin Schuetter, said: "Mouser customers demand efficient, reliable products and Allegro MicroSystems meet and exceed these expectations."

Allegro MicroSystems' Sr director global channel sales, Kyle Purinton, said: "With this distribution deal with Mouser Electronics, we can now offer our highly efficient products to a much larger global audience with the high level of service our existing customers expect."

www.mouser.com



AI-64 SBC available from stock

Farnell is now selling the new BeagleBone AI-64 SBC board from stock. Farnell states this is the first 64-bit open hardware single board computer designed for building performance-optimised embedded applications and offering an artificial intelligence (AI) and machine learning system.

BeagleBoard.org Foundation board president, Jason Kridner, said: "With multiple SuperSpeed USB ports, familiar BeagleBone cape expansion headers and desktop-capable performance, the general-purpose embedded applications for this board are endless, with eight TOPS neural-network performance accessible through familiar Python libraries to boot."

Farnell's head of single board computing, Romain Soreau, added: "We are very pleased to announce our global in-stock availability of the new BeagleBone AI-64 SBC board. Engineers and hobbyists alike can now eliminate barriers from prototype to production with this revolutionary board, which has been built on open-source Linux from BeagleBoard.org. BeagleBone AI-64 board places a massive amount of computing power in the hands of developers in an easy-to-use, single-board computer."

uk.farnell.com



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In Brief

Industrial megatrend

Industry 4.0 is a megatrend, its goal to digitalize and network production along the value chain using intelligent industrial electronics and communication technologies. Leading actors in this transformation will meet from November 15 to 18 at electronica 2022, where they will highlight trends at the IIoT & Cyber Security Forum and Power Electronics & Embedded Systems Forum. electronica.de

Distributor achieves PLC status

Anglia Components is changing its status to PLC, meaning it will be subject to more stringent and complex auditing and financial requirements, increasing confidence amongst global customers and suppliers. Anglia's CEO, Steve Rawlins, said: "The change in status reflects the current scale of the business and the level of companies it now trades with." www.anglia.com

Accelerating battery deployment

Waygate Technologies and the UK Battery Industrialisation Centre have signed a memorandum of understanding to accelerate electrification and battery deployment. The MoU's aim is to accelerate battery technology development by combining UKBIC's manufacturing research facility and Waygate Technologies' knowledge of digital industrial computed tomography. www.ukbic.co.uk

Investing in analog IP

Agile Analog has announced a recruitment drive and move to the iconic Radio House in Cambridge. Agile Analog's CEO, Barry Paterson, said: "The space at Radio House will provide us with break out spaces, pods, meeting rooms and audio-visual equipment which will allow us to both grow our UK-based headcount and give us a working collaboration centre." www.agileanalog.com



Explore the future of electronics sourcing

On Thursday 25 May 2023, purchasing professionals and design engineers will converge on the Kassam Stadium to explore component innovation and distribution

This year's *Electronic Component Show*—held in May at the Kassam Stadium, Oxford—was hailed a great success and details of *ECS 2023* have been confirmed for Thursday 25 May 2023.

Electronics Sourcing's publisher, Mark Leary, said: "The one-day tabletop and seminar series concept is the perfect remedy for purchasing professionals and exhibitors alike. I was impressed that *ECS* attracted a high calibre of visitors from industries such as medical devices, offshore, Formula 1, automotive, agriculture, aviation, industrial, food manufacturing, marine, robotics and more."

Post show visitor and exhibitor feedback proved positive, with visitors liking the ability to meet over 70 new or existing suppliers in one day, under one roof.

Visitors also liked the educational seminars covering topical solutions, complimentary snacks/drinks, ample free car parking and the show's relaxed welcoming feel.

At the time of writing, all the Silver category exhibitor packages for 2023 are sold, with only 16 remaining stand packages available. Responding to visitor and exhibitor feedback, the 2023 event will feature additional food services, seating and meeting areas.

The *ECS* blueprint is a one-day show that is time effective, educational and beneficial in a relaxed stadium venue with the widest spectrum of suppliers and service providers for visitors to meet.

Confirmed exhibitors at *ECS 2023* include: APC, AZEGO, Powell, Lincoln Binns, SAS, Phoenix Contact, Cupio, Luso Electronics, NiCAB, Harwin, Midas Displays, NCAB, G-English, Incap, Yamaichi Connectors, ODU, Electron Electronics, Future Facilities, Electronic Technicians Ltd, Lemo, Adaptix imaging, Nicomatic, Hammamatsu, Solid State Supplies PLC, Pacer, European Circuits, Win-Source CN, Anders, Phoenix Dynamics, Evaluate 2000, CML, Micros, Rochester Electronics, Wurth, Review Display Systems, Rapid Electronics, Ashlea, Simms, Rebound Group, Camden Boss, SOS Electronic, Advanced Rework Technology, Winslow Adatics, Hammond Enclosures, Transfer Multisort Electronics, Cliff Electronics, Mouser Electronics, EAO, M-TEK and CT Production.

The seminar program will be confirmed later this year with a mix of topics for design engineers and purchasing professionals.

Mark the date for the *Electronic Component Show*, Thursday 25 May 2023, Kassam Stadium (home of Oxford United Football Club).

Visitor registration for *ECS 2023* is now open.

www.electronic-component-show.co.uk



Exclusively sponsored by



THE BEST WAY TO MANAGE INVENTORY WHEN DEMAND DROPS

Inventory cycles often swing from "just-in-case" to "just-in-time," but recent supply chain trends are pushing manufacturers to amass unnecessarily large inventories. Stockpiling can seem like a beneficial safeguarding measure, but experience has shown that it can backfire and create instability while furthering inflation.

There is a viable substitute for both the just-in-case and just-in-time methods. Instead of hoarding to safeguard resources, manufacturers should leverage vendor and supplier relationships to find stability when the scales of supply and demand invert.

Buffers Become Barricades

As demand outpaces supply within the semiconductor industry, the disparity has driven up prices and lead times — a costly consequence for those who cannot afford to wait for product.

Buying buffer stock is a key part of the just-in-case management model. It entails carrying larger inventories in case supply chains fail. However, over-ordering further depletes market supply, which subsequently increases prices and extends lead times.

In such scenarios, carrying costs are high and buyers may utilize 3rd-party warehouses for storage. This turns buffer stock from a benefit into a liability, as it constricts cashflow and causes logistical complications.

Restored Supply Means Trouble for Stockpilers

When supply chain disruptions start to dissipate, companies realize the downfalls of the stockpiling strategy. In today's market, demand is softening. Inflation and events like the Russia-Ukraine conflict have driven commodity prices higher and consequently reduced consumer spending. Consumer electronics are likely to suffer the most, as these purchases tend to trend downward first. This shift is hurting manufacturers, particularly after they experienced heightened demand during the peak of the pandemic.

The impact is reflected in reduced business outlooks. Micron, which produces DRAM chips for technology like personal computers and smart phones, announced a drastic cut in production after projections showed a 3-8% price drop for DRAM chips.

Although Micron will need to hold the already produced chips, this production slowdown preserves Micron's control over supply, mitigating excess and ensuring better prices.

How to Build a Healthy Inventory

Preemptively planning a holistic inventory strategy builds a foundation for success. Work closely with strategic suppliers to strengthen the supply chain and make securing allocation easier. Engage strategic supplier relationships during periods of inflation to ensure proper budget investment, as a dependable supplier relationship reduces costs by committing to orders in advance.

Plus, providing transparency on component lists helps suppliers better understand your needs and proactively offer supply. Buyers should limit excess supply to a 1–2-month period to avoid disruptions and additional carrying costs.

Price changes and shortages are unpredictable, but it is important to pay attention to consumer behavior and market movements. Independent distributors with market intelligence teams are especially valuable, as they can be your eyes and ears on the market and give recommendations.

Maintain Balance Strategically

Navigating between supply and demand is a balancing act; be sure to use every tool available to you to stabilize inventories. A company's best resource is its supply source, so work closely with strategic partners to control your inventory, instead of having it control you.

www.fusionww.com



Ink dries on coax connector agreement

Princeps has been appointed an authorised distributor by high-performance RF connector manufacturer, COAX Connectors. COAX Connectors designs interconnects incorporating RF connector technology which are manufactured in the UK and Asia to ISO 9001/2015 standards.

A range of straight and angled interconnects is available. In addition to standard gold and nickel-plated designs, alternative finishes include black nickel, white bronze and stainless steel, plus custom interconnect solutions.

To complement its range of RF coaxial connectors, COAX Connectors will work

with Princeps to design and manufacture cable assemblies to customers' requirements for prototype and production quantities.

Princeps' sales director, David Nash, said: "COAX Connectors' latest RF technology coupled with the very competitive pricing structure we are able to offer will also be enhanced by joint FAE customer visits, ensuring customers benefit from product-specific knowledge combined with advice on our flexible ordering and delivery services as designs ramp into production."

www.princeps.co.uk

Tough memory available now

Transcend and Impulse Embedded have announced a distribution partnership for memory and storage components in the industrial sector. The deal will see Impulse offering a line of standard and proprietary internal SSDs, different generations of DRAM memory modules, SD/microSD cards, eMMC memory and flash solutions.

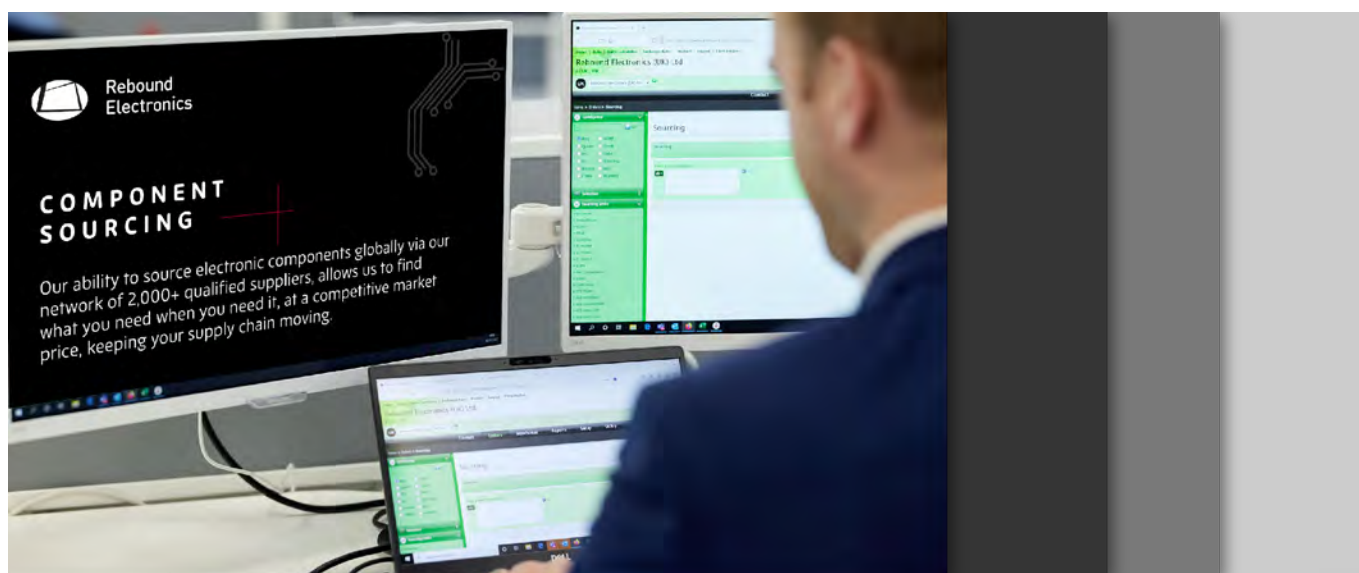
Transcend products are used in industries from transportation and healthcare to 5G

communication, AIoT and embedded applications. When deploying computers in harsh environments, components must match the hardened characteristics of the host system. Transcend products offer features covering data security, resilience to shock, vibration and temperature extremes and protection from unscheduled power loss.

Impulse Embedded's sales director, Robert Plant, said: "We are delighted

to be working with a powerhouse in the industrial storage solutions and flash sector. Their name speaks for itself, and their excellent stock levels, support and internal capacity made the decision to collaborate an easy one."

www.impulse-embedded.co.uk



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New Products with Widest Selection of Inventory

Mouser Electronics specialises in the introduction of the newest products and technologies from its 1,200 manufacturer brands for engineers and buyers worldwide.

The company's extensive product offering includes semiconductors, sensors, optoelectronics, power products, embedded solutions, interconnects, passives, test and measurement, and electromechanical, plus a vast range of other components authorised from the top names in components. Mouser sells millions of tiny parts that function as the essential building blocks of new product design, with leading-edge components that are smaller, faster and smarter.

During this challenging period of supply chain issues across the industry, Mouser teams are doing a great job trying

to stay ahead of product availability issues. Some sources are very limited in their component offerings, but that's not the case with Mouser. The company's wide breadth of inventory allows choices and alternative solutions for customers. Along with a focus on new product introductions, Mouser continues to expand its industry-leading website, mouser.com, with search enhancements, technical resources and online tools dedicated to both buyers and engineers.

Now more important than ever, buying from an authorised distributor is the only way to eliminate the risk of counterfeit or grey market products. With product supply shortages impacting many sectors, it has never been more critical to select genuine products that are 100% certified and fully traceable from each manufacturer.

As an authorised distributor with a commitment to customer service excellence, Mouser offers 27 global Customer Support Centres and has the professionals, products and procedures in place to assist throughout the design and buying process.

Mouser also offers a full suite of online tools to help simplify the purchasing process, such as the Price and Availability Assistant, which makes online buying quick and efficient. It's the latest addition to a library of productivity and pricing tools from Mouser that includes the FORTE intelligent BOM tool, ECAD design resource solution, inventory management tool, API services and order automation, all accessible through the website.

www.mouser.com/servicesandtools/



By the Numbers

- **24-hour operation**
- **Mouser.com features over 6.8 million components from over 1,200 manufacturer brands**
- **Over 1 million sq. ft. (93.000 m²) state-of-the-art facilities at global headquarters and distribution centre**
- **Stocking industry's widest selection of components - nearly 1,000,000 parts in inventory**
- **27 global branch offices**
- **Shipped out 9.6 billion pieces in 2021**

The Global Distributor has installed a state-of-the-art AutoStore, to help increase its capabilities.



Kitting away supply chain disruptions

SeSemi Electronics argues that kitting offers a solution to Covid's significant and lasting impact on logistics and overheads regarding supply chain management

Component kitting services have evolved over time, with customer input helping shape the required service and determine how it is implemented. No two customer requirements are identical, thus flexibility is arguably the single most important factor.

The component purchasing process can often be time consuming, involving multiple purchase orders, receipts, invoices and payments. It also restricts the benefits of vendor reduction, while excess material can take up valuable warehouse space. Furthermore, the pandemic is causing unexpected disruption resulting in processes becoming even more difficult to manage.

The immediate benefit of component kitting is reducing the obvious time-consuming activities in the supply chain processes. In addition, are the measurable benefits of receiving a bespoke production ready box of materials which reduces the time to load components at production stages, limits waste and reduces the commercial and logistic pain incurred by shortages.

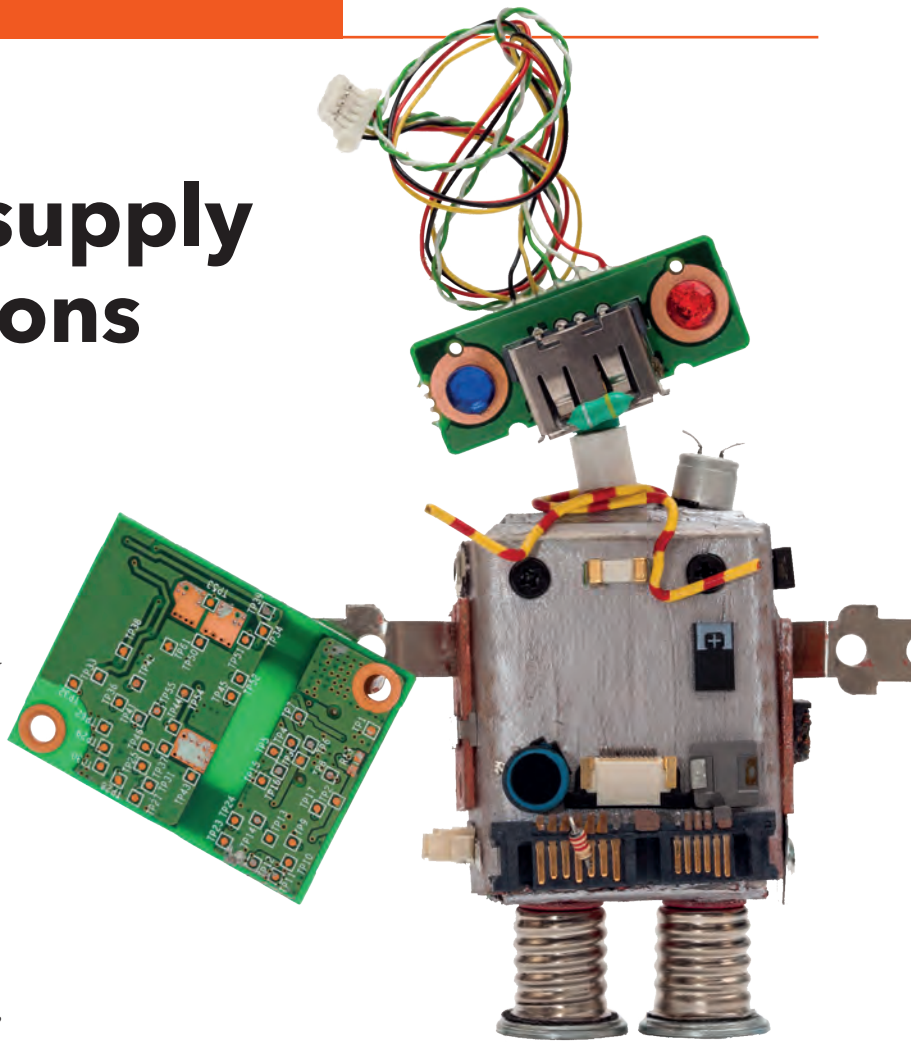
Lead times and product availability have become vulnerabilities, so utilising the knowledge, expertise and global reach of a kitting house can allow customers to stay ahead of continuous

market changes. Another benefit is procurement support for products at risk of shortage or obsolescence.

Risk management is a key element of companies' purchasing structure and while industry is going through a big disruption, it is paramount this process remains of upmost importance. Choosing a partner with an established and stringent QMS is vital.

From prototype stage to full production quantities, SeSemi Electronics can take control of a bill-of-materials and supply custom labelled production ready kits of components to customers around the globe. The company can support long term schedules and hold buffer stock in an ESD, temperature and humidity-controlled warehouse. SeSemi Electronics provides quick turnaround quotations, including market and product knowledge, to stay one step ahead of production disruption.

www.sesemi.co.uk



Benefits of Kitting

- One single invoice
- Reduction in administration handling
- Reduction in stores workload
- Improved cash flow
- Free up warehouse space
- Vendor reduction

eBOM.com

The **GAME CHANGING** site for
the electronics industry

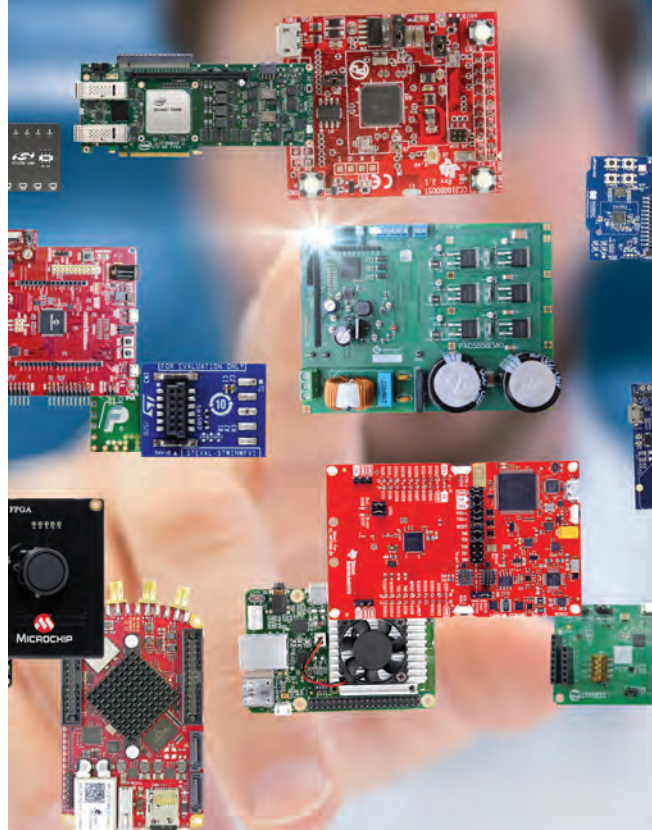


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Committed to client success

Tioga's managing director, Warwick Adams, explains how strong client and supplier partnerships are helping the CEM manage the dual challenges of costs and parts availability

Managing costs and parts availability in the current electronics arena has become the main focus of a CEM's day-to-day life. The emphasis is to check on all parts required to fulfil orders or part ship. Has there been an update from the supplier? Have they suddenly become available from another supplier? What price are they against our quoted cost? Which client is screaming the loudest: the list goes on. We are being reactive to clients, feeding them hand-to-mouth and efficiencies have gone out of the window.

On the plus side, once stock is checked in, the NPI process validated and kits released to the shop floor, this is a seamless journey through manufacturing and onto shipment. Whether it be a full kit or part shipment, this part of the journey is now the easy bit. The whole process is totally driven by stock availability.

As we moved into the 2019/2020 crisis, Tioga held an abundance of stock for all clients whom it has partnered and enjoyed a stable relationship with over many years. Realising the seriousness, the company pushed for orders to secure more stock. However, as time passed without light at the end of the tunnel, stock was gradually used and not replenished. Having to secure stock of non-problem parts ready for when allocated parts arrive has now pushed stock to a record high. The added frustration of component manufacturers increasing prices up to 20 per cent, implementing MOQs and being non-scheduled and non-cancellable has added fuel to the fire.

Moving forward, as partners we now work together to find and secure the stock, cost is agreed at the time of shipping to Tioga and then agreed when invoicing the client. All RFQs requested are ballpark and when placed they are re-assessed at the

point of shipping, if the values differ dramatically the client is kept informed and always has an involvement.

At the moment, controlling spiralling costs is a CEM's single most challenging job. To cover energy, haulage and inflation we've increased our running costs slightly, something we haven't done for many years and has been kept to a minimum.

The reality is that clients and suppliers need to be a strong partnership, communicate well and work together to share the burden of stock levels, increased costs and shipping products in a reasonable timescale. Giving an honest and true reflection of forecasts helps the CEM understand requirements. Placing orders well into the future helps secure the business. However, we also need to ensure we haven't over committed, ending up with high value stock when the market changes and prices start to fall: if they ever do.



Tioga's managing director,
Warwick Adams

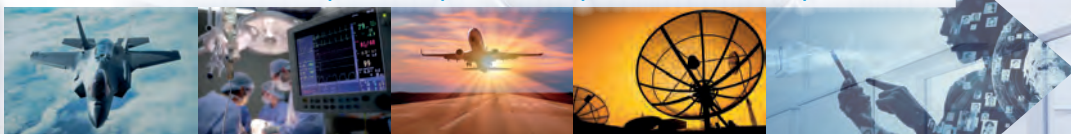
Warwick Adams concluded: "Tioga is committed to its clients. The industry is still frustrating and will continue into 2023. That said, a recent customer survey showed very positive results, confirming we are doing a great job. Thank you to all our people who are helping us ride this storm."

www.tioga.co.uk

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Derby based Tioga Limited, founded in 1996, has developed into one of the UK's leading Contract Electronic Manufacturers.

Offering a broad spectrum of electronic assembly, the heart of Tioga's manufacturing facility is based in Derby right in the centre of the UK in a beautiful listed railway building. The site has been custom converted and fully refurbished into a modern, extensive and sophisticated plant housing state of the art equipment.

Our core competencies far exceed just manufacturing; this encompasses design, engineering support, global procurement and supply chain, manufacturing, test, configuration, warehousing and distribution. In short, we are able to take on board the management of customers' products in their entirety.

Tioga Design Services



Tioga customers have the support of **Tioga Design Services** who provide end-to-end design, development and commercialisation of electronics products.

Having this **specialist expertise** in other areas, such as

re-design and **design of test jigs**, brings added value to Tioga manufacturing and further enhances our customer partnerships.

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www.tioga.co.uk

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- ISO 9001 / ISO 13485 / ISO 14001 / ISO 27001
- Full Turn Key Solution / Boxbuild
- Wide Ranging Expertise
- Design Partnership



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tioga
electronic assembly

PART OF SIMPATICA GROUP LIMITED

Medical interconnect delivered from stock

Intelliconnect has developed a range of triaxial connectors, adaptors and cable assemblies which it describes as competitively priced and high-quality. Delivery from stock or custom designed products are both available.

Triaxial products are available in TRB, TRT and other interfaces. They are used extensively in medical applications such as imaging and dosimetry in hospitals and clinics throughout North America and Europe and are regarded as the finest performing products of their type.

Intelliconnect's global sales director, Steve Groves, said: "The medical market is very important to Intelliconnect, we work with equipment manufacturers on new products as well as supporting National Health Trusts with timely replacement of damaged or lost interconnects. Our triaxial products also have many general-purpose applications including broadcast and security systems."

Intelliconnect produces a range of interconnect products for medical applications and can design special products for specific requirements including waterproof and harsh environment applications.

www.intelliconnectgroup.com



Protection for maritime electronics

Foremost Electronics has announced a range of enclosures providing rugged protection of electronic systems for shipboard naval systems and maritime electronic equipment. Applications include shipboard targeting radar, anti-submarine systems, communications equipment and control and monitoring equipment.

Foremost's NVent Schroff products offer robust 19in cabinets that meet MIL-S-901D. Their characteristics help systems builders meet stringent shock and vibration resistance requirements on the high seas. The Schroff Varistar platform offers simple system development and high integration capability.

A cabinet for individual requirements can be developed and validated by numerical simulation, saving lengthy and expensive laboratory tests. The elastic suspension is adapted to the mechanical environment and resilience of components. The cabinet's dimensions and weight can be tailored to specific integration requirements. The final design is further validated using a model calibrated by real tests using a finite element calculation.

www.4most.co.uk



Stainless steel increases mount durability

A new range of anti-vibration mounts is available in stainless steel. The design reduces the potential of corrosion and increases durability for OEMs and end users operating in harsh environments or requiring longer lifespan. The mounts are easily installed or retrofitted to applications up to 190.5kg maximum compressive load.

The mounts can be added to vibrating equipment, such as machines, motors or generators, to absorb vibration. This can significantly reduce noise for machine operators and people in the environment. As the mounts reduce vibration, they can improve machine lifetime, decreasing wear rates and lowering maintenance requirements. Efficiency and performance can also increase.

The mounts comprise a rubber cylinder and can be installed using a threaded shaft or threaded insert. For installation flexibility, a rubber headed option can be used as a stop for perpendicular installation. A design capped with a stainless steel disc at either end can be used for parallel mounting.

www.wdscomponents.com

46in sunlight readable TFTs now available

Bridging the large format size demand between 40 and 55in TFT LCD displays, Display Technology is offering AUO 46in high brightness displays designed for outdoor and public information markets. Brightness options are 1,500cd/m² (135W backlight) and 2,500cd/m² (166W backlight). A reduced brightness version is also offered, achieving 700cd/m² (77.1W backlight).



Display Technology's commercial manager, Brendan O'Reilly, said: "These particular AUO panels are ideal for outdoor applications due to its liquid crystal treatment offering advanced wide temperature of -40 to 110°C, anti-glare (haze 28%) and relatively low power consumption, making less technical hurdles for integrators."

The slim 6.6mm deep design allows enclosure integration offering more space for electronics and airflow management. With wide temperature support it can be considered for various passenger information and transport applications. Customers can benefit from the lower power consumption of the 1,500cd/m² model.

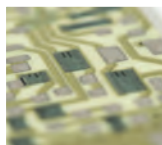
Roadmaps show availability with successor models beyond 2024 so expect long term availability.

www.displaytechnology.co.uk



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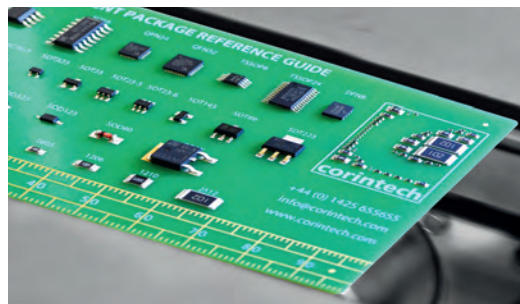


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Conformal coating: why it's becoming a PCB necessity

Do your products' bills-of-materials feature a line item for conformal coating? If not, they may soon, due to increasing expectations of integrity, performance and lifespan

Demand for devices that function in increasingly challenging environments, along with the desire for products to become smaller, means production techniques once reserved for extreme engineering

and high tech, high spend projects are being applied to everyday products.

Wearable devices, environmental sensors, machinery components, home products, businesses and transport are all benefiting from advances in miniaturisation but with the expectation of no impact on operational integrity, performance and lifespan.

Conformal coating is one of the techniques now being applied to everyday electronic products.

Once only used for products that required protection against extreme conditions (aerospace, deep-sea, etc), conformal coating is now used to protect everyday electronic products.

Conformal coating is the application of a thin polymeric film to a printed circuit board. The thickness and type of coating is determined by the product and its applications. The coating moulds to the shape of the board and protects components from moisture, dust, chemicals,

and temperature extremes. As circuit boards decrease in size but increase in complexity, conformal coating also offers protection against electrical failure. Board components are effectively sealed, guaranteeing connection.

Conformal coating offers a cost-effective alternative to protecting electronic assemblies, removing the need for additional containment means.

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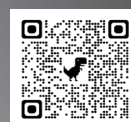


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Deploying a long term supply chain strategy

Although forecasting isn't easy, Nano Electronic Services' director, Steve Drew, explains it is essential to help the supply chain make informed decisions on stock levels



Nano Electronic Services' director,
Steve Drew

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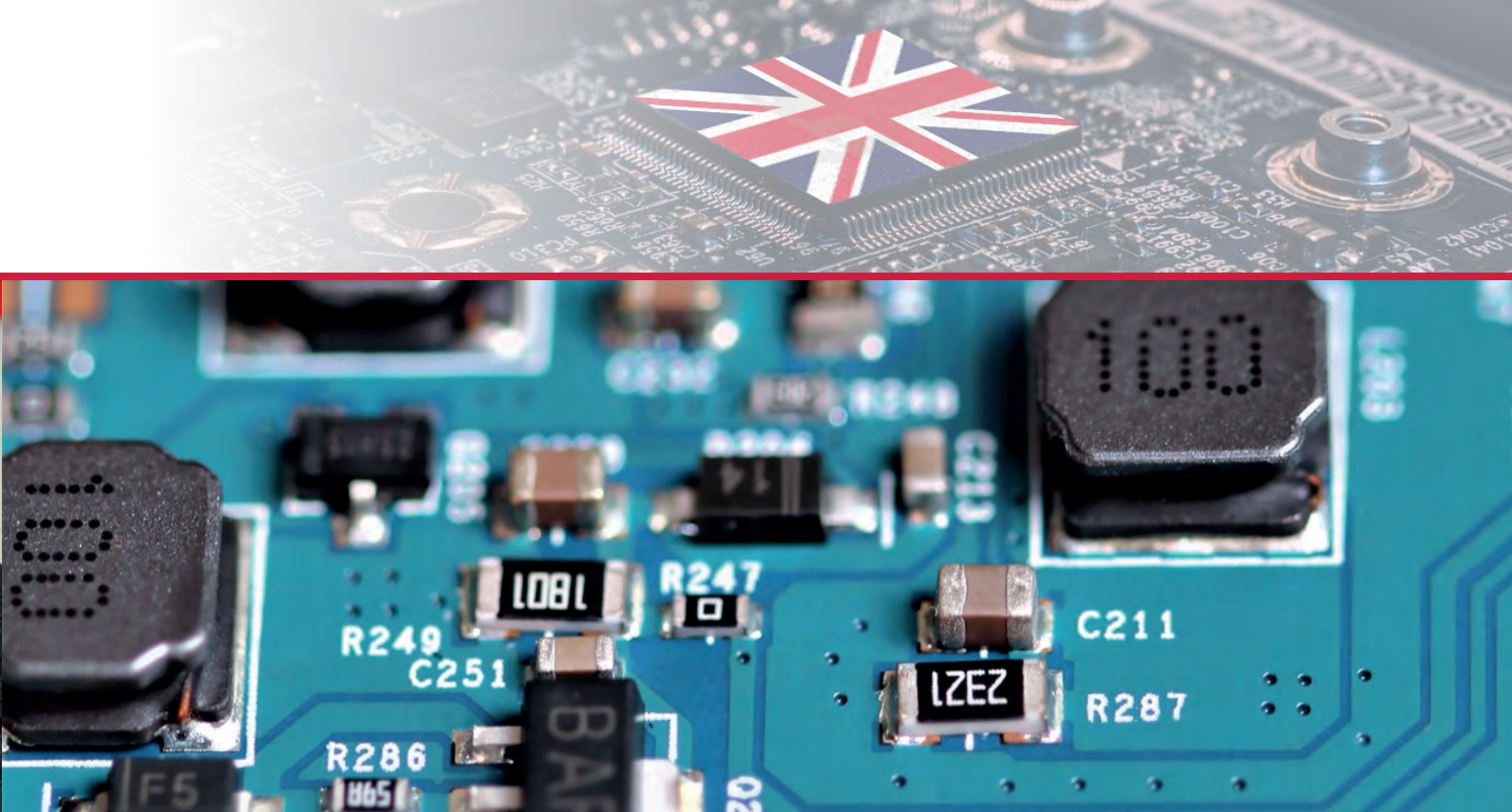
Training Kits and PCB's



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The automotive industry was brought to its knees by semiconductor scarcity. In 2021, automakers were obliged to cancel plans to build ten million cars. The forecast suggests they will cancel a further seven or eight million in 2022 and four million in 2023, as demand for semiconductors outstrips supply by 10 per cent. What goes for automakers goes for many industrial companies because they too rely on semiconductors in their products. The component shortage has impacted companies large and small, with the biggest impact on smaller companies who don't have the resources to buy inventory well in advance of demand.

How much time do companies spend with current suppliers? Most owners and directors probably spend next to no time either thinking about or being actively involved in how and where their companies spend their budgets for electronics. That's a mismatch with potential long term consequences for companies and goes some way towards explaining why so many companies are struggling in the current crisis. We have always pushed back on suppliers to hold inventory and when asked for a forecast, ignore it, as it's probably just the sales guy pushing for an order.



Something has to change. I think we need to consider our supply chain strategies moving forwards and how we deal with them. While the world will eventually sort itself out, I think we need to be more aware of where stock comes from and the many routes it can take before it arrives on our PCB.

Companies should look to work more closely with their supply chain partners, identify critical areas and understand the needs and demands of their business. By building better connections and understanding what everyone's aims and pain points are. By working closer together, suppliers and designers can more easily identify potential issues or

find quicker resolutions. By understanding the needs and demands of all parties, it helps ensure boards and projects move ahead smoothly. Working closer with engineers not on the current design but what their considerations are for the next one, and what the suppliers and manufacturers are developing. Assisting engineering to help make longer term decisions.

Everyone hates forecasting and telling suppliers what they might need. However, now is the time to break this habit, keep the supply chain informed and help them make decisions on stock levels or purchasing requirements. The more companies communicate the quicker they can get

back to levels of normality and ensure stock hoarding ends. Some of the silicon costs are frankly appalling, but by creating a new way of working, we can hopefully manage future stock demand much better.

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“What goes for automakers goes for many industrial companies because they too rely on semiconductors in their products”



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Using standards to increase quality

ART's managing director, Debbie Wade, explains how IPC standards help companies demonstrate better performance, enhance product life and comply with industry requirements

IPC standards are accepted worldwide as the pinnacle manufacturing standards for the electronics industry and can be adopted for every stage of the process from design to assembly and even handling and shipping. IPC standards help manufacturing companies demonstrate the products and services offered have high quality and reliability.

Investing in IPC training and certification programmes can help companies: demonstrate to current and potential customers that the organisation considers rigorous quality control practices very important; meet the requirements of electronics manufacturing companies that expect suppliers to have important credentials; gain valuable industry recognition; and facilitate quality assurance initiatives that have become important in international trading.

Training alone may help with quality initiatives, but when staff have an industry-recognised certification on industry standards, companies have the additional and extra credibility to help source new customers and contracts in today's ever-changing market.

Individuals can become certified to six key IPC standards:

- IPC 6012, Qualification and Performance Specification for Rigid Printed Boards

- IPC-A-600, Acceptability of (Bare) Printed Boards
- IPC-A-610, Acceptability of Electronic Assemblies
- IPC/WHMA-A-620, Requirements and Acceptance for Cable and Wire Harness Assemblies
- J-STD-001, Requirements for Soldered Electrical and Electronic Assemblies
- IPC-7711/7721, Rework, Modification and Repair of Printed Boards and Electronic Assemblies

Building aerospace products or trying to gain contracts in this field? Advanced Rework Technology is the only IPC Accredited Training Partner (IPC Training Centre) in the UK authorised to teach IPC Space Addendum training courses for J-STD-001 and IPC-A-620.

Standardisation is a dynamic function of the electronics industry and is constantly evolving. ART works with IPC to continually move forward with improvements and best practices to support manufacturing.

ART's MD, Debbie Wade, who chairs many IPC committees including vice chair of IPC Technical Activities Executive Council and Chair of European Standards Development and European Training committees, explained why Advanced Rework Technology



should be your training provider: "ART training staff are highly experienced with every part of the industry from design, fabrication, through to assembly and quality and inspection so this will assist the trainer with every step of their teaching which makes our courses second to none.

"The staff here at ART also dedicate their time to sitting on numerous IPC Standards Development and Training Committees. This gives us the added advantage and skills required to not just teach the latest requirements but fully understand the changes to the technical standards and associated training courses. For our knowledge, skills and dedication, we are proud to be the recipients of many industry and IPC awards. In particular, recipients of the prestigious IPC Presidents Award."

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Companies have the additional and extra credibility to help source new customers and contracts in today's ever-changing market



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As an Authorized Training Center. A.R.T Ltd can offer Certified Training to the IPC Standards listed below. A.R.T Ltd are the only training center in the UK able to offer CID PCB Design and IPC-6012 training and Space Addendum training for J-STD-001 and IPC-A-620.



Acceptability of Electronic Assemblies



Requirements for Soldering Electrical and Electronic Assemblies



Repair Rework and Modification of Electronic Assemblies



Requirements and Acceptance for Cable and Wire Harnesses



Qualification and Performance Specification for Rigid PCB's



Acceptability of Printed Boards

Best of
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Crystal clear frequency control

Euroquartz introduces the capabilities of its UK-based AS9100 manufacturing facility and highlights the benefits regarding ITAR controls



Cleanroom handles 7 by 5mm military and extended industrial temperature range clock oscillators

Frequency control products are key parts, essential in many of today's high technology systems, supplying timing and synchronisation of a myriad of processes.

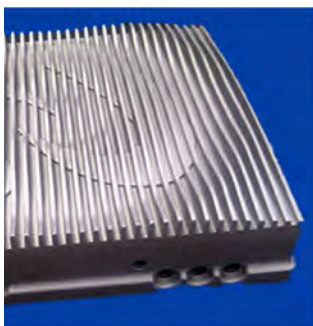
Euroquartz, as a specialist British owned company with AS9100 certification and UK manufacturing facility, produces and supplies military and industrial grade quartz crystals, oscillators and filters.

Cleanroom facilities at the company's Crewkerne headquarters in Somerset have enabled Euroquartz to manufacture a range of 7 by 5mm military and extended industrial temperature range clock oscillators for its UK customer base. A major advantage of UK produced components is their ITAR-free status making them ideal for export applications (see panel).

The Crewkerne plant is a unique crystal facility producing both legacy and surface mount products for a wide range of applications. Euroquartz has been manufacturing crystals since 1982 and has accumulated detailed knowledge of the technology which is shared with its customers. By working closely at a design level with the company's manufacturing partners, Euroquartz can offer a comprehensive range of frequency products backed by full engineering support.



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Best of British

The product range includes quartz crystals, clock oscillators, TCXOs, VCXOs, OCXOs and filters. As the pace of technology development increases, Euroquartz keeps at the forefront of oscillator design by regularly releasing a variety of new products.

Recently released ranges of VCXOs offer both CMOS and differential models in a variety of package sizes. The latest TCXOs also offer a range of output waveforms combined with excellent phase noise and jitter performance in several package sizes.

Euroquartz also supplies crystals for all major Wi-Fi protocols such as: Zigbee, ISM and WLAN, and currently supplies many IoT projects.

Euroquartz has also introduced several innovative products recently offering a variety of high-speed formats such as LVDS, CML and HCSL, all designed to offer superior phase jitter

performance. These oscillators are found in applications such as PCI Express, plus other high-speed data networking systems.

Another recently introduced range is a frequency selectable oscillator enabling a factory-set choice of two frequencies from a single oscillator circuit. The buffered output oscillator is another novel addition offering 60pF of drive from a single oscillator package with four identical output frequencies each with 15pF capability.

Euroquartz is committed to providing high-quality products with full traceability all combined with comprehensive technical support to deliver a quality service for engineers and buyers alike.

www.euroquartz.co.uk

ITAR: a quick guide

International Traffic in Arms Regulations (ITAR) are US export controls designed to restrict and control military related parts and can be a confusing issue. Strictly speaking, ITAR covers defence articles, technology and services with EAR—Export Administration Regulations—covering commercial and dual-use parts. Also included are technologies relating to them.

People often assume that an item listed as EAR99 is not regulated and there are no compliance issues. This is simply not the case as there is obviously a requirement to determine and apply the correct export control classification. However, this is only part of the requirement. Although some components are not listed with a specific control classification, it is the end-user that makes the difference to their status.

Consequently, a customer may purchase an EAR99 listed product but also need to provide an end-user declaration form (EUD).



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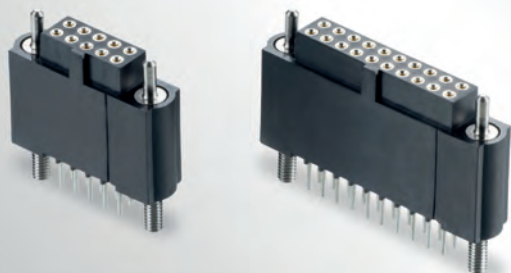
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Greater board-to-board spacing

Complementing its existing Datamate J-Tek connector range with 7.3mm mated board-to-board height, Harwin's new female connector provides a significantly larger 17.15mm connection height. This allows more space between PCBs allowing use of larger board-mounted components or cabling options. Applications include high-end industrial, aerospace, defense and heavy-duty portable equipment.

Harwin's head of product marketing, Ryan Smart, said: "Feedback from our client base has shown that there are times when a greater board separation is necessary. These new extended profiles of Datamate connectors offer the stacking heights needed for such applications while maintaining high degrees of mechanical robustness and reliability."

The connectors are available in double-row layouts of 10, 20 or 30 contact versions and are compatible with existing through-board male connectors. All mating contact surfaces are finished in gold, while terminations are either gold or tin. In addition, board mount jackscrews give strain relief for the solder terminations and guideposts help with mating.

www.harwin.com



Extended temperature TFT portfolio gets 10.1in version

GTK has broadened its family of extended operating temperature range TFTs with a 10.1in version.

GTK's business manager for displays, Clive Dickinson, said: "The 10.1in screen size is becoming the 'go to' size for OEMs and so this new display rounds out this range perfectly. Typically, TFT displays operate at temperatures between -20 to 70°C, but displays in this range can operate between -30 to 85°C, meaning they can be used in a wider range of applications."

The display uses IPS technology, LVDS connectivity and has 1,000cd brightness making it sunlight readable. It also features an extended backlight half-life of 50k hours, making it suitable for industrial, always-on display applications. All of these features, combined with its extended temperature range, make it the product of choice for harsh environments and outdoor applications.

GTK offers OEMs a variety of customisation options including capacitive sensors and extended glass cover lenses to allow flush fitting into recessed housings.

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IoT gateway to over 200 edge devices

Advantech has introduced two LoRaWAN industrial sensing and I/O solutions.

The WISE-2200-M is a Modbus read/write communication device. It supports maximum 128 address and 30 rule settings and can connect to Modbus sensors and meters for different applications. The company states it provides a better connection compared with traditional wireless technology.

The WISE-4610 advanced industrial wireless I/O module features selectable private LoRa and LoRaWAN options. It provides a longer communication range and better penetration through concrete

and steel and creates less interference than 2.4GHz spectrum. The application ready I/O module can be fitted with an IP65 enclosure and powered by solar rechargeable battery or 10 to 50VDC input. It also supports GPS, Galileo, BeiDou and GLONASS systems.

With Advantech Edgelink IoT gateway software 200-plus edge devices may be connected via the southbound interface to different platforms via the northbound interface inside the gateway. This allows users to plug-and-play without worrying about data parsing processes.

www.advantech.eu

Embedded computer supports Win 10 IoT

Duagon's new G28 is a 3U CompactPCI serial CPU board featuring 11th generation Intel Core and Intel Xeon W-11000E series processors/Tiger Lake-H CPUs.

With up to eight cores and 64GB RAM, the single board computer suits high-end embedded rail onboard, rail wayside, medical and critical automation applications. Optional 10Gb Ethernet interfaces allow for high data throughput and direct connection to the network backbone.

Regarding memory, up to 64 GB DDR4 DRAM with ECC is soldered to the board. Components are underfilled and coated for shock/vibration resistance and durability in harsh environmental conditions.

For rail onboard markets, the G28 is used as a central maintenance and virtualization platform and main computing unit for passenger Wi-Fi and internet access. In rail wayside server systems, the computer is used for condition monitoring. Regarding medical and industrial applications, the G28 offers reliable computing performance for surgical robots and factory automation, motion control and robotics.

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by Nathan Pray, manager, digital technology office – B2B, and Stéphane Ratelet, director, business development/digital solutions - EMEA, at Digi-Key Electronics



Nathan Pray, manager, digital technology office – B2B



Stéphane Ratelet, director, business development/digital solutions - EMEA

Speed and access to information and data are critical in all forms of electronic product design and procurement, and an organization's time-to-market can mean the difference between a successful and marginal product acceptance. That's why Digi-Key developed the most advanced, complete suite of real-time APIs, completely free of charge to customers.

API solutions will likely be one of the most disruptive innovations in the electronics market during the next five to ten years, thanks to the benefits they provide to the procurement process. Digi-Key's API solutions provide a digital platform with a competitive advantage to customers. By streamlining

the purchasing process, APIs enable procurement, engineering and design teams to all receive critical real-time information on products they need at lightning speed through automated machine-to-machine connections. Customers using Digi-Key's API solutions save time and bring products to market faster and more efficiently, boosting revenue.

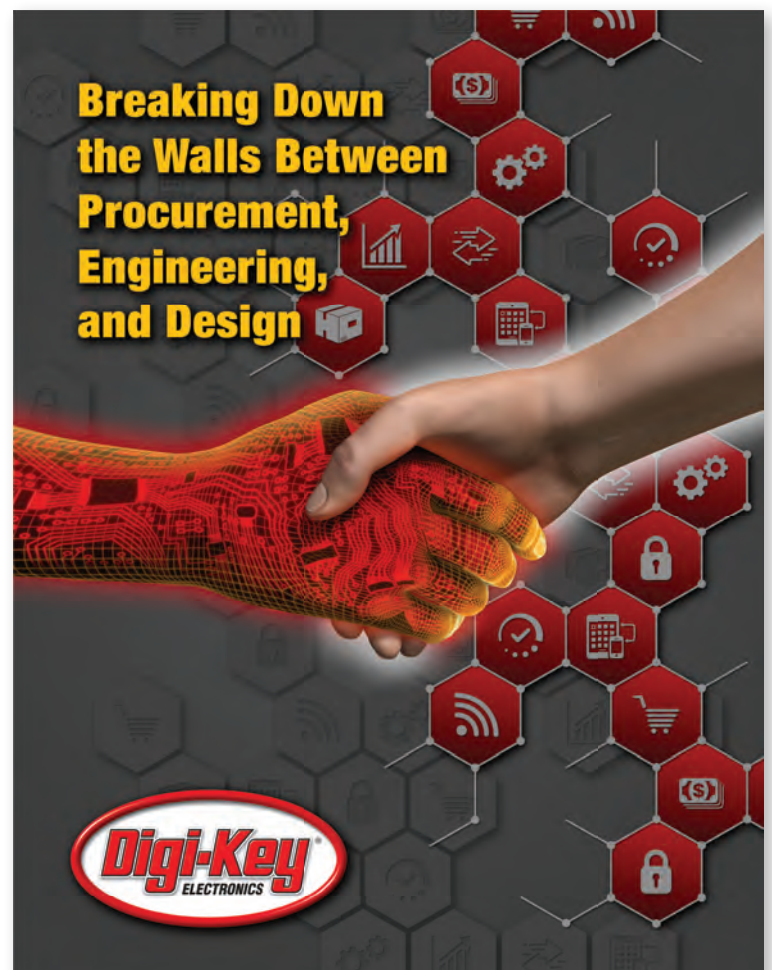
The APIs are free to use and allow customers to connect directly to Digi-Key systems to access automated, real-time product search, price and availability, quoting and ordering, barcoding, product change notifications and more. Digi-Key also collaborates with exceptional integration partners to provide customers with cost-effective and fast options to connect to Digi-Key's API solutions with less development investment.

Digi-Key further provides an ROI calculator that estimates how much you can save in one year by implementing Digi-Key's price and availability and ordering APIs. Customers have seen an average of \$50,000 to \$100,000 in cost savings by implementing API solutions.

In addition to real-time price and availability from Digi-Key's product information APIs, Digi-Key's quote

API secures pricing for 30 days, enabling purchasing professionals to experience a smoother ordering process with more efficient quoting and real-time data on demand. Digi-Key customers can have confidence in the prices they are quoted and do not need to invest in extensive software development to leverage the technology.

For more information about Digi-Key's API solutions, visit www.digikey.co.uk/API to download a free eBook on the benefits of implementing API solutions and use the ROI calculator to see the return on investment that implementing APIs can deliver.



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Knowledge, networking, experience and more

With 25-years' experience in obsolescence management and a broad spectrum of members, IIOM is the right choice for today's supply chain hurdles

The International Institute of Obsolescence Management (IIOM) is 25-years old this year. Having started in the UK as the Component Obsolescence Group (COG) in 1997 as a trade body for manufacturers, asset operators and obsolescence solution providers, it now boasts a global membership and professional recognition scheme.

We all love the buzz of getting the latest technology but how often does it not work as planned with integrated systems or require other support? The modern world is a whirlwind of technological creativity and advancement. However, there are many applications for which newer, smarter and faster means a system or product no longer works and is pushed towards a premature end-of-service or obsolescence.

Traditionally, systems such as air traffic control, aviation flight computers, railway signalling, nuclear powerplant controls, medical scanners, communication infrastructure and many other legacy business systems

and utilities, are good examples of being overtaken by new technology. Could we have foretold a situation where the modern supply chain would be affected by a short-term obsolescence scenario, where even the most common parts would be hard to find? To top it all, some of those may be subject to an obsolescence notice in the near future. There are so many unknowns the situation is precarious to say the least.

For equipment with a long lifecycle, the original design requirement remains unchanged, sometimes for several decades, meaning that proactive obsolescence management has become a necessity to ensure delivery to the customer in a cost effective and timely manner. Today we find ourselves in a situation where the skills associated with obsolescence management are an asset to any purchasing department. When the buy-in from management, to engineers, to purchasing is there, it is a force to be reckoned with. The practices carried out in organisations that suffer at the hand of obsolescence are relevant for the current supply chain and companies you wouldn't expect, automotive as an example, are employing engineers with obsolescence skills to aid future resilience.

Obsolescence is defined as the non-availability of parts or services that were previously available and it's much more than just components. For example, materials, processes, skills, and software can be affected and occur in all stages of the equipment's life cycle, such as development, design, production and in-service. Using obsolescence management as a tool in an organisation creates an understanding of why this may happen and to plan and mitigate for these instances in the future. It is also now recognised as a vital part of the support and through-life strategy by many progressive companies.

IIOM is the professional body for those involved in obsolescence management. The Institute is for professionals worldwide who wish to further their knowledge and understanding of the obsolescence management discipline, obtain professional recognition and network with like-minded individuals from its global membership. The organisation welcomes corporate and individual members and has obsolescence solution providers among its corporate membership, as well as manufacturers and operators. These solution providers offer various obsolescence



Winslow Adaptics' managing director, Teri-Ann Winslow

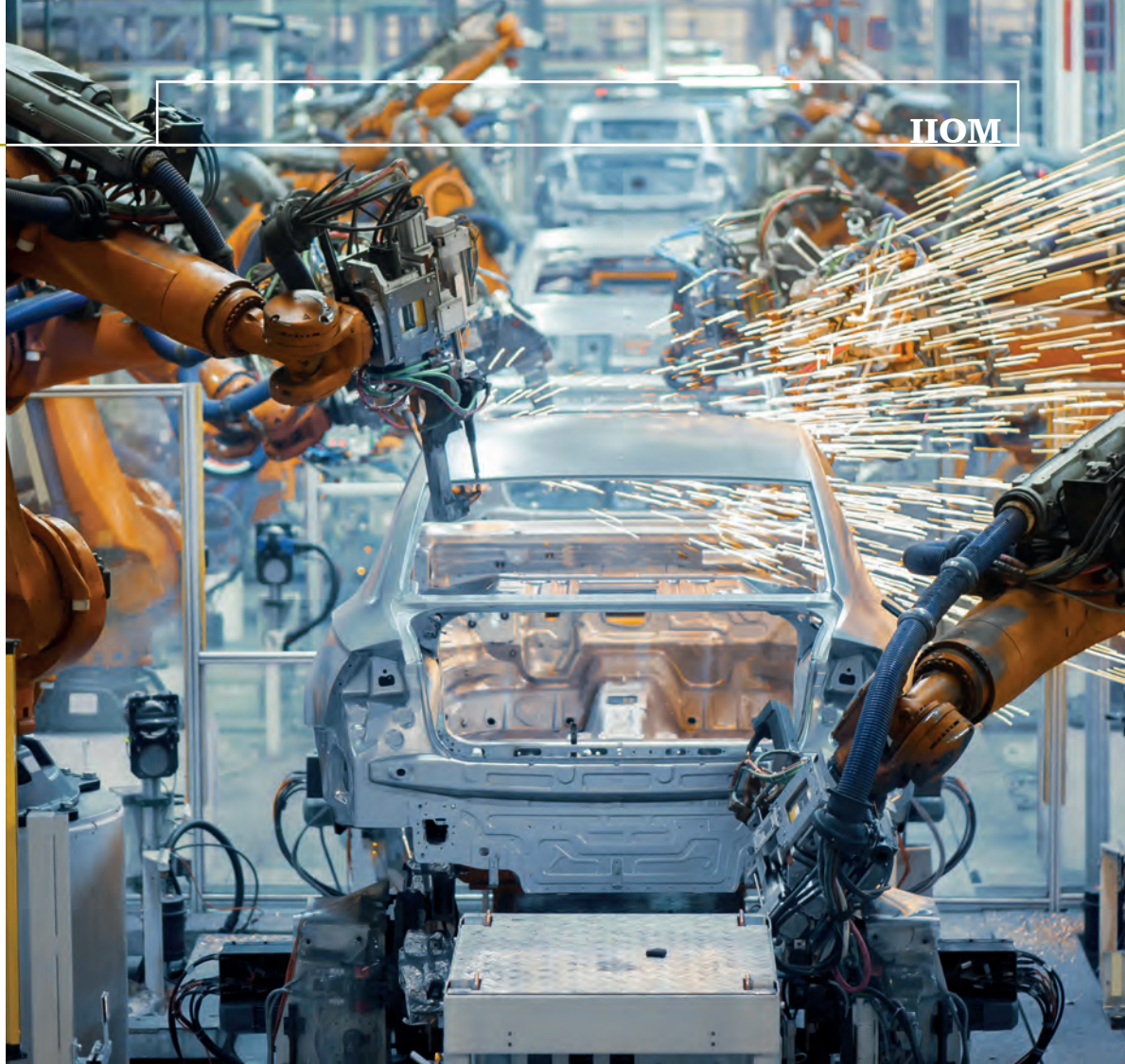
management services, including: component monitoring; counterfeit avoidance; engineering and manufacturing creative; sustainable solutions for obsolete designs; stocks of obsolete and end-of-life components; and training.

Regular member meetings and a biennial international conference provide a mix of formal presentations and informal events at which obsolescence engineers, buyers and solution providers can exchange ideas—not just on obsolescence but also on key issues such as REACH, conflict minerals

and counterfeiting. Meetings also provide access to suppliers of the latest tools and systems developed to support obsolescence monitoring and management.

The consumer 'right to repair' initiative will hopefully lead to a change in attitude in the workplace and obsolescence management will become a central part of the circular economy. Engineers and customers will need to think twice before ending service life and the resulting costly disposal. Obsolescence, whether temporary or not, is here to stay but you can help yourself manage the risk. The good news is that with 25-years' experience and a diverse membership IIOM is there to help.

www.iiom.org



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Solid State Disks introduces its array of technologies and services designed to support customers in sectors stretching from aerospace and defence to rail and telecom

Solid State Disks specialises in the design, development, manufacture and integration of hard disk, floppy disk and tape drive hardware emulators for legacy systems that need to be dependable yet need not be updated frequently.

Application examples include harsh environment customers in the aerospace, automation, defence, energy, rail, semiconductor manufacturing and telecoms sectors.

Often the latest parts take some time to pass reliability and qualification testing. Backwards compatibility is the key as new interfaces may require mechanical or software changes and/or system requalification.

There is often a requirement to support specialised computer systems, well into their middle age, which must continue to operate in critical applications and difficult environments. SSD has successfully delivered form/fit/function replacements for SCSI drives that are more than thirty years old.

Meeting performance is key and price needs to consider long term servicing costs and contracts that require guaranteed levels of availability. Sustainability and energy consumption in developing new products is also

driving new product investment decisions.

Meeting performance in challenging environments and the consequences of any failure drive selection criteria. SSD has collaborated with customers in key market sectors to provide enhanced products such as networked Touchless Removable drive solutions and Direct Ethernet.

With the hardware emulator solution, it is often possible to prolong legacy system life—and increase performance, reliability and environmental immunity—by identifying and replacing the high-risk hardware elements.

SSD offers system level support to engineers using its proprietary technology and has already helped companies including Alstom, Boeing, BP, Canon, Dolby, MOD, NEC, Nokia, Raytheon, Thales and Verizon.

SSD is also a specialist UK OEM flash memory distributor for APRO, Innodisk, SanDisk, SMART Modular Technologies and Transcend who are market leaders for flash disk drive technology and other memory products to the defence and industrial markets. SSD is supplying the latest DRAM and flash memory to customers for multiple end user applications.



Meeting performance is key and price needs to consider long term servicing costs and contracts that require guaranteed levels of availability

The current component shortages are affecting most customer sectors. As a franchised distributor, SSD is kept aware of the latest capacity news, product developments and road maps, and sits at the front of the queue when products become available.

www.solidstatedisks.co.uk

Start your obsolescence journey

Force Technologies' managing director, Karen Salmon, reminisces on IIOM's origins and highlights how it helps OEMs and individuals through their obsolescence journeys

When Ian Blackman invited me to a meeting at GEC Borehamwood's Social Club in 1997, I remember thinking 'why am I driving eighty miles to sit and talk about obsolescence?' The dingy wooden panelled room with a closed bar didn't invoke excitement. However, Ian explained enthusiastically how he had formed COG to help like-minded businesses pick their way through the obsolescence management minefield. The idea was to support OEMs and promote solution providers like Force Technologies

which signed up to become member number 27.

Fast Forward 25-years and having sat on many committees—including the website and contributing to the COG booklets—brings back fond memories. I am still a proud IIOM member, witnessing how the organisation has grown worldwide and continues to help OEMs and individual members through their obsolescence journey.

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Why component obsolescence need not mean product obsolescence

Rochester Electronics' technical sales manager EMEA, Ken Greenwood, steps readers through a thorough checklist designed to help OEMs plan for and manage obsolescence

When long term product availability is vital, companies need to ensure a reliable source of components—even after the component is made obsolete—and plan to manage obsolescence strategically. Failing to do so could lead to: line-stops; unnecessarily large financial commitments tied up in last-time-buy stocks; long-term storage costs; forced product redesigns; and premature product EOL and reduced service lives.

How can customers minimise the impact of component discontinuations?

1. Obsolescence management starts at the design phase. Poor component selection in development can lead to premature product redesign and re-qualification. Lowest cost may not be best choice for long-term supply.

Questions to ask suppliers include:

- What are the OCM commitments to long-term availability?
- Can the supplier demonstrate a controlled transition process through the EOL and into long-term authorised supply?

- Are the design's heart-beat components—the software packed microcontrollers, FPGAs or ASICs—comprehensively documented?
 - Can the true design files (VHDL, Spice-models, test-vectors) be retained and archived at the design phase to offer a chance to rebuild if the unexpected happens?
- 2.** Understand the total cost of obsolescence. Component obsolescence is not just a purchasing problem to be addressed as an afterthought. Does the project plan need to include anticipated product redesigns during its life? How are the costs of component storage accounted for? How will obsolescence impact on after-sales service commitments?
- 3.** Plan for obsolescence and resource the management of it. If equipment has a long qualification, production or in-service life you will face component obsolescence. Preventative planning by purchasing, component



engineering, design and program management can reduce or eliminate the cost and risk.

- 4.** Proactive monitoring of component lifecycles. Regular component monitoring allows a user to anticipate problems before they occur. There are some excellent tools such as IHS Parts Intelligence and Bill of Materials (BOM) Intelligence, which track a component's lifecycle, lead-time and specification changes.
- 5.** Be aware of product discontinuation notices (PDNs). There are many component management databases which can provide a PDN notification to highlight any PDN which affects your products.
- 6.** Last-time-buy; what to forecast? LTB orders are inevitable, but a supplier with an established EOL transition partner offers the chance of risk-free ongoing authorised stock and production if demand rises, redesigns are delayed, or in-service commitments are extended.

- 7.** Purchase from authorised sources. There is a common misconception that once the original manufacturer stops making a component, the grey market sources are the only option for supply. This is far from the truth. The risk of counterfeit and inferior products from unauthorised sources represents a significant risk to production yield and failure rates (MTBR). Inferior or substandard 'testing' by unauthorised third parties gives a veneer of confidence that this can be accurately tested. In truth, the testing is a poor imitation of the original manufacturer's test processes.

Authorised sources, such as Rochester Electronics, receive their stock exclusively from the original manufacturers, therefore Rochester can offer the original warranties and guarantees. Increasingly, Rochester is also able to offer ongoing licensed manufacturing solutions from known-good-die and test products according to the original test procedures. Rochester produced parts are current date coded with no solderability risk and are marked with the original manufacturer's part numbers, 100 per cent compliant with the original specification.

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Complete spectrum of procurement services

As component shortages force companies to consider out-of-franchise sources, it's essential to work with trustworthy partners as Solid State Supplies explains

Counterfeit activity has risen significantly during the recent component shortages, and as more companies are forced to consider the out-of-franchise route to plug procurement gaps, it's essential to work with a partner you can trust.

Solid State Supplies has been in the franchised component distribution business for over 50 years. Sourcing and obsolescence services (SOS) are an important element of our remit, and the team has been strengthened so we can now supply both commercial and military hard-to-source parts.

Commercial and industrial sourcing divisional manager, Peter Greenslade, brings 30-years of experience and an extensive network of global sourcing contacts to the company.

Peter said: "When conditions are this challenging, we must be flexible as a supply partner. With this in mind, we have worked hard to establish a wider network of trusted, verified suppliers so we can source products for lines we are not franchised

for, protecting customers and keeping production schedules on track."

Solid State Supplies verifies all sources and carries out full due diligence to mitigate risk, providing return rights and warranty on all goods supplied. Our experience means we are well positioned to avoid pitfalls and pre-empt problems; we protect customers with dedicated buffer stocks, and our close relationships with our suppliers often allows us to secure more product on behalf of key customers.

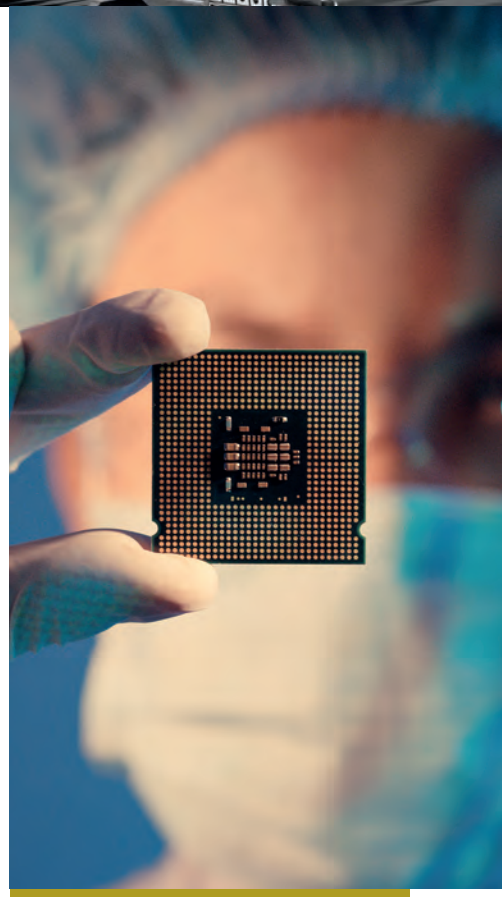
Avoiding counterfeit products has always been a focus for the military and aerospace sectors. Solid State Supplies is a member of ERAI, host to the world's largest database of suspect counterfeit and non-conforming electronic parts.

Military and hi-rel sourcing divisional manager, Paul Dale, advises OEMs in the defence and aerospace sectors to make sure they have an approved supply chain with industry recognised approval. Paul added: "When we source mil/hi-rel electronic

components, we only buy from other suppliers with AS9120 accreditation. It's essential that any distributor has an industry-recognised system in place, and it's important to establish what your distributor's counterfeit-avoidance policy is. When we buy components, if we cannot obtain them with the manufacturer's C of C, we test to AS6081 which is an international recognised standard for inspecting electronic components for suspected counterfeiting. In some cases, we add extra testing in line with customer requirements; the test houses we use are all AS9100 approved."

Our combination of cost-effective, reliable provision of regular franchised components, assured sourcing of hard-to-find product and experienced management of EOL and obsolescence situations ensures your supply schedules can run without disruption—and buying counterfeit products from us is something you'll never have to worry about.

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We have worked hard to establish a wider network of trusted, verified suppliers so we can source products for lines we are not franchised for



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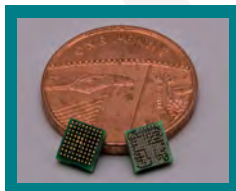
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When the chips are down there are options

Winslow Adaptics explains how it designs, develops and manufactures products to support electronics system lifecycles

The semiconductor shortages we are all experiencing are frustrating to say the least. It's keeping us on our toes and each day doesn't seem to get any better. Having said that, we are expecting it to improve but, we're not sure when.

Today's obsolescence marketplace now includes a temporary obsolescence scenario, it's like allocation on steroids. A myriad of component types are either temporarily unavailable or have lead times extended exponentially. Even end-of-life notices have been affected. For example, an Intel voltage regulator went from LTB notice September 21 for last orders end of March 22 to; no further orders accepted Feb 22 to; part placed on allocation to US DOD, Intel strategic accounts and Intel internal production early March 22, which meant all outstanding orders were cancelled unless you could prove it was for one of the three. The PCN was then changed again July 22 to say that capacity had been secured to continue production with last shipments March 23.

Keeping ahead of the game is a challenge and time is precious but it's worthwhile sitting back and weighing up the options. Is there something else that could be deployed to effectively solve the problem?

Although redesign can seem like the way to go when your back is against the wall, this is not always the case. Techniques are employed to enable the original design to be utilised in the traditional world of legacy designs and the high-reliability markets of defence and aerospace where re-design either isn't an option point blank or isn't a cost-effective route ahead.

The current situation doesn't discriminate. The highly regulated medical devices and automotive industries are now looking at ways to avoid lengthy re-design and using proven methods as an alternative or to bridge the supply gap.

The right to repair campaign, which is currently a company-to-consumer activity, will most likely eventually branch out into business-to-business. The trend we are currently in allows us to examine our procedures for product redesign and technology updates and explore the possibilities available to either extend the life of a product or enhance the technology without completely redesigning the entire electronic system.

As we see lead times improve the fall out is likely to be an increase to EOL notices. Considering that most of us wouldn't have predicted a global pandemic and

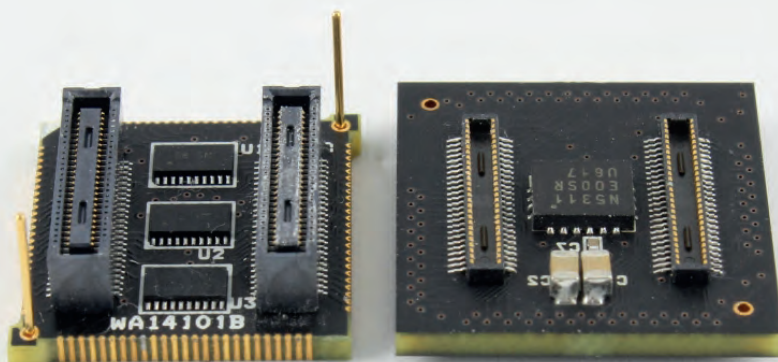
the experience gained in the last two years, why wouldn't we pay attention and implement a risk management strategy for the future, even if it becomes a temporary event.

For more than 40-years, Winslow Adaptics has been involved in the design, development and manufacture of a wide range of products to support the electronics system lifecycle, working with clients in industries such as medical, defence, aerospace, automotive and rail. The company has been an active member of IIOM since 2003.

www.winslowadaptics.com



Keeping ahead of the game is a challenge and time is precious but it's worthwhile sitting back and weighing up the options



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Navigating supply chain challenges

NOTE Windsor's logistics manager, Brendon Jones, explains how trustworthy partnerships with customers are helping overcome challenging market conditions

It was a relief when many of the UK's covid restrictions were lifted and scaled back in much of Europe, bringing anticipation of an improvement in the supply chain. Despite this positive move, it is worth being mindful of the restrictions and lockdowns still operating in many parts of the Far East and their lasting impact from factory capacities to shipping availability. These factors cloud some of the positivity.

Coupled with this, are ongoing component shortages driven by phenomenal growth in

5G, cloud computing, infotainment and consumer electronics markets. The continuing global trend toward miniaturisation and digitalisation during the pandemic has increased demand. This applies to component manufacturers across all industries including consumer electronics, electric vehicles, healthcare and energy production. Events in Ukraine and Russia have compounded the issue limiting supplies of raw materials in an already constrained world. This has created further factors that need careful consideration when planning effective fulfilment in the already challenged supply chain.

As the electronics industry progresses, supply and logistics are currently the biggest challenges for contract electronics manufacturers meeting customer requirements. To a degree, NOTE has mitigated some of these challenges through its proven Kanban model and more recently an increase in inventory to ensure component availability.

The first point at which these conditions are felt is component procurement. In essence, NOTE's ability to procure in an effective and timely manner is paramount. In many projects, the 80/20 rule applies. Roughly 80



Note Windsor's logistics manager, **Brendon Jones**

percent of components are readily available and can be sourced relatively easily, while the remainder need further work to source from trusted and approved sources. It is those last few components that dictate when the project enters the manufacturing stage, so planning is crucial.

As the component market is so volatile, delays can occur at any stage of the sourcing process. Depending on when it occurs often determines how it is mitigated. While the market is unpredictable, there are many options using NOTE Windsor's local sourcing team or the central sourcing team within the wider NOTE group to bring leverage to procurements.

If a supply delay only impacts schedules by a few days or maybe weeks, robust planning programs can often accommodate this. Occasionally the delay does not occur until quite late in the planning process meaning materials may already have been kitted in preparation for assembly, pending a last item. A key to avoiding this is looking at the BoM early to ensure a good grasp on lead times and order ahead of time.

If there are last minute BoM changes from the customer, we can work with them to look at component availability and cost using our internal software which analyses lead times, obsolescence and BoM cost.

In these unusual times it is the partnerships and relationships of trust we have fostered with customers and suppliers, that help overcome challenging market conditions.

Customers are being asked to forward plan as far in advance as possible to mitigate global lead-times. Customers understand this and are supporting us by providing the same to ensure we can manage challenges that lay ahead together.

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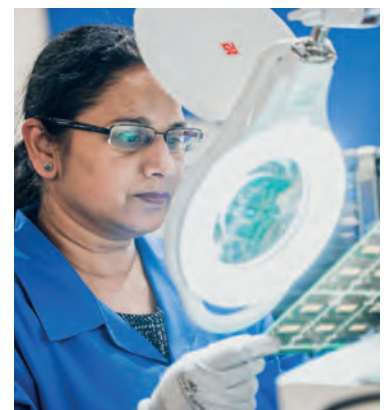
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Transportation • By John Denslinger

Will transport undermine supply continuity?



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 asks whether America's transportation links could undermine supply continuity just when the electronics industry needs it the most

There is an old adage describing resilience and persistence in the face of adversity: 'bend, not break'. Unfortunately, when it comes to global supply lines, the opposite seems our destiny: 'break, not bend'. US global supply chains once considered the ultimate in cost effectiveness, flexibility and reliability are procurement headaches. Today, nothing seems normal or consistent about everyday movement of raw materials, supplies and finished goods.

How robust are America's transportation links? A supplier's lifeline relies on transportation certainty whether it's ports, rail or truck. One might ask if supply lines built on multi-mode transit are a liability. In hindsight, the west coast port congestion at the beginning of the Covid era might have been the first indicator given: massive queues at seas; off-loading delays measured in months not days; disruption to the efficient recycling of containers and cargo ships; and a system seemingly overwhelmed as consumer demand continuously escalated throughout the pandemic.

To their credit though, ports still handle record imports. Regulatory relief from both Federal and California governments eased the logjam. Now, two years later, the current West Coast Port labor contract has expired with no agreement in place. Each has agreed to forego sanctioned work stoppages (union authorised strikes and management induced lockouts), but that still doesn't rule out slowdowns and shutdowns. Until negotiations are settled, this link is potentially disruptive.

Air transport aside, goods move about the continent by railroads and trucks to intermediate and last mile destinations completing the classic multi-mode transportation system. Question: is it likely rail and/or trucking will become the next weak link upsetting supply continuity?

Railroads: as West Coast port negotiations continue, the same is also true for railroads. Hopes of resolving

contract differences between the railroad unions and a management consortium have failed over the past two years despite multiple mediation and arbitration attempts. In July, President Biden found it necessary to appoint a Presidential Emergency Board (PEB) under the Railway Labor Act facilitating contract settlement. A couple of 30-day cooling off periods mandated by law, as well as the ever-present Congressional intervention forcing binding arbitration almost assures there won't be any organised disruption. Rail is probably not a weak link.

Trucking: the issue here is quite different and volatile. There are two issues. The first is specific to California law AB5, better known as California's gig worker law. While the law intended to regulate gig economy platforms like Uber, Lyft and DoorDash, it also snared 70,000 truckers who work as independent contractors. Despite appeals for reconsideration, the State has not been inclined to make the exception. In protest, independent truckers shutdown the Port of Oakland, the eight largest in the US. Similar, smaller protests have taken place at ports in Long Beach and LA. The combination of trucker blockades and dockworkers electing not to enter terminals is crippling Oakland Port productivity. The second issue is also central to California: as of January 1, 2023 a ban on diesel trucks with engines made before 2010 goes into effect. The new law, CARB's Truck and Bus Regulation, will make an estimated 80,000 trucks illegal in California. A prolonged truck shortage could make trucking the least reliable and weakest link of the three.

Are the transport issues described above solvable? Yes, but settlements across so many domains is never quick, never easy. Until there is complete resolution, America's transportation links could undermine supply continuity just when we need it the most.



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Obsolete passives: no bid or no problem?

To find alternatives to obsolete or allocated capacitors or resistors, a distributor must commit knowledge, resource and time says Charcroft's Roger Tall



When a distributor receives an enquiry for an obsolete capacitor or resistor, the fastest and easiest response is a no-bid. For the distributor, this is a simple way of avoiding the work of finding an alternative. For the customer, it represents a dead-end and means extra work to find the part from another supplier or try to find a viable alternative.

The customer may be able to source the obsolete passive from an unfranchised source or the grey market. The customer then faces the added risk of losing full component traceability. The part could have been compromised by unsuitable storage or recovery from existing hardware nearing its end-of-life.

Instead of no-bidding, the distributor should accept responsibility for

identifying an alternative. Providing this service is an essential part of developing and maintaining a long-term customer partnership.

Obsolescence is not the only reason buyers may find passives hard to source. As lead-times have extended, some passives are on long lead-times or allocation. Sourcing these passives is similar to sourcing an obsolete part. So, the distributor should automatically deliver the same level of skill and commitment to identify an alternative solution.

The process of identifying an alternative begins with knowing the part's full specification. Some bills-of-materials will only show a part number or even the internal part number used by some defence OEMs. The first step is finding the datasheet and checking the detailed parameters.

The challenge is that most distributors focus on fast-moving, high-volume markets. How many have kept copies of original datasheets for parts specified years or decades ago? Unlike non-specialist distributors, Charcroft has always focused on supporting customers in the military, aerospace and other demanding markets, where the end products have exceptionally long lifetimes.

This is why Charcroft has a digitised archive of every datasheet it has received over the past 50-years. Finding a full specification is just a matter of checking a datasheet possibly printed in the 1970s.

Defence OEMs' internal part numbers are also archived, so when a legacy internal part number appears on an enquiry, it can be cross-referenced to



Roger Tall, director and product specialist



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the component manufacturer's original part number.

This archive is a vital resource for finding replacement passives. Once the product description is known, it can be matched to an available part number from a different manufacturer or to its mil-spec part number.

An alternative can often be found by checking each parameter of the original against the required performance. Critical systems in defence, military, space or high-end industry need to be failure-free but that does not mean every component, in every system, needs the maximum possible screening offered by the mil-spec.

Every aspect of the passive component must be examined, from capacitance or resistance, to temperature, voltage, stability and packaging.

Must the replacement match the one per cent tolerance specified or was this a standard practice to specify passives to a tight tolerance? If the tolerance

another solution may be to manufacture a custom passive assembly. One custom assembly, manufactured by Charcroft in the UK, combines one capacitor and two resistors from different manufacturers to provide a solution. These components were assembled in a series/parallel combination and encapsulated in a plastic case.

Custom assemblies can replace an obsolete passive by combining a deep knowledge of the demands of harsh applications, with an understanding of legacy and modern passive component technologies. Lateral thinking is often needed.

No-bidding on obsolete passives can be overcome if the distributor is prepared to dedicate the required time, skill and resources. It is not easy but is essential for a strong customer/distributor relationship. This is particularly important for customers buying passives for critical systems expected to perform reliably over many years.

The distributor must be prepared to dedicate specialist knowledge and resource, and work in partnership with customers and component manufacturers, to source alternative solutions. No bid should be replaced with no problem.

www.charcroft.com



Legacy datasheet archive dates back to the 1970s

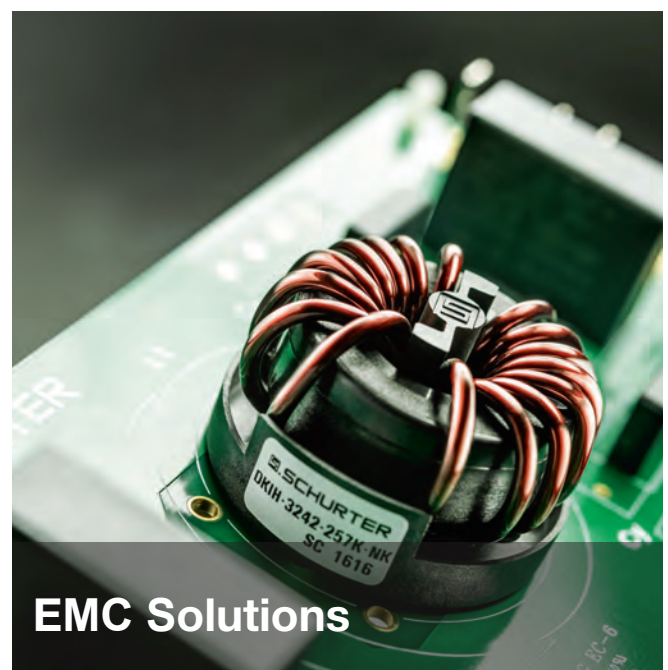


Critical systems in defence, military, space or high-end industry need to be failure-free

can be relaxed to five per cent, without compromising performance or reliability, the number of possible alternatives becomes larger.

If the obsolete passive was specified in a metal case, the replacement could be in a plastic case with an epoxy end-fill to maintain reliability.

Where no available alternative can be identified,



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FTDI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	50	N/A	0 €	N/A	50	2,500+	Y
Harwin	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,550	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
CIRCUIT PROTECTION											
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,800	N/A	0 €	N/A	50	2,500+	Y
EPCOS/TKD	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,950	N/A	0 €	N/A	50	2,500+	Y
Littelfuse	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	11,450	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,150	N/A	0 €	N/A	50	2,500+	Y
ENCLOSURES											
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Hammond	Switch Electronics	01482 862255	switchelectronics.co.uk	Y	500	N/A	£0	70%	2	6	Y
Hammond	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,350	N/A	0 €	N/A	50	2,500+	Y
Metcase Enclosures	OKW Enclosures	01489 583858	www.metcase.co.uk	N	288	£40,000	£0	N/A	5	22	Y
New Age Enclosures	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
OKW Enclosures Ltd	OKW Enclosures	01489 583858	www.okw.co.uk	N	1,955	£40,000	£0	N/A	5	22	Y
Rolec Enclosures	OKW Enclosures	01489 583858	www.rolec-enclosures.co.uk	Y	935	£40,000	£0	N/A	5	22	Y
Teko Enclosures	OKW Enclosures	01489 583858	www.teko.co.uk	Y	1,860	£40,000	£0	N/A	5	22	Y
FREQUENCY MANAGEMENT											
ABRACON	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,750	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
ECS	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,050	N/A	0 €	N/A	50	2,500+	Y
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Buyers' Guide

Manufacturer	Distributor	Telephone	Website	Franchised Distributor	No of Lines for Principal	Stock Value for Principal	Minimum Order Value	% Lead Free for Principal Range	No. of Technical Support Staff	Total No. of Staff	Buffer Stock Facility
Golledge Electronics Ltd	Golledge Electronics Ltd	01460 256 100	www.golledge.com	N	N/A	£800,000	£0	100%	12	24	Y
IQD Frequency Products	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,500	N/A	0 €	N/A	50	2,500+	Y
Jauch Quartz	Digi-Key Electronics	0800 587 0991	www.digikey.co.uk	Y	500	£250,000	0	100%	15	130	Y
Kyocera	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	950	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
TXC Corporation	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y

HEATSINKS

Aavid	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
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ICs & SEMICONDUCTORS

Alliance Memory	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	500	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18,700	N/A	0 €	N/A	50	2,500+	Y
	Avant Electronics LTD	01449 774247	www.avantelectronics.co.uk	N	5000	N/A	£100	N/A	2	10	Y
Broadcom Limited	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Central Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,250	N/A	0 €	N/A	50	2,500+	Y
Cirrus Logic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Cree, Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Diodes Incorporated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	8,200	N/A	0 €	N/A	50	2,500+	Y
FTDI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	100	N/A	0 €	N/A	50	2,500+	Y
Infineon	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	8,300	N/A	0 €	N/A	50	2,500+	Y
Intel	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,750	N/A	0 €	N/A	50	2,500+	Y
Maxim Integrated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	14,050	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	24,200	N/A	0 €	N/A	50	2,500+	Y
Micron Technology	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
Monolithic Power Systems (MPS)	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	850	N/A	0 €	N/A	50	2,500+	Y
Nexperia	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,600	N/A	0 €	N/A	50	2,500+	Y
Nordic Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	60	N/A	0 €	N/A	50	2,500+	Y
NXP	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
ON Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18,700	N/A	0 €	N/A	50	2,500+	Y
Power Integrations	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	750	N/A	0 €	N/A	50	2,500+	Y
Qorvo	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	700	N/A	0 €	N/A	50	2,500+	Y
Renesas Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,550	N/A	0 €	N/A	50	2,500+	Y
ROHM Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,900	N/A	0 €	N/A	50	2,500+	Y
Semtech	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	350	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
Skyworks	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
STMicroelectronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10,050	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	39,050	N/A	0 €	N/A	50	2,500+	Y
Toshiba	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,050	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10,850	N/A	0 €	N/A	50	2,500+	Y
Xilinx	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,900	N/A	0 €	N/A	50	2,500+	Y

INTERCONNECTION

3M	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,750	N/A	0 €	N/A	50	2,500+	Y
Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	33,200	N/A	0 €	N/A	50	2,500+	Y
Cinch Connectivity Solutions	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,250	N/A	0 €	N/A	50	2,500+	Y
FCI / Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,850	N/A	0 €	N/A	50	2,500+	Y
HARTING	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,800	N/A	0 €	N/A	50	2,500+	Y
Harwin	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,950	N/A	0 €	N/A	50	2,500+	Y
Hirose Electric	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	7,850	N/A	0 €	N/A	50	2,500+	Y
Intelliconnect (Europe) Ltd		01245 347145	www.intelliconnect.co.uk	N/A	N/A	N/A	N/A	100%	5	30	
JA Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	23,600	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	17,150	N/A	0 €	N/A	50	2,500+	Y
Radiall	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y
Samtec	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	16,300	N/A	0 €	N/A	50	2,500+	Y
Souriau	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,300	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	41,850	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,650	N/A	0 €	N/A	50	2,500+	Y

Buyers' Guide

Manufacturer	Distributor	Telephone	Website	Franchised Distributor	No. of Lines for Principal	Stock Value for Principal	Minimum Order Value	% Lead Free for Principal Range	No. of Technical Support Staff	Total No. of Staff	Buffer Stock Facility
OBSOLESCENCE / HARD TO FIND											
	Cyclops Electronics	01904 415 415	www.cyclops-electronics.com	N/A	177,232	£12m	£100	75%	3	78	Y
Rochester Electronics	Rochester Electronics	+44.1480.408400	www.rocelec.com	Y	299	N/A	\$250	N/A	10	400+	Y
OPTO ELECTRONICS											
Broadcom Limited	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,300	N/A	0 €	N/A	50	2,500+	Y
Cree, Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,800	N/A	0 €	N/A	50	2,500+	Y
Intel	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	20	N/A	0 €	N/A	50	2,500+	Y
Osram Opto Semiconductor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,300	N/A	0 €	N/A	50	2,500+	Y
Toshiba	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	450	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y
PASSIVES											
AVX	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	17850	N/A	0 €	N/A	50	2,500+	Y
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	15,100	N/A	0 €	N/A	50	2,500+	Y
Coilcraft	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,750	N/A	0 €	N/A	50	2,500+	Y
EPCOS / TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,450	N/A	0 €	N/A	50	2,500+	Y
KEMET	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	23,650	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	18700	N/A	0 €	N/A	50	2,500+	Y
Ohmite	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,550	N/A	0 €	N/A	50	2,500+	Y
Panasonic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25,450	N/A	0 €	N/A	50	2,500+	Y
Taiyo Yuden	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,100	N/A	0 €	N/A	50	2,500+	Y
TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	13,050	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	11,500	N/A	0 €	N/A	50	2,500+	Y
TT Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,050	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	43850	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,750	N/A	0 €	N/A	50	2,500+	Y
Yageo	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	21,450	N/A	0 €	N/A	50	2,500+	Y
PASSIVES ALTERNATIVES											
BEC Distribution Ltd		01844 275824	www.bec.co.uk		5,000	N/A	£0	100%	3	5	Y
POWER & BATTERIES											
FRIWO Gerätebau GmbH	Haredata Electronics	01423 796240	www.haredata.co.uk	Y	250 - 500	€1M	£250	100%	7	14	Y
Jauch Quartz		01276 605900	www.jauch.com			£500,000	0	95	15	130	Y
Mean Well	Ecopac (UK) Power Ltd	01844 204420	www.ecopacpower.co.uk	Y	6,000	£2M	£0	100%	8	30	Y
Bel Power Solutions	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	600	N/A	0 €	N/A	50	2,500+	Y
CUI Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
MEAN WELL	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,400	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1500	N/A	0 €	N/A	50	2,500+	Y
RECOM	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,150	N/A	0 €	N/A	50	2,500+	Y
TDK-Lambda	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,900	N/A	0 €	N/A	50	2,500+	Y
TRACO Power	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,000	N/A	0 €	N/A	50	2,500+	Y
Vicor	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,300	N/A	0 €	N/A	50	2,500+	Y
XP Power	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
SENSORS											
ams	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Analog Devices Inc.	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	300	N/A	0 €	N/A	50	2,500+	Y
Bosch	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25	N/A	0 €	N/A	50	2,500+	Y
Honeywell	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,200	N/A	0 €	N/A	50	2,500+	Y
Maxim Integrated	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	350	N/A	0 €	N/A	50	2,500+	Y
NXP	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	300	N/A	0 €	N/A	50	2,500+	Y
Sensirion	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	80	N/A	0 €	N/A	50	2,500+	Y
STMicroelectronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	75	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	650	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	850	N/A	0 €	N/A	50	2,500+	Y
SWITCHES & KEYBOARDS											
Apem	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,850	N/A	0 €	N/A	50	2,500+	Y
C&K Switches	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,550	N/A	0 €	N/A	50	2,500+	Y
E-Switch	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	2,350	N/A	0 €	N/A	50	2,500+	Y

Buyers' Guide

Manufacturer	Distributor	Telephone	Website	Franchised Distributor	No. of Lines for Principal	Stock Value for Principal	Minimum Order Value	% Lead Free for Principal Range	No. of Technical Support Staff	Total No. of Staff	Buffer Stock Facility
EAO	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,800	N/A	0 €	N/A	50	2,500+	Y
Honeywell	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
NKK Switches	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,000	N/A	0 €	N/A	50	2,500+	Y
Omron	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,700	N/A	0 €	N/A	50	2,500+	Y
Panasonic	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	550	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,350	N/A	0 €	N/A	50	2,500+	Y

TERMINAL BLOCKS

Marathon Special Products	Global Supply Services	01904 436 488	www.global-supply-services.com	Y	8,000	£800,000	£100	100%	3	11	Y
Molex	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,850	N/A	0 €	N/A	50	2,500+	Y
Phoenix Contact	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	13,550	N/A	0 €	N/A	50	2,500+	Y
TE Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,750	N/A	0 €	N/A	50	2,500+	Y

THERMAL MANAGEMENT

Bergquist Company	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	250	N/A	0 €	N/A	50	2,500+	Y
Delta Electronics	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	700	N/A	0 €	N/A	50	2,500+	Y
ebm-papst	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
EMI Thermal	EMI Thermal	01992 510000	www.emithermal.com	N	800	N/A	£20	100%	12	200	Y
Materials Direct	Materials Direct	+44 (0)1908 222 211	www.materials-direct.com	N/A	N/A	£1,000,000	£0	N/A	5	55	Y
Sanyo Denki	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,450	N/A	0 €	N/A	50	2,500+	Y
Sunon	G.English Electronics Ltd	0208 855 0991	www.gelec.co.uk	Y	3,500	£1,000,000+	£0	100%	10	28	Y
Sunon	Thermaco Ltd	01684 566163	www.thermaco.co.uk	Y	3,500	£450,000	£100	100%	7	15	Y
Universal Science	Universal Science	+44 (0)1908 222 211	www.universal-science.com	N/A	N/A	£1,000,000	£0	N/A	5	55	Y

TRANSFORMERS & INDUCTORS

Best Windings	Best Windings	0044 (0)1394 448424	www.bestwindings.co.uk	N	300	N/A	£100	N/A	2	24	Y
Bourns	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,900	N/A	0 €	N/A	50	2,500+	Y
Coilcraft	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	5,500	N/A	0 €	N/A	50	2,500+	Y
EPCOS / TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,300	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	6,900	N/A	0 €	N/A	50	2,500+	Y
TDK	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	4,050	N/A	0 €	N/A	50	2,500+	Y
Vishay	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,200	N/A	0 €	N/A	50	2,500+	Y
Würth Elektronik	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,400	N/A	0 €	N/A	50	2,500+	Y

WIRELESS SOLUTIONS

DIGI	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	200	N/A	0 €	N/A	50	2,500+	Y
Espressif	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	30	N/A	0 €	N/A	50	2,500+	Y
Laird Connectivity	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	100	N/A	0 €	N/A	50	2,500+	Y
Lantronix	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	25	N/A	0 €	N/A	50	2,500+	Y
Microchip	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Murata	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	30	N/A	0 €	N/A	50	2,500+	Y
Silicon Laboratories	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	150	N/A	0 €	N/A	50	2,500+	Y
Texas Instruments	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	20	N/A	0 €	N/A	50	2,500+	Y
u-blox	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	10	N/A	0 €	N/A	50	2,500+	Y



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Contract Manufacturers Buyers' Guide

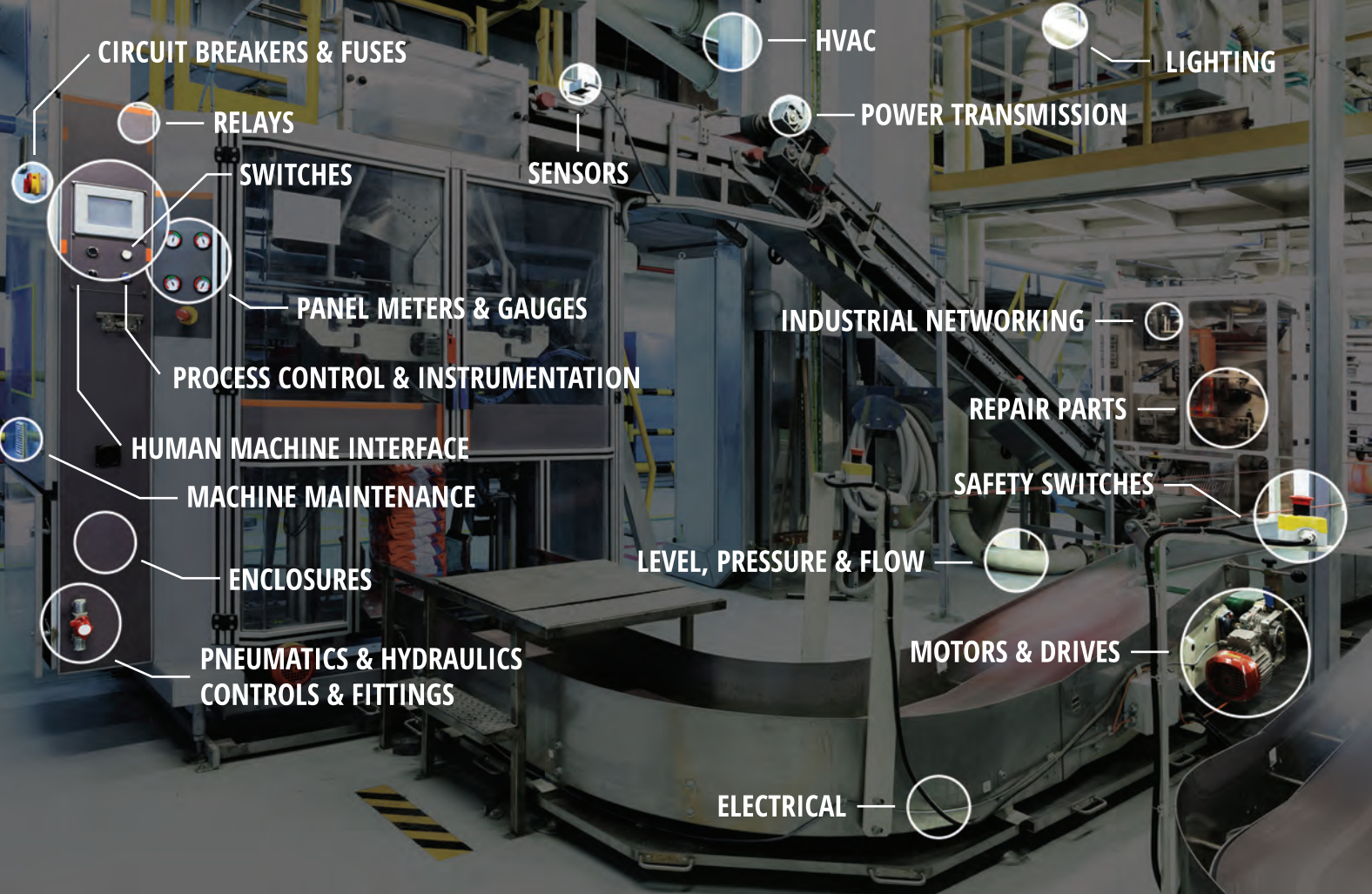
Manufacturer	Telephone	Website	Turnover	Location	Employees	Number of Surface Mount Lines	Approvals	BGA Capacity	Lead Free Manufacturer	Prototyping	Design Capability	Full Turnkey	Cables and Harnessing
Challenger Solutions Ltd	01245 325252	www.challengersolutions.com	£10m	Essex/SE	70	9	AS9100 Rev D, ISO9001:2015, ISO 14001:2015, UL, CCC, IPC-610-G Class 3, TUV	Y	Y	Y	Y	Y	Y
CML Innovative Technologies (uk) Ltd	01284 714700	www.cml-it.com	£12M	UK/EU/China	65		ISO9001, TS16949, UL ISO9001 2015, IATF 16949 2016	N	Y	Y	Y	Y	Y
Corintech Ltd	+44 (0)1425 655655	www.corintech.com	£12.5m	UK & Far East	72	10	AS9100, ISO9001, IPC-A-610 Class 3, J-STD-001	Y	Y	Y	Y	Y	Y
Custom Interconnect Ltd	01264 321321	www.cil-uk.co.uk	£18.6m	Andover (Hampshire)	130	6	AS9100 ISO13485 ISO9001 IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y
Electronic Technicians Ltd	01202 897722	www.etluc.co.uk	£3.7m	SE	50	2	AS9100, ISO9001, ISO14001, IPC610/620 Class 3	Y	Y	Y	Y	Y	Y
FermionX Ltd	+44(0)1903 524600	www.fermionx.com	£5m	Worthing, W. Sussex	40	4	ISO9001:2015, ISO14001:2015, IPC 610 A Class 2 & 3	Y	Y	Y	Y	Y	Y
G&B Electronic Designs Ltd	01420 474188	www.gandbelectronics.co.uk	£4.6m	Hampshire	60	2	ISO9001, ISO13485, IPC-A-610, IPC1-STD-001, IPC 7711/7721	Y	Y	Y	N	Y	N
Hallmark Electronics Ltd	01782 562255	www.hallmarkelectronics.com	£2.4m	Staffordshire	26	2	ISO9001:2015, IPC-A-610 to Class 3, UL	Y	Y	Y	Y	Y	Y
Icon Electronics Limited	01423 449080	www.iconelectronics.co.uk	£8.5m	Hampshire & Yorkshire	75	6	AS9100, ISO9001, BS EN ISO/IEC 80079-34:2018 ATEX, IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y
Incap Electronics UK Limited	01782 753200	www.incapcorp.com	€169,8m	UK, Slovakia, Estonia & India	2,500	22	ISO9100, ISO14001, ISO13485, AS9100D, ISO45001 & IATF16949	Y	Y	Y	Y	Y	Y
Industrial Electronic Wiring Ltd.	+44(0)1793 694033	www.jewco.uk	£5.5m	Swindon, UK	60	N/A	ISO9001:2015, IPC610, IPC620	N	Y	Y	N	Y	Y
Jaltek	01582578170	jaltek.com	£15m	UK	105	3	AS9100, ISO9001, ISO13485, IPC-A-610 Class 3, (Certified IPC Trainer (IPC-A-610, J-STD-001 & J-STD-001 Space Addendum)	Y	Y	Y	Y	Y	Y
KEY-TECH ELECTRONIC SYSTEMS	01592 597711	www.key-tech.co.uk	£7m	Scotland	65	2	ISO9001:2015, J-STD-001, IPC-610/620 CLASS 3, IPC-7711, BS EN ISO13485:2016, ISO 13485	Y	Y	Y	N	Y	Y
Nemco Limited	01438 346600	www.nemco.co.uk	£15.9m	SE	120	6	AS9100, ISO9001:2008, IPC610/620 to Class 3, ISO14001-2004, SC21	Y	Y	Y	Y	Y	Y
NOTE Group	01753 746700	www.note-uk.co.uk	£207m	UK/EU/China	1,200	20	IPC610 to Class 3, ISO9001:2015, 13485, 14001, 18001	Y	Y	Y	Y	Y	Y
M-TEK (Assembly) Ltd	01189 455377	www.mtek.co.uk	£2.4m	SE	30	4	ISO9001, ISO14001, IPC-A-610 Class 3, IPC-7711/7721, WHMA-3620, Certified IPC Trainer	Y	Y	Y	Y	Y	Y
Pektron	01332 832424	www.pektron.com	£50m	E-Midlands	350	8	ISO9001, ISO14001, TS16949, BEAB, VCA, TUV, UL	Y	Y	Y	Y	Y	Y
Simtek EMS Ltd	01843 233120	www.simtekems.co.uk	£8.2m	SE	77	3	ISO9001:2008, ISO13485, IPC-A-610 Class 3 & IPC-7711	Y	Y	Y	Y	Y	Y
TEXCEL TECHNOLOGY PLC	+44(0)1322621700	www.texceltechnology.com	£15.5m	SE	131	7	ISO9001, ISO14001, IPC610 Class 3,	Y	Y	Y	Y	Y	Y
Tioga Limited	01332 360884	www.tioga.co.uk	£16m	Derby	130	6	ISO 9001, ISO 13485, ISO14001, IPC 610, 620, 7711/7721	Y	Y	Y	Y	Y	Y
Wilson Process Systems	01424 722222	www.wps.co.uk	£12m	SE	100	5	ISO9001:2015, IPC-A-610 Class 3	Y	Y	Y	Y	Y	Y

PCB Buyers' Guide

Manufacturer	Telephone	Website	Service Provided (ie Broker, Manufacturer &/or Repair)	Location	Approvals	Volume - Small, Medium, Large	Double-sided	Multi-Layer 4-10/10-20-30	Metal PCBs	Ceramic PCBs	Heavy Copper PCBs	Flex / Flex-Rigid	Obsolescence Solutions	Modifications	Prototyping
ABL Circuits Ltd	01462 894312	www.ablcircuits.co.uk	M	SE	ISO9000: 2015	SML	Y	4-10	Y	N/A	N/A	Y	Y	Y	Y
Cambridge Circuit Company Ltd	01223 423100	www.cambridge-circuit.co.uk	M	SE	ISO9001:2015, UL, ISO 14001:2015	SML	Y	4-16	Y	N/A	N/A	Y	Y	Y	Y
DK-Daleba Printed Circuit Boards	01992 510000	www.dk-daleba.co.uk	M	UK, Europe, Asia	ISO 9001:2015, UL, TS16949, JOSCAR	SML	Y	4-58	Y	Y	Y	Y	Y	Y	Y
GSPK Circuits Ltd	+44 (0)1423 798 740	www.gspkcircuits.ltd.uk	M/R	UK, Europe, Asia	IS 9001:2015, IATF 16949:2016, EN (AS) 9100, Joscar	SML	Y	4-34	Y	Y	Y	Y	Y	Y	Y
Tate Circuit Industries Ltd	01543 622 435	www.tatecircuits.com	M/B	UK/China	ISO 9001:2015, UL	SML	Y	4-20	Y	N/A	N/A	Y	Y	Y	Y

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