

ELECTRONICS

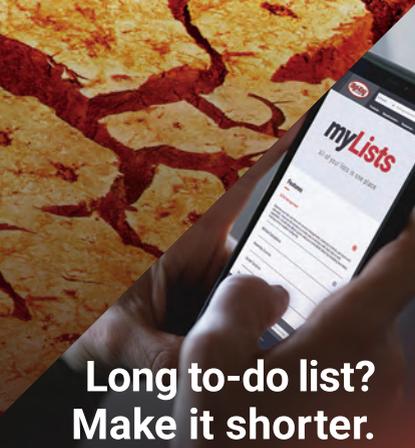
OCTOBER 2022

# sourcing

AN MMG PUBLISHING TITLE

UK & IRELAND

## Protecting electronics in harsh environments

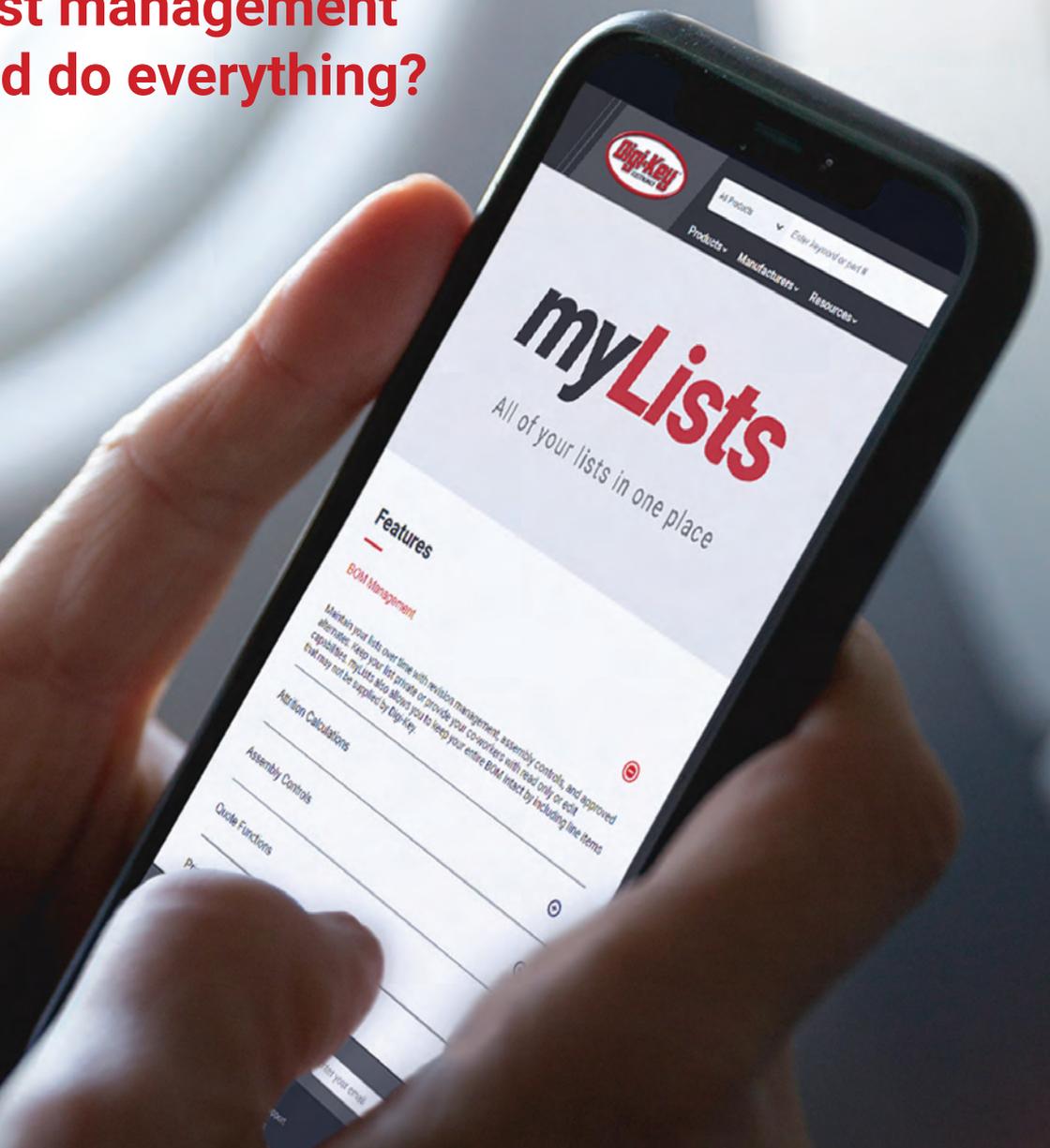


Long to-do list?  
Make it shorter.



DETAILS INSIDE

Wish a list management tool could do everything?



## Check that off your list.

myLists lets you instantly generate quotes, check in-stock items, lead times, and more with one easy-to-use solution. Now you can cross “work more efficiently” off your list for good.

Give myLists a try today at [digikey.co.uk/mylists](https://digikey.co.uk/mylists)





## On the cover – October 2022

Protecting electronics in harsh environments  
page 10-15

# Editor's Word



### Lessons will be learned

When you get to my age, you become numb to the phrase 'lessons will be learned'. It is normally applied to a negative event where the organisation involved was found lacking and promises to do better in the future.

What the phrase should say is 'lessons have been learned and documented in our standard operating procedure so that all existing and future employees will be forever aware of past problems and the updated procedures designed to prevent them repeating'.

Sadly, given that I hear the simplified version repeated time-after-time from the same or similar organisations suggests lessons might have been learned by a handful of current employees but haven't been widely shared or passed forward.

The reason I mention this is that I'm wondering what is going to happen to the hundreds of thousands of supply chain lessons learned by purchasing professionals over the last three years?

*Electronics Sourcing* has done its bit, printing hundreds of articles explaining how component manufacturers, distributors, purchasers, CEMs and OEMs have handled the situation. All the issues are archived and available to read for free.

However, what is the industry as a whole doing? I hope: commercial enterprises are adding the lessons to their standard operating procedures; software vendors are embedding the lessons in their code; associations and federations are adding the lessons to their resources; and universities are using the lessons to create real lessons.

If you can record your lessons, please do so.

*Jon Barrett*

### NEWS



Traction gains momentum

04

### HARSH ENVIRONMENTS



Protection in hazardous environments

10

### POWER PRODUCTS



Reliable battery management

16

### EMC



Reliable touch panel performance

24

### BUYERS GUIDE



All the facts and figures to help you buy

30

### Contact



#### EDITORIAL

**Managing Editor:** Jon Barrett  
jonb@electronics-sourcing.co.uk  
**Contributing Editor:** Amy Barker  
amyb@electronics-sourcing.co.uk

#### ADVERTISING

**Director of Sales:** Emma Evernden  
emma.evernden@electronics-sourcing.co.uk  
**Sales Executive:** Jim Powell  
jim.powell@electronics-sourcing.co.uk

#### PRODUCTION & DESIGN

**Production & Design Manager:** Josh Hilton  
josh.hilton@electronics-sourcing.co.uk  
**Junior Creative Artworker:** Tom Claydon-Smith  
tom.claydon-smith@electronics-sourcing.co.uk

#### CIRCULATION

**Circulation Manager:** Vicky Leary  
vicky.leary@electronics-sourcing.co.uk  
**Circulation Account Manager:** Liz Poole  
liz.poole@electronics-sourcing.co.uk

#### PUBLISHER

**Mark Leary**  
mark.leary@electronics-sourcing.co.uk  
**Director of Operations:** Denise Patten  
denise.patten@mmqpublishing.co.uk

Issue 197, Vol.18 No.10

Published 12 times per year  
by MMG Publishing Limited  
ANNUAL SUBSCRIPTION:  
EU Countries £60 Rest of World £90

MMG PUBLISHING LTD  
Suite 2, 1-3 Warren Court, Park Road,  
Crowborough, East Sussex TN6 2QX  
Tel: +44 (0)1892 613400  
Fax: +44 (0)1892 613402  
@Electrosourcing

Printed by: Pensord Press Ltd  
Electronics Sourcing is printed on  
sustainably sourced paper stock  
ISSN 2043-9504  
© 2022 MMG Publishing Ltd



ELECTRONICS SOURCING IS INDEPENDENTLY ABC AUDITED 2006/2021



Articles appearing in this magazine do not necessarily express the views of the Editor or the publishers. Every effort is made to ensure the accuracy of information published. No legal responsibility will be accepted by the publishers for loss arising from articles / information contained and published. All rights reserved. No part of this publication may be reproduced or stored in a retrieval system or transmitted in any form without the written consent of the publishers.

View current editions online

[www.electronics-sourcing.co.uk](http://www.electronics-sourcing.co.uk)



## Traction gains momentum

Battery Service Hub has received its first container of GS Yuasa's latest 2V Traction batteries. The cells will provide power to the expanding materials handling market.

Launched in October 2021, GS Yuasa's Traction ranges have been designed for materials handling applications ranging from forklift trucks to floor cleaning machines. Options include 24, 48 and 80V, all utilising GS Yuasa's 2V traction cells to offer high performance and minimal maintenance.

Battery Service Hub director, Andy Riddle, said: "The GS Yuasa name is widely regarded as the best in the industry, renowned for quality and reliability. With the new GS Yuasa Traction range, we know it's something we can confidently put our name to and supply to our customers."

All batteries are supplied in a durable, dip coated tray, manufactured to DIN/EN 60254-2 standards, with both DIN and BIS sizes available. Individual cells and a broad range of accessories are also available.

[www.gs-yuasa.eu](http://www.gs-yuasa.eu)

## Power resistors receive military certification

Ohmite Manufacturing Company's power axial resistors have received the Established Reliability for military standards MIL-PRF39007 Certification from the Defense Logistics Agency (DLA).

Ohmite's global director of products, Debasis Roy, said: "Designers can rely on the performance of these parts. This certification provides Ohmite with the opportunity to provide another source for power axial resistors with Established Reliability to our customers who need mission-critical parts."

Ohmite will begin production of the MIL-PRF39007-certified resistors immediately at its manufacturing facility in Brownsville, Texas. The certification also enables Ohmite to pursue additional military standard certifications for other products.

Dr Roy added: "To get certified at this level, these parts can have only one failure in many thousand hours of use, a standard requiring the highest quality manufacturing. We are proud to receive this 'stamp of approval' from the DLA and offer this product to our customers requiring high reliability performance from their power resistors."

[www.ohmite.com](http://www.ohmite.com)



## Breaking ground on distribution centre expansion

Mouser Electronics is expanding its global headquarters and distribution centre. The company recently broke ground on a 416,000ft<sup>2</sup> three-story building that will expand its distribution centre, located south of Dallas-Fort Worth, Texas.

Mouser Electronics' senior vice president of business operations, Pete Shopp, said: "With a larger warehouse space and continuing investment into automation and staffing, Mouser is preparing for the future while ensuring the highest levels of customer service today. The tools and systems we've put in place offer another way we can help shorten our customers' time to market."

On completion, Mouser's 78-acre global headquarters and distribution centre will comprise almost 1.5 million square feet to accommodate Mouser's inventory of one million unique SKUs for products and technologies from over 1,200 electronic component manufacturers.

The new building will feature a triple-mezzanine floorplan, advanced automation and a skybridge connector to the existing distribution centre building.

[www.mouser.com](http://www.mouser.com)



# TrustedParts.com

Built by the companies you know and trust.



- ✓ Best defense against counterfeit components
- ✓ Proper packaging and handling
- ✓ Fully warrantied and supported by the manufacturer

FACTORY  
AUTHORIZED

Search authorized distributors at  [TrustedParts.com](https://www.TrustedParts.com)

## In Brief

### Micro connectors from stock

Lane Electronics can supply a range of Nicomatic high performance micro connectors from stock. Nicomatic connectors are modular, providing versatility in connector form and function while offering proven mechanical, electrical and environmental performance and dependability. Applications include UAVs, robotics, space satellites and radars, airborne and ground applications in civil and defence avionics. [www.fclane.com](http://www.fclane.com)

### Investing in power portfolio

Farnell has expanded its in-stock range of Traco Power's most popular DC/DC converters, AC/DC power supplies and DIN rail products. Farnell currently supplies over 5,000 Traco Power products for use in industrial and information technology, transportation, railway, medical/healthcare, automation/control, renewable energy and smart grid sectors. [www.farnell.com](http://www.farnell.com)

### Corrosion free protection

Foremost Electronics can now supply the latest stand-alone enclosure series from Fibox. The new NEO enclosure has been designed for industrial control, IoT and building automation and suits applications requiring a protective and robust solution offering high ingress protection while being non-corroding. Specifications include IP66/IP67 and IK08 rating; and flame resistant (UL 94 HB). [www.4most.co.uk](http://www.4most.co.uk)

### IoT SIM cards shipping

Digi-Key Electronics is now offering a selection of Soracom products, including removable IoT SIM cards, USB dongles and IoT cloud integration and protocol conversion services, through its Fulfilled by Digi-Key program. Soracom's IoT SIM cards give users access to a global network of mobile operators and leverage GSM, LTE, 4G, 3G and 2G technologies. [www.digikey.com](http://www.digikey.com)

## MCBs available for same-day shipping

Galco Industrial Electronics is now IMO Automation's global e-commerce premier partner, making Galco the first and only global supplier of IMO products online.

Galco's vice president of marketing, Bill Abbe, said: "Galco's established e-commerce presence has allowed us to bring big partners like IMO to our customers. IMO products can be easily cross-referenced with other brands allowing us to provide more solutions to address supply chain shortages."

Galco's in-stock offerings of IMO product lines anticipate increased demand for miniature circuit breakers. The addition of IMO's miniature circuit breakers to Galco's cross-referencing database also provides Galco's customers with a comparable high-quality replacement. Their selection of UB10 and US10 MCBs are currently available for same-day shipping.

Galco will carry IMO product lines including miniature circuit breakers, AC drives, compact programmable logic controllers, human machine interfaces and more.

[galco.com](http://galco.com)



## UK interconnect sales advance despite slowing revenues

UK interconnect companies are reporting no signs of a let up in a booming market. Members of the Interconnect Technology Suppliers Association (ITSA) enjoyed second quarter sales levels up as much as 20 per cent over the same period in 2021, adding the caveat that revenue growth slowed slightly compared to Q1.

Bookings are plentiful and continue to perform well. Some ITSA members declared orders up by as much as 40 per cent. Four key sectors—medical, security, data centres and telecom—are driving the market.

While warning of peaks and troughs, ITSA members remain positive about the final months of 2022. The book-to-bill ratio stands at a healthy 1.22:1, which they say, will deliver continued sales growth through the rest of this year.

There are clouds on this sunny horizon. Members listed lead times, material availability, labour shortages, higher employment costs, inflation, interest rate rises and political uncertainty as negative influences.

[www.itsa.org.uk](http://www.itsa.org.uk)



## Speeding IoT time-to-market

Telit's LN920 LTE data card features a Qualcomm Snapdragon X12+ LTE modem. The M.2 form factor suits laptops, tablets, enterprise routers and IIoT gateways. Specifications include 300 to 600 Mbit/s download speed, high-precision GNSS positioning and, thanks to broad frequency band support, worldwide operation. Cat 6 and Cat 12 variants are available from Rutronik.

The card supports cellular bands between 600MHz and 3.7GHz, including Band 14 (first responder) and Band 48 (CBRS), suiting private and public LTE applications worldwide. Combined with pre-certifications by regulators and Tier 1 operators in Europe, Australia, USA, Japan and Canada, the LN920 supports rapid development of global SKU devices.

Maintenance for Telit's standard 3GPP and custom AT commands are included in both variants. The product supports advanced security features qualified for enterprise applications, such as Secure Environment SE Linux and Secure Boot.

An operating temperature range of -40 to 85°C suits the FN920 to industrial environments.

[www.rutronik24.com](http://www.rutronik24.com)



## Securing Cyber Essentials status

Anglia Components has achieved Cyber Essentials certification for its IT systems. The government-backed scheme provides independent validation of UK firms' defences against common cyber-attacks. It also demonstrates a commitment to cyber-security.

Anglia's CEO, Steve Rawlins, said: "We are delighted, though not surprised, that Anglia has secured the Cyber Essentials certification. Given the confidential nature of our contracts, cyber-security is something we have always taken incredibly seriously at Anglia.

"The certification provides valuable reassurance for all of our customers that data about their business and relationship with us is held securely. Cyber Essentials is a requirement for some customers working on government contracts. We hope this achievement will encourage more customers to collaborate with us on a wider range of projects."

Cyber Essentials was launched by the UK's National Cyber Security Centre. It is designed to help businesses of any type or size protect themselves from the most common types of cyber-attack, such as ransomware, password guessing and network attacks.

[www.anglia.com](http://www.anglia.com)



## Short lead times, competitive pricing

Princeps has announced a franchise agreement with UK interconnect manufacturer KEC. Under the authorised reseller agreement, Princeps will supply KEC's full portfolio of interconnect products, including D-type connectors, M12 connectors/cables, Profibus connectors/cables, backshells, bulkhead glands, panel fittings and conduit systems.

A specialist in EMC interconnect technology, KEC products incorporate screening techniques developed from its 40-years' experience and suit applications across multiple industries, including aerospace and defence, naval, rail, power distribution, nuclear power, automation and medical.

KEC interconnects are said to offer a price-competitive option compared with other suppliers and can be matched to parts from most major manufacturers. Manufactured in the UK, a further advantage of KEC products is significantly-reduced lead times of around six to eight weeks.

Princeps' MD, Dan Hughes, said: "We are delighted to have been appointed by KEC and be able to offer our worldwide customer base the benefit of KEC's patented technologies in the vital design aspect of EMI/RFI shielding."

[www.princeps.co.uk](http://www.princeps.co.uk)



# Widest selection of electronic components™

In stock and ready to ship



[mouser.co.uk](http://mouser.co.uk)

Exclusively sponsored by



# YOUR BEST RESOURCE FOR COMBATTING COUNTERFEIT

**C**ounterfeit products are a frustrating obstacle for electronic component buyers. When counterfeits breach a supply line, it erodes trust in supplier relations and chips away at crucial product timelines.

While delays like shortages and lengthy lead times are sometimes inescapable, counterfeit products should be preventable. The best way to avoid counterfeit products is to maintain a relationship with a strategic supplier that puts quality assurance at the center of their business.

## Desperate Times, Dubious Measures

The pandemic created a market of desperation primed for opportunists looking to exploit manufacturers struggling to secure electronic components. Lead times were, and still are, extensive, which is a challenge for businesses operating on 'just-in-time' inventory models. As manufacturers wait in line to buy parts, projects get delayed, and revenue is lost.

When COVID-19 hit, sales projections and component orders were slashed to prepare for a decline in consumer spending. However, demand did not align with those actions and manufacturers that held minimal stock or counted on timely orders felt the impact as the supply chain broke down.

Demand quickly outweighed supply, and manufacturers with no resources were unable to support the rise in orders. Left to navigate the uncharted waters of the open market, OEMs, CMs, and EMS firms became victims of fraud. Bad actors set up fake websites or impersonate legitimate companies to exploit market newcomers. After payments are received, sources disappear, and buyers are forced back into the search for components.

If buyers do receive parts from bad actors, they are often blanks, clones or misrepresented remanufactured components. The parts are either worthless or degraded by prior use, which could unknowingly be put into a product, resulting in defective electronics.

## The Best Component? Trust

When supply chain issues occur, you should avoid counterfeit

by having a trusted resource to fall back on. You could avoid counterfeit by buying from authorized and direct sources only, but you significantly limit your options, and by extension pose grave risks to your business in certain circumstances, by overlooking independent distributors.

If a distributor uses in-house testing, customers benefit from fully integrated end-to-end solutions. Fusion Worldwide acquired Prosemi, Singapore's largest test house, to ensure the highest quality standards and provide expedited service. As one of the world's largest independent distributors, Fusion Worldwide understands the importance of maintaining ownership over quality procedures and timelines.

When vetting testing procedures, buyers should verify that products undergo strict visual inspection, lab, electrical, and other necessary testing to validate authenticity. One of the most commonly performed tests is the golden sample, which allows comparisons across numerous metrics directly traceable to the manufacturers. In the absence of a golden sample, silver sample comparisons of past receipts can serve as a powerful method of authentication as well.

In an economy where adherence to time to market is essential, prompt testing turnover coupled with untouchable quality is nearly priceless.

## Building Your Strategy

Quality should be the central focus for manufacturers and their partners. To build trust, maintain long-term transparent communication so both parties can follow the state of the market and business needs. Supply chain disruptions are a part of business but being a victim of fraud and counterfeit products does not have to be. Buying from the open market presents risk as compared to buying from direct or authorized sources, but the degree of that risk is largely a function of the source. A strong partnership with a reputable independent distributor with a robust quality inspection regime can reduce that risk to near infinitesimal levels.

[www.fusionww.com](http://www.fusionww.com)



Search and buy components online, worldwide, 24/7.  
Demo Rocketchips at Electronica | Booth C2 259  
1.866.663.4483 | [rocketchips.com](http://rocketchips.com) | © Fusion Trade, Inc. 2022



# eBOM.com

The GAME CHANGING site for  
the electronics industry



powered by  
 TrustedParts.com

**DISCOVER | SOURCE |  
COMPARE | BUY**



## Widest selection of electronic components™

In stock and ready to ship



**mouser.co.uk**

# Equipment protection in hazardous environments

*Hammond Electronics' European account manager, Russell Irvine, offers buyers an overview of the enclosure selection process for hazardous environments*

Hazardous environments are not specifically defined by any standard but are normally understood to be environments where: dust and/or water are to be found in the atmosphere; corrosive gases or liquids could be present; temperature extremes are expected; or shock and vibration can be encountered.

Hazardous environments do not have the same requirements as 'hazardous areas', defined by numerous international specifications as atmospheres where explosive gas or dust will be present. Equipment installed in such areas will need to be either explosion proof—in which case the enclosure will be required to contain an internal explosion—or else intrinsically safe—where the input energy is sufficiently restricted to prevent an explosion, but again the enclosure will normally be sealed to prevent any escape of flammable materials.

For use in hazardous environments, enclosures are typically manufactured from plastic, aluminium, GRP or stainless steel. The most widely used plastic materials are ABS and polycarbonate. Fire resistance is a consideration. The relevant

standard is UL94 which specifies a vertical or horizontal burn. The more stringent test is the vertical burn test. Material will be classified as V0, V1 or V2 where V0 is the highest performance. Polycarbonate or GRP would normally be specified for outdoor use because of its good impact resistance and better resistance to UV embrittlement and colour fading than ABS.

Aluminium housings are strong and robust. They do not corrode, are electrically conductive, have an intrinsically high level of electro-magnetic attenuation and are easily machined. For applications where protection against shock damage is important, EMC is likely to be an issue or high temperatures, dust or water are expected to be present, an aluminium enclosure is the ideal low-cost choice.

Stainless steel and GRP both have good corrosion resistance when installed in environments where chemicals are likely to be present.

The enclosure will provide a secure environment for the housed electronics or systems. When it comes to the protection level required, it will be a balancing act. Over-specify



and the enclosure cost will be unnecessarily high. Under-specify and there is the risk of equipment failure or malfunction resulting from contaminant ingress or impact damage.

The relevant international standard is IEC 60529. For installation in environments where dust and water are likely to be present, IP65 would normally be the minimum requirement. In North America, enclosures' environmental sealing is normally defined as a NEMA (National Electrical Manufacturers Association) number. NEMA ratings also require additional product features and tests (such as functionality under icing conditions, enclosures for hazardous areas, knock-outs for cable connections and others) not addressed by IP ratings.

EN 60529 defines ratings as IPxx, where the first



**Aluminium housings do not corrode, are electrically conductive, have an intrinsically high level of electro-magnetic attenuation and are easily machined**

*Continue on page 12 >*

Rebound Electronics

electronica

We are excited to announce, for the first time in 10 years we will be exhibiting at...

**ELECTRONICA MUNICH 2022**

Hall B4, Stand 158

+44 (0)1635 555999

enquiries@reboundeu.com

reboundeu.com

**ELECTRONICS** | **DESIGN & MANUFACTURE**

**Harsh environment application?**  
High-reliability electronics, manufactured at Corintech, keeping equipment operational in all environments.

- Advanced Electronics Engineering
- PCB Layout
- Product Design
- Design for Manufacture
- PCB Assembly
- High-Reliability Ceramic Circuits
- Conformal Coating and Encapsulation
- AS9100, ISO 9001, IPC, J-STD

Contact us Today

+44 (0)1425 655655  
info@corintech.com  
www.corintech.com





Hammond Electronics' European account manager, **Russell Irvine**

digit defines the protection against solid objects and the second the protection against water ingress.

As an example, IP68: the first digit '6' means totally dust tight and the second digit '8' means protection against continuous immersion in water greater than 1m in depth.

### Impact Protection

The relevant standard is IEC 622262, which defines an IK rating, a measure of the impact resistance of the enclosure.

Standard enclosures are widely available direct from the manufacturer, from international catalogue distributors and specialist enclosure distributors. Typically, enclosures enjoy extended availability and high levels of technical support throughout their lifetime. The majority of manufacturers offer in-house modification capability to configure the enclosure to the requirements of a specific project.

[hammfg.com](http://hammfg.com)

### Protection classes for solid object protection

First figure	Scope of protection
0	No protection.
1	Protection from solid objects greater than 50mm in diameter.
2	Protection against solid objects greater in diameter than 12.5mm.
3	Protection against solid objects greater in diameter than 2.5mm.
4	Protection against solid objects larger than 1.0mm.
5	Protection against the ingress of dust in harmful quantities.
6	Dust tight.

### Protection classes for solid object protection

Second figure	Scope of protection
0	No protection.
1	Protected against vertically falling drops of water.
2	Protection against falling water droplets up to 15° from the vertical.
3	Protected against direct water sprays from up to 60 degrees from the vertical.
4	Protected against splashing water from any direction.
5	Protection against low pressure 6.3mm jets of water sprayed from any angle.
6	Protection against powerful 12.5mm water jets from any angle.
7	Protection against temporary immersion in water up to 1 metre deep.
8	Protection against continuous immersion in water greater than 1 metre in depth.
9	Protection against high-pressure, high-temperature jet sprays, wash-downs or steam-cleaning procedures.

### IK number

IK number	Scope of protection
00	No impact protection
01	Protection against an impact of 0.14 joule, equivalent to a 0.25kg mass dropped from 56mm.
02	Protection against an impact of 0.2 joule, equivalent to a 0.25kg mass dropped from 80mm.
03	Protection against an impact of 0.35 joule, equivalent to a 0.25kg mass dropped from 140mm.
04	Protection against an impact of 0.5 joule, equivalent to a 0.25kg mass dropped from 200mm.
05	Protection against an impact of 0.7 joule, equivalent to a 0.25kg mass dropped from 280mm.
06	Protection against an impact of 1 joule, equivalent to a 0.25kg mass dropped from 400mm.
07	Protection against an impact of 2 joule, equivalent to a 0.5kg mass dropped from 400mm.
08	Protection against an impact of 5 joule, equivalent to a 1.7kg mass dropped from 300mm.
09	Protection against an impact of 10 joule, equivalent to a 5kg mass dropped from 200mm.
10	Protection against an impact of 20 joule, equivalent to a 5kg mass dropped from 400mm.



**CML Innovative Technologies Ltd.**

69/70 Eastern Way,  
Bury St Edmunds, Suffolk,  
IP32 7AB, United Kingdom

Tel: +44 (0) 1284 714700  
email: [uksales@cml-it.com](mailto:uksales@cml-it.com)

[www.cml-it.com](http://www.cml-it.com)



KITTING FACILITY



STOCK HOLDING



CONTRACT ASSEMBLY



CUSTOM SOLUTIONS

# Stay cool in harsh environments

*G English Electronics walks readers through the myriad of options available when deploying cooling fans in harsh operating environments*

As demand for thinner, sleeker, more functional designs continues to rise, the need for cooling fans to manage additional heat looks set to remain for the foreseeable future. Understanding the intensity and distribution of heat inside a unit, plus the wider environment the unit will be exposed to, is fundamental to selecting a suitable fan.

The environment the fan is exposed to will dictate the suitable bearing type. A harsh environment will typically

lead in the direction of ball bearings. These are widely considered to be a robust type, leading to longer life. Ball bearings' numerous benefits include resistance to dust and vibration without limitation on mounting orientation. Also, a ball bearing fan suits operation in extreme temperatures: at both ends of the scale.

A range of additional protections can be added to ball bearing fans to protect against water. Starting at an

IP21 conformal coating, protection extends to a fully enclosed IP68 model, whether the unit is exposed to low levels of moisture or finds itself fully submerged in up to 1m of water.

IP rated fans don't just help protect from water but also other environmental factors which could impact the fan's life. For example, excess levels of pollution may mean a fan is exposed to corrosives. Outdoor applications in

*Continue on page 14 >*



**A ball bearing fan suits operation in extreme temperatures: at both ends of the scale**

Welcome to our

## DIN RAIL FAMILY

Designed for easy installation and suited for Industry standard DIN Rail!



### CVB-PLUS

Features integrated pluggable terminal blocks!

### CMEB

Extendable and features integrated terminals.

### CNMB

Available in 8 different sizes, multiple design options and accessories.

### CVB450 & CVB225

Clip together design for fast and simplified assembly.

### CDIB

Low and deep profile DIN Mounted Enclosures.

### CIME

Modular sections or custom length extrusion for 72mm or 107mm PCBs.



[www.camdenboss.com](http://www.camdenboss.com)

+44 (0) 1638 716101

[sales@camdenboss.com](mailto:sales@camdenboss.com)



urban environments, such as signage in city centres or busy roads, will also likely need the added protection to ensure they operate as expected.

Sunon offers a range of additional protection to help guard against harsh environments. The company has dedicated an entire range of fans to this: the GF Series. For example, protection for unique environments, such as coastal/marine, is covered by the GR47 Salt Fog, ensuring the combination of moisture and salt do not threaten the fan's life expectancy. An ATEX rating is also available, meaning the fan is certified to safely operate in a hazardous environment.

For OEMs worried about how the working

environment may impact the fan, adding an additional wire for tacho feedback may help put their mind at ease. This lets the user monitor the fan's speed, meaning if the environment is causing the fan's performance to change, it can be counteracted with a voltage change within the voltage range. An additional benefit is the ability to factor out batch variation by monitoring the RPM rather than setting a fixed voltage. Other functions such as locked rotor detection and auto-restart are also available.

Working with an approved distributor, such as Gelec, at the design stage is often the best way to ensure the correct

specification is found for each application. Gelec offers many years of experience and direct access to manufacturers for additional support. An open and transparent relationship helps avoid additional costs caused by either over-specifying or having to arrange early replacements. Instead, this relationship lends itself to finding an ideal balance between performance, protection and value.

[www.gelec.co.uk](http://www.gelec.co.uk)



**Outdoor applications in urban environments, such as signage in city centres or busy roads, will also likely need the added protection to ensure they operate as expected**

# Harsh environment products

## Sealed for success

Amphenol's SurLok Plus series is a high reliability alternative to conventional compression lugs. With an IP67 protection rating, this version of the original SurLok series is sealed against environmental influences. This makes it ideal for use in harsh, demanding environments such as energy storage, e-mobility, process control and heavy equipment.

SurLok Plus is available in smaller sizes (3.6, 5.7 and 8.0mm) than its predecessor SurLok and features a quick-lock and press-to-release design. Amphenol uses industry standards for crimp, screw and busbar termination options, eliminating investment in special torque tools. This combination allows straightforward on-site installation.

Three different colours (red, black and orange) and different mechanical coding options allow multiple SurLok Plus connectors to be used side-by-side without the risk of reverse polarity.

[www.rutronik24.com](http://www.rutronik24.com)



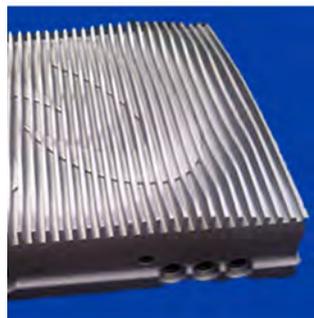
## Small, lightweight connectors keep F1 cars on track

Nicomatic's engineers are working with multiple Formula 1 teams designing custom connectors and small modules to ensure ultra-reliable signal and power integrity in the latest-generation cars.

Designs based on customised 2mm pitch CMM and 1.27mm pitch EMM series interconnects ensure reliable signal and power integrity under high-vibration and heat conditions. The company states standard series CMM connectors save up to 60 per cent space and up to 50 per cent weight compared to other standard rectangular connectors with the same functionalities. The EMM Series is 40 per cent smaller than CMM and integrates features such as reversed contacts and 90deg back protection.

Nicomatic specialises in custom solutions, with over 1,000 completed every year. The company uses modular manufacturing methods and has a dedicated custom-manufacturing area in its French factory. Custom designs can be supplied in short lead times with no minimum order value.

[www.nicomatic.com](http://www.nicomatic.com)



## Rugged 20W converters suit rail tasks

TDK's new 20W PYD20 series DC/DC converters feature an 18:1 ultra-wide input range of 8.5 to 160VDC. These board mount products are packaged in the industry-standard 2 by 1in format and feature a silicone potted plastic case to provide resistance to shock and vibration, beneficial for EN50155 applications on railway rolling stock.

Applications also include industrial and measurement equipment requiring battery back-up or a DC source.

The PYD20 series offers three nominal single outputs of 5, 12 and 15V, adjustable over a -20 to +10 per cent range for non-standard voltages. Three dual fixed output models,  $\pm 12$ ,  $\pm 15$  and  $\pm 24$ V are also available and can be configured to operate as single 24, 30 and 48V outputs.

All models have over-current, output-overvoltage and over-temperature protection. Remote on/off is standard. The modules have efficiencies up to 90 per cent and can operate with a case temperature of between -40 to 105°C with derating at high temperatures.

[www.emea.lambda.tdk.com](http://www.emea.lambda.tdk.com)



## Reliable battery management

Thanks to 4300VDC/1 min galvanic isolation and 1000VDC operating voltage, Würth Elektronik's WE-BMS signal transformers for battery management systems suit energy storage systems, e-bikes and e-scooters. Würth Elektronik states the design offers far longer physical creepage than comparable products while remaining compact. Low-profile 3.45mm height variants are also available.

The transformers are optimised for battery management systems. They are primarily used to ensure reliable operation and provide information about charging status.

Individual battery cells are connected in series, as are the downstream BMS controllers. Voltage differences and electromagnetic interference may occur between series-connected components or boards. The WE-BMS transformer isolates components and suppresses EMI.

Applications include storage systems for solar installations or uninterrupted power supplies. As the WE-BMS series is AEC-Q200 qualified, it suits e-mobility applications. WE-BMS supports serial daisy chain, isoSPI and SPI.

Operating temperature range is -40 to 125°C.

[www.we-online.com](http://www.we-online.com)



## 4kW converter suits high performance applications

TTPi has launched UltraMod4000, a GaN-based, multipurpose, bi-directional, isolated, DC/DC converter, designed to work either standalone or in multi-modular system. PPM Power has been appointed UK distributor.

At around 200g and measuring 100 by 80 by 26mm, the UltraMod4000 has a 4kW throughput, suitable for high-performance automotive applications and other vertical markets.

PPM Power's sales director, Phil Surman, said: "We're delighted to be showcasing this ground-breaking product, which has roots in the UK's world leading power electronics academic community. The UltraMod series of power converters shows what wide-bandgap semiconductor technology is capable of delivering."

TTPi's commercial director, Dan Somers, added: "The UltraMod4000 is part of our flagship range of ultra-compact power converters. We're excited to be launching such a high-power device to the market and we're delighted with the market response to date."

UltraMod suits applications where weight, size and efficiency are critical. For example, electric vehicles, aerospace, rail, industrial and renewable applications.

[ppmpower.co.uk](http://ppmpower.co.uk)



## Robust supplies for demanding applications



Cosel has introduced the AEA800F series 800W free-air convection cooling power supplies. Designed for applications requiring a high level of safety, the AEA800F is certified to EN62477-1 (OVC III) for industrial applications and ANSI/AAMI ES60601-1 and EN60601-1 3rd Edition for medical applications.

Input voltage is 85 to 264VAC. Three output voltages are available: 24, 36 and 48V with respective current ratings of 34A (peak 72.5), 22.7A (peak 48.4) and 17A (peak 36.3). Output voltage can be adjusted.

In industrial and medical applications, power supplies must be able to deliver extra power during peak operation times such as motor start-up. The AEA800F can deliver 300 per cent of its free-air, convection cooled, nominal power for up to 3,000ms.

Regarding safety, the AEA800F is certified to the EN62477-1 over voltage category three (OVC III), meaning final equipment can be directly connected to the main distribution panel without adding an extra level of isolation.

[www.coseleurope.eu](http://www.coseleurope.eu)



**ROHM**  
SEMICONDUCTOR



# POWER THE FUTURE

## ROHM'S GEN 4 SiC POWER DEVICES

As a technology leader ROHM is contributing to the realization of a sustainable society by focusing on the development of low carbon technologies for automotive and industrial applications through power solutions centered on SiC Technology. With an in-house vertically integrated manufacturing system, ROHM provides high quality products and stable supply to the market. Take the next development step with our Generation 4 SiC power device solutions.

### **Industry-leading low ON resistance**

Reduced ON resistance by 40% compared to previous generation without sacrificing short-circuit ruggedness.

### **Minimizes switching loss**

50% lower switching loss over previous generation by significantly reducing the gate-drain capacitance.

### **Supports 15V Gate-Source voltage**

A more flexible gate voltage range 15 -18V, enabling to design a gate drive circuit that can also be used for IGBTs.

[www.rohm.com](http://www.rohm.com)

Exclusively sponsored by



# Digi-Key Expands Product Distribution Center to Continue Delivering Excellence Globally

By **Chris Lauer**, vice president, order fulfillment at **Digi-Key Electronics**



**Chris Lauer**, vice president, order fulfillment at **Digi-Key Electronics**

**A**fter five years of planning and building, we're proud to announce that in August we celebrated the ribbon cutting of our new, state-of-the-art Product Distribution Center expansion (PDCe) in Thief River Falls, Minnesota, by cutting tape from an official Digi-Reel. At 204,400 square meters, Digi-Key's new PDCe is one of the 10 largest warehouses in North

America, combining with Digi-Key's existing headquarters to provide a total of nearly 279,000 square meters.

It's an important milestone for Digi-Key and our community, suppliers and customers. The new facility will help us continue to deliver excellence to our customers for many years to come, allowing us to pick, pack and ship nearly three times the previous daily average of 27,000 packages to customers in more than 180 countries around the world. As exciting as this expansion is for us, our hope is that our customers truly don't notice a difference – the transition for customers should be seamless and provide an even better customer service experience.

The opening of the facility comes at a time of record growth. In 2021, Digi-Key grew faster than ever with a 65% sales increase, and orders in 2022 are up more than 25% over last year. Supplier additions increased markedly as

well, with 250 suppliers already added this year.

The new facility is nearly fully automated; the only task that is truly done by hand is the actual physical picking of parts. Digi-Key has developed many proprietary systems to aid in ensuring our customers get the right part in the right quantity every time. The largest component of our newly automated system is the KNAPP Order, Storage and Retrieval (OSR) which provides the right parts to the picker every time, eliminating walk time and providing an ergonomically appropriate environment for the person doing the picking. This high level of automation improves efficiency by up to 35% for picking and improves packaging quality and efficiency.

The PDCe features two primary sorting systems to provide redundancy in the case of a breakdown and to enable future growth. Creating a team-friendly work environment while also

planning for scalability and growth were top of mind in the plans and design of the new building. There are over 43 kilometers of automated conveyor belt in the new facility, and an average order will travel more than 975 meters inside the building.

Sustainability was also considered during the planning and construction of the facility. The roof's white membrane reflects the sun's heat, sensor-activated LED lights minimize electricity usage and a specially designed conveying system maximizes energy usage and efficiency.

We thank our customers, suppliers and carrier partners for supporting Digi-Key's growth and expansion. We couldn't have done it without you, and we look forward to continuing to serve you as we fuel innovation around the globe with the highest levels of service and support you've come to trust during the last 50 years. Cheers to the next 50 years and beyond!





# TrustedParts.com

Genuine electronic components from  
only authorized sources.

Enter a component part number



**54B+**

PARTS  
IN STOCK

**25M+**

UNIQUE PART  
NUMBERS

**4K+**

LEADING  
MANUFACTURERS

**2.3M**

USERS  
PER YEAR

**120M**

SEARCHES  
PER YEAR

**ALWAYS REAL-TIME PRICING AND AVAILABILITY**

Search authorized distributors at  **TrustedParts.com**

# Power electronics drive heavy copper

*DK Daleba's business development manager, Tony Hawkins, explains how power electronics is driving the growing trend for heavy copper circuits*

Three ounce PCBs are defined as heavy copper but for many power applications, including EVs, engineers are requiring boards with extreme heavy copper—30 ounces per layer and more.

These PCBs offer benefits such as: increased endurance to thermal strains; higher current carrying capacity; increased mechanical strength at connector sites/PTH holes; use of exotic materials to their full potential; and reduced product size by incorporating multiple copper weights on the same layer providing power and logic on one outer layer.

Likewise, heavy copper plated vias carry higher current through the board to transfer heat to an external heatsink, while on-board heatsinks can be directly plated onto the board surface using up to 120oz copper.

Manufacturing heavy copper PCBs is a specialist manufacturing process. DK-Daleba's UK manufacturing group has developed techniques which are only shared under strict NDA conditions. Once signed, the best suited production techniques for a project can be shared along with design rule advice. Beyond bare board

manufacture, DK-Daleba will also share specific advice for assembly techniques.

When costed, heavy copper boards must incorporate extended plating times but overall solutions are likely to be less when, for instance, traditional busbars are eliminated.

[www.dk-daleba.co.uk](http://www.dk-daleba.co.uk)



DK Daleba's business development manager, **Tony Hawkins**



## SUPPLYING PCBs SINCE 1963.

**DK-DALEBA**  
Printed Circuits

**DK-Daleba has been trusted by their customers to supply PCBs for almost 60 years.**

- ✓ UK manufacturing for short lead-times
- ✓ Asia manufacturing for optimum prices
- ✓ UK and Asia based engineering and logistic teams
- ✓ Consignment stocks – 6 million customer PCBs in stock

**Talk to DK-Daleba today about all your PCB requirements!**



**50+ MILLION PCBs DELIVERED EACH YEAR.**



+44 (0) 1992 510000 | [sales@dk-daleba.co.uk](mailto:sales@dk-daleba.co.uk) [www.dk-daleba.co.uk](http://www.dk-daleba.co.uk) | DK-Daleba, Orland House, Hertford SG13 7AT

# PCB planning in a dynamic market

*In this article Fineline highlights the value of working with a PCB value add partner that is prepared to talk about risk rather than just taking an order*

Events of recent years have shown the importance of adapting how we work. Lockdowns, increased demand, unstable pricing and lead-times, freight disruption and component shortages have brought many challenges to the electronics market. A versatile, agile and resilient (VAR) supply chain should be there to support you.

Traditional material planning was often a combination of demand forecast and product lead-time. Where forecasts are prone to inaccuracy, the simple solution was to implement a vendor managed inventory program (VMI), with the supplier holding stock and shipping against demand. Due to component shortages which often trigger re-designs, there is greater risk to the traditional VMI solutions, with stock not being consumed in line with agreements, or even becoming obsolete.

With the current inflation challenges and threat of recession, demand will likely drop at a time when interest rates are rising. The situation will worsen. The cost of financing, warehousing and stock management whilst relatively low, will increase, but the greatest risk is the cost of obsolescence.

For custom-made products like PCBs, the cost of writing off unused stock can be

*Continue on page 22 >*

**FINELINE**

THE GLOBAL  
PCB EXPERTS

YOUR COMPLETE  
SUPPLY CHAIN PARTNER

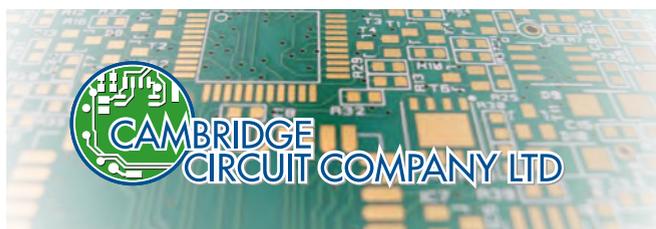
We deliver the benefits of a global PCB company and local support that our customers value

WE'RE HERE  
TO HELP

Tel: +44 (0)1249 815815  
Email: [uk-sales@fineline-global.com](mailto:uk-sales@fineline-global.com)  
[www.fineline-global.com](http://www.fineline-global.com)



**With the current inflation challenges and threat of recession, demand will likely drop at a time when interest rates are rising**



**We're a UK-based PCB manufacturer providing a cost-effective, quality, responsive and reliable service.**

**Using extensive PCB manufacturing knowledge and experience, we offer:**

- In-house production of Multilayer, Flex and Flex-Rigid, PTH, and Single-sided
- Efficient mass-volume production from our trusted strategic overseas partner
  - Prototypes a speciality
- 24HR to 5 Day standard turnaround

**Want to know more?**

To find out how we can help you get in touch:  
[sales@cambridge-circuit.co.uk](mailto:sales@cambridge-circuit.co.uk) | Tel: 01223 423 100  
[www.cambridge-circuit.co.uk](http://www.cambridge-circuit.co.uk)

@CamCircPCB Like us Follow us



significant, as can be the cost of holding stock with no demand. So how do buyers secure availability, manage costs and mitigate the risk of obsolescence?

A 'value add reseller' that has the supply chain to support changing demands, multiple technology and lead-time solutions, along with offering VMI programs can help, but it is a fine line when choosing the right partner. Global companies can often offer the best possible information on changing markets around the world, monitor industry trends and use market knowledge to keep the customer updated and agree the best actions.

Being versatile, agile and resilient is crucial. It is important that suppliers work with customers to review the forecast, stock and WIP and be prepared to talk openly about risk.

How many suppliers advise a customer that they

are ordering too many boards? Traditional KPIs for material management were based on unit price, availability and stock levels. Today should we consider the risk of too much stock or even obsolescence? The costs of this may be far higher than a small saving in unit price. It is important to capture the full cost of ownership. Working with a partner that is prepared to talk about risk rather than just taking an order, might just be the company that saves their customers the most.

There is a fine line between success and failure in material planning.

[www.fineline-global.com](http://www.fineline-global.com)

## Extended colours at no extra cost

Metcase has extended its range of 'no extra cost' custom paint colours and finishes. Eight new shades have been added to its range of always-in-stock paints, bringing the total to 37 colours, plus anodising, passivate, pre-treatment and anti-corrosion finishes.

The new colours are violet blue (RAL 5000), cobalt blue (RAL 5013), pigeon blue (RAL 5014), yellow (Pantone 1235C), medium dark orange (Pantone 159C), salmon orange (Pantone 2027C), teal (Pantone 2238C) and anthracite (Pantone 432C). The company can supply its 19in

enclosures and desktop/portable instrument enclosures in any specified RAL or Pantone colour. However, there is no extra charge if the customer chooses a colour from the always-in-stock range.

Metcase's in-house facilities include a large powder paint line and wet paint cubicle. Its team can supply enclosures and front panels in any custom colour or special finish. There is usually a minimum order of 10 to 25 units but this does not apply to always-in-stock colours.

[www.metcase.co.uk](http://www.metcase.co.uk)



## Bright displays suit vehicle applications

Review Display Systems has introduced a new range of high-performance, small-size TFT display modules. Sizes and resolutions range from 1.4in (240 by 240px) to 4.3in WQVGA (480 by 272px).

The company states the full line-up of TFT displays offers excellent optical performance and features in-plane switching technology, which ensures highly consistent image reproduction and colour saturation from all viewing angles. Contrast ratios are specified from 500:1 to 800:1.

RDS' display business manager, Justin Coleman, said: "The new range will enable RDS to support a diverse range of portable and static applications including in-vehicle devices such as dashcams, domestic monitoring and metering equipment, and e-mobility systems to name but a few. Additionally, we can offer semi-custom display options to meet user specific requirements."

High brightness, white LED backlights are used throughout, providing brightness specifications ranging from 500 to 1000cd/m<sup>2</sup>.

[www.review-displays.com](http://www.review-displays.com)



## MAGNETIC POGO CONNECTORS

EDAC's NEW Magnetic Pogo Connectors are a reliable, precision made interconnect solution. Each connector has a long life span of up to 30,000 mating cycles making them the ideal choice for the fast moving world of consumer electronics.

The Pogo pairs rely on a magnetic force to make and maintain a connection, whilst increasing the reliability and providing polarisation. Assembled in high-temperature thermoplastic, each piece is precision machined to ensure a high quality, low resistance connector - giving it the edge over other technologies.

### APPLICATIONS



Smart wearables and fitness devices



Medical and health equipment



Home appliances and smart home technology

Designed specifically for quick release applications, EDAC's new Magnetic Pogo Connectors deliver a new solution for modern applications.

01933 427300 | [ENQUIRIES@EDACEUROPE.NET](mailto:ENQUIRIES@EDACEUROPE.NET) | @EDACEUROPE

**EDAC**  
EUROPE

# Guaranteeing reliable touch panel performance

*Schurter engineers help electronics purchasers identify solutions for touchscreen applications with high EMC requirements*

To be a strong contender in the European market, touch panel products must comply with European directives and be CE certified, meaning the product has met EU health and safety as well as environmental obligations. An essential element of such products is meeting the requirements for electromagnetic compatibility (EMC), but what does this actually mean?

The touch panel must have a high immunity to interference to prevent other electrical devices in its immediate vicinity affecting the touch panel's operation. Similarly, the panel must not interfere with other products, so its emissions must be low. EMC requirements for each

touch panel will depend on its application area. For example, medical devices require a higher interference immunity for safety reasons.

Many modern electronic devices work with highly integrated, high clocked circuits, which can often cause emitted interference signals. These signals can also have a high edge steepness, which leads to further harmonics. However, by choosing the right components and filter elements, these emissions can be combatted effectively at source.

A PCAP touchscreen should never trigger an action if it is not touched, known as a ghost touch. However, a touch screen may be disturbed by high-frequency energy from conducted or radiated emissions. Precautions are taken to achieve high interference

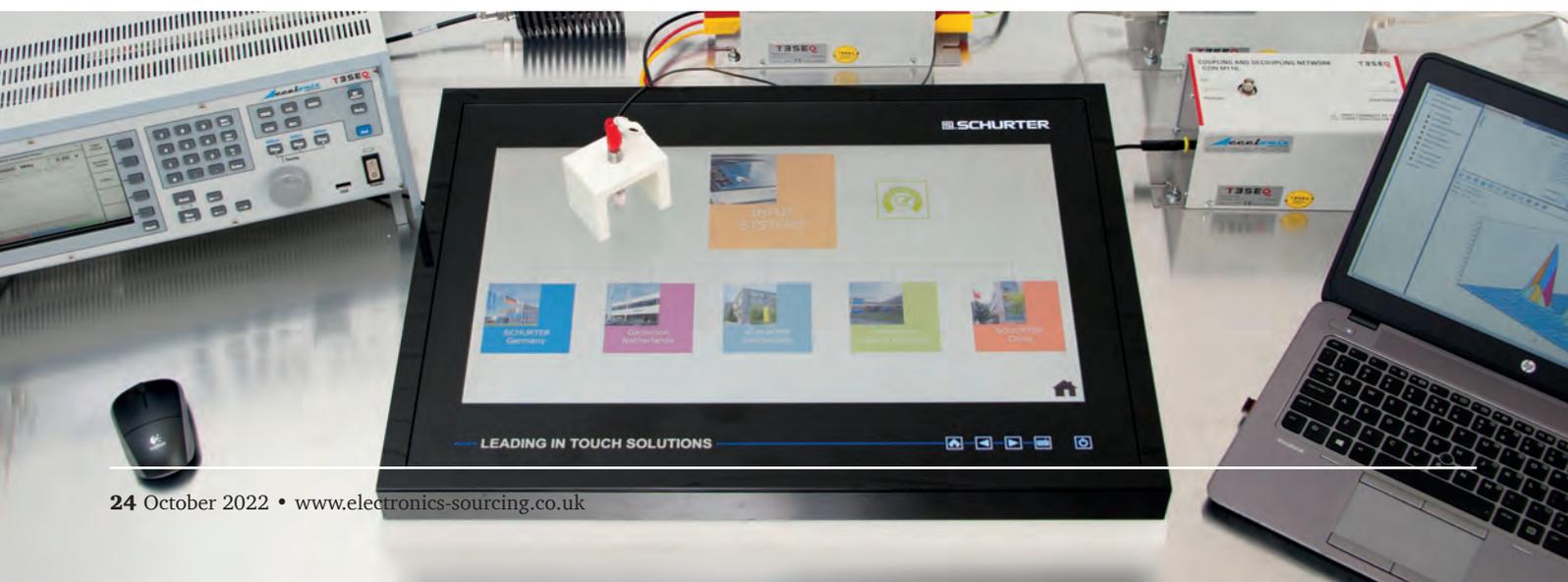
immunity. These include hardware solutions (such as signal/power line filtering and shielding the PCBs and wiring) and software solutions (touchscreen controller chips have in-built functions including noise suppression and frequency hopping).

The touchscreen sensor is an important component in the design and can be made of polyester or ITO glass. Touch points can be integrated on a printed circuit board and an optimal conductor pattern of the sensor is essential for functionality. The sensor is laminated or bonded behind the cover lens material. The sensors are manufactured using an etching or screen-printing process and are available in tailored shapes and sizes. For optimal touchscreen products with electromagnetic capability, it is essential that the touch screen controller be

mounted correctly. Ground connections, whether separate or not are also important as they help determine the final performance of the touchscreen product.

Schurter's engineers have decades of EMC experience and are often involved at a project's earliest stages via a joint development team. Engineers consider the EMC properties of the touchscreens and product during the design phase. The company manufactures the sensor design itself to match the respective application and provides customers with detailed assembly instructions for the installation of the touch panel and corresponding controller. Schurter developers use professional test equipment to determine the conducted immunity and fine-tune the optimal functionality.

[www.schurter.com](http://www.schurter.com)



# Is your work area safe from electrostatic damage?

*Antistat explains the important role of electrostatic protected areas when handling sensitive components and introduces the key elements of an effective EPA*

With ever-increasing expectations of today's market, reliability levels for electronics need to be just as high. Consequently, avoiding damage to sensitive electronic components from electrostatic discharge (ESD) is essential.

Creating an ESD safe workspace or electrostatic

protected area (EPA), where all surfaces, objects, people and ESD sensitive devices are protected is one of the best things you can do to ensure a productive, secure, reliable environment and is now standard in any electronics production facility.

In its simplest form, a workstation kit consisting of dissipative matting, signage, bonding plugs, wrist strap and leads will be enough to create an EPA. We recommend if you have space, to include an ESD floor and heel grounders, to

allow personnel to stand or move around on the job.

Your EPA should have well defined boundaries making it clear when entering and leaving an EPA. ESD sensitive devices should only be handled within the EPA under protected and controlled conditions and should be placed in ESD protective packaging before being moved away from the EPA.

Finally, testing and monitoring of equipment will play an important part in the success of your EPA.

Antistat's wrist strap testers ensure integrity of the wrist strap and lead while constant monitors ensure reliable ground connections continuously while you work and are a constant check that the user and working area is grounded.

[www.antistat.co.uk](http://www.antistat.co.uk)

## RTS



**Thermal fuse now also available with shunt**

- Separates rated voltages up to 60 VDC
- Reflow compatible through mechanical activation procedure
- Space-saving thanks to integrated shunt

[sales.uk@schurter.com](mailto:sales.uk@schurter.com)  
+44 1296 319 000  
[thermal-protection.schurter.com](http://thermal-protection.schurter.com)

**SCHURTER**  
ELECTRONIC COMPONENTS

 **Kemtron**  
Proven EMC Shielding Solutions  
Kemtron Ltd. is now part of

 **TE**  
connectivity

## RFI/EMI shielding

Trust Kemtron for high performance RFI/EMI shielding for extreme climatic, environmental and operational conditions.



Manufacturers of RFI/EMI Shielding Gaskets & Components

**ENQUIRE TODAY OR  
REQUEST A VIDEO CALL**

Our dedicated manufacturing facility and team produce materials and components to your needs.

+44 (0)1376 348115 | [info@kemtron.co.uk](mailto:info@kemtron.co.uk)  
[www.kemtron.co.uk](http://www.kemtron.co.uk) | [www.te.com](http://www.te.com)

# How purchasers are navigating supply chain issues

*In this article, Rittal examines ways purchasers can overcome supply chain hurdles in today's manufacturing landscape*

The sheer variety of applications in today's manufacturing space may lead purchasers to believe they need customised industrial enclosures to tackle the nuances of each application's requirements. While customisation does provide value in solving unique challenges in certain industries, it can also prove problematic as it

often results in longer lead times, integration issues and more complicated assembly and installation.

Specifying standardised automation equipment, particularly control panels and enclosure solutions, can help purchasers address a variety of specific challenges whilst eliminating the delays often

associated with customised enclosures. Making the move towards standardised enclosures can help reduce overheads by removing the additional manpower costs often associated with custom modifications.

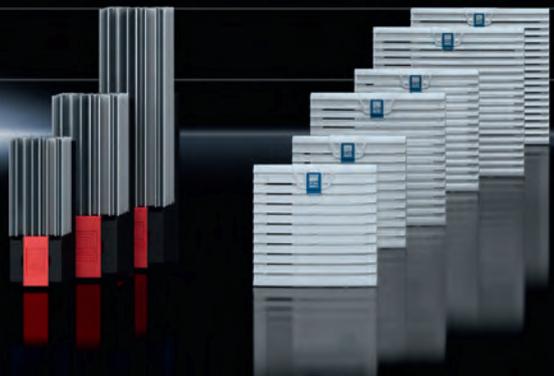
The modular nature of Rittal's industrial enclosures helps create enhanced flexibility in design,

configuration, assembly and installation. For example, the VX25 baying enclosure system offers nearly limitless configuration possibilities, due to the interchangeable panels and bayable enclosure options. Along with an IP66 rating, the VX25 is a versatile industrial enclosure that can be deployed in a variety of environments for enhanced reliability and productivity.

## Rittal – The System.

Faster – better – everywhere.

# Enclosure Climate Control Whatever the scale..... .....we have the solution



ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

This same level of standardised flexibility also applies to VX SE free-standing enclosures. The VX SE's space-saving nature lets manufacturers scale based on demand or space constraints. In addition, a range of widths and dimensions can replace up to three baying enclosures, for use in more confined production floors. With a unibody construction and IP66 protection rating, the VX SE can be deployed in different applications with no customisation.

The global interconnected nature of modern manufacturing means purchasers will likely be working with automation partners in a variety of international locations. While historically this model helped purchasers source a wider variety of panels, enclosures, cooling units and power distribution systems, the last few years have demonstrated difficulty in facilitating complex supply chains.

As a result, many UK-based manufacturers spent the last two years reshoring, helping ensure parts they require don't get caught in logistical issues halfway around the

world. For purchasers, this helped create a new supply chain model, when working with automation partners who can provide flexible, efficient UK-based solutions quickly and efficiently.

Rittal is a global manufacturer and system solutions provider with a UK-based production and modification centre, with bases in Hellaby and Plymouth. This local and international network lets the company provide innovative industrial automation products to manufacturers across the country quickly and cost-effectively.

Also, Rittal's two UK distribution centres serve manufacturers with a robust inventory of products and solutions for fast order fulfilment. Next day delivery options are available on standard product lines to further streamline the supply chain and provide greater peace of mind that orders can be filled without disruptions.

Advances in design and manufacturing technology have made the complete digitalisation of the industrial panel and

enclosure engineering process a reality. While purchasers don't work directly with these digital design and engineering platforms, the downstream impact of incorporating a digitalised design and engineering system into the supply chain, creates a more connected value chain built on transparency and efficiency, this in turn providing a smoother procurement process.

Designed to provide end-to-end visibility and transparency from panel engineering to the production process, Rittal's EPLAN is a digital design platform featuring cloud-based apps, digital twin technology and a 3D control panel to provide manufacturers with more efficient and transparent designs and engineering workflows.

Synchronisation of each step in the enclosure design and engineering process coupled with detailed reporting, real-time updates and schematic storage/sharing helps manufacturers overcome common stumbling blocks during production operations.

Rittal and EPLAN, as part of the wider value chain, are helping alleviate purchasing issues including increasing pricing pressures which produce the problem of how to successfully provide the right product, at the right time, for the right price.

Shortages of skilled labour, component parts and other resources can result in costly adaptations and alterations to the panel or enclosure design. Ineffective workflows stemming from outdated and inefficient data capture, storage and communication systems can also contribute to supply chain challenges.

As purchasers in manufacturing environments continue to face challenges in national and international supply chains, the shift towards a more strategic and creative approach has never been clearer. Purchasers effectively implementing these strategies help them meet their customers' needs, with minimal effect on them. Solutions from Rittal and EPLAN are playing a pivotal role in this and the wider supply chain.

[www.rittal.co.uk](http://www.rittal.co.uk)



IT INFRASTRUCTURE

SOFTWARE & SERVICES



[www.rittal.co.uk](http://www.rittal.co.uk)

# Choosing a third-party manufacturer

*In this article, Nano Electronic Services' director, Steve Drew, shares a set of factors that OEMs should consider during the process of identifying a third-party manufacturer*

Many OEMs realise the benefits of using a third-party company for producing electronics assemblies including saving money, improving product quality and eliminating the need to invest in new equipment. Before making an outsourcing decision, it's important OEMs are aware of what to look for before partnering with another company.

**Location:** Some businesses make the mistake of looking overseas for a contract manufacturer. In many cases, offshore companies will charge less for assembly services, but there's a reason for that. They don't always adhere to the same safety and labour standards as valued in the UK. Counterfeit parts may be used to shave costs and cut corners which could compromise quality or reliability.

Regarding UK suppliers, next-day delivery lets OEMs look further afield than the assembler next door. A nearby factory offers advantages, letting engineers visit to solve issues or pick up boards the same day. However, a little time and effort might find an ideal manufacturing partner further afield. With video calls and 24-hour delivery, buyers don't need to look so close to home.

**Price:** Don't focus on the best price, there may be a reason it's so low. In life, you get what you pay for. Poor quality and support can cost in the long run. Find a supply partner to work with who can sustain high quality each and every time. Sometimes it's those extra details that matter. Does the more expensive supplier go the extra mile when

quoting or provide more comprehensive feedback on BoM or build issues?

**Experience:** How long has the supplier been in business? Is it well established? Does it have product knowledge or work with similar customers? Does it have experience with the relevant market sector or application?

**Equipment and processes:** Explore how the manufacturer's processes work, how it takes a product from goods-in to goods-out. Does it have the necessary checks in place? Does it provide traceability at component level and through the assembly processes? Is its equipment suitable for the application? This is a tricky question as one pick-and-place machine looks like another. Don't be blinded by 'placement per



**Nano Electronic Services'**  
director, **Steve Drew**

hour'. It means nothing if boards take one-hour to build, then spend three-days in manual. Is the process efficient and does it meet the required lead times?

**Fit and culture:** It's an odd question but do staff at the OEM and assembler get on, can they work together? Ultimately, are they nice people to work with?

**Scope:** Can the assembler support the project across its lifetime including concept, design, prototyping and production? Does the manufacturer deal with multiple suppliers across different project stages which can impact timings, especially for small enterprises? It is often best to stick with one 'do it all' factory but lose the flexibility or best cost.

**Capacity and flexibility:** Can the manufacturer support the anticipated volumes now and in the future? Do its future plans align with the project's expectations? Will it efficiently help with prototypes? When the customer needs help, will the manufacturer be supportive?

**Test and box build:** Does the manufacturer have inhouse test or box build capability? Can it help create test programs and test boards in house? Does it have the capability to put everything together and manage ongoing supply? Does it have experienced test personnel?

**Reviews and references:** OEMs should ask manufacturers

for reviews and customer references. Getting an idea of the types of companies the manufacturer is building for will provide assurances of its work and where the OEM's business might fit in.

**Standards:** Most companies are ISO9001 these days but the OEM should ensure certification is current. If the project requires other standards, ensure the manufacturer

can support these (ATEX, ISO13485, AS9120, TS16949 etc). Are operators trained to IPC standards, do they have in house trainers, can they work to IPC Class 2 and 3?

Bandwidth and knowledge. Finally, does the OEM have the experience or time to manage the identified suppliers? Is the OEM comfortable auditing the factory and understand what it is being told? Does

the OEM have the time to manage its own internal project, while looking after one or multiple contractors?

[www.nanoelectronicservices.com](http://www.nanoelectronicservices.com)



## CONTROL-KNOBS

Soft-touch CONTROL-KNOBS are easy to grip and comfortable to operate. They can be illuminated if required, using SMD LED technology (5V). This allows individual RGB lighting and colours. These new collet knobs are available with or without a pointer line for fine tuning or as part of a menu-driven interface.

**OKW ENCLOSURES LTD**  
01489 583858 | [www.okw.co.uk](http://www.okw.co.uk)



**“““**  
**Don't focus on the best price, there may be a reason it's so low. In life, you get what you pay for. Poor quality and support can cost in the long run**

## 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
<b>CABLE ASSEMBLY &amp; HARNESSING</b>											
Amphenol	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	3,000	N/A	0 €	N/A	50	2,500+	Y
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
<b>CIRCUIT PROTECTION</b>											
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
<b>ENCLOSURES</b>											
Bud Industries	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	1,600	N/A	0 €	N/A	50	2,500+	Y
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
<b>FREQUENCY MANAGEMENT</b>											
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
Epson	Mouser Electronics	01494-427500	www.mouser.co.uk	Y	900	N/A	0 €	N/A	50	2,500+	Y

## Services Sourcing

**CEM**

**WILSON**  
PROCESS SYSTEMS  
ELECTRONICS MANUFACTURING SERVICES

**In-house processes including:**  
Oversized PCB Capability  
Automated SMT/Through-Hole Assembly  
Hand Assembly/Box Build  
Design For Manufacture  
Environmental Testing  
Wide Range of Coatings/Encapsulation  
Full Test Services  
IPC Certified Staff

www.wps.co.uk  
01424 722222  
enquire@wps.co.uk

IPC Certified Assembly Specialist  
BSI ISO 9001:2015

**DEVICE PROGRAMMING**

**action circuits**  
(UK) LIMITED

device programming & reeling specialists

**I.C. PROGRAMMING & LASER MARKING SERVICES**

Tel: 00 44 (0)1582 412323  
Email: sales@actioncircuits.com  
www.actioncircuits.com

**TAPE REELING**

**action circuits**  
(UK) LIMITED

device programming & reeling specialists

**SMD TAPING & REELING SERVICES**

Tel: 00 44 (0)1582 412323  
Email: sales@actioncircuits.com  
www.actioncircuits.com

**INTERCONNECTION**

**HRS HIROSE**  
ELECTRIC EUROPE B.V.

More than 50,000 connectors

www.hirose.com/eu  
eu.info.3d@hirose-gl.com

**CELL PACK SOLUTIONS**

Custom Battery Pack Design & Assembly  
Battery Distribution

www.cellpacksolutions.co.uk

**TRACER**  
High Performance Lithium Batteries  
12-24V ~ 4-170Ah  
www.tracerpower.com

Tel: 0191 496 9999

**WANT TO ADVERTISE HERE?**

Contact us at [sales@electronics-sourcing.com](mailto:sales@electronics-sourcing.com) or call us on 01892 613400

# 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
-------	--------------------	--------------	------------------	---	-----	-----	-----	-----	----	--------	---

## 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	
JAE 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
<b>OBSOLESCENCE / HARD TO FIND</b>											
	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
<b>OPTO ELECTRONICS</b>											
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
<b>PASSIVES</b>											
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
<b>PASSIVES ALTERNATIVES</b>											
BEC Distribution Ltd		01844 275824	www.bec.co.uk		5,000	N/A	£0	100%	3	5	Y
<b>POWER &amp; BATTERIES</b>											
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
<b>SENSORS</b>											
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
<b>SWITCHES &amp; KEYBOARDS</b>											
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

**Best**  
Windings Ltd

## For the Best in Windings

ISO 9001 Design, Manufacture and Supply



- Transformers, inductors, coils, modules
- Custom and standard
- Through hole, surface mount, low profile, encapsulated
- Signal, power, high voltage, safety critical
- Low, medium and high volume
- UK and offshore manufacture
- Security, military, avionics, medical, industrial, telecoms, datacoms, consumer, audio, video . . .



**Why settle for less? Talk to Best Windings**

Tel: +44 (0)1394 448424 sales@bestwindings.co.uk www.bestwindings.co.uk  
Best Windings Ltd, Viking Works, Bucklesham Road, Ipswich, IP10 0NX, UK

## 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 140001:2015, UL, CCC, IPC-610-G Class 3, TUV	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
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
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
Electronic Technicians Ltd	01202 897722	www.etuk.co.uk	£3.7m	SE	50	2	AS9100, ISO9001, ISO14001, IPC610/620 Class 3	Y	Y	Y	Y	Y
FermionX Ltd	+44(0)1903 524600	www.fermionx.com	£6.5m	Worthing, W. Sussex	56	3	ISO9001:2015, ISO4001:2015, IPC-A-610 Class 2 & 3, IPC-J-STD-001	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, IPC-J-STD-001, IPC 7711/7721	Y	Y	Y	N	Y
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
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
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
Industrial Electronic Wiring Ltd.	+44(0)1793 694033	www.jew.co.uk	£5.5m	Swindon, UK	60	N/A	ISO9001:2015, IPC610, IPC620	N	Y	Y	N	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
KEY-TECH ELECTRONIC SYSTEMS	01592 597711	www.key-tech.co.uk	£7m	Scotland	65	2	ISO9001:2015, I-STD-001, IPC-610/620 CLASS 3, IPC-7711, BS EN ISO13485:2016, ISO 13485	Y	Y	Y	N	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
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
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
Pektron	01332 832424	www.pektron.com	£50m	E-Midlands	350	8	ISO9001, ISO14001, TS16949, BEAB, VCA, TUV, UL	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
TEXCEL TECHNOLOGY PLC	+44(0)1322621700	www.texceltechnology.com	£15.5m	SE	131	7	ISO9001, ISO14001, IPC610 Class 3,	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
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

## 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
Stevenage Circuits Ltd	01438 761811	www.stevenagecircuits.co.uk	M/B	UK/China	ISO 9001:2015, EN 9100:2018, EN 9104:2013, UL 796, ISO 14001:2015	SML	Y	4-44+	Y	N/A	N/A	F, F/R	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

## Advert Index

Advert	Page	Advert	Page
Anglia Components Ltd	BC	Fineline Ltd	21
Best Windings Ltd	33	Fusion Worldwide	08
Cambridge Circuit Company Ltd	22	GELEC	15
CamdenBoss Ltd	13	Kemtron	25
CML Innovative Technologies Ltd	12	Mouser Electronics	07 & 09
Corintech	11	OKW Enclosures Ltd	29
Digi-Key Electronics	FC & IFC	Rebound Electronics	11
DK-Daleba	20	Rittal Ltd	26 & 27
eBOM.com	09	ROHM	17
EDAC	23	Schurter Electronic Components	25
electronica 2022	IBC	Trusted Parts (ECIA)	05 & 19

November 15–18, 2022

# Driving sustainable progress.

Discover the future today.  
At electronica 2022.

**Get your ticket now!**

[electronica.de/tickets](https://electronica.de/tickets)



50

CELEBRATING

**50 YEARS**

OF SERVICE TO THE  
ELECTRONICS INDUSTRY

**anglia**  
est.1972

[www.anglia.com](http://www.anglia.com)