



Aerospace  
& Defence

Lighting

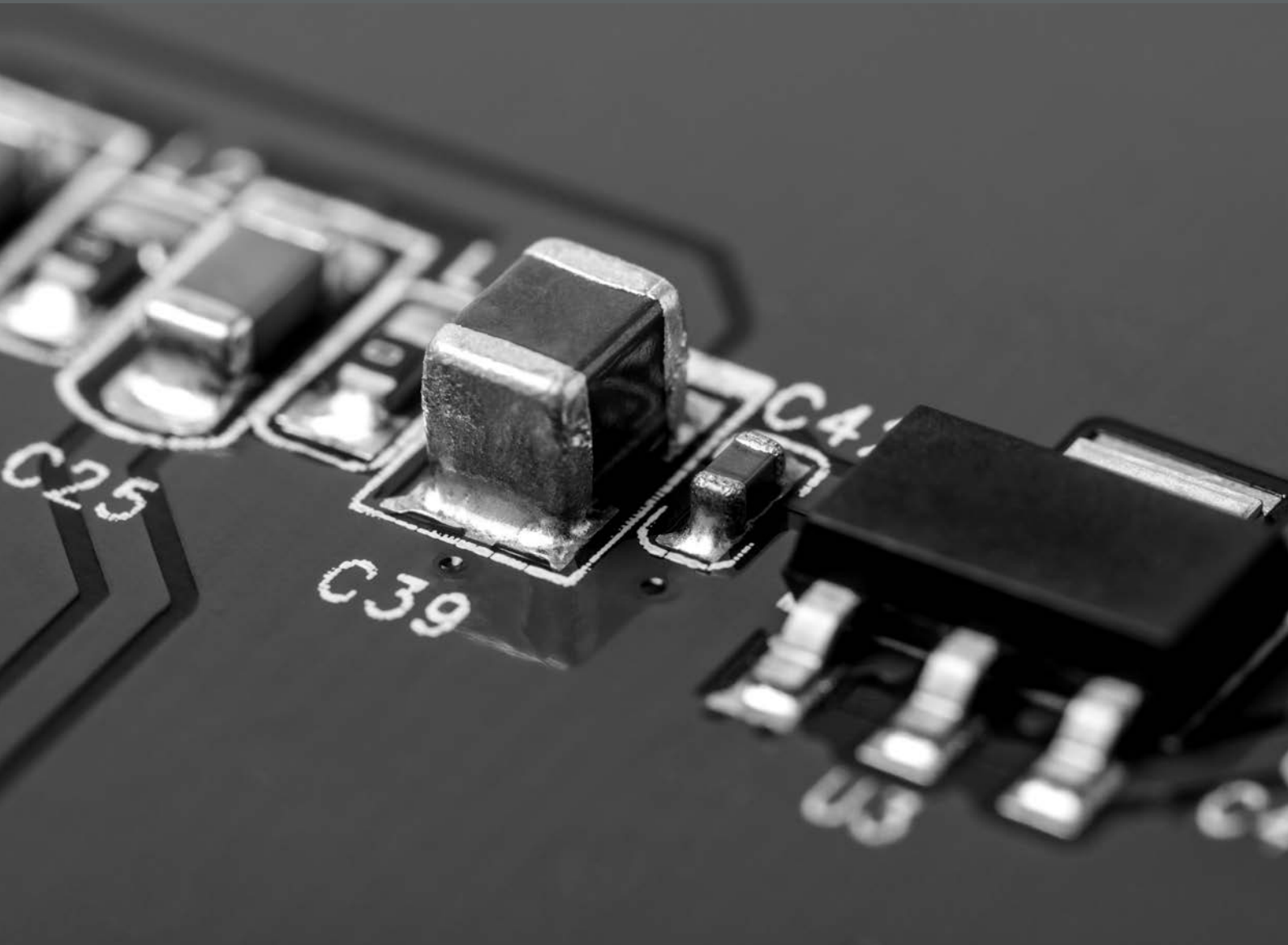
Power  
Management

Internet  
of Things

Transportation

## Components – EMEA

### PEMCO News – 3<sup>rd</sup> Quarter 2018




## Components – EMEA

### Lighting Guide

The advent of LED lighting has provided more consistent and positively scalable lighting outcomes. LEDs offer huge energy savings, design flexibility, and reliability, and are now entering nearly every application in the built environment. Arrow is a global distributor who provides customers with the full range of services and support they need. We offer end-to-end-support through a solution-based approach. At the same time, we stay flexible and leave the customer in full control of the IP.

**To receive your copy of the Lighting Guide, please contact your Arrow sales representative.**

 [Lighting Guide](#)



### Sensor Guide

As an enabling technology for the IoT, sensors are one of today's fastest growing product areas. Often, the sensor specification is the starting point for a design. Whether you are looking for a board level component, packaged product, encapsulated wireless sensor, or complete end-to-end IoT system, we are confident Arrow will have a solution that works for you. We have access to the tools, expertise and partners to get you to market as quickly as possible.

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 [Sensor Guide](#)



### Automotive Guide

Transportation and the automotive industry. At its core, it's about how people get from point A to point B. But for Arrow, it's about how we help drive the next wave of innovation. Not since Henry Ford's assembly line has there been a more transformative time in the automotive industry.

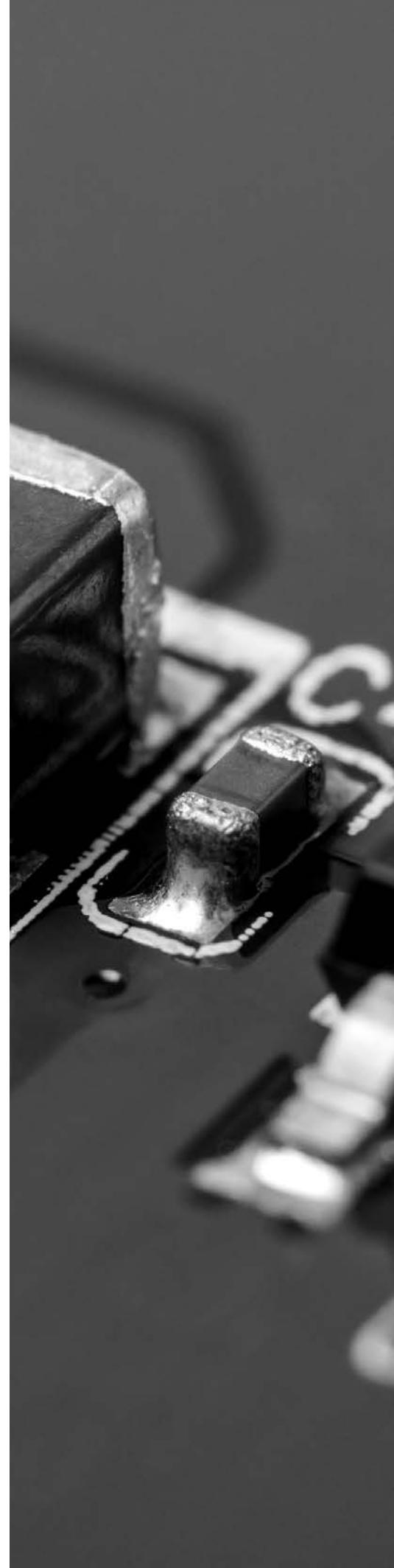
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# 3 Awards Received from Molex

## Southern Europe, DACH and MVP Awards Go to Arrow

Arrow Electronics received three awards during Molex’s 2018 European Distribution Conference, recently held in Vienna. In addition to being awarded the Regional Distributor of the Year for Southern Europe (Iberia, Italy and Israel) and DACH (Germany, Austria, and Switzerland), Arrow’s supplier business manager Stefan Bouwmans was also named ‘Most Valuable Person’ for 2017.

Arrow was chosen for these awards based on their growth in year-on-year sales, project conversion, and engagement, as well as what Molex described as clear financial, operational, and executive management excellence.

Matthias Hutter, Vice President Product Management and Supplier Marketing, Arrow EMEA Components, said: “These awards represent a shared success and we are thrilled that the contributions of our teams in Southern Europe and DACH were recognized with the Regional Distributor of the Year awards for 2017.”

Paul Keenan, Sales Director – Distribution Europe, Molex, added: “Arrow continues to deliver top class sales and engineering performance across the Molex technology range. We are proud to recognise Arrow’s contributions to our distribution channel.”



**Names from left to right**

- |                        |  |
|------------------------|--|
| Dean Hassel            | Regional Vice President Sales UBE and GSA EMEA, Arrow              |
| Paolo Deandreis        | Regional Distribution Sales Manager - Southern Europe, Molex       |
| Axel Prauss            | Director Marketing PEMCO EMEA, Arrow                               |
| Stefan Bouwmans        | Technology & Supplier Business Manager EMEA, Arrow                 |
| Wolf Martin Neugebauer | Corporate Distribution Account Manager, Molex                      |
| Markus Hefter          | Director Product Management EMEA, Arrow                            |
| Sabine Muehlberger     | Regional Distribution Sales Manager - DACH, Molex                  |
| Matthias Hutter        | Vice President Product Management & Supplier Marketing EMEA, Arrow |

## 3M™ High-Speed Card-Edge Connector, SPD08

The 3M High-Speed Card-Edge Connector SPD08 supports high-speed board-to-board and wire-to-board connections. It has a robust and flexible contact design for reliable connections. It also features a flexible stacking height and compact design to conserve board space and provide optimal value to customers. The connector's flexible design handles from 20 up to 200 contact positions and can support up to 15 Gbps board-to-board applications. Additionally, when used in conjunction with the 3M™ Twin Axial Cable, the 3M SPD08 connector supports up to 25 Gbps wire-to-board applications with a reliable, simultaneous ribbon termination.

### Market Segments and Applications

The SPD08 connector is typically used by enterprise & network OEMs whose applications include datacom systems, enterprise servers, test applications, defense, and telecommunications equipment. More specifically, this includes base stations, servers, hubs, switches, and routers. Within these markets, SPD08 supports multiple application protocols. These include the 10 Gigabit Attachment Unit Interface (XAUI), Peripheral Component Interconnect Express (PCIe) and the Serial Advanced Technology Attachment (SATA).

### Features & Benefits

#### Supports High Speed Board-to-Board Connections

- Controlled impedance, crosstalk limiting contact design supports speeds of up to 15 Gbps (at 30 mm stack height)
- Embedded ground plane within riser card limits row-to-row crosstalk and enhances signal integrity
- Supports XAUI, PCI express (Gen 1/2/3), SATA and other application speeds

### Flexible Stacking Height and Robust Connection

- Supports flexible stacking height (16–40 mm) with the use of a PCB intermediate riser card
- Robust contact design is tolerant of misalignment, provides a reliable connection, and supports blind mate



Connectors - SPD08-180-L-RB-TR  
available with or without latches/ejectors

### High Density Board Footprint

- High density (0.8 mm pitch), two-row design conserves board space and simplifies trace routing

### Flexible Design Options

- 20–200 contact positions (see availability and standard configuration details in customer drawing 78-5100-2420-7)
- Available with optional latches for robust mechanical stability
- 0.5 A current rating per contact for mixed signal and power applications

### Widespread Applicability

- Supports 25 Gbps wire-to-board applications using 3M™ Twin Axial Cable terminated to the edge

### Promise to the User

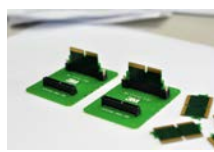
The SPD08 Connector features high-speed signal transmission performance up to 15 Gbps for board-to-board applications and 25 Gbps for wire-to-board applications. Its high density 0.80 mm pitch surface-mount structure features a flexible stacking height and a robust tolerance for misalignment, which is ideal for blind mate applications. Each single pin has a current-carrying capacity of up to 3.0 A, and the connector's LCP resin housing can withstand 260 °C.



Wire-to-board test board for high-speed test



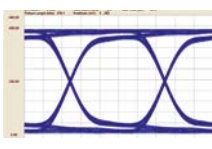
80 pos. connector in high-speed application (PCIe)



SPD08 sample board with paddle card



Connector latching mechanism maintains secure connection of twin axial cable assembly, vertical.



Data transmission of 6 Gbps/50 ps rise time > 85% opening factor. Cable length 0.50 m



Connector latching mechanism maintains secure connection of twin axial cable assembly, right angle.

### ORDERABLE PART NUMBERS

- SPD08-020-L-RB-TR
- SPD08-020-RB-TR
- SPD08-040-L-RB-TR
- SPD08-040-RB-TR
- SPD08-050-L-RB-TR
- SPD08-050-RB-TR
- SPD08-060-L-RB-TR
- SPD08-060-RB-TR
- SPD08-080-RB-TR
- SPD08-100-L-RB-TR
- SPD08-100-RB-TR
- SPD08-120-L-RB-TR
- SPD08-120-RB-TR
- SPD08-140-L-RB-TR
- SPD08-160-L-RB-TR
- SPD08-160-RB-TR
- SPD08-180-L-RB-TR

## Shield-Kon® Termination Solutions



Wherever shielded cables and wires are fitted, there is the problem of finding a permanent, repeatable, safe and quick connection of the braided shield. Conventional connection methods use soldering, which is more time-consuming and more expensive, and can often result in damage to the dielectric or to the internal shield conductor caused by heat.

ABB offers two solutions: The one-piece Shield-Kon® connector, which is wrapped around the shield during the crimping process. This solderless, wraparound connector terminates shielded cable in seconds with uniform precision. Once crimped, it provides a compact, lightweight, low resistance, high-strength connection. The connector works equally well on braided, wrapped, or foil shields and has the added advantage of being able to be used as a mid-span termination. Only four sizes, which can be easily identified by the color of their insulation, are needed to cover a range of shielding diameters from 1.27–7.62 mm.



The Shield-Kon® two-piece shield termination system consists of two cylindrical sleeves: an inner sleeve with a smaller diameter, and an outer sleeve that has a larger diameter but is shorter and less hard than the inner sleeve and will be crimped on the inner one. All inner and outer sleeves are color-coded according to their size. The conductors of the cable are inserted through the inner sleeve, whereas the shield (braided or foiled) and the drain wire are inserted between the two sleeves.

### ORDERABLE SERIES

- GSB, GSC, RSK

## AVX Circuit Protection Products

### AVX Offers a Broad Range of Multilayer Varistors for Consumer, Industrial and Automotive Applications



AVX multilayer varistors, with a unique high-energy multilayer construction, provide state-of-the-art overvoltage circuit protection and protection from voltage transients caused by ESD, inductive switching, automotive-related transients, etc. AVX multilayer varistors also provide EMI/RFI filtering in the

off-state, which can replace the need for additional EMC capacitors in the system.

### Product Range

- Available in a wide range of components – from high energy to low capacitance or ultra-low leakage
- Case Size: 0201–3220, Radial, Axial
- Voltage: 3.0–385 V
- Energy: up to 13.8 J
- Capacitance: from 0.47 pF–4.7 μF

### Features & Benefits

- Bi-directional protection & EMI filtering
- High reliability & Multiple strikes capability
- Temperature stability (no derating)
- Small size & weight
- Fast response (<1ns)
- AEC-Q200 qualified (Automotive series)

### Applications

- Automotive
- Consumer
- Home appliances
- Automation
- Lighting
- Industrial/Professional
- Renewable/Smart Energy

### See the Application Guide for More Details

[www.avx.com/docs/techinfo/ApplicationGuides/CircProtAppGuide.pdf](http://www.avx.com/docs/techinfo/ApplicationGuides/CircProtAppGuide.pdf)

## Trimpot® Potentiometers – Viable Components



Bourns® Trimpot® products are used in virtually every electronic market. With a 70-year history of trimming potentiometers and technology innovation, Bourns offers the industry's broadest lines of Trimpot® products. The Trimpot® Trimming Potentiometer is a variable resistor that is used in

a circuit to correct for variations in other circuit components or to adjust to customers' exact specifications. Trimmers can be used to adjust voltage or current in the circuit. Miniature Precision Trimmers are available, offering tighter linearity and lower CRV.

### Features & Benefits

- Cost-effective solution used to adjust variations in the electrical circuit
- Used as a voltage divider to adjust output voltage
- Used in rheostat mode to control current
- Available in multi-turn or single-turn models
- Available in sealed or open frame models
- Manufactured to withstand stringent processing environments
- Wide range of various models for all types of requirements

- Range of small footprint options with various sizes
- The only approved manufacturer of high-reliability military trimmers
- Manufactured in ISO and TS14000 factories

### Applications

- Automation systems
- Calibration equipment
- Measurement sensors
- Power modules
- RF amplifiers
- Industrial sensors
- Audio equipment
- Home and office automation systems
- Communication equipment
- Photo optical sensors
- Power supplies

### ORDERABLE PART NUMBERS

3005; 3006; 3009; 3057; 3059; 3082; 3214; 3223; 3224; 3250; 3252; 3260; 3262; 3266; 3269; 3290; 3292; 3296; 3299; 3312; 3313; 3314; 3329; 3339; 3345; 3360; 3361; 3362; 3386; PVG3; PVG5; PV12; PV32; PV37

## Wide Series of AEC-Q TVS Diodes from Bourns






### Features & Benefits

- Surface mount package
- Stand-off voltage: 12–58 volts
- RoHS compliant\*
- AEC-Q101 compliant\*\*

- Overvoltage transient protection
- Automotive
  - Entertainment applications
  - Comfort applications
- Telecom, computer, industrial and consumer electronics applications

### Applications

- Protection of power buses
- Protection of I/O interfaces

	 CDSOT23-T24CAN-Q	 CDSOD323-TxxxC-DSL-Q	 SMAJ-Q	 SMBJ-Q	 SMCJ-Q	 SMLJ-Q	 5.0SMDJ-Q
<b>Package Type</b>	SOT-23	SOD323	DO-214AC (SMA)	DO-214AA (SMB)	DO-214AB (SMC)	DO-214AB (SMC)	DO-214AB (SMC)
<b>Peak Pulse Power (Watt) (10/1000 µs)</b>	(320W 8/20µs)	(250W 8/20µs)	400	600	1500	3000	5000
<b>Peak Pulse Current (A) (10/1000 µs)</b>	(8 8/20 µs)	(11/6 8/20 µs)	20.1~4.3	30.2~6.5	75.4~16.1	150.6~32	252~72.1
<b>Stand-Off Voltage (V)</b>	24	12/24	12~58	12~58	12~58	12~58	12~43
<b>Breakdown Voltage (V)</b>	26.2	13.3/26.7	13.3~64.4	13.3~64.4	13.3~64.4	13.3~64.4	13.3~47.8

\* RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.  
 \*\* "Q" part number suffix indicates AEC-Q101 compliance.

## KONTAKT CHEMIE Air Dusters

As electronics are increasingly used in diverse fields, the KONTAKT CHEMIE product range meets the needs of:

- Technical cleaning
- Maintenance and quality assurance
- Reliable and long-lasting protection
- Special uses



### Air Dusters

A range of products made out of a high pressure, non-flammable, liquid gas blend that acts like compressed air. Available in a variety of sizes, all offering a jet of dry gas to remove dust and airborne contamination from very delicate or inaccessible areas of electrical and electronic equipment.

### Features & Benefits

- Blows away lint, oxide particles and dry contaminants
- Helps to eliminate failures caused by fluids (water, oil mist etc.) trapped in dust or dirt
- Essential for all cleaning operations where liquid solvents are inappropriate
- Moisture- and oil-free source, replacing laborious and expensive compressed air cleaning

- Quick and safe
- Harmless to plastics, coatings and delicate components
- Non-oxidising
- Leaves no residue or condensation
- Always at hand as part of any service kit

### Applications

To be used where it is difficult to remove dust using conventional methods, in industry and at home:

- Magnetic tape heads
- Precision instruments
- Printed circuit boards
- Laboratory equipment
- Miniature assemblies
- Watch mechanisms
- Optics and lenses
- Communication equipment
- Data processing equipment
- Cash dispensers
- Fiberglass cable connections
- Medical instruments

### ORDERABLE PART NUMBERS

- 33162-DE Air Duster 360 200ml
- 33187-DE Air Duster 360 SUPER 200ml
- 33163-DE Air Duster 67 200ml
- 33167-DE Air Duster 67 400ml

## HellermannTyton

## HellermannTyton T-Series Cable Ties



HellermannTyton launched the first T-Series cable tie made from Polyamide 6.6 (PA66 or Nylon) 60 years ago. Today, the product range includes a wide variety of sizes, colours and additives to enhance the tie's properties. T-Series cable ties are available in dimensions ranging from as little as 2.3×83mm to 12.5×1030mm. These reliable allrounders for non-specialised indoor bundling applications deliver high strength and high abrasion resistance at temperatures ranging from -40 to +85°C.

PA66W cable ties are UV stabilised, making them ideal for outdoor use where sunlight and weathering quickly make standard ties go brittle.

PA66HS T-Series ties are heat stabilised. The plastic is modified to withstand operating temperatures of up to +105°C. It also delivers good chemical resistance.

For applications with higher continuous temperatures of up to +130°C, T-Series ties made from polyamide 4.6 (PA46) are available. To protect sensitive wire sheaths from damage when they are bundled, HellermannTyton also manufactures T-Series cable ties in an outside-serrated version, where the smooth side of the band faces inwards.

### ORDERABLE PART NUMBERS

#### PA66 Weather-resistant

- 111-01960 Article: T18R-PA66W-BK
- 111-03570 Article: T30LL-PA66W-BK

#### PA66 Heat-stabilised

- 111-01950 Article: T18R-PA66HS-BK
- 111-03459 Article: T30L-PA66HS-NA

#### PA46

- 111-00526 Article: T50L-PA46-NA
- 111-00969 Article: T50R-PA46-BK

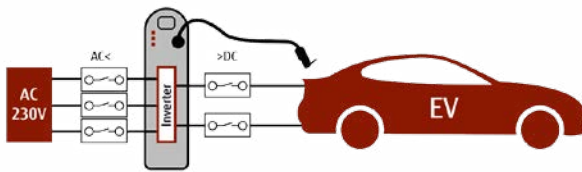


## Fujitsu Components – New Relay Solutions for the EV Charging Market, Best Fit-for-Purpose

Following the growing number of electric vehicles on the road, an increase in number of installations of EV loading stations is rapidly changing the green energy landscape.

Fujitsu is proud to contribute to the transition of the mobility industry to more sustainable energy sources by offering a series of specialized relays, such as:

- High-current AC relays of up to 120A
- Signal relays with high dielectric strength
- DC relays of up to 30A/450VDC



Power relays are the designated solution to galvanically cut off the circuit from the power supply in the event of abnormalities in the power grid.

Fujitsu offers a number of relays dedicated to this task, such as the FTR-K1 (16A), FTR-K3 (32A), FTR-K4 (120A) and FTR-K5 (32A, sealed) series.

The Fujitsu FTR-E1 (450VDC, 30A) relay is the safe choice for a secure cut off on the DC side, in case of a defect or malfunction of the battery system.

Fujitsu, your reliable partner for safe switching solutions for more than 100 years. Please contact Fujitsu Components Europe B.V. for more information.

For a complete overview of our relay solutions, please go to [www.fujitsu.com/uk/products/devices/components/relays/](http://www.fujitsu.com/uk/products/devices/components/relays/)

### ORDERABLE PART NUMBERS

- FTR-E1
- FTR-K1
- FTR-K3
- FTR-K4
- FTR-K5

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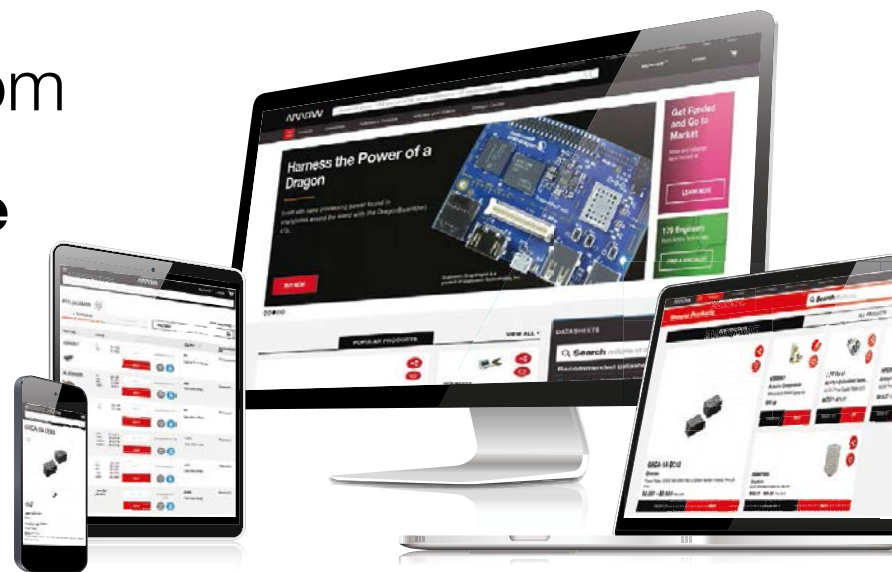
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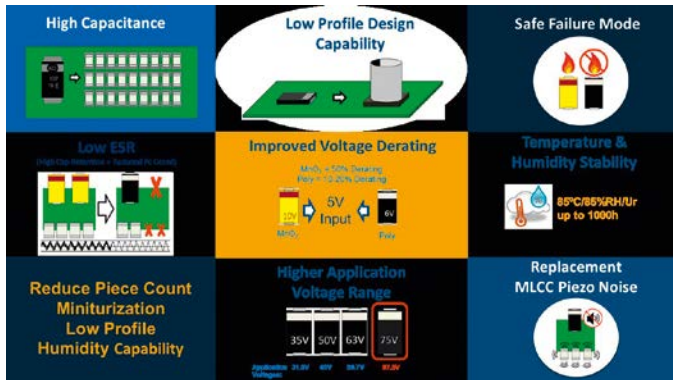


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## Polymer Capacitors – Your Solution When MLCC Lead Times Are Tight



Over and over again the question comes up, “How long is the MLCC shortage going to continue?” The general consensus in the industry is that this will continue through 2020. In the meantime, KEMET’s KO-CAP polymer electrolytic capacitors are available to offer some relief. There are several design considerations that must be taken into account when determining to make the switch.

### The Benefits of Polymer

KO-CAP is a tantalum-based polymer electrolytic capacitor. Like traditional tantalum capacitors, KO-CAP has an anode that is a sintered slug of tantalum powder with an oxide dielectric. That’s where the similarities end. The cathode is a conductive polymer. This conductive polymer material has much lower resistivity than manganese dioxide, which is what is used in legacy tantalum capacitors.

### Features & Benefits

- High volumetric efficiency
- Low ESR
- Stable frequency response
- Stable temperature profile
- Stable across voltage
- No piezoelectric noise

When caught up in an MLCC supply shortage, making the switch over to KO-CAP is not trivial. A switch is only possible when the parameters of KO-CAP intersect with the design requirements.

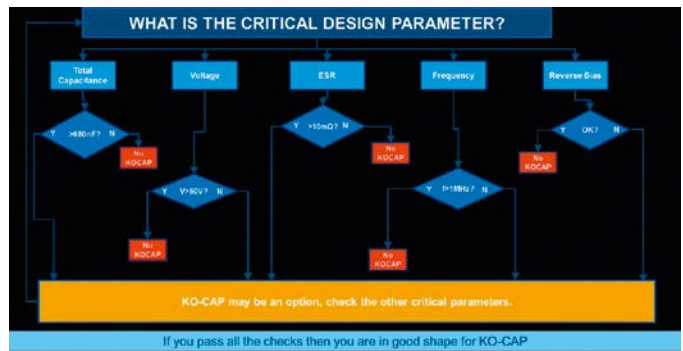
### Making the Change

There are several factors that must be considered when making the switch over to KO-CAP.

Total capacitance: Must be greater than 680 nF for KO-CAP to be considered

- Voltage: Must be less than 50V
- ESR: 4 to 8 milliohms are the lowest
- Frequency: Best suited for switching frequencies less than 1 MHz
- Reverse bias: Must not see reverse bias voltage

If all of these factors are suitable for the design conditions, then migrating to KO-CAP is an option.



### The Value Proposition

It may seem like a challenging design change to go from MLCC to polymer, but in the cases where a bank of MLCCs is replaced with one KO-CAP, it becomes a compelling change. Sometimes MLCCs are the only option, but when the design requirements allow for it, switching to KO-CAP may well be worth the design change. These benefits include:

- Reduced BOM count
- Lower total capacitance cost
- Reduced board area
- Electrical stability

In addition to these benefits, the tantalum supply chain is currently stable and KEMET is adding more capacity. When there are no other MLCC options available, consider KO-CAP and perhaps find some relief in this MLCC capacity crunch.

### ORDERABLE PART NUMBER

T5xx (KO-CAP)

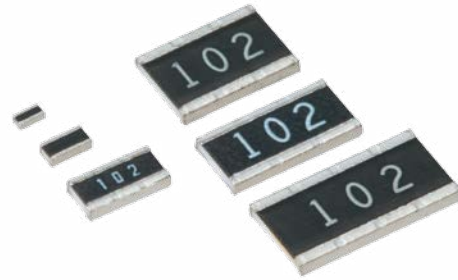
## Automotive-Grade Wide Terminal Thick Film Resistors – WK73/WU73 Series

High reliability and enhanced terminal strength are essential in all power applications. KOA's WK73/WU73-series has a 90° rotated design and this offers several advantages compared to standard resistor footprints.

For example, the power rating of the 0612 size is three times higher than that of the 1206. This saves board space and is possible due to the improved heat dissipation via the solder joints. The higher terminal strength is due to the bigger soldering area. The smaller distance between the terminals results in less expansion stress to the solder joints. Finally, the inner resistance pattern is designed to minimize hotspots. All the above mentioned benefits combined result in superior reliability, compared to standard flat chip resistors.

### Features & Benefits

- Excellent heat dissipation characteristics
- Superior temperature and power cycling performance
- Low thermal expansion stress
- Higher rated power – less board space than standard chips
- Standard sizes 0204, 0306, 0508, 0612, 1020, 1218 and 1225
- High component and equipment reliability
- Resistance range 10 mΩ...1 MΩ
- Resistance tolerances  $\pm 0.5\%$ ,  $\pm 1\%$ ,  $\pm 5\%$
- Operating temperatures of up to +155 °C
- AEC-Q200 qualified
- Anti-sulfuration type also available



### Application Examples

- Automotive electronics e.g. ECU for engine bay
- Power supplies
- Motor control units
- Industrial power control
- Battery packs
- Consumer electronics
- etc.

### ORDERABLE PART NUMBERS

- WK73 R: 10 Ω...1 MΩ, 0402...1225
- WK73 S: 10 mΩ...9.76 Ω, 0508...1225
- WG73: Pulse withstanding, 560 mΩ...1 kΩ, 1020
- WU73: Improved T.C.R., 10 mΩ...100 mΩ, 0612
- WK73 R/S\_RT: Anti-sulfuration, 1 Ω...1 MΩ, 0508...1225

## Automotive-Grade Anti Surge/Pulse Thick Film Resistors – SG73 Series

The KOA SG73-family offers several chip resistor solutions with high surge/pulse withstanding characteristics.

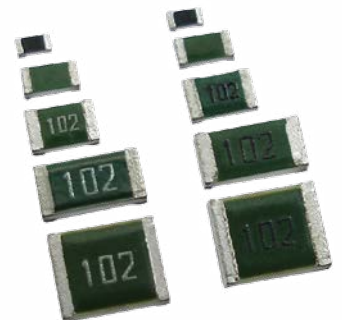
The new SG73G-series has a T.C.R. of  $\pm 50$  ppm/K as well as a tolerance of  $\pm 0.25\%$ , so it is ideal for precision designs such as high-accuracy sensing or voltage detection circuits in automotive and industrial applications. The special inner construction offers outstanding pulse load capability and higher rated power.

### Features & Benefits

- Outstanding pulse performance
- Excellent in ESD characteristics (SG73, SG73S)
- High component and equipment reliability
- Available in sizes 0402...2512
- Resistance range 1 Ω...10 MΩ
- Resistance tolerances of up to  $\pm 0.25\%$
- Operating temperatures of up to +155 °C
- AEC-Q200 qualified
- Anti-sulfuration type also available

### Application Examples

- Automotive electronics e.g. ECU for engine bay
- Power supplies
- Industrial electronics
- Measuring instruments
- Motor control units
- Smart meter
- Power conditioner/inverter
- White goods
- etc.



### ORDERABLE PART NUMBERS

- SG73: Pulse & surge withstanding,  $\pm 10\%$ ,  $\pm 20\%$ , 0603...2512
- SG73 P: Pulse withstanding,  $\pm 0.5\%$ ... $\pm 5\%$ , 0402...1210
- SG73 S: Surge withstanding,  $\pm 0.5\%$ ... $\pm 5\%$ , 0402...1210
- SG73 P/S\_RT: Anti-sulfuration, 1 Ω...10 MΩ, 0402...2512
- SG73 G: High precision & pulse withstanding,  $\pm 0.25\%$ ,  $\pm 0.5\%$ , 0603, 0805, 1206, T.C.R.  $\pm 50$  ppm/K

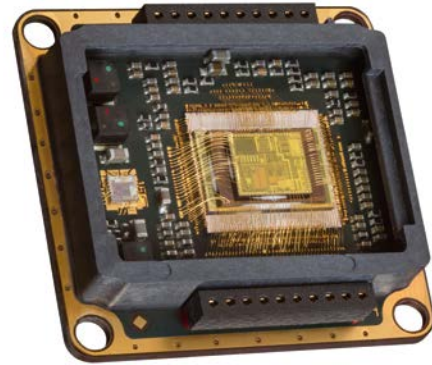
## ISI, a Molex Company: Integrated Solutions – Endless Possibilities

As of April 2016, the ISI Group is now a part of the Molex family. This new relationship has opened new avenues of innovated technology solutions that were not previously possible. The ISI Group teamed with Molex are now capable of integrated solutions at any volume, market, or location on the planet.

Specializing in microelectronics design and manufacturing, ISI engages directly with customers from the point of product concept to best understand their unique system challenges. They can design and deliver a miniaturized electronic solution utilizing ISI's high density advanced packaging, interconnect and systems capabilities. In addition to microelectronics, ISI Group has leading products in the area of FPGA accelerated computing, signal processing, and data acquisition.

ISI's capabilities include design concept through to the manufactured product, including system level engineering, mechanical and physical packaging, and next level integration. ISI solutions are used in a broad range of applications, such as medical, industrial IoT, transportation, communications, wearables, home automation and military.

Contact your Molex representative for further information.



## End-to-End Optical Infrastructure for Next-Gen Networks

Oplink, a Molex company, offers integrated design and manufacturing solutions to global leading and emerging network equipment makers. As a leading provider of optical communication components, intelligent modules and subsystems, Oplink serves multiple markets, from metro and long-haul transport, to data center networking and cable TV. Having produced some of the highest performing, field-proven optical components in the market today, Oplink offers the distinctive, highly skilled optics expertise that differentiates them from other providers, together with a strong capability in mechanical design.

In addition to custom capabilities, Oplink offers a wide variety of SFP+ products for applications including Wireless, Datacenter, Datacom, Telecom and more. SFP+ products are compliant to Ethernet, SONET, CPRI, and Fiber Channel standards, supporting distances from 220m to 80 km, over multimode fiber for short distance and single mode fiber for long distance. Oplink also offer transceivers with Coarse Wavelength Division Multiplexing (CWDM) and Dense Wavelength Division Multiplexing (DWDM) technology enabling higher bandwidth fiber capacity. These products are designed with Digital Diagnostic Monitoring (DDM) functions supporting temperature range options from -5 to +70 °C, -5 to +85 °C or -40 to +85 °C.



### ORDERABLE PART NUMBER

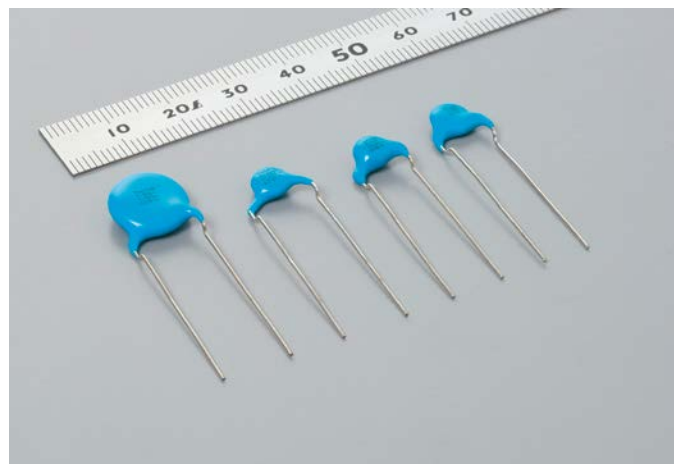
- TPP5XGFLRC000E2A

## X1 Capacitor Rated at 760 VAC for High Voltage Industrial Applications

Murata introduced the DE1 Type RB series of X1 class leaded ceramic safety capacitors. Suitable for use in high voltage industrial applications, such as 3-phase power supplies or inverters driving 3-phase motors, the series is rated at 760 VAC (RMS) for X1 class use. The DE1 complies with the internationally recognized standards IEC 60384-14, UL0384-14 and EN60384-14 for X1/Y1 class capacitors used in EMI suppression circuits. With its compact dimensions, the capacitor also helps reduce the overall space requirements of the application. It is also rated with a high maximum operating temperature of 125°C, permitting it to be placed close to the source of the electromagnetic noise.

The DE1 series can also be used as a Y1 class capacitor to connect an AC power line with the ground, for which it is rated at 500VAC (RMS).

Available in standard values from 10 to 4,700 pF, the DE1 series has value-dependent dimensions from 6.0 to 14.0 mm outer diameter.



Part Number	Capacitance	Lead spacing F	Lead diameter d	L size or Outer diameter D	T size	Temperature characteristics	Rated voltage	Notes
DE11XRB100KA4BR01F	10 pF	10.0 ±1.0 m	0.6 ±0.05 mm	8.0 mm max.	5.0 mm max.	SL (JIS)	500 Vac (r.m.s.)	X1:AC760V, Y1:AC500V Certified products, Halogen-free products
DE11XRB150KA4BR01F	15 pF			6.0 mm max.	6.0 mm max.	SL (JIS)		
DE11XRB220KA4BR01F	22 pF			6.0 mm max.	5.0 mm max.	SL (JIS)		
DE11XRB330KA4BR01F	33 pF			7.0 mm max.	5.0 mm max.	SL (JIS)		
DE11XRB470KA4BR01F	47 pF			8.0 mm max.	5.0 mm max.	SL (JIS)		
DE11XRB680KA4BR01F	68 pF			9.0 mm max.	5.0 mm max.	SL (JIS)		
DE1B3RB101KA4BR01F	100 pF			6.0 mm max.	5.0 mm max.	B (JIS)		
DE1B3RB151KA4BR01F	150 pF			8.0 mm max.	5.0 mm max.	B (JIS)		
DE1B3RB221KA4BR01F	220 pF			6.0 mm max.	6.0 mm max.	B (JIS)		
DE1B3RB331KA4BR01F	330 pF			7.0 mm max.	6.0 mm max.	B (JIS)		
DE1B3RB471KA4BR01F	470 pF			8.0 mm max.	6.0 mm max.	B (JIS)		
DE1B3RB681KA4BR01F	680 pF			9.0 mm max.	6.0 mm max.	B (JIS)		
DE1E3RB102MA4BR01F	1000 pF			8.0 mm max.	6.0 mm max.	E (JIS)		
DE1E3RB152MA4BR01F	1500 pF			9.0 mm max.	6.0 mm max.	E (JIS)		
DE1E3RB222MA4BR01F	2200 pF			11.0 mm max.	6.0 mm max.	E (JIS)		
DE1E3RB332MA4BR01F	3300 pF			13.0 mm max.	6.0 mm max.	E (JIS)		
DE1E3RB472MA4BR01F	4700 pF	14.0 mm max.	6.0 mm max.	E (JIS)				

## State-of-the-Art Lighting Control at Your Fingertips

### DALleco BT

DALleco BT is a Bluetooth®-enabled, universal and cost-efficient light management system for luminaire and ceiling integration. It is easy to install, simple to start up and convenient to operate. This system is the right solution for any space under 100 m<sup>2</sup>: offices or smaller conference rooms, entrance areas, washrooms, corridors in factories and warehouses.



### Features & Benefits

- Intuitive manual dimming, switching and changing of color temperature
- Simplified startup thanks to predefined operation modes
- Firmware update over-the-air via Bluetooth possible
- One DALI channel for controlling standard or tunable white LED drivers or any other DALI ECG, plug-and-play start-up and smartphone control
- Up to 32 LED drivers, 4 light and motion sensors, and an unlimited number of push buttons may be connected

- Creation of groups for scenes and sequences
- Control of white, Tunable White, RGB and RGBW LED modules
- Dry contacts for connection to any commercial push button
- Use of commercial push buttons and sensors

### CASAMBI – Compatible Bluetooth Dimmer

With the new LED dimmer OPTOPTRONIC BLE DIM, the LED module can be connected and paired with a smartphone or tablet. Combined with the new wireless Casambi control app, no extra cabling or gateway is required. This opens a wide range of possibilities which facilitate renovation projects such as in entertainment areas, restaurants, hotel rooms or retail areas.



Light is yours to command. Find out more about app control solutions on [www.osram.com/app-control-lighting-systems](http://www.osram.com/app-control-lighting-systems)

### ORDERABLE PART NUMBERS

- DALleco BT: 4052899988781
- OT BLE DIM: 4052899557833



sumida.com

## Innovation in Automation – PANTA® SMD 0.50 mm Pitch

A Surface Mount Device (SMD) is any device that is packaged in a way that allows the leads to be soldered directly onto the pads on the surface of a circuit board. This is in contrast to a through-hole (THT) device, where the leads are threaded through holes in the board and then soldered to pads on the opposite side of the circuit board. The PANTA® SMD in particular, with its new 0.50 mm pitch, is used as a high-density flexible board connection for use on circuit boards in sandwich configuration or for electronic connections to various assembly positions.



### Features & Benefits

- Subsequent bending of the PCB connection of up to 180°
- High flexibility and bending durability
- Economic alternative compared to e.g. milled and rigid-flexible PCB
- High temperature resistance
- Automatic assembly through the SMD pick & place process

- Total length: 15.2 mm
- Application: -40 to +125 °C
- Current rating: 1A @20 °C
- Package unity: 1.500 pcs. on tape & reel

PANTA® SMD generates a cost saving compared to other conventional connection methods by avoiding manual assembly and extra process steps in manufacturing. Technical assistance and comprehensive project management on request. [www.sumida-flexcon.com](http://www.sumida-flexcon.com)

### Characteristics

- Pitch: 0.5 mm
- Number of pins: 8 to 50
- Bridging length: 10.8 mm

### ORDERABLE PART NUMBER

e.g. SMD-22-050-K-083

## Panasonic HE-Y7 Power Relay – The Multi-Purpose Solution Suitable for Every High Power Application

The HE-Y7 relay is designed to combine the requirements of different markets in one switching solution. With small dimensions, it has been possible to efficiently switch loads up to 120A.

The printed HE-Y7 is able to handle loads up to 120A/277VAC in ambient temperatures up to 85°C. Panasonic managed to successfully integrate the 1 Form A contact into the extremely small dimensions of 40x50x43 mm (LxWxH). The new relay is designed to meet the combined requirements of different markets in one switching solution.

A galvanic separation of min. 3.6 mm guarantees high insulation resistance. Furthermore, the high dielectric strength protects against surge voltages. This fact, combined with rapid opening of the contacts, makes it possible to reliably handle high DC loads. At the same time, a mechanical life of min. 1 million operations assures a problem-free service life, while the low contact resistance (in the range of some mΩ) ensures extremely low power dissipation. The reduced operating power helps with energy savings and energy consumption. A further highlight of the new design is the parallel arrangement of the coil and load terminals. This simplifies the process of connecting current paths on the circuit board, and high isolation-distance requirements can be met without extra effort. The HE-Y7 relay, offered in a variety of DC coil voltages and certified by the UL & VDE, can thus be used to control many applications – at an optimized price/performance ratio.

Using the Panasonic HE-Y7 relay allows the customer to utilize the switching of a high power load on the PCB. It also helps save costs with regard to other electrically-controlled switches and associated expenses. In most cases, the control cabinet is no longer necessary. The advantages are obvious: no wiring, reduced installation expenses, small size, reduced thermal losses, flexibility, and one single working point: the Printed Circuit Board.

In many application areas, such as frequency inverters, solar inverters, and battery chargers, the switching function has already advanced to the next level.

Switching very high loads on the PCB with the HE-Y7 relay has become easier than ever before. The new Panasonic relay can be ordered from July 2018 onwards.



### Features & Benefits

- 1 Form A contact
- High switching capacity: 120A/277VAC
- Compact size: 40x50x43 mm (LxWxH)
- Min. 3.6 mm contact gap for reliable isolation
- Handles high DC loads
- Simplified current path guiding on the circuit board
- Optimized price/performance ratio

### Applications

- UPS/battery charger
- Elevator/escalator
- Photovoltaic
- Drives
- Water heating applications-Driver

### ORDERABLE PART NUMBERS

- AHE62X0N
- AHE62X5N
- AHE62X1N
- AHE62X2N

## Low-Loss and Precise Chip Fuses



**SCHURTER offers a broad range of high-quality chip fuses which were developed specially for low-loss and precise overcurrent protection in secondary circuitry. Six different types, available in chip dimensions from 0402 to 1206, offer compact and effective protection in the event of a fault.**

SCHURTER chip fuses are available in a number of different current ratings, from 50 mA to 25 A, at a rated voltage of up to 125 VAC/VDC. Depending on the version and voltage ratings, a breaking capacity of up to 600 A is reached. Thanks to these impressively high values and variety, these chip fuses can be used in a wide range of applications.

### Overcurrent Protection

The higher the current, the faster malfunctions can lead to fires. Suitable devices to protect against overcurrents must be installed in both PSEs (power sourcing equipment) and PDs (powered device). The simplest, most cost-effective and reliable solution for protection against overcurrent is a chip fuse. In addition, they take very little space. The USF 0603 from SCHURTER is the ideal fuse

for PoE applications. This thin-film fuse measures just 1.6 mm long, 0.8 mm wide and only 0.6 mm high. It offers overcurrent protection with super-quick-acting characteristics in a range of rated currents, from 500 mA to 5 A. It stands out due to a breaking capacity of 50 A at 32 V over the entire range of rated currents. Even today, such breaking capacity is unmatched in fuses of this size.

### Overcurrent Protection for Power over Ethernet

Transmitting both power and data over a single cable is an ingenious and simple idea – a “plug & play” solution. As the amount of current increases, so does the danger of fire. Thus it is essential to protect electronics from overcurrent. Just a few examples of devices tied into these networks include sensors, IP phones, card readers, remote-controlled webcams, point of sales (POS) terminals and small hubs and servers. Since the Ethernet standard was introduced, data rates have continually increased and today are reaching speeds up to 100 gigabits per second.

### Certification

All chip fuses come with cURus certification. The USI 1206 is also VDE-approved, the only chip fuse with this type of certification available. As halogen-free and RoHS-conform fuses, SCHURTER chip fuses can moreover be used for lead-free soldering processes.

### Precise Opening Times

SCHURTER chip fuses set themselves apart from comparable products through their extremely precise opening times and minimal power dissipation. In addition, their solid construction makes them especially resistant to vibrations and pulse loads.

### Features and Benefits

- Numerous current ratings, from 50 mA to 25 A
- High rated voltages of up to 125 VAC/VDC
- High breaking capacity of up to 600 A (internal tests)
- Super-Quick-Acting (FF), Quick-Acting (F) and Time-Lag (T) versions
- Precise, low-loss, resistant to vibrations and pulses

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### ORDERABLE SERIES

- 3412 and 3413



## LUMAWISE Endurance N Enhanced Base

TE Connectivity's (TE) LUMAWISE Endurance N enhanced base creates a platform for the rapid development and manufacture of NEMA/ANSI street-and outdoor lighting control solutions. The enhanced base takes TE's LUMAWISE light controller base assembly to the next level of performance. By providing AC power switching and DC power supplies necessary for complex control node solutions, it allows designers more time to focus on value-adding features. The enhanced base presents organized DC power and signaling interfaces to the designer and incorporates a mechanical architecture which supports design re-use and modularity across lighting control products. Using the enhanced base as a product platform de-risks project schedules, cost of design changes, and reduces opportunity costs by enabling more value-adding innovation. It also streamlines supply chains, all to drive benefit of the bottom line.

### Features & Benefits

- Enable cost-effective design re-use through organized DC power and signaling interfaces
- Help reduce supply chain expenses with new project opportunities, lower certification and engineering
- De-risk project schedules and cost of design changes
- Improve manufacturability and further innovation focus



### Applications

- Street & roadway lighting control
- Commercial & campus outdoor lighting management
- Smart cities control networks
- Smart grid to smart cities bridging

### ORDERABLE PART NUMBERS

- GPL K24 (2-2314786-1
- 2-2314786-2
- 2-2314786-3
- 2-2314786-4)

## Potter & Brumfield Relay T9G Series

TE Connectivity's (TE) Potter & Brumfield relay T9G series is a 30A power PCB relay for HVAC, appliance and industrial control applications. The T9G relay is the smallest relay in its class with a 30% smaller package size and 13% less PCB floor space, all while keeping the standard footprint, allowing manufacturers to add more components on PCBs without compromising the relay's performance. By having both UL and VDE certifications, this versatile relay's PCB and quick connect terminations provide a globally-applicable solution that is user-friendly and easy to install.

### Features & Benefits

- Save PCB space with the smallest relay in its class while maintaining standard footprint
- Achieve a globally-applicable relay solution with UL and VDE certifications
- Help provide operator safety through increased insulation (UL 61810-1)
- Increase relay performance through 4 kV dielectric rating/8 kV surge voltage between coil and contacts



### Applications

- HVAC
- Appliances
- Industrial controls
- Energy management

### ORDERABLE PART NUMBER

- GPL Z26

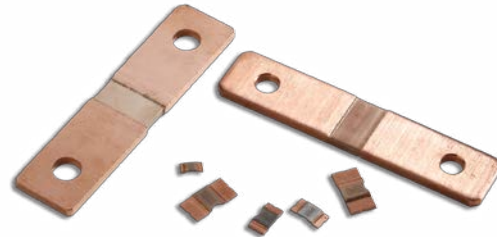
## Automotive-Grade Current Sensing Shunt Resistors – PU Series

Yageo's PU series shunt resistor is a perfect solution for applications which require high precision and high power current sensing components. An E-beam welding process is introduced to combine the central metal alloy and copper (Cu) together at the terminations. The central open-air design is the key to achieving excellent heat dissipation.

The PU series features resistance from 0.2 to 5 mΩ, with high power (10W), high precision (1%), a low temperature coefficient of resistance (TCR 75 ppm/°C), low thermal EMF, excellent heat dissipation and a capability to sense minimal current. The Yageo PU series offers high performance, a wide range of sizes (2512, 3921, 5931), and versatility, and it fully meets the requirements of customers in different applications. New form factors of sensing hole, size 8420, 8518 with max. power rating of up to 36W, resistance down to 0.05 mΩ.

### Features & Benefits

- AEC-Q200 qualified
- Low resistance value (down to 0.05 mΩ)
- High power (3–36W) and high stability
- Withstand high temperature and humidity
- Excellent heat dissipation
- Low thermal EMF, low TCR



### Applications

- Power systems
- Automotive
- Telecom base stations
- Industrial equipment
- Alternative energy

### ORDERABLE PART NUMBERS

- PU3921
- PU5931

## Thick Film, Automotive-Grade Anti-Surge Chip Resistor – SR Series

Yageo's automotive grade, thick film, anti-surge chip resistor – SR series offers case sizes from 0402 to 2512, resistance range of 1~100KΩ, tolerance down to ±0.5% and TCR of ±200 ppm/°C, with a power rating of 1/16 W-1 W. Excellent anti-pulse/surge capability, perfect solution for high power requirement, protection of electronic circuits against extreme pulses and surges.

### Features & Benefits

- AEC-Q200 qualified
- Withstand high pulse power for short duration
- Triple/quadruple rated power available in SR0402~SR1206

### Applications

- Automotive electronics
- Telecommunications
- Power supplies



### ORDERABLE PART NUMBERS

- SR0402
- SR0603
- SR0805
- SR1206
- SR1210



### POWER OPTIMIZED 119fs FOR THE FASTEST DATA LINKS

The AX7 ClearClock™ XO for next generation networking and RF applications leads the industry in low power consumption while maintaining typical jitter of 0.119ps ideal for clocking serial data links beyond 56Gbps.



**AX7**  
ClearClock™  
7.0 x 5.0 x 1.8 mm

#### APPLICATIONS

- RF Systems
- High Speed SERDES up to 56Gbps
- High Performance Computing (HPC)
- Network Processors
- PCI Express
- BTS / Basestations
- Test and Measurement
- FPGA / Processors
- 100 / 400Gb Ethernet
- Server, Storage, Fibre Channel Networking and Communications
- Backplane / Chip to Chip Buses

#### FEATURES

- 119fs typ jitter (150fs MAX f>200MHz)
- Widest frequency in its class from 50 to 2100MHz
- Lowest in-class power consumption 70mA MAX IDD (LVDS)
- Industry Standard 5.0 x 7.0 mm Footprint
- Supports LVPECL, LVDS, CML, HCSL

## ANTENNAS ENGINEERED FOR THE IoT

### THE RIGHT ANTENNA MAKES ALL THE DIFFERENCE CONNECTIVITY SOLUTIONS FOR AN IOT FUTURE.

Abraccon's wide range of high performance antennas are designed for connectivity in the IoT. Contact an Abraccon representative today to get connected to the future.

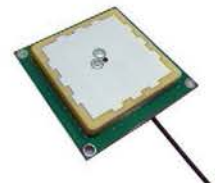


#### APPLICATIONS

- Industrial & Home Automation
- Wearables & IoT
- VR/AR
- Set-Top Box
- LPWA/LoRa/Sigfox
- Automotive Navigation
- Tracking Systems
- RTLS



**ACAG0301-24505500-T**  
Dual-Band WiFi, Bluetooth, ISM  
Chip Antenna  
3.2 x 1.6 x 1.2 mm



**ARRKP5062-S915B**  
RFID Patch Antenna  
50.0 x 50.0 x 6.2 mm



**AEACA0190012-S815**  
ISM, LPWA External Antenna  
190.0 x Ø12.9 mm



**AEACCA115021-S688**  
4G/LTE External Antenna  
115.6 x 21.7 x 5.8 mm

TO LEARN MORE, VISIT [ABRACON.COM/Q2NPI](http://ABRACON.COM/Q2NPI)

# Are You Five Years Out?

Most people live in the present. The world of now. But a handful of us work in a unique world that doesn't quite exist yet—the world of Five Years Out.

Five Years Out is the tangible future. And the people who live and work there know that new technologies, new materials, new ideas and new electronics will make life not only different, but better. Not just cheaper, but smarter. Not just easier, but more inspired.

Five Years Out is an exciting place to be. So exciting that, once you've been there, it's hard to get excited about the present. Because we know what's coming is going to be so much better.

Five Years Out is a community of builders, designers, engineers and imaginers who navigate the path between possibility and practicality. Creating the future of everything from cars to coffeemakers.

Are you one of them? Then you're probably working with us.



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