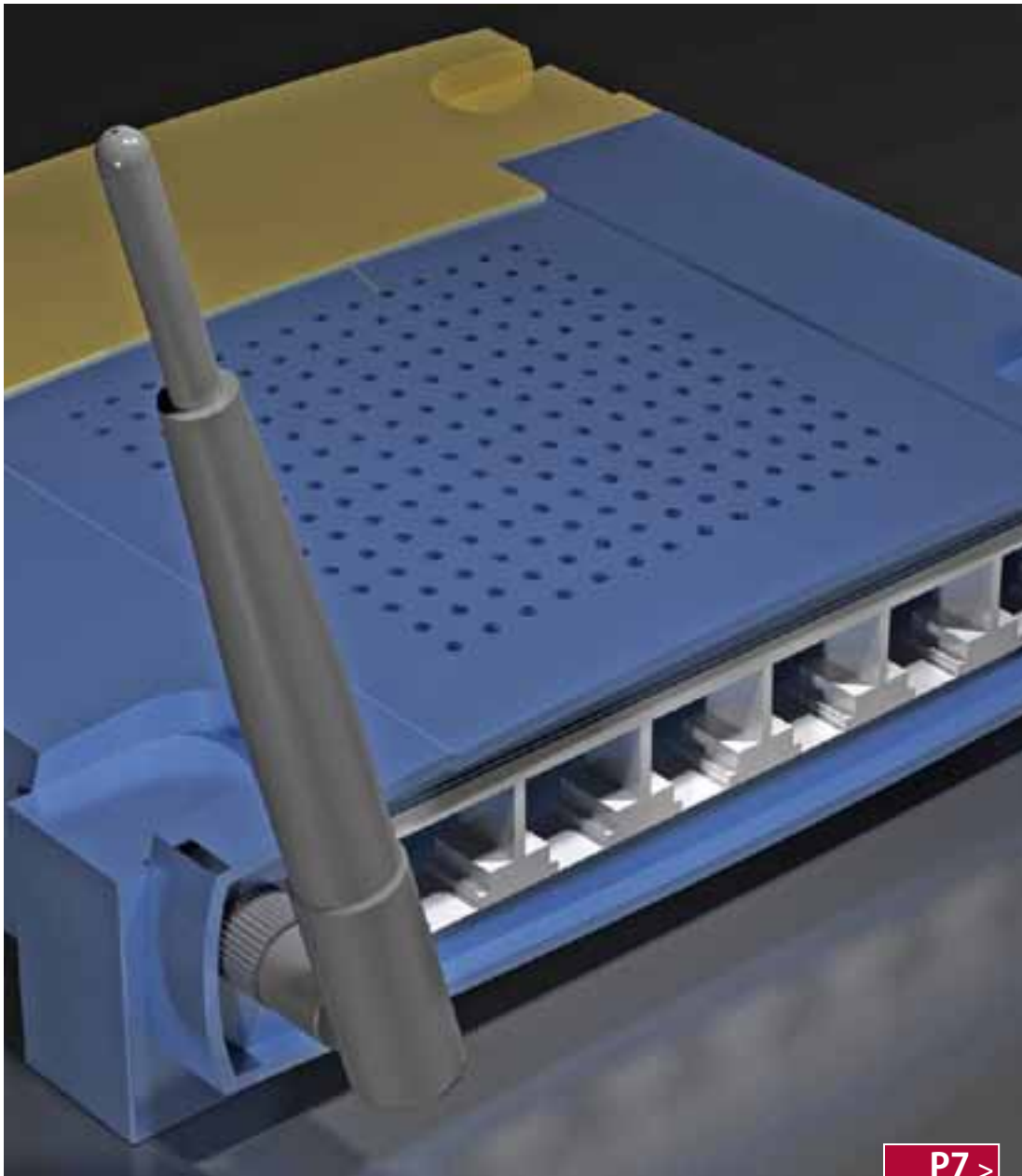


## LAN modules with low insertion loss



P7 >

Specifically for LAN applications, EPCOS has developed magnetic modules for both electrical isolation and suppression of common-mode and differential-mode interference

ISSUE TWO - AUTUMN 2009

### Inside...



P2 >

New trends in electromechanical relays from Tyco Electronics



P4 >

Sensing a Change - Felix Corbett



P8 >

High-Power Thick Film Resistors from Vishay



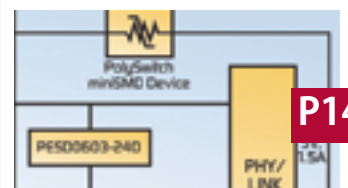
P9 >

MycroCrystal clock - world's lowest current drain



P11 >

The Molex Mini-Fit H20™ - sealed connector



P14 >

Circuit protection devices from Tyco Electronics

# New trends in the application of electromechanical relays

## INTRODUCTION

Electromechanical relays are innovative and reliable components; they offer robust, long-lasting and economical solutions to highly topical and volatile questions related to emissions reduction and motor-vehicle fuel consumption. The expanded network relay program addresses the new demands in automation applications as well as the subject of energy cost savings for industry and in the household. Signal and telecom relays are being applied in new areas, for example in order to completely shut off Ethernet ports, or are being used in medical electronics as measuring point change over switches. Signal relays from Tyco Electronics with high voltage stability are being used in automotive electronics for new functions in hybrid vehicles.

## NEW AREAS OF APPLICATION FOR AUTOMOTIVE RELAYS

In the area of automotive relays, growth is being driven partly by the ever-increasing upgrade of vehicle equipment. However, the rising needs are based primarily on new fields of application resulting from ever-increasing demands for vehicle safety, fuel consumption reductions and vehicle comfort - all of which create new requirements for on-board power supply.

The increasing number of power-consuming components in the automobile requires more sophisticated energy management in the on-board power supply. This is unavoidable in order to guarantee adequate supply for the systems related to vehicle safety. In the event of voltage drops, specific load paths such as the additional plug-ins or the audio system are switched off. Tyco Electronics has developed bistable printed circuit board relays specifically for such applications. Bistable relays are

Selection of automotive, general purpose and signal relays from Tyco Electronics



switched by a power impulse; however, they keep the relevant state of operation powerless. This functionality of the on-board power supply also enables the reduction of the closed-circuit current during vehicle stoppage by switching off stand-by functions. The goal here is to guarantee the starting of the motor after long-term stoppage.

A multitude of new applications requires the use of relays. The current automotive relays often represent the more cost-effective alternative to semiconductor switches, in particular for high switching currents.

## NEW MARKET TRENDS IN THE AREA OF GENERAL PURPOSE RELAYS

The steady increase in energy costs has lent new significance to the subject of "alternative energy." As a leading manufacturer of solar components, Tyco Electronics offers a comprehensive product palette of relays developed specifically for this purpose. First of all, there is the PCFN Solar, a new relay for application in inverters. This is a relay

with a higher switching capacity in a more compact design and with low power consumption. Additionally, Tyco Electronics offers a comprehensive product palette to the wind energy industry, for application in the control cabinet as well as in the diverse control of wind power facilities.

## NEW APPLICATIONS FOR THE AREA OF SIGNAL RELAYS

Electromechanical signal and telecom relays demonstrate significant advantages for cost-effective and reliable solutions compared to alternative switch principles in electronic circuits.

Signal and telecom relays are distinguished by:

- » compact designs combined with high switching capacities
- » a large load range from zero up to 60 W / 125 VA

- » high insulation properties between the load and control circuits as well as in the open load circuits
- » high overload capacity
- » excellent properties from DC up to high frequencies
- » and extremely high reliability in operation.

As a result of these amazing properties, they are constantly being used in new electronics applications, for example in the areas of:

- » Automotive Electronics
- » Optical Transmission Technology
- » Industrial Electronics
- » Measurement Technology
- » Medical Electronics
- » Network and Server Systems

Visit [www.avnet-abacus.eu/TycoElectronics/ElectromechanicalRelays](http://www.avnet-abacus.eu/TycoElectronics/ElectromechanicalRelays) to read the full article.

## Welcome

Welcome to Focus from Avnet Abacus. Our extensive portfolio enables us to provide our customers with an enviable range of products from world-leading suppliers combined with the extensive knowledge of our exceptional team of product specialists – read on to find out more.

For further information about any of the items featured in this issue, please contact your local office (see back page) or email us at [focus@avnet-abacus.eu](mailto:focus@avnet-abacus.eu).

With very best regards  
Graham McBeth  
President Avnet Abacus



## X-fest is back by popular demand!



Avnet Abacus, in association with Silica, will be attending X-fest 2009

From October 2009 through February 2010, X-fest events will be hosted in 37 locations throughout Asia, Europe, North America and Japan. X-fest is a global series of FREE technical seminars, offering practical, how-to training for designers interested in using the new Spartan®-6 and Virtex®-6 FPGA families from Xilinx.

These full-day events will showcase innovative design techniques, methodologies and implementations as well as reference designs from multiple manufacturers that can accelerate myriad applications from PCIe to video to wireless to embedded networking and more! Avnet Abacus will exhibit their range of IP&E products at these events. Don't miss this opportunity to learn how to maximize

next generation FPGAs and to improve your design capabilities.

To find out more or to register for the event, go to [www.em.avnet.com/xfest](http://www.em.avnet.com/xfest)



## Visit us at PEA-09

THE INDUSTRY'S BIGGEST MEETING PLACE FOR PROCESSING, ELECTRONICS AND AUTOMATION

Avnet Abacus – the new force in electronic component distribution – is pleased to announce that we will be showcasing our extended linecard at PEA-09. Focused on interconnect, passives, electromechanical and power supplies, Avnet Abacus has a clear vision of becoming number one

in the market.

PEA-09 is the largest trade event for everyone involved in automation and electronics on land and at sea in Norway. PEA provides the ideal opportunity to build relationships within the industry and has become the natural meeting place for establishing contacts and shar-

ing the latest trade news.

Visit [www.pea-messen.no](http://www.pea-messen.no) to find out more.



# Sensing a Change

Felix Corbett - Marketing Director Northern Europe, Avnet Abacus

**Climate change and security are not only occupying vast tracts of newsprint and endless twitters, but also driving fast growth in the sensor market. To minimise energy wastage, professional and consumer equipment of all kinds is being equipped with sensors to turn the system off or reduce output at times of low demand. Security systems use sensors to detect the presence of threats from people, explosives or other hazards.**

The result is that the potential global market for sensing and measurement technology is now in excess of \$100Bn, with products ranging from consumer and communications to automotive and industrial engineering. Whilst automotive has been the key driver in European growth over recent years, the ever increasing demand for automated measurement and control of industrial systems, means that the role of sensors in traditional electronics is becoming more and more significant. This opportunity has prompted market leading suppliers of passive and emech components to adapt their technology and / or make acquisitions to serve these requirements.

One of the most common sensor requirements is open – close detection, which is a feature of systems from building automation to clamshell mobiles through white goods. ALPS and Murata have come up with new and effective alternatives to traditional micro switches or hall-



effect switches, with the benefit of unlimited lifetime and multi-functionality. Murata anisotropic magnetic resistance (AMR) devices are ideal non-contact sensors. They offer the same sensitivity as a hall effect probe but can be used with thinner magnets and have a wider detection area giving greater flexibility in the location of the sensor vis-à-vis the magnet. Alps Electric recently announced what it claims is the industry's smallest magnetic sensor, the HGDFPA Series, a switching output-type magnetic

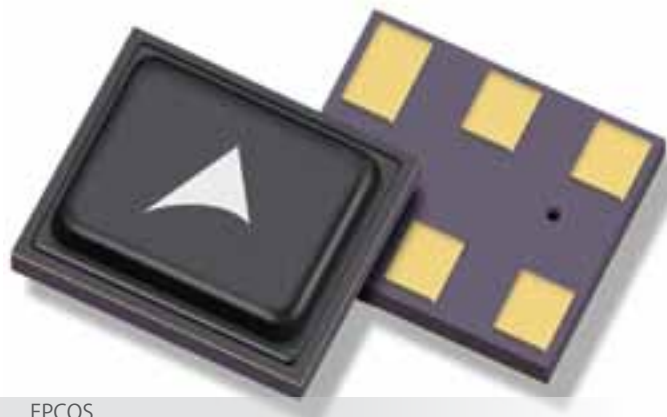
sensor in which the cable connections can be made by a connector.

EPCOS has been on the acquisition trail to add sensing technologies to its portfolio. In May, for example, it acquired part of Technitrol to get access to miniaturized MEMS microphones. If their acquisition of Aktiv Sensor two years ago is anything to go by, the partnership should be a fruitful one. EPCOS has released some fantastic miniature pressure sensors based on Aktiv Sensor MEMS technology offering a high

level of accuracy, ideal for medical and instrumentation applications as well as pneumatic systems. For example, the recently announced calibrated and temperature-compensated T5300 has dimensions of only 2.2 x 2.6 x 0.9 mm<sup>3</sup> and is the world's most compact packaged sensor of its kind, according to EPCOS. This benefits developers of navigation equipment and mobile phones, for example, who wish to accurately determine altitude above sea level with the aid of air pressure measurements. Together with a GPS-determined location, the altitude measurement permits precise 3D positioning.

On the security side, infra-red sensing is the core technology – with applications including proximity/ movement detection, flame detection and gas detection. Murata is pushing the boundaries here, and has announced a new series of ultra-compact SMD PIR sensors. These new devices offer the favourable sensitivity and stability characteristics of the TO-39 range, but occupy less than a third of the volume and just over half the board area.

NTC sensing offers an ideal solution for temperature measurement, and is a key component in many protection systems, particularly important in industrial control applications. To simplify the specification process, EPCOS offers an online tool that calculates the resistance/temperature characteristics of NTC Thermistors across its full range, and exports the results into Microsoft Excel.



EPCOS



ALPS

Its site also offers PSpice simulations of the temperature measurement and compensation characteristics of every device in its data book.

The user interface has traditionally been dominated by mechanical switches and keypads, but is also seeing major innovations in sensor technology. Although capacitive touch is the most common solution, the ITW Active Touch division is using an ultrasound based approach to deliver a durable touch-sensitive technology that is very suitable for demanding industrial and outdoor environments. C&K now offers a hybrid system called SensoNav, which utilises electromechanical technology in a sensepad package, ideal for multifunction touch panel controls. It has now released a 14-function navigation switch based on this technology, which combines sensitive touch and tactile functions while

guaranteeing an extended life span of 1 million actuations per direction.

The diversity of solutions to detect and measure heat, position, movement, light and touch has never been greater. It isn't possible to do justice to the wealth of new and adapted sensor products

being released onto the market in a short article. Distributors like Avnet Abacus have a team of specialists available to work with you on your current project. Contact us for a free evaluation and recommendations for solutions to address your current project challenge.



## New linecards now available...



visit  
[www.avnet-abacus.eu](http://www.avnet-abacus.eu)  
 to view or download  
 the linecard for your region

## ELECTROMECHANICAL

# Solar relays for a sunny future

Fujitsu Components endeavours to reduce the environmental impact of the products throughout the product lifecycle. Simultaneously Fujitsu designs its products for integration in environmental improving appliances. Fujitsu Components' product range contains power relays that are recommended to be used in solar energy systems.

Solar energy is produced by gathering sunlight and converting it into electricity. Supplying the generated electricity to the electricity network requires an interface between the solar converter and the power grid. The circuit break function between the converter and the power grid must have a contact gap of  $\geq 1.5\text{mm}$  (according to safety standard DIN VDE 0126-1-1).

Fujitsu Components offers three different relays that meet these requirements.

The FTR-K2G with a contact gap of 3mm is one of the (AC) relays within Fujitsu Components' power relay line-up that is suitable for integration in solar energy systems.

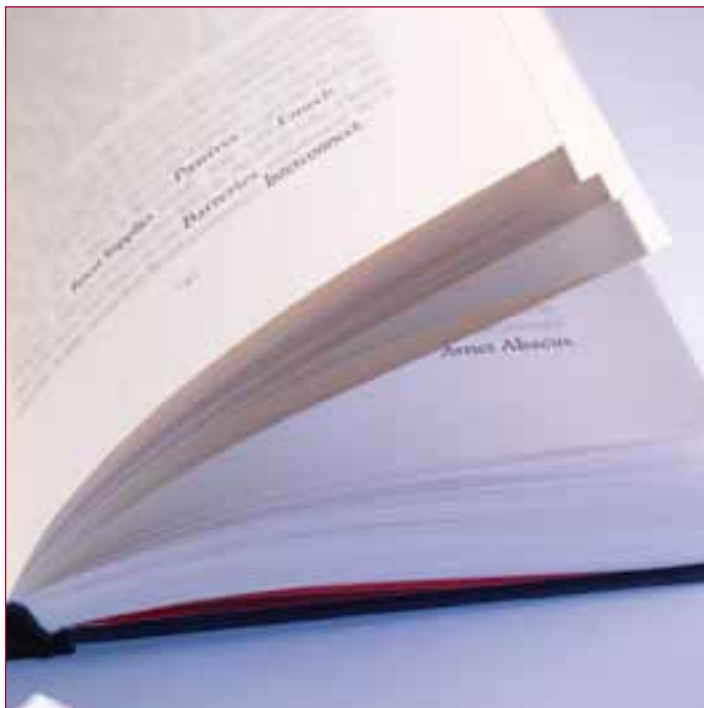
Fujitsu is also proud to introduce the newly



developed relays FTR-K3-WG and FTR-F4G. Both relays meet the safety requirements with a contact gap of 1.5mm.

The DC relays FTR-J2 and brand-new FTR-K2W are suitable to be integrated in the solar energy system to switch on/cut off the DC voltage generated by the solar panel.

For more information about Fujitsu solar relays visit [emea.fujitsu.com/components/](http://emea.fujitsu.com/components/).



## A new chapter in European distribution...

Focused on interconnect, passives, emech, power supplies and batteries, Avnet Abacus unifies the strengths of Avnet Time and the Abacus Group to create a new chapter in European distribution.



Emech • Interconnect • Passives • Power supplies • Batteries

## Kingbright

+49 2835 - 44 46-0

Kingbright Electronic Europe GmbH

## CERAMIC SMD-LED'S

- High current
- Dimensions 2.5 x 2.0mm, 3.2 x 2.8mm & 3.5 x 3.5mm
- Colours: red, green, yellow & blue
- High thermal conductivity
- Very low thermal resistance



**Quality - Efficiency - Innovation - First-class service**

Kingbright Electronic Europe GmbH  
 Lindenau 7 / Gewerbegebiet • D-47661 Issum  
 Phone +49 (28 35) 44 46-0 • Fax: +49 (28 35) 4

4 46-29

# LAN modules with low insertion loss

## SPECIALISED SOLUTIONS FOR IT

Specifically for LAN applications, EPCOS has developed magnetic modules for both electrical isolation and suppression of common-mode and differential-mode interference. The modules are available in single, dual and quad-port versions and are fully compliant to IEEE 802.3. All modules are qualified according to IPC/JEDEC J-STD-020C.

The insertion loss of the modules is up to -1.0 dB. Values of down to -16 dB and -40 dB are attained for return loss and crosstalk, respectively. In addition to the standard temperature range from 0 to +70 °C, versions with an extended temperature range from -40 to +85 °C were developed for industrial applications among others. Typical applications are 10/100 Base-T and 1000 Base-T, including Power over Ethernet functionality (PoE) e.g. in industrial network solutions (factory automation) or in private and business networks.

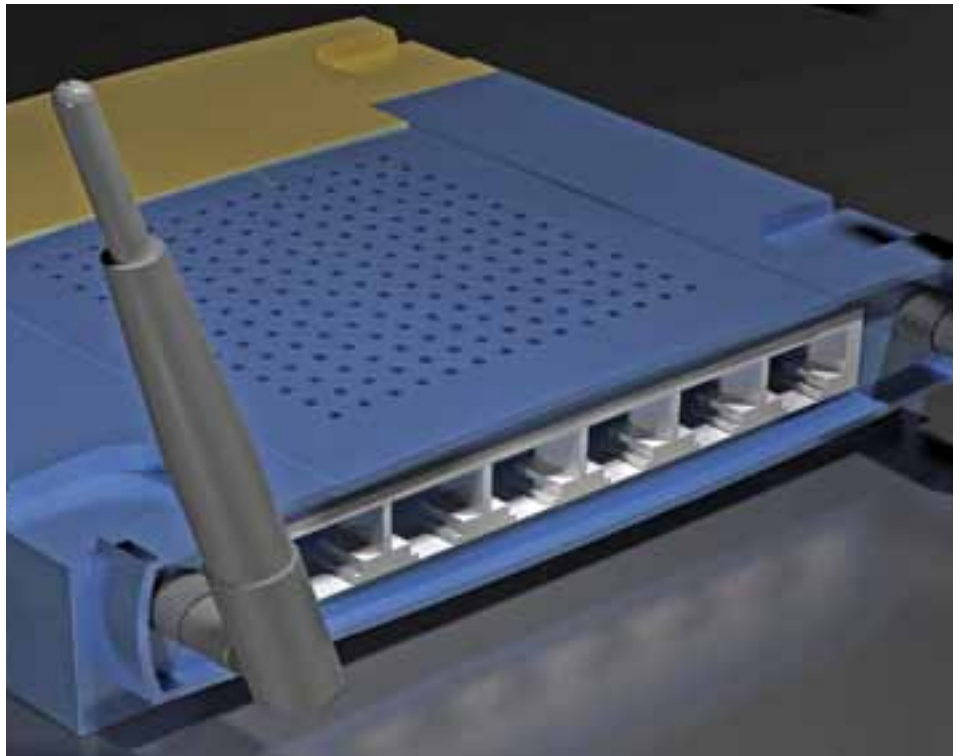
Ethernet Protocol is the common basis for data communication in LANs. The physical layer of the Ethernet is standardized in IEEE 802.3. Depending on the technology, different transmission speeds can be distinguished: 10 Base-T with 10 Mbit/s, 100 Base-T with 100 Mbit/s and 1000 Base-T with 1 Gbit/s transmission speed. IEEE 802.3af describes transmission of power via the Ethernet port. Voice over IP (VoIP) applications in which the phone is powered via the Ethernet connection use this technology, for example.

According to LAN standards the transceiver chip side (PHY) and the medium side (connecting cable) must be galvanically isolated. EPCOS magnetic modules provide minimum 1500 V dielectric isolation combined with excellent insertion and return loss as well as crosstalk and differential to common mode rejection.

Electrical characteristics and circuits are given in the detailed specification. Additional modules are available on request!

### APPLICATIONS

- » 10/100 Base-T
- » 1000 Base-T
- » Power over Ethernet



### FEATURES

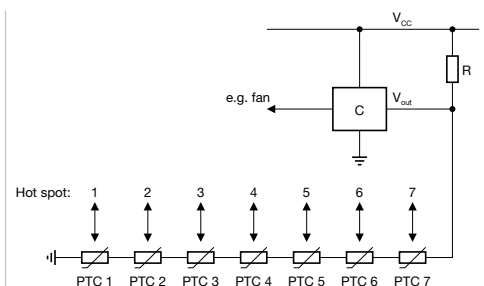
- » Single, Dual and Quad Port solutions
- » Standard temperature range from 0 to +70 °C
- » Extended temperature range from -40 to +85 °C
- » Fully compliant with IEEE 802.3
- » Fully compliant with IPC / JEDEC J-STD-020C
- » Optimized for all major transceiver ICs
- » Industry standard footprint
- » RoHS compatible

For part numbers and available types go to [www.epcos.com/lan\\_modules](http://www.epcos.com/lan_modules)

### KEEPING AN EYE ON HOT SPOTS

Thermal management is becoming increasingly important in IT as a result of miniaturization, rising power consumption and tougher requirements on reliability. At the same time the number of hot spots on boards and equipment is also growing.

With the B59601\* series EPCOS offers miniaturized size 0603 PTC thermistors for the monitoring of hot spots. At a specified sensor temperature, the resistance of these components rises rapidly. For example, the PTC with a specified sensor temperature of 95 °C ± 3 K (4.7 kΩ) has a resistance of over 40 kΩ at 105 °C. The exceptionally steep and rapid change in resistance with temperature allows several hot spots to be monitored with one simple circuit (see figure).



PTCs from EPCOS are available with sensor temperatures of between 75 °C and 135 °C in steps of 10 K.

### KEY DATA FOR 470 Ω TYPES

PART NUMBER	T SENSE (°C)	T TOLERANCE (± K)
B59601A0075A062	75	5
B59601A0085A062	85	5
B59601A0095A062	95	5
B59601A0095B062	95	3
B59601A0115A062	115	5

Data sheets are available under

[www.epcos.com/inf/55/db/PTC\\_09/Sensors\\_A401\\_A601\\_A602\\_A603\\_A604\\_A701.pdf](http://www.epcos.com/inf/55/db/PTC_09/Sensors_A401_A601_A602_A603_A604_A701.pdf)

For more types see [www.epcos.com/ptc](http://www.epcos.com/ptc)



# New WSLT2010...18 1-W surface-mount power Metal Strip<sup>®</sup> resistor

THE INDUSTRY'S FIRST TO OFFER TEMPERATURE RANGE OF -65 °C TO +275 °C

The device's high-temperature capability and high power ratings allow designers to use the WSLT2010...18 in harsh, high-temperature environments without sacrificing power rating or electrical performance. Manufactured using proprietary techniques, that result in extremely low resistance values, the WSLT2010...18 features all-welded construction with a solid metal nickel-chrome alloy resistive element with low TCR of < 20 PPM/°C.

## KEY APPLICATIONS

- » Current sensing and pulse applications, including linear power supplies, instruments, and power amplifiers in automotive engine and transmission controls, audio electronics, climate controls, and anti-lock brakes
- » Industrial oil/gas well drilling, including down hole test/measurement equipment

## KEY BENEFITS

- » Industry's first current sensing resistor in the 2010 case size to operate over a temperature range of -65 °C to +275 °C
- » 1-W power rating is double the standard WSL rating
- » Features a very low 10-mΩ to



- 500-mΩ resistance value range
- » Tight tolerance down to ±0.5 %
- » Low TCR values down to ±75 ppm/°C
- » Excellent frequency response to 50 MHz
- » Low thermal EMF of less than 3 μV/°C
- » The resistor offers low inductance values

# High-power thick film resistors

LPS 300, LPS 600, LPS 800 POWER RESISTOR FOR MOUNTING ONTO A HEATSINK

The high power dissipation and compact 57-mm by 60-mm footprint of Vishay's new LPS300, LPS600, and LPS800 thick film resistors allow designers to reduce the size of their end products by saving valuable space on the circuit board.

To view the data sheet go to <http://www.vishay.com/docs/49915/49915.pdf>

## KEY APPLICATIONS

- » Wind turbines
- » Inverters
- » Converters
- » Snubbers
- » Discharge resistors
- » Power supplies in trains and medical equipment
- » Scanner and X ray tables, and large UPS drives

## KEY BENEFITS

- » High power dissipation of 300 W, 600 W, and 800 W at + 85 °C
- » Provide a wide resistance range of 0.3 Ω to 900 kΩ
- » Non-inductive (< 0.1 μH)
- » High dielectric strength up to 12 kVRMS



- » Thermal resistance at rated power and + 85 °C is 0.112 °C/W junction-to-case
- » Feature a standard temperature coefficient of ± 150 ppm/°C for values above 10 Ω
- » Tolerances from ± 1 % to ± 10 %
- » Offer high-temperature performance to + 175 °C
- » Low weight 83g
- » Small size: 57 mm x 60 mm



For more information about resistors from Vishay visit [www.vishay.com](http://www.vishay.com)

# Precise real time clock has world's lowest current drain

For applications requiring ultra-low power consumption, Micro Crystal has introduced a SMD package real time clock (RTC) that typically draws just 130nA @ 3.0V. The RV-2123-C2 is ideal for compact portable devices, especially where a super capacitor is used for backup supply operation. Its ultra-wide 1.1V to 5.5V operating range provides added flexibility. Communications with other circuitry is simplified by an SPI-Bus® (SCL up to 8 MHz @ 5.0V).

The SON 10 pin ceramic package contains a built-in 32.768 kHz Tuning Fork crystal, matched with a CMOS-based oscillator and real-time-clock circuitry. At room temperature, frequency

and time keeping is within +/-10ppm or within +/- 20ppm @ 25°C. A user programmable Frequency Offset Compensation Register can be used to improve time accuracy. Aging rate is at a maximum of 3ppm for the first year.

The clock function tracks minutes and seconds either in 24-hour or in 12-hour AM/PM format. Programmable alarm setting and universal timer functions further increase flexibility. A calendar function provides year, month, date, and day-of-the-week, with built-in century and leap-year flags.

Moreover, the RV-2123-C2 offers open-drain Interrupt and programmable Clock Output for peripheral devices (32.768 kHz down to 1 Hz).

Because it is entirely self-contained, the RV-2123-C2 is a simple solution that can save engineering, procurement and inventory costs. External dimensions of the standard ceramic package are 5.0 x 3.2 x 1.2 max. mm. Like all Micro Crystal products, it is RoHS compliant and 100% lead free.

Micro Crystal's RV-2123-C2 Real Time Clock is available in production quantities, with 10 to 12 week delivery, in 10,000 piece lots, it is priced at under \$1.80 each.

Potential applications are widespread, including:

- » battery powered handheld devices
- » portable point of sales terminals
- » GPS
- » digital still cameras
- » glucose meters
- » security systems appliances
- » factory automation
- » programmable logic control and data loggers

SPI-Bus is a trademark of Motorola, Inc.

## ABOUT MICRO CRYSTAL AG:

Micro Crystal AG, Grenchen, Switzerland develops, manufactures and sells Crystal devices, Oscillators, OCXO and Real Time Clocks for the world wide market of the electronic industry. Micro Crystal employs about 1000 people worldwide, with large-volume production in China, Thailand and Switzerland. A network of offices in Europe, Asia, Japan and North America ensures tight relationship to global customers and strong technical support. Micro Crystal AG stands for reliable technology, commitment for quality and environmentally friendly production. [www.microcrystal.com](http://www.microcrystal.com)

## ABOUT SWATCH GROUP ELECTRONIC SYSTEMS

Micro Crystal is a member of the Swatch Group Electronics Systems (SGES). This group is formed by daughter companies of the Swatch Group active in the electronics field, in order to ensure synergy of development for customers' applications. [www.electronicssystemswatchgroup.com](http://www.electronicssystemswatchgroup.com)



**The World Leading Manufacturer of Ceramic Package Real Time Clocks with Embedded Crystal**

**Applications:** Digital Still Camera, Industrial Control, Dashboards, Navigation Systems, Automotive, Point of Sales Terminals, Metering, Data Logger, Health Care, Security Systems, White Goods

**Features:** World Smallest Temperature Compensated RTC, World No. 1 in Power Consumption, High Accuracy by Laser Trimming, Reliable Ceramic Package Technology, High Volume Production, Automotive Qualified and Extended Temperature Range up to 125°C

**SWISS MADE QUALITY**

Type	Interface	Supply Voltage	Power	Time Accuracy	Dimension	Feature
RV-8564-C2	PC	1.2 to 5.5V	250nA	± 20ppm @ 25°C	5.0x3.2x1.2mm	Low Power, Ext. Temp. Range
RV-2123-C2	SPI	1.1 to 5.5V	130nA	± 20ppm @ 25°C	5.0x3.2x1.2mm	World No.1 Lowest Power Consumption
RV-3029-C2	PC	1.3 to 5.5V	850nA	± 3ppm @ 25°C	5.0x3.2x1.2mm	Digital Temp. Compensation, Ext. Temp. Range
RV-3049-C2	SPI	1.3 to 5.5V	850nA	± 3ppm @ 25°C	5.0x3.2x1.2mm	Digital Temp. Compensation, Ext. Temp. Range



Micro Crystal AG  
 Muehlestrasse 14 CH-2540 Grenchen Switzerland  
 Phone +41 32 655 82 82 Fax +41 32 655 82 83  
[sales@microcrystal.com](mailto:sales@microcrystal.com) [www.microcrystal.com](http://www.microcrystal.com)

A COMPANY OF THE SWATCH GROUP

# New from Amphenol TMM Connector Series

Amphenol InfoCom Europe is pleased to announce the Amphenol TMM 1,27mm (staggered) contact spacing connectors. The new connectors meet a wide variety of needs in Telecom and Industrial equipment.

Designed for board to board and wire to board interconnections offering a large number of positions, the TMM connectors are available in even number positions from 4 to 26, with fully tinned contacts.

Additional features include a Polarization guide on male connectors to ensure the right orientation, kinked contacts on connectors – intended to provide significant connector retention on PCB during

soldering operations – and locking latches are available on female connectors.

Amphenol's commercial products are used in a variety of end user applications including networking, telecom, server & computer, storage & HDD, consumer electronics and entertainment, professional audio & Industrial.

For full details including application, electrical, mechanical and environmental data plus ordering information, visit [www.avnet-abacus.eu/Amphenol/TMMConnectors](http://www.avnet-abacus.eu/Amphenol/TMMConnectors).

## Amphenol



PAYMENT • DIGITAL TACHOGRAPH • SET TOP BOX • RFID • METERING

## Amphenol Card Connector Solutions

Amphenol provides superior card connector solutions for all kinds of applications

### PCB Slimline



- C702 10M008 252 40**
- Extremely compact
  - Protected switch
  - 100,000 mating cycles
  - Reflow compliant

### Low Profile Pushmatic®



- C702 10M008 925 4**
- According to Automotive requirements
  - Ejection over solenoid
  - Integrated dust protection
  - Closed System

### Hybrid Pushmatic®



- C703 10M008 607 5**
- For chip and magnetic stripe
  - Card locking in active position
  - Card presence and locking switch

### Wiping XXS



- C702 10M008 230 40**
- PCB mounting, dip solder pins
  - Self cleaning card presence switch
  - Normally open or normally closed switch

Amphenol-Tuchel Electronics GmbH

t: +49 7131 929 0 e: [info@amphenol.de](mailto:info@amphenol.de)  
[www.smart-card-connector.info](http://www.smart-card-connector.info)

## Amphenol

# Molex Introduces the Mini-Fit H2O™ Sealed Mid-Range Power Connector

**Pre-installed seals provide a tight, weatherproof connection and reduce assembly time.**

The new Mini-Fit H2O™ weatherproof and compact connection system from Molex is designed for wire-to-wire applications of up to 9.0A per circuit. It is IP67-rated, which ensures connector integrity even when submersed in one meter of water for a period of up to 30 minutes. The product family consists of 2-circuit plug and receptacle assemblies with integrated seals and male and female crimp terminals.

The plug and receptacle assemblies are equipped with pre-installed interface and wire seals, providing customers with a superior water- and dust-tight connection while significantly reducing installer assembly time.

"Molex continues to be a leader in the connector marketplace by developing products that not only excel in challenging conditions but save customers time and money," said Tom Orton, product manager, Molex Incorporated. "The Mini-Fit H2O family's pre-installed seals provide a superior water- and dust-tight connection and significantly reduce installer assembly time."

The compact size of the Mini-Fit H2O family makes it the preferred choice for tight-space applications such as those found in commercial and recreational vehicles, outdoor lighting and advertising systems and material handling equipment. The terminals have a new wingless design that prevents damage to the seals upon terminal installation or removal. The terminals will accept both 18 and 20 AWG, UL 1015 (or equivalent) wires. Other features include a positive-locking system to ensure the connectors are securely mated and that will prevent accidental un-mating. Mini-Fit H2O connectors are made from UV-stabilized



materials, which allow the products to be exposed to direct sunlight.

## FEATURES & BENEFITS

- » IP-67 rated, ensuring a water and dust-tight interconnection in the harshest of environments
- » Pre-assembled seals reduce the number of components and lower the applied cost of cable assembly
- » Positive locking ensures the connectors are securely mated and prevents accidental un-mating
- » Connectors are molded from UV stabilized materials to meet the requirements for outdoor applications
- » User-friendly terminal extraction and insertion allowing for easy assembly and field repair

## APPLICATIONS

- » Vending machines
- » Heating, Ventilation and Air Conditioning (HVAC) units
- » Recreational vehicles
- » Material handling equipment
- » Agricultural machinery
- » Outdoor lighting, signage and advertising
- » Industrial instrumentation and production equipment

For more information on Molex's Mini-Fit H2O system, visit [www.molex.com/link/minifith2o.html](http://www.molex.com/link/minifith2o.html)

## ABOUT MOLEX

Molex Incorporated is a 70-year-old global manufacturer of electronic, electrical and fiber optic interconnection systems. Based in Lisle, Illinois, USA, the company operates 59 manufacturing facilities in 19 countries. The Molex website is [www.molex.com](http://www.molex.com).

**molex**®

go to  
[www.avnet-abacus.eu](http://www.avnet-abacus.eu)  
for more information

# Avoiding Battery Directive headache in the UK

**Batteries are one area of electronics that have defied the downturn and sales are continuing to show healthy growth on the back of a growing desire to use professional and consumer electronics products on the move.**

The downside of this growth is the number of batteries finding their way into landfill, some of which include hazardous chemicals in their make-up.

Whilst most customers support the principle of the new regulations covering battery disposal, in practice, they will be keen to keep the cost of compliance to a minimum. Fortunately, there is a very straightforward way of avoiding holding the compliance baby. The regulatory burden in the UK is placed squarely on the shoulders of the 'producer' which is defined as the first person in the supply chain that physically receives and takes ownership of the product in the UK. Most of the battery product in the UK is imported and first received by either a battery distributor or a direct account of the battery manufacturer and both are now defined as a 'producer' under the new regulations. So if you source from a distributor with a UK warehouse, they and not you are responsible for complying with the regulations.

## PRODUCER RESPONSIBILITIES

The regulations apply to all types of batteries including automotive, portable (household) batteries (AAA / AA / coin cells etc.) and industrial batteries. As of September this year anyone directly importing these products into the UK will be deemed a battery "producer" under the Waste Batteries and Accumulators Regula-



by **Tim Parker**  
**Battery Products  
 Business Manager  
 Avnet Abacus**

tions 2009, with responsibility for ensuring that they take back and recycle all batteries that are returned to them – regardless of whether or not they have sold them in the first place.

Producers should have started keeping detailed records of all battery products supplied to the market by weight and chemistry from 5 May 2009. Their obligations then depend on weight and vary slightly depending on the type of product sold. If you place one tonne or more of portable batteries on the market per year you will have to pay for the collection, recycling and disposal of waste batteries in proportion to

your market share from 1 January 2010. You will have had to register with a battery compliance scheme that will arrange the collection, recycling and disposal of batteries on your behalf by 15 October 2009. The details are slightly different for automotive and industrial batteries but the principles are exactly the same.

The only exception is for product that is subsequently exported – this is exempt from the regulations. If you're sourcing your batteries direct from a manufacturer with a warehouse in the Far East, for example, or are using a supplier with a pan-European stocking location outside the UK, then you are responsible for complying with these regulations.

## UK SUPPLY CHAIN

With a UK warehouse and a commitment to comply with these new regulations Avnet Abacus are well placed to offer a solution to customers who are concerned about this new legislation.



Avnet Abacus offers the benefits of a consultancy approach to technical support. With a complete range of primary and secondary cells in all chemistries from major brand name manufacturers in our portfolio, our experienced technical specialists can evaluate your application and recommend the optimum power solution for your project. Where a standard solution is not suitable, Avnet Abacus specialists can develop a battery pack to a unique design to fit your application.

The new regulations provide the ideal opportunity to evaluate not only your battery supply chain but even the products and technologies that you're using. Contact Avnet Abacus for a free consultation on the implications of the directive for your business, and a technical review of the power solutions you're using today.





circuit protection  
equipment connectors  
input systems  
emc-products



safe&easy

**SCHURTER**  
ELECTRONIC COMPONENTS  
[www.schurter.com](http://www.schurter.com)

## INTERCONNECT

# HARTING D Sub-miniature SMT

LIMITED REGIONAL AVAILABILITY

HARTING has introduced the new D sub-miniature surface mount connector range. With 9, 15, 25 and 37 contact positions for both right angle male and female connectors. The range also comes in either standard or low profile. The need for this range is due to the fact that customers do not want to mix termination technologies on their PCB. If all components can be attached in one operation, without the need to subsequently hand solder or press-fit other components, this will save time and cost. The height of the connector also allows standard Pick-and-Place equipment to move over already placed connectors without the need to move around these parts, which saves time.

The design of the contacts gives excellent positional coplanarity of the solder leads, we can achieve less than 0,1mm; this is due to the stamped open design which is very accurately controlled rather than stamped and formed contacts commonly used in other connectors. The coplanarity is very important as it ensures the best solder attachment to the printed circuit boards. The open design of the solder tail also allows for the heat used during the soldering process to efficiently make the connection. This open design also allows easy inspection of the joints after the soldering process.

The black insulator material simplifies camera recognition, and the large, level surface is ideal for

use with common Pick-and-Place vacuum applications. The position of this surface gives very good balance as it is close to the centre of gravity position. Different shape plastic pegs are integrated into the insulator moulding to ensure very accurate positioning of the connector prior to soldering.

The die-cast brackets, which hold the connector in place on the printed circuit board, offer exceptional retention due to the ribbed design. This also ensures that the solder paste is evenly spread between the pad and the fixing brackets. The retention force has been measured at over 600N per bracket; so no need to worry about the connector failing off the board during mating.

Performance levels 2 & 3 plating is standard, but other plating types are available on request. We also offer a range of common accessories for metric and imperial screw-locks and nut fixings. The smaller connectors are supplied on a reel for best use on the Pick-and-Place equipment, the larger sizes can be supplied in trays, for standard chip-shooters.

These new products are ideally suited for many markets.



Pushing Performance



# Coordinated circuit protection strategies help prevent damage to USB charger systems and portable electronics

The evolution of USB protocols, such as USB Charger and USB 3.0 has increased the demand for more robust and reliable circuit protection techniques. The new USB protocols have also increased data-rate speeds and, to ensure data integrity between devices, have made low-capacitance ESD protection of the bus more important than ever.

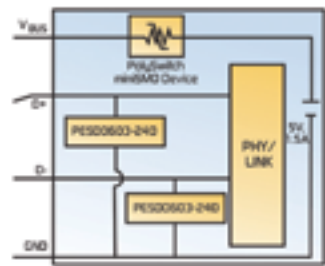


Figure 1. Host and hub chargers require coordinated overcurrent and overvoltage circuit protection

## HIGHER CURRENT, HIGHER RISK

Although power via USB has been in use for some time, the new standard dramatically increases the amount of current that can flow to a USB device – to a new maximum current rating of 1.5A (instead of 0.5A for USB 1.0 and 2.0). These higher current applications require more reliable and robust circuit protection to help prevent damage caused by overvoltage transients and overcurrent conditions.

Overvoltage transients are generally caused by ESD (electrostatic discharge) and may occur on both the power bus as well as the data lines. Although modern ICs are protected up to 2000V, a human body can easily build up static charge that ranges up to 25,000V. In I/O port protection applications, a very low capacitance ESD device with fast clamping and recovery response is required on the data lines.

Overcurrent conditions can also affect the power bus. The circuit protection requirement here is the ability to handle inrush currents (up to 1.5A per port for USB charging) reliably, and limit current faults below 5A in 60 seconds in the event of a fault (UL 60950 Table 2C).

## PROTECTING HOST/HUB CHARGERS

In host/hub charger applications, the portable device may not cause the voltage to drop below 2.0V under normal operating conditions. It must limit the amount of current drawn from a host/hub charger to 1.5A at low speed or full speed or to 0.9A at high speed.

A coordinated circuit protection strategy for protecting host or hub chargers is shown in Figure 1. The PolySwitch™ device helps protect against overcurrent damage on the VBUS line, and PESD devices are used to shunt ESD away from sensitive circuitry on the data lines.

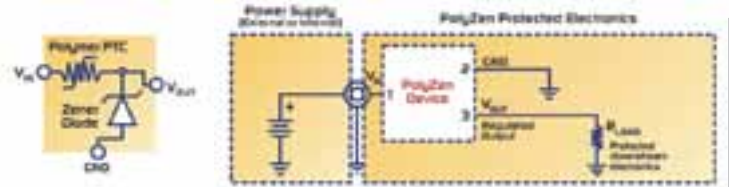


Figure 2. Tyco Electronics' PolyZen device helps provide input power protection for portable electronics

PESD devices provide low capacitance compared to traditional MLV (multilayer varistor) or TVS (transient voltage suppression) diode technology. Their low-trigger voltage and low-clamping voltage also helps protect sensitive electronic components.

## POLYZEN™ DEVICE HELPS PROTECT PORTABLE ELECTRONICS CHARGED VIA USB PORTS

Multiple interfaces and charging systems can expose portable devices to damage caused by the use of incorrect chargers, improperly regulated third-party chargers, or hot connect/ disconnect events. Although typical USB supplies provide regulated lines at 5V +/- 5%, the voltage at these lines may, under certain circumstances, exceed 5.25V, resulting in damage to the system or unprotected peripherals.

As shown in Figure 2, the PolyZen device incorporates a stable Zener diode for crisp voltage clamping and a resistively nonlinear PPTC (polymeric positive temperature coefficient) layer. The PPTC layer responds to either diode heating or overcurrent events by transitioning from a low to high resistance state. In the event of a sustained high-power overvoltage condition, the tripped PPTC element limits current and generates

a voltage drop to help protect both the Zener and the follow-on electronics – effectively increasing the diode's power handling capability.

## PROTECTION RECOMMENDATIONS

For traditional USB 2.0 host and hub charger applications, Tyco Electronics recommends the PolySwitch miniSMDC110 device for single port connections, the PolySwitch miniSMDC150 device for 2-port connections and the PolySwitch nanoSMDC200S device for 3-port connections. To help protect traditional 0.5A USB peripherals from overvoltage surges on VBUS, Tyco Electronics recommends PolyZen ZEN056V130A24LS and ZEN065V130A24LS devices.

For new USB charging applications, including dedicated chargers, hosts and hubs, Tyco Electronics recommends PolySwitch nanoSMDC200S devices for overcurrent protection on each port. To support new 1.5A charging on the device side, PolyZen ZEN056V230A16LS devices on the VBUS line are suggested. PESD0603-240 devices, on all D+ and D- line devices and host/hub, independent of USB 2.0 or USB charging, are also recommended.

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

go to  
[www.avnet-abacus.eu](http://www.avnet-abacus.eu)  
for more information

 Tyco Electronics

# Avnet Abacus Suppliers A-Z



The above suppliers are available across Europe from Avnet Abacus. Regional suppliers are also available – visit [www.avnet-abacus.eu](http://www.avnet-abacus.eu) to view the full linecard for your region.

## AVNET ABACUS OFFICES

### Austria

Schönbrunner Str. 297-307  
A-1120 Vienna  
+43 1 86642-0  
+43 1 86642 250  
wien@avnet-abacus.eu

### Belgium

Eagle Building  
Kouterveldstraat 20  
B-1831 Diegem  
+32 (0)2 7099 167  
+32 (0)2 7099 801  
diegem@avnet-abacus.eu

### Belarus

c/o Avnet Abacus Russia  
Office 26, Building 2  
10 Korovinskoye Shoussee,  
127486 Moscow  
+7 495 937 2167  
+7 495 937 1263  
belarus@avnet-abacus.eu

### Croatia

c/o Avnet Abacus Slovenia  
Dunajska Cesta 159  
1000 Ljubljana  
+386 (0)1 560 97 54  
+386 (0)1 560 98 78  
croatia@avnet-abacus.eu

### Czech Republic

c/o Avnet Abacus Austria  
Schönbrunner Str. 297-307  
A-1120 Vienna  
+43 1 86642-0  
+43 1 86642 250  
praha@avnet-abacus.eu

### Denmark

Knudlundvej 24  
DK-8653 Them  
+45 86 84 84 84  
+45 86 84 82 44  
them@avnet-abacus.eu

### Denmark

Banemarksvej 50 B  
DK-2605 Brøndby  
+45 86 84 84 84  
+45 43 29 37 00  
brondby@avnet-abacus.eu

### Denmark

Ellekaer 9, DK-2730 Herlev  
+45 43 22 80 40  
+45 43 22 80 41  
herlev@avnet-abacus.eu

### Egypt

c/o Avnet Abacus Turkey  
Bayar Cad, Gülbahar Sok,  
No:17 Perdemsac Plaza  
D:132 TR-34742 Kozyatagi  
/ Istanbul  
+90 216 372 59 54  
+90 216 372 61 39  
egypt@avnet-abacus.eu

### Estonia

Ehitajate tee 114  
13157 Tallinn  
+372 (0)6257991  
+372 (0)6257995  
tallinn@avnet-abacus.eu

### Finland

Pihatörmä 1 B  
FI-02240 Espoo  
+358 (0) 207 499 220  
+358 (0) 207 499 240  
 espoo@avnet-abacus.eu

### France

6/8 rue Ambroise Croizat  
ZAE Les Glaïses, F-91127  
Palaiseau Cedex, Paris  
+33 (0) 1 6447 2929  
+33 (0) 1 6447 9150  
paris@avnet-abacus.eu

### France

Parc de la Plaine  
35 Avenue Marcel Dassault  
F-31506 Toulouse  
+33 (0) 5 6247 4787  
+33 (0) 5 6247 4789  
toulouse@avnet-abacus.eu

### France

Technoparc  
Bât E, 4 avenue des  
Peupliers  
F-35517 Cesson Sevigne,  
Rennes  
+33 (0) 2 9983 7720  
+33 (0) 2 9983 4829  
rennes@avnet-abacus.eu

### France

Parc Club du Moulin à Vent  
Bât 40, 33 rue du Dr. G Lévy  
F-69693 Vénissieux Cedex,  
Lyon  
+33 (0) 4 7877 1370  
+33 (0) 4 7877 1391  
lyon@avnet-abacus.eu

### Germany

Gutenbergstr. 15  
D-10587 Berlin  
+49 (0) 30 790 997 0  
+49 (0) 30 790 997 51  
berlin@avnet-abacus.eu

### Germany

Werner-von-Siemens-  
Straße 2-6  
Gebäude 5137  
D-76646 Bruchsal  
+49 (0) 7251 917 90  
+49 (0) 7251 917 92 25  
bruchsal@avnet-abacus.eu

### Germany

Wilhelmstr. 1  
D-59439 Holzwickede /  
Dortmund  
+49 (0) 2301 2959 27  
+49 (0) 2301 2959 29  
dortmund@avnet-abacus.eu

### Germany

Hans-Böckler-Strasse 10 a  
D-37079 Göttingen  
+49 (0) 551 305 430  
+49 (0) 551 305 4329  
goettingen@avnet-abacus.eu

### Germany

Rathausallee 70  
D-22846 Norderstedt  
Bei Hamburg  
+49 (0) 40 608 23 59 0  
+49 (0) 40 608 23 59-20  
hamburg@avnet-abacus.eu

### Germany

Gruber Str. 60c  
D-85586 Poing / Munich  
+49 (0) 8121 777 03  
+49 (0) 8121 777 531  
munich@avnet-abacus.eu

### Germany

Lina-Ammon-Str. 19 b  
D-90471 Nürnberg  
+49 (0) 911 244 250  
+49 (0) 911 244 25 25  
nuernberg@avnet-abacus.eu

### Germany

Gutenbergstr. 15  
D-70771 Leinfelden-  
Echterdingen / Stuttgart  
+49 (0) 711 78260 02  
+49 (0) 711 78260 333  
stuttgart@avnet-abacus.eu

### Hungary

c/o Avnet Abacus Austria  
Schönbrunner Str. 297-307  
A-1120 Vienna  
+43 1 86642-0  
+43 1 86642 250  
budapest@avnet-abacus.eu

### Italy

Via Manzoni 44  
I-20095 Cusano Milanino  
(Milano)  
+39 02 660 921  
+39 02 66092 332  
milano@avnet-abacus.eu

### Italy

Viale dell'industria 23  
I-35129 Padova  
+39 049 7800 381  
+39 049 7730 36  
padova@avnet-abacus.eu

### Italy

Via Zoe Fontana 110  
I-00131 Roma  
+39 06 4131 498  
+39 06 4192 618  
roma@avnet-abacus.eu

### Italy

Via Scaglia Est 144  
I-41100 Modena  
+39 059 351 300  
+39 059 344 993  
modena@avnet-abacus.eu

### Italy

Via Panciatici 40/11  
I-50127 Firenze  
+39 055 436 1928  
+39 055 428 8810  
firenze@avnet-abacus.eu

### Lithuania

c/o Avnet Abacus Poland  
Plac Solny 16  
PL-50-062 Wroclaw  
+48 71 34 205 99  
+48 71 34 229 10  
lithuania@avnet-abacus.eu

### Netherlands

Takkebijsters 2  
NL-4817 BL Breda  
+31 (0) 76 57 22 300  
+31 (0) 76 57 22 303  
breda@avnet-abacus.eu

### Norway

Elveveien 26, Box 356  
N-1472 Fjellhamar  
+47 67 97 87 20  
+47 67 97 87 21  
oslo@avnet-abacus.eu

### Poland

Plac Solny 16  
PL-50-062 Wroclaw  
+48 71 34 205 99  
+48 71 34 229 10  
wroclaw@avnet-abacus.eu

### Portugal

c/o Avnet Abacus Madrid  
C/Chile, 10, Oficina 229  
ES-28290 Las Matas /  
Madrid  
+34 (0) 913 72 7200  
+34 (0) 91 636 9781  
portugal@avnet-abacus.eu

### Russia

Office 26, Building 2  
10 Korovinskoye Shoussee  
127486 Moscow  
+7 495 937 2167  
+7 495 937 1263  
moscow@avnet-abacus.eu

### Serbia

c/o Avnet Abacus Slovenia  
Dunajska Cesta 159  
1000 Ljubljana  
+386 (0) 1 560 97 54  
+386 (0) 1 560 98 78  
serbia@avnet-abacus.eu

### Slovakia

c/o Avnet Abacus Austria  
Schönbrunner Str. 297-307  
A-1120 Vienna  
+43 1 86642-0  
+43 1 86642 250  
slovakia@avnet-abacus.eu

### Slovenia

Dunajska Cesta 159  
1000 Ljubljana  
+386 (0) 1 560 97 54  
+386 (0) 1 560 98 78  
ljublana@avnet-abacus.eu

### Spain

C/Mallorca, 1-23, 2a Plta 1  
ES-08014 Barcelona  
+34 (0) 93 327 85 50  
+34 (0) 93 426 80 21  
barcelona@avnet-abacus.eu

### Spain

C/Chile, 10, Oficina 229  
ES-28290 Las Matas /  
Madrid  
+34 (0) 913 72 7200  
+34 (0) 91 636 9781  
madrid@avnet-abacus.eu

### Spain

Plaza Zabalgaré,  
12 Bajo Izda  
ES-48960 Galdacon /  
Vizcaya  
+34 (0) 94 457 0044  
+34 (0) 94 456 77 10  
bilbao@avnet-abacu.eu

### Sweden

Smörhålevägen 3  
SE-43442 Kungsbacka  
+46 (0)300 140 50  
+46 (0)300 140 15  
gothenburg@avnet-abacus.eu

### Sweden

Esplanaden 3D  
Box 1830, SE-171 27 Solna  
+46 (0)8 587 464 00  
+46 (0)8 587 464 01  
stockholm@avnet-abacus.eu

### Switzerland

Bernstrasse 392  
CH-8953 Dietikon  
+41 (0) 43 322 49 90  
+41 (0) 43 322 49 99  
zurich@avnet-abacus.eu

### Turkey

Bayar Cad, Gülbahar Sok,  
No:17 Perdemsac Plaza  
D:132 TR-34742 Kozyatagi  
/ Istanbul  
+90 216 372 59 54  
+90 216 372 61 39  
istanbul@avnet-abacus.eu

### UK

Cherrycourt Way, Leighton  
Buzzard, Bedfordshire  
LU7 4YY  
+44 (0)1525 858000  
+44 (0)1525 858111  
leightonbuzzard@avnet.eu

### UK

Unit 5B, Waltham Park,  
White Waltham, Maiden-  
head, Berkshire SL6 3TP  
+44 (0)1628 512912  
+44 (0)1628 512999  
maidenhead@avnet.eu

### UK

21a Hursley Road,  
Chandlers Ford, Eastleigh,  
Hampshire SO53 2FS  
+44 (0)2380 263516  
+44 (0)2380 263514  
eastleigh@avnet.eu

### UK

Waterside House, Brunel  
Way, Stroudwater Business  
Park, Stonehouse, Glos  
GL10 3SW  
+44 (0)1453 794111  
+44 (0)1453 791252  
stonehouse@avnet.eu

### UK

Abacus House, Bone Lane,  
Newbury, Berkshire RG14  
5SF  
+44 (0)1635 36222  
+44 (0)1635 38670  
newbury@avnet.eu

### UK

Avnet House, Rutherford  
Close, Meadway, Stevenage,  
Hertfordshire SG1 2EF  
+44 (0)1438 789 789  
+44 (0)1438 789 799  
stevenage@avnet.eu

### UK

Hall Mews, Clifford Road,  
Boston Spa, Near Wetherby,  
Yorkshire LS23 6DT  
+44 (0)1937 841312  
+44 (0)1937 841062  
bostonspa@avnet.eu

### UK

Deltron Emcon House,  
Hargreaves Way, Sawcliffe  
Industrial Park, Scunthorpe,  
North Lincs, DN15 8RF  
+44 (0)1724 407601  
+44 (0)1724 281650  
scunthorpe@avnet.eu

### UK

Unit A5, 5 Ashworth House,  
Deakins Business Park,  
The Hall Coppice, Egerton,  
Bolton BL7 9RP  
+44 (0)1204 590270  
+44 (0)1204 590299  
bolton@avnet.eu

### Ukraine

c/o Avnet Abacus Poland  
Plac Solny 16  
PL-50-062 Wroclaw  
+48 71 34 205 99  
+48 71 34 229 10  
ukraine@avnet-abacus.eu

All trademarks and logos are the property of their respective owners. This document provides a brief overview only and is not intended to be complete or binding offer. Product information, including information related to a product's specifications, uses or conformance with legal or other requirements, is obtained by Avnet from its suppliers or other sources deemed reliable and is provided by Avnet on an 'As Is' basis. Avnet makes no representation as to the accuracy or completeness of the product information and Avnet disclaims all representations, warranties and liabilities under any theory with respect to the product information, including any implied warranties of merchantability, fitness for a particular purpose, title and/or non-refrangement. All product information is subject to change without notice.

