

C O D I C O <sup>®</sup>

ENGLISH

2015/1

# impulse

RUBYCON E-Caps for Automotive

QUALCOMM: New Wi-Fi Modules

FCI's new PwrBlade+™ Connector

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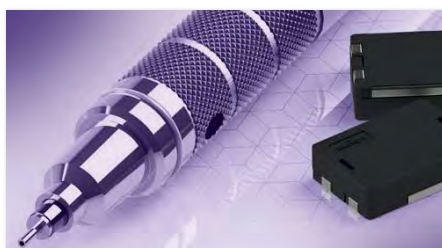


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As one of Japan's leading manufacturers of Al-electrolytic capacitors, RUBYCON provide solutions for more than just industrial applications, fitted exactly to your requirements. Also for automotive there are special series available; with extended temperature ranges, high ripple-current capability, and high capacitance values in miniaturized case sizes.

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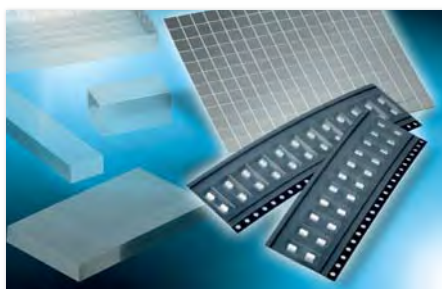


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## Editorial

Dear Readers,

This year CODICO is celebrating 20 years of ISO certification! It was exactly 20 years ago, on 31.5.1995, that CODICO was granted its first ISO certificate. In those days there were only about 30 people working at CODICO, and, as the group certification photo shows, there's a lot that's happened over the years. We wanted then, and we want now, to look for new opportunities, find them, and take advantage of them – and we achieve this, among other things, with a properly certified quality management system. According to the ISO Survey, there are already more than a million companies worldwide using the ISO certification as an instrument in guiding their business and improving performance even further.

Then, and now, our view is that quality can only be improved if you really know and understand your potentials. Quality is still the basic precondition, the essential, for staying innovative and competitive in the long term, and so winning through against the competition. We work in close co-operation with our independent expert assessors and our internal quality management, to guarantee quality in the long term, in products, services, and management, fulfilling the requirements of customers and suppliers too, optimizing processes, and at the same time bringing down costs. We are absolutely certain that professional quality management is the key factor in our success as a company.

If anyone wants to know what quality is going to mean in the future, all it takes is a look at the changes in society and the changes in values. What challenges are our customers faced with? What demands, what requirements have to be met? And how can we provide even better support for our customers?

We are looking forward to continue working closely with you in finding solutions in the future – and in fulfilling all your expectations with regard to ourselves.



▶ Sven Krumpel D01

### 20 years of ISO Certification: Quality management then and now

We are celebrating the 20th anniversary of our ISO Certificate! A good reason to take a look behind the scenes and to talk to the lady, who is standing behind CODICO Quality Management. Petra Huynh has been responsible for the ISO certification for 15 years, and for her daily work takes as her inspiration a quote from John F. Akers: »Quality starts with putting customer satisfaction at the focus of our thinking.«

Read the interesting interview with Petra on the next page. >



Sven Krumpel  
CEO CODICO



# 20 YEARS OF ISO CERTIFICATION



## Quality management then and now

**CODICO values its quality management, but how do we do that? Read here an interview with Petra Huynh, CODICO's quality manager, about developments which have been taken place in recent years and her important job (Interview led by Birgit Punzet).**

ments to be assessed and towards a process-oriented quality management system – have changed, but my tasks as Quality Manager have also become more complex.



Petra Huynh

### **Why did CODICO decide in 1995 to obtain ISO certification?**

**Petra Huynh:** The decision was taken to intensify the already well defined quality policy, to expand our knowledge in this sector, and to harmonize our activities with an appropriate standard. And the certification, even then, meant even greater security in co-operation, by the avoidance of errors, and therefore the reduction of costs.

### **Why do we keep having ourselves recertified, and how often did we do this?**

By way of the certification we have set ourselves on a course of constant improvement, and committed ourselves to carrying out a recertification every three years.

### **How has your own work changed since those days?**

I have been looking after the quality management system since the year 2000. Not only the demands of the system itself – away from 20 ele-

### **How does a certification take place?**

#### **What steps have to be taken?**

Certification is a process with the aid of which proof is provided that the requirements of the standard are being properly met. To do this, all the processes are audited once a year by our partner *quality austria* on the basis of random sampling, and every three years in a total assessment, systematically and independently. CODICO values this external consideration of our quality management very highly, because our experienced auditors always provide inputs which in turn continue to a further development of our system. The successful passing of these audits in turn forms the basis for the further holding of the certificate in accordance with ISO 9001:2008.

### **Has the significance of the certification changed?**

Operating a certified quality management system is still a basic precondition today for remaining innovative and competitive in the long term, and so being able to keep ahead of the competition.





© Getty - Fotostock.com

**When and why did the management decide to appoint an own Quality Manager?**

It's a requirement of the Standard, so it's a precondition for every QMS!!

**What are the tasks of a Quality Manager?**

As Quality Manager I see myself as an internal service provider and advisor for all matters involving quality management. My tasks include:

- The further development of the QMS
- The planning and performance of internal quality audits
- The preparation and adaptation of the Q-documentation
- Regular reporting to the management about the state of development and the effectiveness of the quality management
- Preparation, follow-up, and monitoring of external audits
- Planning and provision of training procedures within the framework of quality management
- Motivation and advice for the staff in all matters relating to quality management, and much more besides

**What qualifications are needed as Quality Manager?**

I completed by training as a Quality Manager and internal auditor in 2000 at the WIFI (Austrian training institute in Vienna). Regular refresher seminars and examinations are a precondition for my personal recurrent certification.

**Can you tell our readers something about yourself... Who is the lady behind the Quality Management at CODICO?**

After graduating at the Commercial Academy, I started my career with CODICO in 1988 as a specialist in the Order Processing department, with responsibility for passive component elements in the West Austria region. After four years I moved to the team in the Sales Internal Service, where, until the birth of my daughter in 1998, I was responsible for customer care with regard to enquiries and quotations. After my period of leave I successfully completed my training as Quality Manager and internal auditor, and since then I have been handling the quality management system – and I love it.

If you have any questions about CODICO Quality Management and ISO certification, you are welcome to approach our Quality Manager:

**D02**

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1995: CODICO celebrates the 1st ISO certification



Internet of Things (IoT) is used to describe a phenomenon where home PCs as devices are gradually being replaced by »intelligent objects«. Instead of being at the centre of human attention, as it is currently the case with the Internet, IoT will inconspicuously be assisting humans in their daily tasks. The objective of these ever-shrinking tiny computers is to help people in their everyday lives without distracting them or even being noticed.\*

According to official estimates, more than 25 billion such devices will be connected to each other over the Internet by 2020. With respect to Wi-Fi, the industry is looking for solutions that are even smaller and more compact, while costing less and less.

Low power consumption is also an issue in IoT, since such devices are often powered by batteries. CODICO offers two Wi-Fi modules tailored specifically to meet these requirements, which were developed by market leader QUALCOMM.

\*See: Wikipedia

# INTERNET OF THINGS

## The new single and dual band Wi-Fi modules by QUALCOMM



We already presented the single-band DNSA-141 Wi-Fi module in detail in our 2014/1 Impulse issue. Now we added a second module that also supports dual-band (2.4GHz and 5GHz) and diversity at 2.4GHz, the DNSA-144. Although both modules are produced and marketed by Wistron, they are based on the SP141 and SP144 Wi-Fi reference designs by QUALCOMM. Therefore, Wistron appears as an original design manufacturer (ODM), which precisely observes the reference design specifications and manufactures according to these. While Wistron delivers the hardware, QUALCOMM exclusively provides technical support and development boards. A support page was set up specifically for this purpose, where users can download the entire support package (demos, drivers, datasheets, user guides, etc.):

<https://developer.qualcomm.com/mobile-development/development-devices/ios-wifi-development-platform/tools-and-resources>. Both development kits can be ordered through CODICO online: [www.codico.com/en/formulare/qualcomm](http://www.codico.com/en/formulare/qualcomm)

Both module solutions are based on the same highly integrated QCA4002 (DNSA-141) and QCA4004 (DNSA-144) Wi-Fi components (image 1) by QUALCOMM. The SPI interface allows for a

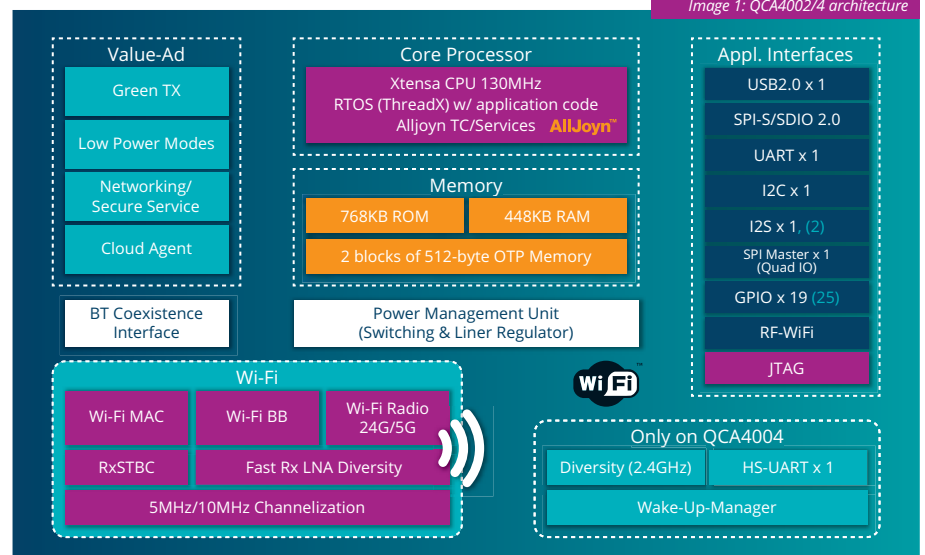
quick and easy connection to an MCU-based system environment. For this purpose, the corresponding open source API drivers, available as C-code on the said support website, will have to be ported to the host MCU.

In both cases, users benefit from the fact that the entire TCP/IP protocol stack and higher protocols such as HTTP, DHCP, and DNS and encryptions are already integrated in the QCA4002/4 modules. As a result, no in-depth Wi-Fi skills are

required for development, and users can instead focus their attention on the core applications on their host MCU. The QCA4002/4 thus operates as a »black box« which, although it can be controlled from the outside, executes all network processes using its internal CPU.

Image 2 shows the software architecture of the QCA4002/4 modules. All protocols/functions below the orange line are covered by the integrated

Image 1: QCA4002/4 architecture





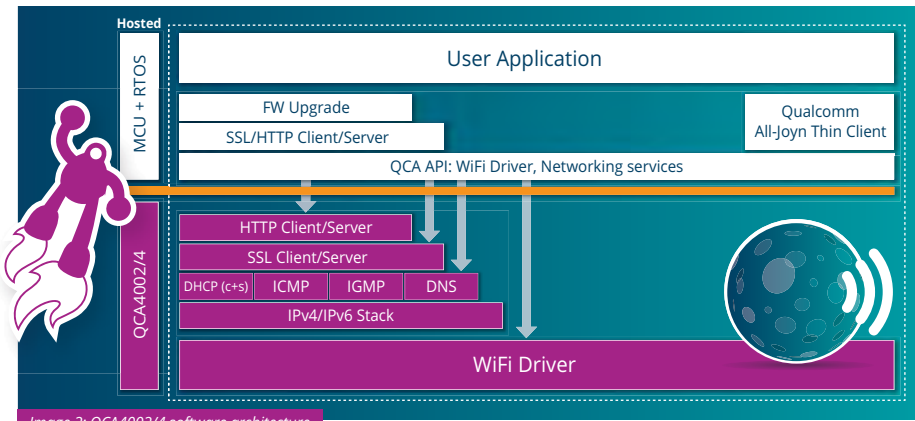


Image 2: QCA4002/4 software architecture

quick, simple, and cost-optimized system integration. Measuring only 20x25mm (DNSA-141, image 3 and 4) and 20x42mm (DNSA-144, image 5 and 6) the modules can be addressed via SPI with the exact same API as QCA4002/4.

Of course, the modules also support the low power features integrated in the QCA4002/4, such as, for instance, Low-Power-Listen, Green-Tx-Power-Saving, or IEEE-Sleep-Mode (sleep: 130µA/2ms wake up, suspend: 10µA/35ms wake up). Instead of the dual-band functionality, the second antenna connection of DNS-144 can be used for reception diversity, allowing for a more stable wireless connection and thus a higher range. Support for Rx/Tx diversity, however, is only available at 2.4GHz.

network processor and the hardware (MAC and PHY), while the API (application programming interface) and applications run on the host MCU.

MAC and PHY directly from the host MCU if, e.g. users want to use their own stack in the operating system.

As the arrows indicate, the API allows direct access to each individual protocol layer, allowing users themselves to manage the distribution of the protocol function between the host MCU and QCA4002/4. So it is possible, for instance, to circumvent the entire TCP/IP stack and address

Despite the fact that the QCA4002/4 parts already integrate several RF components, many customers shy away from the efforts of an own RF design and the subsequent calibration and certification procedures. To relieve them from this last burden, the two module solutions offer a

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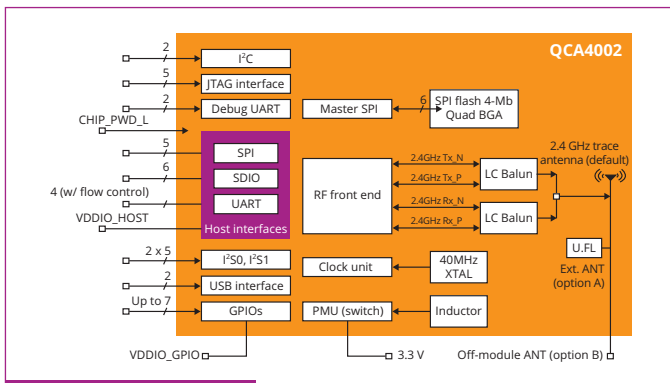


Image 4: DNSA-141 block diagram

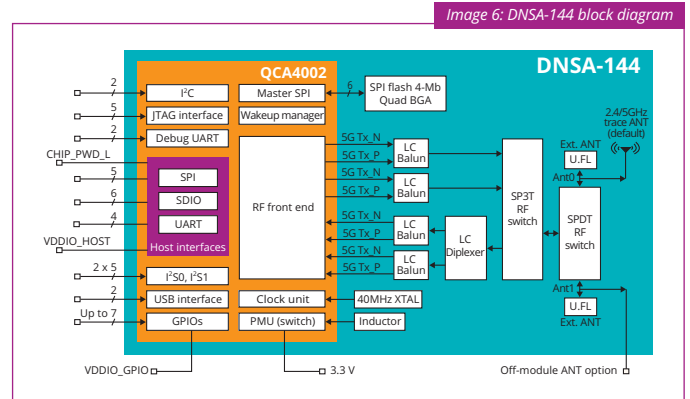


Image 6: DNSA-144 block diagram

## DNSA-141



Image 3: DNSA-141 module

- QCA4002 based Wi-Fi module
- 2.4GHz Single-Band IEEE 802.11b/g/n
- Internal PA and LNA, no external RFSW
- Green Tx Power Saving, Low Power Listen and IEEE Sleep Mode
- On board printed antenna or IPEX-connector
- Single power supply: 3.3V
- Integrated IPv4/IPv6 networking stack
- Full security support: SSL, WPS, WPA, WPA2, WEP
- Integrated services: HTTP, DHCP, DNS, ICMP, IGMP
- Easy to use SPI host interface
- 25mm x 20mm size, 2-layer, single side component
- Operation temperature: -40°C – 85°C (Industry Class Version)
- Regulatory compliances: CE, FCC and IC

## DNSA-144



Image 5: DNSA-144 module

- QCA4004 based Wi-Fi module
- 2.4GHz and 5GHz, Dual-Band IEEE 802.11a/b/g/n
- Rx/Tx Diversity for 2.4GHz
- Internal PA and LNA, no external RFSW
- Green Tx Power Saving, Low Power Listen IEEE Sleep Mode
- On board printed antenna or IPEX-connector
- Single power supply: 3.3V
- Integrated IPv4/IPv6 networking stack
- Full security support: SSL, WPS, WPA, WPA2, WEP
- Integrated services: HTTP, DHCP, DNS, ICMP, IGMP
- Easy to use SPI host interface
- 25mm x 42mm size, 2-layer, single side component
- Operation temperature: -40°C – 85°C (Industry Class Version)
- Regulatory compliances: Planning CE, FCC and IC

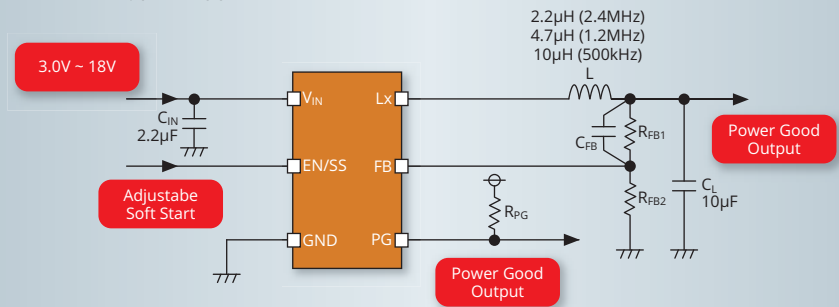
# TWIN

## TOREX XC9263/64

18V, 500mA Step-Down DC/DC Converter

The XC9263/64 is a synchronous step-down DC/DC with a P-Ch High Side Switch to ensure low Voltage operation with 100% max duty ratio. It can operate from 3.0V~18.0V and deliver loads up to 500mA making it an ideal replacement for inefficient Linear Regulators used in many industrial applications. With a 0.75V reference voltage source, the output voltage is set externally within a range of 1.0V~15V using external resistors.

XC9263/64: Typical Application Circuit



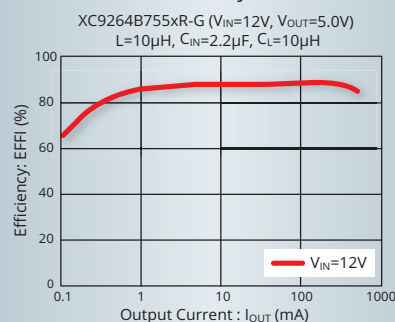
P-Ch High Side switch for low Voltage operation and 100% duty ratio

Designed for very high efficiencies at low output loads, with low quiescent current (only 12uA) and automatic PFM/PWM mode, the XC9263/64 also works with Low ESR ceramic capacitors and comes with a choice of three switching frequencies (500kHz, 1.2MHz & 2.4MHz), adjustable soft start and a power good output.

Available in the ultra small USP-6C package, measuring only 2.0x1.8x0.6mm an extremely small DC/DC circuit can be implemented with a minimal number of external components.

The XC9263/64 includes Over Current and VOUT short circuit protection circuits and the designer can select either a Latch or Auto-restart configuration depending on the application requirements. Operating temperature range is -40 °C to +105 °C.

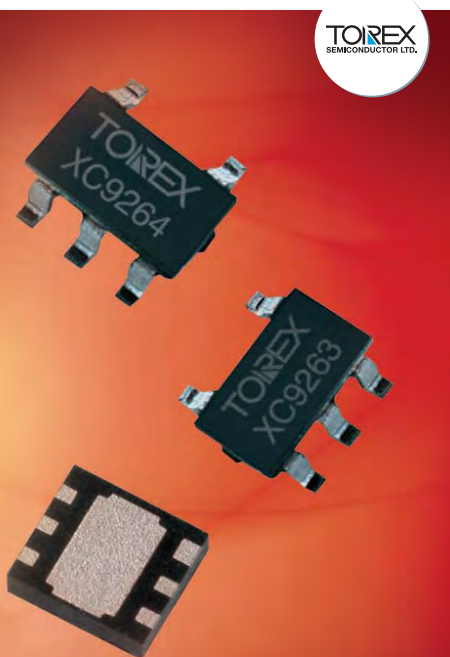
XC9263/64: Efficiency Performance



For more information please contact

A02

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# POWER!

The XC9266 incorporates Hi-SAT COT, TOREX's own Constant On-Time architecture, to deliver extremely fast transient response performance and high efficiency.

## TOREX XC9266

5.5V, 6A Hi-SAT COT Step Down DC/DC Converter

The XC9266 is a new 6A buck DC/DC Converter that operates between 2.7V–5.5V with optional switching frequencies of either 1.2MHz or 3MHz available. With a 0.6V reference voltage source, the output voltage is set externally within a range of 0.8V–3.6V using external resistors. Furthermore, it is also possible to control the output voltage dynamically using an external digital-to-analog converter (DAC).

With Hi-SAT COT, the XC9266 only needs one low cost 47µF ceramic capacitor at the output side whereas competitor's equivalent parts often need multiple capacitors to achieve similar levels of performance.

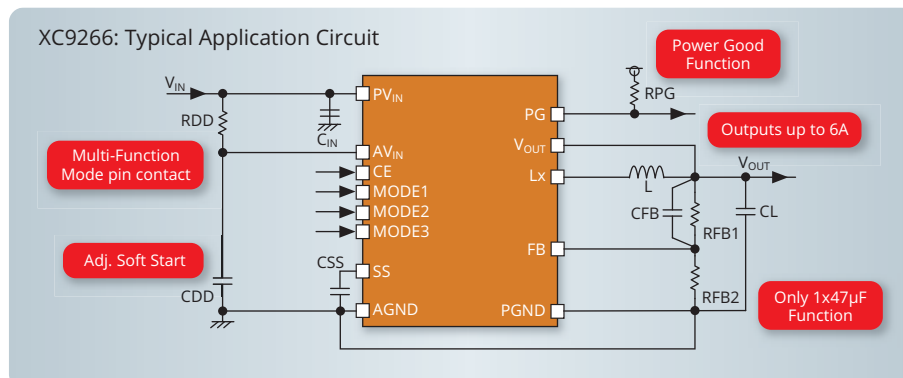
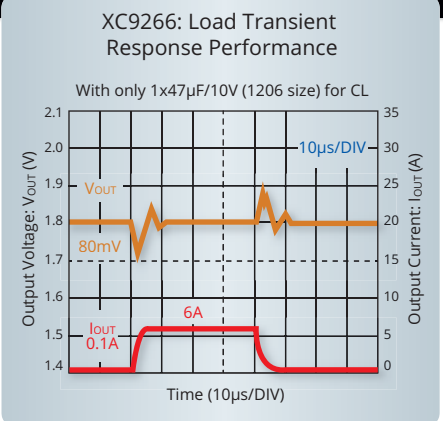
The XC9266 also allows for different features to be selected using the MODE pins. Using a High

or Low signal to the MODE1 pin enables the selection of PWM control or PWM/PFM auto switching control. Short protection with latch or hiccup mode can be selected via the MODE2 pin and the MODE3 pin allows an optional CL discharge with soft OFF function to be selected. The integral soft start time can be adjusted with an external capacitor (CSS) and a Power Good feature is also included to help with system power-up sequencing.

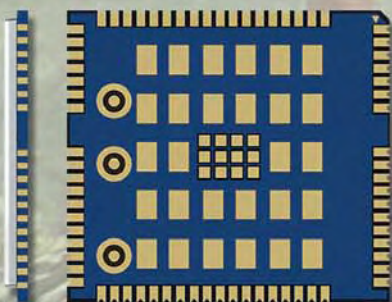
Operating temperature range is -40°C ~ +105°C. All the above is available in a QFN-24 package measuring 4x4x0.8mm. For more information please contact

A03

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# NEW DEVELOPMENT: UC20-G UMTS/HSPA+







# True Worldwide Coverage and High Reliability while Roaming across Different Wireless Networks

QECETEL Wireless Solutions announced the introduction of UC20-G UMTS/HSPA+ module, based on QUALCOMM Technologies, Inc. chipsets and supporting five UMTS/HSPA+ bands (800/850/900/1900/2100MHz) and providing ubiquitous 2G coverage with quad band GPRS and EDGE class 12. UC20-G delivers up to 14.4Mbps downlink and 5.76Mbps uplink data rates.

Operating on both GSM/GPRS and UMTS/HSPA+ networks, UC20-G provides true worldwide coverage and reliability even while roaming across different wireless network technologies. It is layout-compatible with QECETEL UMTS/HSDPA UC15 and GSM/GPRS M10 modules and supports GPS and GLONASS location technologies.

«The UC20-G UMTS/HSPA+ module is a new member of QECETEL's 3G products. Its UMTS-based modem provides data connectivity on HSPA+, HSDPA, HSUPA, WCDMA, EDGE, GPRS networks.» said Jaron Xu, QECETEL Marketing Director. «UC20-G, banded for global market and UC20-A, UC20-E, each banded for Asian and European market constitute a comprehensive product portfolio of QECETEL UC20 series. By using Qualcomm Technologies' Gobi 3G solution, UC20 series offers our customer the technology flexibility to address the requirements of M2M products and drive 2G to 3G migration in global market.»

UC20 provides power saving solutions by DPO (Dynamic Power Optimization). Battery life is extended and talk as well as standby time are maximized dramatically through DPO, which attempts to turn off GNSS RF parts, reduces current consumption up to 50% without impact on TTFF.

UC20 is fully digital audio capable, supports both GPS and GLONASS location technologies, and provides full-duplex PCM input and output. These features combined with the up to 14.4Mbps downlink and 5.76Mbps uplink data rates make UC20 ideal for surveillance and security applications. A rich set of Internet protocols, industry-

standard interfaces (USB/UART/PCM/ADC/NET-LIGHT/SD/Rx-diversity) and abundant functions (USB drivers for Windows XP, Windows Vista,

Windows 7, Windows 8, Windows CE, Linux, Android/eCall/GNSS) extend the applicability of UC20 module to a wide range of M2M applications such as automotive, metering, tracking systems, security solutions, routers, wireless POS, mobile computing devices, PDA, and tablet PC.

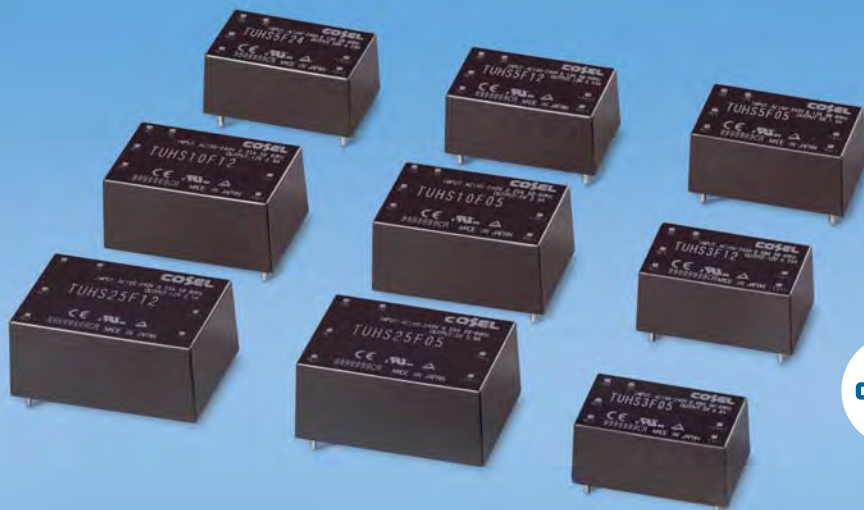
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## QUICK SPECS

Frequency Bands	UC20-G 800/850/900/1900/2100MHz@UMTS 850/900/1800/1900MHz@GSM
Supply Voltage Range	3.4 ~ 4.3V, 3.8V typ.
Operation Temperature	-40 °C ~ +85 °C
Dimensions	32.0 × 29.0 × 2.5mm
Weight	Approx. 4.9g
DATA	HSPA+ Max.14.4Mbps (DL)/ Max.5.76Mbps (UL)
Protocols	TCP/ UDP/ PPP/ FTP/ MMS/ SMTP/ SMTSP/ HTTP/ HTTPS/ PING/ SSL
USB Driver	Windows XP, Windows Vista, Windows 7, Windows 8, Windows CE5.0/6.0/7.0, Linux 2.6/3.0, Android 2.3/4.0/4.2
Special Features	eCall, USIM Detection, Firmware update, QuecLocator, FOTA, GNSS
Interfaces	Digital Audio PCM interface, USB 2.0 High Speed, 2x UART, USIM, Netlight, ADC, RTC, Antenna primary, diversity, GNSS
Certificates	CE/GCF/FCC/PTCRB/AT&T/OFA/NCC/RCM/IC/Rogers/Vodafone/KC/NAL/TA





# STRONG & IN GOOD SHAPE

COSEL launches their all new TUNS, a combination of the previously released PFC modules (DPG, DPF, DPA) and a high voltage DC/DC module (DHS, DBS, DAS), creating a truly integrated AC/DC print module.

The brick format (LxHxW = 4.62x0.5x2.42 inches, 117.3x12.7x61.5mm), single output converter comes with three different voltages – widely adjustable (9.60 - 14.40, 22.40 - 33.60, 38.40 - 52.80VDC) and is inherently safe (built in overcurrent, - voltage and - temperature protection). The TUNS Series operates on input voltages from 85 up to 264VAC at 50/60Hz thanks to PFC (power factor correction) it reaches a «cos Phi» of up to 0.96. The Harmonic Attenuation complies with IEC61000-3-2 Class A. The relinquishment of tantalum and aluminium capacitors, makes the compact converter designed for conduction cooling highly reliable (5 years warranty). The new series now embraces 300 and 500W versions together with the already existent 50 and 100W power ratings. The thermal performance is top of the art.

The TUNS300 will deliver 100% of the rated output power at a base plate temperature of up to 100°C. The TUNS500 can achieve 100% output

power at baseplate temperatures up to 85°C. The TUNS is in good shape at the low end of the temperature scale. The minimum start - up temperature sits at -40°C and allows usage in outdoor applications in very harsh environments, the combination of very low and extra high

makes the product perfect for applications requiring compact size, high efficiency and reliability. Furthermore, the product does not require any forced cooling. The conduction cooling design supports noise sensitive applications, aside from Telecom, and semiconductor manufacturing equipment, also RF, broadcasting, military and display applications plus medical products with no direct or indirect contact to the patient. Safety comprises UL60950, cUL, CE and EN60950-1 and makes the product fit for global market.

The TUNS series aligns with the TUHS family, the low power end of COSEL's compelling range of AC/DC-print modules. The TUHS series, introduced in our Impulse issue 1-2014, remains the smallest standby Power Supply available on the market as per today. The single output converter comes in four power ratings 3/5/10/25W with three different output voltages 5/12/24VDC.

The print module is suitable for industrial applications with ambient temperatures ranging from -40 to 85°C. The class II converter is approved according to EN60950-1, cUL and UL and meets EN55022 Level B. Worldwide usage due to an input voltage range of 90-264VAC at 50/60Hz makes it the perfect companion for countless applications.

A05

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MODEL	TUHS3	TUHS5	TUHS10	TUHS25	
Input Voltage	AC85V-264V (50/60Hz)				
Output Voltage/Current	5V	0.6A	1A	2A	5A
	12V	0.25A	0.45A	0.9A	2.1A
	24V	0.13A	0.22A	0.45A	1.1A
Operating Temperature	40-85°C (Derating Required)				
Withstand Voltage	Input-Output AC3, 000V 1minute Cutoff Current: 10mA				
Isolation Resistance	Input-Output DC500V 50MQ min (at room temperature)				
Agency Approvals	UL60950-1,C-UL,EN60950-1				
Conductive Noise*	FCC-B,VCCI-B,CISPR22-B,EN55011-B,EN55022-B				
Case Size**	28.7x17.5x12.7	28.7x17.5x12.7	33x22x15	36x25.4x16.5	

\*Connecting with the recommended circuit, \*\*WxDxH, excluding external components



# WIFI & BLE MODULES



Atmel

WINC1500 software

Atmel

Atmel | SMART WINC1500-XSTK  
Xplained Pro

Starter kit



Now new from ATMEL – WiFi and BLE modules as well.

These are already certified modules with the focus on low power IoT applications. This makes it possible for almost any design to be integrated quite easily into the IoT network, and to do it the developer does not need any know-how with regard to WiFi, RF, or the Internet. The module works entirely independently and is easily addressed via a serial interface. Target applications are in the wide field of battery-powered devices, industrial applications, and medical situations.

The modules from ATMEL have been optimized for battery applications, operating with an input voltage of 1.8V to

3.6V, and requiring only 4 $\mu$ A in stand-by mode. This means that IoT nodes provided with ATMEL modules and powered by batteries can send data to an SSI server for a very long time.

If you already have a high-performing controller in your application with an Internet-capable operating system, then you also have the possibility of using what is known as a link controller. This form is available from ATMEL as well. A link module consists essentially of the entire RF functional performance capacity in the form of one module. In this situation, however, the individual network protocol and the application need to be processed in the main processor of the application in hand.

The WiFi link module has been given the designation ATWILC1000. This involves an IEEE 802.11 b/g/n

IOT link controller, which is addressed via an SDIO interface.

The ATWILC3000 is a combined WiFi IEEE 802.11 b/g/n and Bluetooth 4.0 IOT link module, addressed via the UART or SDIO interface.

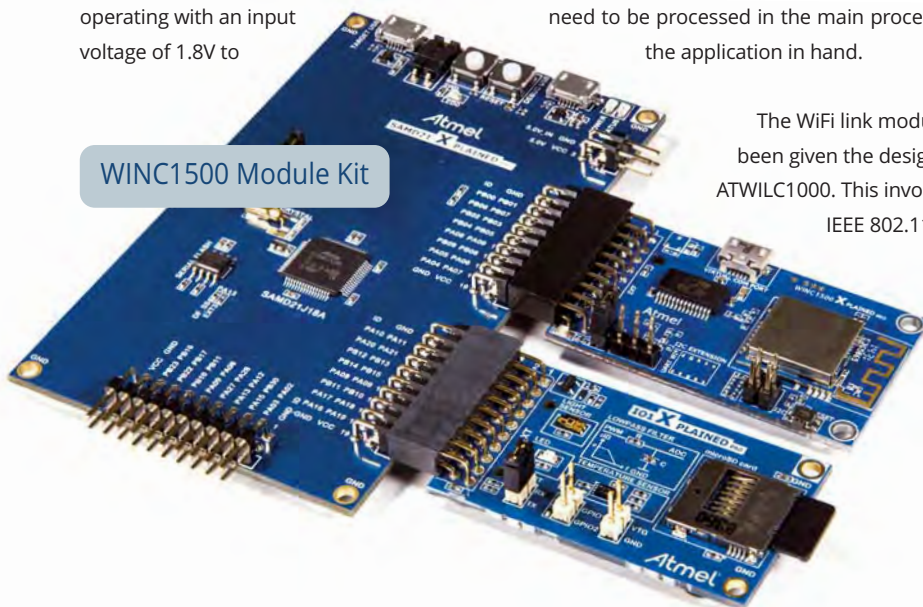
Most customers, however, are interested in a more complete solution with which the entire protocol processing is carried out in the module. In this situation, on the one hand ATMEL can offer the ATWILC1500 module, an IEEE 802.11 b/g/n IOT network controller which is addressed via UART or SPI. On the other, there is also the ATWILC3400 module, which offers IEEE 802.11 b/g/n and BT 4.0 IOT. As the interface, use can also be made here of UART, SPI, I2C or SDIO. All the modules and starter kits are available from CODICO for easy evaluation.

Contact us if you have any further questions, or just ask for additional documentation.

A06

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WINC1500 Module Kit



# POE

## PLUG&PLAY BY SILVERTEL



POE as a technology is becoming ever more widespread and popular. POE enabled devices are easy to deploy and centrally manage, and reduce installers' reliance on mains wiring and qualified electricians for the installation of mains plug points.

SILVERTEL have been making the addition of POE functionality to end devices easy for over eight years. As acknowledged experts and world leaders in POE module design, with a range spanning the highest powers available in POE modules, in multiple packages, footprints, indu-

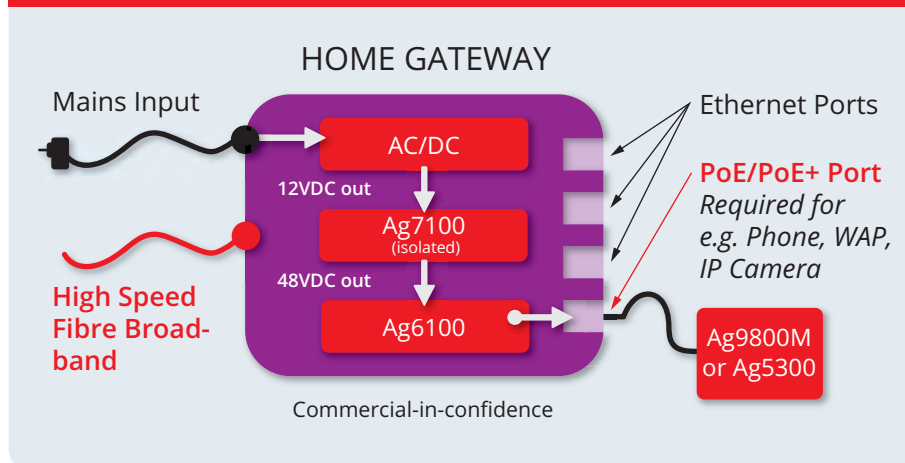
ustrial temperature options and the smallest packages available for both IEEE802.3af (PoE: 15,4W) and IEEE802.3at (PoE+: 30W) specifications.

There is now also a full range of modules to implement the POE injection or power feeding

### HIGHLIGHTS

- Wide Input Voltage Range: 11-27VDC
- Maximum rated output power: 40Watt
- Adjustable Output voltage: 48-57VDC
- Compact dimensions: 51x30x16mm (LxBxH)
- Isolation Voltage: 1,500V
- Protection: Overvoltage, Current, Temperature, High efficiency, low ripple & noise, »Plug&Play« solution

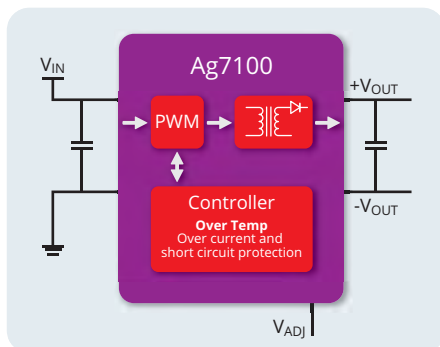
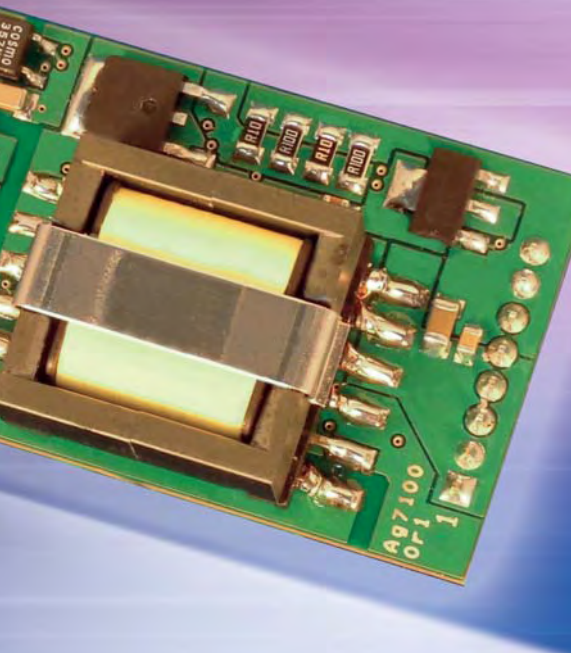
A simple example of where Ag7100 fits into new product designs can be seen below powering a PSE module (Ag6100, compliant to PoE and PoE+) supplying SILVERTEL PD modules (Ag9800, Ag5300)



function, generally known as PSE (Power Sourcing Equipment), from standard POE (IEEE802.3af) up to full 100W Power over HDBaseT modules, and for multi port designs, even a four channel 802.3at module.

All SILVERTEL PSE modules work from 48 to 57VDC which creates a problem with customers only having a 12 or 24VDC rail available, especially





when talking about battery backup. This is why SILVERTEL now launches their all new Ag7100: a standalone isolated DC/DC boost converter for 12/24V input up to 48V output in a miniature DIL footprint of only 51x30mm it is substantially smaller than many other boost converters for this power level.

The Ag7100 can be used without heatsinking in many applications. And by providing 1500V of isolation, it also makes compliance with the full IEEE POE specifications and IEC60950 safety standards straightforward.

**A07**

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Worlds Smallest Isolated IEEE802.af Compliant PoE PD Module	Ag9800	Two Bridge Rectifiers Low Cost Smoothing capacitor	M: Standard module Smallest PD solution available Low cost Class 0 operation MT: Provides Over Temperature Protection SMT package – 28mm(L) x 17.8mm(W) x 12mm(H)
	Ag9700	M & S:2 bridge rectifiers & low cost smoothing capacitor 2BR:Low cost smoothing cap (BRs are onboard) *No 3V option in SMT package(M=SMTpackage)	Very low cost isolated solution Pin compatible with Ag9400/Ag9600 Class 0 operation SIL package – 56mm(L) x 18mm(W) x 14mm(H) SMT package – 32mm(L) x 23mm(W) x 18mm(H)
	Ag9700-FL	Low cost smoothing capacitor (Bridge Rectifiers are onboard)	Industrial Temperature Over Temperature Protection Very low Ripple Output Programmable Classification Pin compatible & suggested replacement for Ag9000 SIL package – 56mm(L) x 18mm(W) x 14mm(H)
	Ag9200	Two bridge rectifiers & Low cost smoothing capacitor	High efficiency synchronous rectification Class programming capability SIL package – 56mm(L) x 18mm(W) x 14mm(H)
Isolated PoE IEEE802.3af Compliant Powered Device (PD) Modules	Ag9312	Three low cost bridge rectifiers Two low cost smoothing capacitors	Triple Input – PoE / 24VAC / 12VDC DIL package – 51mm x 30mm x 16mm Designed for use in IP Cameras
	Ag9512	No external components required	Ideal form-factor for IP cameras Class 0 operation Package size –38: 38mm x 38mm –42: 42mm x 42mm
	Ag5300	Two low cost bridge rectifiers One low cost smoothing capacitor	Compliant to IEEE 802.3at Class 4 operation (IEEE 802.3af defaults to class 0) SIL package – 57mm(L) x 14mm(H) x 18mm(W) Continuous 24W operation at 70°C -20°C
Worlds Smallest Isolated 30W PoE+ IEEE802.3at PD Module	Ag5200	Two low cost bridge rectifiers One low cost smoothing capacitor	Compliant to IEEE 802.3at Class 4 operation (IEEE 802.3af defaults to class 0) DIL package – 51mm(L) x 16mm(H) x 30mm(W) Continuous 30W operation at 50°C, -40°C lower operating temp.
	Ag5100	Two low cost bridge rectifiers Three low cost smoothing capacitors	Compliant to IEEE 802.3at Class 4 operation (IEEE 802.3af defaults to class 0) DIL package – 70mm(L) x 14mm(H) x 30mm(W)
	Ag9330	Three low cost bridge rectifiers Two low cost smoothing capacitors	IEEE 802.3af and IEEE 802.3at compliant Triple Input – PoE / 24V AC / 12V DC DIL package – 60mm x 30mm x 16mm
	Ag5500	Two low cost bridge rectifiers Three low cost smoothing capacitors	Class programming capability Packaging: Half brick – 59mm(L) x 61mm(W) x 20mm(H)
PD MODULES	Ag5610	Two low cost bridge rectifiers Three low cost smoothing capacitors	Only 88W solution available. Use with Ag6600 PSE module. Compatible with IEEE 802.3af, 802.3at, UPOE & PoH (HDBaseT) Packaging: Ag5610 – 75mm(L) x 70mm(W) x 9mm (H) Ag5600 – 61mm(L) x 59mm(W) x 19mm (H)
	Ag6100	No external components required	Compliant to IEEE 802.3af & 802.3at standards Class programming capability Industrial temperature option as standard -S only 57V input required if 60W output power from -HP SIL package – 8mm(D) x 53mm(L) x 14mm(H)
	Ag6400	No external components required	Compliant to IEEE 802.3af and 802.3at standards Class programming capability Supports hardware and software modes SIL package – 8mm(D) x 56mm(L) x 14mm(H)
PSE MODULES	Ag6600	No external components required	With Ag5610: Only 100W PoE solution available Compliant to IEEE 802.3af, 802.3at & PoH standards HDBaseT Compatible. Built-in safety features. DIL package – 51mm(L) x 35mm(W) x 7mm(H)
	Ag6100	No external components required	Compliant to IEEE 802.3af & 802.3at standards Class programming capability Industrial temperature option as standard -S only 57V input required if 60W output power from -HP SIL package – 8mm(D) x 53mm(L) x 14mm(H)

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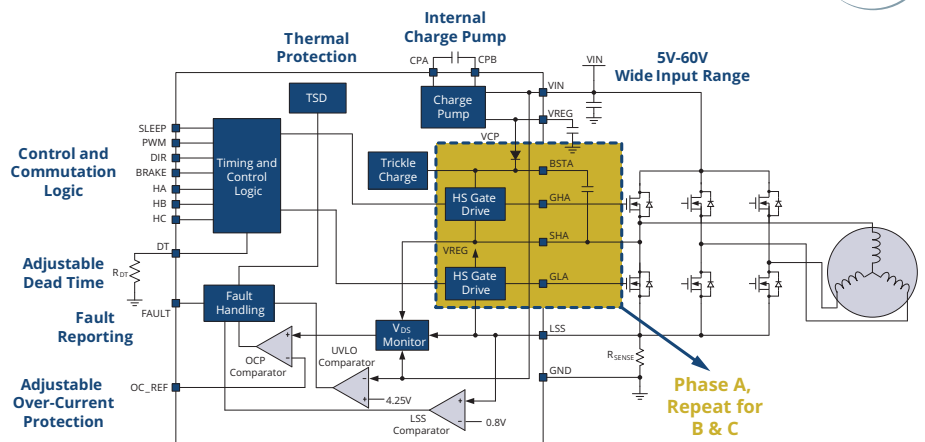
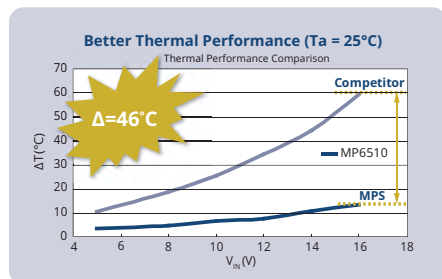
Sets every machine in motion:

# MOTOR DRIVER



Founded in 1997, MPS pioneered integrated power semiconductor solutions and power delivery architectures. Motor drivers are an area of focus for MPS.

MPS motor driver solutions offer a wide range of high-performance, cost effective, and reliable solutions for stepper motors, brushless DC motors, brushed DC motors, and solenoids. Using



industry leading semiconductor process and advanced packaging technologies, MPS motor drivers achieve highest efficiency, best thermal performance, and smallest solution size. MPS' proprietary fourth generation BCD process technology is the key to its competitive advantage.

Many conventional analog technologies are handicapped by an inability to support the integration of power devices at high power levels. This results in unacceptably large semiconductors and/or significant levels of power losses. High power loss results in significant heat dissipation.

PART NUMBER	MINIMUM SUPPLY (V)	MAXIMUM SUPPLY (V)	MAXIMUM SW VOLTAGE (V)	NUMBER OF HALF-BRIDGES	SINK/SOURCE CURRENT (A)	HALL INPUT	INTEGRATED DC/DC	PACKAGE
MP6530	5	60	60	3	1/0.8	No	No	4x4 QFN-28
MP6531	5	60	60	3	1/0.8	No	No	TSSOP-28
MP6532	5	60	60	3	1/0.8	Yes	No	4x4 QFN-28
MP6533	5	60	60	3	1/0.8	Yes	No	TSSOP-28
MP6534	5	60	60	3	1/0.8	No	Yes	5x5 QFN-40
MP6535	5	60	60	3	1/0.8	Yes	Yes	5x5 QFN-40
MP1921A	9	18	100	1	2.5/1.5	No	No	SOIC-8 EP, 3x3 QFN-8, 3x3 QFN-9, 4x4 QFN-10
MP1924	9	18	100	1	4.5/3	No	No	SOIC-8, 4x4 QFN-10



# Every inch matters!



## HIGHLIGHTS

- Single or Triple H-bridge MOSFET Pre-Drivers
- Wide Input Voltage Range
- Internal Charge Pumps
- Over-Current Protection
- Adjustable Dead Time to Prevent Shoot-Through
- Thermal Shutdown and UVLO Protection
- Thermally-Enhanced Packages

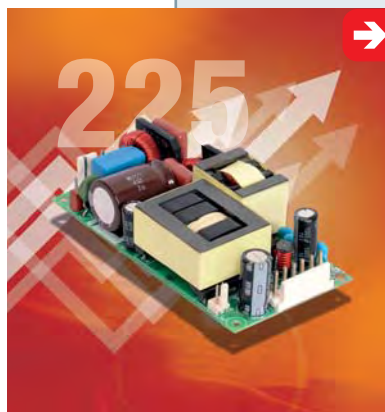
This must be managed to avoid damaging or reducing the overall performance and efficiency of the system. MPS' superior low RDSOn MOSFET integration enables high efficiency and thermal performance. A brushless DC motor is an electronically commutated motor running from a DC source. Due to its high reliability and ruggedness, it has been used in many speed control system. MPS brushless DC motor pre-drivers are designed to drive high-power brushless DC motors used in various industrial, automotive, and consumer applications such as power tools, fans, pumps, E-bikes, etc.

### MPS Advantages:

- Wide input range to support different applications
- Over-current protection increases system reliability
- Internal bootstrap charge pump supports 100% duty operation

**A08**

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The all new WLP »Low Profile« series from EOS Power embraces industry standard with minimum height.

Available in two ratings 225W (WxL: 2x4 inch; 101.6x50.8mm) and 350W (WxL: 3x5 inch; 127x76.2mm), the WLP series measures a height of only 1 inch (25.4mm). The new product line comes with industrial and medical approvals, not limited to MOOP (Means of Operator Protection, non-patient contact) but also including MOPP (Means of Patient Protection, patient contact).

**WLP series:  
Small and  
saves money**

The BF (body floating) classified product achieves efficiencies of up to 94% and is compliant to the ErP directive (2009/125/EC, standby power <0.5W). Output voltages range from 12 to 58VDC, an optional cover kit is available upon request.



A thermal shut-down feature makes the power supply inherently safe, whenever cooling fails, regardless of the power rating or cooling method. A calculated MTBF of more than 800khrs makes the versatile giant a perfect match for countless applications when every inch matters.

**A09**

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# LIGHT TRENDS

## NEW PACKAGES IN LOW- AND MID-POWER RANGES



The portfolio in the low-power and mid-power ranges from PLESSEY is now complete. The packages already available (1005, 3020, 5630) have been supplemented by these newcomers: 3014 and 3030.

**A10**

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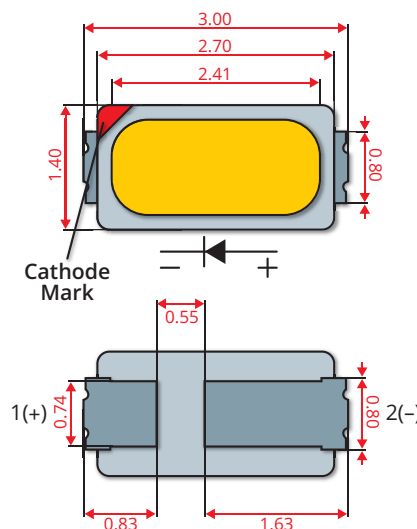
### LOW- & MIDPOWER PRODUCT OVERVIEW

PART NUMBER	PACKAGE	LUMINOUS FLUX (lm)	CCT (K)	TYPICAL VF (V)	IF (mA)
PLW13D003	1005	0.7		3,30	5
PLW114050	3020	21	2580-7040	3,25	60
PLW3014	3014	14	2600-7000	3,10	30
PLW16A120	5630	45	2580-7040	3,10	100
PLW16A200	5630	60	2580-7040	3,20	150
PLW3030	3030	155	2600-7000	6,15	150

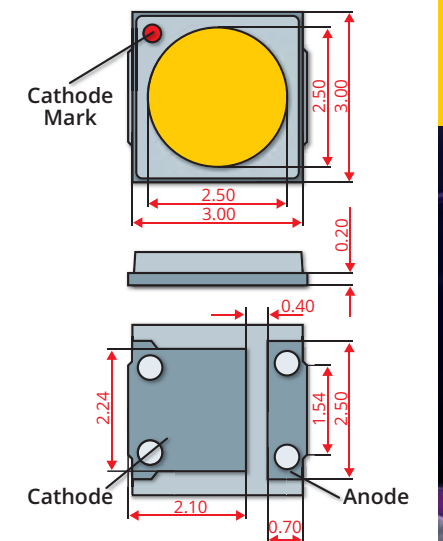
### HIGHLIGHTS

- 3014 footprint (3.0x1.4x0.8mm) or 3030 footprint (3.2x3.0x0.6mm)
- Up to 142lm/W light output or up to 160lm/W light output respectively
- High reliability PLCC packaging
- Diffused pale yellow resin
- 120° radiation angle
- ANSI binning

### PLESSEY 3014



### PLESSEY 3030





# NOW AS HIGH-POWER TOO

PLESSEY is extending its portfolio, and, in addition to the already popular low-power and mid-power packages, has recently begun to offer some interesting products in the high-power segment too.

This means that all market segments can now be excellently served, such as lighting for the architecture, shop/retail, medical, and entertainment sectors, and street lighting too, to mention just a few of the possible applications. The range extends to the following packages: 3535, 5050 and 5060. In particular, the popular 3535 package is available in all colours. Another feature, and, at the same time, an added advantage of this package is that, thanks to the convex lens and the availability of every colour in the radiation angles of 60°, 90° and 120°, there is no longer any need for secondary optics!

**A11**

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PART NUMBER	VARIANT	COLOUR	CCT/WAVELENGTH	INTENSITY	VF	@ IF	LENS ANGLE	
PLW3535Ax	PLW3535AA-C	● Cool White	4750-10000K	139 lm	3.2V	350mA	135deg	
	PLW3535AB-C						90deg	
	PLW3535AC-C						65deg	
	PLW3535AA-N	● Neutral White					3700-4750K	130deg
	PLW3535AB-N							90deg
	PLW3535AC-N	65deg						
	PLW3535AA-W	● Warm White					2600-3700K	130deg
PLW3535AB-W	90deg							
PLW3535AC-W	65deg							
PLR3535Ax-S	PLR3535AA-S	● Super Red	650-670nm	280mW	2.5	350mA	125deg	
	PLR3535AB-S						85deg	
	PLR3535AC-S						55deg	
PLR3535Ax	PLR3535AA	● Red	620-635nm	56.8 lm	2.5	350mA	125deg	
	PLR3535AB						85deg	
	PLR3535AC						55deg	
PLA3535Ax	PLA3535AA	● Amber	580-600nm	56.8 lm	2.5	350mA	125deg	
	PLA3535AB						85deg	
	PLA3535AC						55deg	
PLG3535Ax	PLG3535AA	● Green	520-535nm	87.4 lm	3.2	350mA	125deg	
	PLG3535AB						90deg	
	PLG3535AC						65deg	
PLC3535Ax	PLC3535AA	● Cyan	500-520nm	80.6 lm	3.2	350mA	125deg	
	PLC3535AB						90deg	
	PLC3535AC						65deg	
PLB3535Ax-R	PLB3535AA-R	● Blue	455-470nm	30.6 lm	3.2	350mA	125deg	
	PLB3535AB-R						90deg	
	PLB3535AC-R						65deg	
PLB3535Ax-L	PLB3535AA-L	● Royal Blue	440-460nm	520mW	3.2	350mA	125deg	
	PLB3535AB-L						90deg	
	PLB3535AC-L						65deg	

## HIGH POWER PRODUCT OVERVIEW

3535 SINGLE COLOURS	3535 WHITE	5050 WHITE	5050 MULTI-COLOR	5060 MULTI-COLOR
● 440-460nm, 520mW	● 2600-3700K, 139lm	● 2600-3700K, 645 lm, 13V	● 620-630nm, 97lm	● 620-635nm >45 lm
● 455-470nm, 31lm	● 3700-4750K, 122lm	● 3700-4750K, 680lm, 13V	● 515-535nm, 173lm	● 520-535nm >95lm
● 500-520nm, 81lm	● 4750-10000K, 114lm	● 4750-10000K, 885lm, 13V	● 455-470nm, 32lm	● 450-460nm >600mW
● 520-535nm, 87lm		● 4750-10000K, 300 lm, 3.2V	● 585-595nm, 105lm	● 585-595nm >45lm
● 580-600nm, 57 lm			● 620-630nm, 97 lm	● 620-635nm >45 lm
● 620-635nm, 57 lm			● 515-535nm, 173 lm	● 520-535nm >95lm
● 650-670nm, 280mW			● 455-470nm, 32 lm	● 450-460nm >600mW
			● 5000-7000K, 200 lm	● 6000-7000K >140lm

# ISABELLENHÜTTE

## AT A GLANCE

### Quality & Technology

To achieve the greatest possible manufacturing depth in the value-adding processes, the different production sectors interact with one another in a way that may indeed be unique anywhere in the world. Thanks to the concentration of all the production stages, from the melt to the rolling mill, the complete manufacture of the component elements and measurement modules, and right up to final testing, at one location, a flexible and completely independent production becomes possible, and this enables ISABELLENHÜTTE to provide the finest quality, always, with complete control over development, production, quality management, and quality assurance. All the series of products meet the most stringent requirements with regard to thermoelectric force, long-term stability, inductivity, and load capacity.

The quality management system is implemented in accordance with the Standards DIN EN ISO 9001:2008 and ISO TS 16949:2009. ISABELLENHÜTTE is also certified in accordance with the ESCC System of the European Space Agency (ESA), which awards them the status of »qualified supplier« of resistors for aerospace applications.

### Research & Development

For decades, ISABELLENHÜTTE has been providing unconditional quality and innovative solutions. And to guarantee that this continues so in the future, and to stay always one step ahead of the competition, ISABELLENHÜTTE consistently welcomes new challenges.

True to the motto »Acting instead of Reacting«, the Research and Development department has

### ISABELLENHÜTTE Heusler GmbH & Co. KG

ISABELLENHÜTTE is an independent family business from Germany with sustained profitable growth. And the highly qualified and dedicated staff really enjoy keeping the company on top. The firm is among the most significant manufacturers of electrical resistance materials and thermoelectric materials for temperature measurement, as well as of passive components for the automobile, electrical, and electronics industry.

Precision measurement technology sets new standards in the measurement of current, voltage, and temperatures in cars and trucks, in hybrid and electric vehicles, and in renewable energy generating systems. In close co-operation with customers, ISABELLENHÜTTE develops new materials, products, and innovative solutions, while helping to set worldwide standards in current, voltage, and temperature measurement technology.





always occupied a very special position within the company. In this context, it is often very specific individual problems from the customers which provide the incentive for a new development, and so become the foundation for innovative solutions for an entire market segment.

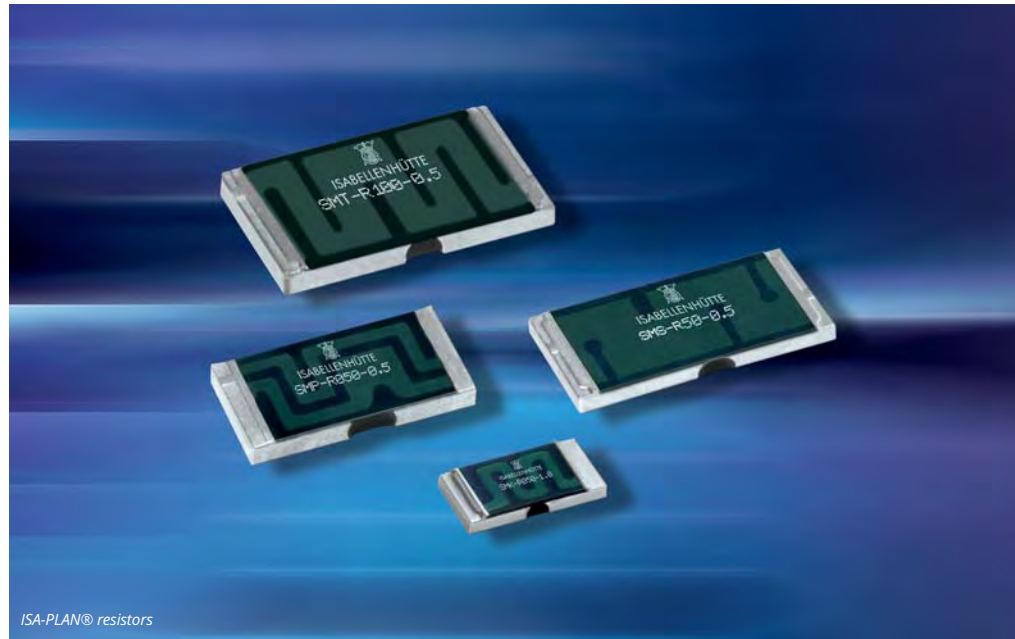
## Product portfolio

As one of the world's leading suppliers, ISABELLENHÜTTE produces top quality precision and power resistors in the low-resistance range for the most widely differing requirements. When the need is to achieve the best possible measurement results in the smallest possible space, we have the best possible products for your applications.

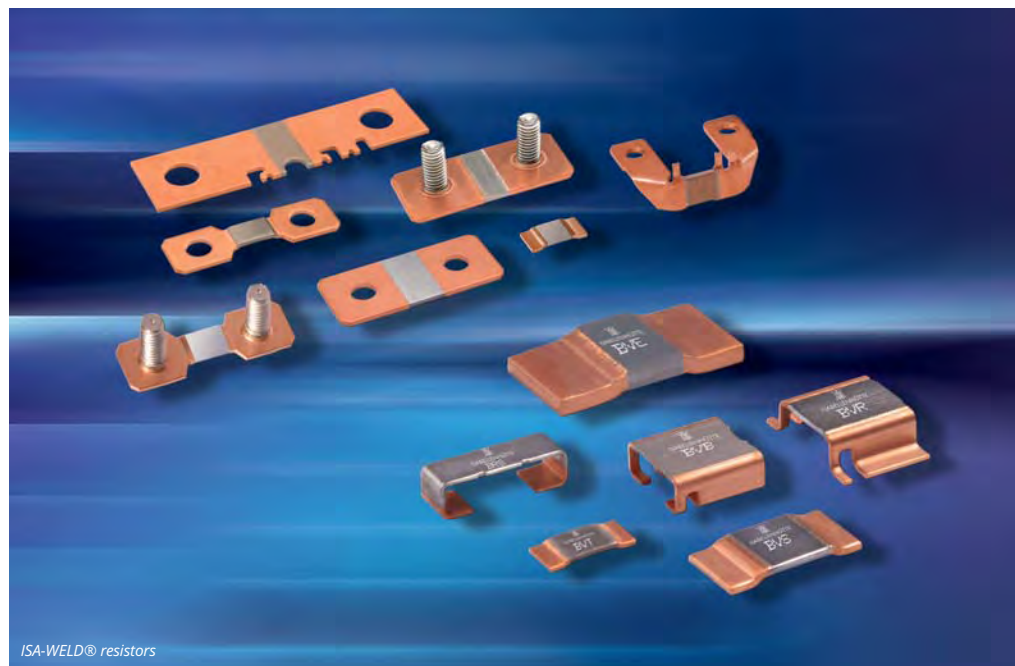
Products from ISABELLENHÜTTE fulfil the most stringent demands for temperature coefficients (TC), thermoelectric voltage, long-term stability, inductance values, and load capacity. Because these properties are influenced both by the resistance materials used as well as by the design and technology, there are two fundamentally different manufacturing technologies to choose from: ISA-PLAN® and ISA-WELD®.

**ISA-PLAN® resistors** are manufactured from etched homogeneous precision resistance alloys, such as MANGANIN® or ZERANIN®. These are mounted, electrically isolated, on a thermally conductive metal substrate. Because the materials have a low temperature coefficient of less than 10ppm/K, and can be thermoelectrically optimally adapted to copper, thermoelectric voltages can be reduced close to zero. In addition, the good heat dissipation into the substrate, combined with its high thermal capacity, make for an excellent pulse load capacity.

**ISA-WELD® resistors** are manufactured from solid electron-beam welded composite material formed from copper and resistance alloys, such as MANGANIN®, ZERANIN®, ISAOHM® or Aluchrom. In terms of stamping and bending technology, the resistors can be adapted to almost any shape or application. Added to these features are many other advantages, such as the comparatively low lead resistance of the copper connections, their high thermal conductivity and heat storage capacity, and the resulting uniform current density and heat distribution in the resistor. They are particularly well-suited for the



ISA-PLAN® resistors



ISA-WELD® resistors

extremely low-resistance range below 5mOhm. ISA-WELD® components are available in both SMD format as well as for power busbar mounting.

## Applications & Markets

Precision and power resistors from ISABELLENHÜTTE are always in demand where quality is essential and needs to satisfy standardized as well as unique requirements. In the automotive sector in particular, these products are used in the most widely differing systems. These include, for example, engine control, injection systems, or driving assistance and energy management

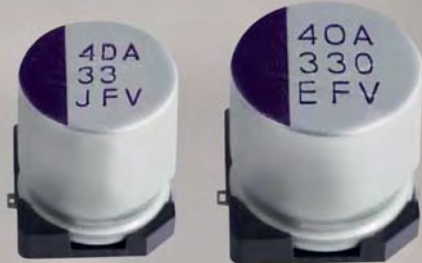
systems, as well as applications such as ignition, lighting systems, water pumps, transmissions, and locking systems.

In industrial and power electronics too, energy measurement, telecommunications, and medical technology, resistors from ISABELLENHÜTTE form the »inner values« that really count. In drive systems they are used, among other areas, in frequency inverters, high-current applications, PFC circuits, power modules, and as precharging resistors for power supply units.

P01

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# Aluminium-Hybrid Electrolytic Capacitors from RUBYCON



For 2015 RUBYCON presents an aluminium-polymer electrolytic capacitor as a hybrid version.

The particular feature of these capacitors, an in-house development, is the combination of functional liquid and highly-conductive polymer. Thanks to this, in comparison with conventional aluminium electrolytic capacitors, ESR values are low and ripple current capability is high, and all in compact case sizes. Another effect of the polymer is that the ESR is almost stable over the whole temperature range. The wounded internal structure in this context corresponds to that of electrolytic capacitors. Currently there is one series »PFV« available, with a temperature range from -55°C to +125°C, a guaranteed life time of 4,000 hours at 125°C, and full ripple current. Further specifications are shown in the following table:

VOLTAGE (V)	CAPACITANCE (uF)	DIMENSIONS DxH (mm)	ESR (mOhm max @20°C/100kHz)	Ripple current (mA @125°C/100kHz)
25	220	8x10.5	27	1600
25	330	10x10.5	20	2000
35	150	8x10.5	27	1600
35	270	10x10.5	20	2000
50	68	8x10.5	30	1250
50	100	10x10.5	28	1600
63	33	8x10.5	40	1100
63	56	10x10.5	30	1400

For more details, samples, or a quotation, please don't hesitate to contact us.

P02

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**NEW**

## Focus products:

### HGX (THT)

- Temperature range -40°C to +150°C
- Capacitance range 1.200uF to 6.800uF
- Voltage range 25V, 35V



As one of Japan's leading manufacturers of Al-electrolytic capacitors, RUBYCON provide solutions for more than just industrial applications, fitted exactly to your requirements.

Also for automotive there are special series available; with extended temperature ranges, high ripple-current capability, and high capacitance values in miniaturized case sizes. And a corresponding guaranteed life time is provided as well.

In close co-operation with the engineers at RUBYCON, we develop a solution that really fits to your needs. So please don't hesitate to contact us if you can't find exactly what you need in the datasheets. The components are of course certified in accordance with AEC-Q200 and TS16949.



# RUBYCON E-CAPS FOR AUTOMOTIVE

The new RUBYCON Automotive Catalogue is available on:  
[www.codico.com/en/news/latest-news/detail/artikel/rubycon-7](http://www.codico.com/en/news/latest-news/detail/artikel/rubycon-7)

## HGV (SMD)

- Temperature range -40°C to +150°C
- Capacitance range 2.000uF to 3.900uF
- Voltage range 25V, 35V



## JXC (THT)

- Temperature range -55°C to +105°C
- Capacitance range 390uF to 5.100uF
- Voltage range 25V, 35V



## HBX (THT)

- Temperature range -40°C to +125°C
- Capacitance range 30uF to 62uF
- Voltage range 250V



## HGX (THT)

VOLTAGE (V)	CAPACITANCE (uF)	DIMENSIONS DxL (mm)	RIPPLE CURRENT (mA@135°C/100kHz)	RIPPLE CURRENT (mA@125°C/100kHz)	ESR (Ohm@20°C/100kHz)	GUARANTEED LIFETIME @135°C AND FULL RIPPLE CURRENT (h)
25	1600	12.5x20	2060	2870	0,046	3000
25	6800	18x30	3720	5190	0,020	3000
35	2200	12.5x30	3130	4370	0,027	3000
35	3900	16x30	3500	4880	0,020	3000

## HGV (SMD)

VOLTAGE (V)	CAPACITANCE (uF)	DIMENSIONS DxL (mm)	RIPPLE CURRENT (mA@135°C/100kHz)	RIPPLE CURRENT (mA@125°C/100kHz)	ESR (Ohm@20°C/100kHz)	GUARANTEED LIFETIME @135°C AND FULL RIPPLE CURRENT (h)
25	3000	16x20	2320	3240	0,034	3000
25	3900	18x20	2490	3470	0,033	3000
35	2000	16x20	2320	3240	0,034	3000
35	2700	18x20	2490	3470	0,033	3000

## JXC (THT)

VOLTAGE (V)	CAPACITANCE (uF)	DIMENSIONS DxL (mm)	RIPPLE CURRENT (mA@105°C/100kHz)	ESR (Ohm@20°C/100kHz)	GUARANTEED LIFETIME @105°C AND FULL RIPPLE CURRENT (h)
25	3900	18x25	2790	0,022	8000
25	5100	18x30	3240	0,019	8000
35	2700	16x30	3060	0,019	8000
35	3300	18x30	3240	0,019	8000

## HBX (THT)

VOLTAGE (V)	CAPACITANCE (uF)	DIMENSIONS DxL (mm)	RIPPLE CURRENT (mA@125°C/100kHz)	GUARANTEED LIFETIME @125°C AND FULL RIPPLE CURRENT (h)
250	30	12.5x20	1100	3000
250	62	10x50	2180	3000

Contact us,  
and tell us exactly  
what you need.

P03

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### LR Series

- Low profile (width: 5mm)
- Variants for horizontal mounting
- High rating of 8 Ampere
- NO, NC and CO version
- Coil voltage from 3 Volt, sensitive coil with 170mW
- AgSnO contact material for inrush loads, gold-plated contacts on request
- Minimum of 8mm clearance and creepage distance
- Socket mountings for use in cabinets



### JE Series

- Low profile (height: 10.5mm)
- Footprint requiring only 200mm<sup>2</sup>
- High rating of 8 Ampere
- NO and CO version
- Coil voltage from 3 Volt, sensitive coil with 200mW
- AgSnO contact material for inrush loads, optional gold-plated contacts
- Minimum of 5.5mm clearance and creepage distance
- Plastics in accordance with IEC 60335-1 on request
- Fully automatic production line



### GQ Series

- Footprint requiring only 180mm<sup>2</sup>
- NO version with 10 Ampere rating
- AgSnO + indium contacts, very effective for inrush loads - TV5 rating
- Coil voltage from 3 Volt, sensitive coil with 200mW
- Minimum 5.5mm clearance and creepage distance
- UL rating of 100,000 switching cycles at 10A/250VAC and 105°C ambient temperature
- Plastics in accordance with IEC 60335-1 on request
- Fully automatic production line

# PROBLEMS WITH SPACE?



### SJE Series

- Footprint requiring 200mm<sup>2</sup>
- Rating up to 10 Ampere
- NO version (pin-compatible with JE Series) and CO version
- Coil voltage from 3 Volt, coil capacity 200mW, 400mW or 450mW
- Minimum 5.5mm clearance and 8mm creepage distance (NO version)
- VDE rating of 60,000 switching cycles at 10A/250VAC and 105°C ambient temperature
- TV5 rating
- Plastics in accordance with IEC 60335-1 optional



### SRB Series

- Mounting width only 7.0mm; footprint requiring only 144mm<sup>2</sup>
- NO version with 5 Ampere rating
- Coil voltage from 5 Volt, coil sensitivity of 200mW or 360mW
- 4kV coil-to-contact dielectric strength
- VDE rating of 80,000 switching cycles at 5A/250VAC and 85°C ambient temperature
- TV3 rating
- Plastics in accordance with IEC 60335-1 optional



# PANASONIC Polymer-Cap News



PANASONIC have extended their product spectrum of aluminium-polymer-capacitors »SP-Caps« with regard to voltage and temperature range

Panasonic

The CS, CT and CX series, which differ in their case heights, are now available as 35V versions. In addition no voltage derating has to be considered. The capacitance range is from 10uF to 22uF.

SERIES	VOLTAGE (V)	CAPACITANCE (uF)	CASE HEIGHT(mm)	RIPPLE CURRENT (mA@100kHz/+45°C)	ESR (mOhm @100kHz/+20°C)
CS	35	10	1,1	3200	40
CT	35	15	1,4	3200	40
CX	35	15	1,9	3200	40
CX	35	22	1,9	3200	40

Completely new – the »HX« series, with a temperature range from -55°C to +125°C. With this type, PANASONIC is targeting applications with peak temperatures of up to 125°C, and such with high requirements to life time.

- Voltage range: 2V-25V
- Capacitance range: 15uF-560uF
- Ripple current: up to 8.500mA at 45°C
- ESR: down to 4,5mOhm at 20°C

As perfect addition to the new SP-caps PANASONIC have also introduced a new series among the POSCAPs. The versions TCE and TCF are designed for a temperature range of -55°C to +125°C, and provide higher capacitances (up to 1.000uF) and a bigger selection of CV-values. Please don't hesitate to contact us for datasheets, samples, or a quotation.

P05

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GOODSKY

GOODSKY

In modern designs, the space available for components is often very limited. That means developers are increasingly looking for components with small footprint or low-profile.

Let us introduce some selected products from our suppliers GOODSKY and SANYOU, which are right in line with this trend.

These relays are used in a whole range of industries, from building automation, to white goods, to machine and industrial controls. Typical applications are use in actuators in wall sockets, relays in heating systems, time and monitoring relays, interface modules, and cabinets.

The series mentioned are all VDE and cULus listed.

P04

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SANYOU

SANYOU



NEW

MURATA announces the launch of its BNx series of surface mount, LC combined-type EMI suppression filters for the automotive, industrial electronics, and healthcare markets. The filters employ an exclusive circuit configuration combining capacitors and ferrite beads to achieve superior frequency characteristics and excellent attenuation characteristics for highly effective noise damping.



# NEW EMI-FILTER

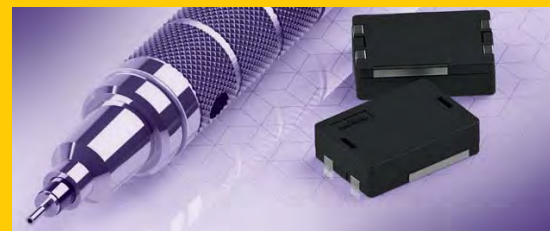
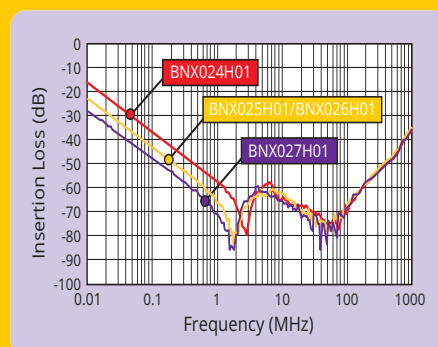
In recent years, the trend toward more sophisticated functionality in set devices has intensified the need to reduce noise levels and this has driven the demand for noise filters with improved attenuation characteristics. In response to this market demand, MURATA has developed the BNx026/27/28/29 series of EMI suppression filters that deliver high attenuation characteristics over a wider bandwidth range.

The new series of DC line noise filters cover a wide range of frequencies, from the kilohertz to the gigahertz bands. The filters are also compatible with large currents and high voltages, making them suitable for a broad range of applications. Insertion loss characteristics enable high attenuation rates of 35dB or more over a wide range from 15kHz to 1GHz.

BNx filters with a current rating of 15A are ideal for power supply circuits susceptible to low-frequency-band noise, whilst parts with a voltage

rating of 50V (BNx026H01 and BNx027H01) are suitable for automotive applications requiring support for high voltages.

MURATA's BNx series of EMI filters are suitable for noise reduction on DC power lines in electronic equipment, automobiles, medical equipment, factory automation equipment, control equipment, communication equipment, digital AV equipment, and other applications. Mass production is currently underway at plants in Japan.



## Features

- Insertion loss characteristics enable high attenuation of 35dB or more over a wide range from 15kHz to 1GHz
- Products with a current rating of 15A are ideal for power supply circuits susceptible to low-frequency-band noise
- Products with a voltage rating of 50V (BNx026H01 and BNx027H01) are suitable for automotive applications requiring support for high voltages

P06

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# SPACE-SAVING

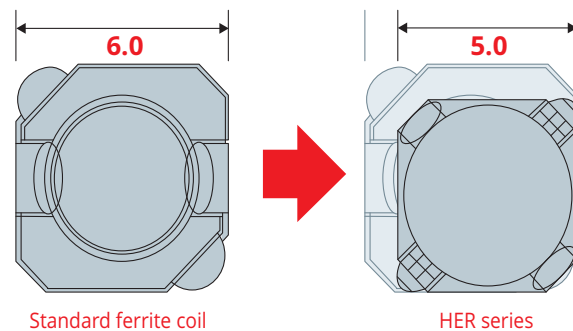
## Hybrid Power Inductors from SAGAMI

For years, the performance of SAGAMI power choke inductors are characterized as high-quality and reliable components, particularly well-suited for automotive and industrial applications.

In addition to the standard series 7E and the 150°C CER, SAGAMI introduced the first SMD hybrid version »HER« to the market. The HER series units are made of a special ferrite mixture composed of the ferrite materials manganese-zinc and nickel-zinc. Because of this special material composition, higher rated currents and more compact design arrangements can be achieved in comparison with conventional ferrite cores. Setting in relation the rated current values of the two series 7E and CER, the outcome confirms that the HER series are higher by 20% and 40%. This means, there are two very relevant advantages namely weight and space savings.

Let's not forget the high inductance values of the hybrid version. While with conventional iron powder cores the maximum values go up to 12µH, the HER series achieves about 820µH. This new product design means the chokes are smaller but have a much higher performance in capacity. These two main characteristics offer an innovative solution for applications where space is limited.

**MINIATURIZATION**  
30% space saving with equal or higher current!



The hybrid series is available in the following sizes: 8x8mm, 10x10mm, and 12x12mm with possible heights from 4.5mm up to 8mm. The inductance range is specified between 1µH and 820µH with a saturation current value from 1.5A up to 26.3A. Smaller dimensions are already in construction and will be available in near future (mid of 2015).

P07

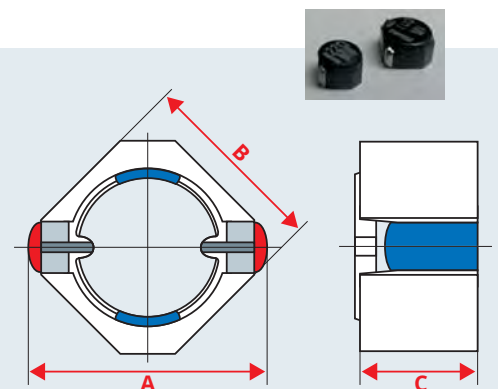
► Selma Jakupovic, +43 1 86305 127  
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### HIGHLIGHTS

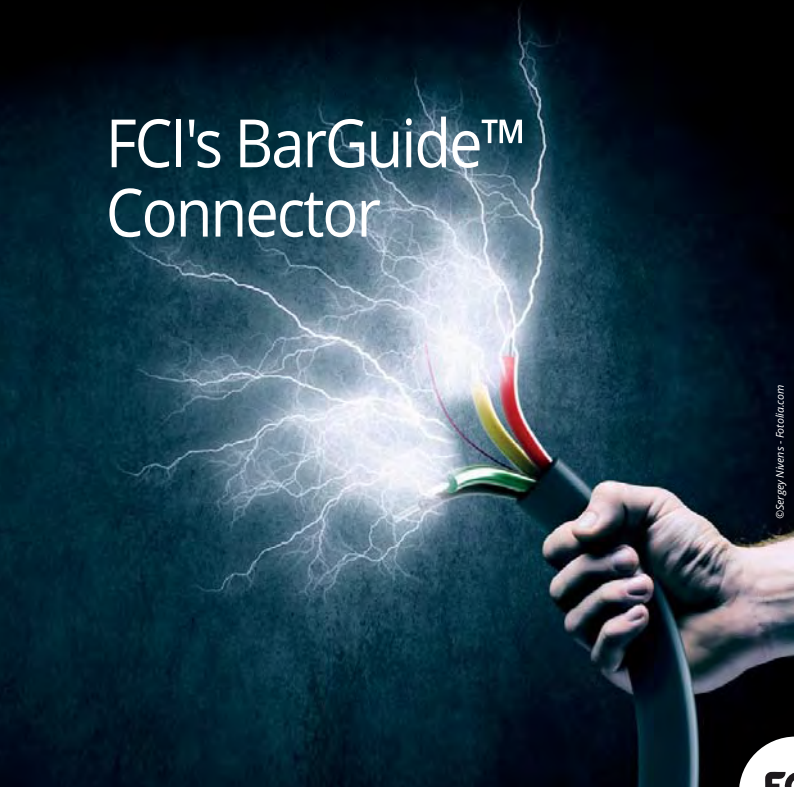
- Higher allowable current characteristics
- Weight and space savings
- Various choices in height
- 8mm and 10mm size meets the requirements of AEC-Q200
- AEC-Q200 qualification for the remaining types is planned
- SMD version
- Temperature range -40°C to +125°C

### Overview of the several types:

TYPE NAME	A	B	C	INDUKTIVITÄT (µH)	DC SATURATION ALLOWABLE CURRENT (A)	TEMPERATURE RISE ALLOWABLE CURRENT (A)
HER8042	11.3 max.	8.0 ±0.3	4.5 max.	1.0 ~ 33	3.56 ~ 20.6	1.32 ~ 7.00
HER8065			6.8 max.	1.1 ~ 100	2.47 ~ 22.0	1.00 ~ 7.1
HER1042	14.1 max.	10.0 ±0.5	4.5 max.	1.5 ~ 82	2.50 ~ 18.7	1.15 ~ 7.70
HER1065			6.8 max.	1.5 ~ 270	1.92 ~ 24.2	0.83 ~ 9.10
HER1242	16.9 max.	12.0 ±0.5	4.5 max.	2.0 ~ 150	2.52 ~ 20.7	1.00 ~ 9.90
HER1257			6.0 max.	2.7 ~ 330	2.10 ~ 22.7	0.82 ~ 8.80
HER1277			8.0 max.	2.0 ~ 820	1.5 ~ 26.3	0.65 ~ 9.60
TYPE NAME	A	B	C	INDUKTIVITÄT (µH)	DC SATURATION ALLOWABLE CURRENT (A)	TEMPERATURE RISE ALLOWABLE CURRENT (A)
HER3027	4.6 max.	3.0 ±0.2	3.0 max.	1.0 ~ 68	0.35 ~ 2.85	0.35 ~ 2.60
HER4027	6.1 max.	4.0 ±0.3	2.9 Typ.	0.82 ~ 100	0.40 ~ 4.20	0.36 ~ 3.50
HER5027	7.5 max.	5.0 ±0.3	2.9 Typ.	0.82 ~ 180	0.35 ~ 6.10	0.37 ~ 5.30
HER6027	9.0 max.	6.0 ±0.3	2.9 Typ.	0.82 ~ 470	0.3 ~ 7.20	0.3 ~ 6.70



# FCI's BarGuide™ Connector



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FCI announces the release of the BarGuide™ Power Connectors.

The BarGuide™ connectors are developed to meet the ever evolving demands for high power distribution in high density packaging and they are used to provide high amperage connections between busbars and circuit boards. BarGuide™ connectors provide a current carrying capability from 60-250Amps, based on specific pins' size. They are available with press fit PCB tails for mounting on both circuit boards and busbars and come in vertical and right angle designs that can provide parallel or perpendicular interconnections.

BarGuide™ connectors provide a high current, low power loss interconnection with a quick connect/disconnect function for space constrained board to board, board to busbar, and busbar to busbar power distribution applications.

These connectors use a high performance spring which provides a large surface contact area, thus ensuring small voltage loss, minimum heat generation, and low insertion and extraction forces. FCI's proprietary AGT™ plating technology adds an additional benefit to customers by providing maximum conductivity and long-term reliability.

Reliable:  
FCI's new  
BarGuide™  
Connector

S01

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# CODICO UNVEILS:

## The Minitek Pwr™ Hybrid Wire-to-Board Connectors

FCI, a leading supplier of connectors and interconnect systems, announces the launch of its innovative Minitek Pwr™ Hybrid 3.0 & Minitek Pwr™ Hybrid 4.2 connectors.

Augmenting the Minitek Pwr™ family, the new Hybrid series has an improved and flexible modular design over traditional power connectors. Both the 3.0 and 4.2 configurations are available for dual row and 2 to 24 power circuits, and 2 to 12 signal for Wire-to-Board applications. Crimping and removal tools are available for wire harness assemblies. Vertical Wave soldering headers are available in through-hole configurations.

The Minitek Pwr™ Hybrid 3.0mm and 4.2mm allows the flexibility of selecting the number of pins, and the placement of Power and Signal contacts, making it highly configurable for varying power needs.

It is backward mat-able with traditional 3.0mm/4.2mm power connectors if the signal pin is



# FCI's PwrBlade+™ Cable Connectors

FCI presents new members of its PwrBlade product family = PwrBlade+™ cable connectors!

Rated at 60Amps per contact and capable of terminating the widest range of wires in one housing, 26AWG-6AWG, the PwrBlade+™ cable connectors offer flexibility to meet a wide variety of customer needs. The connectors come in both cable-to-cable and cable-to-board solutions. The cable connectors are offered in either panel mount or free hanging designs. The new slide to lock (STL) panel mount design saves on installation, material, and labor costs by eliminating hardware.

The available wire range is 10AWG-6AWG for high power, 16AWG-12AWG for low power, and 26AWG-22AWG for signal allowing users to select the appropriate connector and contact arrangements to meet their application needs. The PwrBlade+™ Cable is designed to operate between -40°C and 125°C.

## Outstanding highlights are:

- Lower contact resistance
- 30% more current carrying capacity (compared to PwrBlade)
- Larger wire size capability up to 13mm<sup>2</sup>, 6AWG (to use fewer wires, occupy less space)
- New Low Power contacts – save space for lower current requirements
- Housing ventilation
- appropriate arrangement of contacts

The PwrBlade+™ Cable Connectors provides a flexible, low cost solution in applications such as telecommunication switches, high-end servers, and hot swappable power supplies.

S03

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## Minitek Pwr™ Hybrid Series

taken out of the design. In addition, it has a compact design and clear identification for cable harness termination. The signal pin design in the centre of the connector allows better heat dissipation, thereby enhancing current rating capability.

The Minitek Pwr™ Hybrid 3.0 is designed for power applications with current ratings of up to 5A per contact. Its crimp and snap-in receptacles are used to terminate AWG 20 to 30 wires. The Minitek Pwr™ Hybrid 4.2 is manufactured for high-current and high-density applications, and supports up to 9A per contact. Its crimp and snap-in receptacles are used to terminate AWG 16 to 30 wires.

Similar to the Minitek Pwr™ series, the Hybrid series features fully isolated terminals to prevent them from potential damage during operation, scoop-proof housings to ensure terminals are not compromised during angled mating, and a high retention force to secure terminals in their housings.

Target applications include Consumer, Industrial & Instrumentation, Data and Communications.

S02

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## New members in the PwrBlade product family: PwrBlade+™



# RJ45 PRODUCTS FOR THE INDUSTRY

## Tool-Free Field Assembly Plug Category 6A



Our new product member within the enhanced Y-ConRJ45 series is called Y-ConProfixPlug. One of YAMAICHI Electronics' goals during the development was to create a RJ45 connector which is able to transmit 10G Base-T, easy to handle and fulfils the stringent Category 6A according to the ISO/ IEC 11801 standard.

### Tool free assembly

The tool-free and robust IP20 plug offers features which are unique on the market. The field assembly is easy and does not require any kind of special tool.

### Smallest plug available on the market

The dimensions of the Y-ConProfixPlug are the smallest of all available plugs on the market. Even in rows or clusters the plug fits into every RJ45 multiport jack.

### Unique integrated power contacts

Also a unique feature is the power transmission of up to 3.1A over the special integrated power contacts while being fully compatible with the standard RJ45 connections. YAMAICHI Electronics offers the plug with optional additional power contacts. So the customer has the full flexibility to choose.

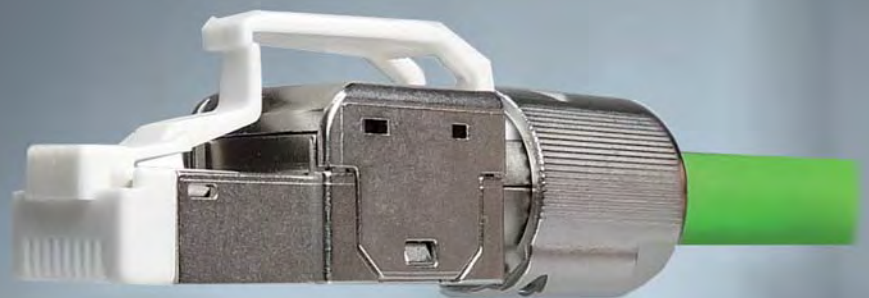
Regarding the cable dimensions, the Y-ConProfixPlug supports different outer cable dimensions as well as different wire types. The connector

is designed in such a way that it can be reused up to 5 times with different AWG and diverse types such as solid and stranded wires.

All these and many more features make the Y-ConProfixPlug a reliable connector for all industrial areas.

## HIGHLIGHTS

- Category 6A acc. ISO/ IEC 11801 standard
- Wire connection: IDC contacts
- Current rating: 3.1A @ 70°
- Durability: 1,500 mating cycles
- AWG 22-27 solid wire
- AWG 24-27 stranded wire
- Optional power contacts
- Reusable up to 5 times
- Tool-free assembly
- Supporting outer cable dimensions from 6.8mm up to 9.5mm





## Industrial RJ45 Jack Category 6A

A new highlight component for industrial RJ45 connectivity is the Y-ConJack-6\* series. This new category 6A (Cat 6A) jack enhances the Y-ConRJ45 product range from YAMAICHI Electronics.

The new RJ45 Y-ConJack-6\* series is designed to transmit 10G Base-T and fulfils the stringent Cat 6A ISO/ IEC 11801 standard. Furthermore the series is the first Cat 6A tab-down variant on the market.

These variants are designed to perfectly fit together with our new Y-ConPrefixPlug-6\* and also with all other RJ45 plugs available on the market.

As an optional feature YAMAICHI Electronics offers two light pipes and also two separate power contacts which are additionally integrated and able to transmit up to 3.1A at 70°C.

Compared to YAMAICHI Electronics' Cat 5 jacks the power transmission capability was increased of more than 45%. These are only some of the features which are offered by the new Y-ConJack-

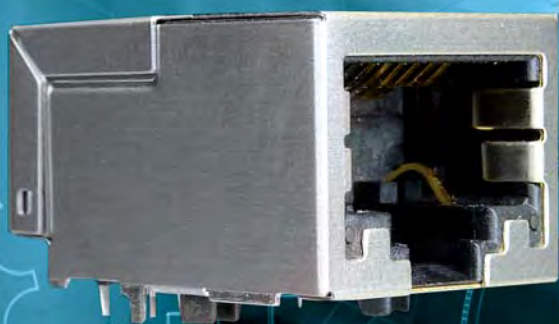
6\*. With the new Y-ConJack-6\* series your industrial systems are prepared for the future.

504

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### HIGHLIGHTS

- Category 6A acc. ISO/ IEC 11801 standard
- Reflow capable max. 260°C/10sec
- Power contacts current rating: 3.1A at 70°C
- Tab-down version
- Durability: 1,500 mating cycles
- Optional light pipes
- Optional power contacts
- Orientation: 90°





# EZ-SHIELD CANS

Standard & individual dimensions, Low Profile & more!

Suitable for the product range of EZ-BoardWare and especially for EZ-BoardWare RFI Shield Can Clips (see picture 1) HARWIN developed RFI Shield Cans (see picture 2).

They offer protection to sensitive circuitry at PCB level against electro-magnetic and radio frequency interference (EMI and RFI). All shield cans were designed and developed to be used with EZ-BoardWare RFI Shield Can Clips.

The clips can be part of the automatic pick and place process and can be soldered in SMT soldering process. The cans are mounted after soldering process by simply pushing them into the surface mount clips so installation costs are minimized. To mount them after soldering profile ensures a uniform thermal process across the PCB during component soldering. Nevertheless the clips ensure secure can retention, resistant to shock and vibration!

An additional advantage is easy removal and replacement – ideal when adjustment, repair and maintenance is required (cost saving).

Small demands (prototypes) & individual dimensions = EZ-Shield Can Set S01-806005KIT (see picture 3). This kit is the perfect solution for small demands (such as prototypes) and if special dimensions are required.

### One kit contains:

- 2 pre-scribed screens (80x60x0.30mm, etched lines in pitch 5mm, Nickel Silver material)
- 24 Shield Can Clips
- IS-39 Instruction sheet

Along those etched lines screens can be cut and folded easily to achieve an individual design!

### Standard RFI Shield Cans with defined dimensions:

Can be used for serial production or for all applications meeting standard dimensions.

Standard RFI Shield Cans are available in heights 5mm, 3mm and 2.5mm (low profile):

- S01-30200500: 30x20x5mm
  - S01-30300500: 30x30x5mm
  - S01-30250500: 50x25x5mm
- All S01 Cans are Nickel Silver with 0.30mm thickness*

- S02-20150300: 20x15x3mm
  - S02-25200300: 20x15x3mm
  - S02-30200300: 20x15x2.5mm
- All S02 Cans are Nickel Silver with 0.20mm thickness.*

### Individual RFI Shield Cans for series production (high demands):

It is possible to offer shield cans with individual dimensions. In this case please send us your requirements and your demands and we will check our possibilities.

S05

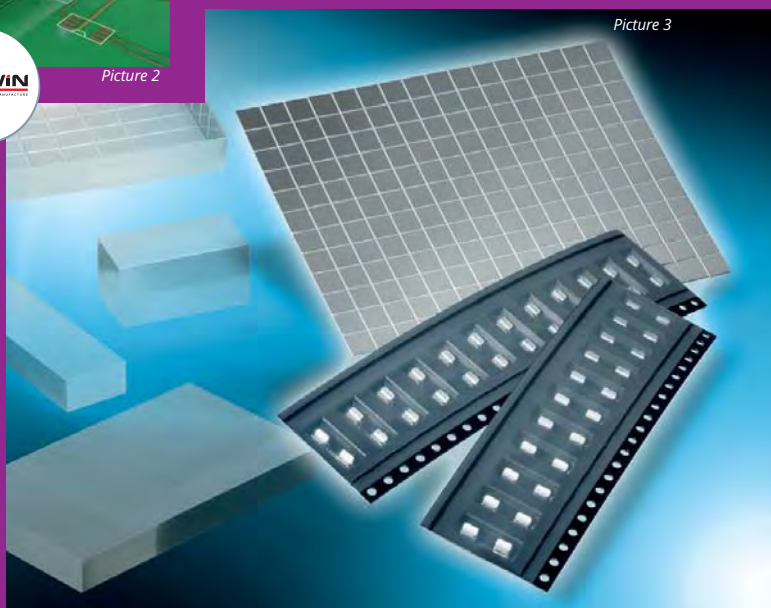
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Picture 1



Picture 2

Picture 3





# MORE EZ-BOARDWARE

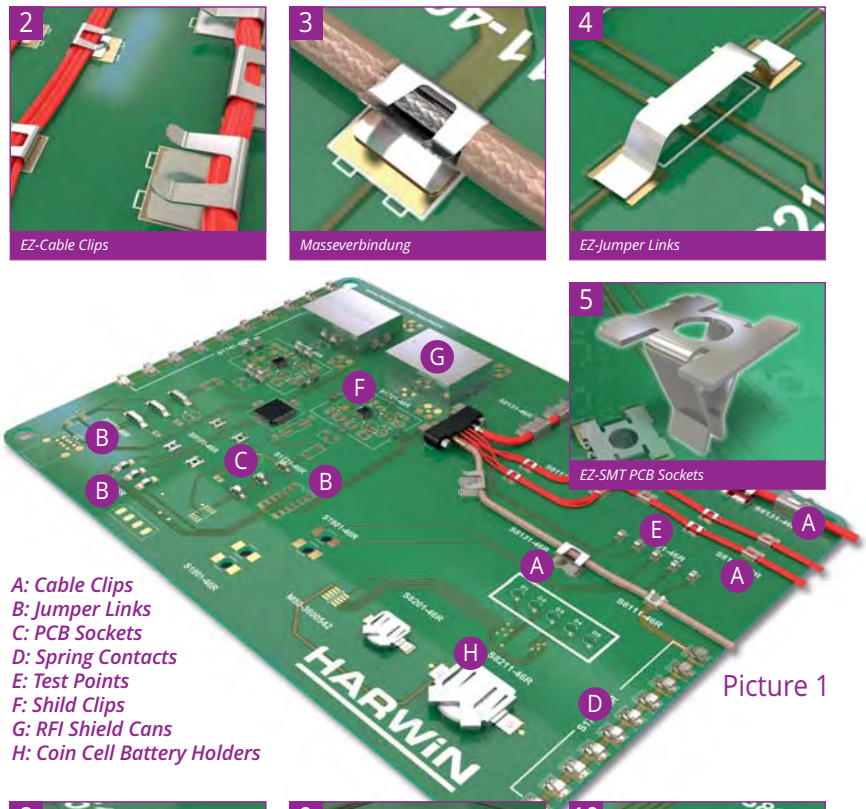


EZ-BoardWare from HARWIN (picture 1) is a range of SMT PCB hardware that simplifies PCB design, and offers numerous process improvements:

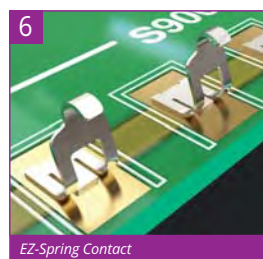
- Suitable for automated pick and place process and for SMT soldering process
- SMT PCB hardware saves PCB space
- Packed in EIA-481-2 compliant tape & reel
- Increases design flexibility
- Improves quality

Besides EZ-RFI Shield Cans this product line includes the following products:

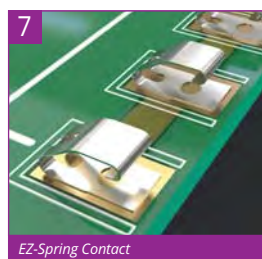
**EZ-Cable Clips:** Ultra-low profile, these SMT products can be used to secure cable to a PCB, removing the need for bulky push in style clips (picture 2). HARWIN's Cable Clips, can also be used to provide a link to the ground plane when used with Coax cable (picture 3).



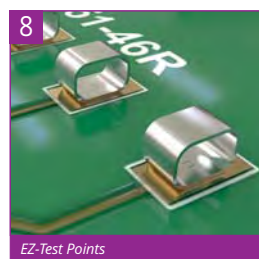
Picture 1



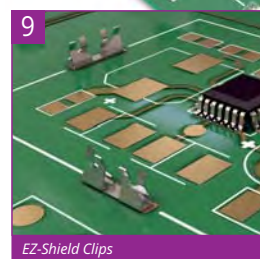
EZ-Spring Contact



EZ-Spring Contact



EZ-Test Points



EZ-Shield Clips



EZ-Coin Cell Battery Holders

**EZ-Jumper Links:** Offering a simple solution to complicated PCB layout, jumper links allow designers to avoid double layer boards by jumping over PCB tracks (picture 4).

**EZ-SMT PCB Socket:** A low cost alternative to PCB sockets, these components can be placed freely using industry standard machinery and accept pins of between 1.10 and 1.80mm diameter (picture 5).

**EZ-Spring Contacts:** Also known as Spring Fingers, RFI Shield Fingers or Grounding Contacts, these Spring Contacts can be assembled to PCBs and used as grounding or shielding contacts, in con-

tact with metal frames or shields. Suitable for both wiping and sliding action, the individual contacts are ideal for automated placement (picture 6 and 7)

**EZ-Test Points:** By soldering these SMT Test Points to a circuit board, test engineers have easy and convenient points on the PCB to take their readings. This minimizes the damage risk, and they are easily soldered at the same time as the rest of the components (picture 8).

**EZ-Shield Clips:** Also referred to as RFI Shield Clips, these clips are a fast and convenient method of securing a RFI shield can to a PCB. This

removes secondary soldering, and makes re-work and maintenance damage-free and easy (picture 9).

**EZ-Coin Cell Battery Holders:** Low profile SMT Coin Cell Holders provide a cost effective solution to the problem of battery mounting. Coin cells are securely held in place, yet they can be quickly and easily removed when they run down (picture 10).

506

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# FAKRA- & HSD-CONNECTORS

## Portfolio for Automotive Applications expanded!

With the introduction of FAKRA and HSD connector series YAMAICHI Electronics has checked off another box as a competent partner for the automobile industry.

**F**AKRA connectors (FAKRA is derived from German for Automobile Working Group, **F**Ach**K**Reis **A**utomobil) are coaxial high-frequency connectors that meet the requirements of DIN20860 and USCAR 17&18.

FAKRA connector applications lie in the transmission of a variety of signals, such as shortwave, mobile telephony, GPS, or telematics signals. Thanks to standardisation, each application is assigned a specific colour and mechanical code to ensure proper connections between the board and cable sides. Electrical transmission is specified by a differential impedance of 50 Ohm and a frequency of up to 6GHz.

YAMAICHI Electronics is starting into the market with the HF106P series – a single-pin board connector variant. The version is available in A,C,D,H,I and K codings. That permits applications to be served that include radio, GPS, GSM or the control of auxiliary heating.

### HSD – High Speed Data Connector Series

Since continued growth in demand for higher data transmission rates means that the one-pin FAKRA connector is no longer sufficient for some applications, the **HSD** interface has been defined (High Speed Data). This plug connector system is used for signals like USB or IEEE1394, for example. For the HSD interface, signal transmission via LVDS (Low Voltage Differential Signaling) is used. This prevents crosstalk between signals and interference from external signals as well as possible. The system is 100 Ohm impedance controlled, so it brings top quality to signal transmission.

### HIGHLIGHTS

- FAKRA and HSD developed and tested for automotive applications
- FAKRA according to DIN ISO 20860 and USCAR 17&18
- HSD Power with two additional power pins up to 5A each
- HSD and HSD Power with primary and secondary locking

With its HF107P and HF108P series, YAMAICHI offers two series of the HSD variant. The HF107P series is a four-pin HSD version with an additional shield washer. This washer ensures improved EMC shielding. This variant is initially available in the colour and mechanical codes B, C and E.

The second variant, HF108P, offers two additional external pins for separate power supply. These pins can each carry 5A. Coding D was selected as the starting version.

Both series have numerous features, such as 100 Ohm differential impedance, two locking stages, particularly secure connector locking and contact protection on the pins. Of course, their design takes the special requirements of the automotive industry into consideration, so the system is specially developed and tested for environmental influences, vibrations, shock and long service life. The metal housing is die-cast zinc, with gold-plated centre contacts with tinned TH solder contacts. All products are available in T&R packaging. They are fabricated at a TS16949 certified facility.

With the new FAKRA and HSD series, YAMAICHI Electronics has once again confirmed its status



FAKRA & HSD Connectors

as an excellent partner in the automotive market, continually expanding its product lines to meet the needs of the market. For many years, YAMAICHI Electronics has been a reliable partner whose products are used by all well-known OEMs. In addition to the I/O connectors, YAMAICHI Electronics offers a wide variety of other products for automotive applications: card readers, computing module connectors and internal board-to-board and board-to-cable systems

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# SERIES EF1

Connectors handle up to 130 Amps for high power connectivity!

## HIGHLIGHTS

- Contact positions: 1
- Current rating: 130A (max)
- Voltage rating: AC/DC 600V
- Operating temperature: -25°C to +105°C
- Mating cycles: 30
- Type: In-line

HIROSE have introduced the EF1 series to meet the requirement for smaller yet higher performing power connectors for industrial applications.

The EF1 series consists of a DIN rail mount type in-line plug and socket (picture 1) and a panel mount type in-line plug and socket (picture 2) which both accept high power crimp contacts with the capacity to handle up to 130A (amps) current rating (picture 3).

Suitable applications are power controllers, inverters, storage battery, medical devices, BTS and robot controllers.

S08

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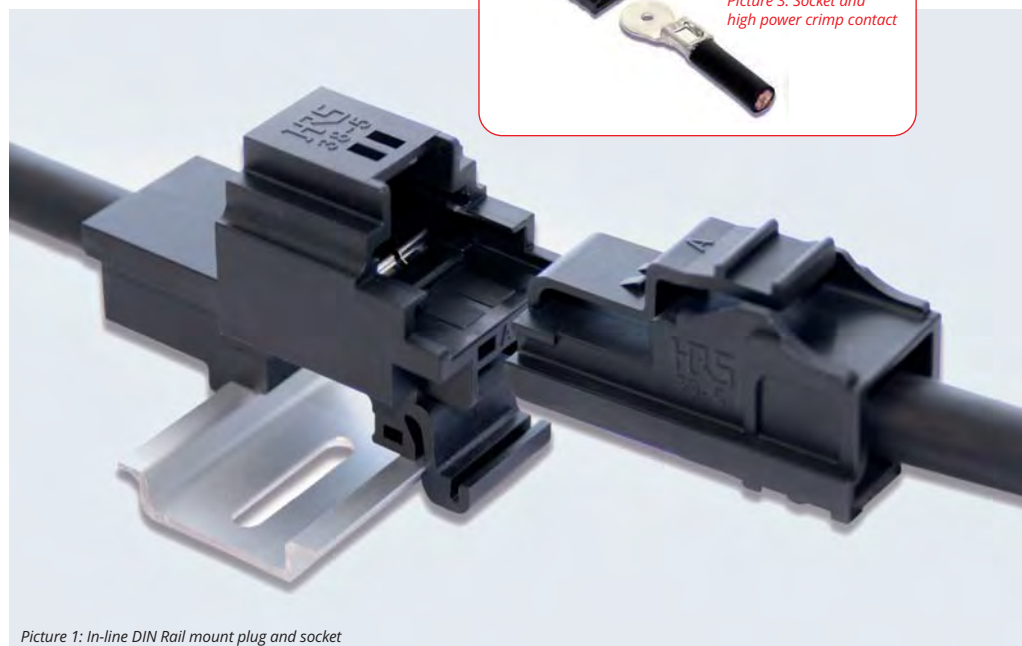
The innovative connector design allows the crimped cable to be inserted into the connector housing in a quick and user-friendly one-step operation (picture 3). The crimp contact can be easily terminated to the cable with use of a standard market commodity JIS C 9711 hand tool.

The snap-in lock provides a positive tactile sensation and an audible click to confirm correct mating engagement and secure connection. The unique shape of the internal spring contact and contact points allows the optimum contact force to maintain a highly reliable stable connection.

The housing features four different mating keying styles to prevent incorrect mating when multiple connectors are used. The connectors are available in a red colour to define the plus or minus connection.



HIROSE  
ELECTRIC  
EUROPE B.V.



Picture 1: In-line DIN Rail mount plug and socket

# NEW CONNECTORS: HR08D & HR34B

HIROSE Electric have introduced the HR08D & HR34B (picture 1 and 2) circular range to meet with the requirement for robust waterproof connectors with advanced reliability for industrial equipment. Both series provide the following characteristics and technical details:

## Unique

The user friendly, unique, push-on bayonet locking mechanism: It mates and locks in one step, which is confirmed with an audible tactile click. Disconnection is simple by rotating and pulling the connector sleeve (picture 3). The secure robust lock ensures high reliability and withstands vibration.

## Easy handling

The visual white alignment markings allow blind mating and the three guide keys permit correct engagement.

## IP68 rating

High protection against water and oil ingress is guaranteed due to the special resin gaskets strategically placed at each internal connection point. The water resistance performance meets with IP68 rating, allowing the connector to withstand submergence in a 2 meter water depth for 14 days in its mated condition.

## Flexibility

The secure strain relief can be assembled on to the cable in one simple step. The internal clamp securely anchors the gasket to give maximum resistance against cable wrenching forces. The cable can exit the rear of the plug in eight different directions in 45° increments to offer versatile design flexibility (picture 4).

At first sight both series seem to be almost identical. But they differ from each other in a view details:

## Color & surface coating

HR08D – Nickel plating

HR34B – Black Chrome plating

## Contact positions

HR08D – 2 & 10

HR34B – 4 & 10

## Applications

Ideal applications for both series are machine tools, servomotors and measurement and control devices.

**HR08D** – mates with an existing series on the market which is mainly in usage with Mitsubishi servomotors.

**HR34B** – mates with an existing series on the market which is mainly in usage with FANUC servomotors.

S09

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# IP68 Rated, Waterproof Circular Connector with Push-on Bayonet Locking!

## Key Features HR08D

- Contact positions: 2, 10
- Current & voltage rating:  
3A; 200V AC, 250V DC
- Crimp and solder contacts for AWG20-25
- IP68 waterproof rating
- Push-on Bayonet Locking mechanism
- Multi-directional cable exit



Picture 1: HR08D

## Key Features HR34B

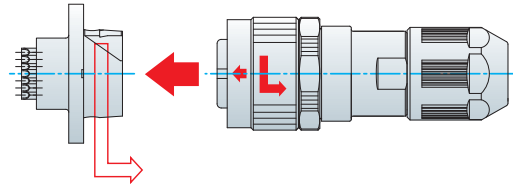
- Contact positions: 4, 10
- Current & voltage rating:  
4 pos.: 5A; 200V AC, 200V DC  
10 pos.: 3A; 200V AC, 250V DC
- Crimp and solder contacts for AWG20-25
- IP68 waterproof rating
- Push-on Bayonet Locking mechanism
- Multi-directional cable exit



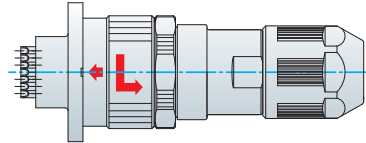
Picture 2:  
HR34B HR34B in mated condition

## Push-on Bayonet Lock

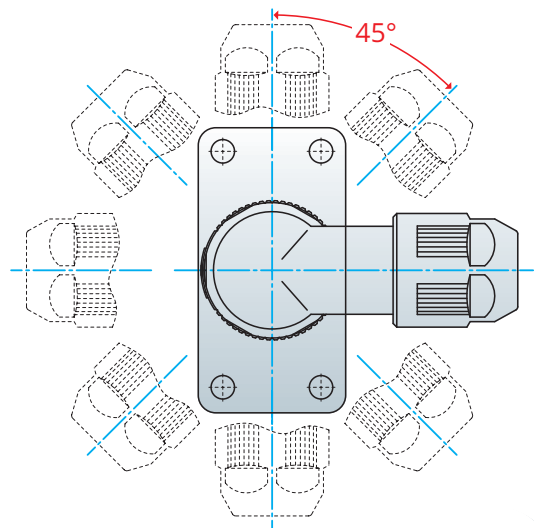
**Mating:** Just inserting plug unit will complete mating



**Un-mating:** Rotating sleeve to unlock mating



Picture 3: bayonet locking mechanism



Picture 4: cable exits





# ECO-TRONIC

STOCKO increased its product family ECO-TRONIC 2.5mm pitch to meet requirements of automotive, domestic appliances industries, electrical and electronic industries applications.



**Main features:**

- RAST 2.5 Standard
- With and without locking function
- Straight version for vertical mating process
- Qualification according to DIN EN 60352-5

ECO-TRONIC Connectors are used in applications of domestic appliances and industry. In the area of automotive they are mainly used in luminaires and in interiors of vehicles. Both new products are senseful complements to the existing ECO-TRONIC product range and fulfil the requirement for an alternative connection technology. With both new products more and universal fields of applications are possible. With its continuously modification and upgrading of its product range STOCKO meets the market's demands of functional and economical products.

**S10**

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Besides existing IDC housings and in IDC technology and pin connectors in THT and SMD technology STOCKO developed crimp housings and pin connectors in press-fit technology.

### ECO-TRONIC crimp housings

Similar to IDC housings the new crimp housings can be used for direct connections as well as for indirect connections (picture 1 and 2). The automotive specification LV 214 requires a contact extraction force of 55N of the housing's primary locking and secondary locking of ECO-TRONIC's crimp housings fulfils this requirement, too! ECO-TRONIC's crimp housings are available with 2-12Pins and with tinned and gold plated contacts.

Their crimp connection fulfils the requirements of VW-Crimping standard 60333 for wire sizes 0.22mm<sup>2</sup> and 0.35mm<sup>2</sup>.

**Main features:**

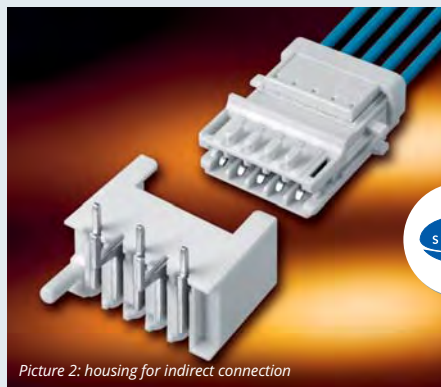
- RAST 2.5 Standard
- Crimp technology
- Direct and indirect connections
- 2-12pins
- Tinned and gold plated contacts
- Wire size: 0.22-0.35mm<sup>2</sup>
- Rated current and voltage: 2A, 32V
- Approval is following LV214 und VW 60330 (USCAR 2 is scheduled for 2015)
- Straight cable exit

### ECO-TRONIC pin connectors in press-fit technology

Besides pin connectors in THT and SMD technology STOCKO developed pin connectors in press-fit technology (picture 3). The new developed and innovative press-fit area meets the requirements of different market segments.



Picture 1: housing for direct connections



Picture 2: housing for indirect connection



Picture 3: pin connector in press-fit technology





# WME

SOURIAU (part of Esterline Connection Technologies) is pleased to introduce the WME series. These cable connectors are ideal for a wide variety of harsh-environment applications from road service vehicles to agricultural, mining, and mobile machinery.

The SOURIAU WME cable connector series is approved by the EN 16330 for both outside and inside cabin connectivity. This European standard applies to power systems, drive implements, and attachments such as street cleaning brushes, snow plows, and more, and ensures interchangeability of vehicles and implements to resolve both the compatibility issue and ensure safety of the installers and workers. The WME Series is ideal for a wide variety of harsh-environment applications from winter and road service vehicles to agricultural, mining, and mobile machinery. The WME Series offers UV resistance and waterproof sealing when mated. It has a self-closing cap with a secondary locking feature that makes it shock- and vibration-resistant. The connector also has an enhanced-grip feature to facilitate connection while wearing gloves. The product family includes a complete range of connectors, closing caps, backshells, and accessories.



SOURIAU's new WME cable connector series with dust caps.



**WME1** is the external vehicle attachment solution. It consists of thermoplastic shells, cable glands, a closing cap, and inserts that are halogen-free and RoHS-compliant. It can withstand extreme temperatures ranging from -30°C to +85°C and is IP68/69K rated, as well as resistant to a wide array of fluids such as gas and mineral oils, acids, and cleaning agents.

It also features a withstand voltage of 5,000V and has a mechanical durability of 250 mating cycles.

**WME2** is the internal cabin solution, which is also halogen-free and RoHS-approved. It has an operating temperature range from -40°C to +125°C, and is UL94 V-O flammability rated. Its electrical components have a withstand voltage of 1,500V, and its mechanical durability is 250 mating cycles. The WME Series also includes accessories such as protective caps for plugs and dust caps.

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# ELECTRONICA2014



A new record year at the 26th electronica, the world's leading trade fair for electronic components, systems and applications.

More than 73,000 visitors from over 80 countries celebrated the 50th anniversary of electronica – the world's largest event for the electronics industry – from 8 to 11 November 2014. Once again, the world's leading trade fair took place in Munich, offering a global platform for networking between several sectors operating in the electronics industry. As in the previous years, visitor satisfaction was extremely high, and CODICO, of course, could not miss the opportunity to participate again in 2014. CODICO welcomed visitors and customers alike at its 280m<sup>2</sup> booth, and a team of experts was at their disposal at all times. POWER INTEGRATIONS and HIROSE were CODICO's co-exhibitors at the electronica 2014, presenting their latest technological developments and offering professional advice at the booth. CODICO's booth was exceptionally well visited throughout the four-day fair, with people coming by for expert chat or a break.

Visitors didn't have to starve, though, and there was enough game and entertainment as well: Our exclusive catering served delicious food and drink around the clock. At the same time, visitors were free to have some fun with the hand-made art race track from the Vienna Museumsquartier, so that swelling crowds occasionally gathered around the CODICO booth.

If you did not have the opportunity to visit CODICO at the electronica 2014, we are happy to give you a small impression here.

**D03**

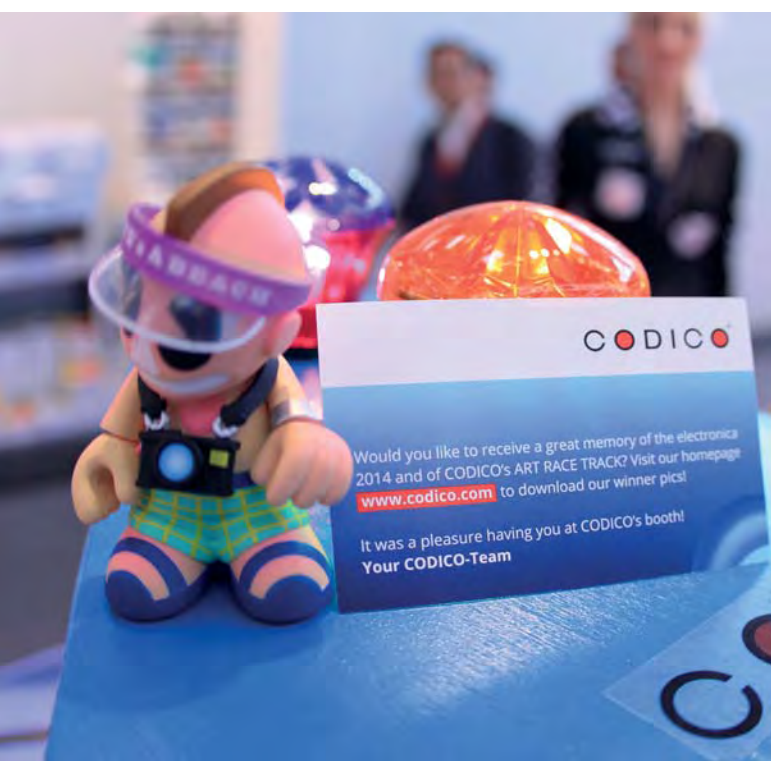
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Another success year for CODICO!





# CODICO TEAM

Hello readers!

## Srećko Dražić

Well, my dear Impulse readers, I hope you're having a really good day. My name is Srećko Dražić, and I'm 42 years old. I started my career with CODICO as a member of the sales team in the »Active Components« group, and since August 2011 I have been working as a product manager in the »Passive Components« department.

To find a healthy balance to my daily work, I spend as much time as possible with my family, my kids keeping me fit. Whenever possible I go running and I also try to practice yoga as much as possible. Reading books I find it very stimulating to find out more about the views of life adopted by the most widely differing cultures. Some attitudes could hardly be more different, while others match with our own 100%. As so often happens in life, there isn't just one way of looking at things, but many, and I think that is very important. Nowadays we react very quickly when it comes to spotting and emphasising differences. We have got so immersed in this that we could fill whole books with these issues. But one thing often gets forgotten, and that is the fact that we can learn a very great deal from one another, and broaden our horizons. On the other hand, we also tend to forget how similar people are to one another. While we could fill whole books when it comes to the differences, we could fill the whole universe with the similarities.

CODICO is an international company, and I find that a wonderful thing. Our manufacturers are spread all over the world, our customers are based all over Europe, and my colleagues come from all corners of the earth. Every single day gives me the opportunity to learn something new, and that makes my work tremendously exciting.



D04

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## Wolfgang Koller

First, I would like to thank you all. I'm happy that you want to read something about me. I'm in charge of customer advice and sales of active components in Upper Austria, Salzburg, Tyrol, and Vorarlberg. This is also where my roots lie, since I'm an Upper Austrian in Vienna: After completing my training, I moved to Vienna aiming to become successful in the business of technological capital goods in the telecommunications industry. I'm hugely interested in new technologies. At the time, telecommunications companies had to master the new challenges of data communications to secure their business for the future. Technologies can contribute to the development of completely new solution approaches and business models, but the pertinent risks must be also analysed and dealt with. I'm interested in working out what you feel is important, and it's fun to see your ideas materialize and your business evolve. I'm always amazed at the sheer variety of innovative approaches of our customers in using our products. Talking to our customers always helps me learn a lot.



D05

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## Andreas Nöhrer

**H**i, my name is Andreas Nöhrer and I have been working in the IT department at CODICO since October 2011.

I applied for this quite diversified position at CODICO right after finishing my studies and was hired relatively soon. Even before joining CODICO, I was able to gather some experience during my studies by working part time at hs2n Informationstechnologie GmbH.

My main duties at CODICO involve staff support, although my activities have expanded into various different directions ever since I joined the company. Since I am in contact with other employees of CODICO most of the time, I truly appreciate the positive work climate among colleagues. This positive cooperation makes my daily work at CODICO much easier, and in many situations, work is a fun and joyful experience.

I come from St. Georgen, a district of the city of Eisenstadt, so I commute to work from Burgenland to Perchtoldsdorf every day. Although I have to cover quite a distance on a daily basis, I appreciate the good location of CODICO, which was one of the main reasons I applied for the position.

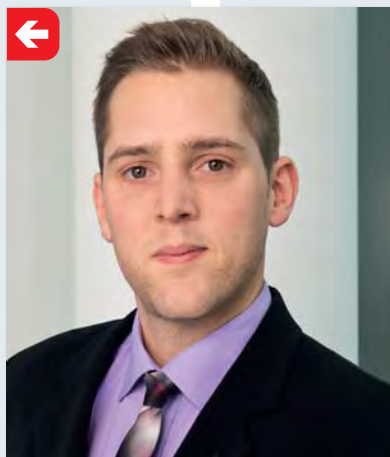
In my leisure time, I am involved in different activities that, in addition to my work, help make my daily routine more varied. I relatively do a lot of sports, mostly with my friends and family. Depending on the time of the year, these include tennis, football, beach volleyball, running, skiing, and a lot more. I particularly like the rural area surrounding St. Georgen for my sports activities, because it offers a serene environment where you can regain a lot of energy for your professional and private objectives.

In addition to my professional activity, I am also a member of the voluntary fire department of St. Georgen. This activity requires a lot of time for exercises, training, and organisational duties. Such effort is necessary, however, to stay up to date and to be well-prepared in case of emergency. Recently, I accepted an administrative position in the command staff, since the challenges of the fire department are becoming ever more demanding.

All in all, I can reconcile my job and my private activities quite well. Therefore, I am looking forward to the future challenges awaiting me at CODICO.

D06

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## Eveline Fink

**H**ello, my name is Eveline Fink, and I'm really pleased to be allowed to appear in Impulse once again. I've been with the company for 15 years, and this is the second time I've done this.

I had the good fortune, after my second period of parental leave at the end of 2011, to be able to return to CODICO, but this time in Logistics, where I was involved, among other things, with goods outgoing, dispatch, complaints and other issues

involving products, etc. For the first nine years I was in the Active Marketing sector, Sales Internal Service, with responsibility for Points of Sale.

You live and learn, and from the procedures involved in logistics it's possible to acquire an even better view of what's happening, so as to understand the entire process of the business. It is a very extensive and interesting experience to discover what has to happen before and after the sale of the goods in order to keep the customer satisfied. From the sales point of view, I accordingly always regard dealing with complaints as a new challenge, and as a renewed opportunity for making positive contact with the customer.

I spend most of my free time with my family and friends, and, naturally enough, I enjoy that the most as well. With a husband and two children (aged 6 and 12) things very rarely get boring. Frequent visits to the theatre and concerts are all part of the fun, and loud concerts that really rock are my favourite. I don't actively play any instruments anymore, but I leave this to my children. I quite like singing and whistling (often to the regret of my colleagues), but, funnily enough, no-one has so far offered me a job as a singer @.

I also like spending a few quiet hours in coffee shops, with a nice breakfast and the chance to catch up on some gossip. When the weather allows, I spend a lot of time outdoors, making short trips and practicing a little bit of sport.

After all these years, CODICO is still a really nice place to work, with plenty of variety, and I am really happy to be a part of the whole!

D07

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