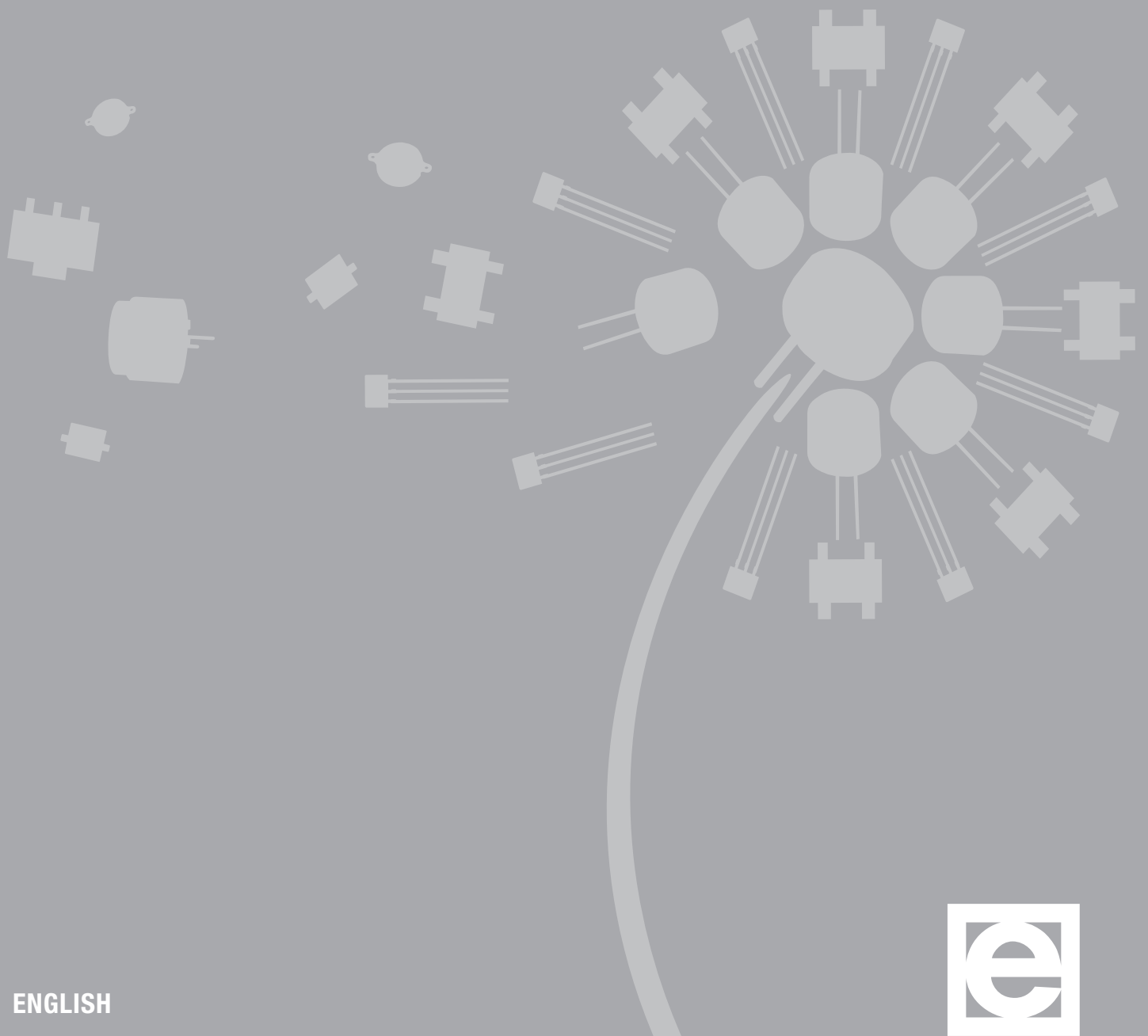
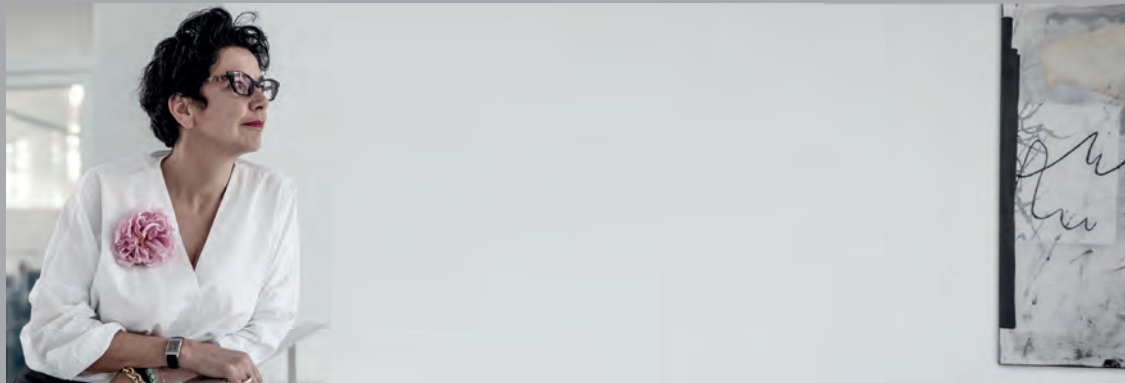


# LINECARD



Dr. Christiane Endrich



## „Where the future of electrical engineering is at home“



**Quality and technical support** Quality is not a question of being demanding, but a key for success. Who recommends quality, shows that he is an expert himself. Every good engineer is perfectly aware that he needs excellent instruments to be successful. Business relationships which last over 30 years have become rare in the struggle for orders and yield. And it is exactly for this reason why we focus on continuity and close cooperation, not only for what concerns the relationships towards our suppliers, but also with regard to our colleagues. Thus on one hand we can guarantee competitive advantages and a maximum of product availability, on the other hand a positive social environment generates a major efficiency and a higher motivation in the daily business. Together with Novitronic AG, we have excellent access to the market for electromechanical components, which we will further extend in the future.

Our colleague in Asia, who directly knows the problems on-site and the appropriate solutions and thus affords a smooth workflow, proves that closeness has nothing to do with distance. The marketing teams of Endrich and their colleagues are sophisticated but not detached, because they possess excellent technical skills, which are completed by many years of professional experience in design. Surely at this point we can be a little bit proud of our uniqueness: all the product ranges are taken care of for you by **endrich** teams of experts and by professionals operating for our producers. In short, we are capable of exactly providing the technical support you desire. The figures but first and foremost the high level of customer satisfaction show that this strategy works.





One fourth of the yearly turnover of **endrich** is generated by its activities in the automotive supply industry, considered particularly delicate. This result is only feasible thanks to the permanent contact and the growing relationships with our partners. In this way we manage to operate successfully for our customers and to be profitable for ourselves. Medium-sized manufacturers as well as big enterprises in Asia, Europe and the USA form the basis for our design-in in the technically oriented distribution business.

## „A family with more than 10,000 children“

**Facts:** From our central stock in Nagold we deliver to 50 countries worldwide with standards like “just in time”, buffer stocks or consignment stock, 100 % bar code labelled and therefore traceable. Our customised logistic strategies enable us to supply our products quickly wherever you need them. We remain in constant contact on-site with the supplier and are at the same time always close to you. We always act locally and think globally in the truest sense of the word.

**Philosophy:** In the procurement of true innovations from Asia we do not only see a challenge – it really is a central driving force for our company. Top service and highest quality are our gauge, in a sector known for its worldwide quality competition. When costs and product development spin like turbines we remain composed and keep thinking goal-oriented. We do not abandon our clients, but provide advice about the right products and their potentialities already in the forefront. The advantages of familiar thinking are possible only in a family enterprise. **endrich** stands for the dialogue from person to person drawn from long relationships with our customers and manufacturers and inspired by our claim “**endrich – components of life**“.





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# CAPACITORS

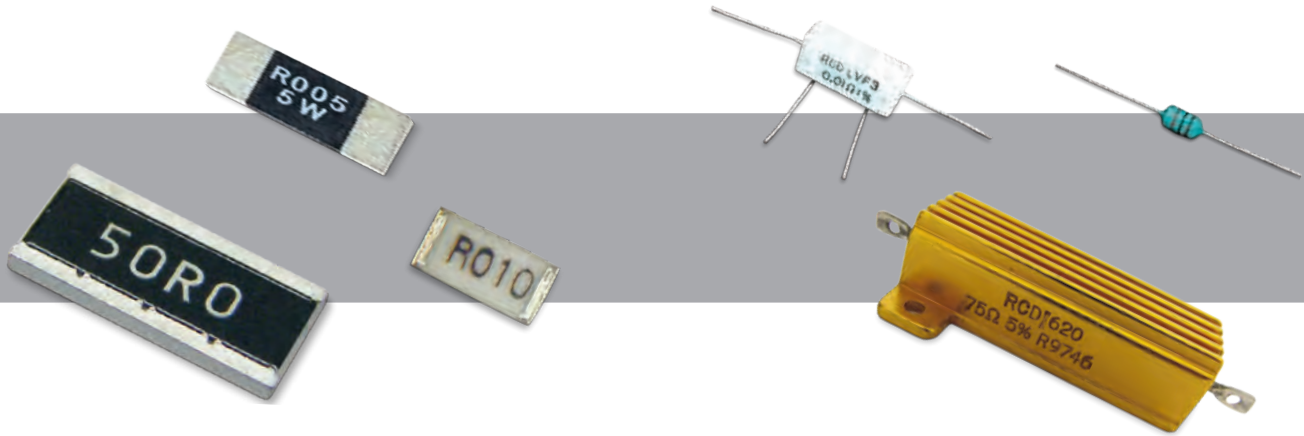


Manufacturer			<b>Panasonic</b>	
SMD	Electrolytic	■		
	Hybrid	■		
	Polymer		■	
	MLCC			■
THT	Electrolytic	■		
	Hybrid	■		
	Polymer		■	
	MLCC			

## FEATURES

<b>Certificates</b>	IATF 16949, ISO 14001, AEC-Q200	TS 16949 partly, ISO 14001, AEC-Q200 partly	ISO 9001, IATF16949, ISO 14000, OHSAS 18000, AS 9100
<b>General information</b>	<p>Large portfolio of SMD and polymer hybrid capacitors</p> <p><b>Hybrid technology:</b> Aluminium electrolyte capacitor combined with polymer hybrid material</p> <p>Extremely high ampacity in comparison with identical SMD capacitors</p> <p>High voltage, up to 125V in a temperature range from 105 °C ... 150 °C</p> <p>Radial type HEH up to 100V / 10.000 h</p>	<p>Inventor as well as leading manufacturer of polymer technology</p> <p>Life time up to 5.000 h / 105 °C &gt; 100.000 h / 85 °C</p> <p>Low ESR, up to 5 mOhm</p> <p>High ripple load (@ Oscon SVPE 10 x 13 mm)</p> <p>Poscap / Oscon / SP-cap</p> <p>Voltage range: 2 ... 35V</p> <p>Capacity range: up to 1500 uF</p>	<p>PDC is the only manufacturer of MLCC in Taiwan with true vertical integration. PDC manufactures the finished products as well as the ceramic powder for them.</p> <p>The product range includes MLCC capacitors for special requirements, such as</p> <p>High voltages: up to 10 kV</p> <p>High capacitance up to 330 µF</p> <p>Tight tolerance: up to +/-1 %.</p> <p>For safety relevant applications: X1/Y2, X2</p> <p>Large sizes: 3035 / 4252 / 5550 / 5780 / 6560/ 7680/ 8850/ 13060</p> <p>Further features such as low ESR, soft termination, AEC-Q200 qualification and many more.</p>
<b>Applications</b>	Automotive Telecommunication Computer & IT Measurement Sensors Consumer Power supplies Industrial Medical	Automotive Telecommunication Computer & IT Measurement Sensors Consumer Power supplies Industrial Medical	Automotive Industry Telecommunication Power Supply
<b>News</b>	For 2017 new SMD series with higher capacity in same case size, available for 105 °C and 125 °C	Voltage range up to 50V for Poscap Ultra low SP-cap with 3 mOhm	

# RESISTORS

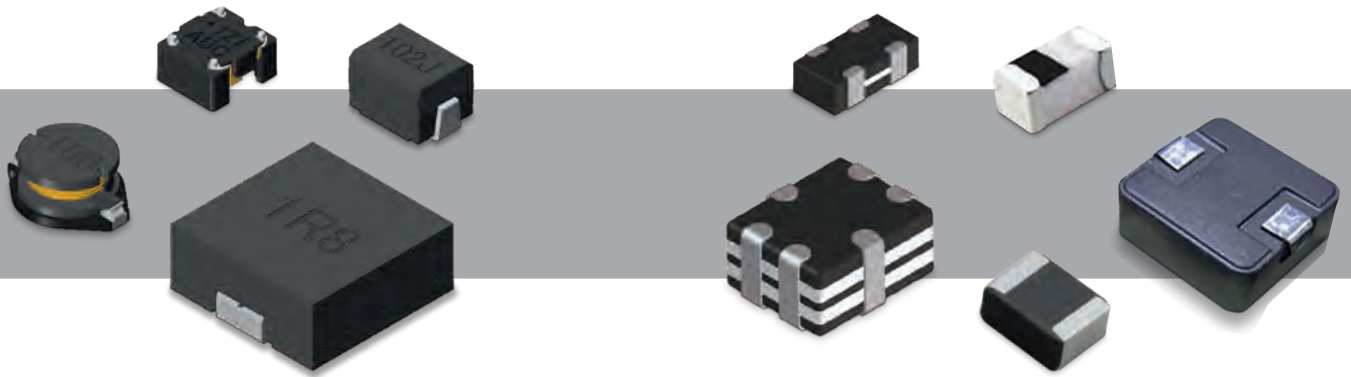


Manufacturer	SEM SUSUMU <i>Thin Film Specialist and Innovator</i>	PDC	RCD	E&C <sup>TM</sup>
Thin Film Resistors	■			
Current Sense Resistors (Shunts)	■	■	■	
High Frequency Resistors	■			
Thick Film Resistors		■	■	
Special Resistors	■	■	■	■

FEATURES

<b>Certificates</b>	ISO 9001 IATF16949	ISO 9001 IATF16949	ISO 9001	ISO 9001
<b>General information</b>	Thin film chip resistors with excellent long term stability  Metal foil current sensing resistors with short- & longside terminals.  High frequency products such as attenuators, terminators and splitters	Thin film chip resistors optimised for special purposes  Surge resistors with double/triple power rating  High voltage safety resistors with UL certificate	Industries' widest portfolio containing film- foil- wirewound- ceramic- , metal glaze- , metal oxide-resistors in chip, melf, through hole, leaded, ceramic, heat sink construction  Custom types available  SWIFT <sup>TM</sup> program for faster production	Specialized in high ohmic values in the range of Mega Ohm to Peta Ohm  High voltages up to 750,000V  Custom types available
<b>Applications</b>	Automotive Industrial Test & Measurement White goods Medical equipment	Automotive Industrial White goods Medical equipment General Purpose	Industrial White goods Medical equipment Aerospace & Avionic General Purpose	Industrial Test & Measurement Medical equipment Sensors Institutes and Universities
<b>News</b>	Precision chip resistors with fusible function  Chip attenuator for frequency up to 50 GHz  Thin film resistors with extended Ohm ranges up to 7.5 Mega Ohm	Thin film melf resistors with improved reliability  Green resistors with lead content less 100 ppm (10 times lower than RoHS requirement for chip resistors)	CM300 type – ultra low profile 300Watt power film resistor with proprietary flame retardant epoxy insulation  Attached to a suitable air- or water-cooled heat sink CM300 ensures optimal environmental protection & dielectric strength	HC Series: smallest size high Ohm chip resistor in the market  Case 0402 is available up to 150 GOhm

# INDUCTIVE COMPONENTS

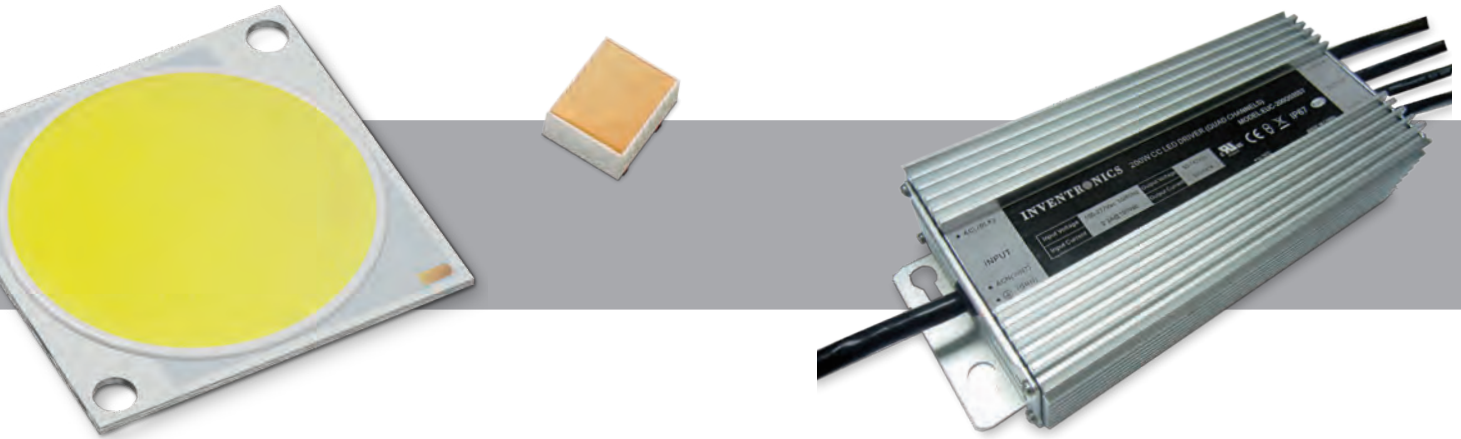


Manufacturer			
Chip Inductors	■	■	■
Power Inductors	■	■	■
Line Filters	■	■	■
Chip ferrit beads	■	■	■
Transformers and Through Hole	■		■

## FEATURES

<b>Certificates</b>	ISO 9001 IATF16949	ISO 9001 IATF16949	ISO 9001, ISO 14000 IATF16949
<b>General information</b>	<p>Very wide range of SMD and THT inductors for DC/DC power – HF- and general purpose applications</p> <p>Following the trend of automatic production, ABC is still capable to maintain a very high flexibility for small MOQ and quick delivery</p> <p>Holding more than 100 patents, ABC offers products of high quality by following the popular shapes and land pattern in the market</p> <p>ABC is capable to produce semi custom and custom inductors and transformers</p>	<p>RF components such as chip beads and line filters in the technologies: multilayer, wire wound and thin film</p> <p>Power components such as wire wound chip inductors and high current chip beads</p> <p>Inpaq's WIP series is referenced by Qualcomm for their Snapdragon Platforms</p>	<p>PDC offers a wide portfolio of standard inductors. The focus of PDC's investments is on the modernization of production facilities and the expansion of production capacities.</p> <p>The product range includes:</p> <p>HF inductors: Wire-wound, also as common mode and common or differential mode filters, air core coils and baluns</p> <p>Power and filter chokes: unshielded, shielded, with iron powder- or Ferrite core as choke, filter or transformer</p>
<b>Applications</b>	<p>Automotive</p> <p>Industrial</p> <p>White goods</p> <p>Medical equipment</p> <p>General Purpose</p>	<p>Automotive</p> <p>Industrial</p> <p>White goods</p> <p>Medical equipment</p> <p>General Purpose</p>	<p>Industry</p> <p>Telecommunication</p> <p>Power Supply</p> <p>White Goods</p>
<b>News</b>	<p>Extended lineup for Iron Powder high current power choke coils:</p> <p>HC Series: very low profile</p> <p>CIP: middle size, with focus on lowest DCR or highest current rating</p> <p>HE Series: universal series from ~4 x 4 mm to 17 x 18 mm</p>	<p>TNF0605 is the smallest thin film common mode choke in the market supporting USB 3.0 for up to 10 GHz cutoff frequency</p> <p>WIP-Y performance upgrade to the existing WIP-P and WIP-S types. WPASX/ WPAPX Series is qualified according to AEC-Q200 for automotive applications</p>	

# LED



Manufacturer		CITIZEN	EVERLIGHT	DOMINANT <sup>™</sup> Semiconductors	HARVATEK	Lexar
Low power LEDs	SMD	■	■	■	■	■
	THT		■	■	■	
	7-Segment displays		■		■	
	LED-Modules(ZHAGA)					■

FEATURES

Certificates	ISO 9001 ISO 14001	ISO 9001 ISO 14001	ISO 9001 ISO 14001 TS 16949	ISO 9001 ISO 16949 ISO 14001	ISO 9001 14001 AECQ102
General information	Wide range of low power LEDs in several colors and packages  Ultra small sizes 0,15 mm height Many RGB types available	Wide range of low power LEDs in several colors and packages  Superb cost-efficiency Standard packages and colors on stock  All colors available: 2700 ... 6500K	Wide range of automotive certificated LEDs in several colors and packages  All automotive certificates are available	Chip LEDs PLCC LEDs LED Displays Signage RGB LEDs	Wide range of white SMD LEDs, UV LEDs, RGB / RGBW LEDs, Automotive LEDs and LED-Modules (Zhaga)
Applications	Industrial lighting Status LED Micro electronics Watches	Industrial lighting General lighting LED displays LED stripes Status LED	Interior and exterior lighting for automotive applications	Consumer electronics White goods Industry Videowalls	General lighting Automotive lighting Linear Lighting
News		Agricultural SMD LEDs from 365 ... 745 nm and 0,2 ... 2W Sizes 2835, 3030 and 3535  RGB IC LED's Top View / Side View	Super high brightness 2,5 x 2,0 x 0,7 mm LED 85 ... 120 lm, 700 mA, amber, red, yellow	RGB IC LED	RGBWW LEDs



# POWER SUPPLIES



Manufacturer				
Power supplies	Indoor	■	■	■
	Outdoor		■	■

FEATURES

Certificates	ISO 9001	ISO 9001	ISO 9001 ISO 14001
General information	6 ... 100 Watt DIP-switch current selection DALI drivers Compact housing 5 years warranty Made in EU	IP67 drivers More than 1000 standard drivers DALI and programmable versions up to 500W constant voltage 7 years warranty	1 ... 150Watt DALI drivers IP65 versions 5 years warranty Made in EU
Applications	Interior lighting Spotlights Design lights	Interior and exterior lighting Tunnel and stadium lighting Downlights Industrial Luminaries	Interior and exterior lighting
News	Programmable driver with TRIAC- and 1 ... 10V dimming	EUM-Series with globale cables + compact housings	Bluetooth driver Programmable via app Luminaire control and dimming with smart phone

# DISPLAYS / EMBEDDED SYSTEMS



Manufacturer				
Touch PCs	■	■		
Touch Monitors	■	■		
Boxed Industrial PCs		■		
Embedded Boards			■	
TFT-Displays				■
Monochrome LC-Displays				■
Passive Matrix OLED-Displays				
E-Paper				

## FEATURES

Certificates	ISO9001, QS9000, ISO14000, ISO14001, OHSAS18000, UL, TUV, TS16949-1/2	ISO9001 EN 60601-1	ISO9001:2015 ISO13485:2016	ISO9001, ISO13485, ISO/TS16949, ISO14001, QC-080000
General information	Headquarters in Switzerland, subsidiaries in Germany, Hongkong and China Established: 2008 Key products: Premium touch PCs; Touch monitors up to 42" Deep in-house development Linux software support with local FAE	Headquarters in Germany with subsidiaries in Hongkong, China, USA, India and Japan Established: 2001 Key products: Touch PCs; Touch monitors up to 84" Global market leader in large size optical bonding Microsoft Gold partner	Headquarters and production in Germany Established: 1990 Key products: Embedded boards Excellent hard- and software support Longterm availability up to 15 years guaranteed	Headquarters in Hongkong, subsidiaries in China and USA Established: 2008 Key products: TFT-displays with touch option; monochrome LC-modules Deep in-house development Partner for iSi30 / iSi50-TFT-display series
Applications	Industry, Marine, Medical	Industry, Telecommunication, digital signage	Medical, Industry, Building automation	Industry, Medical, Marine
News	Touch PCs 5.0" ... 12.1" NXP i.MX6 based UltraLite/DualCore processing units NXP i.MX8 platform in development Touch monitors with LVDS or HDMI interface 7.0" ... 42" Aluminium, stainless steel and plastic housing 4mm safety glass cover lens (UL751 S46B) HTML5-web-terminals with gigabit Ethernet CODESYS TargetVisu option available Customizations upon request development-kits available	Touch PCs 7.0" ... 55.0" ARM boards with Allwinner V40 QuadCore and Rockchip RK3399 processing units X86 boards with Intel® N3350/N4200 Dual-/QuadCore as well as i3, i5 and i7 Kaby Lake processing units Touch monitors 7.0" ... 21.5" / 32" ... 84" Patented optical bonding process up to 104" diagonal Broad standard portfolio available in small batches	armStone Single-Board-Computer (SBC), ARM Cortex™-A5/A9/A9r2 efus Computer-on-Module (COM), ARM-Cortex™-A7/A9 PicoCore (CoM), ARM Cortex™-A7 / A53 Operating systems: Windows, Linux NXP i.MX6, i.MX7 and i.MX8 UltraLite/ Single-/ Dual-/Quad-Core processing units, Snapdragon QuadCore Modules with WiFi/Bluetooth 5.0 and camera Development-kits available	Endrich iSi30-displays with standard LVDS interface 7.0" ... 10.1" Endrich iSi50-displays with standard TTL-RGB interface 4.3" ... 7.0" TFT-displays 2.4" ... 15.6" Customized monochrome LC-modules Customer-specific PCB and subassembly production

# DISPLAYS / EMBEDDED SYSTEMS

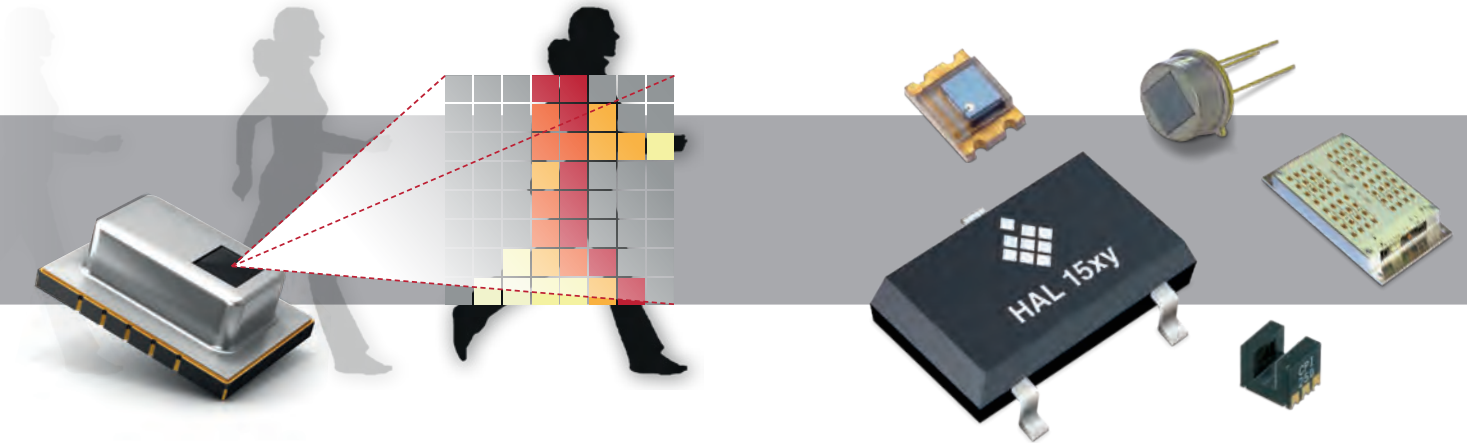


Manufacturer					
Touch PCs					
Touch Monitors					
Boxed Industrial PCs					
Embedded Boards					
TFT-Displays	■	■	■	■	
Monochrome LC-Displays	■	■	■	■	
Passive Matrix OLED-Displays	■		■	■	■
E-Paper	■				

## FEATURES

<b>Certificates</b>	ISO9001 ISO14001	ISO9001 ISO14001 ISO/TS16949	ISO9001 ISO14001	ISO9001 ISO14001 ISO/TS16949	ISO9001 ISO14001 ISO/TS16949
<b>General information</b>	Headquarters in Hong Kong with subsidiaries in China Established: 2010 Key products: TFT-displays, OLED-displays, E-Paper-displays On-cell/In-cell bonding process, optical bonding and full assembly Touch panel full assembly	Headquarters in Taiwan with subsidiaries in Hongkong and China Established: 1989 Key products: TFT-displays with touch option; monochrome LC-modules Focused on extended requirements for material and lifetime of TFT-displays	Headquarters in China with subsidiary in Hongkong Established: 2005 Key products: TFT-displays with touch option Broad portfolio of cost optimized modules Specialist for industrial displays	Headquarters in Taiwan with subsidiaries in China Established: 2007 Key products: passive matrix OLED-displays; TFT-displays; monochrome LC-modules Own OLED-glass production TFT-displays with innovative interfaces	Headquarters in Taiwan with subsidiaries in China Established: 1997 Key products: passive matrix OLED-displays Own OLED-glass production Global market leader for passive matrix OLED-displays
<b>Applications</b>	Industry, Telecommunication, White Goods, Building automation	Industry, Telecommunication, White Goods, Medical	Industry, Telecommunication, White Goods, Building automation	Industry, Medical, Telecommunication	Wearables, Medical, Consumer, White Goods
<b>News</b>	TFT-Displays 1.3" ... 24.5" E-Paper-Displays 1.54" ... 8.0" pmOLED-Displays 0.42" ... 3.12" Customizations of cover lens, backlight and interfaces Monochrome LC-modules	TFT-displays 1.44" ... 21.5" Minimum backlight lifetime up to 50k hours Extended operating temperature -30°C ... +85°C Super high brightness up to 1.600 cd/m <sup>2</sup> Touch sensors for almost all displays Customized monochrome LC-modules	TFT-displays 1.45" ... 10.4" Special resolutions and sizes upon request PCAP touch sensors 2.8" ... 10.4" Customizations of cover lens, backlight and interfaces Monochrome LC-modules Passive matrix OLED-displays	Passive matrix OLED-displays 0.49" ... 5.5" TFT-displays with HDMI and RaspberryPi interface 5.0" ... 10.1" TFT-displays with 36-pin MCU interface 3.5" ... 10.2" TFT-displays with PIC24-controller 3.5" ... 5.7" Monochrome STN/FSTN LC-modules, alphanumeric and graphic	Passive matrix OLED-displays 0.42" ... 3.2" Full-color OLED-displays 0.96" ... 1.8" OLED-displays with special shapes and materials upon request

# SENSORS






Manufacturer		EVERLIGHT	MICRONAS	NICERA	JRC	Panasonic	RFbeam
Grid Eye – Thermopile Array						■	
Magnetic Field	■		■	■			
Infrarot		■		■			
Solar Cells						■	
Radar					■		■
Vibration							

## FEATURES

<b>Certificates</b>	ISO 9001	ISO 9001 ISO/TS 16949 partly	ISO 9001 TS 16949	ISO 9001 ISO/TS 16949 partly	ISO 14001 ISO/TS 16949	ISO 9001	ISO 9001
<b>General information</b>	Innovative manufacturer of TMR-sensors with licensed MLU-technology	Famous Taiwanese manufacturer with a high production capability Large product range of IR sensors	Development and production with own waferfab in Germany High innovation power Large portfolio of switches, linear and angle sensors Leading manufacturer of linear sensors in the automotive sector	Long-standing partner for electronic components on ceramic basis	Japanese manufacturer for analog and microwave components	Global player with a wide product range Manufacturer of e.g. solar cells and thermopile sensors	Swiss company Specialist for consumer and special applications in the radar sector Development of HF applications
<b>Applications</b>	Industrial applications White goods Metering applications Current measurement	Industrial White goods Measurement equipment Light barriers	Automotive Industrial White goods Medical equipment	Home automation Measurement equipment White goods Security (e.g. burglar alarm)	Movement detector Door opener People counting	Grid-Eye: Object & person recognition Non-contact temp. measurement Solar cells: Watches Shutters & lighting control Home automation	Traffic control Door opener Movement detector Lighting control Speed measurement
<b>News</b>	CT83x omnipolar switch with low current consumption between 200 nA and 1,6 mA  CT834 TMR-sensor with analog output	Ambient light sensors with digital output  Ambient light sensors with proximity sensors	HAL 15xy – ASIL-A ready HAC – hallsensor with integrated capacitors HAR – hallsensor as dual-die version (redundancy)	Digital pyrosensor Lens for pyrosensor	Detection of heart and breathing rate Low power module	Grid-Eye Generation 2 with better accuracy and detection distance Foil cell with thickness 0.18 mm Energy harvesting applications	Digital 3D radar

# TEMPERATURE SENSORS / THERMISTORS

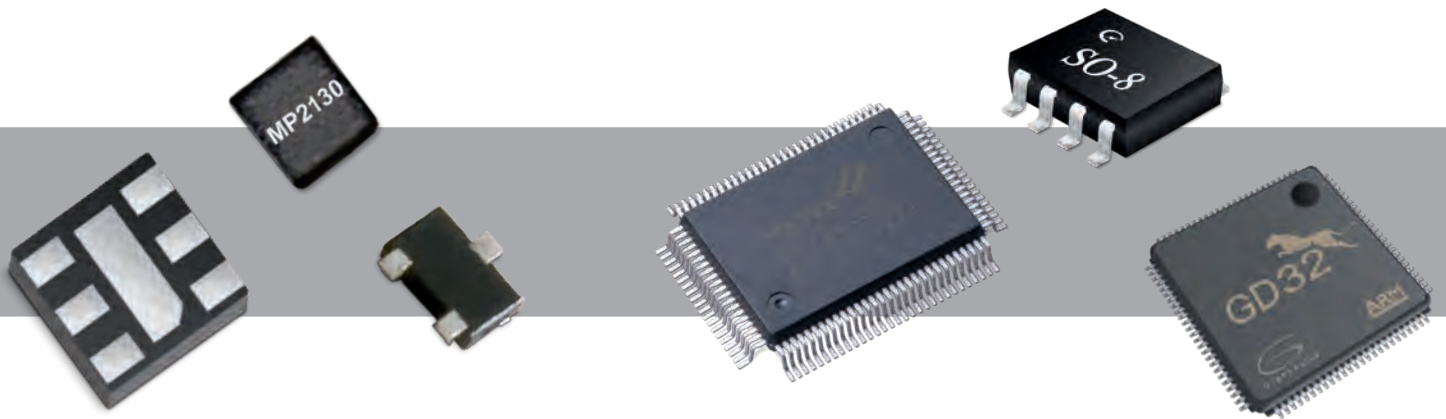


Manufacturer			
NTC SMD	■	■	■
NTC leaded		■	■
PTC leaded	■		
NTC film type		■	■
NTC thermistor probes	■	■	■
PTC thermistor probes			■
Assembled sensors	■	■	■

FEATURES

<b>Certificates</b>	IATF 16949 ISO 9001 ISO 14001	IATF 16949 ISO 9001 ISO 14001 ISO 13485	ISO 9001 ATEX
<b>General information</b>	Thick film thermistors based on Al <sub>2</sub> O <sub>3</sub> substrate Tateyama patented core material technology Wide variety and customization of R/T curves Guaranteed long-term stability of minimum 10 years High quality with best price/performance ratio	Semiconducting ceramic resistors Guaranteed long term stability of minimum 10 years High precision thermistors featuring extremely small B-value tolerance and resistance High quality with best price/performance ratio	Semiconductor based ceramic resistors Most responsive and flexible temperature sensor supplier in Europe Wide range of assembled NTC/PTC/PtRTD temperature probes Custom sensors on demand High quality with best price/performance ratio
<b>Applications</b>	Automotive Battery management HVAC Electro domestics Industrial Metering Medical	Automotive Battery management HVAC Electro domestics Industrial Metering Medical	Automotive Battery management HVAC Electro domestics Industrial Metering Medical
<b>News</b>	Temperature sensor with a fast thermal response for e-motor (Coil & Hairpin)	Temperature sensors for e-mobility applications (HV/EV) μ-pressure and temperature sensor for medical applications	Assembled temperature sensors up to IP68 for refrigerators and freezers

# ANALOG IC

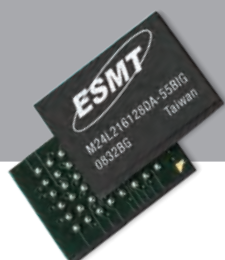


Manufacturer					
Analog switches		■	■	■	
Audio ICs	■	■	■	■	
Communication ICs	■	■			
Display drivers	■	■			
GaAs MMICs		■			
LED drivers	■	■	■		
Microcontroller	■				
Motor ICs	■	■	■	■	
Operational amplifiers	■	■	■	■	
Power supply ICs	■	■	■	■	
Video ICs	■	■		■	
Logic IC				■	
Touch & Multisensor IC	■				■

## FEATURES

Certificates	ISO 9001 ISO 14001	ISO 9001 / ISO 14001 IATF 16949	ISO 9001 / ISO 14001 IATF 16949	ISO 9001 / ISO 14001	ISO 9001 / ISO 14001
General information	Taiwanese company with product development focus in the area of microcontrollers and their peripheral products. The microcontroller range includes fully integrated digital and analog functions such as A/D converters, LCD drivers, PWM generators, high current LED drivers, touch switches, SPI/I2C interfaces, USB drivers, voice functions, RF functions, Telecom functions etc. Microcontroller devices meet with full industry specifications, and are as OTP and flash type available	NJRC (New Japan Radio Ltd.) is a Japanese company with its development focus in analog ICs  Leading company for operational amplifiers (OPA) and LDO  Beside this JRC offers a large diversity of ICs for communication, automotive, industrial and RF- applications  For the automotive applications special parts can be provided with AEC-Q qualification	Monolithic Power Systems (MPS) is a USA based high performance analog semiconductor company  DC/DC converter ICs, LED driver ICs, Class D audio amplifier ICs that are well-suited for small form factors  Linear ICs including operational and current sense amplifiers  Battery chargers and protection devices  Power over Ethernet (PoE) Motor ICs	SG Micro Corp is specialized in high performance, high quality analog IC design, marketing and sales.  Experts for analog IC design with more than 20 years of experience in IC design, layout, process, assembly, test and quality control.  Assurance of performance and quality of the products  Leading supplier of analog ICs	Azoteq is a South Afrika based company focust on multi-sensor, single chip solution and LED power control device.  In the latest generation multi-sensor, single chip solution IC they combine up to 6 different sensors in one IC. Sensors like touch, proxy, inductive, Hall, ALS and temperature.
Applications	Industrial and communication market  White goods  Entertainment	Sensors, head sets, automotive, entertainment equipment, TV, white goods, PLC, navigation systems, mobile phones, RF-applications, GPS	Sensors, TV, white goods, router, navigation systems, mobile applications, automotive, general lighting, industrial applications	Industrial and communication market, White goods, Entertainment, Medical	Industrial and communication market, White goods, Entertainment, Medical
News	32 - Bit MCU PIR Sensor	Special high- and low- side switches for sensors, high power OPA, GPS Front-End-Module	Mini module Motordriver IC with intergreted Hall sensor	Levelshifter	ProxFusion®

# MEMORY IC

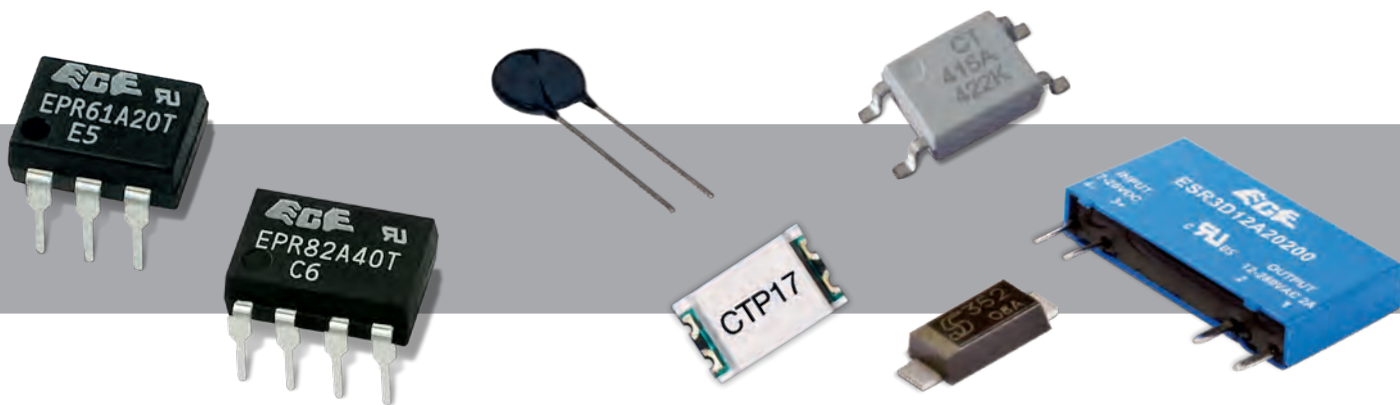


Manufacturer	ALLIANCE MEMORY	FIDELIX	ESMT	GigaDevice
SRAM/pSRAM	■	■		
SDRAM/DDR/DDR2/DDR3/ DDR4	■	■	■	
Flash	■	■	■	■
MCP		■	■	
Audio IC			■	
Micrcontroler				■
Power Supply IC			■	

## FEATURES

Certificates	ISO 9001 ISO 14001	ISO 9001 ISO 14001	ISO 9001 ISO 14001	ISO 9001 ISO 14001
General information	Alliance Memory Inc. is an American company manufacturing discontinued components to provide durable industrial and communications applications to support.  Product extension to SDRAM and DDR1/2/3/4 and Parallel Flash	Korean company without own production. Development of efficient and cost-effective storage solutions.  PSRAMs 4 Mb - 32 Mb, Low power SDRAMs, Low power DDR1/2/3, SDRAMs 32 Mb – 2 Gb and memory for mobile applications	Elite Semiconductor Memory Technology Inc. („ESMT“), is a Taiwanese IC design house.  Wide range of memory densities (1 Mb – 8 Gb) and various DRAM products (SDRAM, DDR, Mobile SD/DDR1 to DDR4)  16 Mb – 4 Gb  Selection of NOR and NAND Flash 1 Mb – 8 Gb	GigaDevice, stands for advanced memory technology and microcontroller in China. No own production.  Large product range of NOR Flash and NAND Flash  The 32Bit MCU extend the product portfolio.
Applications	Industrial and communications market	Low power and fast speed  Memory solutions for mobile communication and point-to-point applications	PCs, servers and workstations  PC peripherals, industrial products, consumer products, communication devices	Industrial  Medical and consumer area
News	Psram: 8 Mb – 128 Mb 8Gb DDR3 2Gb DDR2 4Gb DDR4 1 Gb-16 Mb Parallel NOR Flash	SPI Nand Flash: 1 Gb – 8 G	8 Gb DDR3 4 Gb DDR4  SPI NAND Flash: 1 Gb – 4 Gb Parallel NAND Flash: 1 Gb – 8 Gb	1 Gb NAND Parallel 1 Gb – 4 Gb NAND SPI  Microcontroller Cortex M23 and Risc-V

# PROTECTION DEVICES



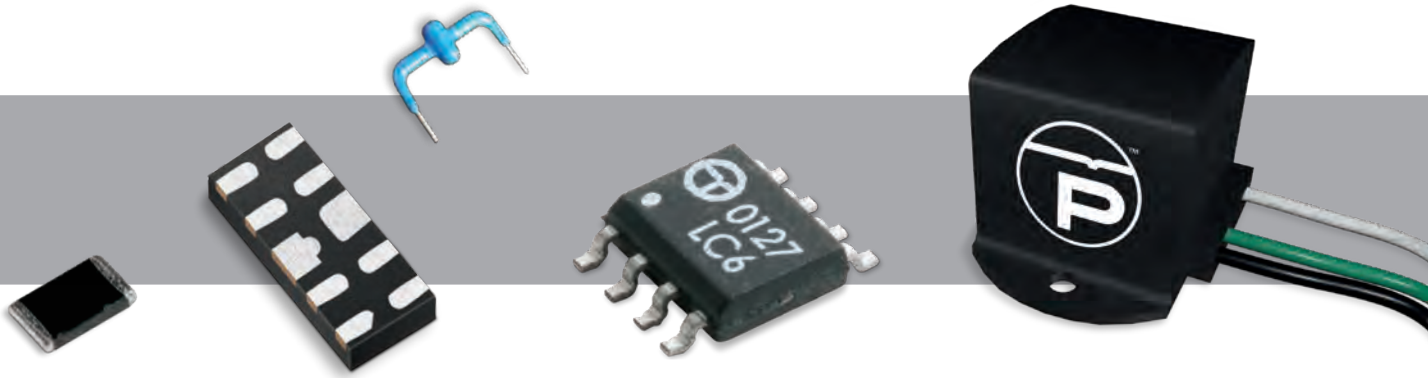
Manufacturer		SEMITEC Corporation	CT Micro International Corporation	cosmo	EGE
Overcurrent	PPTC				■
	Power thermistor	■			
	CRD	■			
Coupler/SSR	Opto coupler		■	■	
	MOS relay		■	■	■
	Solid state relay			■	■

## FEATURES

<b>Certificates</b>	ISO 9001 ISO 14001	ISO 9001 ISO14001 IATF 16969	ISO 9001 ISO 14001	ISO 9001 ISO 14001 IATF 16969
<b>General information</b>	<p>Unique current regulative characteristic</p> <p>Pinch off currents from 0.1 ... 22 mA</p> <p>Voltages up to 100 V</p> <p>High dynamic impedance</p> <p>Low temperature drift</p>	<p>DFN, DIL, SMD, mini-flat (SOP), LSOP, SSOP and new wide body-housing</p> <p>Single- and multi-channel</p> <p>CTR 50 ... 15000 %</p> <p>High-speed coupler up to 10 MBit</p> <p>Isolating voltage up to 5 kV</p> <p>UL, VDE and TUV approved</p>	<p>DIL, SMD, mini-flat (SOP), LSOP and SSOP-housing</p> <p>Single- and multi-channel</p> <p>CTR 50 ... 2000 %</p> <p>High-speed coupler up to 10 MBit</p> <p>Isolating voltage up to 5 kV</p> <p>UL, VDE and TUV approved</p>	<p>DIL, SMD and mini-flat (SOP) housing</p> <p>Load current: 130 mA ... 40 A</p> <p>Load voltage: 60 ... 800 V</p> <p>On-resistance: 0.83 ... 28 Ohm</p> <p>Isolation voltage: up to 5 kV</p> <p>Trigger current: 10 ... 25 mA</p> <p>UL and TÜV approved</p>
<b>Applications</b>	<p>PLC (programmable logic controller)</p> <p>Sensor applications</p> <p>LED control circuits</p>	<p>Power supply</p> <p>Home appliances</p> <p>Industrial</p> <p>Telecommunication</p> <p>Network</p> <p>Point of sales</p> <p>Testing instruments</p>	<p>Power supply</p> <p>Home appliances</p> <p>Industrial</p> <p>Telecommunication</p> <p>Network</p> <p>Point of sales</p> <p>Testing instruments</p>	<p>Power supply</p> <p>Home appliances</p> <p>Industrial</p> <p>Telecommunication</p> <p>Network</p> <p>Point of sales</p> <p>Testing instruments</p>
<b>News</b>	<p>CRD S-223T ... 22 mA and 500 mW rated current regulative diode in compact SOD-123FL package</p>	<p>CTP17 – smallest and flattest opto coupler worldwide</p> <p>CT816L low input current phototransistor optocoupler with higher operating temperature of 110°C</p> <p>CTH214 &amp; CTH217 – New 4-Pin half pitch mini-flat phototransistor optocoupler</p>		<p>High current MOS relays including the EPR311A038005 with a continuous peak load current of 6A</p>



# PROTECTION DEVICES




Manufacturer				PASSIVE SYSTEM ALLIANCE INPAO TECHNOLOGY CO. LTD.	
Over-voltage protection	TVS-Diode/array		■		■
	Multilayer Varistor	■		■	
	CSPD	■			
	ESD suppressor			■	
	Protection thyristor		■		
	Protection module		■		

## FEATURES

<b>Certificates</b>	ISO 9001 / ISO 14001 IATF 16949 AEC-Q200 (partly)	ISO 9001 AEC-Q101 (partly) TIATF 16949 (partly)	ISO 9001 / ISO 14001 IATF 16949 AEC-Q200	ISO 9001 / ISO 14001 IATF 16949 AEC-Q101 (partly)
<b>General information</b>	Sizes: 0201 to 6420 Voltage: 3.3 to 385 VDC Up to 5.5 kA (8/20 μs) Special parts with 0.05 pF for RF-applications High ESD handling ability (ESD types >30 kV) CSPDs with superior high surge and high voltage protection capability	Size: SMD 0201, modules and throughhole options Uni- and bi-directional Voltage: 1 ... 440 V High surge capability up to 2.2 MW Ultra low capacitances down to 0.15 pF High ESD handling ability (>30 kV Contact/Air) No ageing	Sizes: 0201 ... 1812 Voltage: 4 ... 42 VAC Extremely quick response time (< 1 ns) Extremely low capacitance (0.2 pF) Extremely low leakage current Zero signal distortion	Eris Technology Corporation, is a Taiwanese ODM providing a variety of support services to design, manufacturing, and aftermarketing services for diode products.  Eris business scope comprises Schottky diodes, TVS diodes, Zener diodes, bridge diodes, wafers, and much more.
<b>Applications</b>	Telecom + Networking: Ethernet Access Points IP cameras Base stations Security systems Power line modems	Automotive Industrial Telecommunication Networking Medical Test + Measurement Security Point of sales	Automotive RF modules Antenna circuits HDMI + USB Handheld devices Set-top boxes	Automotive Telecommunication Consumer Computer + IT Industrial electronics
<b>News</b>	SHV series, high voltage protection up to 385 V DC, from 1210 up to 3220  SHA series, load dump protection up to 80 joule  From 1210 up to 3220	SM3/5/10KW series – super flat DFN 2 package, high power surge protection  AEC-Q101 qualified  PAM8S series, pulse 5A/5B load dump suppression  DFN8-36-T73 for I/O Link protection	ESD Guard™ in miniature size 0201  AEC-Q200 specified  MLVS AM & EGA AM series for automotive applications	New CRD series in SMA & SMB package

# QUARTZ / OSCILLATOR / FILTER

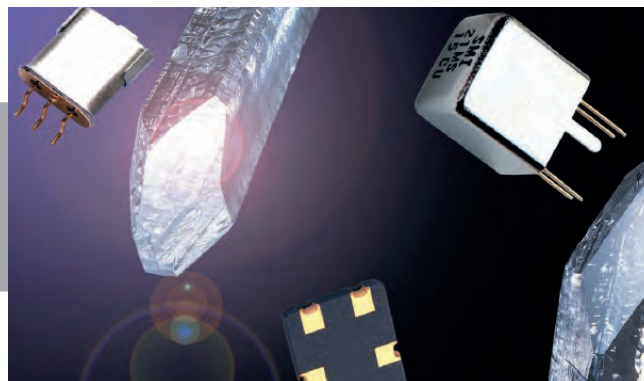





Manufacturer		CITIZEN	SMI	 Electronic Ceramics MARUWA
Quartz crystals	MHz	■	■	
Clock crystals	kHz	■	■	
Oscillators		■	■	■
MCF filter			■	
SAW filter			■	
Dielectric filters				■

## FEATURES

<b>Certificates</b>	ISO 9001	ISO 9001	ISO 9001
<b>General information</b>	Through-hole and SMD tuning fork crystals Smallest size: 1.6 × 1.0 mm Tight tolerances: up to ± 5 ppm Extended temperature range: - 40 ... + 85 °C (+125 °C)	Crystals, clock OSC, TCXO, VCXO, MCF Frequencies: 16 kHz ... 300 MHz Wide range SMD and through-hole packages LVPECL, LVDS oscillators Tight tolerances and excellent temperature stability Package down to 1.2 x 1.0 mm RTC (real time clock)	Compact, high performance sub miniature VCOs and LTCC Operating frequency: 1 MHz ... 5 GHz Through-hole and SMD Small size: up to 3.2 × 4.5 mm Excellent tolerance over temperature range Custom made products
<b>Applications</b>	Smart metering GPS Home automation BTM/IoT Industrial controls Token Wrist watch RFID	Industry electronics Medical equipment Computer gaming Reference clock TV / Audio RFID	RF Audio Wireless microphone Industrial RF control Base station Wi-Fi
<b>News</b>	Low ESR SMD tuning fork 3.2 x 1.5 mm SMD tuning fork 3.2 x 1.5 mm with parallel contacts (better EMI performance) SMD 1.6 x 1.0 mm tuning fork SMD tuning fork 3.2 x 1.5 mm with tolerance of ±50 ppm incl. stability over temp. range (CM315G)	SMD oscillator 32.768 kHz with extremely low current consumption High stability VC-TCXO, meets STRATUM3 TCXO with ±0.5 ppm tolerance HF-CMOS oscillator 55 ... 160 MHz with excellent temperature stability LVDS and LVPECL Osc.	Smallest size VCO Base station: Wireless microphone transceiver

# QUARTZ / OSCILLATOR / FILTER



Manufacturer			 Chequers Electronic (China) Limited	
Quartz crystals	MHz		■	■
Clock crystals	kHz		■	■
Ceramic resonators			■	
Oscillators		■	■	■
MCF Filter			■	■
SAW Filter			■	■
Dielectric filters			■	■
Ceramic filters			■	

## FEATURES

Certificates	IATF16949 AEC-Q100	IATF 16949	IATF16949 AEC-Q200 / AEC-Q100
<b>General information</b>	<p>MEMS-based silicon timing solutions from 1 Hz ... 900 MHz</p> <p>Low power, ultra-performance oscillators</p> <p>Differential and high-temp. oscillators, Automotive</p> <p>Extended temperature: - 55 ... 125 °C</p> <p>Clock generators, VCXO, DCXO &amp; VCTCXO (Stratum 3) / OCXO</p> <p>Spread spectrum and field prog. oscillators</p> <p>Size down to 1.5 x 0.8 CSP or SOT23</p>	<p>Ceramic resonators: 1 ... 60 MHz, 2.5 × 2.0 mm or smaller Temp.: - 40 °C ... + 8 °C</p> <p>Ceramic filters: e.g. 455 kHz / 10.7 MHz / 27 / 45 MHz</p> <p>Dielectric filters: 433 MHz ... 5 GHz Temp.: - 40 ... + 85 °C</p> <p>Quartz: up to 200 MHz, 1.6 × 1.2 mm, Temp.: - 40 ... + 125 °C</p> <p>Oscillators: up to 200 MHz, 2.5 × 2.0 mm, Temp.: - 40 ... + 125 °C</p>	<p>SAW &amp; BAW filters: 200 MHz ... 3 GHz</p> <p>IF filter: 33 MHz ... 900 MHz</p> <p>Extended Temp. Range: -40 °C ... 125 °C</p> <p>Dielectric and Notch filter</p> <p>Duplexer and Diplexer</p> <p>Quartz and Quartz-Osc. for automotive use</p> <p>Extended temperature: - 40 ... + 125 °C</p> <p>Standard and customized size: 1.6 × 1.0 mm</p>
<b>Applications</b>	<p>Automotive, Electric vehicles</p> <p>Ethernet, DDR and PCI applications</p> <p>Industrial controls</p> <p>Medical</p> <p>Wireless &amp; Backhaul</p> <p>Fiber Optic, DSL</p>	<p>Industry electronics</p> <p>Consumers</p> <p>RF modules</p> <p>Lighting</p> <p>White goods</p>	<p>Vehicle electronics, Digital radio</p> <p>Cellular (GSM, LTE)</p> <p>GNSS, RF modules</p> <p>Wi-Fi &amp; Bluetooth®</p> <p>V2X Application</p>
<b>News</b>	<p>Elite Platform™ Super-TCXOs are tight stability (<math>\pm 0.1</math> ppm to <math>\pm 2.5</math> ppm), replace legacy quartz OCXOs in emerging 5G and IEEE 1588 synchronization applications while reducing power consumption and size</p> <p>SiTime's automotive (AEC-Q100) deliver <math>\pm 20</math> ppm frequency stability from -55 °C to 125 °C</p> <p>SiTime's EMI reduction oscillators (Spread Spectrum) ensure emissions compliance through spread spectrum clocking</p> <p>OCXO (<math>\pm 0.005 \sim 0.008</math> ppm)</p>	<p>Smallest 2.0 mm x 1.6 mm ceramic resonator for 20 ... 60 MHz</p> <p>SMD quartz down to 1.6 x 1.2 mm</p> <p>IF filter e.g 10.7 m 450/455 kHz</p>	<p>FEM (Front End Module, Filter + LNA) for GNSS and WiFi</p> <p>Dual filter für RKE application</p> <p>Miniature VC-TCXO and TCXO</p> <p>Narrow band BAW, TC-SAW, SAW filters for mobile phone, IoT, GNSS</p> <p>LTE filter for world wide used bands</p>

# RF MODULES / ANTENNAS



Manufacturer	<b>AUREL</b> WIRELESS	<b>Panasonic</b> INDUSTRY	<b>Fibocom</b>
RF-modules (315 MHz ... 2.4 GHz)	■		
Bluetooth®		■	
WiFi™		■	
GSM/GPRS/EDGE			■
UMTS			■
LTE			■
LPWA (Cat NB1/NB2, Cat M1)			■
5G			■
LoRa™ Transceiver	■		

## FEATURES

Certificates	ISO 9001	ISO 9001, ISO 14001	ISO 9001, ISO 14001
<b>General information</b>	<p>Low power RF modules for 315, 433.92, 868, 915 MHz and 2.4 GHz</p> <p>Products in compliance with the European Standards (RED)</p> <p>Complete AM &amp; FM transmitter modules</p> <p>KeyFob transmitter, transceiver and antennas</p> <p>Extremely low current consumption for extended battery use</p> <p>Customized product development</p>	<p>Bluetooth® 4.2 Dual Mode (BR, Bluetooth® LE) modules</p> <p>Bluetooth® 5.0 Low Energy modules</p> <p>Bluetooth® 5.0/4.2 + IEEE® 802.15.4 modules</p> <p>WiFi™ Embedded 802.11 b/g/n modules</p> <p>Combo WiFi™ Radio 2.4GHz &amp; 5GHz 802.11 a/b/g/n + Bluetooth® 5.0 (BR, DER, LE) modules</p> <p>Modules with embedded chip antenna</p> <p>Solderable modules</p> <p>Industry modules with extended temperature range</p>	<p>GSM/GPRS/EDGE modules and UMTS modules</p> <p>LTE Cat 1 -Cat 20 modules and 5G modules</p> <p>LPWA (Cat NB1/2, Cat M1) modules</p> <p>SoC (System on Chip) modules</p> <p>Available form factor: LGA/LCC, M.2 and Mini PCIe Card</p> <p>Backwards compatible modules</p> <p>Global and regional modules</p> <p>Qualcomm, MediaTek and Intel based modules</p>
<b>Applications</b>	<p>Gate openers / access control</p> <p>Home/car alarm systems</p> <p>Home automation</p> <p>General metering systems</p> <p>Telemetry and remote controls</p> <p>Personal security</p> <p>Social alarms</p> <p>IoT applications</p> <p>Long range Communication</p>	<p>General metering systems</p> <p>Telemetry and remote controls</p> <p>Smart Home / Home automation</p> <p>Medical healthcare</p> <p>Sensor applications</p> <p>Industrial IoT</p>	<p>Remote controls / maintenance</p> <p>E-Call</p> <p>Smart Home</p> <p>Smart Metering</p> <p>Smart City</p> <p>Security monitoring</p> <p>POS</p>
<b>News</b>	<p>Transceiver module with Semtech LoRa™</p> <p>Technology enable radio link up to 12 km LOS</p> <p>SMD FSK &amp; OOK transceiver</p> <p>Rain sensor for weather station</p> <p>Rolling code KeyFob in different packages and numbers of push buttons</p>	<p><b>PAN1780 – Bluetooth® 5.0 Low Energy Module</b></p> <p>Nordic nRF52840 (ARM Cortex-M4F with 64 MHz)</p> <p>LE 2Mbps high-speed PHY / LE long range coded PHY</p> <p>Embedded 1 MB flash memory + 256 kB internal RAM</p> <p>Qualified Bluetooth® Mesh profile stack</p> <p>Supports NFC-A for simple pairing</p>	<p><b>SQ808 series – intelligent LTE Cat 4 module</b></p> <p>Based on Qualcomm QCM2150 platform</p> <p>Supports long-distance communication (GSM-LTE), short-distance transmission (BT®/WiFi™) as well as GNSS positioning technologies</p> <p>Embedded Android operating system</p> <p>LCC+LGA packaged for easy patching</p>

# RF MODULES / ANTENNAS

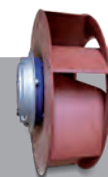


Manufacturer	<b>LOCOSYS</b>	<b>PSA</b> <small>PASSIVE SYSTEM ALLIANCE INPAVO TECHNOLOGY CO., LTD.</small>	<b>2J</b> antennas
GPS/GNSS receiver modules	■		
GPS/GNSS smart antenna modules	■		
Antennas f. ISM Band, Bluetooth®/WiFi™		■	■
Antennas f. GPS/GNSS		■	■
Antennas f. Cellular		■	■
Antennas f. Car2Car communication		■	
Antennas f. NFC (Near Field Communication)		■	
WPC (Wireless Power Charging)		■	

## FEATURES

Certificates	IATF 16949, ISO 9001, ISO 16750, ISO 26262	IATF 16949, ISO 9001, ISO 14001, QS 9000	IATF 16949, ISO 9001, ISO 14001
<b>General information</b>	<p>GNSS (GPS/GLONASS/BeiDou/Galileo) modules and GNSS-mouse</p> <p>GNSS RTD/RTK modules</p> <p>GNSS antenna modules</p> <p>ADR &amp; UDR solutions</p> <p>RTK solutions</p> <p>Products comply with AEC Q100</p>	<p>High product variety: patch antennas, chip antennas, active antennas, dipole antennas, SMT antennas, LCT/LDS, NFC and WPC solutions</p> <p>Customized patch antennas with high gain for GPS, GLONASS, Galileo, BeiDou, SDARS, DAB, etc.</p> <p>Patch antennas with small sizes (to 6 x 6 mm) and low profiles (to 2 mm)</p> <p>Chip antennas for GNSS, Cellular, Bluetooth®/WiFi™ and ISM band</p> <p>Multi-band antennas</p> <p>Customized solutions for WPC and NFC</p> <p>LDS (Laser Direct Structure) solutions</p>	<p>High product variety: PCB and flexible foil antennas, SMD/SMT antennas, omnidirectional antennas and patch antennas</p> <p>Standard and customized internal and external antennas with high efficiency for Cellular, GNSS, Bluetooth®/WiFi™ and ISM band</p> <p>Multi-band antennas</p> <p>Customized cables and connectors</p> <p>Custom colors of enclosures – logo printing possible</p> <p>Antennas certified according to IP67, IP69K, IK09</p>
<b>Applications</b>	<p>Tracking / Tracing</p> <p>Telematics / Navigation</p> <p>Car infotainment</p> <p>E-Call</p> <p>Autonomous driving</p> <p>Precision agriculture</p> <p>Offshore / Marine applications</p> <p>AGV robotics</p>	<p>Tracking / Tracing</p> <p>Telematics / Navigation</p> <p>Car infotainment</p> <p>V2X/V2V communication</p> <p>Wireless Charging applications</p> <p>Keyless systems</p> <p>E-Call</p> <p>Autonomous driving</p>	<p>Tracking / Tracing</p> <p>Telematics / Navigation</p> <p>Automation</p> <p>M2M</p> <p>Telecommunications</p> <p>Smart City</p> <p>Smart Home</p> <p>Marine applications</p>
<b>News</b>	<p><b>High-Precision GNSS solutions – RTK-4671 series</b></p> <p>RTK-4671-SHDR/MHDR is a high-precision GNSS RTK solution for smart driving and for lane level navigation</p> <p>RTK-4671-SHPF/MHPF is a high-precision GNSS RTK board for centimeter-level positioning and heading and direction</p>	<p><b>L1/L2/L5/L6 antenna series</b></p> <p>Stacked patch antennas with/without housing for the high accuracy navigation system with centimeter-Level</p> <p>Narrow band and wideband antennas</p> <p>2 Pin or 4 Pin solutions</p>	<p><b>5G NR antennas</b></p> <p>High-performance antennas for 5G networks</p> <p>Ground plane independent and dependent antennas for internal and external use</p> <p>Antenna solutions up to 4 × 5G NR MIMO</p>

# ELECTROMECHANICS



Manufacturer							
Fan	■	■	■	■			■
Heatsink	■						■
Fan accessories					■	■	
Customized complete systems	■						■

## FEATURES

<b>Certificates</b>	IECQ QC080000, ISO14064, ISO14001, ISO/IATF 16949, OHSAS18001, ISO9001	ISO 9001	ISO9001	ISO 9001 ISO 14001	ISO9001	ISO9001	CNAS ISO 17025, ISO9001/ISO140001, OHSAS18001, TS16949, USA ESDA ANSI S20.20
<b>General information</b>	Adda, one of the largest major cooling fan manufacturers worldwide, was established in 1978, and has been specialized in cooling fans and modules as well as insisting in its service and technical cooperation to the clients for more than 40 years.	Ecofit was founded in 1976 in Vendôme (Frankreich) and belongs since 1994 to the Rosenberg group. From standard products to made-to-measure developments, Ecofit has been offering all customers an invaluable expertise based on more than 40 years know-how.	Fulltech is one of the professional AC cooling fan manufacturers based in Taiwan and has been selling fans worldwide since 1990. Fulltech commits themselves to fan's design, development and manufacturing.	NMB was founded in 1951 in Tokyo. With 60% market share for ball bearings and extension in the product range NMB is one of the global player's worldwide.	Qianyuan was founded in 2003. The main products are such as wire form fan guards for cooling systems, grills, net racks for white goods (roaster, oven, etc.).	The Thoptec Entwicklungs & Vertriebs GmbH is not only a manufacturer of fasteners for electronic components, but also supports its customers with special solutions from product planning and construction through to series production.	Asia Vital Components Co., Ltd World top 5 manufacturer of DC/Blower/EC fans, Fan Tray, Cooler, Heat Sinks and Thermal Modules. Found in 1991 in Taiwan More than 1700 technical patents IPO in Taiwan in 2003 (TSE 3017)
<b>Applications</b>	White goods Cooling technology (Automotive) Pico projectors Drones Industrial PC appliance Industrial automation Medical technology IT & Telecom etc.	Residential ventilation Heating Railway Professional dryers Filtration Refrigeration Wind energy industry Thermal management of electrical cabinets HVAC (Heating, Ventilation, Air Conditioning)	Photography lighting device Control panels Stage lights Refrigerators Freezers LED display cooling Heat exchangers Fog machines Electricity control Elevators Photovoltaic industry Medical equipment	Air conditioning and ventilation industry Agricultural industry Industrial technology Heating and burner technology Household appliances Compressors Railway technology Food industry Medical technology Personal protection etc.			PC/Server/Notebook Solution Telecommunication Green Energy E-Mobility Consumer Electronics Lighting Medical Device Automotive Smart Innovation
<b>News</b>		125D-A ETRI fans (higher airflow, w/o noise level increase; wider power range; 0 ... 10 V or PWM)	EC Fans Cross flow fan with right sided motor				

# ELECTROMECHANICS







Manufacturer				<b>knitter-switch</b>
Tactile switches			■	■
Push-button switches			■	■
Micro switches		■	■	■
Silicone keypads & membrane keyboards	■			■
Relays		■		
Tilt switches		■		■
DIP-/piano switches		■	■	
Rotary DIP switches		■	■	■
Slide switches		■	■	■
Industrial control switches		■	■	
Detector-/manipulation switches		■		■

## FEATURES

<b>Certificates</b>	ISO 9001/14001 TS 16949	ISO9001, ISO14001, IATF16949, OHSAS18001	IATF16949, ISO 9001, ISO 14001	ISO 9001/14001
<b>General information</b>	Win Industry Company was founded in 1978 in Taipei as an original supplier of silicone rubber products. Meanwhile, Win produces at two locations on a total area of approx. 90,000 m <sup>2</sup> and has steadily expanded its product range. In the meantime, tooling and mold making as well as the finishing treatment such as screen printing, spraying, laser etching takes places in-house.	In 1981, the Excel Cell Electronic Co., Ltd. was founded. While button cells were the original pillar, ECE has meanwhile expanded its portfolio with a wide range of switches, plugs and small stamping parts. ECE is characterized i.a. through vertical integration, production capability, strict quality assurance and in-house development.	Diptronics Manufacturing Inc., founded in 1985, specializing in tactile switches and DIP/rotary DIP switches manufacturing. Complete production lines, in six large production facilities, enable a timely delivery of the highest quality. Strength: integration of core competence, complete in-house manufacturing, in-house engineering team, in-house LED switch assembly line, support in production and design, flexible delivery.	Since its founding in 1966 knitter-switch has remained at the forefront of switch technology. The large selection of switches, supplemented by keyboards, is constantly being expanded using the latest technologies and materials, and the shortest delivery times are achieved. The focus is on quality and service (support for customized solutions and in the design process).
<b>Applications</b>	Human Machine Interface (HMI) Home appliances Building automation Industry Mechanical engineering Automotive applications HVAC Medical technology Safety technology Ground conveyor etc.	Industrial control Instrument equipment Security systems Consumer electronics Household appliance Power energy industry Optoelectronic industry Automotive electronic industry Computer and peripherals Network and communication etc.	3C Industry IT Industry Medical devices Cloud devices Industrial control field Automobile industry White goods Automatic home Appliances Security Smart wearables etc.	Home appliances Building automation Industry Mechanical engineering Automotive applications HVAC Medical technology Safety technology Ground conveyor etc.
<b>News</b>			Diptronics continues to focus on the switch business, but is constantly developing new technologies (smartphone, automotive and illuminated switches) to meet rapidly changing market demands.	ICE Series (Industrial Control Switches which are compliant to all relevant safety standards)

# CONNECTORS



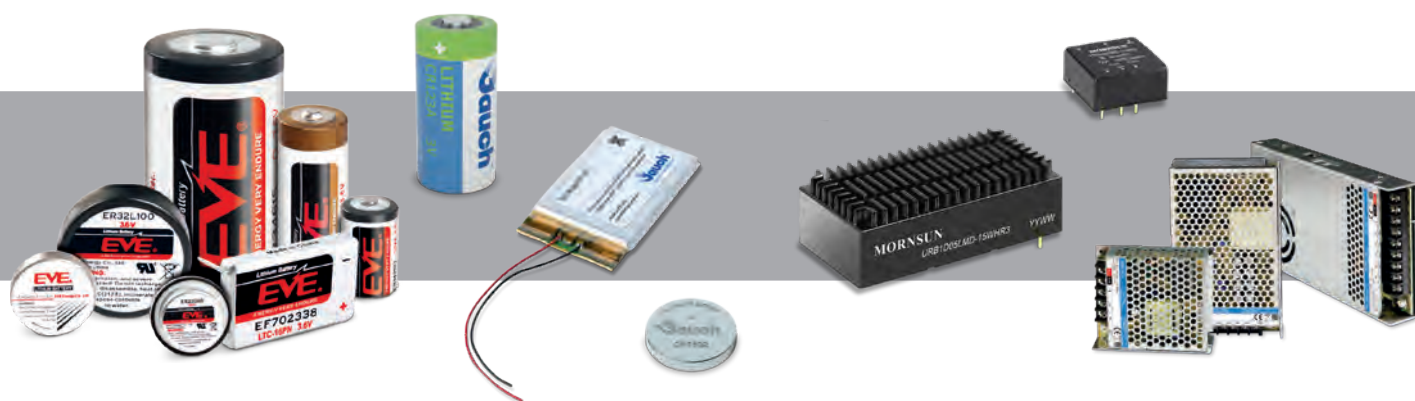
Manufacturer					
Data	USB	■	■	■	■
	RJ	■	■	■	■
	D-Sub	■	■	■	
	HDMI / SATA		■	■	
	FFC / FPC		■	■	■
	IDC / flat cable	■	■	■	
Power	Terminal blocks		■	■	■
	Header / housing	■	■	■	





## FEATURES

<b>Certificates</b>	ISO 9001 TS 16949 ISO14001 VG und TÜV New: IRIS Certification	ISO 9001 TS 16949 ISO 13485	ISO 9001 TS 16949 ISO 14001 OHSAS 18001 TÜV (Solar)	ISO 9001 TS 16949 ISO 9000 ISO 14001
<b>General information</b>	Wide variety of quality connectors for high end performance applications	Producer of connectors for data- and power connections Best price/performance ratio	TE-Connectivity is a unique component manufacturer for automotive industry as well as further branches	High value PCB connectors
<b>Applications</b>	Telecommunication Automotive Computer & IT Power units Industry Military Marine Railway Audio LED cabling Solar connectors AC/DC	Telecommunication Automotive Computer & IT Sensors Retail industry Power units	Telecommunication Automotive Computer & IT Measurement systems Sensors Retail industry Power units Industry Solar	Telecommunication Automotive Computer & IT Sensors Retail industry Power units
<b>News</b>	USB C 3.1	USB C 3.1	Dynamic Series Micro-Match USB C 3.1 Mini I/O	



# BATTERIES / POWER SUPPLIES

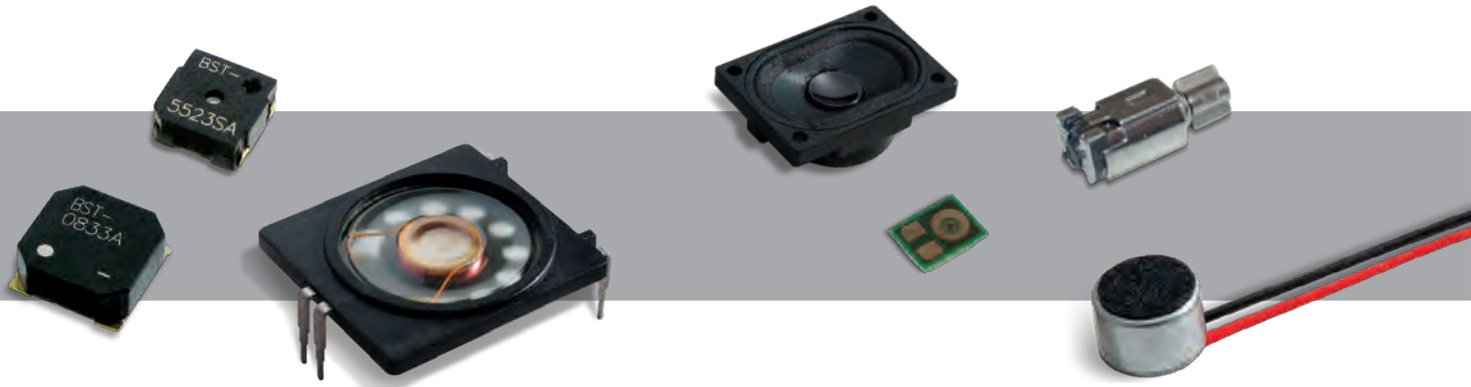


Manufacturer				
Li-SOCl <sub>2</sub> / Li-MnO <sub>2</sub>	■	■	■	
Super Pulse Cap	■	■	■	
Li-Ion / Li-Polymer	■	■	■	
AC/DC converter				■
DC/DC converter				■
Transceiver modul				■
AC/DC switching power supply				■

## FEATURES

Certificates	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001 IATF 16949
General information	<p>One of the biggest manufacturers for lithium primary cells</p> <p>Own engineering and production facility</p> <p>Li-SOCl<sub>2</sub> and Li-MnO<sub>2</sub></p> <p>High temperature cells Temp.: - 40 ... + 145 °C</p> <p>SPC – super pulse capacitors</p> <p>Customized battery packs with PCB</p> <p>ICR18650 with 2000 mAh and 2900 mAh</p>	<p>One of the biggest manufacturers for lithium primary cells</p> <p>Own engineering and production facility</p> <p>Li-SOCl<sub>2</sub> and Li-MnO<sub>2</sub></p> <p>High temperature cells Temp.: - 40 ... + 145 °C</p> <p>SPC – super pulse capacitors</p> <p>Customized battery packs with PCB</p> <p>ICR18650 with 2000 mAh and 2900 mAh</p>	<p>One of the biggest manufacturers for lithium primary cells</p> <p>Own engineering and production facility</p> <p>Li-SOCl<sub>2</sub> and Li-MnO<sub>2</sub></p> <p>High temperature cells Temp.: - 40 ... + 145 °C</p> <p>SPC – super pulse capacitors</p> <p>Customized battery packs with PCB</p> <p>ICR18650 with 2000 mAh and 2900 mAh</p>	<p>Leading manufacturer of modules for power supply</p> <p>Successful in research and use of electromagnetic insulation technologies</p> <p>Isolated 0.25 – 200 W DC/DC converter</p> <p>Isolated 1 – 350 W AC/DC converter</p> <p>Isolated CAN/RS-485/RS-232 transceiver modules</p> <p>Enclosed AC/DC Power Supply 35 – 350 W (with/without active PFC)</p> <p>Different power supply IC solutions</p> <p>Packages: SMD, SIP, DIP, DIN rail etc.</p> <p>Certifications according to EN, UL, CB and CSA</p> <p>Professional technical support</p> <p>Own production sites</p>
Applications	<p>Automotive</p> <p>Industrial</p> <p>White goods</p> <p>Medical equipment</p> <p>General Purpose</p>	<p>Automotive</p> <p>Industrial</p> <p>White goods</p> <p>Medical equipment</p> <p>General Purpose</p>	<p>Automotive</p> <p>Industrial</p> <p>White goods</p> <p>Medical equipment</p> <p>General Purpose</p>	<p>Industry</p> <p>Transportation</p> <p>Energy Technology, Medical</p> <p>Testing and measuring technology</p> <p>Automotive, Telecommunications, Consumer, Photovoltaics</p>
News				<p>3W AC/DC converter with transient output power up to 12 W – LDE03-20Bxx-0</p> <p>Ultra-compact size 5 – 15 W AC/DC converter – LSxx-13Bxx</p>

# ACOUSTICS



Manufacturer	BAOLONG	ChinaSound	VECO	KOTL	Li Sheng Technologies	BSE
Piezoel. transducer		■				
Piezoel. buzzer		■				
Piezoel. speaker		■				
Piezoel. element		■				
E-magn. transducer						
Dyn. speakers		■	■		■	
SMD microphones <small>Reflow solderable</small>			■			■
Standard microphones			■			■
MEMS microphones						■
Coin type vibration motors	■			■		
Cylinder type vibration motors	■			■		
SMD vibration motors	■			■		
Linear vibration motors	■			■		

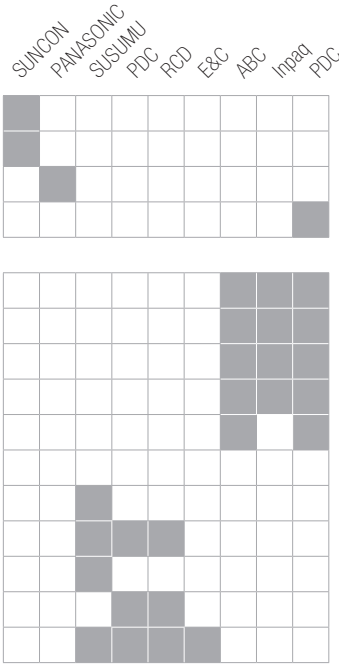
## FEATURES

Certificates	ISO9001, ISO14001, OHSAS18001	TS 16949	TS 16949	ISO 9001	TS 16949	ISO 9001, TS 16949
<b>General information</b>	<p>Baolong is located in Wenzhou, established in 1986.</p> <p>Focus: Micro vibration motors, micro driving motors, and could be customized.</p> <p>Advantage: High life, small size, light weight and low power consumption.</p>	<p>Chinasound is producing in Changzhou (China)</p> <p>Main focus are piezo parts and buzzers, also alarm buzzers and mylar speakers, own R&amp;D facilities</p>	<p>Main subject are speakers of all kind, also microphones (ECM technology, conventional &amp; reflowable)</p> <p>Strong commitment to R&amp;D, state-of-the-art laboratories, meets customer requirements with regard to size, sound and/or power consumption</p>	<p>KOTL has its location in Wenzhou</p> <p>Focus: micro vibration motors; well experienced in mechanical engineering, stable construction motors with excellent performance, light weight, low power consumption</p>	<p>LS was established in 2007 in Shuyang (2014 in Changzhou) with 5000 m<sup>2</sup> production area and 4000 employees</p> <p>Focused on notebooks, ear phones, audio equipment, home appliance and automotive applications. Mainly dynamic loudspeakers</p>	<p>BO SUNG ELECTRONICS Co., Ltd. (B S E) was founded in 1987 in Incheon, South Korea. Later renamed into BSE (Best Sound Electronics)</p> <p>BSE develops and produces acoustic solutions, consisting of ECM &amp; MEMS microphones</p>
<b>Applications</b>	<p>Mobile phones</p> <p>Sports bracelets</p> <p>Smart watches</p> <p>Electronic cigarette</p> <p>High-end electric toothbrushes</p> <p>Devices with haptic feedback, etc.</p>	<p>Piezo alarms for fire and security industry</p> <p>Home appliances</p> <p>POS</p>	<p>Computer industry</p> <p>Telecommunication</p> <p>Automotive</p> <p>Consumer</p> <p>Home appliances</p> <p>Customized</p>	<p>Vibration alarm</p> <p>Silent alarm</p> <p>Haptic feedback</p> <p>Smartphone, razor and toothbrush</p>	<p>Computer industry</p> <p>Telecommunication</p> <p>Automotive</p> <p>Home appliances</p>	<p>Mainly utilized in the leading consumer mobile devices</p> <p>MP3</p> <p>Computers</p> <p>Communication</p> <p>Automotive applications</p>
<b>News</b>	<p>Smallest SMT vibration motor-BLT-3211H</p> <p>Samll coin vibration motor 0720 &amp; 0625</p> <p>LRA vibration motor 0832 &amp; 0412</p>	<p>Customer specific piezo alarms</p> <p>SMD-loudspeaker</p>	<p>Waterproof speakers, microphones and receivers (up to IP67)</p> <p>Speakers in small boxes</p> <p>SMD-loudspeaker</p>	<p>Reflow solderable SMD types</p> <p>Linear vibration motors</p>	<p>Automotive loudspeaker</p>	<p>Earphone Receiver</p>



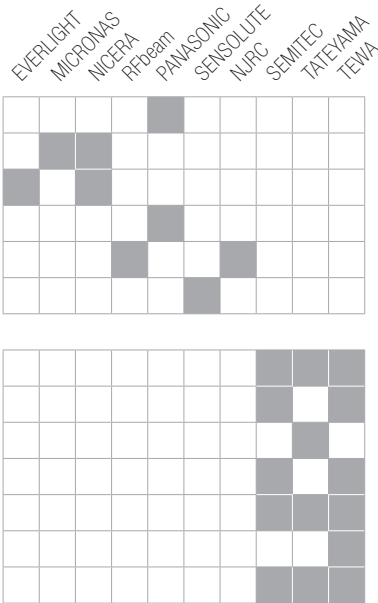
# PASSIVE COMPONENTS

CAPACITORS
Electrolytic (SMD, THT)
Hybrid (SMD, THT)
Polymer (SMD, THT)
MLCC
INDUCTIVE COMPONENTS
Chip inductors
Power inductors
Line filters
Chip ferrit beads
Transformers and through hole
RESISTORS
Thin film resistors
Current sense resistors (Shunts)
High frequency resistors
Thick film resistors
Special resistors



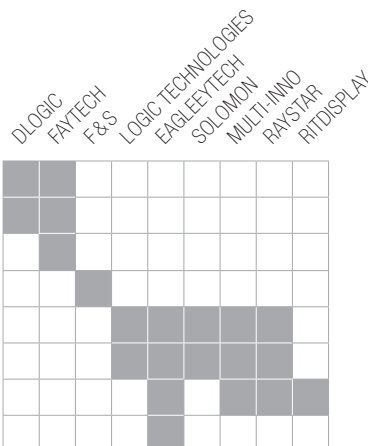
# SENSORS

Grid Eye – thermopile array
Magnetic field
Infrared
Solar cells
Radar
Vibration
TEMPERATURE SENSORS
NTC, SMD
NTC leaded
PTC leaded
NTC film type
NTC thermistor probes
PTC thermistor probes
Assembled sensors



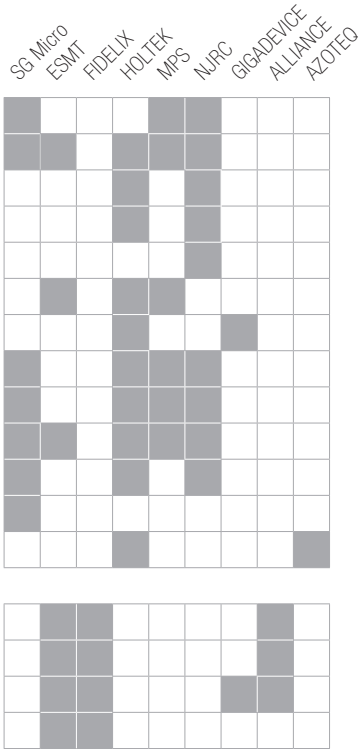
# DISPLAYS / EMBEDDED SYSTEMS

Touch PCs
Touch monitors
Boxed industrial PCs
Embedded boards
TFT-displays
Monochrome LC-displays
Passive Matrix OLED-displays
E-Paper



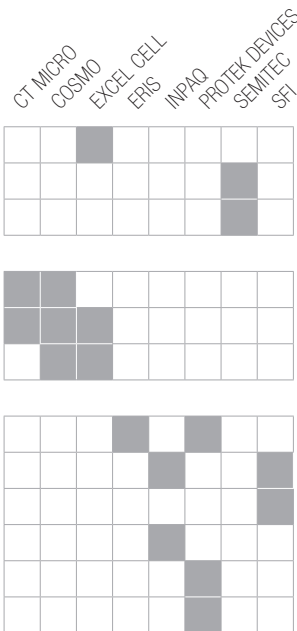
# SEMICONDUCTORS

ANALOG ICs
Analog switches
Audio ICs
Communication ICs
Display drivers
GaAs MMIC
LED-Treiber
Micro controller
Motor ICs
Operational amplifiers
Power supply ICs
Video ICs
Logic ICs
Touch & Multisensor IC
SPEICHER ICs
SRAM/pSRAM
SDRAM/DDR/DDR2/DDR3/DDR4
Flash
MCP



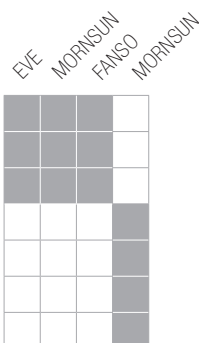
# PROTECTION DEVICES

OVERCURRENT PROTECTION
PPTC
Power thermistor
CRD
COUPLER/SSR
Opto coupler
MOS relay
Solid state relay
OVERVOLTAGE PROTECTION
TVS Diode-/array
Multilayer Varistor
CSPD (chip surge protection device)
ESD suppressor
Protection thyristor
Protection module



# BATTERIES / POWER SUPPLIES

Li-SOCI2 / Li-MnO2
Super pulse cap
Li-Ion / Li-polymer
AC/DC converter
DC/DC converter
Transceiver module
AC/DC power supplies



## LED

Low power LED, SMD / THT
7-segment displays
LED-Modules(ZHAGA)
Power supplies

CITIZEN  
EVERLIGHT  
DOMINANT  
HARVATEK  
LEXSTAR  
FULHAM  
INVENTRONICS  
ELT

■	■	■	■	■					
	■								
				■					
					■	■	■	■	

CITIZEN

EVERLIGHT

DOMINANT<sup>TM</sup>  
Semiconductors  
Innovating Illumination

FULHAM  
Lighting... Global. Clever. Sustainable.

INVENTRONICS

ELT

Lextar

## RF PRODUCTS

QUARZE / OSZILLATOREN / FILTER
Quartz crystals (MHz) / (kHz)
Ceramic resonators
Oscillators
MCF / SAW filters
Dielectric filters
Ceramic filters / resonators
RF MODULES / ANTENNAS
RF modules (315 MHz ... 2.4 GHz)
WiFi <sup>TM</sup> -, Bluetooth <sup>®</sup> modules
GPS/GNSS modules
LPWA (Cat NB1/NB2, Cat M1) modules
GSM/UMTS/LTE modules
5G modules
Antennas f. ISM Band, WiFi <sup>TM</sup> , Bluetooth <sup>®</sup>
Antennas f. GPS/GNSS
Antennas f. Cellular
Antennas f. Car2Car communication
Antennas f. NFC (Near Field Comm.)
WPC (Wireless Power Charging)
LoRa <sup>TM</sup> Transceiver

AUREL  
CHEQUERS  
CITIZEN  
INPAQ  
MARUWA  
SMI  
TST  
PANASONIC  
LOCOSYS  
SiTime  
FIBOCOM  
2J ANTENNAS

	■	■			■	■								
	■													
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	■													

CQ

AUREL  
WIRELESS

PSA PASSIVE SYSTEM ALLIANCE  
INPAQ TECHNOLOGY CO. LTD.

SMI

Electronic Ceramics  
MARUWA

FIBOCOM

TST

LOCOSYS

SiTime<sup>TM</sup>

2J  
antennas

Panasonic  
INDUSTRY

CITIZEN

## ACOUSTICS

Piezoel. transducers
Magnetic transducers
Dynamic speakers (4 ... 50 Ω)
Electret condenser microphones
MEMS microphones
Vibration motors

BAOLONG  
CHINASOUND  
KOTL  
VANSONIC  
LS  
BSE

	■								
		■							
			■	■	■				
				■	■	■			
	■								

KOTL

Chinasound

Li Sheng  
Technologies

VECO

BSE

BAOLONG



## OFFICES IN EUROPE

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### Germany

Nagold (Headquarters)

### Austria

### France

### Spain

### Italy

### Hungary

### Bulgaria

### Romania

### Switzerland

 **novitronic**  
powered by endrich



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