novitronic
powered by endrich

endrich
components of life

LINECARD

Content

Design-In Concept

Our Service

+ Solution-oriented, competent consulting by our technically experienced employees
+ Personal and individual solution oriented support
+ Cross-product project management
+ Implementation of customer-specific requirements
+ Network of service providers

Our Claim

+ Innovative products and customized solutions
+ High quality standards
+ Regular trend analysis
+ Great flexibility in product development
+ Long partnerships with suppliers

Your Advantages

+ endrich as reliable partner
+ Optimized product design
+ R&D support in hardware and software
+ Suitable product selection
+ Focus on own core competence
+ Reduced development times through endrich support

Our Service → **Your Benefits** ← **Our Standards**

Dr. Christiane Endrich

„Where the future of electronics is at home"

Quality and technical support: success through excellence In today's world, quality is crucial to success - it is more than just an aspiration, it is the key to excellence. Those who focus on quality demonstrate their expertise. True to the motto: you can only be truly successful with first-class components. In times when long-term business relationships have become rare, we really on continuity and close co-operation. Not only with regard to suppliers, but also within the team. This enables us to guarantee competitive advantages and maximum product availability. A positive working environment also promotes efficiency and motivation in everyday life.

Our **endrich** marketing teams and sales staff are demanding, innovative and results-oriented. They have outstanding technical qualifications, which are complemented by many years of experience in design-in. Each product area is managed by **endrich** specialists and experts from our manufacturers. This means that we can always offer you the customised technical support you need.

„endrich: Innovation, proximity and service in perfection"

From our central warehouse in Nagold, we deliver to over 50 countries worldwide, always to the highest standards such as „just in time", buffer and consignment stock, including customer-specific labelling for seamless traceability. Thanks to our customised and customer-oriented logistics, we can quickly get our products to where you need us. We maintain close contacts directly with the manufacturer and at the same time are always close to you, thinking locally and acting globally - in the truest sense of the word.

We see the procurement of innovative components and the development of customised system- and IoT-solutions not only as a challenge, but also as a key strength of our company. The highest level of service and quality are benchmarks for us, especially in an industry that is known for its global quality competition. Even when costs and product development are developing rapidly, we remain calm and make targeted use of our expertise. We do not leave our customers alone, but advise them at an early stage on suitable products and their possibilities - right through to sales. The advantages of family thinking are only possible in a family business like **endrich**. We are standing for personal dialogue from person to person and focus on long-term customer and manufacturer relationships, in line with our claim **„endrich - components of life"**.

IoT Platform

Endrich – Your Partner for IoT Development and Connected Technologies

At endrich, we heve made it our mission to activity promote are committed to actively advancing research and development in the field of IoT (Internet of Things). With this new focus, we are entering an era where we expand our long-standing expertise in the design of electronic components to comprehensive and holistic systems in the IoT domain. Through our own developments and in-depth know-how, we set new standards and shape the future of connected technologies.

In an increasingly connected world, the development of intelligent products is crucial for success. Data is the foundation of every intelligent decision. At Endrich, we stand by our customers as a reliable partner to jointly develop innovative IoT solutions.

Our **E-IoT ecosystem** offers a complete solution from a single source: from IoT nodes and smart sensors to gateways and cloud services – everything you need for your IoT development. We leverage our extensive experience to create tailored solutions that meet your specific needs.

Endrich – Your Partner for Innovative IoT Solutions

CUSTOMIZED SOFTWARE & HARDWARE DESIGN

endrich

We offer:

Customized Development
Transform conventional devices into smart products with us. Our open IoT single-board computer design enables quick and flexible adaptations to fulfill your specific requirements.
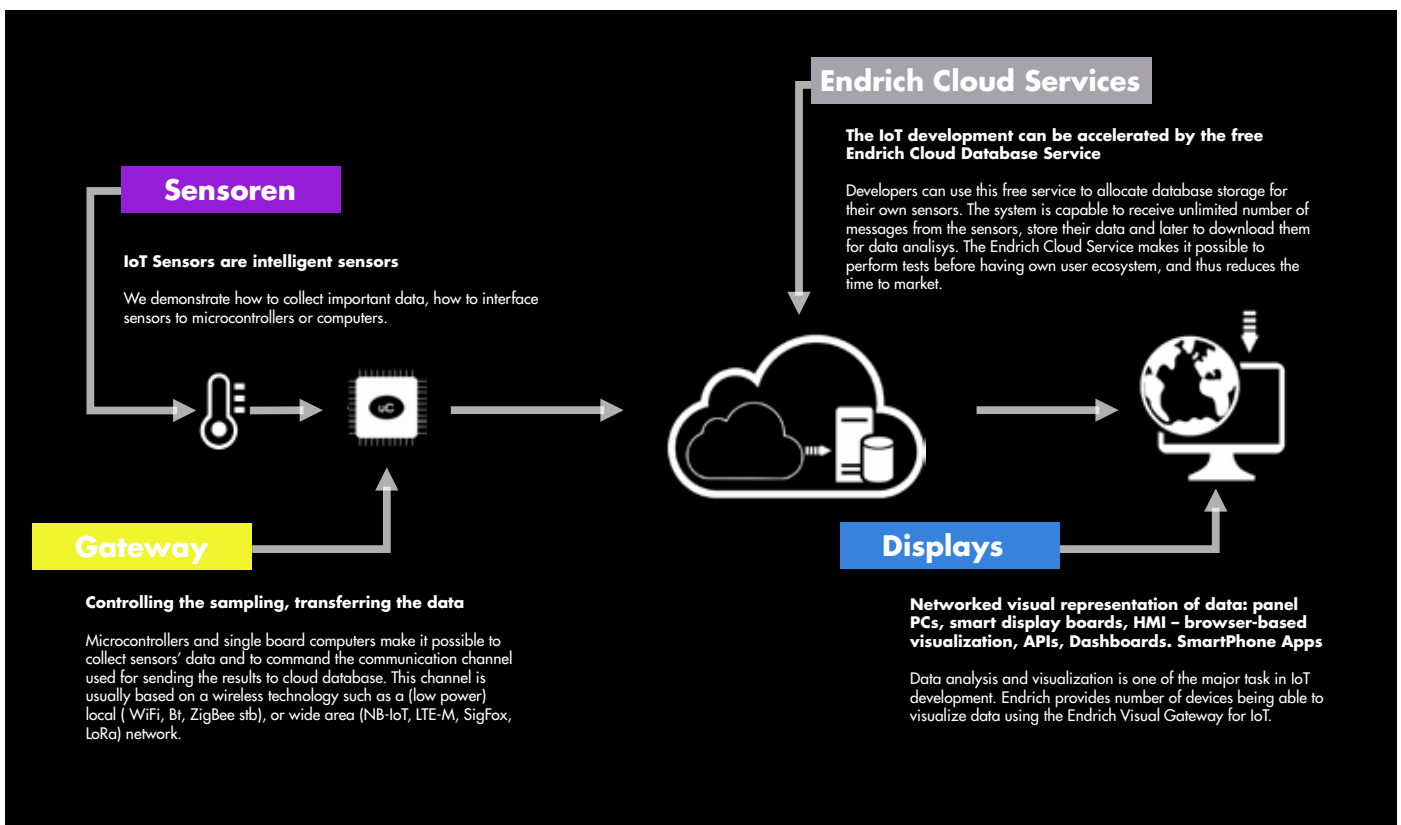
Enhancement of Existing Systems
With our IoT extensions for Arduino, Raspberry Pi, and other single-board computers, we make your existing systems „IoT ready."

Comprehensive Environmental Monitoring
Our solutions help you efficiently to monitor environmental parameters such as air quality and temperature, optimizing processes and creating safer working and living environments.

e-IoT Concept

One way to transmit data is through smart sensors directly connected to the Internet. However, in many cases, a local wireless sensor network with a single Internet gateway is a better and more economical solution. We will discuss these options illustrated by the e-IoT ecosystem, which offers cellular LPWAN connectivity for direct sensor-database communication and recently utilizes NeoCortec's revolutionary NeoMesh protocol. This enables an ad-hoc, extremely energy-efficient sub-GHz mesh WLAN to collect data locally and transfer it to the Internet via a single access point.

Sensoren

IoT Sensors are intelligent sensors

We demonstrate how to collect important data, how to interface sensors to microcontrollers or computers.

Gateway

Controlling the sampling, transferring the data

Microcontrollers and single board computers make it possible to collect sensors' data and to command the communication channel used for sending the results to cloud database. This channel is usually based on a wireless technology such as a (low power) local (WiFi, Bt, ZigBee stb), or wide area (NB-IoT, LTE-M, SigFox, LoRa) network.

Endrich Cloud Services

The IoT development can be accelerated by the free Endrich Cloud Database Service

Developers can use this free service to allocate database storage for their own sensors. The system is capable to receive unlimited number of messages from the sensors, store their data and later to download them for data analisys. The Endrich Cloud Service makes it possible to perform tests before having own user ecosystem, and thus reduces the time to market.

Displays

Networked visual representation of data: panel PCs, smart display boards, HMI – browser-based visualization, APIs, Dashboards. SmartPhone Apps

Data analysis and visualization is one of the major task in IoT development. Endrich provides number of devices being able to visualize data using the Endrich Visual Gateway for IoT.

Industry 4.0 demands connected machines and systems that exchange and utilize data from sensors. Electronics based on microcontrollers (MCUs) take care of controlling the sensors and even allow for processing data directly on-site (edge computing) before transferring it to a database for analysis or visualization. The ecosystem that makes all this possible is called IoT (Internet of Things) and includes hardware components as well as software services like databases and visualization tools. Endrich's own **e-IoT system** provides a comprehensive solution from a single source. Multiple IoT nodes, smart sensors, gateway devices, and cloud services are available to our partners to initiate and advance their IoT development.

„We make your device smart". Endrich operates in three key areas, the first of which focuses on transforming conventional devices into **SMART** devices. To this end, we have developed a RISC-V-based IoT single-board computer under an open hardware and software structure, with all technical data freely available to our customers. The device serves as an evaluation board to establish connections and conduct tests with the entire e-IoT platform. This can form the basis for a more specific product development.

„Make your SBC IoT ready". The second area involves integrating other commercially available SBCs (single-board computers) such as **Arduino** or **Raspberry Pi**. Endrich offers extension shields to convert these MCU boards into fully-fledged IoT endpoints by adding sensors and communication capabilities.

„We care about the environment". To provide a better environment for people, Endrich employs IoT technologies for monitoring environmental parameters.
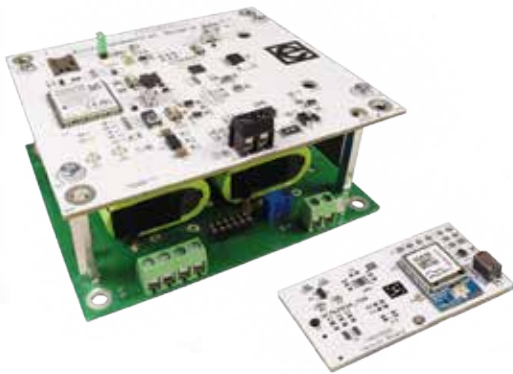
The above-mentioned areas require the detection of operational parameters (e.g., machines and equipment, mainly for telemetry and predictive maintenance) as well as environmental parameters such as air quality, temperature distribution, and other important measures that describe the properties of a particular environment (e.g., in buildings, warehouses, cities, or residential areas).

Together towards success At endrich, we understand that every development is unique. That's why we work closely with our customers to develop customized solutions that are optimally tailored to their needs. With our technical expertise and experience, we elevate your projects to the next level. Together, we create innovations that make a difference.

Let us realize your vision together

Systems Solutions

EXPERTISE

Endrich is your partner for every phase of the product lifecycle, from concept to market launch. With a comprehensive consulting service, innovative solutions, and high-quality accessories, we provide a holistic support. Our collaborations with leading partners enable us to develop customized solutions that are precisely tailored to your needs, distinguished by their versatility and quality.
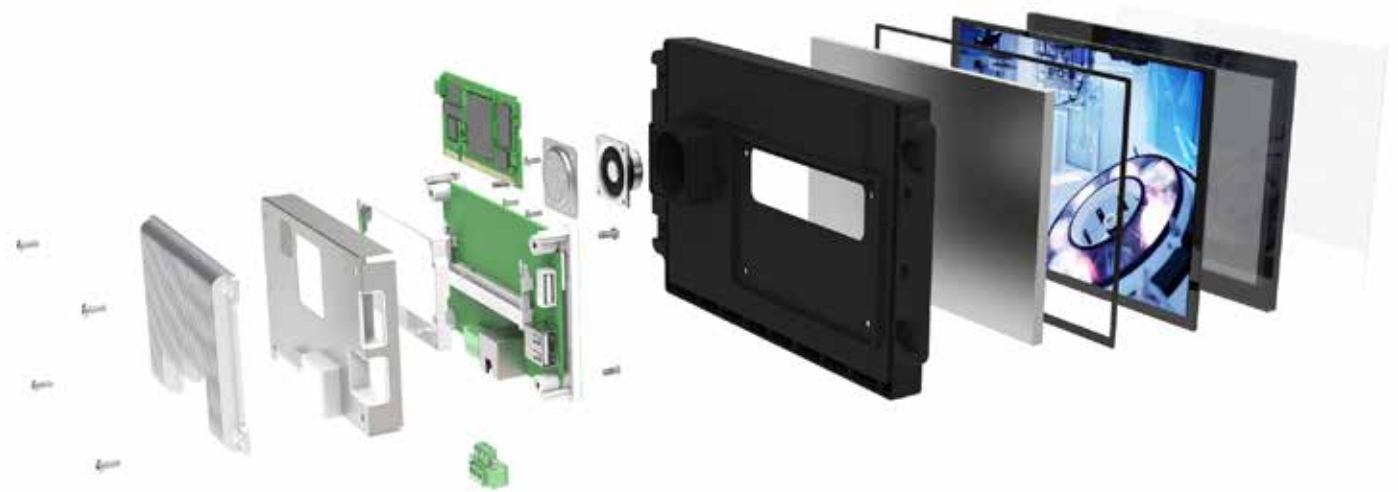
CONSULTING

- Requirements analysis and concept definition
- Material concepts
- Support with product selection
- Customised adaptations
- Solution optimisation through feedback loops

SERVICE AND SUPPORT

- Project management from concept to production
- Support with product qualification and certification
- Technical support and maintenance services
- Training courses
- Spare parts management
- Logistics concepts

ACCESSORIES AND ADDITIONAL SERVICES

- Assembly of the complete module
- Selection and integration of NFC, NB-IoT, Bluetooth and WLAN modules
- Calibration of the capacitive touch panel
- Audio and camera solutions
- Software integration and customisation

CUSTOMER ADVANTAGES

- Everything from a single source
- Personalised support and direct contact person
- Extensive and in-depth market knowledge
- Cross-product expertise
- More time for your own core expertise

Product Overview

With the constantly expanding product portfolio in the areas of Displays + Embedded, Active, Passive, Radio, Sensors, Acoustics, Lighting Solutions, Power Supplies as well as Electromechanics, endrich always offers its customers the right product for the respective application. The quality of the products is not a question of pretension, but the key to success. Who recommends quality shows that he is an expert himself.

Sensors

Displays & Embedded Systems

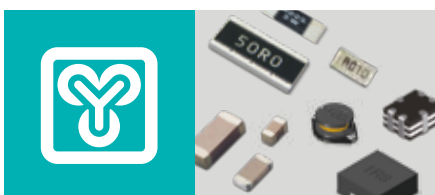Wireless Connectivity & IoT Solutions

Active Components

Electromechanics

Lighting Solutions

Passive Components

Acoustics

Power Supplies & Batteries Systems

Temperature Sensors

Manufacturer	Semitec	Tateyama	Tewa
NTC	■	■	■
PTC			■
Assembled Sensors	■	■	■

Eigenschaften

| Certifications	IATF 16949 ISO 9001 ISO 14001 ISO 13485	IATF 16949 ISO 9001 ISO 14001	ISO 9001 ATEX
General Information	Semiconductor based 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	Thick film thermistors based on AI2 O3 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	Semiconductor based ceramic resistors Flexible temperature sensor supplier in Europe Wide range of assembled NTC/ PTC/PtRTD temperature probes Customized sensors on demand High quality with best price/performance ratio
Applications	Automotive Battery Management HVAC Electro Domestics Industrial Metering Medical	Automotive Battery Management HVAC Electro Domestics Industrial Metering Medical Technology	Automotive Battery Management HVAC Electro Domestics Industrial Metering Medical Technology
Specifics	Temperature sensors for e-mobility applications (HV/EV) µ-pressure and temperature sensor for medical applications	Temperature sensor with a fast thermal response for e-motor (Coil & Hairpin)	Assembled temperature sensors up to IP68 for refrigerators and freezers

Magnetic Field Sensors

Manufacturer	Magnesensor	Sensitec	S4sensors	TDK-Micronas
Magnetic field	▪	▪	▪	▪
Current measurement	▪	▪	▪	▪

Features

Certifications	ISO 9001	ISO 9001 IATF 16949	ISO 9001 IATF 16949	ISO 9001 IATF 16949
General Information	Asian manufacturer of Hall sensors Broad portfolio of switches and linear sensors	Production with own chipfab in Germany Very broad portfolio of current sensors	Start-up with membership of the innovative SPARC Group Niche supplier for angle and current sensor Production in Italy	Development / production with own chipfab in Germany High level of expertise in the field of functional safety Leading manufacturer of linear sensors in the automotive sector
Applications	Industry White Goods	Current Measurement Automotive Industry White Good	Industrial Joystick Applications Position Detection (3D)	Automotive Industry White Goods Medical Technology
Specifics	Good price-performance ratio Many different types of analog and digital Hall sensors available.	Current sensors of different complexity: - Discrete components (chip level) - Current sensor modules - Residual current sensors	Angle sensor S4-3DB01 with unique stray field immunity I²C interface available	HAL39xy - True 3D sensor with internal stray field compensation HAC - Hall sensor with integrated capacitors HAR - Hall sensor as dual-die-variant (redundancy)

Optical Sensors
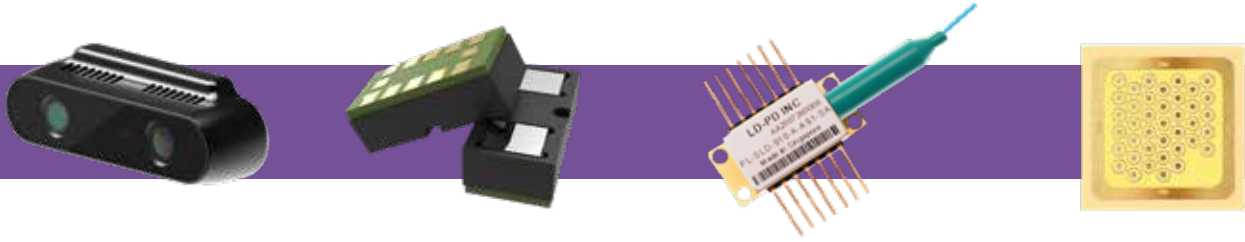
Manufacturer	Brightlaser	Everlight	LD-PD	Lextar	Epigap OSA
Infrared Leds		■		■	■
Photo Reflectors and Light Barriers		■		■	
Bio-Monitoring Sensors and Multi LEDs		■		■	■
Optical Detector	■	■		■	■
Infrared receiver		■			
VCSEL & TOF Sensors	■		■	■	
Laser Dioden	■		■		
Laser modules and systems			■		
Photodiode for Laser			■		

Features

	Brightlaser	Everlight	LD-PD	Lextar	Epigap OSA
Certifications	ISO 14001 IATF 16949	ISO 9001 IATF 16949	ISO 9001 IATF 16949	ISO 9001 IATF 16949	ISO 9001 IATF 16949
General Information	Core Business: Provides the VCSELs & PDs and VCSEL based solutions for Metaverse, Artificial Intelligence (AI) and IoT	Well-known Taiwanese manufacturer with a high level of manufacturing know-how Wide range of IR sensors: IR LEDs, phototransistors, photodiodes, ambient light sensors, bio-sensors and light barriers	Singapore supplier of laser diodes, VCSEL, photodiodes (APD, InGaAs, Si Quadrant, pigtaited), light sources, detector modules and laser systems	Well-known Taiwanese manufacturer with a high level of manufacturing know-how Wide range of IR sensors and VCSELs	Innovat photonics made in Germany Customization and sophisticated realization (point source chip diameter 10-150um)
Applications	Industrial sensors, Pulse oximetry, Low light laser therapy, Brain therapy, Machine vision, Red lighting, Data communication, Spectroscopy, 3D sensing 5G mobile networking, Long-reach optical interconnects, Optics transceivers, Hair removal	Medical Non-Invasive Measurements White Goods Measuring Instruments Light Curtains Bio-Monitoring Heating Ventilation Air Conditioning	Fiber optic communication, Atomic trapping and cooling Spectroscopy Gas detection DNA Analyse Quantum computing wind lidar TDLAS: Tunable Diode Laser Absorption Spectroscopy CRDS: Cavity-Ring-Down-Spektroskopie	Camera Vision, 3D Sensors Vital, Signs Motion Detectors, Door position People, Counting, Automotive, Solutions for Innenraumsensoren, Access Control, CCTV, Biomonitoring Sensors	Phototherapy & Biophotonics Fluorescence & Absorption measurement technology (Dialysis instruments, Spectral photometers...), Lab automation diagnostic (Clinical chemistry analysers
Specifics	Wavelength of VCSEL chips: 660-680nm/808nm/850nm/940nm/1060nm Automotive VCSEL Diode VCSEL Array - High Power VCSEL Point and Line Modules Power: several milliwatts to ten watts	Wide product range and Cheap Alternative in „low power" Infrarot LEDs	H_2S Hydrogen Sulfide HCL Hydrogen Chloride C_2H_2 Acetylene C_2H_4 Ethylene CH_4 Methane HCN Prussic Acid OCS Carbonyl Sulfide H_2O_2 Hydrogen Peroxide SO_2 Sulphur Dioxide NO_2 Nitrogen Dioxide HCHO Formaldehyde CH_2OH Hydroxymethyl Group C_2H_6 Ethane NH_3 Ammonia	Wide product range and cheap alternative in „high power" Infrared LEDs	3mm, 5mm and TO leds package 255-1720nm SMD 365-1650nm Multi-chip SMD package (3x3x1.1mm for 4 chips; 5x5x1.1mm for 6chips); SMD-Module (3.2x4.9mm, 7 wavelengths, 430-1650nm); Multi-chip Module (14 chips, Z-diode, ESD-Protection...)

Motion and Inertial Sensors

Manufacturer	RF beam	Nisshinbo	NiCeRa	Panasonic
Pyrosensors (PIR)			■	
Radar sensors	■	■		
Inertial measurement unit (IMU) sensors				■

Features

Certifications	ISO 9001	ISO 14001 IATF 16949	ISO 14001 IATF 16949 partly	ISO 9001
General Information	Swiss company Specialist for consumer and special applications in the field of radar sensors and development of RF applications	Japanese manufacturer of analog and optical components as well microwave components	Long-standing partner for ceramic-based electronic components, including pyrosensors (PIR sensors) and the associated Fresnel lenses	The 6in1 sensor is a 6DoF inertial sensor with functional safety standard ISO26262 compliance for automotive applications. The sensor consists of 3 acceleration and 3 rate sensing elements on a single MEMS chip.
Applications	Traffic Technology Door Opener Motion Detectors Light Control Speed Measurement	Motion Detector Door Opener People Counting	Motion Detection Building Technique Security Technology White Goods	Automotive applications: - Traction Control Systems (TCS) - Electronic Stability Control (ESC) - Adaptive Cruise Control (ACC) Non-automotive applications: - Agriculture or construction machine - Drones - E-bike
Specifics	Digital 1D-, 2D- and 3D-Radare, i.e.: K-LD2 (24GHz CW 1D Radar) K-LD7/K-MD7 (24GHz FSK 2D Radar) V-MD3 (24GHz FMCW 3D MIMO Radar) V-LD1 (small and low cost digital 61GHz FMCW radar distance sensor)	Low-power radar modules NJR4267 series (24GHz radar sensor with long range (up to 30m) for non-contact switching and lighting applications (e.g. high-bay warehouse) NJR4652 series (60GHz Smart Sensor Micro-module)	Digital pyrosensors with I²C or UART- interface SMD pyrosensors available	ASIL-B(D) compliant AEC-Q100 Grade 1 4.5x4.5x1.1mm QFN SPI Interface

RFbeam Microwave   NiSSHiNBO   NiCeRa Nippon Ceramic Co., Ltd.   Panasonic

Special Sensors

Hersteller	CFSensor	Azoteq	Cubic	Sensolute	Panasonic	Micro Sensor
Solar cells					■	
Gas-, Particle- and VOC Sensoren	■		■			
Pressure Sensors	■					■
Pressure Transmitter	■					■
Flow Sensors						■
Vibration Sensors				■		
Touch Sensors		■				

Features

	CFSensor	Azoteq	Cubic	Sensolute	Panasonic	Micro Sensor
Certifications	ISO 9001 IATF 16949	ISO 9001	ISO 9001 IATF 16949	ISO 9001	ISO 9001	ISO9001 ISO14001 ISO18001
General Information	High-tech company that has been dedicated to the research, development and manufacture of infrared sensors, piezoresistive silicon pressure sensor chips, SOI high-temperature pressure sensor chips, board mounted MEMS pressure sensors, pressure sensor modules, pressure transmitters and flow sensors	Azoteq is a fabless manufacturer of capacitive and inductive sensor technology with headquarter in South Africa The Proxsense touch sensor family enables various touch sensor applications such as buttons or sliders. With the Proxfusion series, capacitive or inductive touch measurements are possible and, in addition, other sensors such as magnetic field sensors are integrated.	Global player with a broad product range in environmental sensors. Establish: Year 2003, in Wuhan, Optical Valley	The micro vibration sensor is used to detect movements and vibrations. Its small dimensions make it suitable for use in very small electrical devices. It is very easy to integrate and does not require any special signal evaluation.	Amorphous silicon solar cells for indoor and outdoor use in glass, stainless steel and plastic film The solar cells have a high degree of efficiency with good long-term stability	Since the 1970s, Micro Sensor has been involved in the research and development of pressure sensors and transmitters based on piezoresistive measuring principles
Applications	Very broad product range of PCB MEMS pressure sensors for Household Appliances, Healthcare, Automotive, Water Pumps, Air Compressors, Meteorology, IoT	Wearables, Gaming Keyboards and Joysticks, Control Panels e.g. for White Goods or Industry HMI Interfaces Bounce-free buttons	IAQ Monitoring DCV – Smart HVAC HVAC Refrigerant Gas leakage alarm Home Automation Control HVAC Equipment	Bicycle rear light Animal Monitoring Wake-up for portable devices	Clocks Remote controls of blinds and lighting control Building Technology Energy Harvesting Applications	Process Control Intelligent Manufacturing Smart City Precision Control Specific Applications
Specifics	CO2 Sensor Module XGZG360M CO2 gas Sensor XGZG360 Thermopile Temperature Sensor XGZT263 MEMS pressure Sensors pressure transmitters flow Sensors	Touch sensors with up to 150 channels	Gas meter production lines Automotive Key Production Lines Actualization Particle Sensors, CO_2 Sensors-VOC/HCHO Sensors, HCHO, Formaldehyde, CO Sensor	Very small design Purely passive Noiseless	Film solar cell only 0.18 mm thick Customised solutions possible	M20 M-Series: Pressure transmitters for general industrial applications MPM3801: Digital pressure sensor with I²C/SPI interface MPM280AU: Pressure sensor for hydrogen pressure measurement

Touch PCs & Embedded Systems

Manufacturer	DLogic	ASRock Industrial	DFI	F&S Elektronik Systeme	Vekatech
Touch PCs	■				
Boxed PCs		■	■		
Embedded Boards x86		■	■		
Embedded Boards ARM				■	■

Features

	DLogic	ASRock Industrial	DFI	F&S Elektronik Systeme	Vekatech
Certifications	ISO 9001 ISO 14001 ISO 45001	ISO 9001 ISO 14001 IATF 16949	ISO 50001 ISO 9001 ISO 13485 ISO 14001 ISO 14064-1 ISO 45001 QC 080000	ISO 9001 ISO 13485	ISO 9001 ISO 14001
General Information	Headquartered in Switzerland with branches in Germany, Hong Kong and China Founded: 2008	Headquarters in Taiwan with production facilities in Asia Logistics centres in Europe and Taiwan Founded: 2011	Headquarters in Taiwan with production facilities in Asia Logistics centre in Europe Founded: 1981	Head office with development and production in Germany Founded: 1990	Head office with development and production in Bulgaria Founded: 2004
Applications	Industrial Automation Medical Technology Marine E-charging Stations	Industrial Automation Building Automation Video Surveillance Pay Stations Robotics Gaming	Industrial Automation Building Automation Video Surveillance Pay Stations Robotics Gaming	Industrial Automation Building Automation Medical Technology	Industrial Automation Building Automation Medical Technology
Specifics	Touch PCs (ARM) with NXP i.MX 8M Plus, 5.0' - 15.6' Manufacturer with a very high level of integration Customised adaptations possible for all products	Industrial Motherboards (x86) ATX, Micro-ATX, Micro-STX, Mini-STX, Mini-ITX Single board computer 3.5', 4x4, NUC, UTX, Pico-ITX Computer on Module COM Express Qseven Fanless and fanless embedded box PCs Industrial IoT PCs Space-saving and expandable AIoT platforms	Industrial Motherboards (x86) ATX, Micro-ATX, Mini-ITX Single Board Computer 1.8', 2.5', 3.5', 4' Computer on Module COM Express Mini COM Express Compact COM Express Basic QSeven Products with extended temperature range	Single Board Computer (ARM) with NXP i.MX 8MP, i.MX 8ULP, i.MX95 System-on-Modules (ARM), with NXP i.MX 8M Plus, i.MX 8ULP, i.MX93 SoM standards OSM (open standard module) SMARC Windows on ARM Linux Yocto / Buildroot Development service and production for carrier boards Customised adaptations possible for all products	Single Board Computer (ARM) with Renesas MPU Raspberry Pi 4 compatible System-on-Modules (ARM) with Renesas MPU System-on-Modules with RISC-V MPU Linux Yocto / Debian

DLOGIC   ASRock Industrial   DFI   F&S Elektronik Systeme   vekatech

Touch Monitore & Displays

Manufacturer	RiT	Eagleeye Tech	Multi-Inno	SGD	Raystar
Touch Monitore	■				
TFT-Displays with PCAP		■	■	■	■
Monochrome LC-Displays		■	■	■	■
pmOLED Displays			■		■
E-Paper Displays		■			

Features

Certifications	ISO 9001 ISO 14001 ISO 45001	ISO 9001 ISO 14001 IATF 16949 QC 080000	ISO 9001 ISO 14001	ISO 9001 ISO 14001 IATF 16946	ISO 9001 ISO 14001 ISO 45001 IATF 16949
General Information	Headquartered in Switzerland with branches in Germany, Hong Kong and China Founded: 2008	Head office in Hong Kong with production in China Founded: 2010	Head office in Hong Kong with production in China Founded: 2005	Headquarters in Taiwan with production in Taiwan and China Founded: 1989	Headquarters in Taiwan with production in Taiwan and China Founded: 2007
Applications	Industrial Automation Medical Technology Marine E-charging Stations	Industrial Automation Building Automation Medical Technology Telecommunications	Industrial Automation Building Automation Medical Technology Telecommunications	Industrial Automation Building Automation Medical Technology Telecommunications	Industrial Automation Building Automation Medical Technology Telecommunications
Specifics	Touch monitors 7.0' - 49', 1,000cd/m², optically bonded, optional IK10 Manufacturer with a very high level of integration Customised adaptations possible for all products	TFT displays with PCAP from 0.96' - 108' E-paper displays from 0.97' - 31.2' Monochrome LC displays endrich iSi30+ displays with standardised MIPI and LVDS interface Customised adaptations such as protective glass, backlight, interfaces possible	TFT displays with PCAP from 0.96' - 15.6' pmOLED displays from 0.49' - 5.5' Monochrome LC Displays Special resolutions and sizes on request Customised adaptations such as protective glass, backlight, interfaces possible	TFT displays with PCAP from 1.44' - 21.5' Very high brightness up to 1,600 cd/m² Extended operating temperature range from 30°C to 85°C Monochrome LC Displays	TFT displays with PCAP from 4.3' - 10.1' with HDMI interface pmOLED displays from 0.49' - 5.5' SMART Display series from 3.5' - 10.1' with CAN bus and UART interface Monochrome LC Displays

Quartz / Oscillators / Filters

Manufacturer		Citizen	Maruwa	SMI
Quartz Crystals	MHz	■		■
Clock Crystals	kHz	■		■
Oscillators	MHz	■	■	■
Oscillators	kHz			■
MCF Filter				■
Dielectric Filters			■	

Features

Certifications	ISO 9001	ISO 9001	ISO 9001
General Information	Wired and SMD watch crystals Smallest design: 1.6 × 1.0 mm Tight tolerances: Up to ± 5 ppm Extended temperature range: - 40 ... + 85 °C (+125 °C in design)	Compact, small housing, high-quality voltage-controlled oscillators (VCO) Frequency range: 100 MHz ... 5 GHz Small designs: up to 3.2 × 4.5 mm Low phase noise Excellent temperature stability Customised products	Quartz crystals, standard oscillators, TCXO, VCXO, MCF Frequencies: 16 kHz ... 300 MHz Large selection of SMD and leaded housings LVPECL, LVDS oscillators Tight tolerances and excellent temperature stability Smallest design: 1,2 × 1,0 mm RTC (real time clock)
Applications	Measuring Devices GPS DEVICES Household Appliances BTM / IoT Clocks and Watches Industrial Controls Time Recording Tokens RFID	HF Audio Wireless Microphones Industrial Radio Controls Telecommunications WiFi	Computer & PC Games Industrial Electronics Medical Technology Reference Ascillators TV / Audio RFID
Specifics	Low ESR SMD watch crystal in SMD 3.2 x 1.5 mm housing SMD 3.2 x 1.5 mm watch crystal with parallel connections (improved EMI) SMD 1.6 x 1.0 mm tuning fork CM315 housing with tolerance of +-50 ppm incl. temperature drift (CM315G)	Small voltage-controlled oscillators for wireless stage microphones Base Station: Transceiver	SMD oscillator 32.768 kHz with extremely low power consumption and high precision Oscillators for LVDS and LVPCEL AEC-Q200 clock crystal Precision TCXOs with ±0.5 ppm tolerance

CITIZEN   **MARUWA**   **SMI**

Quartz / Oscillators / Filters

Manufacturer		Chequers	SiTime	TST
Quartz Crystals	MHz	■		■
Clock Crystals	kHz	■		■
Ceramic Resonators		■		
Ceramic Resonators		■	■	■
MCF Filter		■		■
SAW Filter		■		■
Dielectric Filters		■		■
Ceramic Filters		■		

Features

	Chequers	SiTime	TST
Certifications	IATF 16949 supply chain	IATF 16949 supply chain AEC-Q100	IATF 16949 AEC-Q200 / AEC-Q100
General Information	Ceramic resonators: 1 ... 60 MHz ≤ 2,5 × 2,0 mm Temp: - 40 ... + 85 °C Ceramic filter: z.B. 455 kHz / 10.7 MHz / 27 MHz / 45 MHz Dielectric filter: 433 MHz ... 5 GHz, Temp.: - 40 ... + 85 °C Quarze: bis 200 MHz, 1,6 × 1.2 mm, Temp.: - 40 ... + 125 °C Oscillators: bis 200 MHz, 2.0 × 1.6 mm, Temp.: - 40 ... + 125 °C	Silicon MEMS based oscillators lators from 1 Hz ... 900 MHz Low Power, Ultra-Perf. oscillators Differential and High-Temp. oscillators VCXO, DCXO, VCTCXO, OCXO Spread Spectrum & Field Prog oscillators Solutions for the extended temperature range from - 55 ... +125 °C Designs from SMD 7 x 5 mm up to 1.5 x 0.8 mm CSP and SOT23	SAW & BAW filter 200 MHz ... 3 GHz SMD up to 1.1 x 0.9 mm Intermediate frequency filter from 33 MHz ... 900 MHz SMD up to 1.6 × 1.2 mm Extended temperature range: - 40 ... + 125 °C Dielectric filter and notch filter Duplexer and diplexer Standard and customised crystals and oscillators for automotive
Applications	Industrial Electronics Consumer Industry Radio Technology Lighting Industry White Goods	Automotive Ethernet DDR and PCI Applications Industrial Controls Medical Technology Wireless & Backhaul Fibre, Cable, DSL	Vehicle Electronics Digital Radio Mobile Radio (GSM, LTE) GNSS Radio Modules WiFi & BT V2X Applications
Specifics	Small SMD ceramic resonators 2.5 × 2 mm for 20 ... 60 MHz Miniature quartz 1.6 x 1.2 mm SMD intermediate frequency filter e.g: 10.7 MHz , 450/455 kHz	Elite Platform™ Super TCXOs stability (± 0.1 ppm to ± 2.5 ppm). Repla- ces conventional crystal OCXOs for 5G and IEEE 1588 synchronisation applications, while reducing power consumption and size SiTime's Automotive (AEC-Q100) Osc. ± 20 ppm Frequency stability from -55 °C to 125 °C Reduces EMI through spread spectrum clocking OCXO (±0.005 ~ 0.008 ppm)	FEM (Front End Module - Filter + Amplifier SMD Module for GNSS applications) Dual Filter for RKE applications Miniature VC-TCXO and TCXO Narrow band SAW filters for IoT and TC SAW filters LTE filters for worldwide frequency bands

CQ
Chequers Electronic (China) Limited

SiTime

TST

RF Modules / Antennas

Manufacturer	Aurel	Neocortec	Panasonic	Feasycom
RF-Module (ISM-Band 868 MHz … 2.4 GHz)	■			
Bluetooth®			■	■
WiFi™			■	■
Mesh Netzwerk	■	■	■	■
LoRa™ Transceiver	■			

Features

|				
Certifications	ISO 9001	ISO 9001 ISO 14001	ISO 9001 ISO 14001	ISO 9001 ISO 14001 IATF 16949
General Information	Radio modules for the ISM bands 315, 433.92, 868, 915 MHz and 2.4 GHz Products conform to applicable European standards (RED) Transmitters, receivers, transceivers and hand-held transmitters AM & FM Transceivers / transmitters with antennas Receivers with extremely low power consumption for use in battery-powered systems Customised developments and production Electronics with radio	868, 915 MHz and 2.4 GHz modules Mesh network Easy to build, modify and expand Low maintenance, long-lasting performance Simple integration, no hidden costs	Bluetooth® 4.2/5.0/5.1/5.3 Low Energy Module Supports IEEE® 802.15.4 Combo WiFi™ 2.4 GHz, 5 GHz and 5.2 GHz 802.11 a/b/g/n/ac/ax + Bluetooth® 5.0 (BR, DER, LE) modules Modules with integrated antenna or U.FL connector Solderable modules Industrial modules with extended temperature range	Bluetooth® 4.2/5.0/5.1/5.2/5.3 Low Energy Module Supports IEEE® 802.15.4 Combo WiFi™ 2.4 GHz and 5 GHz 802.11 a/b/g/n/ac/ax + Bluetooth® 5.2 (BR, DER, LE) modules Modules with integrated chip antenna Solderable modules Industrial modules with extended temperature range
Applications	Door / gate opener access systems House alarm systems / smoke detectors Home automation Measuring and dosing systems Telemetry / radio control Emergency call systems / radio-networks IoT applications Long range communication	Wireless sensor networks Mobile ad-hoc networks Home control & buildings Home Automation Industrial Automation Alarm and security systems Agriculture and forestry	Diagnostics and maintenance systems Industrial IoT Telemetry / radio control Smart home / home automation Medical Healthcare Sensor applications	Consumer products Industrial IoT Telemetry / radio control Smart home / home automation Smart City Sensor applications
Specifics	Long range transceiver for ranges of up to 12 km SMD transceiver 868 MHz Rain sensor for applications in weather stations Rolling code hand-held transmitter in different variants	NC1000C-8 and NC1000P-8 - 868MHz SRD band NC1000C-9 and NC1000P-9 - 915MHz ISM band NC2400C and NC2400P - Global: 2.4GHz ISM band	PAN1783A - Bluetooth® 5.3, IEEE® 802.15.4 & NFC-A supports Bluetooth direction finding AoA & AoD PAN9019 Wi-Fi® 6 Radio 2.4 GHz & 5.0 GHz 802.11 a/b/g/n/ac/ax & Bluetooth® 5.2 (BR, EDR, LE) only PAN9019A: & 802.15.4 Bluetooth combo module	FSC-BT631D BLE Bluetooth 5.3 Modul 5,4x5,8x1,2 mm FSC-1038A Bluetooth 5.4 LE Audio-Modul FSC-BW256 Bluetooth 5.0 Dual Mode 802.11 a/b/g/n/ax

Manufacturer	Locosys	2J antennas	Inpaq
GPS/GNSS Receiver Modules	■		
GPS/GNSS Smart Antennen Module	■		
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)			■
UWB			■

Features

	Locosys	2J antennas	Inpaq
Certifications	IATF 16949 ISO 9001 ISO 16750 ISO 26262	IATF 16949 ISO 9001 ISO 14001	IATF 16949 ISO 9001 ISO 14001 QS 9000
General Information	GNSS (GPS/GLONASS/BeiDou/Galileo) modules and GNSS-Mouse GNSS RTD/RTK modules GNSS antenna modules ADR & UDR solutions RTK solutions Products according to AEC Q100	PCB and flexible foil antennas, SMD/SMT and omnidirectional antennas and patch antennas Standard and customised internal and external antennas with high efficiency for Cellular, GNSS, Bluetooth®/WiFi™ and ISM band Multi-band antennas Customised cables, cable lengths and connectors Option for logo imprint and customised customised housing colour Antennas with IP67, IP69K and IK09	Patch antennas, chip antennas, active antennas, dipole antennas, SMT antennas, LCT/LDS, NFC, wireless power charger Customised patch antennas for GPS, GLONASS, Galileo, BeiDou, SDARS, DAB etc. Patch antennas with small dimensions (up to 6 x 6 mm) and low height (up to 2 mm) possible Chip antennas for GNSS, Cellular, Bluetooth ®/WiFi™ and ISM band Multi-band antennas, helix antennas, 5G antennas, ultra-wideband Customised solutions for WPC and NFC LDS (laser direct structuring) solutions
Applications	Tracking / Tracing Telematics / Navigation Drones E-Call / Emergency Call Systems Autonomous driving Agriculture Marine applications AGV robotics	Tracking / Tracing Telematics / Navigation Automation M2M Telecommunications Smart City / Smart Home Marine applications	Tracking / Tracing Telematics / Navigation Car infotainment V2X/V2V communication Wireless charging applications Keyless systems E-Call Autonomous driving
Specifics	High-precision GNSS RTK solutions for centimetre navigation - from the module to the base station RTK-1010 as GNSS RTK module solution RTK-4057 as GNSS RTK board solution RTK-Mx00 as a system solution suitable as a rover or base station	5G NR antennas High-performance antennas for 5G networks Ground plane dependent and independent antennas for internal and external use External antenna solutions with up to 4 × 5G NR MIMO	L1/L2/L5/L6 antenna series Stacked patch antennas with/without housing for high-precision, centimetre-accurate navigation systems Narrowband and broadband antennas as 2-pin or 4-pin solution

Analog ICs
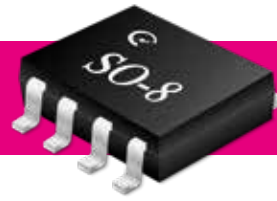
Manufacturer	Holtek	MPS	Nisshinbo	SG Micro
Analog Switches		■	■	
Audio ICs	■	■	■	
Communication ICs	■		■	
Display Drivers	■		■	
GaAs MMICs			■	
LED Drivers	■	■	■	
Microcontroller	■			
Motor ICs	■	■	■	■
Operational Amplifiers	■	■	■	■
Power Supply ICs	■	■	■	■
Video ICs	■		■	■
Logik ICs				■
Touch & Multisensor ICs	■			

Features

	Holtek	MPS	Nisshinbo	SG Micro
Certifications	ISO 9001 ISO 14001	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001
General Information	Taiwan-based company specialising in the development of micro-controllers and their surrounding components The microcontrollers contain fully integrated digital and analogue functions such as: A/D converters, LCD drivers, PWM generators, LED drivers, SPI/I2C interface, USB drivers, voice functions, RF functions, telecom functions etc. The microcontrollers fulfil industrial requirements and are available as OTP and Flash versions	Monolithic Power Systems (MPS) is a USA-based company specialising in high-performance semiconductors Product areas: DC/DC converter ICs LED driver ICs Class D audio amplifier ICs Linear ICs such as operational and current sense amplifiers Battery charging and protection ICs Motor control ICs	Nisshinbo is a Japanese company focusing on the development and production of analogue ICs Leading in the field of operational amplifiers (OPA) and LDO Nisshinbo offers a wide variety of ICs for communication, automotive, industrial and RF applications	SG Micro specialises in high performance, high quality analogue IC design, marketing and sales. Experts in analogue IC design with more than 20 years of experience in IC design, layout, process, assembly, test and quality control. Ensuring product performance and quality Leading supplier of analogue ICs
Applications	Industrial and Communication Applications White Goods Consumer electronics	Sensors, Headphones, Automotive, TV, White Goods, PLC, Navigation Systems, Mobile Phones, Engine Controls	Sensors, Headphones, Automotive, TV, White Goods, PLC, Navigation Systems, Mobile Phones, Motor Controls, RF Applications, GPS	Industrial and Communication Applications White Goods Consumer Electronics Medical
Specifics	32 - Bit MCU PIR Sensor	Mini modules Motor control with integrated Hall sensor	Miniature N and P switching drivers for sensors, switching controllers, GPS front-end modules	Levelshifter

Memory ICs

Manufacturer	Alliance	ESMT	Fidelix	GigaDevice
SRAM/pSRAM	■			
SDRAM/DDR/DDR2/DDR3/ DDR4	■	■	■	
Flash	■	■		■
MCP		■		
eMMC	■	■		
Audio IC		■		
Microcontroller				■
Power Supply ICs		■		■

Features

	Alliance	ESMT	Fidelix	GigaDevice
Certifications	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 Production of components to support long-life industrial and communications applications Product expansion to SDRAM and DDR1/2/3/4 and Parallel Flash	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 flashes 1 Mb - 8 Gb	Korean fabless company Development of high-performance and cost-effective memory solutions PSRAMs 4 Mb - 32 Mb, Low Power SDRAMs, Low Power DDR1/2/3, SDRAMs 32 Mb - 2 Gb and memory for mobile applications	GigaDevice stands for advanced memory technology and micro controllers in China Fabless Large product range of NOR flashes and NAND flashes The 32Bit MCU expands the product portfolio
Applications	Industrial and Communication Market	PCs, servers and Workstations PC accessories Industrial Applications Consumer Communication	'low power' and fast storage solutions for mobile communication and point-to-point applications	Industrial Medical Consumer Automotive
Specifics	Psram: 8 Mb – 128 Mb 8 Gb DDR3 2 Gb DDR2 4 Gb DDR4 1 Gb-16 Mb Parallel NOR Flash	8 Gb DDR3 4 Gb DDR4 SPI NAND Flash: 1 Gb – 4 Gb Parallel NAND Flash: 1 Gb – 8 Gb	SPI Nand Flash: 1 Gb – 8 G	1 Gb NAND Parallel 1 Gb – 4 Gb NAND SPI Microcontroller Cortex M23 and Risc-V

Protection Devices

Manufacturer		Cosmo	CT Micro	ECE	Semitec
Overcurrent	PPTCs			■	
	Power Thermistors				■
	CRDs				■
Coupler/SSR	Opto Coupler	■	■		
	MOS Relay	■	■	■	
	Solid State Relay	■		■	

Features

|	Cosmo	CT Micro	ECE	Semitec
Certifications	ISO 9001 ISO 14001	ISO 9001 ISO 14001 IATF 16969	ISO 9001 ISO 14001 IATF 16969	ISO 9001 ISO 14001
General Information	DIL, SMD, mini-flat (SOP), LSOP and SSOP packages Single and array types CTR: 50 ... 2000% High-speed coupler up to 10 MBit Insulation voltages up to 5 kV UL, VDE and TÜV approvals	DFN, DIL, SMD, Mini-flat (SOP), LSOP, SSOP and new wide body-housing Single- and multi-channel CTR: 50 ... 15000 % High-speed couplers up to 10 MBit Insulation voltages up to 5 kV UL, VDE and TÜV approvals	DIL, SMD and miniflat (SOP) housing Load current: 130 ... 40 A Load voltage: 60 ... 800 V On resistance: 0.83 ... 28 Ω Insulation voltages: up to 5 kV Tripping current: 10...25mA UL and TÜV approvals	Unique Current control characteristic Control currents: 0,1 ... 22 mA Voltages up to 100 V High dynamic impedance Low temperature drift
Applications	Power Supply Household Appliances Industry Telecommunications Network Technology Payment Systems (POS) Measuring and Testing Devices	Power Supply Household Appliances Industry Telecommunications Network technology Payment systems (POS) Measuring and Testing Devices	Power Supply Household Appliances Industry Telecommunications Network Technology Payment Systems (POS) Measuring and Testing Devices	PLC (programmable logic controller) Sensors LED Control Loops
Specifics		CTP17 – smallest and flattest optocoupler worldwide CT816L low input current phototransistor optocoupler with higher operating temperature of 110 °C CTH214 & CTH217 – new 4-pin half pitch mini-flat phototransistor optocoupler	High current MOS relays including the EPR311A038005 with a continuous peak load current of 6A	CRD S-223T ... 22 mA and 500 mW rated current regulative diode in compact SOD-123FL package

cosmo   CT Micro
International Corporation   ECE   SEMITEC
SEMITEC Corporation

Manufacturer		Eris	ProTek	Inpaq	SFI
Over-voltage Protection	TVS-Dioden/Arrays	■	■		
	Multilayer Varistor			■	■
	CSPDs				■
	ESD Suppressor			■	
	Protection Thyristors		■		
	Protection Modules		■		
Discrete	Dioden	■			
	Transistors	■			

Features

Certifications	ISO 9001 ISO 14001 IATF 16949 AEC-Q101 (Teilbereiche)	ISO 9001 AEC-Q101 (Teilbereiche) IATF 16949 (Teilbereiche)	ISO 9001 ISO 14001 IATF 16949 AEC-Q200	ISO 9001 ISO 14001 IATF 16949 AEC-Q200 (Teilbereiche)
General Information	Eris is a Taiwanese ODM who offers a wide range of support services for design services for design, manufacturing and aftermarketing services for diode products Eris' business scope includes Schottky diodes, TVS diodes, Zener diodes, bridge diodes, wafers diodes, wafers, MOSFETs and bipolar transistors	Designs: SMD from 0201, modules and wired solutions Uni- and bi-directional Voltages: 1 ... 440 VDC Pulse power up to 2.2 MW Low capacitance up to 0.15 pF High ESD protection > 30 kV No ageing	Types: 0201 ... 1812 Voltages: 4 ... 42 VAC Extremely short response time (< 1 ns) Very low capacitance (0.2 pF) Extremely low leakage current Zero signal distortion	Types: 0201 ... 6420 Voltages: 3,3 ... 385 VDC Pulse currents up to 5.5 kA (8/20μs) Very low capacitance down to 0.05 pF for HF applications ESD protection up to > 30 kV CSPDs with superior overvoltage and overcurrent protection
Applications	Automotive Telecommunications Industry Consumer Computer + IT	Automotive Industry Telecommunications Network technology Medical technology Measuring and Testing Devices Security technology Payment systems (POS)	Automotive HF Modules Antenna Circuits HDMI + USB Display Ports Handheld Devices Set-top Boxes	Telecommunications + Network: Ethernet Access Control IP Cameras Base Stations Security Systems Modems
Specifics	New CRD series in SMA & SMB package	SM3/5/10KW series - super flat DFN 2 housing, high peak pulse power AEC-Q101 qualified PA-M8S series, pulse 5A/5B load dump suppression according to ISO 16750-2 DFN8-36-T73 for the protection of I/O links	ESD GuardTM in miniature size 0201 AEC-Q200 specified MLVS AM & EGA AM series for automotive applications	SHV series - Voltage protection for increased voltage range up to 385 V DC, small designs from 1210 ... 3220 SHA series - load dump Protection up to 80 joules, in 1210 ... 3220 enclosures

Thermal Management
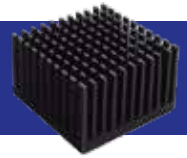
Manufacturer	ADDA	SINWAN	Ecofit	Fulltech	Minebea Mitsumi	QianYuang	Thoptec
Fan	■	■	■	■	■		
Heat Sink	■						
Fan Accessories						■	■
Customised Complete Systems	■						

Features

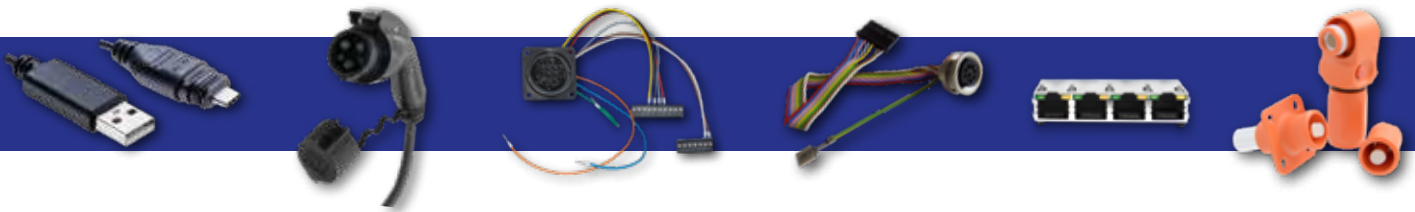| Certifications	IECQ QC080000 ISO 14064 ISO 14001 ISO/IATF 16949 OHSAS 18001 ISO 9001	ISO 9001 EN 60529	ISO 9001	ISO 9001	ISO 9001 ISO 14001	ISO 9001	ISO 9001
General Information	ADDA, one of the world's largest fan manufacturers, was founded in 1978 and specialises in cooling solutions with fans & heat sinks ADDA supports its customers with a large standard portfolio and customised solutions	Founded in 1976 in Taiwan. Design, production and assembly Hundreds of product combinations including: AC/DC axial, EC fans, all-metal, centrifugal and tangential fans, blowers, motors, Dust-tight, splash-proof, all IP protection classes	Ecofit was founded in 1976 in Vendôme (France) and has been part of the Rosenberg Group since 1994 From standard products to customised developments, Ecofit offers all its customers invaluable know-how based on more than 40 years of experience	Fulltech is an AC fan manufacturer from Taiwan and has been selling fans worldwide since 1990 Fulltech offers design, development and manufacture of the fans	NMB-Minebea was founded in Tokyo in 1951 With a market share of 60 % for ball bearings and the expansion of its portfolio, NMB-Minebea is one of the global players worldwide	Qianyuan was founded in 2003. The most important products are: Wire and finger protection grilles for fans, grilles for cooling systems and grills, mesh racks for white goods (roasters, ovens, etc.). oven, etc.)	Thoptec is not only a manufacturer of fastening elements for electronic components, but also supports its customers with special solutions from product planning to series production. but also supports its customers with special solutions from product planning to series production
Applications	White goods Cooling technology (automotive) Mini projectors Drones Industrial PC applications Industrial automation, Medical IT & Telecoms Consumer goods	Medicine Industrial drive technology Air purification Industrial trucks Food industry Home Appliance	Building ventilation Railway Dryers Filtration Refrigeration/cooling technology Wind energy Air conditioning of switch cabinets HVAC (heating, ventilation, air conditioning)	Photography lighting, Control panels, Stage lighting, White goods, LED displays, Heat exchangers, Fog machines, Power monitoring, Elevators lifts, Photovoltaic industry, Medical	Air conditioning and ventilation industry, Agricultural industry, Industrial technology, Heating & burner technology, Household appliances, Compressors sors, Railway, Food industry, Medical, Personal protection		
Specifics		IPRating + 30 days (GR-487) Salt spray-certified fan (EN60529)	125D-A ETRI fan: higher airflow, without increase in noise level; wider power range; 0 ... 10 V or PWM	EC fans Cross-flow fan fan with right-hand motor			

ADDA

SINWAN Since 1976
Sinwan Electric Industries Co., Ltd.

ECOFIT
ECOFIT & ETRI PRODUCTS

FULLTECH®

MinebeaMitsumi
Passion to Create Value through Difference

QIANYUAN

THOPTEC

Electromechanics

Manufacturer	Diptronics	ECE	knitter-switch	win	Marquardt
Touch Switches	■		■		
Pushbutton Switches	■		■		■
Microswitches / Snap-action Switch	■	■	■		■
Silicone keypads/ Membrane keypads			■	■	
Relays		■			
Tilt Switches		■	■		
DIP/Piano Switches	■	■			
Rotary coding Switches	■	■	■		
Slide Switches	■	■	■		■
Industrial Switches/ Buttons	■	■			
Detectors/ Tamper Switches		■	■		
Rocker Switch / Toggle Switch					■
Luminaires					■
Foot Switches					■
ECO Switches					■
Keys					■

Features

Certifications	IATF 16949 ISO 9001 ISO 14001	ISO 9001 ISO 14001 IATF 16949 OHSAS18001	ISO 9001 ISO 14001	ISO 9001 ISO 14001 IATF 16949 medical care ISO 13485	ISO 9001 ISO 1400, IATF 16949
General Information	Founded in 1985, Diptronics specialises in the produczion of pushbuttons and coding switches. Strengths: Complete in-house production, Own engineering team, LED switch assembly line, Support in production and design	Since its foundation in 1981, Excel Cell Electronic has expanded its portfolio with a wide range of switches, connectors and small stamped parts. Strengths: vertical integration and in-house development	Knitter-switch has a leading position in switch technology. Extensive selection of switches, keyboards (support for customised solutions)	Win was founded in Taipei in 1978. Win now produces at two locations with an expanded portfolio. Tool and mould making as well as finishing such as screen printing, painting, laser etching	Since 1925, Marquardt has developed into a leading supplier of switches and switching systems. Marquardt attaches great importance to innovation and the development of high-quality products that fulfil the requirements of its customers
Applications	IoT, Notebooks, Smart home, Automotive, White goods, Medical, Industry, Security, Telecommunication	MMS, Household technology, Building automation, Industry, Mechanical engineering, Automotive, Medical, Safety technology, Industrial trucks	Household technology, building automation, industry, mechanical engineering, automotive, medical technology, safety technology, industrial trucks	MMS, Household technology, Building automation, Industry, Mechanical engineering Automotive, Medical, Safety technology, Industrial trucks	Household technology, Building automation, Industry, Mechanical engineering, Automotive, Medical
Specifics	Concentration on switch business, Business; further development of new technologies (smartphone, automotive and illuminated switches)		ICE series: switch series for industrial control that fulfils all relevant safety regulations		

DIPTRONICS   ECE   knitter-switch   win   MARQUARDT

Connectors

Manufacturer		Amphenol
Data Connectors	USB	■
	RJ	■
	D-Sub	■
	HDMI / SATA	■
	FFC / FPC	■
	IDC / Flat Ribbon Cable	■
	Antennas	■
Power Connectors	Terminal Blocks	■
	Header / Housing	■
	Battery Connectors	■
	Charging Connectors	■
	High Current Connectors	■
	CEE Connector	■
Circular Connectors	MS Industrial Connectors	■
	MIL Connectors	■
	Coaxial Connectors	■
	Solar Connectors	■
	Audio Connectors	■
	Sensor Connectors	■
Rectangular Connectors	Heavy-Duty Rectangular connectors	■
	A-Series	■
	Terminal Blocks	■
	Data Connectors	■
	Printed Circuit Connectors	■

Features

Certifications	ISO 9001 ISO 14001 VG und TüV
General Information	Large selection of high-quality connectors for demanding applications
Applications	Telecommunications, computers and IT, Power Supplies, Industry, Defence, Marine, Railway, Audio, LED cabling, Solar plugs AC/DC, Mechanical engineering, measurement and Control technology, Medical, EV charging
Specifics	ComboLock® Draht-zu-Platine Minitek® Pwr PCIe® BarKlip® BK200 E/A

INDUSTRIAL@AMPHENOL TRUSTED GLOBALLY   Amphenol® RF   GEC TH   AD   Amphenol ANYTEK

Manufacturer		Adam Tech	ECE	Fujikura
Data Connectors	USB	■	■	
	RJ	■	■	
	D-Sub	■		
	HDMI / SATA	■		
	FFC / FPC	■	■	
	IDC / Flatcable	■		
Power Connectors	Terminal Blocks	■	■	
	Header / Housing	■		
MS Connectors	MIL-DTL-5015			■

Features

Certifications	ISO 9001 ISO 13485 IATF 16949	ISO 9001 ISO 45001 IATF 16949	ISO 9001 ISO 14001
General Information	Adam Tech is a manufacturer specialising in high-quality electronic connectors, cables and interconnect solutions The company offers a wide range including board-to-board, wire-to-board, wire-to-wire connectors and customised cable assemblies Manufacturer of connectors for power and data connectivity	Excel Cell Electronics is a leading company in the electronics industry, specialising in the development and manufacture of high-quality electronic components High quality printed circuit board connectors	Fujikura is a leading manufacturer of electrical products under the brand name DDK The company offers a wide range of high quality connectors for various applications Manufacturer of circular connectors according to MIL-DTL-5015 standard
Applications	Telecommunications Automotive Computers and IT Sensors Industry Power supplies	Telecommunications Automotive Computers and IT Sensors Industry Power supplies	Mechanical engineering Transport Power generation Industry
Specifics	USB Type-C (USB4 Gen 3) High speed data (HSD) FAKRA connectors Magnetic cable assemblies and connectors		

Only available in Switzerland

	High frequency	Signalling technology
Manufacturer	**Huber & Suhner**	**Werma**
Cable Plugs	■	
Device Plugs	■	
Print Connectors	■	
Adapter	■	
Termination Resistors	■	
Attenuator	■	
Lightning Protection	■	
Custom Assembly	■	
Cables	■	
Horns		■
Sirens		■
Optical and Acoustic Combinations		■
Signal Lights		■
Traffic Lights		■
Signal Towers		■

Features

Certificates	ISO 9001 ISO 14001 Neu: IRIS Certification	ISO 9001 ISO 14001 ISO 50001
General Information	Huber+Suhner is a globally active Swiss company specialising in the development and manufacture of components and system solutions in the field of electrical and optical connection technology. The main areas are radio frequency, low frequency and fibre optics.	WERMA Signaltechnik is a German company that develops and produces optical and acoustic signalling devices. The company was founded in 1950
Applications	High frequency: Communication technology Mobile radio Aerospace Aerospace defence Measurement technology	Manufacturing and production plants Mechanical and plant engineering Automation technology Logistics and material flow Building technology and security systems

HUBER+SUHNER

WERMA SIGNALTECHNIK

Customized Cable Assemblies

Endrich offers customized cable assemblies tailored to your specifications, manufactured by our partners. Your assemblies are produced with consistently high quality on modern, efficient, and precise fully- and semi-automatic machines, as well as cutting and assembly devices. Before delivery, they are tested using various methods according to your requirements. Customer-specific components can be integrated into the assembly.

Versions	Processing techniques	Testing techniques
Single wires	Crimping technology, press connections	Polarity testing
Flat ribbon cable	Soldering technology	Short circuit test
Coaxial cable	Ultrasonic welding	Length check
Wiring harnesses	Potting technology, hotmelt	Micrograph inspection
Sheathed cables (shielded and unshielded)	Device installation	Trigger force measurement
	Automatic bandaging	Crimp force monitoring

Assembly examples:

Amphenol C16-3 device connector with individual wires and D-SUB sockets	Flat ribbon cable	Hummel hybrid connectors with cable and wires	Amphenol M16 device socket with flat cable
M12 pre-assembled	RJ connectors and Molex Micro-Fit	Ultrasonic welding of copper wires	Solar connectors

Lighting Solutions / LEDs

Manufacturer		Citizen	Everlight	Harvatek	Dominant
Low Power LEDs	SMD	■	■	■	■
	Wired		■	■	
	7-Segm. Displays		■	■	
High Power LEDs	SMD		■		
	COB	■			
Modules		■		■	
Light Engines					

Features

Certificates	ISO 9001 ISO 14001	ISO 9001 ISO 14001	ISO 9001 IATF 16949 ISO 14001	ISO 9001 ISO 14001 IATF 16949 AECQ102
General Information	COB and SMD LEDs for general lighting, horticulture, and industrial applications with outstanding performance, efficiency, and reliability	Leading global optoelectronics manufacturer of visible LEDs with low and high power, SMD and through-hole LEDs, digital displays, infrared emitters, optical sensors, fiber optic components, and opto-coupler components	As one of the world leaders in SMD LED technology, Harvatek is proficient in the development and manufacturing of SMD LEDs, providing excellent solutions for backlighting, displays, and keyboard lighting	Dominant is one of the world's leading manufacturers of LEDs, providing powerful and innovative solutions for automotive manufacturers. All Dominant products are qualified according to automotive standard AEC-Q102.
Applications	Spot Lights Down Lights High Bay Street Lights Flood Lights Horticulture UV Module	LED Lighting UV LED Industry Status Horticulture Signage	LED Lighting UV LED Industry Status Keyboards	Automotive Industry Status
Specifics	COB Serie Version 9 Type-F & Type-Y COB High Intensity Serie Version 4 Type-F	Deep RED High Power and Royal Blue Horticulture Signage RGB 4 in 1 RGBW CSP RGB IC	IC RGB	SpicePlus Color / RGB Sideway IC RGB

Lighting Solutions / LEDs

Manufacturer		Lextar	OSA	Crystal IS	Audax
Low Power LEDs	SMD	■	■		
	Wired		■		
	7-Segm. Displays				
High Power LEDs	SMD	■	■	■	
	COB				
Modules		■			■
Light Engines					■

Features

Certificates	ISO 9001 ISO 14001 ISO 45001 IATF 16949 ANSI/ESDS20.20 ISO 17025 ISO 262626 (2021/E) ISO 50001 AECQ102	ISO 9001	ISO 9001	ISO 9001
General Information	Lextar boasts a highly skilled research and development team with over 2,300 patents worldwide, offering exceptional optoelectronic technology solutions and services	OSA develops and manufactures specialized, customized high brightness and high power LED chips and SMD LEDs	The product line from Crystal IS leverages the unique properties of aluminum nitride to offer high-quality UVC LED products	Audax Electronics was founded in 2012 and has focused on the development of LED light engines The product portfolio is continuously expanded with cutting-edge LED solutions
Applications	LED Lighting UV Industrie Status Automotive	LED Lighting UV Horticulture Customized LED Modules	Water Treatment Surface Treatment Air Treatment	LED Lighting UV Horticulture Custom LED Modules
Specifics		LEDs for hyperspectral imaging and measurement technology Custom wavelengths	Ultraviolet light in the wavelength range of 260 nm to 270 nm	LED Boards UV Boards Horticulture LED Boards RGB/W LED Boards

LEDs

Manufacturer		Inventronics	LiFud	ELT	Fulham
Power Supplies	Indoor	■	■	■	■
	Outdoor	■	■	■	

Features

	Inventronics	LiFud	ELT	Fulham
Certificates	ISO 9001	ISO 9001 ISO 14001	ISO 9001 ISO 14001	ISO 9001
General Information	Inventronics was founded in 2007 and is one of the world's leading manufacturers of LED drivers, specializing in the development of innovative, highly reliable, and long-lasting products that are certified to all major international safety and performance standards	LiFud was founded in 2007. They are dedicated to technological innovation and the development of energy-saving, healthy, and environmentally friendly LED drivers	ELT is a Spanish corporate group specializing in the development, manufacturing, and distribution of LED drivers, having achieved a leading market position over more than 40 years	Decades of experience have positioned Fulham at the forefront of innovative technology in essential lighting products, smart lighting controls, and health and sanitation solutions.
Applications	Interior Lighting Outdoor Lighting Tunnel Lighting Stadium Lighting Industrial Lighting Horticulture	Interior Lighting Outdoor Llighting Shop Lighting Industrial Lighting Smart Lighting	Interior Lighting Outdoor Lighting	Interior Lighting
Specifics	Mx & MGS Serie EUM Serie EBM Serie	Dali2 DT8 LED driver GSDYG series Triac dimming LF-AAT series	New triac driver series DLCM	Lumo Series European LED Drivers

inventronics   LiFud   eLT   FULHAM
Lighting. Global. Clever. Sustainable.

Accessories

Manufacturer		Ledil	Bender+Wirth	cooliance	Celera
Accessories for High Power LEDs	Holder	■	■		
	Heat Sink			■	
	Optics	■			
Thermal management					■

Features

| Certificates	ISO 9001	ISO 9001 ISO 14001	ISO 9001 ISO 14001	ISO 9001
General Information	As the undisputed market leader in LED optics, LEDiL firmly believes in the right light for enhanced well-being and safety, optimized functionality, and improved sustainability through energy efficiency	Since 1899, Bender+Wirth has been supplying the lighting industry with components of the highest quality worldwide Their current product portfolio includes LED holders, LED connectors and lamp sockets	Cooliance is a global company that develops and manufactures a wide range of reliable thermal solutions and heat sinks	Celera is a technology company that provides solutions in the form of products and services for the thermal management of electrical and electronic devices across various industries and applications, including computers, smartphones, LEDs, and electric vehicles
Applications	Indoor Lighting Outdoor Lighting UV Horticulture Street Lighting	General Lighting	General Lighting Customised Solutions	LED Module General Lighting Industry Sensoren
Specifics	New series DAISY, STRADELLA, LISA Zhaga Standard	COB holder for UV-C: Series 430 made from a UV-resistant mineral	Zhaga Standard Customised adaptations	High heat dissipation High flexibility and adaptability Excellent mechanical and chemical stability

LEDiL®   **BENDER +WIRTH**   **cooliance**   **CELERA** Passion for Technique

Capacitors

Manufacturer	Panasonic	PDC	SunCon	Walsin
Elektrolyte			■	
Polymer	■			
Hybrid	■		■	
MLCC		■		■

Features

	Panasonic	PDC	SunCon	Walsin
Certificates	IATF 16949 ISO 14001 AEC-Q200	IATF 16949 ISO 14001 AEC-Q200 OHAS 18000 AS9100	IATF 16949 ISO 14001 AEC-Q200	ISO 9001 ISO 14001 IATF 16949
General Information	Inventor and leading manufacturer of polymer technology, known for its long lifespan and compact size In the field of hybrid capacitors, Panasonic ranks among the top three manufacturers in the global market	PDC is the only Taiwanese manufacturer of MLCCs with true manufacturing depth, from ceramic powder to the production of finished products They specialize in unique requirements such as: High voltages: up to 10 kV High capacitance: up to 330 µF Tight tolerance: up to +/- 1% For safety-critical applications: X1/Y2, X2 Large packages >1210 Additional features include low ESR, soft termination, AEC-Q200 qualification	A large portfolio of SMD electrolytic capacitors and polymer hybrid capacitors As a pioneer in polymer hybrid capacitors, which combine the advantages of wet electrolyte and solid capacitors, SUNCON offers the third generation of its EP-CAP capacitors Benefits include very high ripple current capability, lowest ESR values, long lifespan, and usability at very high temperatures up to +150°C	Walsin is among the top five manufacturers of multilayer ceramic capacitors (MLCC) in the global market The product range includes standard components as well as optimized versions for specific applications, including those focused on miniaturization
Applications	Automotive Smart Industry Smart Products Medical	Automotive Smart Industry Smart Products Medical	Automotive Smart Industry Smart Products Medical	Automotive Smart Industry Smart Products Medical
Specifics	Voltage extension for POSCAPs up to 50 V Ultra-low SP-cap with 3 mOhm.	Specifically suitable for large packages and high voltages	The FVF series is suitable for universal applications due to ripple current tables for use at different maximum temperatures The FVS series is referred to as semi-bipolar and offers resistance to short-term negative voltage up to -16V Expansion of the housing to a diameter of 18mm and a height of 20mm for SMD electrolytic capacitors.	Specifically suitable for custom large-scale projects or logistics systems.

Panasonic

PDC

SunCon

PSA PASSIVE SYSTEM ALLIANCE WALSIN TECHNOLOGY CORPORATION
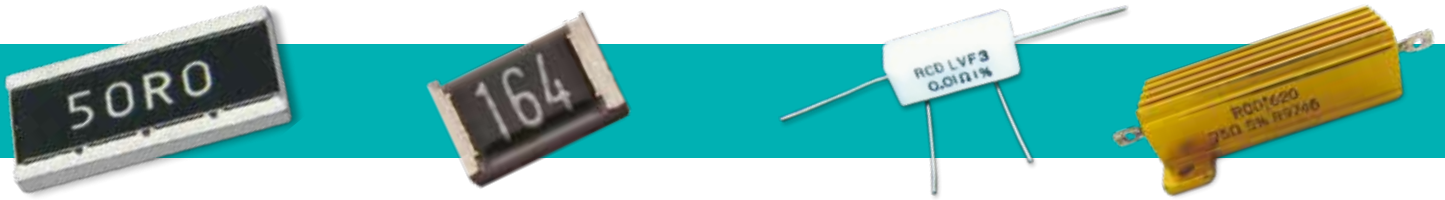
Resistors

Manufacturer	E&C	PDC	RCD	Susumu	Walsin
Thin Film Resistors				■	■
Shunts		■	■	■	■
Thick Film Resistors		■	■		■
Special Resistors	■	■	■	■	■

Features

	E&C	PDC	RCD	Susumu	Walsin
Certificates	ISO 9001	IATF 16949￼ ISO 14001 AEC-Q200 OHAS 18000 AS9100	ISO 9001	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001 IATF 16949
General Information	Specialized in high-resistance resistors in the range of Mega to Peta Ohms, for voltages up to 750,000 VDC￼ Custom products available	Thick-film resistors optimized for specific applications￼ Surge resistors with 2- or 3-times rated power￼ High-voltage and safety resistors with UL certification	The largest selection of resistors from the following categories: thick-film, thin-film, wirewound, ceramic, metal glaze, and metal oxide￼ Resistors are available in various forms, including chip, MELF, THT, radial, axial, as well as with or without heat sinks	Thin-film chip resistors with excellent long-term stability, as well as ultra-precision networks for use as voltage dividers￼ Metal foil shunts with terminals on the short and long sides￼ High-frequency products such as attenuators, termination resistors, and splitters	Walsin is among the top five manufacturers of thick-film resistors in the global market￼ The product range includes standard components as well as optimized versions for specific applications, including miniaturization, high power ratings, and high voltages
Applications	Smart Industry Smart Products Medical	Automotive Smart Industry Smart Products Medical	Smart Industry Smart Products Medical	Automotive Smart Industry Smart Products Medical	Automotive Smart Industry Smart Products Medical
Specifics	The HC series refers to some of the smallest high-ohm chip resistors available on the market￼ Package 0402 is available up to 150 G Ohm	Chip resistors with lead content <100 ppm, making them RoHS compliant without exception	CM300 Type – ultra-flat 300 Watt power resistors with a proprietary flame-retardant protective coating￼ When combined with appropriate air or water cooling, the CM300 delivers optimal performance	Custom products available￼ Chip attenuators for frequencies up to 50 GHz￼ Thin-film resistors with up to 7.5 Megaohms	Specifically suitable for custom large-scale projects or logistics systems

E&C®   PDC   RCD   SUSUMU Thin Film Specialist and Innovator   PSA PASSIVE SYSTEM ALLIANCE WALSIN TECHNOLOGY CORPORATION

Inductive Components

Manufacturer	ABC	Inpaq
Power Chokes	■	■
Iron/Metal Core	■	■
Filter	■	■
Chip	■	■

Features

Certificates	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001 IATF 16949
General Information	Wide selection of SMD and THT Inductors for applications such as DC/DC converters or as filter chokes in bus systems Despite focusing on automated production, ABC maintains significant flexibility, resulting in small minimum order quantities (MOQ) and reasonable delivery times While holding over 100 patents, ABC also offers many products in standard market configurations	Inpaq offers inductors for RF and DC applications, such as chip ferrite beads, filters, and chokes, using technologies like multilayer, wire-wound, and thin-film Inpaq is one of the largest manufacturers of miniature inductors. The WIP series has a monthly output of 600 million units
Applications	Automotive Smart Industry Smart Products Medical	Automotive Smart Industry Smart Products Medical
Specifics	ABC is capable of producing semi-customized and customized inductors and transformers	Inpaq's WIP series is referenced by Qualcomm for the Snapdragon platform

Acoustics
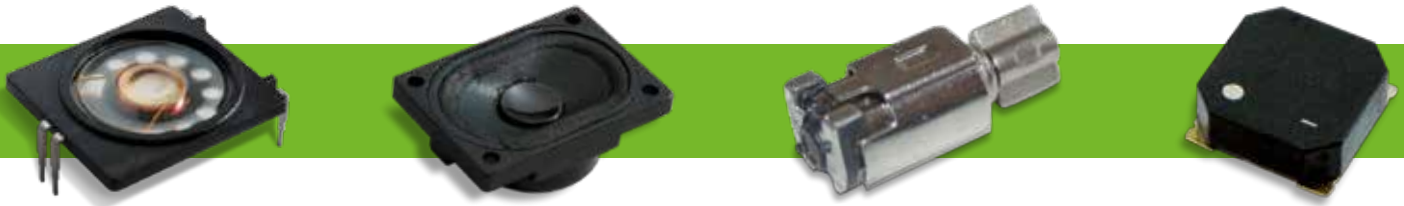
Manufacturer	Baolong	BSE	Chinasound	Qinlon	Universal	Vansonic
Piezoelectric Transducers			■	■	■	
Piezoelectric Buzzers			■	■	■	
Piezoelectric Speaker			■	■	■	
Piezoelectric Element			■		■	
E-magnetic Transducer				■	■	
E-magnetic Buzzer				■	■	
Dynamic Speakers			■	■	■	■
SMD microphones, reflow solderable		■			■	■
Standard Microphones		■			■	■
MEMS Microphones		■			■	
Coin Type Vibration Motors	■					
Cylinder Type Vibration Motors	■					
SMD Vibration Motors	■					
Linear Vibration Motors	■					

Features

	Baolong	BSE	Chinasound	Qinlon	Universal	Vansonic
Certificates	ISO 9001 ISO 14001 OHSAS 18001 IATF1 6949	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001 IATF 16949	ISO 9001 ISO 14001 IATF 16949 ISO 45001
General Information	Location: Wenzhou/ China, founded: 1986 Baolong specialises in micro vibration motors and micro drive motors. Customised adaptations possible. Advantages: Long service life, small size, light weight, low energy consumption	BSE was founded in 1987 in Incheon, South Korea. Founded BSE develops and produces acoustic solutions, primarily microphones	Chinasound develops and produces piezo components, buzzers, including warning buzzers and Mylar loudspeakers in Changzhou, China	Qinlon was founded in 1994 Development and research of electroacoustic components such as loudspeakers, buzzers and ultrasonic sensors. One of its strengths is the combination of applications and suitable acoustic technology	Company in China, founded in 1996 Manufacturer of electro-acoustic components such as buzzers, loudspeakers and microphones High quality can be guaranteed thanks to professionalism and many years of experience	Locations in Foshan and Shanghai Broad product range of loudspeakers and microphones (ECM technology: conventional and reflow solderable) Customised solutions
Applications	Mobile phones Fitness watches E-cigarettes Electric toothbrushes Switches and control panels (haptic feedback)	Smartphones MP3 players Computers Communications Automotive	Piezoelectric warning buzzers and sirens for fire protection and security systems Household appliances Payment systems (POS)	Automotive Intelligent household appliances	Automotive Household appliances Communication Consumer industry	Computer industry Telecommunications Automotive Consumer industry Household appliances
Specifics	Smallest SMD Vibration motor BLT-3211H, small disc-shaped vibration motors 0720 & 0625, LRA vibration motors 0832 & 0412	Receiver loudspeaker	Customised piezoelectric warning buzzer SMD loudspeaker	Own research institute for the continuous automation of production to promote product quality	Customised solutions	Water-protected speakers, microphones and receivers (up to IP67), Speakers in small enclosures, SMD speakers

BAOLONG · BSE · ChinaSound · QINLON · HXE · VECO

Batteries / Power Supplies

Manufacturer	EVE	Fanso	Friwo	Vision Group
Li-SOCl$_2$ / Li-MnO$_2$	■	■		
Super Pulse Cap	■	■		
Lithium 9 V	■	■		
Li-Ion / Li-Polymer / LiFePo	■		■	■
AC/DC Switching Power Supply			■	
DC/DC Converter				
Custom Design Batteries			■	

Features

	EVE	Fanso	Friwo	Vision Group
Certificates	ISO 9001 ISO 14001 IATF 16949	ISO 9001 UL RoHs UN 38.3 IATF 16949	ISO 8000 ISO 9001 ISO 14001 ISO 13485 TS 16949 SIQ (ENEC) UL C-Tick UKCA PSA CCC EAC UN38.3	ISO 9001 ISO 14001 ISO 45001 IEC 62619 UN 38.3 CE
General Information	One of the largest producers of lithium batteries Development and production in-house Li-SOCl$_2$ and Li-MnO$_2$ High-temperature cells Temp: - 40 ... +125 °C SPC - Super Pulse Capacitors Customised battery packs ICR18650 with 2000 mAh and 2900 mAh	Qualified manufacturer of primary lithium batteries specialising in: 3.6 V Li-SOCl$_2$ batteries and 3.0 V Li-MnO$_2$ batteries Ultra-thin Li-SoCl$_2$ / Li-MnO$_2$ pouch batteries 9 V lithium batteries Super capacitors SLS1016 / 1025	Leading manufacturer of power supplies Plug-in power supplies: 6 - 60 W AC/DC converters Desktop power supplies: 6 - 60 W AC/DC converters AC/DC switching power supplies: 6 - 175 W (with/without active PFC) Housing: Plug-in and desktop housing and openframe	Manufacturer for LiFePo, LiFePO$_4$ batteries 12V (5Ah...300Ah) with F2/M5/M6/M8 terminals The batteries have a long service life with a number of cycles of >2000
Applications	Automotive Industry White Goods Medical Consumer	LWD & MWD: Oil Exploration, Electronic Pressure Gauges, Flow Meters, TPMS, Smart Meters, RFID, RAM and CMOS Circuits, Geothermal Detectors, Underwater Munitions, Sonar, GPS and IoT Devices	Industry Tools Medical E-Mobility	Rehab Vehicles Vehicles for senior citizens Solar power storage Cleaning machines Forklift trucks Golf carts
Specifics		Revolutionary ultra-thin Li-MnO$_2$ battery CP104851 Ultra-thin Li-MnO$_2$ battery pack for medical applications Supercapacitor 1520 and 1550	Open frame power supply units HERC up to 175 W FOXNeo series 6-30W IPX2 protection for primary plug	The LiFePO$_4$ batteries can be charged using the charging technology for lead-acid batteries

EVE
ENERGY VERY ENDURE

FANSO

FRIWO

VISION GROUP

Batteries / Power Supplies

Manufacturer	Jauch	maxell
Li-MnO2		■
Li-Ion / Li-Polymer	■	
AC/DC Converter		
DC/DC Converter		
Powerbanks	■	
Custom Design Batteries	■	
Transceiver Modul		
AC/DC Switching Power supply		
Mangan Dioxide		■
Alkaline		■
Silver Oxide		■
Isolation Amplifier		

Features

Certificates	ISO 9001 UL RoHs UN 38.3 IATF 16949	ISO 9001 ISO 14001 UL
General Information	Leading German specialist for battery technology Li-Ion / Li-Po batteries Li-SoCl$_2$ / Li-MnO$_2$ Li button cells Lithium iron phosphate NiMH batteries Mobile lithium energy storage (XT-Powerbanks)	Leading manufacturer of batteries Primary batteries CR Manganese Dioxide button cells CR Manganese Dioxide cylindrical cells SR silver oxide button cells Alkaline batteries Rechargeable batteries ML Lithium Manganese button cells Solid state batteries Professional technical support and own production facilities
Applications	Industrial Electronics Medical Measurement and control technology Safety technology Automotive tooling Military and defence E-mobility Smart metering Communication technologies	Industry Automotive Medical Telecommunications Consumer Transport Test and Measurement Technology
Specifics	New proprietary battery brand 'JAUCH' with its own lithium polymer, lithium ion, lithium manganese dioxide and lithium thionyl chloride batteries	Solid batteries

Batteries / Power Supplies

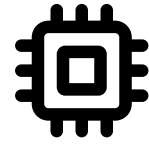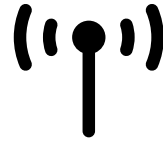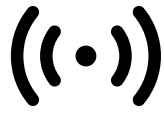| Manufacturer	Yuasa	Energizer	Ansmann
PB Battery 6V and 12V (VRLA / Industry)	■		
PB Battery 6V and 12V (VRLA / Industry)	■		
Alkaline Batteries 1,5V		■	
Lithium Metal Batteries 1,5V		■	
NiMH Battery 1,2V	■	■	■
Button Cells 3V		■	■
Chargers for NiMH Battery			■
Power Supplies			■
Li-Ion Battery Packs			■
Portable Spotlight			■

Features

	Yuasa	Energizer	Ansmann
Certifications	ISO9001 UL VDS (only some types from NP series) IATA (No limitation) UN2800	ISO 9001 UL UN 3090 (Lithium-Metall-Zellen) IATA 62nd Edition ICAO IEC 60086-1	ISO 9001 UL UN 3480 (Lithium-Ion-Akku-Packs) UN 3496 (NiMH-Batterien) IEC 60086-1 IATA
General Information	One of the leading manufacturers of lead accumulators Sealed construction Maintenance-free Valve regulated (low pressure) Leak-proof Can be operated in any position without loss of capacity, except for continuous upside-down operation Electrolyte bound in fibreglass mat Gas recombination cycle Excellent fast charging and discharging discharge properties Cycle operation or continuous charging possible Low self-discharge Easy to recycle	One of the leading manufacturers of alkaline cells Leakproof Low self-discharge Long storage time	A manufacturer of NiMH rechargeable batteries Leakproof Low self-discharge Long storage time
Applications	Emergency power systems / emergency lighting Fire protection Cyclical applications such as golf carts e-mobility Wind energy systems UPSs Medical (not for life support equipment) Industrial electric drives	Batteries for professional applications Fire protection Small Applications Sensors Remote Controls Medical (not for life support equipment)	Batteries for professional applications Small Applications Sensors Remote Controls

Product Overview

Sensors

	Semitec	Tateyama	TEWA	Jumo	Panasonic	CFSensor	LD-PD	MST Magnesensor	MPS	NiCeRa	Sensitec	S4 Sensors	TDK-Micronas	Nisshinbo	Everlight	Lextar	Epigap OSA	Brighlaser	Wavespectrum	RFbeam	OmniPreSense	Micro Sensor	Audiowell	Sensolute	Azoteq	Advanced Photonix	Cubic
Magnetic Field							✓	✓	✓	✓	✓	✓															
Current Measurement								✓	✓		✓	✓	✓														
Partikelsensoren					✓																					✓	
Infrared Leds															✓	✓	✓	✓							✓		
Solar cells					✓																						
Grid Eye – Thermopile Array					✓																						
Radar sensors													✓							✓	✓						
Ultraschallsensoren										✓													✓				
Pyrosensors (PIR)										✓																	
Vibration Sensors																								✓			
Touch Sensors																									✓		
Gas Sensors						✓																					✓
Druck-, Füllstandsensoren						✓																✓					
Inertial Measurement Unit (IMU)					✓																						
NTCs	✓	✓	✓																								
PTCs			✓	✓																							
Konfektionierte Thermistoren	✓	✓	✓																								
Laser und VCSEL							✓										✓	✓	✓								
TOF Sensoren													✓					✓									

SEMITEC · SEMITEC Corporation · TATEYAMA · CTS | TEWA · JUMO · Panasonic · CFSensor · LD-PD INC SINGAPORE · Magnesensor Technology Ltd · MPS · NiCeRa Nippon Ceramic Co., Ltd. · SENSITEC MAGNETORESISTIVE SENSORS · S4sensors · TDK · NISSHINBO · EVERLIGHT · Lextar · osa opto light · BRIGHTLASER · WAVE spectrum · RFbeam Microwave · OmniPreSense Sensing a Safer World · MICROSENSOR · AUDIOWELL SENSOR TECHNOLOGY · SENSOLUTE · Azoteq · Advanced Photonix · Cubic

Touch PCs & Embedded Systeme
Touch Monitore & Displays

	DLogic	ASRock Industrial	DFI	F&S Elektronik Systeme	Vekatech	Eagleye Tech	Multi-Inno	SGD	Raystar
Touch PCs	✓								
Boxed PCs		✓	✓						
Embedded Boards x86		✓	✓						
Embedded Boards ARM				✓	✓				
Touch Monitore	✓								
TFT-Displays with PCAP						✓	✓	✓	✓
Monochrome LC-Displays						✓	✓	✓	✓
pmOLED-Displays							✓		✓
E-Paper Displays					✓				

DLOGIC · EAGLEEYE TECH · ASRock Industrial · Multi-Inno Technology Co., Ltd · DFI · SGD Display the World · F&S Elektronik Systeme · RAYSTAR OLED Display Provider · vekatech

RF Products

Quartz / Oscillator / Filters

	Chequers	Citizen	Maruwa	SiTime	SMI	TST	2J antennas	Inpaq	Aurel	Locosys	Panasonic	Feasycom	neocortec
Quarze (MHz) / (kHz)	✓	✓		✓	✓								
Ceramic Resonators	✓												
Oscillators	✓	✓	✓	✓	✓	✓							
MCF Filters / SAW Filters	✓				✓	✓							
Dielectric Filters	✓		✓		✓								
Ceramic Filters	✓												

Antennen

	Chequers	Citizen	Maruwa	SiTime	SMI	TST	2J antennas	Inpaq	Aurel	Locosys	Panasonic	Feasycom	neocortec
Antennas f. ISM Band, Bluetooth ®/WiFi™							✓	✓					
Antennas f. GPS/GNSS							✓	✓		✓			
Antennas f. Cellular							✓	✓					
Antennas f. Car2Car Communication							✓	✓					
Antennas f. NFC (Near Field Comm.)							✓	✓					
WPC (Wireless Power Charging)								✓					
UWB								✓					

Module

	Chequers	Citizen	Maruwa	SiTime	SMI	TST	2J antennas	Inpaq	Aurel	Locosys	Panasonic	Feasycom	neocortec
RF-Module (315 MHz … 2.4 GHz)									✓				
WiFi™-, Bluetooth®-Module											✓	✓	
GPS/GNSS Module										✓			
LoRa™ Transceiver									✓				
Mesh Netzwerk									✓		✓	✓	✓

Semiconductors

Analog ICs

	Holtek	MPS	Nisshinbo	SG Micro	Alliance	ESMT	Fidelix	GigaDevice
Analog Switches		✓	✓	✓				
Audio ICs	✓	✓	✓	✓		✓		
Communication ICs	✓		✓					
Display Drivers	✓		✓					
GaAs MMIC			✓					
LED Drivers	✓	✓				✓		
Microcontroller	✓							✓
Motor ICs	✓	✓	✓	✓				✓
Operational Amplifiers	✓	✓	✓	✓				
Power Supply ICs	✓	✓	✓	✓		✓		✓
Video ICs	✓		✓	✓				
Logic ICs				✓				
Touch & Multisensor IC	✓							

Speicher ICs

	Holtek	MPS	Nisshinbo	SG Micro	Alliance	ESMT	Fidelix	GigaDevice
SRAMs/pSRAMs					✓			
SDRAMs/DDR/DDR2/DDR3/DDR4					✓	✓	✓	
Flash					✓	✓		✓
MCP						✓		
eMMCs					✓	✓		

Protection Devices

	CT Micro	Cosmo	Eris	ECE	Inpaq	ProTek	Semitec	SFI
Overcurrent Protection								
PPTC				✓				
Power Thermistors							✓	
CRDs							✓	
Coupler/SSR								
Opto Coupler	✓	✓						
MOS Relay	✓	✓		✓				
Solid State Relay		✓		✓				
Overvoltage Protection								
TVS-Dioden/-Arrays		✓		✓				
Multilayer Varistors					✓			✓
CSPD (chip surge protection device)								✓
ESD Suppressor				✓				
Protection Thyristors						✓		
Protection Modules						✓		
Discrete								
Dioden		✓						
Transistoren		✓						

Elektromechanics

	SINWAN	ADDA	Ecofit	Fulltech	Minebea Mitsumi	Qian Yuan	Thoptec	ECE	Diptronics	knitter-switch	win	Marquardt	Amphenol	Adam Tech	Fujikura
Fan															
Fan	✓	✓	✓	✓	✓										
Heat Sink		✓													
Fan Accessories						✓	✓								
Customised Complete Systems	✓														
Switches															
Touch Switches								✓	✓						
Pushbutton Switches								✓	✓		✓				
Microswitches								✓	✓	✓	✓				
Microswitches/Silicone keypads									✓	✓					
Relays								✓							
Tilt Switches								✓		✓					
DIP/Piano Switches								✓	✓						
Rotary DIP Switches								✓	✓	✓					
Slide Switch								✓	✓			✓			
Industiral Control Switches								✓	✓			✓			
Detectors / Tamper Switches								✓							
Plug Connectors															
Data								✓					✓	✓	✓
Power								✓					✓	✓	✓
Circular													✓		✓
Rectangular													✓	✓	
MS Connectors													✓		✓
Customised Cable Assemblies													✓		✓

Elektromechanics

Only available in Switzerland

	Huber & Suhner	Werma
Cable Plugs	✓	
Device Plugs	✓	
Print Connectors	✓	
Adapter	✓	
Termination Resistors	✓	
Attenuator	✓	
Lightning Protection	✓	
Custom Assembly	✓	
Cables	✓	
Horns		✓
Sirens		✓
Optical and Acoustic Combinations		✓
Signal Lights		✓
Traffic Lights		✓
Signal Towers		✓

HUBER+SUHNER   **WERMA** SIGNALTECHNIK

Lighting Solutions

	Citizen	Everlight	Harvatek	Dominant	Lextar	osa opto light	Crystal IS	Audax	Inventronics	LiFud	ELT	Fulham	Ledil	Bender + Wirth	cooliance	Celera
Lichtlösungen / LEDs																
Low Power LEDs, SMD	✓	✓	✓	✓	✓	✓										
Low Power LEDs, Wired		✓	✓		✓											
7-Segment Displays		✓	✓													
High Power LEDs, SMD		✓			✓	✓	✓									
High Power LEDs, COB	✓															
Modules	✓		✓					✓								
Light Engines								✓								
LEDs																
Power Supplies Indoor									✓	✓	✓	✓				
Power Supplies Outdoor									✓	✓	✓					
Accessories																
Holder												✓	✓			
Heat Sinks															✓	
Optics													✓			
Thermal Management																✓

CITIZEN ELECTRONICS CO., LTD.   **EVERLIGHT**

HARVATEK   **DOMINANT** Semiconductors — Innovating Illumination

Lextar   **EPIGAP OSA**

Crystal IS an Asahi Kasei company   **AUDAX** ELECTRONICS

inventronics   **LiFud**

ELT   **FULHAM** Lighting. Global. Clever. Sustainable.

LEDiL   **BENDER +WIRTH**

cooliance   **CELERA** Passion for Technique

Passive Components

Capacitors	Panasonic	SunCon	E&C	PDC	RCD	Susumu	Walsin	ABC	Inpaq
Elektrolyt		✓							
Polymer	✓								
Hybrid	✓	✓							
MLCC				✓			✓		
Inductive Components									
Power chokes (ferrite core)								✓	✓
Iron / metal core								✓	✓
Filter								✓	✓
Chip								✓	✓
Resistors									
Thin Film Resistors						✓	✓		
Shunts				✓	✓	✓	✓		
Thick Film Resistors				✓	✓		✓		
Special Resistors			✓		✓	✓	✓		

Acoustics

	Baolong	BSE	ChinaSound	Qinlon	Universal	Vansonic
Piezoelectric Transducers		✓	✓	✓		
Piezoelectric Buzzers			✓	✓		
Dynamic Speakers		✓	✓	✓	✓	
Electret Sondenser Microphones		✓			✓	✓
Standard Microphones		✓			✓	
Vibration Motors	✓					

Batteries / Power Supplies

	EVE	Fanso	Friwo	Vision Group	Jauch	maxell
Li-SOCl$_2$ / Li-MnO$_2$	✓	✓				✓
Super Pulse Cap	✓	✓				
Lithium 9 V	✓	✓				
Li-Ion / Li-Polymer/LifePo	✓		✓	✓	✓	
AC/DC Converter			✓			
DC/DC Converter			✓			
Custom Design Batteries			✓		✓	
Transceiver Modules						
AC/DC Switching Power Supply						
Isolation Amplifier			✓			
Powerbanks				✓		
Mangan Dioxide						✓
Alkaline						✓
Silver Oxide						✓

Batteries / Power Supplies

Only available in Switzerland

	Yuasa	Energizer	Ansmann
PB Battery 6V and 12V (VRLA / Industry)	✓		
Chargers for PB Battery 6V, 12V and 24V	✓		
Alkaline Batteries 1,5V		✓	
Lithium Metal Battery 1,5V		✓	
NiMH-Akku 1,2V	✓	✓	✓
Button Cells 3V		✓	✓
Button Cells 3V			✓
Power Supplies			✓
Li-Ion Battery Packs			✓
Portable Spotlight			✓

BÜROS IN EUROPA

Deutschland
Nagold (Zentrale)

Österreich

Frankreich

Spanien

Italien

Ungarn

Schweiz
novitronic
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endrich group
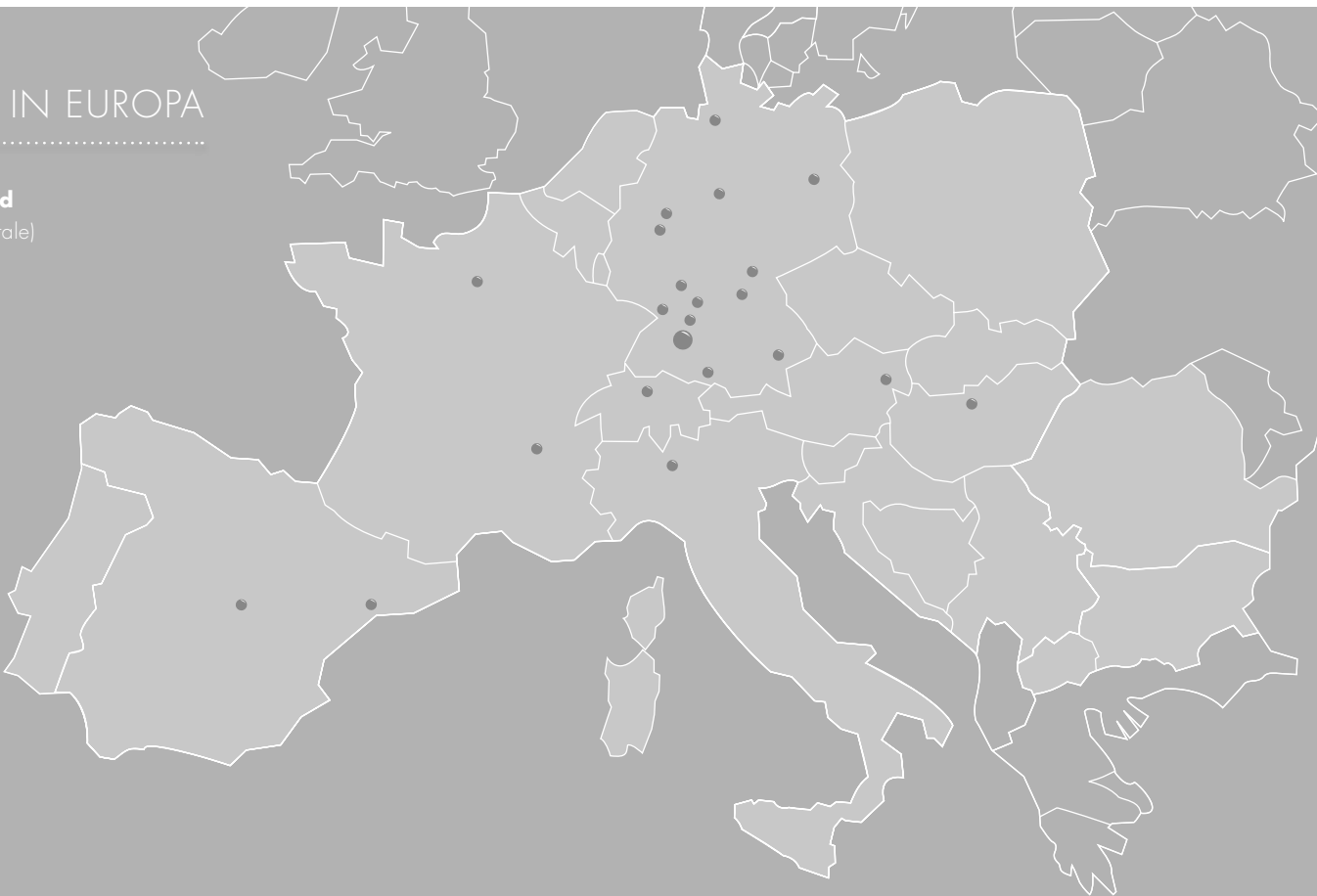
endrich Bauelemente Vertriebs GmbH
Hauptstraße 56 · 72202 Nagold
Tel.: +49 7452 6007-0 · info@endrich.com

endrich Ges.m.b.H.
Ohlsdorfer Straße 18 · 4810 Gmunden · Österreich
Tel.: +43 1665 2525 · austria@endrich.com

endrich Bauelemente Vertriebs GmbH
Sales Office and R&D Budapest
Office: H-1191 Budapest, Corvin krt. 7-13
Tel.: +36 1297 4191 · hungary@endrich.com

www.endrich.com

Novitronic GmbH
Hauptstraße 56 · 72202 Nagold
Tel.: +49 7452 88780-20 · info@novitronic.de

Novitronic AG
Thurgauerstrasse 74 · 8050 Zürich
Tel.: +41 4430 69191 · info@novitronic.com

www.novitronic.com