





# SHAPING THE FUTURE WITH ELECTRONICS

Hi-Rel Business | New Space | Power Management  
E-Mobility | IoT Solutions | Obsolescence Solutions

# HI-REL BUSINESS | NEW SPACE

Manufacturers	Products	Applications
	<p>EPC Space is focused on designing and manufacturing radiation hardened (Rad Hard) GaN-on-silicon transistors and ICs packaged, tested, and qualified for satellite and high-reliability applications. Built for mission-critical environments, EPC Space's GaN technology guarantees high power density, fast switching, and superior radiation tolerance, making it the ideal choice for spaceborne and high-reliability electronics.</p> <p>Products: JANS MIL-PRF-19500 Certification for Rad-Hard GaN-on-Silicon transistors and ICs, Rad-Hard GaN Packaged HEMTs, Rad-Hard GaN Die on Ceramic Adapter, Rad-Hard GaN Drivers &amp; Power Stage Modules, Rad-Hard GaN Drivers &amp; Power Stage ICs</p> <p>Available engineering tools: Demonstration Boards, Point-of-Load Evaluation Boards, Motor Drive Evaluation Boards</p>	<p>Space High-Efficiency DC/DC Converters, Space Systems Lidar, Space Motor Drives, Space Systems - Ion Thrusters, Low Earth Orbit (LEO), Geostationary Earth Orbit (GEO)</p>
	<p>Rad-hard space qualified optocouplers &amp; optoelectronic components, high gain-, high speed-, high voltage optocouplers, VCSEL high power laser diodes, rad-hard &amp; military solid-state relays, voltage regulators, ITAR free products, Rad-Hard Power MOSFETs, N-Channel, P-Channel, Combination N++ P-Channel</p>	<p>Space Heritage, New Space, Aerospace, Avionics</p>
	<p>Military hermetic hybrid DC/DC-converters 5W to 120W, single, dual, triple versions            Space rad-hard hermetic hybrid DC/DC-converters 5W to 120W, single, dual, triple versions, TID 100krad, SEE 82MeV            MIL-PRF-38534 DLA qualified, SMD part number available            New space rad tolerant hermetic hybrid DC/DC-converters 25W, 40W, single, dual versions, TID up to 30krad, SEE up to 60MeV            EMI filters complementary to their hermetic hybrid DC/DC-converters offering a range of input voltages and packages            Rad-hard and Rad-tolerant PCB based DC/DC-converters with key features and tailored to customer's requirements, single, dual, triple, quad, octo versions, Output power 5W to 400W, TID 100krad, SEE 60MeV</p> <p><b>Space Components</b>            Rad-hard &amp; rad tolerant MRAMs 64Mb (4Mx16) class S 100K            Radiation hard logic ICs (AND, NAND, OR, XOR),            Hi-Rel diodes, rectifier &amp; Schottky diodes, unipolar &amp; bipolar TVS diodes, Zener diodes, COTS diodes, Diode assemblies - ISOPAC®, center taps and doublers,            Hi-Rel ICs &amp; components DLA/DSCC certified products, QML/SMD 5962, memories, logic devices, analog ICs            Nuclear Event Detector (NED) screened to class H military flow or class K space flow            MIL-STD-1553 data bus couplers &amp; accessories</p>	<p>Space, New Space, Defense, Aerospace, Aviation, Marine, Launch Vehicles, Industrial-Embedded Products, FPGA-Boards</p>
	<p>Quantic Eulex develops innovative ceramic components for the most demanding high-frequency microwave, millimeter-wave, and 5G applications. The solutions deliver design advantages through small-footprint, low-profiling packaging, and a wide voltage range, fully tested up to 67Ghz. At temperatures ranging from ranging from -55° to 125°C.</p> <p>Patented High-Frequency Ceramic Capacitors single-layer ceramic capacitors Broadband Capacitor, Eulex Gap Capacitor, Single Layer Binary Capacitor, Vertical Layer, Ultra High-Q MLCC, Substrates and Stand-Offs</p>	<p>Hi-Rel applications, high-frequency microwave, millimeter-wave, 5G applications</p>






# HI-REL BUSINESS | NEW SPACE

Manufacturers	Products	Applications
	<p>Highest energy and power density capacitors with MTBF&gt;5,000,000 hours, product range 22 to 1,000,000 <math>\mu</math>F (5.5 to 150V) -55°C to +200°C very low ESR, very high current handling capability, highest levels of quality, Qualified to NASA INST-002, ISO 9001 and AS9100 registered, MIL-STD-704 space grade capacitors for critical missions</p>	<p>Space, New Space, Power Hold-up Avionics, Satellite Thrusters, Radar Lidar, EMP and Laser, Oil &amp; Gas</p>
	<p>Multi-layer Polymer (MLP) Film Stacked Capacitors It's branded capacitor products include Capstick® Capacitor (lead-frame capacitor), Surfilm® Capacitor (surface mount chip capacitor), Quencharc® Capacitor (RC network snubber capacitor), and the Angstor® Capacitor line.</p> <p>New Angstor series: 1200 VDC high-voltage polyester capacitors, withstand high current ripples, self-repairing, ultra-low ESR/RSL</p>	<p>Military, Space, Commercial, Automotive, Telecom Mission-critical</p>
	<p>Multilayer ceramic capacitors (MLCCs) and leaded devices. Surface mount (SMT) multi-layer ceramic chips capacitors in both custom and EIA standard sizes; switch mode power supply (SMPS) capacitors in accordance with MIL-PRF-49470 and DSCC/DLA 87106, 88011 drawings and customer source controlled drawings (SCDs); SMT high voltage MLCC; radial leaded high voltage capacitors; SMD large body size MLCC; discoidal capacitors; discoidal arrays; and custom molded case radial parts.</p> <p>SMPS family for input and output filters in switch-mode power supplies DH Series: negative dielectric energy pulse capacitors, +250°C, 10 KV</p>	<p>Defence, Aerospace, Hi-Rel applications, Industrial, Telecommunications Missiles Downhole</p>
	<p>ESCC FM, QM, EM qualified rad-hard POL converter 2A, 24V flatpack, buck-boost operation, rad-hard POL converter 8A, 40V (prototype), Voltage clamp 10A, 40V, DC/DC-converter controller, PWM controller with start-up, quad LVDS line receiver with extended common mode, quad LVDS line driver, 1:4 LVDS fanout buffer with extended common mode, Screening &amp; testing of SPACE IC products to the ESCC 9000 requirements, Rad-tolerant POL converter in a plastic package</p>	<p>Space, New Space, Satellite Business, Harsh Environments</p>
	<p>Space &amp; military MIL-PRF-55342 thin &amp; thick film SMT chip resistors, MIL-PRF-914 SMT chip resistor networks, MIL-PRF-32159 zero Ohm chip resistors (jumpers), Mission critical precision chip resistors, high frequency chip resistors, silicon chip resistors, SMT fixed chip attenuators, 4-terminal current sense chip resistors, High power chip resistors, high voltage chip resistors, wire &amp; epoxy bondable chip resistors for hybrids, power moisture compliant chip resistors, Hi-Rel screening</p>	<p>Space, New Space, Defense, Aviation Hybrid Modules, Biomedical</p>
	<p>VPG Foil Resistors' unique, ultra-precision Bulk Metal Foil resistor products provide an extremely low temperature coefficient of resistance (TCR) and exceptional long-term stability through temperature extremes.</p> <p>VPG Foil Resistors is comprised of four brands (VFR, Alpha Electronics, Powertron and APR). They design and manufacture the widest selection of highly precise and reliable precision resistors from customized made-to-order to standardized made-to-stock that meet any required specifications.</p> <p>Products: High Precision Foil Resistors, Standard &amp; Custom Resistors, Currents Sense-, Power-, SMD-, THT-, Thermosensitive Resistors, Hybrid Chips (PRND), Trimmers, Voltage Divider Networks</p>	<p>Space Qualified Resistors, Aviation, Aerospace, Defence, Downhole Oil &amp; Gas</p>
	<p>Hi-Rel &amp; High Temperature Hybrid Microcircuit Crystal Oscillators &amp; Crystal Units, LVDS Output Oscillators for Space Applications, MIL-PRF-55310, MIL-PRF-38534, MIL-883B, TTL-LVDT-CMOS-HC/ACMOS-ECL, Lowest voltage is 1.8V, SMD-Packages 5x7mm, High Shock &amp; Vibration Designs, Extreme High temperatures products operating up to +230°C New Commercial Space Oscillators for LEO Applications, SMD-Packages 3x5mm</p>	<p>Space Heritage, New Space, Aerospace, Aircraft, Defense, High Temperature Products</p>

# POWER MANAGEMENT

Manufacturers	Products	Applications
	<p>Fabless semiconductors, mixed signal integrated circuit solutions, power management &amp; delivery systems Linear regulator (LDO), buck-boost regulator, buck regulator, VRM controller, power stage</p>	<p>Automotive, Server Applications, Wearables</p>
	<p>Isolated single, dual &amp; triple output DC/DC-converters up to 3000W High performance DC/DC-bricks Railway conform with the input battery voltage transient ranges of EN50155 up to 10:1 ratio input voltage range High power DC/DC-converters 500W, 1000W Mid-range power DC/DC-converters 100 to 500W Low power DC/DC-converters 1 to 75W Chassis mount converters, SMT&amp;THT modules, brick assembly modules Encapsulated PCB mount from 2 to 60W AC/DC-power supplies 250W, 300W and 600W with 90-264VAC input Switch mode AC/DC supplies, 15 to 150W chassis Industry standard footprints SIP, DIP, SMT, 1x1 and 1x2 thru hole patterns Operating temperature range -40 to +105°C baseplate High efficiency up to 97%</p>	<p>Transportation, Railway, Industrial Applications, Commercial Applications, Medical Industry, Avionics</p>
	<p>Rotary encoders, thin section encoders, bus cover encoders, wheel encoders, bearingless encoders, small size encoders, miniature encoders, motor &amp; gearbox flange encoders. Inductive, magnetic, optical, absolute, incremental, programmable encoders Hollow shaft or shaft options, 12-250mm diameter, up to 200,000 rpm with compact robust design and flange options SSI/BISS, CAN, RS 422 interface, high accuracy up to 21-bit resolution possible -45°C to 100°C operating temperature, shock and vibration resistant, IP65 protection</p> <p>Door detectors, pressure sensors, potentiometer, inclinometers, rotational speed sensors, draw wire sensors, sensor connectors</p>	<p>Motor &amp; Gearbox Applications, Elevators, Industrial Machines, Robotics, E-Mobility, Defense, Medical</p>
	<p>Isolated and non-isolated DC/DC-converters 1W to 1000W Input voltage range 2.5V to 520V with 10:1, 8:1, 4:1, 2:1 ratios Railway DC/DC-converters: 10 to 160VDC input, 5 to 56VDC output voltage, 50 to 800W High voltage DC/DC-converters: 180 to 400VDC, 300 to 520W Over-voltage, over-current, short-circuit and over-temperature protection High efficiency up to 96%</p>	<p>Railway, Industrial Applications, Server Applications, Telecommunication</p>
	<p>Ultra-precision Bulk Metal Foil resistor providing an extremely low temperature coefficient of resistance (TCR) and exceptional long-term stability through temperature extremes.</p> <p>High Precision Foil Resistors, Standard &amp; Custom Resistors, Currents Sense-, Power-, SMD-, THT-, Thermosensitive Resistors, Hybrid Chips (PRND), Trimmers, Voltage Divider Networks</p>	<p>Power the innovations, Medical, Industrial Automation, Telecommunications</p>
 <p>THE LEADER OF CONVERTER</p>	<p>Single and dual output DC/DC-converters from 0.1 to 50W, Switch mode AC/DC supplies Encapsulated PCB mount from 1 to 30W AC/DC power supplies 25 to 1200W enclosed/open frame type Industry standard footprints SIP, DIP, SMT, 1x1 and 1x2 thru hole patterns</p>	<p>Railway, Industrial Applications, Commercial Applications, Medical Industry</p>

# E-MOBILITY

Manufacturers	Products	Applications
	<p>High voltage power distribution units (PDU), high voltage battery disconnect units (BDU), high voltage on board chargers (OBC) and DC/DC-converters, combo OBC and DC/DC-converter, electric vehicle communication controller (EVCC), supply equipment communication controller (SECC)                      OBC: 6.6kW to 40kW, 94% efficiency                      DC/DC-converter: 300W to 12kW                      Combo OBC and DC/DC-converter: 3.3, 6.6 or 11kW OBC + 1 to 3kW DC/DC</p> <p>EV chargers, high voltage power connectors (plastic or metal), manual service disconnectors, signal connectors, charging connectors, high voltage wire harness</p>	<p>Battery Management Systems,                      Automotive,                      Electric Vehicles,                      Charger Systems,                      Agriculture,                      Automatic Guided Vehicles,                      UGVs,                      UAVs</p>
	<p><b>Powering the Future of Transportation</b>                      DC/DC-converters from 300 to 3000W for 12, 24, 28, 48, 400VDC battery voltages                      3000W BCA series bi-directional DC/DC-converters                      Ruggedized enclosed 3000W BCE series bi-directional DC/DC-converters                      1500 &amp; 3000W bi-directional non-isolated DC/DC-converters 12V/48V battery with a CAN 2.0b interface including remote ON/OFF                      HVC series 400S12.4KOHVC-L-CM: 4kW auxiliary power module, 220VDC to 420VDC input, 9 to 16V output and provides a single isolated 12VDC output for powering auxiliary equipment, liquid cooled, rugged and fully IP rated, vibration resistant, thermally optimized enclosure                      HVC 800S24.4KOHBC 16-32V output 4kW                      High efficiency up to 97%</p> <p>1000W full-bricks with wide input range at 9 to 36VDC                      AC/DC on-board charger module with 6.6kW, 240 to 450 VDC output, operate from international nominal mains voltages of 100-120 / 200-240VAC nominal.                      OBC series are liquid cooled and feature a rugged, fully IP rated, vibration resistant, thermally optimized enclosure with slotted through holes for easy installation                      300W AC/DC Li-Ion battery chargers for e-mobility and battery applications                      High efficiency up to 95%</p> <p><b>Battery Management Systems</b>                      Standard brick size DC/DC-converters 50 to 1000W                      Single modules with 9 to 160VDC input &amp; 5 to 57VDC output voltage                      Option: chassis mount and DIN-rail version, good shock and vibration dampening, temperature range -40 to +105°C                      high efficiency &gt;95%</p>	<p>Battery Management Systems,                      Automotive,                      Mild Hybrid Vehicles,                      Autonomous Vehicles,                      Recreation Vehicles,                      Electric Industrial Vehicles,                      Agriculture Vehicles,                      Last Mile Transit,                      Automatic Guided Vehicles,                      Fork Lifts</p>
	<p>Electric vehicle on-board chargers and DC/DC-converters                      2-in-1 on-board chargers 6.6kW &amp; DC/DC-converters 1 to 3kW, liquid-cooling                      Single 6.6KW EV on-board chargers with 85 to 265VAC input voltage &amp; 400 to 850VDC output voltage, CAN bus interface, air-cooling</p>	<p>Automotive,                      Electric Vehicles,                      Hybrid Vehicles,                      Marine &amp; Yacht</p>
	<p>GNSS receivers with accuracies from meter level down to millimeter level                      Multi-constellation, multi-frequency, high-performance                      Compatible with GPS, BDS, GLONASS, Galileo, QZSS                      Processing of multiple GNSS signals on a single chip                      Ultra low latency processing technology: more than 100Hz RTK processing ability, less than 10ms output delay, up to 200Hz attitude and positioning data                      Dual-RTK solution: single-board dual-antenna positioning and dual-RTK calculation                      High precision even if satellite signals are blocked: centimeter-level accuracy maintained for more than 10 minutes after interrupted base station or blocked communication</p>	<p>Precision Agriculture,                      Surveying, UAV, Drones,                      Robotics, CORS                      Autonomous Driving,                      Vehicle Navigation,                      IoT, Trackers, Wearables,                      Precision Timing</p>
	<p>Ultra-precision Bulk Metal Foil resistor providing an extremely low temperature coefficient of resistance (TCR) and exceptional long-term stability through temperature extremes.</p> <p>High Precision Foil Resistors, Standard &amp; Custom Resistors, Currents Sense-, Power-, SMD-, THT-, Thermosensitive Resistors, Hybrid Chips (PRND), Trimmers, Voltage Divider Networks</p>	<p>Automotive,                      Electric vehicle,                      EV Battery Management Solutions,                      Motor control</p>

# IOT SOLUTIONS

Manufacturers	Products	Applications
	<p><b>Position Sensor Au2001</b>            Non-magnetic sensor chip, non-contact position sensing            Operating voltage from 2.8 to 3.6V, average current 2.3µA            Supports SPI for simple interface with micro controllers            Supports two modes: low sensitivity and high sensitivity mode            Package: 3 x 3 x 1mm 16 pin QFN</p> <p><b>MEMS</b>            3-axis and 6-axis accelerometers, automotive IMU, consumer IMU            Suited for noise reduction, step counting, tapping detection, vibration/drop/tilt detection, gesture recognition            Extended temperature range, low power consumption, high reliability, AEC-Q100 qualified, low noise, TDM/I2S/I2C/SPI digital interface</p>	<p>Position Sensors,            Water Flow Sensors,            True Wireless Stereo,            Consumer Products,            Automotive,            Anti-Theft Systems,            Collision Warning and            Crash Prevention systems,            Navigation,            Drones, Robots,            VR, Smartphones,            Wearables,            Activity Tracking</p>
	<p>Barantech's products combine elegance with high reliability, durability and precision            Built for extreme conditions: flawless operation regardless of weather, vandalism            Customizable designs, different materials: stainless steel, aluminum, glass, plastic</p> <p><b>Elegant High-Quality Switches</b>            Touch metal piezo switches, momentary pulse switches, smart and high voltage switches            No moving parts, hermetically sealed, vibration and impact tested, programmable, non/RGB illuminated, round or square shape            Enhanced touch - operation by hand, gloves or tools            Work trouble-free for over 50 million activations</p> <p><b>HMI Control Panels</b>            Glass &amp; polycarbonate control panels, aluminum/stainless steel control panels, security and access control panels            Glass panels: touch technology, else: piezo touch buttons in solid-state construction            Backlighting in different colors (glass panels), illuminated/RGB LED, different housings, hermetic housing, no moving parts            Compatible with different communication protocols, IoT capable through Bluetooth</p> <p><b>Keypads</b>            Aluminum/stainless steel housing, no moving parts, with LED indication            Maximum long-term use, low maintenance, perfect for high-risk areas            Matrix output to eliminate costly ASIC interfaces</p>	<p>Marine Control Systems,            Luxury Yachts,            Diving Equipment,            Car Wash,            Medical,            Hygiene,            Food Processing,            Chemical,            Public Transport,            Parking Systems,            Charging Terminals,            Bike Share Terminals,            Automated Environments,            Oil &amp; Gas,            Aviation,            Defence,            Access Control            Keypads &amp; Panels,            Security Gates,            Anti-Vandal,            White Goods,            Manufacturing,            Emergency Switches</p>
	<p>Power management ICs for energy harvesting applications, enabling device autonomy            Harvesting from any kind of source: solar, thermal or AC sources, indoor, outdoor, artificial light, low and high-power sources can be addressed            Ultra low cold-start (2µW) allows start from indoor light, high boost efficiency, fast charging            Boost or buck-boost architectures, single or dual source, minimize BoM and board footprint</p>	<p>Industry 4.0,            Smart Building,            Remote Controls,            Wearables,            Trackers &amp; Sensors,            Electronic Shelf Labels</p>
	<p>Character Displays from 0.42" to 15.6", with or w/o backlight, touch panels            TFT LCD modules, TN/STN/FSTN/DFSTN LCD modules, VA LCD modules, COG displays            OLED modules, OLED switches, UART TFT displays, HMI modules, RGB LED modules</p>	<p>Industrial applications,            Medical devices,            White goods</p>

# OBSOLESCENCE SOLUTIONS

Manufacturers	Products	Applications
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**Component Modification Services**  
 Robotic hot solder dip – compliance with RoHS directive  
 Elimination of tin-whiskers through tin-lead-alloy, lead attach coplanarity and compression bond, lead-free solder alloy, gold mitigation, forming and cutting of pins, BGA reballing for the conversion of tin-lead, column grid array (CGA)  
 Interconnect technology; packaging & assembly, electrical & environment testing

Space, Aerospace,  
 Aviation, Defense,  
 Implantable  
 Medical Industry,  
 Industrial Applications,  
 Transportation



**Solving Obsolescence and Supply Chain Shortages**  
 Remanufacturing of legacy components, custom solutions for mitigating device obsolescence and board re-design, adapter products, interconnect pitch adapters, programming adapters

Space,  
 Aerospace,  
 Aviation, Defense,  
 Automotive,  
 Railway,  
 Transportation,  
 Medical,  
 Industrial Applications,  
 Adapter Solutions

**Allocation & Obsolescence**  
 ASIC / FPGA adapters to include code reconstruction and re-targeting; package/ 1:1 footprint conversion, device re-targeting, connectors; reverse engineering of small plastic & metal parts; atmel AVR adapters for micro controllers

**Test & Development**  
 Prototyping adapters/interposers, emulation & test interface, programming adapters, voltage regulation, test clips & modules, Custom development

**Interconnect**  
 Screw machine/turn pin sockets, PCB connectors, stamped pin IC sockets, wire wrap, PLCC sockets & plugs, SIMM sockets, transistor and circular IC sockets, shorting link/jumpers, opto/diode display sockets, dual row component header, single row high profile IC sockets  
 Custom interconnects

**Jermyn Semiconductor Hardware**  
 Mounting pads, transistor & circular IC sockets, opto/diode display sockets, insulators, panel washers, bushes and covers, component carriers, heatsinks

**Precision Engineering**  
 Reverse engineering solutions: re-manufacturing of legacy components, including material study to meet current regulations, even if only the physical part exists without a drawing  
 Injection moulding, CNC machining, toolmaking



**Bare die components:** every industry standard is supported, customized setups are available  
**Bare die cross referencing, die re-engineering, obsolete die stocks, wafer dicing, dummy bare dies**  
**Wafer and die level testing:** bipolar transistor, comparator, digital + logic, diode, MOSFET / JFET, operational amplifier, transistor, voltage regulator, class H testing, class K testing

Defense,  
 Military,  
 Industrial,  
 Medical,  
 Obsolescence Solutions,  
 Industrial Applications

Access to procure obsolete or allocated components with anti-counterfeiting program  
 Life cycle management with last time buy, end of life and product change notification service

## MEMBERSHIPS



# OUR SERVICES

KAMAKA - ESTABLISHED IN 1992

AUTHORIZED DISTRIBUTOR & SOLUTION PROVIDER

- ▶ Anti-Counterfeiting Program
- ▶ Requirement Engineering
- ▶ Total Quality Management:  
DIN EN 9120:2018 (technically equivalent to AS 9120B and SJAC 9120A); DIN EN ISO 9001:2015;  
DIN EN 61340-5-1: ESD compliant storage & handling process
- ▶ Qualified Visual & Electrical Test Reports
- ▶ Hi-Rel: Screening & Procedure Service
- ▶ Long Lifetime Program up to 25 years
- ▶ Monitoring of Critical Components
- ▶ Traceability is guaranteed
- ▶ Supplier Risk Management
- ▶ ITAR free products available

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