




# SHAPING THE FUTURE WITH ELECTRONICS



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

# OUR SERVICES AT A GLANCE

## Hi-Rel Business

New Space, Aerospace, Avionics, Defense, Hybrid Capacitors, Time-To-Digital Converters, Rad Hard Space Products, Rad Hard and Rad Tolerant MOSFETs, Rad Hard DC/DC Converters, Mil & Space Chip Resistors, MRAMS MIL & Space Diodes, MIL-STD-1533 Data Bus Couplers

## E-Mobility

EV On-Board Chargers, AC/DC- & DC/DC- Battery Chargers, Bi-Directional DC/DC-Converters, 2-in-1 On-Board Chargers & DC/DC-Converters, EV On-Board DC/DC Converters, MEMS, Equalizers

## IoT Solutions

High-quality LCD Modules, TFT-, LCD-, OLED-Displays, Access Control Keypads, Piezo Switches, Non-touch Metal IR Switches, IoT Products & Sensors

## Power Management


Backup Ultracapacitors, AC/DC- & DC/DC-Converters, Ultra Low Power Energy Harvesting Products, POL-Converters, Power Controllers, LDOs, Smart Power Stage Products

## Obsolescence Solutions

Adapter Solutions, Anti-Counterfeiting Program, BGA Reballing, Long Lifetime Program, Requirement Engineering, Re-Tinning, Component Harvesting, Replacement of obsolete FPGAs











# HI-REL BUSINESS

| Manufacturers   | Products  | Applications  |
|---|---|---|
|  | <p>ESA Space Qualified ESCC 5000 and 5010 Hi-Rel components, Hi-Rel Radiation Hardened Power MOS Transistors from 60V up to 650V, N-CH, Based on the unique CoolMOS™ superjunction technology, Hi-Rel Silicon Bipolar RF Microwave Transistors, Hi-Rel Silicon, PIN- and Schottky-Diodes for RF Microwave Applications, Bare Dies (Chips), ECoLEO Rad Tolerant N-CH MOSFETS 60, 150V in a Plastic SMD &amp; THT Package<br/>No export license required!</p> | <p>Space Heritage, Satellite Programs, Microwave Applications, RF-Foundry Services, New Space, LEO Applications</p> |
|   | <p><b>Power Discrete:</b> MIL-PRF-19500, Rad hard MOSFETs, Space Schottky Diodes, Rad Hard GaN HEMTs, Space ultrafast Rectifiers<br/><b>Power ICs:</b> MIL-PRF-38535, Gate Drivers, PWM Controllers, POL Regulators, Linear &amp; LDO Regulators<br/><b>Multi-Chip Modules:</b> MIL-PRF-38534, Solid State Relays, Power Stages</p>   | <p>Deep Space Heritage, Aerospace, Defense, Aviation, Aircraft, New Space</p>                                       |

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# HI-REL BUSINESS

| Manufacturers   | Products  | Applications  |
|---|---|---|
|    | Rad-Hard Space qualified Optocouplers & Optoelectronic Components, High Gain-, High Speed-, High Voltage Optocouplers, VCSEL High Power Laser Diodes, Rad-Hard & Military Solid-State Relays, Voltage Regulators, <b>ITAR free products</b> , Manufacturing, Screening & Testing of Hi-Rel optoelectronic components  | Space Heritage, Defense, Aerospace, Avionics, New Space   |
|    | European Rad-Hard Fabless Semiconductor Supplier, 100KRad, 62,5MeV Products<br><b>Rad-Hard Motion-Series:</b> Chips for Resolver/LVDT, Thermocouple Pressure Sensors, Limit Switches, Relay Drivers and BiSS Communication.<br><b>Rad-Hard Power-Series:</b> DC/DC POL-Converter, Input 5 to 11V, Output 0.9 to 5V.<br><b>Rad-Hard Time-Series:</b> Time-to-Digital Converters, Phase Locked Loop (PLL) product.<br><b>Rad-Hard AI-Series:</b> Low Power Neural-Network Interface SOC for real time video/ image processing.<br>Customized Rad-Hard Chip Design, ESCC-Q-ST-60-02C compliant, ITAR free products   | Nuclear, Space, Medical, Autonomous Operation, Rovers/Landers, Drones Robotic, Satellite, Space Launchers |
|    | <b>Micross Space:</b><br>DC/DC-Converters including custom Hybrids, EMI Filters, 30-300KRad 80MeV Radiation Hard logic (AND, NAND, OR, XOR), Zener Diodes, Unipolar TVS, Bipolar TVS (Axial and SMD), 64Mb (4Mx16) Class S 100K Rad-Hard & Rad Rolerant, MIL-STD-1533 Data Bus Couplers 38534-Norm<br><b>Component Modification Services:</b><br>Robotic Hot Solder Dip - compliance with RoHS directive<br>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 | Aerospace, Defense, Aviation, Space, Marine, Industrial-Embedded Products, FPGA-Boards, Launch Vehicles   |
|  | FastCap® Ultracapacitors for energy storage applications of operating up to 150°C, high shock 500G peak & vibration 20G rms. Lithium free - no risk of explosions, 20+ year shelf life, Hermetic Ultra-Capacitor Technology D & AA size cells, 35 to 340F capacitance Voltage 1 to 2V, very low ESR 15 to 32 mohm, Low Temperature Ultracapacitors from -55 to +85°C, 35F, 40mohm   | Hi-Rel Avionics, Space Missions, High Temperature Products, Harsh Environments                            |
|  | Highest Energy and Power Density Capacitors with MTBF>5.000.000 hours, product range 22 to 1.000.000 $\mu$ 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   | Power Hold-up Avionics, Oil & Gas Exploration, New Space, Radar Lidar, Directed Energy                    |
|  | ESCC Qualified Rad-Hard POL Converters 2A, 24V & 8A, 40V, Voltage Clamp 10A, 40V, DC/DC Converter PWM Controllers, Quad LVDS Line Receivers with Extended Common Mode, Quad LVDS Line Drivers, 1:4 LVDS Fanout Buffers with Extended Common Mode, Screening & testing of SPACE IC products to the ESCC 9000 requirements, Rad-Tolerant POL Converters in a plastic package  | Space Missions, Satellite Business, Harsh Environments, New Space   |
|  | MIL-PRF-55342, MIL-PRF-914, MIL-PRF-32159 Thin & Thick Film Chip Resistors, Mission critical Precision Chip Resistors, Chip Resistor Networks, High Frequency Products, Silicon Chip Resistors, Chip Attenuators, Current Sense Resistors, High Power Chip Resistors, High Voltage Chip Resistors, Power Moisture Compliant Chip Resistors, Zero Ohm Chip Resistors (Jumpers)   | Space, Defense, Aviation Hybrid Modules, Medical, Biomedical, New Space                                   |
|  | Hi-Rel & High Temperature Hybrid Microcircuit Crystal Oscillators & Crystal Units, MIL-PRF-55310, MIL-PRF-38534, MIL-883B, TTL-LVDT-CMOS-HC/ACMOS-ECL, Lowest voltage is 1.8V, SMD-Packages 5x7mm, High Shock & Vibration Designs, High operating temperatures up to +230°C   | Space Heritage, Aircraft, Hi-Rel Defense, Aerospace, High Temperature Products, New Space *               |

# POWER MANAGEMENT

| Manufacturers   | Products  | Applications  |
|---|---|---|
|    | <p>Fabless semiconductors, Mixed Signal Integrated Circuits solutions, Advanced Timing, Power Management &amp; Delivery Systems, RF Signal Chain components, MEMS, IMUs &amp; Flow Sensors.</p> <p><b>Timing</b><br/>SyncE &amp; IEEE 1588, Jitter Attenuators, Clock Generators, Buffers, Oscillators</p> <p><b>Power Management &amp; Delivery Systems</b><br/>Power Controllers, DC/DC, LDO, Buck-Boost, SPS</p> <p><b>RF Signal Chain</b><br/>FEM, Power Amplifiers, Switches</p> <p><b>MEMS</b><br/>3-axis Accelerometers, Gyroscopes</p> <p><b>IOT &amp; Sensors</b><br/>Water Flow Sensors, Position Sensors</p>   | <p>Communication, Data Center, Internet of Things, Automotive</p>   |
|    | <p>Isolated Single, Dual &amp; Triple Output DC/DC-Converters up to 3000W, High Performance DC/DC-Bricks, high efficiency operation up to 97%, 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, AC/DC-Power Supplies 250W, 300W and 600W with 90-264VAC input, operating temperature range -40 to +105°C Baseplate, <b>up to 5-year warranty</b></p>   | <p>Industrial Applications, Transportation, Medical Industry, Avionics, Railway</p>   |
|   | <p>Low Power Single and Dual Output DC/DC Converters from 1 to 75W, Industry Standard Footprints SIP, DIP, SMT, 1x1 and 1x2 Thru Hole Patterns, Switch mode AC/DC Supplies, 15 to 150W chassis, encapsulated PCB mount from 2 to 60W, <b>2-year warranty</b></p>  | <p>Commercial, Industrial Applications, Medical Industry, Railway</p>   |
|  | <p><b>IoT Solutions:</b> Power Management ICs (PMICs) for energy harvesting applications, Harvesting from Photovoltaic Cells and Thermo-Electric Generators, Ultra-Low-Power-Start-up, Ultra-Low-Power Boost Regulators, The RF AEM30330, Vibration AEM30330 and solar AEM10330 PMICs both utilize a buck-boost architecture. This enables them to cover a greater range of input voltage levels from 100mV to 4.5V, low and High-Power sources can be addressed, AEM30330 is targeted at RF/vibration-oriented deployments including industrial equipment, home automation systems, healthcare monitoring, AEM10330 is for solar deployments to manage up to 7 connected photovoltaic cells together with EP112 Harvesting Antenna</p> | <p>IoT Applications, Energy Harvesting, Wireless Sensors, Industry 4.0, Home Automation, Smart Metering, Smart Agriculture, Wearables, E-Health, E-Mobility</p> |
|  | <p>Isolated and non-isolated DC/DC-Converters 1W to 1000W, efficiency up to 96%, over-voltage, over-current, short-circuit and over-temperature protection, input voltage range 2.5V – 650V 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 650VDC, 300 to 800W, AC/DC-Converters 85 to 305V input, 3.3 to 48V output voltage, 5 to 350W, VPX Power Supply 3U 500W and 6U 1000W, VITA 62</p>  | <p>Railway, Industrial Applications, Server Applications, Telecommunication</p>   |
|  | <p>Single and Dual Output DC/DC Converters from 0.1 to 50W, Industry Standard Footprints SIP, DIP, SMT, 1x1 and 1x2 Thru Hole Patterns, Switch mode AC/DC Supplies; encapsulated PCB mount from 1 to 30W, AC/DC power supplies 25 to 1200W Enclosed/Open frame type, <b>2-year warranty</b></p>   | <p>Commercial, Industrial Applications, Medical Industry, Railway</p>   |

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# E-MOBILITY

| Manufacturers   | Products   | Applications  |
|---|--|---|
|    | <p><b>MEMS:</b> 3-axis accelerometers, Small, Low Power Inertial Measurement Units with precise acceleration measurements for Wearables.</p> <p>6-axis IMU Consumer, Small, Low Power Inertial Measurement Units with precise acceleration and gyroscopic measurement.</p>   | (True Wireless Stereo), Automotive, Automated Driving, Networking, Digital Cockpit/VI   |
|    | <p><b>Powering the Future of Transportation</b></p> <p>DC/DC-Converters from 300 to 3000W for 12, 24, 28, 48, 400VDC Battery Voltages; 3000W BCA Series Bi-directional DC/DC-Converters, High efficiency up to 97%; Ruggedized Enclosed 3000W BCE Series Bi-directional DC/DC-Converters; 1500 &amp; 3000W Bi-directional Non-Isolated DC/DC-Converters 12V/48V Battery with an efficiency up to 97% and CAN 2.0b interface including remote ON/OFF; HVC Series 400S12.3K0HVC-L-CM is a 3kW auxiliary power module that accepts input voltage from 230VDC to 420VDC and provides a single isolated 12VDC output for powering auxiliary equipment. It is liquid cooled, rugged and is packaged in a fully IP rated, vibration resistant, thermally optimized enclosure;</p> <p>1000 Watt Full-Bricks with wide input range at 9 to 36VDC, efficiency up to 95%; AC/DC On-board Charger Module with 6.6kW; These Module provide a 240 to 450 VDC output and 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;</p> <p>300W AC/DC Li-ion Battery Chargers for E-mobility and Battery Applications;</p> <p>7kW Liquid Cooled AC/DC Bi-directional Converters that convert AC voltage to an adjustable nominal 800VDC or 400VDC to charge E-Mobility Li-ion batteries; Protection degree IP6K9K rated</p> <p><b>Battery Management Systems</b></p> <p>Standard brick size DC/DC-Converters 50 to 1000W,</p> <p>Single modules with 9 to 160VDC input &amp; 5 to 57VDC output voltage,</p> <p>Option: Chassis mount and DIN-rail version, High Efficiency &gt;95% good shock and vibration dampening, temperature range -40 to +105°C,</p> <p><b>up to 5-year warranty</b></p> | <p>Battery Management Systems,</p> <p>Mild Hybrid Vehicles,</p> <p>Autonomous Vehicles,</p> <p>Recreation Vehicles,</p> <p>Electric industrial Vehicles,</p> <p>Agriculture Vehicles,</p> <p>Last mile transit,</p> <p>Automatic Guided Vehicles,</p> <p>Fork Lifts</p> |
|  | <p>Electric Vehicle On-Board Chargers and DC/DC-Converters</p> <p>2-in-1 On Board-Chargers 6,6kW &amp; DC/DC-Converters 2,5kW, Liquid-cooling,</p> <p>2-in-1 On Board-Chargers 13kW &amp; DC/DC-Converters 6,0kW, Liquid-cooling,</p> <p>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>10kW On-Board-Chargers with 265 to 480VAC input voltage &amp; 32A output current &amp; 200 to 480VDC output voltage, capable of parallel operation, Liquid-cooling,</p> <p>0,8 to 6kW DC/DC-Converters: 400 to 850VDC input &amp; 14 to 48VDC output voltage,</p> <p>3 to 6kW DC/DC-Converters: 250 to 430VDC input &amp; 14 to 28VDC output voltage,</p> <p>1,5 to 4,2kW DC/DC-Converters: 65 to 120VDC input &amp; 14 to 55VDC output voltage,</p> <p>600W DC/DC Converters: 9 to 30VDC input &amp; 255 to 450VDC output voltage,</p> <p>HV-to-HV DC/DC Converters: 250 to 850VDC input &amp; 250 to 850VDC output voltage,</p> <p>Liquid or conduction cooling, Programmable CV/CC Output,</p> <p>IP67 Enclosure, CAN Communication, compliance with SAE J1772/IEC 61851,</p> <p>Automotive quality standard, Lifecycle traceability</p>  | <p>Automotive,</p> <p>Electric Vehicles,</p> <p>Hybrid Vehicles,</p> <p>Marine &amp; Yacht Applications</p>   |

# OBSOLESCENCE SOLUTIONS

| Manufacturers   | Products  | Applications  |
|---|---|---|
|  | <p>Counterfeit Mitigation Services: IC Counterfeit Detection Testing</p> <p>Component Modification: Robotic Hot Solder Dip – Compliance with RoHS directive</p> <p>lead-free Solder Alloy, grid failure &lt;1%, Nadcap Certificated</p> <p>Elimination of Tin-Whiskers through tin-lead-alloy</p> <p>Component Obsolescence Challenges, Non-availability of tin-lead components</p> <p>Life-time buy opportunity (Long Term Packaging)</p> <p>BGA Reballing for the Conversion of tin-lead, Component Harvesting</p> <p>Lead Reconditioning, Lead Attach Coplanarity and Compression Bond</p> <p>Forming and Cutting of Pins</p> <p>Gold Mitigation, column grid array (CGA) interconnect technology</p> <p>Packaging &amp; Assembly, Electrical &amp; Environment Testing</p>  | <p>Aerospace &amp; Defense, Space,</p> <p>Industrial Applications, Implantable Medical Industry,</p> <p>Transportation</p>              |
|  | <p>Design &amp; manufacture for the electronic system lifecycle</p> <p>Custom solutions for mitigating Device Obsolescence and Board Re-Design</p> <p>Adapter Products, Interconnect Pitch Adapters, Programming Adapters,</p> <p><b>Allocation &amp; Obsolescence</b></p> <p>ASIC / FPGA Adapters to include code reconstruction and re-targeting; Package/ 1:1 Footprint Conversion, Device Re-targeting, Connectors; Reverse Engineering of Small Plastic &amp; Metal Parts; Atmel AVR Adapters for Micro Controllers</p> <p><b>Test &amp; Development</b></p> <p>Production &amp; Test Sockets, Prototyping Adapters/Interposers, Emulation &amp; Test Interface, Programming Adapters, Voltage Regulation, Test Clips &amp; Modules, Custom Development</p> <p><b>Interconnect</b></p> <p>Screw Machine/ Turn Pin Sockets, Dual Row Component Header, PCB Connectors, Single Row High Profile IC Sockets, Stamped Pin IC Sockets , Wire Wrap</p> <p><b>Jermyn Semiconductor Hardware</b></p> <p>Mounting Pads, Transistor &amp; Circular IC Sockets, Opto/Diode Display Sockets, Insulators, Panel Washers, Bushes and Covers, Component Carriers, Heatsinks,</p> <p><b>Precision Engineering</b></p> <p>Reverse Engineering Solutions; Injection Moulding , CNC Machining, Toolmaking</p> | <p>Adapter Solutions, Aviation, Defense, Space, Automotive, Medical Industry, Industrial Applications, Railway, Package Conversions</p> |

# IOT SOLUTIONS

| Manufacturers   | Products  | Applications  |
|---|---|---|
|  | <p><b>IoT and Sensors:</b> Au2001 is an inductive sensing IC targeted for water metering applications. The IC supports SPI for simple interface with micro controllers. The IC works on a wide range of supply from 2.8V - 3.6V. The IC supports two models - low sensitivity mode for lesser sensing distance and high sensitivity mode and less than 5uA in high sensitivity mode, when triggered once in 70ms. The IC is available in 3mm x 3mm 16 pin QFN package.</p>  | <p>Water Flow Sensors, Position Sensors</p>   |
|  | <p>Touch Metal Piezo Switches &amp; Keypads, Non-Touch Infrared Metal Switches</p> <p>Piezo Electric Pushbutton Switches: Ring-, Point- and Non-illuminated from 16mm to 28mm diameters. Piezo Electric Keypads, Access Control Stand Alone, Access Control Keypads with communication protocol, Access Control Keypad Readers, Industrial Solutions and Custom Designs, all products are in Aluminum or Stainless Steel with an operation temperature from -40 to +125°C and IP68/69K protection</p> <p>Tested for 50,000,000 cycles including vibration and impact tests, Non-Touch Infrared Metal Switches with detection range 5 to 80cm</p> <p>Piezo Technology Pushbuttons work reliably under a glass thickness of 3mm</p> | <p>Access Control Panels, Fuel dispensing e-Car Charging, Underwater, Submarines, Oil and Gas, Parking Systems, Rail Traffic &amp; Public Transport, Emergency Switches</p> |
|  | <p>Character Displays of 8x1, 10x4, 16x1, 16x4, 20x2, 20x4, 24x2, 40x2, 40x4, 68x4</p> <p>Graphic LCDs (TN/ STN/ FSTN/ DFSTN) Displays with or w/o backlight, COG Displays, TFT-, LCD-Modules, HMI Modules, UART TFT Displays, Touch Panels, OLED Character &amp; Graphic Displays, OLED Modules, OLED Switches</p>   | <p>Industrial Measuring Instruments, Control Devices</p>  |

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# OUR SERVICES

## KAMAKA - ESTABLISHED IN 1992 AUTHORIZED DISTRIBUTOR & SOLUTION PROVIDER

- ▶ Strategic Obsolescence Management
- ▶ Anti-Counterfeiting Program
- ▶ Life Cycle Management
- ▶ Long Lifetime Program up to 25 years
- ▶ Last Time Buy, EOL-, PCN-Service
- ▶ Requirement Engineering
- ▶ Custom Multi Chip Modules
- ▶ Supplier Risk Management
- ▶ Worldwide Access to Allocation & Obsolete Products
- ▶ Hi-Rel: Screening & Procedure Service
- ▶ Qualified Visual & Electrical Test Reports
- ▶ Monitoring of Critical Components
- ▶ Quality Inspection
- ▶ Qualified Visual & Electrical Test Reports
- ▶ Traceability is guaranteed
- ▶ AQL Spot Checks according to DIN/ISO 2859-1
- ▶ 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
- ▶ ITAR Free Products available

## MEMBERSHIPS



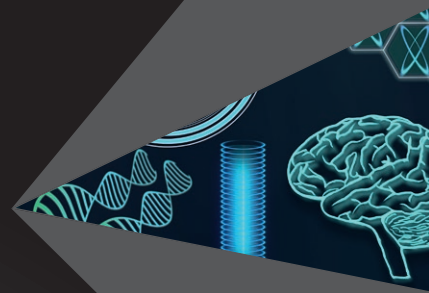
<http://www.cog-d.de>



# ABOUT US

SINCE 1992, KAMAKA ELECTRONIC BAUELEMENTE VERTRIEBS GMBH HAS GLOBALLY ACTED AS ESTABLISHED AUTHORIZED DISTRIBUTOR AND SOLUTION PROVIDER FOR WELL-KNOWN MANUFACTURERS.

CUSTOMER SATISFACTION IS OUR PRIORITY. WE DO NOT ONLY PROVIDE YOU WITH COMPETENT AND QUALIFIED CONSULTATION BUT ALSO WITH A RELIABLE APPLICATION SUPPORT TO ALL OUR PRODUCTS.



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