

LINECARD SPACE



SPACE

COMPONENTS AND SOLUTIONS



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SPACE EVERYWHERE YOU ARE

POWER GENERATION & CONDITIONING SYSTEMS

- » Solar Array Systems
- » Battery Charge & Discharge Management
- » Primary DC Bus Regulation

ELECTRIC PROPULSION SYSTEMS

- » Power Processing Units (PPU)

POWER CONDITIONING, DISTRIBUTION & CONVERSION SYSTEMS

- » Secondary DC Bus Regulation to System Bus
- » Secondary DC Bus Regulation to Payloads

ATTITUDE DETERMINATION & ORBIT CONTROL SYSTEMS

- » Sensors (Star Trackers, Sun-Sensors, GPS, Gyros, ...)
- » Actuators (Reaction Control System, Reaction Wheels, ...)

SATELLITE PAYLOADS

- » TWTAs (EPC High Voltage)
- » SSPAs (EPC Low Voltage)
- » LCTs (Laser Communication Terminals)
- » Scientific Instruments

SATELLITE SYSTEM BUS

- » Communication
- » Command & Data-Handling (OBC, SSMM, DPU)
- » Telemetry
- » Motion Control Systems

Heritage Examples



TESAT LCT 135

LCT135 has the best heritage of space-based laser communication. 9 terminals are in orbit yet and performing flawlessly for by now up to 12 years, executing more than 1,000 laser links per month. LCT135 achieved in 2019 with the launch of EDRS-C another great milestone.



TESAT Gigabit Modulator

The Gigabit Modulator is ideally suited for advanced data downlink subsystems in X-Band and Ka-Band employed onboard Earth Observation Satellites and Scientific Missions.



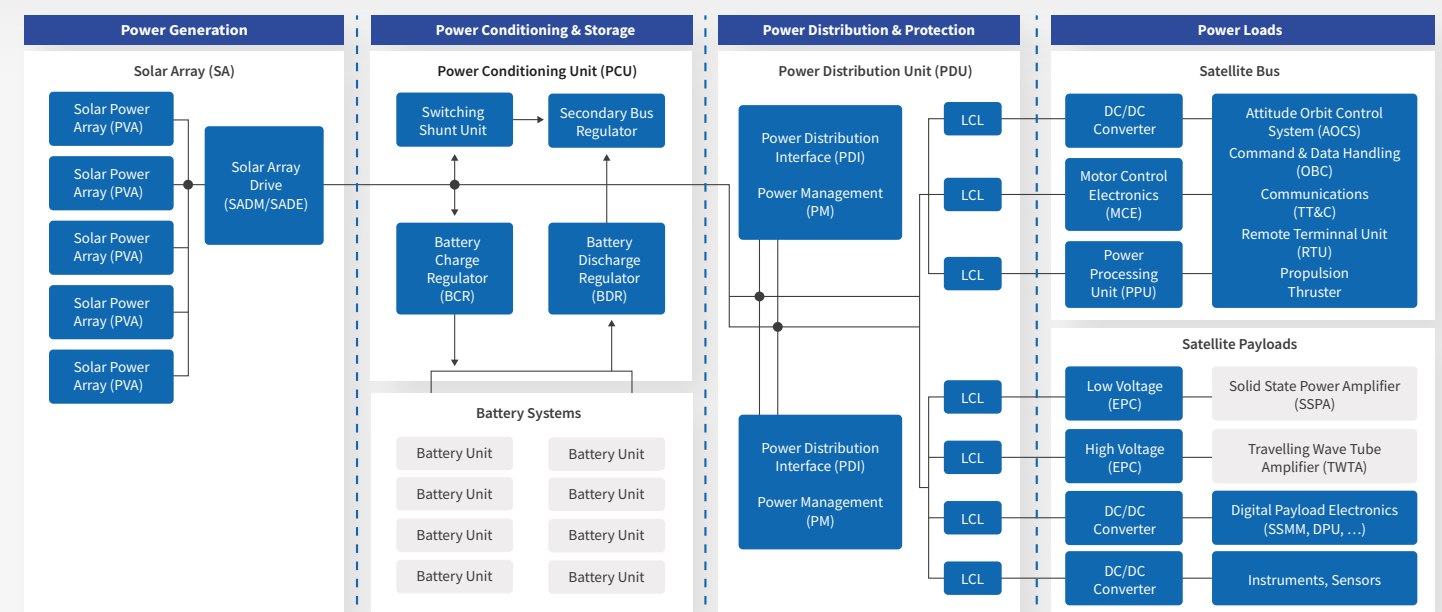
TESAT Microwave Power Module

The Microwave Power Module (MPM) is our standard amplifier. This "all-in-one" comprising of the TWT, the EPC and the Linearized Channel Amplifier (LCAMP) provides significant mass and footprint savings whilst additional cost and mass savings can be found within the use of Dual-MPM versions.

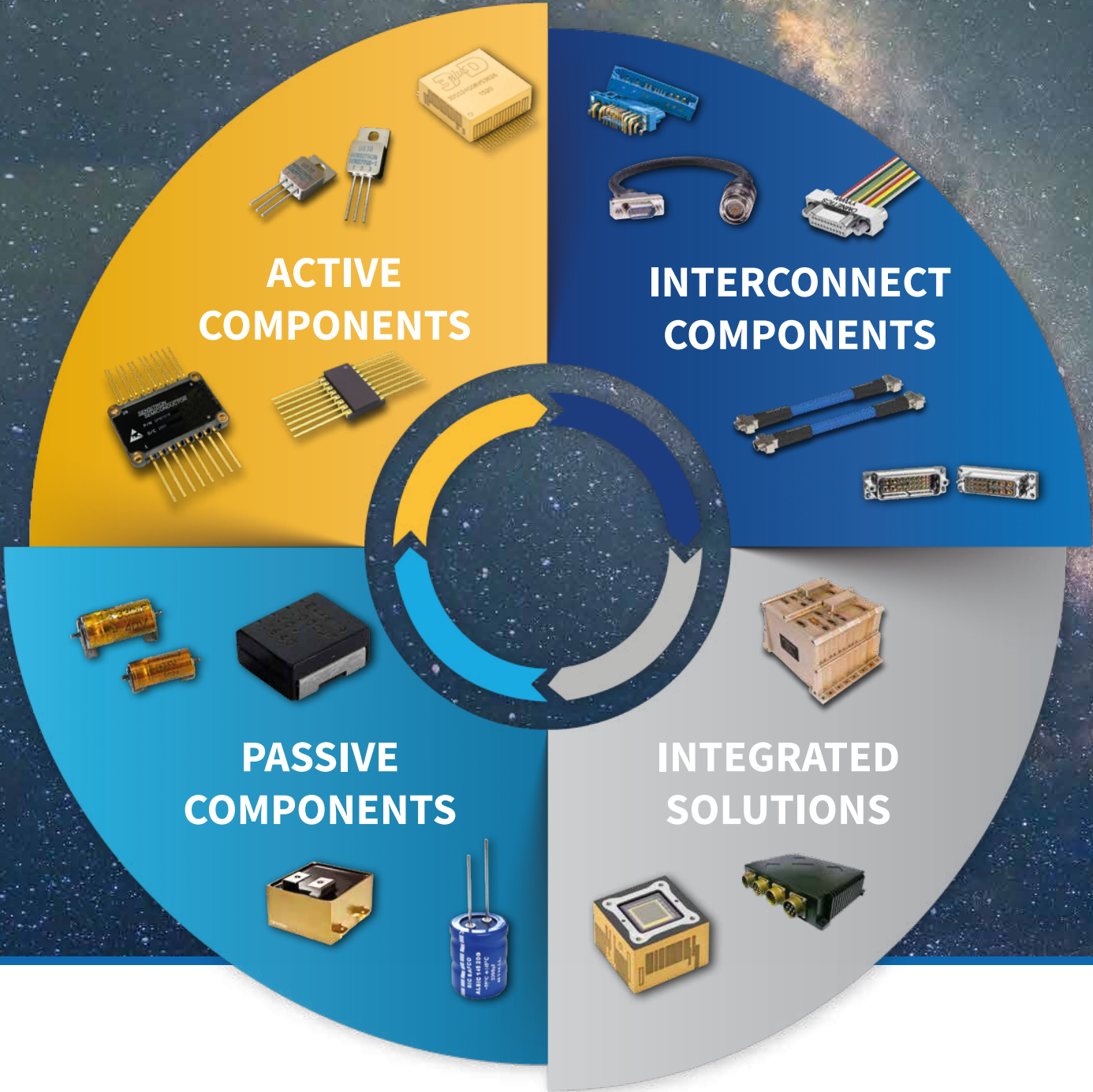


TESAT HDI TR Module

The TR modules are optimized for broadband efficiency between in- and output (power added efficiency) and consist of an Active RF magazine and a Housing & RF transition. This concept results in a maximized reduction in space, weight and time & cost optimization.



OUR PRODUCTS SUPPORT YOUR DESIGNS



OUR SUPPLIER

3D PLUS is a world leading supplier of advanced high density 3D microelectronic products and die/wafer stacking technology. Our products meet the demand for...

More on the following pages
www.3d-plus.com

Productfields ☒ ☐ ☐ ☐

For nearly 70 years, API Delevan has provided the highest quality electronic components for human and robotic mission critical applications to the world's...

More on the following pages
www.delevan.com

Productfields ☐ ☒ ☐ ☐

Exxelia is a leading designer and manufacturer of high reliability passive components and precision subsystems focusing on highly demanding markets...

More on the following pages
www.exxelia.com

Productfields ☐ ☒ ☒ ☐

Isabellenhütte Heusler GmbH & Co. KG - Whenever highest reliability, precision and longevity are required, there is no way around the low-ohmic precision and power...

More on the following pages
www.isabellenhuetten.de

Productfields ☐ ☒ ☐ ☐

Omnetics Connector Corporation is a leading global provider of precision and high-reliability electronic connectors and interconnect systems. For more than...

More on the following pages
www.omnetics.com

Productfields ☐ ☐ ☒ ☐

PAVE Technology Co. is a supplier for reliable Hermetic Connectors, Electrical Feedthrough and High Pressure Electrical Feedthrough Seals.

www.pavetechnologyco.com

Productfields ☐ ☐ ☒ ☐

Positronic builds premium power and signal connectors for a variety of industries. But every product delivers a single outcome: Certainty. Driven by the mission-critical needs...

More on the following pages
www.connectpositronic.com

Productfields ☐ ☐ ☒ ☐

Sensitron has over 50 years of heritage as a leading manufacturer of high reliability power electronic component solutions for the Defense, Aerospace, Space, and...

More on the following pages
www.sensitron.com

Productfields ☒ ☐ ☐ ☐

☒ ACTIVE COMPONENTS

☒ PASSIVE COMPONENTS

☐ INTERCONNECT COMPONENTS

☐ INTEGRATED SOLUTIONS

MOTION MANAGEMENT

Generation, Motion & Actuation

Power Generation

Motion Control(er)

Engine Control

POWER MANAGEMENT

Data Acquisition, Processing & Handling

Power Conversion

Power Generation

Power Distribution

DATA MANAGEMENT

Data Acquisition, Processing & Handling

On Board Computer

Mass Memory (SSMM)

Sensors

ENERGY MANAGEMENT

Battery Management, Energy Distribution

Energy Charging

Energy Discharging

Energy Distribution

3D PLUS is a world leading supplier of advanced high density 3D microelectronic products and die/wafer stacking technology. Our products meet the demand for high reliability, high performance and very small size of today's and tomorrow's electronics.

3D PLUS has been recognized for its innovation in design and manufacturing of miniaturized 3D modules for more than 20 years. Our technology enables stacking heterogeneous active, passive and opto-electronic devices in a single highly miniaturized package.

3D PLUS offers high reliability and high performance innovative products thanks to a strong design activity of complex electronic modules and a high level of technical capability in various areas such as digital, analog and IP Cores. These abilities, combined with a strong Space Radiation expertise, enable us to bring key advantages for all kinds of space missions with a very high level of guarantee.

3D PLUS standard products and custom solutions bring breakthrough advantages to our customers' electronic designs. They are used in diverse computer boards, data recorders boards and custom applications for buses and payloads. Our flight heritage is expanding continuously with products launched in Space every month in GEO, MEO and LEO orbits, for deep space exploration missions, for satellite constellation fleets, and for governmental missions.

More than 175 000 modules are flying in space since 25 years without a single failure.

CONTACT



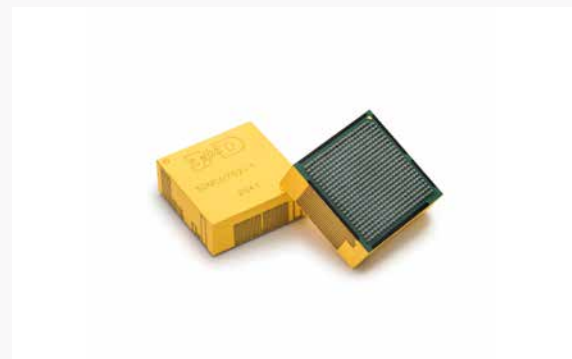
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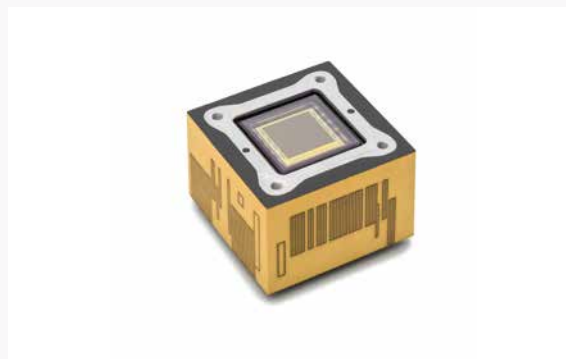
MICRO-SYSTEMS



FUSIO RT Computer Cores

The FUSIO RT family provides a reprogrammable space grade SRAM based FPGA and high reliability embedded memories: a 128 Mbit TMR RHBD configuration memory plus optional computing and mass data storage memories.

These functions are provided in one single miniaturized package, allowing simple design, cost reductions and miniaturisation at board and equipment levels.

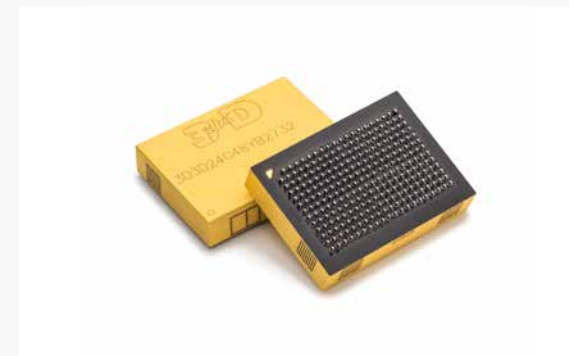


CMOS Camera Heads

3D PLUS Camera Heads Family offers high density, high performance and high resolution CMOS camera solutions for space applications.

These solutions bring together a high resolution CMOS image sensor with an FPGA-based electronic architecture for control of the sensor, image preprocessing, and interfacing of the camera with a space equipment.

MEMORIES



3D PLUS Space qualified product portfolio includes a wide range of memory components:

Volatile Memories:

SRAM, SDRAM, DDR1/DDR2/DDR3/DDR4 , with wide buses up to 72 bits.

Non-volatile Memories:

PROM, MRAM, FLASH NAND and FLASH NOR, available in TMR for SEU immunity.

POINT-OF-LOAD CONVERTERS



3D PLUS PoL Converter modules provide high performances, high reliability, compact size and low weight for space applications.

They are an excellent solution for low voltage power distribution systems designed around high-speed digital electronics.

All input and output filters come integrated within the module. Its output voltage can be adjusted by use of an external resistor.

PERIPHERALS AND PROTECTION ICS



This family includes different termination regulators for 3D PLUS DDR2/3/4 modules. They allow to regulate VTT voltage as required by the JEDEC standards.

3D-PLUS also offers protection ICs such as Latch-up Current Limiter and Switch, to ensure the success of the mission by protecting critical devices from overcurrent and overheating.

IP CORES

Together with its DDR2/3/4 modules and termination regulators, 3D PLUS offers memory controllers validated with different FPGAs (Microchip, Xilinx and NanoXplore), and embedding radiation mitigation. This allows protection against SEUs and SEFIs for the memory devices.

INTERFACES



Our product portfolio includes highly miniaturized radiation tolerant LVDS line drivers, receivers, transceivers and repeater embedding up to 8-channels per module.

Radiation hardened 32-bit wide buffer, level shifters, serializer & deserializer bring max. area & weight savings for Space applications.

Exxelia is a leading designer and manufacturer of high reliability passive components and precision subsystems focusing on highly demanding markets, applications and functions.

Their product portfolio includes wide ranges of capacitors, inductors, transformers, resistors, filters, position sensors, slip rings and high-precision mechanical parts serving numerous leading industrial areas such as aerospace, defense, medical.

Products are commonly used for power electronics, power generation, energy storage, and signal filtering functions .

Exxelia is valued for its ability to meet complex specifications and develop standard and custom products complying with the most demanding qualifications (MIL, ESA).

Thanks to an extensive design capabilities and a robust development process, Exxelia is recognized for its ability to quickly evaluate application specific engineering challenges and provide cost-effective and efficient solutions. For requirements that cannot be met by our catalog products, we offer custom configurations: upgraded performances, custom geometries, robust packaging.

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PASSIVE COMPONENTS

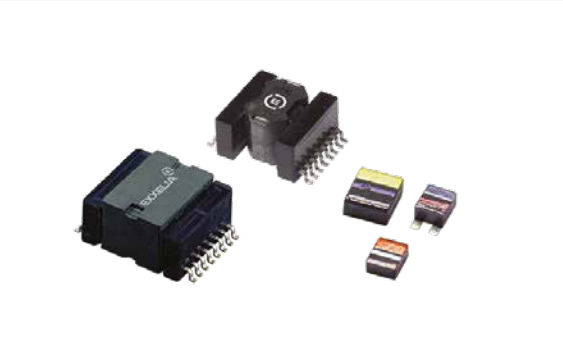


Ceramic capacitors

With one of the most extensive range of ESA QPL products, Exxelia ceramic capacitors allow miniaturization (size 0402 available as QPL) while absorbing thermo-mechanical stresses thanks to the polymer termination.

Exxelia ceramic capacitors serve both longterm traditional space missions, and large new constellations.

New Class I plus materials offer highest C/V with stability over temperature and applied voltage.



Magnetics

Exxelia designs and manufactures magnetic components including wound magnetics, inductors and transformers for high voltage, high temperature and power applications. Their new multiple output CCM Technology (ESA Qualified) allows up to 30% more power density vs traditional technologies.

If you're looking for RF inductor, the MSCI series has an excellent Q factor and is qualified under the ESCC 3201/008..

Transformers or other custom magnetics can be design, manufactured and screen to meet requirements of Class 1, Class 2 and Class 3 space projects

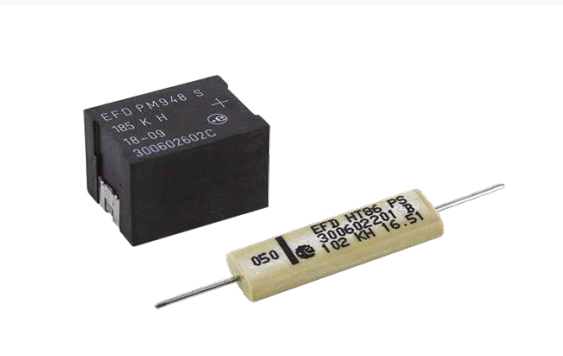
PASSIVE COMPONENTS



Tantalum capacitors

Tantalum capacitors offer the highest charge per unit of volume combined with extremely high reliability and durability. Exxelia manufactures an extensive range of solid (MnO2 and polymer technologies) and wet tantalum capacitors for space applications (exploration, satellites, constellations, launchers), through ESA, MIL and DSCC-qualified series.

Specific interfaces, package size and characteristics are available upon request.



Film capacitors

Exxelia Film capacitors are available in through-hole and SMD design, with a wide range in the ESA Qualified Parts List :

Metallized polyester for enabling miniaturization while providing excellent self-healing properties, Polyphenylene Sulfide for precision capacitors with tight capacitance tolerances down to $\pm 1\%$, or reconstituted mica for high voltage purposes.

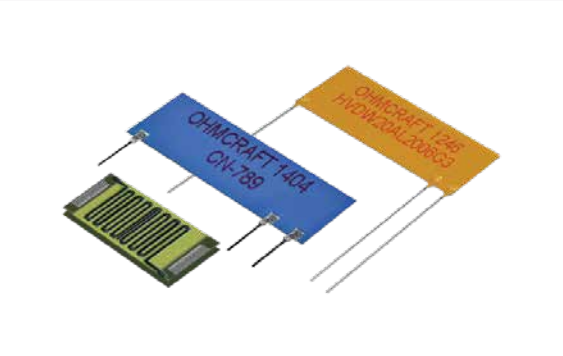


EMI filters & tuning elements

Exxelia provides perfectly sealed EMI-filters with diameters ranging from 3 to 10mm, available in C, L, Pi and T Configurations.

Their metallic package guarantees a better shielding for an efficient EMI protection.

Frequency Tuning Elements with self locking mechanism are high precision crews for cavity filter tuning. INVAR versions are available typically for space applications (low Coefficient of Thermal Expansion).



Resistors (Ohmcraft)

Space applications require a durable technology that will be able to withstand the ruggedness of the environment without affecting its performance.

Exxelia Ohmcraft resistors have proven stability, accuracy, and reliability to support the long-term program life of many space products and programs.

These serpentine patterned resistors produce superior electrical characteristics, including high voltage to 100kV, Resistance values to 4 T Ω , Tolerance to 0.1%, and make the development of custom resistors much quicker than traditional thick film resistors technologies.

Omnetics Connector Corporation is a leading global provider of precision and high-reliability electronic connectors and interconnect systems. For more than 30 years, we have engineered an extensive portfolio of innovative products, with a special focus on micro-miniature and nano-miniature interconnects. With over 300 direct employees, all products are built in the Minnesota factory in compliance with ISO 9001 offering QPL products to MIL-DTL-83513 and MIL-DTL-32139.

Our connectors are among the smallest on the market and deliver exceptional performance in challenging work environments. As interconnect technologies continue to evolve, we design next-generation products that help bring transformative ideas to life.

Our connectors are highly sought after by designers working in the military, aviation, aerospace, medical and other leading-edge industries. We are also leaders in high-mobility interconnects for applications in robotics, surveillance systems and orbital satellite technology.

Omnetics understands the rigorous operating conditions mission-critical applications endure and our solutions include EMI shielding, IP sealing, polarization, rugged materials, and other elements that ensure connectivity under pressure.

Omnetics maintain a large inventory of COTs products.

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INTERCONNECT COMPONENTS



Space Nano-D Connectors

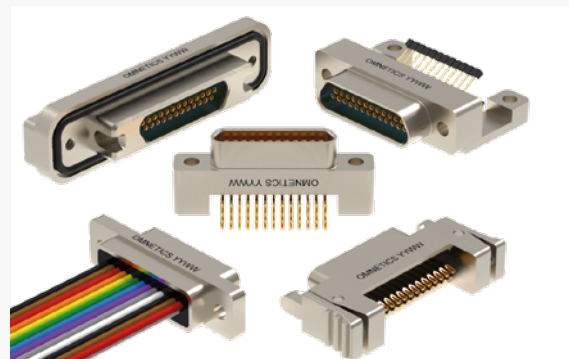
Omnetics has released its own set of standard space grade Bi-Lobes®.

These MIL-DTL-32139 Nano-D connectors have huge space heritage and are inspected per EEE-INST-002.

Bi-Lobes® meet digital high-speed requirements.

Parts are available as pre-wired/cable, SMT, Flex, THT & Panel mount versions.

All Types are available as fast latching options – ideal for space volume production.



Space Micro-D Connectors

Omnetics Micro-D subminiature connectors are QPL qualified, designed and manufactured to meet and exceed MIL-DTL-83513.

These Micro-D connectors are approved for space programs and inspected per EEE-INST-002.

Parts are available as standard & low profile pre-wired/cable, SMT, Flex, THT, Solder Cup & Panel mount and offered as high-speed connector type products.

All Types are available as fast latching options – ideal for space volume production.

INTERCONNECT COMPONENTS



Nano-D Hybrid Connectors

Nano-D Hybrid connectors containing both power (3A) & signal (1A) contacts,

Omnetics offer a range of combo connector options with the ability to handle higher power needs while maintaining a rugged lightweight Nano-D Type size.

Available in various pin size and pin counts, these connectors give designers the ability to determine the amount of signal and power contacts that best serves their application.



Micro-D Hybrid Connectors

Micro-D Hybrid connectors are available with mixed power/signal layouts.

These hybrid combinations eliminates the need to have a D-SUB or other higher power Connectors.

The power contacts can handle up to 10A.

The Hybrid configurations are available in various pin size and pin counts allowing users to combine power & signals in the smallest & lightweight “one connector”.



Space Cable Harnesses

Omnetics wire/cable harnesses with crimped contacts eliminate weak/brittle Solder Cup Connections.

Harnesses with 100% testing of continuity & dielectric withstanding voltage, shielding, overmolding & other customization options meet space project highest signal integrity, lightweight & costs requirements.

„Omnetics the one-shop-supply solution“



„Complete Manufacturing Solutions“

Omnetics wire/cable space harnesses are “Complete Manufacturing Solutions” specialized small wire gauge interconnects.

In addition to building cable harnesses exclusive with Omnetics connectors, Omnetics frequently terminates one end of a cable harness using a standard connector from Lemo, Glenair, USB, Molex, JST, and/or most other major connector brands.

„Omnetics the one-shop-supply solution“

Positronic builds premium power and signal connectors for a variety of industries. But every product delivers a single outcome: Certainty.

Driven by the mission-critical needs of our customers, we've gone to school on the subject for over 50 years. We approach it with scientific discipline—honing the fusion of raw material, engineering ingenuity, and precision manufacturing to push the next limits of reliability.

And with every new project, our curiosity is reignited. How will Certainty be achieved in your system, with its own unique demands? The answers have graced the most formidable missions of our time, from the fires of super-sonic flight to the merciless landscapes of Mars.

What can you be certain about?

- Rock-solid reliability
- Maximum design flexibility
- High efficiency, low heat performance
- Responsive, knowledgeable support

POSITRONIC: The Science of Certainty

CONTACT



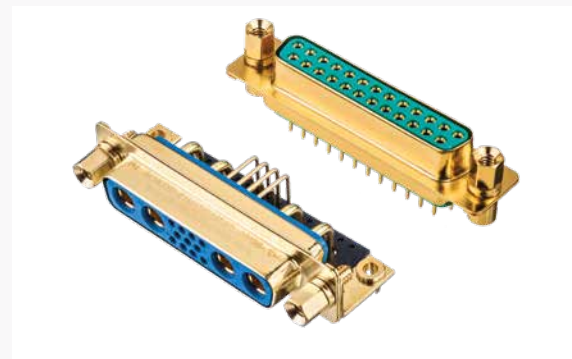
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INTERCONNECT COMPONENTS



D-Subminiature Spaceflight Series

If you're seeking top-of-the-line aerospace connectors, Positronic has you covered. We are a respected supplier of high-performance connectors that meet the stringent qualifications required for space flight, including the Goddard Space Flight Center S-311 and MIL-DTL-24308 Class M specifications. Our D-Subminiature spaceflight series connectors work well in aviation and space flight applications.

ESA QPL 3401 expected in 2022-Q1 for „pressfit & crimped“ contact versions



D-Subminiature Series

Positronic D-Sub connectors are widely used in space, industrial, military, medical, and communications applications. With the broad range of accessories, customization, military qualifications, and industrial standards, Positronic D-sub connectors have been meeting the technical requirement of customers for decades.

INTERCONNECT COMPONENTS



Optik-D Series Connectors

The Optik-D™ fibre-optic connector solution is for designers who need to terminate optical cable in harsh or challenging environments. It is an ARINC 801 conforming fibre-optic connector designed to be used with the Positronic Combo D-Subminiature family.

Optik-D are more cost effective than D38999 or ARINC 600-based systems and are compatible with ARINC 801 products from other manufacturers.



Hermetic Series Connectors

Positronic Hermetic Series are designed for space and industrial vacuum applications. All of our hermetic connectors have been 100% leak tested at 5.10-9 mbar/l.s after fabrication, and conform to the ESA, MIL-DTL-24308 & Goddard connectors.

MODULAR



SP MAX Series Connectors

SP Max is a unique modular connector design, allowing you to choose a fixed shell size and then select the power and signal modules that best fit your application requirements. The final product is produced based on your design and delivered with solid machined contacts, ready to perform. It's designed, for rugged outdoor environments, including, space flight, aircraft, rail, defense, automotive and other similar applications.

ESA QPL 3401 expected in 2022-Q1 for „pressfit & crimped“ contact versions

MODULAR



Scorpion Modular Series Connectors

Design your own connector with our Scorpion series! The Scorpion modular connector can be configured as a power connector, a signal connector, or both, and it offers nearly limitless combinations. Perfect to achieve that ideal blend of size, weight, and power (SWaP). Add options for blind mating, float mount, panel mount, and cable connector options, as well as integral locking systems.

Sensitron has over 50 years of heritage as a leading manufacturer of high reliability power electronic component solutions for the Defense, Aerospace, Space, and Medical markets.

Over 15 years of experience supplying to the space market, providing hi rel components and lightweight, hi density hi rel solutions.

Our products provide rugged, light-weight, and cost effective solutions for switching power supplies, AC-DC rectification, primary & secondary power distribution, motion control, transient voltage spike protection, and custom applications.

Sensitron can design optimal power solution for your application.

Sensitron has a complete staff of engineers whose specialties include electrical and mechanical design, material science expertise, packaging, and testing. From engineering design to finished product, we can provide your application with innovative product to meet your power system requirements.

More about Sensitron

Sensitron is a privately held small business company, founded in 1969 with corporate headquarters located in Hauppauge, New York with worldwide sales and distribution support. The Facility includes a Wafer Fabrication Clean Room and a Microelectronics Manufacturing Clean Room. Sensitron is certified to MIL-PRF-38534, Class K, for Hybrid Microelectronics, MIL-PRF-19500 for JANTX, JANTXV and JANS discrete diodes, and registered to AS9100.

CONTACT



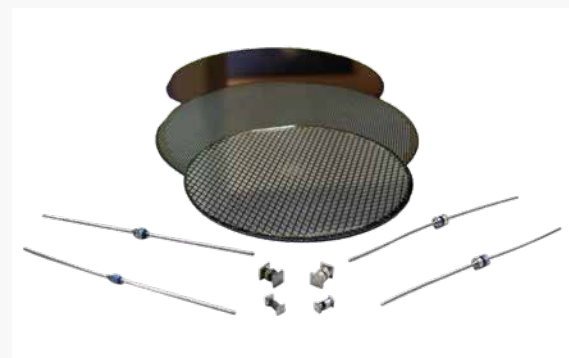
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ACTIVE COMPONENTS



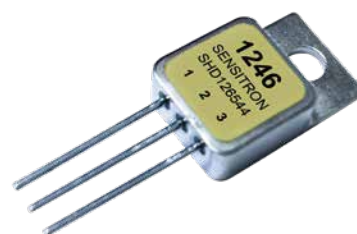
JANS QPL Diodes and JANKC Die

Sensitron is a MIL-PRF-19500 JANS qualified supplier with over 50 years of diode manufacturing heritage.

Our portfolio of glass hermetic sealed SMT & axial lead diodes incl. rectifiers, zener diodes, transient voltage suppressors and small signal switching diodes.

For customers who wish to use hybrid manufacturing technology for size and weight savings we now offer a broad portfolio of JANKC standard products.

NEW: 250V SCHOTTKY DIODES



Space Schottky Diodes

Sensitron offers a broad portfolio of power Schottky diodes in industry standard hermetic packages such as the TO-257, TO-254, SMD-0.5 and many others.

Full JANS equivalent screening and QCI is available on all parts. Our latest offering is a 250 volt dual Schottky diode in a TO-257 package which increases the voltage range above what has been available to date.

ACTIVE COMPONENTS



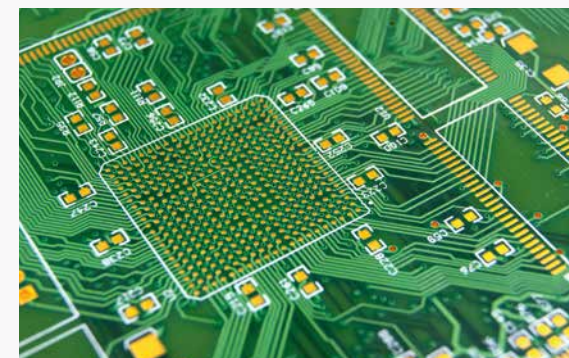
Space SMD Power Diodes

Sensitron's SHD-1, SHD-2 and SHD-3 hermetic power surface mount packages deliver state of the art electrical and thermal performance in a compact low profile package.

A broad portfolio of Schottky and ultrafast rectifiers is available with full JANS equivalent screening and QCI.

Also SMD0.2, SMD0.5, SMD1 & SMD2 Packages with a special SMD packaging concept to address the risk to cracking are offered by Sensitron.

MICRO SYSTEMS

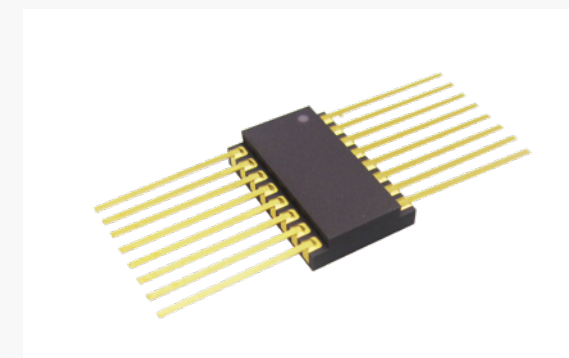


Chip on Board Modules

Sensitron's Chip on Board technology offers unparalleled space and weight savings over SMT PCB based designs using metal and ceramic packages.

Using all space grade materials, the Chip on Board modules utilize a combination of SMT components and bare die with moisture protective coatings on space grade PCBs.

MIL-PRF-38534 equivalent flows are used for components and modules.



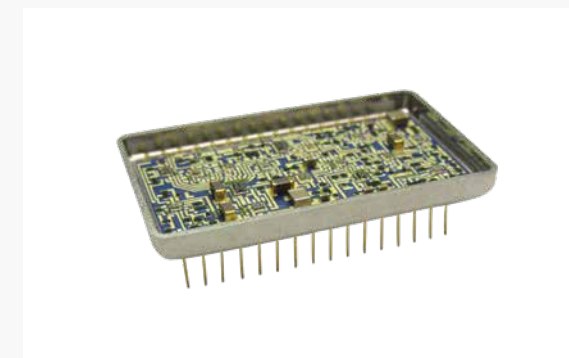
Space Diode Arrays

Sensitron offers a portfolio of space saving diode arrays for space applications.

The arrays of up to 16 diodes allow the user to assemble one device versus assembling up to 16 SMD or axial lead diodes for ease in manufacturing.

Full JANS or Class K equivalent screening and QCI inspections are available.

Custom options are available as well.



Class K Custom Hybrids

Sensitron is a MIL-PRF-38534 Class K supplier of hybrid microelectronics.

Sensitron has a wide variety of package options and Sensitron's expertise in analog and power electronics design, analysis and test make us an ideal partner for your microelectronic circuit design and packaging.

Radiation hardened components are used for all space circuits.

For nearly 70 years, API Delevan has provided the highest quality electronic components for human and robotic mission critical applications to the world's most stringent markets, including aerospace and defense, medical and space.

Designed to withstand the challenges that space microelectronics circuits have to face like extreme vibration, high temperature variations, and high levels of radiation exposure, API Delevan products can be found in such applications as geostationary orbiting and low orbiting satellites, automated exploration vehicles that are traversing the Martian landscape, and many more.

API Delevan Main Advantages:

- most expansive offering of Military QPL products.
- only inductor manufacturer qualified to the "S" failure rate level for MIL-PRF-39010E
- MIL-STD 202 on-site environmental test lab: Thermal Shock, Temperature Cycling, Moisture Resistance, Solderability, Life Test, Calibration, Real Time X-ray, and Failure Analysis
- Space level up-screening to MIL-STD-981C & Group A & B testing

Quality Certifications:

- MIL (Military Specifications) • ER (Established Reliability) • AS 9100 • ISO 9001

CONTACT



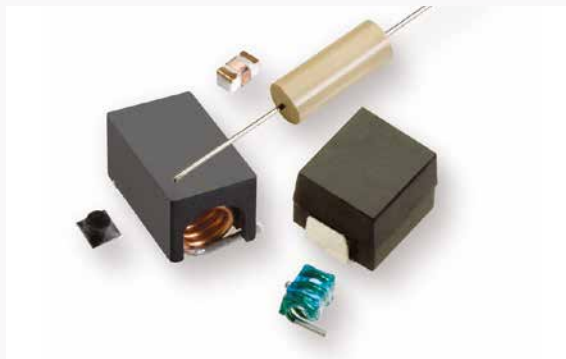
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PASSIVE COMPONENTS



RF Inductors

Products are available in ceramic & ferrite wirewounds, tight tolerance, temperature stable, non-magnetic, high L, epoxy coated, molded, unshielded/shielded, in axial-leaded and surface mount configurations

- Inductance ranges from 0,0018µH to 33.000µH
- Tolerances to within +/- 1% of nominal inductance
- Operating temperatures from -55°C to +125°C



Power Inductors & Transformers

Available products are high current and filter inductors, power line chokes and an extensive single, common and differential mode toroid offering in axial-leaded, radial leaded and surface mount configurations.

- Inductance ranges from 0,22µH to 100.000µH
- Current ratings from 0,050A to 19,9A
- Operating temperatures from -55°C up to +220°C
- Able to withstand high levels of shock and vibration



Isabellenhütte Heusler GmbH & Co. KG - Whenever highest reliability, precision and longevity are required, there is no way around the low-ohmic precision and power resistors made in Germany.

It is not without reason that Isabellenhütte has been supplying resistors to the aerospace industry for more than twenty years:

ESCC qualified ISA-PLAN® technology precision resistors in the value range of 2.2 mOhm to 2 Ohm provide outstanding key features (very high long-term reliability, small temperature coefficient, low inductance, low internal heat resistance, high to very high pulse power rating) to any kind of electronics using low-ohmic resistors for current monitoring and limiting purposes, such as

Power Supplies: Used in DC/DC converters for the decentralized energy distribution in satellites

Battery Management: Monitoring Load/Unload operations ; used in satellites and ground vehicles

Failure Recovery: Used in SEL (Single-Event Latch-up) circuits

Screening and Test Services

Next to its components Isabellenhütte also offers Screening and Test Services accordingly to ESCC 4001 resp. MIL-PRF 55342 and ESCC 22900 & ECSS-Q-ST-60-1 (Radiation) applicable to all of their components. This positions Isabellenhütte ideally in regards to the emerging Newspace market and its dynamic requirements.

CONTACT



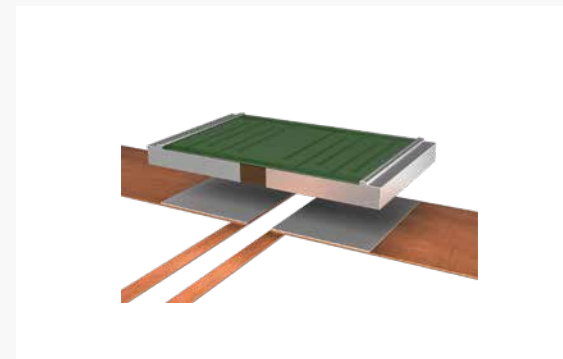
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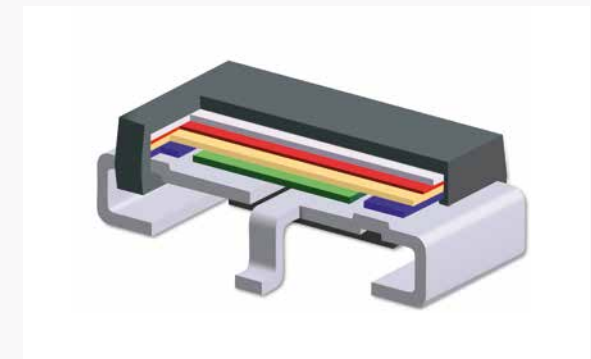
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PASSIVE COMPONENTS



ESCC 4001027 Resistors

- Rated Power up to 3W
- Available in 2010 / 2512 / 2817 case size
- Resistance values from 0.004 to 2.0 Ohm
- Initial Tolerances 0.5% and 1.0%
- Temperature Coefficient Limits [ppm/K]:
 - -100; +0 (-55°C to +22°C)
 - +/- 60 (+22°C to 170°C)
 - +/- 50 (+22°C to 60°C)



ESCC 4001028 Resistors

- Rated Power up to 3W
- Available in 4723 case size
- Resistance values from 0.0022 to 1.0 Ohm
- Initial Tolerances 0.5% and 1.0%
- Temperature Coefficient Limits [ppm/K]:
 - -110; +0 (-55°C to +22°C)
 - +/- 60 (+22°C to 170°C)
 - +/- 30 (+22°C to 60°C)



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