



Mission-Critical Space Components



Join us on a voyage of discovery:

From ground support and launch systems to earth orbit satellites and far out into deep space, Powell offers a world of rugged and reliable advanced component technology products.



Mission-Critical Space Components



Powell Electronics is among the world's largest distributors of electronic components and value-added services. Our focus and expertise include electronic connectors, passive components, filters, switches, sensors, and related electro-mechanical products. For over 75 years, we have brought a unique sense of purpose and vision to electronics distribution.

Today, we are a multi-national company with a global reach, representing the most respected manufacturers. We employ a staff of over 200 people across the USA and Europe. We supply all industries, especially companies servicing key market sectors, including Aerospace, Defence & Space, Telecommunications, Transportation, Medical Imaging and Instrumentation.

Powell Electronics is a specialist at high reliability, harsh environment connector design, manufacturing and supply chain management. An authorized, QPL'ed distributor for over 50 military specifications and ISO9120 certified, Powell Electronics has technical staff to support design-in activities.

At our USA HQ, Powell has 70,000 square feet of connector manufacturing capabilities at its Swedesboro, NJ facility, which is certified to ISO9001 and AS9100. Powell offers automated engineering solutions and connector ODM services.

In Europe we have locally-based technical and commercial employees who are fluent in European languages, and we hold significant product inventory. European franchise agreements include Glenair, Harwin, Amphenol, Quell, Samtec, Planetary Systems, Cinch, ITT Cannon, Honeywell Sensing, Conesys, Positronic and many more.

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Rocket Lab is a premier supplier of flight-proven satellites, subsystems and spacecraft components. The company's spacecraft technology spans space solar power, advanced composite structures, flight software, star trackers, reaction wheels, separation systems, and radios. Rocket Lab space systems technology has enabled more than 1,700 missions globally.

Advanced Lightband: Lightweight, compact separation systems with 100% mission success

Planetary Systems' Advanced Lightband (ALB) separation systems have enabled customers to reduce mission costs and streamline payload integration time from days to minutes. Lightweight and compact, these mechanical systems used to separate spacecrafts from launch vehicles in orbit have never failed to separate during any mission.

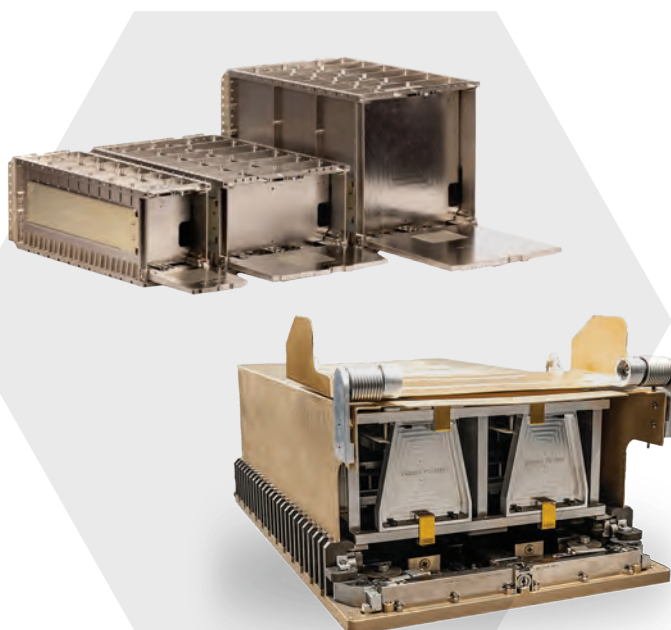
- › Easy to use: only two wires to initiate, no extra fixing required
- › Reliable: extensively tested and proven in space; 30% increase in stiffness allows higher frequency 1st modes and reduces deflection
- › No consumables, non-pyrotechnic, motor-driven mechanism eliminates need for consumable initiators
- › Lightweight - one third of the weight of a typical clamp band; Low-height - half the height of a typical clamp band; Low-shock Ideal for sensitive payloads



Canisterized Satellite Dispenser: Reliable, cost-effective housing for CubeSat payloads

Planetary Systems' Canisterized Satellite Dispenser (CSD) is a reliable deployment mechanism for small secondary or tertiary payloads that minimizes the risk of damage and eliminates the necessity for heavy or complicated interface structures between satellite and launch vehicle

- › Fully encapsulates payload during launch, providing mission assurance for both the primary payload and launch vehicle
- › Easy to load, integrate, and operate. No consumables
- › Largest internal volume - more room for solar panels and other deployables
- › Mounting to any face. Enables CSDs to be densely-packaged on the launch vehicle





Two electrical engineers designed the first EESeal in 1995. They didn't want to create just another filtered connector, they wanted a solution that could solve EMI/RFI, transient protection (ESD and lightning) and other compliance problems almost instantly. Now, 2.5 million units have been shipped across the globe. While most solutions increase cost and prolong lead times, EESeal filtered insert connectors are proven to improve EMI and EMC performance, with delivery in as quick as 24 hours while saving 20-50% over the price of a filtered connector. Whether you're in the middle of the design process and want to avoid a costly board spin, or in the lab facing a failed EMI or EMC test, our team will connect you with an immediate solution. We've built our operations around getting prototypes into your hands quickly.

EESeal and EESeal+: Retrofit EMI filtering and transient suppression into your connector in seconds

Quell's EMI filter and transient suppression inserts for connectors are an easy retrofit that allows users to add custom circuitry to a standard connector in seconds. Quell's patented elastomeric body suspends, isolates and protects discrete electrical components. EESeals are simply pressed into the connector body and the surfaces of the EESeal® morph into a shape that mimics the cork and bottle structure of the connector interface.

- › Installs in seconds, using only your fingertip
- › Virtually invisible, adds <1 gram to your connector weight
- › Ready for the rigours of space, sea, or desert: Ruggedized against shock, fluid immersion, vibration
- › Silicone construction mimics pin layout, naturally adjusting to pin mismatches and alignment
- › No extra bulky connector housings
- › Suits standard or custom connector shell - any size, shape and pin configuration possible
- › Custom samples on short delivery





Harwin's lightweight, small footprint, high reliability products are used in some of the world's leading space projects. The company has many years' experience supplying the space industry, and is certified to EN9100D/AS9100D.

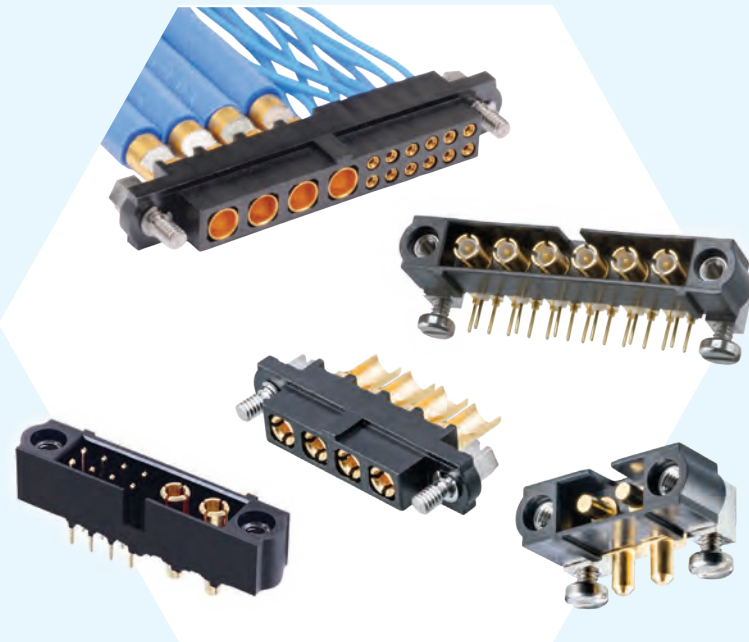
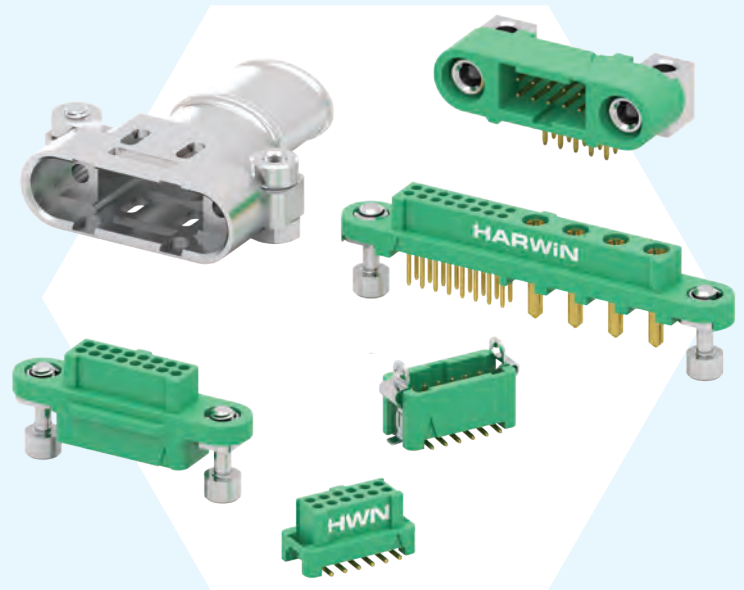


Gecko Micro-Miniature Connectors for SWaP-C Optimization

Harwin's Gecko (G125 series) connectors provide a low profile, dual row interconnect solution, ideally suited for stacking and cable mating application where SWaP-C - Size, Weight, Power and Cost – optimization is paramount.

Gecko-SL, Gecko-MT and Gecko-Latch

- > 2A signal; 10A power
- > Outgassing levels meet NASA/ESA requirements
- > -65 to +150°C; 20g vibration, 100g shock
- > Connectors and cable assemblies available



Datamate High reliability, Miniature Connectors Include Signal, Power and Coax

Harwin's Datamate (M80 and M83 series) connectors provide a compact and flexible interconnect solution, ideally suited for a wide variety of testing environments and conditions. Connectors are available in single, double and triple row configurations, jackscrews or latches.

Datamate J-Tek & Datamate Mix-Tek

- > 3A signal; 40A power; 50Ω coax
- > Outgassing levels meet NASA/ESA requirements
- > -55 to +125°C; 10g vibration, 100g shock
- > Connectors and cable assemblies available



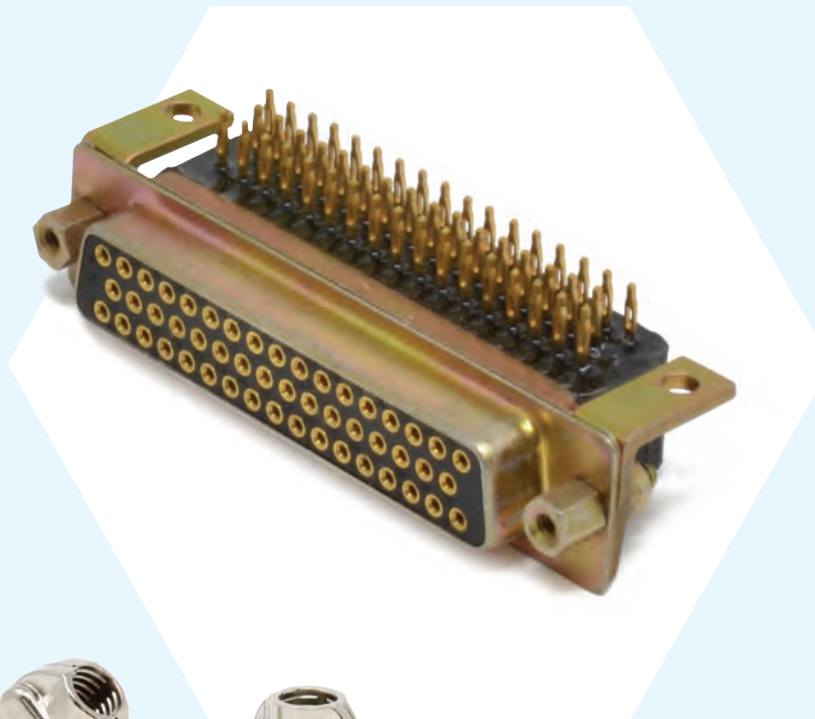


From Apollo 11 to modern space exploration, ITT Cannon has proudly supported global space initiatives with a comprehensive portfolio of space-grade connectors and interconnect solutions. Our high-reliability connectors enable reliable transmission of power, signals, and data with excellent resistance to harsh operating conditions, such as extreme pressure differential, thermal shock, and heavy vibration. ITT Cannon's space connectors meet the design and material specifications required by NASA/GSFC and the European Space Agency. Standard and custom solutions range from connectors utilized in satellites to launch vehicles and custom spacecraft.

D-Subs: Ruggedized, space-grade high-density I/O solutions

Originally designed and patented by Cannon for use on commercial & military aviation systems, today the company offers an array of D-Sub connector styles, sizes, configurations, and accessories for space applications including rocket launchers and satellite systems to flight simulators. This Cannon invention is one of the most widely used connector types in the world.

- › Standard, high density, double density and Combo-D layouts
- › Crimp, solder cup, PCB and wire wrap terminations
- › Wide-range of shell materials and plating options including RoHS
- › Accessory backshells with locking hardware, guide plates and polarization options
- › Select parts qualified to NASA & ESA standards





Cinch exceeds the demanding requirements of space exploration, delivering failure-free, competitive solutions including data, signal, RF, fibre and combination connectors, cables and assemblies.



CIN::APSE®

CIN::APSE Solderless Interconnect: Exceptional Performance to >50GHz

Cinch's CIN::APSE is a proven Z-axis stacking connector technology that offers excellent mechanical and electrical performance at signals well above 50GHz. It suits PCB or flex, PCB-to-PCB or component-to-PCB interconnect without the use of solder.

CIN::APSE

- › Maximize SWaP (Size, Weight, and Performance)
- › Pitch grid of 2.00mm, 1.0mm and 0.80mm achievable
- › Solderless: compression establishes multiple points of contact
- › Customizable: 2 to 7,356 contacts have been used per connector, but no limit exists
- › IC-to-PCB, PCB-to-PCB, Flex-to-PCB, Component-to-PCB
- › 20g vibration; 100g shock





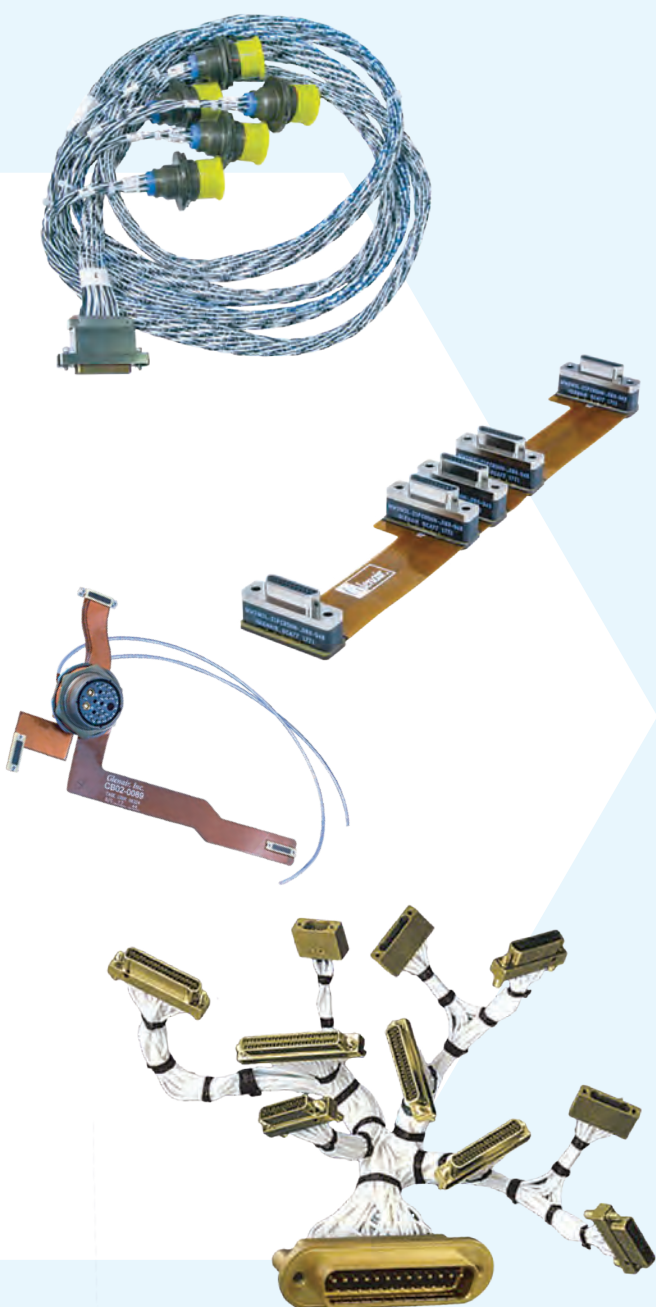
Glenair manufactures high-reliability connectors and cables for mission-critical applications. The AS9100/ISO9001 company now offers dozens of full-spectrum connector product lines, including a broad range of military qualified and signature connector designs such as the MIL-DTL-38999 Series III, and our micro miniature Series 80 Mighty Mouse. Glenair's connectors, backshells and interconnect cable assemblies are all made either in America or in its facilities in Western Europe.

Space-grade cable harness design and assembly to ESA/NASA IPC certification

The overriding concern for space-grade interconnects is reliability. Space launch vehicles and payloads are subjected to shock, vibration, and acoustic stress factors which can damage interconnect systems – particularly if material strength, mating retention forces, contact retention technologies or other design elements of connector/cable components are inadequate for peak and/or sustained levels of mechanical stress. Glenair has been providing space-grade interconnect solutions since the earliest manned space flights. Space-rated connectors, cables and electro-mechanical devices utilize specialised materials, processing and testing to insure reliable performance during launch and throughout operation.

Glenair Space Systems (GSS) in Salem, Germany offers:

- › European-space-flight interconnect component and harness manufacture
- › Highest reliability: every crimp joint, shield junction and electromechanical HDRM inspected and recorded
- › Turnkey Electronic Ground Support Equipment (EGSE) racks and power / data test cables
- › ESA/NASA IPC Certification
- › ISO 5 flow chamber (ESD Standard 61340-5-1), with ample room for large projects.
- › Support from Glenair's worldwide space-grade interconnect solutions



SCAN TO
LEARN
MORE



Space connectors, cables and electro-mechanical devices are a unique class of interconnect technologies that utilize specialized materials, processing and testing to ensure reliable performance during launch, satellite deployment and throughout operation. Space launch vehicles and payloads are subjected to shock, vibration, and acoustic stress factors which can damage interconnect systems – particularly if material strength, mating retention forces, contact retention technologies or other design elements of connector/cable components are inadequate.

SuperNine: MIL-DTL-38999 Series III with superior mating durability, anti-vibration, EMI shielding, environmental sealing

Series 23 SuperNine® advanced performance MIL-DTL-38999 Series III connectors roll up many of the technology advances Glenair has pioneered in our environmental, hermetic, and filter connectors into a comprehensive high-performance MILDTL-38999 Series III solution. SuperNine® combines advanced plating, sealing and other high-performance features including:

- › 1500 mating cycle advanced durability contacts
- › Integrated EMI shield banding porch
- › High-durability anti-vibration coupling
- › Tight-tolerance composite shell fibre optics
- › Extensive line of sealed PC tail configurations
- › Crimp contact hermetics

SuperNine MIL-DTL-38999 connectors are intermateable with all industry-standard D38999 Series III solutions and accommodate Glenair's broad range of connector designator 'H' backshells, protective covers, shrink boots and lightweight composite accessories.



Glenair also offers DLA-Qualified MIL-DTL-38999 Series III composite connectors in Class J (Cad / O.D.) and Class M (Electroless Nickel). Moulded 40% carbon-filled PEEK composite thermoplastic QPL D38999/26 plug and D38999/20 wall-mount receptacles offer outstanding weight savings and unlimited corrosion protection compared to metal versions. Glenair 'Better-than-QPL' SuperNine versions offer enhanced features beyond the QPL such as integrated band porch for EMI termination without the use of a backshell.



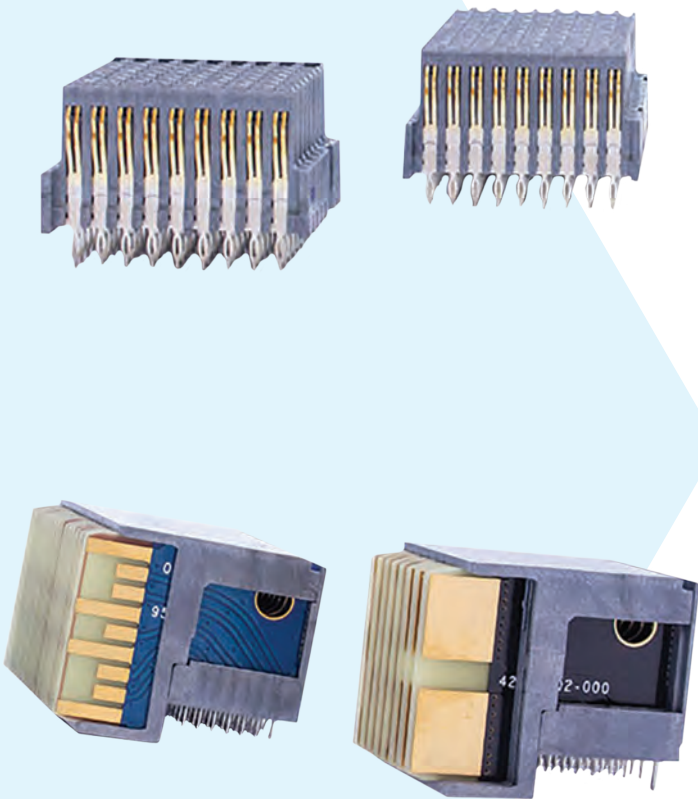
Amphenol designs and manufactures QPL Mil-spec and custom circular and rectangular electrical and electronic connectors for defence and aerospace industries. The company also offers high-speed cable assemblies, media converters and Ethernet switches, fibre optic connectors and cable assemblies, high power and high voltage connectors, EMI/EMP filter connectors, hermetically sealed connectors, and a variety of special applications connectors and custom interconnect systems.

SpaceVPX: Modular VITA 78 connectors facilitate scalable integration and easy maintenance

Built on the proven OpenVPX architecture, SpaceVPX VITA 78 connectors from Amphenol are optimized for the extreme environmental conditions encountered in orbit including high vibrations, radiation exposure, and extreme temperature fluctuations.

Using specialized wafer configurations defined in the VITA 78 specification, SpaceVPX connectors enable dual-redundant connectivity for reliable signal integrity and uninterrupted operation. Their modular nature allows for scalable integration, easy maintenance, and enhanced system flexibility. Their compact design and robust performance help meet the size, weight, and power (SWaP) constraints required for space applications such as satellites and spacecraft.

- › Outgassing: third-party testing – meets NASA and European Space Agency (ESA) outgassing requirements
- › Vibration: 4-point backplane contact system for extreme vibration applications
- › Passed VITA 72 vibration level testing with BER monitoring.
- › Compliant (press-fit) pin technology: tested with various PCB platings to verify performance and reliability
- › Current Capacity: power wafers and wafer configurations to support VITA 78 Space utility management modules
- › Extreme Temperature- tested to a temp range of -67°F (-55°C) to 221°F (105°C)





From deep space discovery to medical breakthroughs, Positronic delivers 'The Science of Certainty'. Positronic is a respected supplier of high performance D-subminiature connectors that meet the stringent qualifications for use in space flight. Qualified to the Goddard Space Flight Center S-311 and MIL-DTL-24308 Class M specifications, these connectors are offered in a broad range of styles and configurations, including mixed power, signal, coax and high voltage versions.

Xavac, Savac, Hivac: Hermetic feedthrough connectors for vacuum applications

Positronic's SAVAC, XAVAC and HIVAC hermetic feedthrough D-Subminiature connectors series feature size #22, #20 or #8 precision-machined contacts for durability and strength. Rated for 10A to 40A contact current range and 1,000VRMS to 2,700VRMS voltage range, the connectors feature a trapezoidal-shaped polarization method, 40N contact retention, 500 mating cycles and 5GΩ insulator resistance. Creepage and clearance is 1mm minimum.

- › Standard and modular options
- › Leakage rate < 5 x 10⁻⁹ mbar.l/s @ vacuum 1.5 x 10⁻² mbar
- › 2 or 4 retention screws
- › Compliant with RoHS 5/6 and UL 94V-3 flammability rating standards

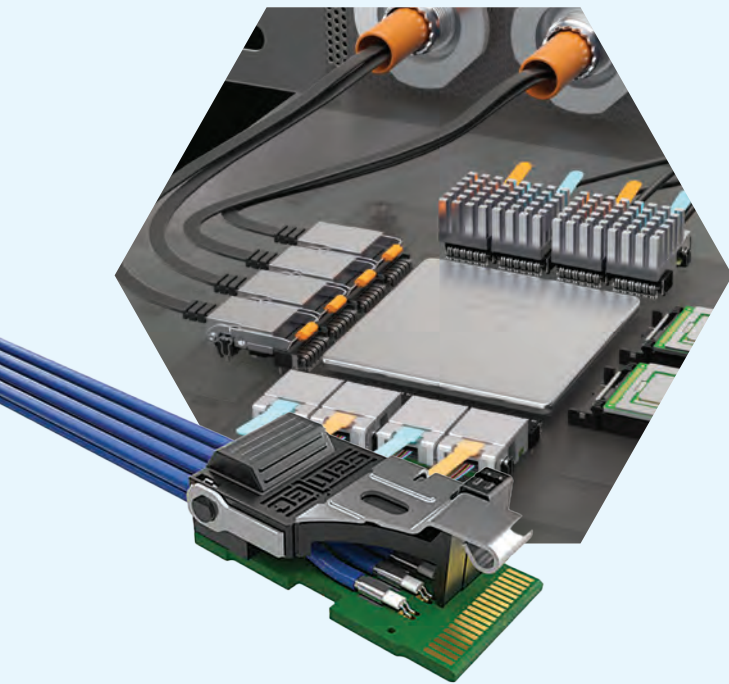


ESA-Certified





Samtec's SET products are approved for NASA Class D missions that require high-reliability, quick-turn and cost-effective solutions for LEO satellites, SmallSats, CubeSats and other space exploration equipment, such as space suits. Samtec boasts a specialist range of precision RF connectors that are designed to provide solutions for frequencies between 18 GHz and 110 GHz, making them ideal for Satcom applications. Samtec also has market-leading expertise in high-speed board-to-board, cable, and rad-hard rugged optics for space applications.



Firefly: Mid-board optical transceivers take data 'off board' at up to 28 Gbps per lane

Samtec's FireFly Micro Flyover System embedded and rugged mid-board optical transceivers take data connection 'off board' for up to 28 Gbps per lane with a path to 112 Gbps PAM4 via optical cable at greater distances, or copper for cost optimization. Simplifying board design and enhancing performance, Firefly is the first interconnect system that gives designers the flexibility of using micro footprint high-performance optical and low-cost copper interconnects interchangeably.

- > Future-proof
- > Highest density
- > Ease of routing and layout
- > Excellent signal integrity



Novaray: Extreme density for 128 Gbps PAM4 per channel in 40% less space

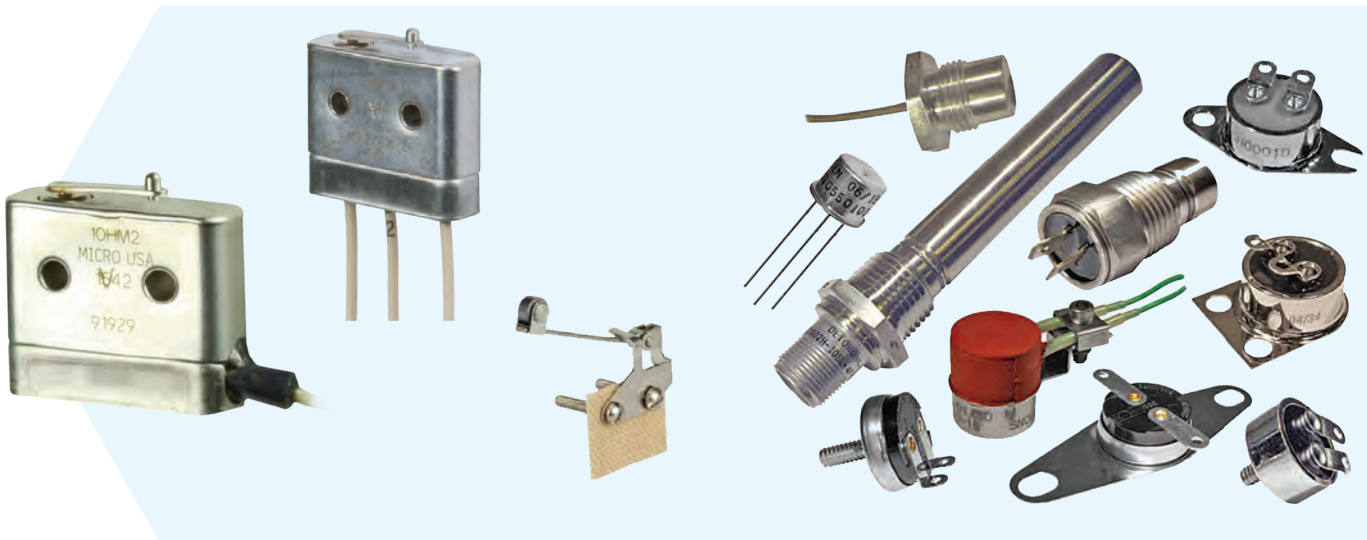
Samtec's NovaRay arrays combine extreme density and extreme performance, which is critical as system sizes decrease and speeds increase. The fully shielded differential pair design and two reliable points of contact contribute to the industry leading 4.0 Tbps aggregate data rate.

- > 0.80mm spacing; 7, 9, 10 and 12mm stack heights; 2, 3 or 4 rows
- > PCIe® 7.0 capable
- > 1 or 2 banks with up to 16 pairs/bank
- > 'Analog Over Array' capable
- > Current rating: 2.1A max (signal), 9.6A max (ground); 200 VAC/283 VDC max voltage rating





Honeywell has been part of every NASA crewed space mission for almost 60 years and is onboard 950 satellites and counting. Honeywell's military-approved solutions have enabled space applications to fly higher and farther, making Honeywell a key supplier within aerospace and defence industries. Devices are in use on the ISS, the Mars Rover, numerous satellites, rockets, telescopes and even space suits.



HM Series: Hermetically sealed miniature microswitches

Honeywell's HM microswitches incorporate glass-to-metal and metal-to-metal sealing ensuring over 50 years of use and are ideal where a symbol 5 seal is required for stringent applications, including a wide range of temperatures from -184°C to 260°C. Designed with a stainless steel housing and hermetic seal construction, the HM switches suit applications where dust, water, other particulate contaminants, and corrosive gases are present. The HM switch has bifurcated gold contacts for controlling low energy loads (mA and mV) reliably or silver contacts for switching power duty loads at 30 vdc or 115 Vac, 400Hz.

- › Available MIL-PRF-8805 qualified or with UL 508 certification
- › Precisely detects position of mechanical components within a particular system that is susceptible to physical and atmospheric (corrosive gas, oxygen, etc.) elements
- › Consistent and precise performance in a hermetic-sealed package for adverse, inclement environments
- › Value-added HM assemblies available



Thermostats: Precision and high reliability

Thermostats can provide either temperature control or over-temperature protection by breaking electrical contact when a specified temperature is reached. Honeywell manufactures a wide range of precision, non-hermetic and hermetically sealed thermostats including high reliability military and aerospace versions. Honeywell can also integrate these thermostats in higher-value cable assemblies, incorporating wire harness and connectors. Also available is a selection of pre-configured REDI-TEMP thermostats.

- › High precision; high reliability
- › Devices MIL-STD-202 Method 213 rated for shock, vibration and acceleration
- › Hermetic and non-hermetically sealed versions
- › Can be integrated into cable assemblies with connectors



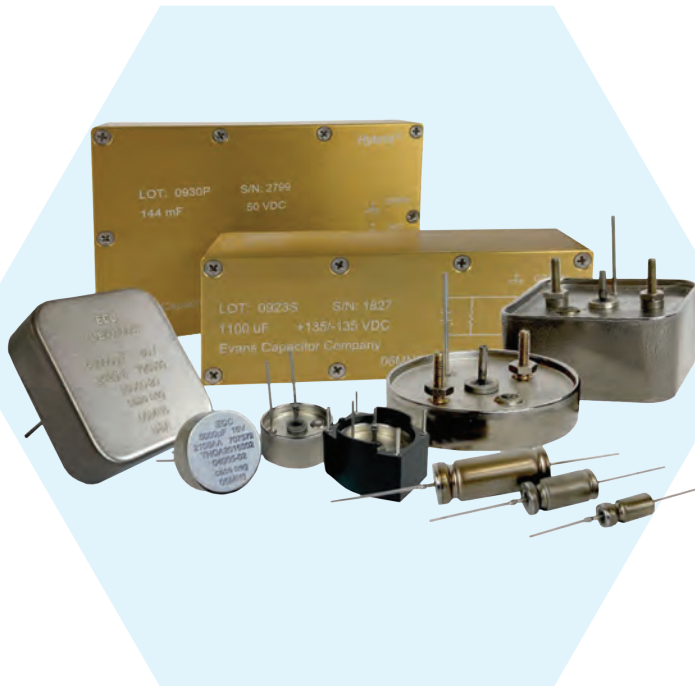


With a 60 year history including over 100 launches and over 1 million flight hours without an in-orbit incident, Quantic Electronics serves a full range of space applications from National Security to commercial LEO constellations. Solutions include optical encoders, oscillators, synthesizers, capacitors and power dividers. Quantic Electronics' space-grade capacitors are routinely specified by leading Tier-1, aerospace and defence contractors where high reliability and SWaP (space, weight and power) savings are required.

TDx series: High power density hybrid wet tantalum capacitors

Quantic Evans TDx series hybrid wet tantalum capacitors range from 10V-125V / 750 μ F-360mF and deliver industry-leading power density. In one 63V / 8900 μ F application, the customer was able to replace 16 devices from a competitor with one TDD series 63V / 9400 μ F capacitor, saving over 90% of the volume and nearly 75% of the weight.

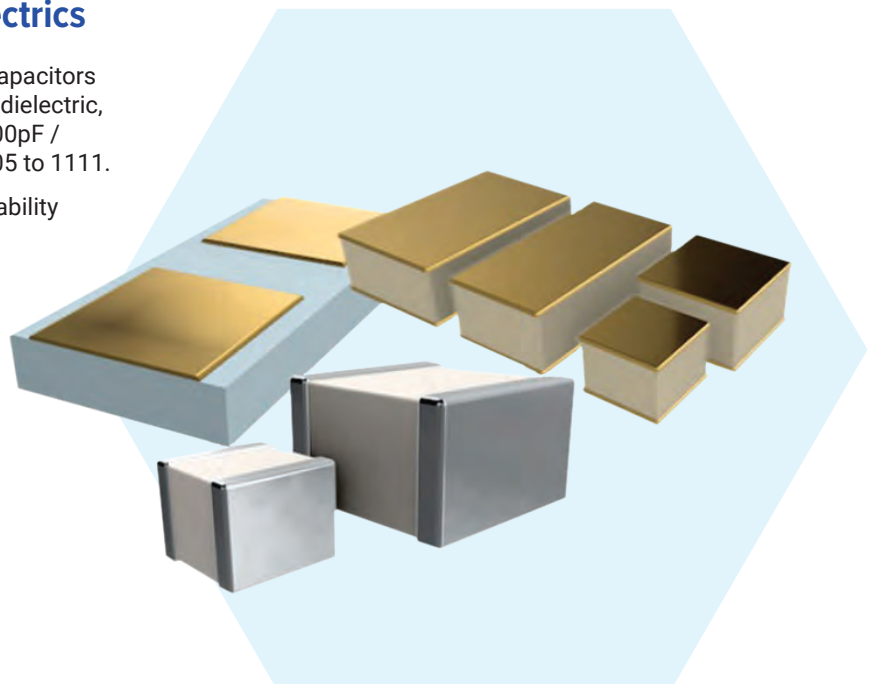
- › Industry leading power density (SWaP)
- › Ultra-low ESR
- › Ruggedized to withstand space level altitude, shock and vibration; RAD hard
- › Qualified to NASA IEEE-INST 002, approved by ESA. Unlimited shelf life



Ultra-High Q high frequency MLCCs deliver higher capacitance with fewer dielectrics

Quantic Eulex Ultra-High Q high frequency ceramic capacitors provide up to 20x more capacitance with same NPO dielectric, case size and voltage. Devices range from 0.1pF-1000pF / 6.3V-1500V and are offered in case sizes from 01005 to 1111.

- › Fewer dielectric layers save volume, increases reliability
- › SMD eliminates need for wire bond
- › Broadband performs to 67GHz
- › High Q /low ESR



Full Manufacturer List



The number of products of our online catalog is expanding daily, if you are looking for a part not yet listed, please Contact us.

- | | | | |
|------------------------------|--------------------------|----------------------------|--------------------------------|
| 3M | Connex | Interswitch | Power Dynamics |
| AB Connectors | Cutler Hammer | ITT Cannon RF | Quell |
| Alden | Cambridge Products | Iron Mountain | RF Industries |
| American Sensor Technologies | Clarostat | ITW Switches | Robert Technologies |
| Amphenol CIT | Continental | Ident Products | Radiall |
| Amphenol LTW | Cannon | J-Tech | Rosenberger |
| Amphenol RF | Commercial Connector | Jyebao | Raychem |
| Aries | Conxall | JKL | Rayovac |
| Advanced Cable Ties | DYNA | JYEBAO | Regal Electronics |
| Allied Electronics | | Jerrick | SPI Connects |
| Ametek | | Kilovac | Schrack |
| Amphenol Canada | | Kings | Product/Tubing |
| Amphenol PCB | | LEMO | Steinel |
| Amphenol Spectra-Strip | DiTom Microwave | Low Noise Factory | SRI Connector Gauge |
| Astrotool | ECCO Switch | M-Wave | Sealtron/HCC |
| Aero Electric | Elcon | Maxim | Simco |
| Alpha Wire | | Midwest Microwave | Stycast |
| Amphenol | | Memory Protection Devices | SV Microwave |
| Amphenol Conn | | Molex (RF) | Somers |
| Amphenol PCD | Elmwood | MECA Electronics | Sivers IMA |
| Amphenol Tuchel | East Coast Microwave | Online | Sumitomo |
| Axicom | Energys | Omega | Santec |
| Agastat | Eaton | Omega Cable | Semflex/CS |
| Altech | | Orion Fans | Sloan |
| Amphenol ARINC | | Paladin | Santron |
| Amphenol F/O & Endicott | Fillconn | Panasonic | Sensyn |
| Amphenol Piher | G&H Technology | Pearce | Southwest Microwave |
| Anderson Power | Guerrilla-RF | Pepperl+Fuchs | TE Connectivity |
| activCirk | George S Maier | Precision Connector | Timbercon |
| Alcoswitch | Guardian | Phoenix Company of Chicago | TT Electronics |
| Altran Magnetics | HCC Industries | Trompeter/CCS | Thes Microwave |
| Amphenol Backplane Systems | H&W | Thermax | Termolite |
| Amphenol Fiber Systems | Hobbs | Tyton | Tri-Star |
| Amphenol Positronic | Hammond Manufacturing | Ulti-Mate | The Phoenix Company of Chicago |
| Anritsu | Harbour Industries | United Microwave | Chicago |
| B & B Batteries | Helios | Vector | Trompeter/CCS |
| Belden Cable | Huber+Suhner | Wiking/Eaton | Thermax |
| Bendix | Harting | Winchester Electronics | Tyton |
| Bentley-Harris | Hellermann Tyton | WithWave | Ulti-Mate |
| Buchanan | Hurst Manufacturing | Mustich | United Microwave |
| CDI | Hartman | XMA Corporation | Vector |
| Carlisle | High Speed Interconnects | Xymox | Wiking/Eaton |
| Conesys | HyCal | Y-Connect | Winchester Electronics |
| Cooper | I.F. Engineering | | |
| CII | Incon | | |
| Cinch | ITT Cannon | | |
| Connectronics | | | |
| Corning Gilbert | | | |
| Cablescon | | | |
| Circuit Assembly | | | |





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