

Space Products Overview



Solutions for Space

Proven Technology. Engineered for Reliability.

Heritage.

Integrity.

Reliability.

Technology.

Dependability.

Performance.

TE Connectivity provides innovative and reliable solutions for the most demanding applications in the space industry with multiple products to address applications in satellites, spacecraft, launch vehicles and ground support equipment.

TE's products are engineered for high quality and high performance. Our agency and integrator-approved products are the cornerstone of our portfolio. We offer a wide variety of products designed to be space compatible. These products are ruggedized and manufactured with materials worthy of space flight and challenging terrestrial applications.

In space applications, success is the only option. With more than 30 years of experience, TE's space products have established themselves as dependable, durable, and reliable. Whether it is interconnect, wire, fiber optics, harnessing materials and devices, high performance relays, contactors and solenoids, switches or identification, we can assist with the enabling technology for your space applications.



Space Agencies

JAXA

(Japan Aerospace Exploration Agency)

ESA

(European Space Agency)

ISRO

(Indian Space Research Organization)

NASA

(National Aeronautics and Space Administration)



High Performance Relays and Solenoids

Applications:

- Power Distribution & Control
- Actuation
- Motion Control

Product Information

KILOVAC High Voltage Relays

- Small size and weight for given power rating
- Low and stable contact resistance over relay life
- Ability to interrupt DC loads
- High resistance to shock, vibration and temperature extremes
- Usable in RF devices

Associated Product Families

- AP10A Series
- AP150X Series
- K41C Series
- K43R Series
- KC-14 Series
- AP44P Series
- K41R Series
- K40P Series
- KC-28 Series
- KC-18 Series

CII Mid-Range Relays

- Qualified to MIL-R-39016, MIL-R-28776, MIL-R-28750, MIL-R-5757, MIL-R-83726, MS27245, MS27247, MIL-R-6106 and MIL-R-83536
- Hermetically sealed
- High shock and vibration ratings
- Designed to perform in a wide range of extreme environments
- MA = T0-5
- MGA = .100 Grid
- 3SBC = 1/5 Size, 2 Pole, .150 Grid
- 3SBH = 1/5 Size, 4 Pole, .150 Grid
- 3SBM = 1/5 Size, .150 Grid Latching

CII DC Solid State Relays

- Optically coupled input/output
- Hermetically sealed
- High shock and vibration resistance
- Some incorporate short circuit protection and status
- DS11 Series
- DS13 Series
- MS18 Series

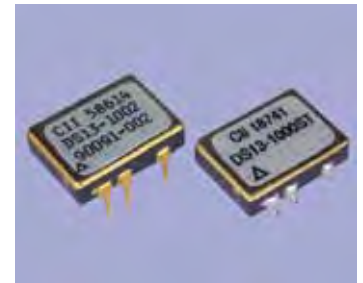
HARTMAN N-Series Relays

- High reliability
- Magnetic latch or side stable
- Meets applicable requirements of MIL-PRF-6106
- Hermetically sealed
- Stainless steel - welded construction
- -55° C through +125° C operating environment
- Multiple mounting and auxiliary contact configurations
- Main contact current ratings 30-125 Ampere
- Multiple main contact configurations: 28 VDC or 115 V 400 Hz
- N208 Series
- N210 Series
- N409 Series
- N415 Series
- N417 Series
- N422 Series
- N436 Series

Custom Solenoids

- Solenoids can be used in space applications and are custom built to customer specifications.
- To request a prototype, contact Tyco Electronics or visit: <http://www.tycoelectronics.com/ADM>

Custom relays available on request. Contact Tyco Electronics.



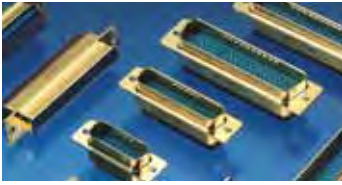
Applications:

- Avionics
- Cable Harnessing
- Ground Support Equipment

Connectors and RF Products

Product Information

Associated Product Families



AMPLIMITE Military Subminiature D Connectors

- For input/output and product break harnessing
- NASA qualified designs
- Ultra-lite features improved EMI performance and up to 20% weight savings

- ULTRA-LITE AMPLIMITE Connectors
- 24308 D-Sub Connectors
- 311P405 (Coax Mix) Connectors
- 311P407 (Series 90) Connectors
- 311P409 (Series 109) Connectors



RF Connectors

- For high performance coaxial applications
- Always EU RoHS/ELV Compliant
- Qualified to MIL-PRF-39012, MIL-DTL-83517, MIL-PRF-55339

- SMA
- Hermetic SMA
- SSMA
- OSMM
- One-Step BNC/TNC
- SMK (2.92 mm)
- OSP (BMA)
- OSSP
- SMP and SMPM



Nano and Microminiature Connectors

- Low out-gassing
- High shock and vibration ratings
- Wide temperature range (-200 °C to +200 °C)
- Lightweight and space-proven

- DUALOBE Product Line
- MCK Assemblies
- HDSM Rectangular



Terminals and Splices

- High temperature
- Radiation resistant
- Gold, silver, nickel and tin platings available

- PIDG
- STRATO-THERM
- AS7928 style
- COPALUM



Quadrax Connectors

- For ethernet and fiber-channel applications
- Designed for use with wire seal boots for sealing and optimized alignment
- Front metal-shell design provides a full ground plane
- Designed per ARINC 600 - Supplement 14

- Various circular and rectangular platforms featuring 4Q4 D-Subs
- Available in cable applied plug and receptacle, along with right-angle PCB receptacle
- Excellent density - 4 quadrax contacts in a .5" x 2.0" window
- Uses standard D-Sub jacking hardware



Fortis Zd Connector

- Allows 10 GB/s+ data rates
- Extreme mechanical and electrical performance
- Modular design allows for user configurability
- Space compatible materials

- Right Angle / Backplane
- Vertical / Stacking
- All plastic, shielded and rugged metal shell



MTC Connectors

- Lightweight materials for weight savings
- Reliable, thin and stackable
- Environmentally sealed
- EMI accessories available

- MTC100-XXX-XXX
- MTC100-XXX-XXX
- MTC10-XXX-XXX-XXX
- MTCP-XXX-XXXX
- MTC-122-XXXX
- MTC-197CTA-XXXX
- MTC-197D-XXX-XXX



Wire, Cable and Devices

Applications:

- Vehicle Wire Harnesses
- Shield Terminations
- Antennae

Product Information

Low Fluoride SPEC 55 Space Wire

- Excellent service history
- Smallest and lightest performance wire
- Rated at +200 °C for 10,000 hours
- Flexible at -85 °C
- Mechanically tough, low out-gassing
- Excellent resistance to chemicals

- 55/Family
- 55/LF Family

Note: Low Fluoride SPEC 55 wire is not ESA approved.

Space Wire and Cable

- Rated 150-200 °C (125-200 °C for CHEMINAX)
- Cross-linked “non-melting” insulation system
- Low fluorine insulation system and low outgassing
- NASA qualified designs are RoHS compliant
- ESA qualified designs are non-RoHS compliant

- 55/Family
- 55/LF Family
- 55F Family
- CHEMINAX Cable Family
- Multicore & EPD Cable Family

CHEMINAX Coaxial Cable

- * Suitable for demanding video and RF applications
- Low capacitance and attenuation
- Lightweight, small size
- High velocity of propagation
- High flexibility
- Rated -65 °C up to 200 °C

•1553 Data Bus	•Twinaxial Cables	•Coaxial/Triaxial	
7724S1664	0024S111	5024S1614	5026S1614
7724S11L4	0024S1614	5026S1612	7526S1664
7724S3LL4	0024S8664	5030S3614	7526J1660
7724S3664	0026S1424	5028S1614	7524S1664
7724S8LL4	0026S1664	5026S5664	9530S1614
7724S8664	0026S1924	5026S1664	
7724T1664	0028S1664	55FA/	
7726S2664	0028S2664	55FB/	
7726S11L4	2524S3614		

SolderSleeve Devices and SolderShield Splices

- Controls EMI
- Designed to provide an environment resistant shield termination on cables
- Rated for 150 °C minimum up to 200 °C max.

- D-110 Series
- D-1744 Series
- D-436 Series
- D-200 Series
- S063 Series
- S096 Series
- S0175 Series
- S200 Series (S01,S02, S03)
- D-150 Series

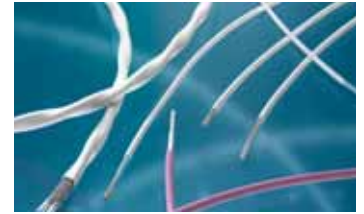
FILTERLINE ElectroLoss Cable

- Rated -65 °C up to 200 °C
- SPEC 55 Insulation
- Suppresses EMI above 100 MHz
- Low out-gassing
- High degree of EMI protection

Quadlite Quadaxial Cable

- Rated -65 °C up to 200 °C
- Customized construction for data standards: 100/1000 BASE T, USB, Fiber Channel, IEEE 1394
- Low out-gassing, lightweight

- EPD-RWC-18104
- CEC-RWC-18687
- CEC-RWC-18658
- CEC-RWC-18664
- CEC-RWC-18685



Applications:

- Flight & Ground Harnessing
- Data & Power Cabling
- Fluid and Damage Resistance

Harnessing Products and HarnWare Software

Product Information

Associated Product Families



Spin-Coupled and Solid Backshell Adapters

- Available in many configurations to match applications
 - Easy to install onto connectors
 - Ideal for high-reliability applications
 - Kitted for customer convenience
 - May use TINEL-LOCK rings or band straps
 - Accommodates Raychem boots
- TXR Series
 - 2xxM Series
 - BND Series



HEXASHIELD High Performance EMC/EMI Adapters

- Superior EMC/EMI shielding performance
 - Simple installation and easy re-entry
 - Excellent mechanical and environmental resistance
 - Efficient strain relief
 - Versatile and flexible
- HEXASHIELD Product Line
 - A HEXASHIELD Flexible version is also available and works well for high-speed data signals, allowing multiple repairs (FLX40 Series)



Molded Parts

- For use in outer space, where use of low out-gassing components is required
 - Provides excellent strain relief at connector cable terminations
 - Available to fit backshell adapters offered by Tyco Electronics
- -8 Space-Grade Molded Parts



Adhesives

- TE manufactures RAYCHEM brand adhesives and sealants to accommodate a wide range of applications, materials, and environmental conditions
- S1009 Space Grade Epoxy



Heat Shrinkable Tubing

- Flexible
 - Thin wall style
 - Always EU RoHS/ELV compliant
- RT-220 Low Out-Gassing Tubing
 - HCTE Conduit
 - RT-218
 - RW-175
 - RT-555



Harness Design Software

- TE offers HarnWare software, a PC computer aided wiring harness design software system
- HarnWare Software



Data Bus (MIL-STD-1553B) Components and Harnesses

Product Information

In-Line Couplers and Terminators

- Tin/Nickel-plated metallic parts
- Baked silicone rubber components
- Low out-gassing tubing

Associated Product Families

- D-500-94XX-X-XXX series for couplers
- D-500-9463-XXX series for terminators

Components offer:

- High package density & weight savings
- Design flexibility
- High Performance Rating (to 150 °C)



Threaded Triaxial Connectors

- Tin/Nickel-plated metallic parts
- Baked silicone rubber components
- Low out-gassing tubing

- DK-621-0911P
- DK-621-0911S
- DK-621-0912P
- DK-621-0912S



Bayonet Triaxial Connectors

- Tin/Nickel-plated metallic parts
- Baked silicone rubber components
- Low out-gassing tubing

- | | |
|---|---|
| <p>“A” Polarization</p> <ul style="list-style-type: none"> • DK-621-0933-1P or S • DK-621-0934-1P or S <p>“C” Polarization</p> <ul style="list-style-type: none"> • DK-621-0937-3P or S • DK-621-0938-3P or S | <p>“B” Polarization</p> <ul style="list-style-type: none"> • DK-621-0935-2P or S • DK-621-0936-2P or S <p>“D” Polarization</p> <ul style="list-style-type: none"> • DK-621-0939-4P or S • DK-621-0940-4P or S |
|---|---|



Splice Kits

- Flux-coated, solder impregnated copper shield braid encased in a transparent heat-shrinkable insulation sleeve provides a controlled soldering process, encapsulation, inspectability, strain relief and insulation

- D-150-9708-5



Standard Space Cables

- Optimized Single Shield
S16 = 7724S1664-9
41L = 7724S1LL4 *

- EMP Hardened
- S86 = 7724S8664-9
 - 48L = 7724S8LL4-9 *

- Optimized Double Shield
- S36 = 7724S3664-9
 - 43L = 7724S3LL4*



*Low fluoride outgassing insulation

Demateable Terminators

- Available with or without lanyard
- Tin/nickel plated metallic parts

- | | |
|--|--|
| <ul style="list-style-type: none"> • DK-621-0937 • DK-621-0938 • DK-621-0939 • DK-621-0940 | <ul style="list-style-type: none"> • DK-621-0933 • DK-621-0934 • DK-621-0935 • DK-621-0936 |
|--|--|



Tyco Electronics also manufactures complete harnesses to customer specifications and print.



FOR MORE INFORMATION

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