ULTRA RUGGED SOLUTIONS

RuggedPower@samtec.com
Samtec’s ultra rugged solutions provide reliability and flexibility in small form factors for extreme/harsh environments. From rugged I/O cable assemblies, sealed & compact optics, and VITA 90 VNX+ modules to ultra rugged hardware and high-temp coatings, these solutions are ideal for military, aerospace, submersible and other harsh environment applications. Many ultra rugged offerings are available now with a robust roadmap to meet or exceed requirements for harsh environment applications and industries.

For design flexibility and cost optimization, Samtec’s Severe Environment Testing (SET) qualified products are Commercial-Off-the-Shelf (COTS) and modified COTS to get solutions to market faster. Visit samtec.com/set for more information and test reports.
RUGGED POWER I/O SYSTEMS
- Four points of contact for a reliable connection
- Micro-hyperboloid contacts for extreme mating cycles
- Extreme density with up to 1,450 I/Os in a 1RU panel
- EMI shielding limits signal degradation and optimizes performance
- Series: B1SD(T)/P1PD(T)/P1M
- samtec.com/ursa

38999 RUGGED I/O SYSTEMS
- High data rate cable system in a rugged 38999 shell
- Salt fog resistant to 48 hours
- IP67 for dust and waterproof sealing
- Threaded cable-to-panel design
- High-density 16 pair; 32 on roadmap
- Series: NVA3E/NVA3P
- samtec.com/novaray-io
**ULTRA RUGGED/COMPACT OPTICS**
- FireHawk™ is the smallest optical transceiver in the industry - 10 x 7.7 x 2.5 mm (<0.4 grams)
- Extreme performance up to 40 Gbps aggregate transfer rates (10 Gbps x 4 channels)
- Rugged BGA attach withstands high shock and vibration
- Radiation tolerant design
- Series: CSPO, CSSO
  - [samtec.com/firehawk](http://samtec.com/firehawk)

**EXTREME ENVIRONMENT OPTICAL SYSTEM**
- Sealed and parylene-coated for exposed military, aerospace and submersible applications
- Ruggedized for tin whisker mitigation and fungal resistance; operates in harsh environments including salt fog, blowing sand and dust, jet fuel exposure, altitudes up to 65,000 feet
- Extended temp range of -40 °C to +85 °C
- Series: ETMO/UEC5/UCC8
  - [samtec.com/firefly](http://samtec.com/firefly)

**EXTENDED TEMP OPTICAL SYSTEMS**
- Extended temperature range from -40 °C to +85 °C
- x4 and x12 designs to 25 Gbps per lane performance
- Samtec’s Extended Temp FireFly™ optical with Amphenol® Aerospace bulkhead interconnects
- Micro footprint allows for increased density
- Series: ETUO/UEC5/UCC8
  - [samtec.com/firefly](http://samtec.com/firefly)

**VITA 90 VNX+ SOLUTIONS**
- RF backplane system to support 110 GHz with high-density size 20 contacts; size 16 on roadmap
- Rugged blind mate solution
- Configured with SEARAY™ right-angle array and rugged optics
- SWaP-C reductions make this ideal for military and aerospace applications
- COTS or modified COTS solution for cost and time flexibility
  - [samtec.com/vnx](http://samtec.com/vnx)
ULTRA RUGGED HARDWARE

- Guide post standoffs (GPSO) allow for .035” of initial misalignment
- Assists with “blind mate” for ultra micro, fine-pitch mezzanine connectors
- 5 to 30 mm stack heights
- 303 stainless steel with MIL-C-13924 black oxide finish
- Jack screw precision standoffs (JSO) reduce the risk of component damage
- Standoffs (SO) with precision machined tolerances (+/- .002” (0.05 mm))
- samtec.com/hardware

HIGH RELIABILITY PLATING

- Palladium alloy plating with gold flash for high-temp, high cycle applications
- Qualified up to 150 ºC ambient
- Available on SEARAY™ 1.27 mm pitch high-density arrays (SEAF/SEAM)
- Product Roadmap includes SEARAY™ 0.80 mm, AcceleRate® HP, LP Array™ and Generate™ 0.80 mm pitch edge cards
- Ideal for ATE applications

ROADMAP

- High cycle “super lube” for extreme mating cycles
- Expanded testing to MIL-DTL-55302 including salt spray and enhanced shock & vibration
- URSA™ I/O configurations of power, signal, RF coax and high-speed contacts for high reliability in harsh environments
- Rugged blind mate solution with RF and optical connectivity for backplane applications
- Size 16 and 20 high frequency coax 38999 contacts for high-density, multi-position housings
- Phase & insertion loss stable microwave/millimeter wave cable assemblies - Orange is the new cable!
SET QUALIFIED PRODUCTS

- **SFM / TFM** | Tiger Eye™ 1.27 mm Pitch Micro Rugged System
- **SEAF / SEAM** | SEARAY™ High-Density Arrays
- **LSHM** | Razor Beam™ Hermaphroditic Strips
- **SSM / TSM** | .100" Pitch Square Post Header & Socket
- **FTSH / CLP** | .050" Pitch Header & Socket
- **ERF8 / ERM8** | EdgeRate® Rugged High-Speed Strips
- **S2M / T2M** | Tiger Eye™ 2.00 mm Pitch Micro Rugged System
- **UMPS / UMPT** | mPOWER® Ultra Micro Power Connectors
- **SEAF8 / SEAM8** | SEARAY™ 0.80 mm Pitch Ultra-High Density Arrays

NASA

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 applications.

Samtec also utilizes NASA outgassing data to determine if certain products meet NASA’s ASTM E595-77/84/90 test requirements. Visit [outgassing.nasa.gov](http://outgassing.nasa.gov) for data.
EXTENDED LIFE PRODUCT™

E.L.P.™ products are tested to rigorous standards, which evaluate contact resistance in simulated storage and field conditions.

- 10 year Mixed Flowing Gas (MFG)
- High Mating Cycles (250 to 2,500)
- Certain plating and/or contact options will apply

For complete details about Samtec’s E.L.P.™ program, a list of qualifying products and test results, please visit samtec.com/ELP or email the Customer Engineering Support Group at ASG@samtec.com

DESIGN QUALIFICATION TESTING

All Samtec series undergo Design Qualification Testing (DQT), which includes:

- Gas Tight
- Normal Force
- Thermal Aging
- Mating/Unmating/Durability
- IR/DWV
- Current Carrying Capacity (CCC)
- Mechanical Shock/Random Vibration/LLCR
- Mechanical Shock/Random Vibration/Event Detection

TESTING REFERENCE CHART

<table>
<thead>
<tr>
<th>TEST</th>
<th>SET</th>
<th>E.L.P.™</th>
<th>DQT</th>
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<tbody>
<tr>
<td>Gas Tight</td>
<td>X</td>
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<tr>
<td>Normal Force</td>
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<td>Thermal Aging</td>
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<tr>
<td>Mating / Unmating / Durability (240 Hrs)</td>
<td>X (100% RH, 250 Cycles)</td>
<td>X* (90-98% RH, 100 Cycles)</td>
<td>X (90-98% RH, 100 Cycles)</td>
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<tr>
<td>IR / DWV</td>
<td>X (At Altitude of 70,000 Feet)</td>
<td>X*</td>
<td>X*</td>
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<tr>
<td>CCC</td>
<td>X*</td>
<td>X*</td>
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</tr>
<tr>
<td>Mechanical Shock / Random Vibration / LLCR &amp; Nanosecond Event Detection</td>
<td>X (40 G Peak, 11 ms, Half Sine &amp; 12gRMS, 5 - 2,000 Hz, 1 Hr / Axis)</td>
<td>X* (100 G Peak, 6 ms, Half Sine &amp; 7.56gRMS Avg, 2 Hr / Axis)</td>
<td>X (100 G Peak, 6 ms, Half Sine &amp; 7.56gRMS Avg, 2 Hr / Axis)</td>
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<td>Temperature Cycling (500 Cycles)</td>
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<td>Mating Cycles (250 to 2,500)</td>
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<td>N/A</td>
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</table>

* Completed as part of initial Design Qualification Testing (DQT). E.L.P.™ and SET testing are performed in addition to DQT.