



# AvionicLinecard DACH 2023

Avionic, Military, Medical and Industrial Components

**Protec GmbH**  
*High-Rel Electronic Components*

**Protec GmbH** was founded in 1976 and is successful in the sales of High Reliability components.

We are particularly specialised in highly qualified components for industrial, military and space applications.

In instances of obsolescence and supply problems, we can also offer our customers effective solutions with our extensive product and market knowledge.

Our customer orientated warehouse, equipped with a modern ESD protection system, guarantees reliable component supply.

With our design-in and market orientated expertise, we can provide long term support for your projects and applications.

Through our distributor and rep strategy, we are the "extended arm" of our Manufacturers. When required we will put you directly in touch with our manufacturer's specialists.

Our first priority is a long term, successful partnership with our customers and manufacturers.



Protec GmbH is a specialized distributor of high quality products for the electronics industry, particularly for the Space, Avionic, High Voltage, High Temperature and niche industrial markets.

**We support customers and manufacturers with our expertise in:**

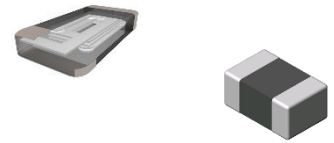
- EUS requirements and licensing processes
- CoC requirements
- Design in support
- Export classifications and rules
- Product trainings

Support and understanding of terms like SLDC, LOT acceptance, PIND, TID, ELDRS, SEE, SEU, SEL, Proton testing and many more industry specific terms.

Responsibilities by Country / Manufacturer	DACH			Nordic									BeNeLux						
	Germany	Austria	Switzerland	Denmark	Sweden	Norway	Finland	France	Italy	Spain	Portugal	UK & Ireland	Belgium	Luxembourg	Netherlands	Czech Republic	Hungary	Poland	Romania
AEM Inc.	•	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•
AirBorn	•	•	•	•	•	•	•					•							
Avalanche Techn.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Axtal	•	•	•	•	•	•	•	•				•	•	•	•				
CalRamic	•	•	•												•	•	•	•	•
Excalibur Systems	•	•	•																
GSI Technology	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
HOLT	•	•	•	•	•	•	•						•	•	•				
Macom	•	•	•			•		•		•	•	•	•		•				
MOOG Protokraft	•	•	•																
Q-Tech	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Skyworks DS	•	•	•	•	•	•	•								•	•	•	•	•
SMC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Smiths Canada	•	•	•	•	•	•	•					•							
Teledyne e2v	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
VMI	•	•													•	•	•	•	•
VPT Components	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
VPT	•	•	•																
Viking Technology	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•



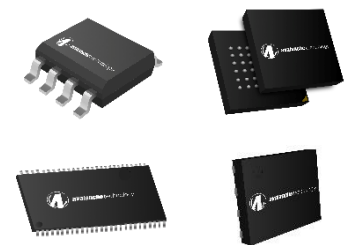
<b>HighRel Fuses</b>	50 - 180 V	125mA - 20A
<b>HighRel Chip Beads</b>	30 - 1000Ω	200mA - 4A
<b>TWM</b>	RoHs to Tin Lead Conversion	



<b>Nano D</b>	Nano-D metal shell - exceed MIL-DTL-32139	9-91 contacts
<b>Micro D / High Speed</b>	Micro-D metal shell - exceed MIL-DTL-32139	9-128 contacts
<b>Macro D</b>	(3A up to 42A per contact)	8-150 contacts
<b>High Speed Rectangular</b>	Vertical board-mount, right angle board-mount, cable I/O, and flex circuit mounting	40-500 contacts
<b>SInergy</b>	Modular hybrid solution 1-5 configurable bays	up to 25Gbps
<b>Stackable</b>	High-density, board-to-board stacking	28-200 contacts
<b>Rectangular R&amp;Z Series</b>	PCB Connectors	10-604 contacts
<b>Z-Axis Interposer</b>	High-density, board-to-board or flex circuit stacking	20-175 contacts
<b>Circular</b>	Micro-miniature circular - similar performance as D38999 connectors more compact & lighter package	up to 10G
<b>Flexible Assemblies</b>	Highly reliable, flexible, printed circuit assembly single-sided, double-sided, multi-layer, rigid-flex	
<b>Cable / Harness</b>	Copper, RF and more — terminated with any connector	
<b>Active Optical Cables</b>	Fully-qualified, Space-Rated Active Optical Cable (SAOC®) & a Rugged Active Optical Cable (RAOC®)	

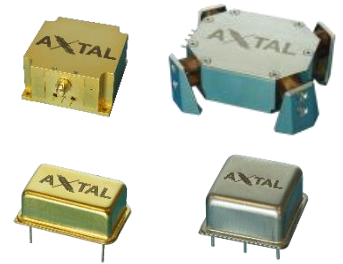


<b>Serie High Performance</b>	1Mb / 4Mb / 8 Mb / 16Mb	1.8V / 3.0V
<b>Serial SPI</b>	1Mb / 4Mb / 8 Mb / 16Mb	3.0V
<b>High-Rel Serial SPI</b>	16Mb	1.8V / 3.0V
<b>Parallel x8</b>	1Mb / 4Mb / 8Mb / 16Mb / 32Mb	3.0V
<b>Parallel x16</b>	1Mb / 4Mb / 8Mb / 16Mb / 32Mb / 64Mb	3.0V
<b>High-Rel Parallel x16</b>	16Mb / 32Mb / 64Mb	3.0V

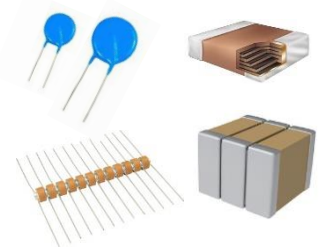




<b>OCXO</b>	±0,005ppm / Ultra Low Noise	10MHz to 150MHz
<b>TCXO</b>	±0,5ppm	1MHz to 2,5GHz
<b>VCXO</b>	±5ppm / Low Noise	1MHz to 1,5GHz
<b>SAW Oscillator</b>	±350ppm	500MHz to 1,6GHz
<b>Quartz Filter</b>	±1ppm	10MHz to 100MHz
<b>PRECISION CRYSTALS</b>	SC, IT and AT-cut crystals for frequency control, instrumentation , military, space and other markets	



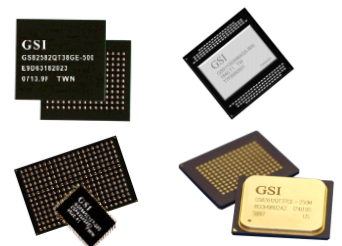
<b>High Voltage Disc</b>	3kV to 20kV/ MIL-PRF-49467 Option	X7R / X5R / X5U / Z5U / NPO
<b>High Voltage Multilayer</b>	500V to 10kV / MIL-PRF-49467 Option	X7R / NPO



<b>ARINC 429</b>	Interface Cards, Protocol Converters, Rugged Systems, Flight Simulator Tester	
<b>MIL-STD-1553</b>	Interface Cards, Couplers, Switches, Repeaters & Accessories	



<b>SRAM</b>	SigmaQuad-II+ (x18 / x32 configuration) 350 MHz	288M / 144M / 72M
<b>SRAM</b>	SyncBurst & NBT (x18 / x32 configuration) 333 MHz	144M / 72M / 36M
<b>APU</b>	High Speed Paralell Computing for SAR, Imaging and AI Applications	

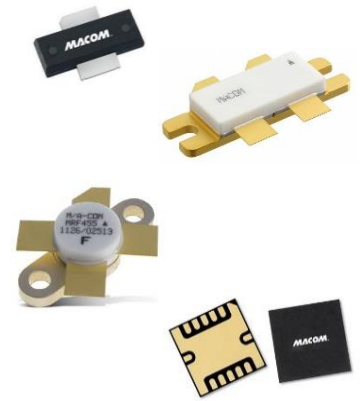


<b>ARINC 429</b>	Line Drivers and Receivers, Protocol IC's	Galvanic Isolation
<b>ARINC 825 / CAN</b>	Controller, Transceiver, HighTemp	High Temperature up to 200°C
<b>MIL-STD-1553</b>	Protocol IC's Dual Transceivers, Encoder/Decoder	Drop-In Replacements available
<b>Discrete to Digital</b>	6/8/16/32-Channels	Level 3 Lightning Protection

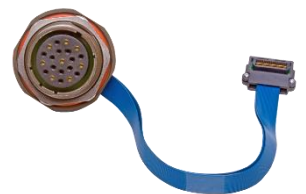




<b>RF - Amplifiers</b>	Gain Blocks, Low Noise, RF Power, Linear, Transimpedance	
<b>RF - Attenuators</b>	Digital, Fixed, Voltage Variable	
<b>RF - Capacitors</b>	Beam Lead, Binary Chip, Bypass, HighQ, MNS, MNOS	
<b>RF - Couplers</b>	Hybrid, Stripline, Broadband	
<b>RF - Diodes</b>	PIN, Step Recovery, Schottky, Varactor Tuning	
<b>RF - Filters</b>	Band Pass, MoCA, Horizontal & Vertical, Low Pass, Duplex, Triplex Filters	
<b>RF - Frequency Conversions</b>	Down Converter, Up Converter, Multipliers, Mixer, Receivers, Transceivers	
<b>RF - Frequency Generation</b>	Comb, Voltage Controlled	
<b>RF - Limiters</b>	C-Band to V-Band	
<b>RF - Switches</b>	Drivers, DPDT, Limiter, SPST, SPDT to SP8T	
<b>RF - Magnetics</b>	Inductors, Baluns, Transformers	
<b>Optical - Clock and Data Recovery</b>	VCEL Driver, DML Driver with CDR / TIA / EML	
<b>Optical - Receiver Modules</b>	APD Photoreceivers, PIN Photoreceivers, HighSpeed Photodetectors and Receivers	
<b>Optical - Laser</b>	Distributed Feedback Lasers, Fabry-Perot Lasers	2,5G, 10G, 25G
<b>Optical - Modulator Drivers</b>	NRZ, PAM, Coherent	Up to 58Gbps
<b>Optical - Post Amplifiers</b>	Limiting Amplifier	
<b>Optical - Photodiodes</b>	APD Photodiode, PAM4 PIN Photodiodes	10G, 25G, 50G, 100G
<b>Optical - Transimpedance</b>	Client Side, Coherent	
<b>Networking - Crosspointswitch</b>	Crosspoint Switches and Signal Conditioners	
<b>Networking - Equalizers</b>	Linear Equalizers 56 / 112 Gbps	2 and 4 Channel
<b>Networking - Processors</b>	Single or Dual-Core Power™ Processor	

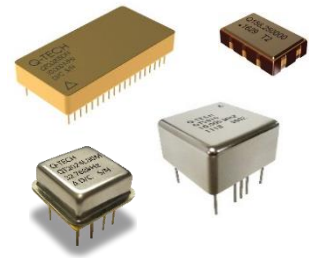


<b>Optical Transceivers</b>	Lightning-, Cutlass-, Dagger-, Matrix-, Hercules-, Magnum-, Sabre 9-, Sabre 11-, Stiletto-, Razor-, Direct 9-Series	Up to 10.3Gbps
<b>Ethernet Media Conv.</b>	Spitfire-, Mustang-, Stingray-, Excalibur-, Mercury-, Maverick-, Neptune-, Saturn-, Titan-Series	Fast, Gigabit and 10 Gigabit
<b>Ethernet Switches</b>	Hornet-, Wildcat-, Viking-Series	Fast, Gigabit and 10 Gigabit
<b>Video Media Converters</b>	Eagle-, Falcon-, Kestrel-Series	DVI, ARINC818, Camera Link, HD-SDI and 3G-SDI

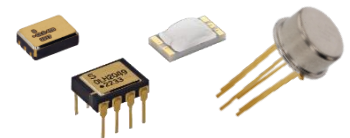




<b>XO</b>	CMOS, TTL, LVDS, LVPECL	15kHz - 250MHz
<b>TCXO</b>	HCMOS, Sine	3MHz - 100MHz
<b>VCXO</b>	HCMOS, Sine	3MHz - 100MHz
<b>OCXO</b>	CMOS, Sine	1MHz - 125MHz
<b>SAW</b>	Sine	400MHz - 1,5GHz
<b>MCXO</b>	CMOS or Sine 5	5MHz - 100MHz
<b>B+ Products</b>		15kHz - 250MHz



<b>Optocouplers</b>	Many different types available like (OLS049 or OLS249) Screening per MILPRF19500 or MILPRF38534	
<b>RF Diodes</b>	PIN, Schottky, Varactor, Limiter	up to JAN equiv.
<b>SPDT</b>	SPDT and ST4T	up to 5GHz
<b>RF Amplifiers LNA</b>	Small QFM Packages 2x2mm	up to 6GHz
<b>Other RF parts</b>	Combined LNA with switch in one package, Gain Blocks	



<b>TVS Diodes</b>	0.2W - 30KW	5V - 400V
<b>Schottky Diodes</b>	10mA - 120A	10V - 200V
<b>Ultrafast Rectifiers</b>	1A - 60A	200V - 1200V
<b>SiC Fets</b>	3 - 50A	650 and 1200V
<b>Chips</b>	Silicon Chips for all devices we make	



<b>LightABLE SM</b>	12.5Gbps / 4TRx or 12Tx / 12Rx	Pluggable
<b>LightABLE SL</b>	12.5Gbps / 4TRx or 12Tx / 12Rx	LGA / interposer
<b>LightABLE28 SL</b>	28Gbps / 4TRx or 12Tx / 12Rx	LGA / interposer
<b>LightCONEX</b>	12.5Gbps / 4TRx or 12Tx / 12Rx	LGA / interposer





<b>ADC</b>	Base-Band up to Ka-Band	35GHz 12.8GSps
<b>DAC</b>	Base-Band up to Ka-Band	12b 12GSps
<b>Memory</b>	DDR, PROM, SRAM, CBRAM, FIFO, MRAM	
<b>Processors</b>	NXP optimized Power, Mil Temp. Range	
<b>SiP Modules</b>	External parts like Memory on one Board	



<b>HV Diodes</b>	2 to 20kV / 30 to 3000ns / 10mA to 3.5A / Axial & SMD	QPL available
<b>HV Assemblies</b>	HV Stacks & Bridges	
<b>HV Opto</b>	10kV and 15kV Optodiode & Optocouplers up to 25kV	



<b>DCDC – DVCH Series</b>	Single 3.3, 5, 5.2, 12, 15 / Dual $\pm 5$ , $\pm 12$ , $\pm 15$	12-50V
<b>DCDC – DVSA Series</b>	Single 3.3, 5, 5.2, 12, 15 / Dual $\pm 5$ , $\pm 7$ , $\pm 12$ , $\pm 15$	15-50V
<b>DCDC – DVSB Series</b>	Dual $\pm 3.3$ , $\pm 5$	15-50V
<b>DCDC – DVGF+ Series</b>	Triple 3.3/ $\pm 12$ , 3.3/ $\pm 15$	15-50V
<b>DCDC – DVHV Series</b>	Single 3.3, 5, 5.2, 12, 15 (trimmable) / Dual $\pm 5$ , $\pm 12$ , $\pm 15$	15-50V
<b>DCDC – DVHF+ Series</b>	Triple 5/ $\pm 12$ , 5/ $\pm 15$	15-50V
<b>DCDC – DVAB Series</b>	Dual $\pm 5$ , $\pm 12$ , $\pm 15$	15-50V
<b>DCDC – DVHF Series</b>	Single 1.9, 3.3, 5, 5.2, 12, 15 / Dual $\pm 5$ , $\pm 12$ , $\pm 15$	15-50V
<b>DCDC – DVWR Series</b>	Triple 3.3/ $\pm 12$ V, 3.3/ $\pm 15$ V	15-50V
<b>DCDC – DVTR Series</b>	Single 2.5, 3.3, 5, 5.2, 7, 8, 9.5, 12, 15, 18, 28 (trimmable) / Dual $\pm 5$ , $\pm 8$ , $\pm 12$ , $\pm 15$ / Triple 5/ $\pm 12$ , 5/ $\pm 15$	15-50V
<b>DCDC – DVHE Series</b>	Single 1.9, 2.5, 3.3, 5V (trimmable)	16-40V
<b>DCDC – DVFL Series</b>	Single 3.3, 5, 5.2, 12, 15, 18, 28 (trimmable) / Dual $\pm 5$ , $\pm 12$ , $\pm 15$ (trimmable)	16-40V
<b>POL – DVPL</b>	3.3 - 5.5V	.8V to 3.4V
<b>DCDC – DVEHF Series</b>	Triple 5/ $\pm 12$ , 5/ $\pm 15$	15-50V
<b>DCDC – DVETR Series</b>	Single 3.3, 5, 5.2, 5.7, 12, 15 / Dual $\pm 5$ , $\pm 12$ , $\pm 15$	15-50V







<b>Transistors</b>	NPN and PNP Small Single and Power BJTs	up to JANSR/F
<b>Diodes</b>	Zener, TC Zener, Schottky, Ultra Fast, Rectifier	up to JANS
<b>MosFets</b>	RadHard 100V, 150V, 200V, 250V	up to 84MeV



<b>DRAM Modules</b>	DDR5 (coming soon), DDR4, DDR3, DDR2, DRAM	up to 32GB
<b>STORAGE (Flash/SSD)</b>	2.5 in. SSD, 1.8 in. SSD, M.2 SSD, slimSATA, etc.	
<b>Rugged Memory</b>	ParallelCell MCP, ParallelSSD	
<b>Persistent Memory</b>	DDR4 NVDIMM, Energy SubSystems (ESS)	



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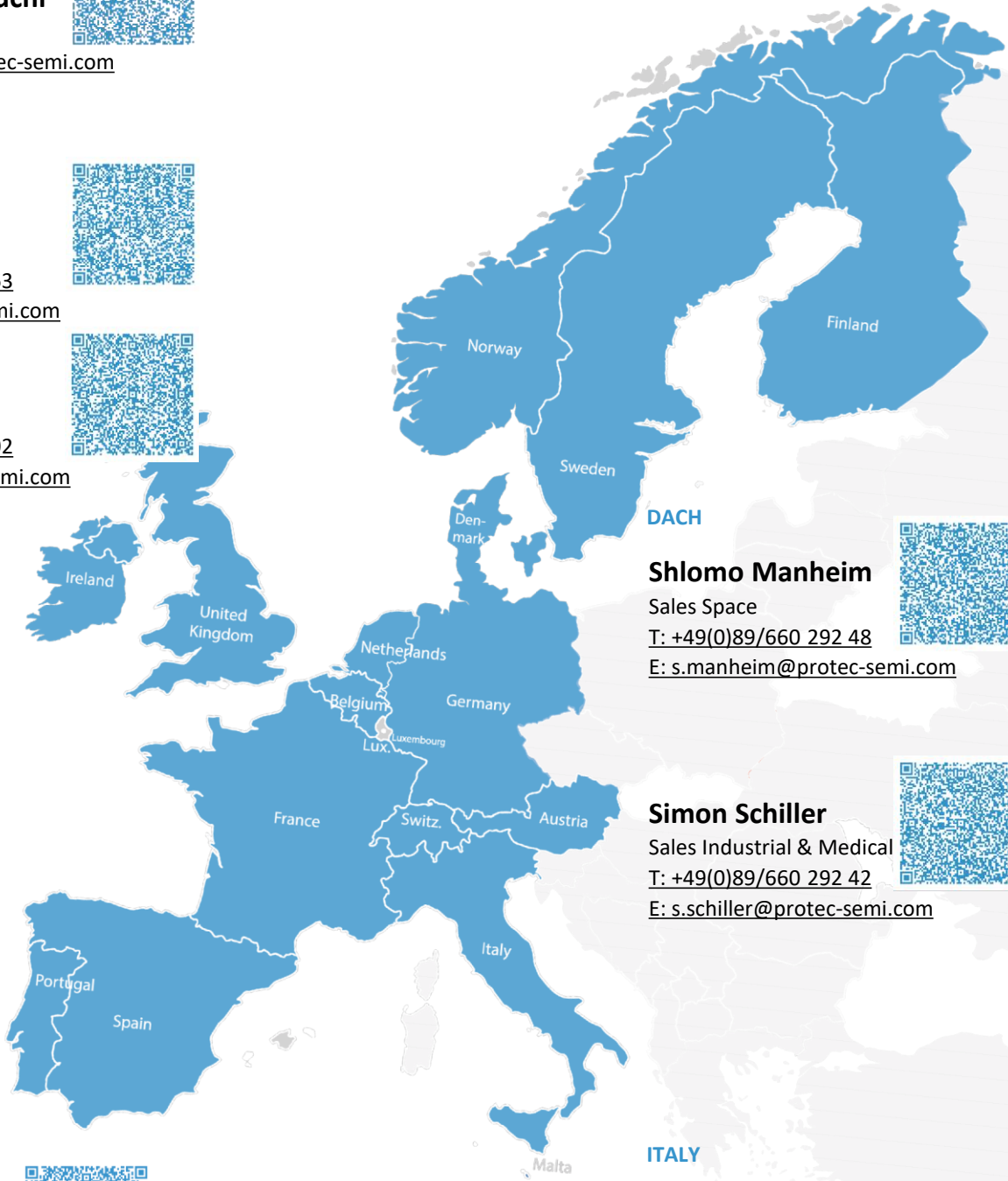
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available here

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PORTUGAL AND  
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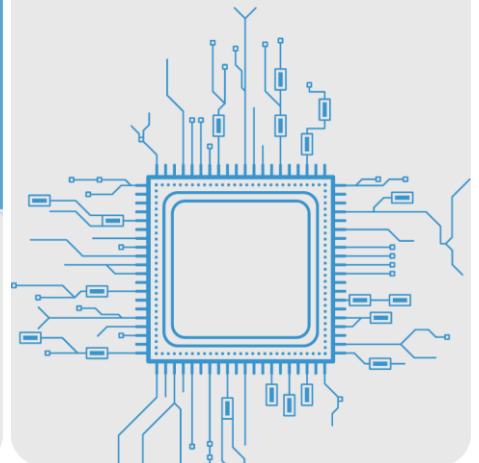
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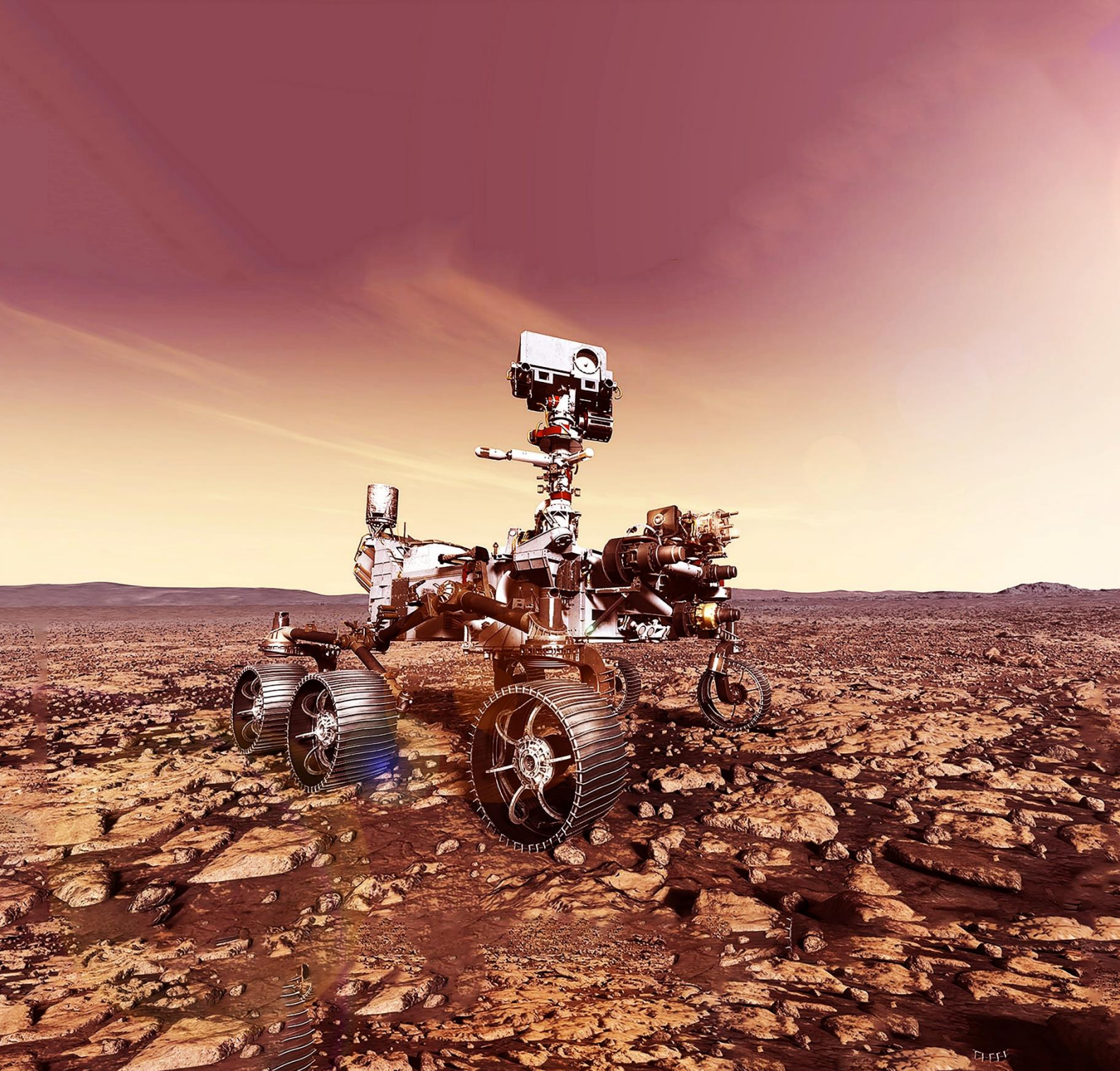
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**HISTORICAL BRAND NAMES OF SUPPLIERS**

following Brands are still known, either sold or renamed, we might be able to help you





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*High-Rel Electronic Components*

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