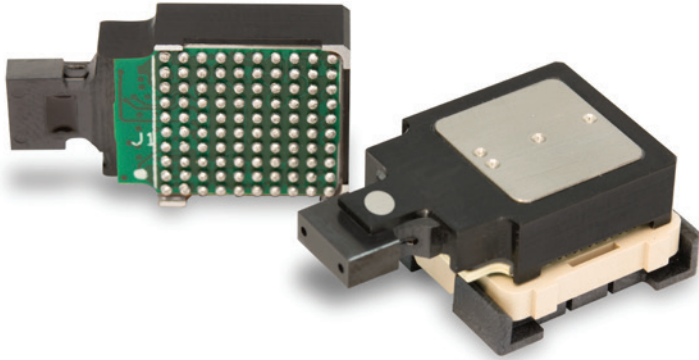


SpaceABLE 10G SM Series

Radiation-resistant Optical Transceivers



Radiation resistant

The *SpaceABLE* 10G SM Series radiation-resistant onboard embedded optical transmitter and receiver modules offer radiation hardness, robustness, longevity, and high I/O density.

The *SpaceABLE*® line of products with their intrinsic radiation resistance, are well suited to provide optical interconnect within space vehicles. These devices are extremely rugged and deliver bandwidth in excess of 120 Gbps in a chip size part.

These modules are offered as a (4+4)-lane transceiver, a 12-channel transmitter, or a 12-channel receiver. All modules operate at 10.3125 Gbps per channel over a recommended operating temperature range of -40 °C to 85 °C at ultra-low bit error rates of 10^{-12} .

SpaceABLE 10G SM Series radiation resistant transceivers are engineered to withstand radiation doses >100 krad (Si). Furthermore, all our devices are tested following ECSS process and lot acceptance. Component pre-screening can be done for every batch of transceivers sold for this application.

Radiation-resistant,
low-SWaP,
multichannel optical
transceivers for space
applications

Key advantages

- **Small:** Less than 6 mm high (SMT version)
- **Rugged:** withstand radiation doses >100 krad (Si) and qualified per MIL-STD 883 shock and vibration.
- **Expected life:** up to 20 years.
- **Performance:** up to 10.3125 Gbps/channel over a recommended operating temperature range of -40 °C to 85 °C
- **Sensitivity:** -9 dBm for BER 10^{-12}
- **Low power consumption:** 85 mW/channel (<10 pJ per bit)

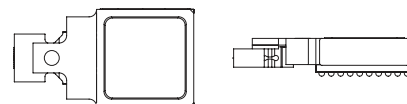
Configurations

- 4TRX (40G, full duplex)
- 12TX or 12 RX (120G, half duplex)

Applications

- High-throughput communication satellites
- LEO satellite constellations
- GEO satellites (with extended lifetime option)
- Board-to-board and payload-to-payload connections
- High I/O density, high BW communication links

Real-size illustration



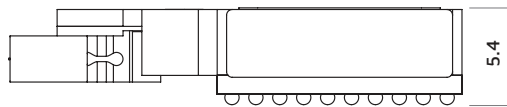
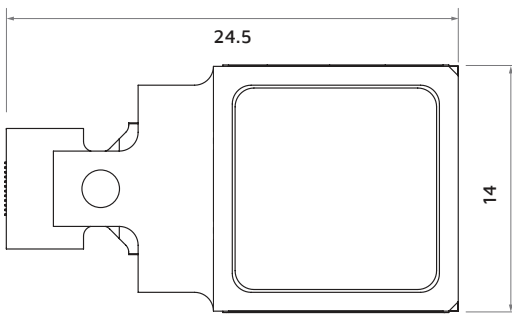
Real size for *SpaceABLE* 10G SM 4TRX, 12TX, and 12RX.

SpaceABLE 10G SM Series features

- 4 TRX (4+4)-lane per device (40G, full duplex)
- 12 TX or 12 RX channel per device (120G)
- Multimode 850 nm wavelength laser
- Standard MT parallel fiber connector
- Surface mountable or pluggable
- RoHS or tin-lead
- Monitoring: LOS, RSSI, temperature, etc
- Industrial grade temperature range (-40°C to 85°C)

Space qualification tests summary

- **Proton testing:** Total Non-Ionizing Dose (TNID)
- **Heavy ion testing:** Single Event Effect & Latch-up (SEE and SEL)
- **Gamma Ray using Cobalt-60:** Total Ionizing Dose (TID)
- **Random vibration:** NASA GEVS, GSFC-STD-7000A
- **TVAC:** Vacuum < 5E-5 hPa
- **Outgassing:** ECSS-Q-ST-70-02C



Drawing of SpaceABLE 10G SM 4TRX, 12TX, and 12RX (SMT versions) (measurements given in mm).

SpaceABLE 10G SM Series ordering information

Part Number	Product Description	Channels or Lanes	Bandwidth (Gbps/ch.)	Sensitivity (dBm)	BER	Mounting	Operating Temp. (°C)
SMX04P518332101	SpaceABLE 10G SM 4TRX transmit/receive	4+4	10.3125	-9	E ⁻¹²	RoHS Pluggable	-40 to 85
SMT12P518333001	SpaceABLE 10G SM 12TX transmitter	12	10.3125	n.a.	E ⁻¹²	RoHS Pluggable	
SMR12P518330101	SpaceABLE 10G SM 12RX receiver	12	10.3125	-9	E ⁻¹²	RoHS Pluggable	
SMX04P518432101	SpaceABLE 10G SM 4TRX transmit/receive	4+4	10.3125	-9	E ⁻¹²	Leaded Pluggable	
SMT12P518433001	SpaceABLE 10G SM 12TX transmitter	12	10.3125	n.a.	E ⁻¹²	Leaded Pluggable	
SMR12P518430101	SpaceABLE 10G SM 12RX receiver	12	10.3125	-9	E ⁻¹²	Leaded Pluggable	
SMX04P518232101	SpaceABLE 10G SM 4TRX transmit/receive	4+4	10.3125	-9	E ⁻¹²	Leaded SMT	
SMT12P518233001	SpaceABLE 10G SM 12TX transmitter	12	10.3125	n.a.	E ⁻¹²	Leaded SMT	
SMR12P518230101	SpaceABLE 10G SM 12RX receiver	12	10.3	-9	E ⁻¹²	Leaded SMT	

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