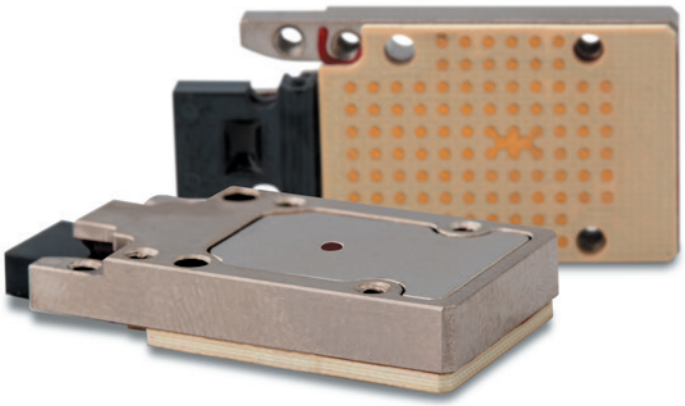
*Space*ABLE 28G SL Series

High-speed Radiation-resistant Optical Transceivers



Radiation resistant

The *Space*ABLE 28G SL Series radiation-resistant onboard embedded optical transmitter and receiver modules offer radiation hardness, robustness, longevity, and high I/O density.

The *Space*ABLE® 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 300 Gbps in a chip size part.

The *Space*ABLE 28G SL Series radiation resistant transceivers are engineered to withstand radiation doses >100 krad (Si). The *Space*ABLE 28G SL Series low profile screw-in module mounts to the board via an LGA connector (interposer). It is offered as a either a (4+4)-lane transceiver (100G full-duplex) or as separate 12-channel transmitter and 12-channel receiver modules (300G half-duplex, as a pair) that operate at up to 28 Gbps per channel over a recommended operating temperature range of –40 °C to 85 °C at ultra-low bit error rates of 10^{-9}.

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, high-speed, multichannel optical transceivers for space applications

Key advantages

- **Small**: less than 6 mm high (module and interposer)
- **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 28 Gbps/channel over a recommended operating temperature range of –40 °C to 85 °C
- **Link budget**: >7 dB with BER 10^{-9} (measured at 25.7 Gbps).
- **Low power consumption**: 160 mW/channel (<6 pJ per bit)

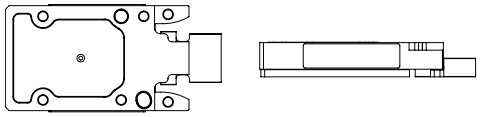
Configurations

- 4TRX (100G, full duplex), in development
- 12TX or 12RX (300G), in development

Applications

- High-throughput communication satellites
- LEO satellite constellations
- GEO satellites
- Board-to-board and payload-to-payload connections
- High I/O density, high BW communication links

Real size illustration



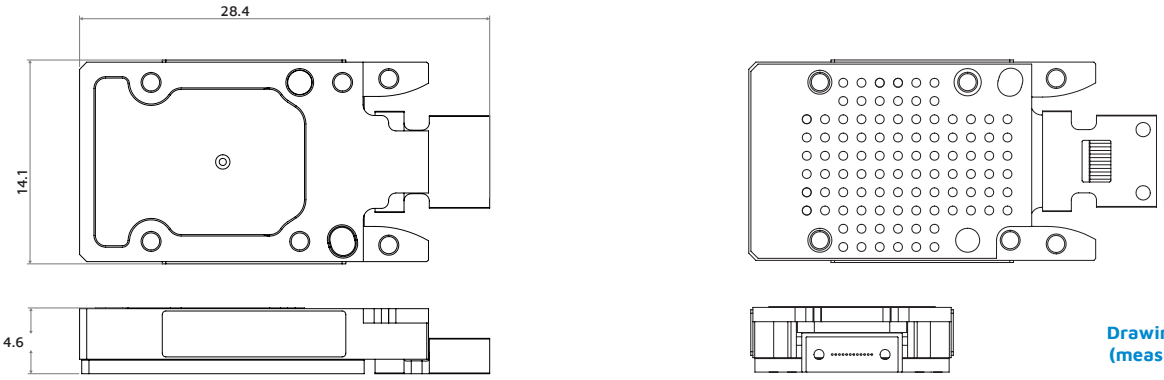
Real size for *Space*ABLE 28G SL 4TRX, 12TX, and 12RX.

*Space*ABLE 28G SL Series features

- 4 TRX (4+4)-lane per module (100G, full duplex)
- 12 TX or 12 RX channel per module (300G half duplex)
- Multimode 850 nm wavelength laser
- Over 60 m reach on OM3 or OM4 ribbon fiber
- Standard MT parallel fiber connector
- RoHS
- Monitoring: LOS, RSSI, temperature, etc.
- Industrial grade temperature range (–40 °C to 85 °C)
- Attaches to system board with 1,55 mm LGA interposer.

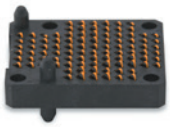
Space qualification tests summary

- **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 *Space*ABLE 28G LL (measurements given in mm).

Note: Attached to PCB with 1.55 mm interposer.



LGA interposers

Screw-in connector shown on a *Space*ABLE 28G SL.

MicroClip™ MT ferrule shown on a *Space*ABLE 10G SL.

*Space*ABLE 28G SL Series ordering information

Part Number	Product Description	Channels or Lanes	Bandwidth (Gbps/ch.)	Sensitivity (dBm)	Mounting	Operating Temp. (°C)
SLX04P528532101	*Space*ABLE 28G SL 4TRX transmit/receive	4+4	25.7	–6	LGA	–40 to 85
SLT12P928533001	*Space*ABLE 28G SL 12TX transmitter	12	25.7	n.a.	LGA	
SLR12P928530101	*Space*ABLE 28G SL 12RX receiver	12	25.7	–6	LGA	

Accessories

415-00041	1.55 mm 96-positions interposer kit (Interposer + screws)

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