

Welcome



“We are pleased to welcome Reflex Photonics to the business family of Smiths Interconnect.

Reflex adds leading ruggedized and radiation resistant transceiver technology to our offering, strengthening our presence and positioning in harsh environment fibre optic end applications.”

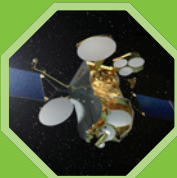
Karen Bomba | President – Smiths Interconnect



Founded in 2002, Reflex Photonics is an advanced developer of rugged, high speed optical transceiver modules and parallel embedded optics products for Space, Defence and Commercial Aerospace, and Industrial applications.

The company addresses the growing market demand for high-speed, high-reliability interconnects where high data rate communication links, low SWaP-C as well as radiation resistance performance are required. Reflex Photonics adds a new technology and product line to Smiths Interconnect’s portfolio, providing customers with a wider range of solutions encompassing multiple market segments. Reflex Photonics’ commitment for strong performance and its focus on innovation are the perfect fit for Smiths Interconnect’s long-term strategy to provide an increasingly wide range of solutions encompassing multiple market segments.

Performance



- Scalable: 10 to 28 Gbps+ in common footprint
- Radiation resistant
- Programmable / reconfigurable (smart)

SWaP-C



- Backplane / blind mate interconnect
- I/O density: 48 fibres in a single transceiver module
- Power: 100 mW/10 Gbps

Rugged

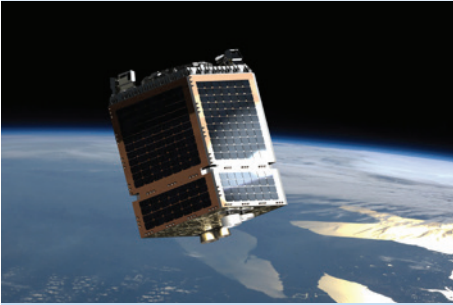


- Encapsulated packaging
- -40 °C to 100 °C operation @12.5 Gbps
- MIL-STD-883 shock and vibration
- Lightning, EMI & EMP immune

Markets & Applications

Through Reflex Photonics, Smiths Interconnect can now offer higher bandwidth, lower latency, and lower SWaP in differentiated high reliability applications.

Space



Optical interconnect within space vehicles in low-earth orbit // Optical interconnect within space vehicles in geostationary orbit

- High-throughput information satellites
- Aircraft and marine connectivity
- Very high-resolution earth imaging relay systems
- Large strategic science projects

Defence and Commercial Aerospace



Optical interconnect for upgraded military aircraft sub-systems // Active electronically scanned array radars

- Digital radars
- High performance computers
- High resolution imaging
- In-flight entertainment and connectivity

Industrial



Optical interconnect for high-speed, high-bandwidth 10GigE and 40GigE cameras // Test fleet data gathering for AI training of future Level 5 autonomous vehicles

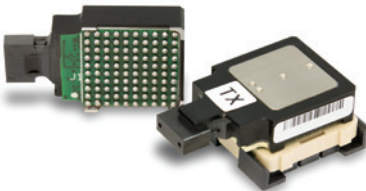
- High resolution cameras
- Autonomous driving cars
- Media converters
- Machine vision
- High speed SEM based defect review systems

Technology

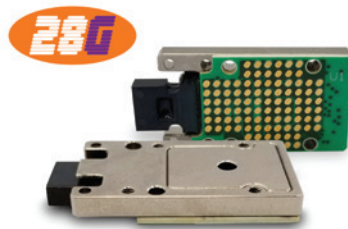
The core technology is the bevel optical fibre, allowing:

- Low-cost assembly
- Vision-assisted optical alignment

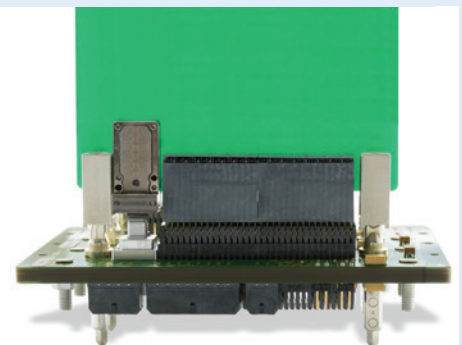
The low profile coupler and materials selection allow for parts that can be solder reflowed or used as engines in standard optical modules.



Optical engine



Ultra dense packaging



Optical interconnect

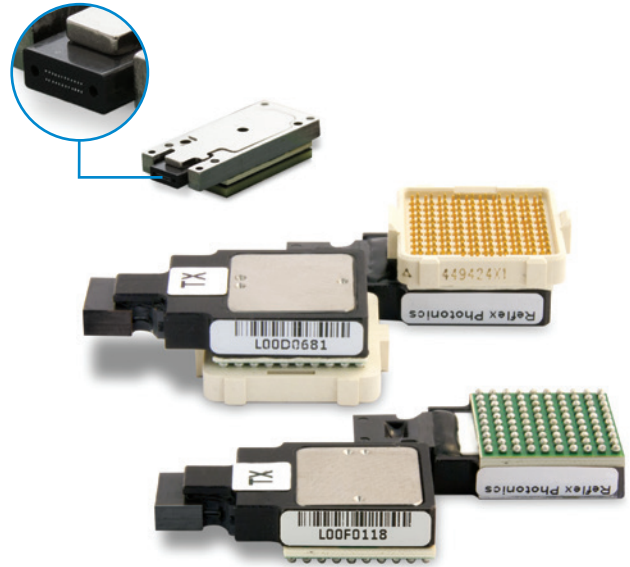
Product Overview

LightABLE™

Embedded Optical Module

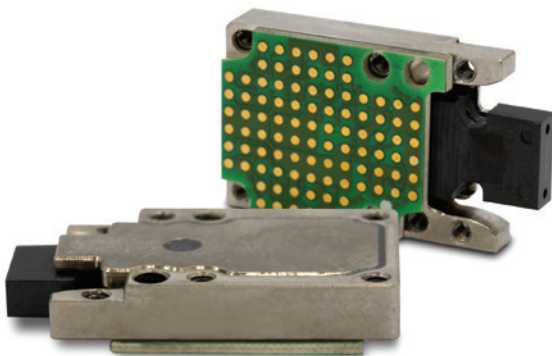
Key Features

- Small: Less than 5 mm high (SMT version)
- Rugged: MIL-STD 883 shock and vibration qualified
- Sealed: Moisture and thermal shock resistant
- Storage temperature: -57 °C to 125 °C
- Performance: Up to 28 Gbps/lane
- Operating temperature: From -40 °C to 100 °C
- Sensitivity: ≤ -12 dBm @ BER 10^{-12}
- Low power consumption: 100 mW/lane
- Proven: Thousands used in aerospace and defence applications



SpaceABLE®

Radiation Resistant Transceiver



Key Features

- Small: Less than 5 mm high.
- Rugged: Withstand radiation doses >100 krad (Si) and qualified per MIL-STD 883 shock and vibration.
- Expected life: Up to 20 years.
- Cold start temperature: -55 °C.
- Performance: Up to 28 Gbps/lane
- Operating temperature: From -40 °C to 100 °C
- Sensitivity: ≤ -9 dBm @ BER 10^{-12}
- Power consumption: as low as 85 mW/lane (<10 pJ per bit)

SpaceABLE® also passed standard LightABLE™ qualifications

- Vibration tests per MIL-STD-883, Method 2007.3
- Mechanical shock tests per MIL-STD-883, Method 2002.4
- Thermal shock tests per MIL-STD-883, Method 1011.9
- Damp heat tests per MIL-STD-202, Method 103B
- Cold storage tests per MIL-STD-810, Method 502.5
- Thermal cycling tests per MIL-STD-883, Method 1010.8

LightVISION™

Industrial Transceiver

Key Features

- Flexible height with LGA interposer
- Rugged RoHS electrical interface
- Screw-in optical module
- Standard MTP/MPO cable connection
- Robust, board-mounted optical module with reduced footprint
- Performance: up to 150G from 0 °C to 85 °C
- Low power consumption: 100 mW per lane



Configurations

- 12-lane transmitter
- 12-lane receiver
- 4-lane transceiver

Applications

- Smart car, high-resolution cameras

- LIDAR connection to embedded computer
- Smart city, surveillance cameras
- Industry 4.0
- Machine vision

Product Overview Continued

SNAP12

12-lane pluggable parallel optical transmitter or receiver

SNAP12 embedded transceiver

The SNAP12 is a pluggable parallel optical transmitter or receiver module. All modules include Reflex Photonics' start of the art *LightABLE™* optical packaging technology. The SNAP12 transmitter and receiver modules enable high performance multilane optical links designed for high-speed data communications and computing applications. The module operates at up to 10.3125 Gbps per lane in commercial and industrial temperature ranges. The interconnect distance is up to 300m.



Specifications & Key Features

- 12 independent parallel optical lane
- Data rate: 10.3125 Gbps, 6.25 Gbps or 3.125 Gbps per lane
- Commercial operating temperature (0 °C to 70 °C)
- 100 mW/lane typical power consumption
- Card edge mountable
- Standard MPO/MPT interconnect
- Single 3.3 V power supply
- OM3 and OM4 multimode fibres supported
- Data protocol agnostic

Capabilities



R&D Lab

- Advanced designs
- Concepts
- De-bug
- Coding
- Thermal testing
- DVT



Manufacturing Lab

- Die placement
- Wire bonding
- Automated dispensing
- Optical alignment



Testing Lab

- Eye diagram capture
- BER testing
- Volume fixturing
- Thermal cycling
- Programming



Optics Lab

- Optical coupler fabrication
- Re-work for PCBs
- Connectors
- Solder reflow ovens
- Inspection systems

Location

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