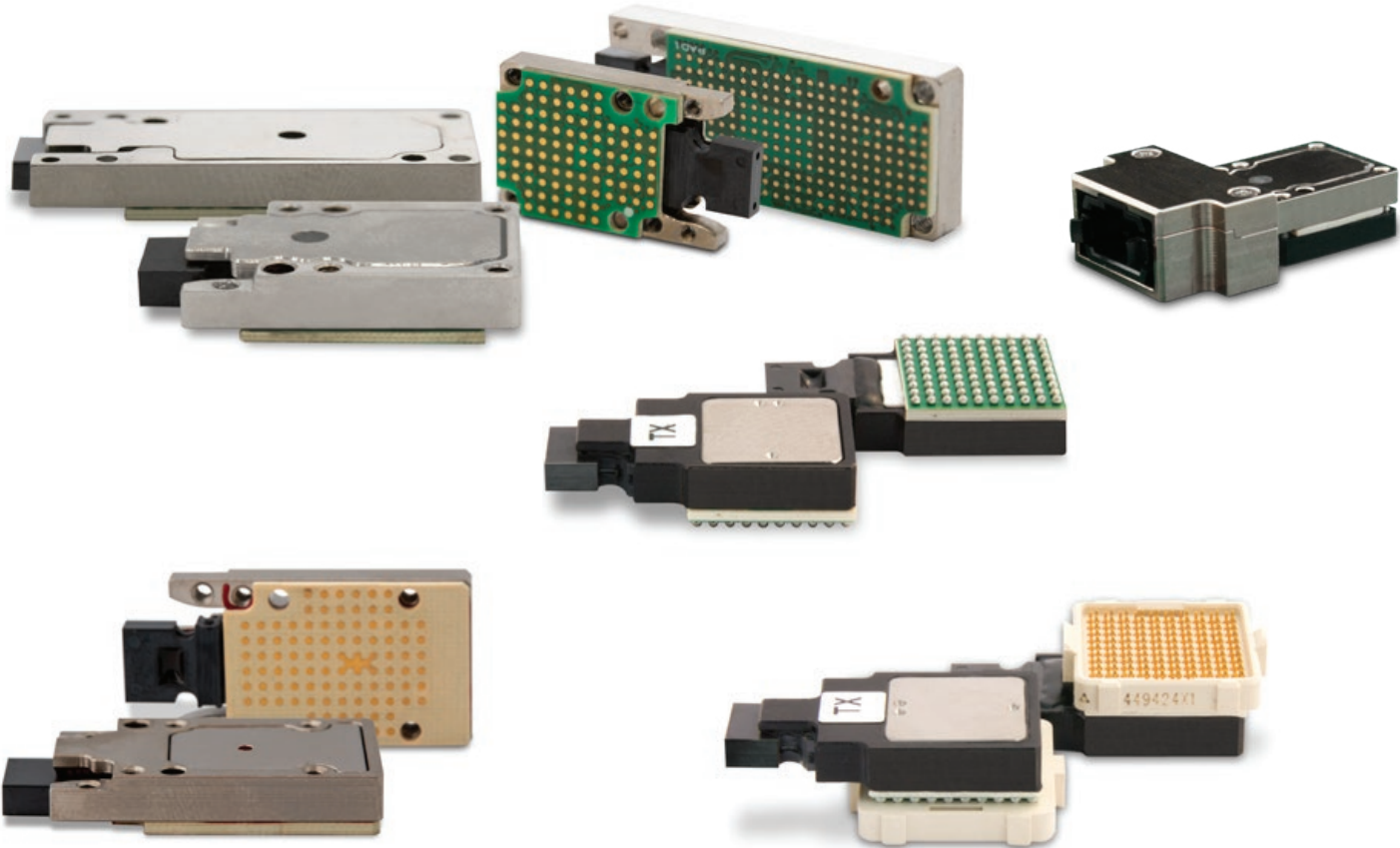


LightABLE

10G LM Series, 10G LL Series, and 28G LL Series

Rugged optical transceivers



The *LightABLE* 10G LM Series, 10G LL Series, and 28G LL Series optical modules are the answer to the stringent SWaP requirements of today's defense applications in which fiber optics are replacing big and power-hungry high-bandwidth copper interconnects.

These modules offer flexibility, light weight, very high bandwidth, and forward compatibility.

The low profile *LightABLE*™ 10G LM Series module can be mounted directly upon a high-speed printed circuit board via surface mountable 1.27 mm pitch BGA or via a MEG-array connector.

The *LightABLE* 10G and 28G LL Series low profile screw-in modules mount to the board via an LGA connector (interposer).

Extensive and flexible product line



LightABLE 10G LM
4TRX, 12TX, and 12RX
(SMT version)



LightABLE 10G LM
4TRX, 12TX, and 12RX
(MEG-array version)



LightABLE 10G LL
4TRX, 12TX, and 12RX



LightABLE 10G LL
12TRX



LightABLE 28G LL
4TRX

Rugged performance

The *LightABLE* embedded optical modules meet the strictest shock and vibration requirements for military applications and offer high bandwidth (greater than 300 Gbps in half-duplex) in a chip-size package.

Channels are independent and support data-agnostic protocols, such as Ethernet, Fiberchannel, Infiniband, and PCIe.

These optical modules include clock and data recovery, equalizers, and pre-emphasis to compensate long traces; these features can be turned off for short traces (less than 10 cm) to reduce power consumption.

Rugged, low-SWaP,
multichannel optical
transceivers for
defense applications.

Key advantages

- **Rugged:** MIL-STD 883 shock and vibration qualified
- **Sealed:** Moisture and thermal shock resistant
- **Operating temperature:** -40 °C to 85 °C
- **Storage temperature:** -57 °C to 100 °C
- **Proven:** Used in many defense applications

	10G		28G
	LM	LL	LL
Height (mm)	< 5 (SMT)	5.5*	6*
Bandwidth (Gbps/channel)	10.3125		28
Sensitivity (dBm for BER 10 ⁻¹²)	-12	-12 or -9	-7.5
Power consumption (mW/channel)	100		180

*: with interposer

Configurations

10G LM Series

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

10G LL Series

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

28G LL Series

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

Applications

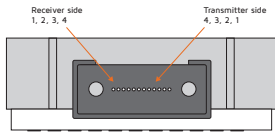
- Sensor connectivity including all-digital AESA radars
- High I/O density, high BW communication links
- ISR embedded systems
- CCD/CMOS imaging sensor
- FPGA SerDes application

LightABLE features

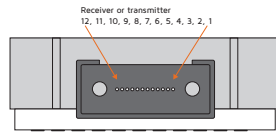
- Multimode 850 nm wavelength laser
- Standard MT parallel fiber connector
- Equalizer, pre-emphasis, and adjustable output
- Monitoring: LOS, RSSI, temperature, etc.
- Integrated microcontroller

	10G		28G
	LM	LL	LL
Reach on OM3 ribbon fiber (m)	Up to 100		Up to 70
Mounting	BGA or MEG-Array	LGA interposer	
Soldering	RoHS or tin-lead	n.a.	

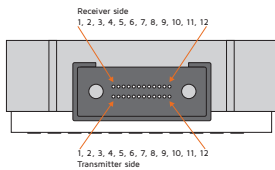
Fiber assignment



LightABLE 10G LM 4TRX, LightABLE 10G LL 4TRX, and LightABLE 28G LL 4TRX

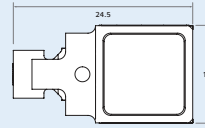


LightABLE 10G LM 12TX or 12RX, LightABLE 10G LL 12TX or 12RX, and LightABLE 28G LL 12TX or 12RX

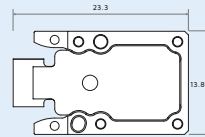


LightABLE 10G LL 12TRX

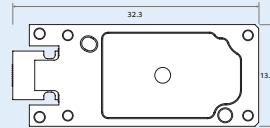
Module actual size



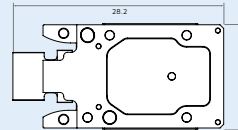
Actual size of LightABLE 10G LM 4TRX, 12TX, and 12RX (SMT versions)*



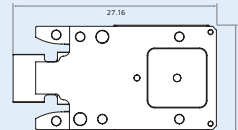
Actual size of LightABLE 10G LL 4TRX, 12TX, and 12RX*



Actual size of LightABLE 10G LL 12TRX*



Actual size of LightABLE 28G LL 4TRX*



Actual size of LightABLE 28G LL 12TX and 12RX*

* measurements given in mm

Optical MT connections

MicroClip

The Reflex Photonics technology MicroClip™ is a small, lightweight clip that connects an MT connector cable to the LightABLE. These modules, when paired with the MicroClip have proven they can withstand a 1 kg live traffic fiber pull test (10 Gbps/channel) on a 12-fiber ribbon cable pigtail without any signal performance degradation.

Screw-in connector

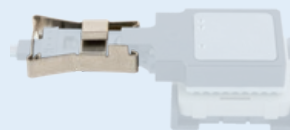
Using Reflex Photonics technology, the screw-in connector provides extra protection for applications where there is significant pulling on the cable.

Electrical connection

Interposers

LGA interposers are used with all LL Series modules. They provide a secure and flexible low-profile electrical interface with the board, and position the LightABLE on the board with two alignment pins.

MicroClip



MicroClip MT ferrule shown on a LightABLE 10G LM module.



Screw-in connector shown on a LightABLE 28G LL module.



LGA interposers

LightABLE ordering information

LightABLE LM 10G Series

Part Number	Product Description	Channels or Lanes	Bandwidth (Gbps/ch.)	Sensitivity (dBm)	Mounting	Soldering	Operating Temp. (°C)
LMT12P4183330AA	LightABLE 10G LM 12TX transmitter	12	10.3125	n.a.	Pluggable	RoHS	-40 to 85
LMT12P4182330AA	LightABLE 10G LM 12TX transmitter	12	10.3125	n.a.	Surface mount	Tin-lead	
LMR12P4183301AA	LightABLE 10G LM 12RX receiver	12	10.3125	-9	Pluggable	RoHS	
LMR12P4182301AA	LightABLE 10G LM 12RX receiver	12	10.3125	-9	Surface mount	Tin-lead	
LMR12P4182303AA	LightABLE 10G LM 12RX receiver	12	10.3125	-12	Surface mount	Tin-lead	
LMR12P4183303AA	LightABLE 10G LM 12RX receiver	12	10.3125	-12	Pluggable	RoHS	
LMR12P4184301AA	LightABLE 10G LM 12RX receiver	12	10.3125	-9	Pluggable	Tin-lead	
LMR12P4184303AA	LightABLE 10G LM 12RX receiver	12	10.3125	-12	Pluggable	Tin-lead	
LMX04P4183321AA	LightABLE 10G LM 4TRX transmit/receive	4+4	10.3125	-9	Pluggable	RoHS	
LMX04P4182321AA	LightABLE 10G LM 4TRX transmit/receive	4+4	10.3125	-9	Surface mount	Tin-lead	
LMX04P4182323AA	LightABLE 10G LM 4TRX transmit/receive	4+4	10.3125	-12	Surface mount	Tin-lead	
LMX04P4183323AA	LightABLE 10G LM 4TRX transmit/receive	4+4	10.3125	-12	Pluggable	RoHS	

LightABLE 10G LL Series

Part Number	Product Description	Channels or Lanes	Bandwidth (Gbps/ch.)	Sensitivity (dBm)	Mounting	Operating Temp. (°C)
LLX04P9185321AA	LightABLE 10G LL 4TRX transmit/receive	4+4	10.3125	-9	LGA	-40 to 85
LLX04P9185323AA	LightABLE 10G LL 4TRX transmit/receive	4+4	10.3125	-12	LGA	
LLT12P9185330AA	LightABLE 10G LL 12TX transmitter	12	10.3125	n.a.	LGA	
LLR12P9185301AA	LightABLE 10G LL 12RX receiver	12	10.3125	-9	LGA	
LLR12P9185303AA	LightABLE 10G LL 12RX receiver	12	10.3125	-12	LGA	
LLX12P418532101	LightABLE 10G LL 12TRX transmit/receive	12+12	10.3125	-9	LGA	
LLR12P618530101	LightABLE 10G LL MPO 12RX receive	12	10.3125	-9	LGA	
LLT12P618533001	LightABLE 10G LL MPO 12TX transmit	12	10.3125	n.a.	LGA	
LLX04P618532101	LightABLE 10G LL MPO 4TRX transmit/receive	4+4	10.3125	-9	LGA	

LightABLE 28G LL Series

Part Number	Product Description	Channels or Lanes	Bandwidth (Gbps/ch.)	Sensitivity (dBm)	Mounting	Operating Temp. (°C)
LLX04P428532101	LightABLE 28G LL 4TRX transmit/receive	4+4	28	-7.5	LGA	-40 to 85
LLT12P928533003	LightABLE 28G LL 12TX transmitter	12	28	n.a.	LGA	
LLR12P928530102	LightABLE 28G LL 12RX receiver	12	28	-7.5	LGA	
LLR12P628530502	LightABLE 28G LL MPO 12RX receive	12	28	-7.5	LGA	
LLT12P628532003	LightABLE 10G LL MPO 12TX transmit	12	28	n.a.	LGA	
LLX04P628532502	LightABLE 28G LL MPO 4TRX transmit/receive	4+4	28	-7.5	LGA	

See datasheets for accessory part numbers including interposers, fiber cables, and dust caps.

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