

LightABLE™

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

Rugged optical transceivers



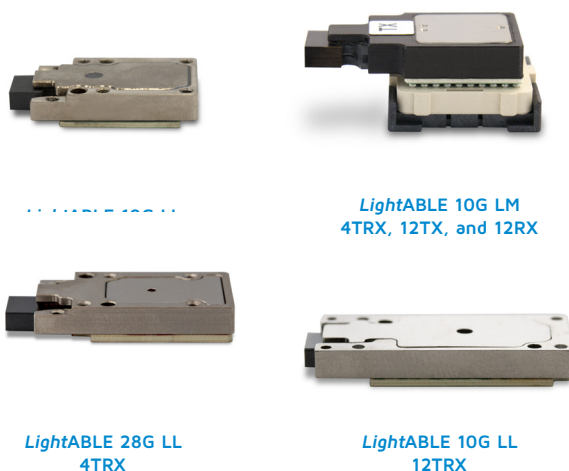
The *LightABLE* 10G LM Series, 10G LL Series, and 28G LL Series optical modules are the answer to the stringent SWaP requirements of today's defence, commercial aerospace, and critical embedded applications in which fibre optics are replacing big and power-hungry high-bandwidth copper interconnects.

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 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



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 defence, commercial aerospace, and critical embedded 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 defence applications

	10G		28G
	LM	LL	LL
Height (mm)	8.7	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

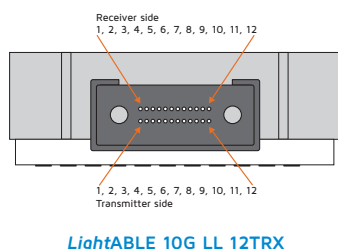
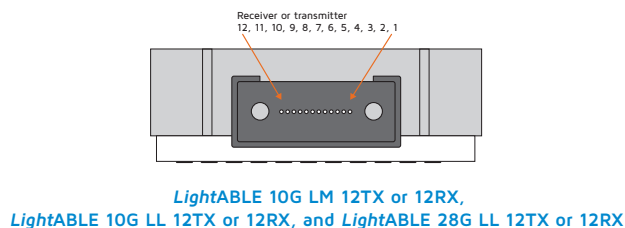
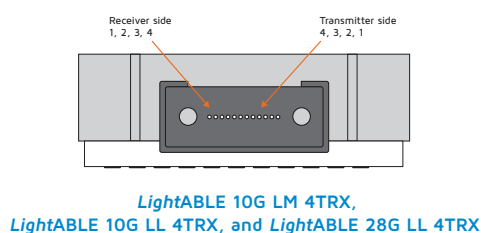
- Sensor connectivity including all-digital AESA radars
- High I/O density, high BW communication links
- ISR embedded systems
- CCD/CMOS imaging sensor
- FPGA SerDes application

LightABLE features

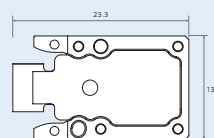
- Multimode 850 nm wavelength laser
- Standard MT parallel fibre connector
- Equalizer, pre-emphasis, and adjustable output
- Monitoring: LOS, RSSI, temperature, etc.
- Integrated microcontroller

	10G		28G
	LM	LL	LL
Reach on OM3 ribbon fibre (m)	Up to 100		Up to 70
Mounting	BGA or MEG-Array	LGA interposer	

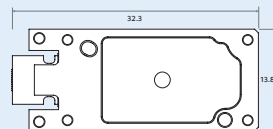
Fibre assignment



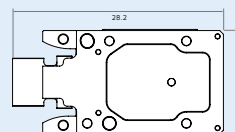
Module actual size



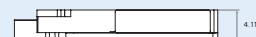
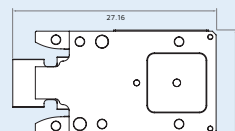
Actual size of *LightABLE* 10G LL 4TRX, 12TX, and 12RX*



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

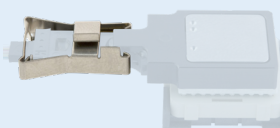
The Reflex Photonics technology MicroClip™ is a small, lightweight clip that connects an MT connector cable to the *LightABLE*. These modules, when paired with the MicroClip have proven they can withstand a 1 kg live traffic fibre pull test (10 Gbps/channel) on a 12-fibre ribbon cable pigtail without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

Electrical connection

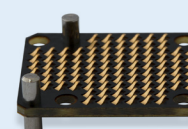
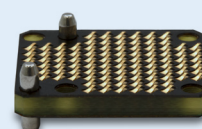
Interposers

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.



LightABLE ordering information

LightABLE LM 10G Series

Part Number	Product Description	Channels or Lanes	Band width (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
LMT12P4183310AA	LightABLE 10G LM 12TX transmitter				Pluggable	RoHS	
LMT12P4184310AA	LightABLE 10G LM 12TX transmitter				Pluggable	Tin-lead	
LMT12P4184330AA	LightABLE 10G LM 12TX transmitter				Pluggable	Tin-lead	
LMR12P4183301AA	LightABLE 10G LM 12RX receiver			-9	Pluggable	RoHS	
LMR12P4183303AA	LightABLE 10G LM 12RX receiver			-12	Pluggable	RoHS	
LMR12P4184301AA	LightABLE 10G LM 12RX receiver			-9	Pluggable	Tin-lead	
LMR12P4184303AA	LightABLE 10G LM 12RX receiver			-12	Pluggable	Tin-lead	
LMX04P4183321AA	LightABLE 10G LM 4TRX transmit/receive	4+4		-9	Pluggable	RoHS	
LMX04P4183323AA	LightABLE 10G LM 4TRX transmit/receive			-12	Pluggable	RoHS	
LMX04P4184323AA	LightABLE 10G LM 4TRX transmit/receive				Pluggable	Tin lead	

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			-12		
LLT12P9185330AA	LightABLE 10G LL 12TX transmitter	12		n.a.		
LLR12P9185301AA	LightABLE 10G LL 12RX receiver			-9		
LLR12P9185303AA	LightABLE 10G LL 12RX receiver			-12		
LLX12P4185321AA	LightABLE 10G LL 12TRX transmit/receive	12+12		-9		
LLR12P6185301AA	LightABLE 10G LL MPO 12RX receive	12		-9		
LLT12P6185330AA	LightABLE 10G LL MPO 12TX transmit			n.a.		
LLX04P6185321AA	LightABLE 10G LL MPO 4TRX transmit/receive	4+4		-9		

LightABLE 28G LL Series

Part Number	Product Description	Channels or Lanes	Bandwidth (Gbps/ch.)	Sensitivity (dBm)	Mounting	Operating Temp. (°C)
LLX04P9285325AA	LightABLE 28G LL 4TRX transmit/receive	4+4	28	-7.5	LGA	-40 to 85
LLT12P928534001	LightABLE 28G LL 12TX transmitter	12		n.a.		
LLR12P928530102	LightABLE 28G LL 12RX receiver			-7.0		
LLR12P628530502	LightABLE 28G LL MPO 12RX receive			-7.5		
LLT12P628534001	LightABLE 10G LL MPO 12TX transmit			n.a.		
LLX04P628532502	LightABLE 28G LL MPO 4TRX transmit/receive	4+4		-7.5		

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