Multiplex, Inc.
Photonics for Communications

MTX310E Series

10Gb/s 1310nm Electro-absorption Modulated Laser (EML)
7 Pin Package with GPO ™ RF Input

The MTX310E (EML) is a cost-effective solution for 10 Gb/s digital optical signal transmission. The MTX310E series modules are optimized to operate at a bit-rate of 10Gb/s for OC-192 and metro transmission with an excellent pedigree of reliability The very low dispersion penalty at 1310nm wavelength find wide applications over most installed intra-city optical fiber networks. The MTX310E module is well suited for reach applications up to 40km.

The 7 pin package with a GPO connector contains a high-speed EML chip, optical isolator, back facet monitor diode, thermistor and thermoelectric cooler. The incorporated thermoelectric cooler keeps the laser chip at a well-controlled temperature. This allows the device to operate over a case temperature range of 0°C to +70°C.

The MTX310E series comes with a standard 1.0 meter single-mode fiber pigtail and an FC/PC connector. Other pigtails fiber types, lengths and terminations may be specified as options.

Applications:

- MTX series is designed for high-speed telecom and datacom transmissions over spans up to 40km in length in compliance with Telcordia GR-253-CORE (issue 3) LR-1 specifications.

Features:

- Industry standard precision GPO package
- High-speed design optimized for modulation at 9.95328Gb/s.
- 50 Ohm input impedance match.
- Integrated optical isolator.

Compliance:

- Conforms to the requirements of the European Union Directive 2002/95/EC for the Restriction of Hazardous Substance (RoHS)

Optical and Electrical Characteristics

All modules are tested to pass the SONET OC-192 eye-mask criteria.

PARAMETER	SYMBOL	CONDITION	MIN	MAX	UNIT
DFB Laser:					
Set temperature for laser operation	T_{SET}	Temperature set for TEC	20	35	°C
Threshold Current	I_{TH}	At T_{SET}, CW operation, BOL		30	mA
Operating Current	I_{op}	At T_{SET}, BOL	40	100	mA
		At T_{SET}, EOL	60	150	
Operating Wavelength	λ	L	1290	1330	nm
Side-Mode Suppression Ratio	SMSR	At T_{SET}, I_{OP}	30		dB
EA Modulator:					
Mark Offset Voltage[1]	V_{MARK}	DC (on level modulator voltage)	-1.0	-0.1	V
Peak-to-Peak RF Drive Voltage	V_{PP}		2.0	2.7	V
Input Impedance	Z_{IN}		45	55	Ω
Module:					
Extinction Ratio	E_R	V_{MARK} biased, modulated with V_{PP}	8		dB
Monitor Photodiode Current	I_{MOD}		10	1500	μA
Modulated Output Power (EOL)	P_{MOD}	$I_{OP} = I_{TH} + 50mA$ 2km 15km 40km	 -6 -4 1	 -1 1 5	dBm
Optical Isolation			30		dB
Operating Case Temperature	T_{CASE}		0	70	°C
Chromatic Dispersion Penalty	DP			1.0	dB
High Frequency Cut-Off	F_{3db}		10		GHz
Low Frequency Cut-Off	F_{LC}			100	kHz
RF Return Loss, 50Ω	S_{11}	0.1 to 8GHz		-10	dB
Rise / Fall Time, 10% - 90%	T_R-T_F			40	ps
TEC current	I_{TEC}		-	1.2	A
Thermistor Resistance	R_{TH}	At 25 °C	9.5	10.5	kΩ
Lead Soldering time	t	Soldering temperature 260 °C,		10	s

Table Notes: 1. Vmark is the top rail DC voltage applied to the modulator.

Absolute Maximum Operating Ratings

Optimal thermal contact between the housing and the application heat-sink is required.

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device.
Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

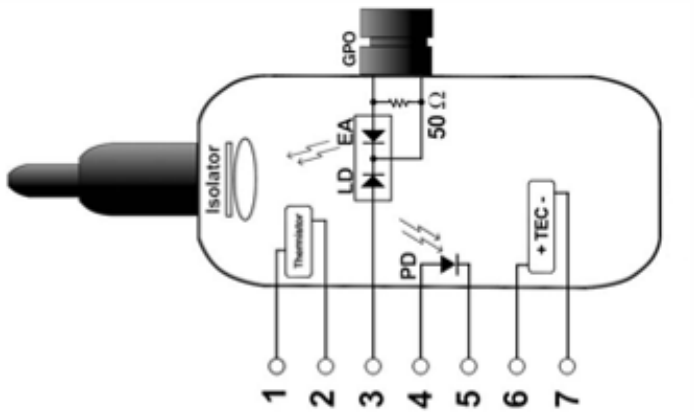
PARAMETER	SYMBOL	CONDITION	MIN	MAX	UNIT
Operating Case Temperature Range	T_{CASE}		-5	75	°C
Storage Case Temperature Range	T_{STG}		-40	85	°C
Laser Forward Bias Current	L_{FL}	CW	-	150	mA
Laser Reverse Voltage	V_{RL}	CW	-	2	V
Optical Output Power	P	CW	-	10	mW
Laser Chip Temperature	T_{LD}		15	40	°C
Modulator Reverse Voltage	V_{MR}		-	5	V
Modulator Forward Voltage	V_{MF}		-	1	V
Photodiode Reverse Voltage	V_{PD}		-	10	V
Photodiode Forward Current	I_{FPD}		-	1	mA
Thermistor Voltage	V_{TH}		-	5	V
Thermistor Current	I_{TH}		-	2	mA
TEC Current	I_{TEC}		-1.5	1.5	A
TEC Voltage	V_{TH}		-	5	V

Ordering information:

MTX	X	XX	X	W	XXX	XX	XX	-XX	-CXXX
	Wavelength:	**Data Rate:**	**Laser Type:**		**Package Style:**	**Fiber Pigtail Type:**	**Pigtail Connector:**	**Reach:**	**Customized Information:**
	3=1310nm	10= 9.9538Gb/s	E= EML		B01=GPO	F5= SMF-900 F6= SMF-250 F7= PMF	SC= SC-UPC FC= FC-UPC LA= LC-APC MC= MC-UPC Other connectors are available upon request	S1=2km I1=15km L1=40km	Customized for specific customer requirements

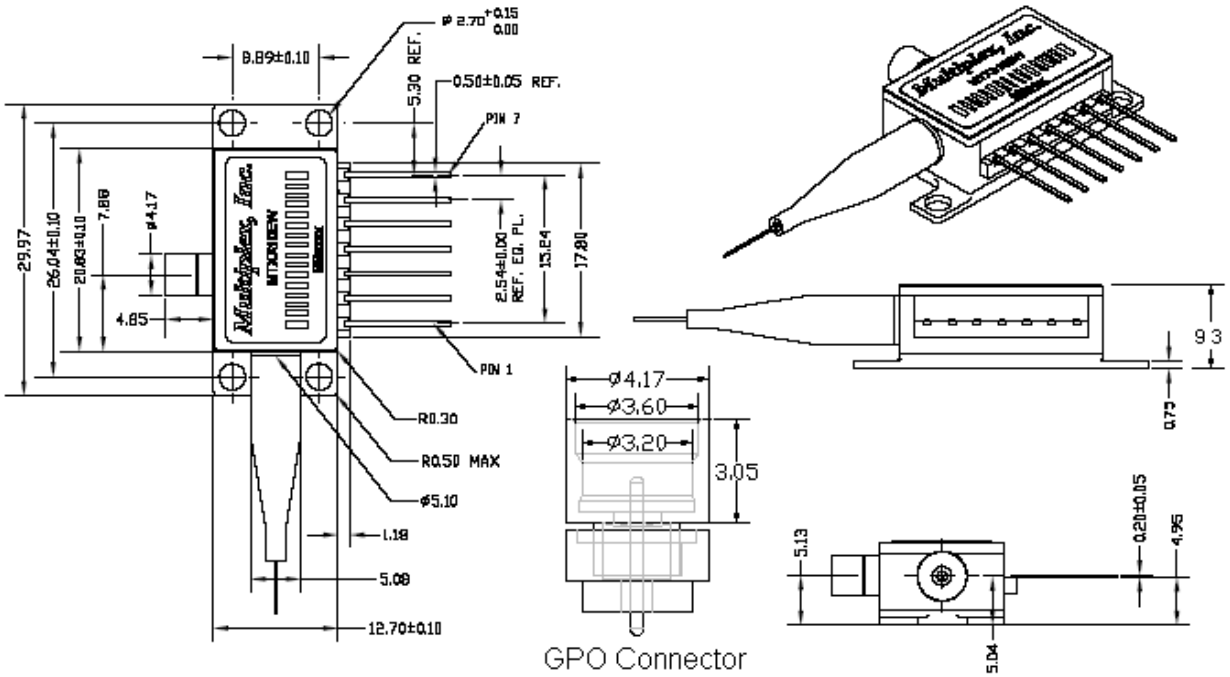
E.g. MTX310EWB01F5SC-L1 has a wavelength 1310nm, Data Rate 9.95328Gb/s, EML Laser, GPO Package, SMF-900 Fiber Pigtail with SC Connector fitted for a 40Km application.

Internal Circuit:



Pin Number	Description
1	Thermistor (Resistance=10 kΩ)
2	Thermistor
3	Laser Anode
4	Detector Monitor Anode
5	Detector Monitor Cathode
6	Thermoelectric Cooler (+)
7	Thermoelectric Cooler (-)
GPO	RF and Case Ground

Mechanical



WARRANTY

Multiplex warrants all standard laser products, when used within the operating limits, against defects in material and workmanship for a period of one year from date of shipment.

QUALITY

Multiplex is qualified to International Standard ISO 9001:2008.

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