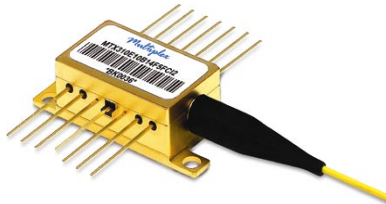


MTX510E Series

10Gb/s 1550nm Electro-absorption Modulated Laser (EML)

14 Pin Package with G-S-G RF Input



The MTX510E series contain an electro-absorption modulated laser (EML) module consists of a multi-quantum-well DFB laser device with 1550nm nominal emission wavelength and a monolithically integrated electro-absorption (EA) modulator in a 14-pin, hermetically-sealed package. State-of-the-art, epoxy-free laser-welding is utilized. The laser module also contains a thermoelectric cooler and a monitor photodiode.

The MTX510E 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 MTX510E module is well suited for short, intermediate and extended reach applications up to 20, 40 and 80 km respectively. Careful control of the output signal for minimum “chirp” allows the MTX510E to provide superior performance and long reach over spans of standard single mode fiber.

The 14 pin package contains a high-speed laser diode, 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 MTX510E series comes with a standard 1.0 meter single-mode fiber pigtail and an FC/PC connector. Other pigtails fiber types and terminations may be specified as options.

Applications:

- MTX510E series is designed for high-speed telecom and datacom transmissions over spans up to 80km in length in compliance with Telcordia GR-253-CORE (issue 3) LR-2 specifications.

Features:

- Industry standard precision 14-pin package with G-S-G RF input.
- Available for C-band ITU Channels 13 through 60 on 50GHz and 100GHz spacing.
- 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	1529.16	1567.13	nm
Side-Mode Suppression Ratio	SMSR	At T_{SET} , I_{OP}	35		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} 20km 40km 80km	8.2 10 10		dB
Monitor Photodiode Current	I_{MOD}		10	1500	μA
Modulated Output Power (EOL)	P_{MOD}	$I_{OP} = I_{TH} + 50mA$ 20km 40km 80km	-6 -1 0	-1 2 4	dBm
Optical Isolation			30		dB
Operating Case Temperature	T_{CASE}		0	70	°C
Chromatic Dispersion Penalty	DP	20km at 9.95328 Gb/s, $2^{31} - 1$ PRBS NRZ modulated, 400 ps/nm dispersion. BER = 10^{-12}		2.0	dB
		40km at 9.95328 Gb/s, $2^{31} - 1$ PRBS NRZ modulated, 800 ps/nm dispersion. BER = 10^{-12}		2.0	
		80km at 9.95328 Gb/s, $2^{31} - 1$ PRBS NRZ modulated, 1600 ps/nm dispersion. BER = 10^{-12}		2.0	
High Frequency Cut-Off	F_{3db}		8		GHz
Low Frequency Cut-Off	F_{LC}			100	kHz
RF Return Loss, 50 Ω	S_{11}	0.1 to 8GHz		-8	

Rise / Fall Time, 10% - 90%	T_R-T_F			40	ps
TEC thermal capacity ³	ΔTEC	At Tset, lop $\Delta \text{TEC} = T_{\text{case}} - T_{\text{set}}$	-30	45	°C
TEC current	I_{TEC}	At Tset, lop EOL	-	1.2	A
TEC voltage	V_{tec}	At Tset, lop EOL		2.5	V
TEC AC resistance	R_{tec}	At Tset, lop EOL		1.7	Ω
TEC power dissipation	P_{tec}	At Tset, lop EOL		1.0	W
Thermistor Resistance	R_{TH}	At 25 °C	9.5	10.5	k Ω
Thermistor B Constant			3800	4000	
Lead Soldering time	t	Soldering temperature 260 °C,		10	s

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

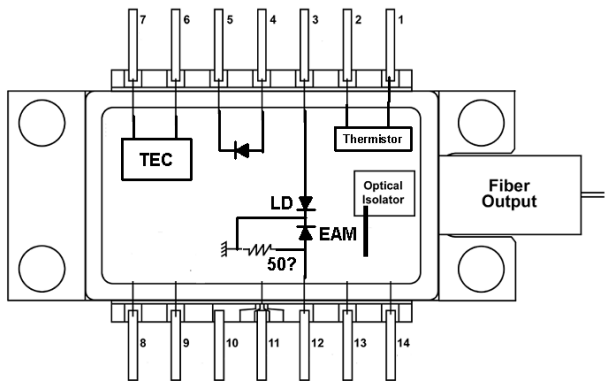
Absolute Maximum Operating Ratings Optimal thermal contact between the housing and the application heat-sink is required. Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for extended periods can adversely affect device 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	I_{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	XXXX	XXX	XX	XX	-XX	-CXXX
	Wavelength:	Data Rate:	Laser Type:	Wavelength:	Package Style:	Fiber Pigtail Type:	Pigtail Connector:	Reach:	Customized Information:
	5=1550nm	10= 9.95328Gb/s	E= EML	WCxx= Fixed λ, C channel. WHxx= Fixed λ, H channel. W [blank] = Omitted for Non-ITU	B04=14-Pin	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	S2=20km I2=40km L2=80km	Customized for specific customer requirements

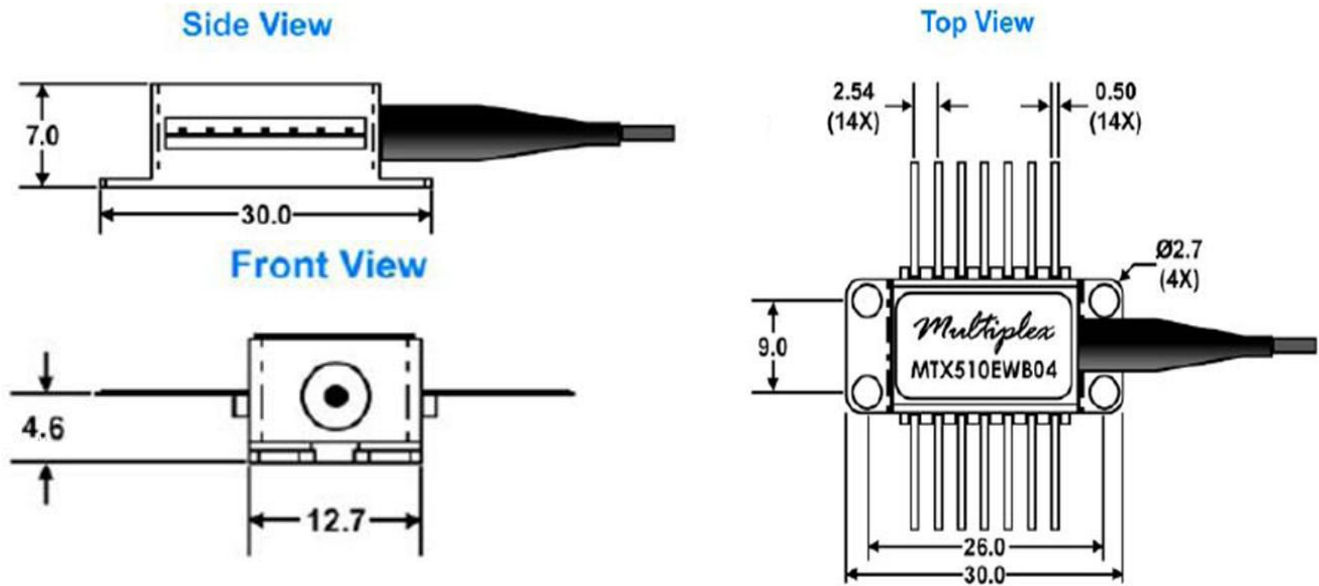
For example, MTX510EWB04F5SC-I2 has a wavelength 1550nm, Data Rate 9.95328Gb/s, non-ITU, 14-Pin Package, SMF-900 Fiber Pigtail with SC Connector fitted for a 40Km application.

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 (-)
8	N/A
9	N/A
10	N/A
11	Ground
12	RF Input
13	Ground
14	N/A

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.



Multiplex, Inc. 
Photonics for Communications
Multiplex, Inc.
5000 Hadley Road
South Plainfield, NJ 07080 USA
Tel: 908.757.8817 Fax: 908.769.4288
www.multiplexinc.com