OKI Electronics Components

Rev.2 [Oct.2002]

OL5160M Preliminary

1550nm 10Gb/s EA Modulated DFB Laser Integrated with EA Driver IC.

1. DESCRIPTION

OL5160M is a 1550-nm electro-absorption (EA) modulated DFB laser (EML) integrated with an EA Driver IC for 10 Gb/s operation. The EML and driver IC is integrated in a 14 + 5 pin small butterfly-type package with an optical isolator, an InGaAs monitor PD and a thermoelectric cooler.

2. FEATURES

- Low dispersion penalty over 40 km (800 ps/nm) for 10 Gb/s operation.
- Large dynamic extinction ratio (> 9.0 dB) and fiber output power (> 3 dBm CW).
- EA driver IC is integrated and the differential electrical signal can be fed through the co-planar transmission lines located at the rear side of the small butterfly package.

3. APPLICATION

- 10 Gb/s (OC-192) intermediate reach transmission
- High-speed data communication

4.OPTICAL AND ELECTRICAL CHARACTERISTICS

(T_{LD}= 25°C, Tc=0 to 75°C , unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Threshold Current	Ith	CW	---	---	35	mA
Operation Current	Iop	---	---	---	100	mA
Fiber Output Power (Average)	P_{AVG}	If = Iop, under modulation	- 1	---	---	dBm
Peak Wavelength	λp	If = Iop	1530	---	1565	nm
Side Mode Suppression Ratio	SMSR	If = Iop	35	---	---	dB
LD Forward Voltage	Vf	If = Iop, CW, Vm = 0V	---	---	1.7	V
Monitor Current	Im	If = Iop, CW	100	---	1000	μA
Driver IC Supply Voltage	Vss	---	-5.5	---	-5.0	V
X-Point Control Voltage	Vx	---	Vss+0.8	---	Vss+2.2	V
EA Modulation Voltage Control Voltage	Vm	---	Vss	---	Vss+1.0	V
EA Bias Control Voltage	Vb	---	Vss	---	Vss+2.2	V
Driver IC Supply Current	Iss	---	--	--	285	mA
Input Return Loss	S11	100kHz-10GHz	---	---	-10	dB
Extinction Ratio	ER	10 Gb/s,2^{31}-1NRZ	9.0	10.0	---	dB
Dispersion Penalty	DP	800 ps/nm, BER at 10^{-12}	---	---	2	dB
Tracking Error	TRE	Im=const. 0/25/75°C	--	---	0.5	dB
TEC Current	Ipe	ΔT = 50°C, Po = 3dBm	---	---	1.2	A
TEC Voltage	Vpe	ΔT = 50°C, Po = 3dBm	---	---	3	V
Thermistor Resistance	Rth	-----	9.5	---	10.5	kΩ
Thermistor B Value	Bth	25°C/50°C	---	3450	---	K

5.ABSOLUTE MAXIMUM RATING

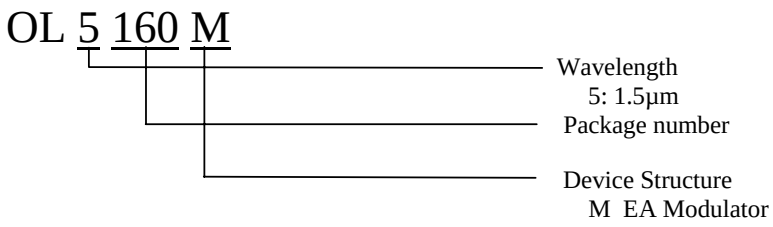
(Tc = 25 °C, unless otherwise specified)

Parameter	Symbol	Min.	Max.	Unit
Operating Case Temperature	Tc	0	75	°C
Storage Temperature	Tstg	-40	85	°C
LD Forward Current	I_{LDF}	---	150	mA
LD Reverse Voltage	V_{LDR}	---	2	V
Driver IC Supply Voltage	Vss	-6.5	0.3	V
X-Point Control Voltage	Vx	Vss-4.8(Min. -6.5)	Vss+2.4(Max. 0.3)	V
EA Modulation Voltage Control Voltage	Vm	-6.5	Vss+1.2(Max. 0.3)	V
EA Bias Control Voltage	Vb	-6.5	Vss+2.4(Max. 0.3)	V
TEC Voltage	Vpe	---	3.2	V
TEC Current	Ipe	---	1.5	A

6. CONNECTOR AND FIBER SPECIFICATIONS

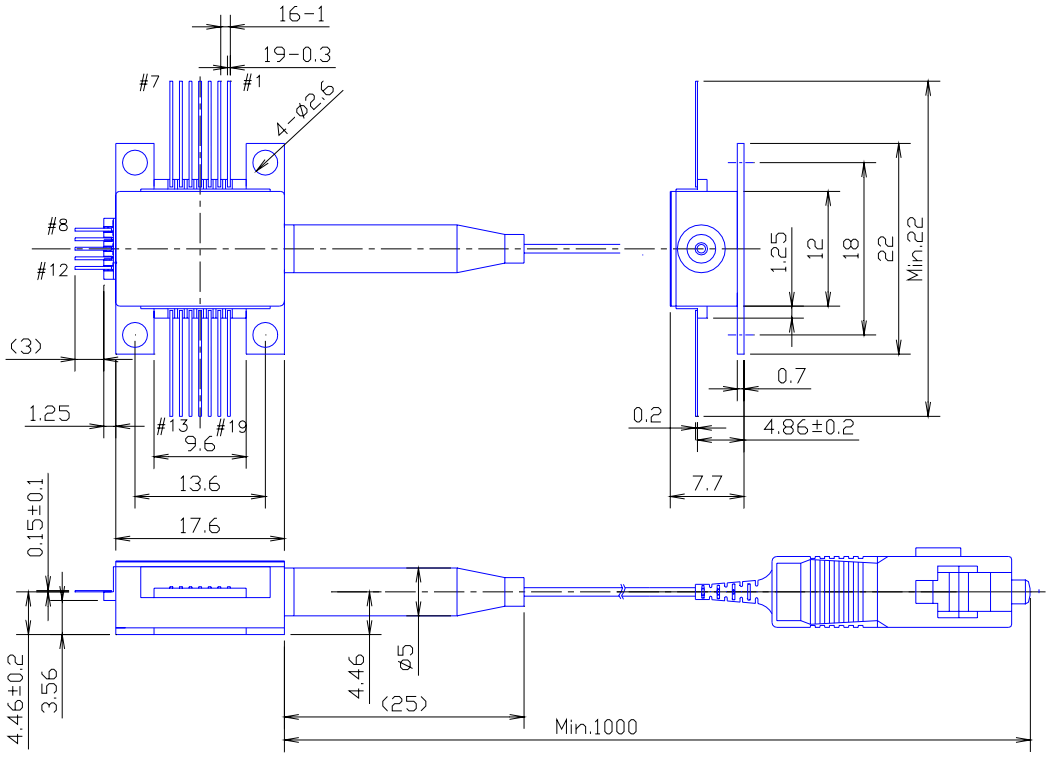
Parameter	Specifications	Unit
Type	SMF	---
Mode Field Diameter	10.5+/-1	um
Cladding Diameter	125+/- 2	um
Jacket Diameter	0.9	mm
Length	1 (min.)	m
Connector	SC/SPC	---

7.ORDERING INFORMATION



8.OUTLINE DRAWING

All dimensions in millimeters
Tolerances unless noted +/-0.5
Package No. 160

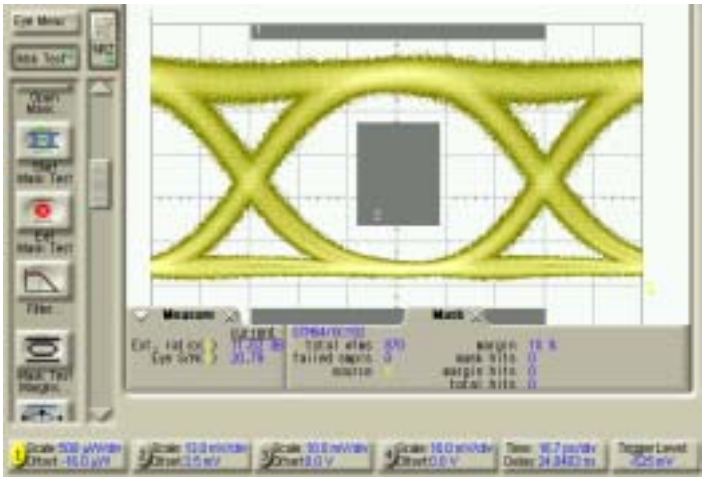


Package Pinout

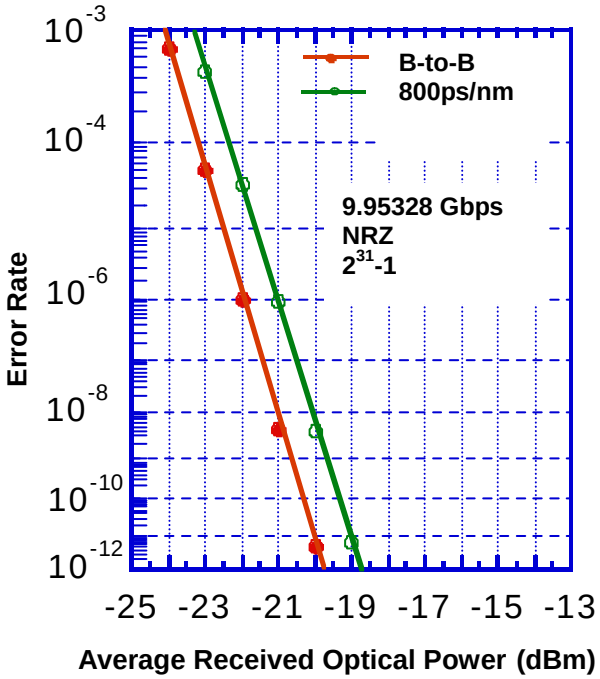
Pin No.		Pin No.	
1	TEC+	11	Din
2	Thermistor	12	GND
3	Vb	13	Monitor Cathode
4	Vm	14	Monitor Anode
5	Vss	15	GND
6	Vx2	16	LD Anode
7	Vx1	17	NC
8	GND	18	NC
9	$\overline{\text{Din}}$	19	TEC-
10	GND		

9.TYPICAL CHARACTERISTICS

Eye – pattern (Back to Back with Filter)



BER Measurement



10. SAFETY INFORMATION ON THIS PRODUCT

Warning Laser Beam	A laser beam is emitted from this laser diode during operation. The invisible or visible laser beam, directly or indirectly, may cause injury to the eye or loss of eyesight. Do not look directly into the laser beam. Avoid exposure to the laser beam, any reflected or collimated beam.
Caution GaAs Product	The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled, ingested or swallowed. Do not destory or burn the product. Do not crush or chemically dissolve the product. Do not put the product in the mouth. Observe related laws and company regulations when discarding this product. The product should be excluded from general industrial waste or household garbage.
Caution Optical Fiber	A glass-fiber is attached on the product. Handle with care. When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.

Notice

1. The information contained herein can change without notice owing to product and/or technical improvements. Before using the product, please make sure that the information being referred to is up-to-date.

2. The outline of action and examples for application circuits described herein have been chosen as an explanation for the standard action and performance of the product. When planning to use the product, please ensure that the external conditions are reflected in the actual circuit, assembly, and program designs.

3. When designing your product, please use our product below the specified maximum ratings and within the specified operating ranges including, but not limited to, operating voltage, power dissipation, and operating temperature.

4. Oki assumes no responsibility or liability whatsoever for any failure or unusual or unexpected operation resulting from misuse, neglect, improper installation, repair, alteration or accident, improper handling, or unusual physical or electrical stress including, but not limited to, exposure to parameters beyond the specified maximum ratings or operation outside the specified operating range.

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