Data sheet

2.5 Gb/s Buried Het Laser 175 km Reach non-WDM applications

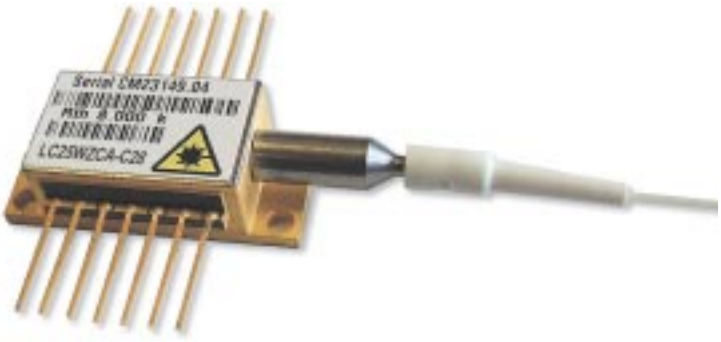
This laser module employs the Bookham Technology strained layer MQW Buried Heterostructure DFB laser chip, and has been designed specifically for use in 2.5 Gb/s long distance single channel optical fibre systems. The device is packaged in a hermetically sealed 14-pin butterfly package incorporating an isolator and monitor photodiode for control of the power of the laser over life and all operating conditions.

Features

- 2.5 Gb/s operation
- Narrow spectral line-width
- Internal TEC with precision NTC thermistor for temperature control
- Code reduction with single product for reaches up to 175 km
- GaInAsP SLMQW DFB single frequency laser chip
- InGaAs monitor photo-diode
- Hermetically sealed 14-pin butterfly package with optical isolator

Applications

- TDM
- On-off ramps
- Long-Haul



Parameters

Parameter	Conditions	Min	Typ	Max	Unit
Threshold current (Ith)			10	22	mA
Slope efficiency by product	2 mW 3 mW 4 mW 10 mW	0.04 0.06 0.08 0.143		0.09 0.13 0.17 0.43	mW/mA
RF input reflection coef (S11)	(1)			-10	dB
Forward voltage			1.3	1.8	V
Peak wavelength (λp)	(2)	1535.82		1560.61	nm
Dispersion penalty at 175 km	(3)			2	dB
Time averaged spectral linewidth	-20 dB		0.1	0.6	nm
Side-mode suppression		32	40		dB
Optical rise/fall time	(4)			125	ps
Monitor photo current		50	250	1200	µA
Monitor dark current				100	nA
Thermistor resistance			10		kΩ
Heatpump current	70°C case temperature	250	600	900	mA
Heatpump voltage	70°C case temperature		1.0	2.4	V
Change of λp with laser temp.	20 to 35		0.09		nm/°C

(1) 50 Ω measurement system, f = dc - 3 GHz
(2) Submount temperature between 20°C & 35°C start of life to achieve required λ p
(3) Standard product dispersion penalty will be compliant to the specified link length of 175 km using an extinction ratio of 10 dB. Fibre dispersion characteristics are derived from the following equation

$$D(\lambda) = \frac{So}{4}\left(\lambda - \frac{\lambda_0^{\,4}}{\lambda^3}\right) ps/(nm.km)$$

Where So = 0.092 ps/(nm^2.km) and λ = 1302 nm
(4) Measurements determined from 20 - 80% pk - pk

Absolute Maximum Ratings

Parameter	Min	Max	Unit
Case operating temperature	0	70	°C
Laser submount operating temperature	20	35	°C
Storage temperature	-40	85	°C
Laser current above Ith		100	mA
Laser reverse voltage		1.0	V
Laser reverse current		10	µA
Monitor diode bias		-10	V
Heatpump voltage		2.4	V
Fibre bend radius	30		mm

Reliability/Quality

Meets Qualification requirements of Telcordia / Bellcore GR468-Core for central office environment.

Operating reliability <500 FITs1 in 15 years.

1- Assumes laser die submount held at <35°C by internal thermoelectric cooler, mean forward current of 35 mA, and end of life limits based on 10 mA increase in Ith and 25% change in laser efficiency. FIT rate data for other end of life criteria, including minimum extinction ratio requirements, are available upon request.

Outline Drawing

Dimensions in mm

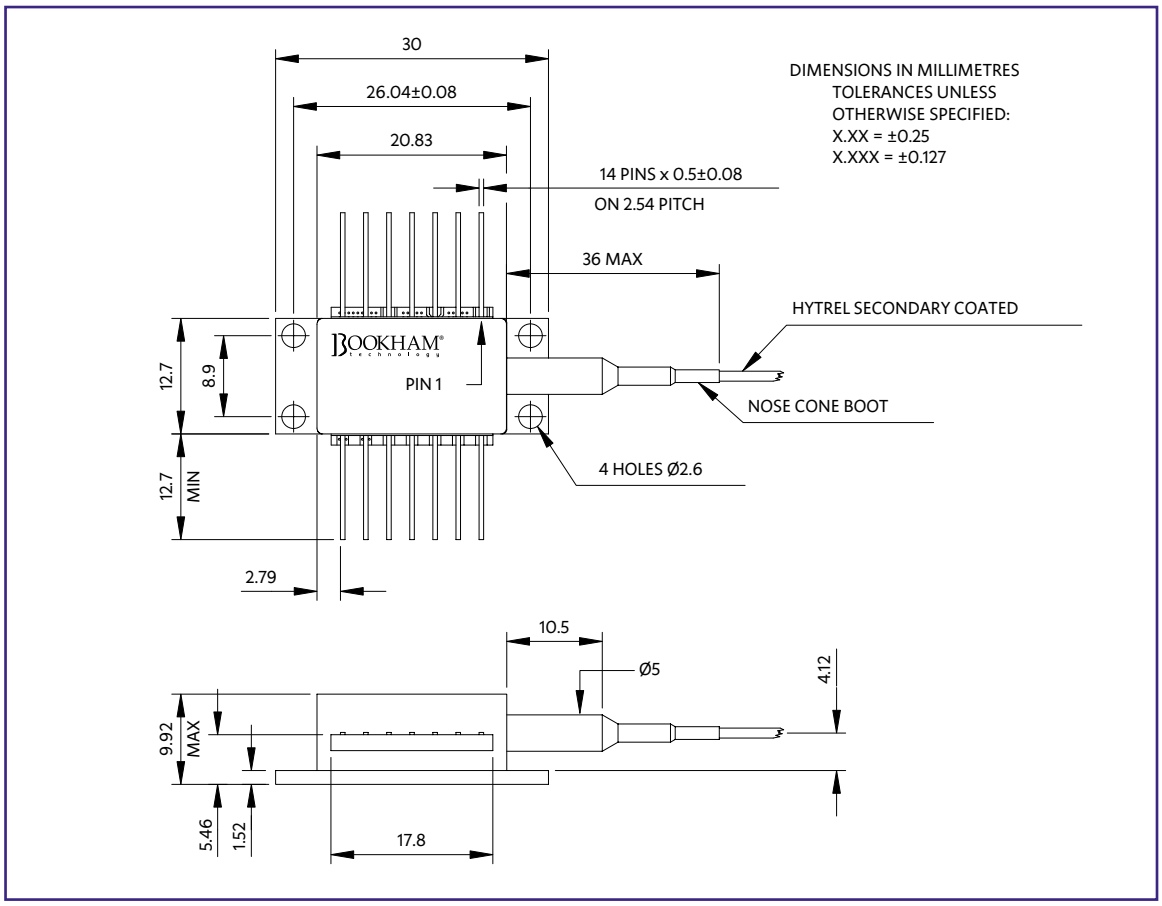


Figure 1: Outline Drawing

*Instructions for Use – LC25WZ*A*

Pin 1 and Pin 2 Thermistor

The thermistor is used in a control loop in conjunction with the thermo-electric cooler to maintain the laser submount temperature at the required value for wavelength. Operating current should be less than 100 µA to prevent self-heating errors.

Pin 3 Laser DC bias (-)

Laser bias current (negative with respect to package ground) is applied via this pin which forms one side of the bias-T connection to the laser cathode.

Pin 4 Monitor anodes, Pin 5 Common Monitor cathode

The back facet monitor provides a mean power reference for the laser and is normally operated with a 5 V reverse bias.

Pin 6 TEC (+), Pin 7 TEC (-)

Applying a positive voltage on pin 6 with respect to pin 7 will cause the internal submount to be cooled relative to the case temperature. Reversing the polarity will raise the submount temperature relative to the case. The TEC supply should be capable of delivering up to 0.9 A at 2.4 V.

Pin 8, 9, 11, 13 Case ground

These pins must be grounded in all applications

Pin 10

This pin is not connected and should be grounded if possible

Pin 12 Laser modulation (-)

The data input (modulation current) is applied via this pin which is a nominal 25 Ohm impedance coplanar line. For 10mW applications the end of life modulation current is 90mA maximum. For all other applications 60mA maximum modulation current should be provisioned.

Pin 14 N/C

This pin is not connected. It should be grounded if possible.

Connections

Pin	Function
1	Thermistor
2	Thermistor
3	Laser DC bias (-)
4	Monitor Anode (-)
5	Monitor Cathode (+)
6	TEC (+)
7	TEC (-)
8	Case Ground
9	Case Ground
10	Not Connected
11	Case Ground
12	Laser Modulation (-)
13	Case Ground
14	Not Connected

Safety Information

Laser safety classifications:
IEC 60825-1: Edition 1.2 Class 1M
21 CFR Ch.1 (4-1-97 Edition) Class IIIb

Electrostatic discharge:
ESD threshold >500 V
A-TSY-000870 class 3.

Ordering Information

LC25WZ	[Power Option]	A	[Connector]
	E= 2 mW pk	-	**C28**= SC/PC
	C= 3 mW pk	-	**C34**= FC/PC
	A= 4 mW pk	-	**C57**= LC
	B= 10 mW pk	-	**C59**= MU

Fibre length 1130 to 1190 mm

E.g. LC25WZCA-C28 is a 3mW device with an SC connector

REFERENCE IEC 60825-1: Edition 1.2

THIS PRODUCT COMPLIES WITH 21 CFR 1040.10

Certificate No. FM 15040

Certificate No. EMS 35100

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