


2.5Gb/s Buried Het Laser non-WDM applications

LC25WZ

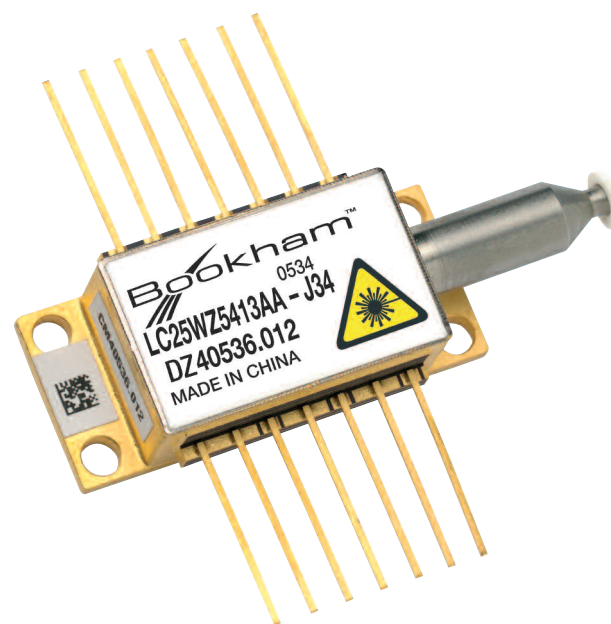
This laser module employs the Bookham strained layer MQW Buried Heterostructure DFB laser chip, and has been designed specifically for use in 2.5Gb/s long distance single channel optical fiber systems. The device is packaged in a hermetically sealed 14-pin butterfly package incorporating an isolator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

Features:

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

Applications:

- TDM
- On-off ramps
- Long-Haul



Parameters

| Parameter | Conditions | Min | Typ | Max | Unit |
|--|---------------------------|-------------------------------|------|------------------------------|------------|
| Threshold current (I_{th}) | | | 10 | 22 | mA |
| Slope efficiency by product | 2mW 3mW 4mW 10mW | 0.04 0.06 0.08 0.143 | | 0.09 0.13 0.17 0.43 | mW/mA |
| RF input reflection coef (S_{11}) | [1] | | | -10 | dB |
| Forward voltage | | | 1.3 | 1.8 | V |
| Peak wavelength (λ_p) | [2] | 1535.82 | | 1560.61 | nm |
| Dispersion penalty | [3] | | | 2 | dB |
| Time averaged spectral linewidth | -20dB | | 0.1 | 0.6 | nm |
| Side-mode suppression | | 32 | 40 | | dB |
| Optical rise/fall time | [4] | | | 125 | ps |
| Monitor photo current | | 50 | 250 | 1200 | μ A |
| Monitor dark current | | | | 100 | nA |
| Thermistor resistance | | | 10 | | k Ω |
| Heatpump current | 70°C case temperature | 250 | 600 | 900 | mA |
| Heatpump voltage | 70°C case temperature | | 1.0 | 2.4 | V |
| Change of λ_p with laser temp. | 20 to 35 | | 0.09 | | nm/°C |

[1] 50 Ω measurement system, f = dc - 3GHz.

[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 175km or 100km using an extinction ratio of 10dB. Fiber dispersion characteristics are derived from the following equation.

$$D(\lambda) = \frac{S_0}{4} \left(\lambda - \frac{\lambda_0^4}{\lambda^3} \right) ps / (nm.km)$$

Where $S_0 = 0.092ps/(nm^2km)$ and $\lambda = 1302nm$.

[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 I_{th} | | 100 | mA |
| Laser reverse voltage | | 1.0 | V |
| Laser reverse current | | 10 | μ A |
| Monitor diode bias | | -10 | V |
| Heatpump voltage | | 2.4 | V |
| Fiber bend radius | 30 | | mm |

Outline Drawing

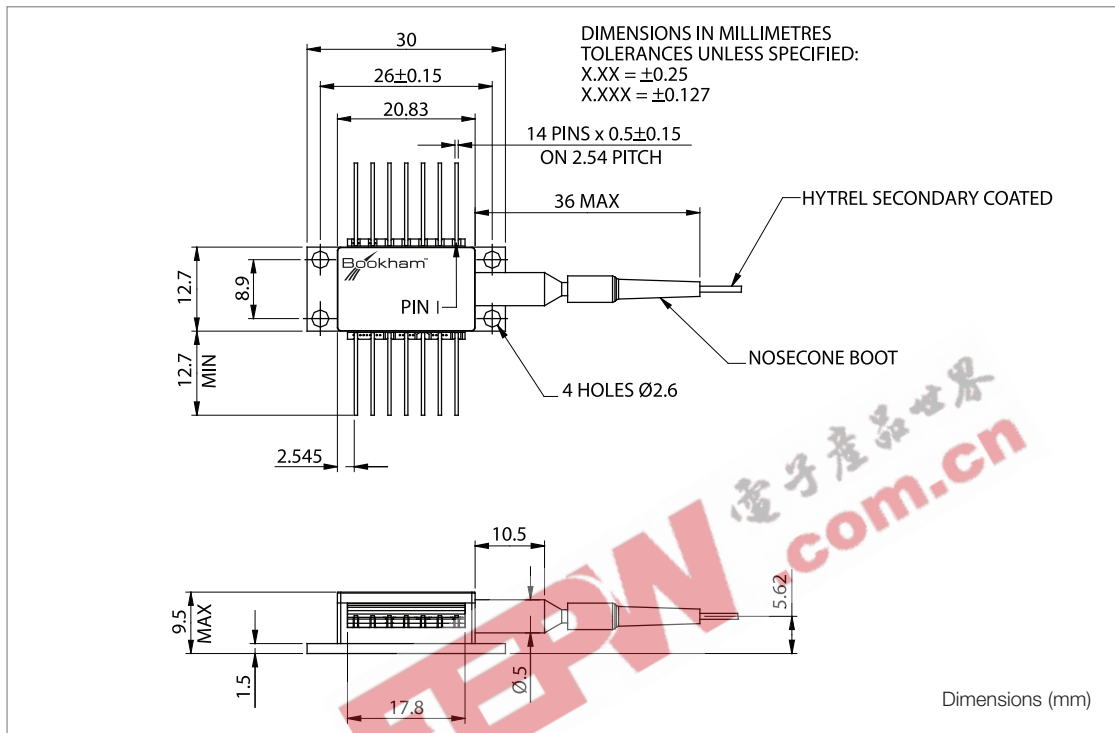


Figure 1: Outline Drawing

Reliability/Quality

Meets Qualification requirements of Telcordia GR-468-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 35mA, and end of life limits based on 10mA 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.

Instructions for Use – LC25WZ

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 100µA 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 5V 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 0.9A at 2.4V.

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 25Ω 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.

| Pin # | Function | Pin # | Function |
|-------|---------------------|-------|----------------------|
| 1 | Thermistor | 8 | Case Ground |
| 2 | Thermistor | 9 | Case Ground |
| 3 | Laser DC bias (-) | 10 | Not Connected |
| 4 | Monitor Anode (-) | 11 | Case Ground |
| 5 | Monitor Cathode (+) | 12 | Laser Modulation (-) |
| 6 | TEC (+) | 13 | Case Ground |
| 7 | TEC (-) | 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 >500V

A-TSY-000870 class 3.

RoHS Compliance



Bookham is fully committed to environment protection and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS compliance is held as part of our controlled documentation for each of our compliant products. RoHS compliance parts are available to order, please refer to the ordering information section for further details.

Ordering Information:

For Low Power, 175km versions

| | | | |
|--------|----------------|---|-------------|
| LC25WZ | [Power Option] | A | [Connector] |
| | E=2mW pk | - | J28= SC/PC |
| | C=3mW pk | - | J34= FC/PC |
| | A=4mW pk | - | J57= LC |
| | | - | J59= MU |

For 10mW version

| | | | |
|---------|----------------|---|-------------|
| LC25WZB | [Reach Option] | | [Connector] |
| | J=100km | - | J28= SC/PC |
| | A=175km | - | J34= FC/PC |
| | | - | J57= LC |
| | | - | J59= MU |

Fiber length 1130 to 1190mm

E.g. LC25WZCA-J28 is a 3mW device with 175km reach and an SC connector.

LC25WZBJ-J34 is a 10mW device with 100km reach and an SC/PC connector.

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