

LC155CDC-20

20mW CW Laser

Features

Built-in Fabry-Perot etalon and dual InGaAs PIN photodetector array allows wavelength stabilized operation to within $\pm 20\text{pm}$ over life.

ITU wavelengths available from 1530nm to 1560nm.

InGaAsP Distributed Feedback (DFB) single frequency laser chip.

Polarization maintaining single mode fibre.

Hermetically sealed 14 pin butterfly package with optical isolator.

Integral thermo-electric cooler with precision thermistor.

Applications

SONET/SDH, OC48/STM-16, OC192/STM-64 systems

Long and very long reach DWDM Networks Transmitters using a LiNbO₃ external modulator.

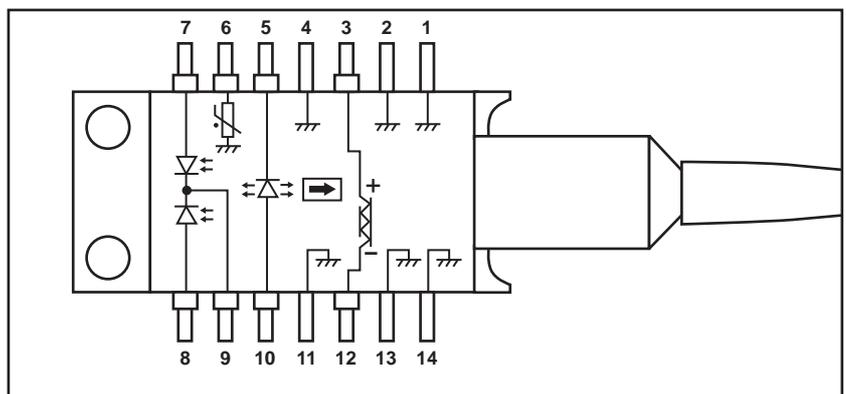
Description

Offering 20mW CW output power, the LC155CDC is a wavelength stabilized DFB laser suitable for deployment in high speed, DWDM applications with 50 GHz channel spacing.

Incorporating an FP etalon and two monitor photodiodes, The LC155CD

may be locked to the ITU grid and will maintain wavelength within $\pm 20\text{pm}$.

The laser is supplied in a 14 Pin butterfly package which incorporates a PIN Fibre Pigtail (Fujikura PANDA type).



Characteristics

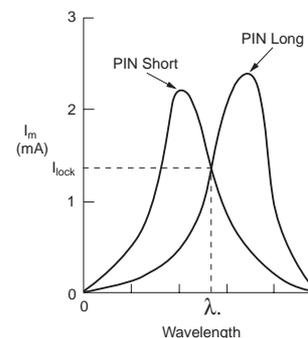
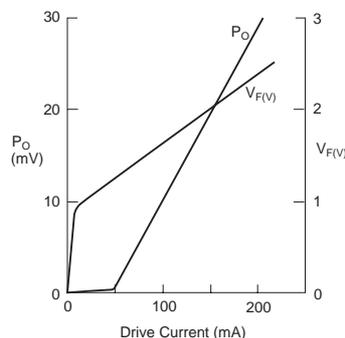
Conditions unless otherwise stated: PIN detector bias: -5V
Optical Back Reflection: -20dB

Parameter	Conditions/Symbol	Min	Typ	Max	Unit
Optical Output Power	P_o	20			mW
Operating Current	I_{op}		175	220	mA
Threshold Current			20	40	mA
Forward Voltage	V_f		1.7	2.7	V
Peak Wavelength Ageing		-20		20	pm
Peak Wavelength SOL		-37	ITU grid	37	pm
Side Mode Suppression	L_{op}	37			dB
Spectral Width			2	20	MHz
PIN Photocurrent	I_m			4	mA
Locking PIN Photocurrent	I_{lock}	0.2		2	mA
PIN Dark Current				100	nA
PIN Spectral Response BW		0.2		0.8	nm
PIN Response Peak Spacing			0.35		nm
Locking Ratio	I_{lock}/I_{peak}	40		80	%
Thermistor Resistance		6.7		12	kOhm
Heatpump Current	Case Temp = 70°C			1.4	A
Heatpump Voltage	Case Temp = 70°C			3	V
Polarization Extinction Ratio		20			dB

Absolute Ratings

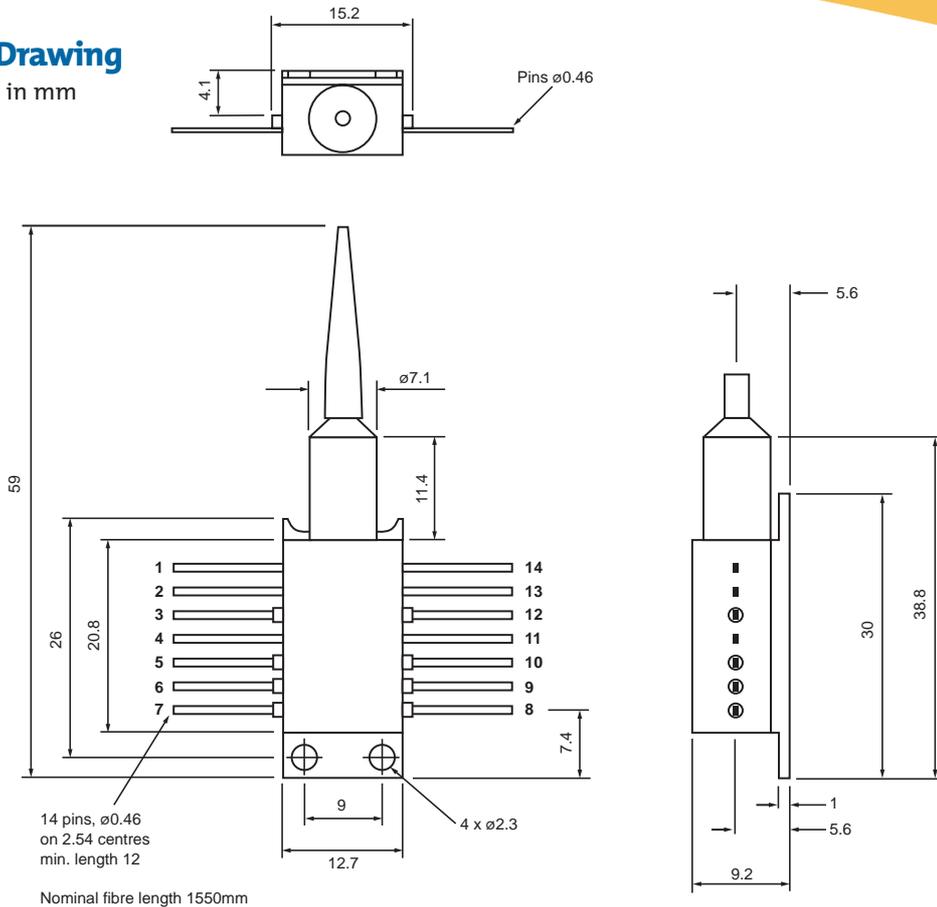
Parameter	Conditions/Symbol	Min	Typ	Max	Unit
Case Operating Temperature		0		70	°C
Storage Temperature		-40		85	°C
Laser Bias Current				275	mA
Laser Reverse Voltage				2	V
PIN Photodiode Reverse Bias				15	V
Fibre Bend Radius		35			mm

Typical Performance Characteristics



Outline Drawing

Dimensions in mm



Instructions for Use - LC155CDC-20

Pin 1,2,4,11,13,14 Package Ground

Ground all Pins for optimum performance

Pin 3 TEC(+) and Pin 12 TEC(-)

Applying a positive voltage on Pin 3 with respect to Pin 7 will cause the internal optics to be cooled relative to the case temperature. Reversing the applied voltage will cause the internal structures to be heated. The power supply for the heatpumps should be capable of sourcing up to 1.2A at 5V.

Pin 5 laser Bias(-) Cathode and Pin 10 Laser Bias(+) Anode

Laser bias current is applied via these Pin 3, both of which are floating with respect to ground. The laser is operated with a forward bias current up to 220mA at 2.7V(max).

Pin 6 Thermistor

The Thermistor is used in the control loop for keeping the internal temperature at a constant value. It has a nominal resistance of 8.2k Ω (at the typical operating temperature of 30°C and is not polarity sensitive). Operating current should be limited to less than 100 μ A to prevent self-heating errors. The exact thermistor value will be supplied with the device to ensure correct operating wavelength. The other side of the thermistor is internally connected to case ground.

Pin 7 Monitor Anode (short), Pin 8 Monitor Anode (Long) and Pin 9 Monitor Cathode

The two back facet monitor diodes are used in a control loop, which maintains constant laser wavelength. Each diode

has a different spectral response, which overlaps at the "locked" wavelength. The loop can control submount temperature and/or laser bias current to maintain the two monitor diode currents at equal values, corresponding to the locked wavelength. The diode cathodes are commoned on pin 9 and are operated with reverse 5V bias.

Connections

Pin 1	Ground	Pin 14	Ground
2	Ground	13	Ground
3	Peltier (+)	12	Peltier (-)
4	Ground	11	Ground
5	Laser cathode	10	Laser anode
6	Thermistor	9	PIN cathode
7	PIN short anode	8	PIN Long anode

Device Ordering Information

Order Code No. LC155CDC****-20

Where **** = Last four digits of wavelength value i.e. for $\lambda_p = 1545.32\text{nm}$ **** = 4532

For wavelength information see Nortel Network's WDM wavelength plan.

The fibre pigtail is terminated with a 2.5mm o.d. ferrule.

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PBo095 ISSUE 2 July 2000

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**INVISIBLE LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3A LASER PRODUCT**

REFERENCE IEC 60825-1:1993



THIS PRODUCT COMPLIES WITH 21 CFR 1040.10

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