

**Applications**

- O-Band DWDM Forward Path
- Broadcast and Narrowcast Networks
- DWDM Cuts New Fiber Costs
- High Optical Splits

**Features**

- OC-48 Pinout Compatible
- *Telcordia Technologies™* 468 Compliant
- Up to 110 Channel Count
- Up to 14 dBm
- Wide Temperature Range – Stable even in Harsh Environments
- RoHS Compliant

The 1623 ITU G.695 compliant O-Band DWDM forward path DFB laser components are designed for both broadcast and narrowcast analog applications. The highly linear, OC-48 pinout compatible components feature options for up to 14 dBm of minimum optical output power with superior distortion performance over an enhanced temperature range of -40°C to +85°C.

**Performance Highlights**

Parameter	Min	Typical	Max	Units
Wavelength	1317.90	1318.10	1318.30	nm
	1321.10	1321.30	1321.50	
	1322.80	1323.00	1323.20	
	1323.97	1324.17	1324.37	
	1325.30	1325.50	1325.70	
	1326.90	1327.10	1327.30	
	1325.60	1325.80	1326.00	
Optical Output Power	1327.05	1327.25	1327.45	dBm
	1329.00	1329.20	1329.40	
	1330.30	1330.50	1330.70	
	6	-	7.9	
	8	-	8.9	
	9	-	9.9	
	10	-	11.9	
Temperature Range	12	-	12.9	°C
	13	-	13.9	
	14	-	-	
	-40	-	+85	
	5	-	1002	
Carrier to Noise Ratio	51	-	-	dB
Composite Second Order (multiple versions)	-	-	-60	dBc
Composite Triple Beat (multiple versions)	-	-	-66	dBc



## Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Condition	Min	Max	Unit
Operating Temperature Range	$T_C$	Continuous	-40	+85	°C
Storage Temperature Range	$T_{STG}$	-	-40	85	°C
Laser Forward dc Current	-	-	-	150	mA
Photodiode Reverse Voltage	$V_{RPD}$	-	-	10	V
Laser Reverse Voltage, dc	-	-	-	1	V
ESD	-	HBM: R = 1500 OHM, C = 100pF	-500	500	V
TEC Current	$I_{TEC}$	Continuous	-1.9	1.9	A

## Electrical/Optical Characteristics

Laser Temperature (TL) = Laser temp set for center WL, IF=IOP, Beginning of Life (BOL)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Wavelength <sup>(1)</sup>	$\lambda_{OPT}$	1318.10 nm option	1317.90	1318.10	1318.30	nm
		1321.30 nm option	1321.10	1321.30	1321.50	
		1323.00 nm option	1322.80	1323.00	1323.20	
		1324.17 nm option	1323.97	1324.17	1324.37	
		1325.50 nm option	1325.30	1325.50	1325.70	
		1327.10 nm option	1326.90	1327.10	1327.30	
		1325.80 nm option	1325.60	1325.80	1326.00	
		1327.25 nm option	1327.05	1327.25	1327.45	
		1329.20 nm option	1329.00	1329.20	1329.40	
		1330.50 nm option	1330.30	1330.50	1330.70	
Optical Output Power	-	-06 version (4mW)	6	-	7.9	d
		-08 version (6mW)	8	-	8.9	
		-09 version (8mW)	9	-	9.9	
		-10 version (10 mW)	10	-	11.9	
		-12 version (16 mW)	12	-	12.9	
		-13 version (20 mW)	13	-	13.9	
		-14 version (25 mW)	14	-	-	
Optical Isolation	ISO	-	30	-	-	dB
Side-Mode Suppression Ration	SMSR	-	35	-	-	dB
Threshold Current	$I_{TH}$	-	-	-	20	mA
Slope Efficiency	$\eta$	$I_F = I_{TH} + 20$ and $I_{TH} + 60$	0.135	-	-	mW/mA
Operating Current	$I_{OP}$	Varies with power option	-	-	120	mA
Laser Temp Range	$T_L$		14	-	37	°C
Monitor PD Responsivity	$r_{PD}$	$V_{RM}=5V$	10	-	200	$\mu A/mW$
Thermistor Resistance	$R_{TH}$	$T_{OP}=25^\circ C$	9.5	10	10.5	KOhm

**Electrical/Optical Characteristics Continued**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Thermistor Temp. Coefficient	TC <sub>TH</sub>	T <sub>OP</sub> =25°C	-	-4.4	-	%/°C
TEC Current	I <sub>TEC</sub>	-40<T <sub>C</sub> <+85°C, I <sub>F</sub> = 100 mA	-1.5	-	1.6	A
Tracking Error	-	T <sub>OP</sub> =25 °C	-1	-	1	dB
Fiber Length	-	May include splice	1.0	1.5	-	M
Fiber Buffer	-	-	-	900	-	µm
Fiber Core/Cladding	-	-	-	9/125	-	µm

(1) Center Wavelength is temperature tuned to be within specs.

**RF Characteristic**

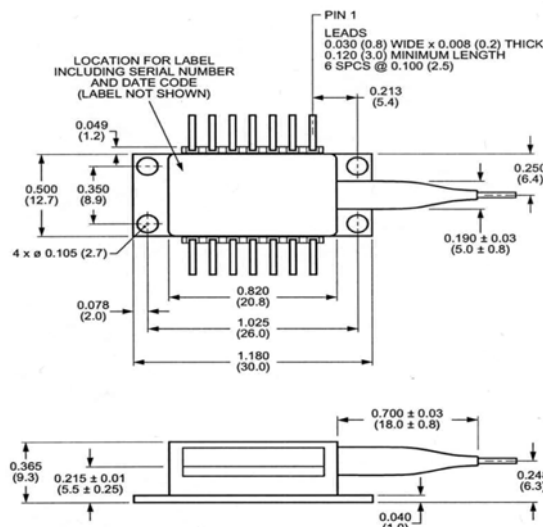
Laser Temperature (T<sub>L</sub>) = Laser temp set for center WL, I<sub>F</sub> = I<sub>OP</sub>, Beginning of Life (BOL)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Frequency Range	F	-	5	-	1002	MHz
Frequency Response	S21	I <sub>op</sub> = 60 mA, 5 - 1002 MHz	-	-	1.5	dB
Carrier-to-Noise Ratio	CNR	-	52	-	-	dB
Comp. Second Order	CSO <sup>(1)</sup>	Standard Options (1623A)	-	-	-55	dBc
		Enhanced Options (1623B)	-	-	-60	dBc
Composite Triple Beat	CTB <sup>(1)</sup>	Standard Options (1623A)	-	-	-65	dBc
		Enhanced Options (1623B)	-	-	-66	dBc
Relative Intensity Noise	RIN	-	-	<-155	-	dB/Hz

1. Distortion performance assumes 0km dispersion. 3.7% OMI, 79 ch. NTSC

In order to prevent reflection-induced distortion, the laser must be connected to an optical cable having a return loss of at least 55 dB for discrete reflections and 30 dB for distributed reflections.

**Outline Drawing (dimensions are in inches & mm)**



**Electrical Schematics**

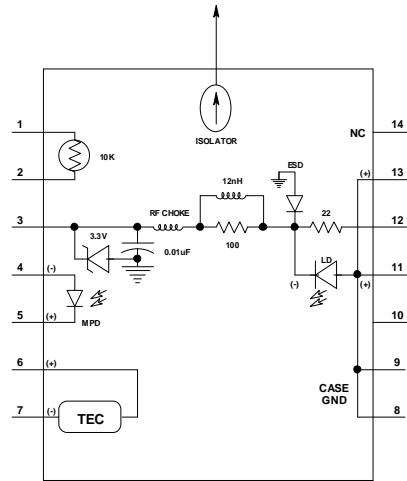


Figure 1. 1623 O-Band DWDM Laser Schematic

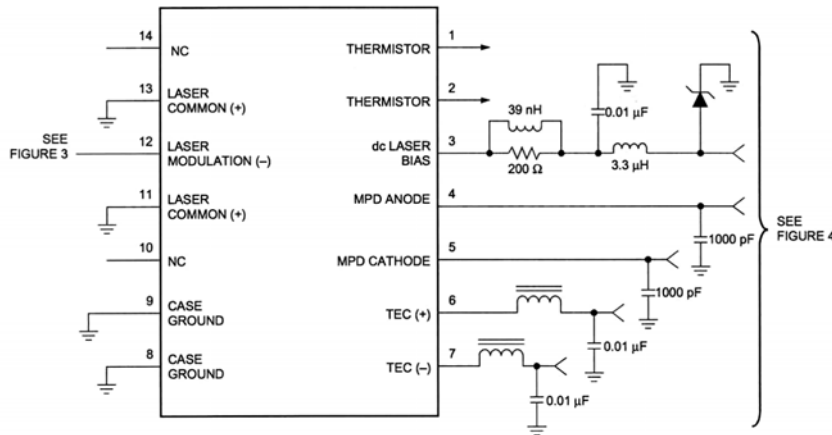


Figure 2. 1623 O-Band DWDM Circuit Schematic

**Pin Definitions**

Pin	Description
1	Thermistor
2	Thermistor
3	Dc Laser Bias (-)
4	MPD Anode (-)
5	MPD Cathode (+)
6	Thermal Electric Cooler (+)
7	Thermal Electric Cooler (-)
8	Case Ground
9	Case Ground
10	NC
11	Laser Common (+)
12	Laser Modulation (-)
13	Laser Common (+)
14	NC

**Laser Safety**

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1 laser product. This device has been classified with the FDA/CDRH under accession number 0220191.

All Versions of this laser are Class 1 laser product, tested according to IEC 60825-1:2007/EN 60825-1:2007 Single-mode fiber pigtail with SC/APC connectors (standard).

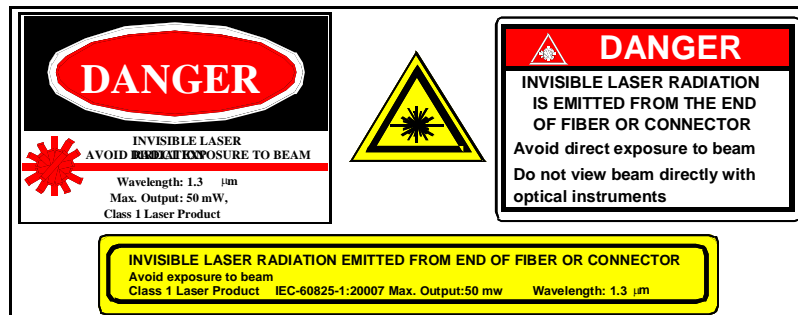
Wavelength = 1.3  $\mu\text{m}$ .

Maximum power = 50 mW.

Because of size constraints, laser safety labeling (including an FDA class 1 label) is not affixed to the module, but attached to the outside of the shipping carton.

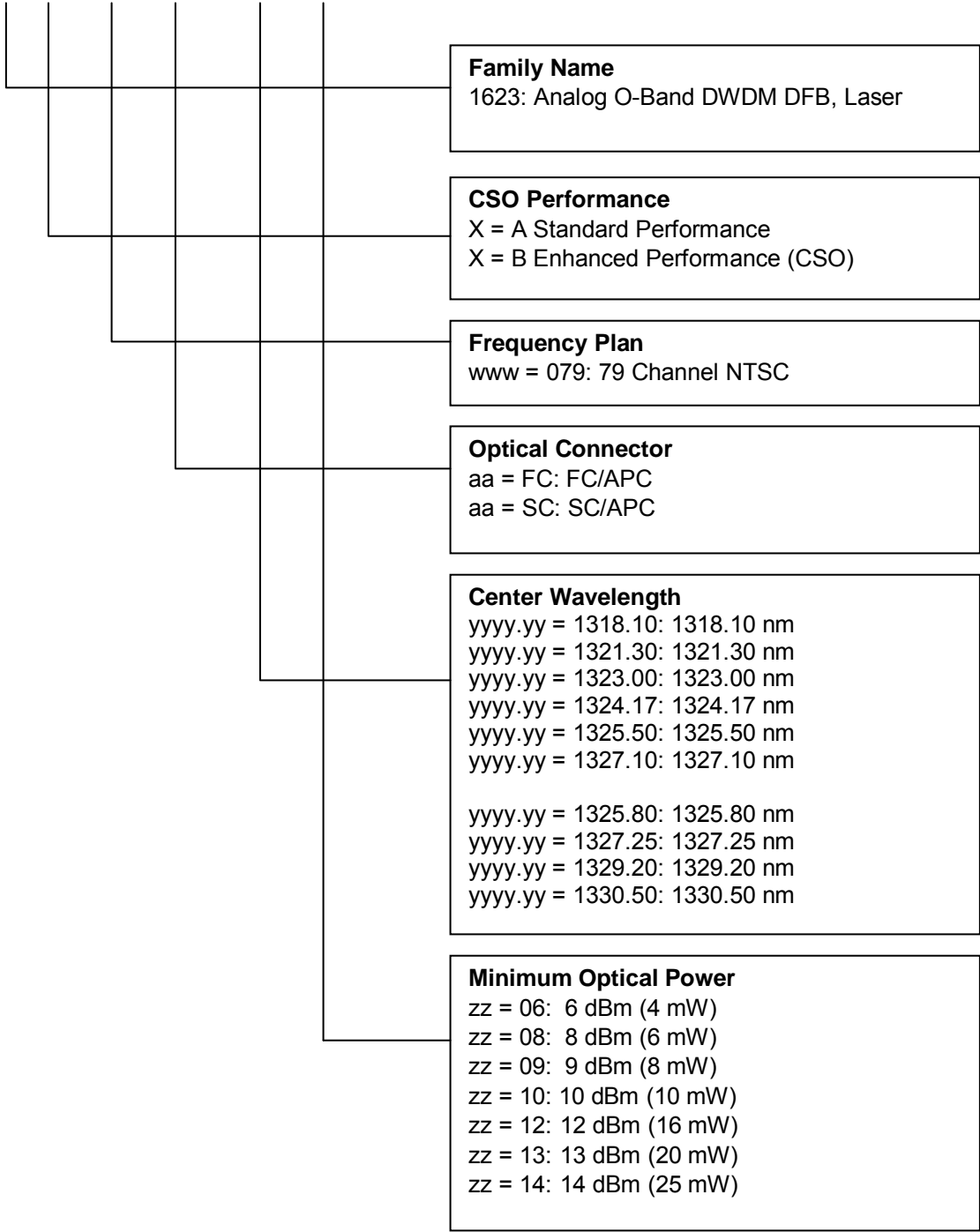
Product is not shipped with power supply.

**Caution: Use of controls, adjustments and procedures other than those specified herein may result in hazardous laser radiation exposure.**



**Ordering Code Definitions**

1623x – www – aa – yyyy-yy - zz



**Family Name**  
1623: Analog O-Band DWDM DFB, Laser

**CSO Performance**  
X = A Standard Performance  
X = B Enhanced Performance (CSO)

**Frequency Plan**  
ww = 079: 79 Channel NTSC

**Optical Connector**  
aa = FC: FC/APC  
aa = SC: SC/APC

**Center Wavelength**  
yyyy.yy = 1318.10: 1318.10 nm  
yyyy.yy = 1321.30: 1321.30 nm  
yyyy.yy = 1323.00: 1323.00 nm  
yyyy.yy = 1324.17: 1324.17 nm  
yyyy.yy = 1325.50: 1325.50 nm  
yyyy.yy = 1327.10: 1327.10 nm  
  
yyyy.yy = 1325.80: 1325.80 nm  
yyyy.yy = 1327.25: 1327.25 nm  
yyyy.yy = 1329.20: 1329.20 nm  
yyyy.yy = 1330.50: 1330.50 nm

**Minimum Optical Power**  
zz = 06: 6 dBm (4 mW)  
zz = 08: 8 dBm (6 mW)  
zz = 09: 9 dBm (8 mW)  
zz = 10: 10 dBm (10 mW)  
zz = 12: 12 dBm (16 mW)  
zz = 13: 13 dBm (20 mW)  
zz = 14: 14 dBm (25 mW)

Information contained herein is deemed reliable and accurate as of the issue date. EMCORE reserves the right to change the design or specification at any time without notice.