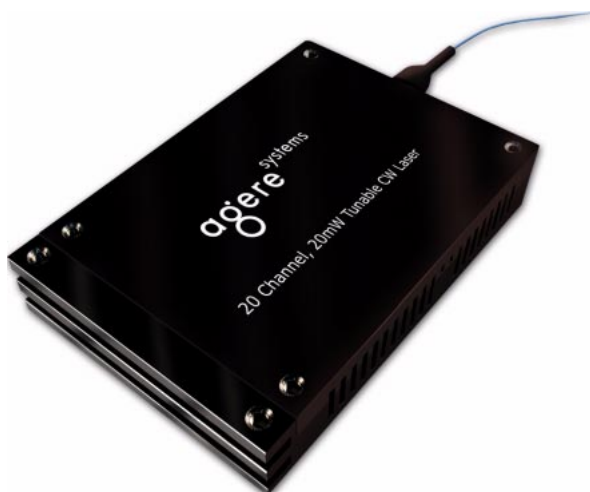


CW20P-Type CW Tunable, Wavelength-Stabilized Laser Module



Offering multiple channel selections and SONET/SDH compatibility, the CW20P-Type CW DBR Laser Module is manufactured in a 24-pin metallic DIP with a polarization-maintaining fiber (PMF) pigtail.

Features

- Tunable up to twenty ITU-T 50 GHz channels
- For use with lithium niobate modulators
- Integrated Etalon stabilizer
—Replaces external wavelength lockers
- 1528.77 nm to 1610.0 nm wavelengths
- Compact design
- Remote programmability
- Asynchronous serial interface for module communication
- High output power, up to 20 mW
- Low profile, 24-pin package
- Laser bias monitor alarm
- Module enable/disable input

Applications

- SONET/SDH extended-reach
- Long-haul, very dense, wave-division multiplexing (DWDM)
- High-speed data communication
- Flexible wavelength systems

Description

The CW20P-type laser modules are designed for use in transmission systems and high-speed data communication applications. The device supports 20 wavelengths. The module uses an RS-232 interface to adjust various module functions such as wavelength. In addition, the interface provides accessibility to the alarm and monitor outputs.

The modules meet all present *Telcordia Technologies** GR-253-CORE requirements and the ITU-T G.957 and G.958 recommendations. The modules are also suited for extended distance data and networking applications when used in conjunction with a lithium niobate modulator.

The CW20P uses a 1.5 μm distributed Bragg reflector (DBR) laser with an integrated wavelength stabilizer. By integrating the wavelength stabilizer with the DBR laser chip, the device offers a compact, cost-effective solution for low-dispersion transmission. Devices are provided at wavelengths that are compatible with the ITU-T wavelength standards at 200 GHz, 100 GHz, and 50 GHz. The package also contains a thermoelectric cooler, thermistor, back-facet monitor, and optical isolator. The laser module requires 5 V, -5.2 V, and 3.3 V.

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Module Processing

The module can withstand normal wave soldering processes. The complete transmitter module is not hermetically sealed; therefore, it should not be immersed in or sprayed with any cleaning solution or solvents. The process cap and fiber pigtail jacket can deform at temperatures greater than 85 °C. The transmitter pins can be wave-soldered at a maximum temperature of 250 °C for 10 seconds.

Connector Options

The standard fiber-optic pigtail is an 8 μm core PMF panda-type fiber. (914 μm) diameter, tight-buffered outer jacket. The standard length is 39 in. ± 4 in. (1 m ± 10 cm) and is terminated with an ST[®] optical connector.

Installation Considerations

Although the module has been designed with ruggedness in mind, care should be used during handling. The optical connector should be kept free from dust, and the process cap should be kept in place as a dust cover when the device is not connected to a cable. If contamination is present on the optical connector, the use of canned air with an extension tube should remove any debris. Other cleaning procedures are identified in the *Cleaning Fiber-Optic Assemblies* Technical Note (TN95-010LWP).

Pin Information

Table 1. Pin Descriptions

Pin Number	Name
1	Ground (TEC)
2	Back-facet Monitor ¹
3	Bias Monitor/Laser Degrade Alarm ¹
4	CW Enable
5	NUC ²
6	Ground
7	Wavelength-Deviation Error Alarm
8	RS-232 Interface (Tx)
9	RS-232 Interface (Rx)
10	Dither Input
11	Ground
12	V _{EE}
13	V _{CC}
14	V _{TEC} (TEC supply voltage)
15	Ground
16	NUC ²
17	Ground
18	NUC ²
19	Ground
20	NUC ²
21	Ground
22	NUC ²
23	Ground
24	V _{CC}

1. Laser back-facet and bias alarm functions are customer-use options that are not required for normal operations of the transmitter and are normally used during manufacture and for diagnostics. The output will optionally be either a logic signal or an analog voltage. All alarm, select, and enable signals are active-high.
2. NUC = no user connection.

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 operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Min	Max	Unit
Supply Voltage (positive)	V _{CC}	—	5.5	V
Supply Voltage (negative)	V _{EE}	—	-6.0	V
Operating Case Temperature Range	T _c	0	70	°C
Storage Case Temperature Range	T _{stg}	-40	85	°C
Lead Soldering Temperature/Time	—	—	250/10	°C/s
Relative Humidity (noncondensing)	RH	—	85	%
Minimum Fiber-Bend Radius	—	1.5 (38.1)	—	in. (mm)

Characteristics

(Minimum and maximum values specified over operating case temperature range at 50% duty cycle data signal. Typical values are measured at room temperature unless otherwise noted.)

Table 2. Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
dc Power Supply Voltage	V _{CC}	4.75	5.0	5.25	V
dc Power Supply Current	I _{CC}	—	350	500	mA
dc Negative Supply Voltage	V _{EE}	-5.46	-5.2	-4.94	V
dc Negative Supply Current	I _{EE}	—	—	250	mA
Power Dissipation	P _{DISS}	—	10	—	W
Module Disable Voltage (TTL) V _{IH}	V _{DIS}	4.2	—	—	V
Module Enable Voltage (TTL) V _{IL}	V _{EN}	0.0	—	0.8	V
λ Deviation Alarm: Levels (CMOS) V _{OL} Levels (CMOS) V _{OH} Setting	V _{λALARM N} V _{λALARM} λ _{ALARM}	0 4.05 -20	— — —	0.6 — 20	V V pm
Laser Degrade Alarm: Levels (CMOS) V _{OH} Levels (CMOS) V _{OL} Setting	V _{ALARM} V _{λALARM N} LD _{ALARM}	4.05 0 —	— — —	— 0.6 I _{BOL} x 125%	V V mA
TEC Current	I _{TEC}	—	1	2	A
TEC Voltage	V _{TEC}	3.2	3.3	3.5	V

Characteristics (continued)

Table 3. Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Average Optical-Fiber Power Output (BOL) ¹	P _F	13.0	—	—	dBm
Output Power Variation (BOL)	ΔP	-0.5	—	0.5	dB
Frequency Drift	Δλ _c	-2.5	—	2.5	GHz
Center Wavelength Range (See Table 6.)	λ _c	1528.77	—	1610.53	nm
Side-mode Suppression Ratio ²	SMSR	32	—	—	dB

1. Output power definitions and measurement per ITU-T Recommendation G.957.

2. Ratio of the average output power in the dominant longitudinal mode to the power in the most significant side mode under fully modulated conditions.

Qualification and Reliability

To help ensure high product reliability and customer satisfaction, Agere Systems is committed to an intensive quality program that starts in the design phase and proceeds through the manufacturing process. Optoelectronics modules are qualified to Agere Systems internal standards using MIL-STD-883 test methods and procedures and using sampling techniques consistent with *Telcordia Technologies* requirements. This qualification program fully meets the intent of *Telcordia* reliability practices TR-NWT-000468 and TA-TSY-000983. In addition, the Agere Systems design, development, and manufacturing facility has been certified to be in full compliance with the latest *ISO** 9001 Quality System Standards.

Laser Safety Information

Class IIIb Laser Product

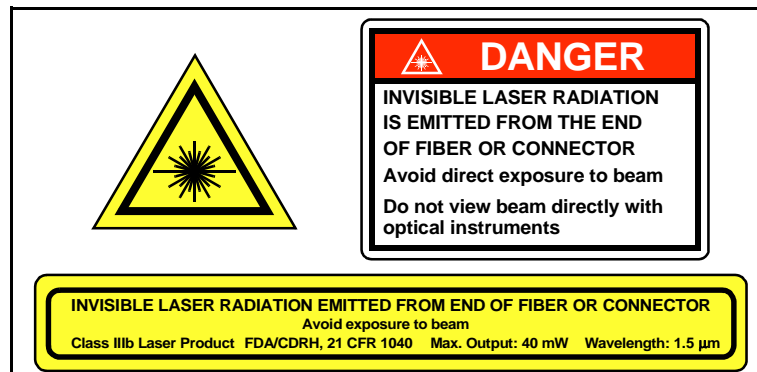
All versions of the CW20P-type modules are classified as Class IIIb laser products per FDA/CDRH, 21 CFR 1040 Laser Safety requirements. The device will be classified with the FDA under an accession number to be determined.

This product complies with 21 CFR 1040.10 and 1040.11.

8 μm/125 μm diameter single-mode fiber pigtail with 914 μm tight-buffered jacket and connector.

Product is not shipped with power supply.

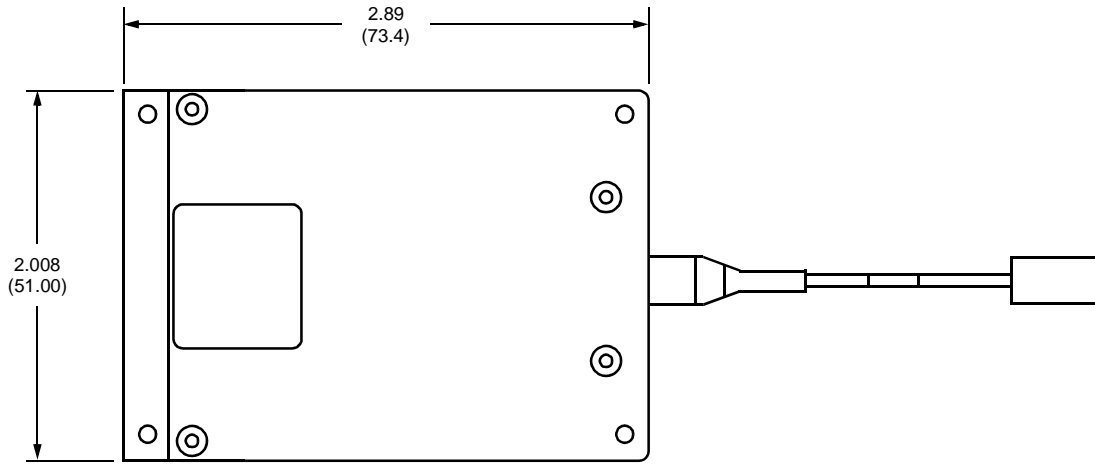
Caution: Use of controls, adjustments, and procedures other than those specified herein may result in hazardous laser radiation exposure.



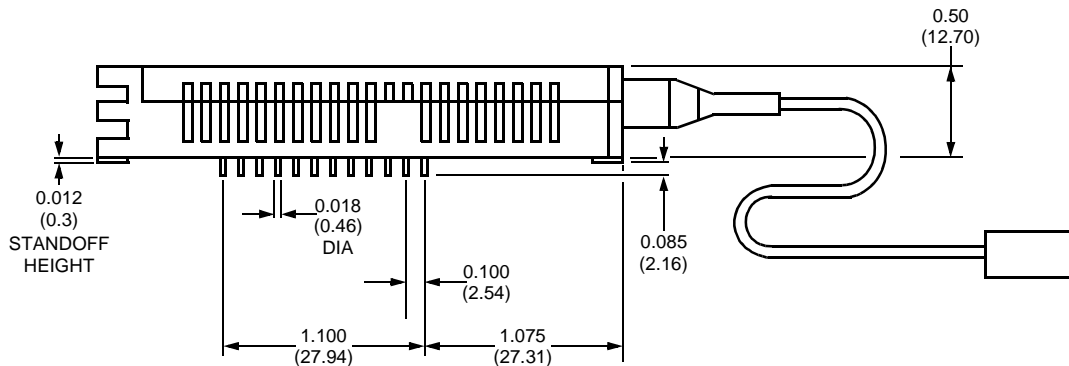
* *ISO* is a registered trademark of The International Organization for Standardization.

Outline Drawings

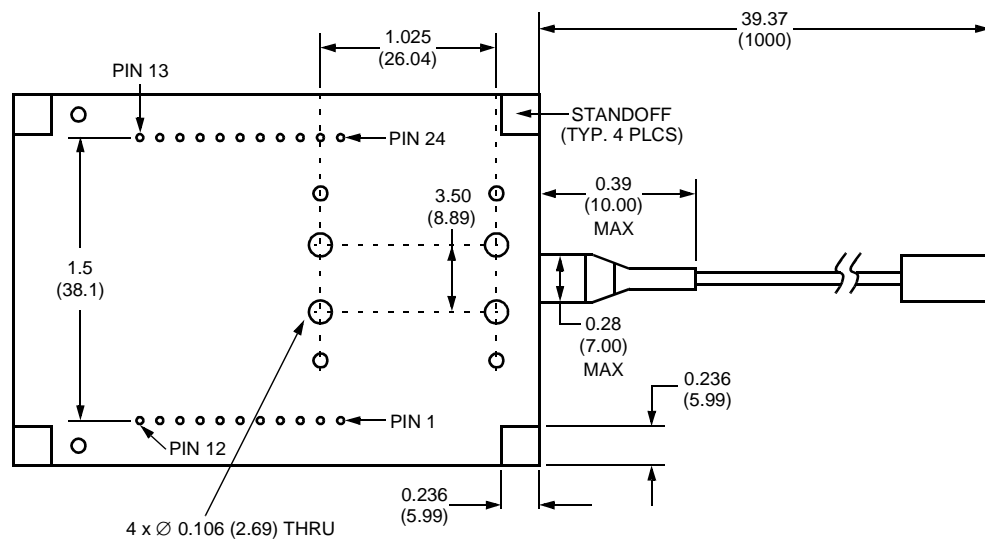
Dimensions are in inches and (millimeters).



(TOP VIEW)



(SIDE VIEW)



(BOTTOM VIEW)

Ordering Information

Table 6. Ordering Information

Product Code	ITU Frequency Range (THz)	Wavelength Range (nm)	Comcode
CW22P61	195.15—196.1	1528.77—1536.22	109071530
CW22P51	194.15—195.1	1536.61—1544.13	109071548
CW22P41	193.15—194.1	1544.53—1552.12	109071555
CW22P31	192.15—193.1	1552.52—1560.2	109071563
CW22P21	191.15—192.1	1560.61—1568.36	109071571
CW22P911	190.15—191.1	1568.77—1576.61	109071589
CW22P901	189.15—190.1	1577.03—1584.95	109071597
CW22P891	188.15—189.1	1585.36—1593.37	109071605
CW22P881	187.15—188.1	1593.79—1601.88	109071613
CW22P871	186.15—187.1	1602.31—1610.49	109071621

Related Product Information

Product Code	Description	Document Number
2623N	10 Gbits/s Single-Drive Lithium Niobate Modulator	DS00-331LWP
2623CSA	10 Gbits/s Single-Drive Lithium Niobate Modulator with Integrated Attenuator	DS00-331 LWP

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