

A1112 High-Power 1550 nm DFB Source Lasers



Description

The A1112 1550 nm DFB laser modules are high-power devices in a 14-pin butterfly package with a thermoelectric cooler and monitor photodiode. The lasers are designed to be used in conjunction with commercially available external modulators for high-performance analog and digital applications. Agere Systems Inc. offers modules with 30 mW or 40 mW output power coupled into polarization-preserving fiber. The A1112 operates with positive or negative bias.

Features

- High fiber-coupled power, 30 mW and 40 mW
- Narrow linewidth, <3 MHz
- Low relative intensity noise, < -162 dB/Hz
- Coupled to polarization-preserving (PANDA-type fiber)

Applications

- Externally modulated CATV transmitters
- Externally modulated analog and digital communication links

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	Min	Max	Unit
Operating Case Temperature Range	Tc	-20	65	°C
Storage Temperature Range	Tstg	-40	70	°C
Forward Current (Laser)	IF	—	275	mA
A1112PB, A1112NB		—	400	mA
A1112PC, A1112NC		—		
Reverse Voltage (Laser)	VR	—	2.0	V
Photodiode Reverse Voltage	VRPD	—	10	V
TEC Voltage	VTEC	—	2.0	V
TEC Current	ITEC	—	1.8	A
Cooling		—	1.5	A
Heating		—		

Electrical/Optical Characteristics

Table 1. Optical Characteristics (25 °C Case Temperature)

Parameter	Symbol	Conditions	Min	Max	Unit
Optical Output Power	PO	—	30	—	mW
A1112PB, A1112NB		—	40	—	mW
A1112PC, A1112NC		—			
Center Wavelength	λ_c	IOP	1540	1560	nm
Linewidth (FWHM)	$\Delta\nu$	IOP	—	3	MHz
Side Mode Suppression Ratio	SMSR	IOP	30	—	dB
Relative Intensity Noise	RIN	IOP, 40 MHz to 860 MHz	—	-162	dBc/Hz
Operating Current	IOP	—	—	250/350	mA
Threshold Current	ITH	—	—	35/40	mA
Forward Voltage	VF	—	—	2.5/3.0	V
Optical Isolation	—	-20 °C to +65°C	30	—	dB
Polarization Extinction Ratio	TE/TM	From fiber end, IOP	20	—	dB
Reverse Voltage	VR	—	—	2.0	V

Table 2. Electrical Characteristics

Parameter	Symbol	Condition	Min	Max	Unit
Monitor Photodiode Reverse Voltage	VRMPD	Iop	—	10	V
Monitor Photodiode Current	IMPd	—	40	2000	μ A
TEC Current	ITEC	$\Delta T = 40$ °C	—	1.8	A
TEC Voltage	VTEC	$\Delta T = 40$ °C	—	2.2	V
Thermistor Resistance	RTH	25 °C	9.0	11.0	k Ω

Electrical/Optical Characteristics (continued)

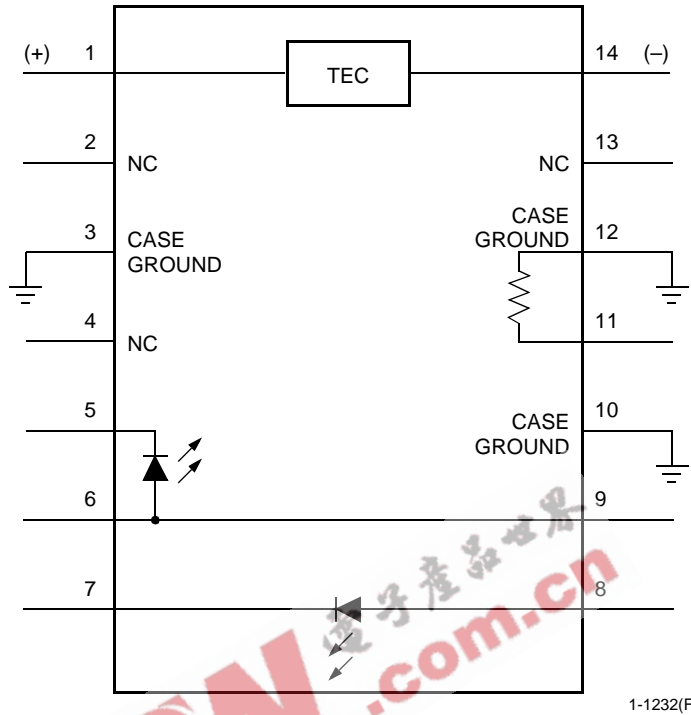


Figure 1. A1112 Laser Positive Bias Circuit Schematic

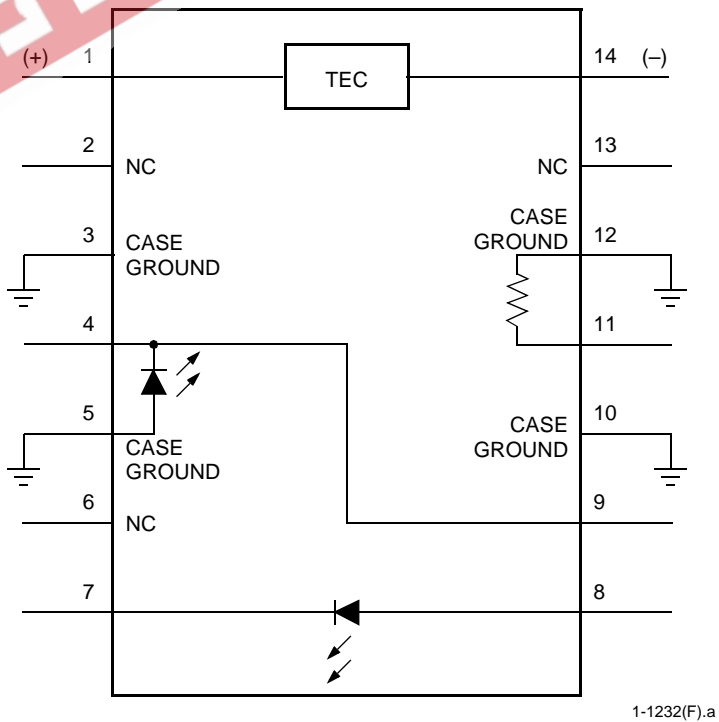
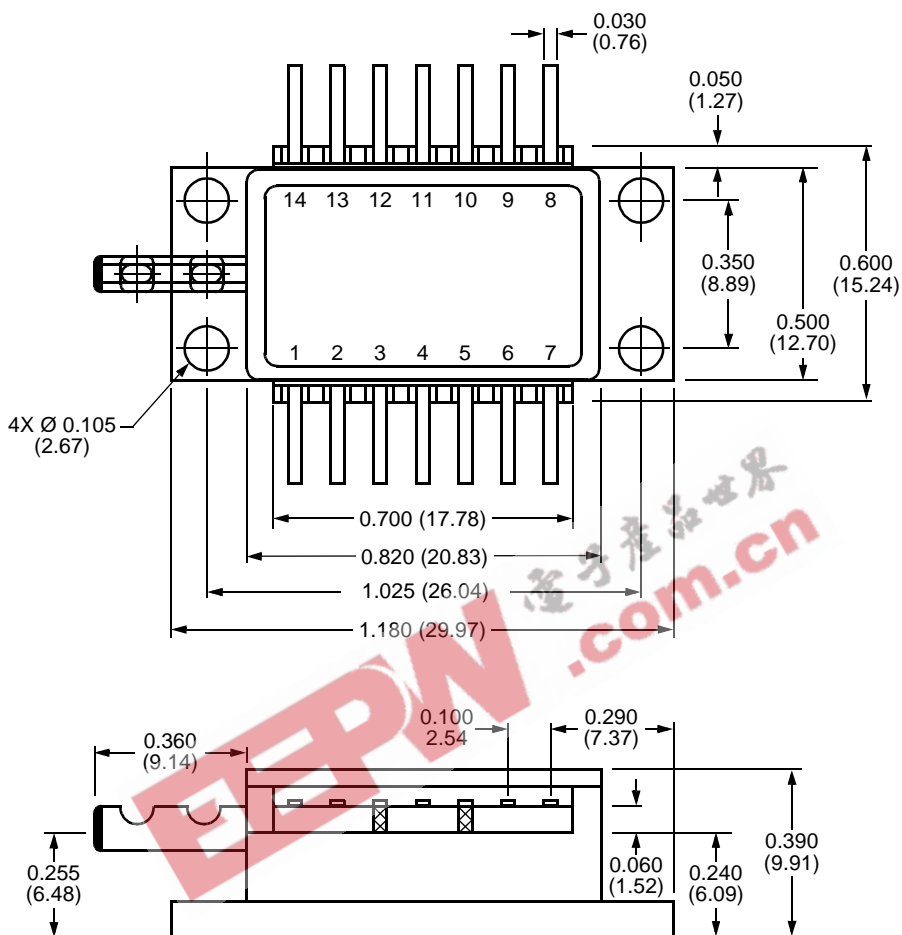


Figure 2. A1112 Laser Negative Bias Circuit Schematic

Outline Diagram

Dimensions are in inches and (millimeters).



1-1177(F)

Pin Information

Table 3. Pin Descriptions

Pin No.	A1112 (Positive Bias)	A1112 (Negative Bias)	Pin No	A1112 (Positive Bias)	A1112 (Negative Bias)
1	TE Cooler (+)	TE Cooler (+)	8	Photodiode Anode	Photodiode Anode
2	NC	NC	9	Laser Anode	Laser Cathode
3	Case Ground	Case Ground	10	Case Ground	Case Ground
4	NC	Laser Cathode	11	Thermistor	Thermistor
5	Laser Cathode, Case Ground	Laser Anode, Case Ground	12	Case Ground	Case Ground
6	Laser Anode	NC	13	NC	NC
7	Photodiode Cathode	Photodiode Cathode	14	TE Cooler (-)	TE Cooler (-)

Laser Safety Information

Class IIIb Laser Product

FDA/CDRH Class IIIb laser product. All versions are Class IIIb laser products per CDRH, 21 CFR 1040 Laser Safety requirements. All versions are Class 3B laser products per IEC¹ 60825-1:1993. The device has been classified with the FDA under an accession number to be determined.

This product complies with 21 CFR 1040.10 and 1040.11.

*Fujikura*² PANDA single-mode fiber pigtail, 1 m—2 m; FC/APC connector, nonaligned

Wavelength = 1.5 μm

Maximum power = 60 mW

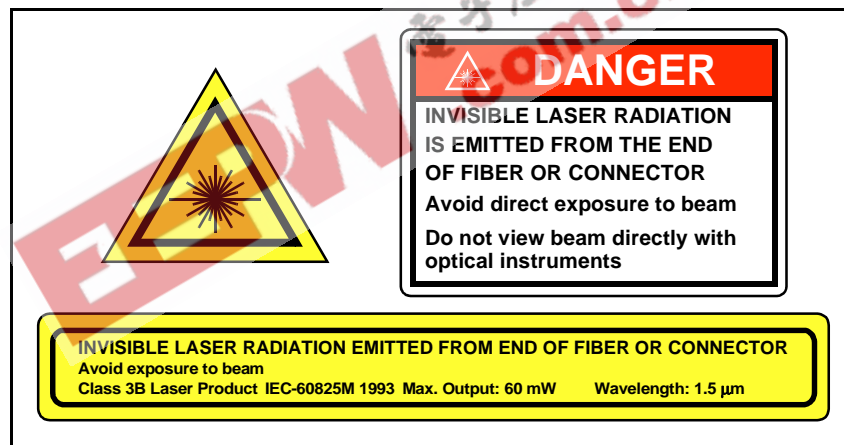
Because of size constraints, laser safety labeling (including an FDA Class IIIb label) is not affixed to the module but attached to the outside of the shipping carton.

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.

1. IEC is a registered trademark of The International Electrotechnical Commission.

2. *Fujikura* is a registered trademark of Fujikura LTD.



Ordering Information

Table 4. Ordering Information¹

Device Code	Output Power/Laser Bias	Fiber/Connector	Comcode
A1112PB	30 mW/ Positive Laser Bias	Fujikura PANDA/ FC/APC nonaligned	108846536
A1112PC	40 mW/ Positive Laser Bias		108846544
A1112NB	30 mW/ Negative Laser Bias		108846510
A1112NC	40 mW/ Negative Laser Bias		108846528

1. For additional ordering information, please contact an account manager at Opto West, Agere Systems, 1-800-362-3891 (for sales staff, please press option 2).

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For additional information, contact your Agere Systems Account Manager or the following:

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