

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	T _C	-20	65	°C
Storage Temperature Range	T _{stg}	-40	70	°C
Forward Current (Laser)	I _F	—	275	mA
A1112PB, A1112NB		—	400	mA
A1112PC, A1112NC				
Reverse Voltage (Laser)	V _R	—	2.0	V
Photodiode Reverse Voltage	V _{RPD}	—	10	V
TEC Voltage	V _{TEC}	—	2.0	V
TEC Current	I _{TEC}	—	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	P _O	—	30	—	mW
A1112PB, A1112NB		—	40	—	mW
A1112PC, A1112NC					
Center Wavelength	λ_C	I _{OP}	1540	1560	nm
Linewidth (FWHM)	$\Delta\nu$	I _{OP}	—	3	MHz
Side Mode Suppression Ratio	SMSR	I _{OP}	30	—	dB
Relative Intensity Noise	RIN	I _{OP} , 40 MHz to 860 MHz	—	-162	dBc/Hz
Operating Current	I _{OP}	—	—	250/350	mA
Threshold Current	I _{TH}	—	—	35/40	mA
Forward Voltage	V _F	—	—	2.5/3.0	V
Optical Isolation	—	-20 °C to +65 °C	30	—	dB
Polarization Extinction Ratio	T _E /T _M	From fiber end, I _{OP}	20	—	dB
Reverse Voltage	V _R	—	—	2.0	V

Table 2. Electrical Characteristics

Parameter	Symbol	Condition	Min	Max	Unit
Monitor Photodiode Reverse Voltage	V _{RMPD}	I _{OP}	—	10	V
Monitor Photodiode Current	I _{MPD}	—	40	2000	μA
TEC Current	I _{TEC}	$\Delta T = 40\text{ °C}$	—	1.8	A
TEC Voltage	V _{TEC}	$\Delta T = 40\text{ °C}$	—	2.2	V
Thermistor Resistance	R _{TH}	25 °C	9.0	11.0	kΩ

Electrical/Optical Characteristics (continued)

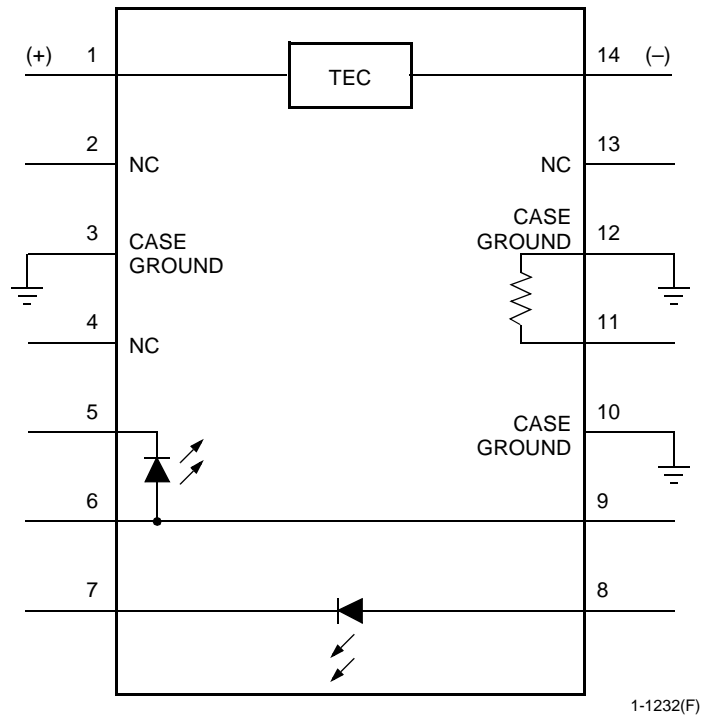


Figure 1. A1112 Laser Positive Bias Ciicuit Schematic

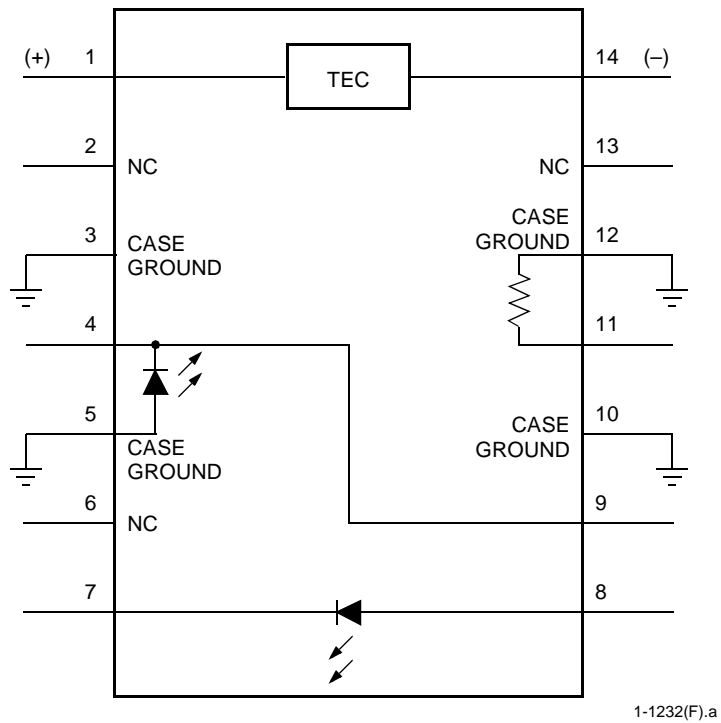
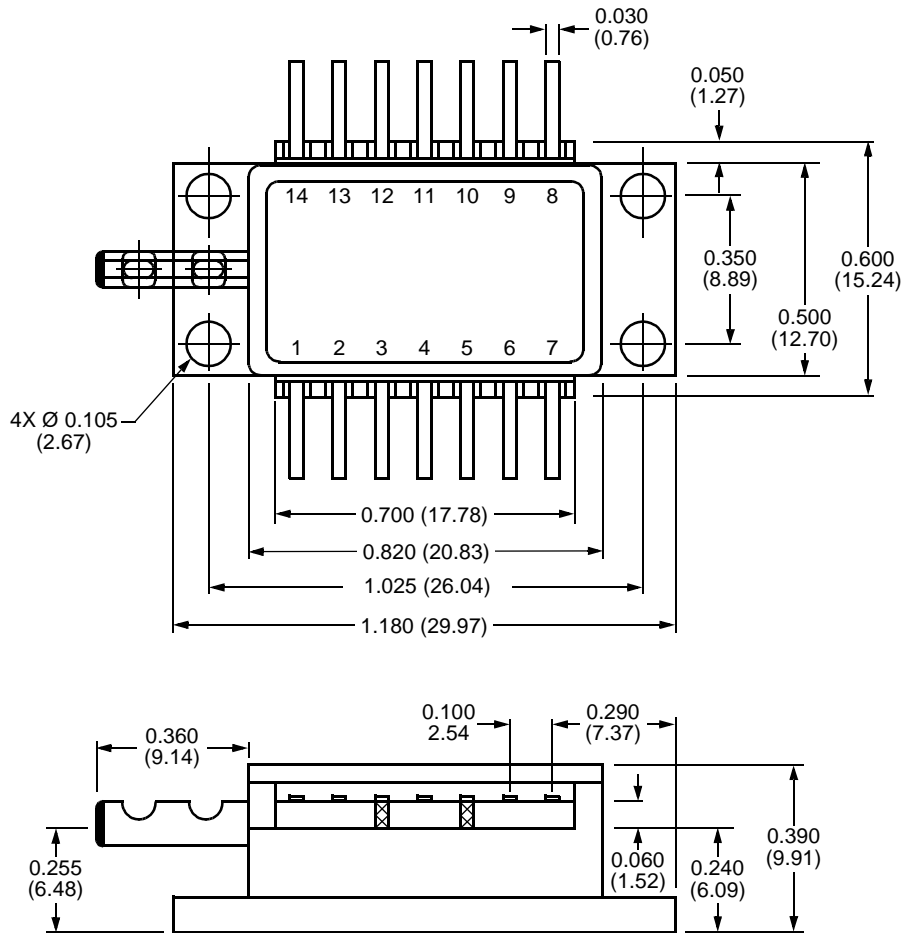


Figure 2. A1112 Laser Negative Bias Ciicuit Schematic

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 *IEC*¹ 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

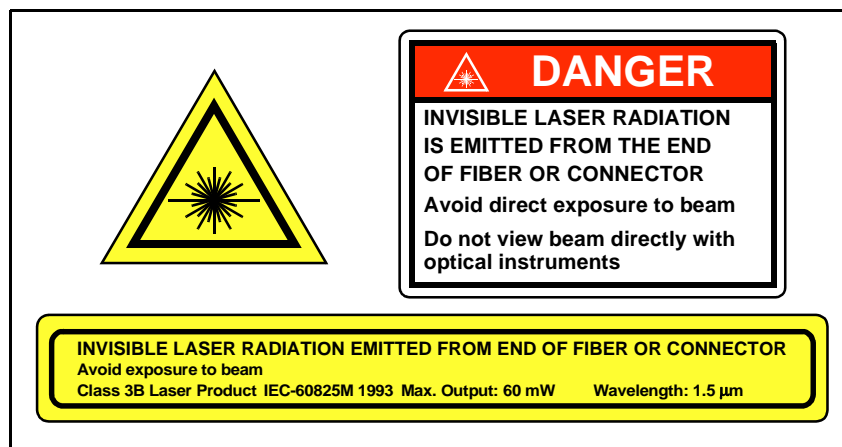
Because of size constraints, laser safety labeling (including an FDA Class IIIb label) is not affixed to the module but attached to the outside of the shipping carton.

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	<i>Fujikura</i> 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).

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

INTERNET: <http://www.agere.com>

E-MAIL: docmaster@micro.lucint.com

N. AMERICA: Agere Systems Inc., 555 Union Boulevard, Room 30L-15P-BA, Allentown, PA 18109-3286
1-800-372-2447, FAX 610-712-4106 (In CANADA: 1-800-553-2448, FAX 610-712-4106)

ASIA PACIFIC: Agere Systems Singapore Pte. Ltd., 77 Science Park Drive, #03-18 Cintech III, Singapore 118256
Tel. (65) 778 8833, FAX (65) 777 7495

CHINA: Agere Systems (Shanghai) Co., Ltd., 33/F Jin Mao Tower, 88 Century Boulevard Pudong, Shanghai 200121 PRC
Tel. (86) 21 50471212, FAX (86) 21 50472266

JAPAN: Agere Systems Japan Ltd., 7-18, Higashi-Gotanda 2-chome, Shinagawa-ku, Tokyo 141, Japan
Tel. (81) 3 5421 1600, FAX (81) 3 5421 1700

EUROPE: Data Requests: DATALINE: Tel. (44) 7000 582 368, FAX (44) 1189 328 148
Technical Inquiries: OPTOELECTRONICS MARKETING: (44) 1344 865 900 (Ascot UK)

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