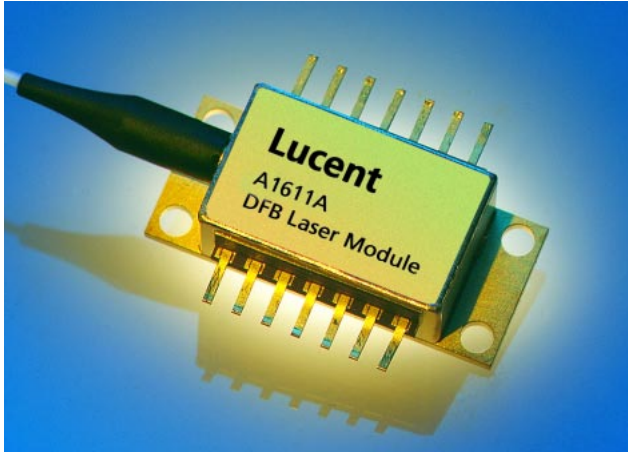




## A1611A/B DFB Laser Modules



### Description

The A1611A/B 1310 nm DFB laser modules are designed for broadcast and narrowcast CATV applications. The modules are highly linear, OC-48 pinout-compatible devices available with standard power output up to 13 mW.

The A1611A/B module is optimized to assist OEM customers with 1310 nm CATV transmitter design. Its range of standard-to-enhanced performance specifications and available output power ensures the flexibility a CATV system designer needs to accurately and cost-effectively address the requirements of any forward-path application.

### Features

- OC-48 pinout compatible
- Negative bias
- 112 channel loading available
- Meets *Telcordia Technologies*\* 468 specifications
- Output power, up to 13 mW

### Applications

- 1310 forward path
- Broadcast and narrowcast networks

\* *Telcordia Technologies* is a trademark of Telcordia Technologies, Inc.

## 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 Case Temperature Range	T <sub>C</sub>	I <sub>F</sub> = I <sub>OP</sub>	−20	65	°C
Storage Case Temperature Range	T <sub>stg</sub>	—	−40	70	°C
Laser Forward Bias	—	—	—	120	mA
Reverse Voltage (Laser)	V <sub>R</sub>	—	—	2	V
Reverse Voltage Photodiode	V <sub>RPD</sub>	—	—	10	V
TEC Current	I <sub>TEC</sub>	−20 °C < T <sub>C</sub> < 65 °C, T <sub>OP</sub> = 25 °C, I <sub>F</sub> = 100 mA	—	1.5	A

## Electrical/Optical Characteristics

Table 1. Electrical and Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Wavelength	λ <sub>OP</sub>	I <sub>F</sub> = I <sub>OP</sub> , T = T <sub>OP</sub>	1300	1310	1320	nm
Optical Output Power	P <sub>O</sub>	I <sub>F</sub> = I <sub>OP</sub>	4	—	13	mW
Optical Isolation	ISO	T <sub>OP</sub> = 25 °C	30	—	—	dB
Side Mode Suppression Ratio	SMSR	I <sub>F</sub> = I <sub>OP</sub>	30	—	—	dB
Threshold Current	I <sub>TH</sub>	25 °C, BOL	—	—	30	mA
Operating Current	I <sub>OP</sub>	BOL	—	65	120	mA
Monitor Operating Current	I <sub>MON</sub>	I <sub>OP</sub> = 0 mA	10	—	200	μA/mW
Thermistor Resistance	R <sub>TH</sub>	T <sub>OP</sub> = 25 °C	—	10 ± 1 @ 25 °C	—	kΩ
Thermistor Temperature Coefficient	T <sub>CTH</sub>	T <sub>OP</sub> = 25 °C	—	−4.4 @ 25 °C	—	%/°C

Table 2. RF Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Frequency Range	F	—	20	—	860	MHz
Frequency Response	S <sub>21</sub>	I <sub>F</sub> = 60 mA, 20 MHz—860 MHz, T <sub>OP</sub> = 25 °C	—	± 0.5	—	dB
Carrier-to-Noise Ratio*	CNR	—	—	51	—	dB
Composite Second Order 1611A 1611B	CSO	—	— —	57 60	— —	— —
Composite Triple Beat	CTB	—	—	66	—	dB
Relative Intensity Noise	RIN	—	—	< −155	—	dB/Hz

\* OMI = 2.8% min, 112 unmodulated NTSC channels, through fiber, up to 20 mW output power.

## Electrical Schematics

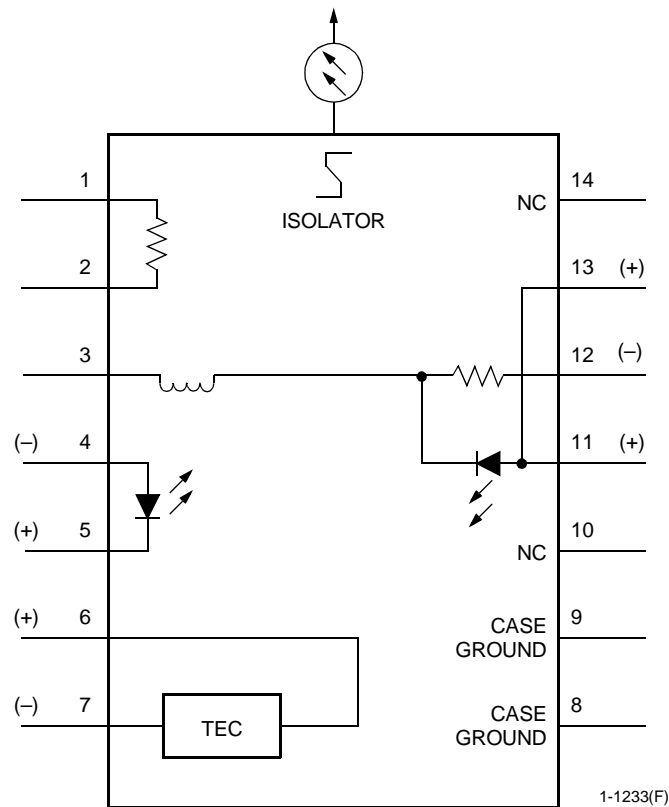


Figure 1. A1611A/B Laser Schematic

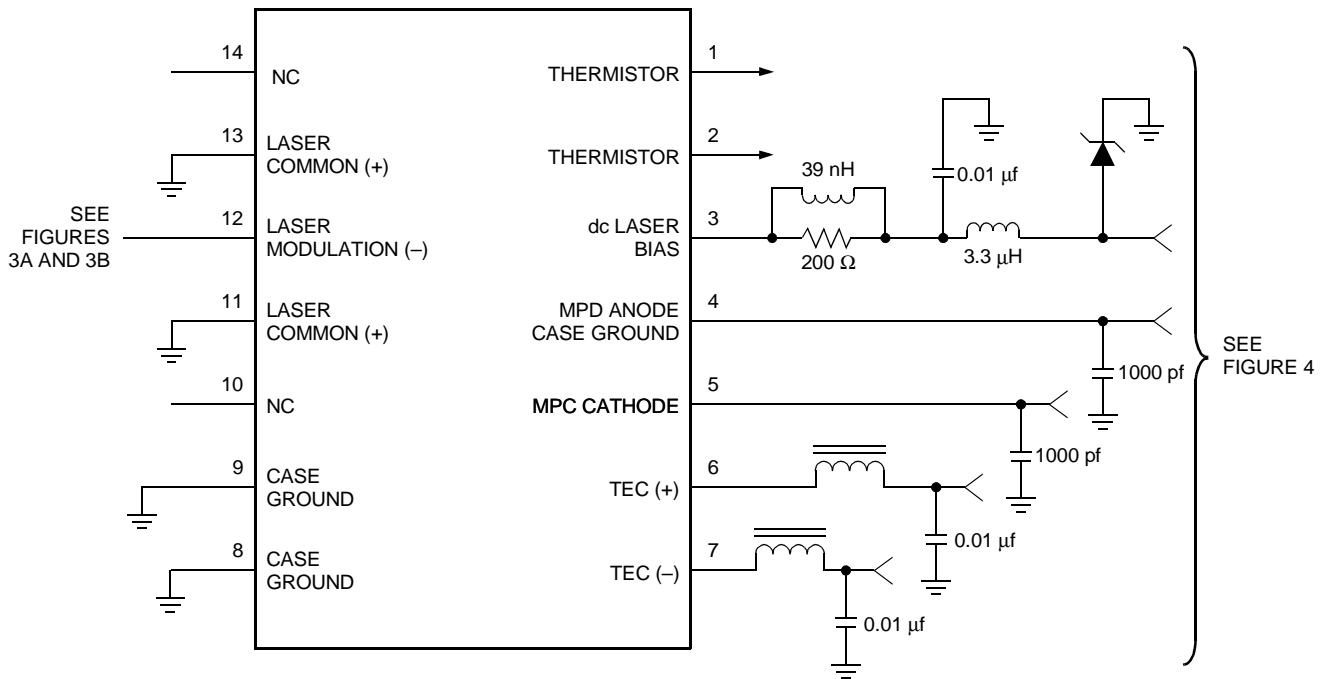


Figure 2. A1611A/B Circuit Schematic

## Electrical Schematics (continued)

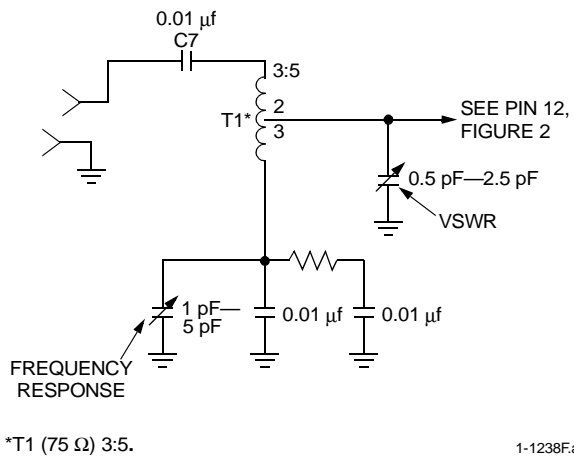


Figure 3a. Impedance-Matched Configuration

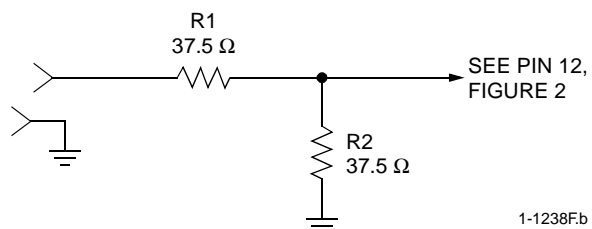
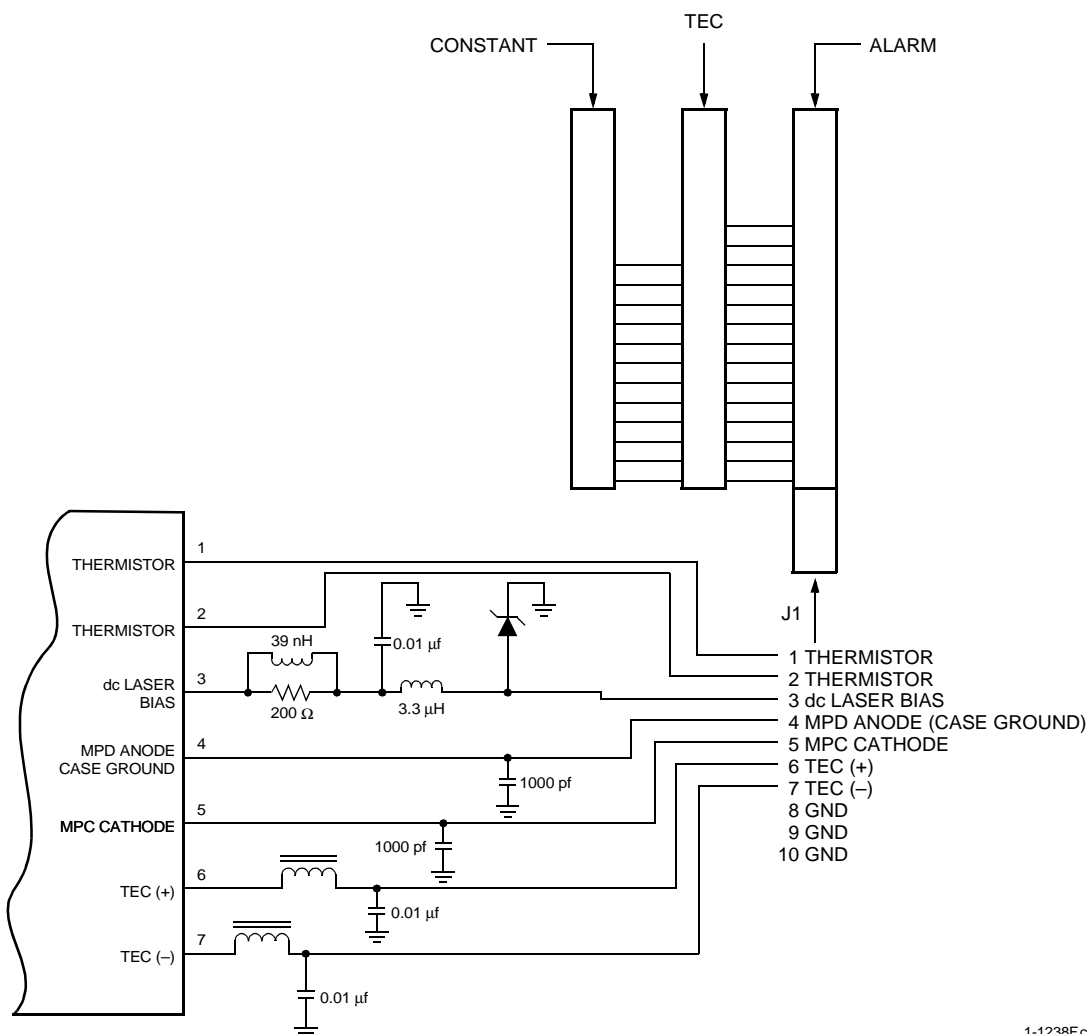


Figure 3b. Resistive-Matched Configuration

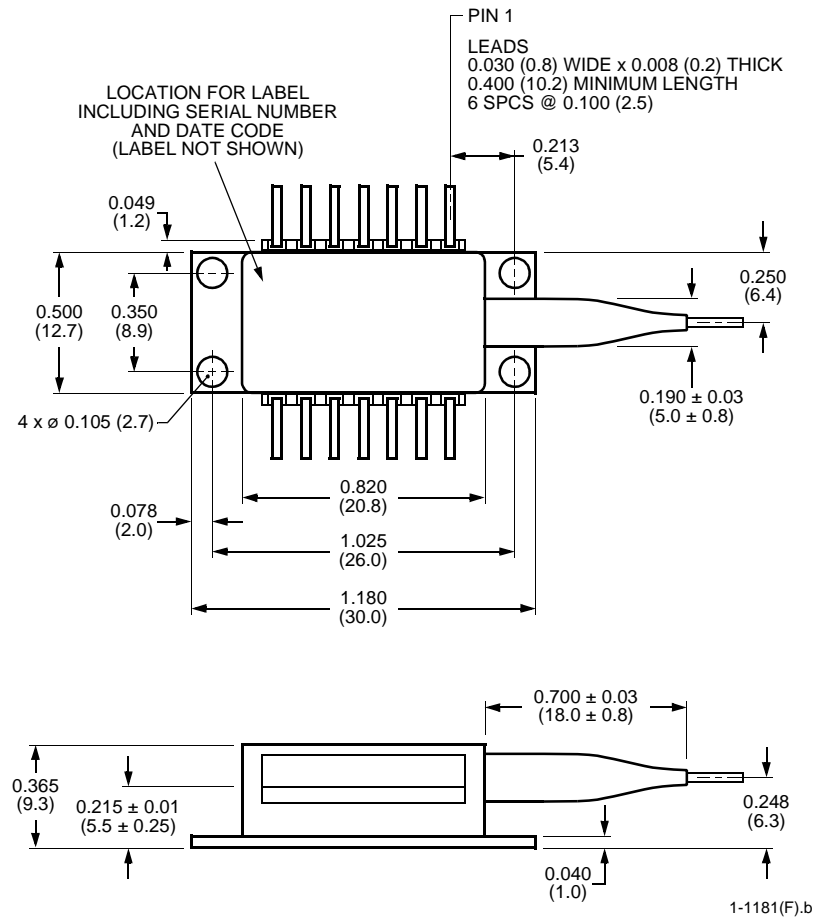


Note: When ordering the dc set, the following boards are included: alarm board, 9108-004; TEC board, 9028-004; constant current, 9383-004.

Figure 4. dc Set (Lucent Supplied)

## Outline Diagram

Dimensions are in inches and (millimeters).



## Pin Information

Table 3. Pin Descriptions

Pin No.	Description
1	Thermistor
2	Thermistor
3	dc Laser Bias (–)
4	MPD Anode, Case Ground (–)
5	MPD Cathode (+)
6	Thermoelectric Cooler (+)
7	Thermoelectric Cooler (–)
8	Case Ground
9	Case Ground
10	NC
11	Laser Common (+)
12	Laser Modulation (–)
13	Laser Common (+)
14	NC

## 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*\* 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.

Single-mode fiber pigtail

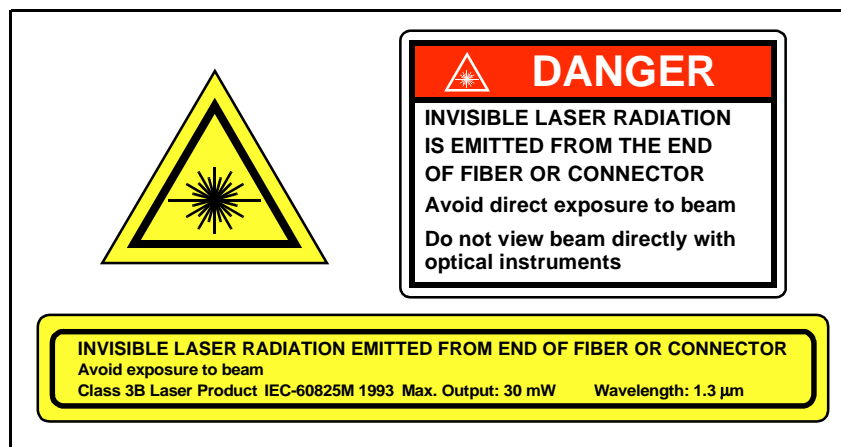
Wavelength = 1.3  $\mu\text{m}$

Maximum power = 30 mW

Because of size constraints, laser safety labeling (including the 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.**



\* *IEC* is a registered trademark of The International Electrotechnical Commission.

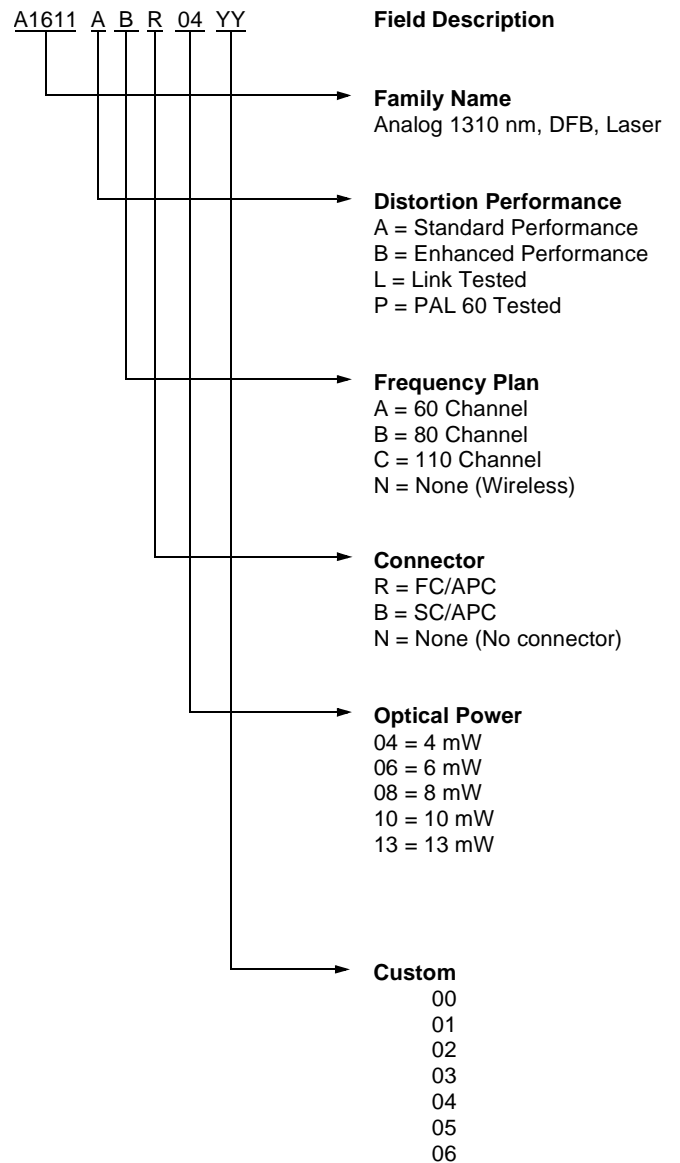
## Ordering Information

Table 4. Ordering Information\*

Device Code	Comcode
A1611ABR04	108851353
A1611ABR06	108851361
A1611ABR08	108851379
A1611ABR10	108851387
A1611ABR13	108851395
A1611ABR16	108851403
A1611ABR20	108851411
A1611ACB04	108851429
A1611ACB06	108851437
A1611ACB08	108851445
A1611ACB10	108851452
A1611ACB13	108851460
A1611ACN10	108851494
A1611ACR04	108851502
A1611ACR06	108851510
A1611ACR08	108851528
A1611BCR04	108851536
A1611BCR06	108851544
A1611BCR08	108851551
A1611BCR10	108851569
A1611BCR13	108851577

\* For additional ordering information, please contact a Lucent account manager at Microelectronics Group, Optoelectronics Division, OPTO West, 1-800-362-3891 (for sales staff, please press option 2).

## Ordering Code Definitions



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For additional information, contact your Microelectronics Group Account Manager or the following:

INTERNET: <http://www.lucent.com/micro>, or for Optoelectronics information, <http://www.lucent.com/micro/opto>

E-MAIL: [docmaster@micro.lucent.com](mailto:docmaster@micro.lucent.com)

N. AMERICA: Microelectronics Group, Lucent Technologies 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)

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**Tel. (65) 778 8833**, FAX (65) 777 7495

CHINA: Microelectronics Group, Lucent Technologies (China) Co., Ltd., A-F2, 23/F, Zao Fong Universe Building, 1800 Zhong Shan Xi Road, Shanghai 200233 P. R. China **Tel. (86) 21 6440 0468, ext. 325**, FAX (86) 21 6440 0652

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**Tel. (81) 3 5421 1600**, FAX (81) 3 5421 1700

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Technical Inquiries: OPTOELECTRONICS MARKETING: **(44) 1344 865 900** (Ascot UK)

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