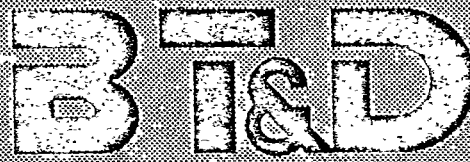


T-41-90

British
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DuPont

T E C H N O L O G I E S

LSC1300

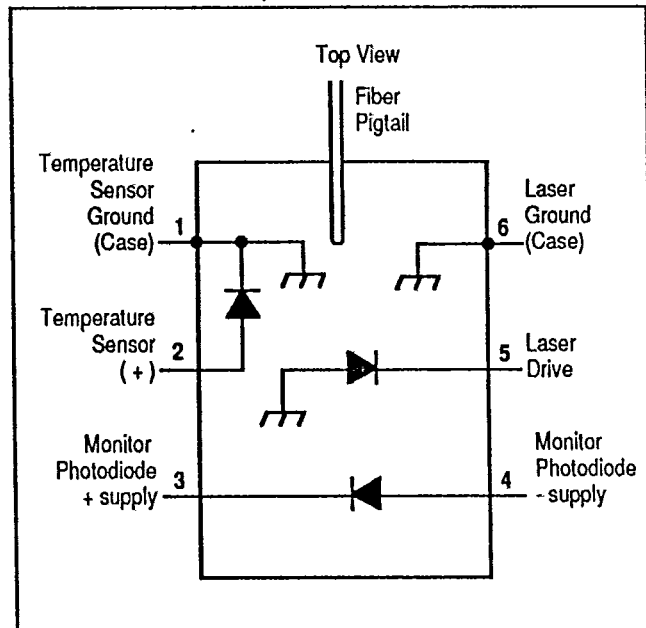
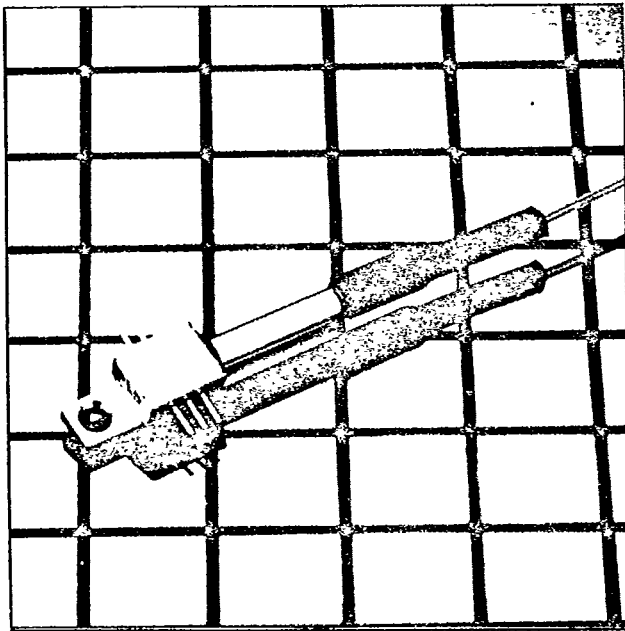
MINIATURE LASER MODULE

Features

- Miniature 6 pin hermetic package includes laser, monitor photodiode, single mode fiber pigtail, and optional temperature sensor
- 200 μ W (-7dBm) typical power output
- 1280 - 1330 nm wavelength
- Modulation capability up to 1.4 Gbits/s

Applications

- Telecommunications
- Local area and metropolitan area networks
- Point to point data communications
- Fiber optic sensors
- Cable television
- Military communications and control systems
- Instrumentation



Description

The LSC1300 miniature laser module converts electricity to light in the 1300 nanometer band. Using an InGaAsP buried heterostructure laser diode fabricated by the Metal-Organic Vapor Phase Epitaxy (MOVPE) process, the LSC1300

offers excellent reliability and modest threshold currents. The hermetic package contains laser, monitor photodiode, optional temperature sensor, and sealed single mode fiber.

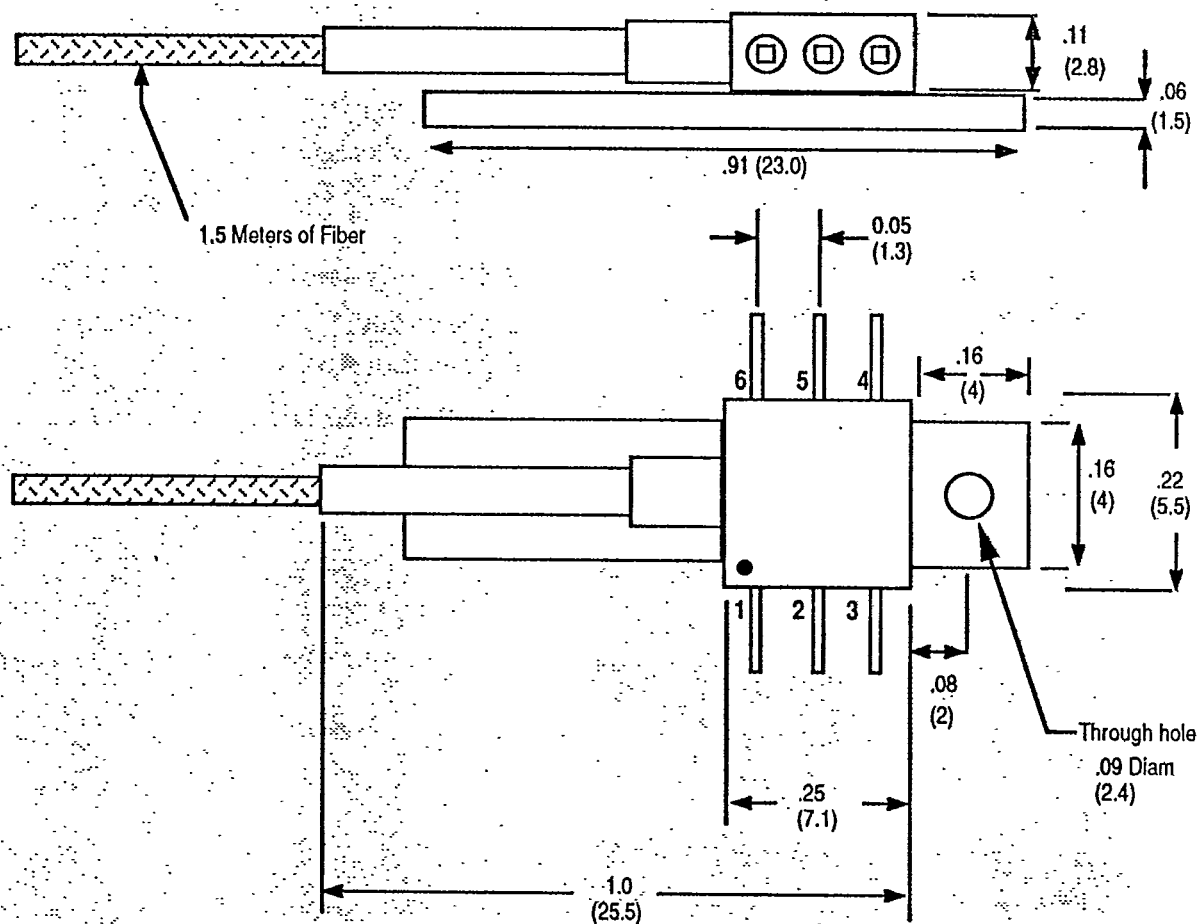
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LSC1300

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PACKAGE DIMENSIONS

dimensions in inches (millimeters)



Pin Assignment

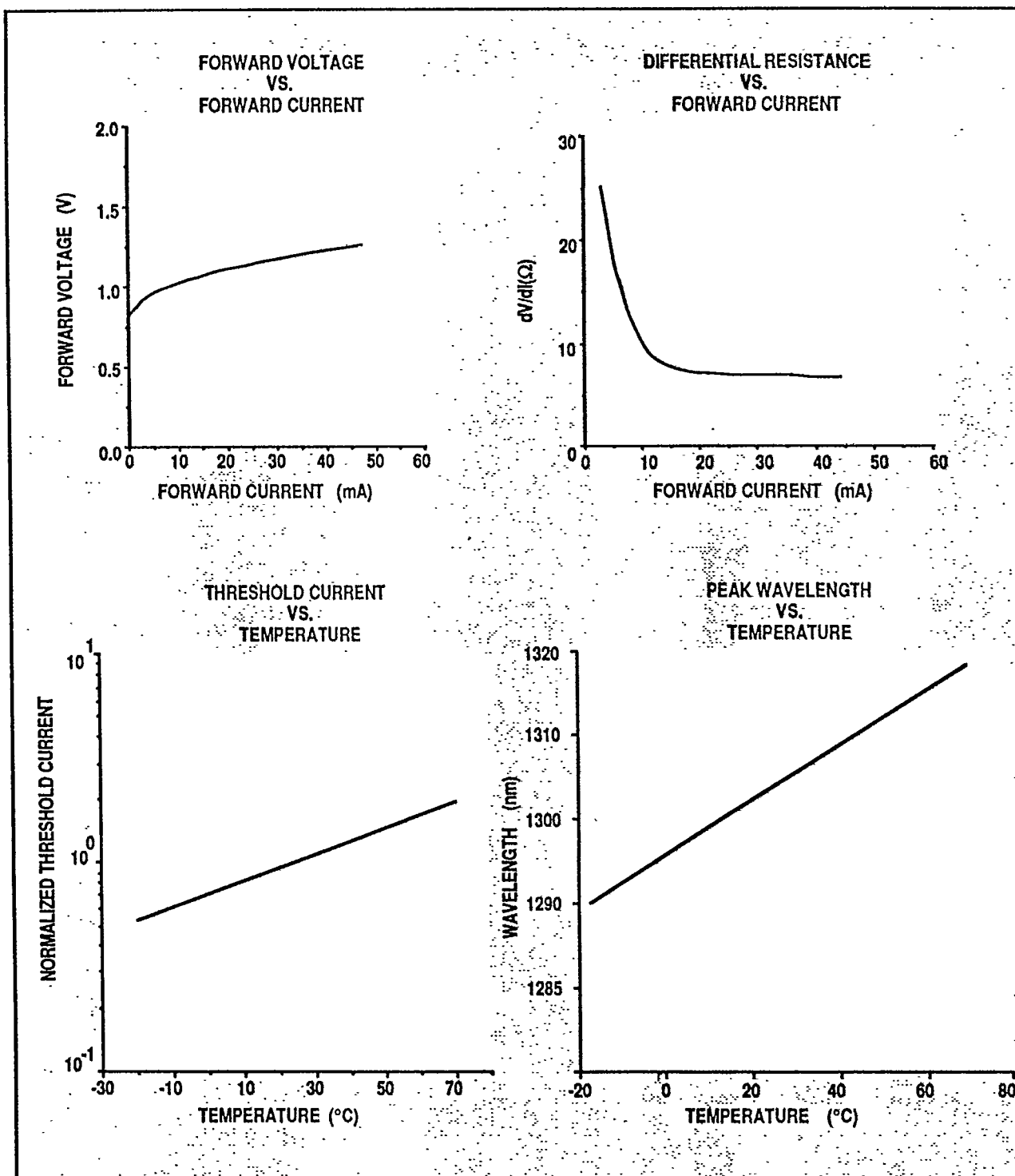
1. Temperature sensor cathode (Ground)
2. Temperature sensor anode (+)
3. Monitor photodiode +v supply
4. Monitor photodiode -v supply
5. Laser cathode
6. Laser anode and case (Ground)

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LSC1300

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LASER DIODE TYPICAL OPERATING CHARACTERISTICS

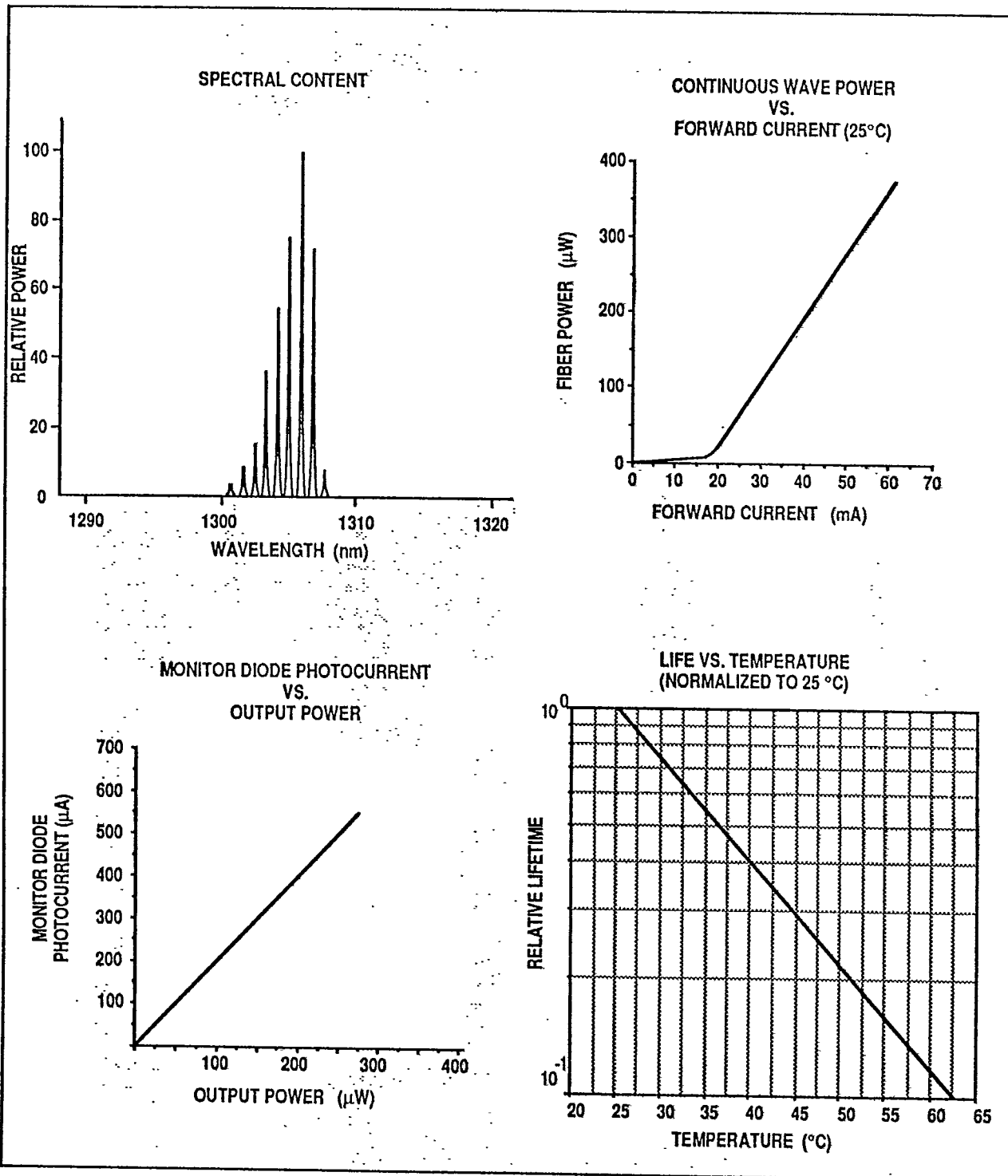


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LSC1300

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LASER DIODE TYPICAL OPERATING CHARACTERISTICS



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LSC1300



SPECIFICATIONS

Absolute Maximum Ratings (at 25°C)

PARAMETER	MIN	TYP	MAX	UNITS
Laser Forward Current	—	—	100	mA
Laser Reverse Current	—	—	100	μA
Laser Reverse Voltage	—	—	2.0	V
Photodiode Forward Current	—	—	1	mA
Photodiode Reverse Voltage (V _r)	—	—	-10	V
Fiber Pull Strength	—	—	10	N
Operating Temperature (case)	-20	—	+65	°C
Storage Temperature	-40	—	+70	°C
Relative Humidity	0	—	noncondensing	% RH
Mechanical Shock	MIL, STD, 883, Method 2002, Test condition B			
Vibration	MIL, STD, 883, Method 2007, Test condition A			

PERFORMANCE SPECIFICATIONS -- LASER ¹

PARAMETER	MIN	TYP	MAX	UNITS
Threshold Current (I _{th})	5	20	35	mA
Temperature Coefficient of Threshold Current (-25°C to +65°C)	—	—	+2.5	%/°C
Differential Resistance	—	—	10	Ω (dV/dI)
Spectral Width (FWHM)	—	3	10	nm
Fiber Output Optical Power (P _f) at I _{th} + 25mA	100 -10	200 -7	400 -4	μW dBm
Temp. Coefficient of Laser Output Power ²	—	—	-1.0	%/°C
Optical Power at 2 mA below Threshold	—	—	6.6 -22	μW dBm
Rise Time; 10% to 90%; I _{th} to I _{th} + 25mA	—	—	0.5	ns
Fall Time; 90% to 10%; I _{th} + 25mA to I _{th}	—	—	0.5	ns
Center Wavelength	1280	1300	1330	nm
Temperature Dependence of Peak Wavelength	—	—	+0.6	nm/°C
Small Signal Frequency Response (-3dB point)	—	1.0	—	GHz
Mode Hopping and Mode Partition Noise ³	Adequately low to allow <5x10 ⁻¹¹ BER at 565 Mbits/s			
MTTF ⁴	—	450,000	—	Hrs

Notes:

- ¹ At 25°C and P_f = 200μW unless otherwise specified.
- ² Change in laser drive current above threshold for constant monitor output current.
- ³ Assuming 2¹⁵ - 1 data pattern, optically dispersive medium of 150 ps/nm and return loss of ≥ .25 dB.
- ⁴ MTTF is defined as the total hours of operation before the device fails to meet the above specifications, or when the threshold current rises more than 100% above its original value, or when the monitor detector responsivity changes by ± 1.5 dB.

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LSC1300



MONITOR PHOTODIODE

PARAMETER	MIN	TYP	MAX	UNITS
Photocurrent (Im) at Ith +25mA	0.2	—	0.7	mA
Responsivity ($\Delta I_m / \Delta P_i$) at $V_r = -5v$	0.5	—	7.0	A/W
Temperature Dependence of Responsivity 1 (from -20°C to +65°C, with respect to 25°C)	—	—	±1.5	dB
Dark Current ($V_r = -5V$) at 25°C	—	—	0.1	μA
at 65°C	—	—	1.0	μA
Photocurrent Linearity (from $P_i = 10\mu W$ to $200\mu W$)	—	—	±0.5	dB

PN TEMPERATURE SENSOR (OPTIONAL)

Forward Voltage (100μA forward current)	0.6	0.7	0.75	V
Temperature Coefficient (-20°C to +65°C)	—	-1.8	—	mV/°C

FIBER PIGTAIL

Type	Tight jacketed, self-mode-stripping, single mode fiber			
Length 2	1.5	—	—	m
Spot Size (mode radius)	4.5	—	5.5	μm
Cladding Diameter	122	—	128	μm
Core / Cladding Concentricity	—	—	1.0	μm
Secondary Jacket Diameter	0.8	0.9	1.0	mm
Effective Cutoff Wavelength (1 meter straight)	1150	—	1200	nm

Notes:

- 1 Fiber output power change for constant monitor output current.
- 2 Fiber length of 1.5 meters is standard without connector. Length will be reduced during connectorization.

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LSC1300



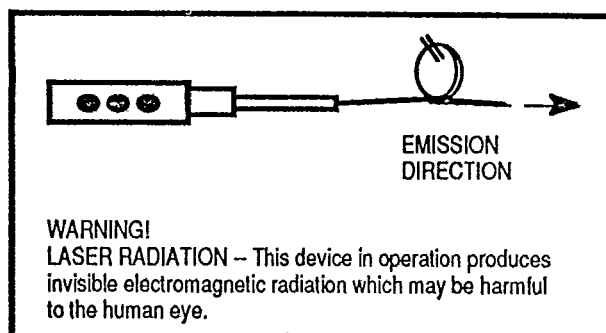
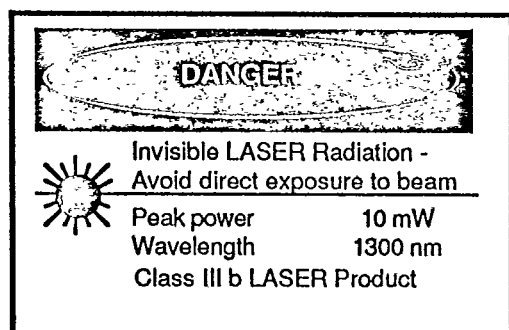
ORDERING INFORMATION

Please order part number L S C 1 3 0 0 - X X

Products are available with custom connectors;
call your account representative for details.

Style: FC/PC = FP
ST = ST
SMA = SA
Biconic = BI
None = NA

SAFETY PRECAUTIONS



HANDLING PRECAUTIONS

1. Normal handling precautions for electrostatic sensitive devices should be taken
2. Semiconductor lasers can be damaged by overloading or by current surges.
Appropriate transient protection precautions should be taken.

To place an order or to obtain more
information, contact:

U.S.A.

BT&D Technologies
Delaware Corporate Center II
Suite 200
2 Righter Parkway
Wilmington, DE 19803
Tel: (800) 545-4306 USA only
(302) 479-0300
Fax: (302) 479-9560

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4997 Shin-Yoshida-Cho
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F-16-21

The drawing shows a top view and a side view of the Temperature Sensor Module. The top view includes dimensions for the overall size (1.0 inch / 25.5 mm), pin spacing (0.08 inch / 2.0 mm), and pin pitch (0.16 inch / 4.0 mm). A through-hole with a diameter of 0.09 inch (2.4 mm) is located near the pins. The side view shows the module's profile with a total height of 0.11 inch (2.8 mm) and a mounting tab width of 0.05 inch (1.3 mm). A 1.5-meter fiber cable is connected to the module.

PIN NO	FUNCTION
1	Temperature Sensor Cathode (GND)
2	Temperature Sensor Anode (+)
3	Monitor Photodiode +V Supply
4	Monitor Photodiode -V Supply
5	Laser Cathode
6	Laser Anode and Case (GND)

End View

Dimensions (mm): 1000 (25 4), 750 (19 05), 240 (6 09), 250 (6 35), 230 (5 84), 280 (7 11), 398 (10 1), 250 (6 35), 040 (1 01), 060 R (1 52 R), 010 (0 46).

Bottom View

Dimensions (mm): 600 (15 24), 040 (1 01), 500 (12 70), 100 (2 54), 787 (20 0), 844 (21 43), 150 (3 81), 300 (7 62).

Pinout Details:

LSC 2110 PIN NO	FUNCTION
1	TED anode (+)
2	Not connected
3	Not connected
4	Reserved
5	Case ground
6	Reserved
7	Monitor Photodiode +v supply
8	Monitor Photodiode -v supply
9	Laser cathode (-)
10	Laser anode (+), ground
11	Thermistor
12	Thermistor
13	Not connected
14	TED cathode (-)

LSC 2300 PIN NO

LSC 2300 PIN NO	FUNCTION
1	Not connected
2	Not connected
3	Not connected
4	Reserved
5	Case ground
6	Reserved
7	Monitor Photodiode +v supply
8	Monitor Photodiode -v supply
9	Laser cathode (-)
10	Laser anode (+), ground
11	Not connected
12	Not connected
13	Not connected
14	Not connected

Fiber Pigtail

60 (1 5 Meters)

End View

1 000 (25 4)
750 (19.05)
250 (6 35)
265 (6 73)
280 (7 11)
374 (9 5)
224 (5 7)
065 (1 65)
060 R (1 52 R)
.020 (0 51) Sq. Width

Bottom View

Fiber Pigtail
60 (1 5 Meters)
600 (15 24)
100 (2 54)
844 (21 43)
984 (25 0 nom)
150 (3 81)
300 (7 62)
500 (12 70)
040 (1 01)

LSC3300 PIN NO

PIN NO	FUNCTION
1	Not connected
2	Not connected
3	Not connected
4	Reserved
5	Case ground
6	Reserved
7	Monitor Photodiode +v supply
8	Monitor Photodiode -v supply
9	Laser cathode (-)
10	Laser anode (+) ground
11	Not connected
12	Not connected
13	Not connected
14	Not connected

Top View: Shows a cylindrical component with a central lens. Dimensions include a diameter of 09 (2.2) [counterbored 16 (4.0)] at the top, a total width of 36 (9.20) on the right, a central lens diameter of 35 (9.0), a distance of 53 (13.45) from the left edge to the center, and a total length of 75 (19.0).

Side View: Shows the component's profile with dimensions: a total length of 32 (8.0), a central section width of 26 (6.5), a distance of 47 (12) (min) from the right edge to the center, a thread specification of M8 x 75, a distance of 08 (2.0) from the thread to the right edge, and a distance of .06 (1.5) from the right edge to the center.

Connections: A diagram showing the rear view (pin side) of the 3-TO case. It includes a circular pinout diagram with pins 1, 2, and 3. Pin 2 is labeled "Laser" and pin 3 is labeled "Photodiode". Below the diagram is a schematic showing the internal connections: pin 2 is connected to the laser diode, and pin 3 is connected to the photodiode.

Bottom View: Shows the component from below with dimensions: a width of 35 (8.90) and a distance of 47 (12) (min) from the right edge to the center.