
155/622 Mb/s SMQW Pigtailed Laser Modules

Technical Data

LST2525 - 200 μ W Coaxial Laser
LST2825 - 1 mW Coaxial Laser
LST3521 - Sugar Cube Package
LST3821 - Sugar Cube Package
HFCT-3002 - 8 Pin DIL Package
HFCT-3012 - 8 Pin DIL Package

Features

- **3 Package Outlines**
- **Strained Multi Quantum Well (SMQW) Fabry Perot laser chip**
- **Low threshold and operating current**
- **Wide Operating Temperature Range**
- **Optical Power up to 1 mW**
- **Modulation Capability up to 622 Mb/s**

Applications

- **Telecommunications**
- **Fiber in the loop**
- **Inter/Intra Office**
- **SONET/SDH**
- **Datacommunications**
- **Switches**

Description

Products in the SMQW pigtailed laser module family consist of either a coaxial style, 8 pin “sugar cube”, or an 8 pin DIL package operating in the 1300 nm wavelength region and coupling light to single mode fiber. They are designed for use in short, medium and long distance networks with bit rates up to 622 Mb/s.

The device features a high reliability SMQW Fabry Perot laser diode and rear facet monitor photodiode. These are electrically connected to four pins in an industry- standard configuration.

Environmental performance is designed to be compatible with the requirements of Bellcore’s TA-NWT-000983 document.



If the specific arrangement or performance you require is not listed, please contact your local representative as our highly flexible design and manufacturing processes allow both physical and electro-optical customization to meet your needs.

A reference transmitter design board HFCT-3000 is available for evaluating the basic performance of the 8 pin DIL package.

Laser Safety Warning

This device is a Class IIIa (3a) Laser Product. It may emit invisible laser radiation if operated with the fiber pigtail disconnected. To avoid possible eye damage do not look into an unconnected fiber pigtail during laser operation. Do not exceed specified operating limits.

Absolute Maximum Ratings

Absolute limiting (maximum) ratings mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided that each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Test Condition	Limits		Unit
			Min.	Max.	
Laser Forward Current	If	DC		120	mA
Laser Reverse Voltage	Vlr	DC		2	V
Photodiode Reverse Voltage	Vr	DC		20	V
Photodiode Forward Current	Ipf	DC		1	mA
Operating Temperature	Tc	Temperature measured at case	-40	+85	°C
Storage Temperature	Ts		-40	+85	°C
Relative Humidity	RH		noncondensing		%RH
Fiber Pull Strength		Three times; 10 sec.		10	N
Mechanical Shock		MIL-STD-883E, Method 2002, Condition A		500	G
Vibration		MIL-STD-883E, Method 2007, Condition A		20	G

Performance Specifications

Parameter	Symbol	Test Condition	LST2525 LST3521 HFCT-3002A		LST2825 LST3821 HFCT-3012A		Unit
			Min.	Max.	Min.	Max.	
LASER		CW, Tc = -40°C to +85°C, Po as noted below unless otherwise stated					
Rated optical power	Po	Tc = ranges specified above, CW	0.2		1		mW
Threshold current	Ith	Tc = +25°C	3.5	10	3.5	10	mA
Threshold current	Ith		1.5	30	1.5	30	mA
Coupled Power in "Off" state	Pth	If = Ith - 2 mA		12		12	µW
Slope efficiency	η	Tc = +25°C	10	16	50	100	µW/mA
Drive current above Ith, for Im = Im (Po, +25°C)	Id	Tc = +25°C	12.5	20	10	20	mA
		Tc = -40°C to +85°C	10	33.3	7.5	33.3	mA
Forward voltage - LST - HFCT	Vf			1.6		1.6	V
				3.0		3.0	V
Centre wavelength	λ	Tc = +25°C	1286	1336	1286	1336	nm
		Tc = -40°C to +85°C	1260	1360	1260	1360	nm
Wavelength/temperature coefficient	Δλ/ΔT			0.4		0.4	nm/°C
Spectral width	σ	One sigma, RMS		2.5		2.5	nm
Rise and fall time	τ	10 - 90%, Ith to Po		380		380	ps

Performance Specifications (Continued)

Parameter	Symbol	Test Condition	LST2525 LST3521 HFCT-3002A		LST2825 LST3821 HFCT-3012A		Unit
			Min.	Max.	Min.	Max.	
MONITOR PHOTODIODE		$T_c = +25^\circ\text{C}$ $V_r = 5\text{ V}$, $P_o = \text{Rated Power}$					
Photocurrent	I_m		200	1000	200	1000	μA
Dark current	I_d	$P_o = 0\ \mu\text{W}$		20		20	nA
Capacitance - LST - HFCT	C	1 MHz		10		10	pF
				20		20	pF
Tracking Error	ΔR	$I_m = I_m(P_o, +25^\circ\text{C})$ $T_c +$ -40°C to $+85^\circ\text{C}$		± 1		± 1	dB
Rise and fall time	τ_r	10 - 90%, I_{th} to P_o		2		2	ns

Fiber Pigtail

Parameter	Minimum	Maximum	Unit
Fiber Pigtail Length	1000		mm
Spot Size (Mode Radius)	4.5	5.5	μm
Cladding Diameter	122	128	μm
Core/Cladding Concentricity		1	μm
Secondary Jacket Diameter	0.8	1	mm
Effective Cutoff Wavelength	1150	1240	nm

Reliability

Parameter	Condition	Minimum	Maximum	Unit
Median Life	50% inc. in total drive current, $T_c = +25^\circ\text{C}$	2×10^5		hours

Other documentation

SMQW Laser Diode Reliability Datasheet

Publication number 5965-1293E

LST282X/LST292X/LST3821/LST3921
Qualification Report

Publication number 5965-8894E

HFCT-3xxx

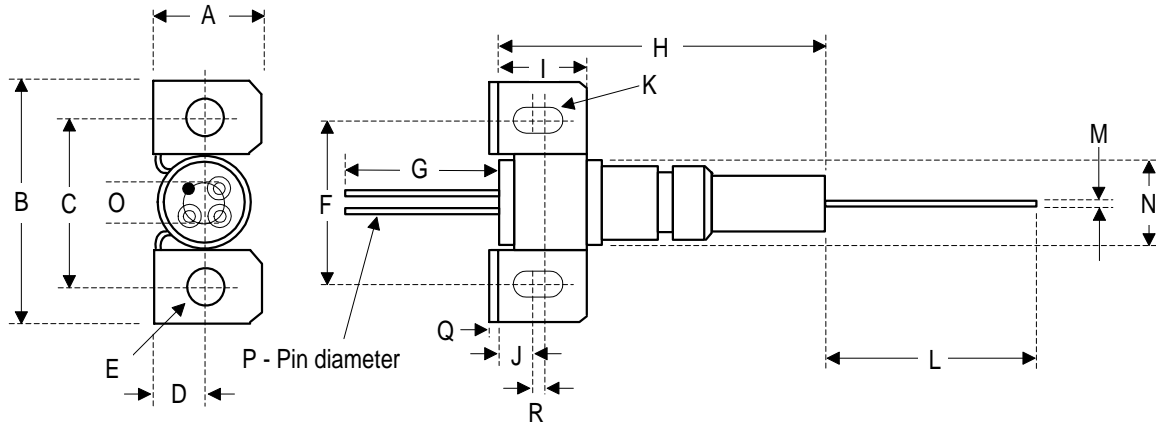
Application Note 1169
Characterization Report

Publication number 5968-4808E
Available April, 1999

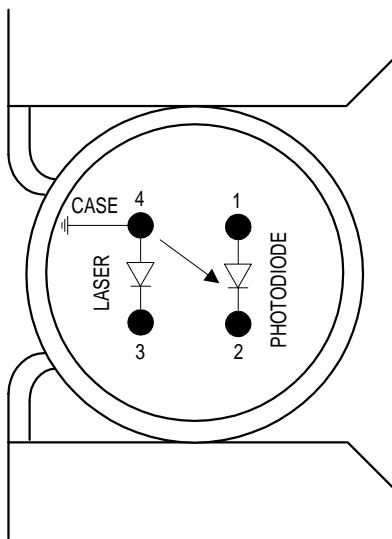
Interim Qualification Report

Publication number 5968-3019E

Example of LST2x25 - All dimensions in mm.



Dimension	Min.	Typ.	Max.	Dimension	Min.	Typ.	Max.	Dimension	Min.	Typ.	Max.
A		7.4		G	12			M		0.9	
B		17		H			20	N		5.3	
C	11.8		12.2	I		5.3		O		2	
D		3.7		J		2		P	0.4		0.5
E	2.4		2.6	K	2.1		2.3	Q		0.5	
F	12.5		12.9	L		1000		R		1.25	

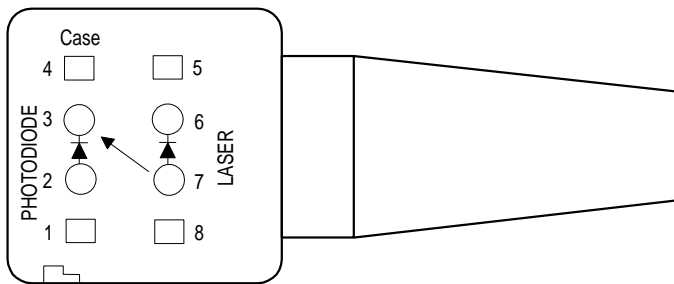
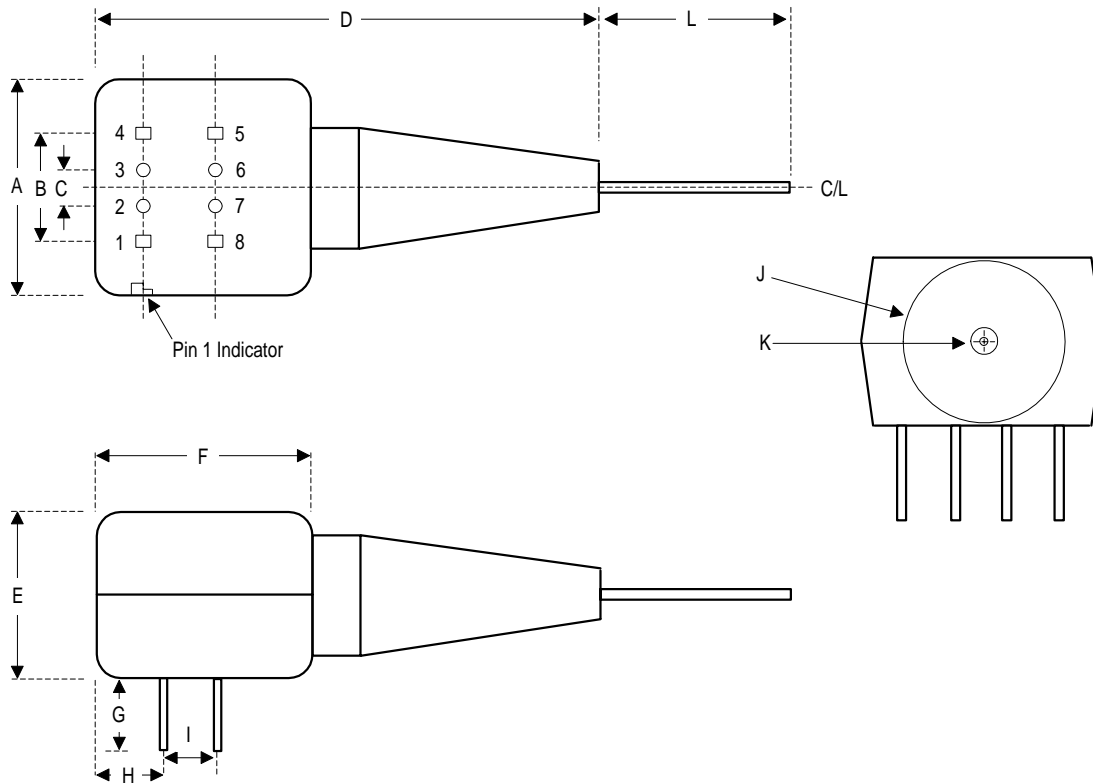


LST2x25

LST2x25

Pin	Function
1	Monitor Anode (-ve)
2	Monitor Cathode (+ve)
3	Laser Cathode (-ve)
4	Laser Anode (+ve)

LST3x21 Specification - All dimensions in mm.



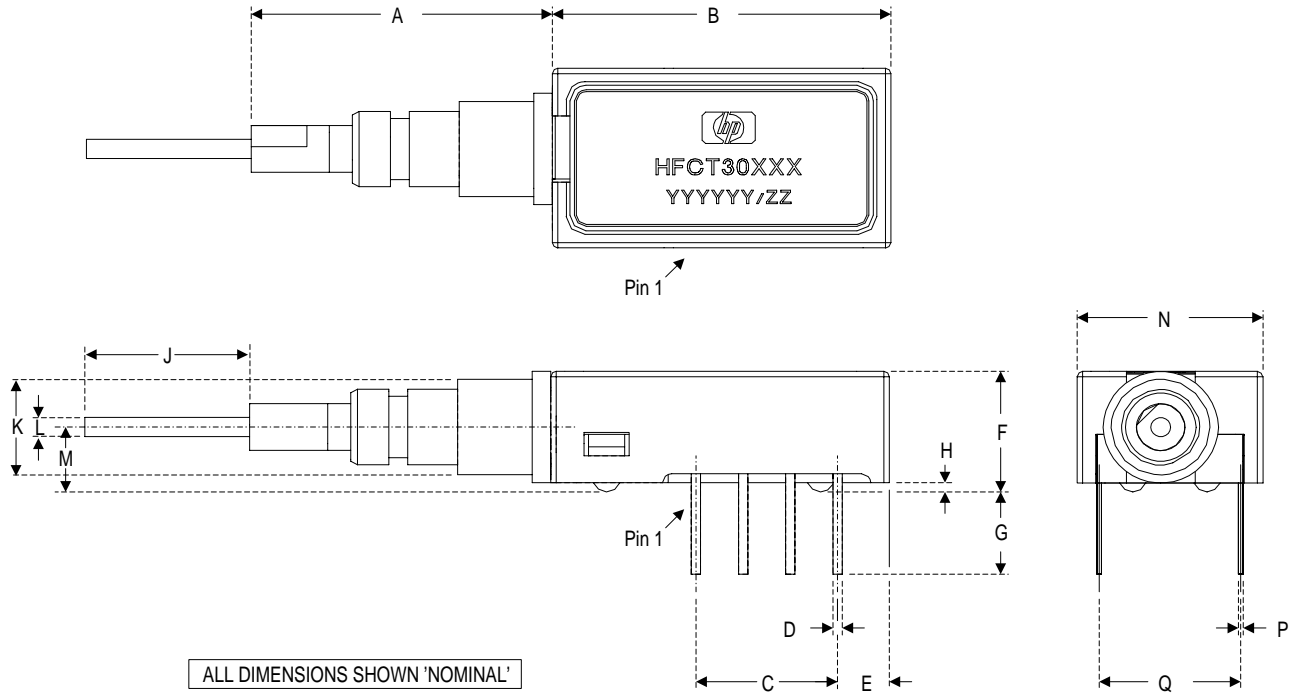
Option 1

Dimension	Typical	Dimension	Typical
A	12.60	G	4.26
B	7.62	H	3.53
C	2.54	I	2.54
D	30.00	J	8.60
E	10.20	K	3.20
F	12.60	L	1000

Pin	Function
1	No connection
2	Monitor Anode (-ve)
3	Monitor Cathode (+ve)
4	No connection
5	No connection
6	Laser Cathode (-ve)
7	Laser Anode (+ve) (Connected to header)
8	No connection

Note: Pins 1, 4, 5 & 8 are isolated from the internal circuitry, but are electrically connected to each other.
Pins 1, 4, 5 & 8 - 0.51 x 0.38 nominal
Pins 2, 3, 6 & 7 - 0.4/0.5 diameter

HFCT-30x2 Specification - All dimensions in mm.



Dimension	Typical	Dimension	Typical	Dimension	Typical
A	16.2	F	6.7	L	0.9
B	18.2	G	4.6	M	3.6
C	7.62	H	0.5	N	10.0
D	0.5	J	1000	P	0.25
E	2.75	K	5.3	Q	7.62

Note: These dimensions are subject to minor changes.

Pin	Function
1	Not connected
2	Package ground*
3	Not connected
4	Photodiode Cathode (+)
5	Photodiode Anode (-)
6	Laser Cathode (-)
7	Laser Anode (+)
8	Package ground*

Note: For single pin ground connection please use pin 2

Ordering Information

Coaxial Package

LST2x25-x-xx

Connector Type:
Blank = No Connector
FP = FC/PC
SC = SC
ST = ST®
DN = DIN (4106.66)

Flange:
B = Without mounting flange
T = Universal flange

Power:
5 = 200 μ W
8 = 1 mW

Available options:

LST2525-B	LST2825-B
LST2525-B-FP	LST2825-B-FP
LST2525-B-SC	LST2825-B-SC
LST2525-B-ST	LST2825-B-ST
LST2525-B-DN	LST2825-B-DN
LST2525-T	LST2825-T
LST2525-T-FP	LST2825-T-FP
LST2525-T-SC	LST2825-T-SC
LST2525-T-ST	LST2825-T-ST
LST2525-T-DN	LST2825-T-DN

Dual-in-Line Packages

LST3x21-xx

Connector Type:
Blank = No Connector
FP = FC/PC
SC = SC
ST = ST®
DN = DIN (4106.66)

Power:
5 = 200 μ W
8 = 1 mW

LST3521	LST3821
LST3521-FP	LST3821-FP
LST3521-SC	LST3821-SC
LST3521-ST	LST3821-ST
LST3521-DN	LST3821-DN

HFCT-30x2Axx

Connector Type:
Blank = No Connector
FP = FC/PC
SC = SC
ST = ST®
DN = DIN (4106.66)

Power:
0 = 200 μ W
1 = 1 mW


HFCT-3002A	HFCT-3012A
HFCT-3002AFP	HFCT-3012AFP
HFCT-3002ASC	HFCT-3012ASC
HFCT-3002AST	HFCT-3012AST
HFCT-3002ADN	HFCT-3012ADN



INVISIBLE LASER RADIATION
DO NOT STARE INTO BEAM OR VIEW
DIRECTLY WITH OPTICAL INSTRUMENTS
CLASS 3A LASER PRODUCT
Peak Power 16 mW
Wavelength 1300 nm

IEC825-1 1993

Laser Warning

DANGER	
	Invisible LASER Radiation - Avoid direct exposure to beam
Peak power	16 mW
Wavelength	1300 nm
Class III a LASER product	

If the drive current is limited to less than
90 mA then the product is Class 1
(IEC825-1)

CDRH Certification

Hewlett-Packard Ltd.
Whitehouse Road
Ipswich, Suffolk IP1 5PB
England

Manufactured: _____ Serial No: _____

Model No: _____

This product conforms to the applicable
requirements of 21 CFR 1040 at the date of
manufacture

www.hp.com/go/fiber

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Data subject to change.

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Obsoletes: 5968-3377E

5968-4809E (3/99)