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# Coaxial Pigtailed Laser Module

## Preliminary Technical Data

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### LST2425X, LST3421X

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#### Features

- Compact Coaxial Package
- Strained Multi Quantum Well Distributed Feedback (DFB) Laser Chip
- Low Thresholds Current and Operating Currents
- Wide Operating Temperature -40°C to +85°C
- Excellent Wavelength Stability with Temperature ~0.1 nm/°C
- Narrow Line Width <1 nm @ -20 dB
- Side Mode Suppression Ratio >-30 dB
- Modulation Capability up to 622 Mb/s
- Convenient Variety of Pinout and Mounting Flange Options

#### Applications

- Telecommunications
- Fiber in the Loop
- Inter/Intra Office

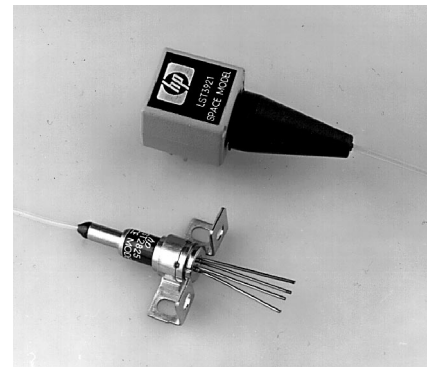
- SONET/SDH
- Datacommunications
- Switches

#### Description

Products in the LST242X family are compact coaxial pigtailed DFB laser transmitters, 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-DFB 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.



Options within the LST242X family offer pinouts and pin rotational orientations designed to match existing products available on the market. We also offer a comprehensive range of alternative mounting flanges including a dual in line option.

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.

#### Preliminary Product Disclaimer

This preliminary data sheet is provided to assist you in the evaluation of engineering samples of the product which is under development and targeted for release during 1997. Until Hewlett-Packard releases this product for general sales, HP reserves the right to alter prices, specifications, features, capabilities, function, manufacturing release dates, and even general availability of the product at any time.

#### Laser Safety Warning

This device is a Class IIIb (3b) 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		Units
			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	A	Temperature measured at case	-40	+85	°C
	B		0	+70	°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-883D, Method 2002, Condition A		500	G
Vibration		MIL-STD-883D, Method 2007, Condition A		20	G

## Performance Specifications

Parameter	Symbol	Test Condition	LST242X LST3421		Units
			Min.	Max.	
<b>LASER</b>		CW, over operating temperature range, Po, as noted below unless otherwise stated and -20 dB ORL			
Rated Optical Power	Po	Tc = ranges specified above, CW	2		mW
Threshold Current	Ith	Tc = +25°C	4	15	mA
Threshold Current	Ith	Over operating temperature range	2	40	mA
Coupled Power in "Off" State	Pth	If = Ith - 2 mA	0	10	μW
Drive Current above Ith, for Im = Im (Po, +25°C)	Id	Tc = +25°C	12.5	25	mA
		Over operating temperature range	-	40	mA
Forward Voltage	Vf			1.6	V
Center Wavelength	λ	Over operating temperature range	1280	1335	nm
Wavelength/Temperature Coefficient	Δλ/ΔT			0.1	nm/°C
Spectral Width	σ	At -20 dB		1	nm
Side Mode Suppression Ratio	SMSR		+30		dB
Rise and Fall Time	τ	10-90%, Ith to Po		0.5	ns
<b>MONITOR PHOTODIODE</b>		Tc = +25°C, Vr = 5 V, Po = Rated Power			
Photocurrent	Im		50	1000	μA
Dark Current	Id	Po = 0 μW		20	nA
Capacitance	C	1 MHz		10	pF
Tracking Error	ΔR	Im = Im (Po, +25°C) Tc + -40°C to + 85°C	-1	1	dB

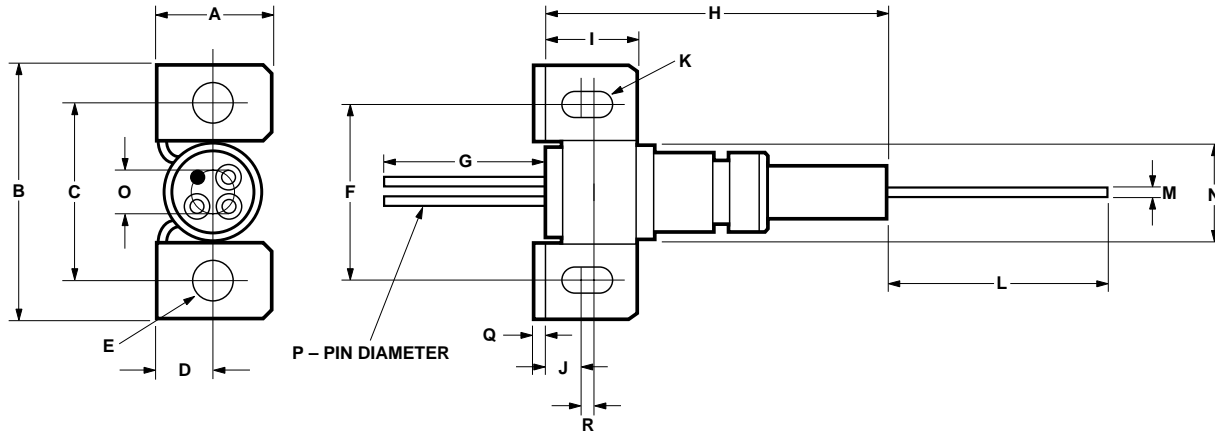
## Fiber Pigtail

Parameter	Minimum	Maximum	Units
Fiber Pigtail Length	1000		mm
Spot Size (Mode Radius)	4.5	5.5	$\mu\text{m}$
Cladding Diameter	122	128	$\mu\text{m}$
Core/Cladding Concentricity		1	$\mu\text{m}$
Secondary Jacket Diameter	0.8	1	mm
Effective Cutoff Wavelength	1150	1240	nm

## Reliability Target

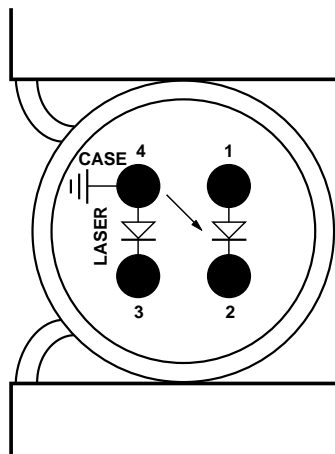
Parameter	Condition	Min.	Max.	Units
Median Life	50% inc. in total drive current, $T_c = +25^\circ\text{C}$	$2 \times 10^5$		hours

**Example of LST242X** – All dimensions in mm.



DIM.	MIN.	TYP.	MAX.	DIM.	MIN.	TYP.	MAX.	DIM.	MIN.	TYP.	MAX.
A		7.4		G	12.0			M		0.9	
B		17.0		H			20.0	N		5.3	
C	11.8		12.2	I		5.3		O		2.0	
D		3.7		J		2.0		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	

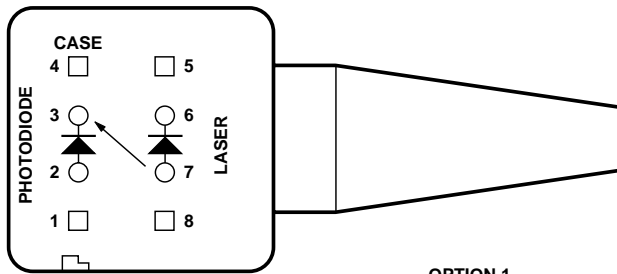
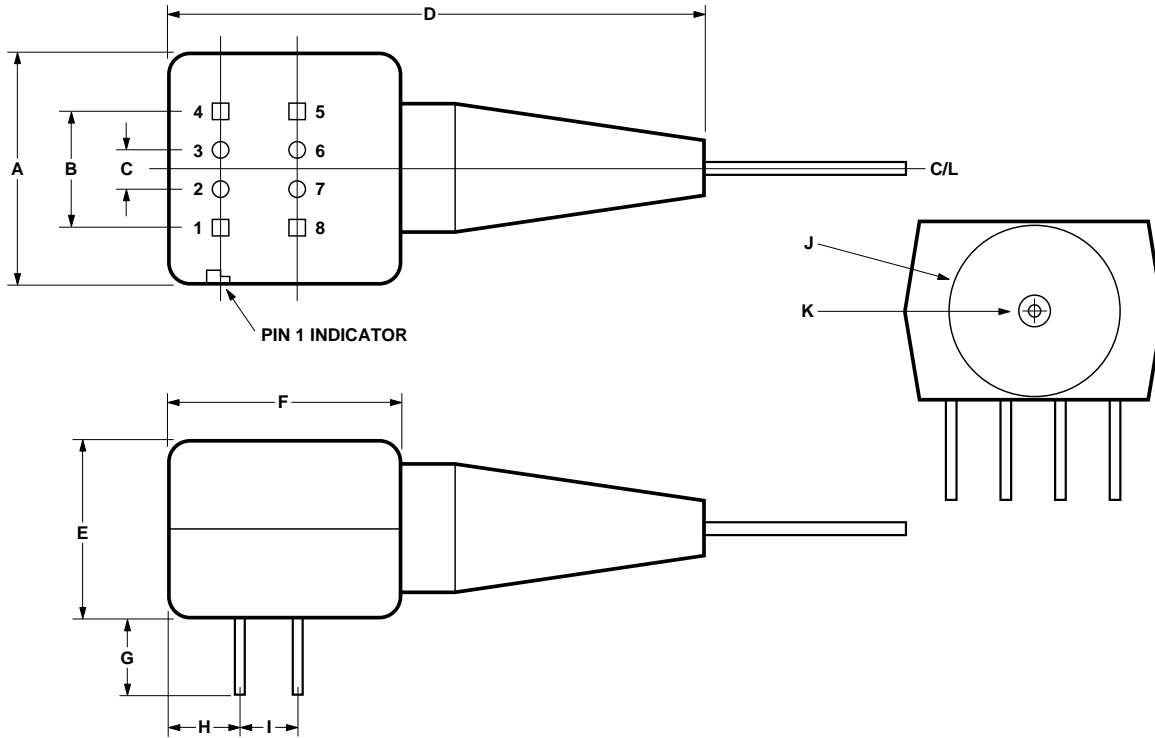
OTHER FLANGE OPTIONS ARE AVAILABLE.



LST2425

PIN	FUNCTION
1	MONITOR ANODE (-VE)
2	MONITOR CATHODE (+VE)
3	LASER CATHODE (-VE)
4	LASER ANODE (+VE)

**LST3421 Specification** – All dimensions in mm.



OPTION 1

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 AND 8 ARE ISOLATED FROM THE INTERNAL CIRCUITRY, BUT ARE ELECTRICALLY CONNECTED TO EACH OTHER.

PINS 1, 4, 5, & 8 – 0.51 x 0.38 NOM.  
 PINS 2, 3, 6, & 7 – 0.4/0.5 DIA.

DIM.	TYP.	DIM.	TYP.	DIM.	TYP.
A	12.60	E	10.20	I	2.54
B	7.62	F	12.60	J	8.60
C	2.54	G	4.26	K	3.20
D	30.00	H	3.53		

## Ordering Information

### Coaxial Package

LST2425X - Y - ZZ

Connector Type:  
AP = Angle polished FC/PC  
Other connections available.  
Contact HP for details.

Flange:  
B = Without mounting flange  
T = Universal flange

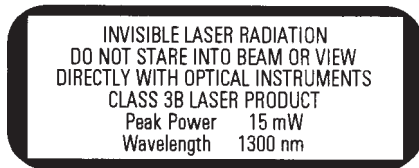
Temperature Range:  
A = -40°C to +85°C  
B = 0°C to +70°C

### Dual-in-Line Package

LST3421X - ZZ

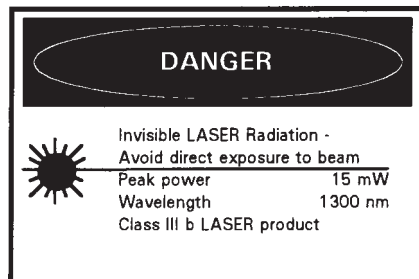
Connector Type:  
AP = Angle polished FC/PC  
Other connections available.  
Contact HP for details.

Temperature Range:  
A = -40°C to +85°C  
B = 0°C to +70°C



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## Laser Warning



## 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.