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# Single Mode Connectorized Laser Diode (Low Power)

## Technical Data

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### LST0605-FC-A

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#### Features

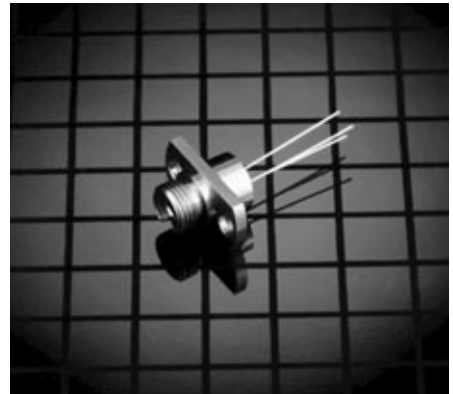
- **1300 nm Single Mode**
- **Hermetic Construction**
- **Industry Standard FC Connector**
- **Low Threshold Current**
- **Integral InGaAs PIN Monitor Photodiode**
- **High Reliability**
- **Connectorized for Ease of Use**

#### Applications

- **Fiber Optic Laser Transmitter**
- **Instrumentation**
- **Subscriber Loop Communications Systems**
- **Low Cost Single Mode Fiber Systems**
- **SM-FDDI**
- **E-O Convertors**

#### Description

The LST0605-FC-A series has been developed for low cost, coolerless low power single mode applications using the FC style connector. Both the buried heterostructure laser and the monitor photodiode are manufactured using the Hewlett-Packard MOVPE process.



#### Laser Safety Warning

This device is a Class IIIb (3b) Laser Product. It may emit invisible laser radiation from an open optical port. To avoid possible eye damage do not look into an open optical port during laser operation. Do not exceed specified operating limits.

## Absolute Maximum Ratings

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided 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	Minimum	Typical	Maximum	Units
Forward Current	-	-	100	mA
Reverse Current	-	-	100	$\mu$ A
Reverse Voltage	-	-	2.0	V
Operating Temperature (Case)	-20	-	70	$^{\circ}$ C
Storage Temperature	-40	-	85	$^{\circ}$ C

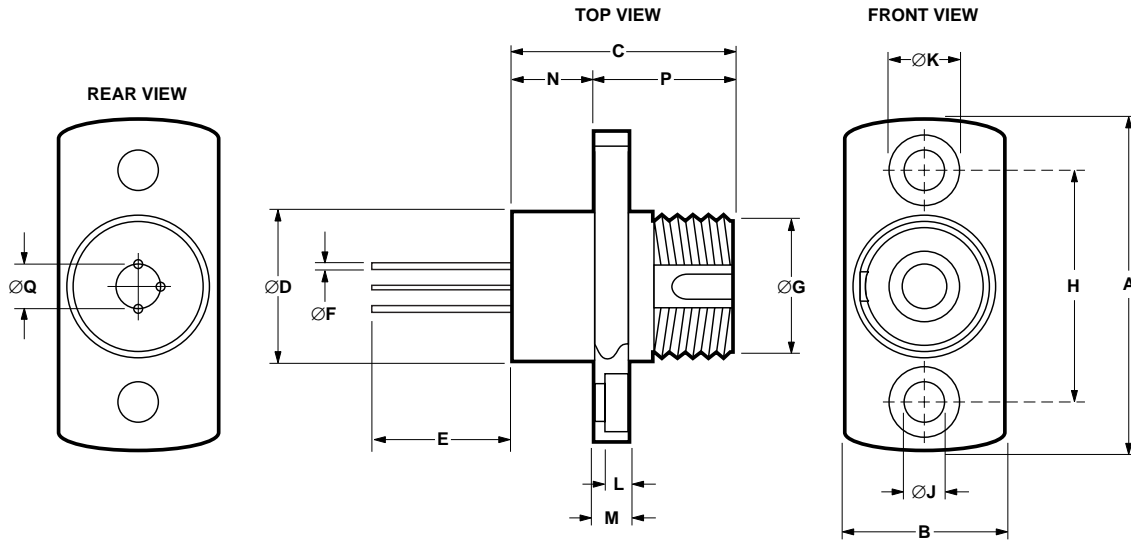
## Performance Specification (Tc 25 $^{\circ}$ C)

Parameter	Minimum	Typical	Maximum	Units	Notes
Peak Wavelength	1270	1300	1330	nm	1
Spectral Width (FWHM)	-	5	10	nm	1
Optical Output	100	200	500	$\mu$ W	1, 2
Forward Voltage	-	1.2	1.4	V	1
Rise Time	-	0.5	1.0	ns	3
Fall Time	-	0.5	1.0	ns	3
Wavelength Temperature Coefficient	-	0.45	0.6	nm/ $^{\circ}$ C	4
Threshold Current	5	14	25	mA	5
Monitor Current	60	125	270	$\mu$ A	6
Dark Current	-	-	50	nA	7
Tracking Error	-	$\pm$ 0.5	$\pm$ 1.5	dB	8

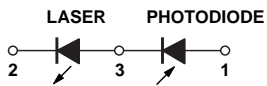
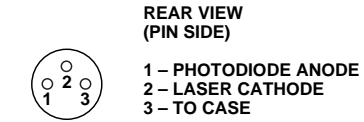
### Notes:

1. CW, Ith + 15 mA.
2. Final test limits using single mode FC terminated fiber.
3. 10/90% rise, 90/10% fall, Ibias = Ith.
4. Im const.
5. CW.
6. -5 V photodiode bias.
7. -5 V bias, Pout = 0  $\mu$ W.
8. -20 $^{\circ}$ C/+70 $^{\circ}$ C, Im const.

# LST0605-FC-A Package Drawing



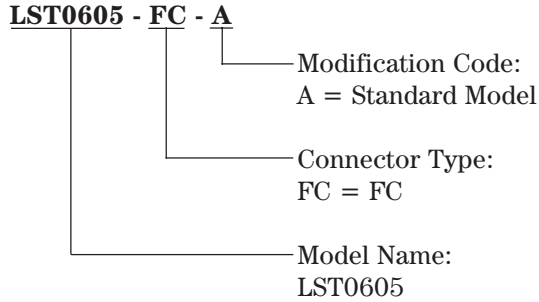
## CONNECTIONS



DIM.	MIN.	MAX.	DIM.	MIN.	MAX.
A	-	19.50	$\varnothing J$	2.08	2.32
B	-	9.50	$\varnothing K$	-	4.20
C	-	13.0	L	-	1.65
$\varnothing D$	-	9.0	M	-	2.20
E	12.0	-	N	-	4.80
$\varnothing F$	0.41	0.47	P	-	8.20
$\varnothing G$	M8 x 0.75		$\varnothing Q$	2.54 NOM.	
H	13.35	13.55			

ALL DIMENSIONS IN MILLIMETERS

## Ordering Information



## Handling Precautions

1. The LST0605 can be damaged by current surges or overvoltage.
2. Power supply transient precautions should be taken.
3. Normal handling precautions for electrostatic sensitive devices should be taken.

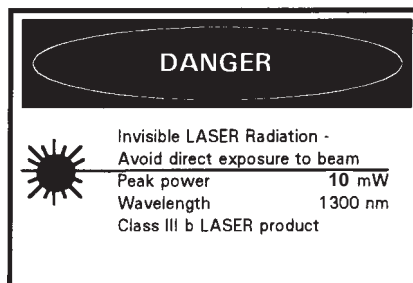
## CDRH Certification

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.

## Laser Warning



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# Single Mode SC Connectorized Laser Transmitter Module

## Technical Data

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### LST062X-SC-A

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#### Features

- **1300 nm Single Mode**
- **Industry Standard SC Connector**
- **High Reliability**
- **Connectorized for Ease of Use**
- **Convenient Variety of 4 Pin Configurations**
- **Hermetic Construction**
- **Wide Operating Temperature -40°C to +85°C**
- **Modulation Capability up to 622 Mbit/s**
- **SONET SR/IR up to OC12 SDH STM1 and 4 Compliant**
- **Laser Eye Safety Classifications: CDRH Class 1 Compliant IEC825-1 Class 3A**
- **200 µW Fiber Coupled Power**

#### Applications

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

#### Description

The LST062X-SC-A series is a laser transmitter, operating in the 1300 nm wavelength region. It is designed for use in short and medium distance networks with bit rates up to 622 Mbit/s.

The device features a high reliability laser diode and a monitor photodiode in a hermetic package. 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 LST062X-SC-A family offer several 4 Pin configurations with pin rotational



orientations designed to match existing products available on the market.

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.

#### Laser Safety Warning

This device is a Class IIIa (3A) Laser Product. It may emit invisible laser radiation from an open optical port. To avoid possible eye damage do not look into an open optical port during laser operation. Do not exceed specified operating limits.

## Absolute Maximum Ratings

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided 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	Conditions	Limits		Units
			Min.	Max.	
Laser Forward Current	I <sub>f</sub>	DC	-	150	mA
Laser Reverse Current	I <sub>r</sub>	DC	-	100	μA
Laser Reverse Voltage	V <sub>lr</sub>	DC	-	2	V
Photodiode Reverse Voltage	V <sub>r</sub>	DC	-	10	V
Photodiode Forward Current	I <sub>pf</sub>	DC	-	1	mA
Operating Temperature	T <sub>c</sub>	Pf = 200 μW	-40	+85	°C
Storage Temperature	T <sub>s</sub>		-40	+85	°C
Relative Humidity	RH		0.0	non-condensing	%/RH
Mechanical Shock		Mil Std 883D, Method 2002, Condition B			
Vibration		Mil Std 883D, Method 2007, Condition A			

## Performance Specifications

Parameter	Symbol	Conditions	Limits		Units
			Min.	Max.	
LASER		CW, T <sub>c</sub> = 25°C, Pf = 200 μW unless otherwise stated			
Threshold Current	I <sub>th</sub>		7	16	mA
Peak Optical Output Power	P <sub>f</sub>	T <sub>c</sub> = -40°C to +85°C CW	200	-	μW
Optical Output Power	P <sub>th</sub>	P <sub>th</sub> = P <sub>f</sub> @ I <sub>th</sub> - 2mA	-	8	μW
Slope Efficiency		T <sub>c</sub> = 25°C	10	25	mW/mA
		T <sub>c</sub> = -40°C to +85°C	5	40	mW/mA
Drive Current above I <sub>th</sub>	I <sub>d</sub>	Pf = 200 μW	8	20	mA
Forward Voltage	V <sub>f</sub>		-	1.6	V
Center Wavelength	λ <sub>c</sub>	Note 1	1260	1360	nm
Temp. Dependence of λ <sub>c</sub>	Dλ <sub>c</sub> /DT	T <sub>c</sub> = -40°C to +85°C	-	0.4	nm/°C
Linewidth	Δλ	1xs, RMS, Note 1	-	2.5	nm
Rise Time	t <sub>r</sub>	10% to 90%: I <sub>th</sub> to P <sub>f</sub> = 200 μW	-	0.5	ns
Fall Time	t <sub>f</sub>	90% to 10%: P <sub>f</sub> = 200 μW to I <sub>th</sub>	-	0.5	ns

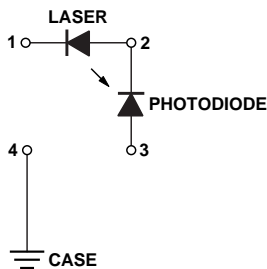
**Note:**

1. Modulated measurements also available.

## Performance Specifications (cont'd.)

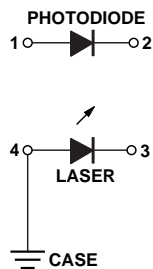
Parameter	Symbol	Conditions	Limits		Units
			Min.	Max.	
MONITOR PHOTODIODE		$T_c = 25^\circ\text{C}$ , $V_r = -5\text{ V}$ (Note 2) $P_f = 200\ \mu\text{W}$ unless otherwise stated			
Photocurrent	$I_m$		100	1500	$\mu\text{A}$
Dark Current	$I_d$	$P_f = 0\ \mu\text{W}$	-	20	nA
Capacitance	C	1 MHz	-	10	Pf
Tracking Error	DR	$I_m = I_m @ (P_f = 200\ \mu\text{W}, T_c = 25^\circ\text{C})$ $T_c = -40^\circ\text{C}$ to $+85^\circ\text{C}$	-	$\pm 1.5$	dB
Rise Time	$t_r$	10% to 90%: $I_{th}$ to $P_f = 200\ \mu\text{W}$	-	2.0	ns
Fall Time	$t_f$	90% to 10%: $P_f = 200\ \mu\text{W}$ to $I_{th}$	-	2.0	ns

**LST0623**



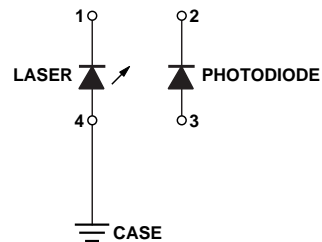
- 1 – LASER CATHODE
- 2 – LASER ANODE/MONITOR PHOTODIODE
- 3 – MONITOR ANODE (-ve)
- 4 – NO CONNECTION

**LST0625**



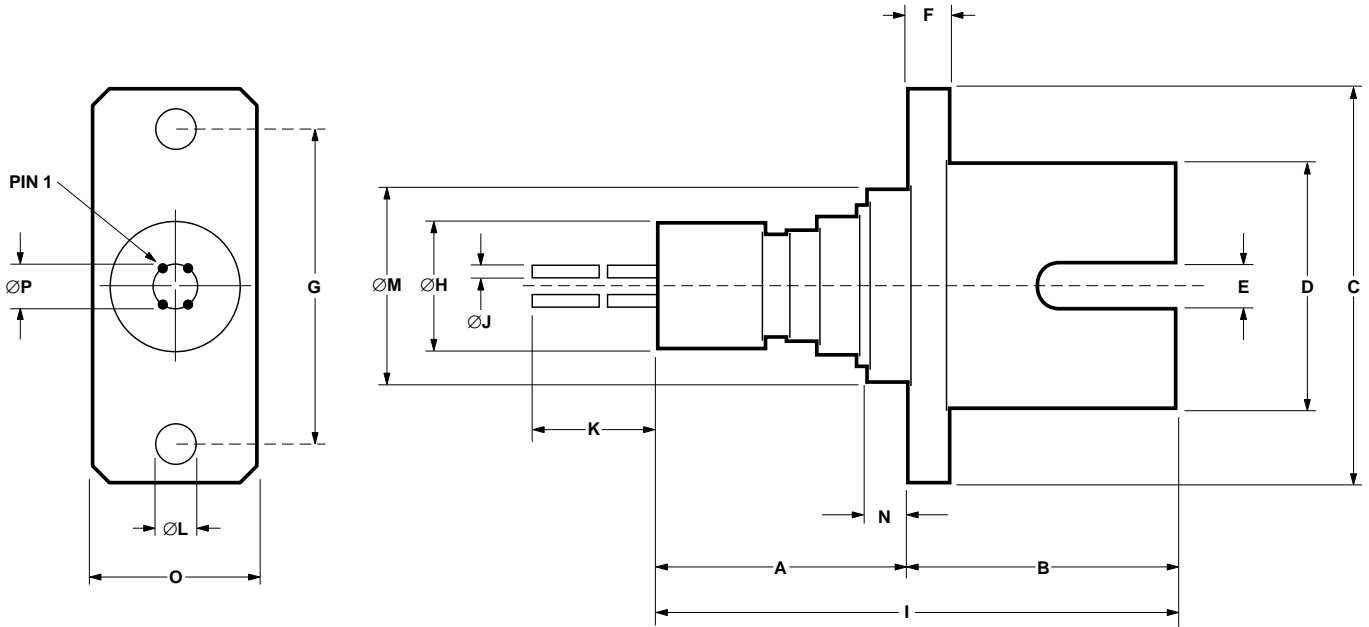
- 1 – MONITOR ANODE (-ve)
- 2 – MONITOR CATHODE (+ve)
- 3 – LASER CATHODE
- 4 – LASER ANODE

**LST0627**



- 1 – LASER CATHODE
- 2 – MONITOR CATHODE (+ve)
- 3 – MONITOR ANODE (-ve)
- 4 – LASER ANODE

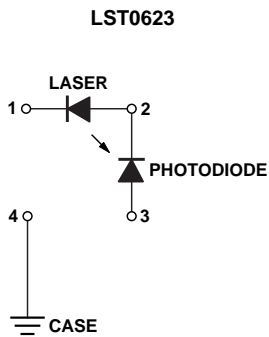
# LST062X-SC-A Package Drawing



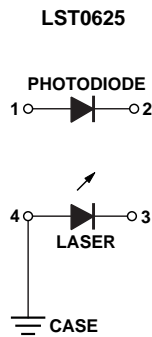
DIM.	MIN.	MAX.	DIM.	MIN.	MAX.
A	-	13.50	I	-	29.00
B	15.1	15.50	∅J	0.41	0.49
C	21.50	22.50	K	12.00	-
D	12.60	13.00	∅L	2.20	2.40
E	2.00	2.20	∅M	-	8.60
F	2.90	3.10	N	-	2.60
G	17.50	18.50	O	9.20	9.40
∅H	-	7.00	∅P	1.90	2.10

ALL DIMENSIONS IN MILLIMETERS

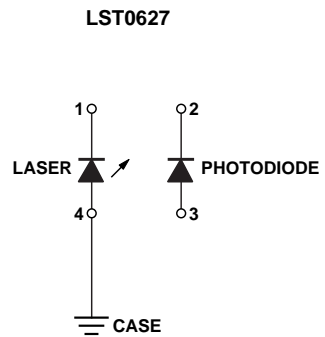
## Pin Outs



- 1 - LASER CATHODE
- 2 - LASER ANODE/MONITOR PHOTODIODE
- 3 - MONITOR ANODE (-ve)
- 4 - NO CONNECTION



- 1 - MONITOR ANODE (-ve)
- 2 - MONITOR CATHODE (+ve)
- 3 - LASER CATHODE
- 4 - LASER ANODE



- 1 - LASER CATHODE
- 2 - MONITOR CATHODE (+ ve)
- 3 - MONITOR ANODE (-ve)
- 4 - LASER ANODE



## Ordering Information

**LST062X - SC - A**

Allowed Model Names:

LST0623-SC-A

LST0625-SC-A

LST0627-SC-A

Pin Outs - See Drawings:

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## Handling Precautions

1. The LST062X can be damaged by current surges or overvoltage.
2. Power supply transient precautions should be taken.
3. Normal handling precautions for electrostatic sensitive devices should be taken.

## 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.

## Laser Warning



INVISIBLE LASER RADIATION  
DO NOT STARE INTO BEAM OR VIEW  
DIRECTLY WITH OPTICAL INSTRUMENTS  
CLASS 3A LASER PRODUCT  
Peak Power 12 mW  
Wavelength 1300 nm

IEC825-1 1993