

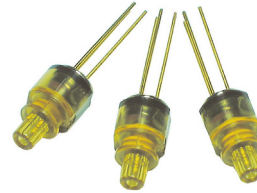
**Features**

- : Multi-mode 850nm VCSEL
- : 4.25 Gbps data rates
- : Low drive current and voltage
- : Common cathode / anode Type
- : Other configurations available on request

**Applications**

- : High speed Data Communications
- : Gigabit Ethernet
- : Fiber Channel

**Description**



**Absolute Maximum Ratings**

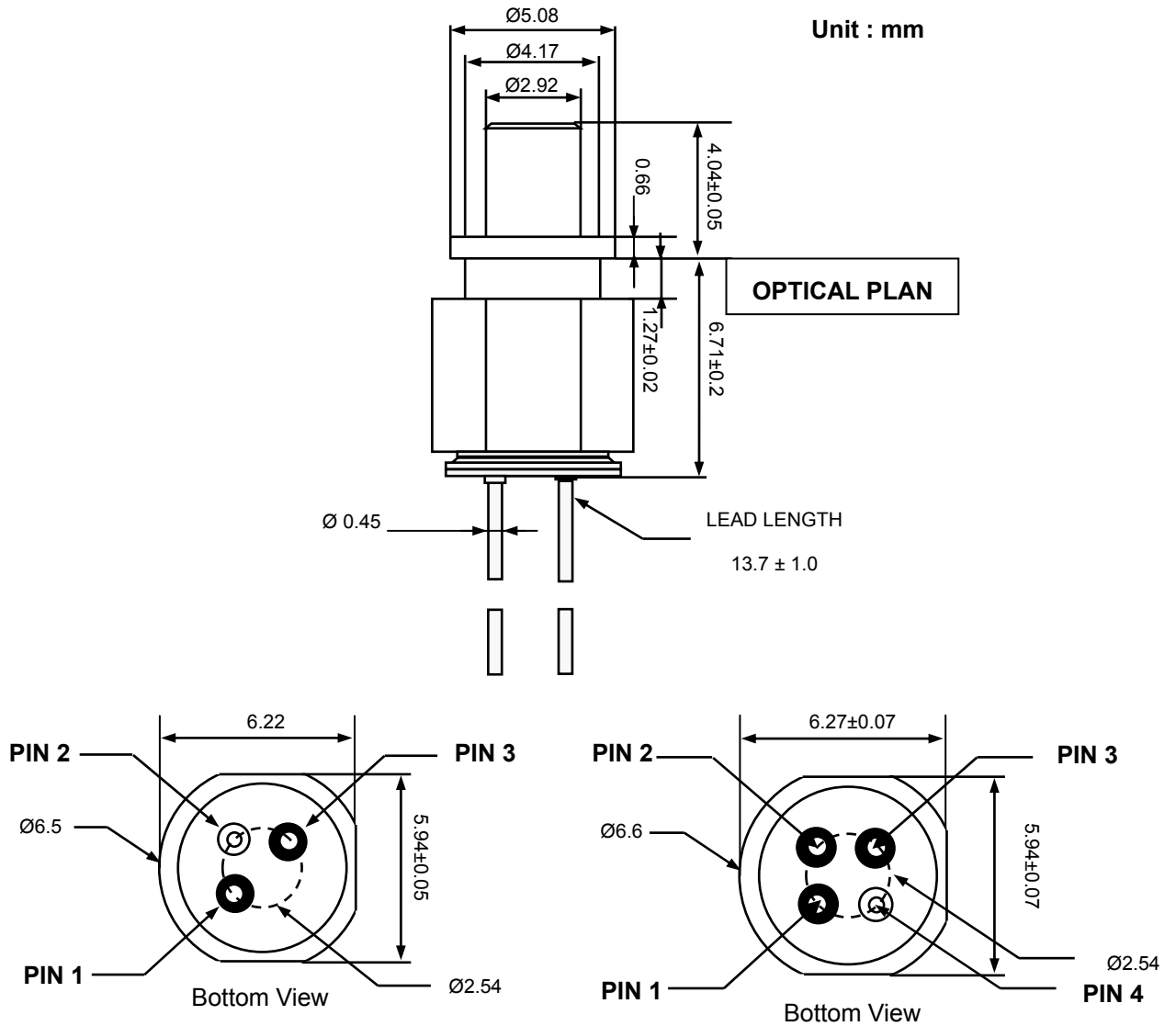
Parameter	Rating
Storage Temperature	-40 to 100 °C
Operating Temperature	-20 to 85 °C
Lead Solder Temperature	260 °C, 10 sec
Continuous Forward Current	12mA
Continuous Reverse Voltage	5V (@10µA)

**Part Number :**

**Description :**

TP85-LCP1F-KC	850nm 4.25Gbps LC TOSA, Common Cathode Type
TP85-LCP1F-AC	850nm 4.25Gbps LC TOSA, Common Anode Type
TP85-LCP1F-K	850nm 4.25Gbps LC TOSA, pin separation Type
TP85-LCP1F-A	850nm 4.25Gbps LC TOSA, pin separation Type

Dimensions



PIN OUT

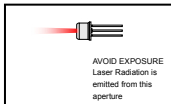
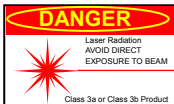
TP85-LCP1F-KC (3pin)		TP85-LCP1F-AC (3pin)		TP85-LCP1F-K (4pin)		TP85-LCP1F-A (4pin)	
Number	Function	Number	Function	Number	Function	Number	Function
1	A <sub>VCSEL</sub>	1	K <sub>VCSEL</sub>	1	A <sub>VCSEL</sub>	1	K <sub>VCSEL</sub>
2	K <sub>VCSEL</sub> , A <sub>m-PD</sub>	2	A <sub>VCSEL</sub> , K <sub>m-PD</sub>	2	K <sub>VCSEL</sub>	2	A <sub>VCSEL</sub>
3	K <sub>m-PD</sub>	3	A <sub>m-PD</sub>	3	K <sub>m-PD</sub>	3	K <sub>m-PD</sub>
				4	A <sub>m-PD</sub>	4	A <sub>m-PD</sub>

**Electro-Optics Characteristics ( $T_a=25^{\circ}\text{C}$  unless otherwise stated)**

Parameters	Symbol	Specified			Unit	Test Conditions
		Min.	Typ.	Max.		
Peak Fiber Coupled Optical Output Power(See threshold current And slope efficiency which Control power output)	$P_{OC}$		500		$\mu\text{W}$	$I_f = 7 \text{ mA}, 50/125 \mu\text{m fiber NA}=0.20$
Threshold Current	$I_{th}$		1.0	2.5	mA	CW
$I_{th}$ Temperature Variation	$\Delta I_{th}$		1.5	2	mA	$T_a=-20 \text{ to } 85^{\circ}\text{C}$
Slope Efficiency	$\eta$	0.04		0.16	W/A	$I_f = 7 \text{ mA}$
$\eta$ Temperature Variation	$\Delta\eta / \Delta T$		-5000		PPM/ $^{\circ}\text{C}$	$T_a=-20 \text{ to } 85^{\circ}\text{C}$ at 7 mA
Peak Wavelength	$\lambda_p$	840	850	860	nm	$I_f = 7 \text{ mA}$
$\lambda_p$ Temperature Coefficient	$\Delta\lambda / \Delta T$		0.06		nm/ $^{\circ}\text{C}$	$T_a=-20 \text{ to } 85^{\circ}\text{C}$ at 7mA
Spectral Bandwidth (RMS)	$\Delta\lambda$			0.85	nm	$I_f = 7 \text{ mA}$
Forward Voltage	$V_f$		1.8	2.2	V	$I_f = 7 \text{ mA}$
Breakdown Voltage	$V_b$		-10		V	
Rise and Fall Times	$t_R$ $t_F$			90 90	ps	Prebias Above Threshold, 20%~80%
Relative Intensity Noise	RIN		-130	-122	dB/Hz	1 GHz BW, $I_f = 7 \text{ mA}$
Series Resistance	$R_s$	20	35	55	Ohm	$I_f = 7 \text{ mA}$
$R_s$ Temperature Coefficient	$dR_s/dT$		-3000		PPM/ $^{\circ}\text{C}$	
Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Monitor Current	$I_{PD}$	0.2		0.7	mA	$P_{OC}=0.5\text{mW}$
Dark current	$I_D$			10	nA	$P_0=0\text{mW}, V_R=5\text{V}$
PD Reverse Voltage	$BVR_{PD}$	40			V	$P_0=0\text{mW}, I_R=100\mu\text{A}$
PD Capacitance	C			50 20	pF	$V_R=0\text{V}, \text{Freq}=1\text{MHz}$ $V_R=5\text{V}, \text{Freq}=1\text{MHz}$

**Notes**

\* These specifications are subject to change without notice


**NOTICE**

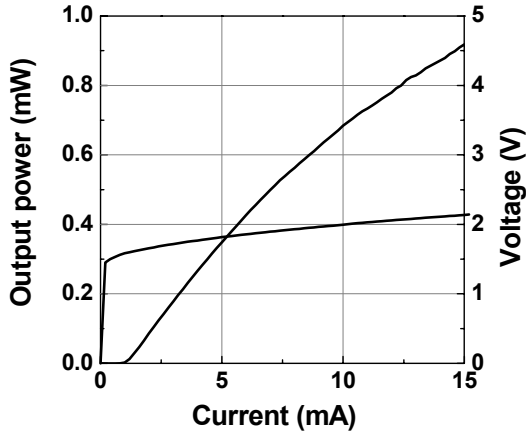
The inherent design of this component causes it to be sensitive to electrostatic discharge(ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product

**DANGER**

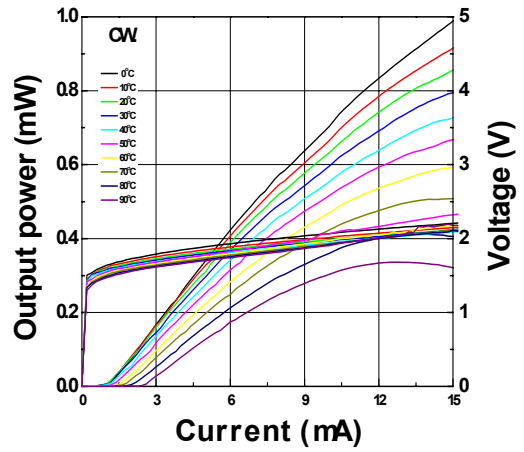
The VCSEL is a class IIIb laser and should be treated as a potential eye hazard. Due to the size of the component, the applicable warning logotype, aperture label, and certification / identification label cannot be placed on the component itself.

Characteristics Curves

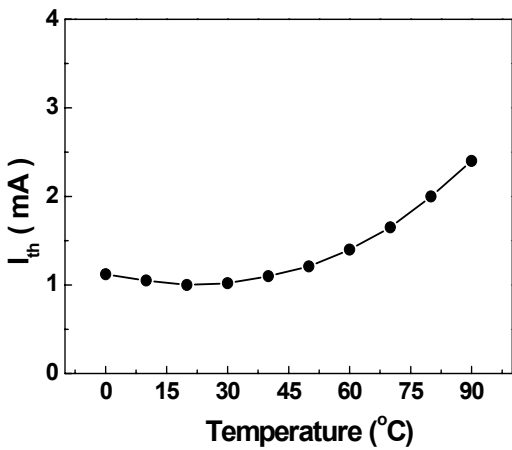
LIV Curve



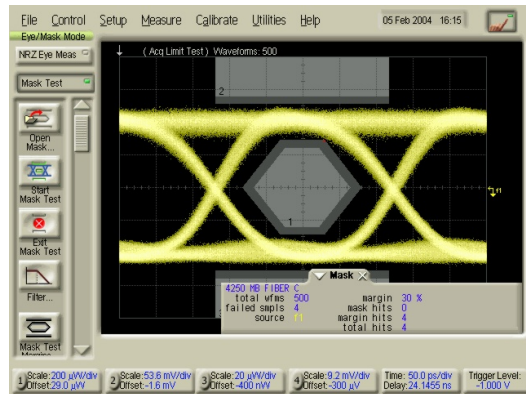
LIV vs Temperature



I<sub>th</sub> vs Temperature



Eye Diagram



Eye diagrams at 7mA Data rate : 4.25Gbps  
 Extinction ratio : 10dB PRBS : 2<sup>31</sup>-1  
 Filtered 3.18Ghz Low pass filter Back to Back