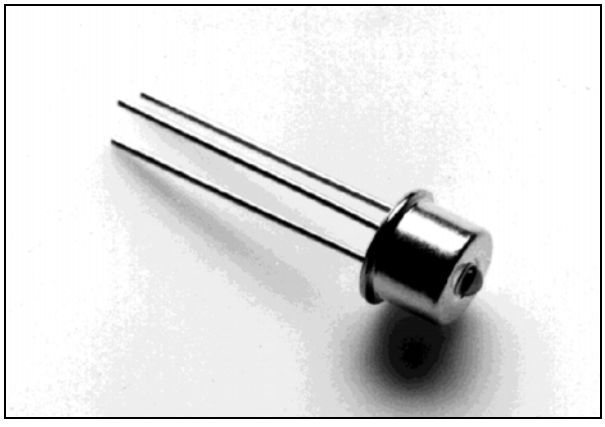
MF194

860 nm - 70 MHz High Performance LED

Data Sheet

September 2004



Ordering Information

MF194	TO-46 Package
MF194 ST	ST Housing
MF194 SC	SC Housing
MF194 SMA	SMA Housing
MF194 FC	FC Housing

-40°C to +85°C

Note: Rated Fiber coupled power apply only on the TO-46 package, for housing options fiber coupled power is typically 10% less.

Features

- 860 nm Surface-Emitting LED
- 70 MHz Bandwidth
- Designed for 50/125 µm fiber

Applications

- LANs
- Test Equipment
- General Purpose

Description

This device is designed for Ethernet and general applications and offers an excellent price/performance ratio for cost-effective solutions. Its double-lens optical system results in optimum coupling of power into the fiber.

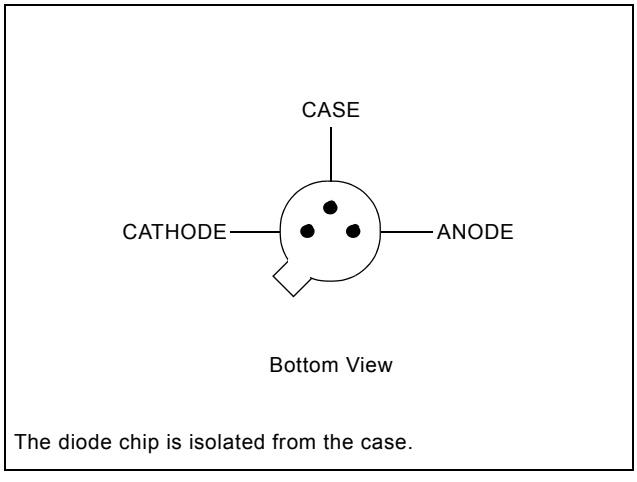


Figure 1 - Pin Diagram

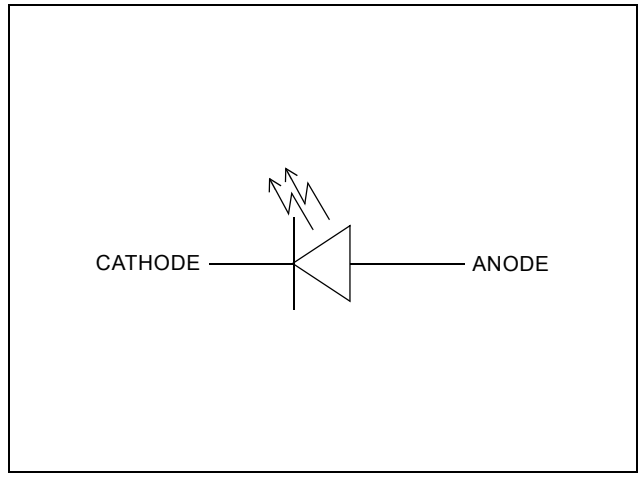


Figure 2 - Functional Schematic

Optical and Electrical Characteristics - Case Temperature 25°C

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition	
Fiber-Coupled Power (Figures 3, 4, and 5) (Table 1)	P_{fiber}	25	45		μW	I_F=60 mA (Note 1)	Fiber: 50/125 μm Graded Index NA=0.20
Rise and Fall Time (10-90%)	t_r,t_f		5	7	ns	I_F=60 mA (no bias)	
Bandwidth (3dB_{el})	f_c		70		MHz	I_F=60 mA	
Peak Wavelength	λ_p	840	860	880	nm	I_F=60mA	
Spectral Width (FWHM)	$\Delta\lambda$		50		nm	I_F=60 mA	
Forward Voltage (Figure 7)	V_F		1.7	1.9	V	I_F=60 mA	
Reverse Current	I_R			20	μA	V_R=1 V	
Capacitance	C		250		pF	V_R-0 V, f=1 MHz	

Note 1: Measured at the exit of 100 meters of fiber.

Absolute Maximum Ratings

Parameter	Symbol	Limit
Storage Temperature	T_{stg}	-55 to +125°C
Operating Temperature (derating: Figure 6)	T_{op}	-40 to +85°C
Electrical Power Dissipation (derating: Figure 6)	P_{tot}	160 mW
Continuous Forward Current (f<10 kHz)	I_F	80 mA
Peak Forward Current (duty cycle<50%,f>1 MHz	I_{FRM}	130 mA
Reverse Voltage	V_R	1.5 V
Soldering Temperature (2 mm from the case for 10 sec.)	T_{sld}	260°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance - Infinite Heat Sink	R_{thjc}			200	°C/W
Thermal Resistance - No Heat Sink	R_{thja}			500	°C/W
Temperature Coefficient - Optical Power	dP/dT_j		-0.5		%/°C
Temperature Coefficient - Wavelength	$d\lambda/dT_j$		0.3		nm/°C

Typical Fiber-Coupled Power

Core Diameter/Cladding Diameter Numerical Aperture			
50/12 5μm 0.20	62.5/125 μm 0.275	100/140 μm 0.29	200/230 μm 0.37
45 μW	95 μW	210 μW	440 μW

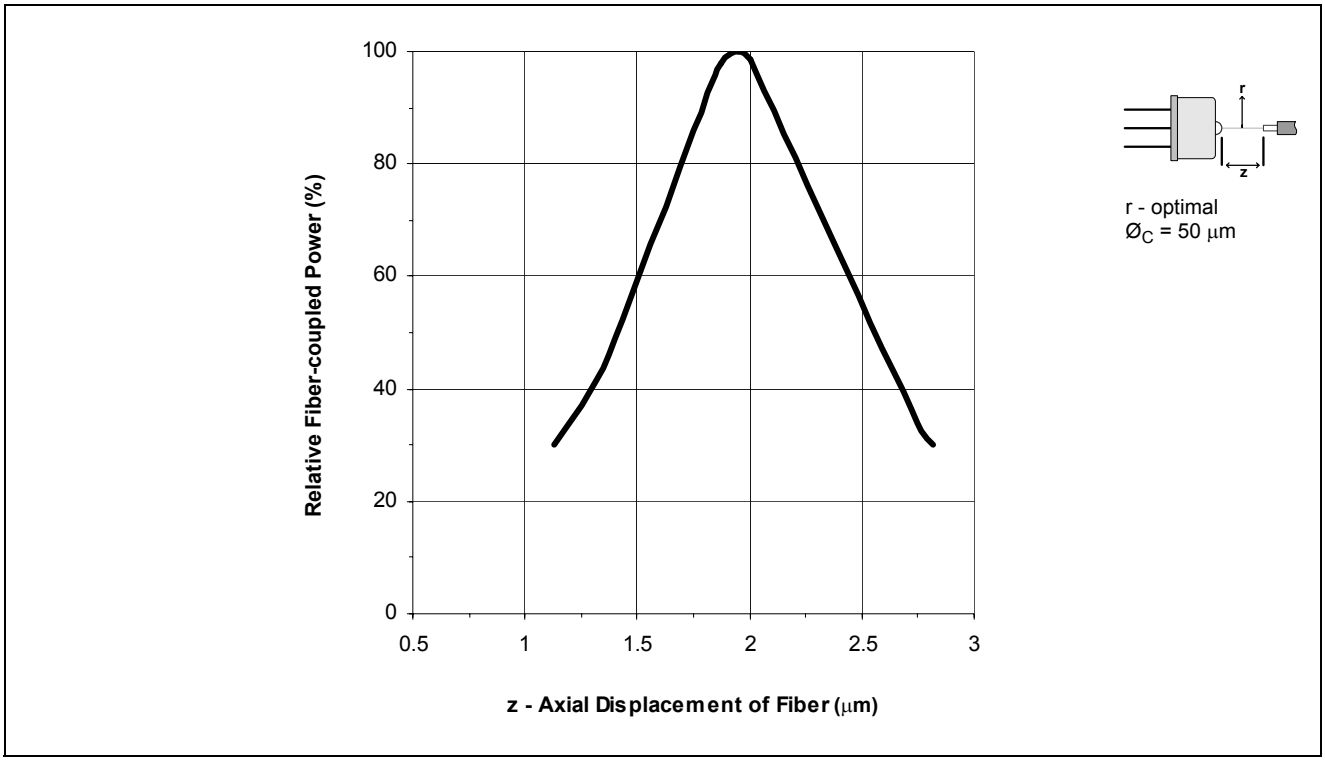


Figure 3 - Relative Fiber-coupled Power vs. z - Axial Displacement of Fiber

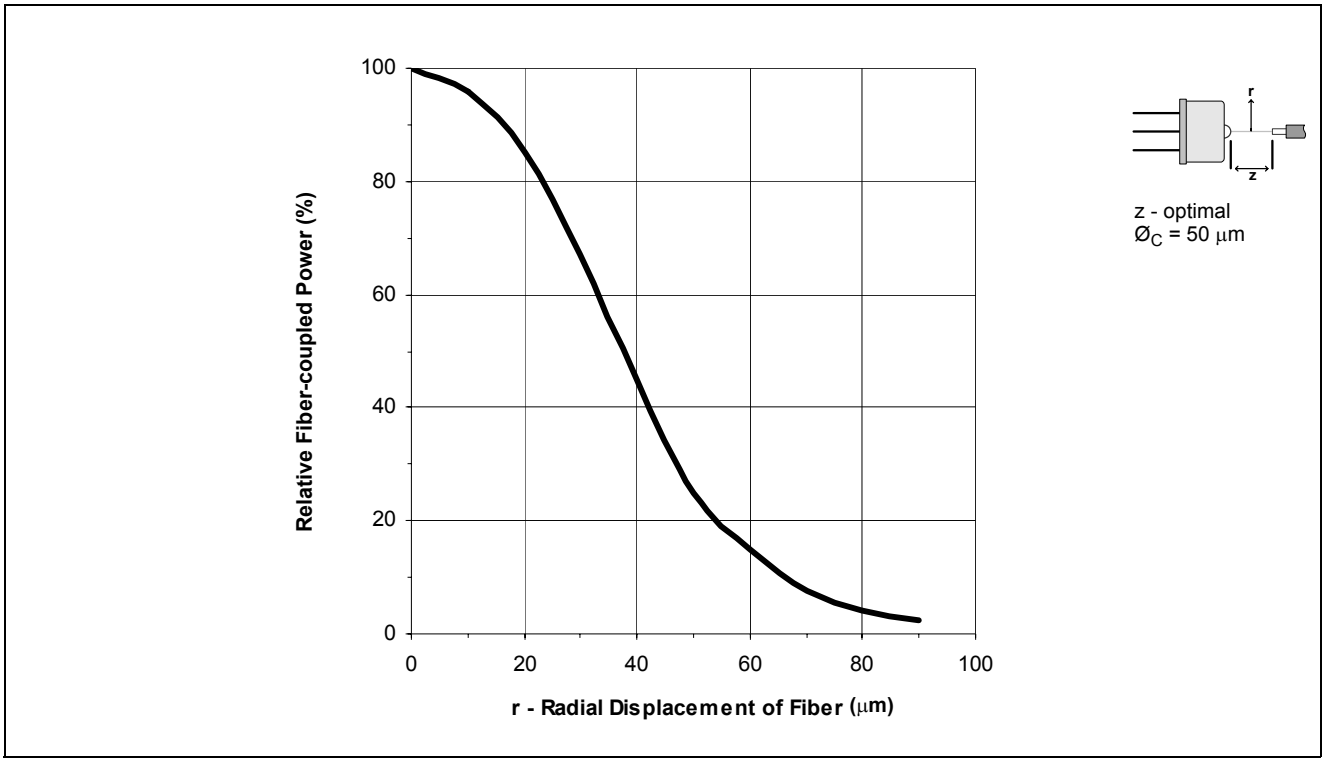


Figure 4 - Relative Fiber-coupled Power vs. r - Radial Displacement of Fiber

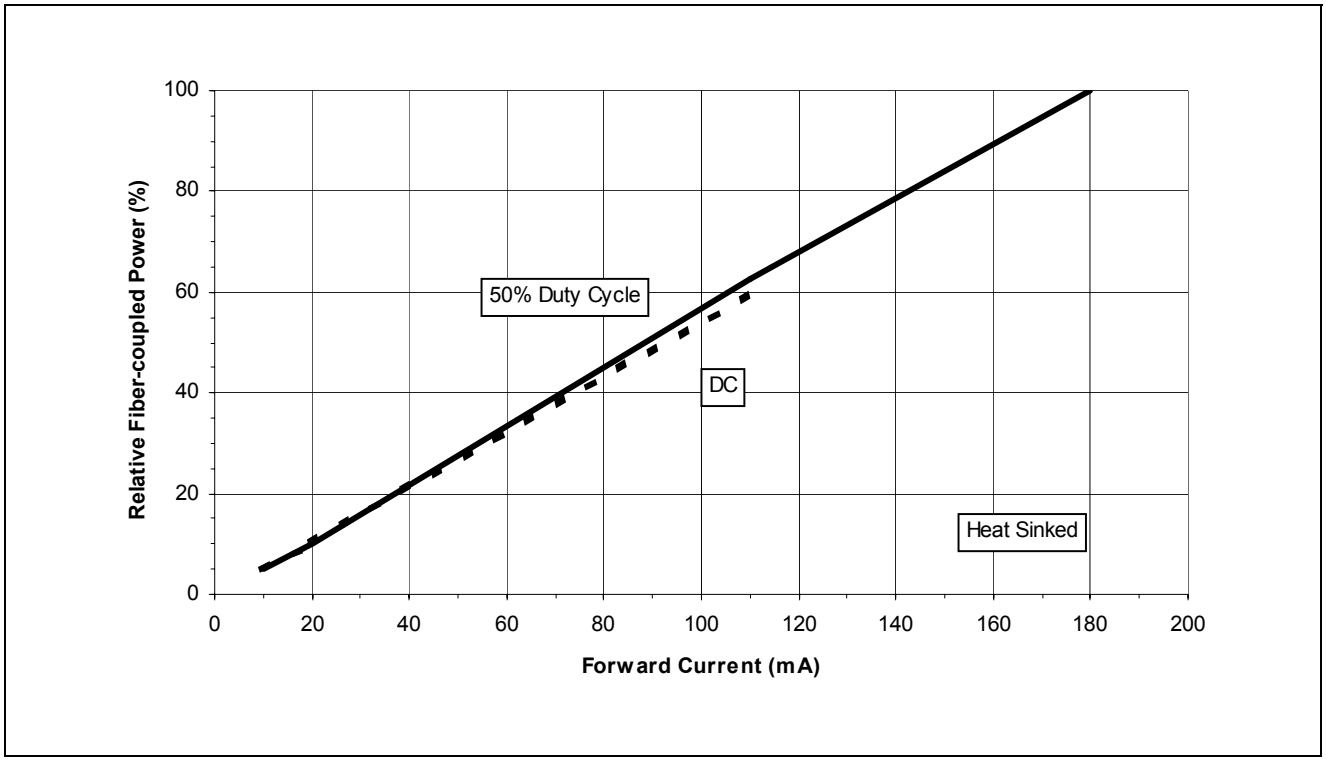


Figure 5 - Relative Fiber-coupled Power vs. Forward Current

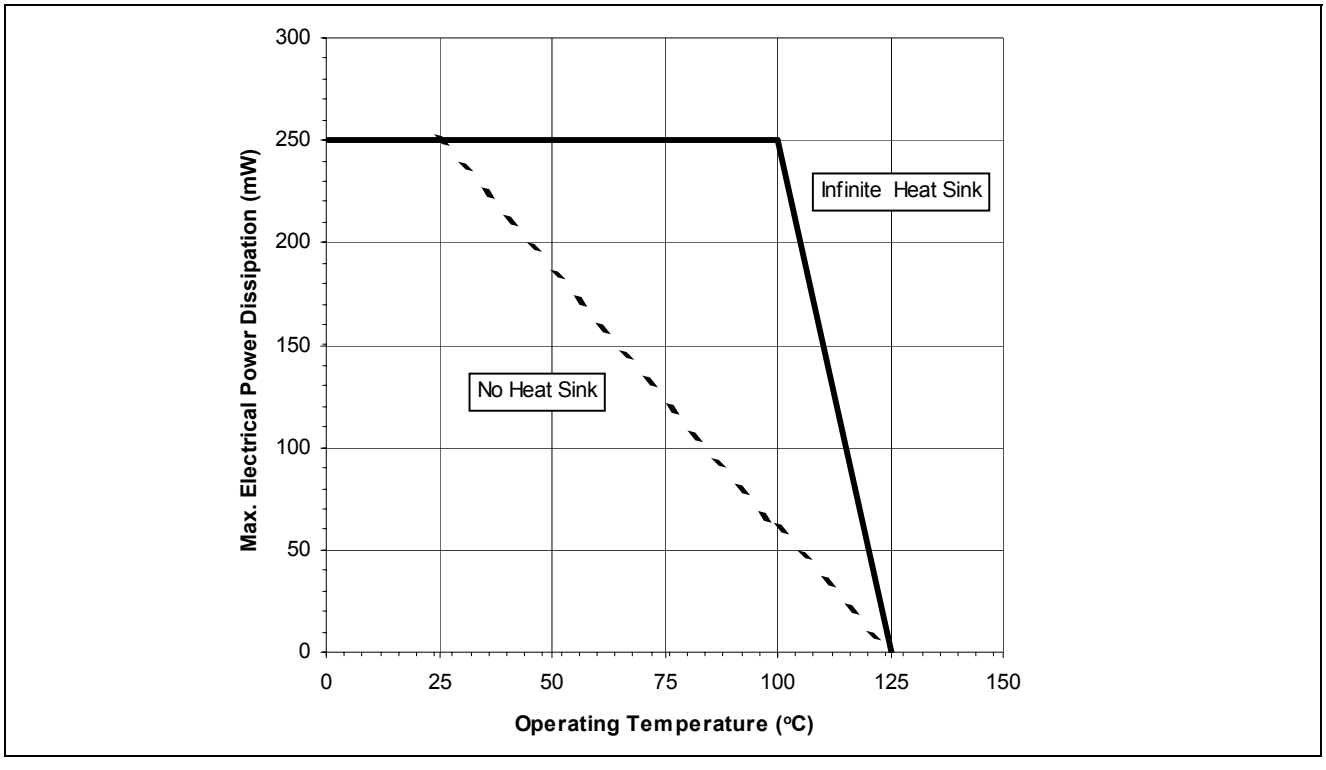


Figure 6 - Max. Electrical Power Dissipation vs. Operating Temperature

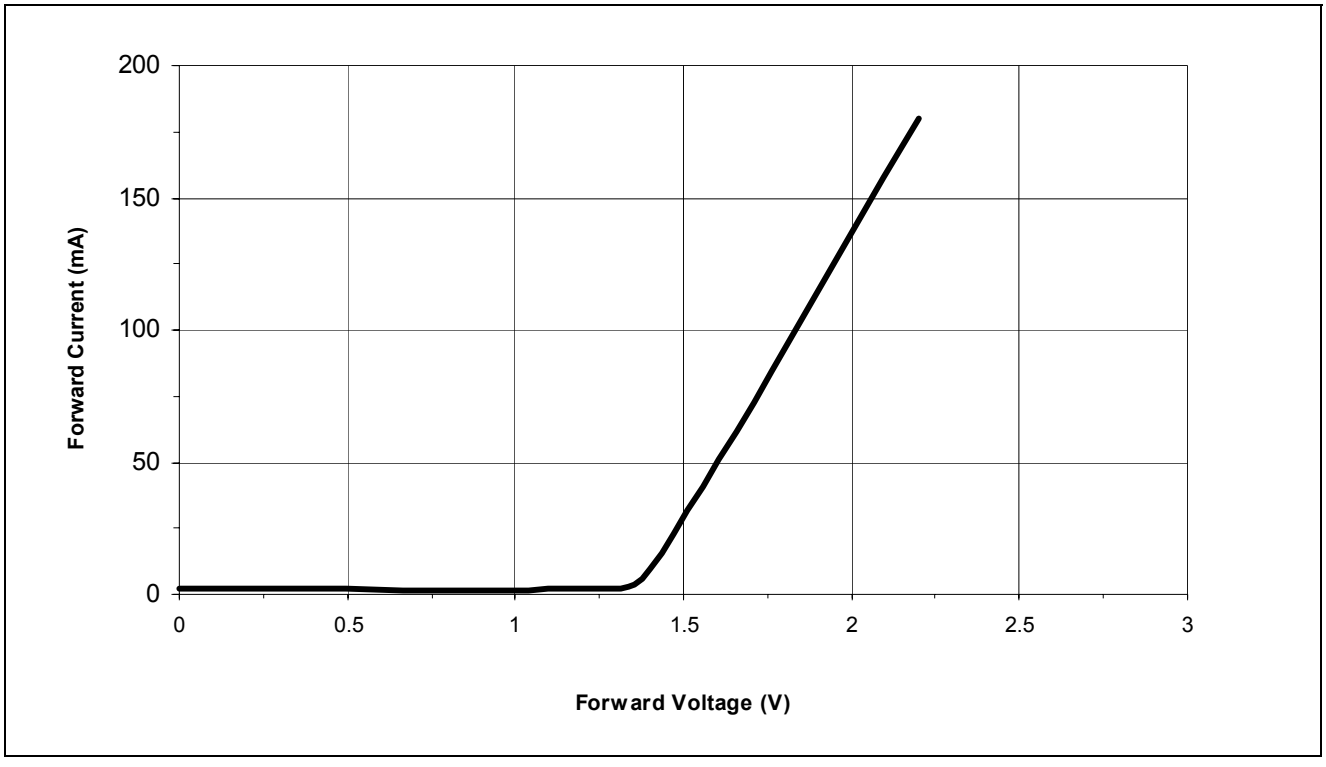
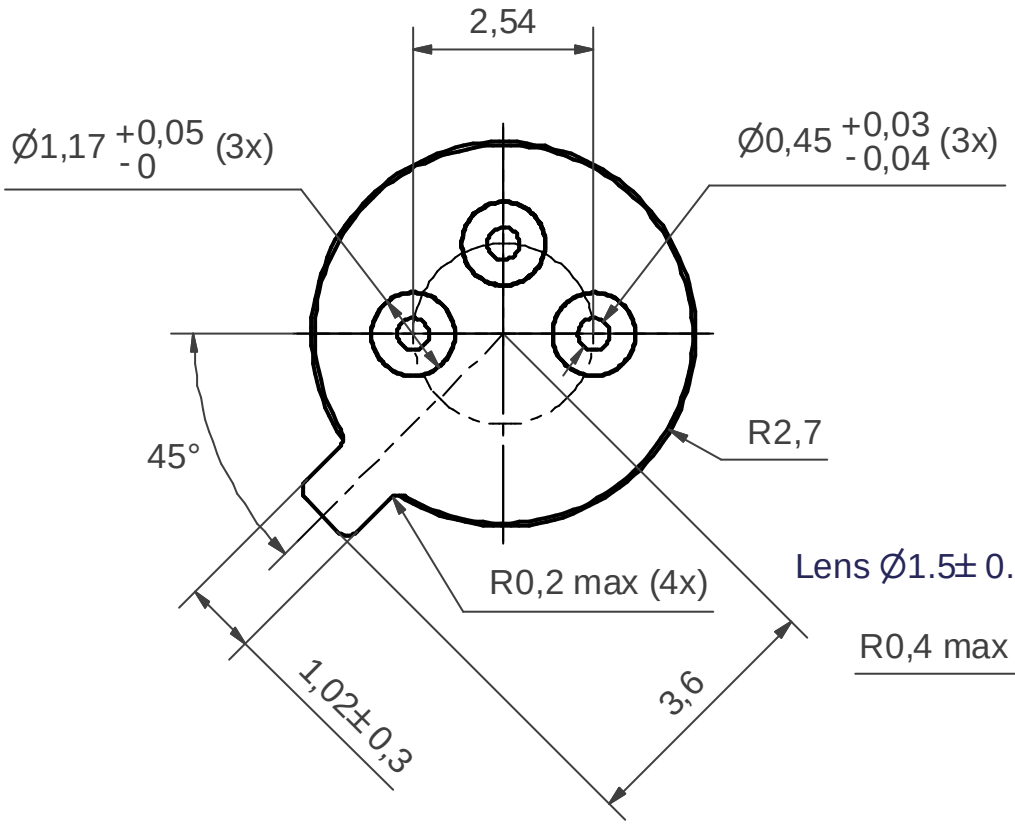
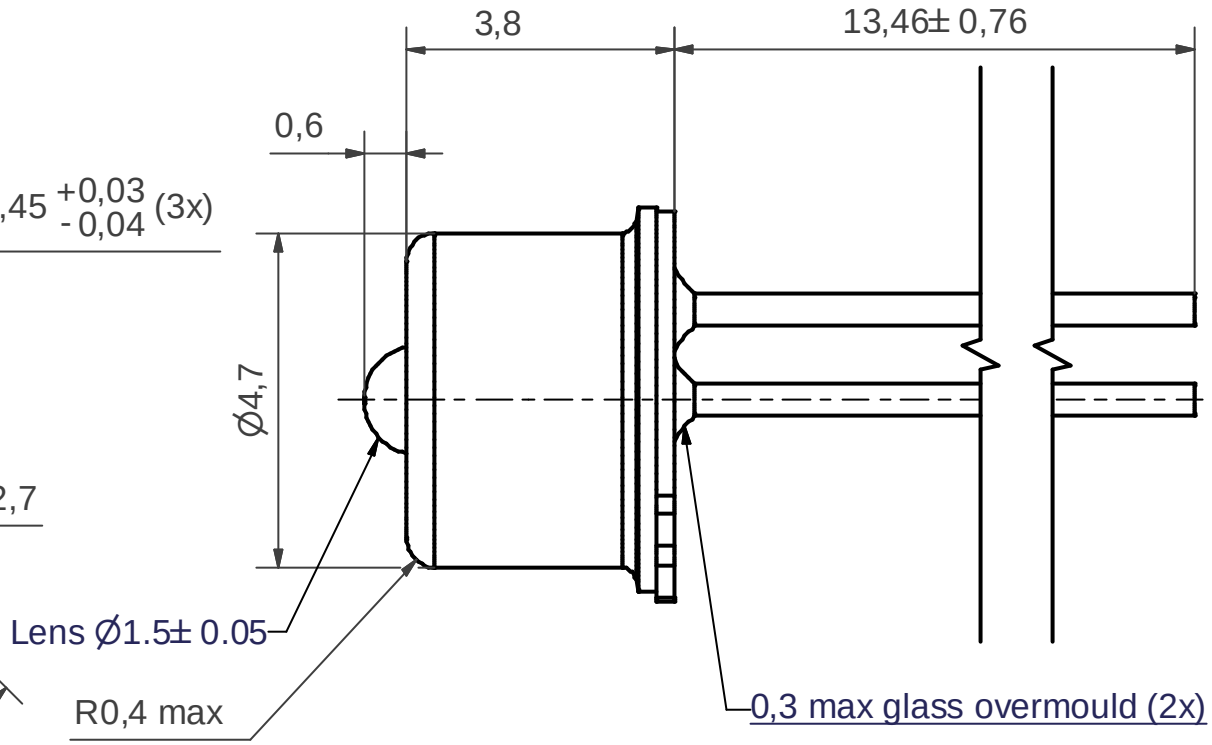


Figure 7 - Forward Current vs. Forward Voltage

BOTTOM VIEW (10 : 1)



SIDE VIEW



NOTES:-

1. All dimensions in mm.
2. General tol. ISO-2768-mK.
3. Coating: Case: Ni 1,5-2,5 µm.
   Header: Ni 2-3 µm / Au min 1,32 µm.

ISSUE	1			
ACN	JS004076R1A			
DATE	22-MAR-03			
APPRD.	TD/BE			

ZARLINK SEMICONDUCTOR

Previous package codes

Package code TB

Drawing type
Package drawing, TO-46 with lens

Title JS004076

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