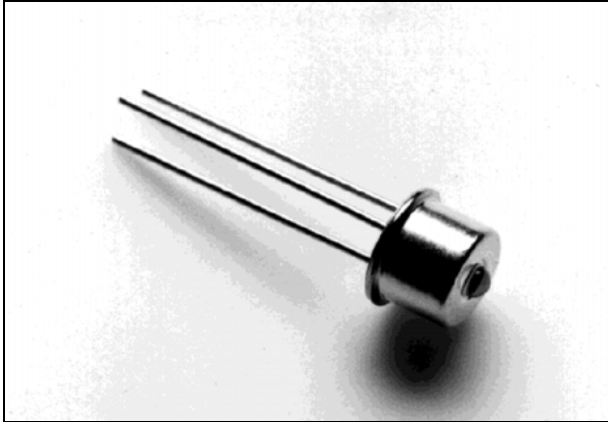


September 2004


**Ordering Information**

|          |               |
|----------|---------------|
| MF388    | TO-46 Package |
| MF388 ST | ST 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**

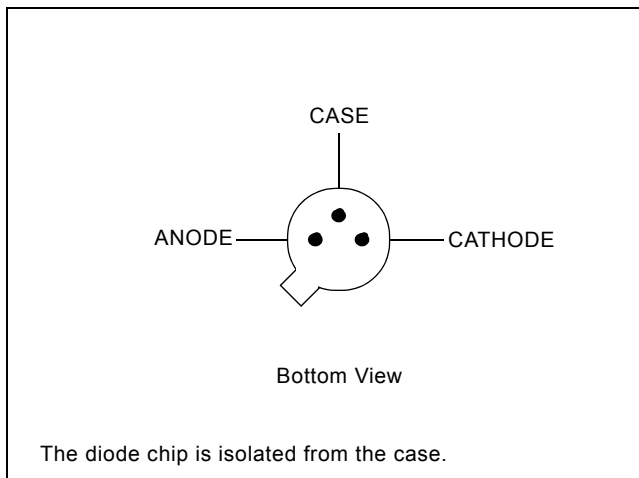
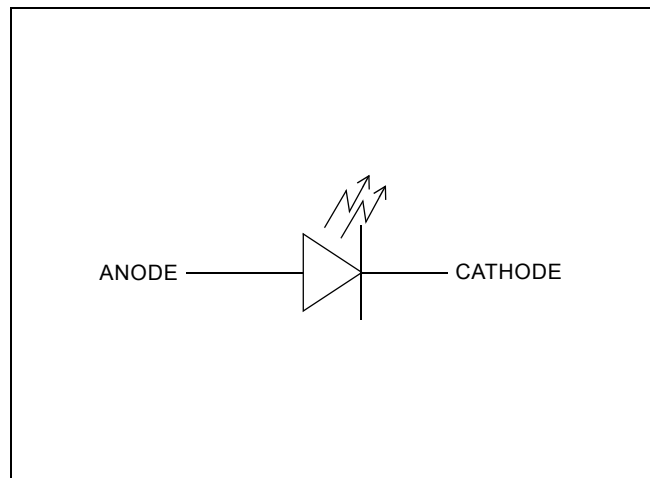
- 820 nm Surface-Emitting LED
- 250 MHz Bandwidth
- Designed for 62.5/125  $\mu\text{m}$  fiber
- High linearity

**Applications**

- FM Video
- Computer graphics
- LANs

**Description**

This device is designed for Ethernet 100 Mbps and Intra-Office Telecom 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<br>(Figures 3, 4, and 5) (Table 1) | $P_{\text{fiber}}$ | 40   | 50   |      | $\mu\text{W}$ | $I_F=50\text{ mA}$<br>(Note 1)   | Fiber:<br>62.5/125 $\mu\text{m}$<br>Graded<br>Index<br>NA=0.275 |
| Rise and Fall Time (10-90%)                            | $t_r, t_f$         |      |      | 2    | ns            | $I_F=50\text{ mA}$<br>(no bias)  |   |
| Bandwidth (3 dB <sub>e</sub> )                         | $f_c$              | 200  | 250  |      | MHz           | $I_F=50\text{ mA}$               |   |
| Peak Center Wavelength                                 | $\lambda_p$        | 800  | 820  | 840  | nm            | $I_F=50\text{ mA}$               |   |
| Spectral Width (FWHM)                                  | $\Delta\lambda$    |      |      | 60   | nm            | $I_F=50\text{ mA}$               |   |
| Forward Voltage (Figure 7)                             | $V_F$              |      |      | 1.85 | V             | $I_F=50\text{ mA}$               |   |
| Reverse Current  | $I_R$              |      |      | 20   | $\mu\text{A}$ | $V_R=1\text{ V}$                 |   |
| Capacitance  | C                  |      | 20   |      | pF            | $V_R=0\text{ V}, f=1\text{ MHz}$ |   |

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

**Absolute Maximum Ratings**

| Parameter  | Symbol           | Limit         |
|--|------------------|---------------|
| Storage Temperature                                    | $T_{\text{stg}}$ | -55 to +125°C |
| Operating Temperature (derating: Figure 6)             | $T_{\text{op}}$  | -40 to +85°C  |
| Electrical Power Dissipation (derating: Figure 6)      | $P_{\text{tot}}$ | 250 mW        |
| Continuous Forward Current (f<10 kHz)                  | $I_F$            | 110 mA        |
| Peak Forward Current (duty cycle<50%, f>1 MHz)         | $I_{\text{FRM}}$ | 180 mA        |
| Reverse Voltage  | $V_R$            | 1.5 V         |
| Soldering Temperature (2 mm from the case for 10 sec.) | $T_{\text{sld}}$ | 260°C         |

**Thermal Characteristics**

| Parameter                               | Symbol          | Min. | Typ. | Max. | Unit                         |
|---|-----------------|------|------|------|------------------------------|
| Thermal Resistance - Infinite Heat Sink | $R_{thjc}$      |      |      | 100  | $^{\circ}\text{C}/\text{W}$  |
| Thermal Resistance - No Heat Sink       | $R_{thja}$      |      |      | 400  | $^{\circ}\text{C}/\text{W}$  |
| Temperature Coefficient - Optical Power | $dP/dT_j$       |      | -0.6 |      | $\%/^{\circ}\text{C}$        |
| Temperature Coefficient - Wavelength    | $d\lambda/dT_j$ |      | 0.3  |      | $\text{nm}/^{\circ}\text{C}$ |

**Typical Fiber-Coupled Power**

| Core Diameter/Cladding Diameter Numerical Aperture |                                 |                               |                               |
|--|---------------------------------|-------------------------------|-------------------------------|
| 50/125 $\mu\text{m}$<br>0.20                       | 62.5/125 $\mu\text{m}$<br>0.275 | 100/140 $\mu\text{m}$<br>0.29 | 200/230 $\mu\text{m}$<br>0.37 |
| 20 $\mu\text{W}$                                   | 50 $\mu\text{W}$                | 100 $\mu\text{W}$             | 140 $\mu\text{W}$             |

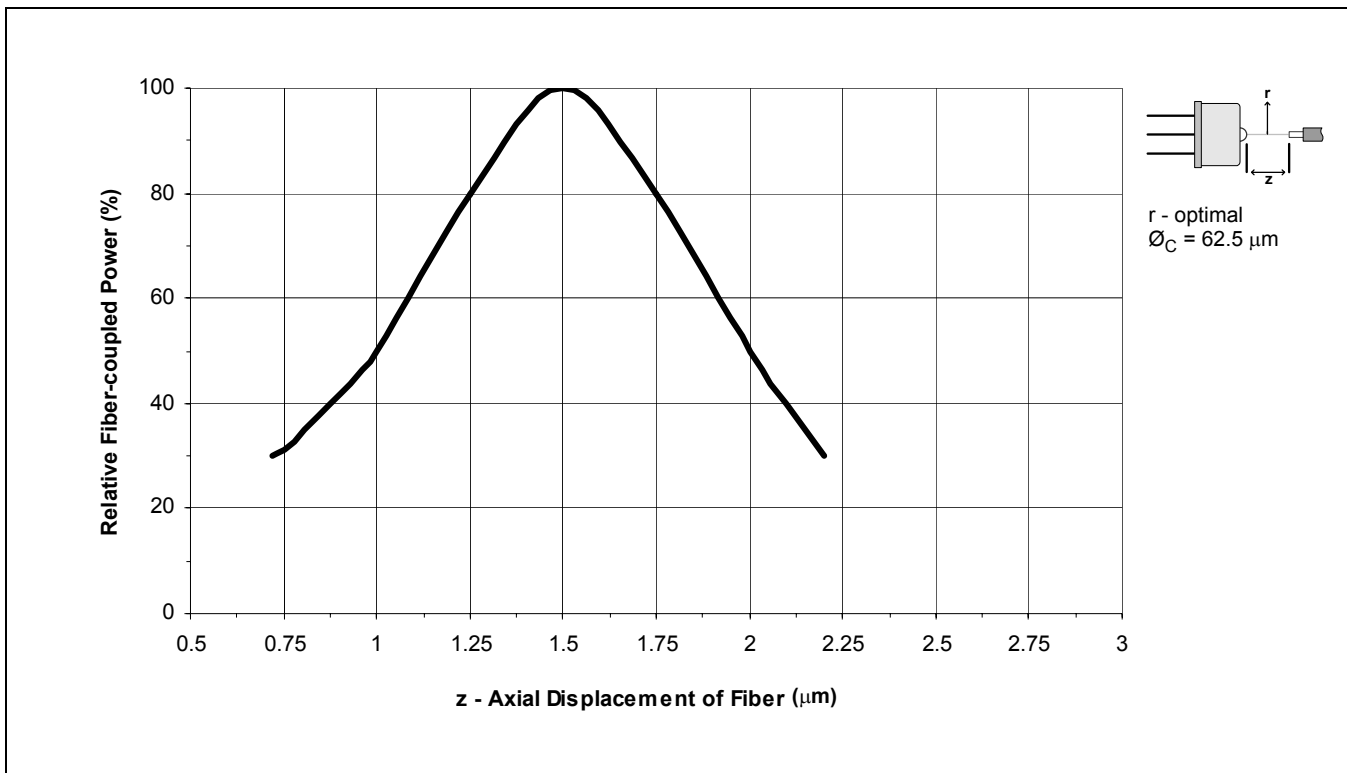


Figure 3 - Relative Fiber-coupled Power vs. z - Axial Displacement of Fiber

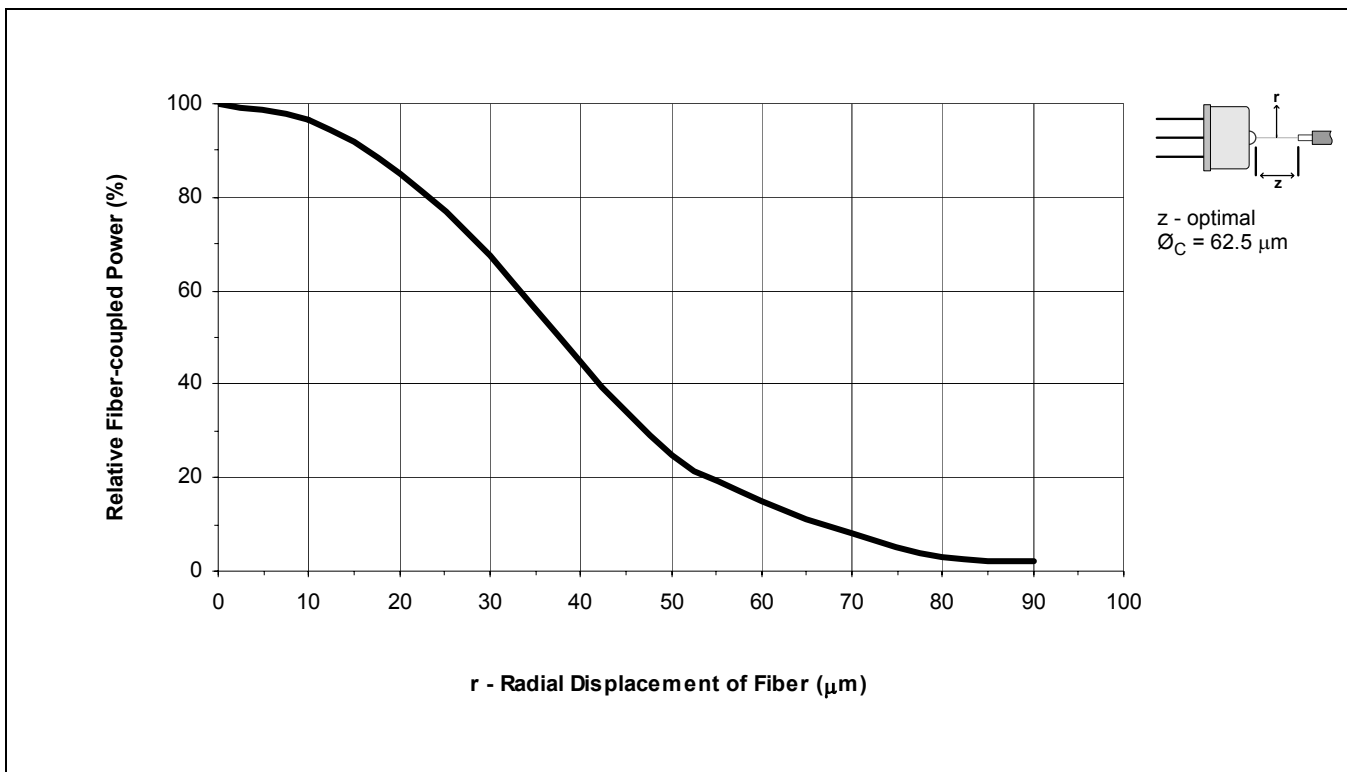


Figure 4 - Relative Fiber-coupled Power vs. r - Radial Displacement of Fiber

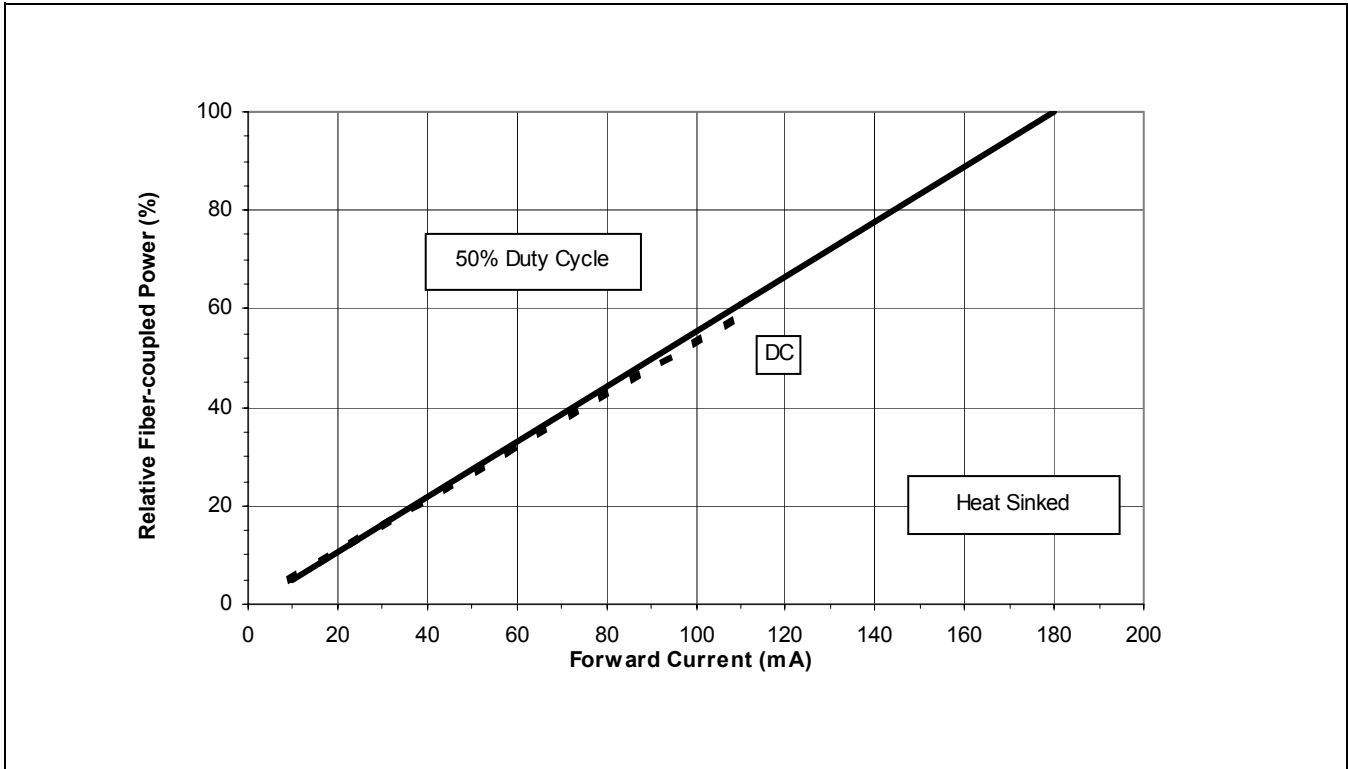


Figure 5 - Relative Fiber-coupled Power vs. Forward Current

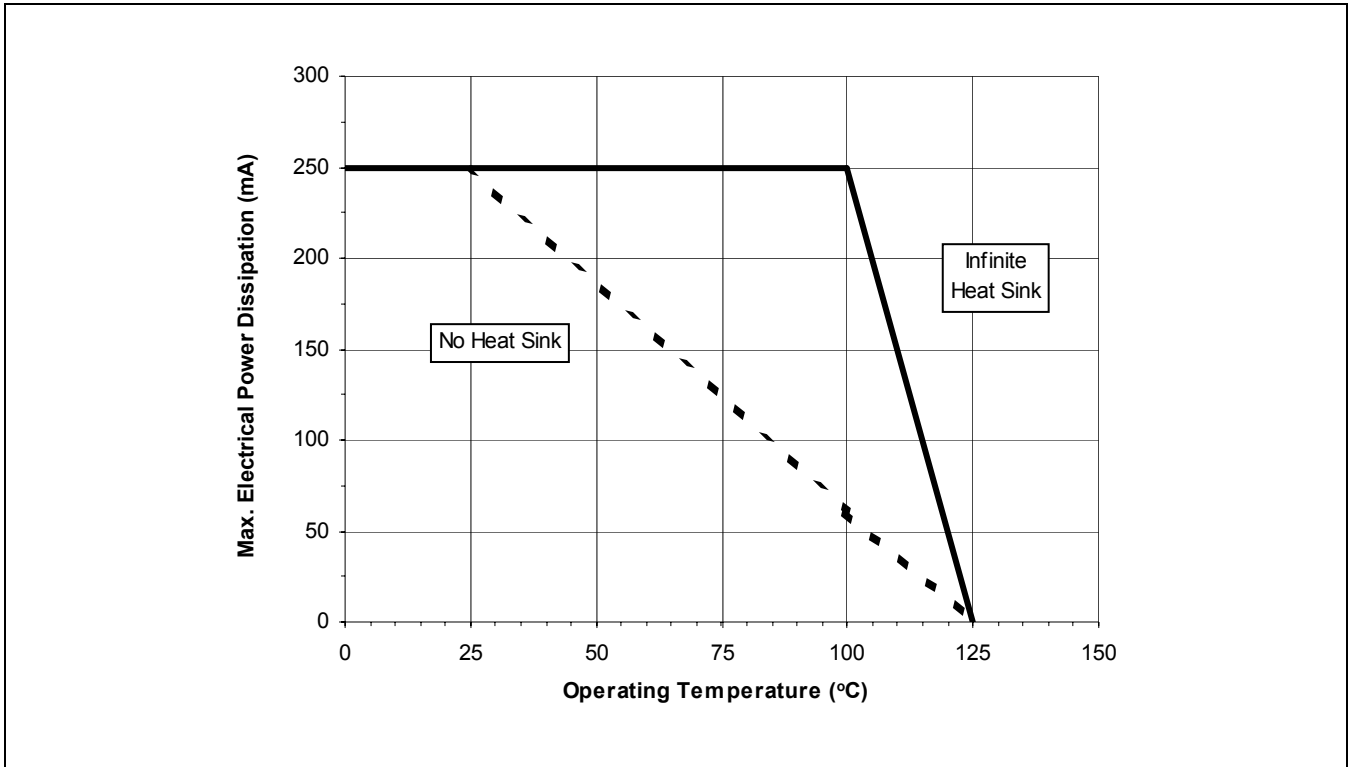


Figure 6 - Max. Electrical Power Dissipation vs. Operating Temperature

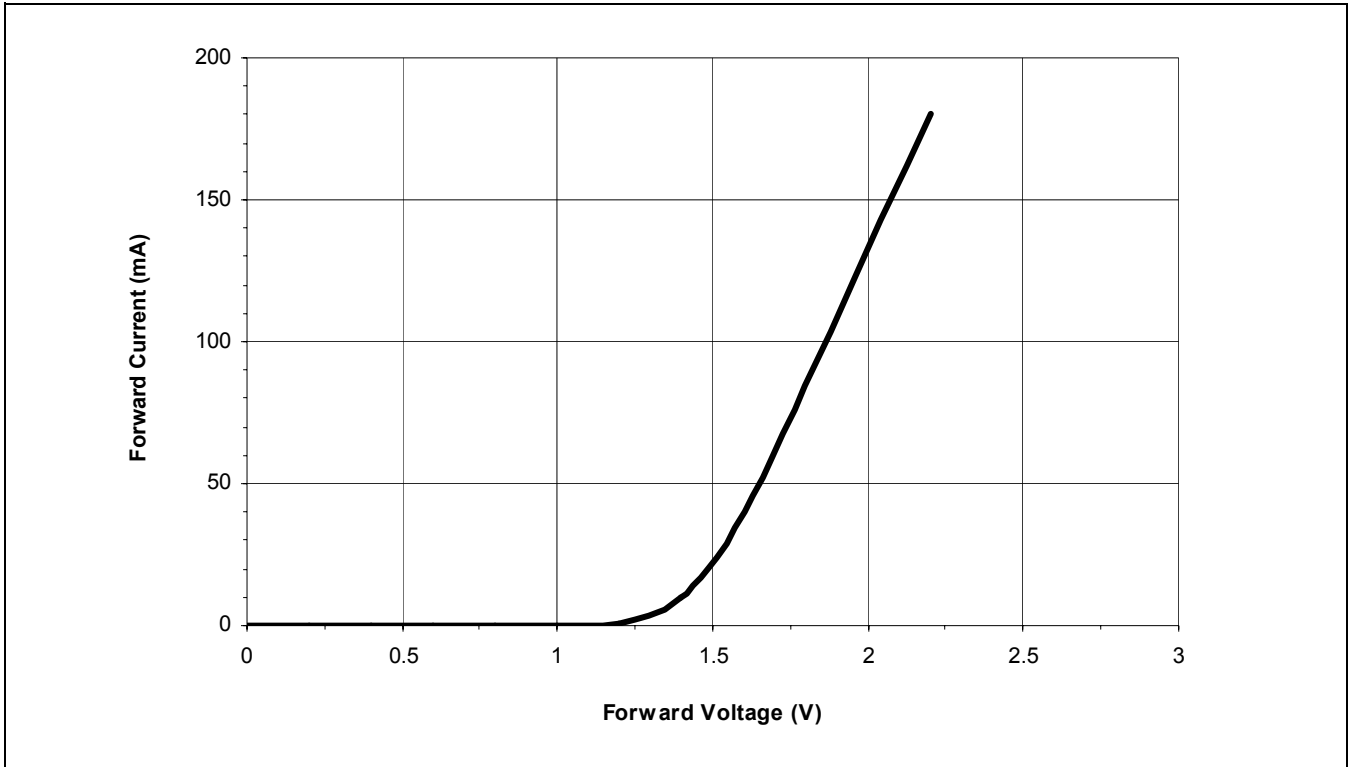
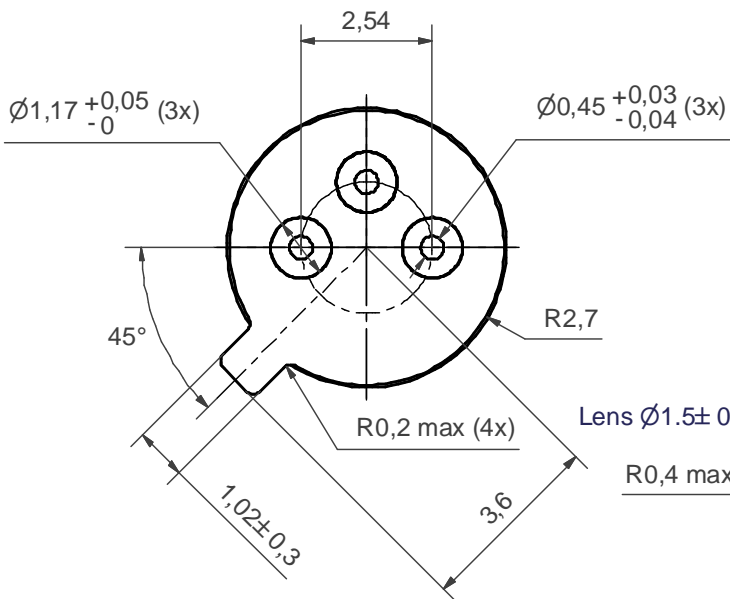
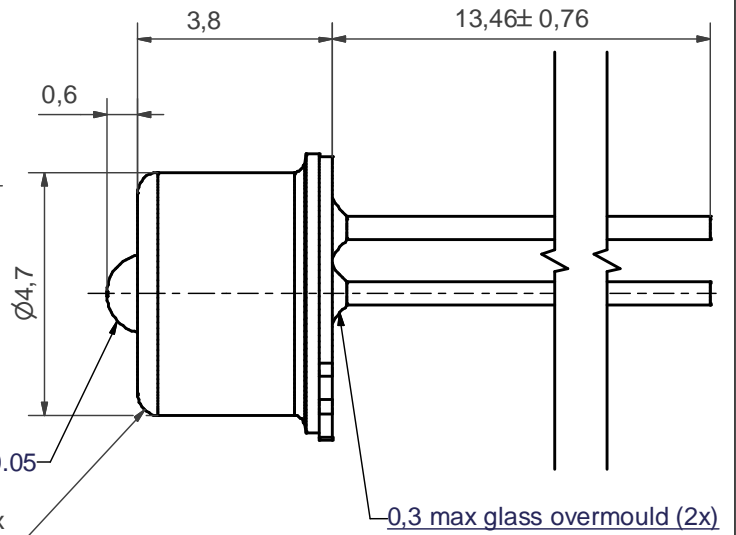


Figure 7 - Forward Current vs. Forward Voltage

### 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  $\mu\text{m}$ .  
Header: Ni 2-3  $\mu\text{m}$  / Au min 1,32  $\mu\text{m}$ .

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Previous package codes

Package code **TB**

Drawing type  
Package drawing, TO-46 with lens

Title **JS004076**



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