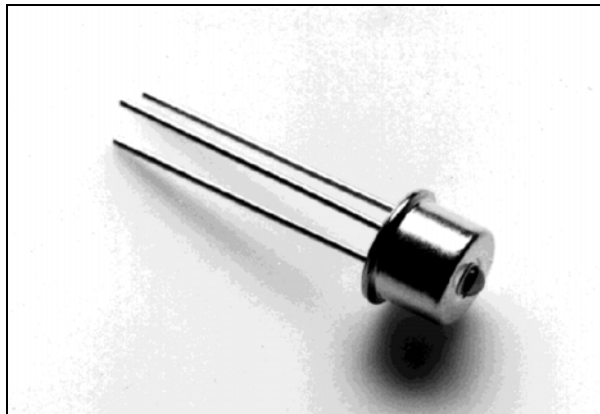


September 2004



### 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

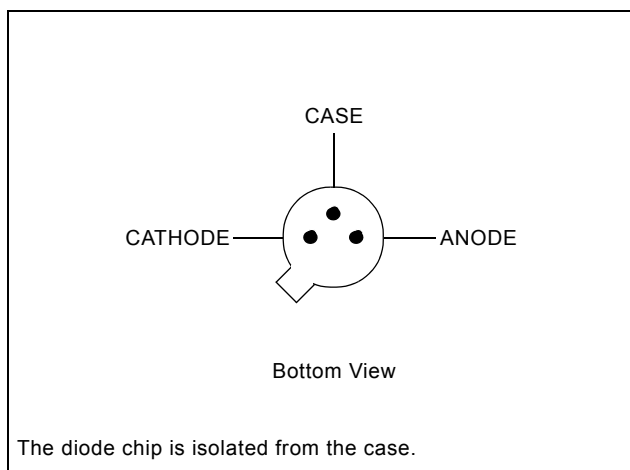
- 860 nm Surface-Emitting LED
- 70 MHz Bandwidth
- Designed for 50/125  $\mu$ m fiber

### Applications

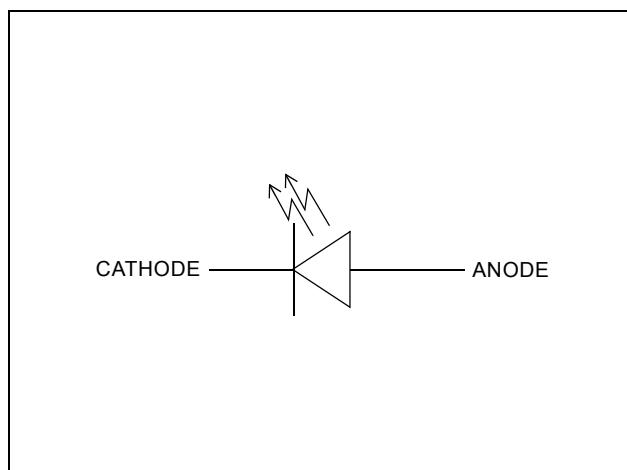
- LANs
- Test Equipment
- General Purpose

### 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 <sub>fiber</sub>	25	45		μW	I <sub>F</sub> =60 mA (Note 1)	Fiber: 50/125 μm
Rise and Fall Time (10-90%)	t <sub>r</sub> ,t <sub>f</sub>		5	7	ns	I <sub>F</sub> =60 mA (no bias)	Graded Index
Bandwidth (3dB <sub>eI</sub> )	f <sub>c</sub>		70		MHz	I <sub>F</sub> =60 mA	NA=0.20
Peak Wavelength	λ <sub>p</sub>	840	860	880	nm	I <sub>F</sub> =60mA	
Spectral Width (FWHM)	Δλ		50		nm	I <sub>F</sub> =60 mA	
Forward Voltage (Figure 7)	V <sub>F</sub>		1.7	1.9	V	I <sub>F</sub> =60 mA	
Reverse Current	I <sub>R</sub>			20	μA	V <sub>R</sub> =1 V	
Capacitance	C		250		pF	V <sub>R</sub> =0 V, f=1 MHz	

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

**Absolute Maximum Ratings**

Parameter	Symbol	Limit
Storage Temperature	$T_{\text{stg}}$	-55 to +125°C
Operating Temperature (derating: Figure 6)	$T_{\text{op}}$	-40 to +85°C
Electrical Power Dissipation (derating: Figure 6)	$P_{\text{tot}}$	160 mW
Continuous Forward Current ( $f < 10\text{ kHz}$ )	$I_F$	80 mA
Peak Forward Current (duty cycle $< 50\%$ , $f > 1\text{ MHz}$ )	$I_{\text{FRM}}$	130 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	$R_{thjc}$			200	$^{\circ}\text{C/W}$
Thermal Resistance - No Heat Sink	$R_{thja}$			500	$^{\circ}\text{C/W}$
Temperature Coefficient - Optical Power	$dP/dT_j$		-0.5		$\%/^{\circ}\text{C}$
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 $\mu\text{m}$ 0.20	62.5/125 $\mu\text{m}$ 0.275	100/140 $\mu\text{m}$ 0.29	200/230 $\mu\text{m}$ 0.37
45 $\mu\text{W}$	95 $\mu\text{W}$	210 $\mu\text{W}$	440 $\mu\text{W}$

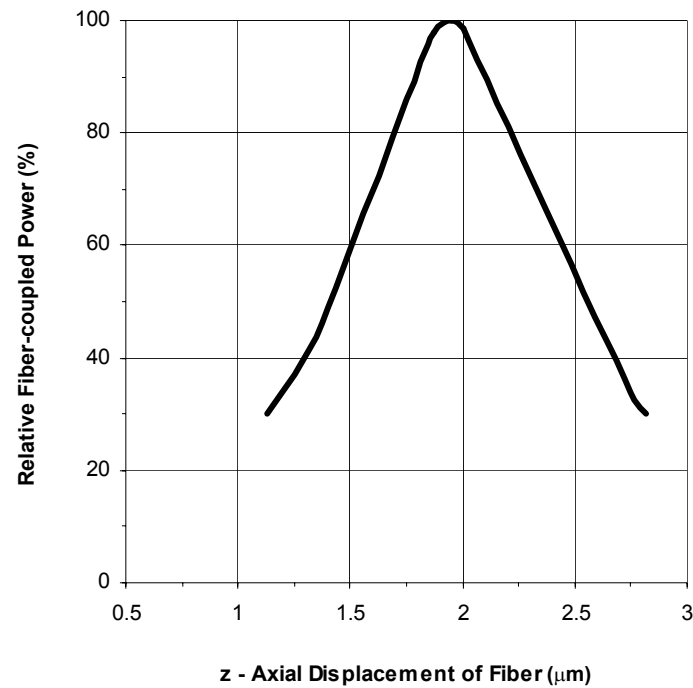


Figure 3 - Relative Fiber-coupled Power vs. z - Axial Displacement of Fiber

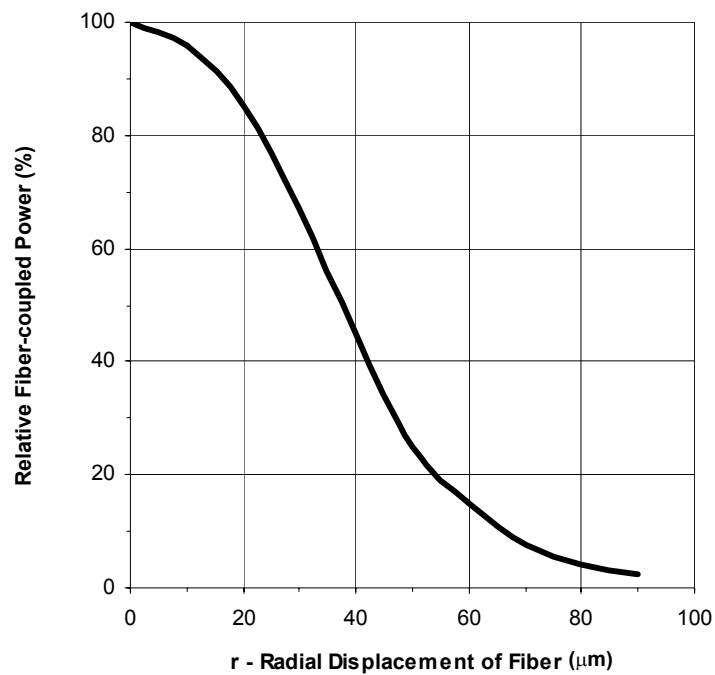


Figure 4 - Relative Fiber-coupled Power vs. r - Radial Displacement of Fiber

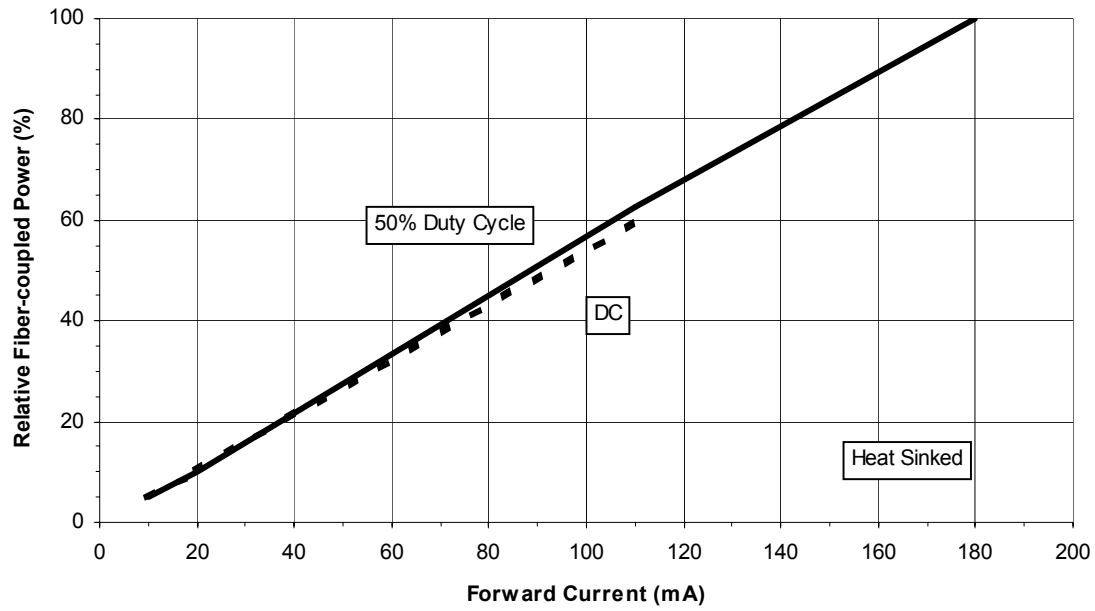


Figure 5 - Relative Fiber-coupled Power vs. Forward Current

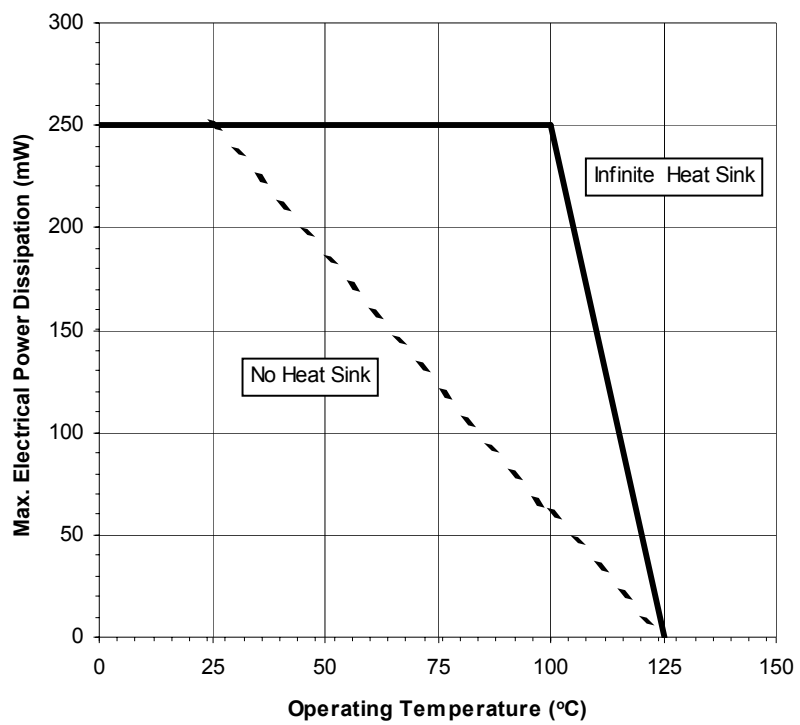
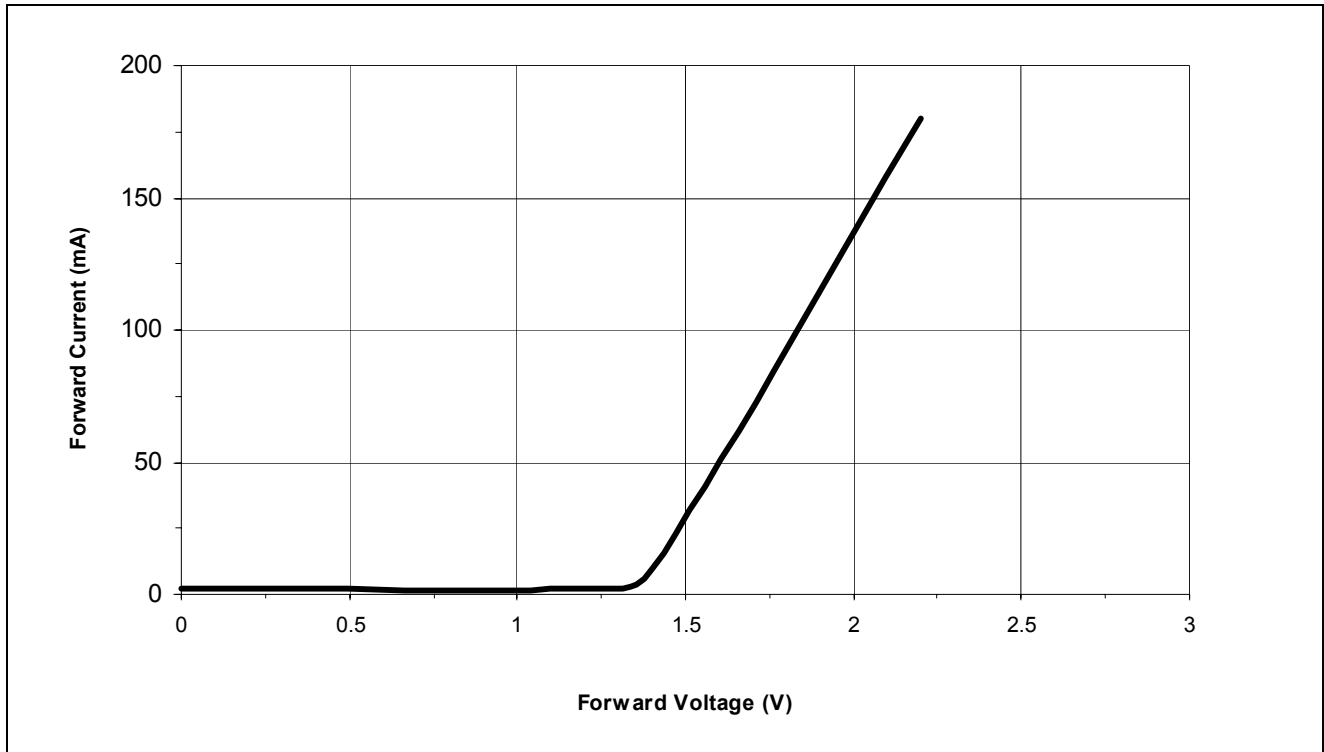
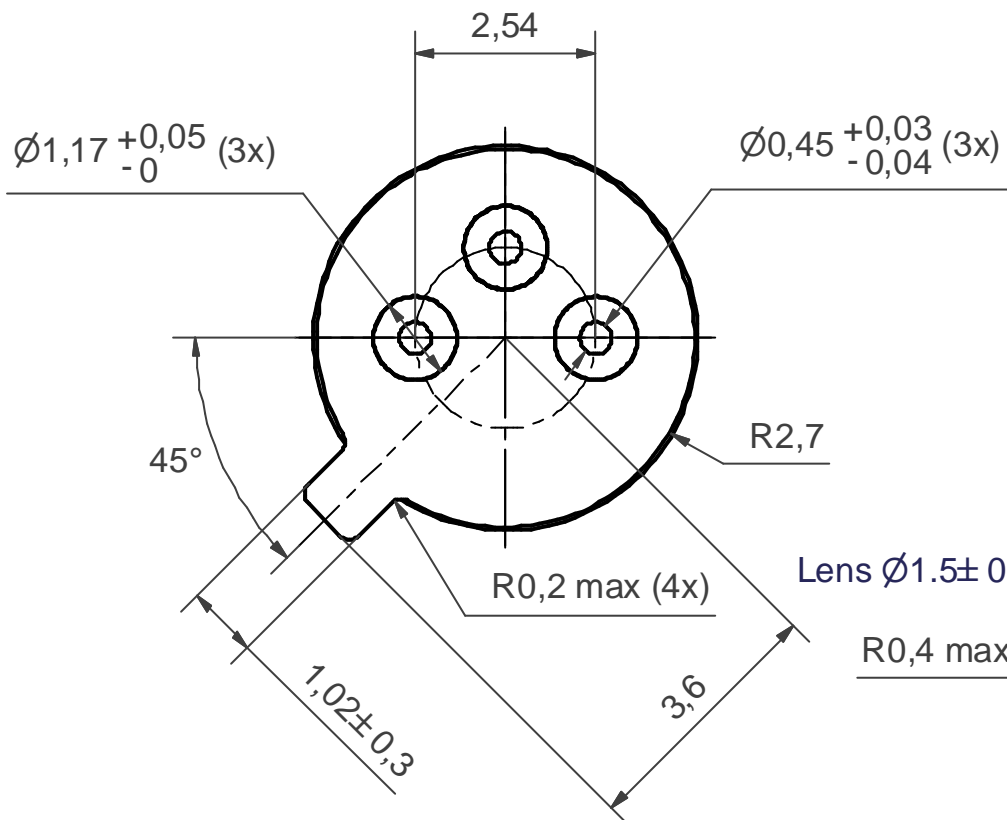


Figure 6 - Max. Electrical Power Dissipation vs. Operating Temperature

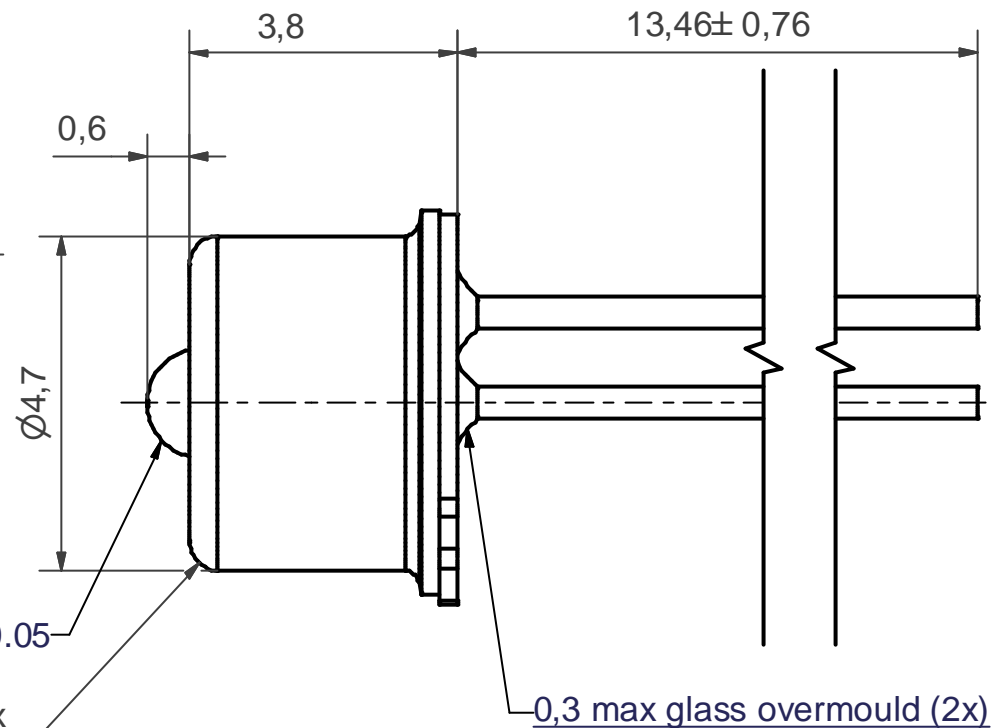


**Figure 7 - Forward Current vs. Forward Voltage**

## 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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