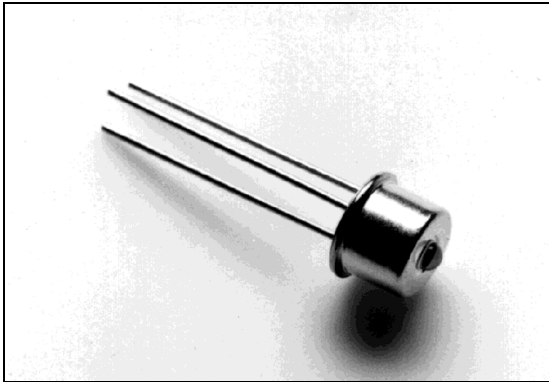


August 2003



### Ordering Information

MF359	TO-46 Package
MF359 ST	ST Housing
MF359 SMA	SMA 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

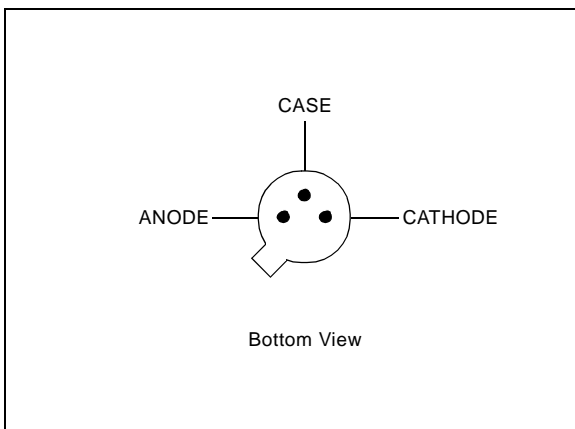
- 780nm Surface-Emitting LED
- 55MHz Bandwidth
- Designed for 62.5/125µm fiber
- Low thermal droop

### Applications

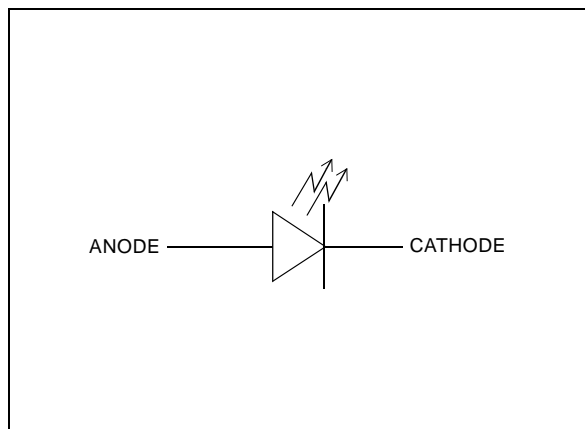
- Baseband Video
- Sensors
- General Purpose

### Description

The low thermal droop of this device allows baseband video transmission with minimum distortion. The double-lens optical system provides for optimum coupling of power into the fiber. It matches with the MF446 PIN Photodiode.



**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	$P_{\text{fiber}}$	80	120		$\mu\text{W}$	$I_F=80\text{mA}$ (Note 1)	Fiber:  62.5/ 125 $\mu\text{m}$ Graded Index NA=0.275
Rise and Fall Time (10-90%)	$t_r, t_f$		6	8	ns	$I_F=80\text{mA}$ (no bias)	
Bandwidth (3dB <sub>el</sub> )	$f_c$		55		MHz	$I_F=80\text{mA}$	
Thermal Droop (non linearity) (Note 2)	$\Delta\text{PI}$		2		%	$I_F=80\text{mA}$	
Peak Wavelength	$\lambda_p$	760	780	800	nm	$I_F=80\text{mA}$	
Spectral Width (FWHM)	$\Delta\lambda$		50		nm	$I_F=80\text{mA}$	
Forward Voltage (Figure 7)	$V_F$		2.2	2.6	V	$I_F=80\text{mA}$	
Reverse Current	$I_R$			20	$\mu\text{A}$	$V_R=1\text{V}$	
Capacitance	C		250		pF	$V_R=0\text{V}, f=1\text{MHz}$	

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

Note 2: Transient decline in optical power due to self-heating.

**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)	$P_{\text{tot}}$	300 mW
Continuous Forward Current (f<10kHz)	$I_F$	110 mA
Peak Forward Current (duty cycle<50%, f>1MHz)	$I_{\text{FRM}}$	180 mA
Reverse Voltage	$V_R$	1.5 V
Soldering Temperature (2mm from the case for 10 sec.)	$T_{\text{slid}}$	260°C

**Thermal Characteristics**

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance - Infinite Heat Sink	$R_{\text{thjc}}$			100	°C/W
Thermal Resistance - No Heat Sink	$R_{\text{thja}}$			400	°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			
50/125 $\mu$ m 0.20	62.5/125 $\mu$ m 0.275	100/140 $\mu$ m 0.29	200/230 $\mu$ m 0.37
60 $\mu$ W	120 $\mu$ W	250 $\mu$ W	400 $\mu$ W

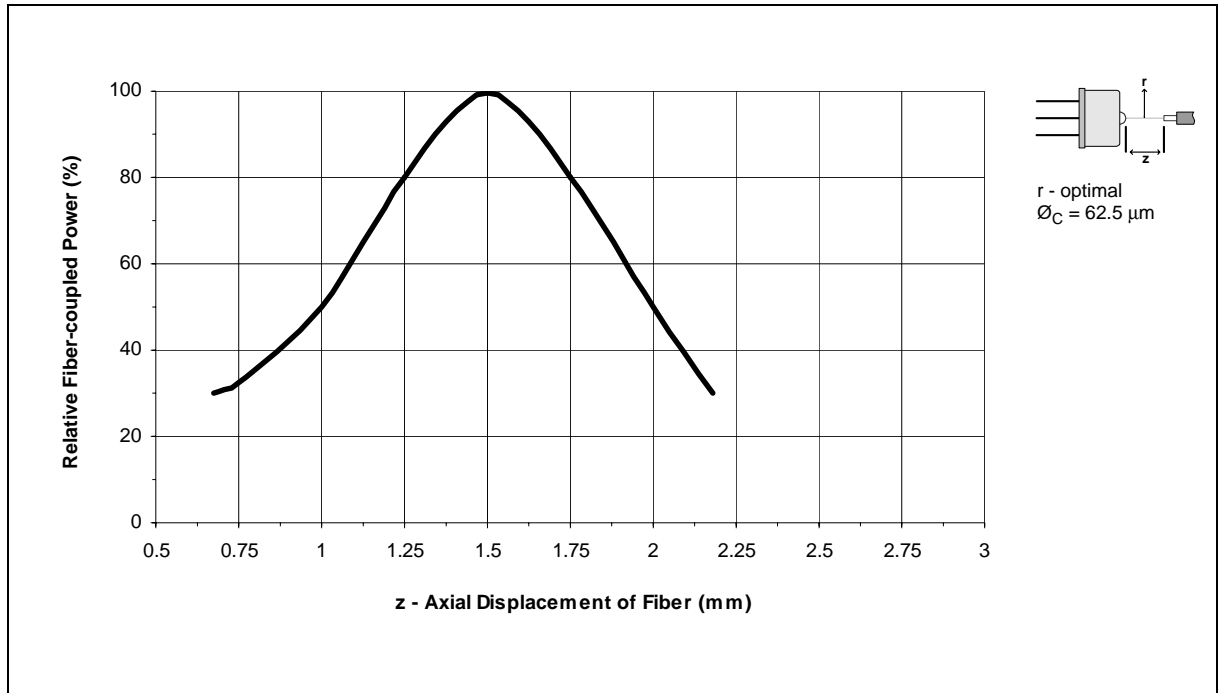


Figure 3 - Relative Fiber-coupled Power vs. z - Axial Displacement of Fiber

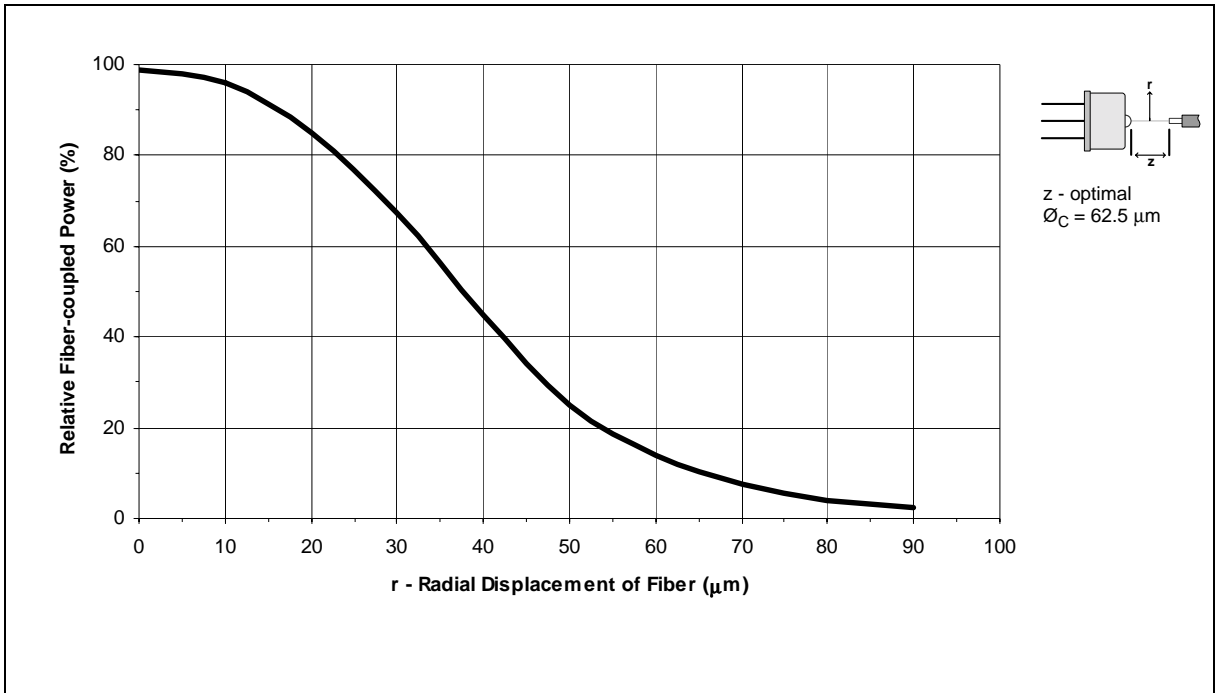


Figure 4 - Relative Fiber-coupled Power vs. r - Radial Displacement of Fiber

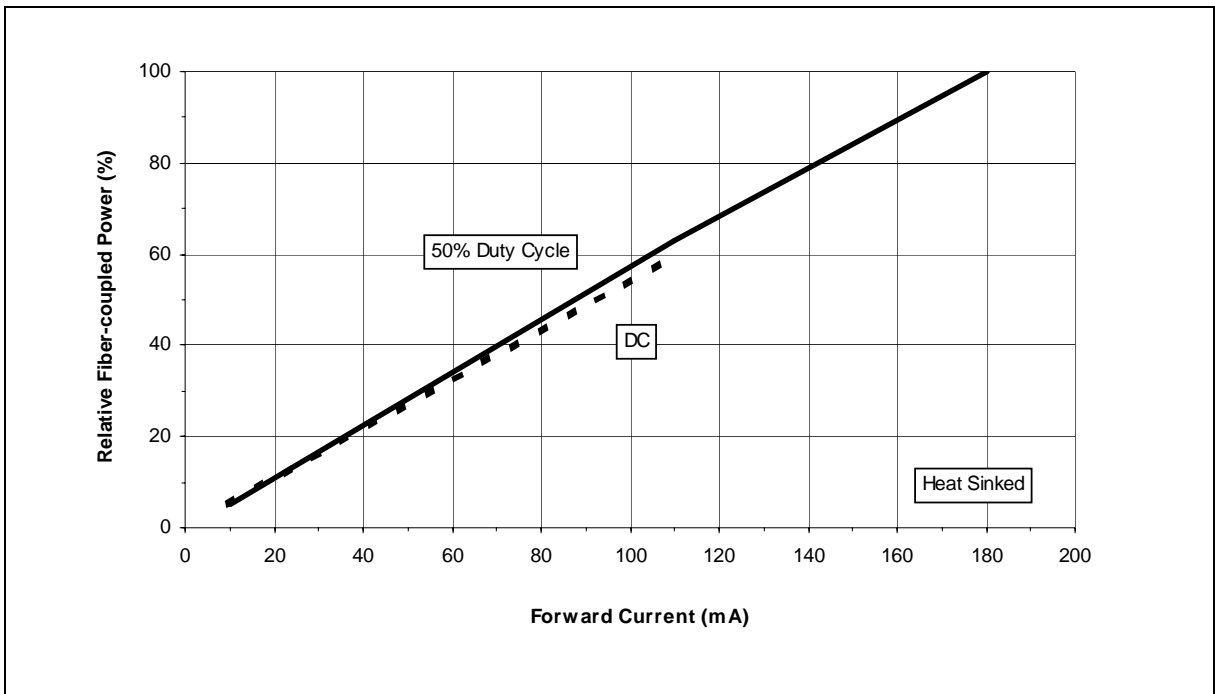


Figure 5 - Relative Fiber-coupled Power vs. Forward Current

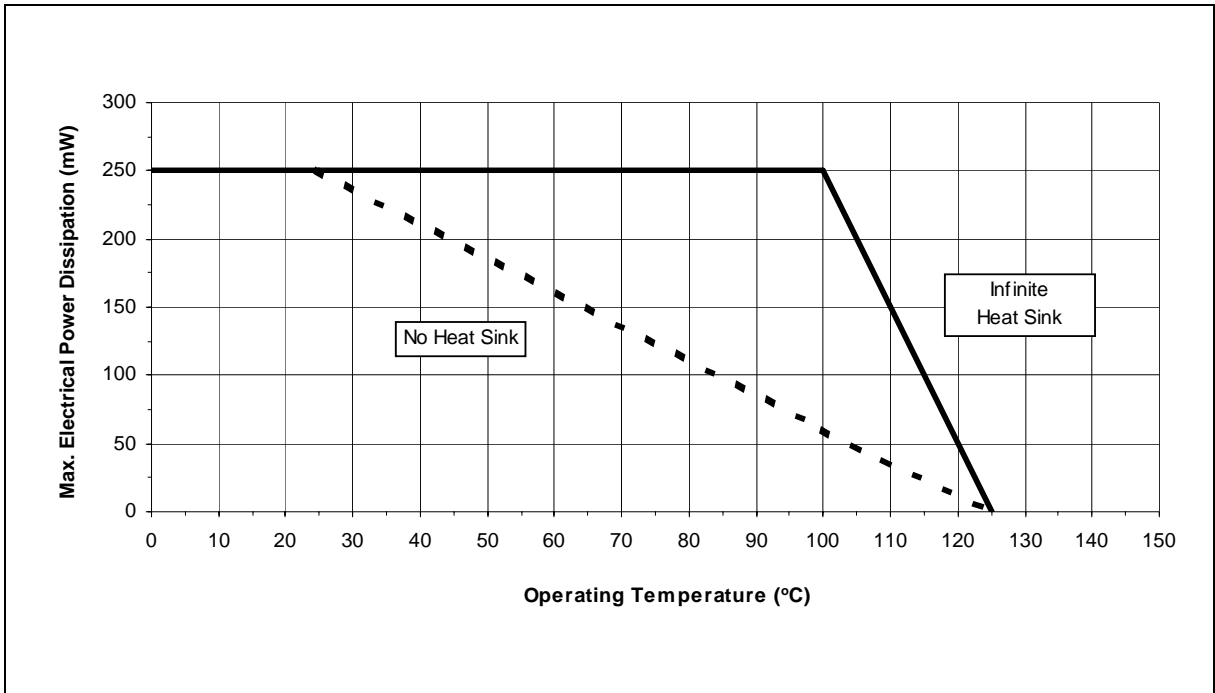


Figure 6 - Max. Electrical Power Dissipation vs. Operating Temperature

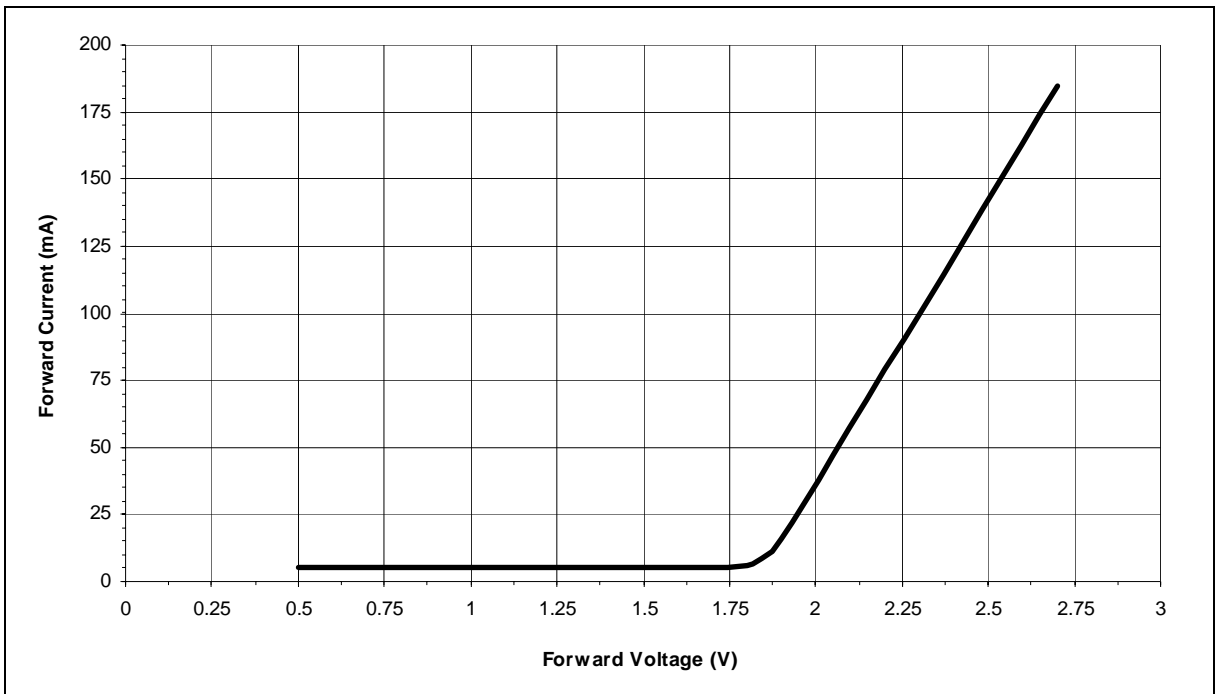
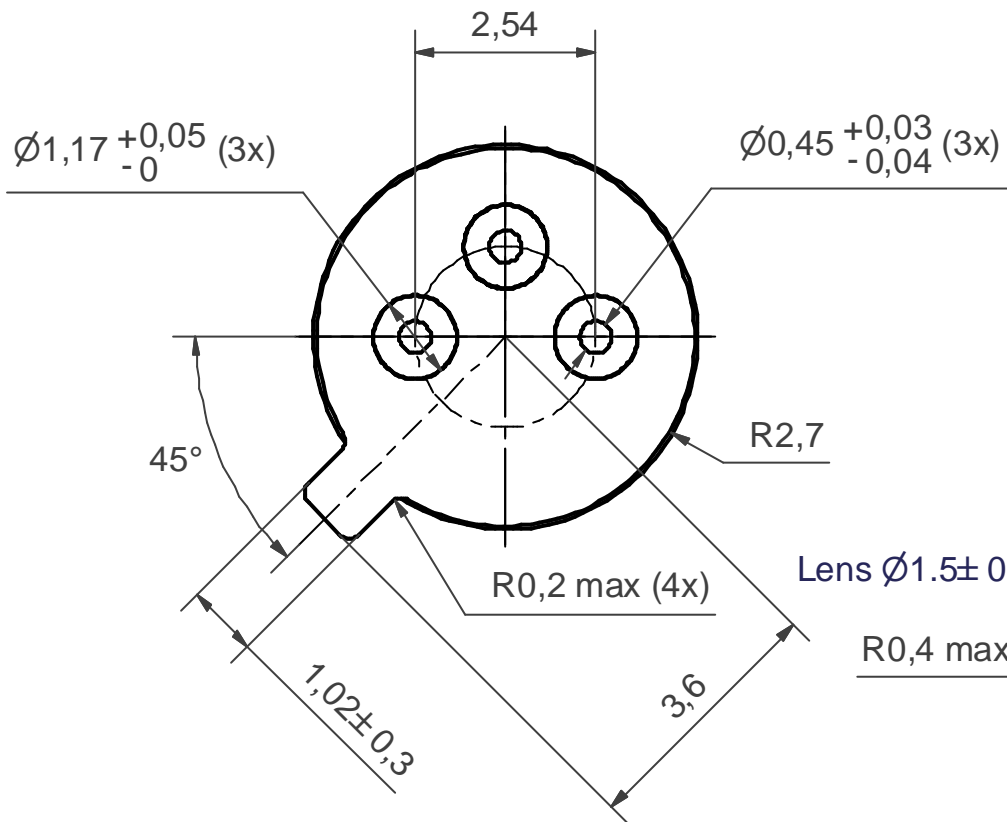
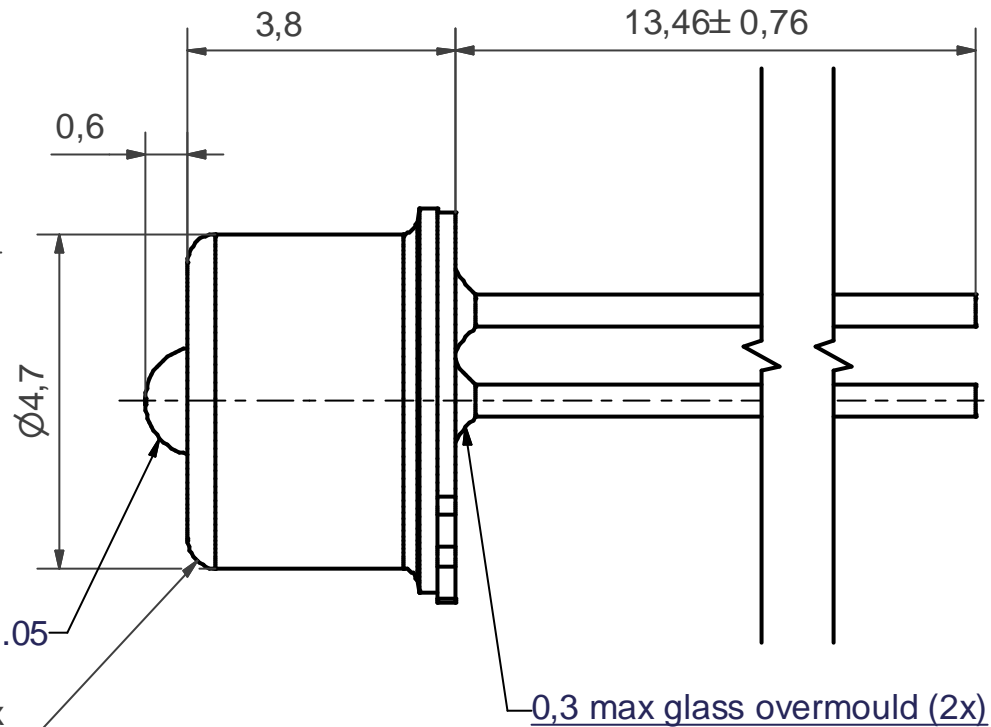


Figure 7 - Forward Current vs. Forward Voltage

### 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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Package code **TB**

Previous package codes

Drawing type  
Package drawing, TO-46 with lens

Title **JS004076**



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