



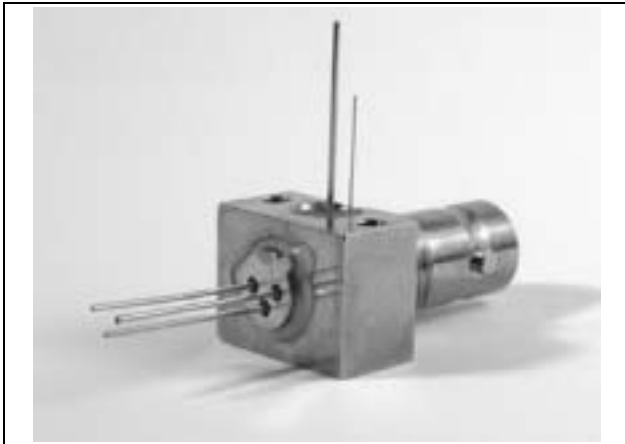
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March 2004



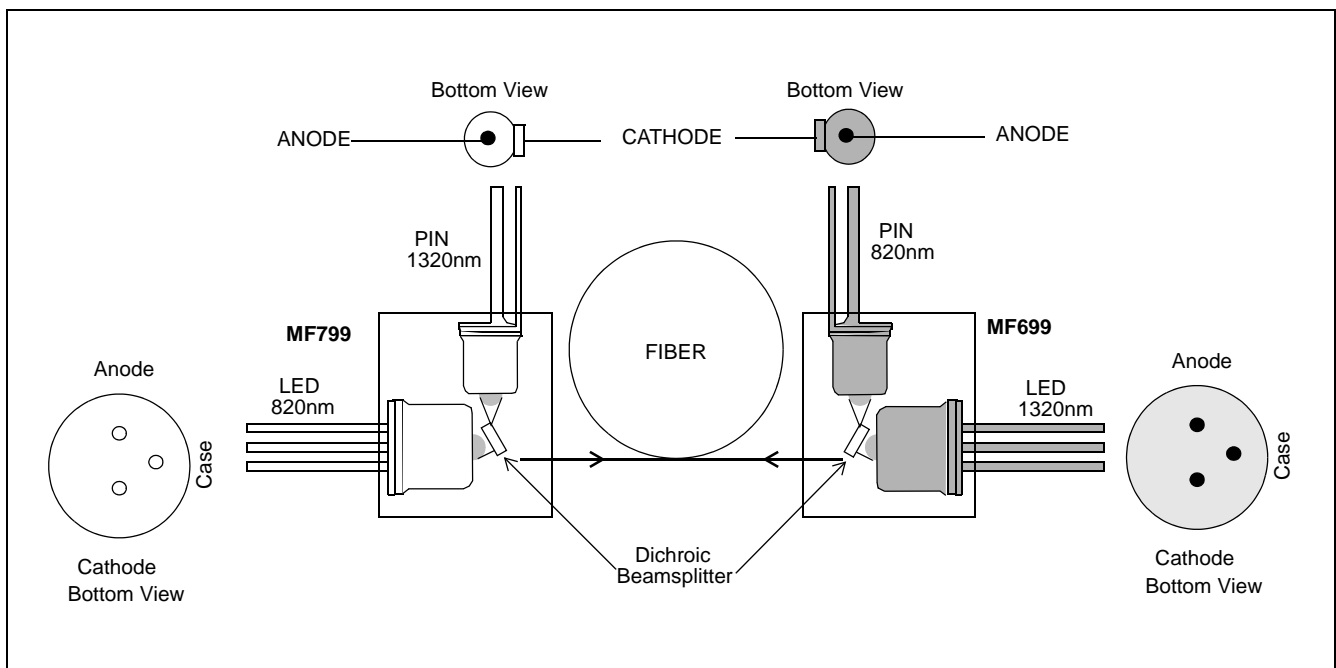
Ordering Information	
MF699	ST-duplex package
-40°C to +85°C	

### Applications

- Ethernet 10 or 100 Mbps
- Token Ring
- Fibre Channel 266 Mbps
- FDDI
- ATM-SDH/SONET 155 Mbps
- Intra-Office Telecom
- WDM Applications

### Features

- Full Duplex Communication Over One Fiber
- Dual Wavelengths 820/1300 nm
- Very Small Size
- Very Low Internal Crosstalk
- Packaged in Industry-Standard ST® Receptacle
- Designed for 62.5/125 μm Fiber



**Figure 1 - MF699 Functional Diagram**

## Description

Used in combination with the MF799, the MF699 Duplex Device is designed for WDM (Wavelength Division Multiplex), Datacom, Video Links, or Intra-Office Telecom Applications. It emits optical power at 1320 nm and detects incoming optical power at 820 nm, allowing full Duplex Communication over one single fiber.

The MF699 uses dichroic (wavelength-selective) beamsplitters for maximum power budget and minimum crosstalk. Minimum internal crosstalk is achieved by the use of wavelength-selective detectors. The long wavelength path meets requirements for FDDI (ANSI X3T9.5) and ATM 155 Mbps.

The MF699 is designed for multi-mode fiber and optimized for 62.5/125  $\mu\text{m}$  fiber.

## Absolute Maximum Ratings

Parameter	Symbol	Limit
Storage Temperature	$T_{\text{stg}}$	-55 to +125°C
Operating Temperature (Figure 3)	$T_{\text{op}}$	-40 to +85°C
LED Power Dissipation (Figure 3)	$P_{\text{tot}}$	160 mW
LED Continuous Forward Current ( $\leq 10$ kHz)	$I_{\text{F}}$	80 mA
LED Peak Forward Current (duty cycle $\leq 50\%$ , $f \geq 1$ MHz)	$I_{\text{FRM}}$	130 mA
LED Reverse Voltage	$V_{\text{RL}}$	0.5 V
PIN Reverse Voltage	$V_{\text{RP}}$	20 V
Soldering Temperature (2 mm from the case for 10 sec)	$T_{\text{slid}}$	260°C

## LED Optical & Electrical Characteristics (Case Temperature -25 to +70°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Fiber-Coupled Power (Figure 2)	$P_{\text{fiber}}$	-20.5			dBm	$I_{\text{Peak}} = 60$ mA (Note 1, 2)
Rise & Fall Time (10 - 90% no bias)	$t_{\text{r,ff}}$		2.5	3.5	ns	$I_{\text{F}} = 60$ mA (Note 2)
Bandwidth (3 dB <sub>el</sub> )	$f_{\text{C}}$		125		MHz	$I_{\text{F}} = 60$ mA (Note 2)
Peak Wavelength	$\lambda_{\text{p}}$		1320		nm	$I_{\text{F}} = 60$ mA
Spectral Width (FWHM)	$\Delta\lambda$		135	180	nm	$I_{\text{F}} = 60$ mA
Forward Voltage (Figure 4)	$V_{\text{F}}$		1.3	1.65	V	$I_{\text{F}} = 60$ mA
Reverse Current	$I_{\text{R}}$			100	$\mu\text{A}$	$V_{\text{R}} = 1$ V
Capacitance	C		200		pF	$V_{\text{R}} = 0\text{V}$ , $f = 1$ MHz

Note 1: Average power at 10 MHz/50% duty cycle. Measured at the exit of 100m of fiber.

Note 2: 62.5/125  $\mu\text{m}$  graded index fiber (NA = 0.275).

**PIN Optical & Electrical Characteristics (Case Temperature -25 to +70°C)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Responsivity (Figure 5)	R	0.25			A/W	$V_R = 5\text{ V}$ $\lambda = 820\text{nm}$ (Note 1)
Bandwidth	$f_c$	500			MHz	$V_R = 5\text{ V}$ $R_L = 50\ \Omega$ (Note 1)
Capacitance (Figure 6)	C		1		pF	$V_R = 5\text{ V}$ $f = 1\text{ MHz}$
Dark Current	$I_d$			3 50	nA	$T_{\text{Case}} = 25^\circ\text{C}$ $T_{\text{Case}} = 70^\circ\text{C}$ $V_R = 5\text{ V}$ $I_{\text{LED}} = 0\text{ mA}$
Crosstalk Current	$I_{\text{Cr}}$		3		nA	$V_R = 5\text{ V}$ $I_{\text{LED}} = 60\text{ mA}$ (Note 2)

Note 1: 62.5/125  $\mu\text{m}$  graded index fiber (NA = 0.275).

Note 2: Internal crosstalk with ceramic ferrule inserted but no power from the fiber. Total Current = dark current + crosstalk current.

**LED Thermal Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Units
Thermal Resistance - Infinite Heat Sink	$R_{\text{thjc}}$			200	$^\circ\text{C/W}$
Thermal Resistance - On PC Board	$R_{\text{thjb}}$			300	$^\circ\text{C/W}$
Temperature Coefficient - Optical Power	$dP/dT_j$		-0.75		$\%/^\circ\text{C}$
Temperature Coefficient - Wavelength	$d\lambda/dT_j$		0.45		$\text{nm}/^\circ\text{C}$

**PIN Thermal Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Units
Temperature Coefficient - Dark Current	$dI_d/dT_j$		5		$\%/^\circ\text{C}$
Temperature Coefficient - Crosstalk Current	$dI_{\text{Cr}}/dT_j$		-0.75		$\%/^\circ\text{C}$

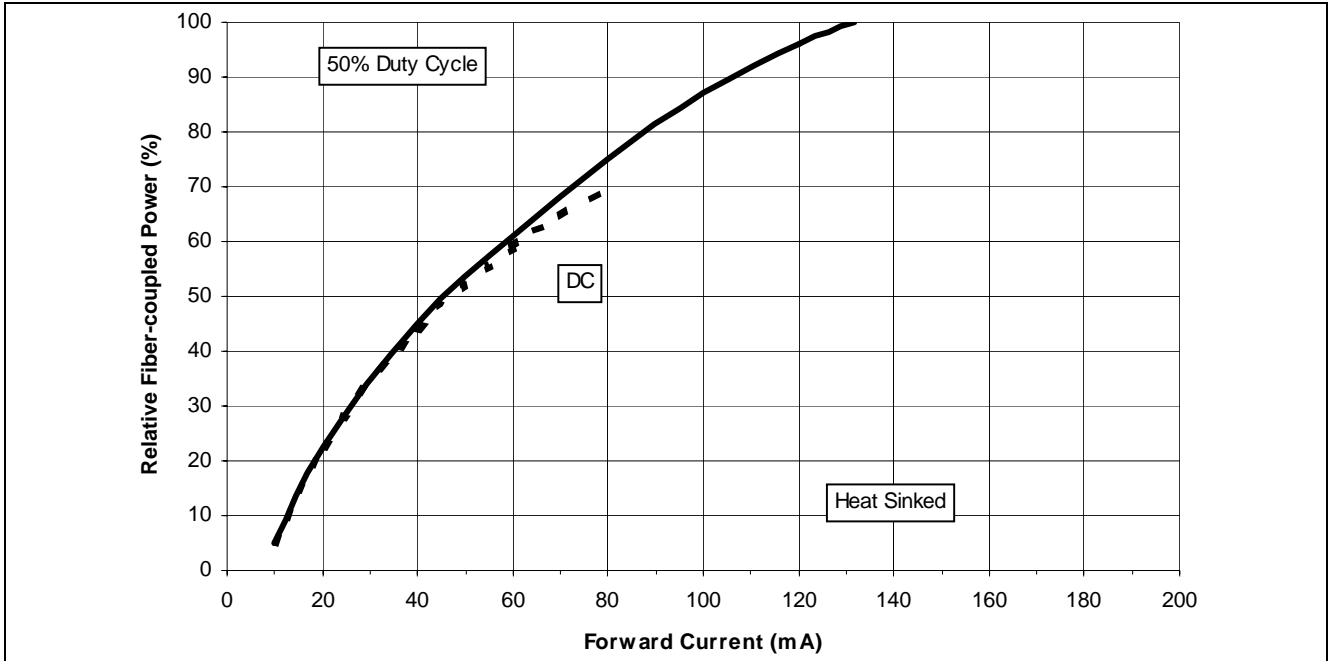


Figure 2 - Relative Fiber-Coupled Power vs Forward Current

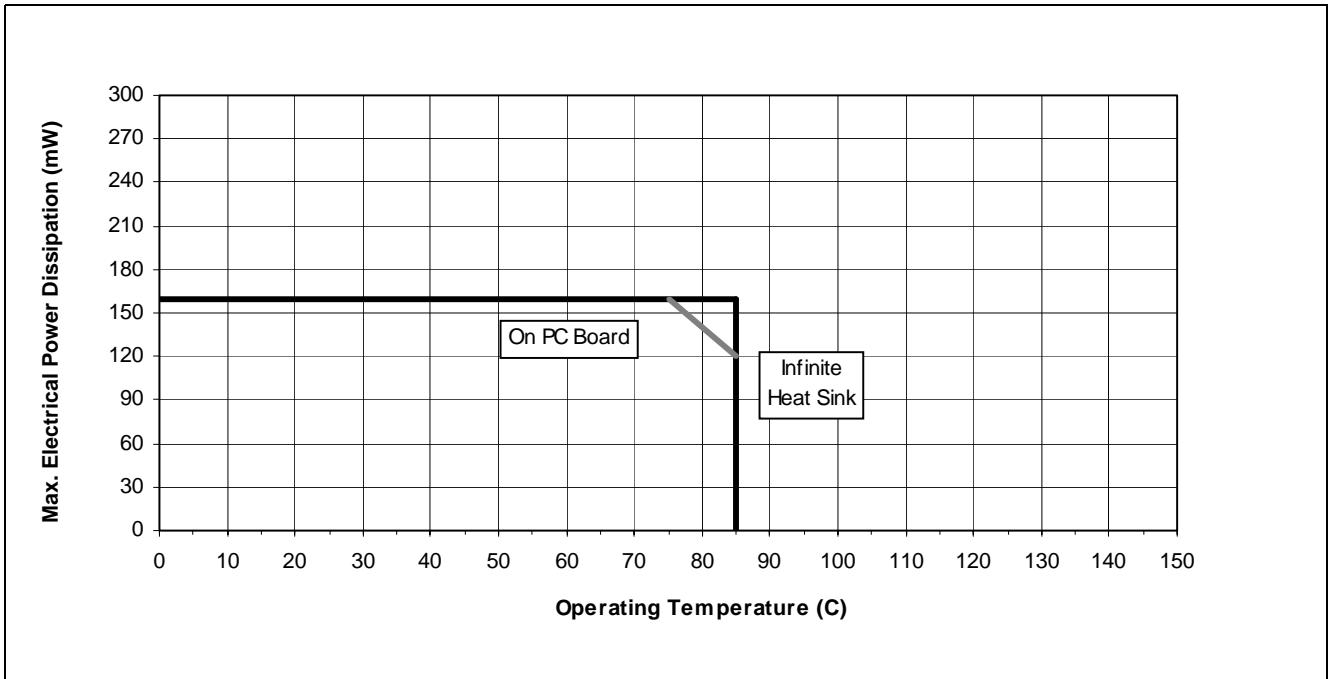


Figure 3 - Max. Electrical Power Dissipation vs Operating Temperature

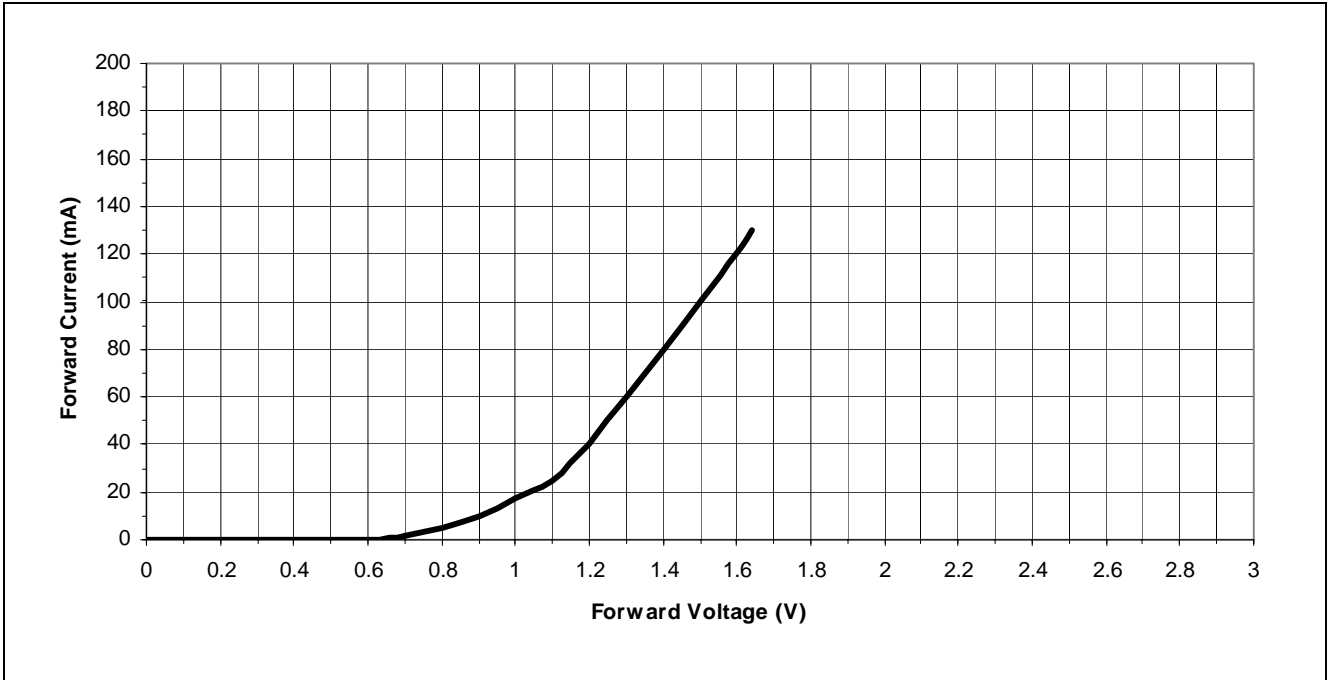


Figure 4 - Forward Current vs Forward Voltage

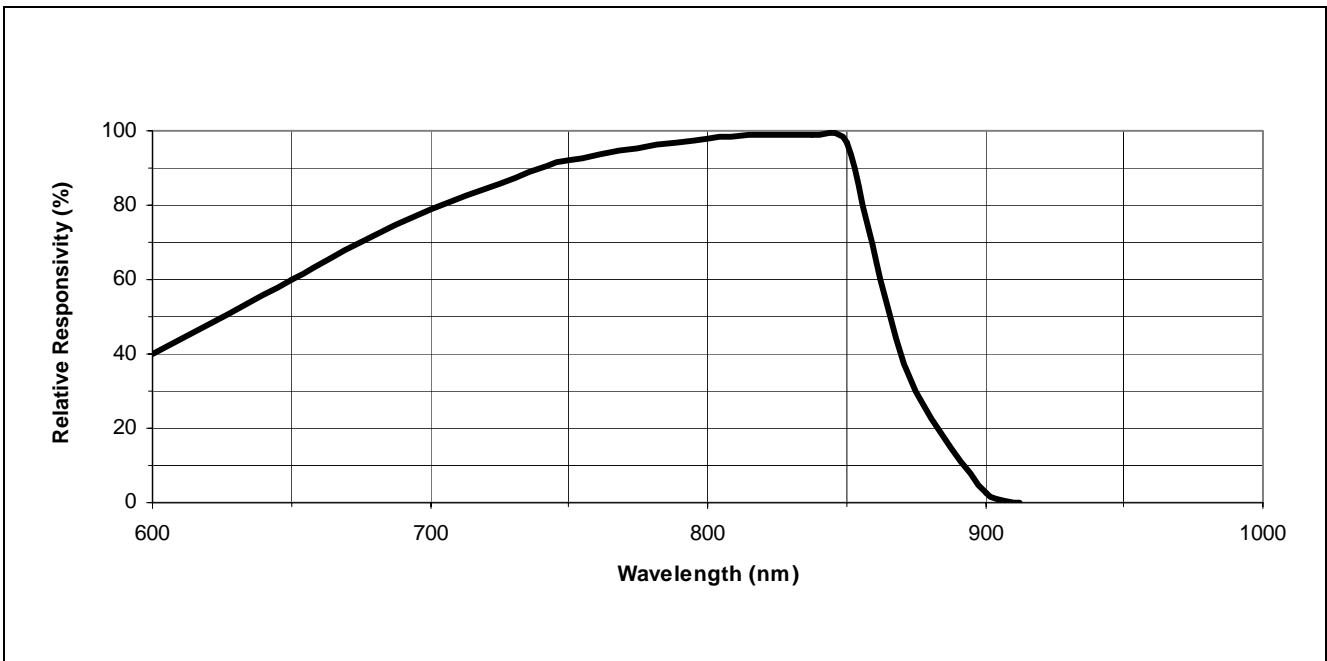


Figure 5 - Relative Responsivity vs Wavelength

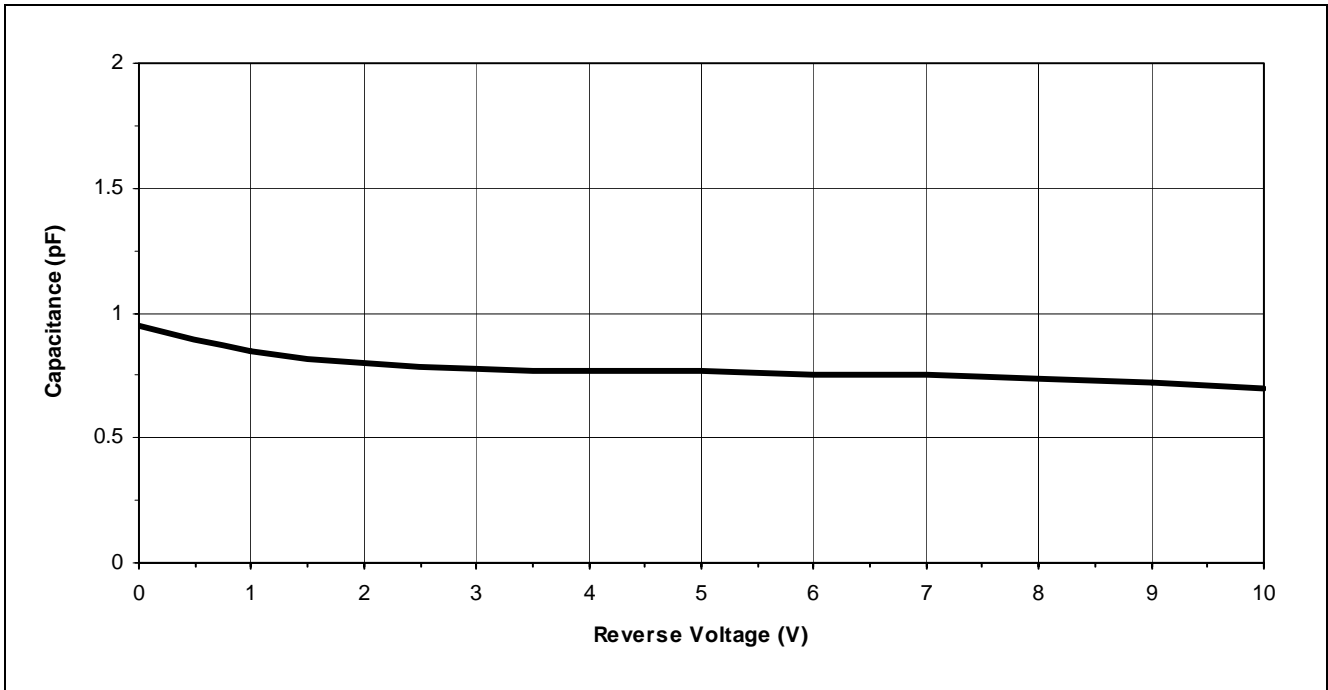
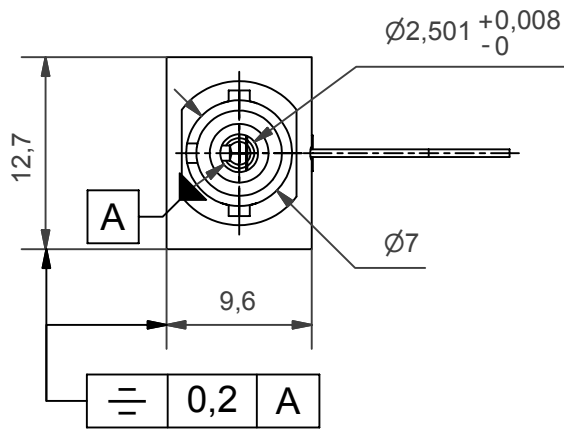
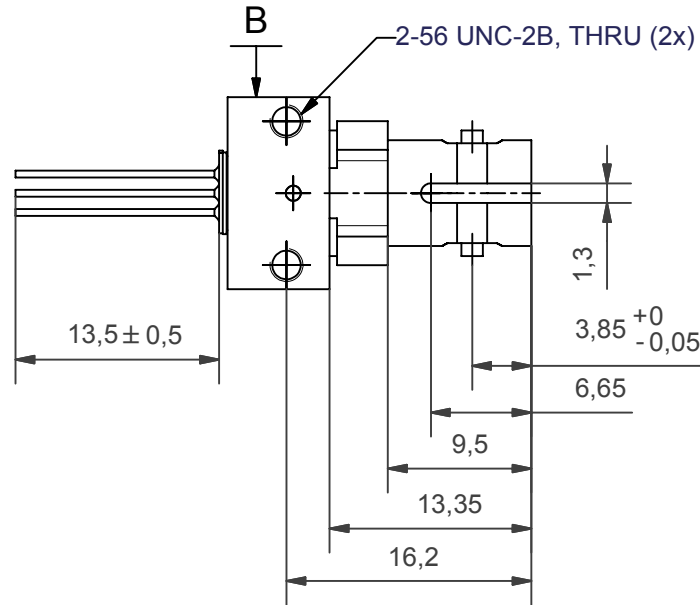


Figure 6 - Capacitance vs Reverse Voltage

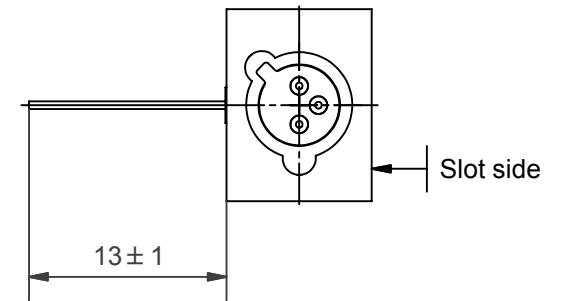
FRONT VIEW (2 : 1)



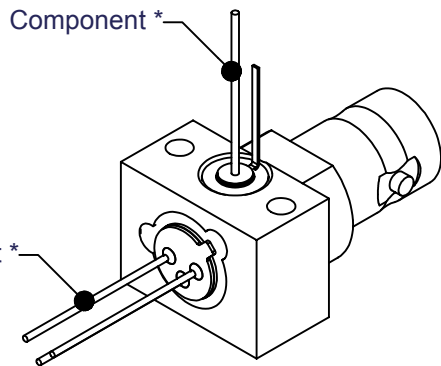
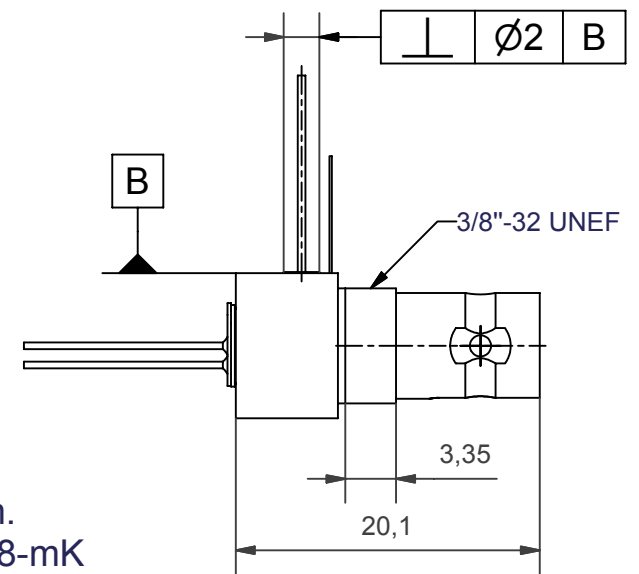
TOP VIEW



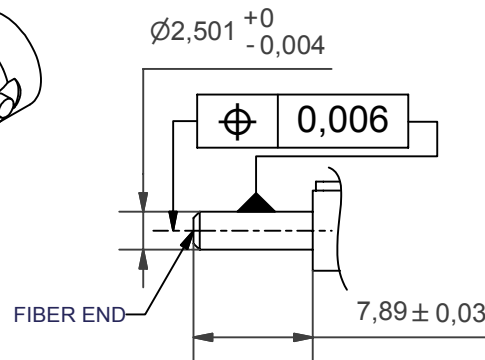
BOTTOM VIEW



SIDE VIEW "B"



MATING FERRULE  
(Not included)



NOTES:-

1. All dimensions in mm.
2. General tol. ISO-2768-mK

\* For details of the component, see separate data sheet and/or package drawing.

Projection Method

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Previous package codes  
**ST-D**

Package code **TH**

Drawing type  
Package Outline drawing for  
Duplex ST Receptacle

Title  
**102557**





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