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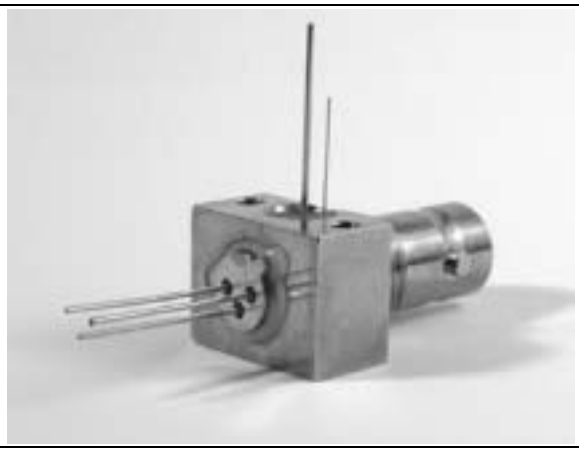
MF699

125 MHz Full Duplex Module (1320 nm Tx, 820 nm Rx)

Data Sheet

March 2004



Ordering Information

MF699	ST-duplex package

-40°C to +85°C

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

Applications

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

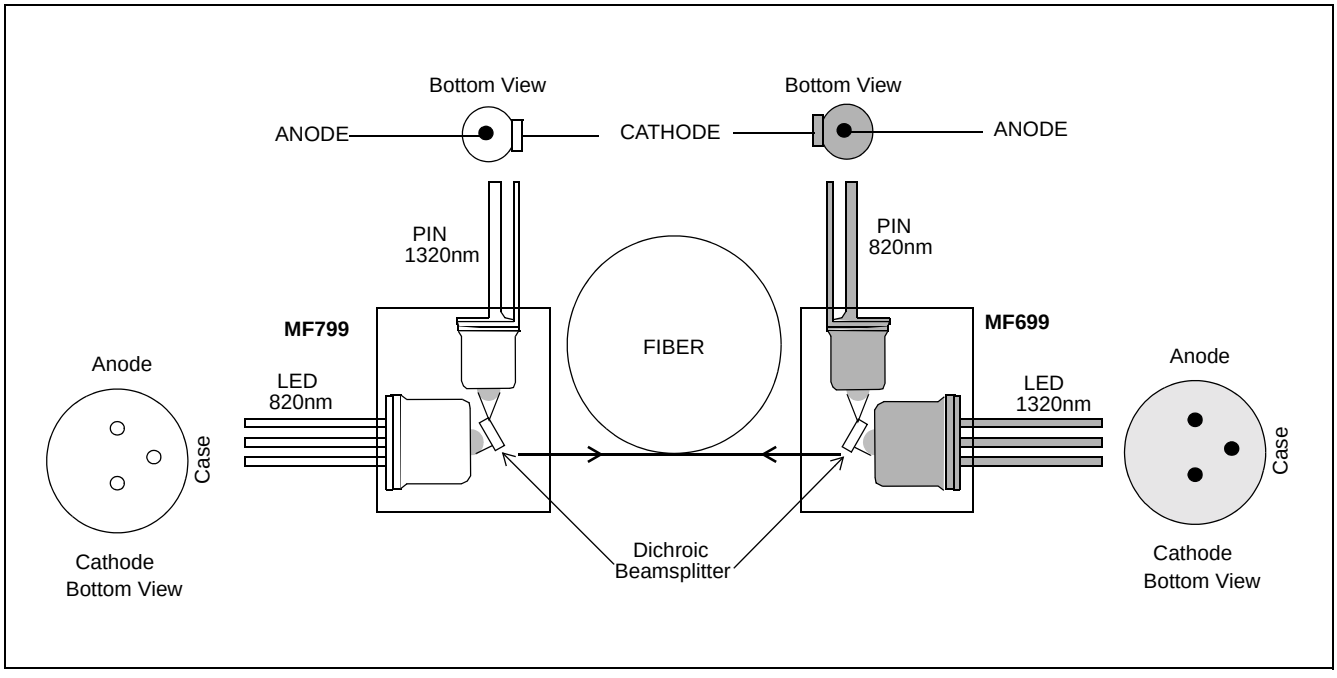


Figure 1 - MF699 Functional Diagram

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 µm fiber.

Absolute Maximum Ratings

Parameter	Symbol	Limit
Storage Temperature	T_{stg}	-55 to +125°C
Operating Temperature (Figure 3)	T_{op}	-40 to +85°C
LED Power Dissipation (Figure 3)	P_{tot}	160 mW
LED Continuous Forward Current (≤10 kHz)	I_F	80 mA
LED Peak Forward Current (duty cycle ≤50%, f≥1 MHz)	I_{FRM}	130 mA
LED Reverse Voltage	V_{RL}	0.5 V
PIN Reverse Voltage	V_{RP}	20 V
Soldering Temperature (2 mm from the case for 10 sec)	T_{sld}	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_{fiber}	-20.5			dBm	I_{Peak} = 60 mA (Note 1, 2)
Rise & Fall Time (10 - 90% no bias)	$t_{r'tf}$		2.5	3.5	ns	I_F = 60 mA (Note 2)
Bandwidth (3 dB_{el})	f_c		125		MHz	I_F = 60 mA (Note 2)
Peak Wavelength	λ_p		1320		nm	I_F = 60 mA
Spectral Width (FWHM)	$\Delta\lambda$		135	180	nm	I_F = 60 mA
Forward Voltage (Figure 4)	V_F		1.3	1.65	V	I_F = 60 mA
Reverse Current	I_R			100	µA	V_R = 1 V
Capacitance	C		200		pF	V_R= 0V, 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 µm 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 V λ = 820nm (Note 1)
Bandwidth	f_c	500			MHz	V_R = 5 V R_L = 50 Ω (Note 1)
Capacitance (Figure 6)	C		1		pF	V_R = 5V f = 1 MHz
Dark Current	I_d			3 50	nA	T_{Case} = 25°C T_{Case} = 70°C V_R = 5 V I_{LED} = 0 mA
Crosstalk Current	I_{Cr}		3		nA	V_R = 5 V I_{LED} = 60 mA (Note 2)

Note 1: 62.5/125 μm 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_{thjc}			200	°C/W
Thermal Resistance - On PC Board	R_{thjb}			300	°C/W
Temperature Coefficient - Optical Power	dP/dT_j		-0.75		%/°C
Temperature Coefficient - Wavelength	$d\lambda/dT_j$		0.45		nm/°C

PIN Thermal Characteristics

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

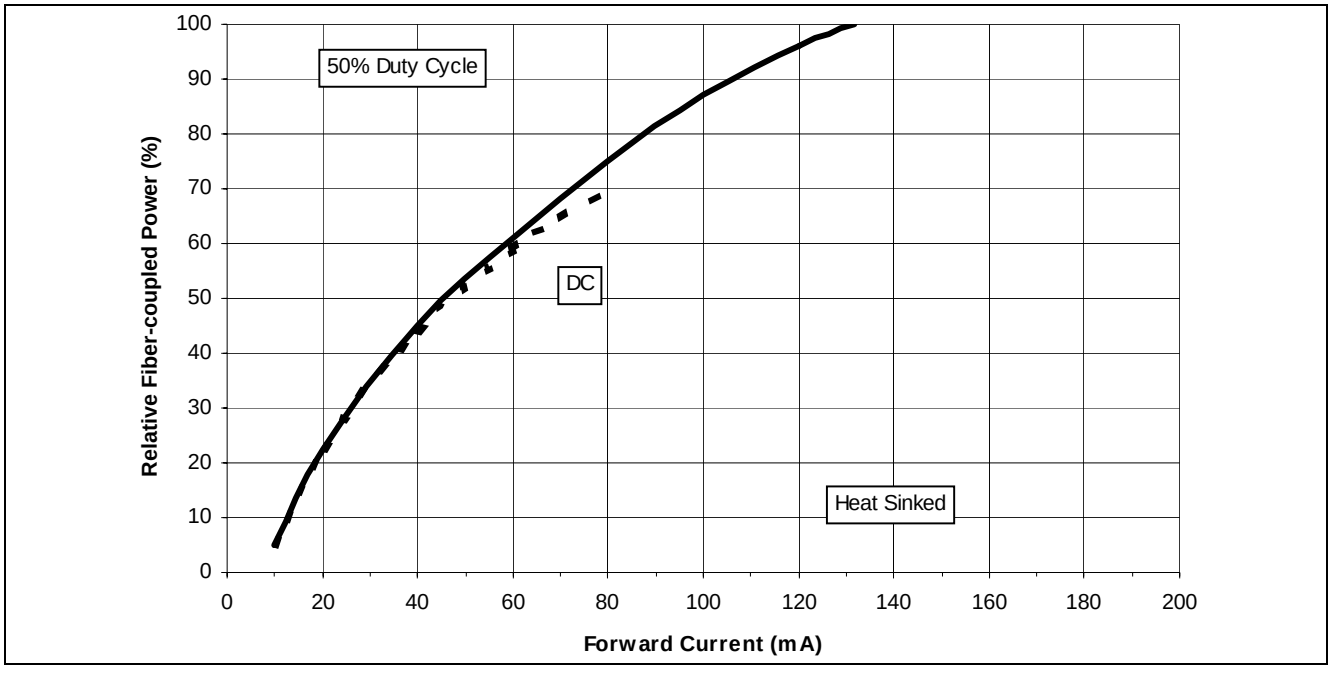


Figure 2 - Relative Fiber-Coupled Power vs Forward Current

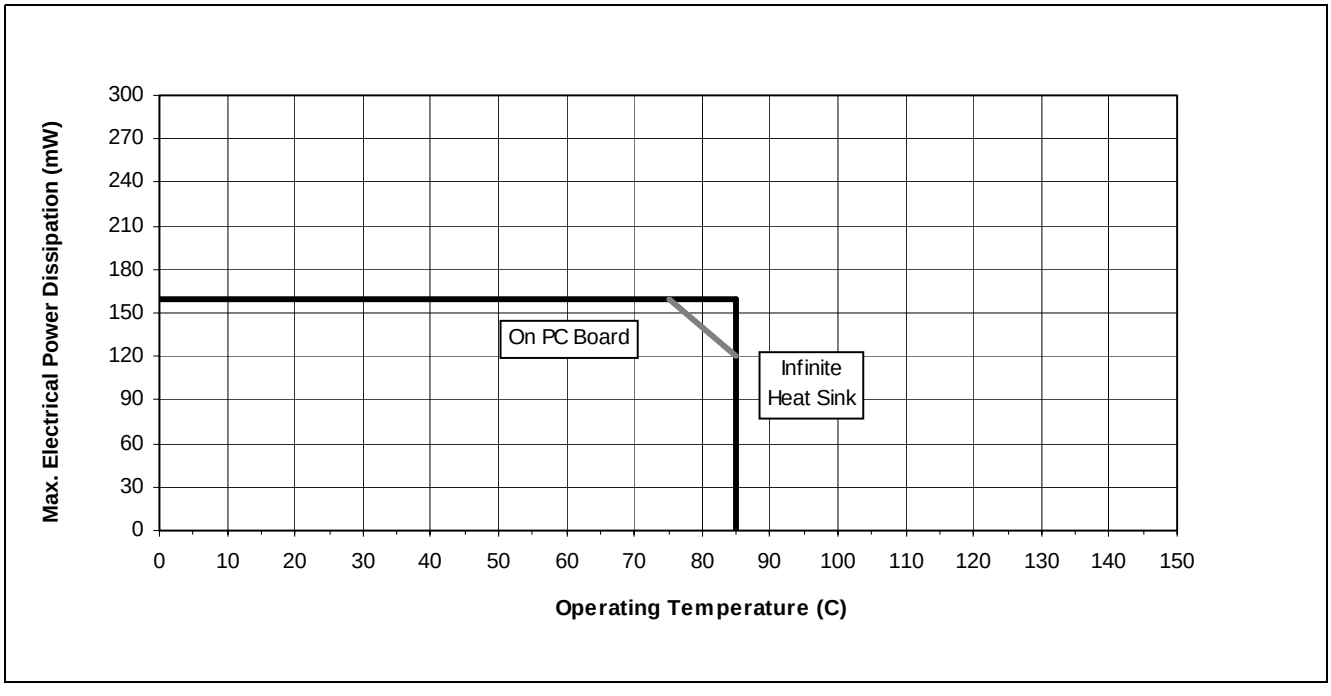


Figure 3 - Max. Electrical Power Dissipation vs Operating Temperature

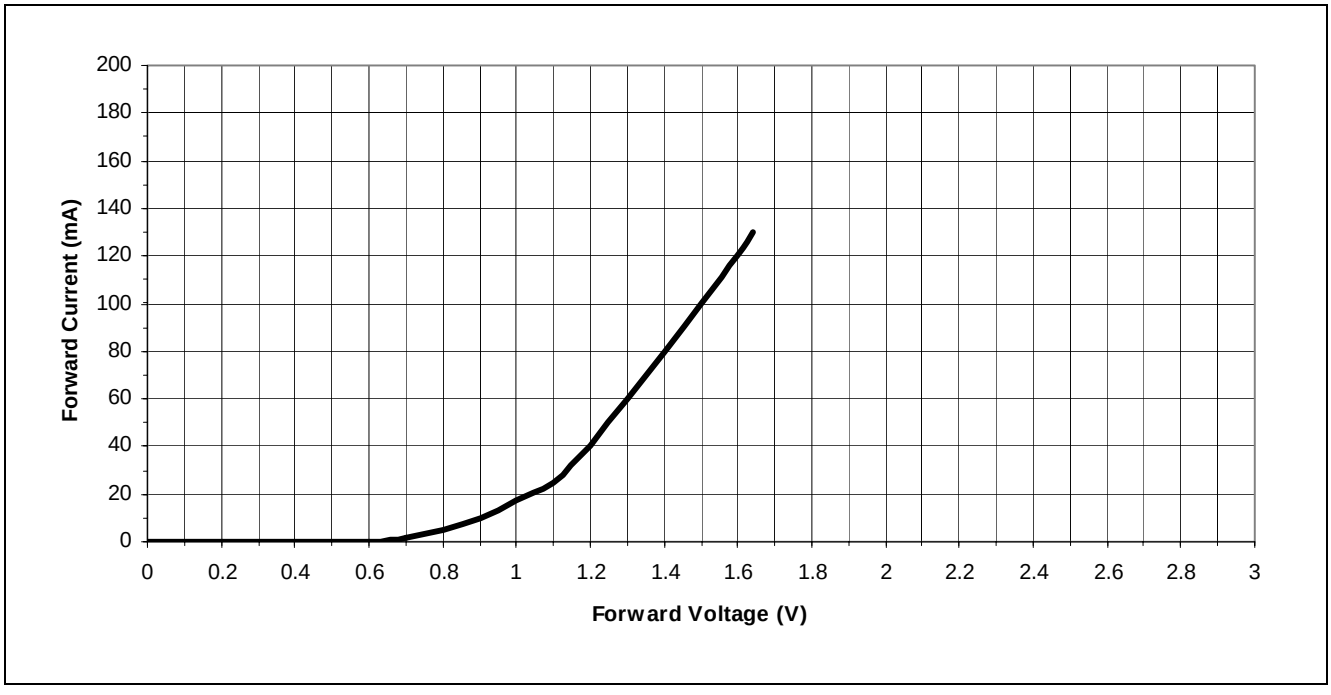


Figure 4 - Forward Current vs Forward Voltage

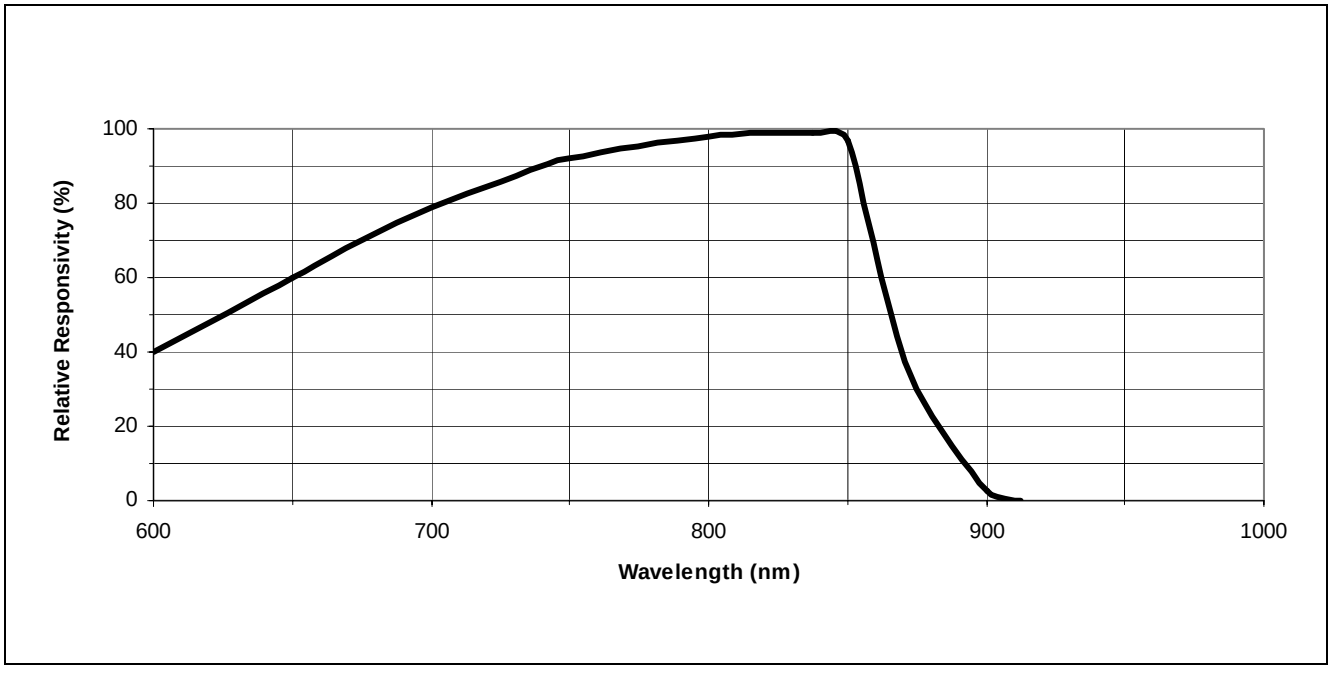


Figure 5 - Relative Responsivity vs Wavelength

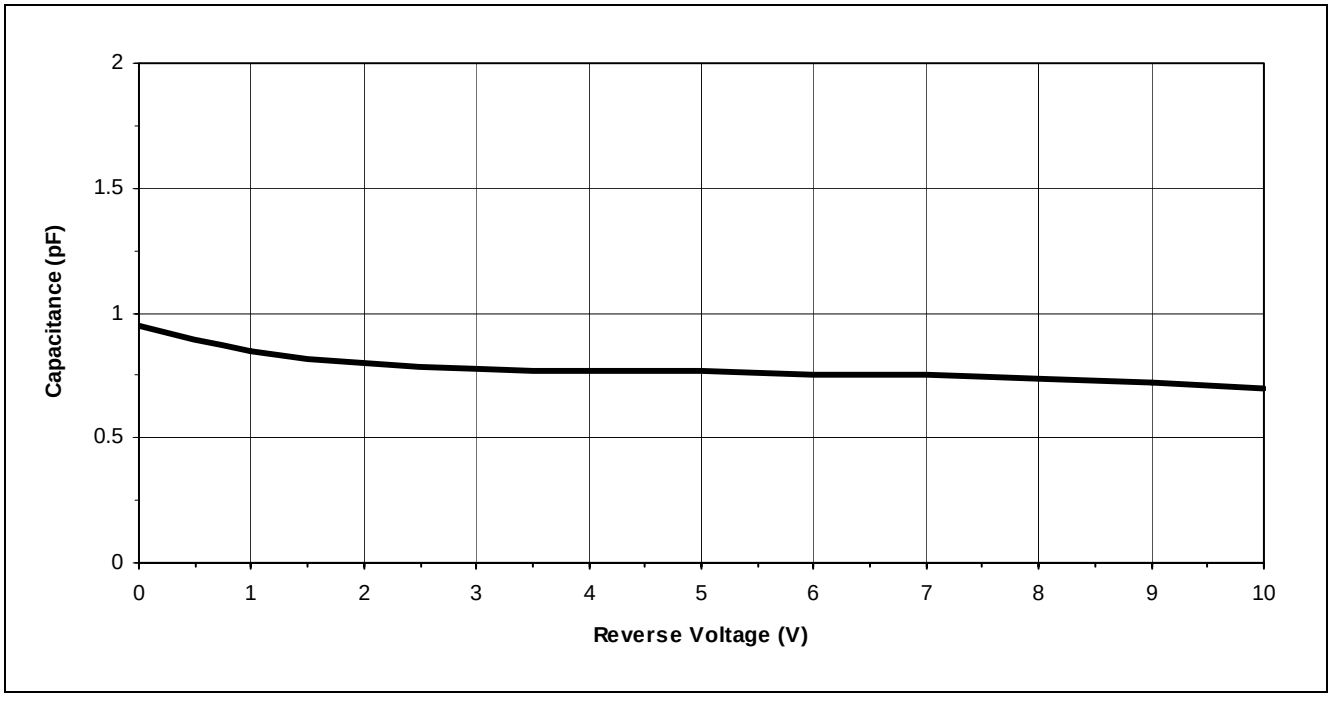
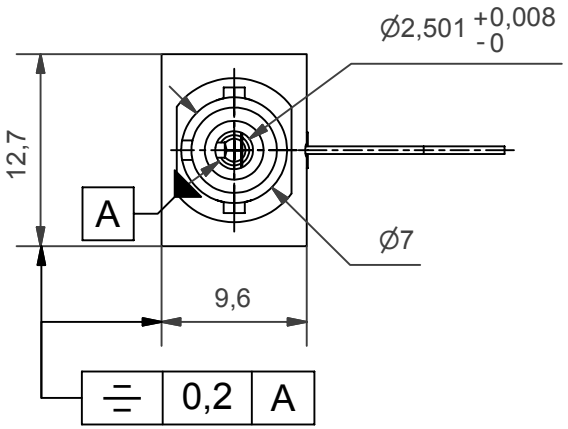
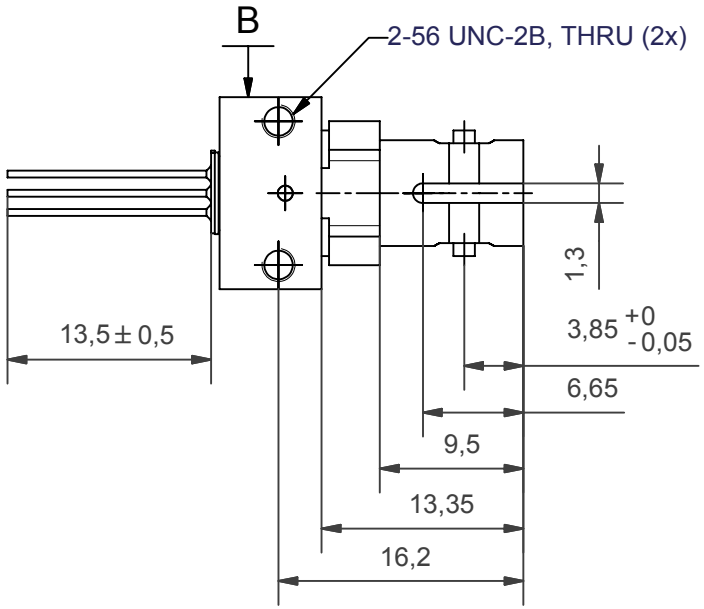


Figure 6 - Capacitance vs Reverse Voltage

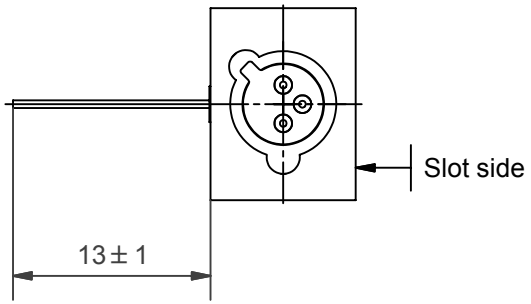
FRONT VIEW (2 : 1)



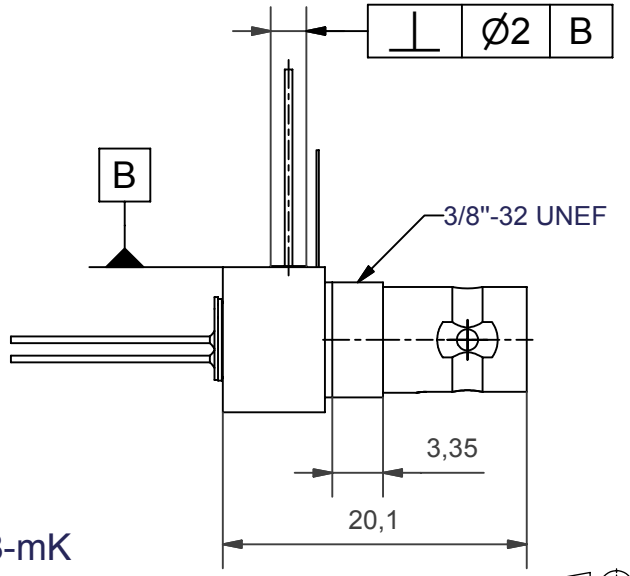
TOP VIEW

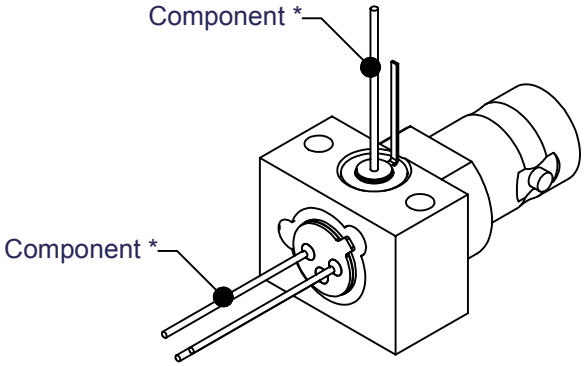


BOTTOM VIEW

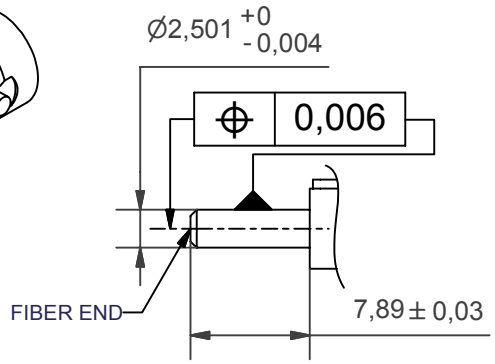


SIDE VIEW "B"





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

ISSUE	2	3		
ACN	102557 rev2	102557 rev3		
DATE	06-APR-04	10-JUN-04		
APPRD.	MD/MA	MD/MA		

ZARLINK SEMICONDUCTOR

Previous package codes
ST-D

Package code TH

Drawing type
Package Outline drawing for Duplex ST Receptacle

Title 102557

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