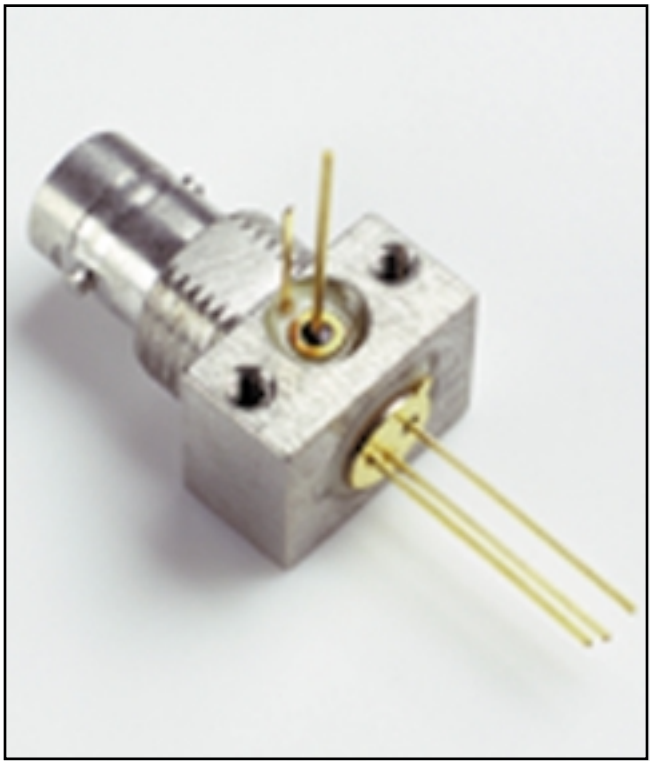
MF699
High-Performance DUPLEX

DS5460 ISSUE 1 June 2001



ST Assembly

Ordering Information

MF699	13330.11, duplex package

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 820nm and detects incoming optical power at 1320nm, 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 155Mbps.

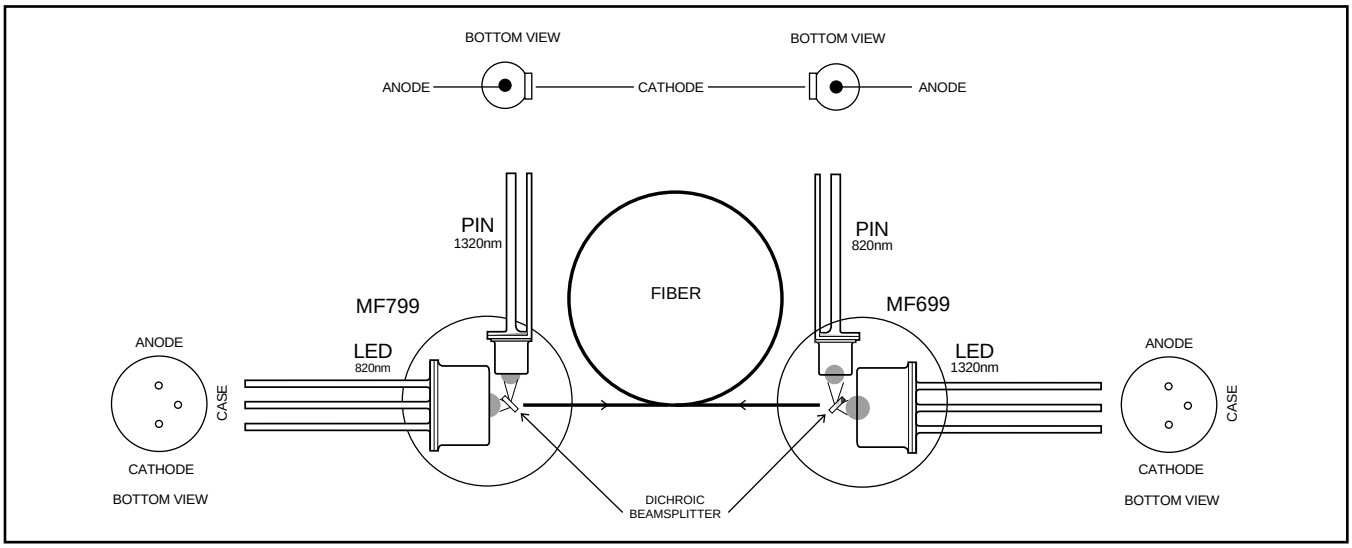
The MF699 is designed for multi-mode fiber and optimized for 62.5/125µm fiber.

Applications

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

Features

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



MF699 Functional Diagram

Absolute Maximum Ratings

Parameter	Symbol	Limit
Storage Temperature	T_{stg}	-55 to +125˚C
Operating Temperature	T_{op}	-40 to +85˚C
TO-46 LED Electrical Power Dissipation	P_{tot}	160 mW
TO-46 LED Continuous Forward Current (f<10 kHz)	I_F	80 mA
TO-46 LED Peak Forward Current (duty cycle <50%, f>1 MHz)	I_{FRM}	130 mA
TO-46 LED Reverse Voltage	V_{RL}	0.5 V
Mini-LED Continuous Forward Current (f<10 kHz)	I_F	80 mA
Mini-LED Reverse Voltage	V_{RL}	0.5 V
Mini-LED Peak Forward Current (duty cycle <50%, f> 1MHz)	I_{FRM}	130 mA
Soldering Temperature (2mm 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 Condition
Fiber-Coupled Power	P_{fiber}	-20.5			dBm	I_{Peak}=60mA (Note 1,2)
Rise & Fall Time	t_r,t_f		2.5		ns	I_F=60mA (Note 2)
Bandwidth ($3dB_{el}$)	f_c		125		MHz	I_F=60mA (Note 2)
Peak Wavelength	λ_p		1320		nm	I_F=60mA
Spectral Width (FWHM)	$\Delta\lambda$		135		nm	I_F=60mA
Forward Voltage	V_F		1.3	1.65	V	I_F=60mA
Reverse Current	I_R			100	µA	V_R=1V
Capacitance	C		200		pF	V_w=0V, f=1MHz

Note 1: Average power at 10MHz/50% duty cycle. Measured at the exit of 100m of fiber.
Note 2: 62.5/125µm graded index fiber (NA=0.275).

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Responsivity	R	0.25			A/W	V_R=5V λ=820nm (Note 1)
Bandwidth	f_c	500			MHz	V_R=5V R_L=50Ω (Note 1)
Capacitance	C		1		pF	V_R=5V f=1MHz
Dark Current	I_d			3 50	nA	T_{Case}=25˚C T_{Case}=70˚C V_R=5V I_{LED}=60mA
Crosstalk Current	I_{Cr}		3		nA	V_R=5V I_{LED}=60mA (Note 2)

Note 1: 62.5/125mm graded indec fiber (NA=0.275)
Note 2: Internal crosstalk with ceramic ferrule inserted but no power from the fiber. Total current = dark current + crosstalk current.

TO-46 LED Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
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	$d\lambda/dT_j$		-0.75		nm/˚C

PIN Thermal Characteristics

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

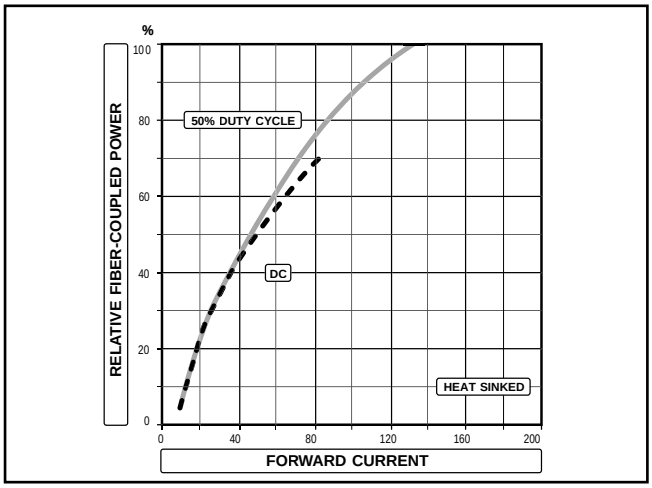


Figure 1

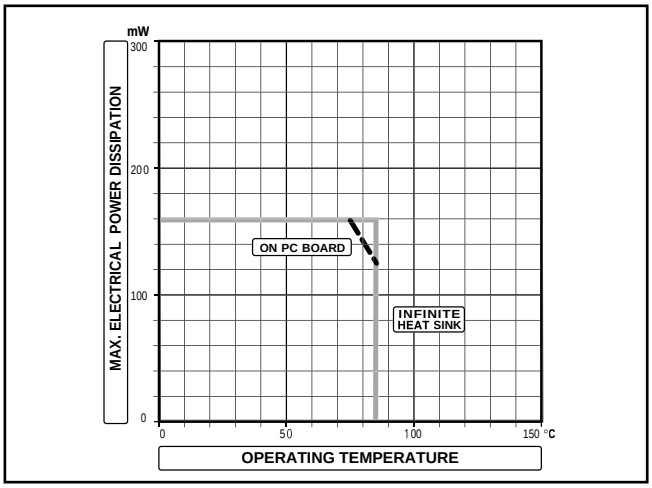


Figure 2

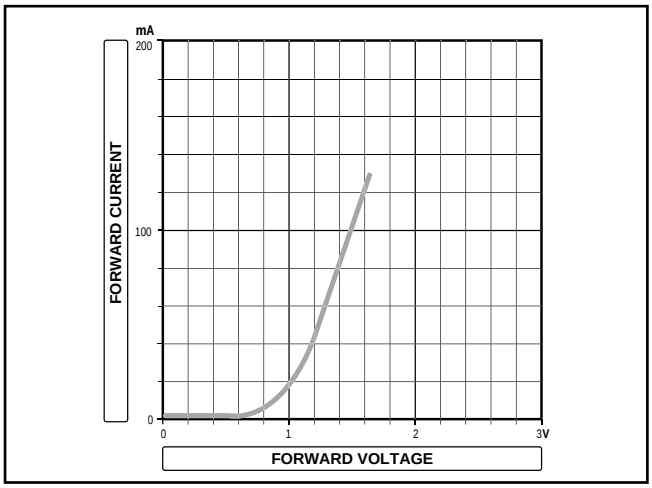


Figure 3

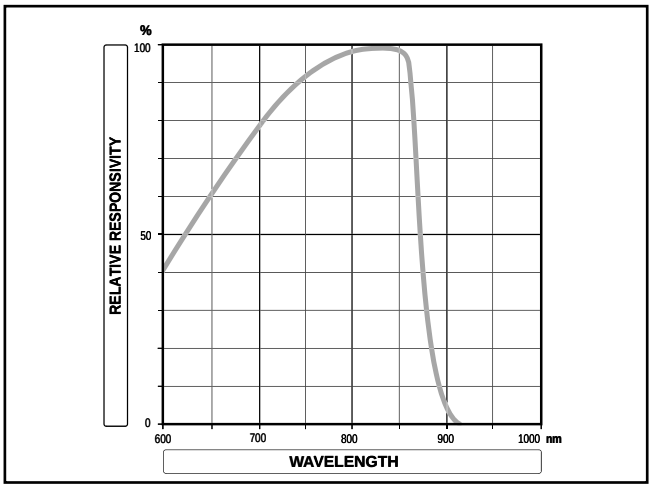


Figure 4

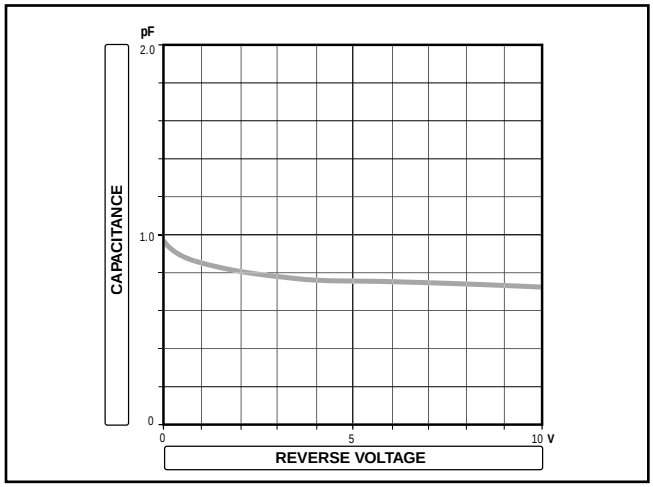
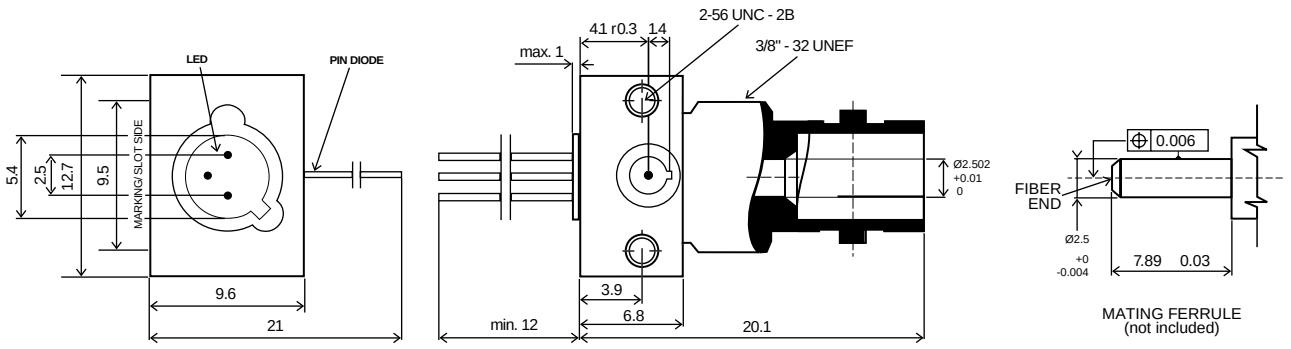
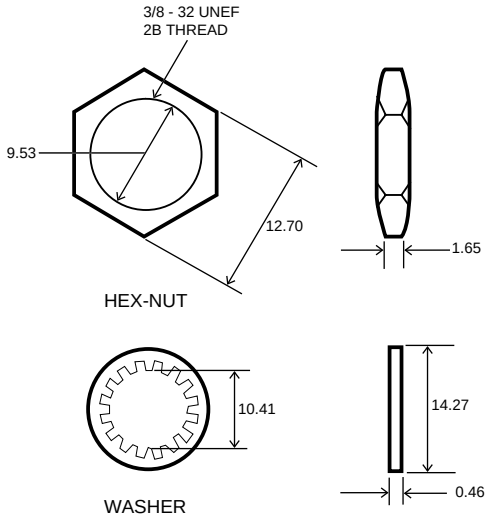


Figure 5



Note: The LED chip is isolated from the case. All dimensions in mm.

MF699 Mechanical Outline



MF699 Packaging Hardware



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