

# 5017F 10 GHz Fiber-Optic Delay Line



The 5017F 10 GHz delay line delivers unmatched performance for radar testing, signal processing, phased antenna array, and phase noise testing. These rugged devices eliminate many of the problems that are inherent in alternative transceiver technologies.

Emcore's fiber-optic transceivers provide bandwidth that is essentially independent of fiber length, loss or delay, and triple transit signals that are immeasurable. In addition to enhanced electrical performance, the delay lines provide several mechanical advantages. Emcore's technology takes advantage of the rigid yet flexible properties of fiber-optic cable to provide enhanced phase and group delay characteristics. The small size of these components allows for a long delay in a compact package with the superior temperature stability of fiber.



## Ordering Information

Model Number	Description
5017F-XXXX	Transceiver, 10 GHz, SMA, 115 μ-sec max
8218-002	DC Power Cable - Lab Supply
8218-003	DC Power Cable - 10901G-XX Supply

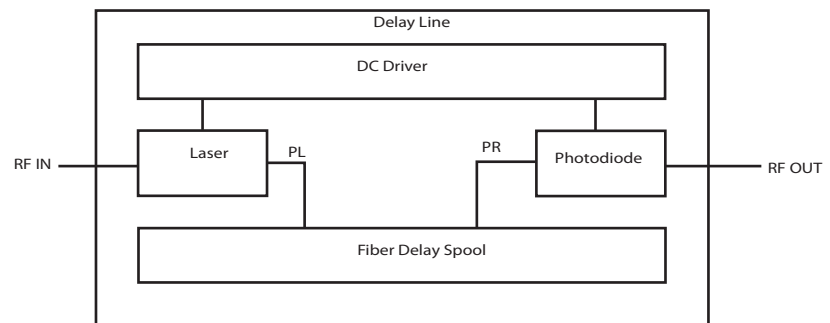
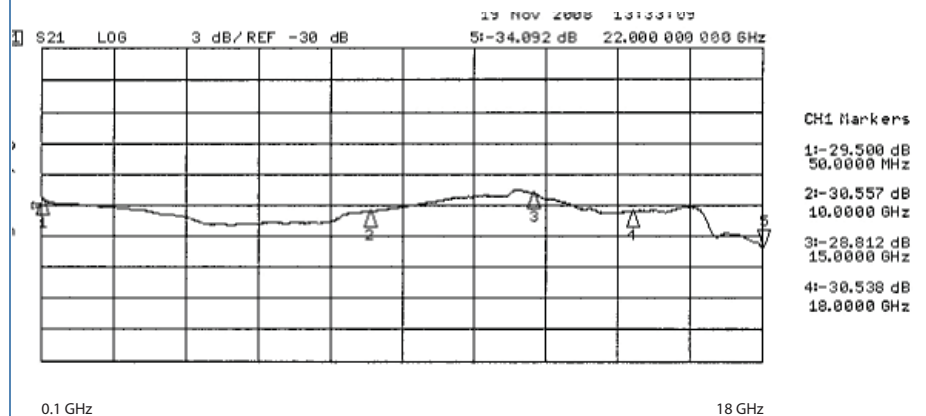
Delay Time XXXX = X (hundreds) X (Tens) X (Ones) X (Tenths)

## Features

- Bandwidth to 10 GHz
- High dynamic range
- -40 to +65 C
- 1310 nm
- Flat frequency response
- Low phase noise

## Applications

- Radar testing
- Signal processing
- Phased antenna array
- Phase noise processing
- Antenna remoting



# 5017F

## 10 GHz Fiber-Optic Delay Line



MICROWAVE

### Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Min	Max	Unit
Operating Temperature Range of Baseplate	-40	+65	°C
Storage Temperature	-55	+85	°C
RF Input Power	-	20	dBm

### DC Interface Characteristics

Pin Number	Min	Typ	Max	Max Ripple	Current
1	14V	15V	16V	100 mV p-p	0.3 A max
2	4.5V	5V	5.5V	200 mV p-p	1.6 A max

### Front Panel LEDs

- Power On

### Pin/Package Information

Nine-Pin, Male D-sub Connector

Pin Number	Function
1	+15 Vdc
2	+5 Vdc
3	Not Used
4	Ground
5	Ground
6	Laser Photodiode Current Monitor
7	Photodiode Current Monitor
8	Laser Current Monitor
9	Laser Over Temperature Alarm <sup>1</sup>

1. Open Collector Output

#### Laser Safety:

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All Versions of this laser are Class 1 laser product, tested according to IEC 60825-1:2007 / EN 60825-1:2007

An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain optical instruments designed for use at a distance (for example, telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3 μm.

Maximum power = 30 mW.

#### Safety:

"Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure"

\*IEC is a registered trademark of the International Electrotechnical Commission.

### RF Interface - SMA Female

### dc Monitor Voltages

- Laser Photodiode Current, pin 6  
1V/1mA (into 1 MOhm load). Proportional to laser optical power
- Photodiode Current, pin 7  
1V/1mA (into 1 MOhm load). Proportional to laser optical power
- Laser DC Current, pin 8  
1V/100mA (into 1 MOhm load)

### Alarm Circuits

- Laser Over Temperature Alarm, pin 9  
Laser Temperature. This alarm is ON (sinks current) if the laser substrate temperature is more than 2 °C higher than the factory setpoint. The alarm is not activated if the temperature is LOWER than the setpoint.

# 5017F

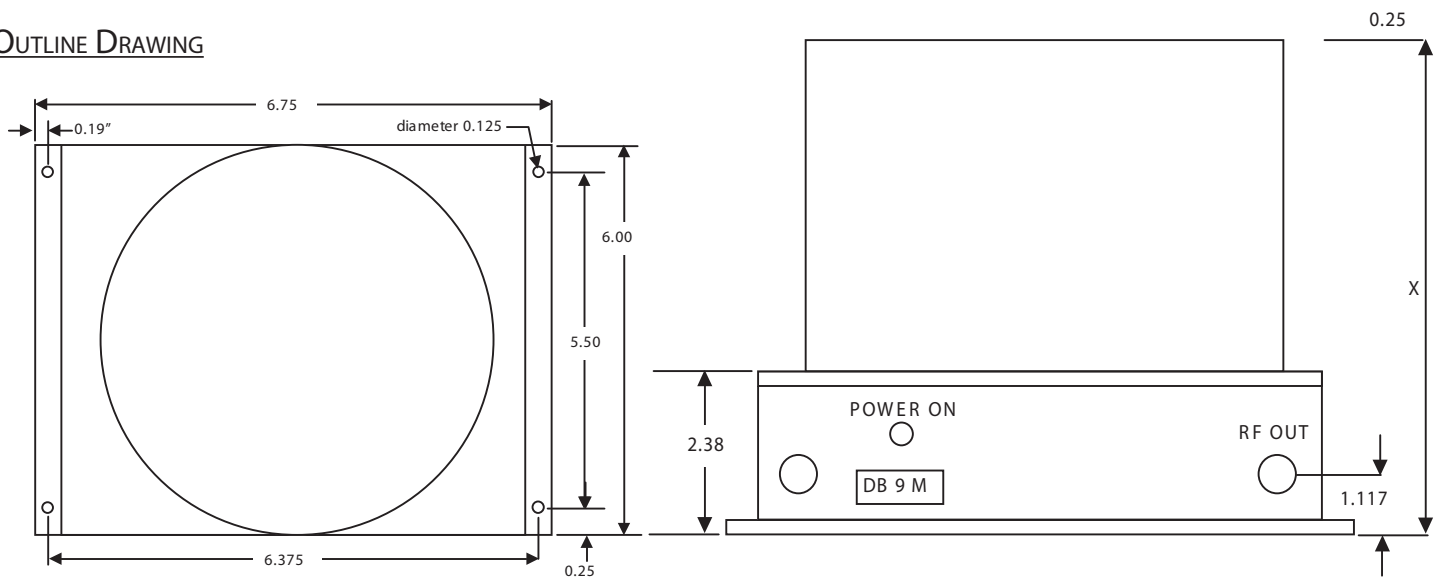
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### Electrical Characteristics

Parameter	5017F	Units
Upper Band Edge Frequency	10	GHz
Lower Band Edge Frequency	0.1	GHz
Amplitude Flatness	5	dB
Insertion Loss, 115 $\mu$ -sec <sup>1</sup>	55	dB
Max Delay	115	$\mu$ -Sec
Input RF Return Loss, max 0.1 - 10 GHz	-7.0	dB
Output RF Return Loss, max 0.1 - 10 GHz	-9.0	dB
Impedance	50	Ohm
Input 1 dB Compression, min	+20	dBm
Input Third Order Intercept, min 0.1 GHz - 4 GHz 4 GHz - 10 GHz	+30 +25	dBm dBm
Noise Figure, max. 0.1 GHz - 4 GHz 4 GHz - 10 GHz	59 64	dB dB
Delay Accuracy	$\pm 1.0$	%

1: Shorter delays will have lower loss

### OUTLINE DRAWING



#### Dimension "X"

35  $\mu$ -Sec Max: 4.38 inches

60  $\mu$ -Sec Max: 5.38 inches

80  $\mu$ -Sec Max: 6.38 inches

115  $\mu$ -Sec Max: 7.88 inches

Rev: December 3, 2012