1 Device Overview

1.1 General Description

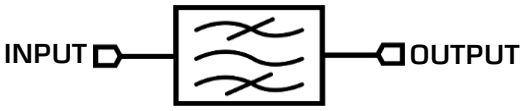
Module

The MFBC-000XXM family of passive MMIC bandpass filters are an ideal solution for mmWave, high rejection filtering. Marki employs unique packaging techniques to provide optimal performance in a convenient connectorized module. Tight fabrication tolerances allow for less unit-to-unit variation than traditional filter technologies. Low unit-to-unit variation allows for accurate simulations using the provided S2P file taken from measured production units. The MFBC-000XXM is available as a connectorized module.

1.2 Features

- Excellent Return Loss
- High Stop Band Suppression
- Wide Stop Band with Fast Roll-Off
- S2P data available

1.3 Functional Block Diagram



1.4 Part Ordering Options[1]

Part Number	1dBc Passband (GHz)	Description	Package	Green Status	Product Lifecycle	Export Classification
MFBC-00008M	36.70 – 51.10	Connectorized Module; 1.85mm connectors	M	RoHS	Active	EAR99
MFBC-00009M	46.50 – 63.50					
MFBC-00017M	34.50 – 49.50					
MFBC-00018M	44.50 – 62.50					
MFBC-00019M	58.30 – 77.70	Connectorized Module; 1mm connectors				
MFBC-00020M	77.35 – 107.80					

[1] Refer to our website for a list of definitions for terminology presented in this table.

Table of Contents

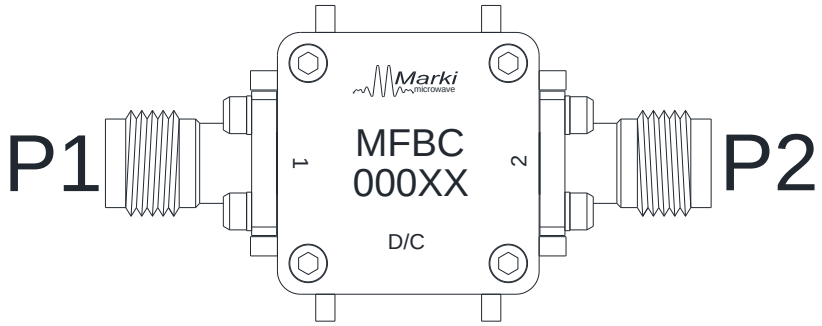
Revision History

Revision Code	Revision Date	Comment
-	March 2023	Datasheet Initial Release

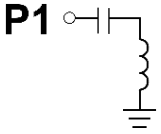
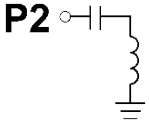
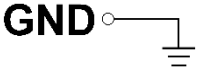
2 Port Configurations and Functions

2.1 Port Diagram[2]

A top-down view of the MFBC-00008M's M package outline drawing is shown below. For all other MFBC-000XXM outline drawings, refer to Section 4 Mechanical Data. The MMIC bandpass filters are symmetrical allowing Port 1 or Port 2 to be used as the input.

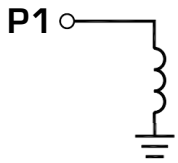
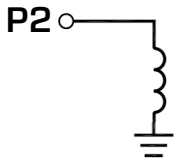
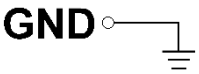


2.2 MFBC-00008/9/19/20M Port Functions

Port	Function	Description	Equivalent Circuit
Port 1	Input/Output	Port 1 is DC open to ground for the M package.	
Port 2	Input/Output	Port 2 is DC open to ground for the M package.	
GND	Ground	M package ground path is provided through the metal housing and outer coax conductor.	

[2] MFBC-00019/20M have 1.0mm connectors, see Section 4 Mechanical Data for more details.

2.3 MFBC-00017/18M Port Functions

Port	Function	Description	Equivalent Circuit
Port 1	Input/Output	Port 1 is DC short to ground for the M package.	
Port 2	Input/Output	Port 2 is DC short to ground for the M package.	
GND	Ground	M package ground path is provided through the metal housing and outer coax conductor.	

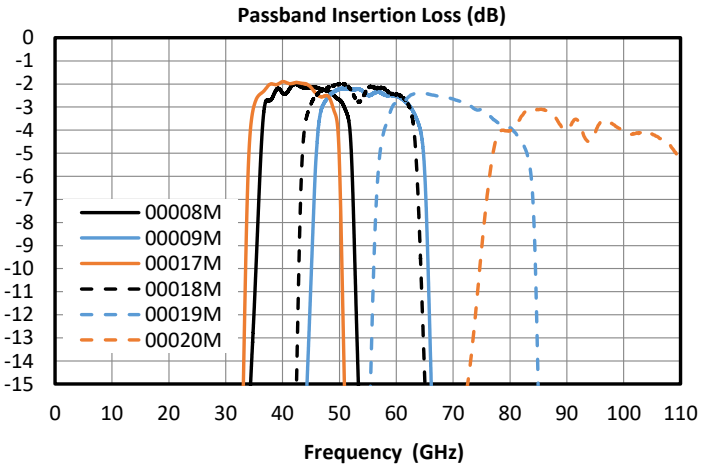
3 Specifications

3.1 Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded or met simultaneously, the device may be inoperable or have a reduced lifetime.

Parameter	MFBC-00017/18M Maximum Rating	MFBC-00008/9/19/20M Maximum Rating	Units
Port 1 DC Current	400	N/A	mA
Port 2 DC Current	400	N/A	mA
Operating Temperature	-55 to +100	-55 to +100	°C
Storage Temperature	-65 to +125	-65 to +125	°C

3.2 Passband Comparison



Part Number	1dBc Cutoff Low (GHz)	1dBc Cutoff High (GHz)
MFBC-00008M	36.70	51.10
MFBC-00009M	46.50	63.50
MFBC-00017M	34.50	49.50
MFBC-00018M	44.50	62.50
MFBC-00019M	58.30	77.70
MFBC-00020M	77.35	107.80

3.3 Electrical Specifications

The electrical specifications apply at T_A=+25°C in a 50Ω system. Typical data for all filters is shown with a sine wave input applied to port 1.

Min and Max limits are guaranteed at T_A=+25°C.

MFBC-00008M	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			44.50	
1dBc Passband (GHz)			36.70 – 51.10	
3dBc Passband (GHz)			36.20 – 52.10	
Insertion Loss @ f_c (dB)	44.50		2.15	
Passband Return Loss (dB)	36.70 – 51.10		15	
Stopband Suppression (dB)	DC – 23.00	40	64	
	62.00 – 67.00	40	45	
Group Delay (ps)			261	
Impedance (Ω)			50	

MFBC-00009M	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			55.60	
1dBc Passband (GHz)			46.50 – 63.50	
3dBc Passband (GHz)			45.80 – 64.90	
Insertion Loss @ f_c (dB)	55.60		2.25	
Passband Return Loss (dB)	46.50 – 63.50		15	
Stopband Suppression (dB)	DC – 29.50	40	67	
Group Delay (ps)			244	
Impedance (Ω)			50	

MFBC-00017M	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			42.00	
1dBc Passband (GHz)			34.50 – 49.50	
3dBc Passband (GHz)			34.00 – 50.00	
Insertion Loss @ f_c (dB)	42.00		2.00	
Passband Return Loss (dB)	34.50 – 49.50		12	
Stopband Suppression (dB)	DC – 30.50	30	51	
	54.50 – 67.00	30	47	
Group Delay (ps)			269	
Impedance (Ω)			50	

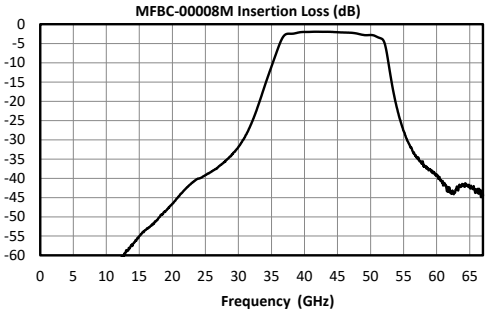
MFBC-00018M	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			53.75	
1dBc Passband (GHz)			44.50 – 62.50	
3dBc Passband (GHz)			43.50 – 63.50	
Insertion Loss @ f_c (dB)	53.75		2.15	
Passband Return Loss (dB)	44.50 – 62.50		10	
Stopband Suppression (dB)	DC – 40.00	30	52	
Group Delay (ps)			242	
Impedance (Ω)			50	

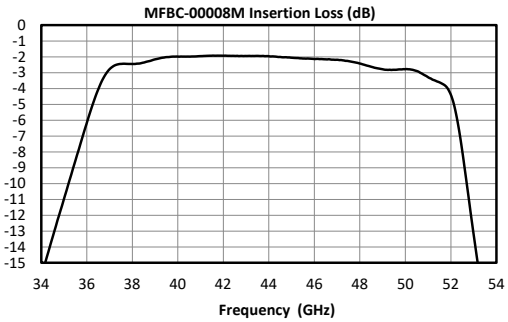
MFBC-00019M	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			70.00	
1dBc Passband (GHz)			58.30 – 77.70	
3dBc Passband (GHz)			56.90 – 83.50	
Insertion Loss @ f_c (dB)	70.00		2.85	
Passband Return Loss (dB)	58.30 – 77.70		13	
Stopband Suppression (dB)	DC – 52.00	30	58	
	89.00 to 110.00	30	42	
Group Delay (ps)			225	
Impedance (Ω)			50	

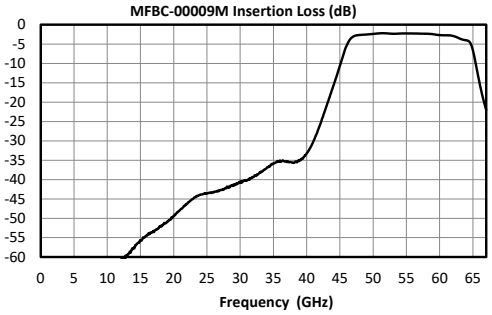
MFBC-00020M	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			93.50	
1dBc Passband (GHz)			77.35 – 107.80	
3dBc Passband (GHz)			76.10 – 112.00	
Insertion Loss @ f_c (dB)	93.50		3.60	
Passband Return Loss (dB)	77.35 – 107.80		10	
Stopband Suppression (dB)	DC – 63.00	30	52	
Group Delay (ps)			198	
Impedance (Ω)			50	

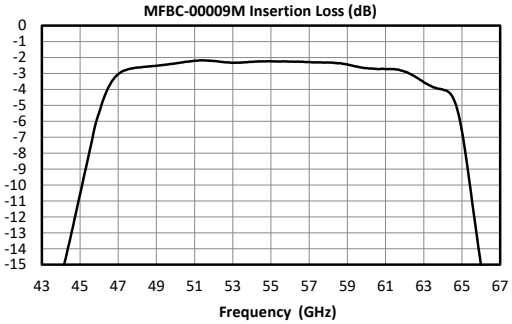
3.4 Typical Performance Plots

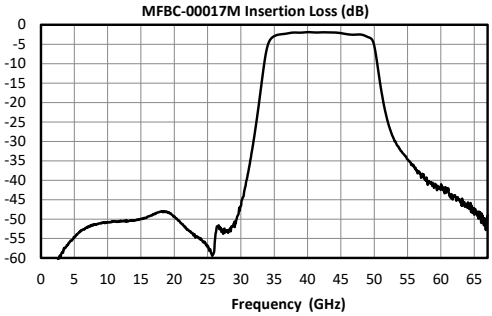
3.4.1 Insertion Loss

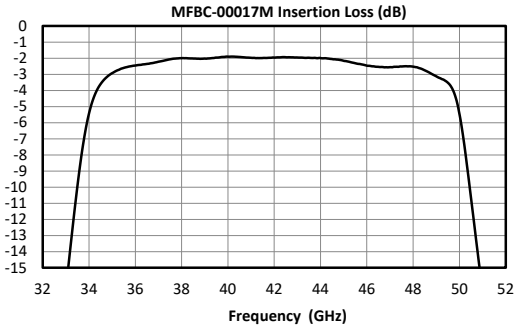


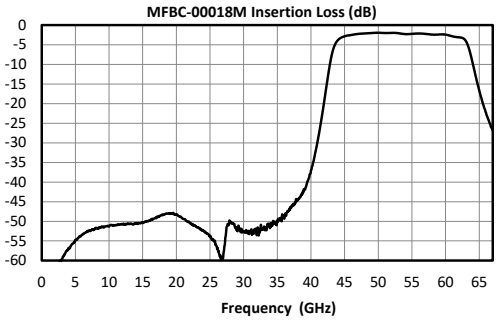


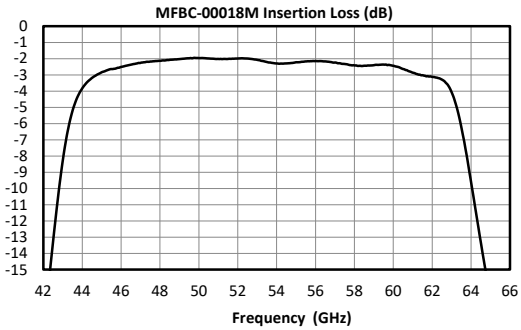


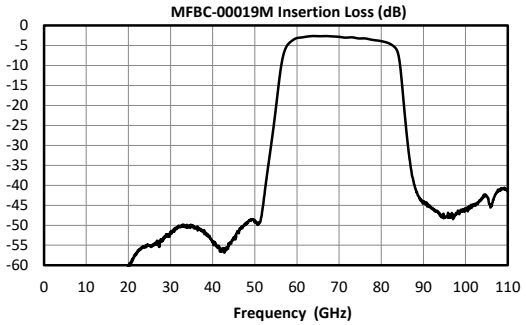


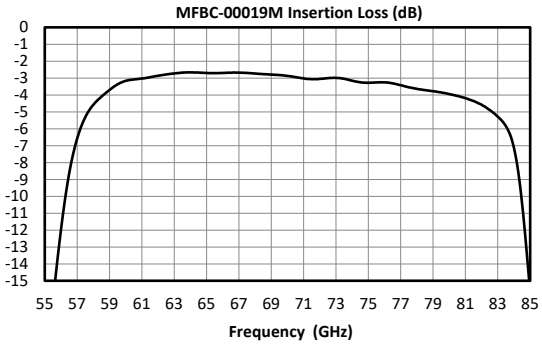


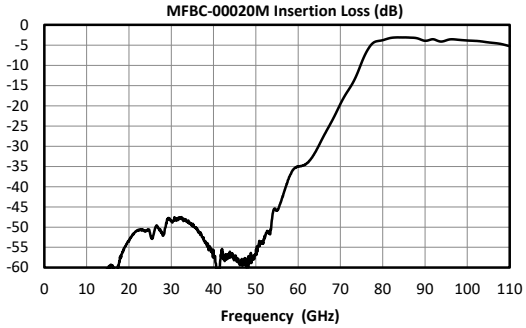


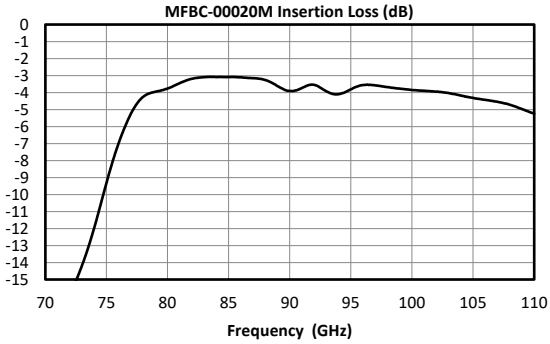




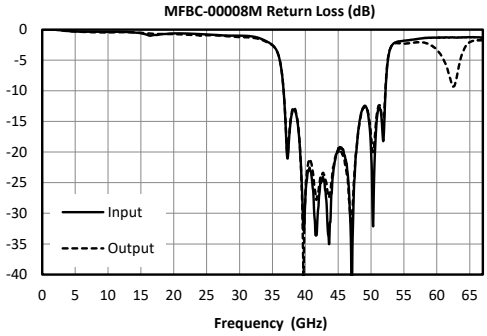


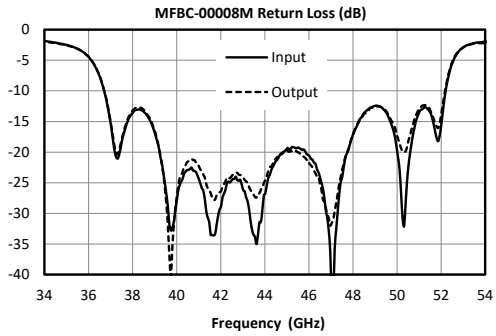


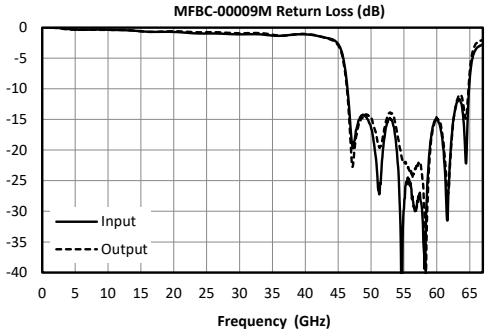


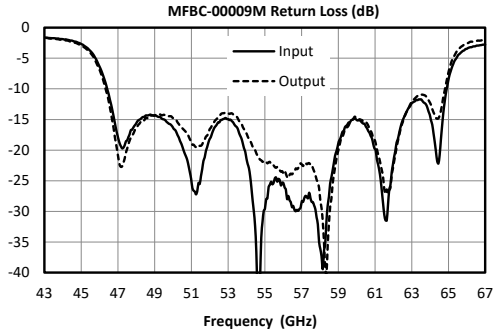


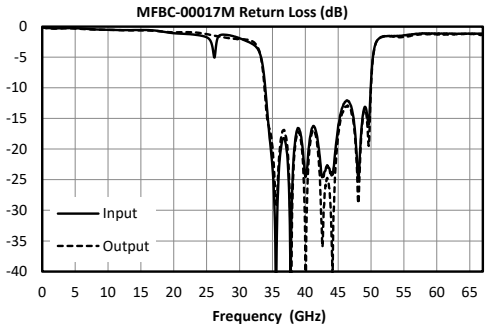
3.4.2 Return Loss

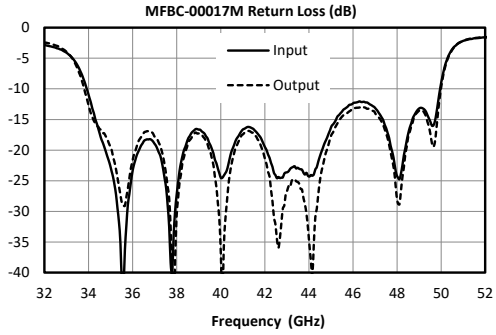


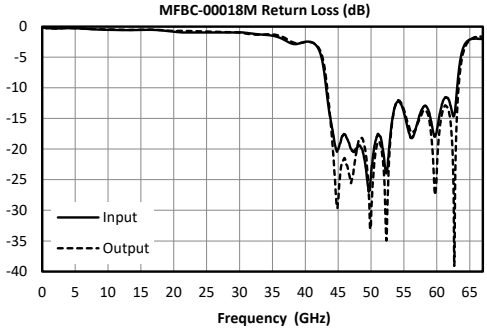


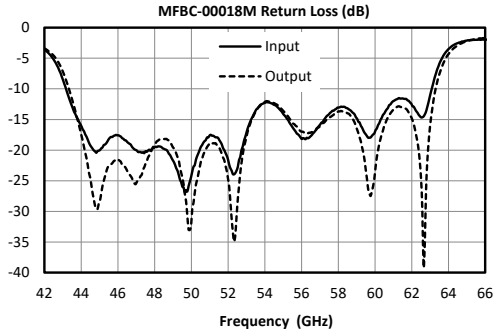


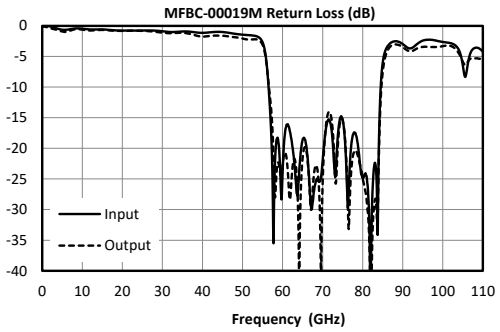


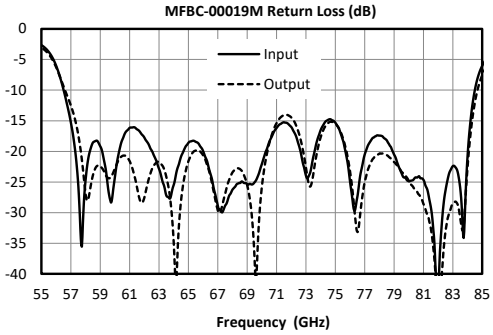


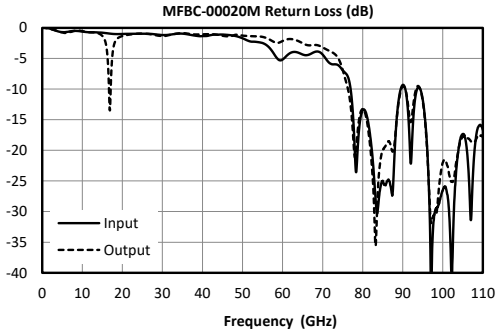


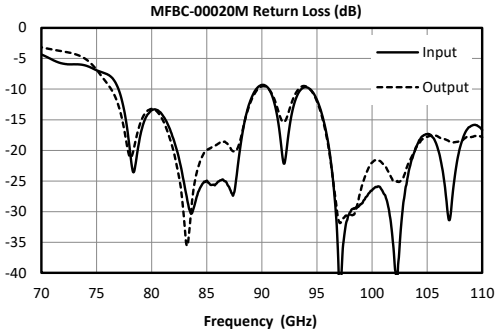




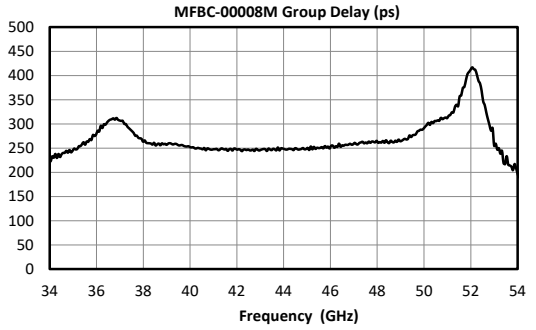


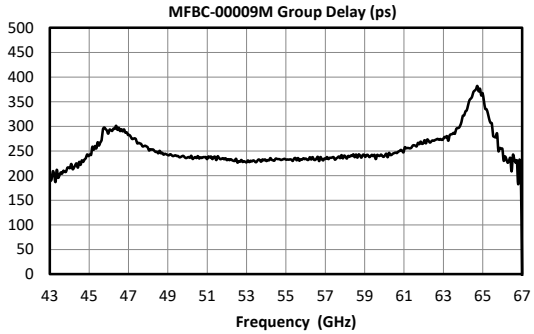


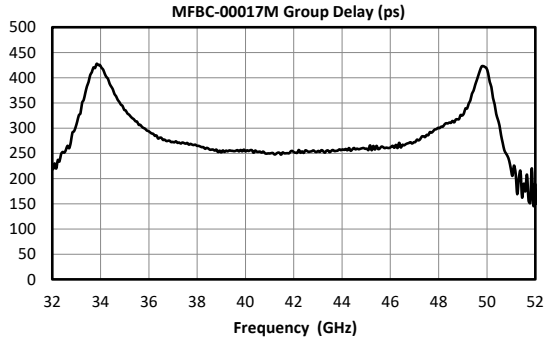


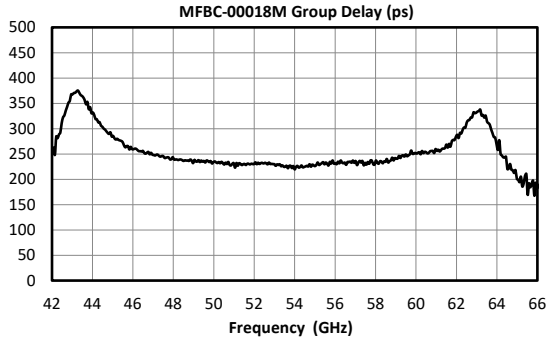


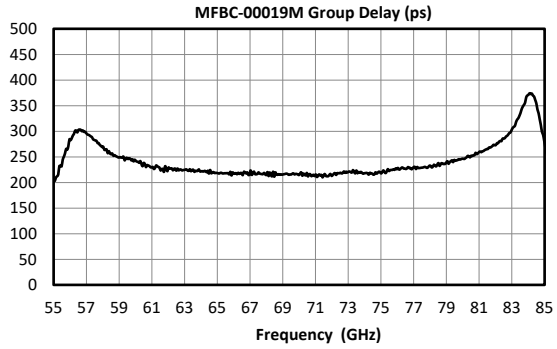
3.4.3 Group Delay

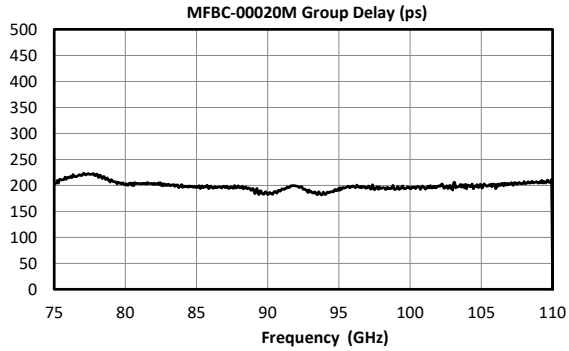








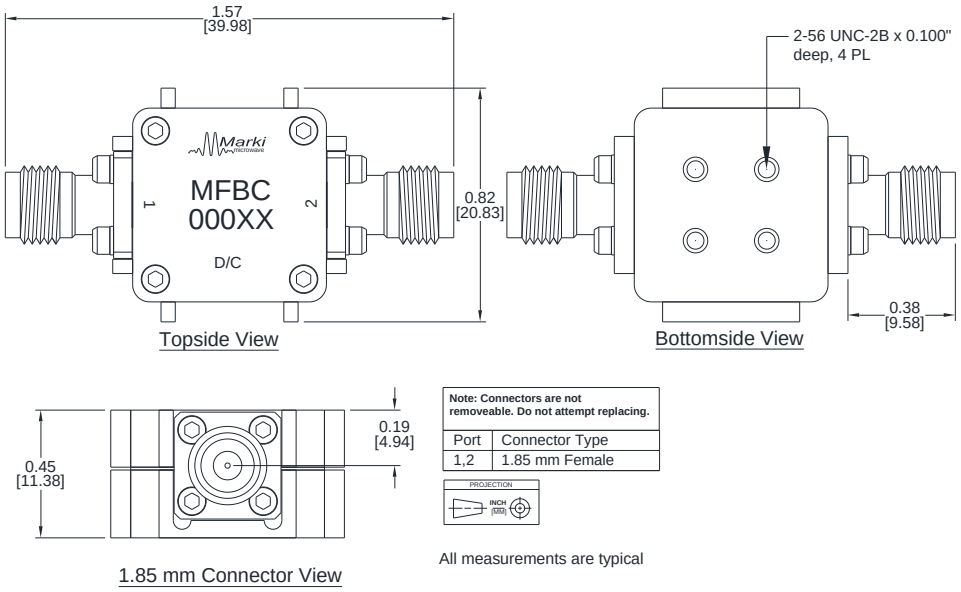




4 Mechanical Data

4.1 M Package Outline Drawing

MFBC-00008/9/17/18M



MFBC-00019/20M