

## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

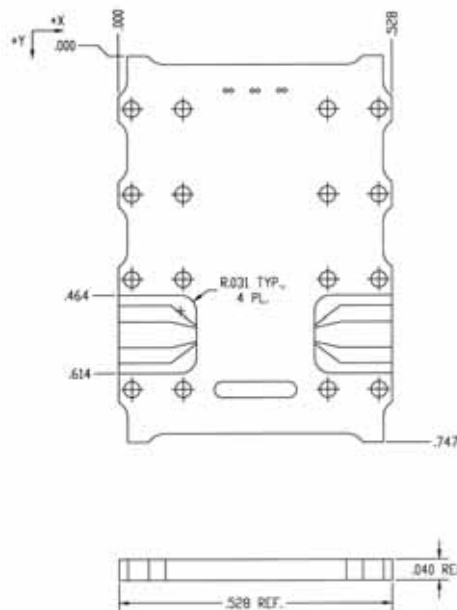
Merrimac's FGBC Series filters allow very wide stopband rejection to be achieved in very small enclosures without the appearance of reentrant spurious passbands. In addition, they require no tuning once incorporated in a circuit, making their already economical design even more cost-effective, especially in high-volume production. The FGBC Series filters incorporate all of the advantages provided by Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication process, and are an excellent choice for applications in which size and weight are critical.



## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	1 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	IMPEDANCE
BANDPASS	1440 MHz Nominal	25	3.5 dB (TYP.) 4.0 dB (MAX.)	50 dB MIN. @ 1150 MHz 50 dB MIN. @ 1650 MHz	50 Ohms
PASSBAND INPUT/OUTPUT VSWR	POWER	SIZE (INCHES - L,W, H)	WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE
2.3:1 MAX.	TBS	0.75 X 0.53 X 0.04	0.7 / 0.02	SMT or 50 Ohm, co-planar waveguide launch with gold pads	-55° - +85° C

## PACKAGE OUTLINE



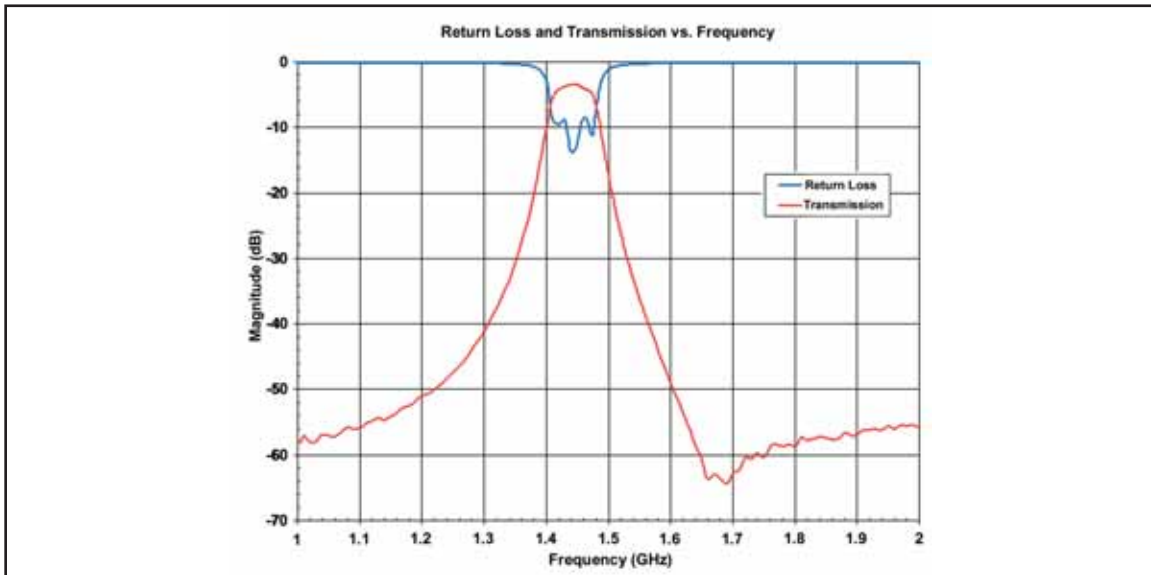
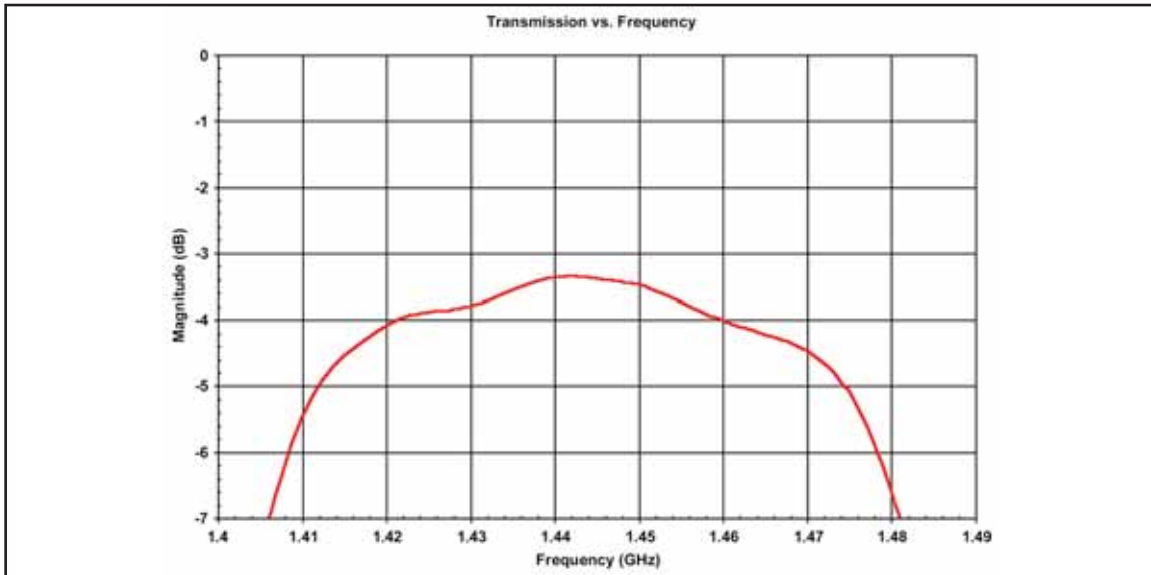
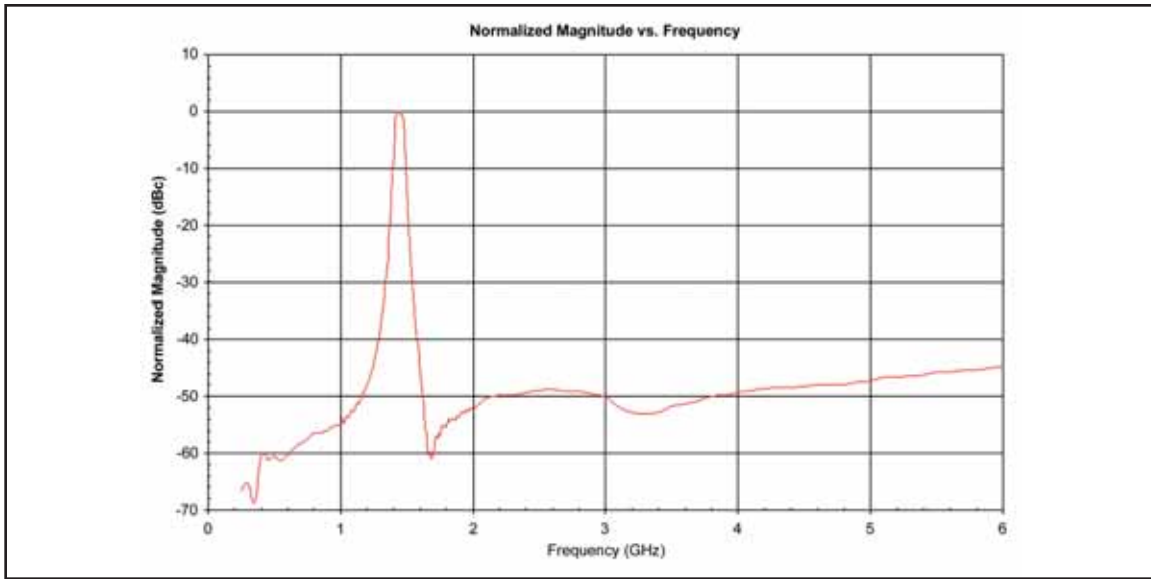
THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO 9001:2000 REGISTERED



U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGC-1.44G



THE MULTI-MIX MICROTECHNOLOGY® GROUP IS ISO 9001:2000 REGISTERED

Merrimac Industries / 41 Fairfield Place, West Caldwell, NJ 07006  
Tel: 1.888.434.MMFM / Fax: 973.882.5990 / Email: MMFM@merrimacind.com / www.Multi-Mix.com

## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

- UP TO 40 GHz
- LOW LOSS
- NO TUNING
- GPS
- SURFACE MOUNT
- TAPE & REEL
- LOW COST

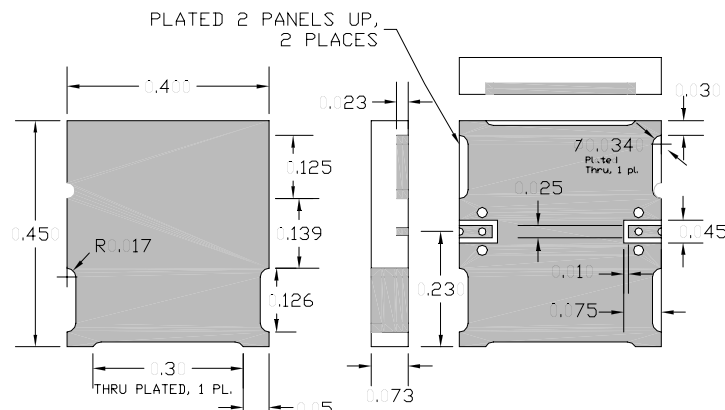


Merrimac's FGBC Series filters allow very wide stopband rejection to be achieved in very small enclosures without the appearance of reentrant spurious passbands. In addition, they require no tuning once incorporated in a circuit, making their already economical design even more cost-effective, especially in high-volume production. The FGBC Series filters incorporate all of the advantages provided by Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication process, and are an excellent choice for applications in which size and weight are critical.

## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	3 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY (dB MAX)	REJECTION	VSWR (MAX)
BANDPASS	2750 MHz Nominal	550	1.5	-40 dB MIN. @ 2.2 GHz -35 dB MIN. @ 3.3 GHz	2.0:1 @ 1400 ± 250 MHz
SIZE (INCHES)		WEIGHT (GRAMS)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
0.450 x 0.400 x 0.075		0.6	SMT	-55° - +85° C	

## PACKAGE OUTLINE



FBGC-2.75G

NOTES:  
1. ALL DIMENSIONS ARE IN INCHES.  
2. TOLERANCES: -3 PLACE DECIMALS; ±.005.

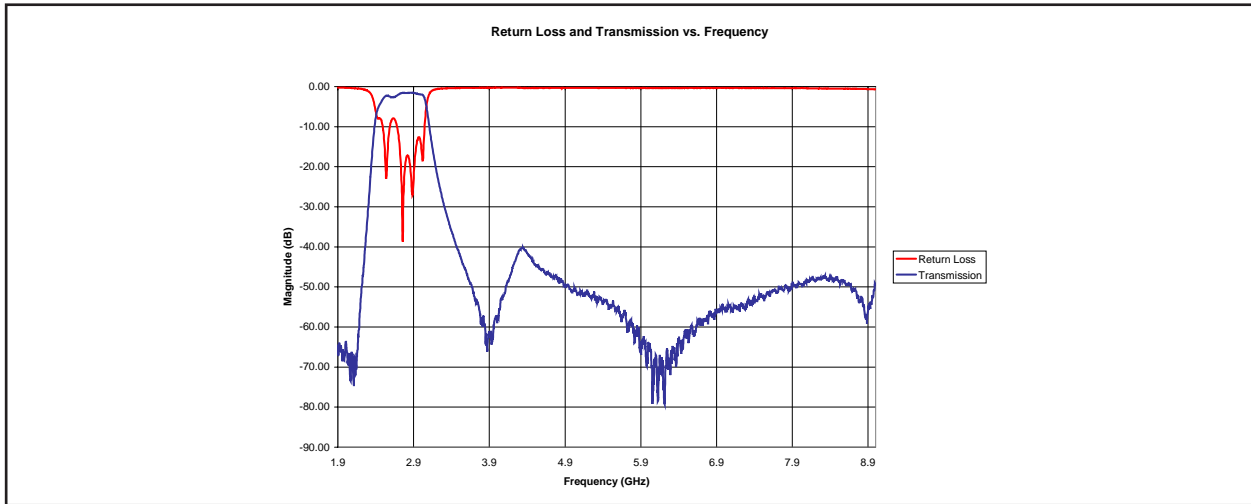
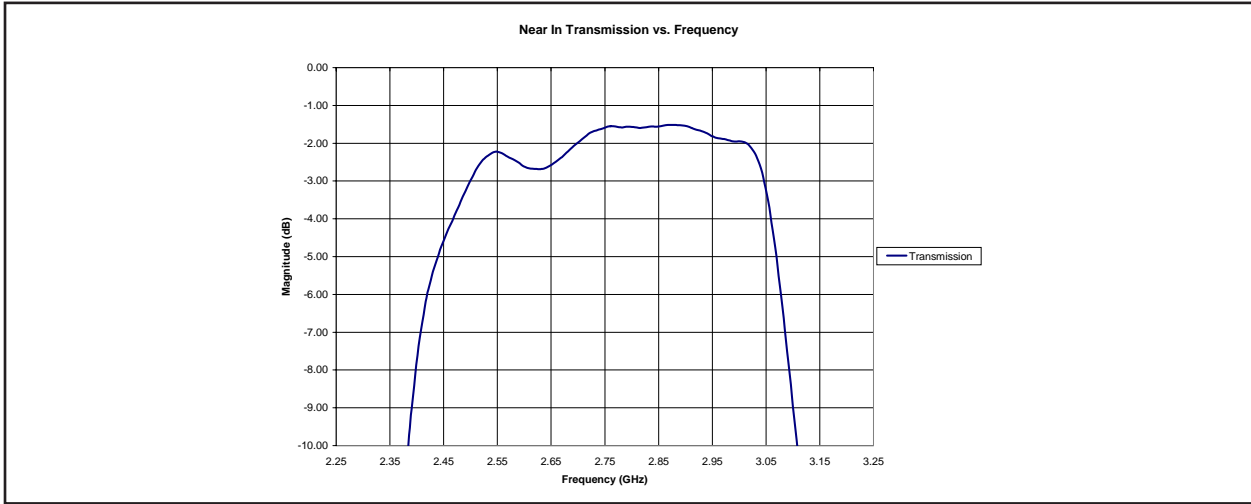
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U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGC-2.75G



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## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

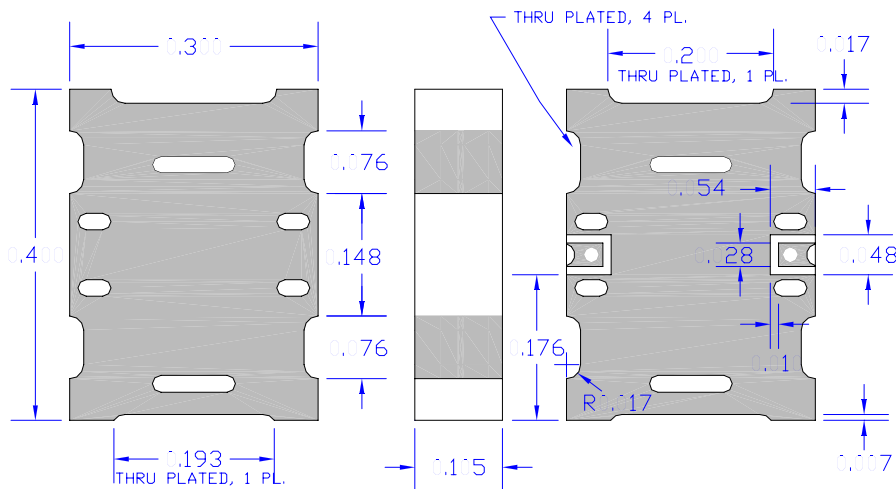
Merrimac's FBGC Series filters allow very wide stopband rejection to be achieved in very small enclosures without the appearance of reentrant spurious passbands. In addition, they require no tuning once incorporated in a circuit, making their already economical design even more cost-effective, especially in high-volume production. The FBGC Series filters incorporate all of the advantages provided by Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication process, and are an excellent choice for applications in which size and weight are critical.



## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	3 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY (dB MAX)	REJECTION	VSWR (MAX)
BANDPASS	1400 MHz Nominal	600	1.0	-15 dB MIN. @ 700 MHz -20 dB MIN. (3.0-13.0 GHz)	2.0:1 @ 1400 ± 250 MHz
POWER (CW TYP.)	SIZE (INCHES)	WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
40.0 dBm	0.40 x 0.35 x 0.105	0.45 / 0.02	SMT	-55° - +85° C	

## PACKAGE OUTLINE



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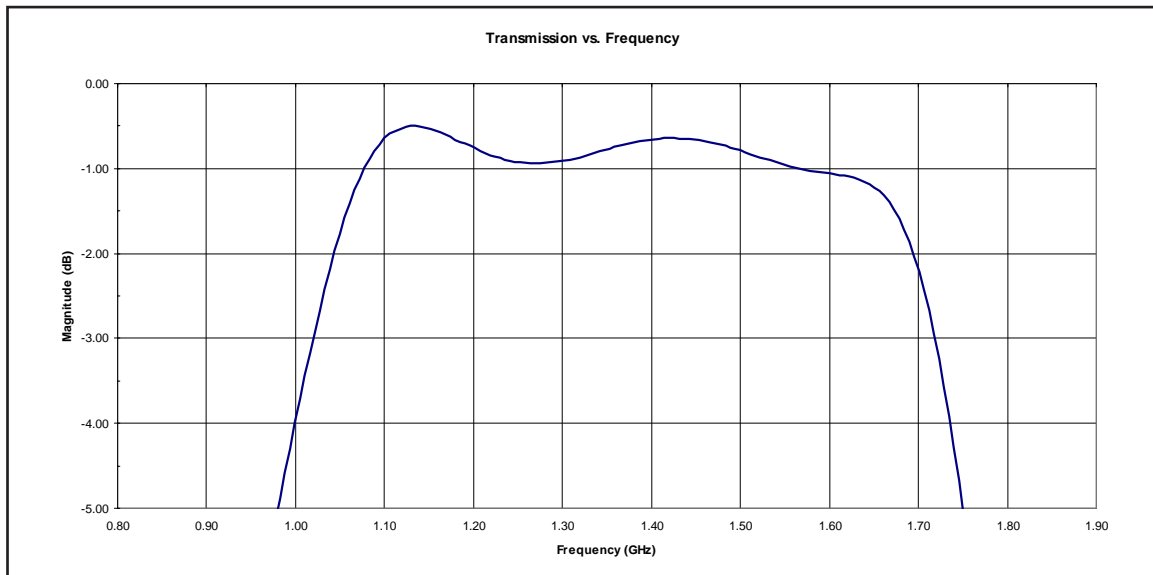
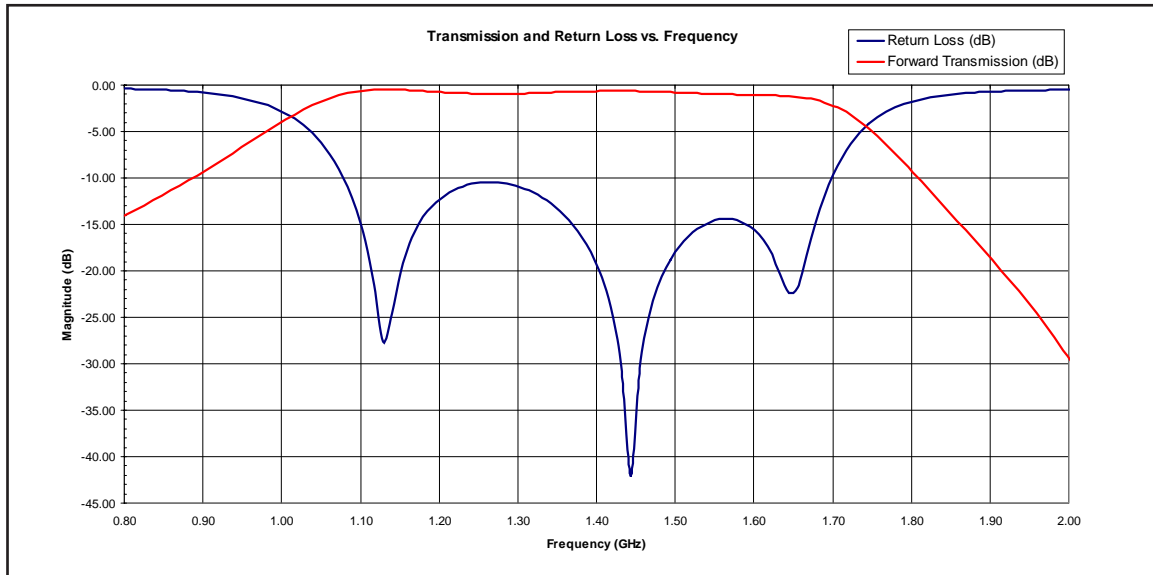
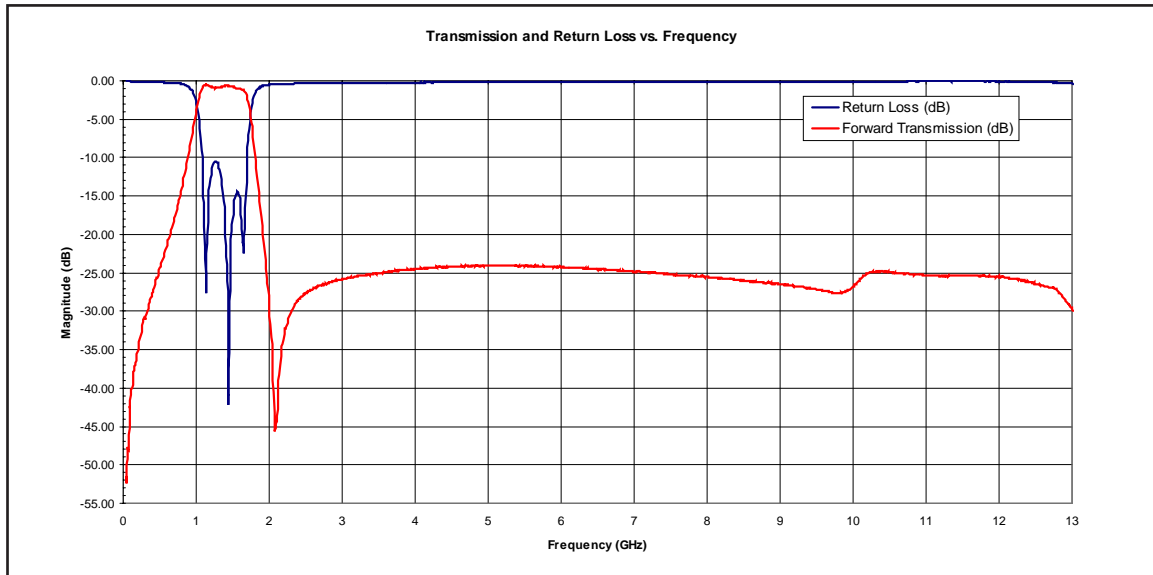
THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO 9001:2000 REGISTERED



U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGC-3-1.4G



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Tel: 1.888.434.MMFM / Fax: 973.882.5990 / Email: MMFM@merrimacind.com / www.Multi-Mix.com

## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

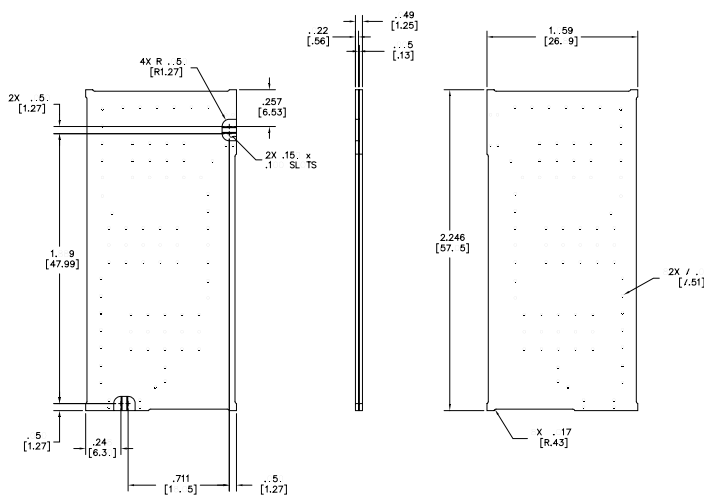
Merrimac's FBGE Series bandpass filters combine the features of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication technology with the ability to operate to three times their center frequency without reentrant spurious passbands. They typically offer better overall performance than filters designed to the same specification with conventional filter fabrication techniques.



## GENERAL SPECIFICATIONS

FILTER TYPE	OPERATING PASSBAND (MIN)	PASSBAND INSERTION LOSS (MAX)	REJECTION (dB MIN)	INPUT/OUTPUT VSWR
BANDPASS	2 - 4 GHz	3.0 dB	40 dB MIN (0-1.0 GHz) 45 dB MIN (5 GHz) 35 dB MIN (5 - 7 GHz)	1.5:1 (MAX) @ 2 - 4 GHz
SIZE (INCHES)	WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
1.059 x 2.246 x 0.049	5.2 / 0.2	CPWG or Surface Mount	-55° - +95° C	

## PACKAGE OUTLINE



### NOTES

- TOLERANCES IN ANGLES ±5°  
N 2 PLACE DECIMALS ±.1  
N 3 PLACE DECIMALS (FEATURE L.GATE INSIDE AREA F PART) ±.2  
N 3 PLACE DECIMALS (FEATURE L.GATE OUTSIDE AREA F PART) ±.5  
N 4 PLACE DECIMALS ±.5
- MAX. IS LARGEST DIMENSION ALL: WE -
- DIMENSIONS IN INCHES [mm]
- METRIC EQUIVALENTS ARE TO THE NEAREST .1mm.

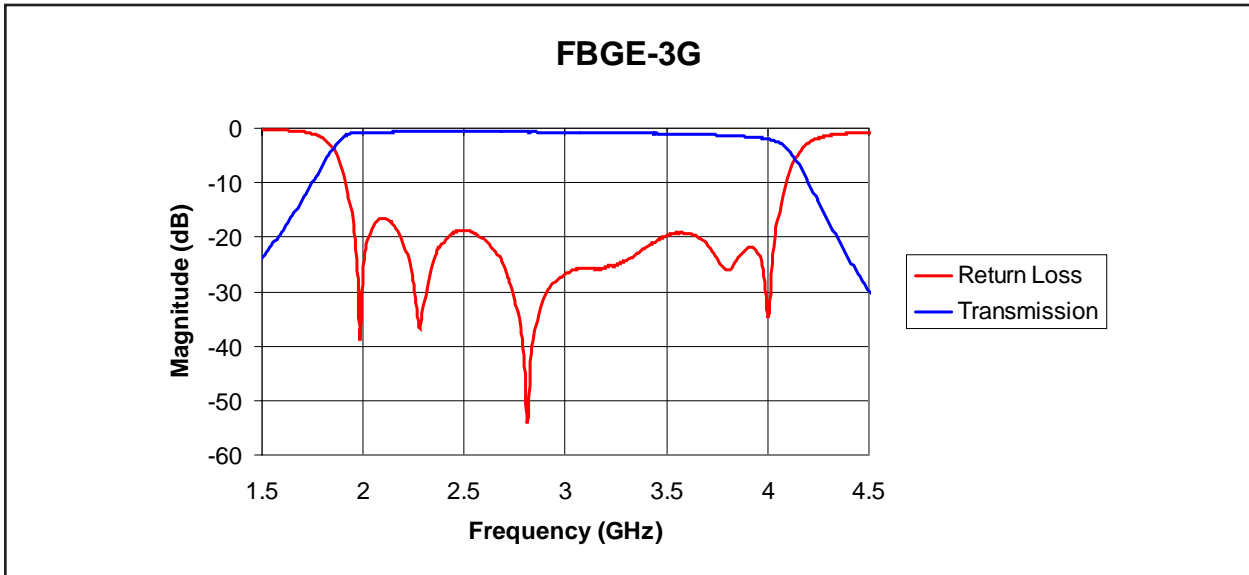
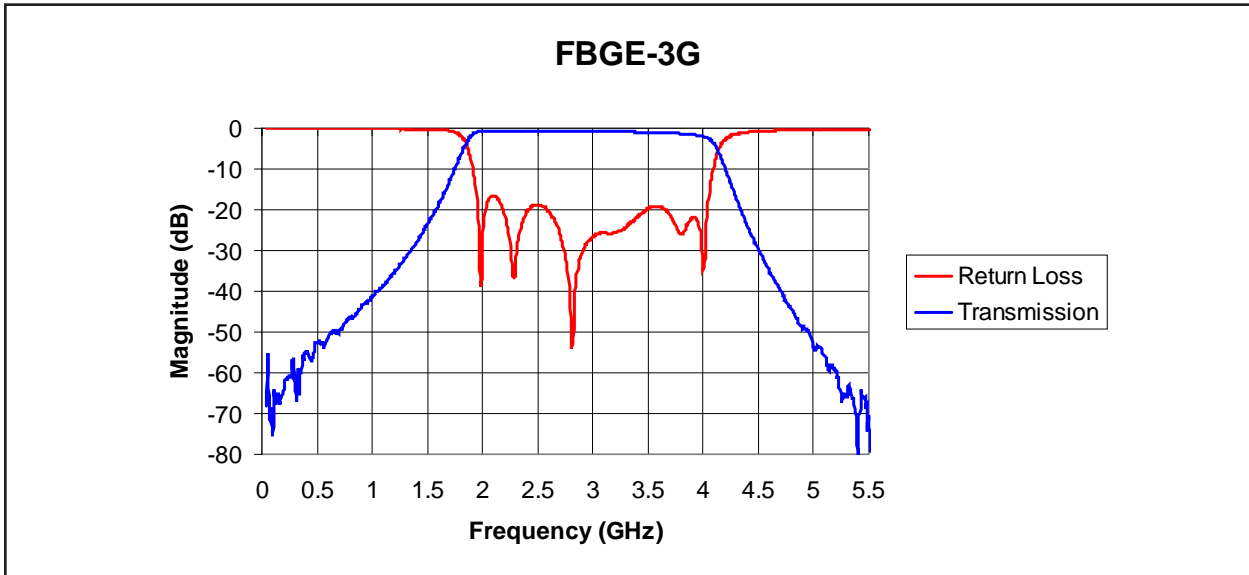
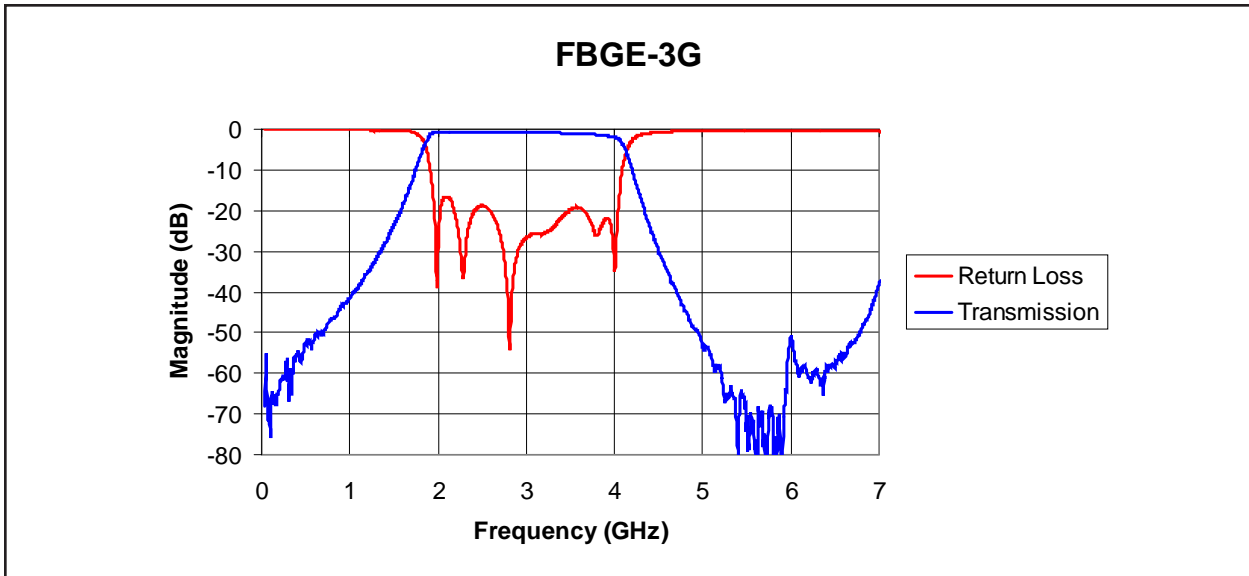


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U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGE-3.0G



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## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

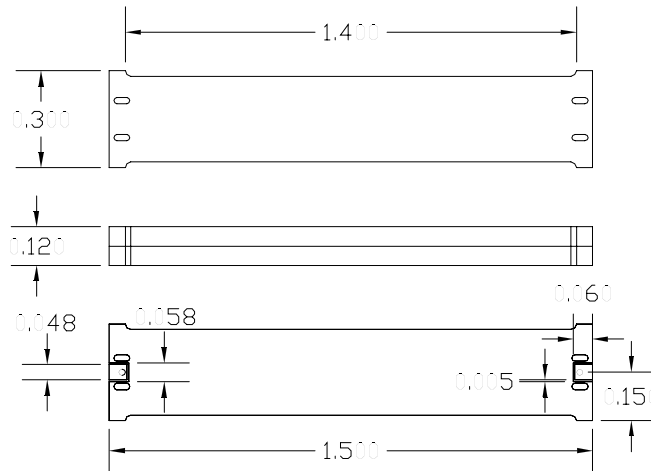
Merrimac's FBGE Series bandpass filters combine the features of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication technology with the ability to operate to three times their center frequency without reentrant spurious passbands. They typically offer better overall performance than filters designed to the same specification with conventional filter fabrication techniques.



## GENERAL SPECIFICATIONS

FILTER TYPE	OPERATING PASSBAND (MIN)	PASSBAND INSERTION LOSS (MAX)	REJECTION (dB MIN)	INPUT/OUTPUT VSWR
BANDPASS	10.51-10.63 GHz	5.0 dB	60 dB MIN (0-9.5 GHz) 45 dB MIN (11.5-19 GHz)	1.7:1 (MAX) @ 10.57 ± 0.060 GHz
SIZE (INCHES)	WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
1.5 x 0.3 x 0.12	1.9 / 0.1	CPWG	-55° - +95° C	

## PACKAGE OUTLINE



NOTES:  
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2. TOLERANCES: -3 PLACE DECIMALS; ±.005.

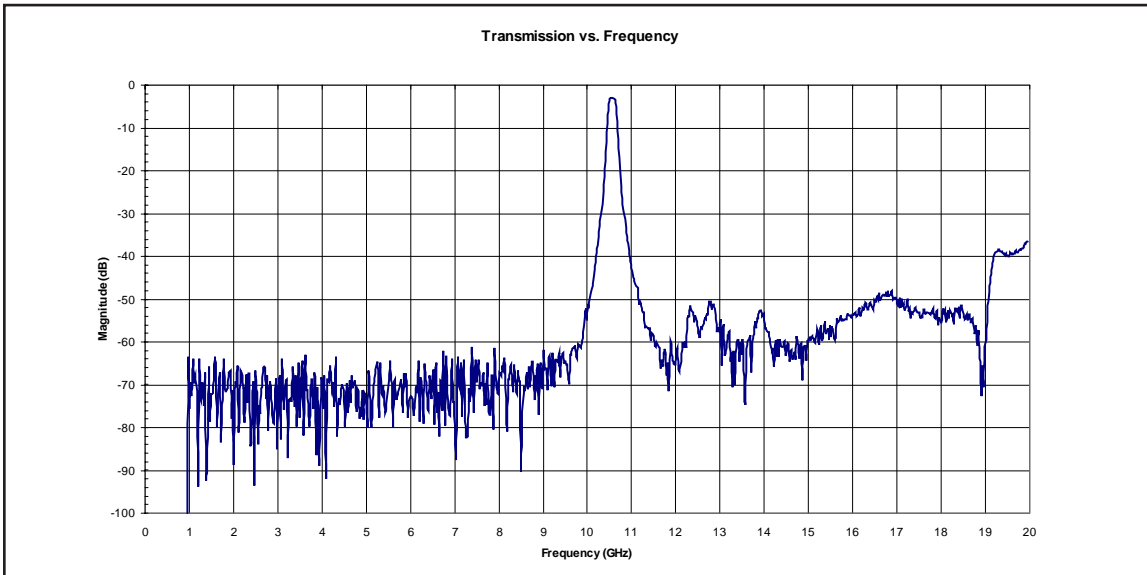
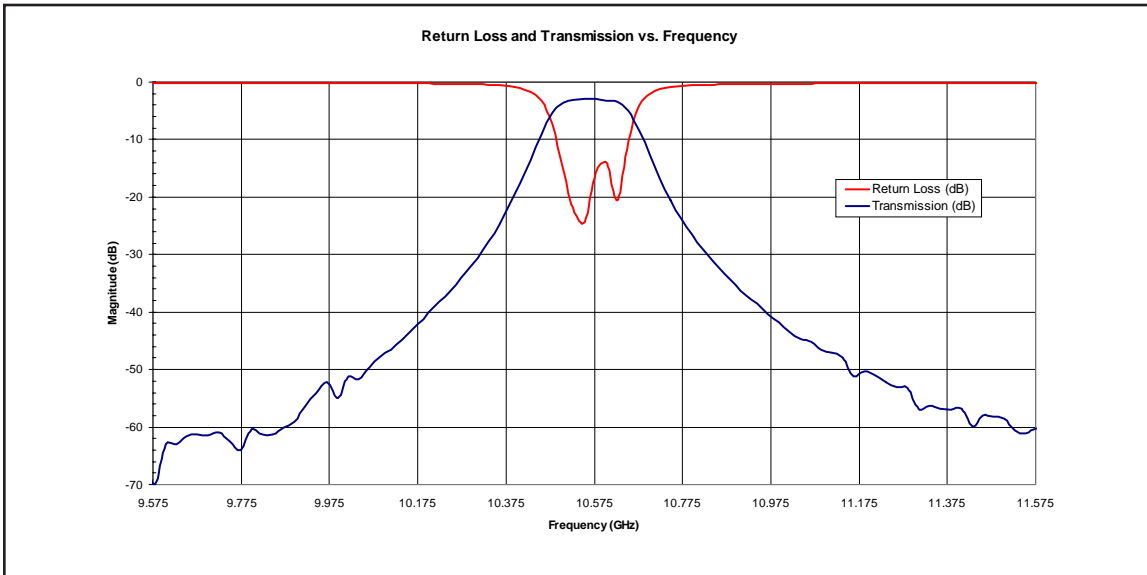
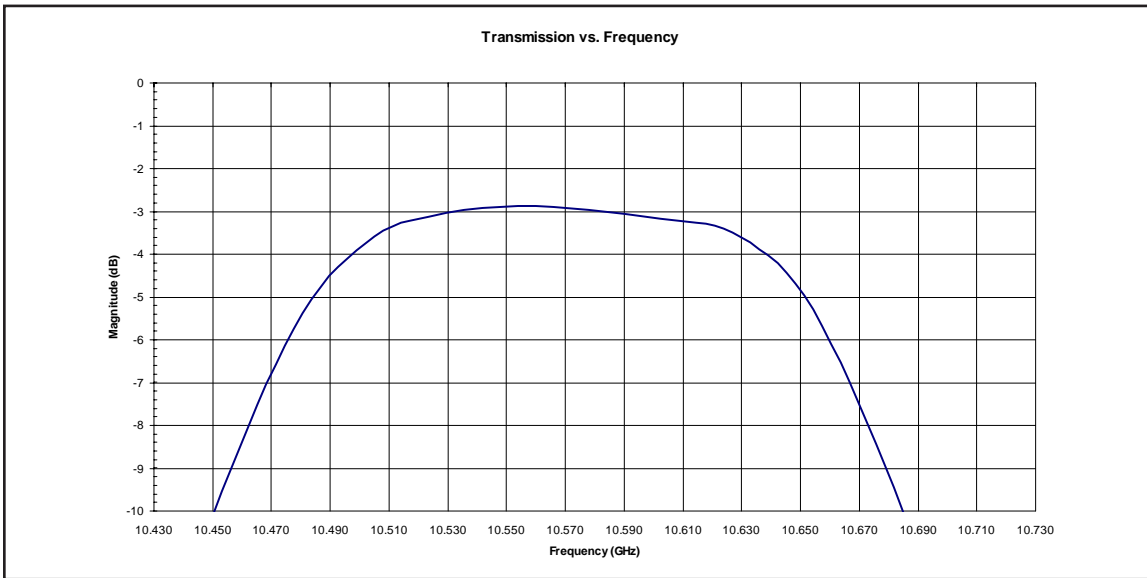
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U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGE-10.57G



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**TECHNICAL DESCRIPTION / APPLICATION**

**MULTI-MIX<sup>®</sup> FILTERS**

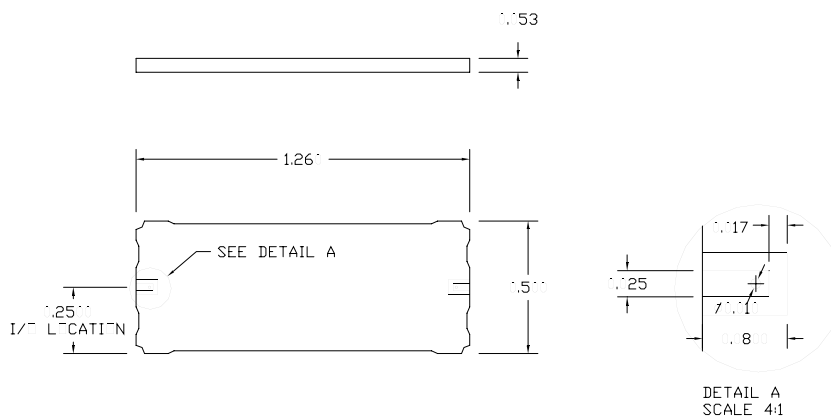
Merrimac's FBGI Series bandpass filters combine the features of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication technology with the ability to operate to three times their center frequency without reentrant spurious passbands. They typically offer better overall performance than filters designed to the same specification with conventional filter fabrication techniques.



**GENERAL SPECIFICATIONS**

FILTER TYPE	CENTER FREQUENCY	1 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	VSWR (MAX)
BANDPASS	800 MHz Nominal	80	2.6 dB (NOM) 3.0 dB (MAX)	-50 dB MIN. @ 600 MHz -50 dB MIN. @ 100 MHz -60 dB MIN @ 1200-3400 MHz	1.6:1
<b>SIZE (INCHES)</b>		<b>WEIGHT (GRAMS / OZ.)</b>	<b>RF INTERFACE/ CONNECTIONS</b>	<b>OPERATING TEMPERATURE</b>	
1.260 x 0.500 x 0.053		1.6 / 0.06	SMT	-55° - +85° C	

**PACKAGE OUTLINE**



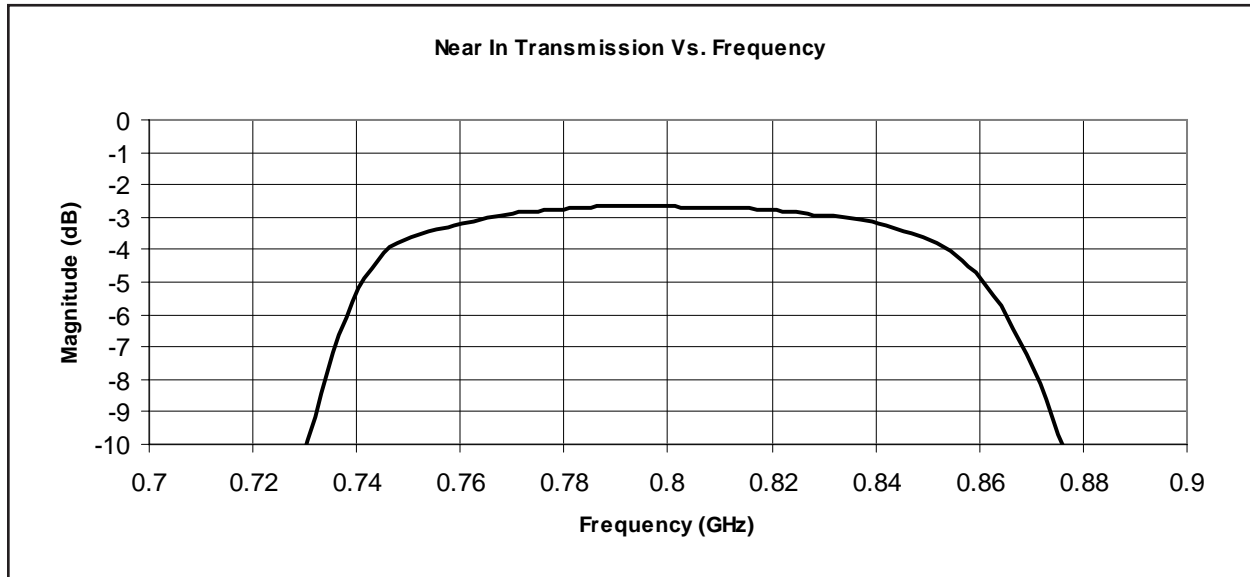
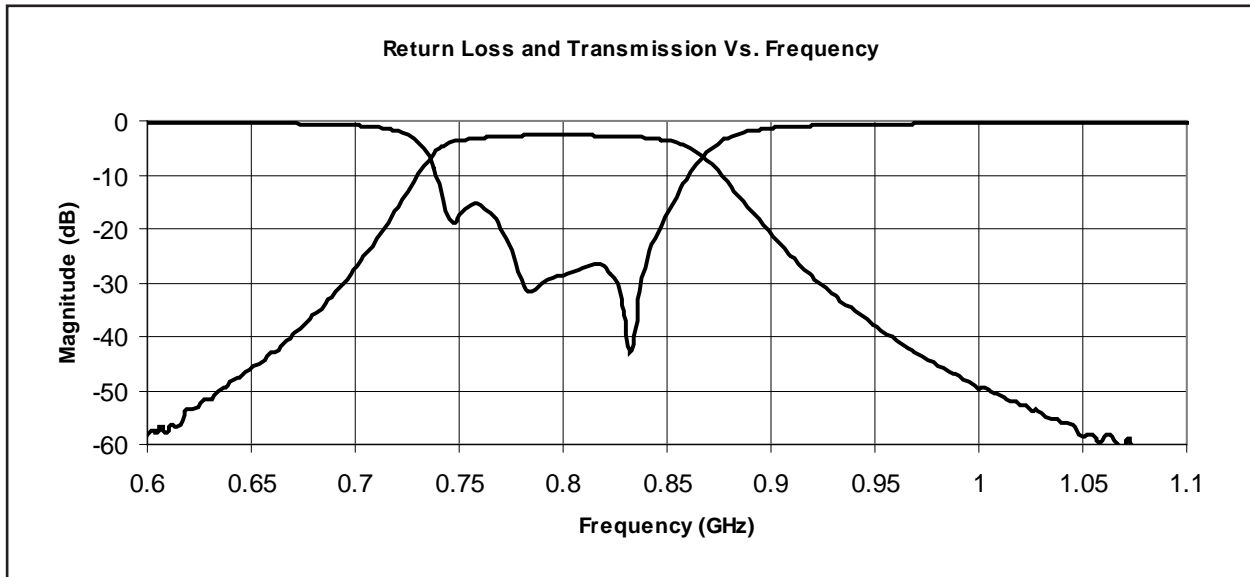
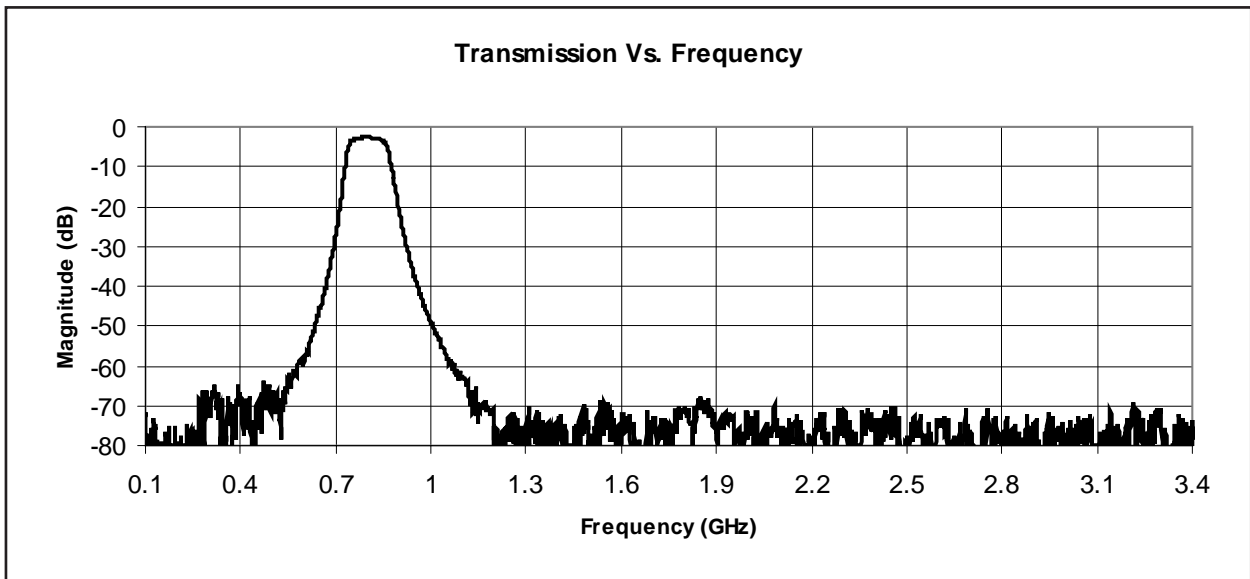
**THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO 9001:2000 REGISTERED**



U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-0.8G



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## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

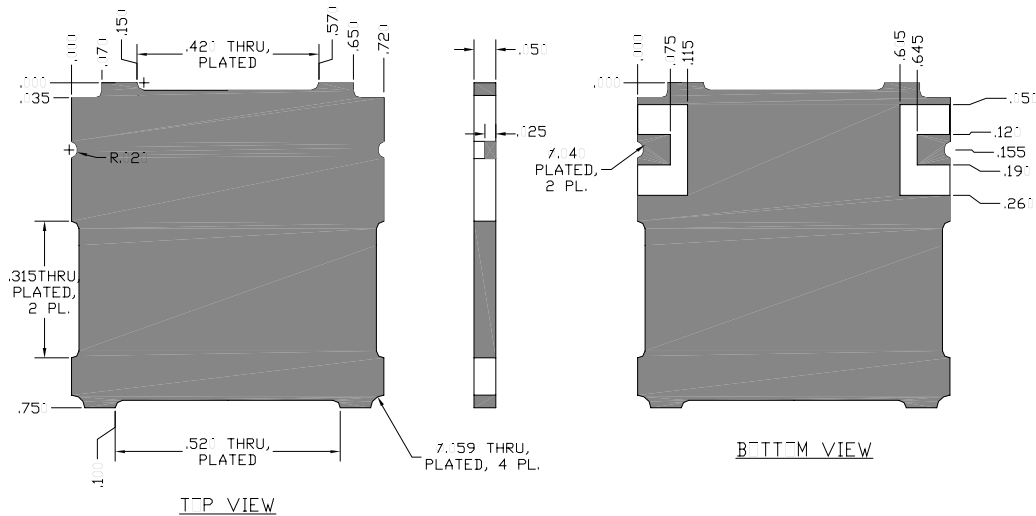
Merrimac's FBGI Series bandpass filters combine the features of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication technology with the ability to operate to three times their center frequency without reentrant spurious passbands. They typically offer better overall performance than filters designed to the same specification with conventional filter fabrication techniques.



## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	1 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION
BANDPASS	1090 MHz Nominal	90	2.5 dB (NOM) 3.0 dB (MAX)	-60 dB MIN. @ 690 MHz -40 dB MIN. @ 890 MHz -35 dB MIN @ 1290 MHz -55 dB MIN @ 1490 MHz
SIZE (INCHES)	WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
0.72 x 0.75 x 0.05	1.3 / 0.05	SMT	-55° - +85° C	

## PACKAGE OUTLINE



FBGI-1.09G

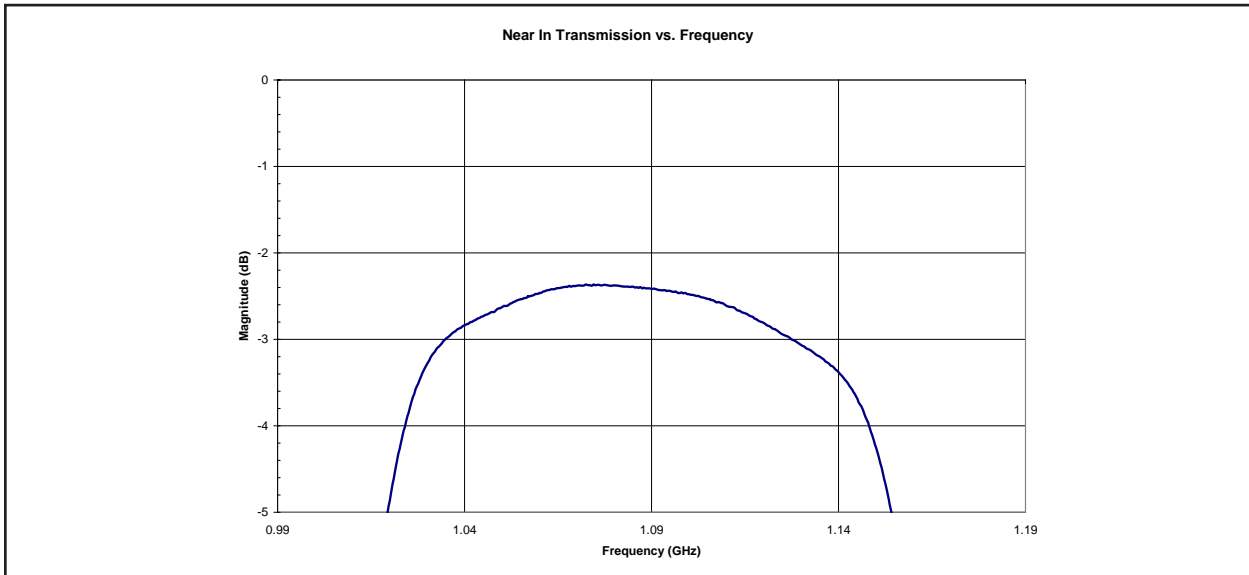
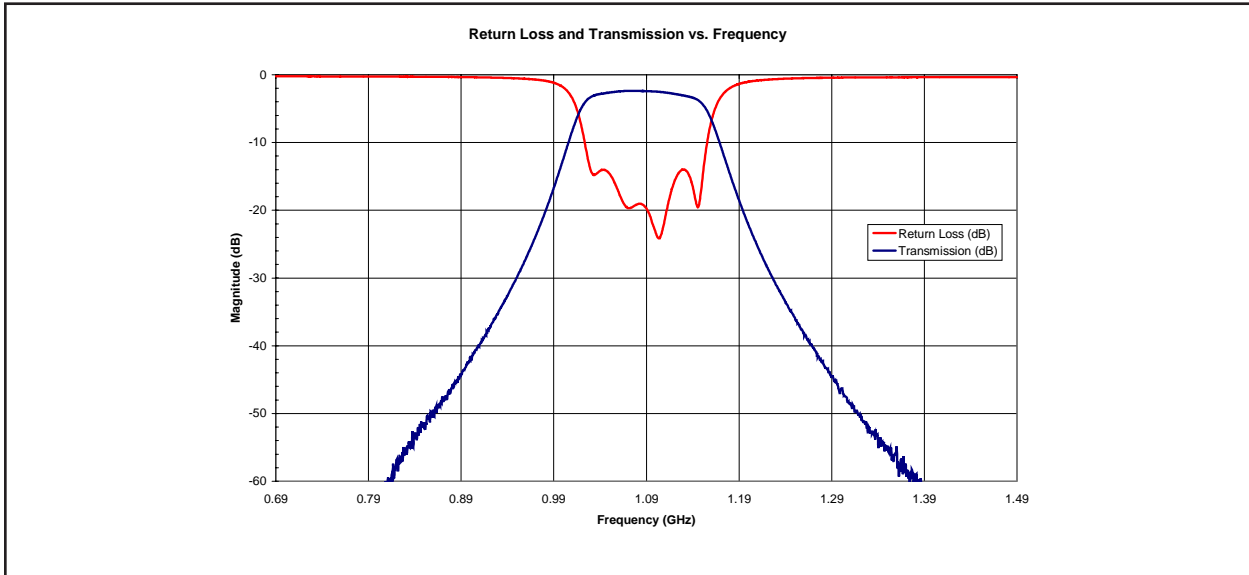
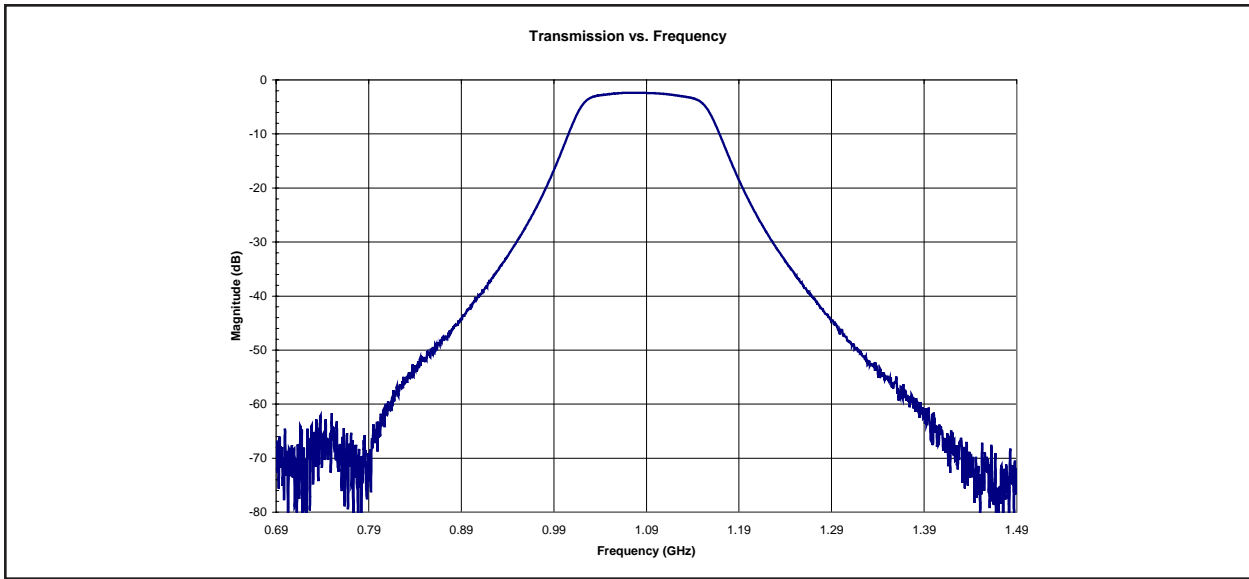
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# TYPICAL PERFORMANCE

FBGI-1.09G



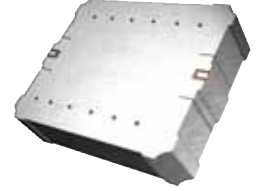
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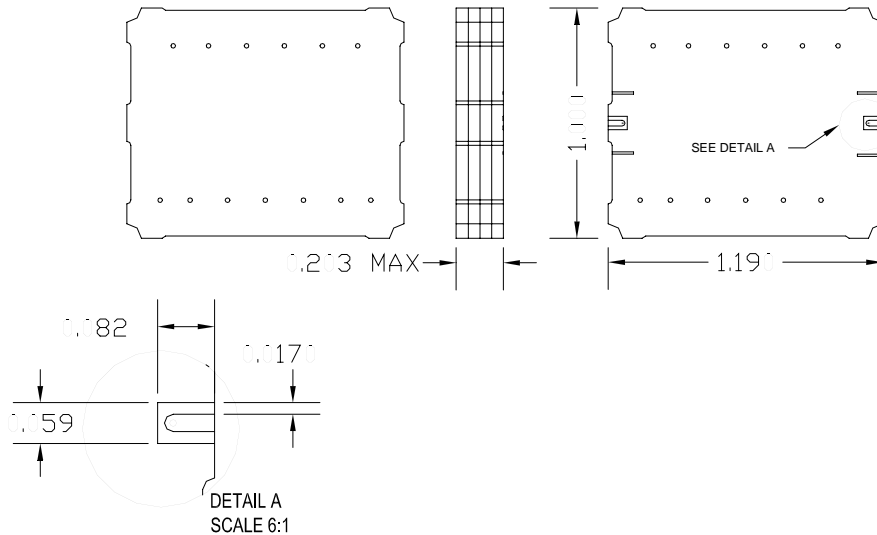
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## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	1 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	VSWR (MAX)
BANDPASS	1250 MHz Nominal	520	1.7 dB (NOM) 2.5 dB (MAX)	-50 dB MIN. @ 800 MHz -50 dB MIN. @ 1700 - 3000 MHz	1.92:1 @ Fc ± 0.2 GHz
SIZE (INCHES)		WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
1.00 x 1.19 x 0.203		10.4 / 0.4	SMT	-55° - +85° C	

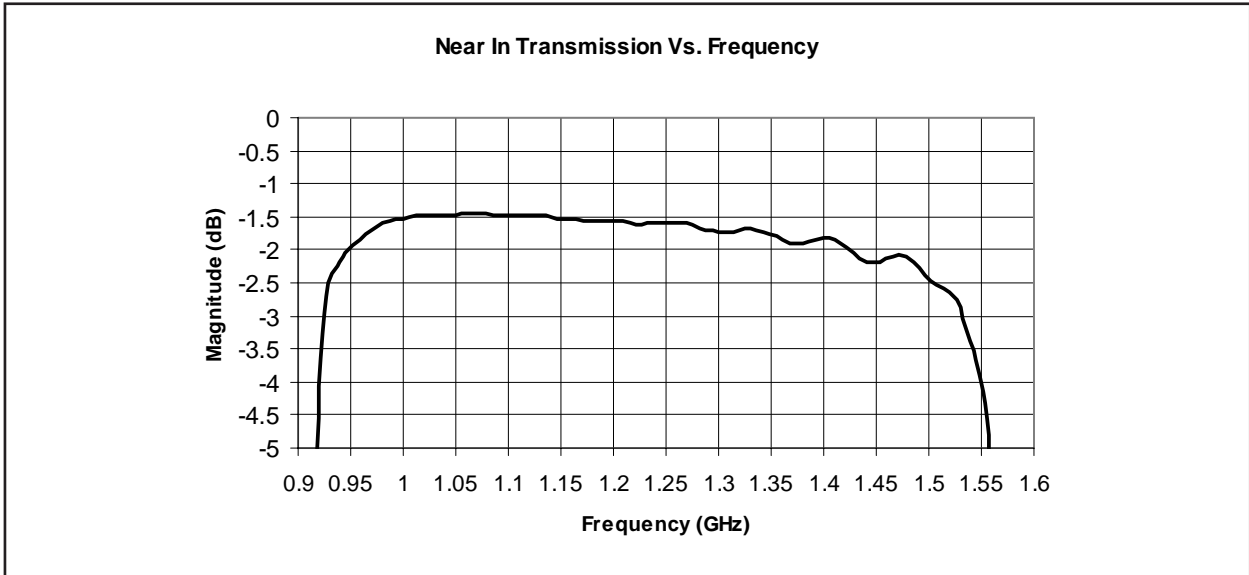
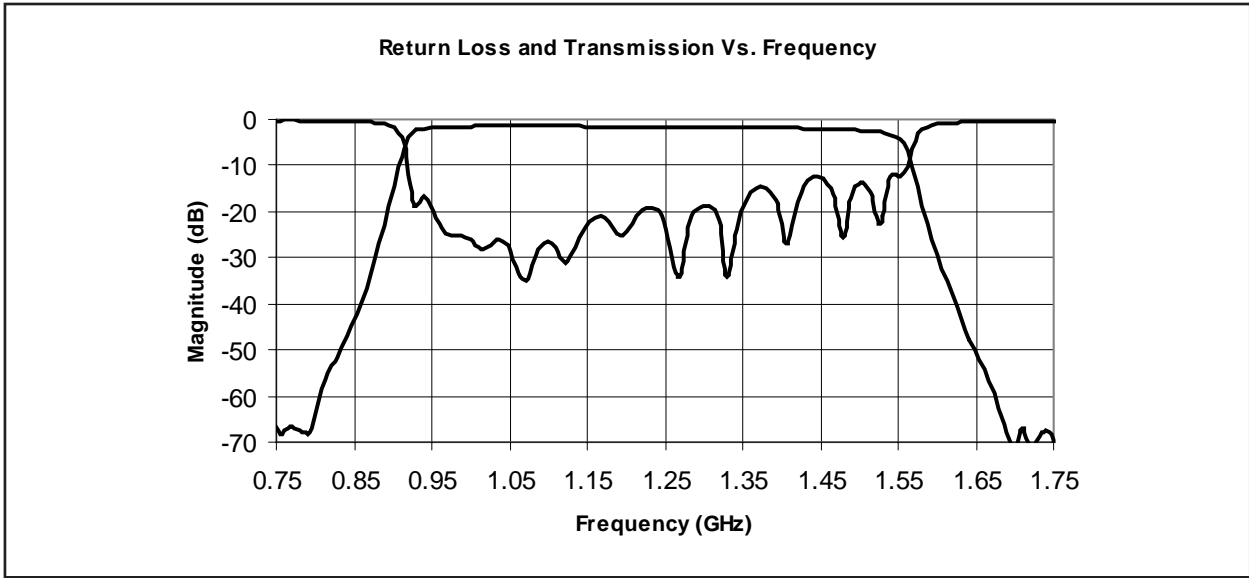
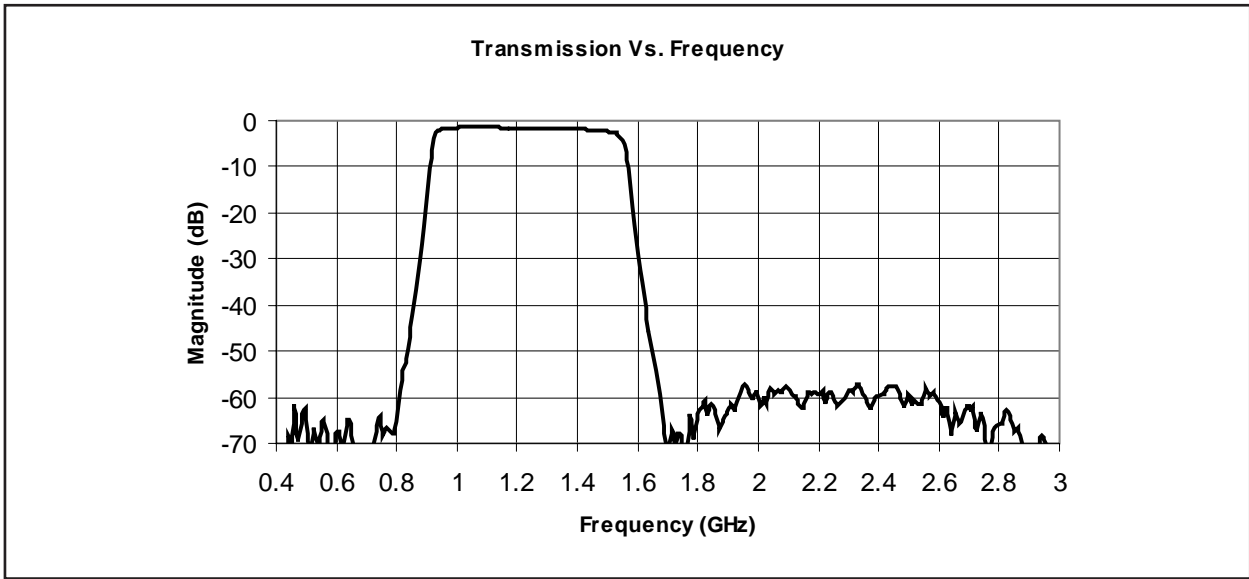
## PACKAGE OUTLINE



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U.S. patent 6,099,677 and other patents pending.



THE MULTI-MIX MICROTECHNOLOGY® GROUP IS ISO 9001:2000 REGISTERED

- 1.88 GHz
- LOW LOSS
- NO TUNING
- PCS COMPATIBLE
- SURFACE MOUNT
- TAPE & REEL
- LOW COST

**GENERAL SPECIFICATIONS**

**ELECTRICAL**

FILTER TYPE	Bandpass
CENTER FREQUENCY	1.88 GHz
1 dB OPERATING BANDWIDTH	60 MHz Nominal
MIDBAND INSERTION LOSS	4.5 dB (TYP)
ATTENUATION	50 dB @ 1.68 GHz 43 dB @ 2.08 GHz
INPUT/OUTPUT IMPEDANCE	50 Ohms, Nominal
INPUT/OUTPUT RETURN LOSS	10 dB (MIN)
POWER	1 W (TYP)

**MECHANICAL**

SIZE / OUTLINE	0.512 x 0.394 x 0.12inches (l,w,h)
WEIGHT	0.9 g
RF INTERFACE / CONNECTIONS	Surface Mount

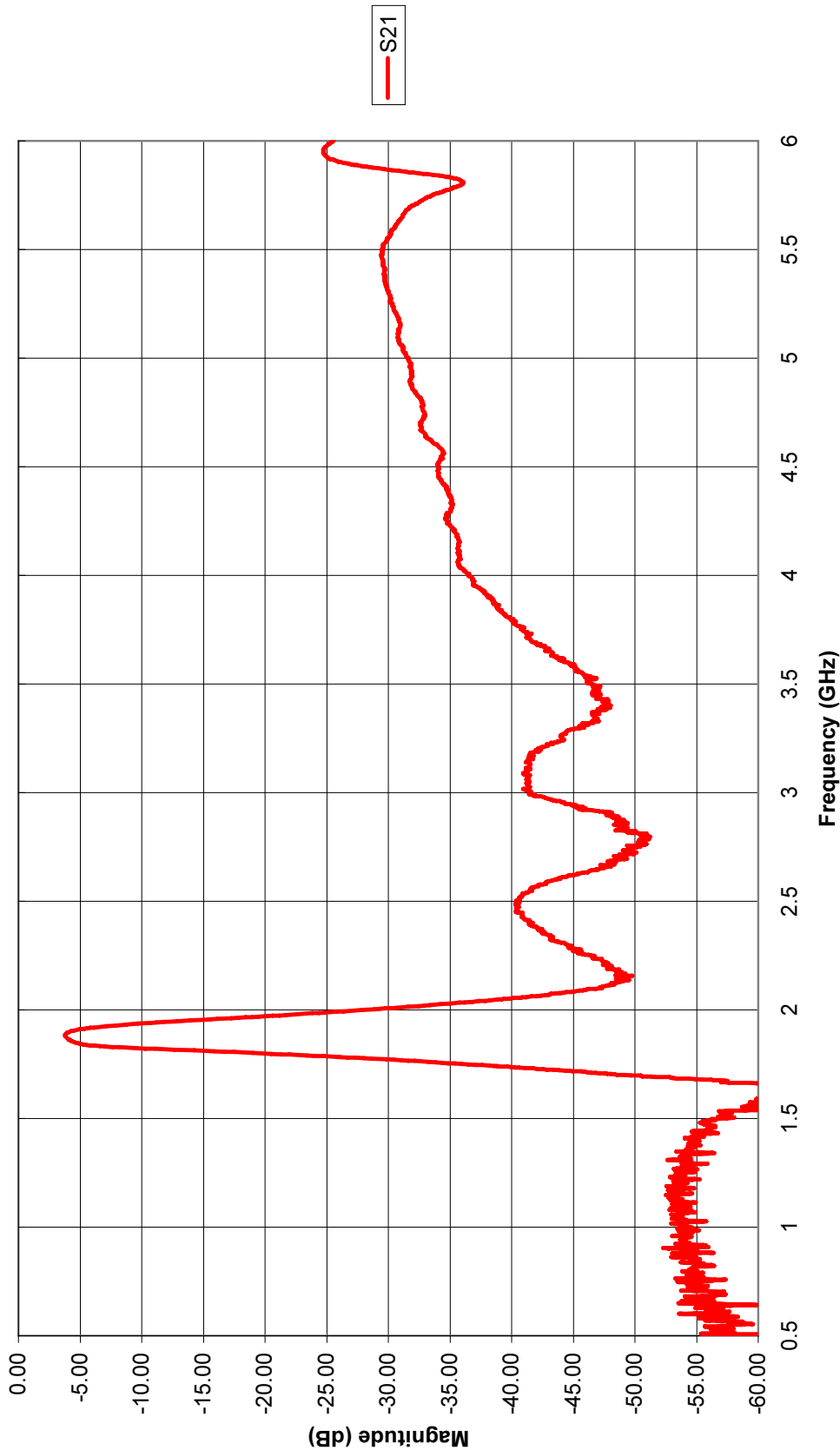
**ENVIRONMENTAL**

OPERATING TEMPERATURE RANGE	-55° C to +85° C
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THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO-9001 REGISTERED



FBGI-1.88G



THE MULTI-MIX MICROTECHNOLOGY® GROUP IS ISO-9001 REGISTERED

- 1.96 GHz
- LOW LOSS
- NO TUNING
- PCS COMPATIBLE
- SURFACE MOUNT
- TAPE & REEL
- LOW COST

**GENERAL SPECIFICATIONS**

**ELECTRICAL**

FILTER TYPE	Bandpass
CENTER FREQUENCY	1.96 GHz
1 dB OPERATING BANDWIDTH	60 MHz Nominal
MIDBAND INSERTION LOSS	4.5 dB (TYP)
ATTENUATION	50 dB @ 1.76 GHz 42 dB @ 2.16 GHz
INPUT/OUTPUT IMPEDANCE	50 Ohms, Nominal
INPUT/OUTPUT RETURN LOSS	10 dB (MIN)
POWER	1 W (TYP)

**MECHANICAL**

SIZE / OUTLINE	0.512 x 0.394 x 0.12inches (l,w,h)
WEIGHT	0.9 g
RF INTERFACE / CONNECTIONS	Surface Mount

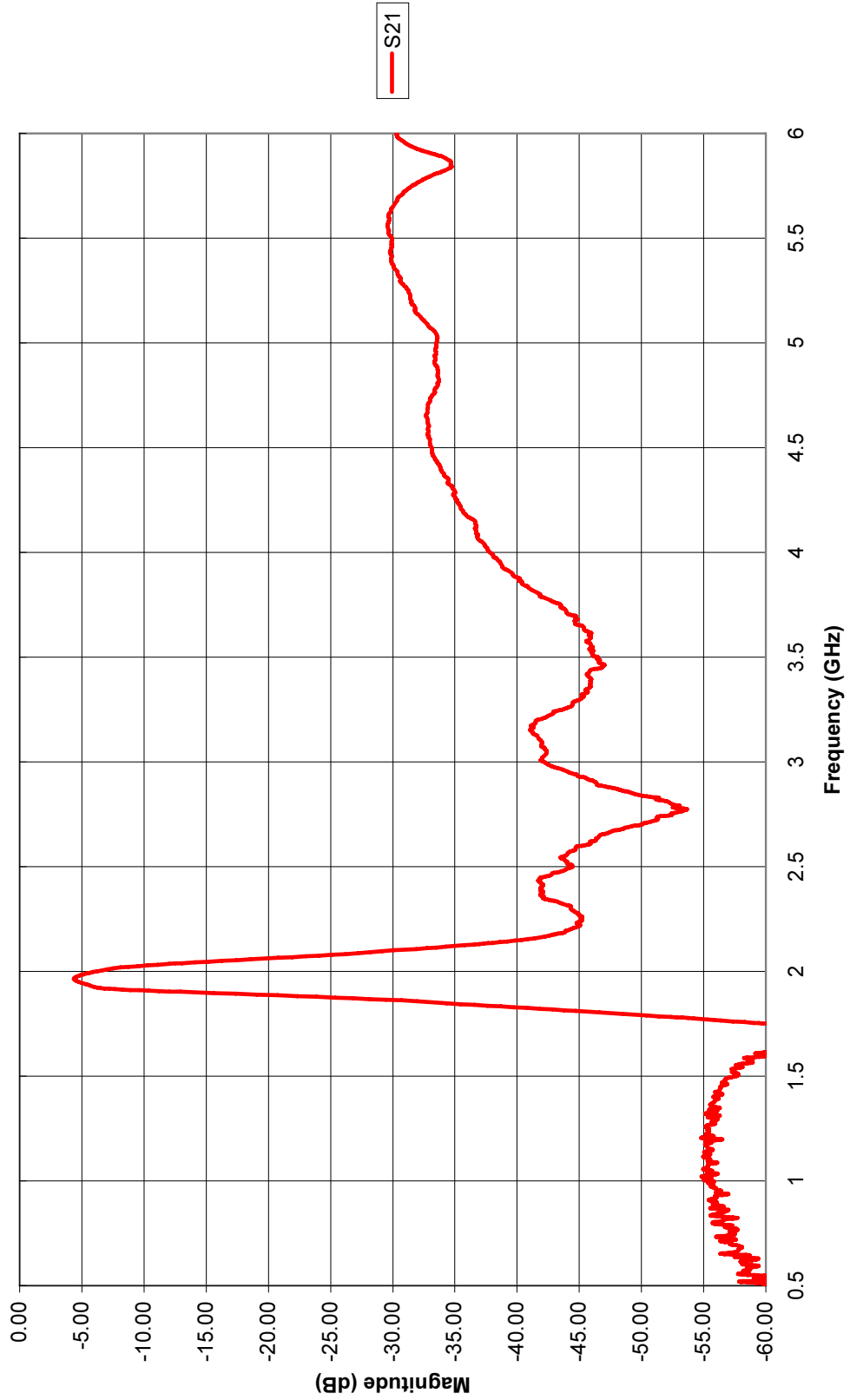
**ENVIRONMENTAL**

OPERATING TEMPERATURE RANGE	-55° C to +85° C
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FBGI-1.96G



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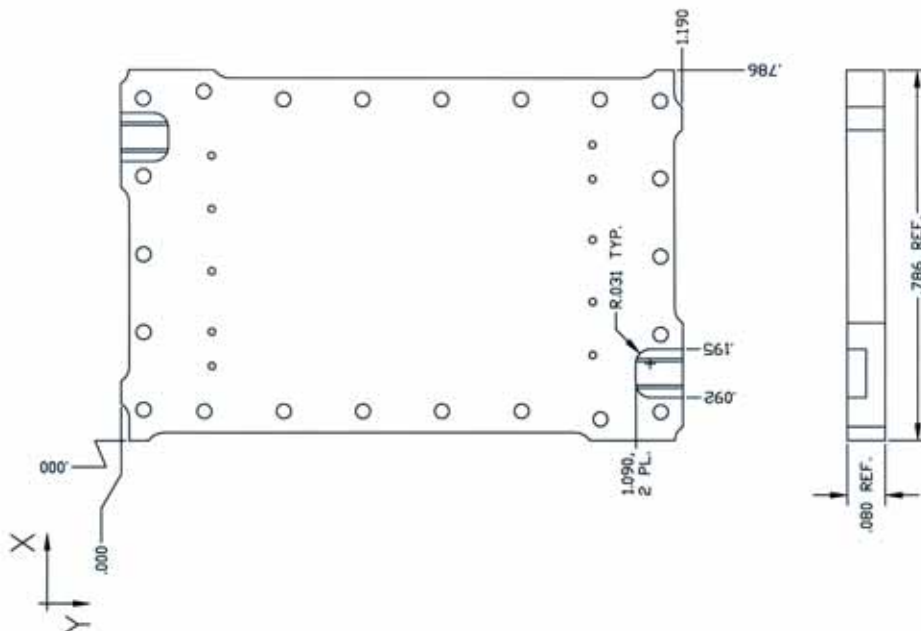
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**GENERAL SPECIFICATIONS**

FILTER TYPE	CENTER FREQUENCY	1 dB OPERATING BANDWIDTH	INSERTION LOSS @ CENTER FREQUENCY	REJECTION (dB MIN)	PASSBAND INPUT/OUTPUT VSWR
BANDPASS	2130 MHz. (NOM)	300 MHz (MIN.)	2 dB TYP 2.5 dB MAX	70 dB MIN @ 1650 MHz 70 dB MIN @ 2600 MHz	1.5:1 (TYP) 2.0:1 (MAX)
INPUT/OUTPUT IMPEDANCE (NOM)	POWER LEVEL	SIZE (INCHES)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
50 Ohms	TBS	1.19 x 0.79 x 0.08	SMT or 50 Ohm, co-planar waveguide launch with gold pads	-55° - +95° C	

**PACKAGE OUTLINE**



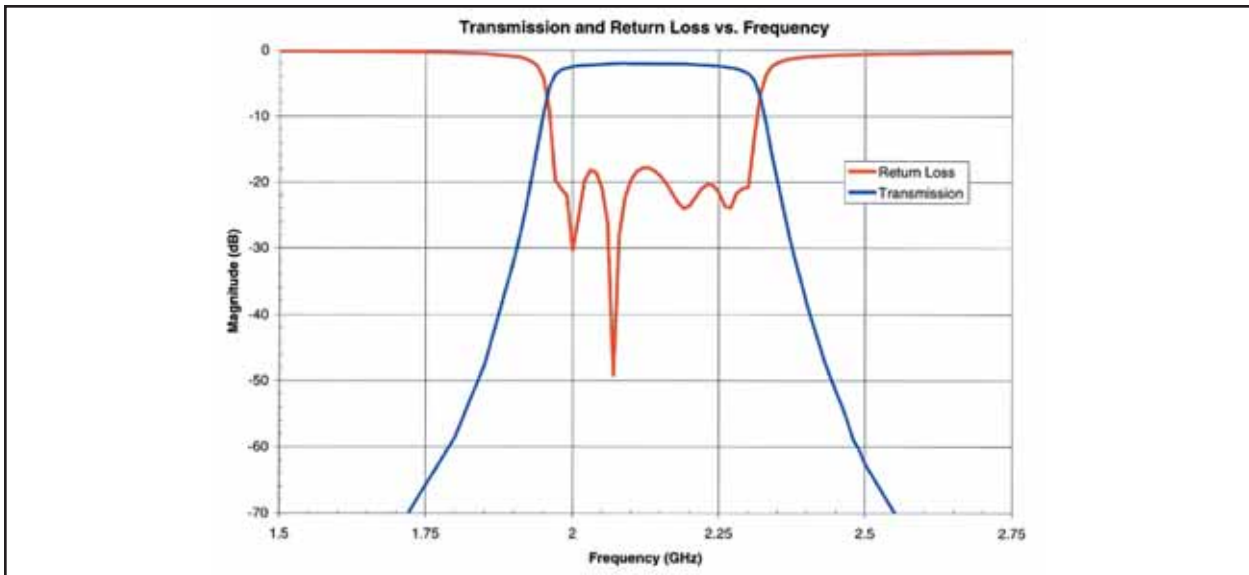
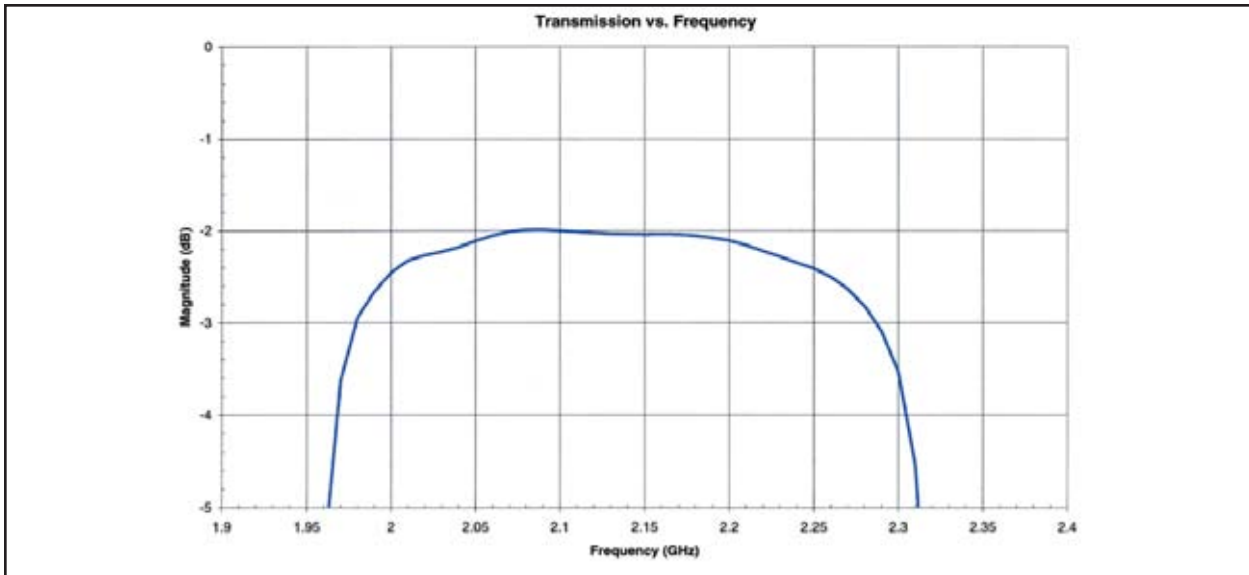
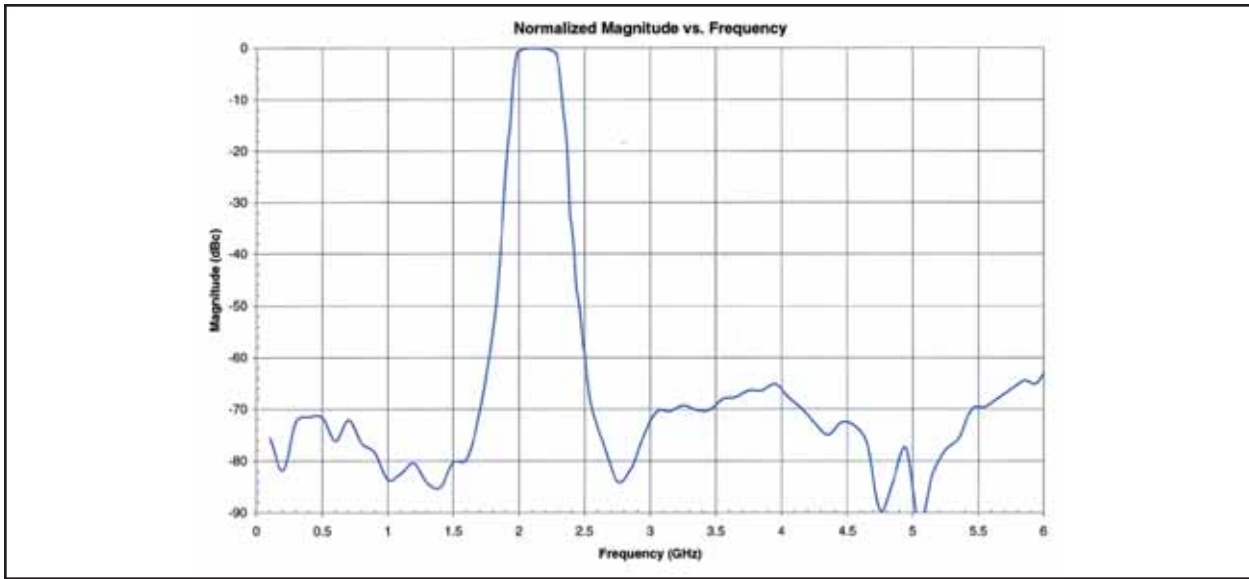
**THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO 9001:2000 REGISTERED**



U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-2.13G



THE MULTI-MIX MICROTECHNOLOGY® GROUP IS ISO 9001:2000 REGISTERED

Merrimac Industries / 41 Fairfield Place, West Caldwell, NJ 07006  
Tel: 1.888.434.MMFM / Fax: 973.882.5990 / Email: MMFM@merrimacind.com / www.Multi-Mix.com

## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

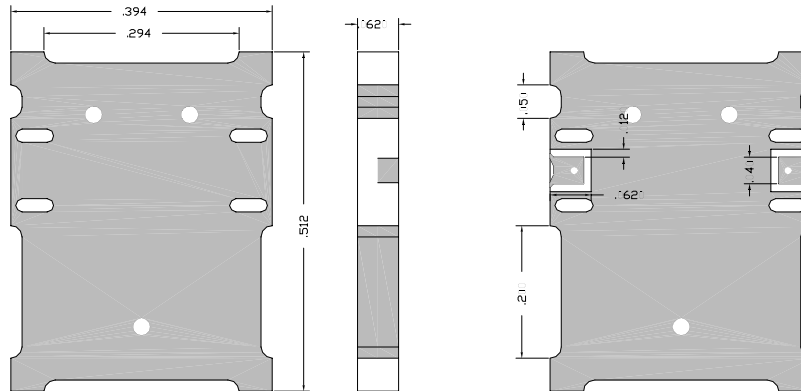
Merrimac's FBGI Series bandpass filters combine the features of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication technology with the ability to operate to three times their center frequency without reentrant spurious passbands. They typically offer better overall performance than filters designed to the same specification with conventional filter fabrication techniques.



## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	3 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	VSWR
BANDPASS	2.2 GHz Nominal	400	1.0 dB (NOM) 2.0 dB (MAX)	-50 dB MIN. @ 1.3 GHz -50 dB MIN. @ 3.3 GHz	2.0:1 (MAX) @ 2.2 ± 0.1 GHz
SIZE (INCHES)		WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
0.512 x 0.394 x 0.100		0.9 / 0.03	SMT	-55° - +85° C	

## PACKAGE OUTLINE



NOTES :

1. TOLERANCE ON THREE PLACE DECIMALS ± .010 EXCEPT AS NOTED .
2. ALL DIMENSIONED UNITS ARE IN INCHES .

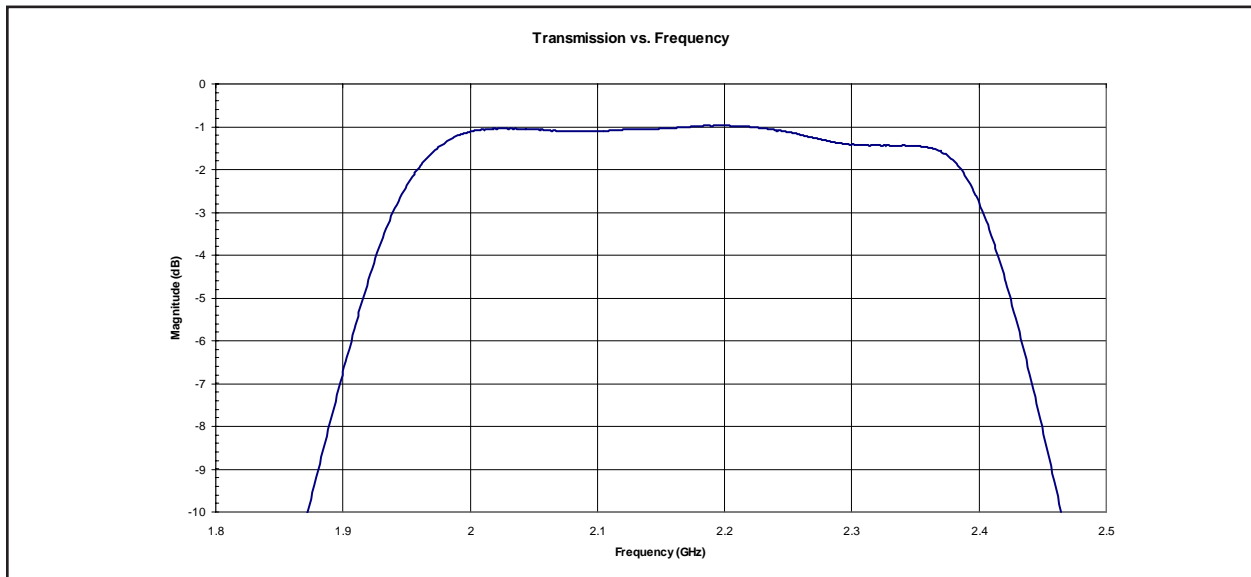
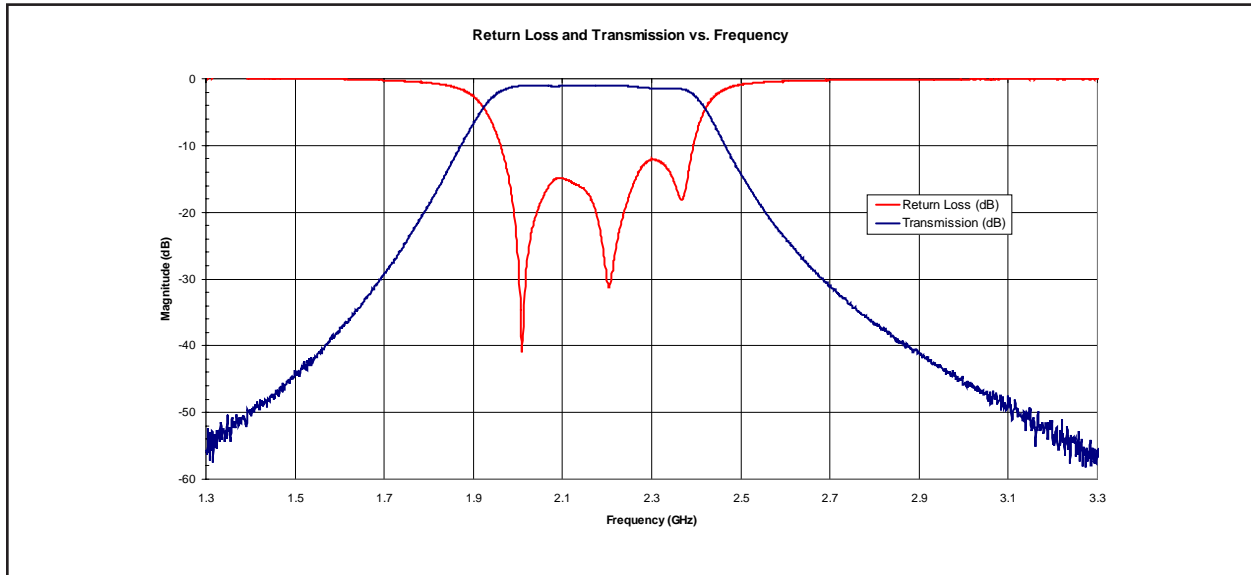
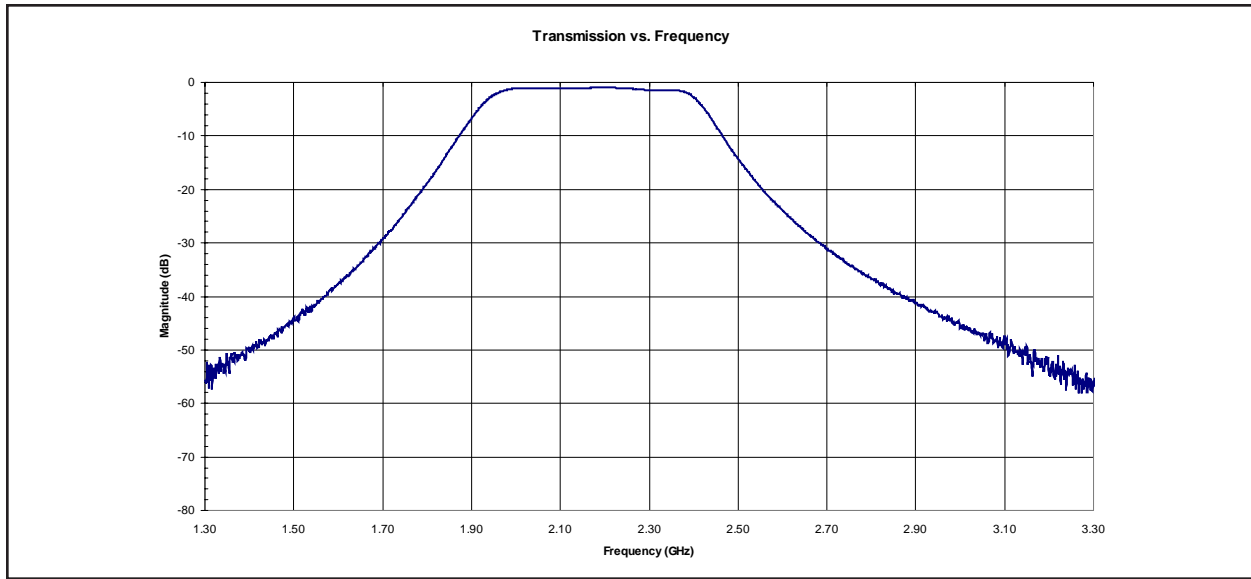
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U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-2.2G



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Tel: 1.888.434.MMFM / Fax: 973.882.5990 / Email: MMFM@merrimacind.com / www.Multi-Mix.com

## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

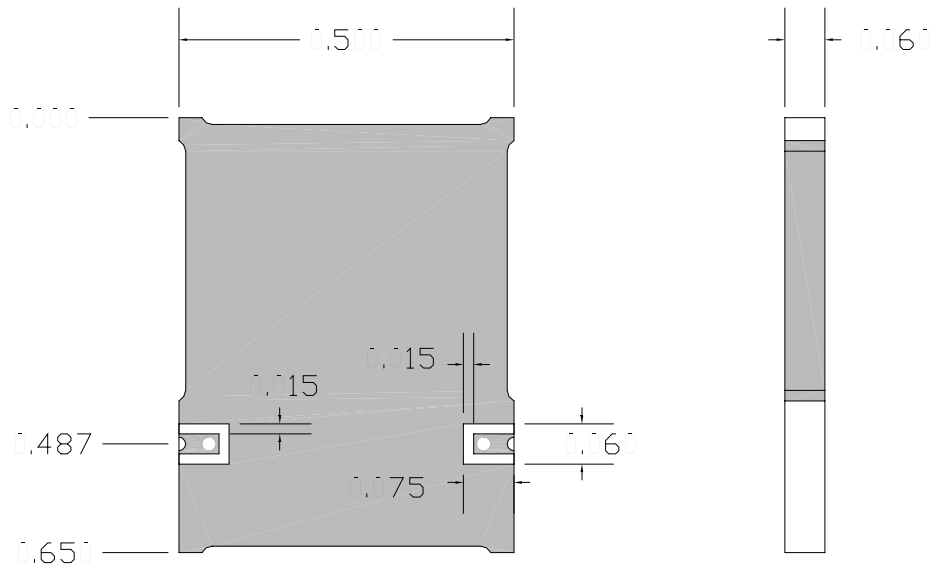
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## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	1 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	VSWR (MAX)
BANDPASS	3100 MHz Nominal	400	2.0 dB (MAX)	40 dB MIN. @ DC-1000 MHz 65 dB MIN. @ 1000-2000 MHz 65 dB MIN @ 4500 - 5000 MHz	1.7:1 @ Fc ± 0.1 GHz
SIZE (INCHES)		WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
0.50 x 0.65 x 0.06		0.85 / 0.03	SMT	-55° - +85° C	

## PACKAGE OUTLINE



FBGI-3.1G

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. TOLERANCES: -3 PLACE DECIMALS; ±.005.

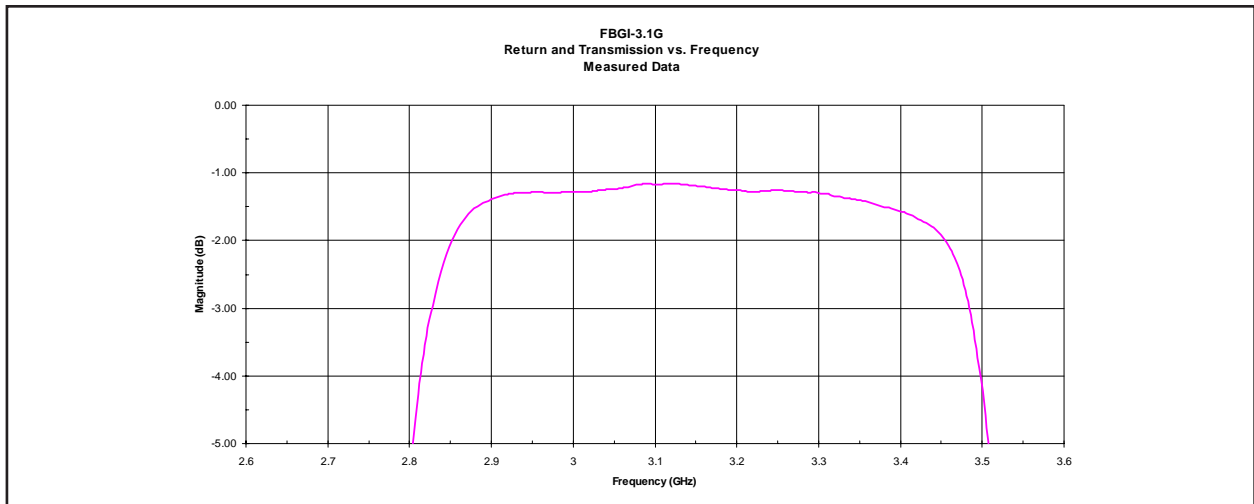
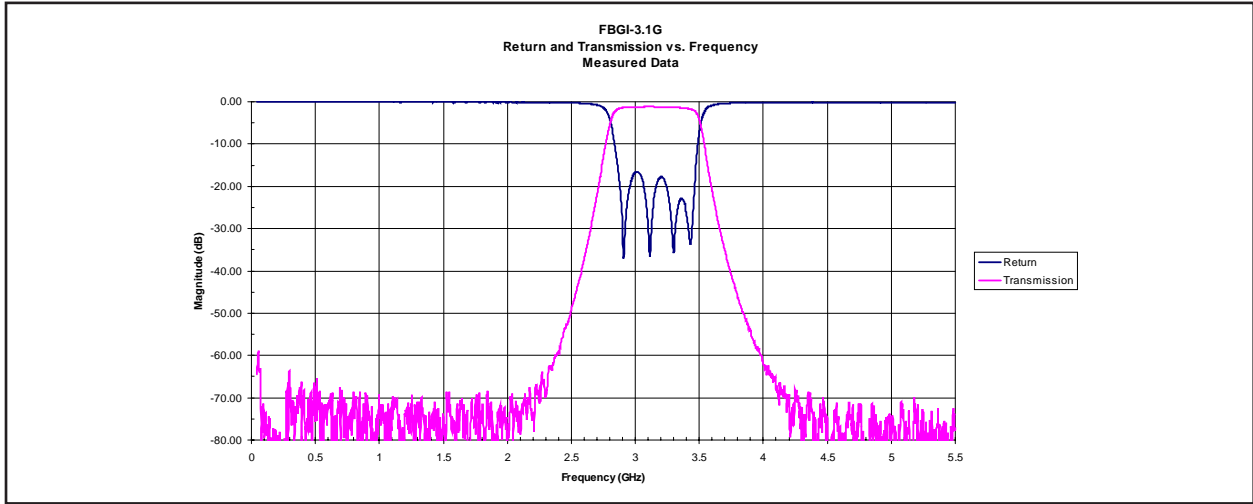
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U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-3.1G



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**TECHNICAL DESCRIPTION / APPLICATION**

**MULTI-MIX<sup>®</sup> FILTERS**

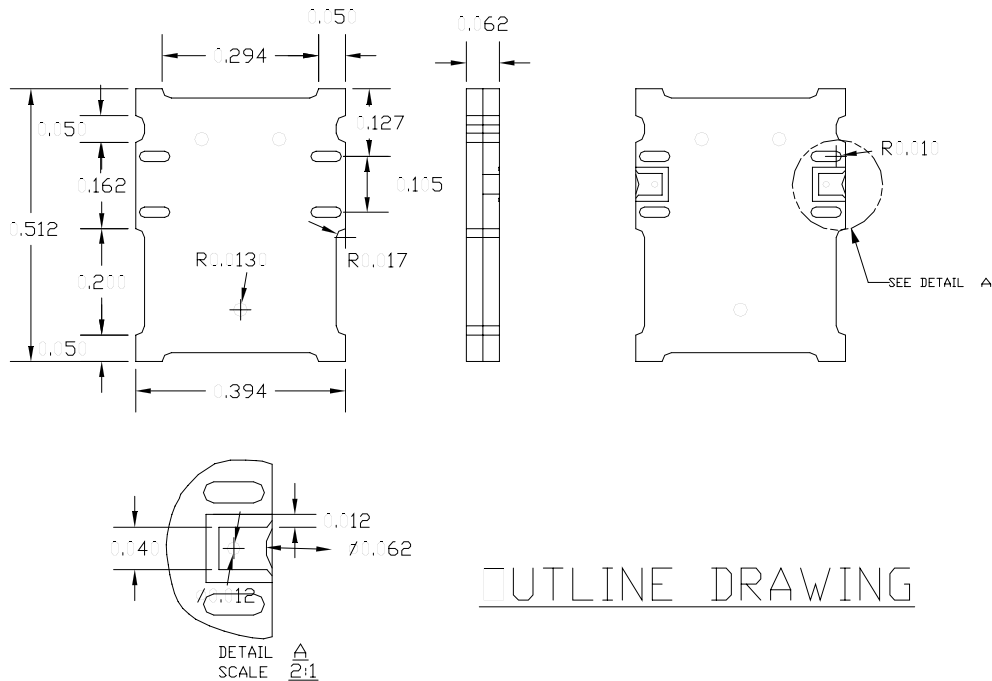
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**GENERAL SPECIFICATIONS**

FILTER TYPE	CENTER FREQUENCY	3 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	VSWR
BANDPASS	3440 MHz Nominal	300	2.0 dB (MAX)	60 dB MIN. @ 940MHz 60 dB MIN. @ 5940 MHz	2.0:1 MAX @ 3440 ± 50 MHz
SIZE (INCHES)		WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
0.512 x 0.394 x 0.062		0.9 / 0.03	SMT	-55° - +85° C	

**PACKAGE OUTLINE**



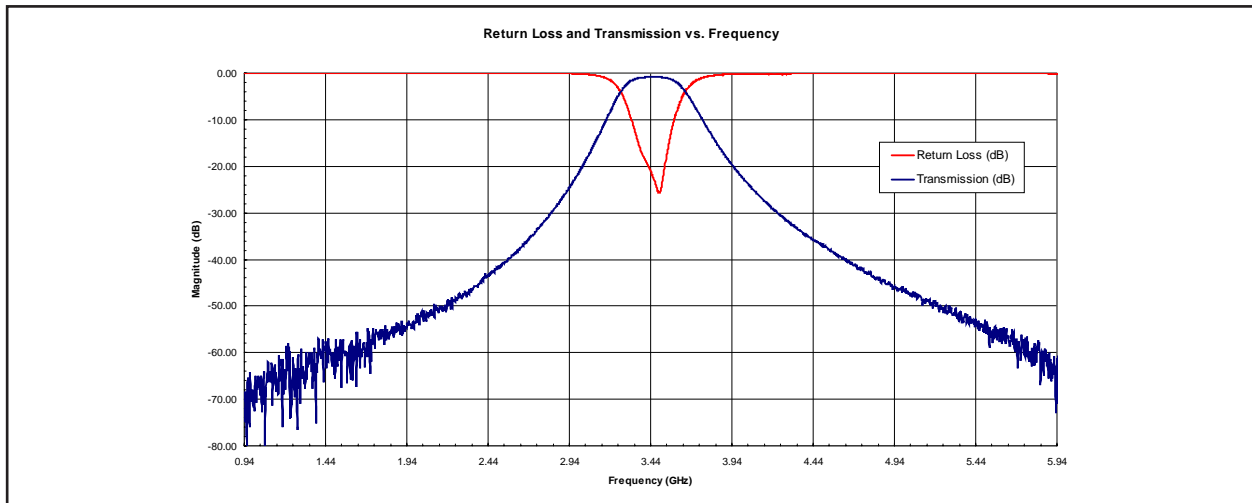
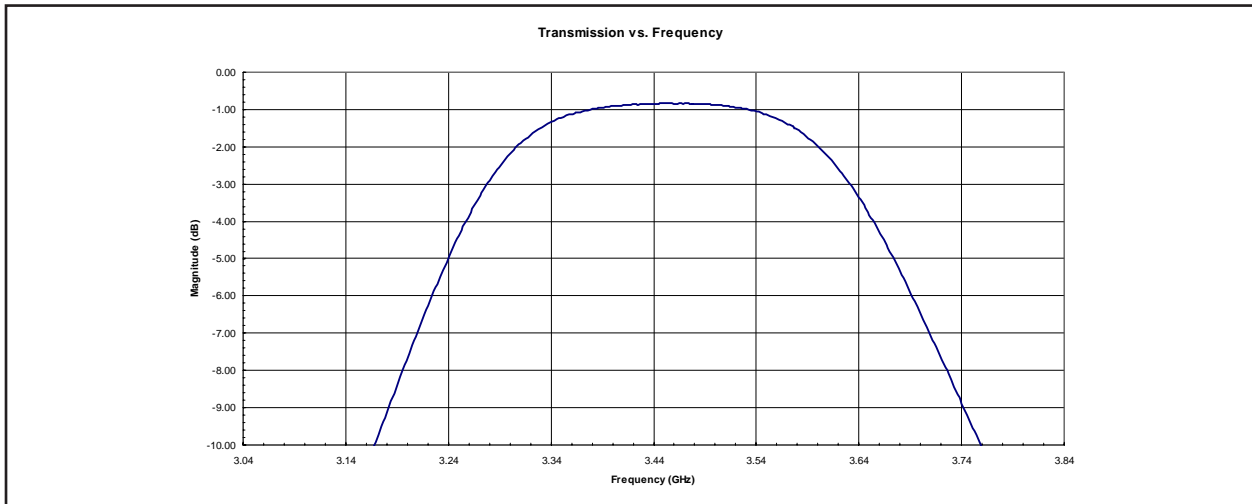
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U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-3.44G



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## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

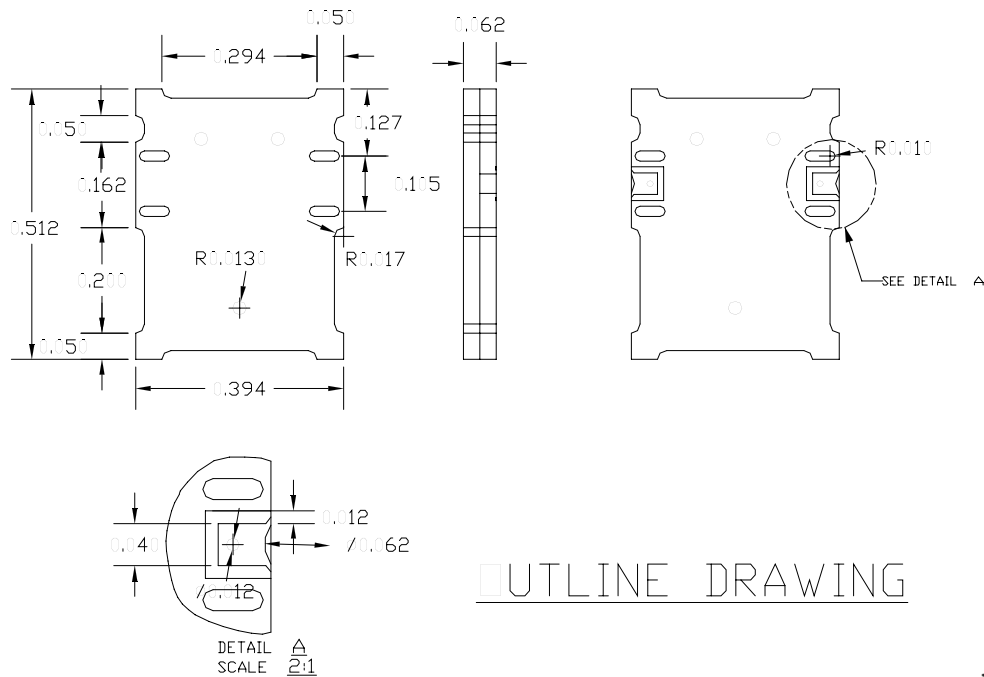
Merrimac's FBGI Series bandpass filters combine the features of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication technology with the ability to operate to three times their center frequency without reentrant spurious passbands. They typically offer better overall performance than filters designed to the same specification with conventional filter fabrication techniques.



## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	3 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	VSWR
BANDPASS	3550 MHz Nominal	300	2.0 dB (MAX)	60 dB MIN. @ 1150 MHz 56 dB MIN. @ 5950 MHz	2.0:1 MAX @ 3550 ± 100 MHz
SIZE (INCHES)	WEIGHT (GRAMS)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	SHOCK/ VIBRATION RANGE	
0.512 x 0.394 x 0.1	0.9	SMT	-55° - +85° C	per MIL P-23971	

## PACKAGE OUTLINE



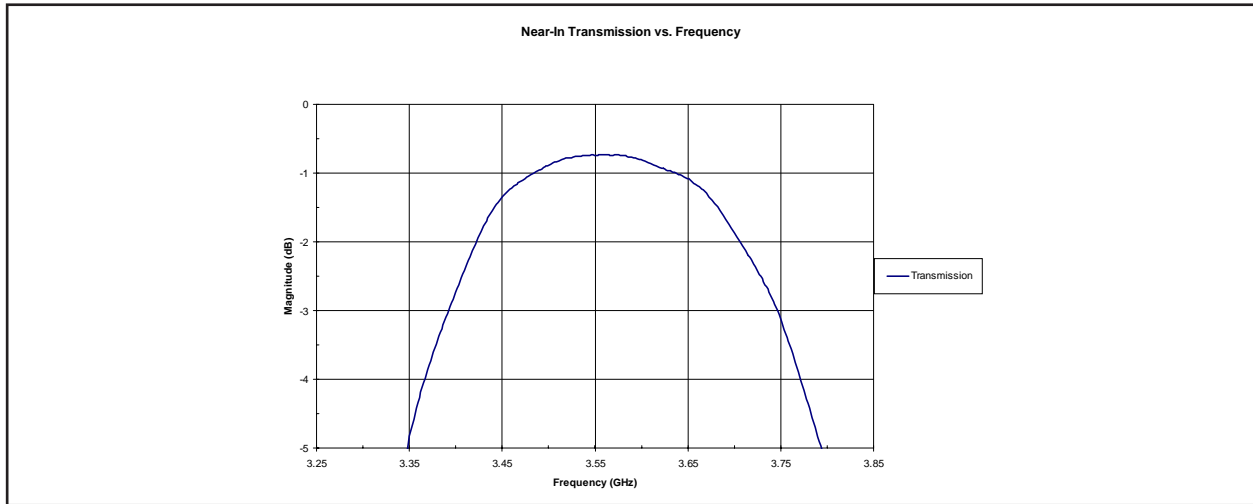
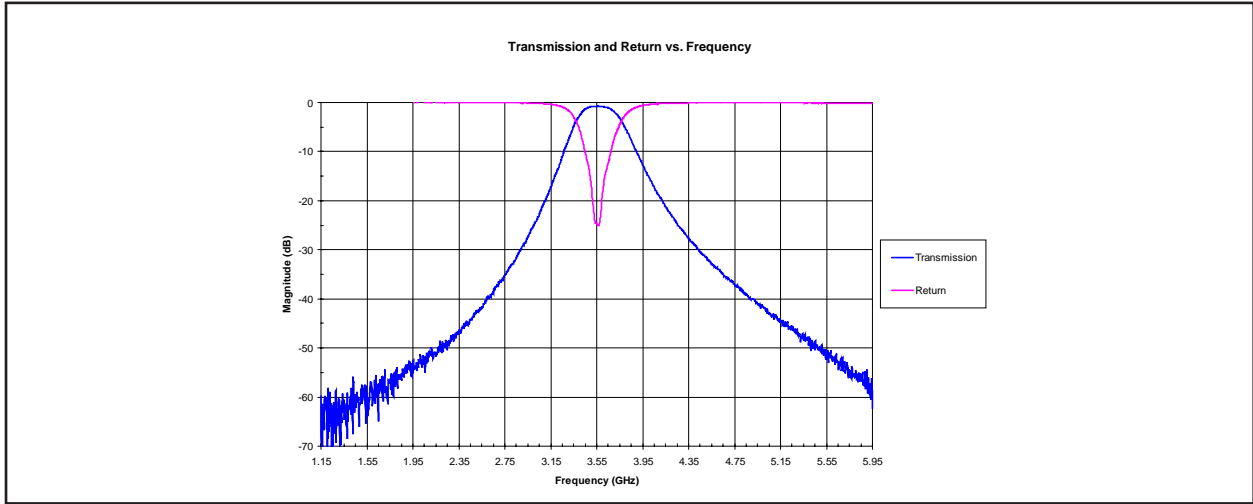
THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO 9001:2000 REGISTERED



U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-3.55G



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Merrimac Industries / 41 Fairfield Place, West Caldwell, NJ 07006  
Tel: 1.888.434.MMFM / Fax: 973.882.5990 / Email: MMFM@merrimacind.com / www.Multi-Mix.com

## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

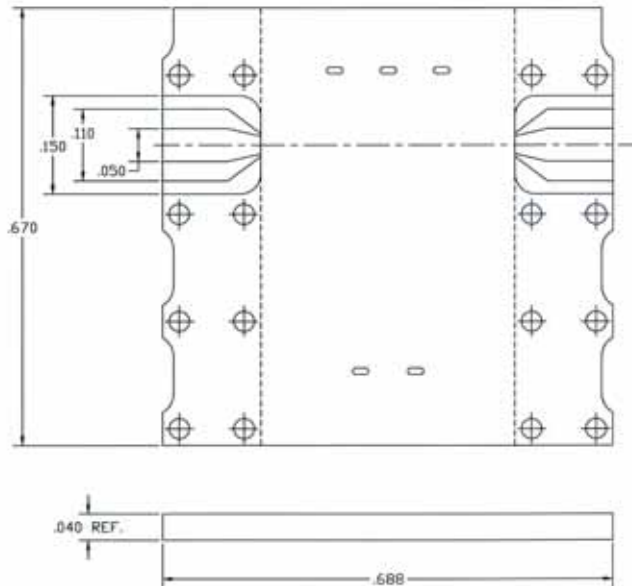
Merrimac's FBGI Series bandpass filters combine the features of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication technology with the ability to operate to three times their center frequency without reentrant spurious passbands. They typically offer better overall performance than filters designed to the same specification with conventional filter fabrication techniques.



## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	1 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	PASSBAND INPUT/ OUTPUT VSWR
BANDPASS	3780 MHz Nominal	575	1.5 dB (MAX)	55 dB MIN. @ 2500 MHz 55 dB MIN. @ 5000 MHz	1.5:1 (TYP) @ Fc ± 0.2 GHz 2.0:1 (MAX) @ Fc ± 0.2 GHz
INPUT/OUTPUT IMPEDANCE	POWER LEVEL	SIZE (INCHES)	WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE
50 Ohms (NOM)	1 W (TYP)	0.67 x 0.69 x 0.04	0.8 / 0.03	SMT or 50 Ohm, co-planar waveguide launch with gold pads	-55° - +85° C

## PACKAGE OUTLINE



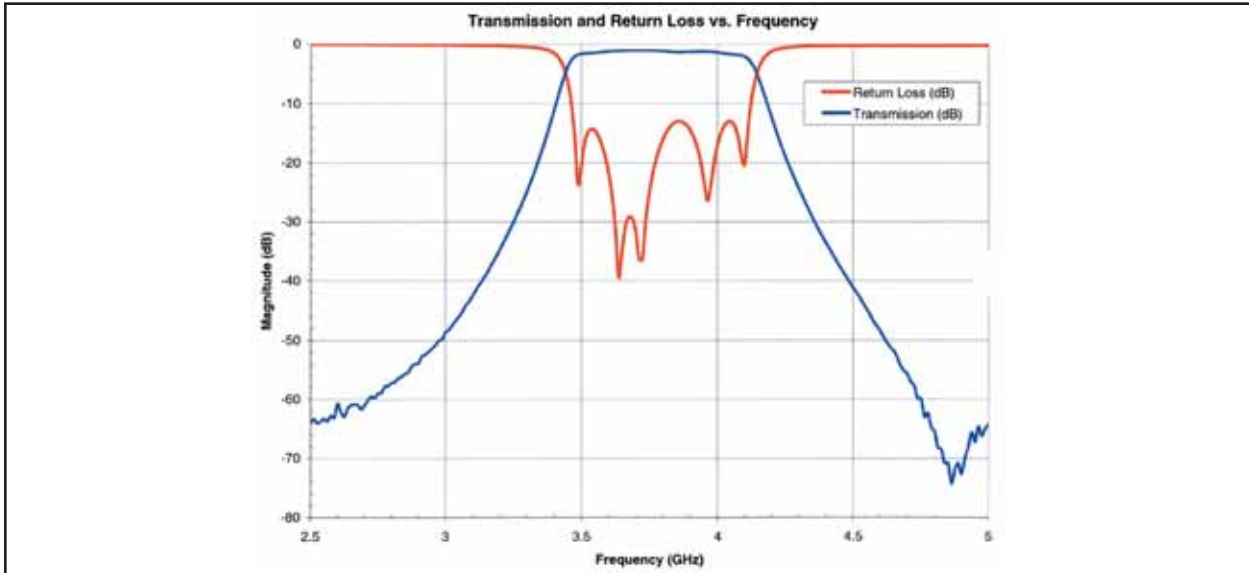
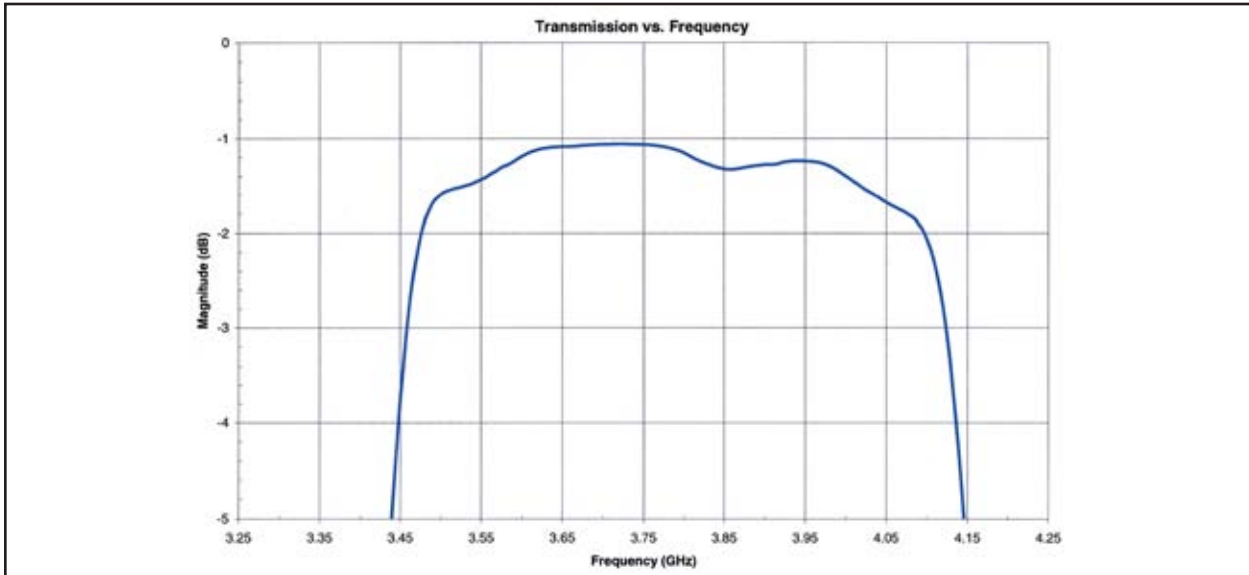
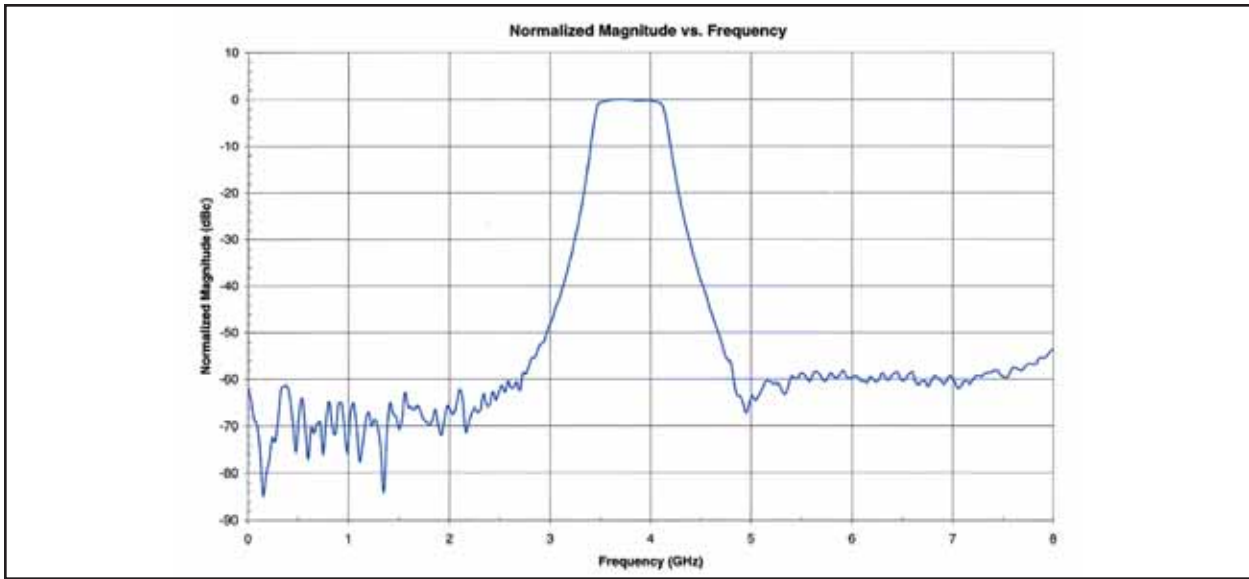
THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO 9001:2000 REGISTERED



U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-3.78G



THE MULTI-MIX MICROTECHNOLOGY® GROUP IS ISO 9001:2000 REGISTERED

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## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

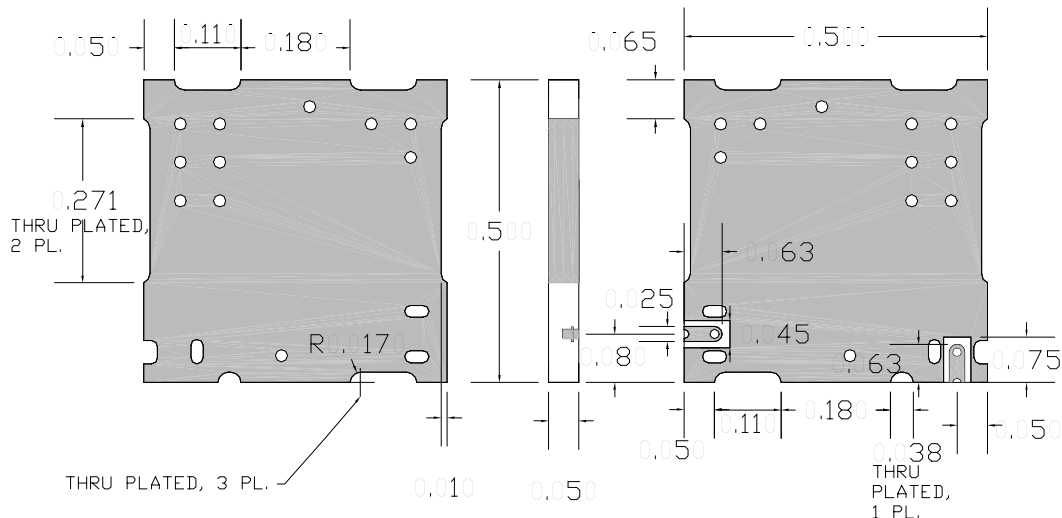
Merrimac's FBGI Series bandpass filters combine the features of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication technology with the ability to operate to three times their center frequency without reentrant spurious passbands. They typically offer better overall performance than filters designed to the same specification with conventional filter fabrication techniques.



## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	1 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	VSWR (MAX)
BANDPASS	3.84 GHz Nominal	400	0.8 dB (MAX)	-30 dB MIN. @ 2.0 GHz -20 dB MIN. @ 5.4 GHz -30 dB MIN. @ 7.2 GHz	1.5:1 @ 3.84±0.1 GHz
SIZE (INCHES)	WEIGHT (GRAMS/OZ.)	RF INTERFACE/CONNECTIONS		OPERATING TEMPERATURE	
0.5 x 0.5 x 0.05	0.6 / 0.02	SMT or 50 Ohm, co-planar waveguide launch with gold pads		-55° - +85° C	

## PACKAGE OUTLINE



- NOTES:  
1. ALL DIMENSIONS ARE IN INCHES.  
2. TOLERANCES: -3 PLACE DECIMALS; ±.005.

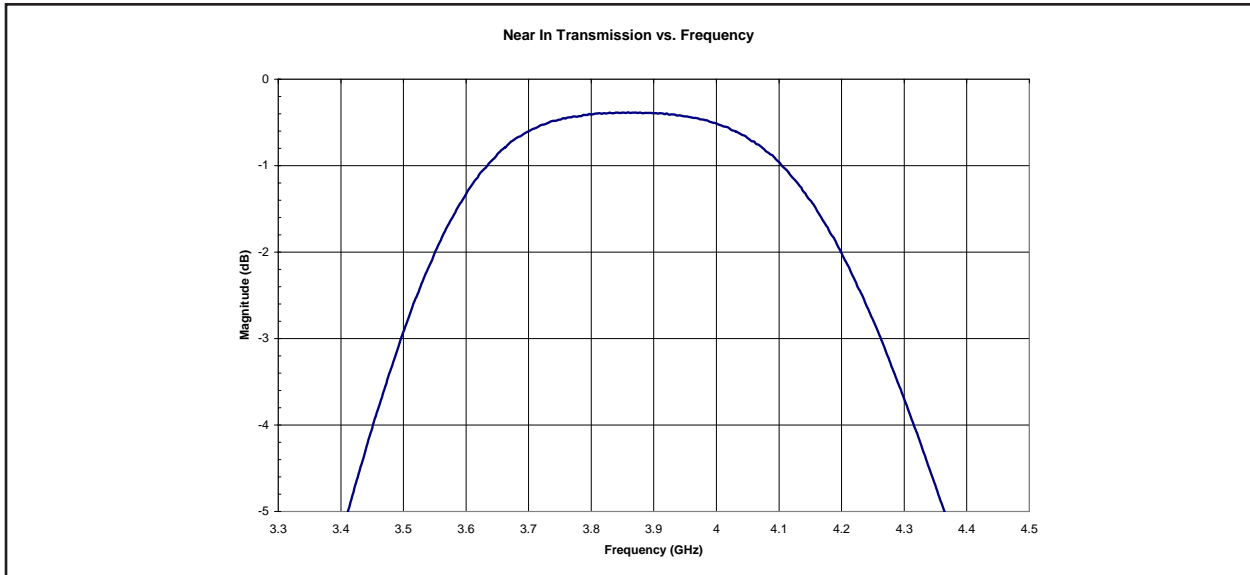
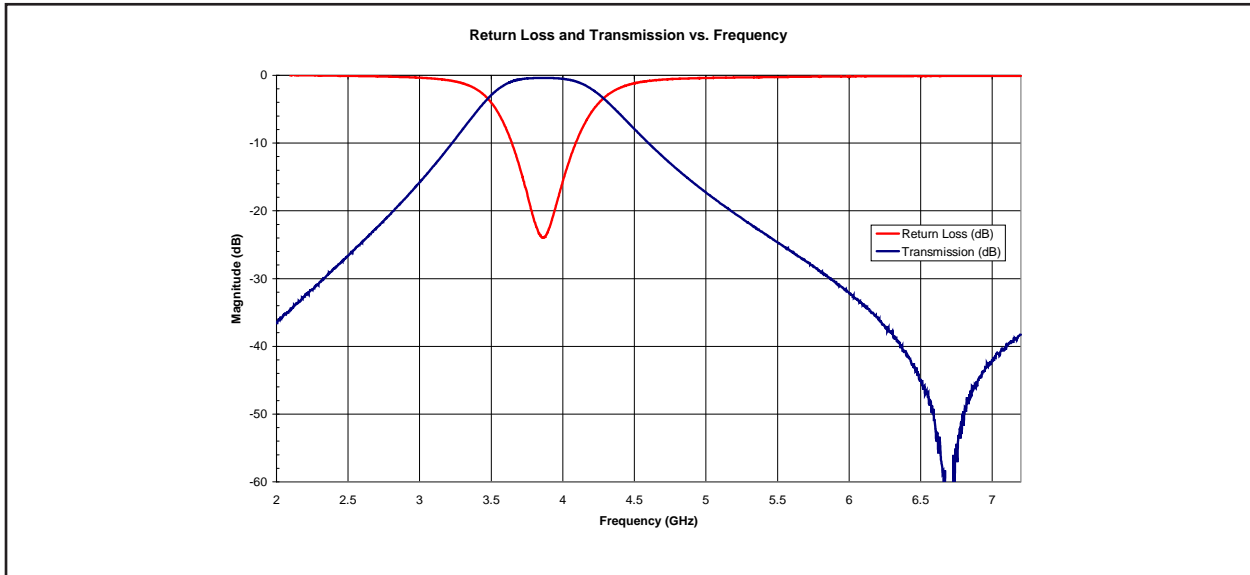
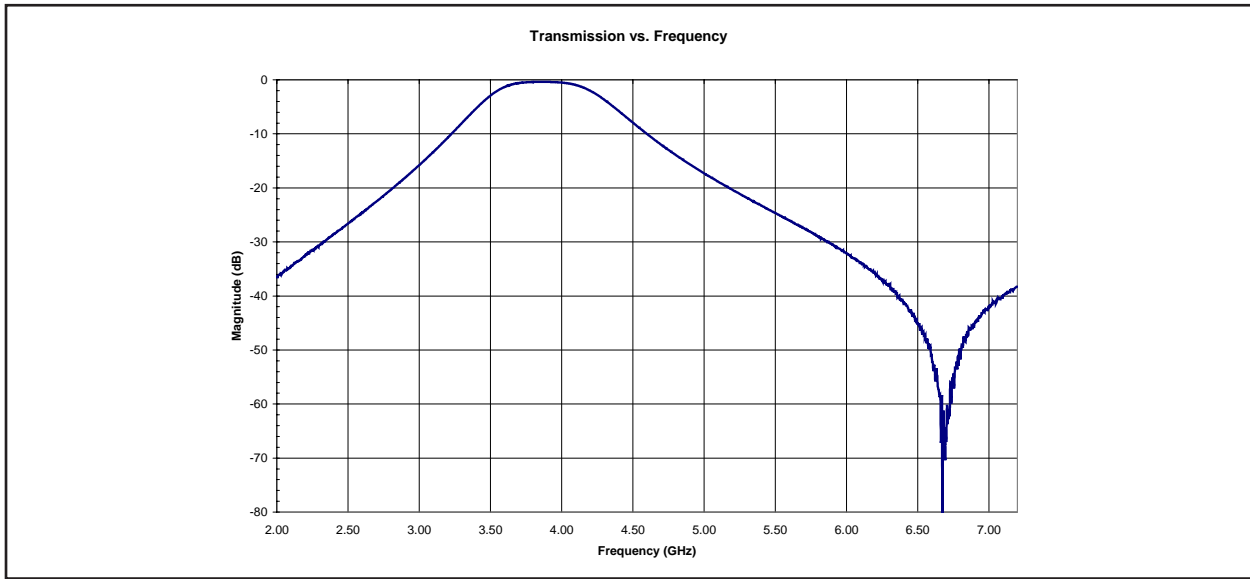
THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO 9001:2000 REGISTERED



U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-3.84G



THE MULTI-MIX MICROTECHNOLOGY® GROUP IS ISO 9001:2000 REGISTERED

Merrimac Industries / 41 Fairfield Place, West Caldwell, NJ 07006  
Tel: 1.888.434.MMFM / Fax: 973.882.5990 / Email: MMFM@merrimacind.com / www.Multi-Mix.com

## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

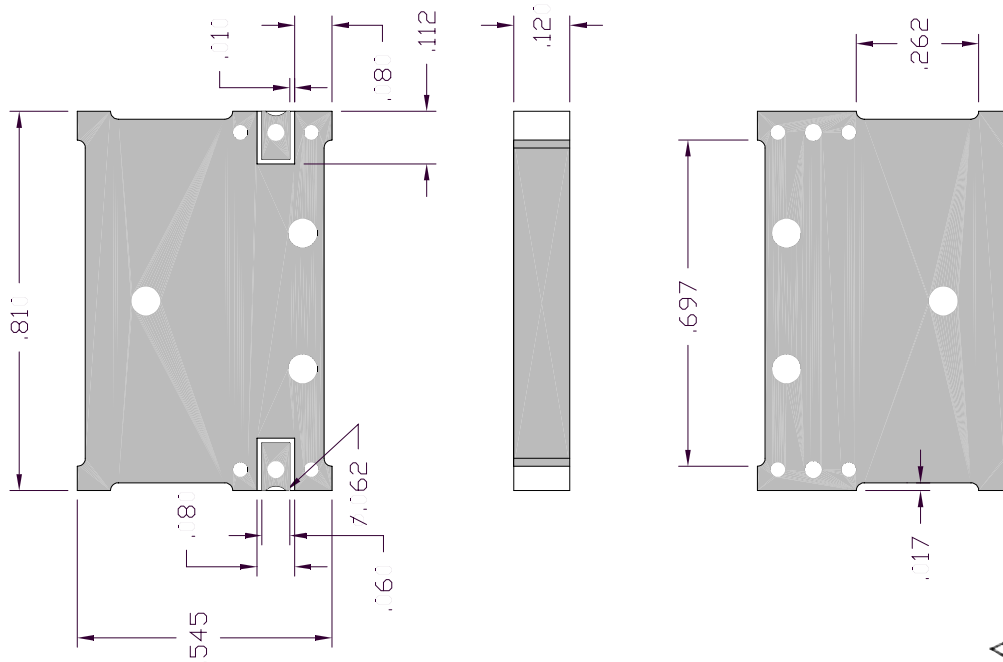
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## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	OPERATING PASSBAND (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	PASSBAND INPUT/ OUTPUT VSWR
BANDPASS	5.77 GHz Nominal	100	1.5 dB (TYP) 2.0 dB (MAX)	60 dB MIN. @ 4.27 GHz 60 dB MIN. @ 7.27 GHz	1.7:1 (MAX) @ 5770±50 MHz
IMPEDANCE	SIZE (INCHES)		WEIGHT (GRAMS/OZ.)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE
50 Ohms	0.8 x 0.55 x 0.12		2.2 / 0.08	SMT	-55° - +85° C

## PACKAGE OUTLINE



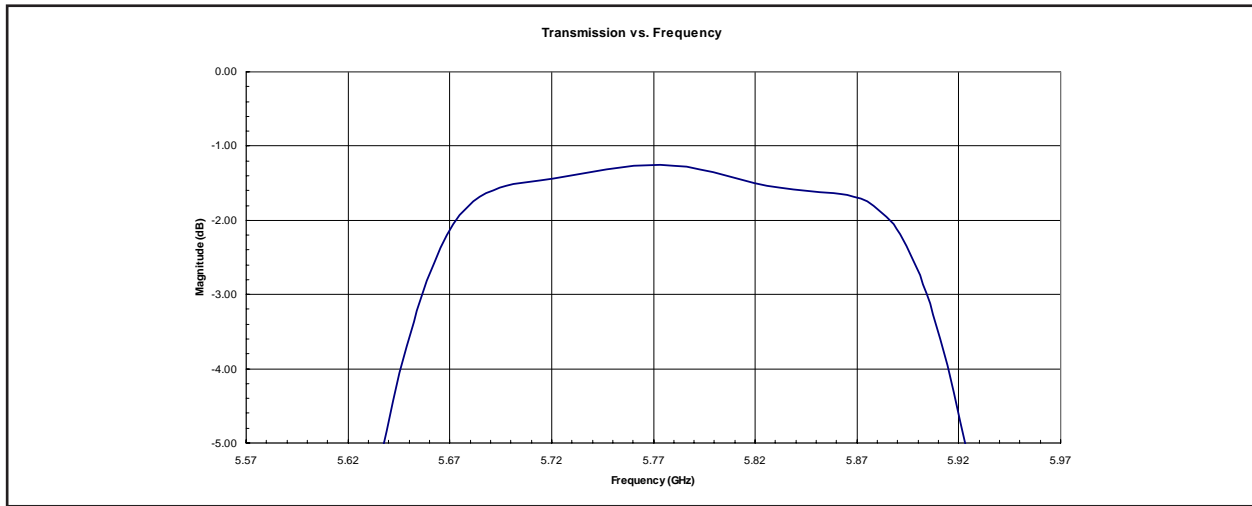
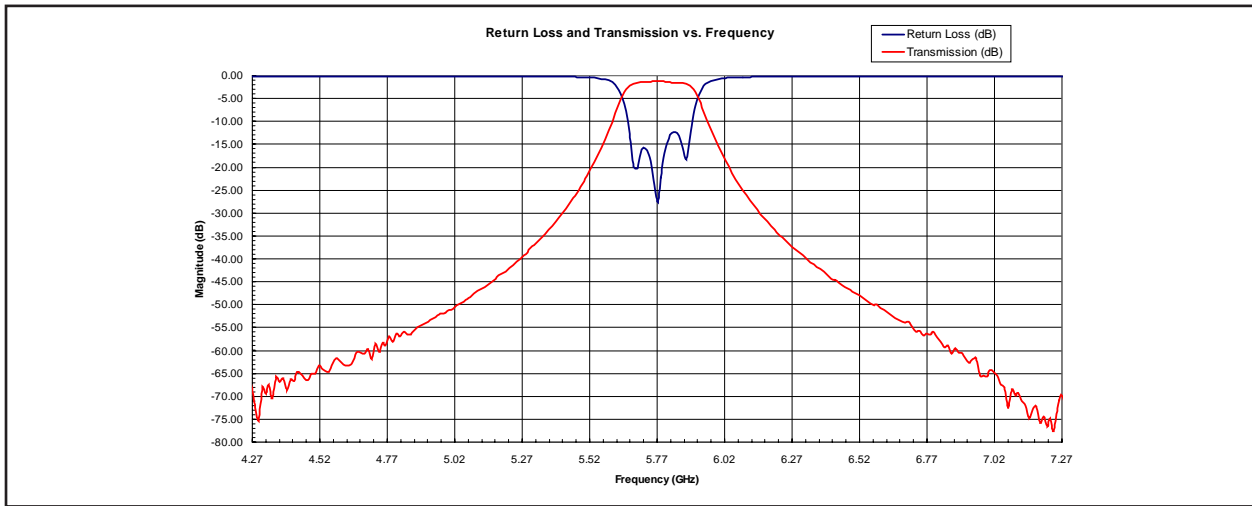
THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO 9001:2000 REGISTERED



U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-5.77G



THE MULTI-MIX MICROTECHNOLOGY® GROUP IS ISO 9001:2000 REGISTERED

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## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

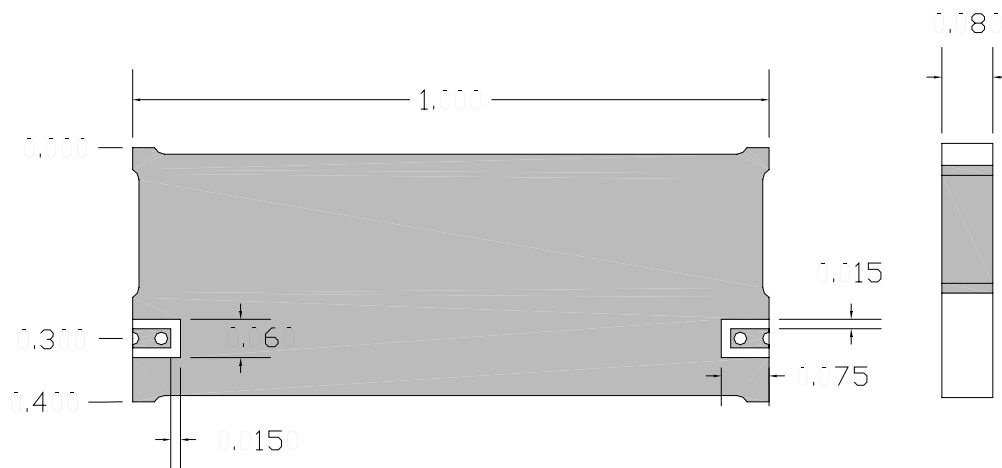
Merrimac's FBGI Series bandpass filters combine the features of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication technology with the ability to operate to three times their center frequency without reentrant spurious passbands. They typically offer better overall performance than filters designed to the same specification with conventional filter fabrication techniques.



## GENERAL SPECIFICATIONS

FILTER TYPE	CENTER FREQUENCY	1 dB OPERATING BANDWIDTH (MHz MIN)	INSERTION LOSS @ CENTER FREQUENCY	REJECTION	VSWR (MAX)
BANDPASS	5893 MHz Nominal	400	3.5 dB (MAX)	40 dB MIN. @ DC-4900 MHz 50 dB MIN. @ 4900-5243 MHz 50 dB MIN. @ 6603-6900 MHz 40 dB MIN @ 6900-8000 MHz	1.7:1 @ Fc ± 0.1 GHz
SIZE (INCHES)	WEIGHT (GRAMS/OZ.)	RF INTERFACE/CONNECTIONS		OPERATING TEMPERATURE	
1.00 x 0.40 x 0.08	2 / 0.1	SMT		-55° - +85° C	

## PACKAGE OUTLINE



FBGI-5.89G

- NOTES:  
1. ALL DIMENSIONS ARE IN INCHES.  
2. TOLERANCES: -3 PLACE DECIMALS; ±.005.

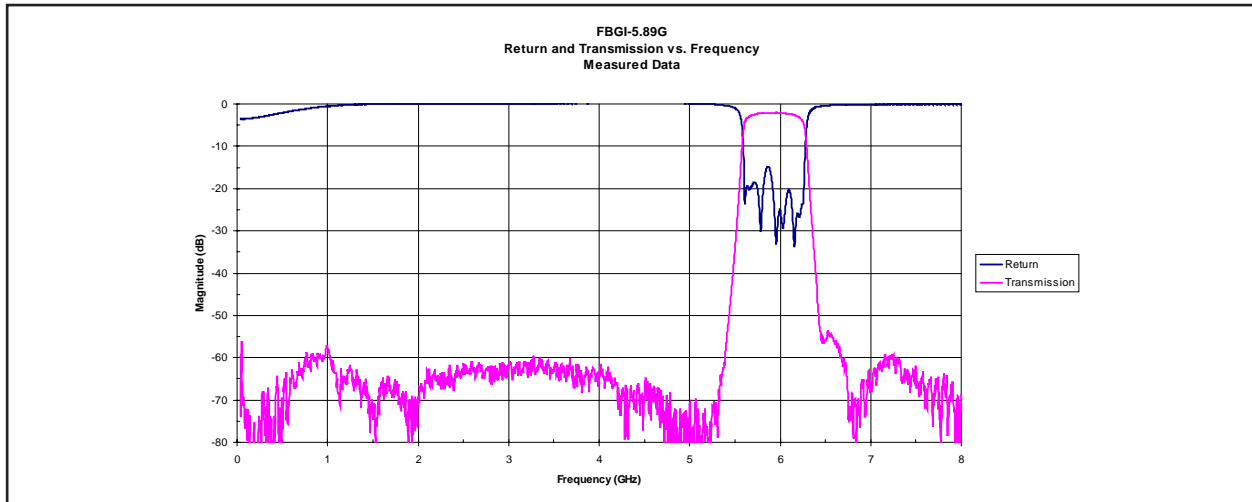
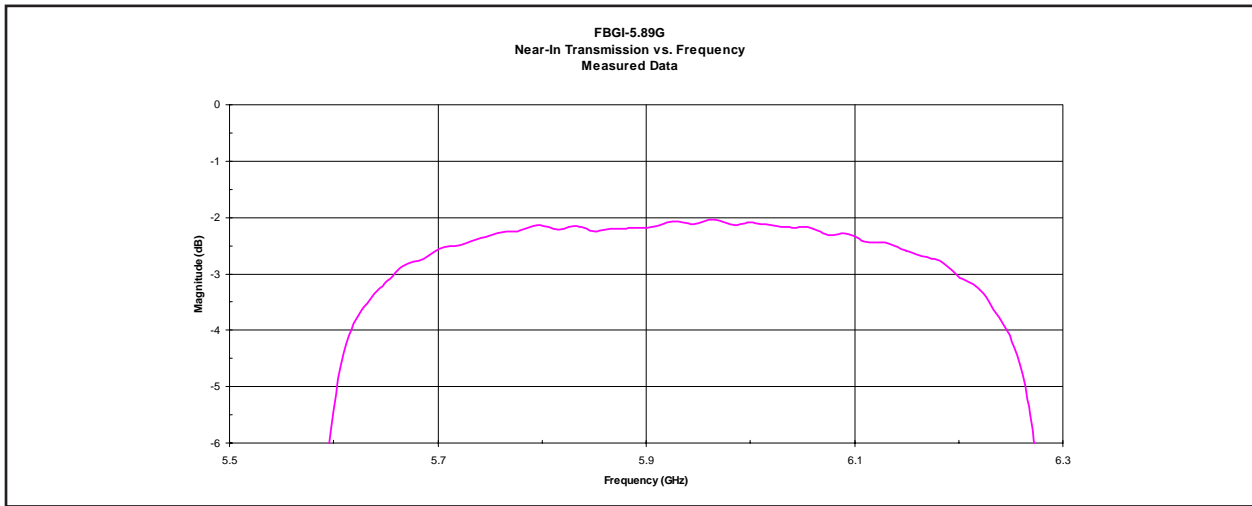
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U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBGI-5.89G



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## TECHNICAL DESCRIPTION / APPLICATION

### MULTI-MIX<sup>®</sup> FILTERS

- UP TO 40GHz
- LOW LOSS
- NO TUNING
- SMT COMPATIBLE
- SMALL & LIGHT WEIGHT
- LOW COST



Merrimac's FBKA Series millimeter-wave filters provide superior performance over conventional filter topologies, with center frequencies as high as 40 GHz. They are extremely small, lightweight, and rugged, and can be qualified for spaceflight applications. In addition, they are low in cost and need no tuning, which makes them an excellent choice for high-volume production in LMDS and other millimeter-wave communications applications. The FBKA Series filters incorporate all of the advantages of Merrimac's patented Multi-Mix<sup>®</sup> multilayer fabrication process, including superior electrical characteristics, extremely small size, and negligible part-to-part performance variation.

Their benefits include:

- Employs fusion bonded stripline with inherent performance benefits at high frequencies.
- Passbands as narrow as 1%.
- Extremely small size and cost effective.
- Can be specified with center frequencies from to 17.5 GHz through 40 GHz.
- Designed for wire-bond attachment / BGA compatible.
- Tuning is not required, which eliminates the filter-tuning step in production test, along with the external tuning circuits or tuning screws required by conventional designs.
- Can be integrated with other Multi-Mix<sup>®</sup> components in a compact enclosure to form a complete passive or active subsystem.
- Inherently low EM emissions.
- No spurious reentrant passbands over wide frequency range (up to 65 GHz).

### GENERAL SPECIFICATIONS

FILTER TYPE	OPERATING BANDPASS	PASSBAND INSERTION LOSS (MAX)	INPUT/OUTPUT RETURN LOSS (MAX)	REJECTION	PASSBAND GROUP DELAY
BANDPASS	29.5 - 30.0 GHz	3 dB	12 dB	43 dB MIN. @ 27.0 GHz 30 dB MIN @ 32.0 - 33.0 GHz	1 nS p-p (MAX)
POWER LEVEL	SIZE (INCHES)	WEIGHT (GRAMS)	RF INTERFACE/ CONNECTIONS	OPERATING TEMPERATURE	
1 W (TYP)	0.413 x 0.296 x 0.020	0.1	Gold plated co-planar WG launch/ BGA compatible	-55° - +125° C	

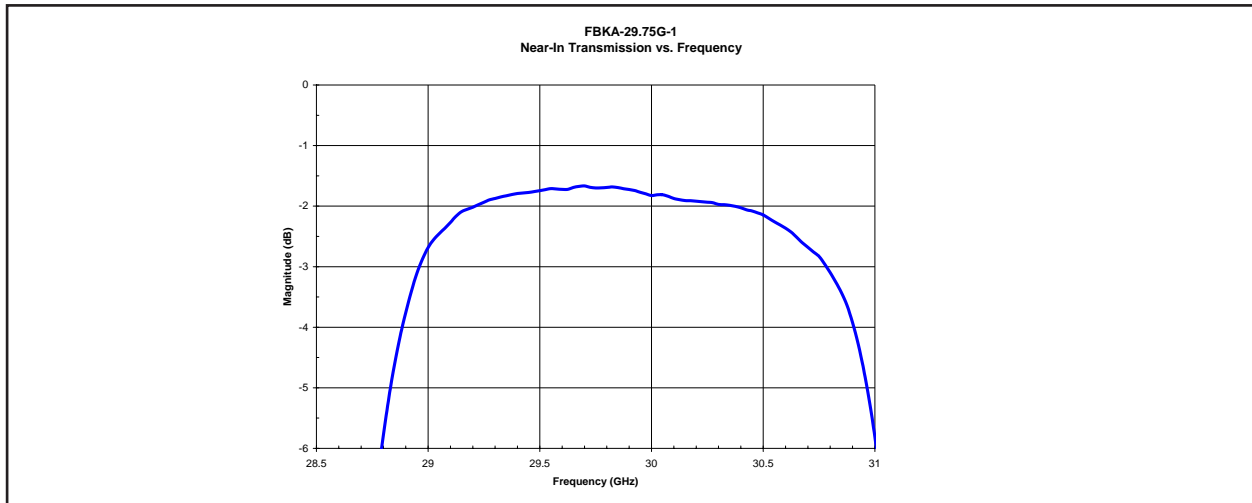
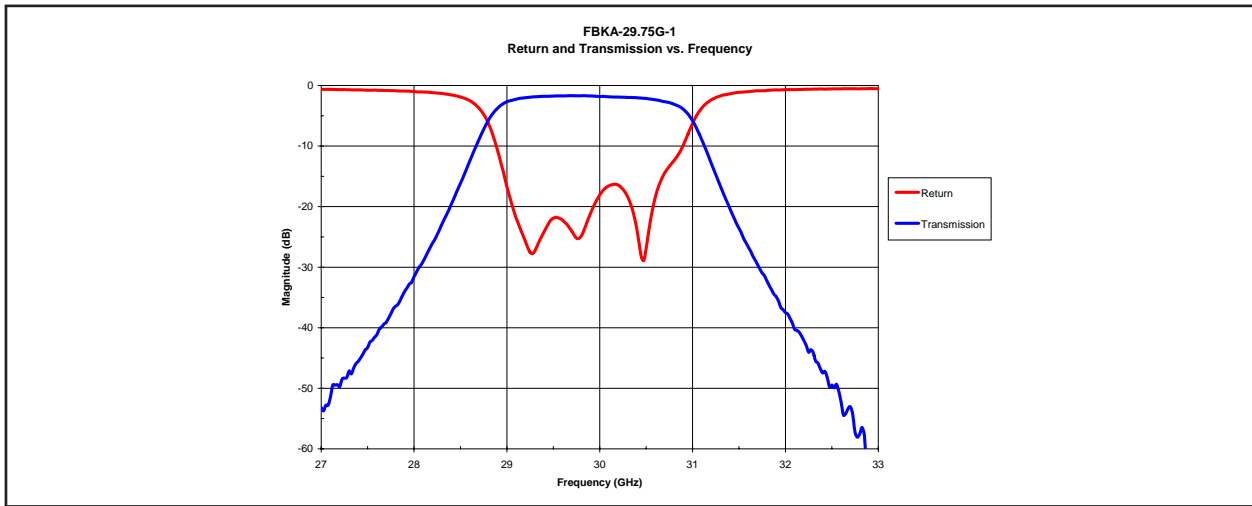
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U.S. patent 6,099,677 and other patents pending.

# TYPICAL PERFORMANCE

FBKA-29.75G-1



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**GENERAL SPECIFICATIONS**

**ELECTRICAL**

FILTER TYPE	Bandpass
OPERATING PASSBAND	3 GHz
PASSBAND INSERTION LOSS*	3.5 dB (TYP)
INPUT/OUTPUT RETURN LOSS	15 dB (TYP)
REJECTION	60 dB min. @ 38.5 GHz 30 dB min. @ 46.0 GHz
POWER LEVEL	1 W Typ.

\*INSERTION LOSS INCLUDES FIXTURING AND COAXIAL CONNECTOR LOSSES AS DISPLAYED IN CHARTS

**MECHANICAL**

SIZE / OUTLINE	0.620 x 0.296 x 0.020 inches (l,w,h)
WEIGHT	0.2g
RF INTERFACE	SMT/GOLD PLATING

**ENVIRONMENTAL**

OPERATING TEMPERATURE RANGE	-55° To + 125°, C
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**THE MULTI-MIX MICROTECHNOLOGY<sup>®</sup> GROUP IS ISO-9001 REGISTERED**



U.S. patent 6,099,677 and other patents pending

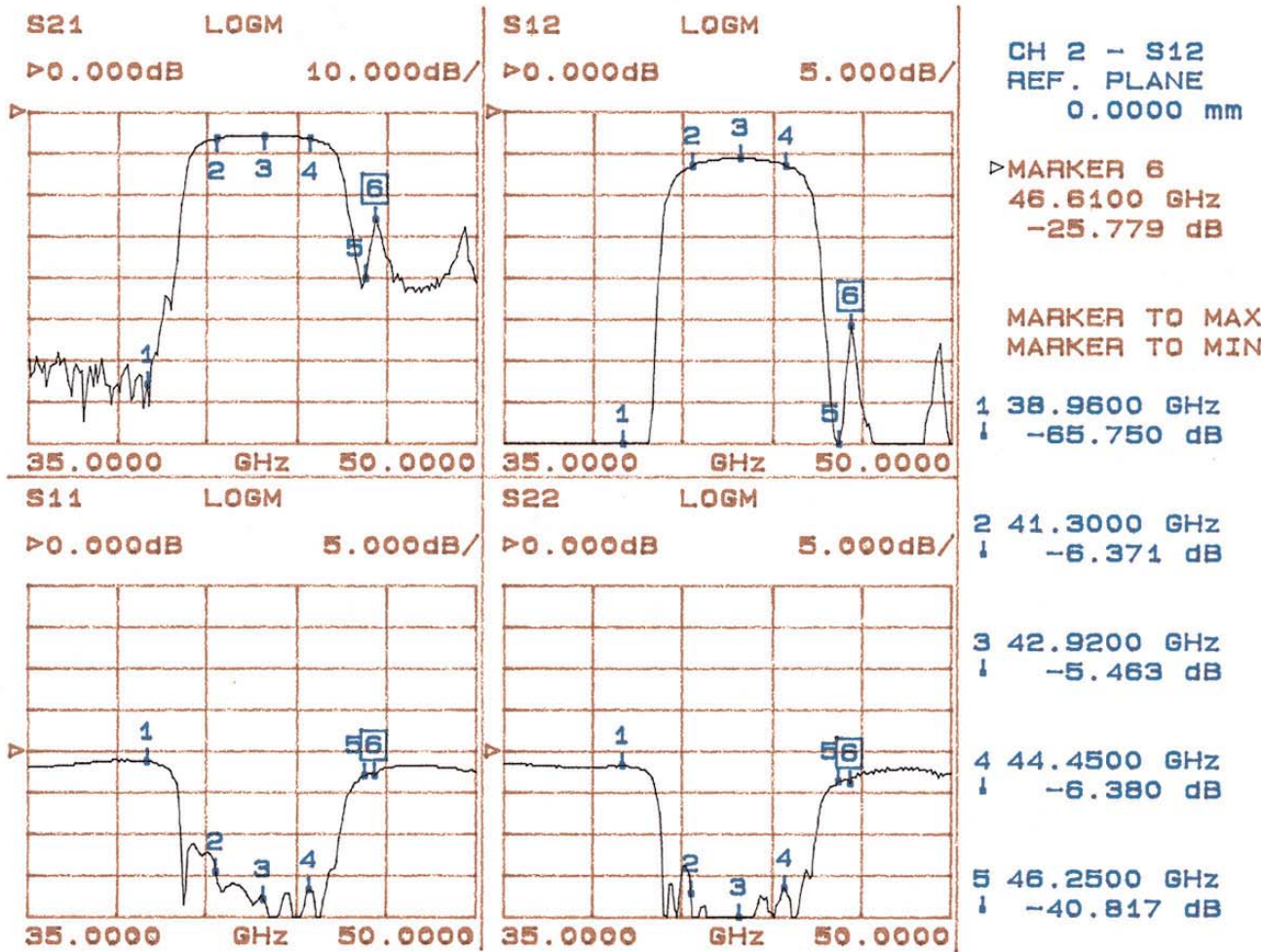
# PERFORMANCE CHARTS

**WILTRON**

380 NETWORK ANALYZER

MODEL: FBMM 42.0G      DATE: 8/14/03  
 DEVICE: B-1 build on 7/23/03      OPERATOR:

START: 35.0000 GHz      GATE START:      ERROR CORR: 12 - TERM  
 STOP: 50.0000 GHz      GATE STOP:      AVERAGING: 1 PTS  
 STEP: 0.0900 GHz      GATE:      IF BNDWTH: MINIMUM  
 WINDOW:



UNIT SOLDERED TO FIXTURE