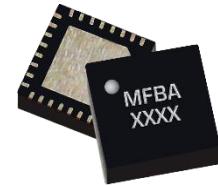


1 Device Overview

1.1 General Description

The MFBA-0000XPSM family of passive MMIC surface mount bandpass filters are an ideal solution for small form factor, high rejection filtering. Passive GaAs MMIC technology allows production of smaller filter constructions that replace larger form factor circuit board constructions. Tight fabrication tolerances allow for less unit to unit variation than traditional filter technologies. The MFBA-0000XPSM is available as a 5x5mm plastic QFN. Low unit to unit variation allows for accurate simulations using the provided S2P file taken from measured production units.



PSM

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 Options¹

Part Number	1dBc Passband (GHz)	Description	Package	Green Status	Product Lifecycle	Export Classification
MFBA-00001PSM	14.10 – 17.90	5 x 5 mm QFN	PSM	RoHS	Active	EAR99
MFBA-00002PSM	18.10 – 26.00					
MFBA-00003PSM	10.10 – 14.10					
MFBA-00004PSM	8.40 – 12.50					
EVB-MFBA-00001P	14.10 – 17.90	Evaluation fixture with 2.92mm connectors	EVB	RoHS	Active	EAR99
EVB-MFBA-00002P	18.10 – 26.00					
EVB-MFBA-00003P	10.10 – 14.10					
EVB-MFBA-00004P	8.40 – 12.50					

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

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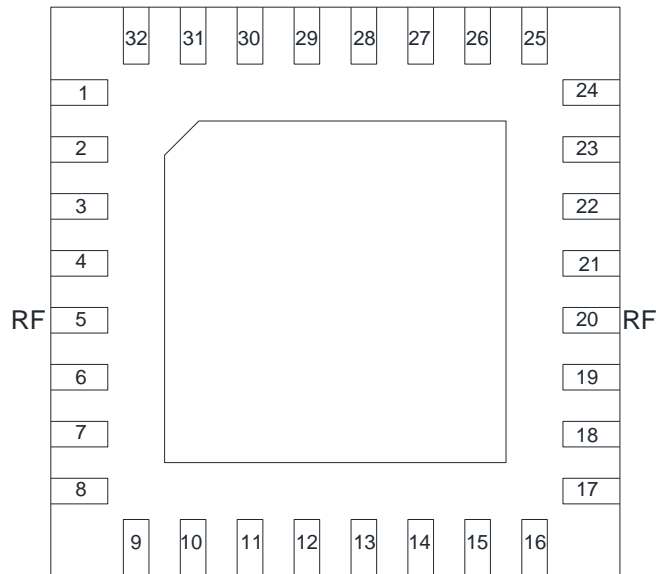
Revision History

Revision Code	Revision Date	Comment
-	October 2022	Datasheet Initial Release

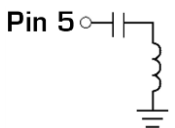
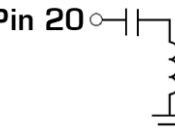
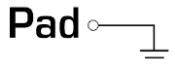
2 Port Configurations and Functions

2.1 Port Diagram

A top-down x-ray view of the MFBA-0000XPSM package outline drawing is shown below. The MMIC bandpass filters are symmetrical allowing Pin 5 or Port 20 to be used as the input.



2.2 Port Functions

Port	Function	Description	Equivalent Circuit
Pin 5	Input/Output	Pin 5 is DC open to ground for the PSM package.	
Pin 20	Input/Output	Pin 20 is DC open to ground for the PSM package.	
Pad	Ground	PSM package ground path is provided through the substrate and ground bond pads.	

3 Specifications

3.1 Absolute Maximum Ratings

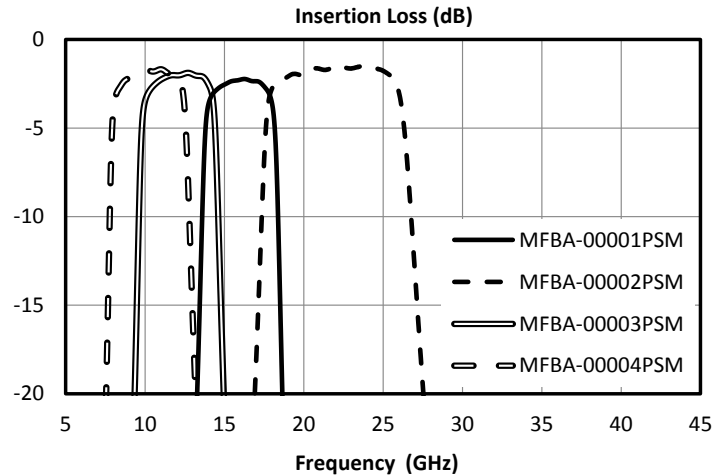
The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded, the device may be inoperable or have a reduced lifetime.

Parameter	Maximum Rating	Units
Port 1 DC Current	400	mA
Port 2 DC Current	400	mA
Operating Temperature	-55 to +100	°C
Storage Temperature	-65 to +125	°C

3.2 Package Information

Parameter	Details	Rating
ESD	Human Body Model (HBM), per MIL-STD-750, Method 1020	N/A

3.3 Passband Comparison



Part Number	1dBc Cutoff Low (GHz)	1dBc Cutoff High (GHz)
MFBA-00001PSM	14.10	17.90
MFBA-00002PSM	18.10	26.00
MFBA-00003PSM	10.10	14.10
MFBA-00004PSM	8.40	12.50

3.4 Electrical Specifications

The electrical specifications apply at $T_A=+25^{\circ}\text{C}$ in a 50Ω system. Typical data shown is for the filter in a PSM package with a sine wave input applied to Pin 5.

Min and Max limits are guaranteed at $T_A=+25^{\circ}\text{C}$.

MFBA-00001PSM	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			16	
1dBc Passband (GHz)			14.10 – 17.90	
3dBc Passband (GHz)			13.75 – 18.25	
Insertion Loss @ f_c (dB)	16		2.40	
Passband Return Loss (dB)	14.60 – 15.60	15	22	
Stopband Suppression (dB)	DC – 11.00	40	82	
	21.00 – 45.00	40	45	
Group Delay (ps)			550	
Impedance (Ω)			50	

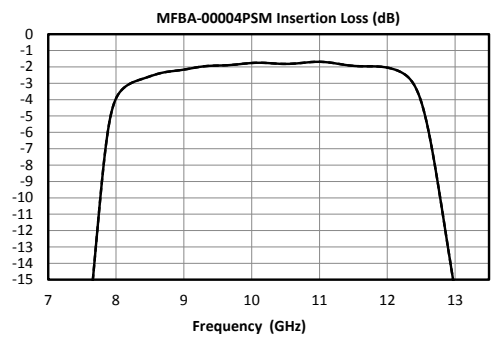
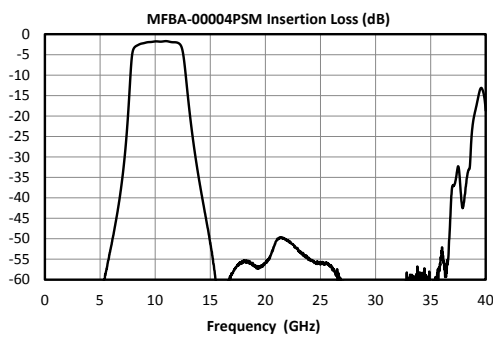
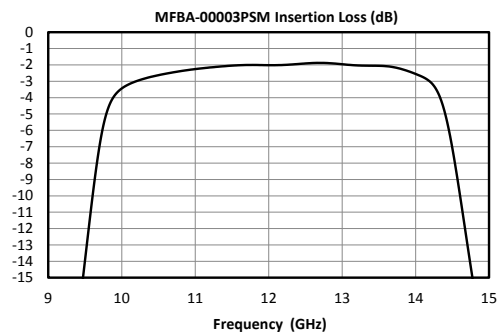
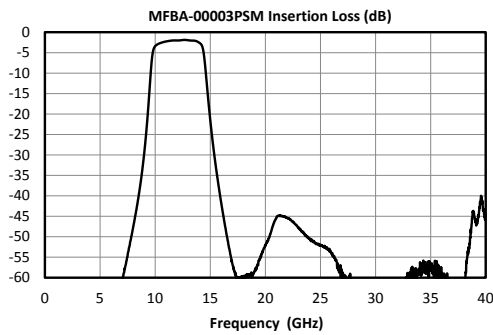
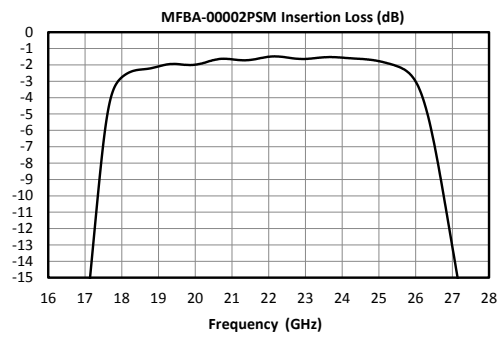
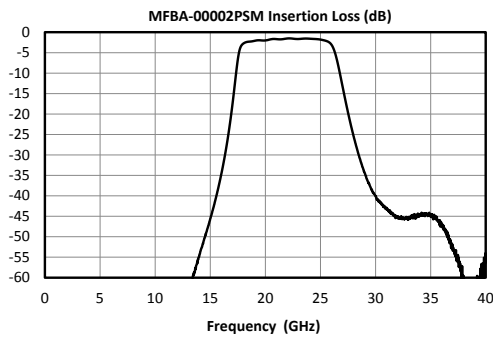
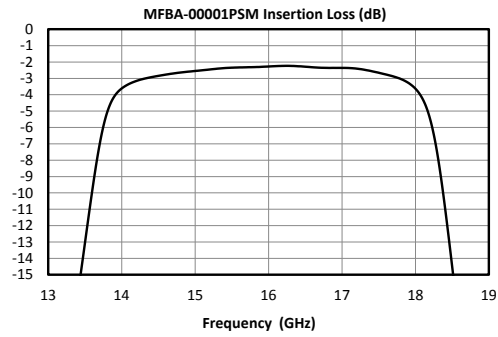
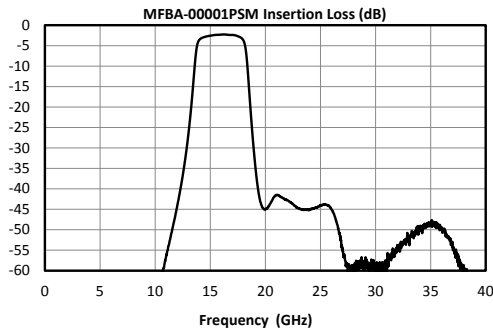
MFBA-00002PSM	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			22.20	
1dBc Passband (GHz)			18.10 – 26.00	
3dBc Passband (GHz)			17.70 – 26.35	
Insertion Loss @ f_c (dB)	22.20		1.80	
Passband Return Loss (dB)	18.10 – 26.00	13	20	
Stopband Suppression (dB)	DC – 14.00	40	78	
	31.00 – 55.00	40	44	
Group Delay (ps)			300	
Impedance (Ω)			50	

MFBA-00003PSM	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			12.00	
1dBc Passband (GHz)			10.10 – 14.10	
3dBc Passband (GHz)			9.75 – 14.40	
Insertion Loss @ f_c (dB)	12.00		2.10	
Passband Return Loss (dB)	10.10 – 14.10	15	21.8	
Stopband Suppression (dB)	DC – 7.00	40	80	
	17.00 – 37.00	40	44	
Group Delay (ps)			521	
Impedance (Ω)			50	

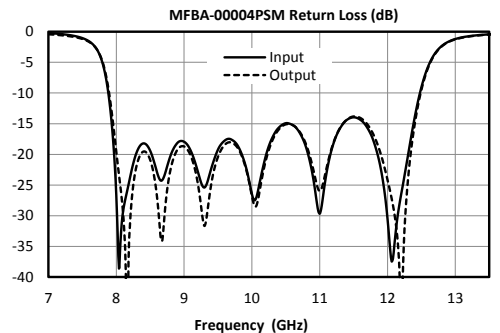
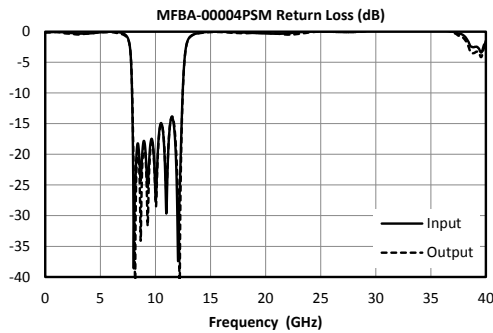
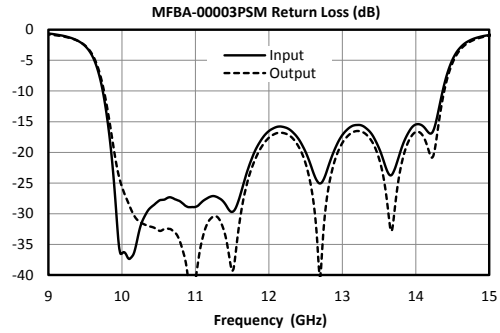
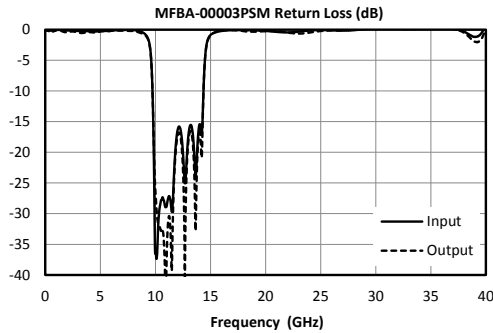
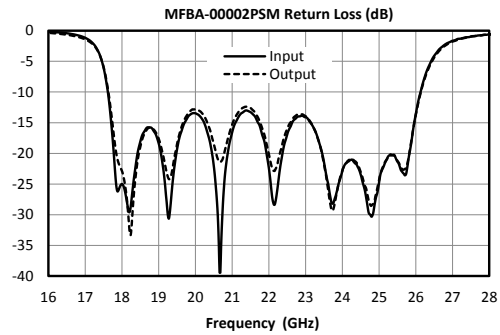
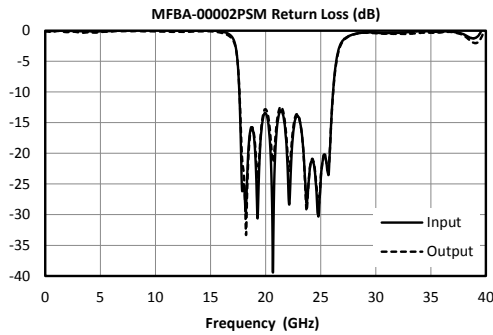
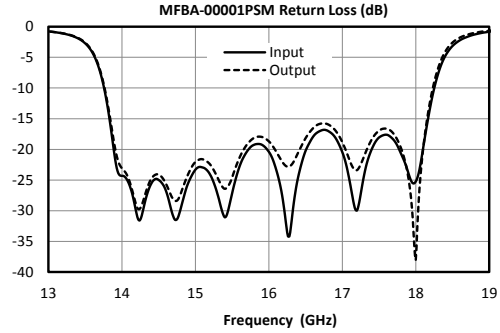
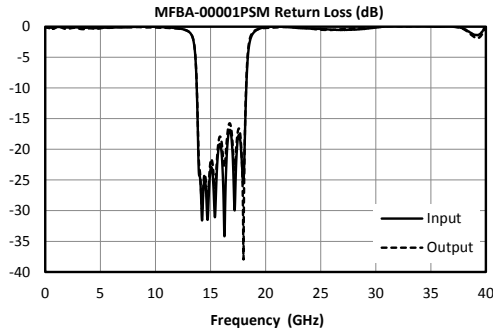
MFBA-00004PSM	Frequency (GHz)	Min	Typ.	Max
Center Frequency, f_c (GHz)			10.00	
1dBc Passband (GHz)			8.40 – 12.25	
3dBc Passband (GHz)			7.95 – 12.50	
Insertion Loss @ f_c (dB)	10.00		1.90	
Passband Return Loss (dB)	8.00 – 12.30	15	19.2	
Stopband Suppression (dB)	DC – 6.00	40	70	
	15.00 – 35.00	40	46	
Group Delay (ps)			523	
Impedance (Ω)			50	

3.5 Typical Performance Plots

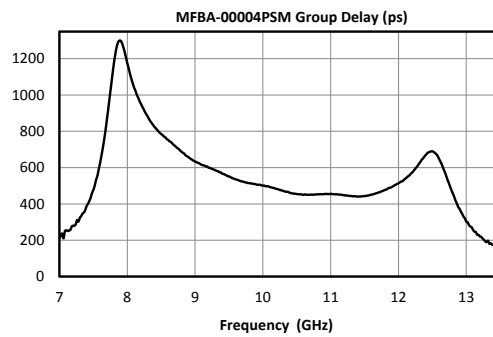
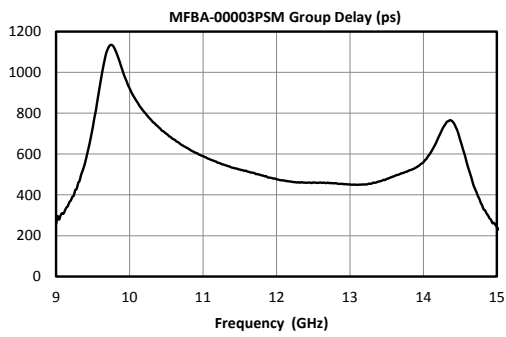
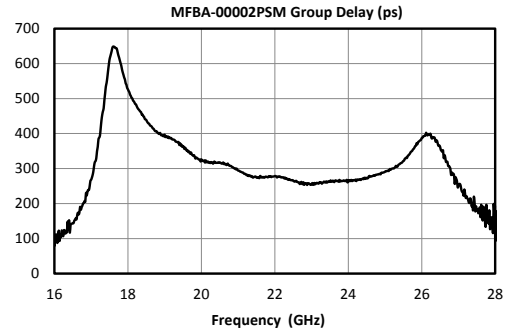
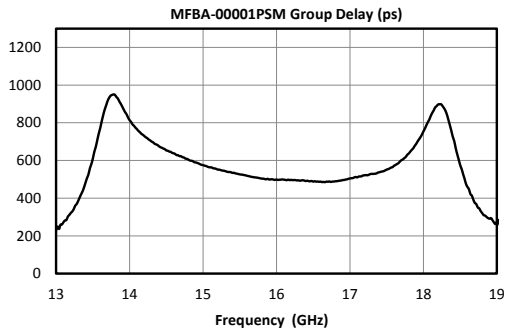
3.5.1 Insertion Loss



3.5.2 Return Loss

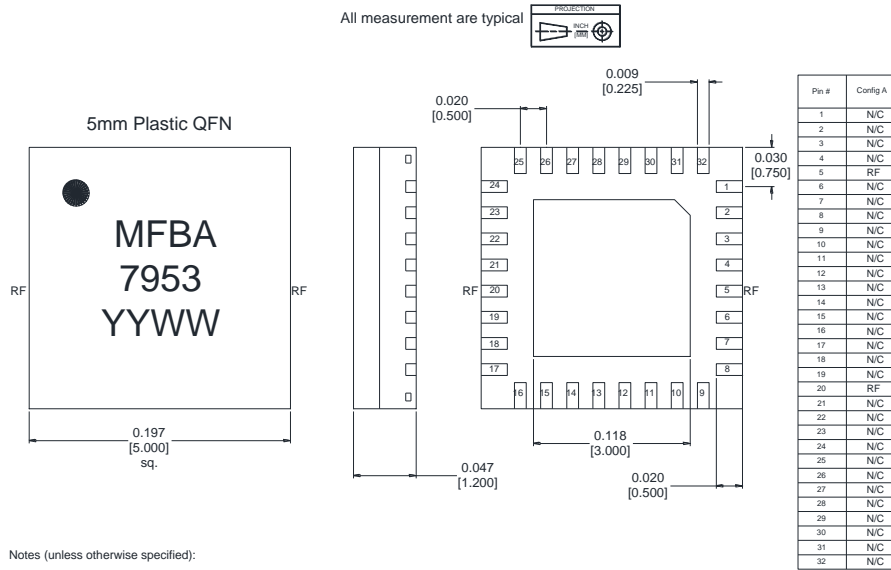


3.5.3 Group Delay



4 Mechanical Data

4.1 PSM Package Outline Drawing

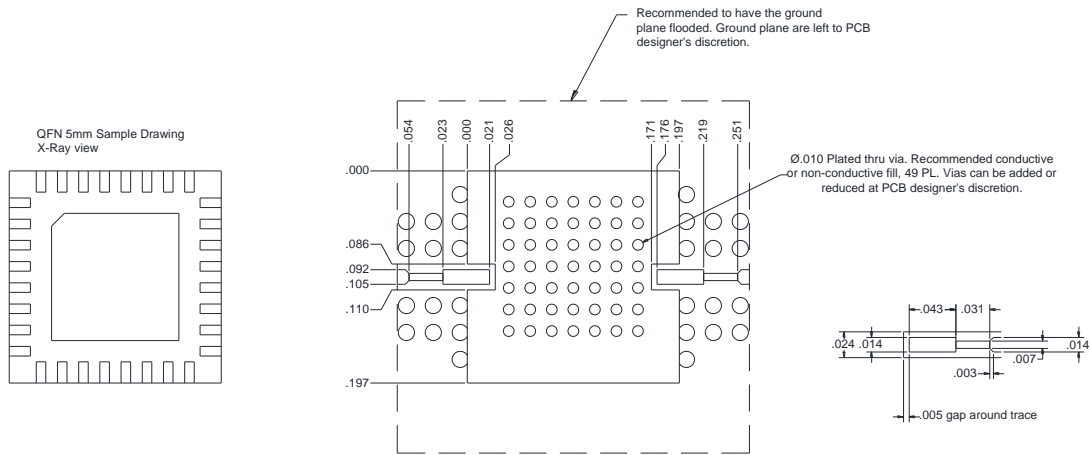


- Notes (unless otherwise specified):
- Substrate material is LCP.
 - I/O Leads and Die Paddle are:
0.008 - 0.05 μm Gold, over
0.02 - 0.15 μm Palladium, over
0.5 - 2.0 μm Nickel.
 - All unconnected pins should be connected to PCB RF ground.

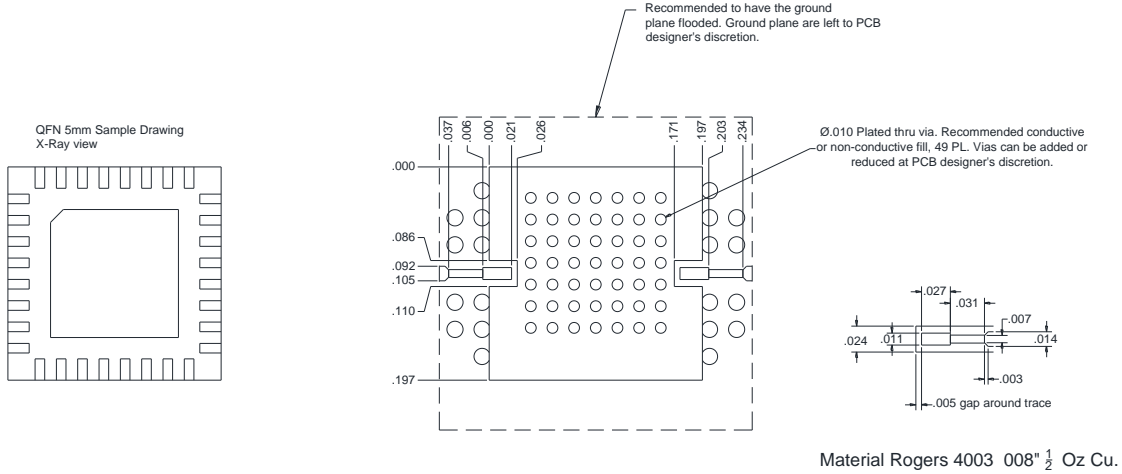
Part Number	Lid Label
MFBA-00001PSM	7950
MFBA-00002PSM	7951
MFBA-00003PSM	7952
MFBA-00004PSM	7953

4.2 PSM Package Footprint

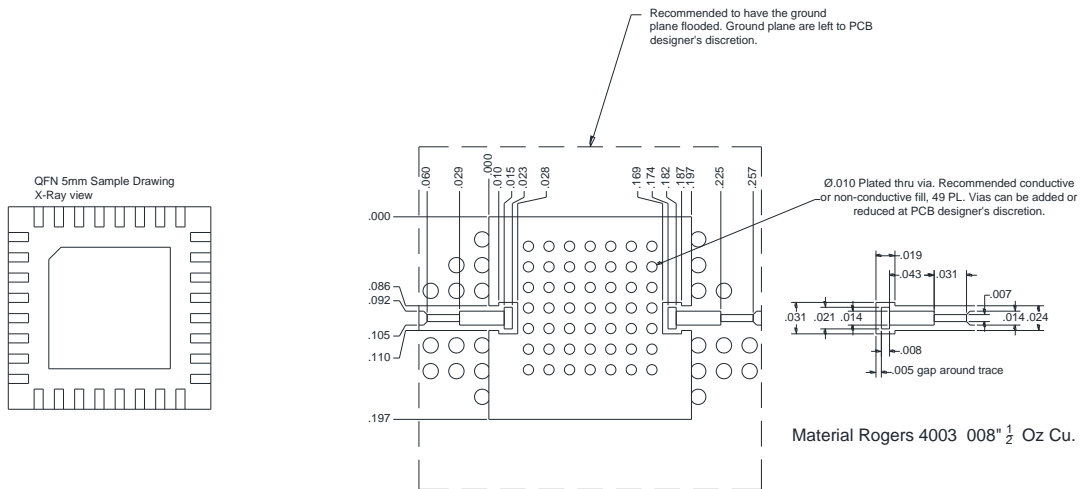
MFBA-00001PSM



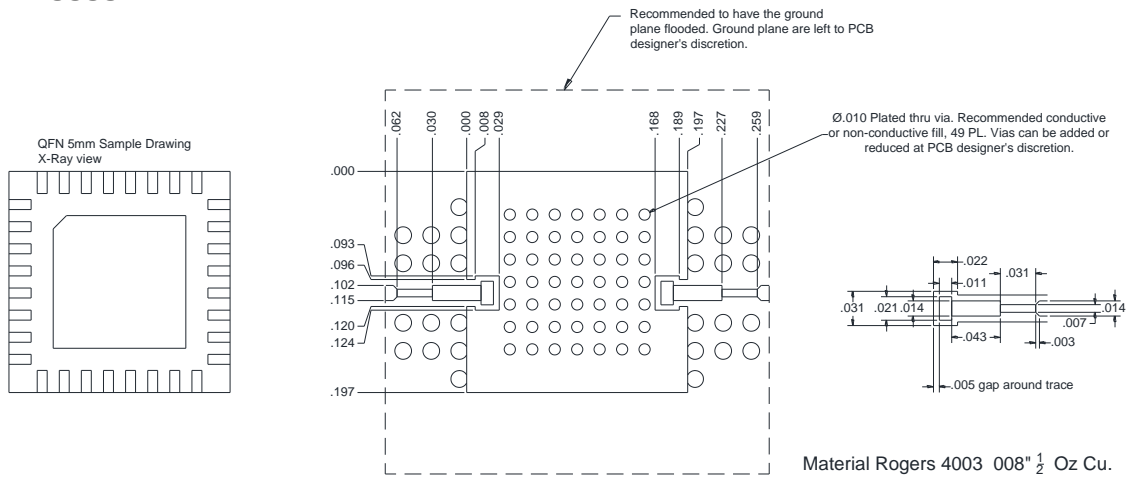
MFBA-00002PSM



MFBA-00003PSM



MFBA-00004PSM



QFN-Package Surface-Mount Landing Pattern

[Click here for a DXF of the above layouts.](#)
[Click here for leaded solder reflow.](#) [Click here for lead-free solder reflow](#)

4.3 EVB Package Outline

