

Ceramic Filters



- 400 MHz to 3000 MHz
- Bandwidths: 0.5 to 5%
- Surface Mount, PC Mount, Connectorized Options
- Custom Configurations Available
- 2 to 6 Poles in Single, Diplexed, or Triplexed Configurations
- Low Cost, High Performance
- Fast Delivery
- Low to High Volume Production Quantities



CERAMIC ELECTRICAL PERFORMANCE

Parameter	Standard	Special
Frequency Range	400-3000 MHz	400-6000 MHz
Bandwidth	0.5 - 5%	0.1 - 25%
Number of Sections	2 - 6	2 - 6
Typical VSWR	1.5:1	<1.5:1
Power Handling	1 watt avg	CONTACT FACTORY
Temperature Range	-20 to +70 degs C	-55 to + 125 degs C



Ceramic Filter Part Number Description

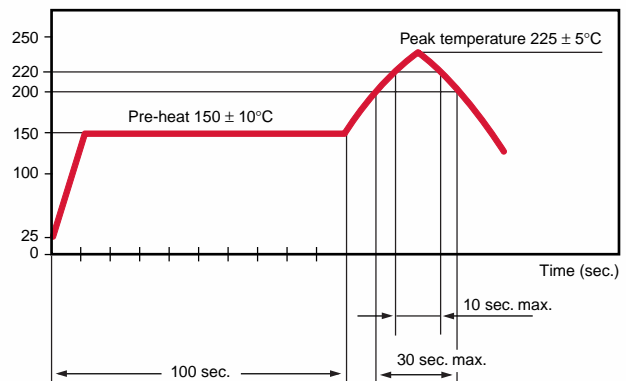
4DF6-1910/25-M

1. Number of Sections
2. Filter Topology
3. Resonator Size
4. Center Frequency
5. 3dB BW
6. Termination Type

Lorch Microwave's "DF" Ceramic Filter Series are versatile, drop-in devices designed and manufactured typically for commercial wireless applications. In addition to the standard cellular, PCS, and GSM bands, Lorch offers custom designed devices tailored for your specific application. DF Series products are available in Surface Mount, PC Mount, and Connectorized packages in 2 to 6 section configurations, and are available in low to high volume production quantities.

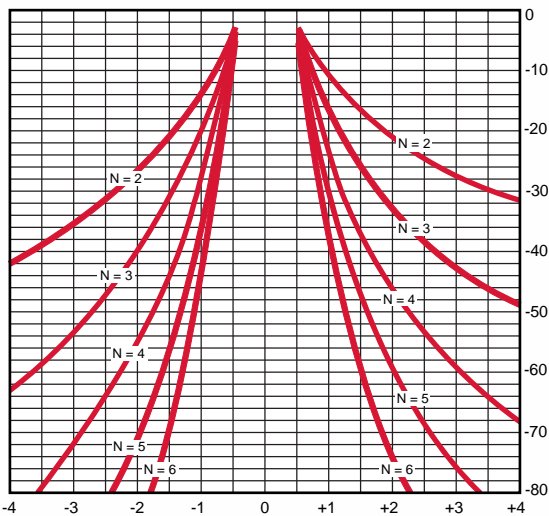
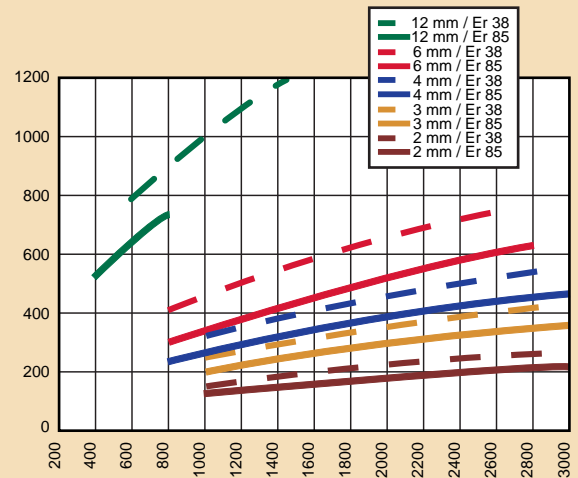
Custom capabilities include custom mechanical configurations, military ruggedness, extreme environmental conditions, and extended frequency and bandwidth ranges. Contact Lorch Microwave for a custom design to your requirements.

Reflow Profile





Ceramic Filters



Filter Attenuation

The attenuation curves above show the typical shape for the coaxial resonators for n=2 thru n=6. Use the formula below to determine the number of sections needed for the required attenuation.

$$\frac{\text{Stopband Frequency} - \text{Center Frequency}}{3 \text{ dB Bandwidth}}$$

Example:

Center Frequency = 1910 MHz
 3 dB BW = 25 MHz
 Stopband Frequency = 2000 MHz
 Attenuation = > 50 dB

$$\frac{2000 - 1910}{25} = +3.6$$

It is determined that 4 sections are required to meet >50 dB attenuation at 2,000 MHz.

Insertion Loss Calculation

Parameters needed:

- 1) Number of Sections (N)
- 2) Typical Resonator Qu (Qu)
- 3) Center Frequency (Fo)
- 4) 3 dB Bandwidth (BW)

$$QI = Fo / BW$$

$$K = Qu / QI$$

The formula is as follows:

$$I.L. = N * .63 * 20 * \text{LOG}_{10}(1 + (1 / (K - 1)))$$

Example:

CF = 1910
 3 dB BW = 25
 Qu = 625 (6MM/Er 38.6)
 N = 4

$$I.L. = 4 * .63 * 20 * \text{LOG}_{10}(1 + (1 / (8.18 - 1))) = 2.85 \text{ dB}$$

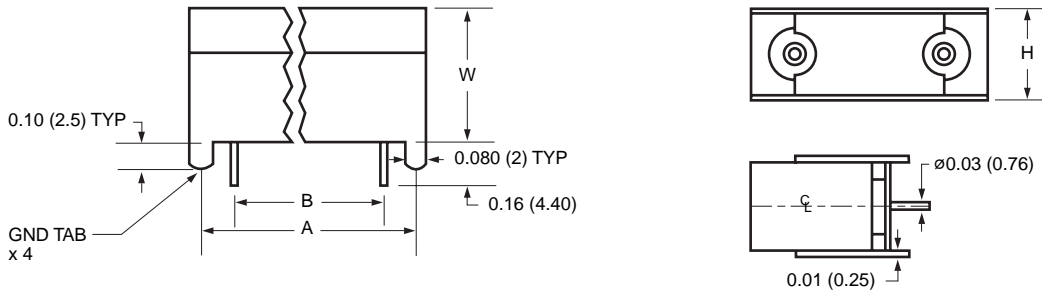


OUTLINE DRAWINGS

Ceramic Filters



Ceramic "P" Series (4 GND PINS) Sections 2 + 3

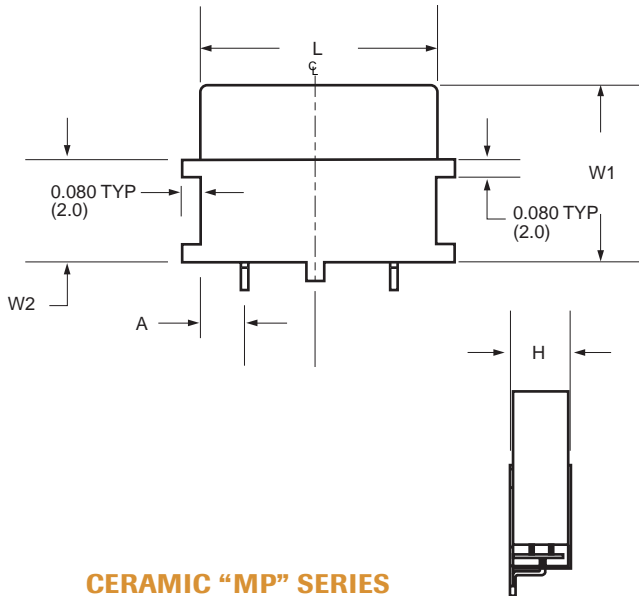


CERAMIC "P" SERIES (4 GND PINS) SECTIONS 2 + 3

Number of Sections	Width Inches (mm)	Height Inches (mm)	A		B	
			2	3	2	3
12 mm	SEE	0.492 (12.5)	0.864 (22)	1.34 (34)	0.47 (12)	0.945 (24)
6 mm	NOTES*	0.256 (6.5)	0.47 (12)	0.747 (19)	0.276 (7)	0.55 (14)
4 mm		0.177 (4.5)	0.235 (6)	0.392 (10)	0.157 (4)	0.315 (8)

*W= Frequency Dependent

Ceramic "MP" Series (Sections 2 + 3)

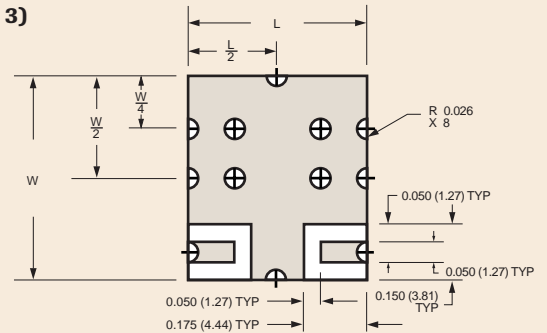


CERAMIC "MP" SERIES (SECTIONS 2 + 3)

Number of Sections	Width 1 Inches (mm)	Width 2 Inches (mm)	Height Inches (mm)	Length Inches (mm)		A
				2	3	
12 mm	SEE	SEE	0.492 (12.5)	0.945 (24)	1.42 (36)	0.236 (6)
6 mm	NOTES*	NOTES*	0.256 (6.5)	0.55 (14)	0.827 (21)	0.138 (3.5)
4 mm			0.177 (4.5)	0.315 (8)	0.47 (12)	0.079 (2)

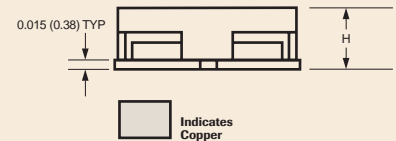
*W1= Frequency Dependent; *W2= .250 over 1 GHz, .500 under 1GHz

Ceramic "M" Series (Sections 2 + 3)

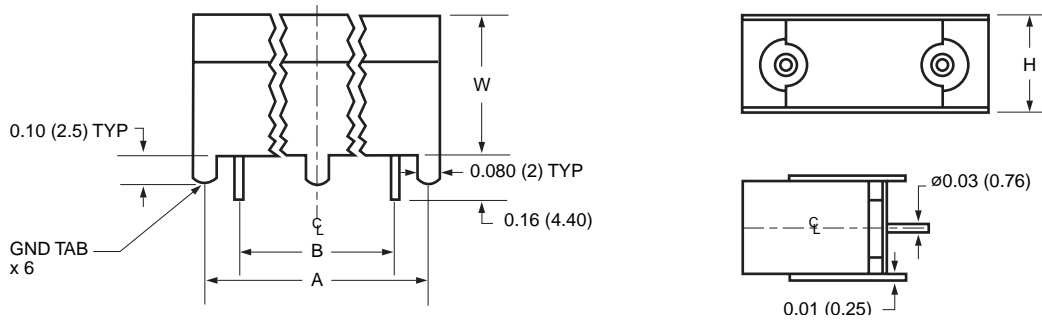


NOTES:

- L= Number of resonators x size of resonators + 0.100 TYP
- H= Size of resonators (height) + .03 TYP
- W= Length of resonators (approx.) length is determined by frequency



Ceramic "P" Series (6 GND PINS) Sections 4, 5 + 6

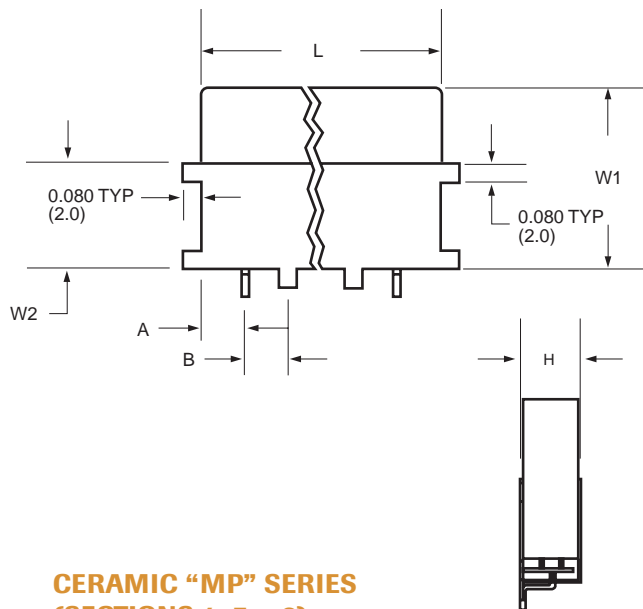


CERAMIC "P" SERIES (6 GND PINS) SECTIONS 4, 5 + 6

Number of Sections	Width Inches (mm)	Height Inches (mm)	A			B		
			4	5	6	4	5	6
12 mm	SEE	0.492 (12.5)	1.08 (46)	2.28 (58)	2.75 (70)	1.42 (36)	1.89 (48)	2.36 (60)
6 mm	NOTES*	0.256 (6.5)	1.02 (26)	1.3 (33)	1.57 (40)	0.826 (21)	1.10 (28)	1.378 (35)
4 mm		0.177 (4.5)	0.55 (14)	0.71 (18)	0.864 (22)	0.576 (12)	0.63 (16)	0.787 (20)

*W= Frequency Dependent

Ceramic "MP" Series (Sections 4, 5 + 6)

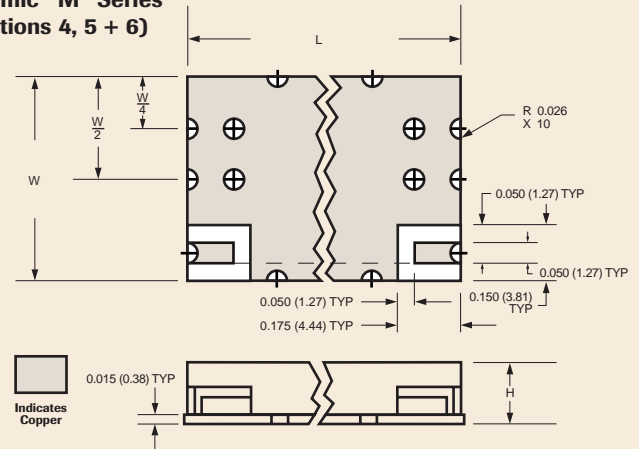


CERAMIC "MP" SERIES (SECTIONS 4, 5 + 6)

Number of Sections	Width 1 Inches (mm)	Width 2 Inches (mm)	Height Inches (mm)	Length Inches (mm)			A	B
				4	5	6		
12 mm	SEE	SEE	0.492 (12.5)	1.89 (48)	2.36 (60)	2.83 (72)	0.236 (6)	0.276 (7)
6 mm	NOTES*	NOTES*	0.256 (6.5)	1.10 (28)	1.38 (35)	1.65 (42)	0.138 (3.5)	0.178 (4.5)
4 mm			0.177 (4.5)	0.63 (16)	0.78 (20)	0.95 (24)	0.079 (2)	0.118 (3)

*W1= Frequency Dependent; *W2= .250 over 1 GHz, .500 under 1GHz

Ceramic "M" Series (Sections 4, 5 + 6)



NOTES:

L= Number of resonators x size of resonators + 0.100 TYP

H= Size of resonators (height) + .03 TYP

W= Length of resonators (approx.) length is determined by frequency