

μ FILTER™

Data Specification

Model Numbers:
 μ FILTER SF & μ FILTERCF



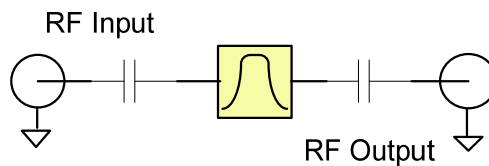
Trusted RF Solutions.™



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1. PRODUCT OVERVIEW

NuWaves' μFILTER™ is offered with a selection of standard bandpass frequencies (SF) as well as custom frequencies (CF). This allows the end-user the capability to select their own custom filter (Bandpass, Highpass, Lowpass, or Band Reject). By utilizing standard SMA connectors, the end user can quickly and easily add filtering to a system. NuWaves' μFILTER™ removes the time and cost burden of creating a design, laying out a PCB, buying parts, assembly, and testing. The custom filter units support nominal filtering bandwidths between 10-40%. Narrower bandwidths are possible for additional cost.



Standard Filter Topology

1.1 PRODUCT HIGHLIGHTS

- **User Definable Custom Filters:** The μFILTER™ CF module is designed to allow-end users the ability to select their own custom filter; Bandpass, Highpass, Lowpass, or Band Reject. Typical designs incorporate a 3-5 pole filter structure, with nominal bandwidths between 10 - 40%. Tighter tolerance filters are available at additional cost.
- **Standard Filters:** The μFILTER™ SF is offered with a variety of standard frequencies consisting of both passive and SAW based designs.
- **Enclosure:** The μFILTER™ is housed in a sleek, black anodized, extruded aluminum enclosure with SMA connectors.
- **Low Cost:** The μFILTER™ SF and μFILTER™ CF are competitively priced. The unique combination of standard and or custom filtering housed in a small size meets the demanding needs of state-of-the-art designs delivering high value for low cost.
- **User Friendly:** AC coupled input and output provide protection against user interface issues.
- **High Reliability:** NuWaves' selection of conservatively rated components provides high reliability and correspondingly high MTBF numbers. Each μFILTER™ is quality inspected to IPC-A-610 Class III standards.
- **Availability:** NuWaves provides quick turn on both standard and custom filters.

1.2 PRODUCT DESCRIPTION

Product	μFILTER™
Functional Description	NuWaves' μFilter™ Module can be designed within the frequency range of 70 to 1000 MHz. Unique to this module is that it is designed to allow end-users the ability to select their own custom filter (Bandpass, Highpass, Lowpass, or Band Reject) while achieving high performance.
Applications	User defined Filters can attenuate unwanted VHF, UHF, cellular, and other unwanted interfering signals <ul style="list-style-type: none"> ▪ Increase rejection levels ▪ Isolation ▪ Coupling ▪ Cable Modem ▪ Spectral Containment ▪ Fixed Wireless ▪ Mobile Infrastructure ▪ Industrial Scientific Medical Band (ISM) Applications
Users	Engineering and Scientific Laboratories <ul style="list-style-type: none"> ▪ Test and Measurement Facilities ▪ OEMs of RF High End Systems ▪ Research Laboratories ▪ Communications Engineering Firms ▪ Cable TV System Engineers ▪ RF System Integrators ▪ Test Ranges ▪ Universities ▪ Antenna Design Facilities ▪ Field Service Technicians ▪ Aerospace and Defense Systems ▪ Radio and TV Engineers ▪ Amateur Radio ▪ Scientific and Consulting Agencies ▪ Radio and Wireless Communication Services ▪ Precision Equipment Repair Organizations ▪ Professional and Technical Service Institutions ▪ Military Radio & Communication Facilities

2. PART NUMBER ORDERING INFORMATION:

2.1 μFILTERS™ CF

BASE PART NUMBER	PART# EXTENSION	DESCRIPTION
μFILTER CF-01-	XXX-XXXX	μFILTER™ Custom Bandpass Filter EX: μFILTER CF-01-075-0375 (75 MHz BW at 375 MHz)
μFILTER CF-02-	XXXX	μFILTER™ Custom Highpass Filter Ex: μFILTER CF-02-750 (3 dB Freq at 750 MHz)

<u>BASE PART NUMBER</u>	<u>PART# EXTENSION</u>	<u>DESCRIPTION</u>
μFILTER CF-03-	XXXX	μFILTER™ Custom Lowpass Filter Ex: μFILTER CF-03-225 (3 dB Freq at 225 MHz)
μFILTER CF-04-	XXX-XXXX	μFILTER™ Custom Band Reject Filter Ex: μFILTER CF-04-050-0175 (175 MHz with 50 MHz wide notch)

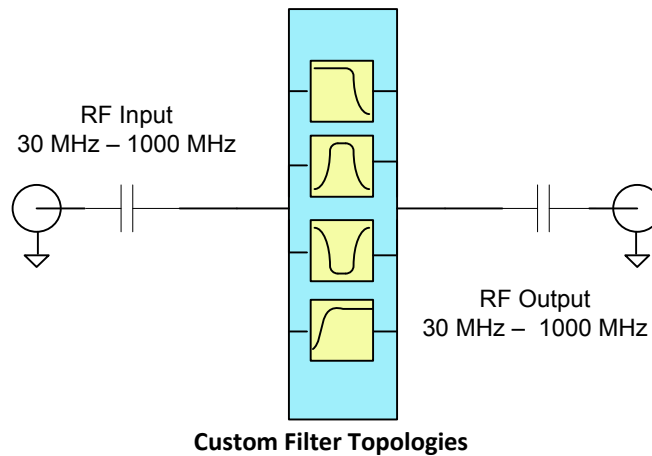
2.2 μFILTERS™ SF

<u>PART NUMBER</u>	<u>CENTER FREQ (MHZ)</u>	<u>BW 3 DB (MHZ)</u>	<u>BW 20 DB (MHZ)</u>	<u>INSERTION LOSS (DB)</u>	<u>NOTES</u>
μFILTER SF-303.8	303.8	303.40-304.25	303.06-304.62	3.0 Min 4.5 Max	BPF
μFILTER SF-303.825	303.825	303.325-304.325	301.0-307.8	1.7 Min 3.0 Max	BPF
μFILTER SF-311.06	311.06	310.70-311.37	310.40-311.62	2.0 Min 3.0 Max	BPF
μFILTER SF-312.2	312.2	309.9-314.6	309-313	1.8 Min 2.5 Max	BPF
μFILTER SF-315	315	312.5-317.5	310-320	1.7 Min 2.5 Max	BPF
μFILTER SF-345.03	345.03	344.75-345.30	344.2-345.8	2.0 Min 3.0 Max	BPF
μFILTER SF-390	390	389-391	385-395	1.7 Min 3.0 Max	BPF

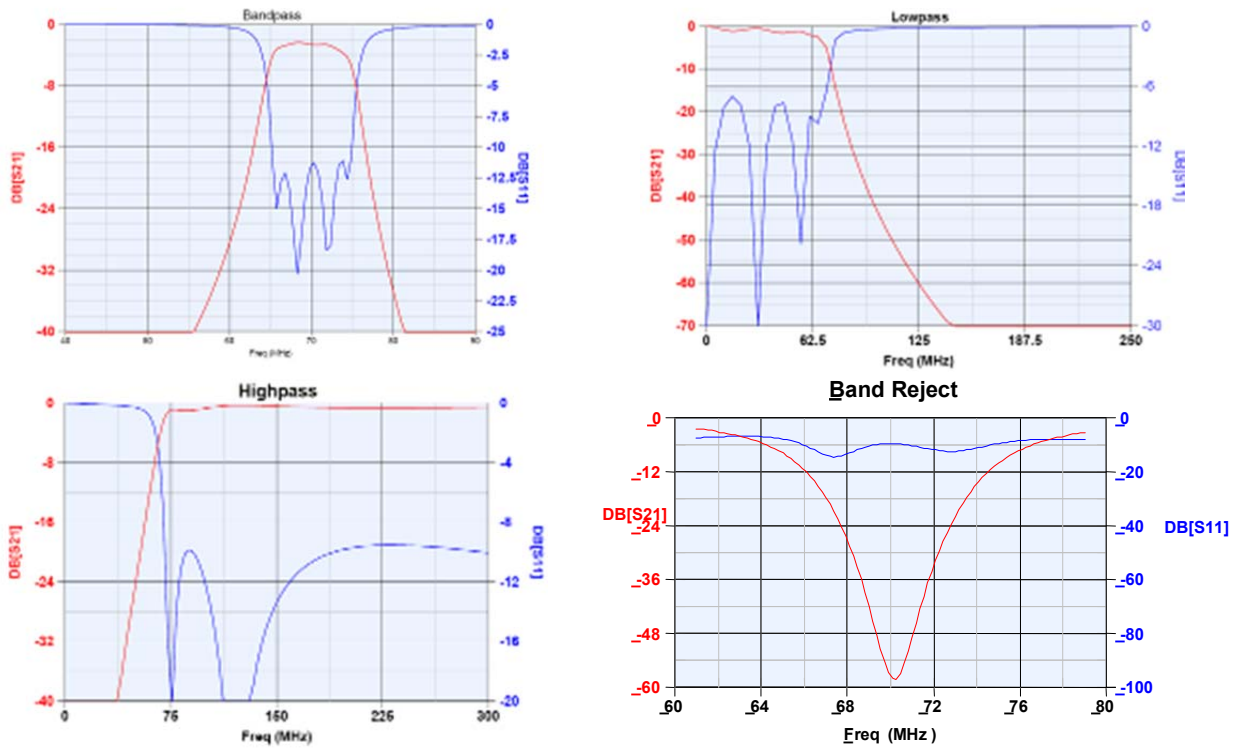
<u>PART NUMBER</u>	<u>CENTER FREQ (MHZ)</u>	<u>BW 3 DB (MHZ)</u>	<u>BW 20 DB (MHZ)</u>	<u>INSERTION LOSS (DB)</u>	<u>NOTES</u>
μFILTER SF-433	433	429-437	418-458	2.7 Min 4.5 Max	BPF
μFILTER SF-433.42	433.42	433.2-433.7	433-433.8	3.3 Min 4.8 Max	BPF
μFILTER SF-433.92	433.92	430.1-437.7	428-442	2.0 Min 3.0 Max	BPF
μFILTER SF-864	864	859.0-870.5	856-872	4.0 Min 6.0 Max	BPF
μFILTER SF-868.39	868.39	867.5-869.3	866.30-870.25	2.7 Min 4.2 Max	BPF
μFILTER SF-869	869	861-876	858-880	2.4 Min 3.1 Max	BPF
μFILTER SF-869.69	869.69	868.7-870.7	867.5-871.6	2.8 Min 4.3 Max	BPF
μFILTER SF-915	915	896-933	890-947	2.9 Min 3.3 Max	BPF
μFILTER SF-920-A	920	880-960	678-1090	3.0 Min 4.0 Max	BPF
μFILTER SF-1575	1575.42	1558-1596	1530-1630	1.3 Min 1.8 Max	BPF
μFILTER SF-1842	1842.5	1802-1882	1782-1914	3.0 Min 3.8 Max	BPF

<u>PART NUMBER</u>	<u>CENTER FREQ (MHZ)</u>	<u>BW 3 DB (MHZ)</u>	<u>BW 20 DB (MHZ)</u>	<u>INSERTION LOSS (DB)</u>	<u>NOTES</u>
μFILTER SF-2442	2441.8	2400-2483	2361-2521	2.5 Min 5.0 Max	BPF

3. μFILTER™ CF BANDWIDTH CHARACTERISTICS



The filter specified can be one of four types. A bandpass, a highpass, a lowpass, or a band reject (notch) filter. Filters are specified at their 3 dB points, that is, if a highpass filter is specified at 400 MHz then the μFILTER™ will pass all frequencies greater than 400 MHz. Filter topologies are either discrete structure or SAW depending on the filtering requirements and availability of SAW filters. Discrete filters are implemented as 2-4 poles for a Bandpass and up to 6 poles for a Lowpass or a Highpass design. The typical passband for band reject and bandpass filters are designed to meet >20% bandwidths. NuWaves can design your custom filter between 10-20% but with an increased cost per unit. Contact NuWaves Application Engineering as specified in Section 7 to get assistance in specifying your μFILTER™ unit.



Custom Filter Types: Bandpass, Lowpass, Highpass, and Band Reject

4. INSTALLATION, CONNECTING, AND USING THE μFILTER™

The μFilter™ module has been designed to be highly reliable under the specified operating conditions. The following installation and hook-up guide lines should be followed to prevent damage to the module.

The μFILTER™ module contains components that are sensitive to Electro-Static Discharge (ESD). The use of wrist strap, mats, and ground straps should be adhered to during the installation process.

AC coupled inputs and outputs are provided. Refer to the Electrical Data section for safe power handling levels.



4.1 ENVIRONMENT

The μFILTER™ module is rated for operation from -20°C to +70°C. Other environmental screening available.

Although the enclosure is a rugged, tightly machined chassis, it is NOT watertight so care must be taken to prevent the unit from getting internal moisture and possible damage. Conformal Coating process can be applied to the circuit board assemblies for an additional cost. Contact the factory for additional details.

5. ELECTRICAL DATA

5.1 RF CHARACTERISTICS

PARAMETER	UNIT	μFILTER SF		
		Min	Typ	Max
Pin	dBm		0	10
VSWR In			2.0	
VSWR Out			2.0	

PARAMETER	UNIT	μFILTER CF		
		Min	Typ	Max
Frequency Range	MHz	70		1000
VSWR In			1.75	
VSWR Out			1.75	

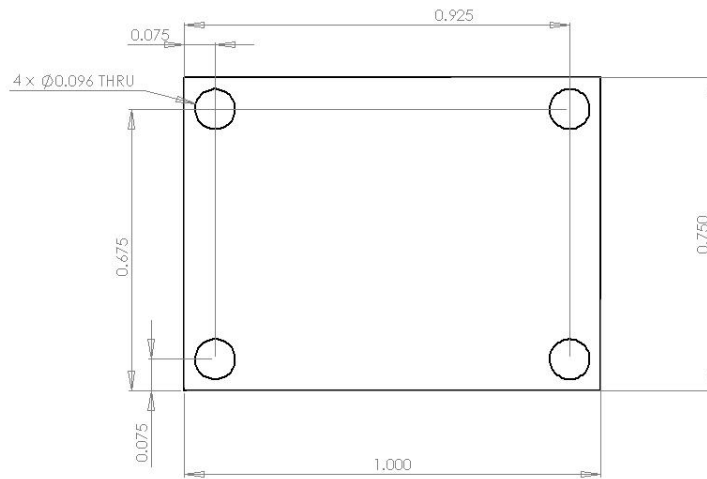
Measurement Conditions:

$Z_0 = 50 \Omega$ at input and output

$T_{amb} = 25^\circ C$

6. MECHANICAL OUTLINES

6.1 ENCLOSURE



μFILTER™ RF Bulkhead Connector Type:

SMA (Female)

μFILTER™ RF Input and Output Mating Connector:

SMA (Male)

Maximum Outline Dimensions	
Length	1.00 in
Width	0.75 in
Height	0.50 in
Weight	1.0 oz. (typ)

7. GETTING ASSISTANCE – APPLICATIONS ENGINEERING

NuWaves Engineering offers technical support for basic configuration help and troubleshooting, Monday through Friday, 8 a.m. to 5 p.m. Eastern Time.

Technical Assistance, Application Engineering, and Sales:

Phone: (513) 360-0800

Email: product.sales@nuwaves.com

NuWaves Home Page: www.nuwaves.com

Standard Product Warranty:

http://www.nuwaves.com/wp-content/uploads/2011/04/NuWaves_Warranty_Repair.pdf

8. GENERAL INFORMATION

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