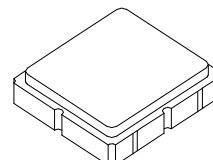


SF2170D

165 MHz SAW Filter



SM3838-6

- **Low Insertion Loss**
- **3.8 X 3.8 X 1.0 mm Surface Mount Case**
- **Single-Ended Input/Output**
- **Complies with Directive 2002/95/EC (RoHS)**

Absolute Maximum Ratings

Rating	Value	Units
Maximum Incident Power in Passband	+10	dBm
Maximum DC Voltage Between any 2 Terminals	30	VDC
Storage Temperature Range in Tape and Reel	-40 to +85	°C
Suitable for Lead-free Soldering - Maximum Soldering Profile	260°C for 30 s	

Electrical Characteristics

Characteristic	Sym	Notes	Min	Typ	Max	Units
Center Frequency	f_c	1		165		MHz
Source Impedance to Matching Network (single ended)				50		Ω
Load Impedance to Matching Network (single ended)				50		Ω
Passband Width			20	22		MHz
Rejection Referenced to Minimum Insertion Loss:						dB
10 MHz to 110 MHz			35	40		
127 MHz to 149 MHz			10	15		
190 to 210 MHz			30	40		
210 to 450 MHz			40	45		
Maximum Insertion Loss				9	10	dB
Insertion Loss Variation over -40 to 85 °C					1	dB
Amplitude Variation over 20 MHz Passband				1.0	1.5	dB _{p-p}
Group Delay Variation over 20 MHz Passband				40	80	ns _{p-p}
Absolute Group Delay at f_c				0.33		μ s
Input/Output Return Loss into Matching over 20 MHz BW			6	8		dB
Operating Temperature			-40		+85	°C

Case Style	SM3838-6 3.8 x 3.8 mm Nominal Footprint	
Lid Symbolization (Y=year, WW=week, S=shift) dot=pin 1 indicator	865, YWWS	
Standard Reel Quantity	Reel Size 7 Inch	1000 Pieces/Reel
	Reel Size 13 Inch	3000 Pieces/Reel

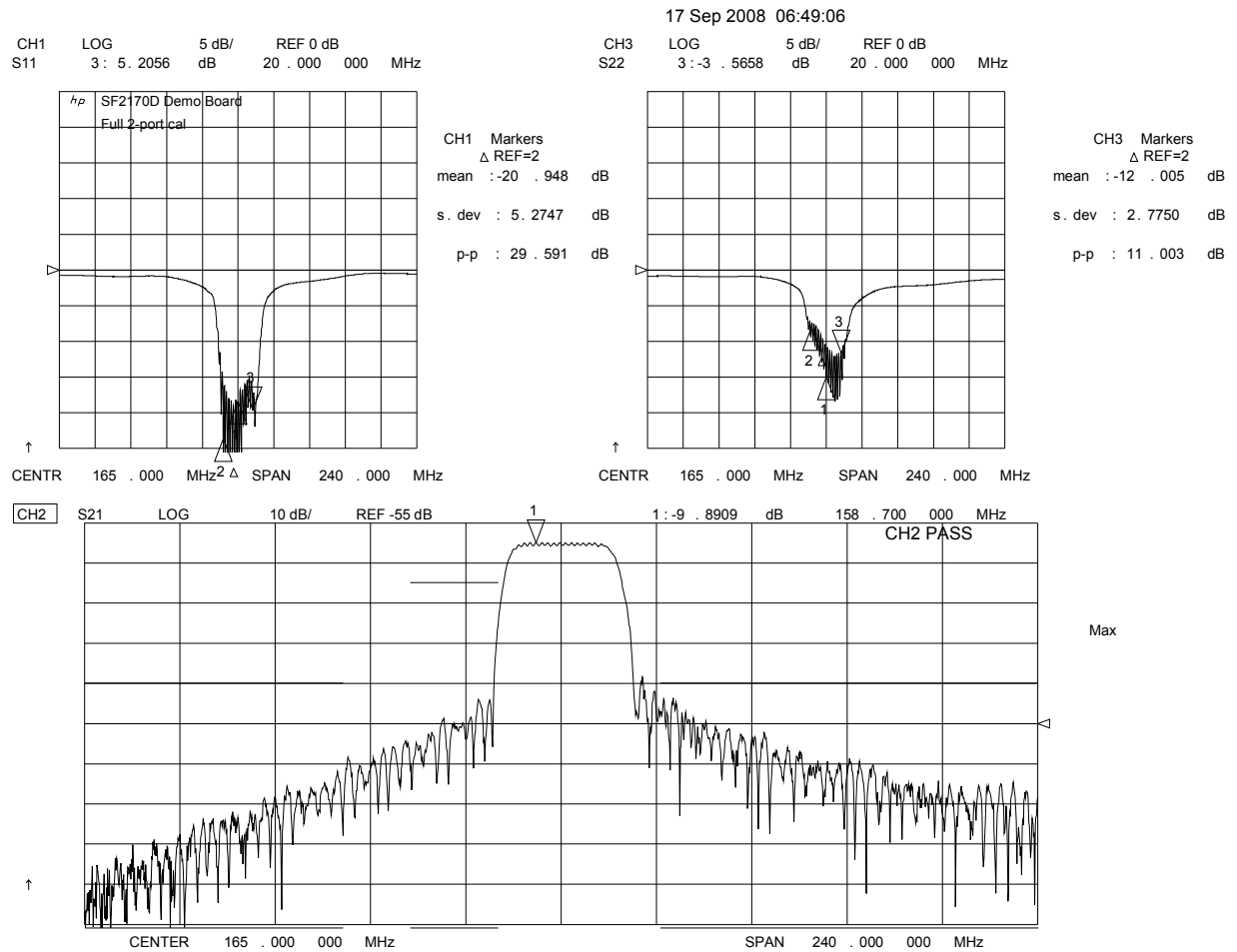


CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

NOTES:

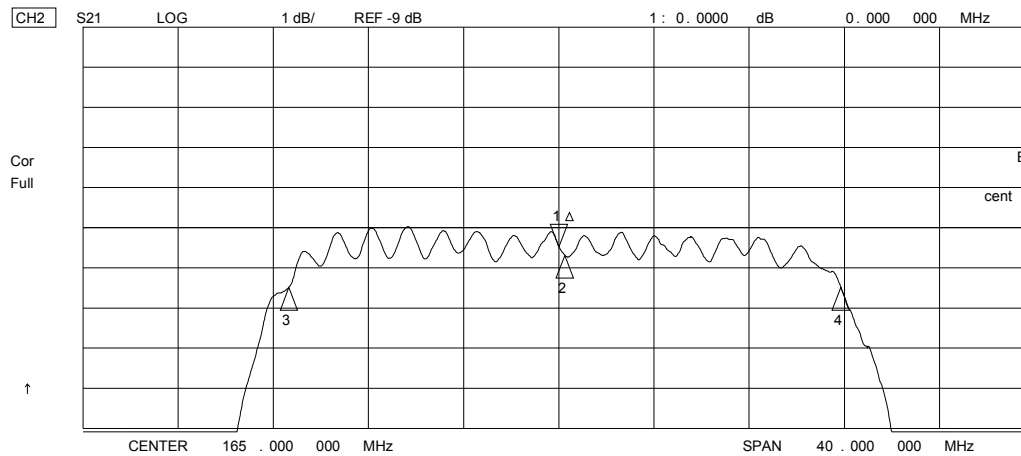
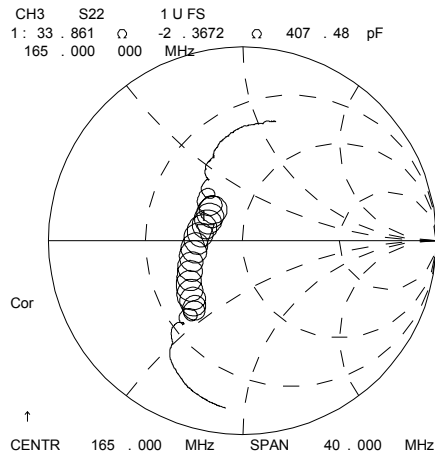
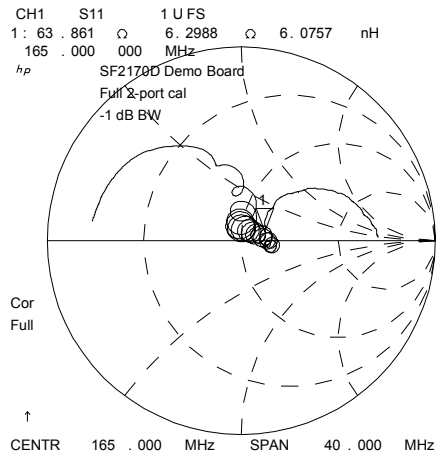
1. Unless noted otherwise, all specifications apply over the operating temperature range with filter soldered to the specified demonstration board with impedance matching to 50 Ω and measured with 50 Ω network analyzer.
2. Unless noted otherwise, all frequency specifications are referenced to the nominal center frequency, f_c .
3. Rejection is measured as attenuation below the minimum IL point in the passband. Rejection in final user application is dependent on PCB layout and external impedance matching design. See Application Note No. 42 for details.
4. The design, manufacturing process, and specifications of this filter are subject to change.
5. Either Port 1 or Port 2 may be used for either input or output in the design. However, impedances and impedance matching may vary between Port 1 and Port 2, so that the filter must always be installed in one direction per the circuit design.
6. US and international patents may apply.
7. Murata, stylized Murata logo, and Murata N.A., Inc. are registered trademarks of Murata Manufacturing Co., Ltd.

Broadband Filter Response and Return Loss (through matching network)



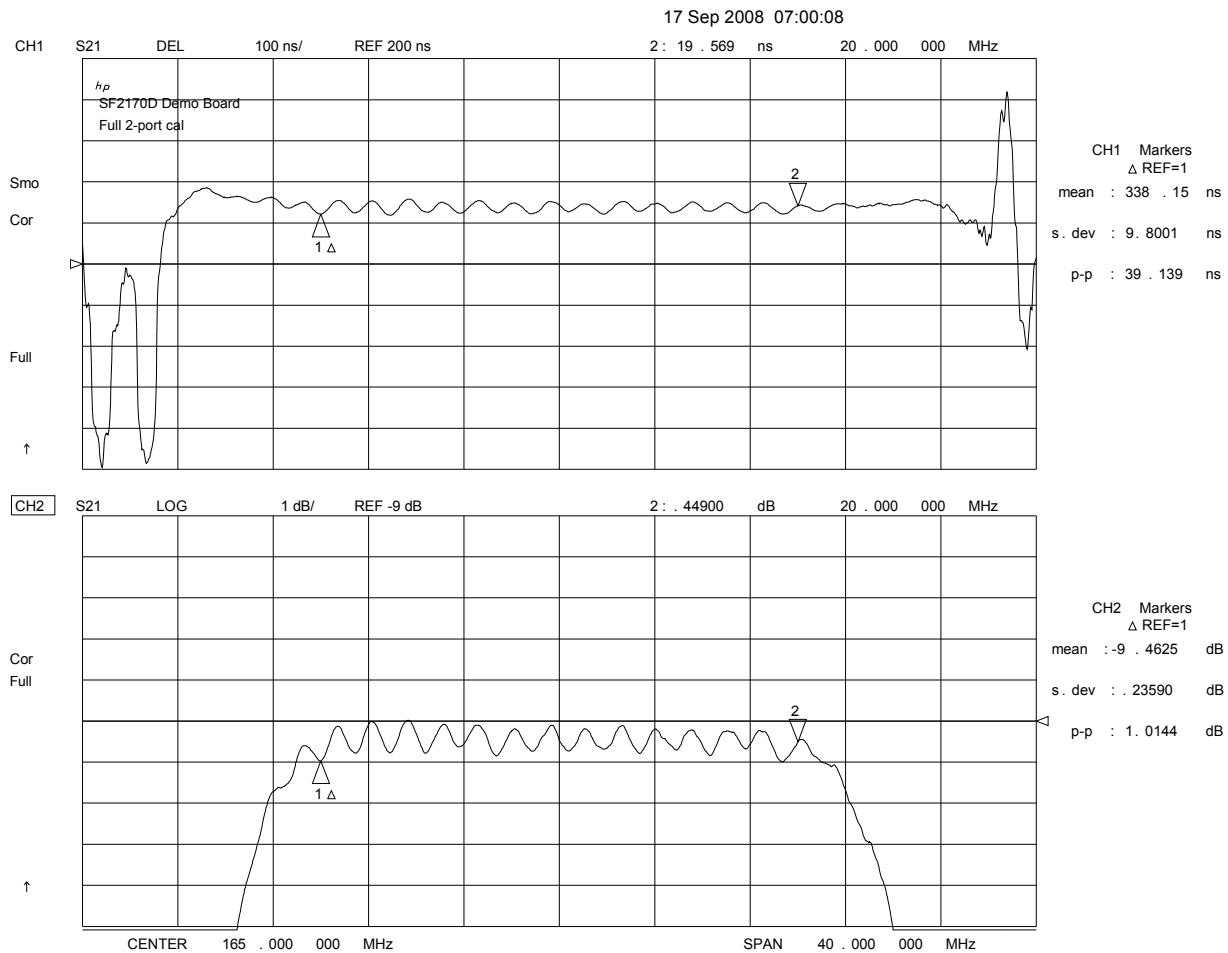
Passband Amplitude and Impedance Detail

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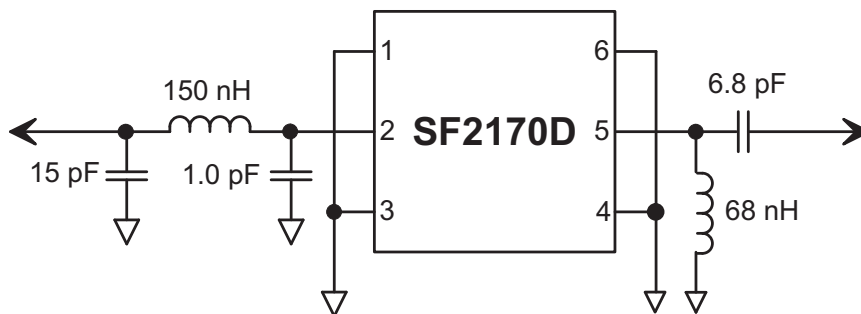


CH2 Markers
△ REF=1
BW: 23.196777 MHz
cent: 165.256979 MHz
Q: 7.1241
loss: -9.4834 dB

Passband Group Delay and Amplitude Ripple



SF2170D Demo Circuit



Technical drawing of a circular component, likely a flange or end plate, showing three views: a top view, a side view, and a detail view of the central hole.

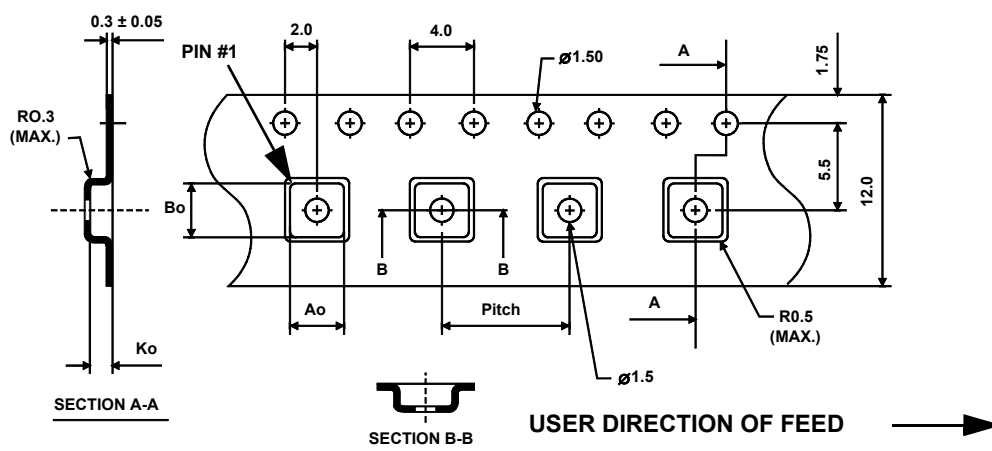
Top View: A large circle with a smaller concentric circle in the center. Dashed lines indicate the center and the hole's diameter. A leader line points from the text "See Detail 'A'" to the central hole.

Side View: A vertical cross-section showing the component's thickness. The total thickness is dimensioned as 12.0. The central hole is dimensioned with a diameter of 100 REF. and a depth of "B" REF.

Detail View (Detail A): A cross-section of the central hole. It shows a circular hole with a diameter of 20.2. The hole is surrounded by a flange with a thickness of 2.0. The distance from the center of the hole to the outer edge of the flange is dimensioned as 13.0.

“B”		Quantity Per Reel
Inches	millimeters	
7	178	1000
13	330	3000

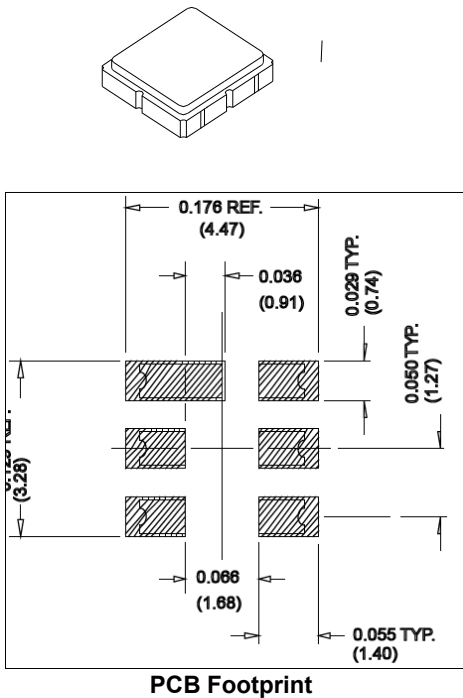
Carrier Tape Dimensions	
Ao	4.25 mm
Bo	4.25 mm
Ko	1.30 mm
Pitch	8.0 mm
W	12.0 mm



SM3838-6 Case

6-Terminal Ceramic Surface-Mount Case

3.8 X 3.8 mm Nominal Footprint



Case Dimensions						
Dimension	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	3.60	3.80	4.0	0.14	0.15	0.16
B	3.60	3.80	4.0	0.14	0.15	0.16
C	1.30	1.50	1.70	0.05	0.06	0.067
D	0.95	1.10	1.25	0.037	0.043	0.05
E	2.39	2.54	2.69	0.090	0.10	0.110
G	0.90	1.0	1.10	0.035	0.04	0.043
H	1.90	2.0	2.10	0.75	0.08	0.83
I	0.50	0.6	0.70	0.020	0.024	0.028
J	1.70	1.8	1.90	0.067	0.07	0.075

Electrical Connections		
Connection		Terminals
Port 1	Single-ended Input	2
Port 2	Single-ended Output	5
	Ground	All others
Single Ended Operation Only		
Dot indicates Pin 1		

Materials	
Solder Pad Plating	0.3 to 1.0 μm Gold over 1.27 to 8.89 μm Nickel
Lid Plating	2.0 to 3.0 μm Nickel
Body	Al ₂ O ₃ Ceramic
Pb Free	

