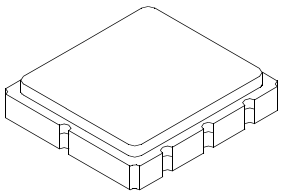
RF1417D

315.0 MHz SAW Filter

- ***Ideal Front-End Filter for Domestic Wireless Receivers***
- ***Low-Loss, Coupled-Resonator Quartz Design***
- ***Simple External Impedance Matching***
- ***Complies with Directive 2002/95/EC (RoHS)***

The RF1417D is a low-loss, compact, and economical surface-acoustic-wave (SAW) filter designed to provide front-end selectivity in 315.0 MHz receivers. Receiver designs using this filter include superhet with 10.7 MHz or 500 kHz IF, direct conversion and superregen. Typical applications of these receivers are wireless remote-control and security devices (especially for automotive keyless entry) operating in the USA under FCC Part 15, in Canada under RSS-210, and in Italy

This coupled-resonator filter (CRF) uses selective null placement to provide suppression, typically greater than 40 dB, of the LO and image spurious responses of superhet receivers with 10.7 MHz IF. RFM's advanced SAW design and fabrication technology is utilized to achieve high performance and very low loss with simple external impedance matching.



SM3838-8 Case
3.8 x 3.8

Electrical Characteristics

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Center Frequency at 25°C	Absolute Frequency	f_c	1, 2, 3	314.85	315.00	315.15	MHz
Insertion Loss		IL_{MIN}	1, 3		1.6	2.5	dB
Passband Ripple (Relative to IL_{MIN}) Fc ±200kHz			1, 3		0.4	1.2	dB
3 dB Bandwidth		BW_3	1, 3	500	600	800	kHz
Rejection Attenuation: (relative to ILmin)	10 - 295 MHz		1, 3	46	51		dB
	295 - 305 MHz			41	46		
	305 - 310 MHz			27	30		
	310 - 313 MHz			17	20		
	313 - 314 MHz			7	10		
	316 - 320 MHz			9	12		
	320 - 325 MHz			16	20		
	325 - 335 MHz			32	36		
	335 - 600 MHz			42	46		
	600 - 1000 MHz			55	60		
Temperature	Freq. Temp. Coefficient	FTC			0.032		$ppm/°C^2$
Frequency Aging	Absolute Value during the First Year	IfAI	5		≤10		ppm/yr
Impedance @ fc	Input $Z_{IN}=R_{IN}\|\|C_{IN}$	Z_{IN}	1	4930Ω//2.09pf			
	Output $Z_{OUT}=R_{OUT}\|\|C_{OUT}$	Z_{OUT}		4930Ω//2.09pf			
Lid Symbolization (Y=year WW=week S=shift)		550 // YWWS					
Standard Reel Quantity	Reel Size 7 Inch		9	500 Pieces/Reel			
	Reel Size 13 Inch			3000 Pieces/Reel			

CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

Notes:

1. Unless noted otherwise, all measurements are made with the filter installed in the specified test fixture which is connected to a 50 Ω test system with VSWR ≤ 1.2:1. The test fixture L and C are adjusted for minimum insertion loss at the filter center frequency, f_c. Note that insertion loss and bandwidth and passband shape are dependent on the impedance matching component values and quality.
2. The frequency f_c is defined as the midpoint between the 3dB frequencies.
3. Where noted specifications apply over the entire specified operating temperature range of -40°C to +90°C.
4. The turnover temperature, T_O, is the temperature of maximum (or turnover) frequency, f_o. The nominal frequency at any case temperature, T_c, may be calculated from: $f = f_o [1 - FTC (T_o - T_c)^2]$.
5. Frequency aging is the change in fc with time and is specified at +65°C or less. Aging may exceed the specification for prolonged temperatures above +65°C. Typically, aging is greatest the first year after manufacture, decreasing significantly in subsequent years.
6. The design, manufacturing process, and specifications of this device are subject to change.
7. One or more of the following U.S. Patents apply: 4,54,488, 4,616,197, and others pending.
8. All equipment designs utilizing this product must be approved by the appropriate government agency prior to manufacture or sale.
9. Tape and Reel Standard Per ANSI / EIA 481.

RF Monolithics, Inc. Phone: (972) 233-2903 Fax: (972) 387-8148 E-mail: info@rfm.com
RFM Europe Phone: 44 1963 251383 Fax: 44 1963 251510 http://www.rfm.com

Absolute Maximum Ratings

Rating	Value	Units
Input Power Level	10	dBm
DC Voltage	12	VDC
Storage Temperature	-40 to +125	°C
Operable Temperature Range	-40 to +125	°C
Soldering Temperature (10 seconds / 5 cycles max.)	260	°C

Electrical Characteristics

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Center Frequency at 25°C	Absolute Frequency	f_c	1, 2, 3	314.85	315.00	315.15	MHz
Insertion Loss		IL_{MIN}	1, 3		2.3	3.0	dB
Passband Ripple (Relative to IL_{MIN}) Fc ±200kHz			1, 3		0.5	1.4	dB
3 dB Bandwidth		BW_3	1, 3	500	600	800	kHz
Rejection Attenuation: (relative to ILmin)	10 - 295 MHz		1, 3	44	49		dB
	295 - 305 MHz			39	44		
	305 - 310 MHz			27	30		
	310 - 313 MHz			17	20		
	313 - 314 MHz			7	10		
	316 - 320 MHz			9	12		
	320 - 325 MHz			16	20		
	325 - 335 MHz			32	36		
	335 - 600 MHz			42	45		
	600 - 1000 MHz			55	60		
Temperature	Freq. Temp. Coefficient	FTC			0.032		ppm/°C^2
Frequency Aging	Absolute Value during the First Year	IfAI	5		≤10		ppm/yr
Impedance @ fc	Input $Z_{IN}=R_{IN}\|\|C_{IN}$	Z_{IN}	1	4930Ω//2.09pf			
	Output $Z_{OUT}=R_{OUT}\|\|C_{OUT}$	Z_{OUT}		4930Ω//2.09pf			

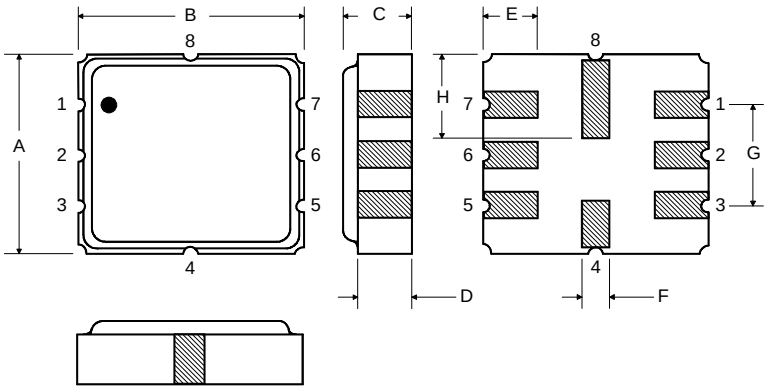
CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

Notes:

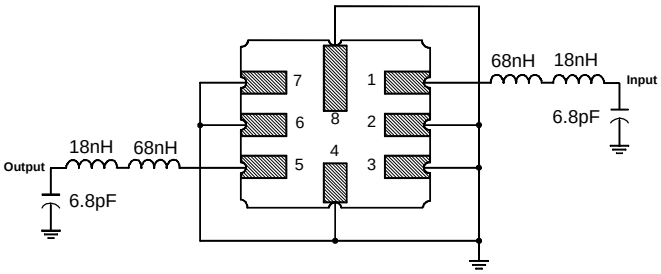
1. Unless noted otherwise, all measurements are made with the filter installed in the specified test fixture which is connected to a 50 Ω test system with VSWR ≤ 1.2:1. The test fixture L and C are adjusted for minimum insertion loss at the filter center frequency, f_c. Note that insertion loss and bandwidth and passband shape are dependent on the impedance matching component values and quality.
2. The frequency f_c is defined as the midpoint between the 3dB frequencies.
3. Where noted specifications apply over the entire specified operating temperature range of -40°C to +125°C.
4. The turnover temperature, T_O, is the temperature of maximum (or turnover) frequency, f_o. The nominal frequency at any case temperature, T_c, may be calculated from: $f = f_o [1 - FTC (T_o - T_c)^2]$.
5. Frequency aging is the change in fc with time and is specified at +65°C or less. Aging may exceed the specification for prolonged temperatures above +65°C. Typically, aging is greatest the first year after manufacture, decreasing significantly in subsequent years.
6. The design, manufacturing process, and specifications of this device are subject to change.
7. One or more of the following U.S. Patents apply: 4,54,488, 4,616,197, and others pending.
8. All equipment designs utilizing this product must be approved by the appropriate government agency prior to manufacture or sale.

Electrical Connections

Pin	Connection
1	Input
2	Input Ground
3	Ground
4	Case Ground
5	Output
6	Output Ground
7	Ground
8	Case Ground



Matching Circuit to 50Ω



Case Dimensions

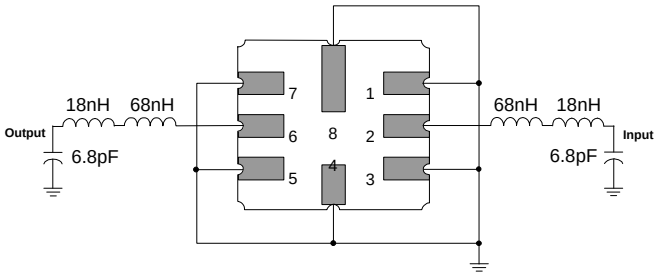
Dimension	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	3.6	3.8	4.0	0.14	0.15	0.16
B	3.6	3.8	4.0	0.14	0.15	0.16
C	1.00	1.20	1.40	0.04	0.05	0.055
D	0.95	1.10	1.25	0.037	0.043	0.05
E	0.90	1.0	1.10	0.035	0.04	0.043
F	0.50	0.6	0.70	0.020	0.024	0.028
G	2.39	2.54	2.69	0.090	0.100	0.110
H	1.40	1.75	2.05	0.055	0.069	0.080

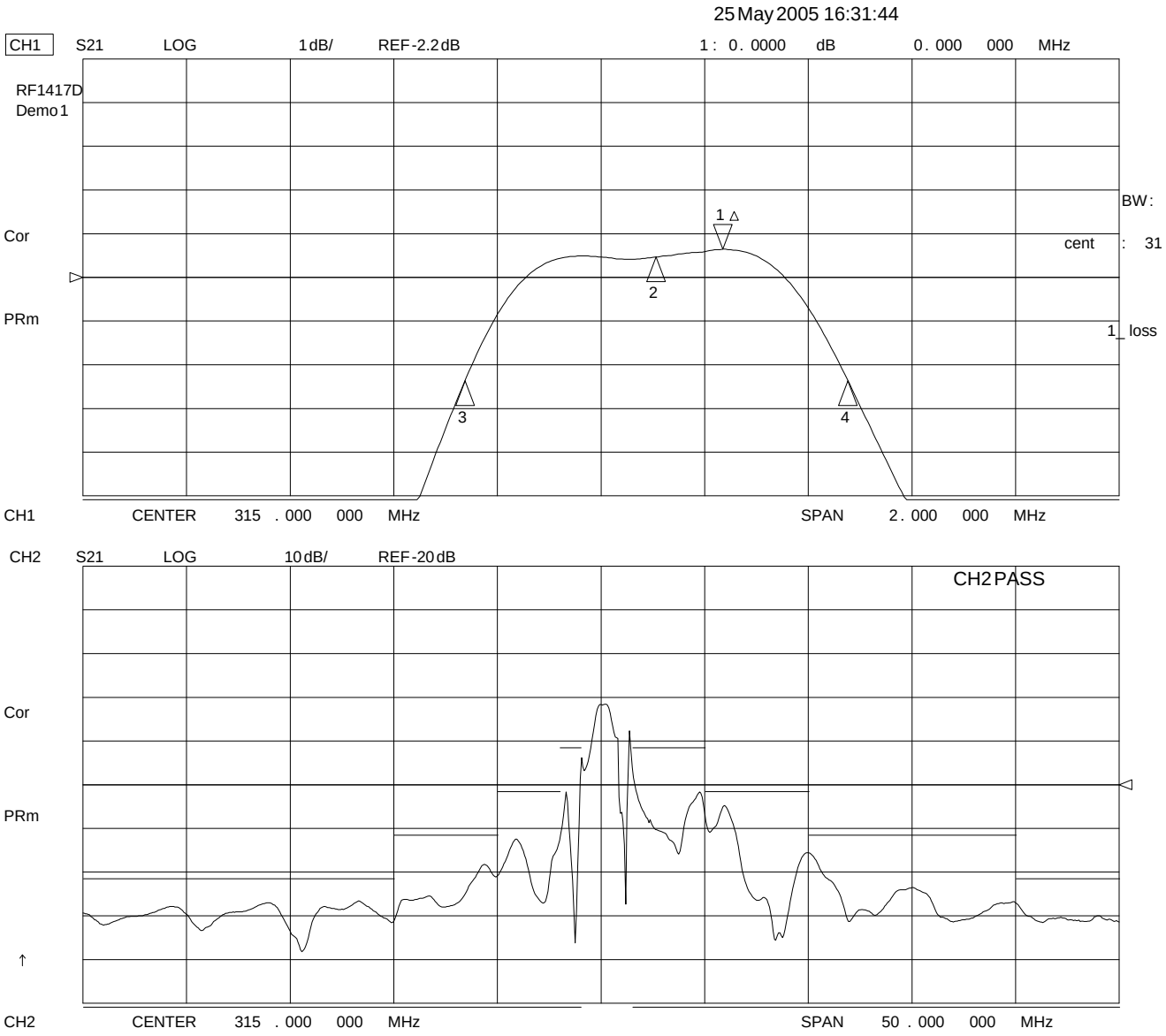
Optional

Electrical Connections

Pin	Connection
1	Input Ground
2	Input
3	Ground
4	Case Ground
5	Output Ground
6	Output
7	Ground
8	Case Ground

Matching Circuit to 50Ω





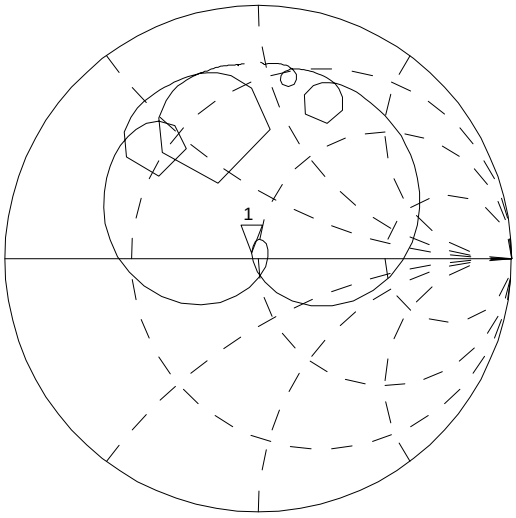
25 May 2005 15:50:50

CH1 S11 1 U FS 1 : 47 . 605 Ω 2 . 1602 Ω 1 . 0914 nH 315 . 000 000 MHz

RF1417D
Demo 1

Cor

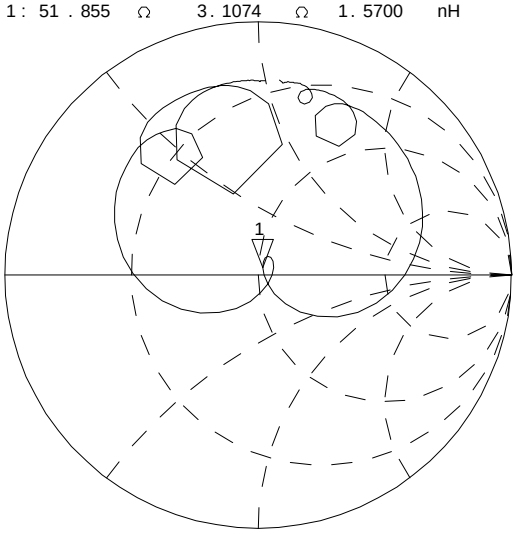
PRm



↑

CH3 S22 1 U FS 1 : 51 . 855 Ω 3 . 1074 Ω 1 . 5700 nH 315 . 000 000 MHz

Cor



↑

CENTER 315 . 000 000 MHz SPAN 5 . 000 000 MHz