



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

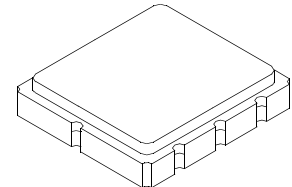


The RF3404E is a low-loss, compact, and economical surface-acoustic-wave (SAW) filter designed to provide front-end selectivity in 433.92 MHz receivers. Receiver designs using this filter include superhet with 10.7 MHz or 500 kHz IF, direct conversion and superregen. Typical applications of these receivers are wireless remote-control and security devices operating in Europe under ETSI I-ETS 300 220.

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.

**RF3404E**

**433.92 MHz  
SAW Filter**



**SM3030-6 Case  
3.0 x 3.0**

#### Electrical Characteristics

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Center Frequency at 25°C Absolute Frequency	$f_c$	1, 2, 3		433.92		MHz
Tolerance from MHz	$\Delta f_c$	1, 2		$\pm 100$		kHz
Insertion Loss (433.760 - 434.080)	$IL_{MIN}$	1, 3		2.3	3.5	dB
3 dB Bandwidth	$BW_3$	1, 3	600	650	750	kHz
Rejection Attenuation: (relative to $IL_{min}$ )						
10 - 414 MHz			30	40		
414 - 424 MHz			27	35		
424 - 430 MHz			16	20		
430 - 432 MHz			8	10		
436 - 437 MHz			19	25		
437 - 440 MHz			25	32		
441 - 445 MHz			15	20		
445 - 1000 MHz			30	46		
Turnover Temperature	$T_o$	3, 4	10	25	40	°C
Temperature Freq. Temp. Coefficient	FTC			0.032		ppm/°C <sup>2</sup>
Frequency Aging Absolute Value during the First Year	$ f_A $	5		$\leq 10$		ppm/yr
Impedance @ $f_c$ Input $Z_{IN} = R_{IN}    C_{IN}$	$Z_{IN}$			64.4 $\Omega$ // 6 pF		
Output $Z_{OUT} = R_{OUT}    C_{OUT}$	$Z_{OUT}$			70.2 $\Omega$ // 6.4 pF		
Lid Symbolization (Y=year WW=week S=shift)				697 // YWWS		
Standard Reel Quantity Reel Size 7 Inch				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  $\Omega$  test system with  $VSWR \leq 1.2:1$ . 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 +105°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  $f_c$  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.

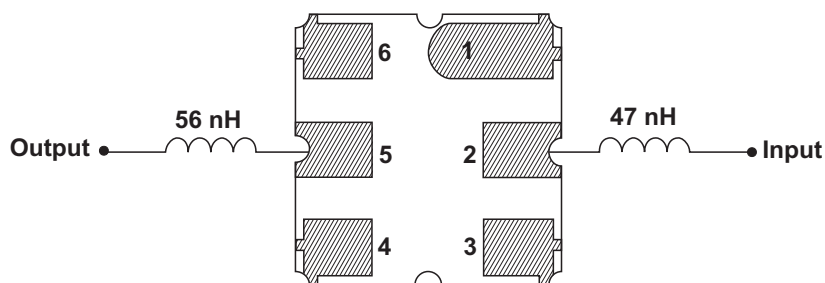
## Absolute Maximum Ratings

Rating	Value	Units
Input Power Level	10	dBm
DC Voltage	12	VDC
Storage Temperature	-40 to +125	°C
Operable Temperature Range	-40 to +105	°C
Soldering Temperature (10 seconds/5 cycles Max..)	260	°C

## Primary Electrical Connections

Pin	Connection
1	Input Return
2	Input
3	Ground
4	Output Return
5	Output
6	Ground

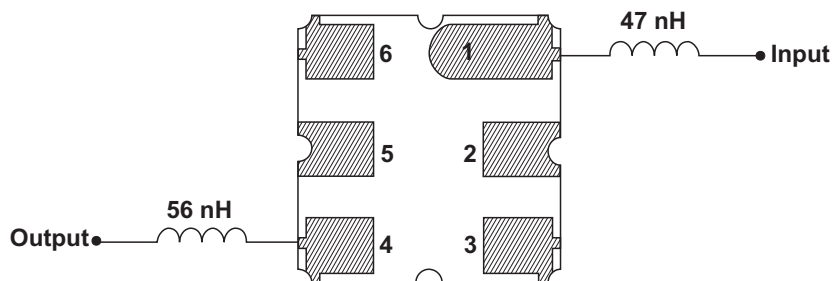
### Primary Matching Circuit to 50 $\Omega$



## Alternate Electrical Connections

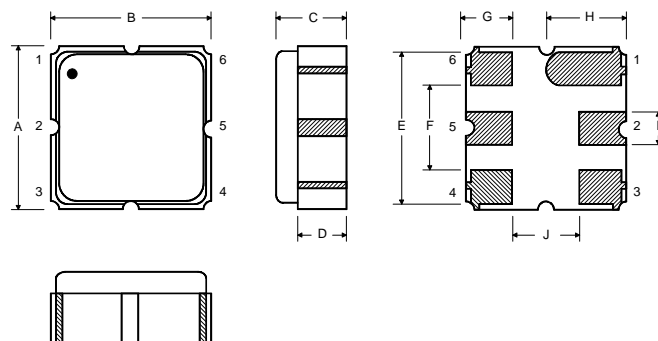
Pin	Connection
1	Input
2	Input Return
3	Ground
4	Output
5	Output Return
6	Ground

### Alternate Matching Circuit to 50 $\Omega$



## Case Dimensions

Dimension	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	2.87	3.0	3.13	0.113	0.118	0.123
B	2.87	3.0	3.13	0.113	0.118	0.123
C	1.12	1.25	1.38	0.044	0.049	0.054
D	0.77	0.90	1.03	0.030	0.035	0.040
E	2.67	2.80	2.93	0.105	0.110	0.115
F	1.47	1.6	1.73	0.058	0.063	0.068
G	0.72	0.85	0.98	0.028	0.033	0.038
H	1.37	1.5	1.63	0.054	0.059	0.064
I	0.47	0.60	0.73	0.019	0.024	0.029
J	1.17	1.30	1.43	0.046	0.051	0.056



11 Jan 2008 06:46:14  
 CH1 S11 1 UFS 1: 51.947  $\Omega$  3.0938  $\Omega$  1.1347 nH 433.920 000 MHz

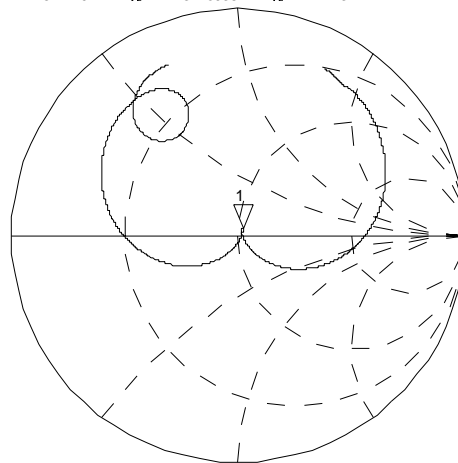
*h<sub>p</sub>*  
 RF3404E DEMO  
 USING 401-1564-001 PCB.

Cor

PRm

Full

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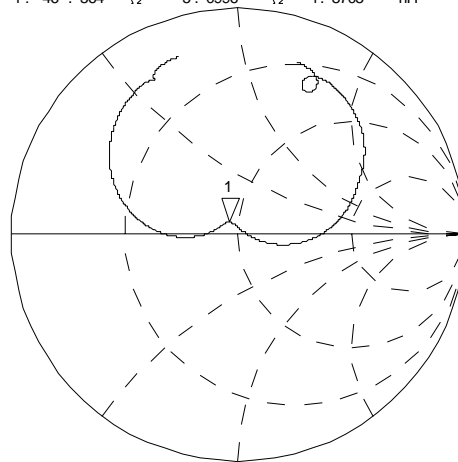
CH2 S22 1 UFS 1: 46.564  $\Omega$  5.0996  $\Omega$  1.8705 nH 433.920 000 MHz

Cor

Full

PRm

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CENTER 433.920 000 MHz SPAN 2.000 000 MHz

