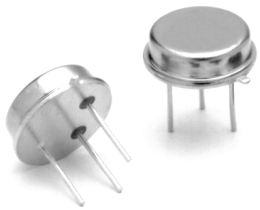
RF3181

916.50 MHz SAW Filter

- ***Ideal Front-End Filter for 916.5 MHz Wireless Receivers***
- ***Low-Loss, Coupled-Resonator Quartz Design***
- ***Simple External Impedance Matching***
- ***Rugged TO39 Hermetic Package***
- ***Complies with Directive 2002/95/EC (RoHS)***

The RF3181 is a low-loss, compact, and economical surface-acoustic-wave (SAW) filter designed to provide front-end selectivity in 916.5 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 the USA under FCC Part 15 and in Canada under DoC RSS-210.

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 (not included). Quartz construction provides excellent frequency stability over a wide temperature range.



TO39-3 Case

Electrical Characteristics

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Center Frequency at 25°C	Absolute Frequency	f_C	1, 2	916.400	916.500	916.600	MHz
	Tolerance from 916.500 MHz	Δf_C				±100	kHz
Insertion Loss		IL	1		3.2	5	dB
3 dB Bandwidth		BW_3	1,2	600	750	1000	kHz
Rejection	at f_C - 21.4 MHz (Image)		1	33	40		dB
	at f_C - 10.7 MHz (LO)			15	37		
	Ultimate				80		
Temperature	Operating Case Temp.	T_C	3, 4	-40		+85	°C
	Turnover Temperature	T_O			25		°C
	Turnover Frequency	f_O			f_C		MHz
	Freq. Temp. Coefficient	FTC			0.032		ppm/°C^2
Frequency Aging	Absolute Value during the First Year	|fA|	5		≤10		ppm/yr
External Impedance	Series Inductance	L	1	Coilcraft 8.2 nH Chip Inductor			nH
	Shunt Capacitance	C	1	1		5	pF
Lid Symbolization (in addition to Lot and/or Date Codes)		RFM RF3181					

CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

Notes:

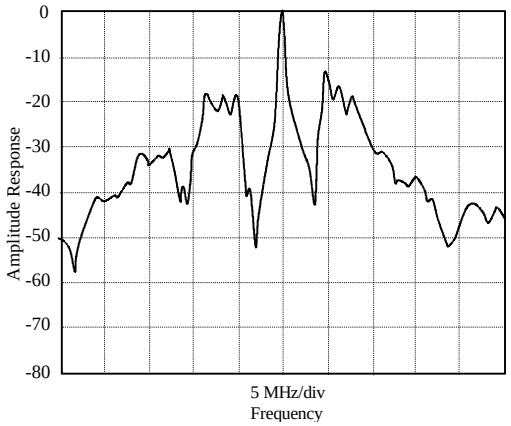
1. Unless noted otherwise, all measurements are made with the filter installed in the specified test fixture which is connected to a 50 Ω test system with VSWR ≤ 1.2:1. The test fixture L and C are adjusted for minimum insertion loss at the filter center frequency, f_c. Note that insertion loss, bandwidth, 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. Unless noted otherwise, specifications apply over the entire specified operating temperature range.
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 without notice.
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.

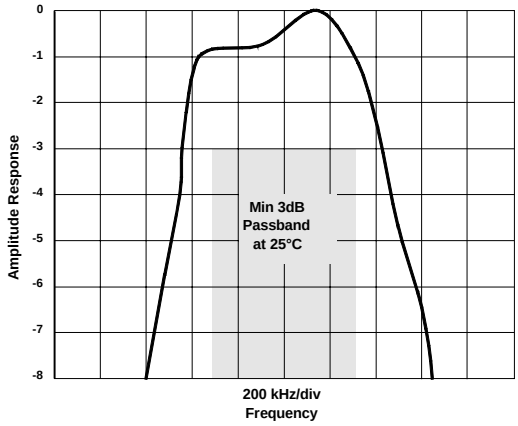
Absolute Maximum Ratings

Rating	Value	Units
Incident RF Power	+13	dBm
DC Voltage Between Any Two Pins (Observe ESD Precautions)	±30	VDC
Case Temperature[5]	-40 to +85	°C
Soldering Temperature (10 seconds / 5 cycles max.)	260	°C

Typical Filter Response

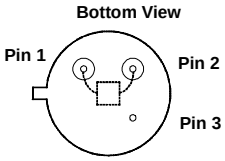
Typical filter responses are shown below. The actual response is dependent on external impedance matching and circuit layout. Illustrated frequencies and minimum rejection for LO and IMAGE are shown only for superhet receivers with 10.7 MHz IF.



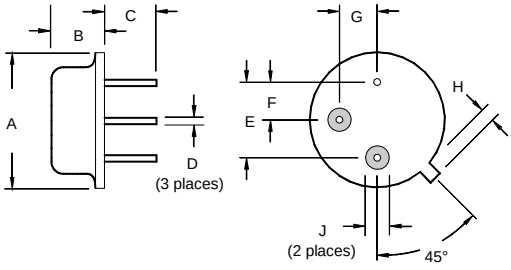


Electrical Connections

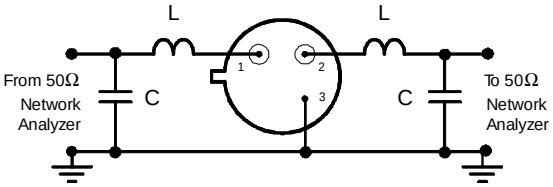
Pin	Connection
1	Input or Output
2	Output or Input
3	Case Ground



Case Design



Typical Test Circuit



Dimensions	Millimeters		Inches	
	Min	Max	Min	Max
A		9.40		0.370
B		3.18		0.125
C	2.50	3.50	0.098	0.138
D	0.46 Nominal		0.018 Nominal	
E	5.08 Nominal		0.200 Nominal	
F	2.54 Nominal		0.100 Nominal	
G	2.54 Nominal		0.100 Nominal	
H		1.02		0.040
J	1.40		0.055	