



**SF2038B**

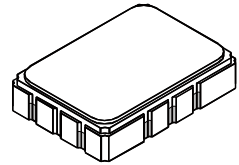
**76.500 MHz  
SAW Filter**

- **Designed for SDARS IF Receiver**
- **Low Insertion Loss**
- **5.0 X 7.0 mm Surface-Mount Case**
- **Differential or Single Ended Input and Output**
- **Complies with Directive 2002/95/EC (RoHS)**



**Absolute Maximum Ratings**

Rating	Value	Units
Maximum Incident Power in Passband	+10	dBm
Max. DC voltage between any 2 terminals	30	VDC
Storage Temperature Range	-40 to +85	°C
Max Soldering Profile	265°C for 10 s	



**SMP-03**

**Electrical Characteristics**

Characteristic	Sym	Notes	Min	Typ	Max	Units
Nominal Center Frequency	$f_c$	1		76.500		MHz
Passband	IL	1		10.0	12.0	dB
1dB Passband	$BW_1$		12.5	14.0		MHz
15dB Bandwidth	$BW_{15}$			16.8	18.0	MHz
30dB Bandwidth	$BW_{30}$			18.0	19.2	MHz
Amplitude Ripple over $f_c \pm 6.25$ MHz					0.70	1.3
Group Delay Variation over $f_c \pm 6.25$ MHz	GDV			40	150	ns <sub>P-P</sub>
Rejection		1, 3				dB
50 to 64.44 MHz			40	46		
64.44 to 66.70 MHz			36	41		
86.30 to 87.06 MHz			*30	44		
87.06 to 91.50 MHz			36	44		
91.50 to 100 MHz			40	47		
Operating Temperature Range	$T_A$	1	-40		+85	°C
Frequency Coefficient	FTC			-87		ppm/°C
Differential Input				175 ohms		
Differential Output				180 ohms		
Case Style		6	SMP-03 7 x 5 mm Nominal Footprint			
Lid Symbolization (YY=year, WW=week, S=shift) See note 4			RFM SF2038B YYWWS			

\*At low temperature extreme -40°C

**Electrical Connections**

Connection	Terminals
Port 1 Hot	10
Port 1 Ground Return	1
Port 2 Hot	5
Port 2 Ground Return	6
Case Ground	All Others

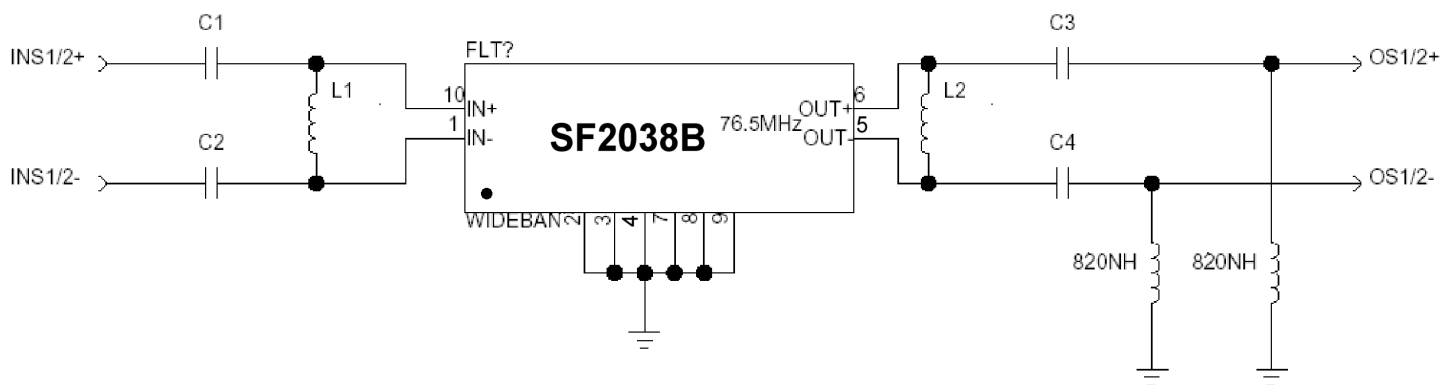
**Notes:**

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. "LRIP" or "L" after the part number indicates "low rate initial production" and "ENG" or "E" indicates "engineering prototypes."
5. The design, manufacturing process, and specifications of this filter are subject to change.
6. Tape and Reel Standard ANSI / EIA 481.
7. 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.
8. US and international patents may apply.
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11. Electrostatic Sensitive Device. Observe precautions for handling.



## Matching Circuit and Matching Component Values Used in G3 Sirius Radios

(Refer to Sirius Radio G3 Chipset Application Note, Doc. #RX000104-B, Sec. 4.2.2)

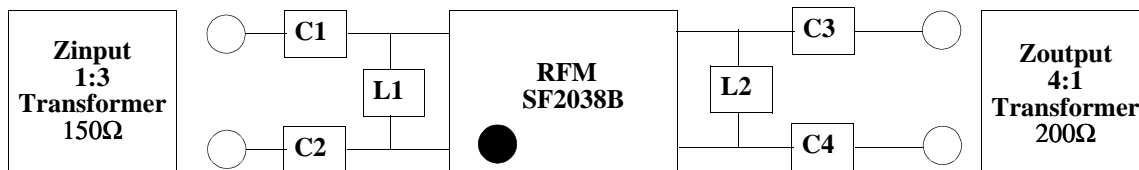


**Wideband SAW Matching Circuit**

### Wideband SAW Matching Values

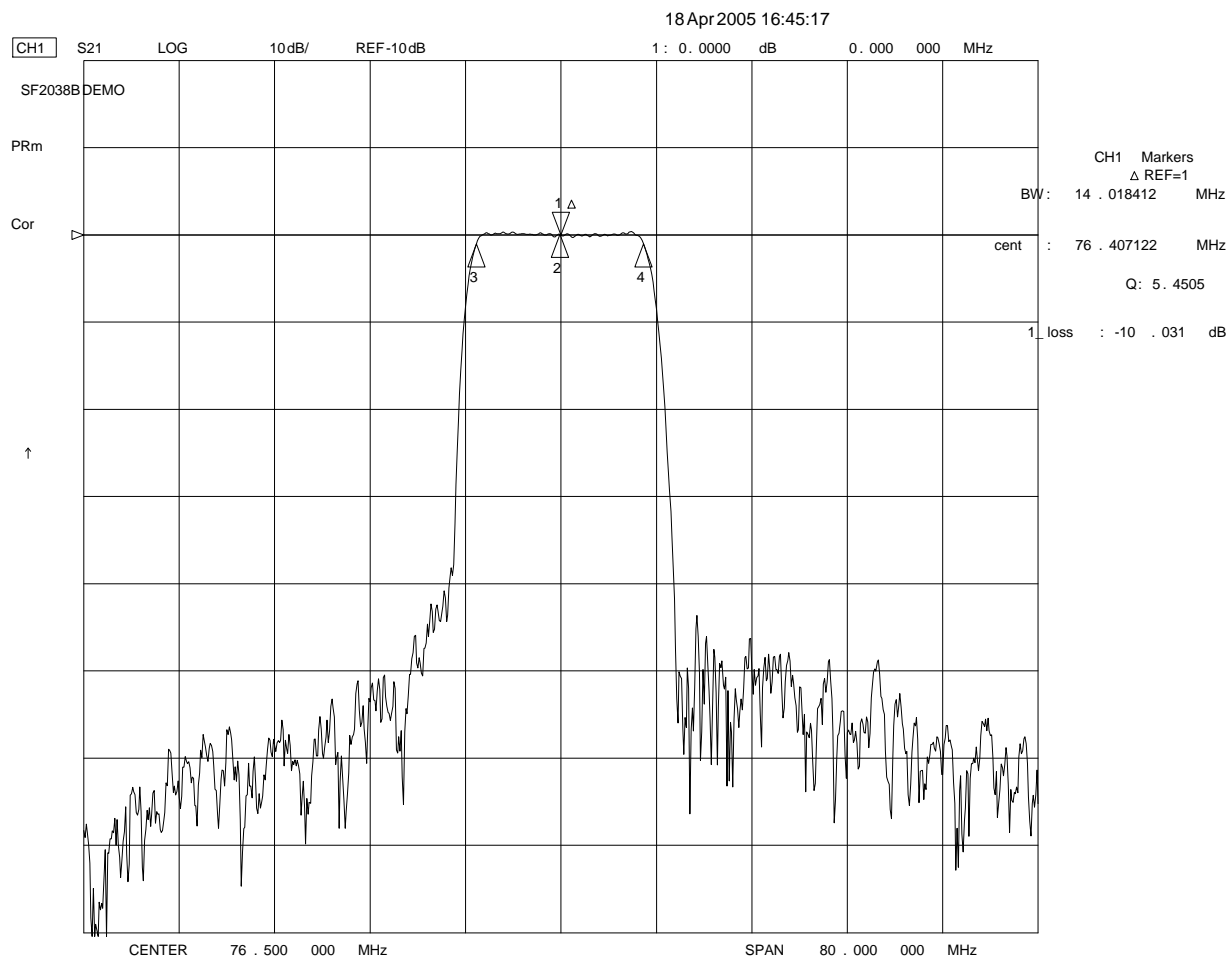
Reference Designator	Value
C1	15 pF
C2	15 pF
L1	270 nH
L2	270 nH
C3	27 pF
C4	27 pF

## Matching Circuit and Matching Component Values Used on Filter Demo Board

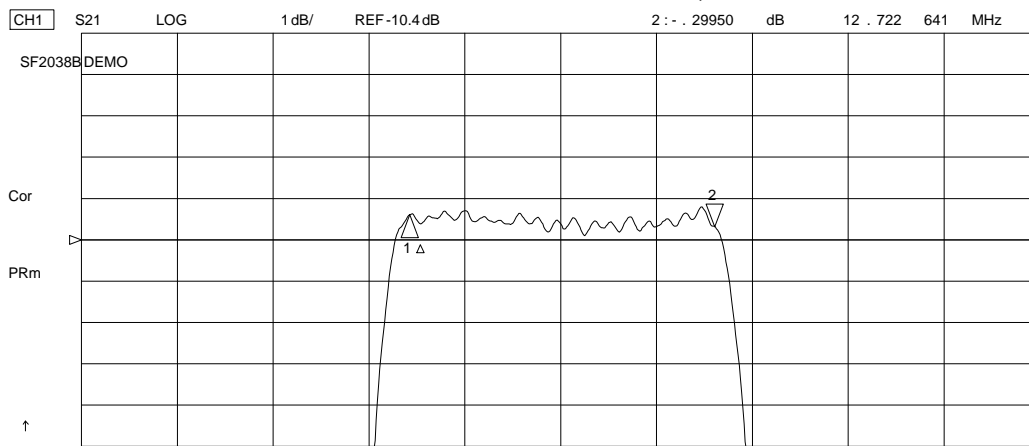


**SF2038B**  
76.500 MHz

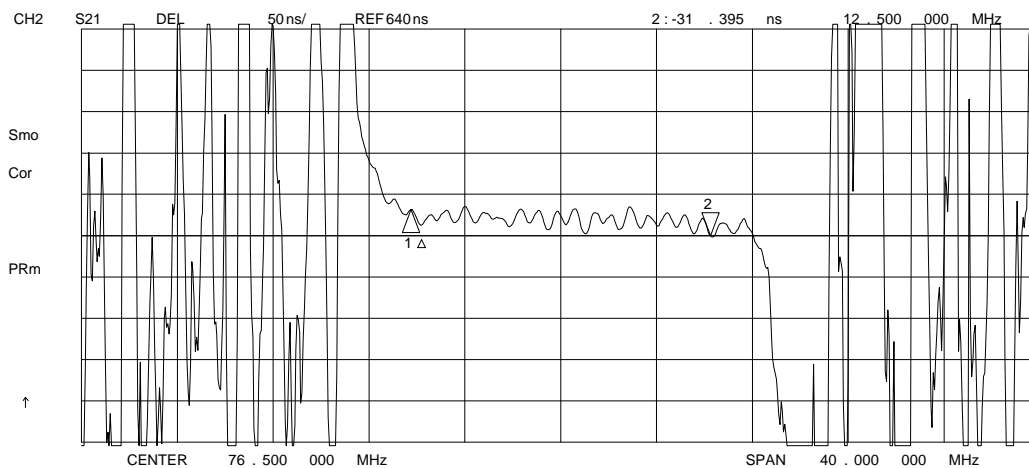
**C1 = 22pF**  
**C2 = 22pF**  
**L1 = 220nH**  
**L2 = 270nH**  
**C3 = 22pF**  
**C4 = 22pF**



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CH1 Markers  
Δ REF=1  
mean : -9 . 9489 dB  
s. dev : . 13250 dB  
p-p : . 69240 dB



CH2 Markers  
Δ REF=1  
mean : 659 . 90 ns  
s. dev : 7 . 6786 ns  
p-p : 35 . 477 ns

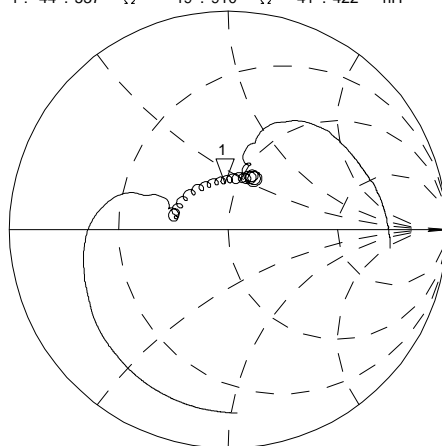
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CH1 S11 1UFS 1 : 44 . 537 Ω 19 . 910 Ω 41 . 422 nH 76 . 500 000 MHz

SF2038BDEMO

Cor

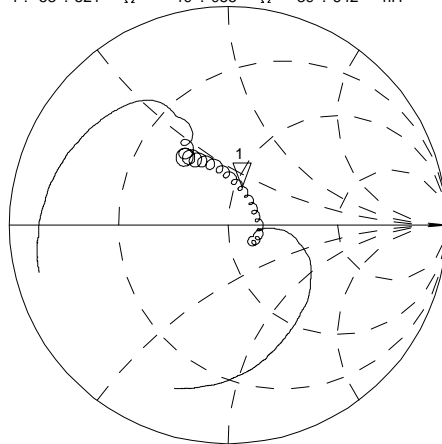
PRm



CH2 S22 1UFS 1 : 53 . 521 Ω 19 . 055 Ω 39 . 642 nH 76 . 500 000 MHz

Cor

PRm

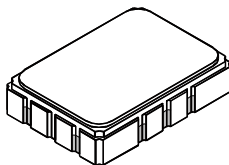


CENTER 76 . 500 000 MHz

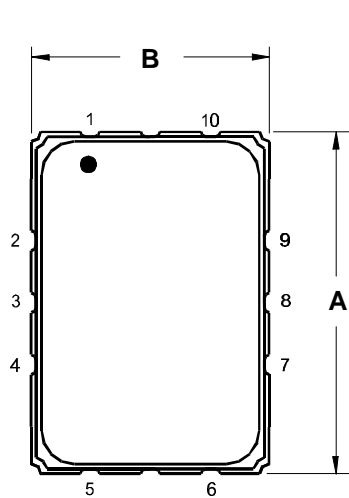
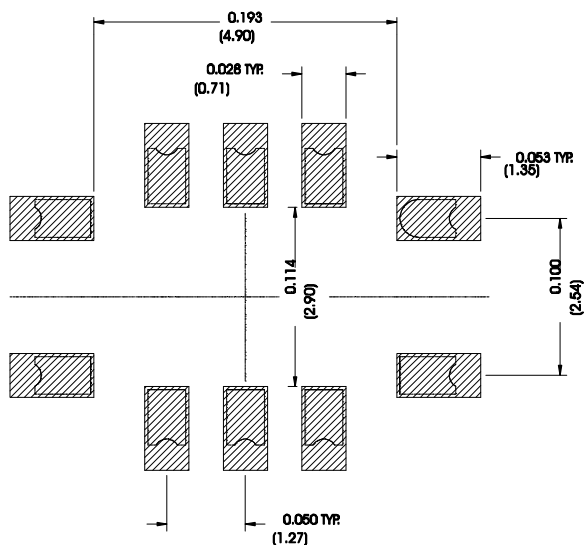
SPAN 40 . 000 000 MHz

# SMP-03 Case

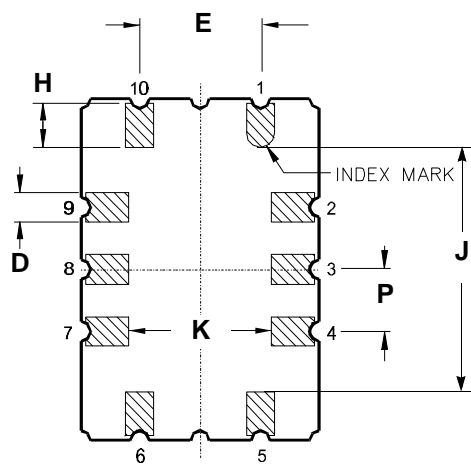
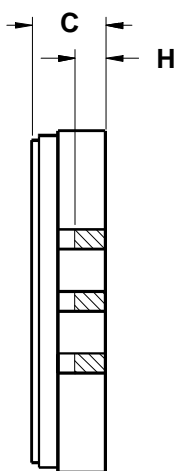
## 10-Terminal Ceramic Surface-Mount Case 7 x 5 mm Nominal Footprint



### Recommended PCB Footprint



TOP VIEW



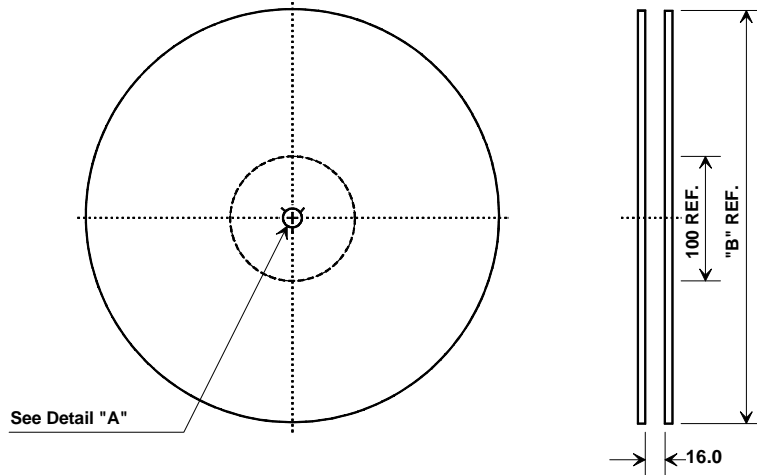
BOTTOM VIEW

Case Dimensions						
Dimension	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	6.80	7.00	7.20	0.268	0.276	0.283
B	4.80	5.00	5.20	0.189	0.197	0.205
C		1.65	2.00		0.065	0.079
D	.47	0.60	.73	0.019	0.024	0.029
E	2.41	2.54	2.67	0.095	0.100	0.105
H	0.87	1.0	1.13	0.034	0.039	0.044
J	4.87	5.00	5.13	0.192	0.197	0.202
K	2.87	3.00	3.13	0.113	0.118	0.123
P	1.14	1.27	1.40	0.045	0.050	0.055

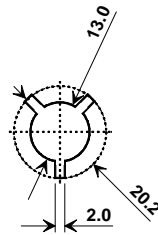
Materials	
Solder Pad Termination	Au plating 30 - 60 ulnches (76.2-152 uM) over 80-200 ulnches (203-508 uM) Ni.
Lid	Fe-Ni-Co Alloy Electroless Nickel Plate (8-11% Phosphorus) 100-200 ulnches Thick
Body	Al <sub>2</sub> O <sub>3</sub> Ceramic
Pb Free	

Electrical Connections		
Connection		Terminals
Port 1	Input or Return	10
	Return or Input	1
Port 2	Output or Return	5
	Return or Output	6
Ground		All others
Single Ended Operation		Return is ground
Differential Operation		Return is hot

## Tape and Reel Specifications



"B" Nominal Size		Quantity Per Reel
Inches	millimeters	
7	178	500
13	330	2000



## COMPONENT ORIENTATION and DIMENSIONS

Carrier Tape Dimensions	
<b>Ao</b>	5.5 mm
<b>Bo</b>	7.5 mm
<b>Ko</b>	2.0 mm
<b>Pitch</b>	8.0 mm
<b>W</b>	16.0 mm

