



**SF2040B**

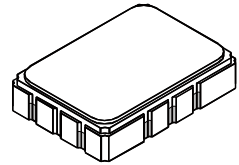
**80.460 MHz  
SAW Filter**

- **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		80.460		MHz
Passband Insertion Loss	IL	1		9.5	12.0	dB
1dB Passband	$BW_1$	1	3.7	4.1		MHz
15dB Bandwidth	$BW_{15}$			6.6	6.7	MHz
30dB Bandwidth	$BW_{30}$			7.6	7.7	MHz
Amplitude Ripple over $f_c \pm 1.85$ MHz				0.5	1.10	dB <sub>P-P</sub>
Group Delay Variation over $f_c \pm 1.85$ MHz	GDV			60	150	ns <sub>P-P</sub>
Rejection		1, 3	40	44		dB
50 to 74.39 MHz			38	40		
74.39 to 75.99 MHz			40	44		
85.21 to 86.5 MHz			45	48		
86.5 to 91.50 MHz			45	53		
91.50 to 100 MHz						
Operating Temperature Range	$T_A$	1	-40		+85	°C
Frequency Temperature Coefficient	FTC			-18		ppm/°C
Differential Input			175 ohms			
Differential Output			1000 ohms			
Case Style		6	SMP-03 7 x 5 mm Nominal Footprint			
Lid Symbolization (YY=year, WW=week, S=shift) See note 4			RFM SF2040B YYWWS			

**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

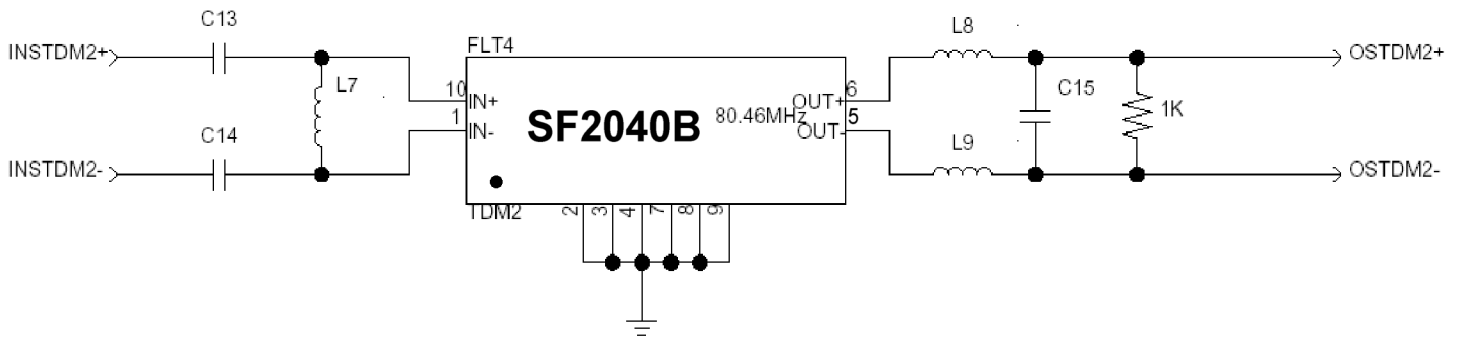
**Notes:**

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  $\Omega$  and measured with 50  $\Omega$  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.
9. RFM, stylized RFM logo, and RF Monolithics, Inc. are registered trademarks of RF Monolithics, Inc.
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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. 4.2.5)

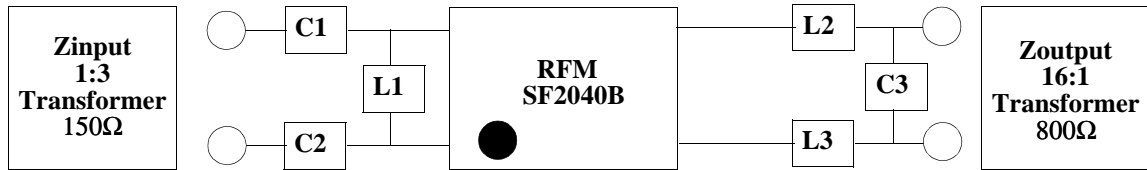


**TDM2 Narrowband SAW Matching Circuit**

**TDM2 Narrowband SAW Matching Values**

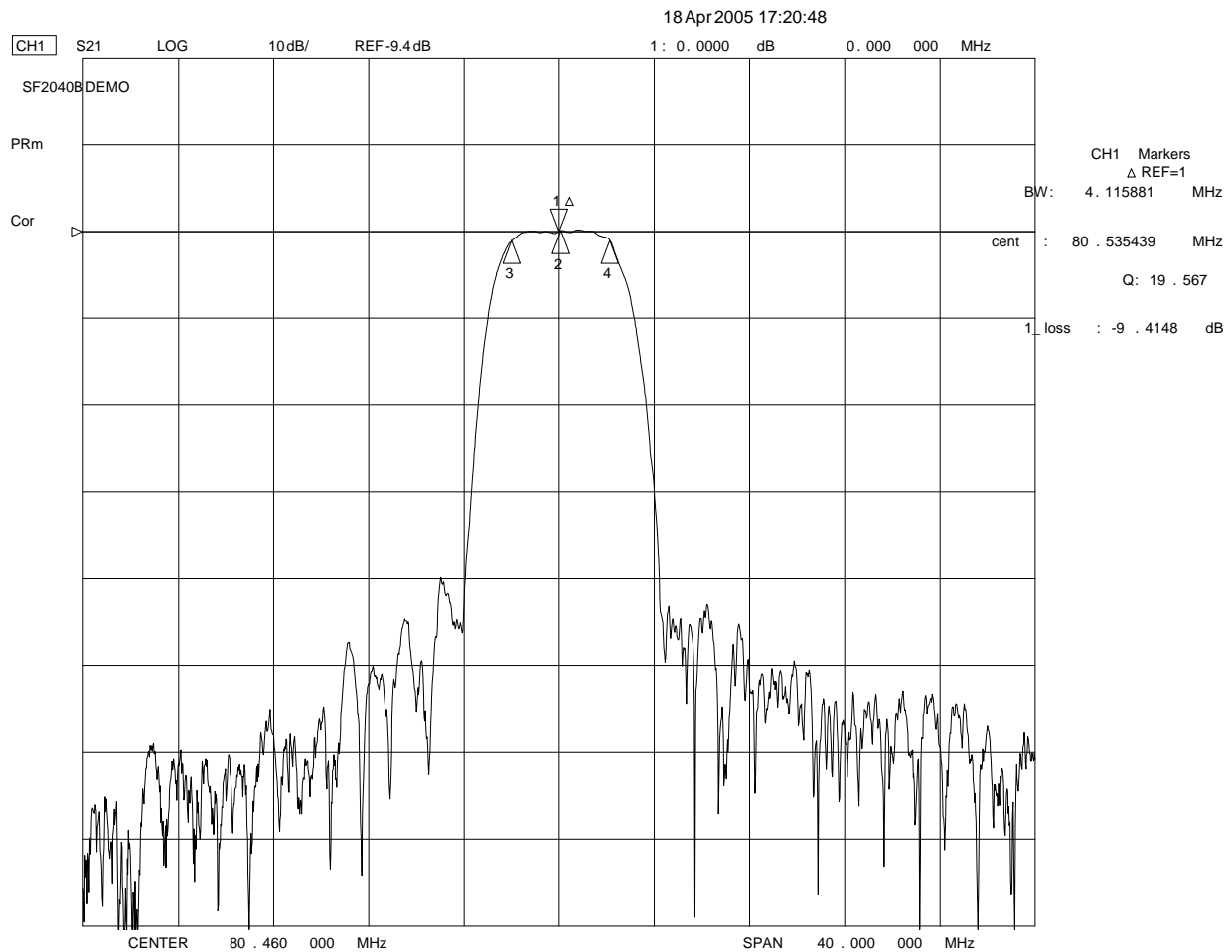
Reference Designator	Value
C13	12 pF
C14	12 pF
L7	240 nH
L8	390 nH
L9	390 pF
C15	10 pF

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

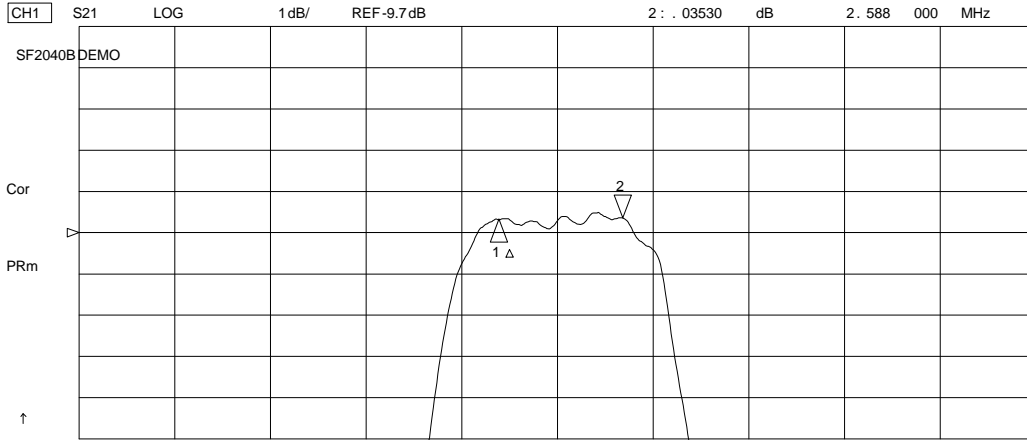


**SF2040B**  
80.460 MHz

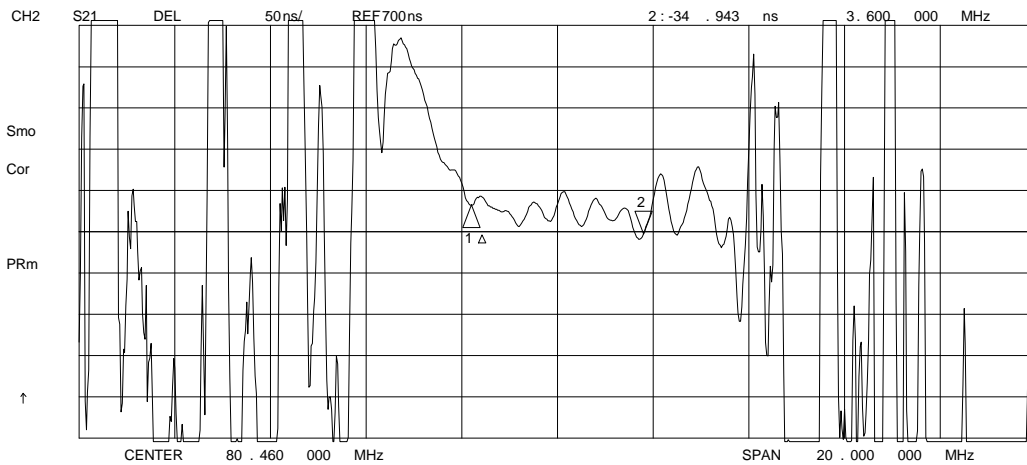
**C1 = 9pF**  
**C2 = 9pF**  
**L1 = 270nH**  
**L2 = 330nH**  
**L3 = 330pF**  
**C3 = 12pF**



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CH1 Markers  
Δ REF=1  
mean : -9.4041 dB  
s. dev : .09650 dB  
p-p : .39870 dB



CH2 Markers  
Δ REF=1  
mean : 723.53 ns  
s. dev : 12.938 ns  
p-p : 57.755 ns

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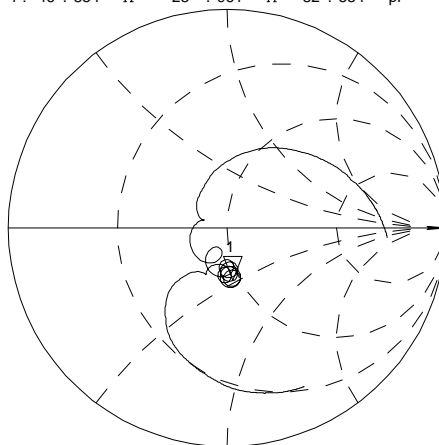
CH1 S11 1UFS

1: 46.854  $\Omega$  -23.961  $\Omega$  82.554 pF

80.460 000 MHz

SF2040BDEMO

PRm



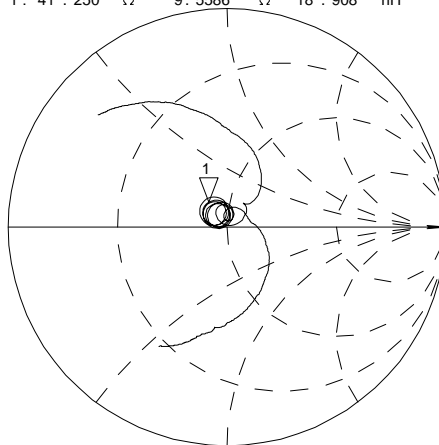
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CH2 S22 1UFS

1: 41.250  $\Omega$  9.5586  $\Omega$  18.908 nH

80.460 000 MHz

PRm



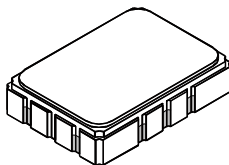
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CENTER 80.460 000 MHz

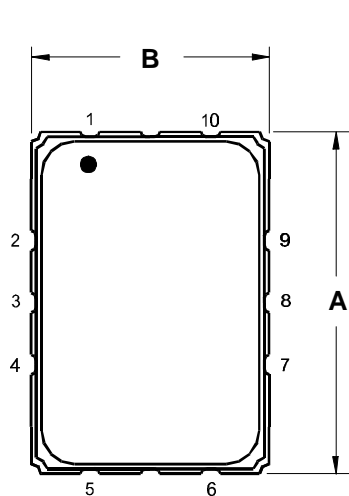
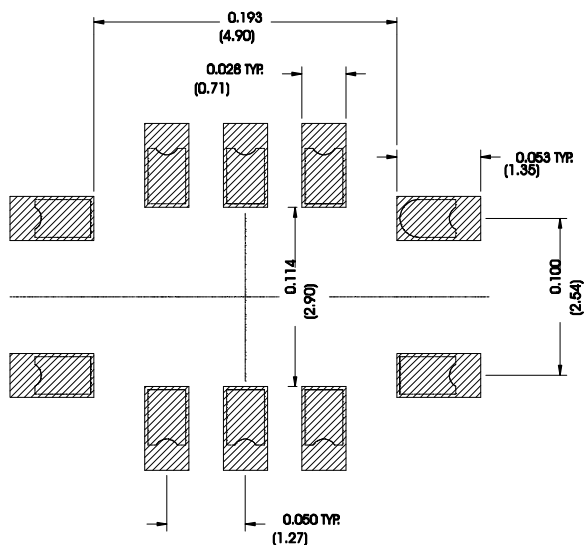
SPAN 20.000 000 MHz

# SMP-03 Case

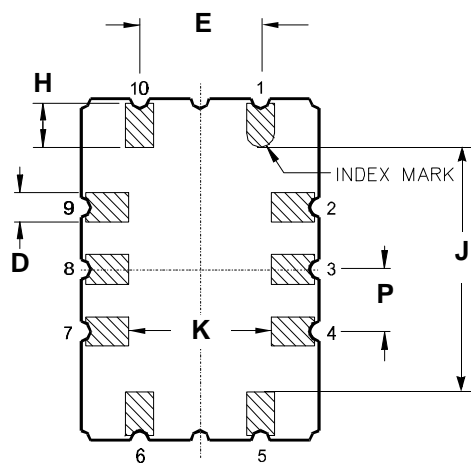
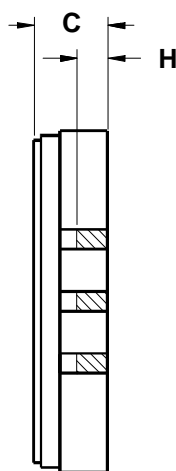
## 10-Terminal Ceramic Surface-Mount Case 7 x 5 mm Nominal Footprint



### Recommended PCB Footprint



TOP VIEW



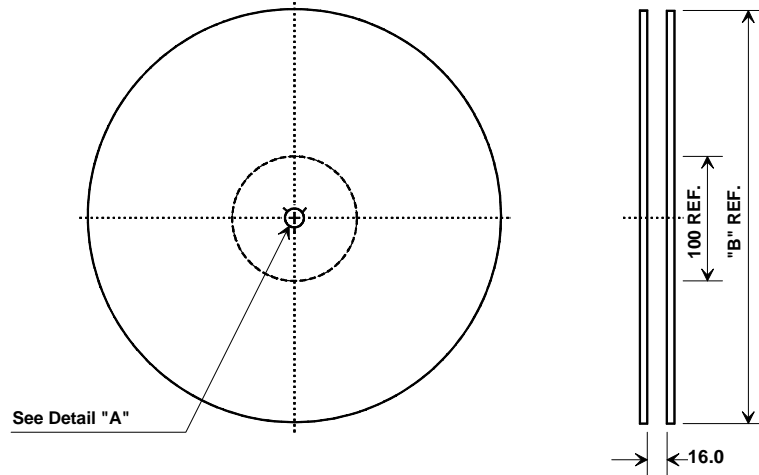
BOTTOM VIEW

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

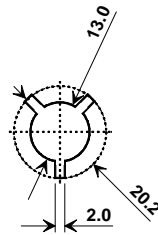
Materials	
Solder Pad Termination	Au plating 30 - 60 ulnches (76.2-152 uM) over 80-200 ulnches (203-508 uM) Ni.
Lid	Fe-Ni-Co Alloy Electroless Nickel Plate (8-11% Phosphorus) 100-200 ulnches Thick
Body	Al <sub>2</sub> O <sub>3</sub> Ceramic
Pb Free	

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

