

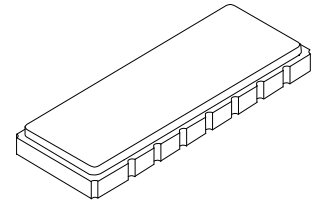
- Precision IF SAW Filter
- Excellent Size-to-Performance Ratio
- Hermetic Surface-mount Case
- Single-ended Input and Output
- Complies with Directive 2002/95/EC (RoHS)
- Tape and Reel Standard per ANSI/EIA-481
- Moisture Sensitivity Level: 1

**Absolute Maximum Ratings**

Rating	Value	Units
Maximum Incident Power in Passband	+18	dBm
Maximum DC Voltage Between any Two Terminals	30	VDC
Storage Temperature Range in Tape and Reel	-40 to +85	°C
Suitable for Lead-free Soldering - Maximum Soldering Profile	260°C for 30 s	

**SF2221A**

**193.60 MHz  
SAW Filter**



**SM1154-14**

**Electrical Specifications**

Characteristic	Sym	Notes	Min	Typ	Max	Units
Nominal Center Frequency	$f_c$		193.60			MHz
Passband:						
Minimum Insertion Loss, 192.9 to 194.3 MHz				8.0	9.0	dB
1 dB Bandwidth	$BW_1$		1.0	1.27		MHz
3 dB Bandwidth	$BW_3$		1.4	1.82		MHz
3 dB Passband VSWR, Matched				2.2:1	3:1	
Group Delay Variation, 192.9 to 194.3 MHz	GDV			300	500	ns <sub>P-P</sub>
Absolute Delay at 193.6 MHz	AGD		800	900	1000	ns
Rejection:						
191.8 and 195.4 MHz			25	30		dB
Ultimate Rejection, <182.6 MHz, >204.6 MHz			45	50		
Operating Temperature Range	$T_A$		0		+70	°C

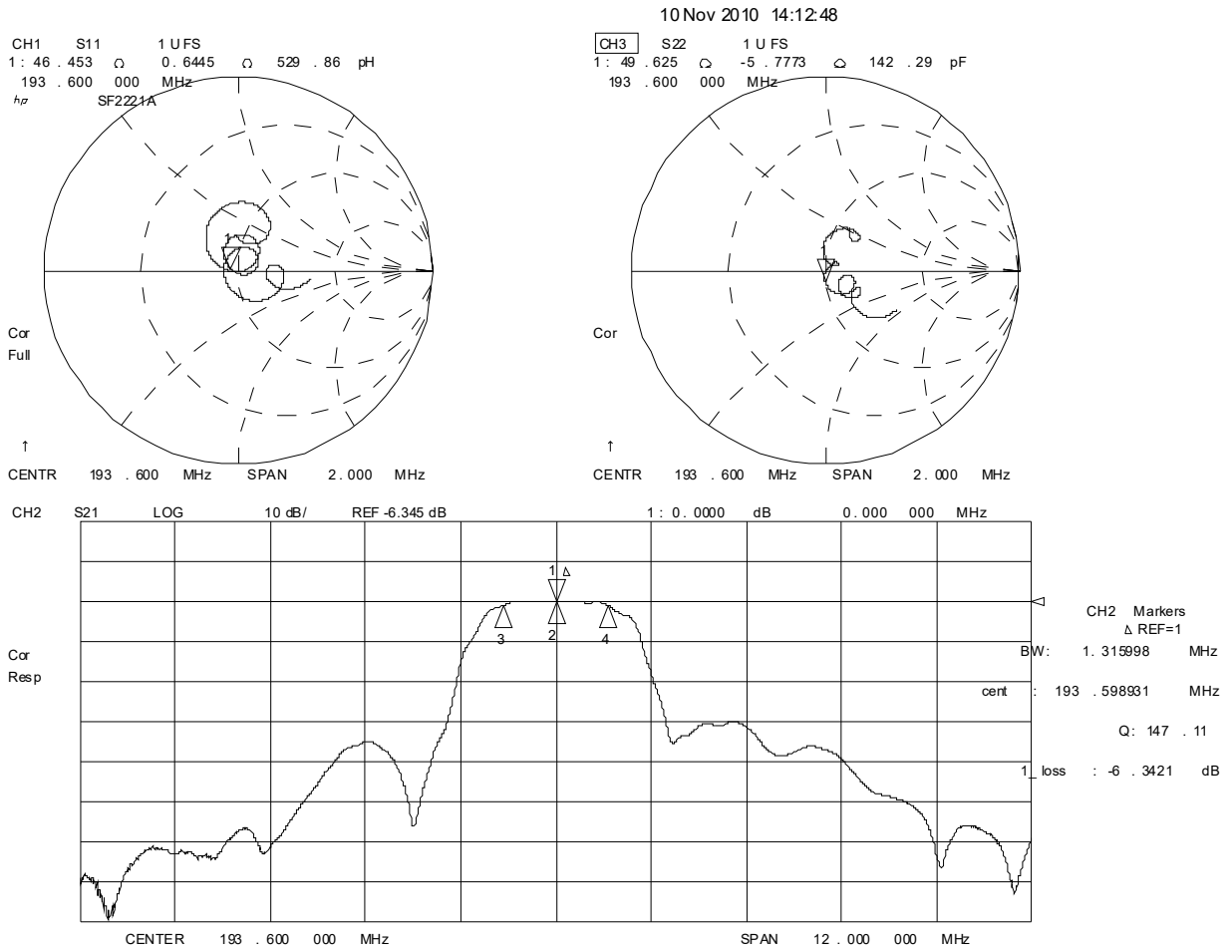
Impedance Matching to 50 $\Omega$ Single-ended Source and Load	External L-C
Case Style	SM1154-14, 11.5 x 4 mm Nominal Footprint
Lid Symbolization (YY = year, WW = week, S = shift, ## = Sequence Code)	SF2221A, YYWWS##

 **CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**

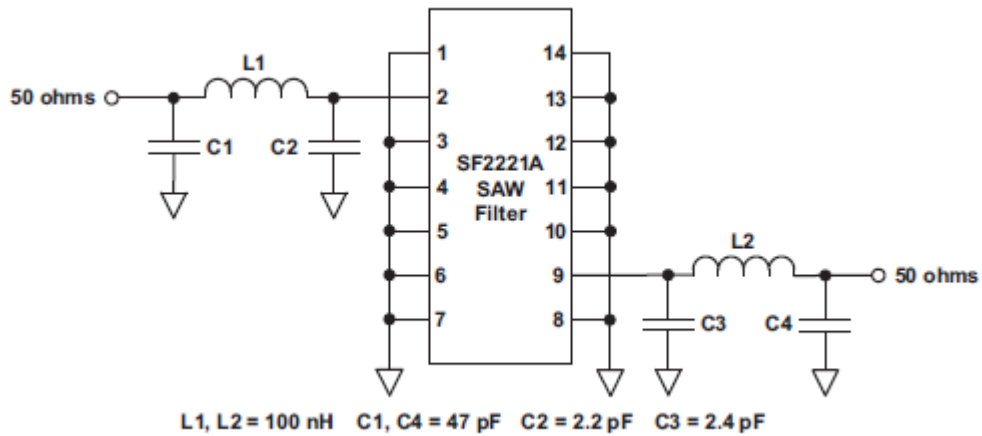
**NOTES:**

1. The design, manufacturing process, and specifications of this device are subject to change.
2. US or International patents may apply.
3. RoHS compliant from the first date of manufacture.

# Frequency Response Plots

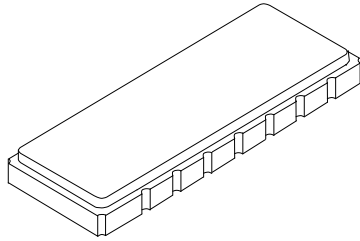


# Tuning Network Topology



# SM1154-14 Ceramic Surface-mount 14-Terminal Case

## 11.5 x 4.0 mm Nominal Footprint

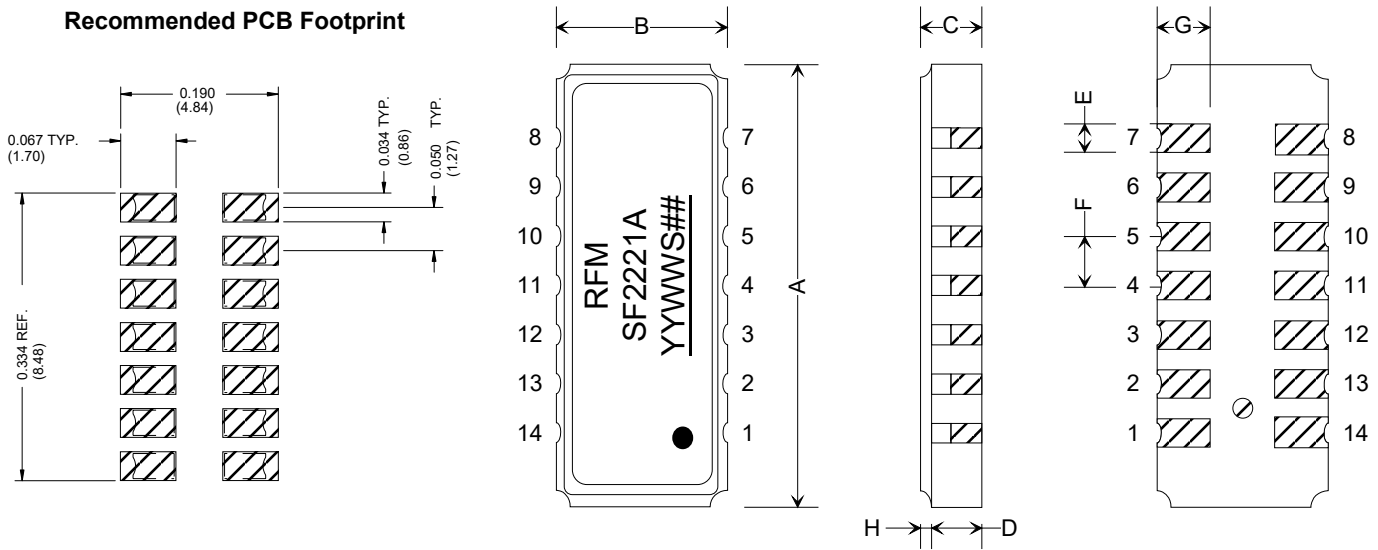


Case Dimensions						
Dimension	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	11.4	11.5	11.6	.442	0.450	0.458
B	3.8	4.0	4.2	.150	0.157	.166
C	1.4	1.6	1.8	.057	0.063	.069
D	1.3	1.5	1.7	.053	0.059	.065
E		0.76			0.030	
F		1.27			0.050	
G		1.27			0.050	
H		0.1			0.004	

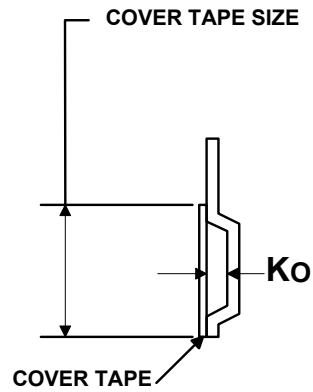
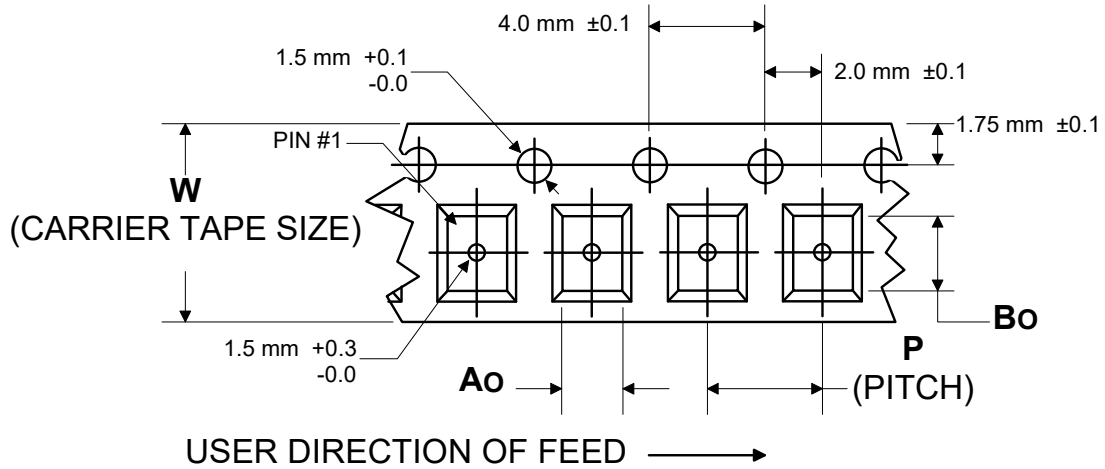
Materials	
Solder Pad Plating	0.3 to 1.0 $\mu\text{m}$ Gold over 1.27 to 8.89 $\mu\text{m}$ Nickel
Lid Plating	2.0 to 3.0 $\mu\text{m}$ Nickel
Body	$\text{Al}_2\text{O}_3$ Ceramic

Electrical Connections	
Connection	Terminals
Input	2
Input Return	13
Output	9
Output Return	6
Ground	All Others

### Recommended PCB Footprint



## COMPONENT ORIENTATION and DIMENSIONS



Carrier Tape Dimensions		
Ao	4.55 mm	±0.1
Bo	12.04 mm	±0.1
Ko	2.13 mm	±0.1
Pitch	8.00 mm	±0.1
W	24.00 mm	±0.3

## Recommended Reflow Profile

1. Preheating shall be fixed at 150~180°C for 60~90 seconds.
2. Ascending time to preheating temperature 150°C shall be 30 seconds min.
3. Heating shall be fixed at 220°C for 50~80 seconds and at 260°C +0/-5°C peak (10 seconds).
4. Time: 5 times maximum.

