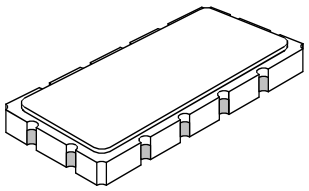
# SF2135A

# 96.0 MHz SAW Filter

- ***Designed for Wide Channel IF Filtering***
- ***Low Insertion Loss***
- ***Hermetic 13.3 x 6.5 mm Surface-mount Case***
- ***Balanced or Single-ended Input and Output***
- ***Complies with Directive 2002/95/EC (RoHS)***



**SMP-53**

**Absolute Maximum Ratings**

| Rating | Value | Units |
|---|---|---|
| Maximum Incident Power in Passband | +13 | dBm |
| Maximum DC Voltage Between any Two Terminals | 30 | VDC |
| Storage Temperature Range | -40 to +85 | °C |
| Suitable for Lead-free Soldering - Maximum Soldering Profile | 260 °C for 30 s | |

**Electrical Characteristics**

| Characteristic | | Sym | Notes | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|---|
| Center Frequency | | $f_C$ | 1 | | 96.0 | | MHz |
| 1 dB Bandwidth | | $BW_1$ | | 1.56 | 1.80 | | MHz |
| Insertion Loss | | IL | 1, 2,3 | | 11.8 | 15.0 | dB |
| Relative Attenuation | 91 to 94.5 MHz | | | 6 | 9.5 | | |
| | 97.5 to 98.5 MHz | | | 6 | 11.5 | | dB |
| | 10 to 60 MHz | | | 55 | 72 | | dB |
| | 76.8 MHz | | | 55 | 72 | | dB |
| | 132 to135 MHz | | | 55 | 74 | | dB |
| | 135 to 1000 MHz | | | 35 | 58 | | |
| Passband Amplitude Ripple | 95.2 to 96.8 MHz | | 1, 2, 3 | | 0.9 | 1.2 | $dB_{P-P}$ |
| Group Delay Ripple | 95.2 to 96.8 MHz | | | | 62 | 100 | $ns_{P-P}$ |
| Operating Temperature | | | 1 | -30 | | +85 | °C |
| Terminating Source Impedance | | | | | 50 | | ohm |
| Terminating Load Impedance | | | | | 50 | | ohm |

| | |
|---|---|
| Impedance Matching to 50 Ω Unbalanced | External L-C |
| Case Style | SMP-53 13.3 x 6.5 mm Nominal Footprint |
| Lid Symbolization (YY = year, WW = week) | RFM SF2135A YYWW |

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

**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, fc.
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. Part to part absolute delay measurement records the absolute delay mean across 1 dB passband.
5. "LRIP" or "L" after the part number indicates "low rate initial production" and "ENG" or "E" indicates "engineering prototypes."
6. The design, manufacturing process, and specifications of this filter are subject to change.
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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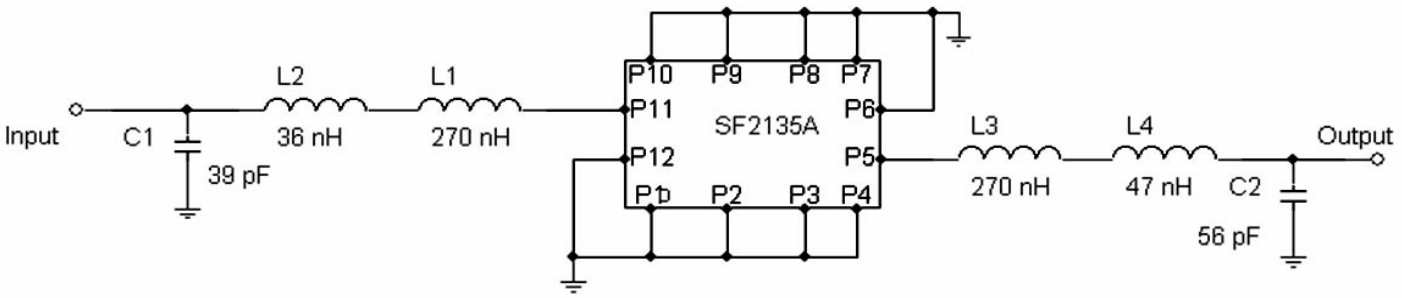
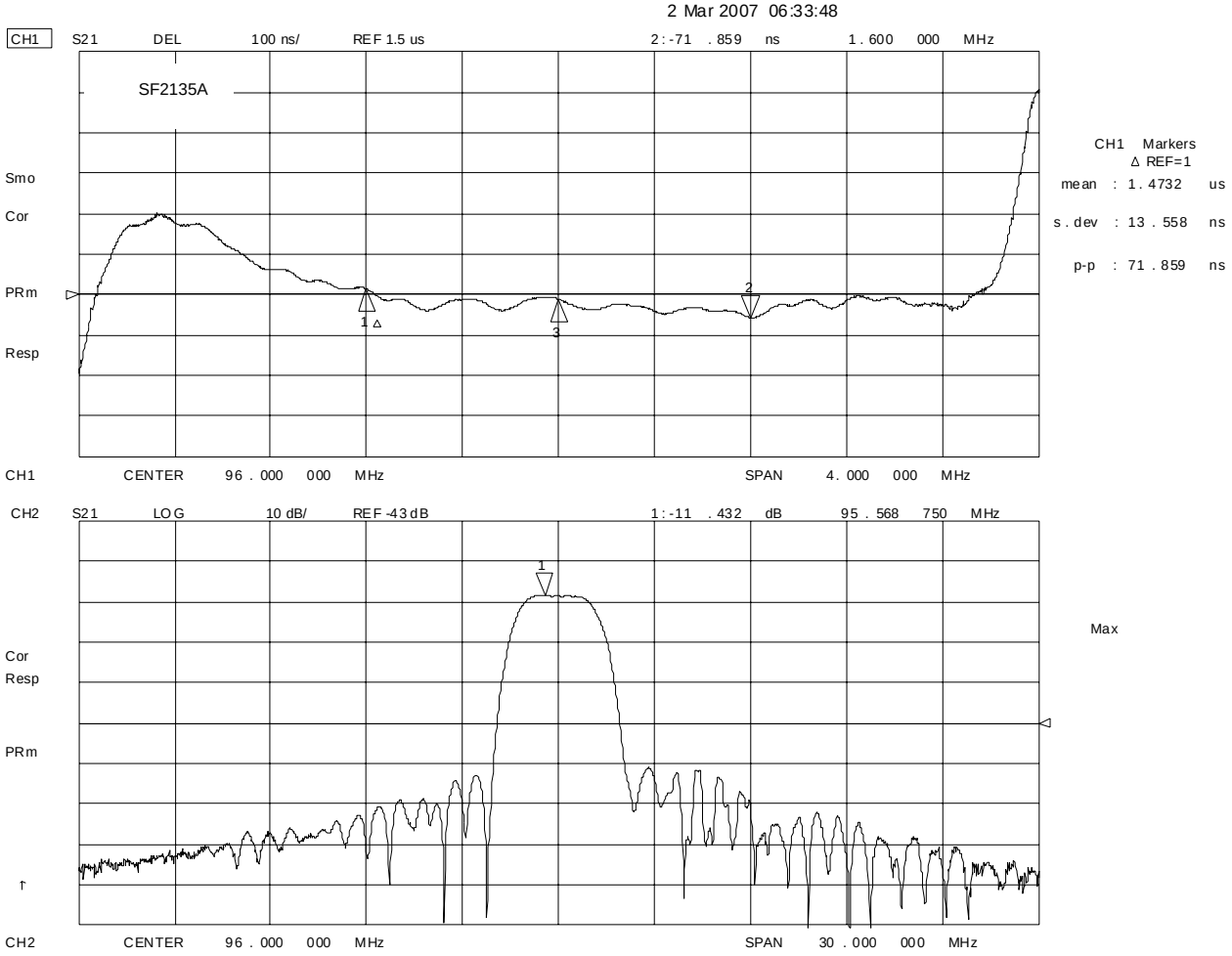
## SF2135A 50 ohm Tuning Network




## SF2135A Group Delay Ripple and Filter Response Plots





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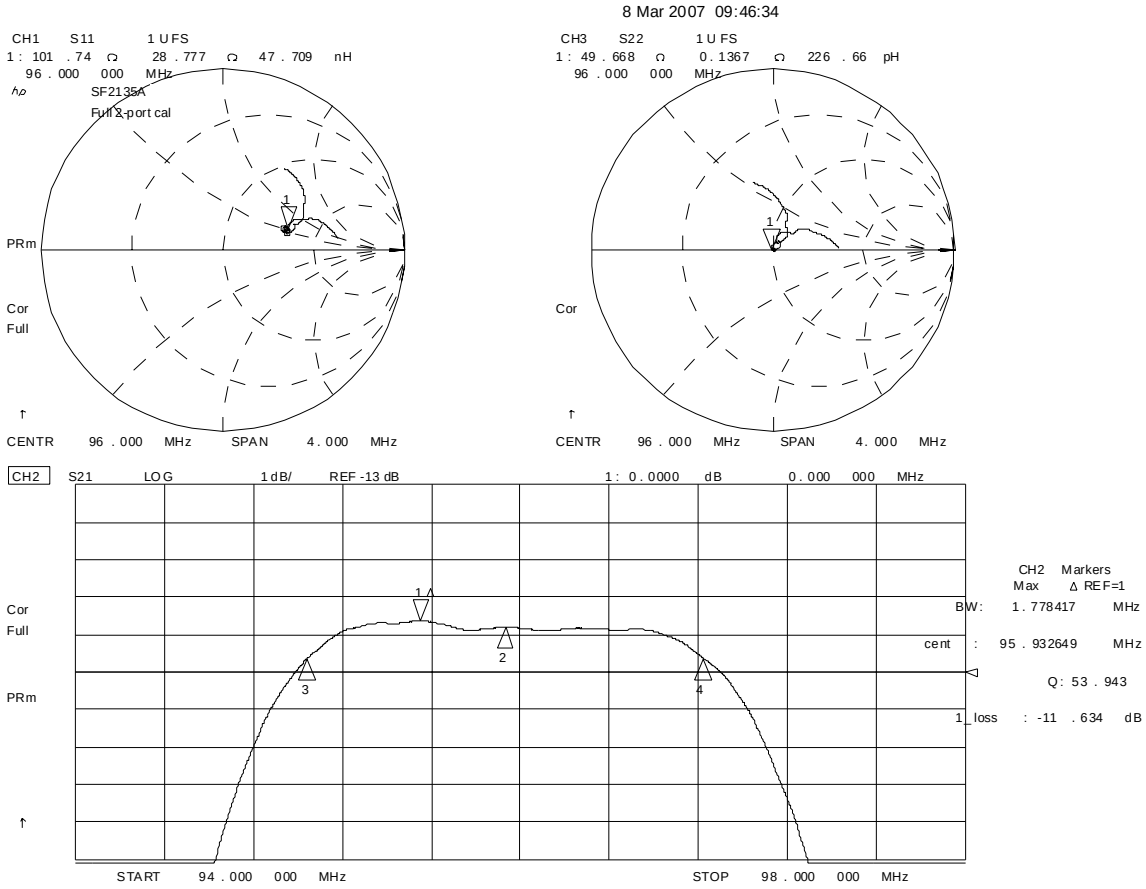
# SF2135A $S_{11}$, $S_{22}$ and Pass-band Plots





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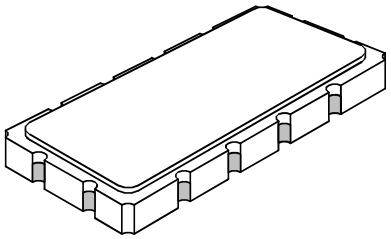
# *SAW Filters Package*
# SMP-53 Case

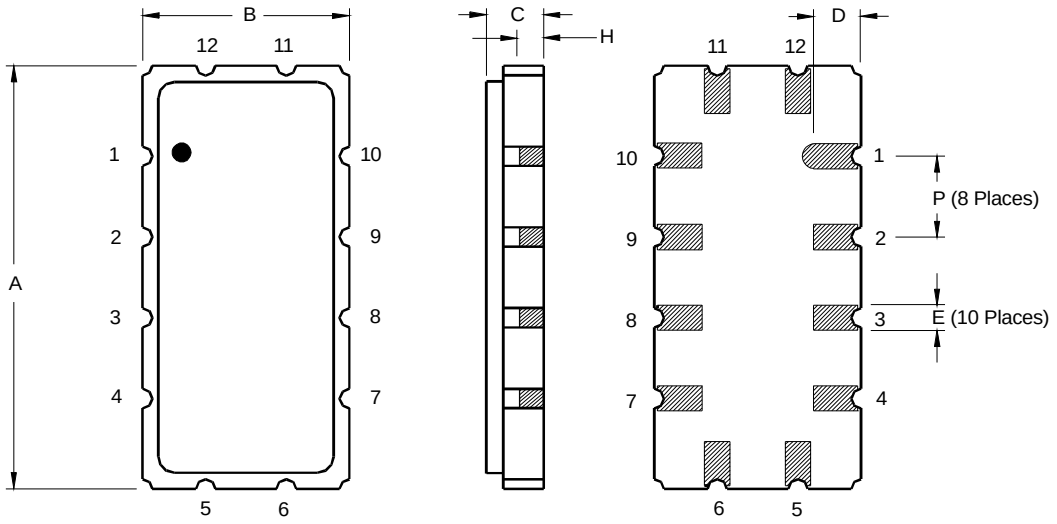
## 12-Terminal Ceramic Surface-Mount Case
## 13.3 x 6.5 mm Nominal Footprint



| Case Dimensions | | | | | | |
|---|---|---|---|---|---|---|
| Dimension | mm | | | Inches | | |
| | Min | Nom | Max | Min | Nom | Max |
| A | 13.08 | 13.31 | 13.60 | 0.515 | 0.524 | 0.535 |
| B | 6.27 | 6.50 | 6.80 | 0.247 | 0.256 | 0.268 |
| C | | 1.91 | 2.00 | | 0.075 | 0.079 |
| D | | 1.50 | | | 0.059 | |
| E | | 0.79 | | | 0.031 | |
| H | | 1.0 | | | 0.039 | |
| P | | 2.54 | | | 0.100 | |

| Materials | |
|---|---|
| Solder Pad Plating | 0.3 to 1.0 µm Gold over 1.27 to 8.89 µm Nickel |
| Lid Plating | 2.0 to 3.0 µm Nickel |
| Body | $Al_2O_3$ Ceramic |
| Pb Free | |

| Electrical Connections | | |
|---|---|---|
| Connection | | Terminals |
| Port 1 | Input or Return | 11 |
| | Return or Input | 12 |
| Port 2 | Output or Return | 5 |
| | Return or Output | 6 |
| | Ground | All others |
| Single-ended Operation | | Return is ground |
| Differential Operation | | Return is hot |




TOPVIEW

BOTTOM VIEW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