

Preliminary



SF2304B

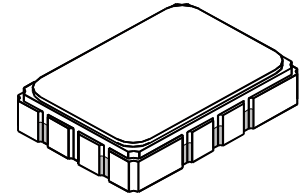
175 MHz SAW Filter

- High Performance 175 MHz SAW Filter
- Hermetic 5 x 7 mm Surface-mount Case
- Single-ended or Differential Input Operation
- Complies with Directive 2002/95/EC (RoHS)



Absolute Maximum Ratings

| Rating | Value | Units |
|--|-----------------|-------|
| Maximum Incident Power in Passband | +10 | dBm |
| DC Voltage on any Non-ground Terminal | 10 | VDC |
| Operating Temperature Range | -40 to +85 | °C |
| Storage Temperature Range in Tape and Reel | -40 to +85 | °C |
| Suitable for Lead-free Soldering - Maximum Soldering Profile | 260 °C for 30 s | |



SMP-03

Electrical Characteristics, 25 °C

| Characteristic | Sym | Notes | Min | Typ | Max | Units |
|--|------------|-------|------|------|------|-------------------|
| Center Frequency | f_C | 1 | | 175 | | MHz |
| Minimum insertion Loss | IL_{MIN} | 1, 2 | | 7.5 | 10 | dB |
| Amplitude Ripple, $f_C \pm 0.45$ MHz | | | | 0.7 | 1.0 | dB _{P-P} |
| Group Delay Ripple, $f_C \pm 0.45$ MHz | | | | 200 | 300 | ns _{P-P} |
| Absolute Delay | | | | 0.68 | 1.50 | µs |
| 1 dB Bandwidth | BW_1 | | 0.90 | 1.04 | | MHz |
| 2.5 dB Bandwidth | $BW_{2.5}$ | | 1.20 | 1.38 | | |
| 3 dB Bandwidth | BW_3 | | 1.30 | 1.46 | | |
| 5 dB Bandwidth | BW_5 | | 1.55 | 1.66 | 1.85 | |
| 30 dB Bandwidth | BW_{30} | | | 3.21 | 3.65 | |
| 40 dB Bandwidth | BW_{40} | | | 3.47 | 3.95 | |
| Ultimate Rejection, 186 to 900 MHz | | | 47 | 50 | | dB |
| Input/Output Return Loss, $f_C \pm 0.45$ MHz | | | 10 | 12 | | dB |

| | | |
|---|---|-----------------------------------|
| Single-ended Terminating Source Impedance | | $Z_S = 50$ ohms |
| Differential Terminating Source Impedance | | $Z_S = 100$ ohms |
| Terminating Load Impedance | | $Z_L = 50$ ohms |
| Case Style | 6 | SMP-03 7 x 5 mm Nominal Footprint |
| Lid Symbolization, YY = year, WW = week | | RFM/SF2304B/YYWW |

Electrical Connection

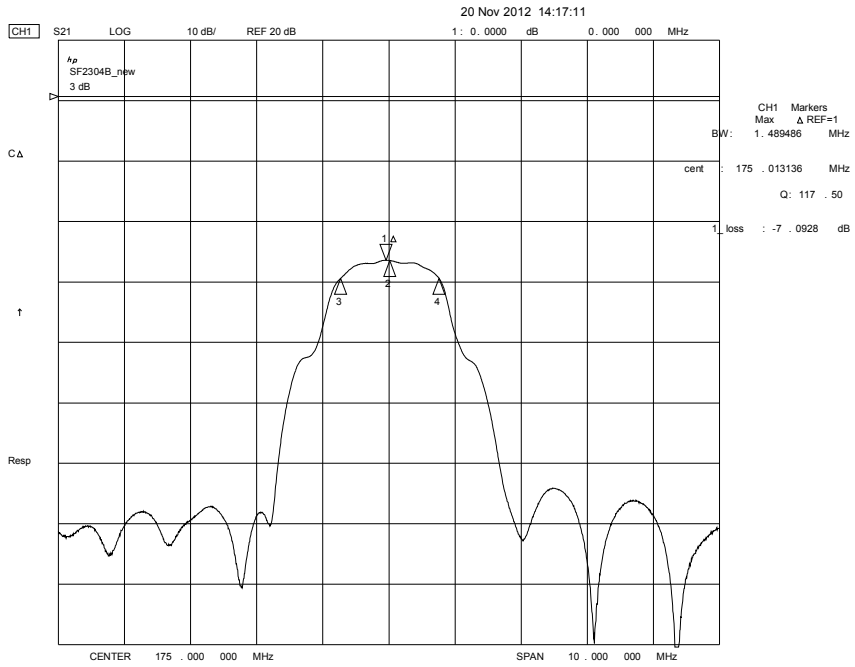
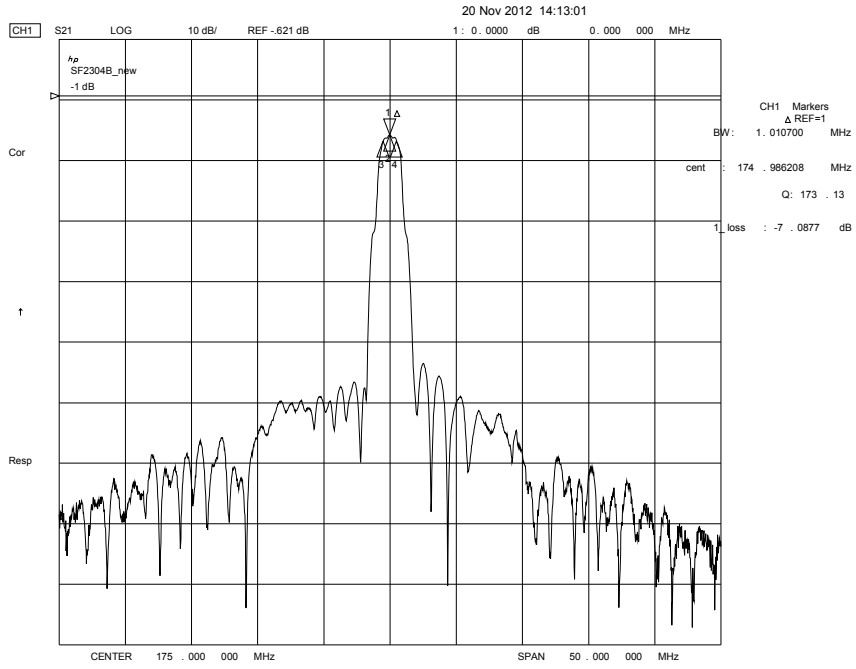
| Connection | Terminals |
|--------------------------|------------|
| Single-ended Input Port | 10 |
| Balanced Input Port | 10, 1 |
| Single-ended Output Port | 5 |
| Ground | All others |

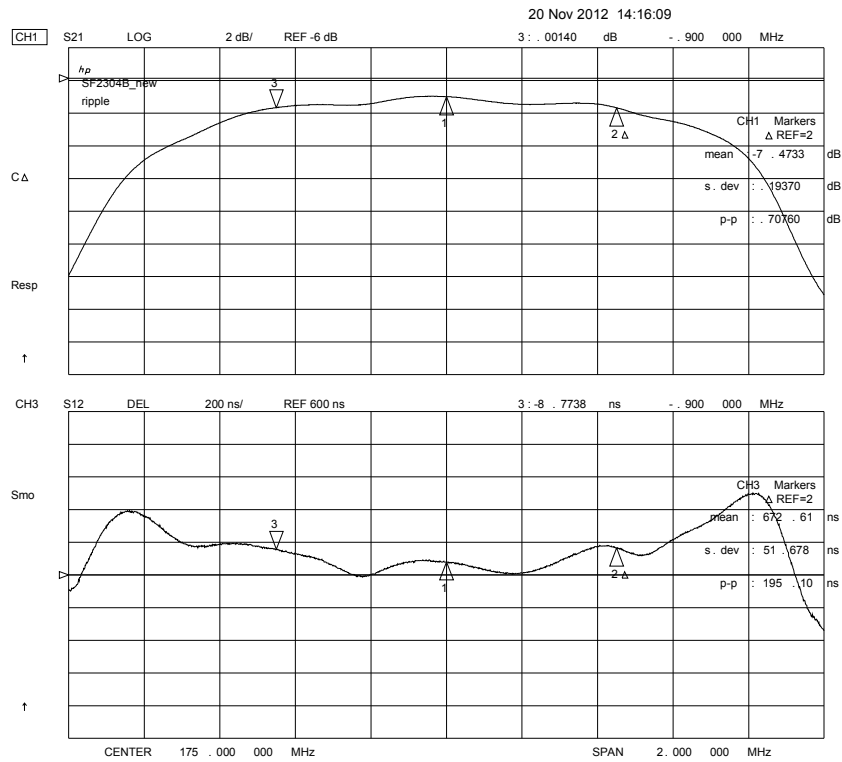
Notes:

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.
9. Electrostatic Sensitive Device. Observe precautions for handling.

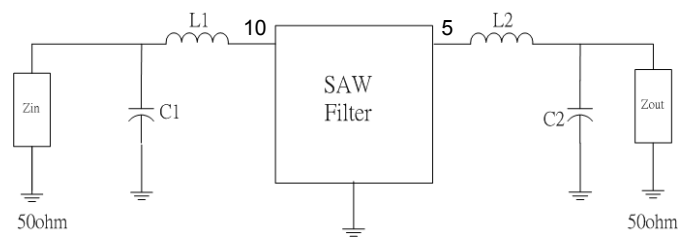


Filter Response Plots





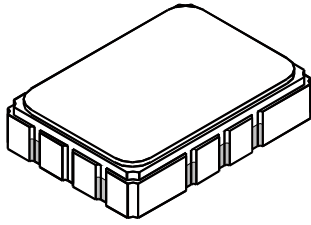
Typical Matching Network



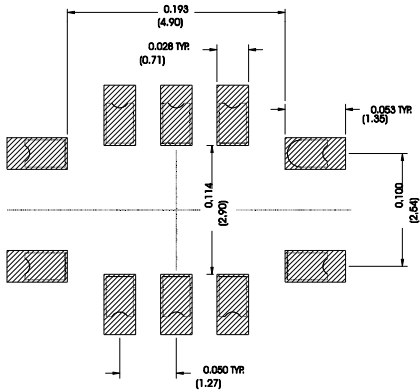
$$C1 = 33 \text{ pF}, L1 = (150 + 22) \text{ nH}, L2 = (24 + 150) \text{ nH}, C2 = 36 \text{ pF}$$

SMP-03 10-Terminal Ceramic Surface-mount Case

5 x 7 mm Nominal Footprint



Recommended PCB Footprint



| 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 | 0.47 | 0.60 | 0.73 | 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 |

| Electrical Connections | | |
|------------------------|---------------------|------------|
| Connection | | Terminals |
| Port 1 | Single-ended Input | 10 |
| Port 1 | Differential Input | 10, 1 |
| Port 2 | Single-ended Output | 5 |
| Ground | | All others |

| Case 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 | |

