

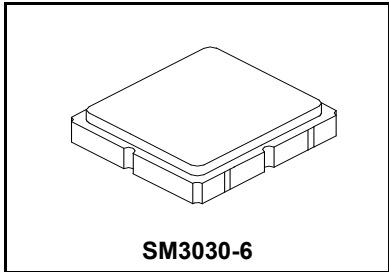


- Low Loss RF SAW Filter
- Surface Mount 3.0 x 3.0 mm Package
- Complies with Directive 2002/95/EC (RoHS)
- Moisture Sensitivity Level: 1

RoHS  
Compliant

SF2293E

1561 MHz  
SAW Filter



**Absolute Maximum Ratings**

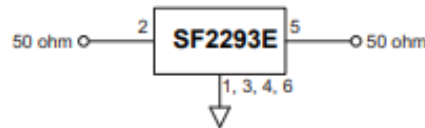
| Rating   | Value           | Units |
|--|-----------------|-------|
| Input Power Level  | 10              | dBm   |
| DC Voltage on any Non-ground Terminal                        | 3               | V     |
| Operable Temperature Range                                   | -45 to +125     | °C    |
| Specification Temperature Range                              | -40 to +85      | °C    |
| Storage Temperature Range                                    | -40 to +95      | °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   | $f_C$                                   |       |     | 1561  |     | MHz              |
| Insertion Loss, 1550.5 to 1571.5 MHz                             | IL                                      |       |     | 3.3   | 4.0 | dB               |
| Amplitude Ripple, 1550.5 to 1571.5 MHz                           |   |       |     | 0.5   | 2.0 |                  |
| Input/Output VSWR, 1550.5 to 1571.5 MHz                          |   |       |     | 1.5:1 | 2:1 |                  |
| Attenuation, Referenced to 0 dB:                                 |   |       |     |       |     | dB               |
| $f_C - 500$ to $f_C - 100$ MHz                                   |   |       | 45  | 49    |     |                  |
| $f_C - 100$ to $f_C - 60$ MHz                                    |   |       | 40  | 45    |     |                  |
| $f_C - 60$ to $f_C - 40$ MHz, -40 to +70 °C                      |   |       | 20  | 32.5  |     |                  |
| $f_C - 60$ to $f_C - 40$ MHz, -40 to +85 °C                      |   |       | 15  | 32.5  |     |                  |
| $f_C + 40$ to $f_C + 60$ MHz                                     |   |       | 20  | 26    |     |                  |
| $f_C + 60$ to $f_C + 80$ MHz                                     |   |       | 35  | 43    |     |                  |
| $f_C + 80$ to $f_C + 500$ MHz                                    |   |       | 45  | 50    |     |                  |
| Source Impedance   | $Z_S$                                   |       |     | 50    |     | $\Omega$         |
| Load Impedance   | $Z_L$                                   |       |     | 50    |     |                  |
| Case Style   | SM3030-6 3.0 x 3.0 mm Nominal Footprint |       |     |       |     |                  |
| Lid Symbolization (Y=year, WW=week, S=shift) dot=pin 1 indicator | A45, YWWS                               |       |     |       |     |                  |
| Standard Reel Quantity   | Reel Size 7 Inch                        |       |     |       |     | 500 Pieces/Reel  |
|  | Reel Size 13 Inch                       |       |     |       |     | 3000 Pieces/Reel |

**Electrical Connections**

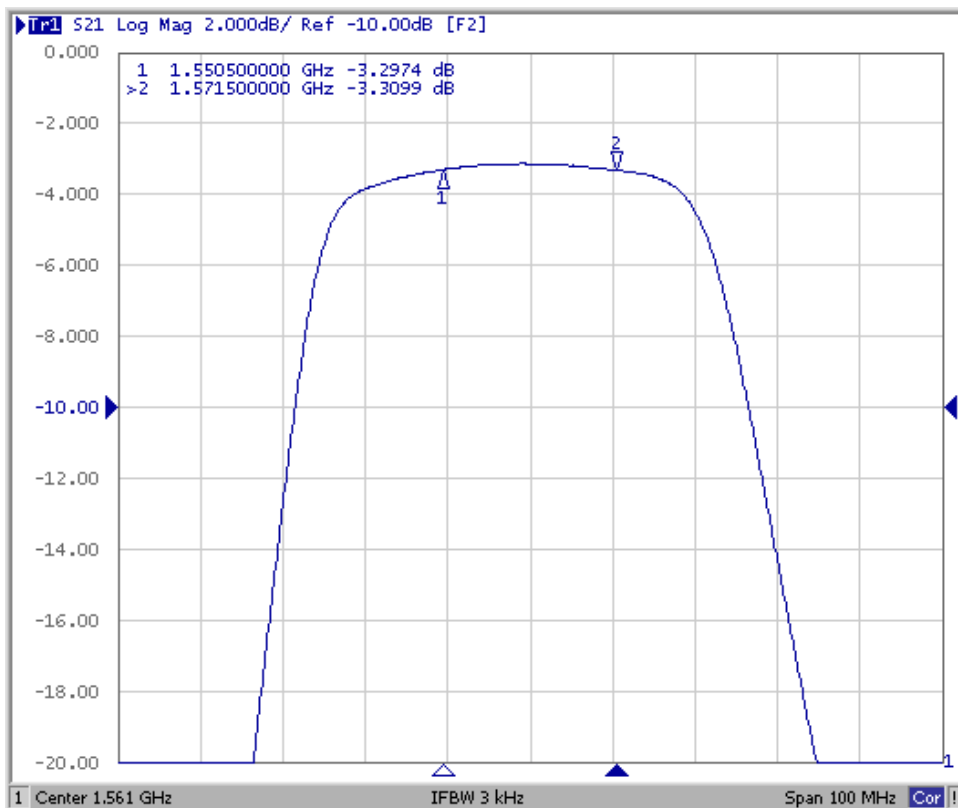
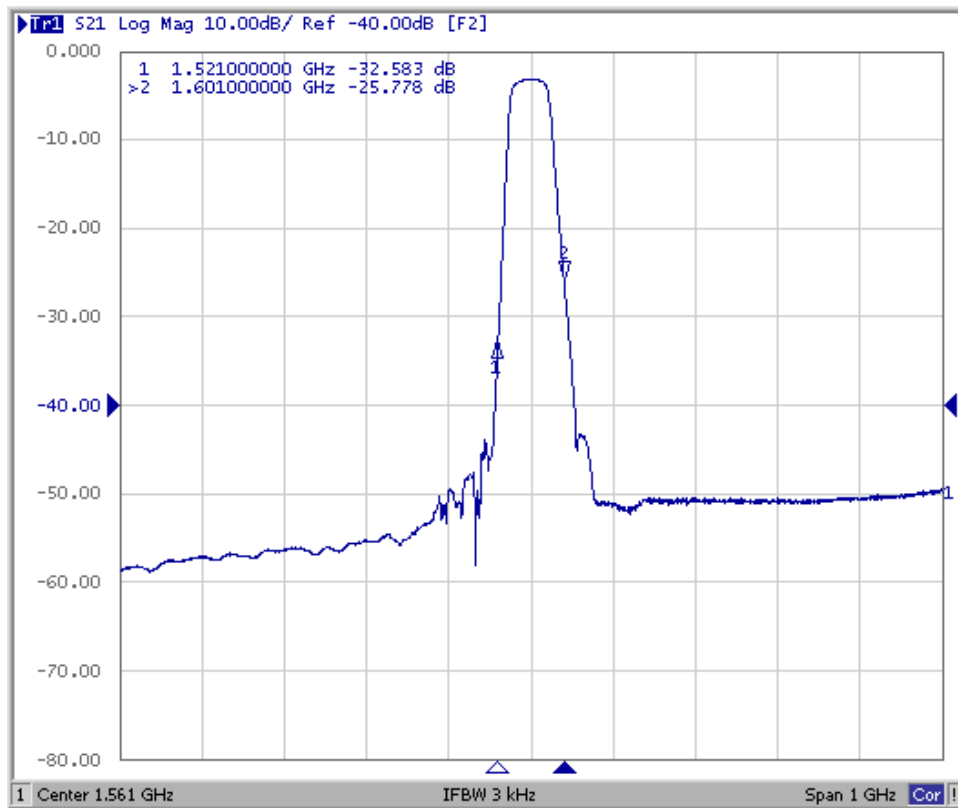
| Connection  | Terminals  |
|-------------|------------|
| Input       | 2          |
| Output      | 5          |
| Case Ground | All others |



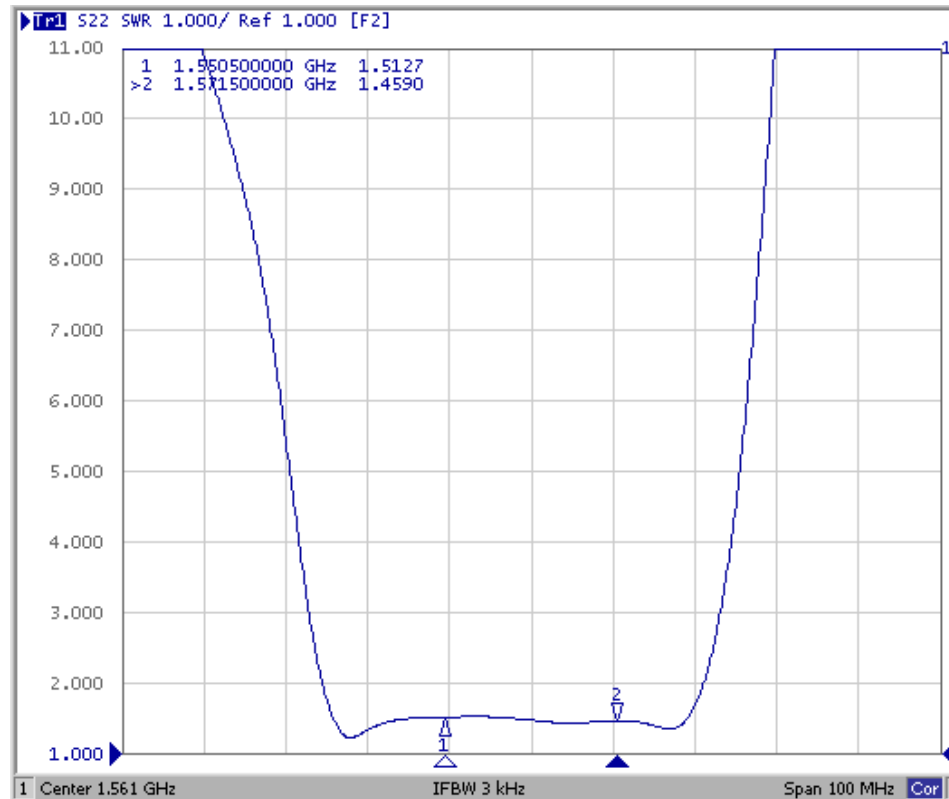
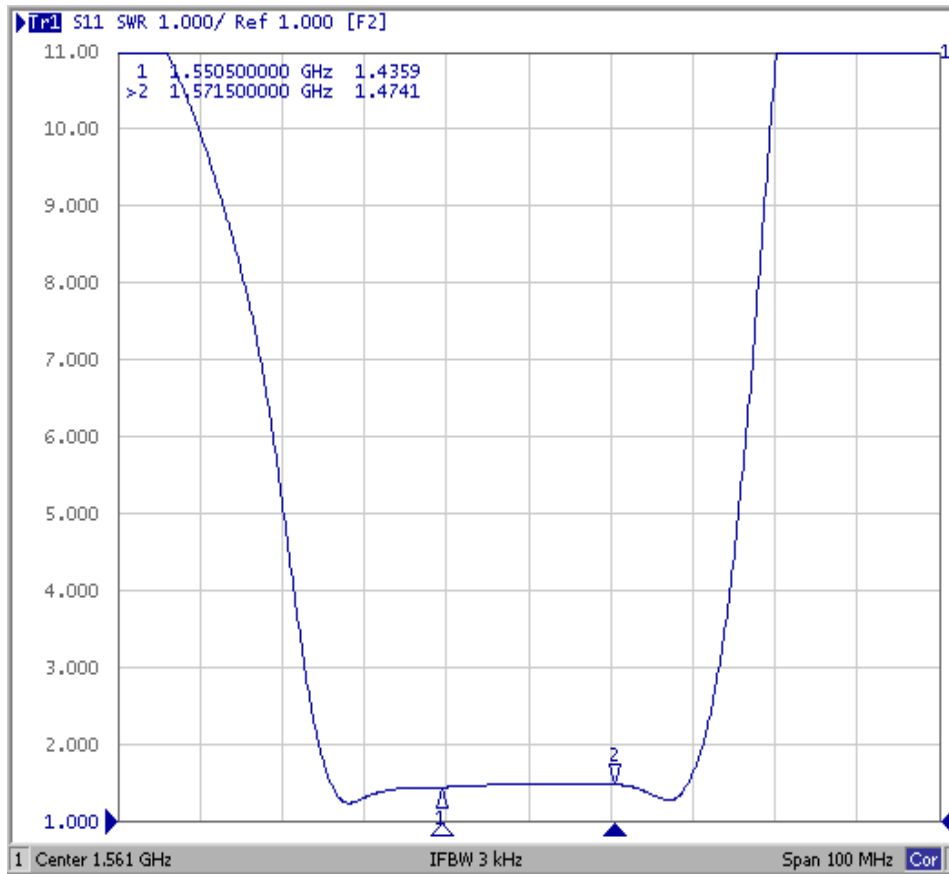
**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**  
**NOTES:**

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.

## Filter Response Plots

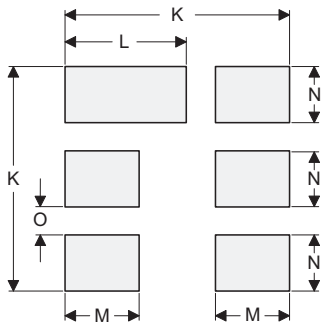


# Filter VSWR Plots



# SM3030-6 Case

## 6-Terminal Ceramic Surface-Mount Case 3.0 X 3.0 mm Nominal Footprint



PCB Footprint Top View

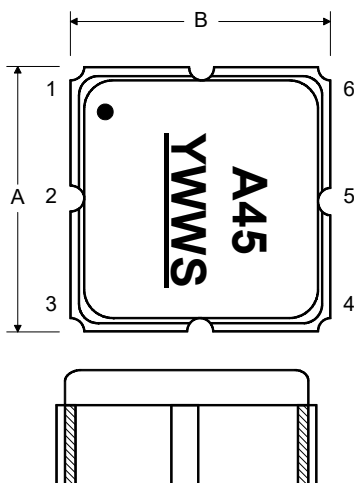
### Case and PCB Footprint Dimensions

| Dimension | mm   |      |      | Inches |       |       |
|-----------|------|------|------|--------|-------|-------|
|           | Min  | Nom  | Max  | Min    | Nom   | Max   |
| A         | 2.87 | 3.00 | 3.13 | 0.113  | 0.118 | 0.123 |
| B         | 2.87 | 3.00 | 3.13 | 0.113  | 0.118 | 0.123 |
| C         | 1.12 | 1.25 | 1.38 | 0.044  | 0.049 | 0.054 |
| D         | 0.77 | 0.90 | 1.03 | 0.030  | 0.035 | 0.040 |
| E         | 2.67 | 2.80 | 2.93 | 0.105  | 0.110 | 0.115 |
| F         | 1.47 | 1.60 | 1.73 | 0.058  | 0.063 | 0.068 |
| G         | 0.72 | 0.85 | 0.98 | 0.028  | 0.033 | 0.038 |
| H         | 1.37 | 1.50 | 1.63 | 0.054  | 0.059 | 0.064 |
| I         | 0.47 | 0.60 | 0.73 | 0.019  | 0.024 | 0.029 |
| J         | 1.17 | 1.30 | 1.43 | 0.046  | 0.051 | 0.056 |
| K         |      | 3.20 |      |        | 0.126 |       |
| L         |      | 1.70 |      |        | 0.067 |       |
| M         |      | 1.05 |      |        | 0.041 |       |
| N         |      | 0.81 |      |        | 0.032 |       |
| O         |      | 0.38 |      |        | 0.015 |       |

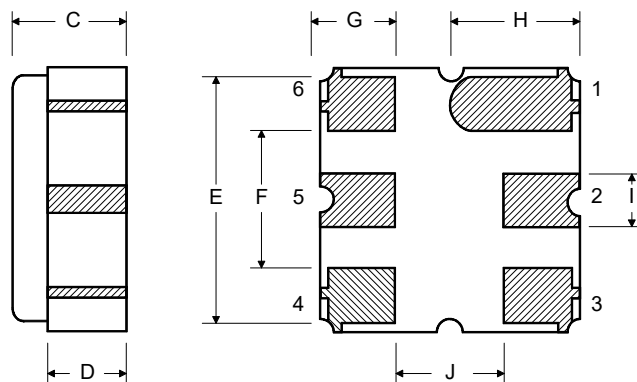
### Case Materials

| 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                                      |

### TOP VIEW

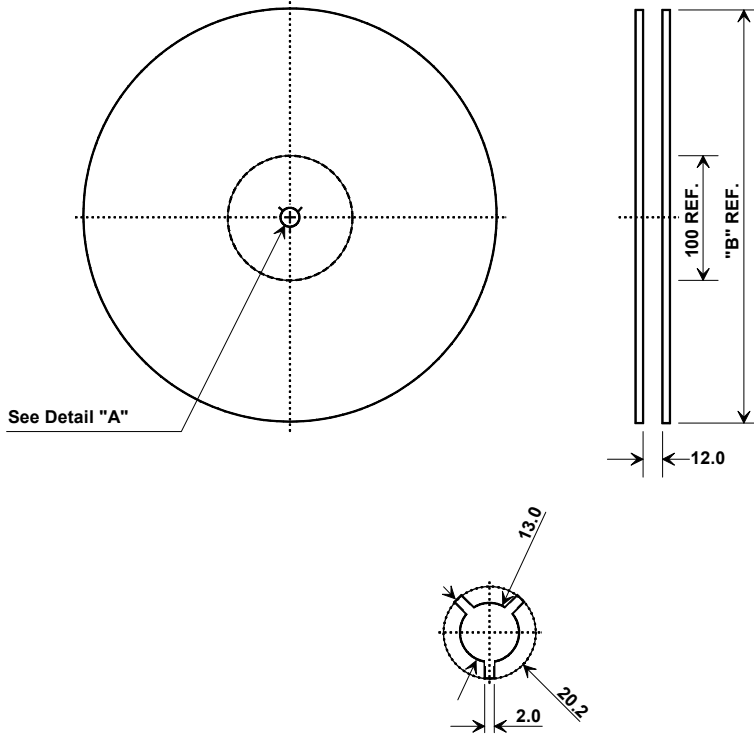


### BOTTOM VIEW



## Tape and Reel Specifications

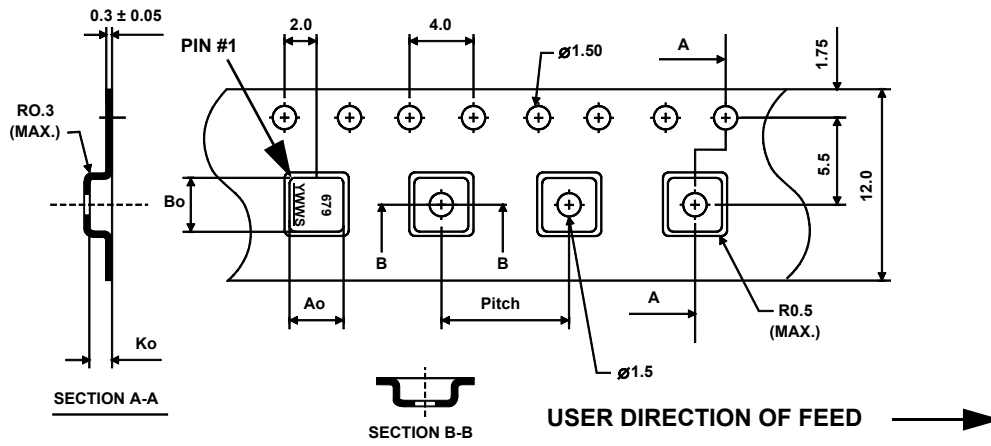
Tape and Reel Standard per ANSI/EIA-481



| "B"    |             | Quantity Per Reel |
|--------|-------------|-------------------|
| Inches | millimeters |                   |
| 7      | 178         | 500               |
| 13     | 330         | 3000              |

### COMPONENT ORIENTATION and DIMENSIONS

| Carrier Tape Dimensions |         |
|-------------------------|---------|
| Ao                      | 3.35 mm |
| Bo                      | 3.35 mm |
| Ko                      | 1.40 mm |
| Pitch                   | 8.0 mm  |
| W                       | 12.0 mm |



## 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.

