

- RF filter designed for front end GPS applications
- Low Insertion Loss
- 2.0 x 2.5 x 0.75 mm Surface Mount Case
- Complies with Directive 2002/95/EC (RoHS)

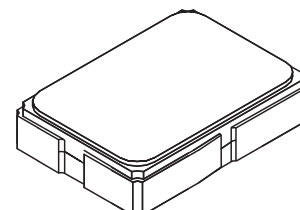


## Absolute Maximum Ratings

| Rating                                     | Value      | Units |
|--------------------------------------------|------------|-------|
| Input Power Level                          | +17        | dBm   |
| DC Voltage                                 | 3          | V     |
| Operating Temperature Range                | -40 to +85 | °C    |
| Storage Temperature Range in Tape and Reel | -40 to +85 | °C    |

**SF1186G-6**

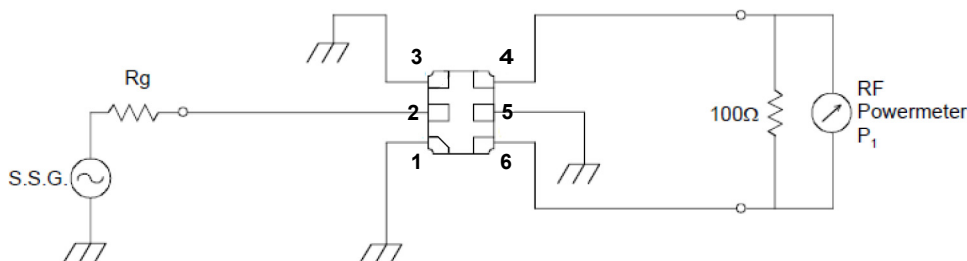
**1575.5 MHz  
SAW Filter**



**SM2520-6**

## Electrical Characteristics

| Characteristic                                                     | Sym                        | Notes              | Min  | Typ     | Max  | Units |
|--------------------------------------------------------------------|----------------------------|--------------------|------|---------|------|-------|
| Center Frequency                                                   | F <sub>C</sub>             |                    |      | 1575.42 |      | MHz   |
| Insertion Loss, 1574 to 1577 MHz                                   | IL                         |                    |      | 1.5     | 1.9  | dB    |
| Amplitude Ripple, 1574 to 1577 MHz                                 |                            |                    |      | 0.2     | 0.5  |       |
| VSWR, 1574 to 1577 MHz                                             |                            |                    |      | 1.5     | 1.8  |       |
| Amplitude Balance 1574 to 1577 MHz                                 |                            |                    | -1.6 | ±1.3    | +1.6 | dB    |
| Phase Balance 1574 to 1577 MHz                                     |                            |                    | 170  | 180±4   | 190  | deg   |
| Attenuation Referenced to 0 dB:                                    |                            |                    |      |         |      | dB    |
| 100 to 1475 MHz                                                    |                            |                    | 30   | 47      |      |       |
| 1475 to 1525 MHz                                                   |                            |                    | 15   | 33      |      |       |
| 1625 to 1675 MHz                                                   |                            |                    | 9    | 22      |      |       |
| 1675 to 3000 MHz                                                   |                            |                    | 30   | 33      |      |       |
| 3000 to 6000 MHz                                                   |                            |                    | 25   | 30      |      |       |
| Case Style                                                         | SM2520-6 Nominal Footprint |                    |      |         |      |       |
| Lid Symbolization (Y=year, WW=week, S=shift) dot = pin 1 indicator | 5A, YWWS                   |                    |      |         |      |       |
| Standard Reel Quantity                                             | Reel Size 7 Inch           | 2,000 Pieces/Reel  |      |         |      |       |
|                                                                    | Reel Size 13 Inch          | 10,000 Pieces/Reel |      |         |      |       |



| Connection | Terminals  |
|------------|------------|
| Input      | 2          |
| Output     | 4, 6       |
| Ground     | All Others |



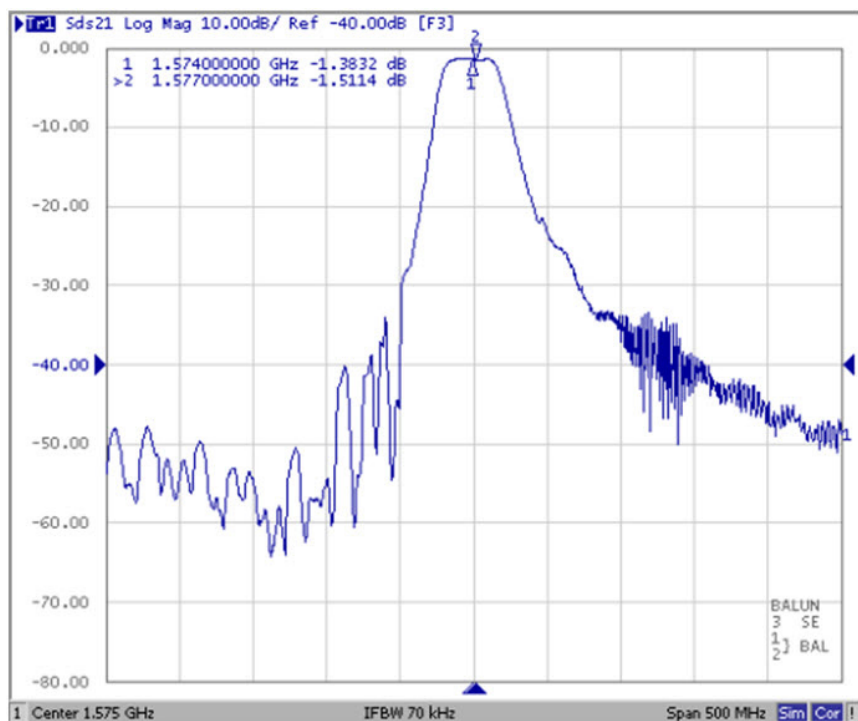
**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**

## NOTES:

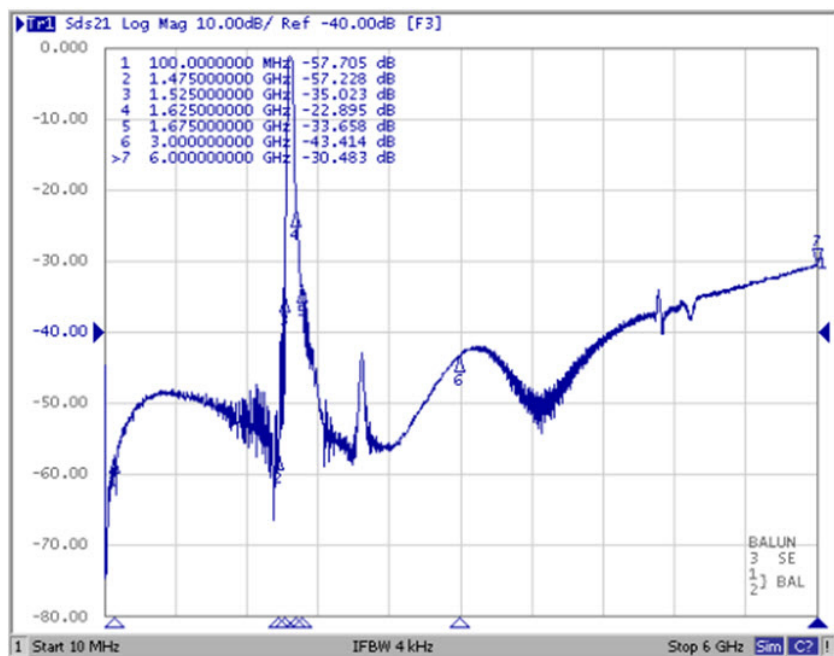
1. Unless noted otherwise, all specifications apply over the operating temperature range with filter soldered to the specified demonstration board with impedance matching to 50  $\Omega$  and measured with 50  $\Omega$  network analyzer.
2. Unless noted otherwise, all frequency specifications are referenced 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. 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.
7. US and international patents may apply.
8. Murata, stylized Murata logo, and Murata N.A., Inc. are registered trademarks of Murata Manufacturing Co., Ltd.

## Frequency Characteristics

### S21 Response (span 500 MHz)

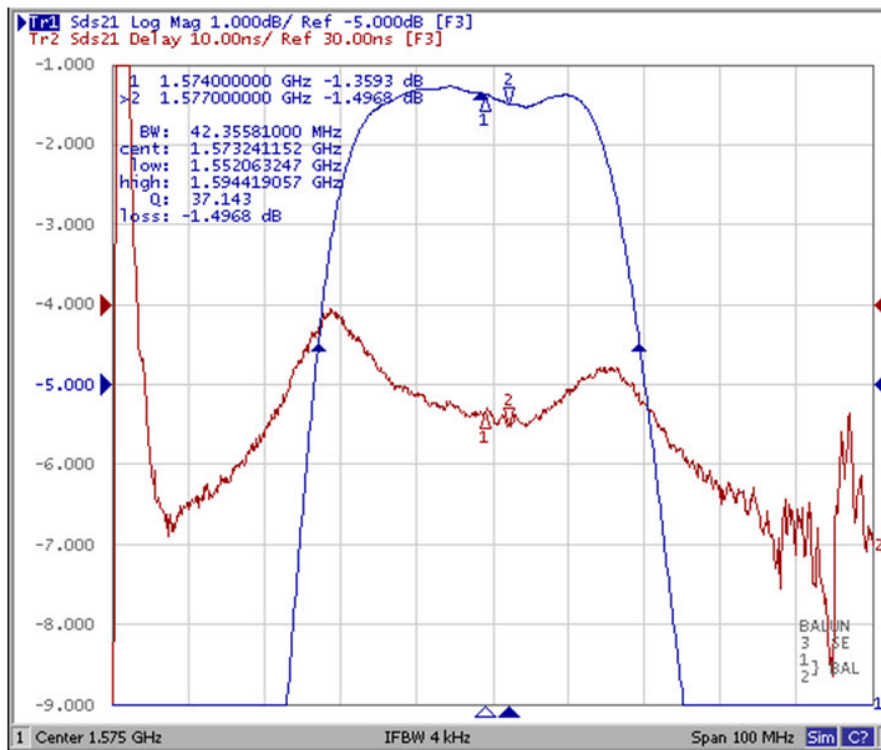


### S21 Response (span 6 GHz)

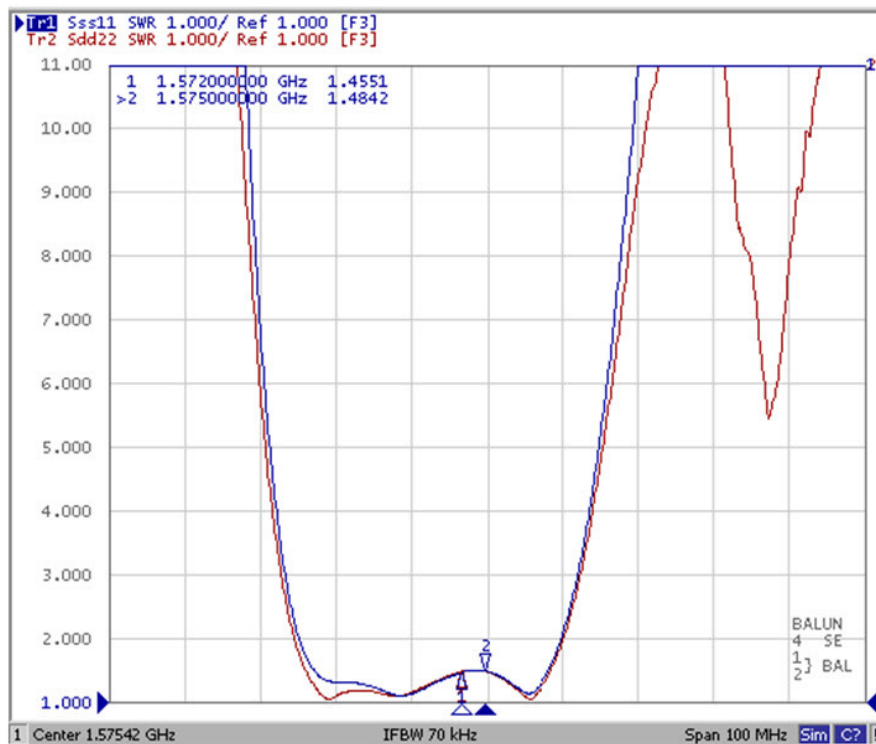


## Frequency Characteristics (continued)

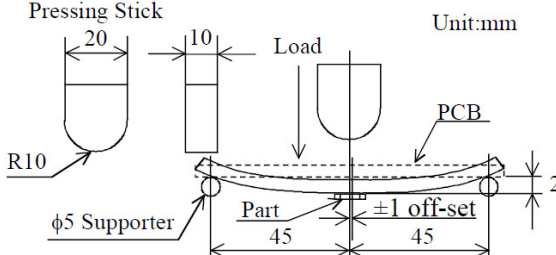
### S21 Response (span 100 MHz)



### S11 and S22 VSWR (span 6 GHz)



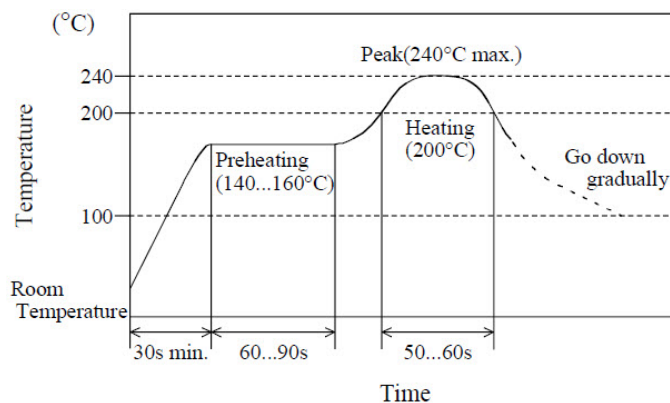
## Physical and Environmental Characteristics

| Test Item                             | Test Condition                                                                                                                                                                                                                                                                                                                                                                         | Criteria                                                           |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| <b>PCB Bend Strength</b>              | <p>Filter is soldered onto the center of 0.8mm thickness PCB which is laid on the two small supporters spaced 90mm as shown in below figure. PCB is deflected to 2mm below from horizontal level by the pressing stick. The force is supplied for 1 second - 5 times repeatedly.</p>  <p>Unit:mm</p> | No visible damage should be induced.                               |
| <b>Vibration</b>                      | The electrical performance is measured after being applied vibration of amplitude of 1.5mm with 10 to 55Hz of vibration frequency to each of 3 perpendicular directions for 2 hours.                                                                                                                                                                                                   |                                                                    |
| <b>Drop Test</b>                      | The electrical performance is measured after dropping with housing (around 100g) from a height of 150cm onto the concrete plate 3 times in each of 6 perpendicular directions.                                                                                                                                                                                                         |                                                                    |
| <b>Solderability</b>                  | Terminals are immersed in rosin flux (concentration 20...25%, solvent: ethanol 75...80%) for 5 seconds, then immersed in soldering bath at $230\pm5^{\circ}\text{C}$ (solder: JIS-Z-3282 H63A, H60A or Sn-3.0Ag-0.5Cu) for $5\pm0.5$ seconds.                                                                                                                                          | 90% minimum of the immersed surface should be covered with solder. |
| <b>Resistance to Soldering Heat</b>   | Filter is preheated at $170\pm10^{\circ}\text{C}$ for 90 seconds, immersed whole electrode in soldering bath at $255\pm5^{\circ}\text{C}$ for $3\pm1$ seconds, then measured after being placed in standard atmospheric conditions for 2 hours.                                                                                                                                        |                                                                    |
| <b>Humidity</b>                       | The electrical performance is measured after being placed in a chamber with 90...95% R.H. at $60^{\circ}\text{C}$ for 500 hours and then being placed in standard atmospheric conditions for 2 hours.                                                                                                                                                                                  |                                                                    |
| <b>Life Test (High Temperature)</b>   | The electrical performance is measured after being placed in a chamber with $85^{\circ}\text{C}$ for 500 hours and then being placed in standard atmospheric conditions for 2 hours.                                                                                                                                                                                                   |                                                                    |
| <b>Life Test (Low Temperature)</b>    | The electrical performance is measured after being placed in a chamber with $-40^{\circ}\text{C}$ for 500 hours and then being placed in standard atmospheric conditions for 2 hours.                                                                                                                                                                                                  |                                                                    |
| <b>Thermal Shock</b>                  | After temperature cycling of $-55^{\circ}\text{C}$ for 30 minutes to $+85^{\circ}\text{C}$ for 30 minutes performed 100 times, filter shall be returned to room temperature. And the electrical performance is measured after being placed in standard atmospheric conditions for 2 hours.                                                                                             |                                                                    |
| <b>Resistance to Reflow Soldering</b> | The electrical performance is measured after being soldered by reflow 2 times with the following reflow profile A or B and then being placed in standard atmospheric conditions for 24 hours.                                                                                                                                                                                          |                                                                    |

# Reflow Profile

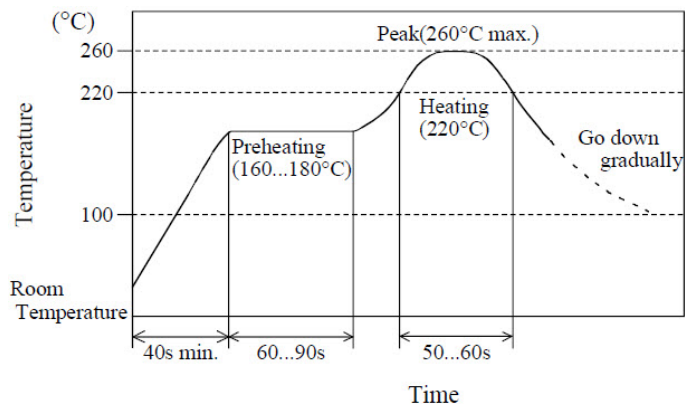
## Profile A

1. Preheating shall be fixed at 140...160°C for 60...90 seconds.
2. Ascending time to preheating temperature 150°C shall be 30 seconds minimum.
3. Heating shall be fixed at 200°C for 50...60 seconds and at 230±10°C peak.



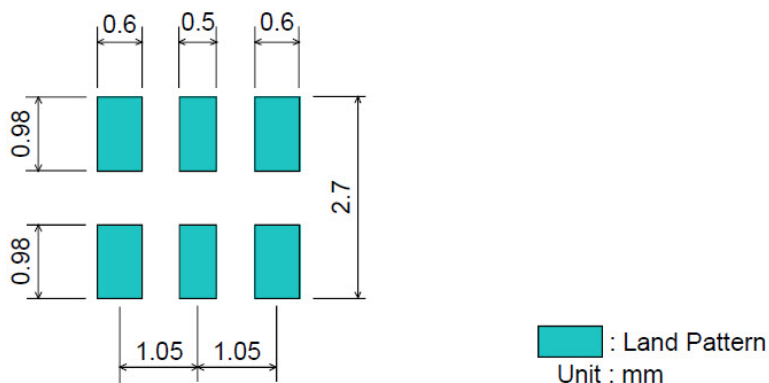
## Profile B

1. Preheating shall be fixed at 160...180°C for 60...90 seconds.
2. Ascending time to preheating temperature 170°C shall be 40 seconds minimum.
3. Heating shall be fixed at 220°C for 50...60 seconds and at 255±5°C peak.



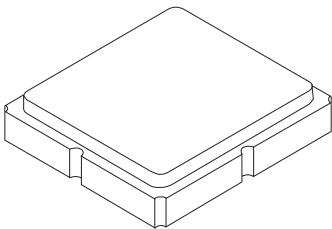
## Recommended Land Pattern

1. Recommended land pattern is as follows.



# SM2520-6 Case

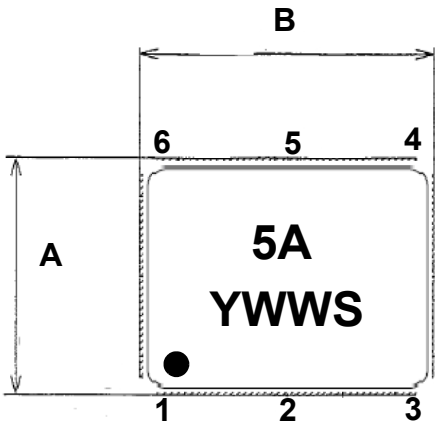
## 6-Terminal Ceramic Surface-Mount Case 2.5 X 2.0 mm Nominal Footprint



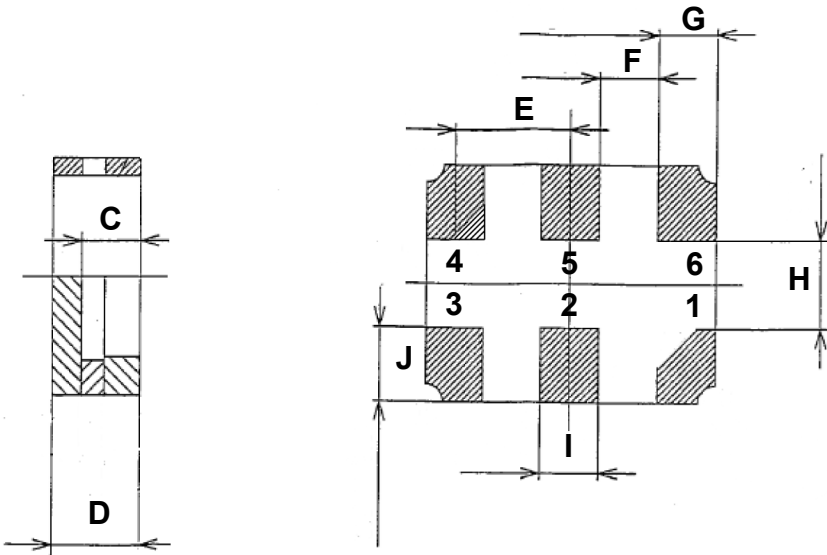
Case and PCB Footprint Dimensions

| Dimension | mm  |      |     | Inches |       |     |
|-----------|-----|------|-----|--------|-------|-----|
|           | Min | Nom  | Max | Min    | Nom   | Max |
| A         | -   | 2.00 | -   | -      | 0.078 | -   |
| B         | -   | 2.50 | -   | -      | 0.098 | -   |
| C         | -   | 0.50 | -   | -      | 0.029 | -   |
| D         | -   | 0.75 | -   | -      | 0.019 | -   |
| E         | -   | 1.00 | -   | -      | 0.039 | -   |
| F         | -   | 0.50 | -   | -      | 0.019 | -   |
| G         | -   | 0.50 | -   | -      | 0.019 | -   |
| H         | -   | 0.74 | -   | -      | 0.029 | -   |
| I         | -   | 0.50 | -   | -      | 0.019 | -   |
| J         | -   | 0.63 | -   | -      | 0.024 | -   |

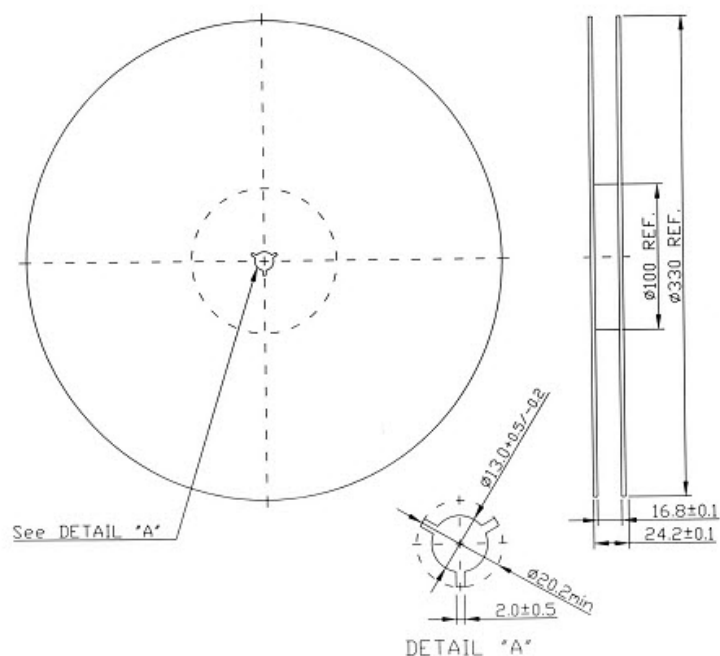
TOP VIEW



BOTTOM VIEW

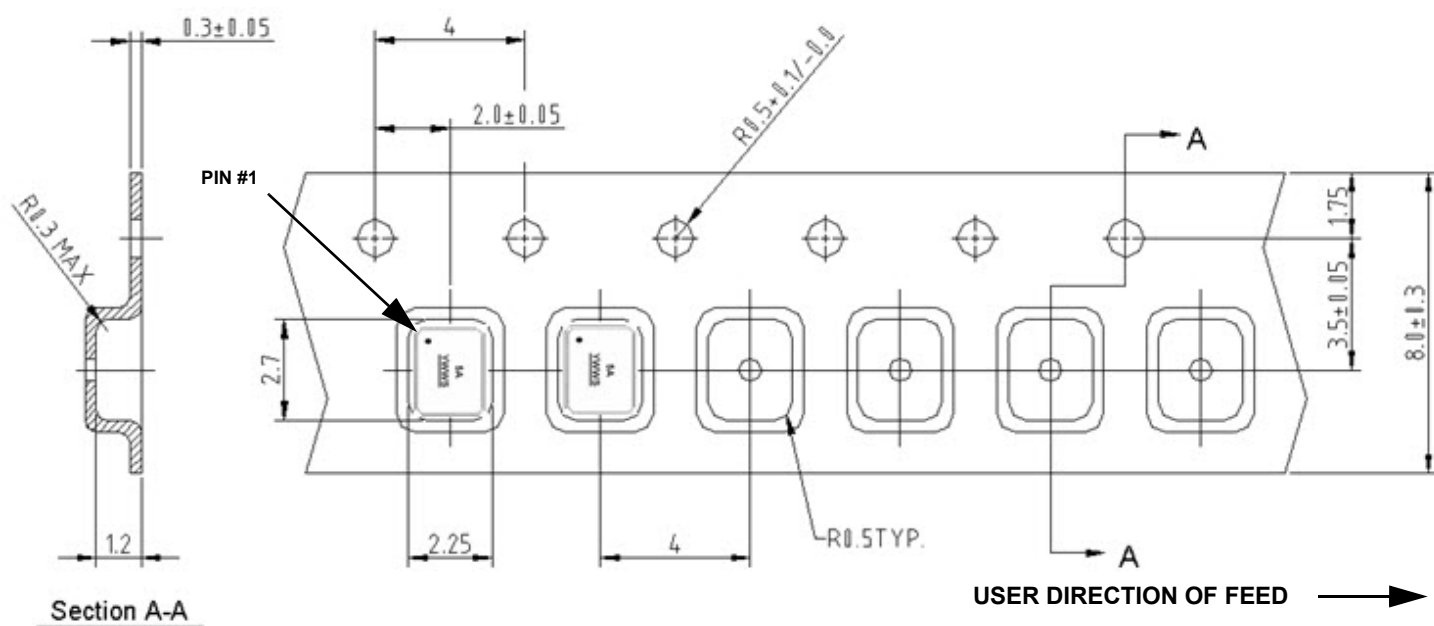


## Tape and Reel Specifications



| "B"    |             | Quantity Per Reel |
|--------|-------------|-------------------|
| Inches | millimeters |                   |
| 7      | 178         | 2000              |
| 13     | 330         | 10000             |

## COMPONENT ORIENTATION and DIMENSIONS



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Murata:](#)

[SF1186G-6](#)