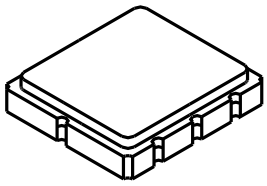
# Preliminary

RFM products are now Murata products.

# SF2356H-1

## 2535/2655MHz SAW Duplexer Filter

- ***Band 7***
- ***Low Insertion Loss Duplexer SAW Filter***
- ***2.0 x 1.6 mm Surface-mount Case***
- ***Complies with Directive 2002/95/EC (RoHS)***



SM2016-9

**Absolute Maximum Ratings**

| Rating | Value | Units |
|---|---|---|
| Input Power Level | 32 | dBm |
| DC Voltage | 0 | VDC |
| Storage Temperature Range in Tape and Reel | -40 to +85 | °C |
| Operating Temperature Range | -30 to +85 | °C |
| Suitable for Lead-free Soldering - Maximum Soldering Profile | 260 °C for 10 sec | |
| Antenna Impedance (single ended) | 50 | Ω |
| Rx Impedance (single ended) | 50 | Ω |
| Tx Impedance (single ended) | 50 | Ω |

**Electrical Characteristics**

| **Ant to Rx (2535 MHz)** | | **Specifications (+25°C)** | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter Description** | **Condition** | **Sym** | **Note** | **Min** | **Typ** | **Max** | **Units** |
| Insertion Loss, | 2500 to 2570 MHz | | | | 2.5 | 3.0 | dB |
| Return Loss of Rx Port | 2500 to 2570 MHz | | | 10.0 | 11.6 | | |
| Return Loss of Ant Port | 2500 to 2570 MHz | | | 10.0 | 11.0 | | |
| Attenuation in TX Band, | 2620 to 2690 MHz | | | 40.0 | 44.6 | | |
| Attenuation in ISM Band | 2400 to 2480 MHz | | | 32.0 | 34.7 | | |
| Attenuation in ISM Band | 2480 to 2483 MHz | | | 32.0 | 37.0 | | |
| **Tx to Ant (2655 MHz)** | | | | | | | |
| Insertion Loss, | 2620 to 2690 MHz | | | - | 2.5 | 3.0 | dB |
| Return Loss of Tx Port | 2620 to 2690 MHz | | | 7.0 | 10.3 | | |
| Return Loss of Ant Port | 2620 to 2690 MHz | | | 7.0 | 8.6 | | |
| Attenuation in Rx Band, | 2500 to 2570 MHz | | | 50.0 | 55.0 | | |
| **Tx to Rx** | | | | | | | |
| Isolation | 2620 to 2690 MHz | | | 45.0 | 47.2 | | dB |
| | 2500 to 2570 MHz | | | 50.0 | 53.3 | | |

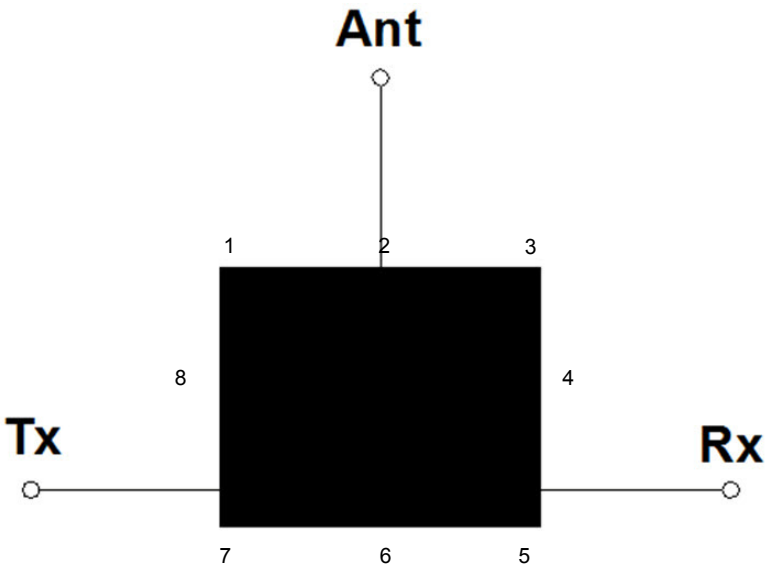
| | |
|---|---|
| Case Style | SM2016 2.0 X 1.6 X 0.9 mm Nominal Footprint |
| Lid Symbolization (Y=year, WW=week, S=shift) dot=pin 1 indicator | 5Q, YWWS |

**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. The design, manufacturing process, and specifications of this filter are subject to change.
5. 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.
6. US and international patents may apply.
7. Murata, stylized Murata logo, and Murata N.A., Inc. are registered trademarks of Murata Manufacturing Co., Ltd.

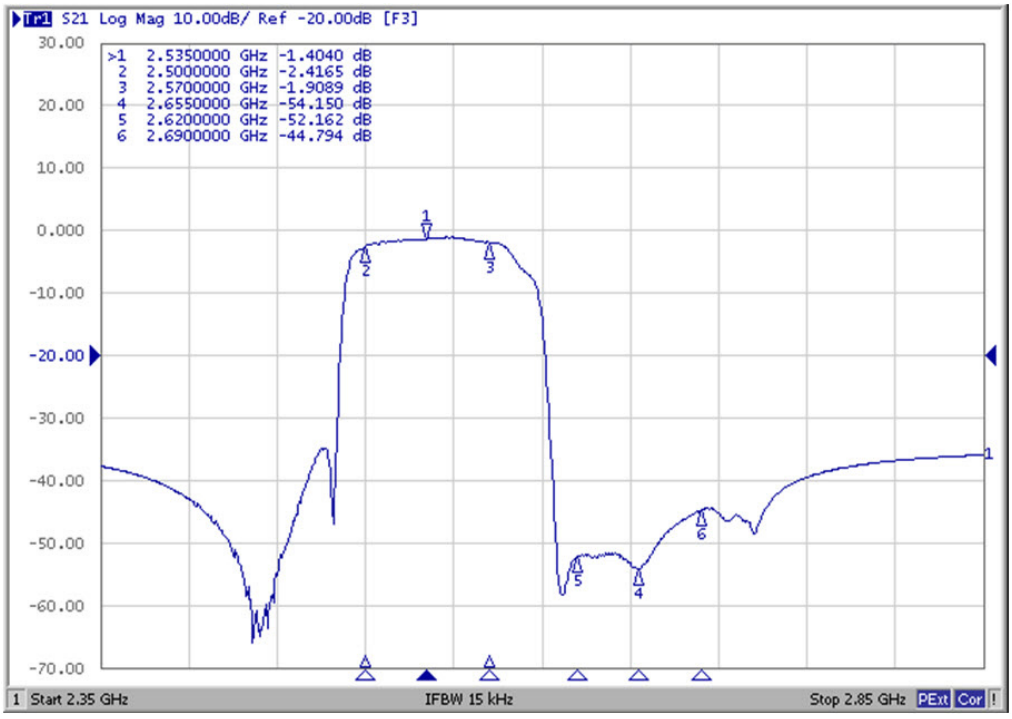
## Measurement Circuit




| Pin Description | |
|---|---|
| 1, 3, 4, 6, 8, 9 | Ground |
| 2 | Antenna |
| 5 | Rx (2535 MHz) |
| 7 | Tx (2655 MHz) |

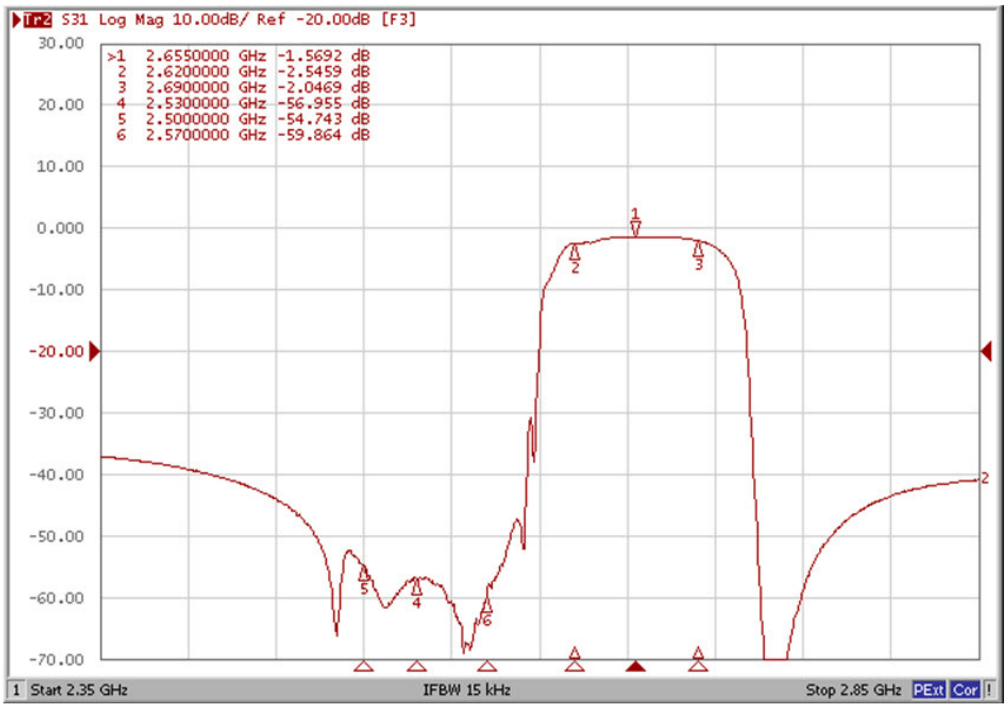
## Frequency Characteristics

**RX**

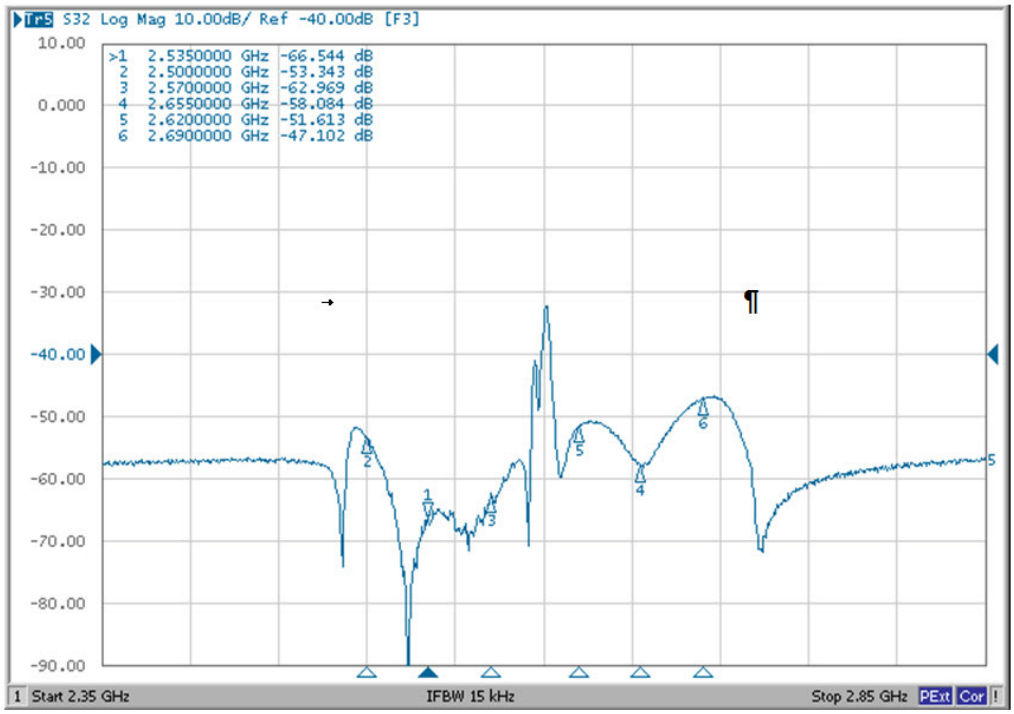


## Frequency Characteristics

### TX



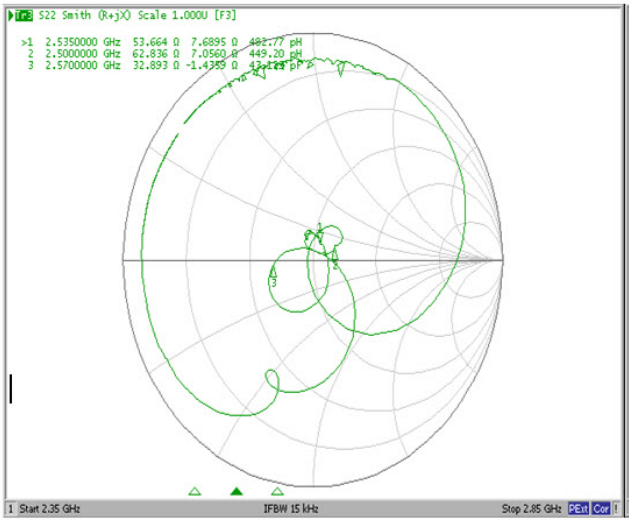

### ISOLATION



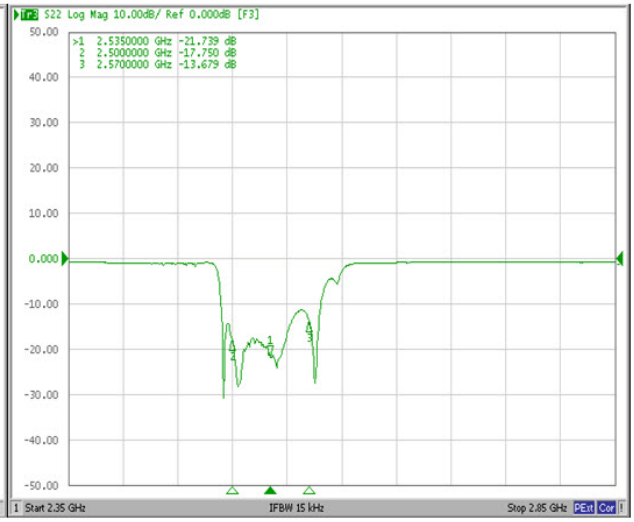
## Frequency Characteristics

**Rx Port**

**Smith Chart**

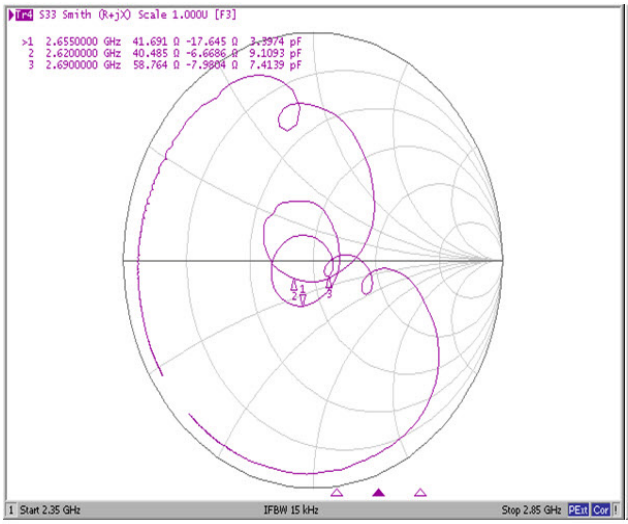



**Return Loss**

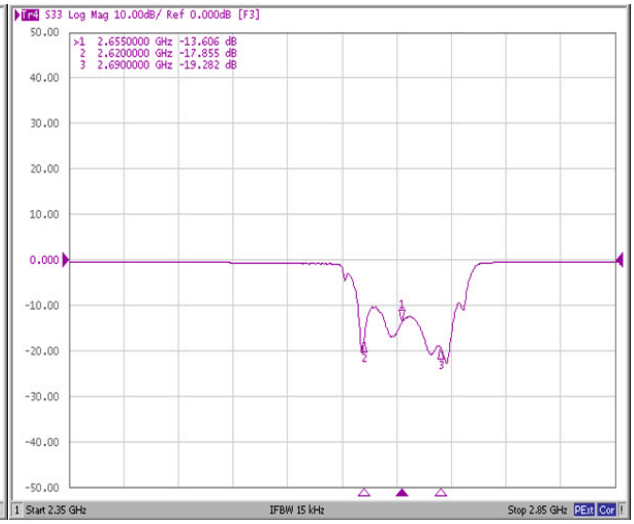



**TX Port**

**Smith Chart**

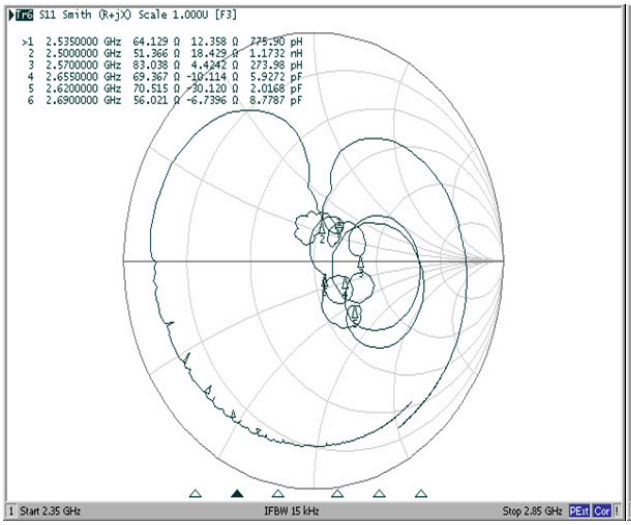



**Return Loss**

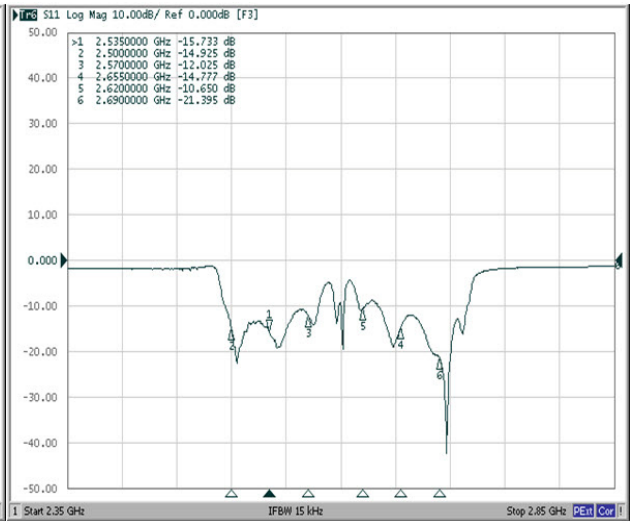



**ANT Port**

**Smith Chart**




**Return Loss**



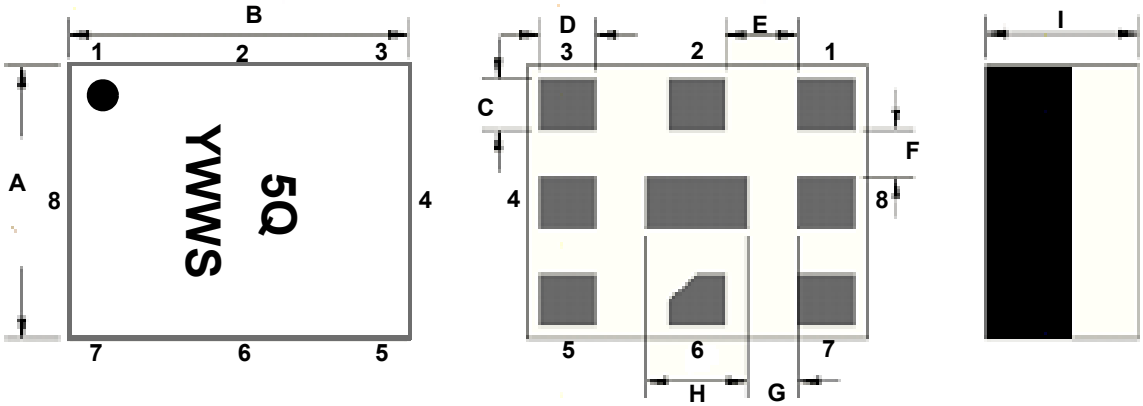
## SMD2016-9 Case

**Case Dimensions**

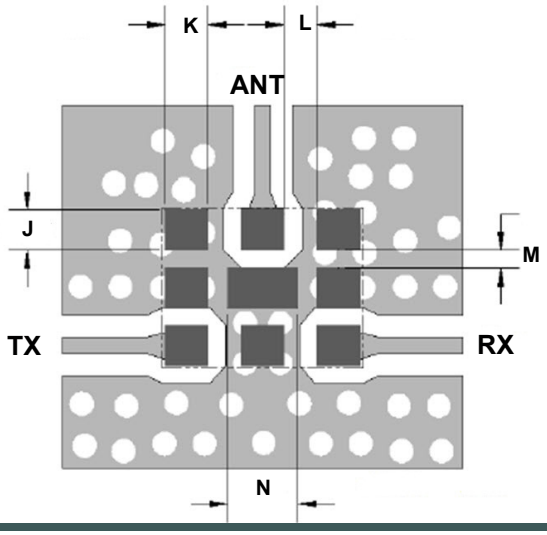
| Dimension | mm | | | Inches | | |
|---|---|---|---|---|---|---|
| | Min | Nom | Max | Min | Nom | Max |
| A | 1.58 | 1.60 | 1.62 | 0.062 | 0.0629 | 0.063 |
| B | 1.98 | 2.00 | 2.02 | 0.077 | 0.078 | 0.079 |
| C | 0.29 | 0.30 | 0.31 | 0.011 | 0.0114 | 0.012 |
| D | 0.32 | 0.33 | 0.34 | 0.0125 | 0.0129 | 0.013 |
| E | 0.42 | 0.43 | 0.44 | 0.016 | 0.0169 | 0.017 |
| F | 0.274 | 0.275 | 0.276 | 0.010 | 0.0108 | 0.01086 |
| G | 0.294 | 0.295 | 0.296 | 0.011 | 0.0116 | 0.01165 |
| H | 0.59 | 0.60 | 0.61 | 0.023 | 0.0236 | 0.024 |
| I | - | - | 0.90 | - | 0.035 | - |
| J | - | 0.40 | - | - | 0.015 | - |
| K | - | 0.43 | - | - | 0.016 | - |
| L | - | 0.33 | - | - | 0.012 | - |
| M | - | 0.18 | - | - | 0.007 | - |
| N | - | 0.70 | - | - | 0.027 | - |

| 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 |

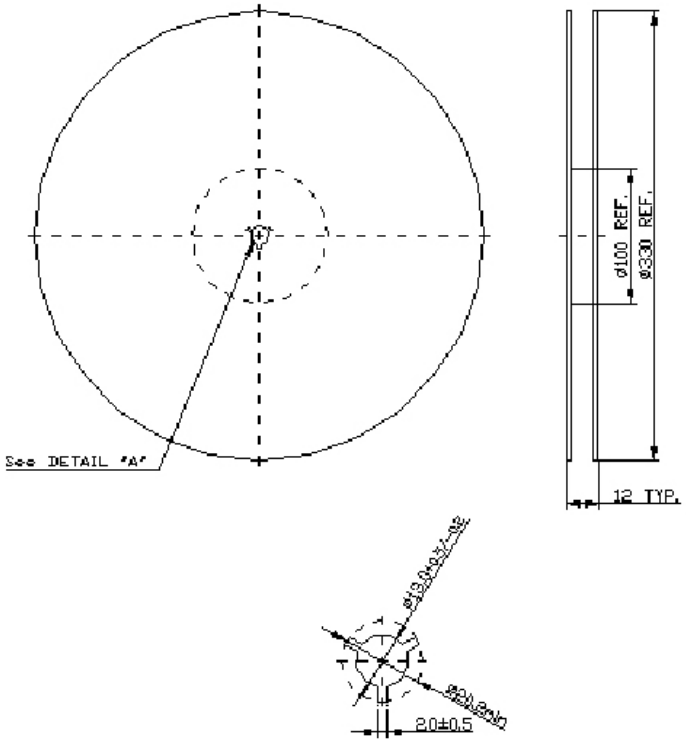
**TOP VIEW** **BOTTOM VIEW** **SIDE VIEW**




**PCB Footprint**



**Tape and Reel Specifications**




**Component Orientation and Dimensions**