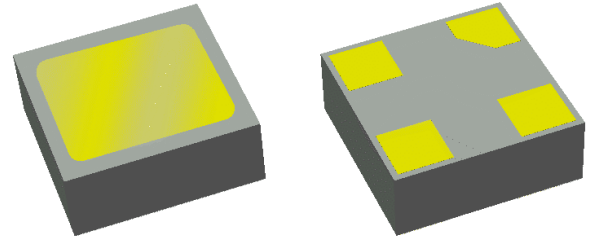


# Data Sheet

## Features

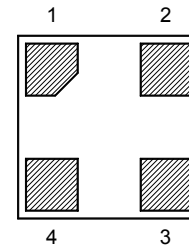
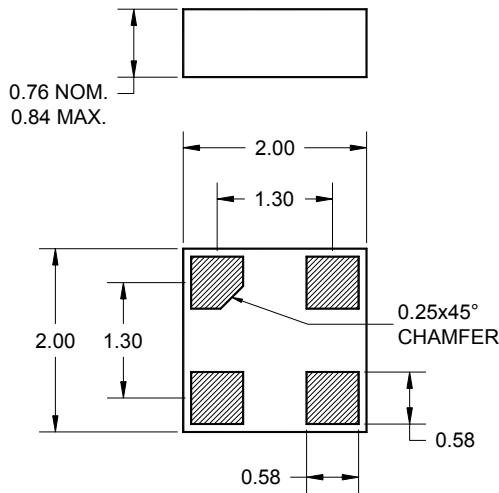
- For PCS applications
- Usable bandwidth 60 MHz
- Low loss
- High attenuation at Tx band
- No impedance matching required for operation at 50 Ω
- Single-ended operation
- Ceramic Surface Mount Package (SMP)
- Small size



## Package Pin Configuration

Surface Mount 2.00 x 2.00 x 0.76 mm

Bottom View



| Pin No. | Description |
|---------|-------------|
| 1       | Input       |
| 3       | Output      |
| 2,4     | Case ground |

Dimensions shown are nominal in millimeters  
 All tolerances are ±0.10mm

Body:  $Al_2O_3$  ceramic  
 Lid: Kovar or Alloy 42, Au over Ni plated  
 Terminations: Au plating 0.5 - 1.0μm,  
 over a 2 - 6μm Ni plating

**Data Sheet**

**Electrical Specifications <sup>(1)</sup>**

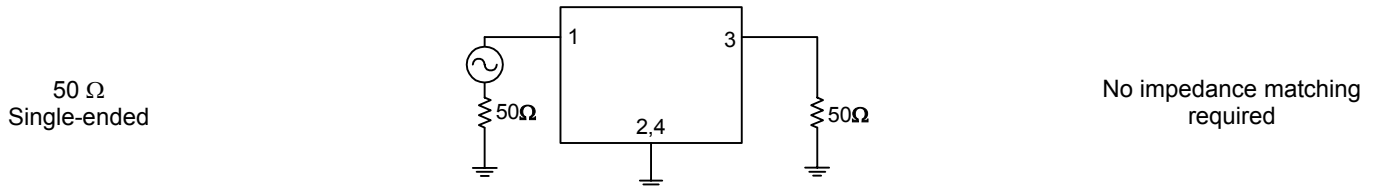
Operating Temperature: <sup>(2)</sup> +25 °C

| Parameter <sup>(3)</sup>                           | Minimum | Typical | Maximum | Unit     |
|--|---------|---------|---------|----------|
| <b>Center Frequency</b>                            | -       | 1960    | -       | MHz      |
| <b>Insertion Loss</b><br>1930 - 1990 MHz           | -       | 2.5     | 3.5     | dB       |
| <b>Amplitude Ripple</b><br>1930 - 1990 MHz         | -       | 1.0     | 1.8     | dB p-p   |
| <b>Absolute Attenuation</b><br>10 - 1600 MHz       | 17      | 20      | -       | dB       |
| 1600 - 1850 MHz                                    | 20      | 25      | -       | dB       |
| 1850 - 1910 MHz                                    | 20      | 25      | -       | dB       |
| 2030 - 2070 MHz                                    | 15      | 25      | -       | dB       |
| 2070 - 2800 MHz                                    | 21      | 27      | -       | dB       |
| 3000 - 6000 MHz                                    | 17      | 22      | -       | dB       |
| <b>Input/Output Return Loss</b><br>1930 - 1990 MHz | 7.0     | 8.5     | -       | dB       |
| <b>Source Impedance <sup>(4)</sup></b>             | -       | 50      | -       | $\Omega$ |
| <b>Load Impedance <sup>(4)</sup></b>               | -       | 50      | -       | $\Omega$ |

**Notes:**

1. All specifications are based on the test circuit shown below
2. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
3. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances
4. This is the optimum impedance in order to achieve the performance shown

**Test Circuit:**



**Data Sheet**

**Electrical Specifications <sup>(1)</sup>**

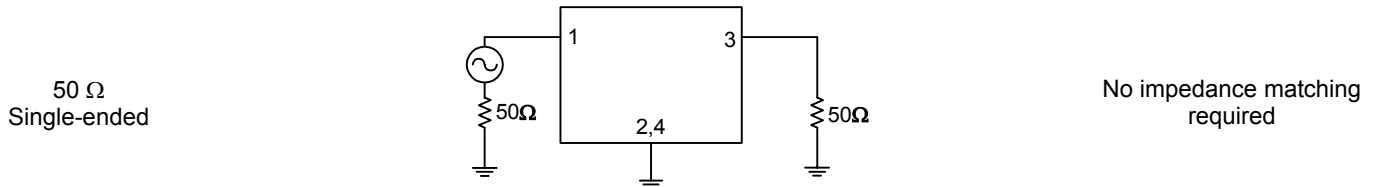
Operating Temperature Range: <sup>(2)</sup> -30 to +80 °C

| Parameter <sup>(3)</sup>                           | Minimum | Typical | Maximum | Unit   |
|--|---------|---------|---------|--------|
| <b>Center Frequency</b>                            | -       | 1960    | -       | MHz    |
| <b>Insertion Loss</b><br>1930 - 1990 MHz           | -       | 2.9     | 4       | dB     |
| <b>Amplitude Ripple</b><br>1930 - 1990 MHz         | -       | 1.0     | 1.8     | dB p-p |
| <b>Absolute Attenuation</b><br>10 - 1600 MHz       | 17      | 20      | -       | dB     |
| 1600 - 1850 MHz                                    | 20      | 25      | -       | dB     |
| 1850 - 1910 MHz                                    | 12      | 25      | -       | dB     |
| 2030 - 2070 MHz                                    | 15      | 25      | -       | dB     |
| 2070 - 2800 MHz                                    | 21      | 27      | -       | dB     |
| 3000 - 6000 MHz                                    | 17      | 22      | -       | dB     |
| <b>Input/Output Return Loss</b><br>1930 - 1990 MHz | 7       | 8.5     | -       | dB     |
| <b>Source Impedance <sup>(4)</sup></b>             | -       | 50      | -       | Ω      |
| <b>Load Impedance <sup>(4)</sup></b>               | -       | 50      | -       | Ω      |

**Notes:**

1. All specifications are based on the test circuit shown below
2. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
3. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances
4. This is the optimum impedance in order to achieve the performance shown

**Test Circuit:**



# Data Sheet

## Electrical Specifications <sup>(1)</sup>

Operating Temperature Range: <sup>(2)</sup> -30 to +85 °C

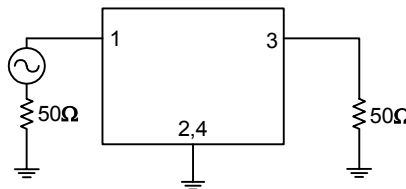
| Parameter <sup>(3)</sup>               | Minimum | Typical | Maximum | Unit   |
|--|---------|---------|---------|--------|
| <b>Center Frequency</b>                | -       | 1960    | -       | MHz    |
| <b>Insertion Loss</b>                  |         |         |         |        |
| 1930 - 1931.5 MHz (-30 to +45 °C)      | -       | 2.9     | 4.25    | dB     |
| 1930 - 1931.5 MHz (-30 to +60 °C)      | -       | 2.9     | 4.50    | dB     |
| 1931.5 - 1990 MHz                      | -       | 2.9     | 3.50    | dB     |
| <b>Amplitude Ripple</b>                |         |         |         |        |
| 1930 - 1990 MHz                        | -       | 1.0     | 1.8     | dB p-p |
| <b>Absolute Attenuation</b>            |         |         |         |        |
| 10 - 1600 MHz                          | 17      | 20      | -       | dB     |
| 1600 - 1850 MHz                        | 20      | 25      | -       | dB     |
| 1850 - 1910 MHz (-30 to +45 °C)        | 17      | 25      | -       | dB     |
| 1850 - 1910 MHz (-30 to +60 °C)        | 15      | 25      | -       | dB     |
| 2030 - 2070 MHz                        | 15      | 25      | -       | dB     |
| 2070 - 2800 MHz                        | 21      | 27      | -       | dB     |
| 3000 - 6000 MHz                        | 17      | 22      | -       | dB     |
| <b>Input/Output Return Loss</b>        |         |         |         |        |
| 1930 - 1990 MHz                        | 7       | 8.5     | -       | dB     |
| <b>Source Impedance <sup>(4)</sup></b> | -       | 50      | -       | Ω      |
| <b>Load Impedance <sup>(4)</sup></b>   | -       | 50      | -       | Ω      |

### Notes:

1. All specifications are based on the test circuit shown below
2. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
3. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances
4. This is the optimum impedance in order to achieve the performance shown

### Test Circuit:

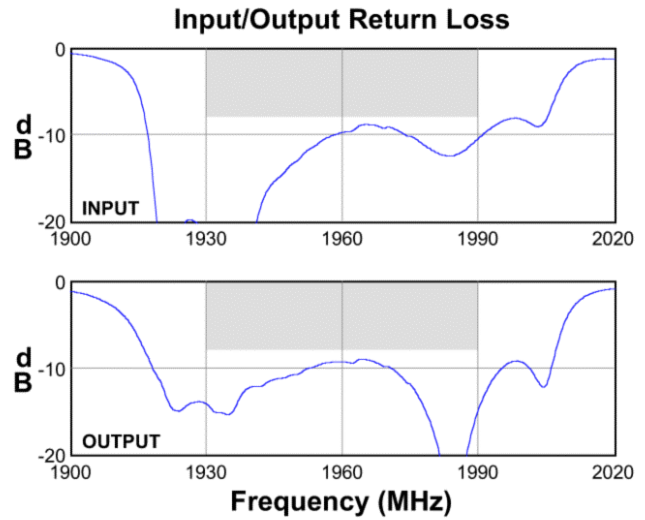
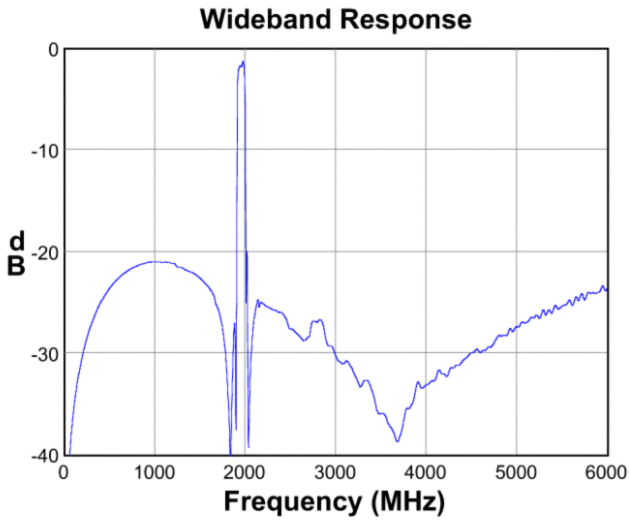
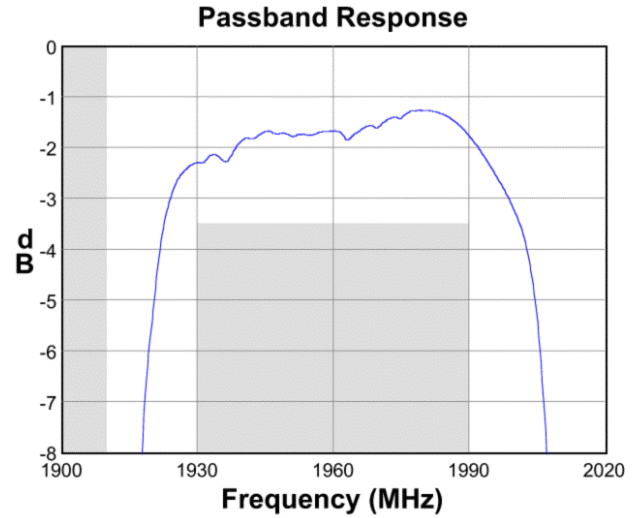
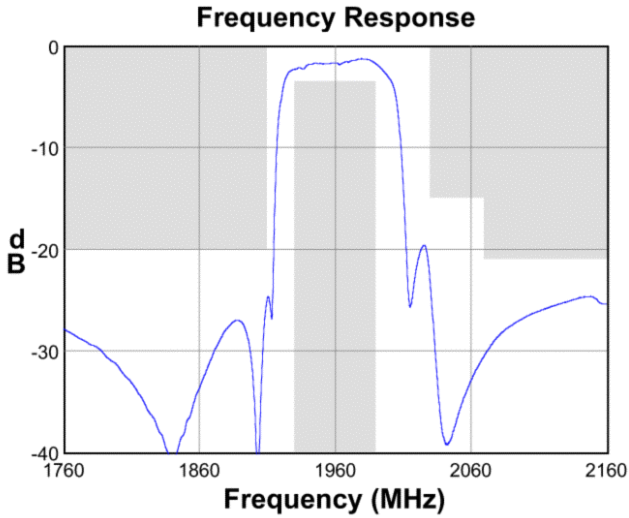
50 Ω  
Single-ended



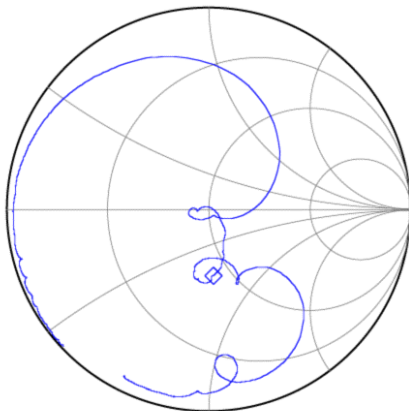
No impedance matching required

**Data Sheet**

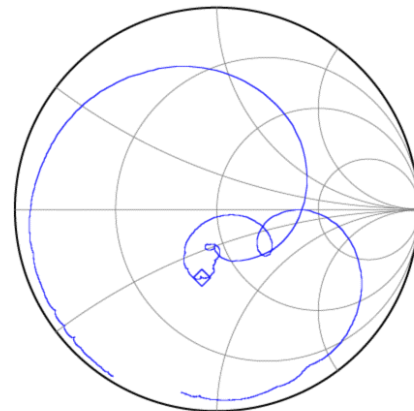
**Typical Performance (at +25°C)**



**Input Smith Chart**



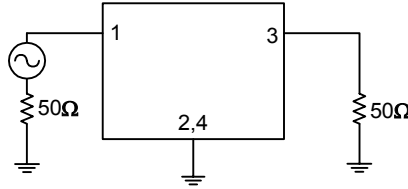
**Output Smith Chart**



**Data Sheet**

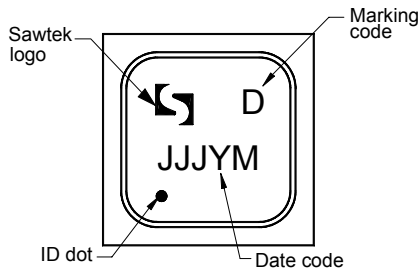
**Matching Schematics**

50 Ω  
Single-ended



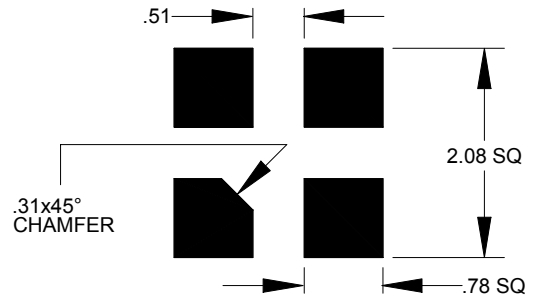
No impedance matching required

**Marking**



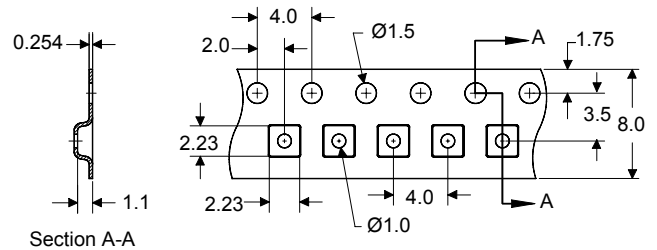
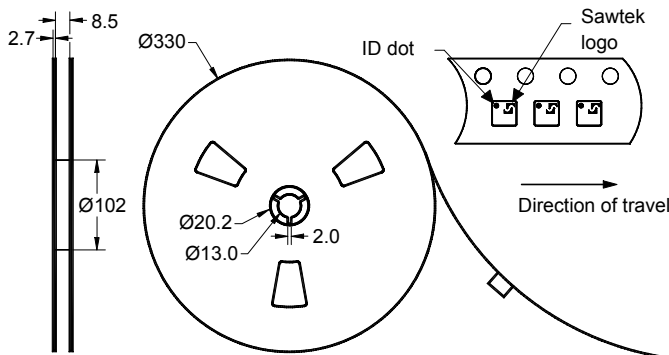
The date code consists of: JJJ = Julian day,  
Y = last digit of year, M = manufacturing site code

**PCB Footprint**



This footprint represents a recommendation only  
Dimensions shown are nominal in millimeters

**Tape and Reel**




Dimensions shown are nominal in millimeters  
Packaging quantity: 10000 units/reel

# Data Sheet

## Maximum Ratings

| Parameter                   | Symbol           | Minimum | Maximum | Unit |
|-----------------------------|------------------|---------|---------|------|
| Operating Temperature Range | T                | -30     | +80     | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | -40     | +85     | °C   |

### Warnings

- Electrostatic Sensitive Device (ESD) 
- Avoid ultrasonic exposure

## Links to Additional Technical Information

[PCB Layout Tips](#)

[Qualification Flowchart](#)

[Soldering Profile](#)

[S-Parameters](#)

[Other Technical Information](#)

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