
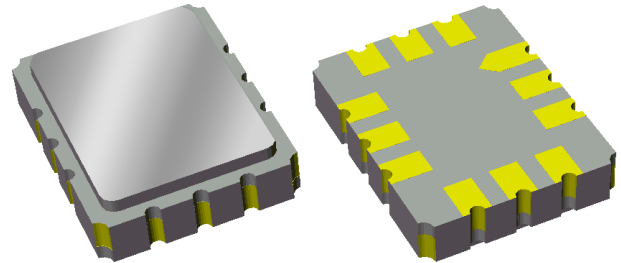


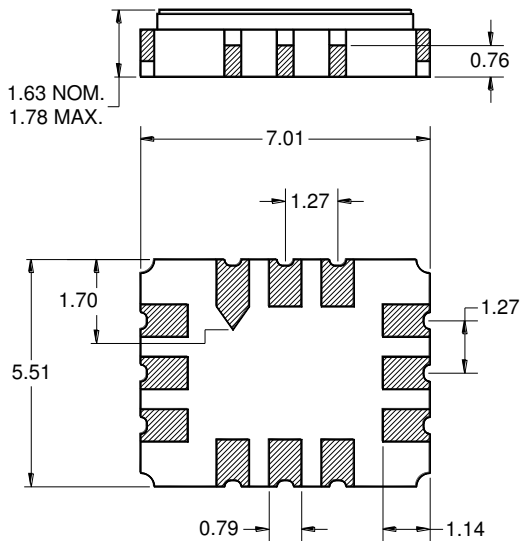
## Features

- Usable Bandwidth of 9 MHz
- High Attenuation
- Single-ended Operation at 50Ω
- Ceramic Surface Mount Package (SMP)
- Hermetic
- RoHS compliant (2002/95/EC), **Pb-free** 



## Package

Surface Mount 7.01 x 5.51 x 1.63 mm  
SMP-28B

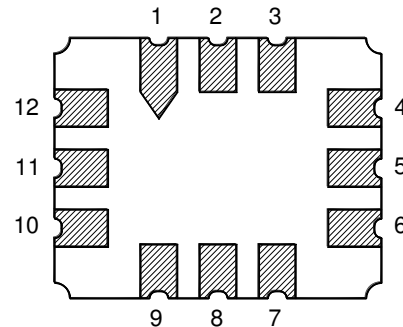


Dimensions shown are nominal in millimeters  
All tolerances are  $\pm 0.15$ mm except overall  
length and width  $\pm 0.13$ mm

Body:  $Al_2O_3$  ceramic  
Lid: Kovar, Ni plated  
Terminations: Au plating 0.5 - 1.0 $\mu$ m,  
over a 2 - 6 $\mu$ m Ni plating

## Pin Configuration

Bottom View



### Single-ended Configuration

Pin No.	Description
9	Input
3	Output
1,2,4,5,6,7	Case Ground
8,10,11,12	Case Ground

**Electrical Specifications** <sup>(1, 2, 3)</sup>

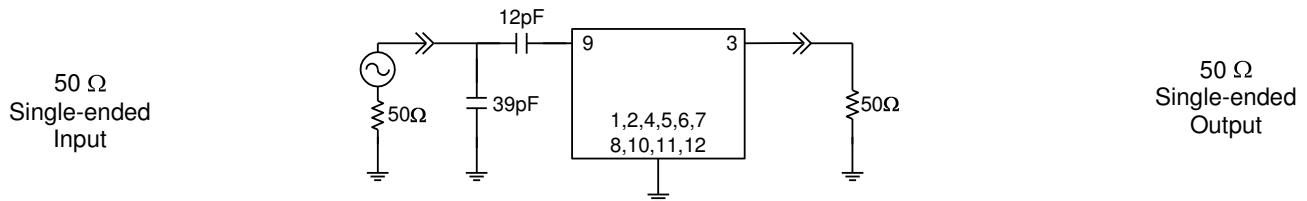
Parameter <sup>(4)</sup>	Minimum	Typical	Maximum	Unit
Center Frequency	-	479.75	-	MHz
Insertion Loss	-	19.5	22	dB
3 dB Bandwidth <sup>(5)</sup>	9.0	11.7	-	MHz
35 dB Bandwidth <sup>(5)</sup>	-	19.9	22	MHz
Passband Variation <sup>(6)</sup>	-	0.38	1.0	dB p-p
Group Delay Variation 475.25 – 484.25 MHz	-	26	50	ns p-p
Source Impedance <sup>(7)</sup>	-	50	-	$\Omega$
Load Impedance <sup>(7)</sup>	-	50	-	$\Omega$
Temperature Coefficient <sup>(3)</sup>	-	-23	-	ppm/ $^{\circ}$ C
Substrate Material	-	LiTaO <sub>3</sub>	-	-

**Notes:**

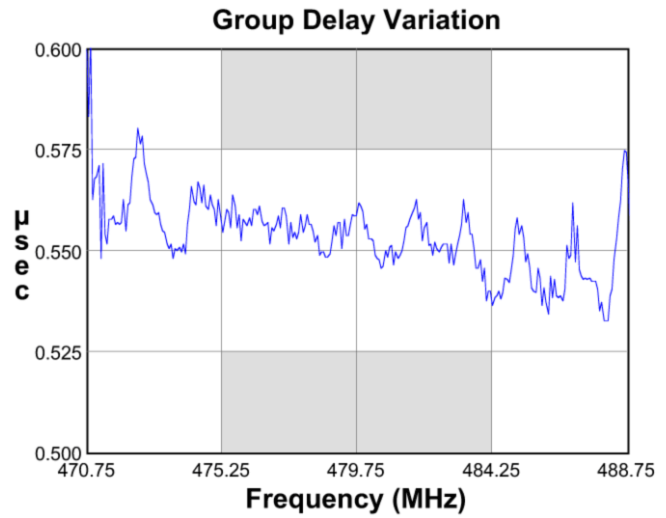
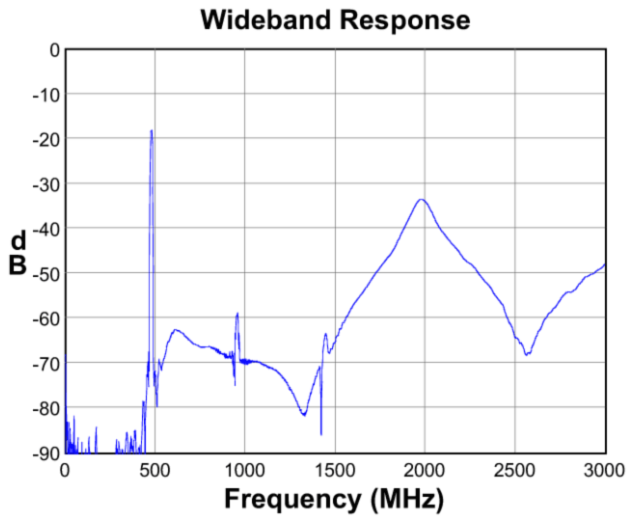
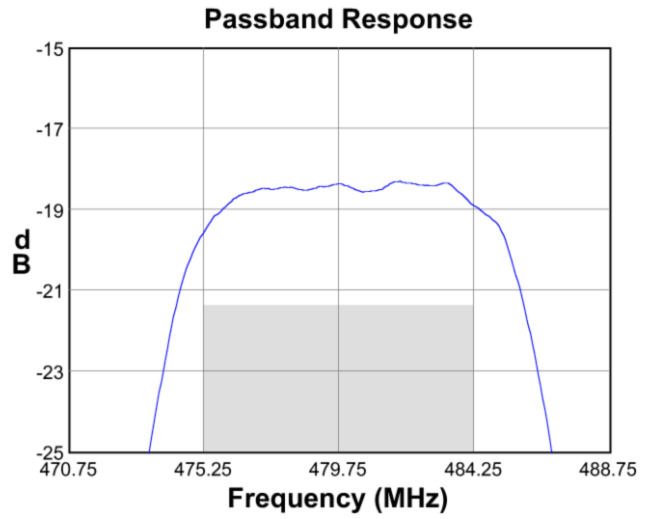
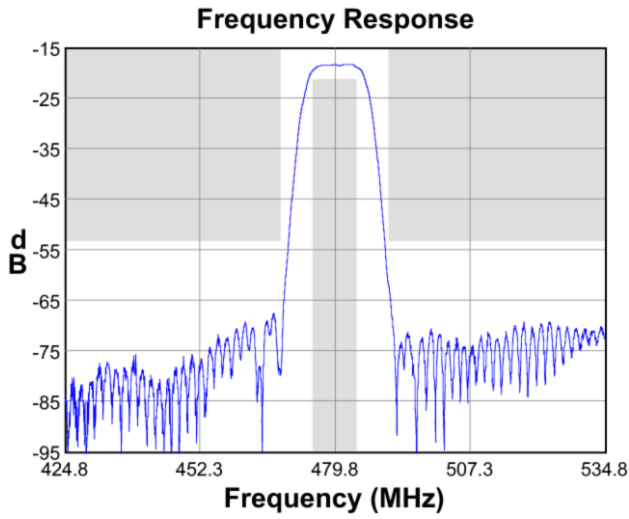
1. All specifications are based on the test circuit shown below
2. This specification is valid for room temperature only
3. Device will function over an operating temperature of -40 to 85  $^{\circ}$ C, but may not meet the above ambient specification. Insertion loss and frequency shift performance will change over temperature. See coefficient of temperature for frequency shift estimation.
4. Electrical margin has been built into the design to account for the variations due to manufacturing tolerances
5. Referenced to insertion loss at 479.75 MHz
6. Referenced to 100% of 1dB bandwidth
7. This is the optimum impedance in order to achieve the performance shown

**Test Circuit:**

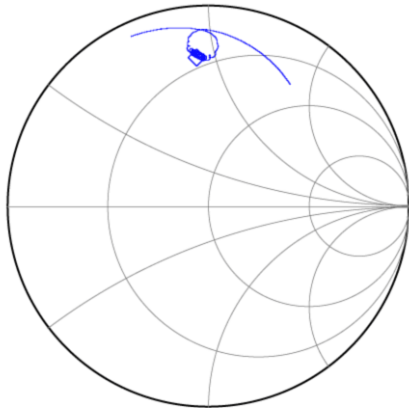
Actual matching values may vary due to PCB layout and parasitics



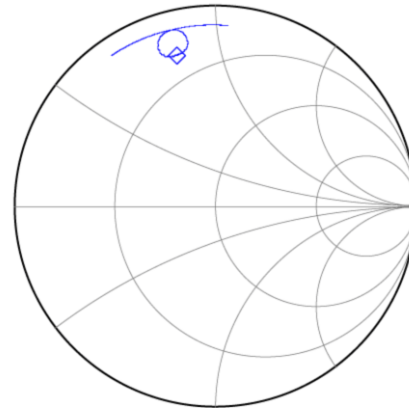
**Typical Performance (at room temperature)**



**Input Smith Chart**

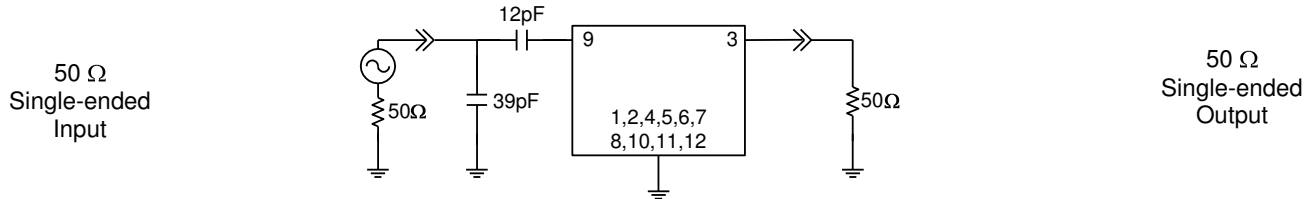


**Output Smith Chart**

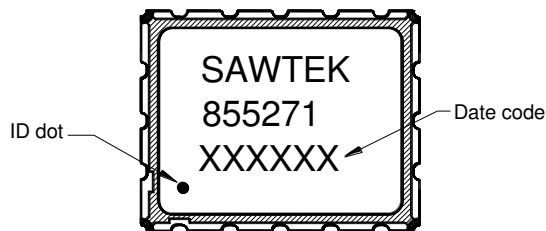


**Matching Schematics**

Actual matching values may vary due to PCB layout and parasitics

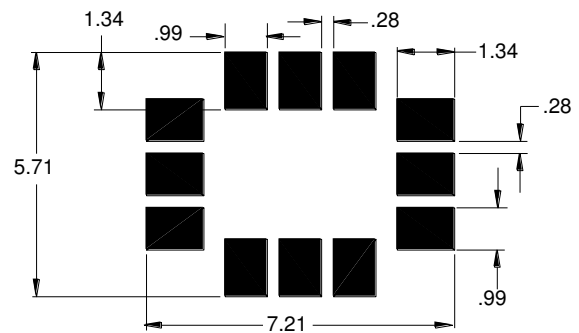


**Marking**



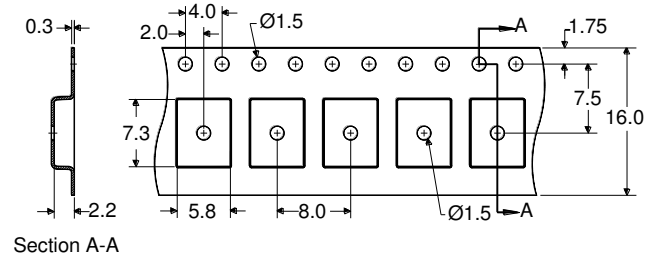
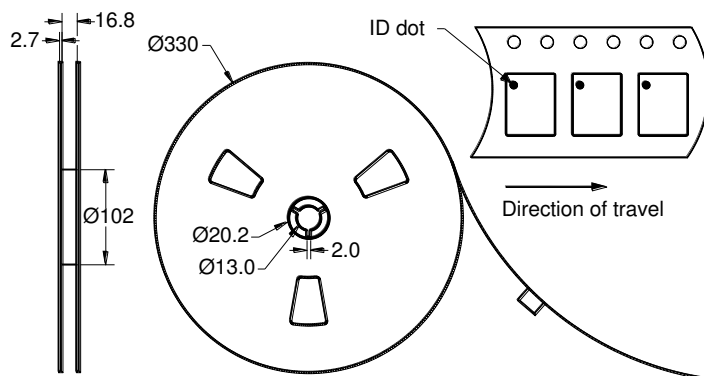
The date code consists of: day of the current year (Julian, 3 digits), last digit of the year (1 digit) and hour (2 digits)

**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: 3000 units/reel

### Maximum Ratings


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

### Important Notes

#### Warnings

- Electrostatic Sensitive Device (ESD) 
- Avoid ultrasonic exposure

#### RoHS Compliance

- This product complies with EU directive 2002/95/EC (RoHS) 

#### Solderability

- Compatible with JESD22-B102, Pb-free process, **260 °C** peak reflow temperature ([see soldering profile](#))

### Links to Additional Technical Information

[PCB Layout Tips](#)

[Qualification Flowchart](#)

[Soldering Profile](#)

[S-Parameters](#)

[RoHS Information](#)

[Other Technical Information](#)

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