
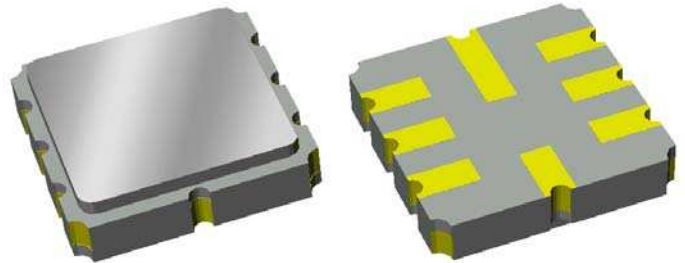


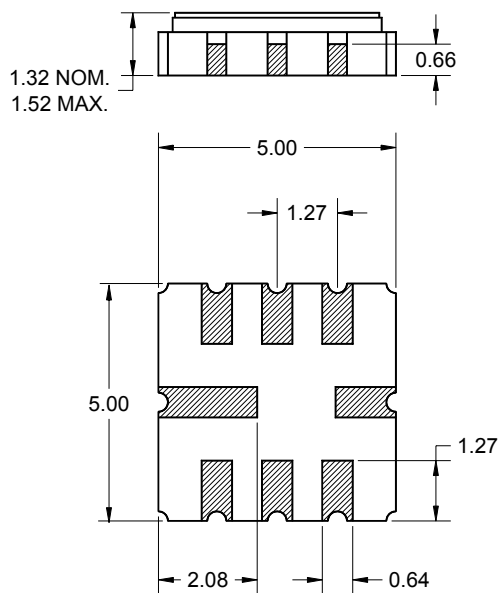
Features

- For WiBro and WiMAX applications
- Usable bandwidth 7.8 MHz
- High attenuation
- Balanced operation
- Ceramic Surface Mount Package (SMP)
- Hermetic
- RoHS compliant (2002/95/EC), Pb-free 



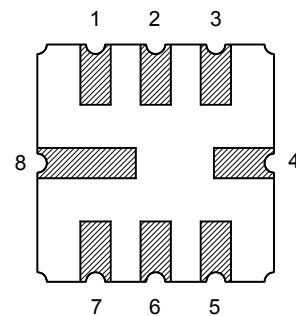
Package

Surface Mount 5.00 x 5.00 x 1.32 mm



Pin Configuration

Bottom View



Pin No.	Description
1	Input
2	Input return
5	Output
6	Output return
3,4,7,8	Case ground

Dimensions shown are nominal in millimeters
All tolerances are $\pm 0.15\text{mm}$ except overall length and width $+0.15/-0.10\text{mm}$

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

Data Sheet

Electrical Specifications ⁽¹⁾

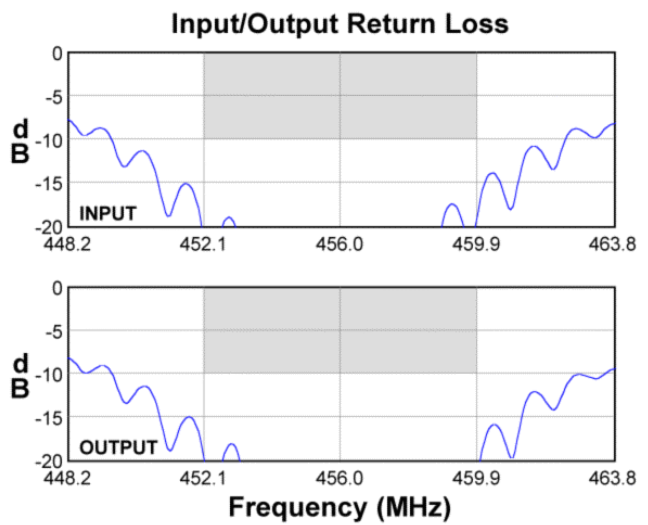
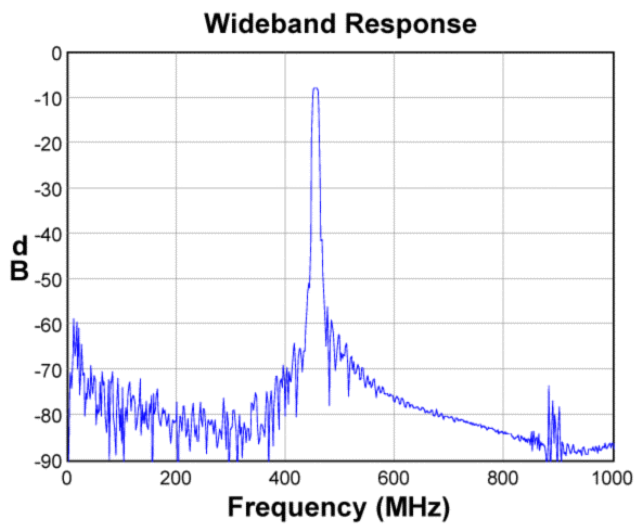
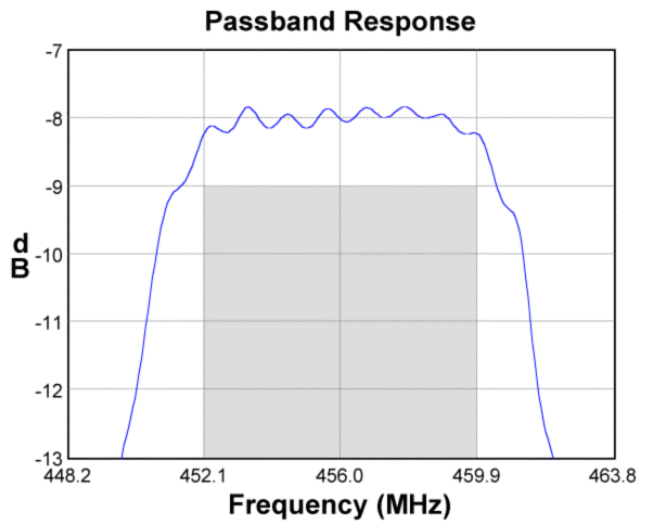
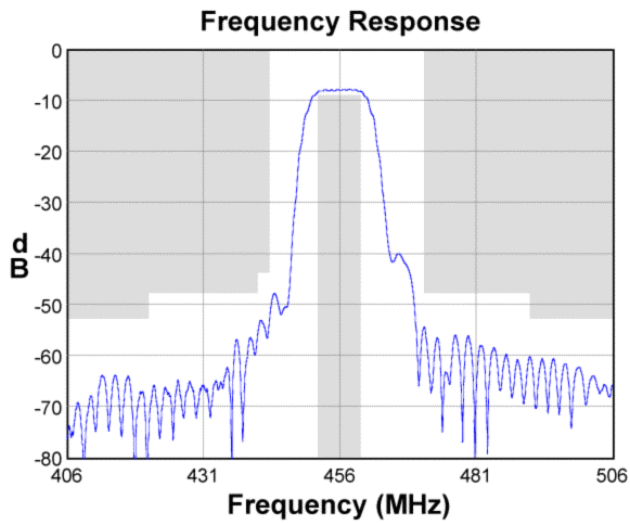
Operating Temperature Range: ⁽²⁾ -20 to +60 °C

Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Center Frequency (Fo)	-	456	-	MHz
Minimum Insertion Loss 452.1 - 459.9 MHz	-	7.9	9	dB
Amplitude Variation ⁽⁴⁾ 452.1 - 459.9 MHz	-	0.49	1.25	dB
30 dB Bandwidth ⁽⁵⁾	-	17.55	18	MHz
Absolute Attenuation ⁽⁵⁾				
10 - 256 MHz	30	50	-	dB
256 - 360 MHz	40	67	-	dB
360 - 421 MHz ⁽⁶⁾	45	56	-	dB
421 - 441 MHz	40	47	-	dB
441 - 443.25 MHz	36	44	-	dB
471.55 - 491 MHz	40	48	-	dB
491 - 552 MHz ⁽⁶⁾	45	50	-	dB
552 - 656 MHz	40	67	-	dB
656 - 946 MHz	30	68	-	dB
Absolute Group Delay at Fo	-	0.43	0.45	μsec
Group Delay Variation 451.8 - 460.2 MHz	-	33	75	ns
Input Return Loss 452.1 - 459.9 MHz	10	15	-	dB
Output Return Loss 452.1 - 459.9 MHz	10	18	-	dB
Optimal Source Impedance (Balanced) ⁽⁷⁾	-	200	-	Ω
Optimal Load Impedance (Balanced) ⁽⁷⁾	-	200	-	Ω

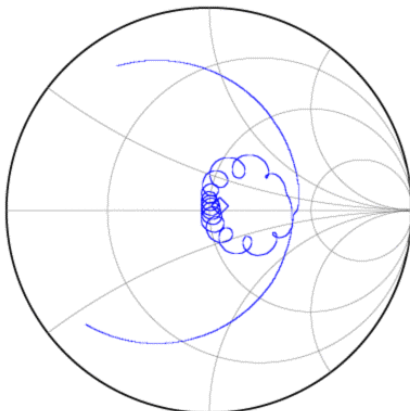
Notes:

1. All specifications are based on the Sawtek reference test system
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. Describes the minimum peak to adjacent valley variation over the defined frequency range
5. Referenced to minimum insertion loss
6. The rejection "floor" in specified ranges allows for 100KHz wide spurious responses at a max peak of 40dB below minimum insertion loss
7. This is the optimum impedance in order to achieve the performance shown

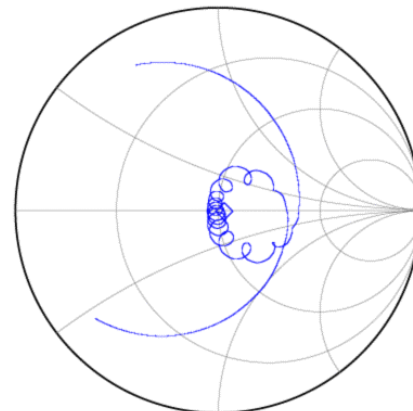
Typical Performance (at +25°C)



Input Smith Chart

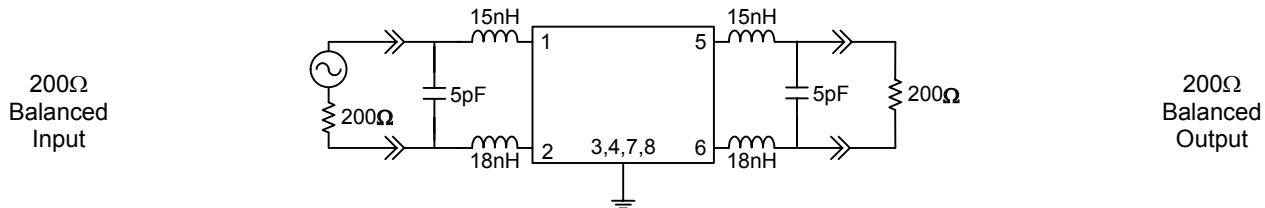


Output Smith Chart

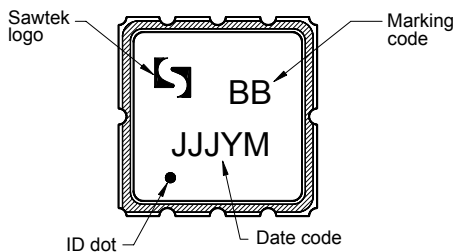


Matching Schematics

Actual matching values may vary due to PCB layout and parasitics

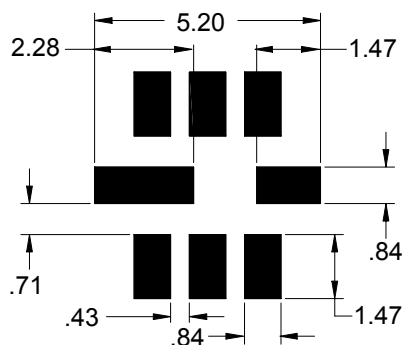


Marking



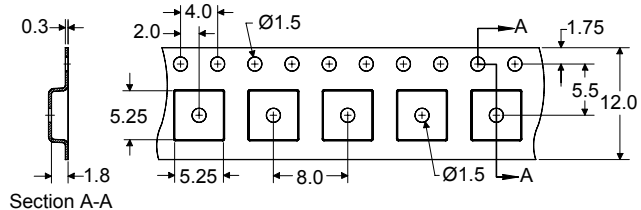
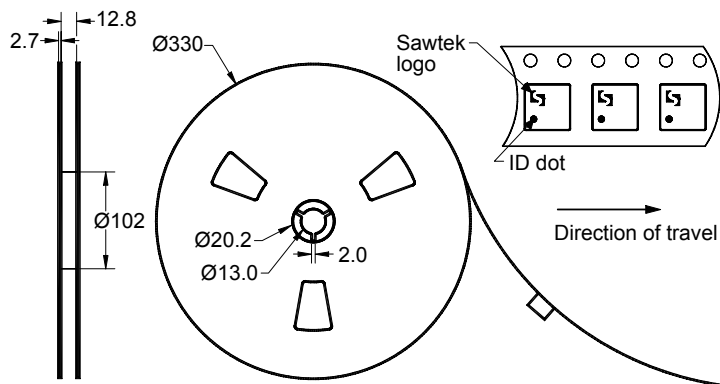
The date code consists of: JJJ = Julian day, Y = last digit of year, M = manufacturing site code

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: 4000 units/reel


Data Sheet

Maximum Ratings


Parameter	Symbol	Minimum	Maximum	Unit
Operating Temperature Range	T	-20	+60	°C
Storage Temperature Range	T _{stg}	-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 JEDEC J-STD-020C **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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