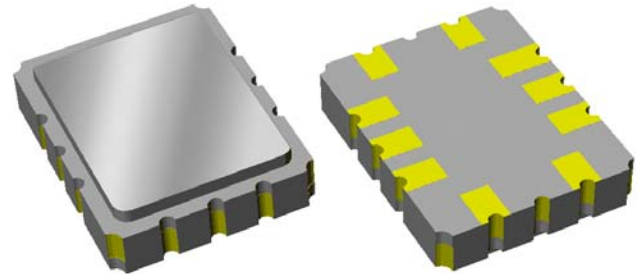


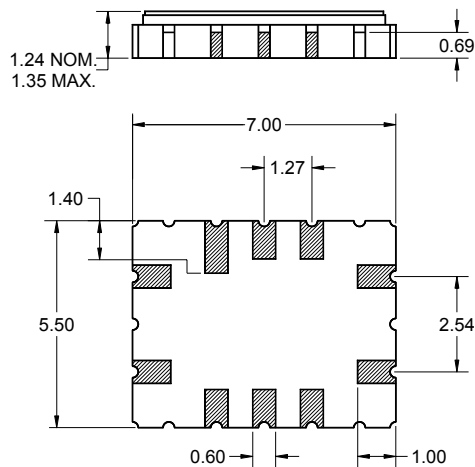
Features

- For WiBro and WiMAX applications
- Usable bandwidth 10 MHz
- High attenuation
- Balanced operation 200 Ω
- Ceramic Surface Mount Package (SMP)
- Hermetic
- RoHS compliant (2002/95/EC), Pb-free 



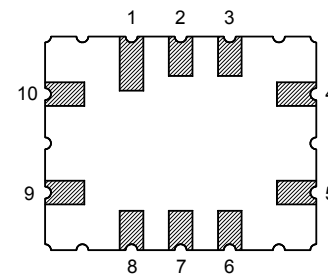
Package

Surface Mount 7.00 x 5.50 x 1.24 mm



Pin Configuration

Bottom View



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

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

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

Electrical Specifications ⁽¹⁾

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

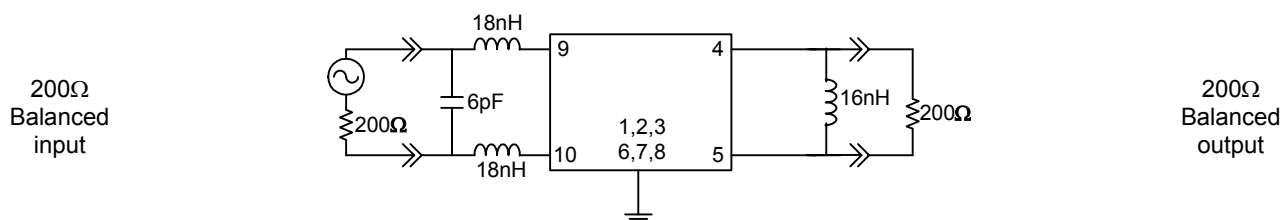
Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Center Frequency, f_0	-	456	-	MHz
Minimum Insertion Loss 451 - 461 MHz	-	8.30	9.50	dB
Amplitude Variation 451 - 461 MHz	-	0.45	1.00	dB
30 dB Bandwidth ⁽³⁾	-	20.00	20.35	MHz
Relative Attenuation ⁽³⁾				
10 - 256 MHz	45	70	-	dB
256 - 360 MHz	40	65	-	dB
360 - 421 MHz	45	50	-	dB
421 - 440 MHz	37	40	-	dB
472.4 - 491 MHz	39	42	-	dB
491 - 552 MHz	45	50	-	dB
552 - 656 MHz	40	55	-	dB
656 - 946 MHz	45	60	-	dB
Absolute Group Delay at F_0	-	0.49	0.51	μ sec
Group Delay Variation 451 - 461 MHz	-	30	65	ns
Input/Output Return Loss 451 - 461 MHz	9	14	-	dB
Source Impedance (Balanced) ⁽⁴⁾	-	200	-	Ω
Load Impedance (Balanced) ⁽⁴⁾	-	200	-	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. Referenced to minimum insertion loss
4. This is the optimum impedance in order to achieve performance shown

Test Circuit:

Actual matching values may vary due to PCB layout and parasitics



Electrical Specifications ⁽¹⁾

Operating Temperature Range: ⁽²⁾ -40 to +85 °C

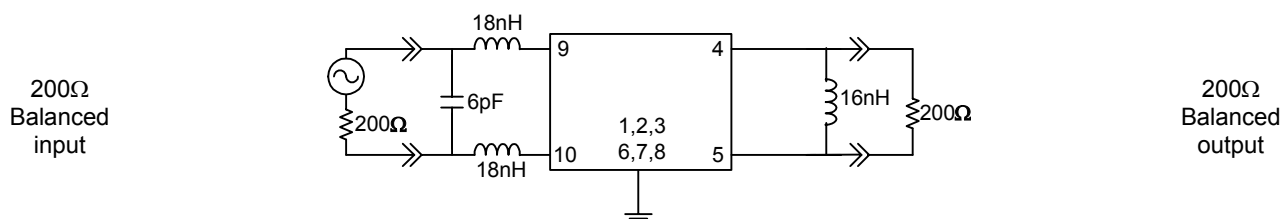
Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Center Frequency, f_0	-	456	-	MHz
Minimum Insertion Loss 451 - 461 MHz	-	8.30	9.75	dB
Amplitude Variation 451 - 461 MHz	-	0.45	1.25	dB
30 dB Bandwidth ⁽³⁾	-	20.00	20.38	MHz
Relative Attenuation ⁽³⁾				
10 - 256 MHz	45	70	-	dB
256 - 360 MHz	40	65	-	dB
360 - 421 MHz	45	50	-	dB
421 - 440 MHz	37	40	-	dB
472.4 - 491 MHz	39	42	-	dB
491 - 552 MHz	45	50	-	dB
552 - 656 MHz	40	55	-	dB
656 - 946 MHz	45	60	-	dB
Absolute Group Delay at F_0	-	0.49	0.51	μsec
Group Delay Variation 451 - 461 MHz	-	30	75	ns
Input/Output Return Loss 451 - 461 MHz	8	14	-	dB
Source Impedance (Balanced) ⁽⁴⁾	-	200	-	Ω
Load Impedance (Balanced) ⁽⁴⁾	-	200	-	Ω

Notes:

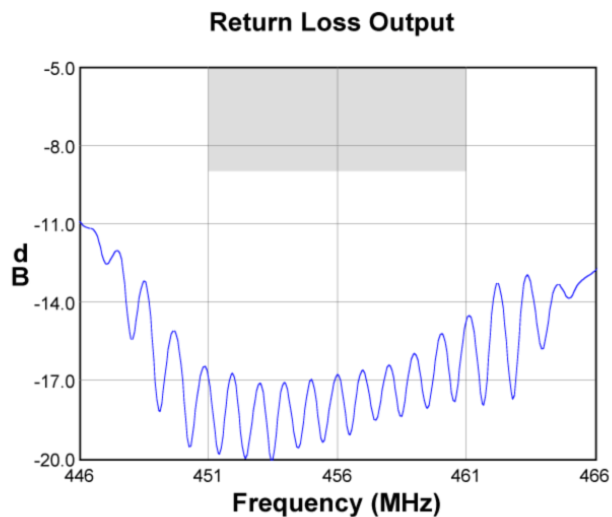
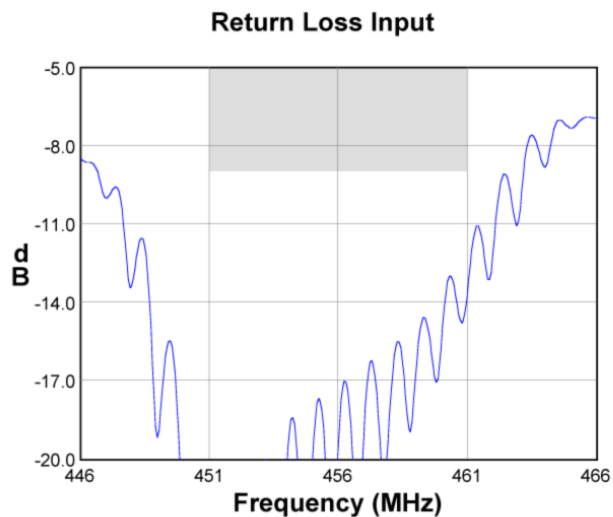
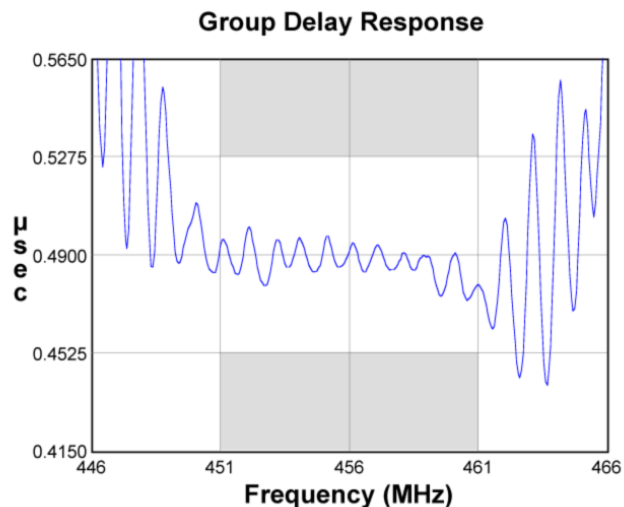
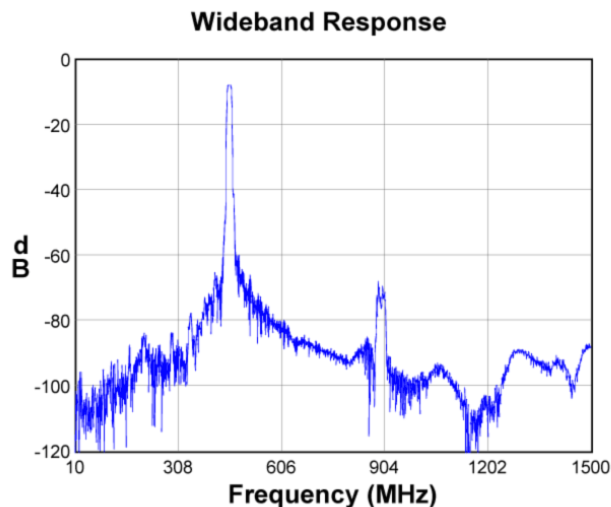
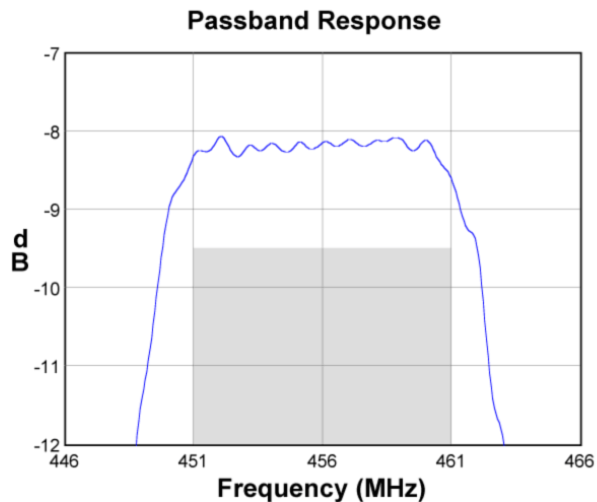
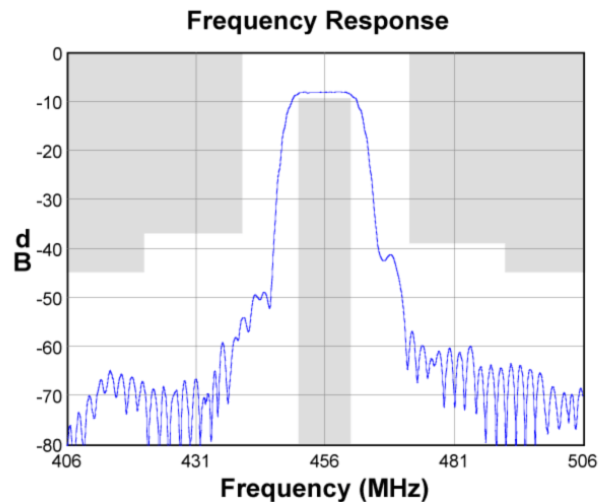
1. All specifications are based on the test circuit shown below
2. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
3. Referenced to minimum insertion loss
4. This is the optimum impedance in order to achieve performance shown

Test Circuit:

Actual matching values may vary due to PCB layout and parasitics

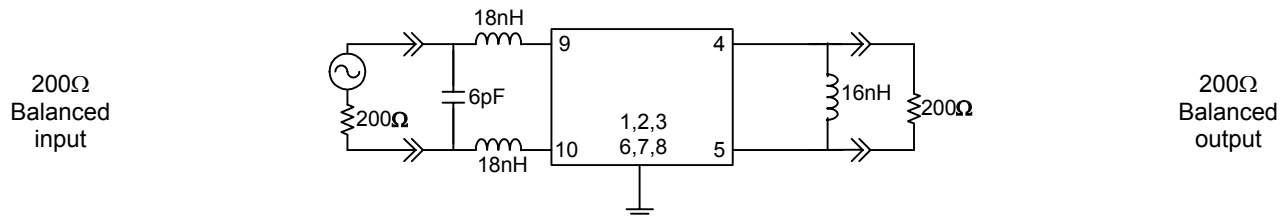


Typical Performance (at +25°C)



Matching Schematics

Actual matching values may vary due to PCB layout and parasitics

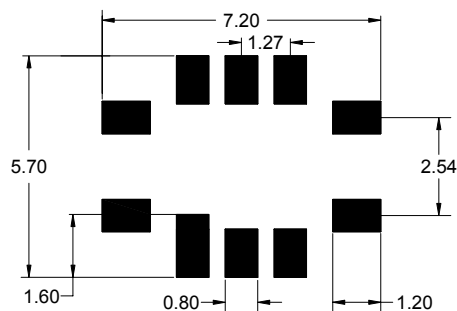


Marking



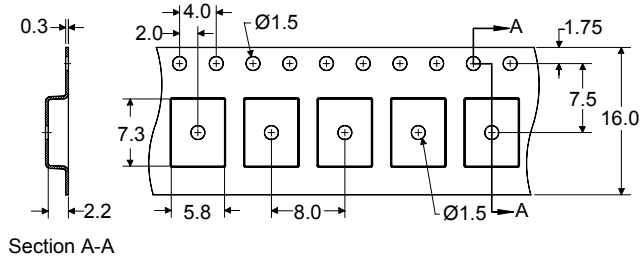
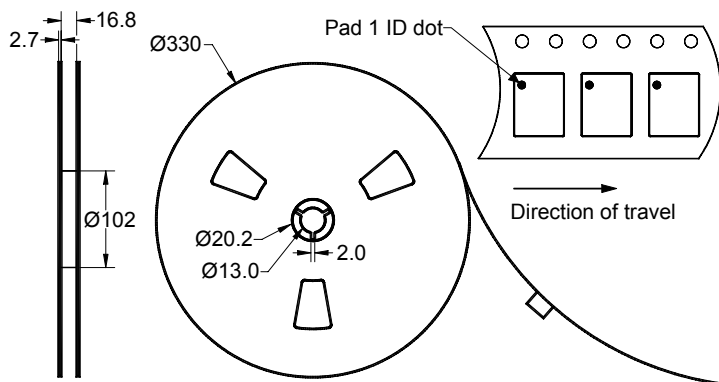
The date code consists of: day of the current year (Julian, 3 digits), last digit of the year (1 digit) and hour (2 digits)

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 _{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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[Representatives or distributors](#)