
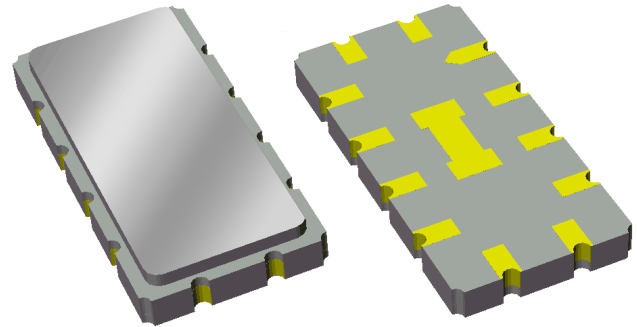


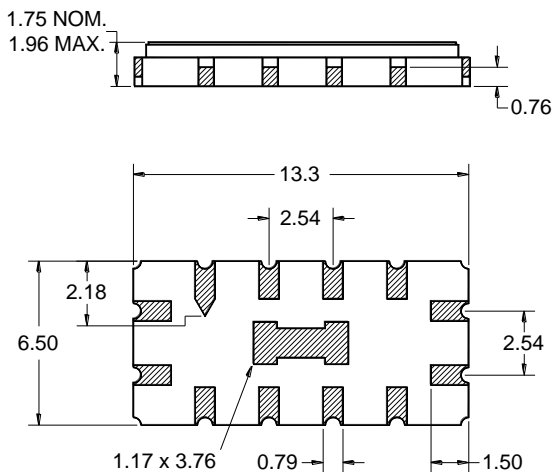
Features

- For GPS applications
- Usable bandwidth 16 MHz
- Low loss
- High attenuation
- Single-ended operation
- Ceramic Surface Mount Package (SMP)
- Hermetic
- RoHS compliant (2002/95/EC), Pb-free 



Package

Surface Mount 13.30 x 6.50 x 1.75 mm
SMP-53



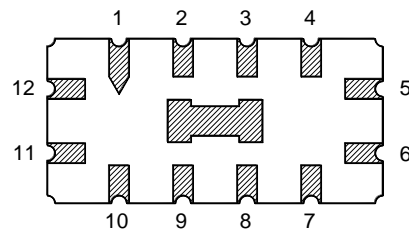
Dimensions shown are nominal in millimeters
All tolerances are ± 0.15 mm except overall
length and width ± 0.10 mm

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

Pin Configuration

Bottom View

This package includes a center pad.
Soldering of the center pad to PCB is not recommended and not required.



Single-ended Configuration

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

Electrical Specifications ⁽¹⁾

Operating Temperature Range: ⁽²⁾ +25 °C

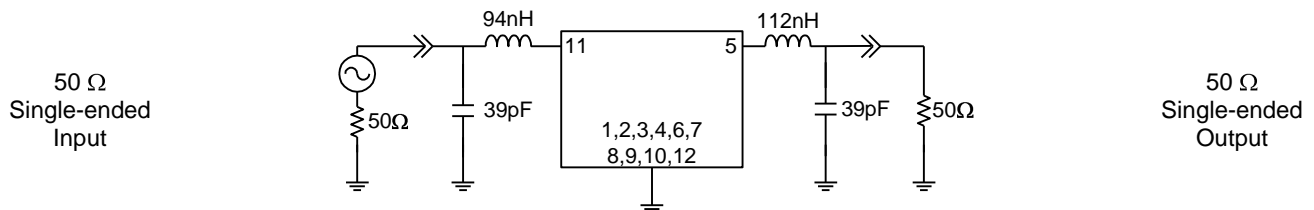
Parameter ⁽³⁾	Minimum	Typical ⁽⁴⁾	Maximum	Unit
Center Frequency	139.6	140	140.4	MHz
Minimum Insertion Loss at Center Frequency	-	8.4	11	dB
1 dB Bandwidth	15	16	-	MHz
3 dB Bandwidth	16	16.9	-	MHz
35 dB Bandwidth	-	21.17	22	MHz
Passband Ripple 133.6 - 146.4 MHz	-	0.6	1	dB p-p
Phase Linearity 133.6 - 146.4 MHz	-	10	14	° p-p
Group Delay Variation 133.6 - 146.4 MHz	-	60	160	ns p-p
Absolute Group Delay	-	1.02	-	µs
Temperature Shift	-	-94	-	ppm/°C
Source Impedance (single-ended) ⁽⁵⁾	-	50	-	Ω
Load Impedance (single-ended) ⁽⁵⁾	-	50	-	Ω

Notes:

1. All specifications are based on the TriQuint 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. Typical values are based on average measurements at room temperature
5. 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



Electrical Specifications ⁽¹⁾

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

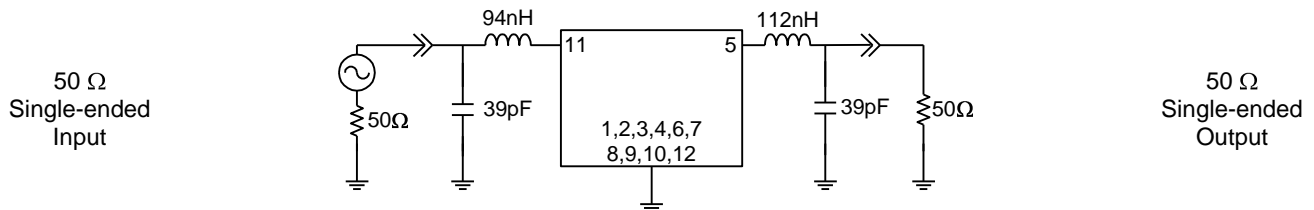
Parameter ⁽³⁾	Minimum	Typical ⁽⁴⁾	Maximum	Unit
Center Frequency	138.6	140	141.4	MHz
Minimum Insertion Loss at Center Frequency	-	8.9	11	dB
Lower 1 dB Band Edge	-	132.1	132.9	MHz
Upper 1 dB Band Edge	147.1	148.2	-	MHz
Lower 3 dB Band Edge	-	131.7	132.6	MHz
Upper 3 dB Band Edge	147.6	148.7	-	MHz
Lower 35 dB Band Edge	128.6	130.2	-	MHz
Upper 35 dB Band Edge	-	151.3	154.0	MHz
Passband Ripple 133.6 - 146.4 MHz	-	0.6	1	dB
Phase Linearity 133.6 - 146.4 MHz	-	10	14	deg
Group Delay Variation 133.6 - 146.4 MHz	-	60	160	ns
Absolute Group Delay	-	1.02	-	μs
Source Impedance (single-ended) ⁽⁶⁾	-	50	-	Ω
Load Impedance (single-ended) ⁽⁶⁾	-	50	-	Ω

Notes:

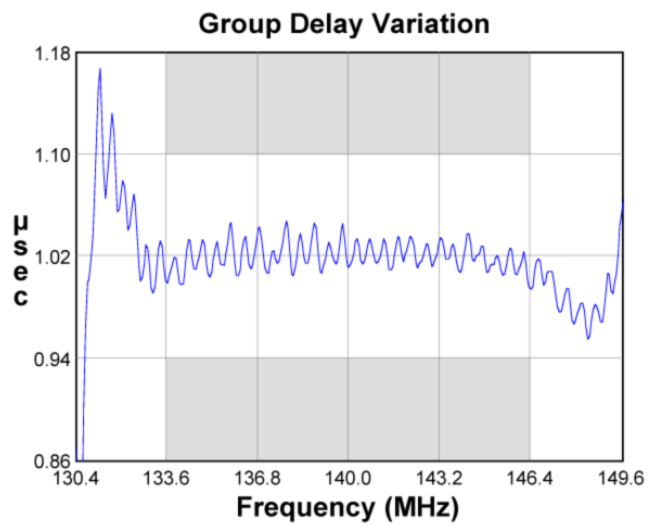
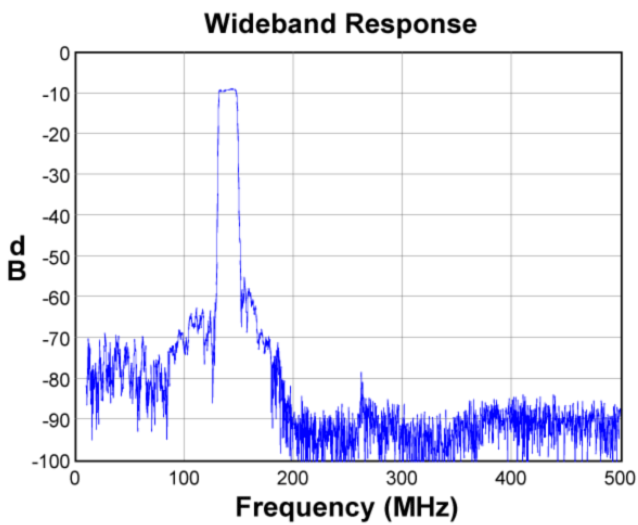
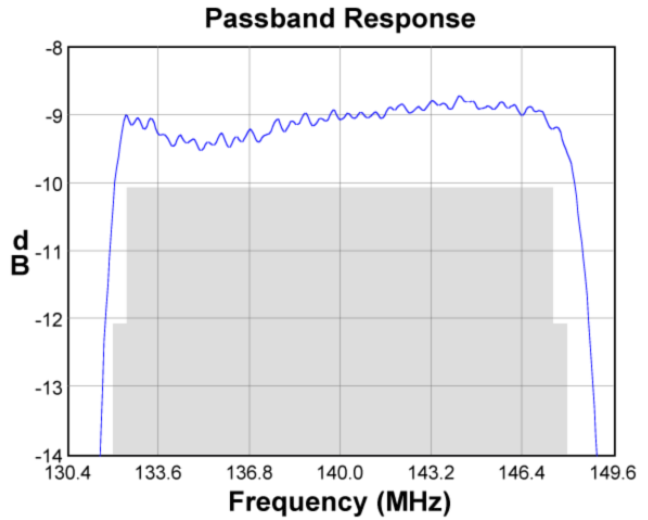
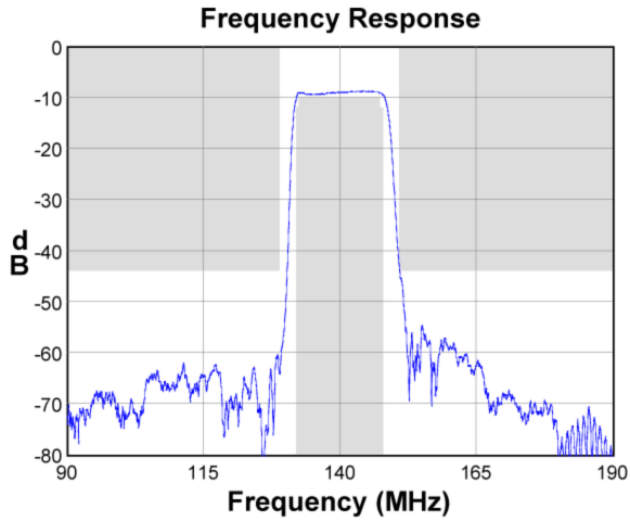
1. All specifications are based on the TriQuint test circuit shown below
2. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
3. Electrical margin has been built into the design to account for the variations due to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

Test Circuit:

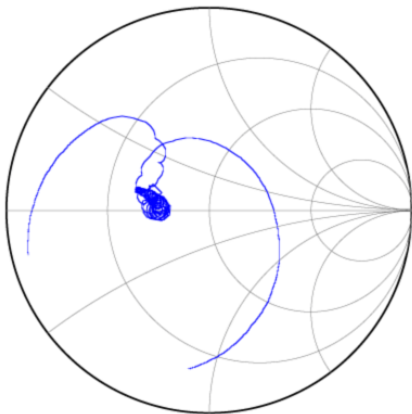
Actual matching values may vary due to PCB layout and parasitics



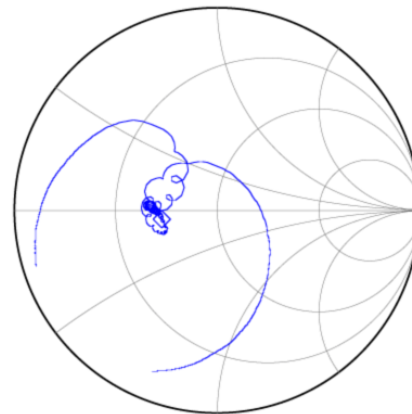
Typical Performance (at room temperature)



Input Smith Chart

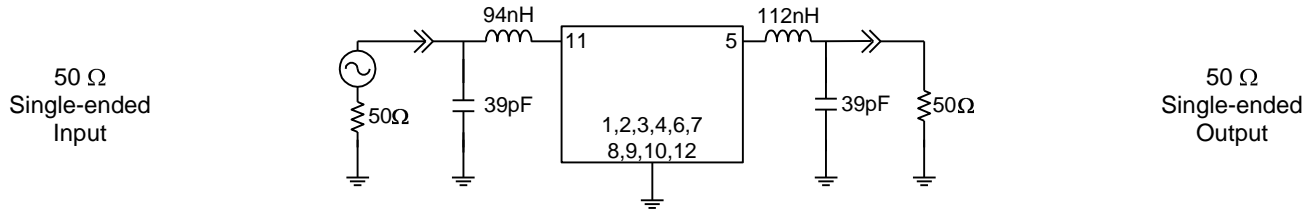


Output Smith Chart

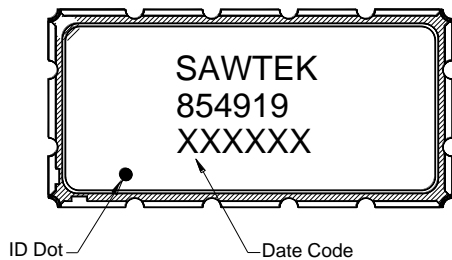


Matching Schematics

Actual matching values may vary due to PCB layout and parasitics

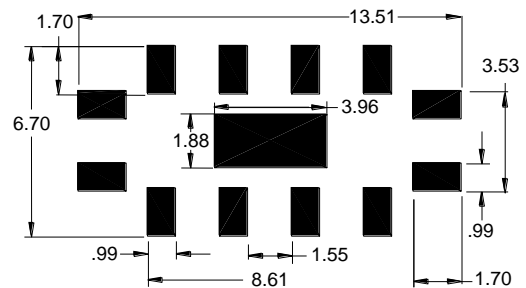


Marking



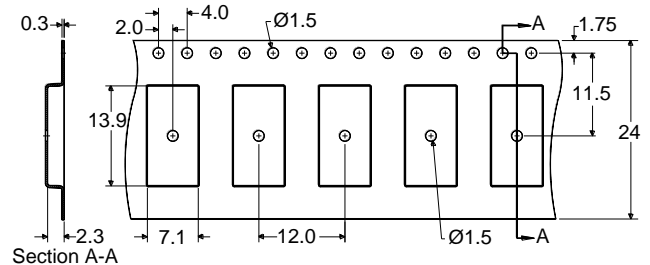
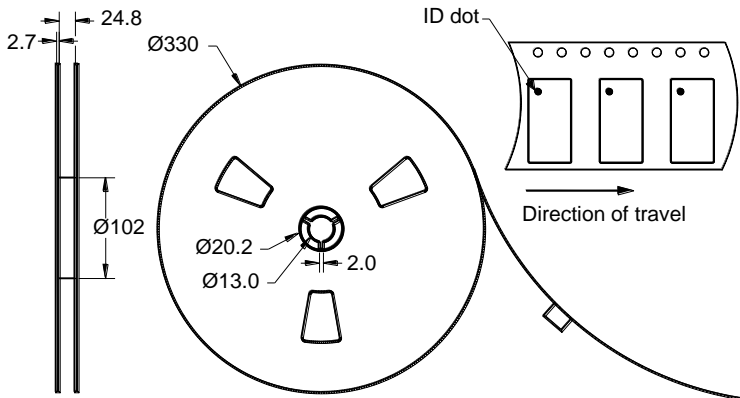
The date code consists of: day of the current year (Julian, 3 digits), last digit of the year (1 digit) and hour (2 digits)

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: 2000 units/reel

Maximum Ratings


Parameter	Symbol	Minimum	Maximum	Unit
Operating Temperature Range	T	-40	+85	°C
Storage Temperature Range	T _{stg}	-40	+85	°C
ESD (Human Body Model), JEDEC JESD22-A114	V _{HBM}	200	-	Volts
ESD (Machine Model), JEDEC JESD22-A115	V _{MM}	150	-	Volts

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, 260C 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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