
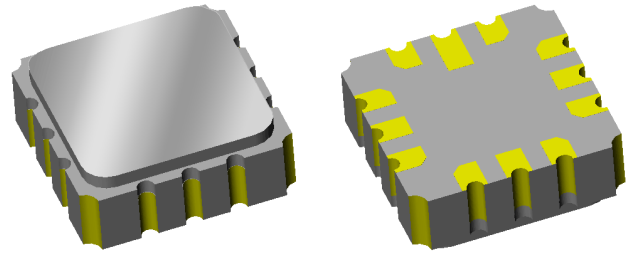


Features

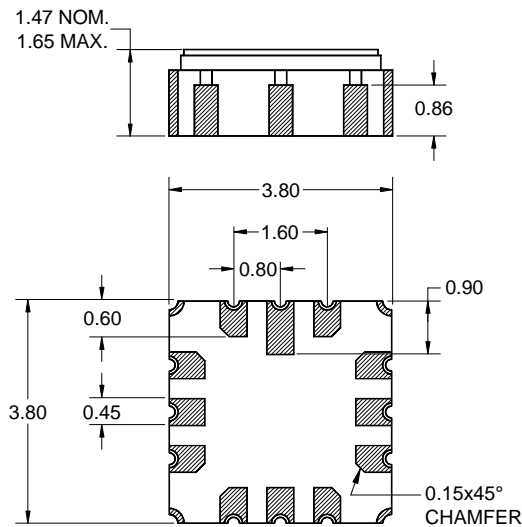
- For CDMA, WCDMA 850 and AMPS applications
- Usable bandwidth 25 MHz (each band)
- High Tx-Rx isolation
- Low insertion loss
- High attenuation
- Single-ended operation
- No matching required for operation at 50Ω
- Ceramic Surface Mount Package (SMP)
- Hermetic
- Qualified for Automotive Applications
- Manufacturing facilities are certified with ISO/TS 16949:2002
- RoHS compliant (2002/95/EC), Pb-free 



Package

Surface Mount 3.80 x 3.80 x 1.47 mm

SMP-15F

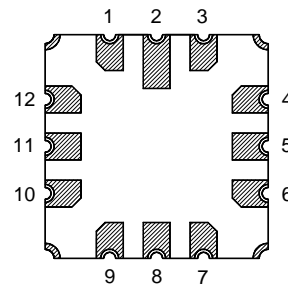


Dimensions shown are nominal in millimeters
All tolerances are ± 0.15 mm except overall
length and width ± 0.10 mm

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



Pin No.	Description
5	Rx
8	Antenna
11	Tx
1,2,3,4,6	Case ground
7,9,10,12	Case ground

Electrical Specifications ⁽¹⁾

Operating Temperature: ⁽²⁾ +25 °C

Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Tx-Ant Specification				
Center Frequency	-	836.5	-	MHz
Maximum Insertion Loss ⁽⁴⁾ 824 - 849 MHz	-	1.9	2.3	dB
Amplitude Ripple 824 - 849 MHz	-	0.5	0.7	dB
Absolute Attenuation 10 - 750 MHz	24	30	-	dB
869 - 894 MHz	45	50	-	dB
1050 - 1100 MHz	20	24	-	dB
1250 - 1325 MHz	14	18	-	dB
Second Harmonic Attenuation 1648 - 1698 MHz	7	10	-	dB
Third Harmonic Attenuation 2472 - 2547 MHz	8	12	-	dB
Return Loss at Tx Terminal ⁽⁴⁾ 824 - 849 MHz	10	13	-	dB
Ant-Rx Specification				
Center Frequency	-	881.5	-	MHz
Maximum Insertion Loss ⁽⁴⁾ 869 - 894 MHz	-	2.3	3.0	dB
Amplitude Ripple 869 - 894 MHz	-	0.6	1.2	dB
869 - 894 MHz (over any 5MHz span)	-	0.4	0.8	dB
Absolute Attenuation 10 - 779 MHz	25	32	-	dB
779 - 804 MHz	34	38	-	dB
824 - 849 MHz	52	56	-	dB
1039 - 1065 MHz	30	38	-	dB
1100 - 1270 MHz	36	42	-	dB
1648 - 1698 MHz	35	42	-	dB
2472 - 2547 MHz	20	27	-	dB
3000 - 6000 MHz	7	10	-	dB
Return Loss at Rx Terminal ⁽⁴⁾ 869 - 894 MHz	9	12	-	dB
Tx-Rx Specification				
Tx to Rx Isolation 824 - 849 MHz	55	60	-	dB
869 - 894 MHz	45	50	-	dB

Notes:

1. All specifications are based on the test circuit shown on page 6
2. This specification is valid for room temperature only. The specification over the full temperature range(s) is available on the next page(s)
3. Electrical margin has been built into the design to account for the variations due to manufacturing tolerances
4. Excluding losses due to PCB

Electrical Specifications ⁽¹⁾

Operating Temperature Range: ⁽²⁾ -30 to +85 °C

Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Tx-Ant Specification				
Center Frequency	-	836.5	-	MHz
Maximum Insertion Loss ⁽⁴⁾ 824 - 849 MHz	-	1.9	2.3	dB
Amplitude Ripple 824 - 849 MHz	-	0.6	1	dB
Absolute Attenuation 10 - 750 MHz	24	30	-	dB
869 - 894 MHz	45	50	-	dB
1050 - 1100 MHz	20	24	-	dB
1250 - 1325 MHz	14	18	-	dB
Second Harmonic Attenuation 1648 - 1698 MHz	7	10	-	dB
Third Harmonic Attenuation 2472 - 2547 MHz	8	12	-	dB
Return Loss at Tx Terminal ⁽⁴⁾ 824 - 849 MHz	10	12	-	dB
Ant-Rx Specification				
Center Frequency	-	881.5	-	MHz
Maximum Insertion Loss ⁽⁴⁾ 869 - 894 MHz	-	2.6	3.2	dB
Amplitude Ripple 869 - 894 MHz	-	0.9	1.4	dB
869 - 894 MHz (over any 5MHz span)	-	0.4	0.8	dB
Absolute Attenuation 10 - 779 MHz	25	32	-	dB
779 - 804 MHz	34	38	-	dB
824 - 849 MHz	50	56	-	dB
1039 - 1065 MHz	30	38	-	dB
1100 - 1270 MHz	36	42	-	dB
1648 - 1698 MHz	35	42	-	dB
2472 - 2547 MHz	20	27	-	dB
3000 - 6000 MHz	7	10	-	dB
Return Loss at Rx Terminal ⁽⁴⁾ 869 - 894 MHz	9	12	-	dB
Tx-Rx Specification				
Tx to Rx Isolation 824 - 849 MHz	54	60	-	dB
869 - 894 MHz	45	49	-	dB

Notes:

1. All specifications are based on the test circuit shown on page 6
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. Excluding losses due to PCB

Electrical Specifications ⁽¹⁾

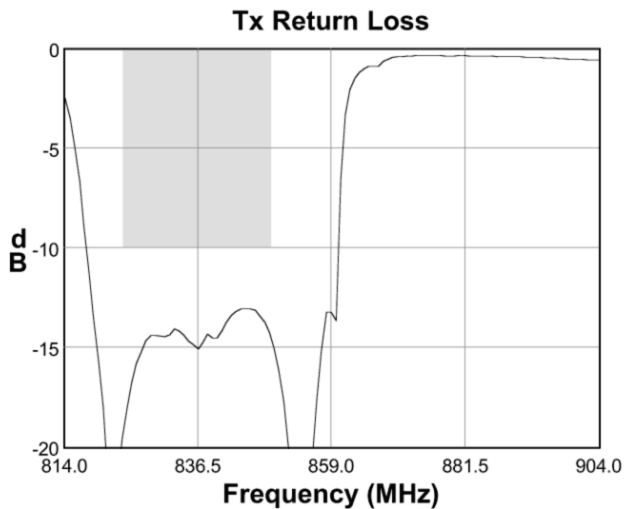
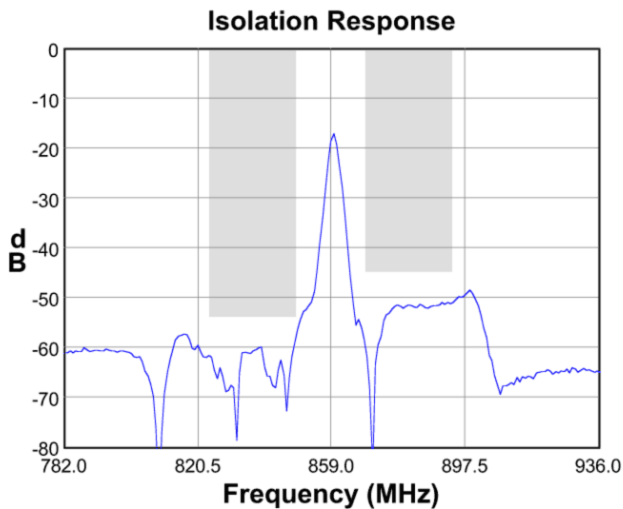
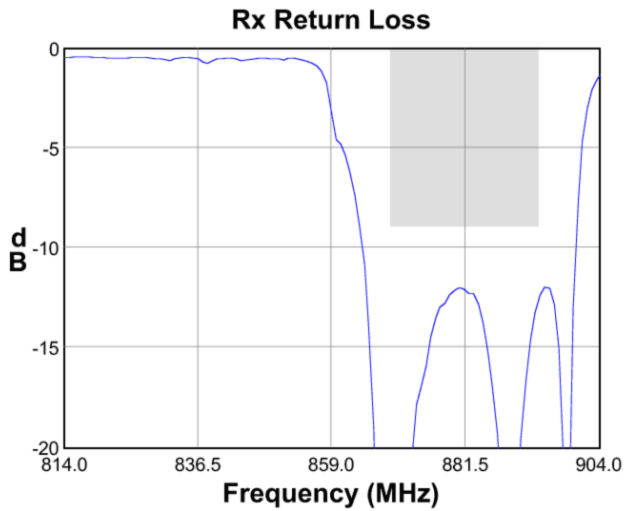
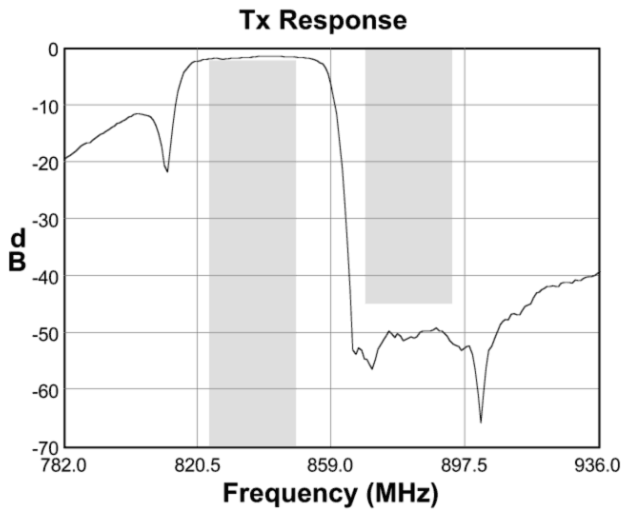
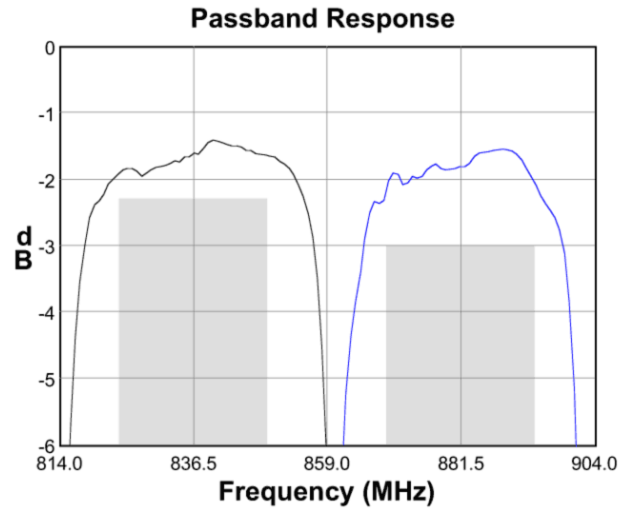
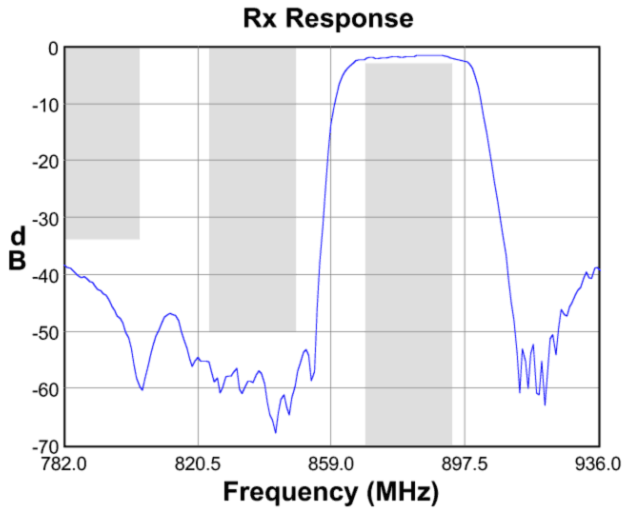
Operating Temperature Range: ⁽²⁾ -40 to +85 °C

Parameter ⁽³⁾	Minimum	Typical	Maximum	Unit
Tx-Ant Specification				
Center Frequency	-	836.5	-	MHz
Maximum Insertion Loss ⁽⁴⁾ 824 - 849 MHz	-	1.9	2.5	dB
Absolute Attenuation DC - 800 MHz	12	30	-	dB
869 - 894 MHz	42	50	-	dB
1715 - 1785 MHz	7	10	-	dB
Second Harmonic Attenuation 1648 - 1698 MHz	7	10	-	dB
Third Harmonic Attenuation 2472 - 2547 MHz	8	12	-	dB
Return Loss at Tx Terminal ⁽⁴⁾ 824 - 849 MHz	10	12	-	dB
Ant-Rx Specification				
Center Frequency	-	881.5	-	MHz
Maximum Insertion Loss ⁽⁴⁾ 869 - 894 MHz	-	2.6	3.6	dB
Absolute Attenuation DC - 800 MHz	25	32	-	dB
824 - 849 MHz	50	56	-	dB
1738 - 1788 MHz	25	30	-	dB
2604 - 2682 MHz	15	22	-	dB
Return Loss at Rx Terminal ⁽⁴⁾ 869 - 894 MHz	9	12	-	dB
Tx-Rx Specification				
Tx to Rx Isolation 824 - 849 MHz	54	60	-	dB
869 - 894 MHz	44	49	-	dB

Notes:

1. All specifications are based on the test circuit shown on page 6
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. Excluding losses due to PCB

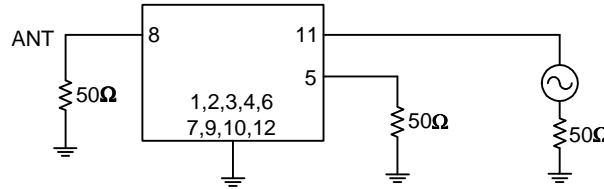
Typical Performance



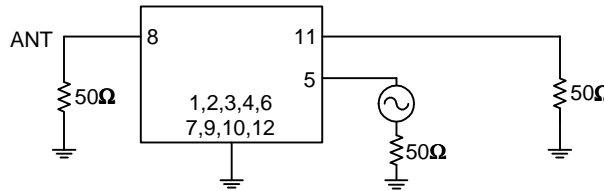
Matching Schematics

Actual matching values may vary due to PCB layout and parasitics

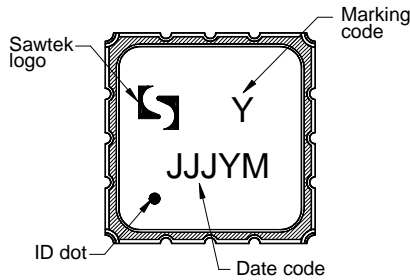
50 Ω
Single-ended
Input



50 Ω
Single-ended
Input

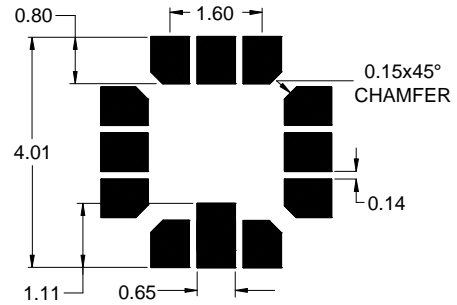


Marking



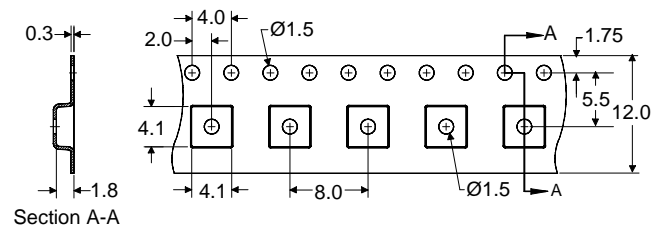
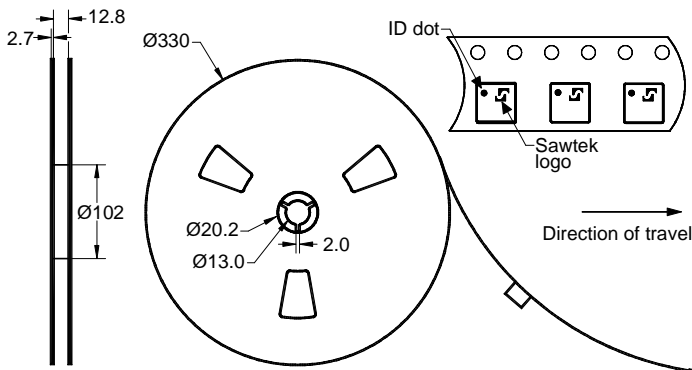
The date code consists of: JJJ = Julian day,
Y = last digit of year, M = manufacturing site code

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

Maximum Ratings


Parameter	Symbol	Minimum	Maximum	Unit
Operating Temperature Range	T	-30	+85	°C
Storage Temperature Range	T _{stg}	-40	+85	°C
RF Power	P _{in}	-	+31	dBm

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](#)

[Other Technical Information](#)

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Contact Information

TriQuint 
SEMICONDUCTOR
PO Box 609501
Orlando, FL 32860-9501
USA

Phone: +1 (407) 886-8860
Fax: +1 (407) 886-7061
Email: info-product@tqs.com
Web: www.triquint.com

Or contact one of our worldwide
Network of [sales offices](#),
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