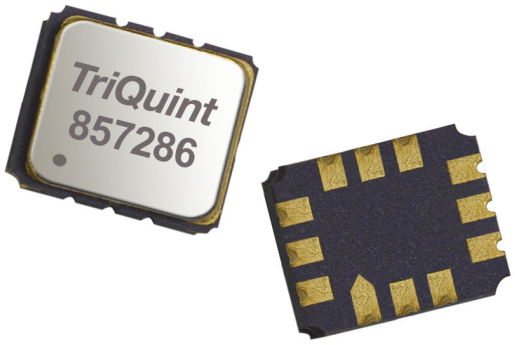
857286

358.4 MHz SAW Filter

Applications

- Base Station Infrastructure
- LTE Macrocells
- General Purpose Wireless

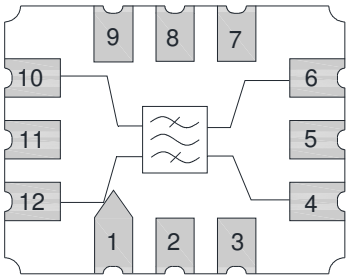


SMP-28B 7.01 x 5.51 x 1.63 mm

Product Features

- Usable bandwidth of 60 MHz
- Balanced operation
- High Attenuation
- Low loss
- Ceramic Surface Mount Package (SMP)
- Small Size: 7.01 x 5.51 x 1.63 mm
- Hermetically Sealed
- RoHS Compliant, Pb-free

Functional Block Diagram



Top View

General Description

The 857286 is a high-performance Surface Acoustic Wave (SAW) filter with a center frequency of 358.4 MHz and a 1 dB bandwidth of 60 MHz.

The 857286 uses common module packaging techniques to achieve the industry standard 7.01 x 5.51 x 1.63 mm footprint. It features low loss with excellent attenuation, and is designed to be used with a balanced input and output.

This device is RoHS compliant and Pb-free.

Pin Configuration

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

Ordering Information

Part No.	Description
857286	Packaged Part
857286-EVB	Evaluation board

Standard T/R size = 3,000 units/reel

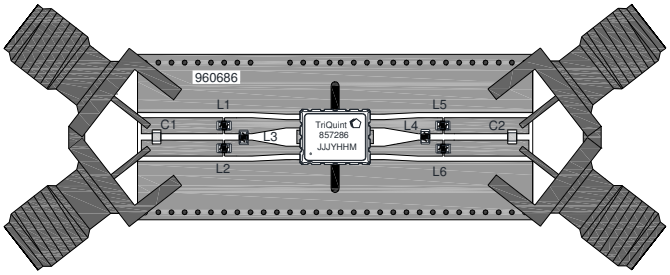
Electrical Specifications (1) (3)

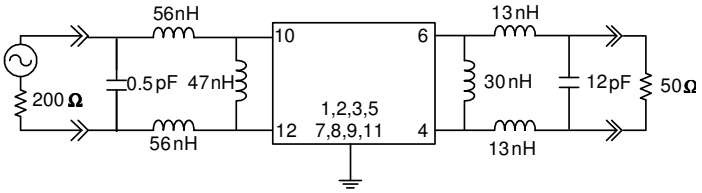
Test conditions unless otherwise noted: (2) Temperature Range - 33 to +105 °C

Parameter	Conditions	Min	Typ at 25°C	Max	Units
Center Frequency		-	358.4	-	MHz
Insertion Loss	(max over 328.4 – 388.4 MHz)	-	10.5	12.8	dB
Amplitude Variation (4)	328.4 – 388.4 MHz	-	0.72	1.2	dB p-p
Absolute Group Delay	(average over 328.4 – 388.4 MHz	-	280	350	ns
Group Delay Variation (4)	328.4 – 388.4 MHz	-	26.8	60	ns p-p
EVM (5)	Over any 3.84 MHz span within 328.4 – 388.4 MHz	-	2.48	3.5	%
IIIP3 (6)	Tone spacing 0.8 – 5 MHz Tone spacing 5 – 30 MHz	40 45	43 50	- -	dBm
Time side-lobe response attn.	(1.0 – 500 µs)	32	38.4	-	dB
Attenuation (7)	40.0 – 110.0 MHz 208.72 – 222.8 MHz 222.8 – 282.8 MHz 454.48 – 468.56 MHz 468.56 – 528.56 MHz 574.16 – 634.16 MHz	50 40 35 45 50 55	70 53 47 56 60 71	- - - - - -	dB
Input Return Loss	328.4 – 388.4 MHz	9.5	12.7	-	dB
Output Return Loss	328.4 – 388.4 MHz	9.5	11.3	-	dB
Source Impedance (8)	Balanced	-	200	-	Ω
Load Impedance (8)	Balanced	-	50	-	Ω

Notes:
1. All specifications are based on the test circuit shown on page 3.
2. In production, devices will be tested at room temperature to a guard-banded specification to ensure electrical compliance over temperature.
3. Electrical margin has been built into the design to account for the variations due to manufacturing tolerances.
4. Variation is defined as the total peak to peak variation over the defined frequency range.
5. Measured a RRC filtered QPSK modulated signal.
6. Tone spacing 0.8 MHz to 30 MHz. Power < 5 dBm per tone. Only measured during engineering development.
7. Relative to Insertion loss.
8. This is the optimum impedance in order to achieve the performance shown.

Evaluation Board



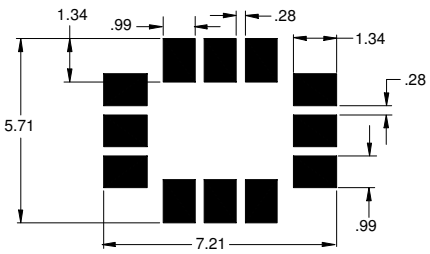


Notes:
1. Top, middle & bottom layers: 1 oz copper. Substrates: FR4 dielecric .031" thick. Finish plating: Nickel: 3-8 µm thick, Gold: 0.03-0.2 µm thick. Hole plating: Copper min .0008 µm thick.

Bill of Material

Reference Des.	Value	Description	Manuf.	Part Number
L1	56 nH	Wire wound ,0603, ±5%	MuRata	LQW18AN56NJ00
L2	56 nH	Wire wound ,0603, ±5%	MuRata	LQW18AN56NJ00
L3	47 nH	Wire wound ,0603, ±5%	MuRata	LQW18AN47NJ00
L4	30 nH	Wire wound ,0603, ±5%	MuRata	LQW18AN30NJ00
L5	13 nH	Wire wound, 0603, ±5%	MuRata	LQW18AN13NJ10
L6	13 nH	Wire wound ,0603, ±5%	MuRata	LQW18AN13NJ10
C1	0.5 pF	Chip Ceramic cap, 0603, ±5%	MuRata	GRM1885C1HR50CZ01
C2	12 pF	Chip Ceramic cap, 0603, ±2%	MuRata	GRM1885C1H120JA01
SMA	N/A	SMA connector	Johnson Components	142-0701-801
PCB	N/A	3-layer	Multiple	960686

PCB Mounting Pattern



Notes:
1. All dimensions are in millimeters. Angles are in degrees.
2. This drawing specifies the mounting pattern used on the TriQuint evaluation board for this product. Some modification may be necessary to suit end user assembly materials and processes.

Absolute Maximum Ratings

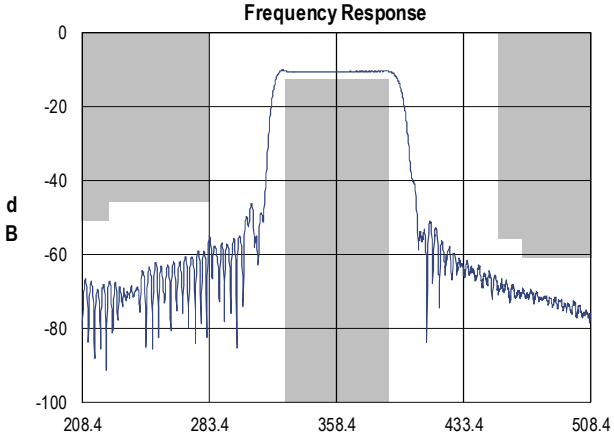
Parameter	Rating
Storage Temperature	- 40 to + 85 °C
Operating Temperature	- 33 to + 105 °C
Input power, in band, CW, 24 hours @ 50 °C (1)	+ 19 dBm
Input power, out of band, CW, 24 hours @ 50 °C (1)	+ 25 dBm

1. Operation of this device outside the parameter ranges given may cause permanent damage.

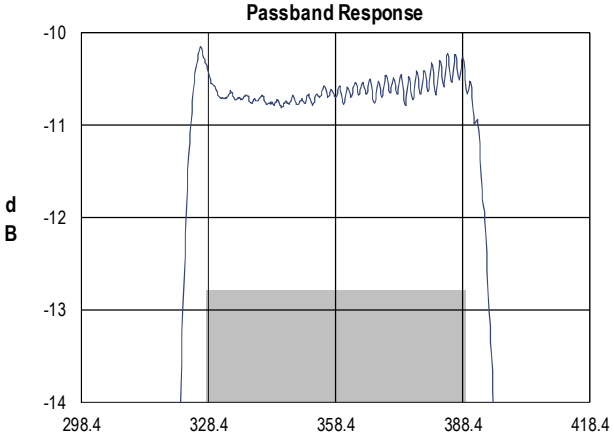
Performance Plots

Test conditions unless otherwise noted: Temp.= +25 °C

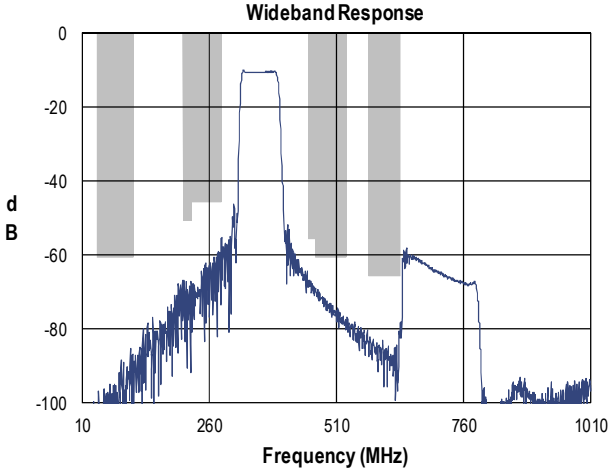
Frequency Response



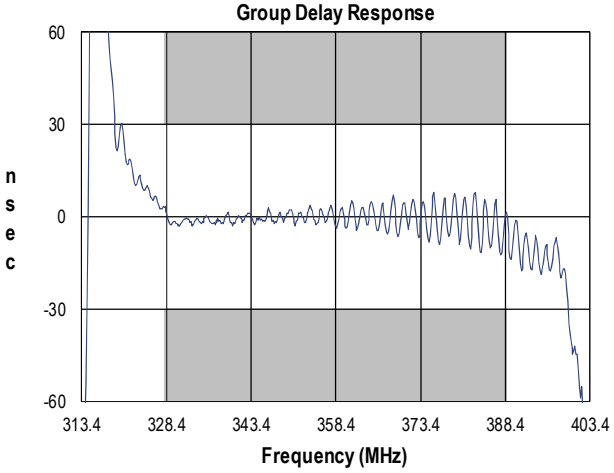
Passband Response



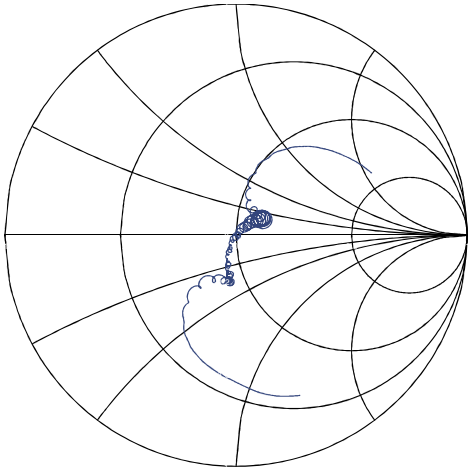
Wideband Response



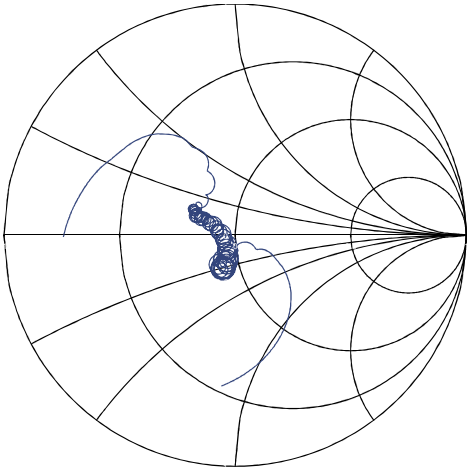
Group Delay Response



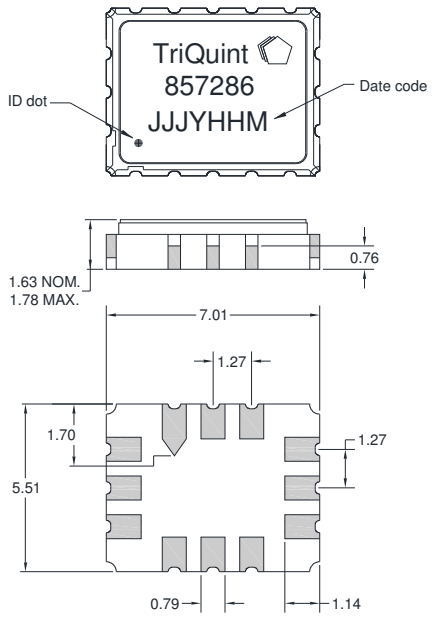
Input Smith Chart



Output Smith Chart



Package Information, Marking and Dimensions



Package Style: SMP-28B
Dimensions: 7.01 x 5.51 x 1.63 mm

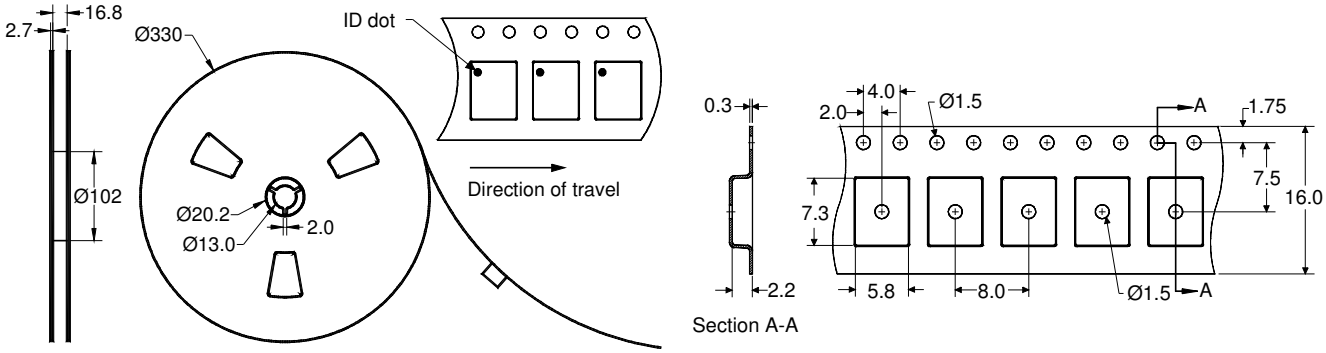
Body: Al_2O_3 ceramic
Lid: *Kovar*, *Ni* plating
Terminations: *Au* plating 0.5 - 1.0µm, over a 2-6µm *Ni* plating

The date code consists of:
The day of the year – Julian (3 digits), Y= last digit of the year - (1 digit), HH = the hour of the day – Military (2 digits)

Notes:
1. All dimensions shown are typical in millimeters
2. All tolerances are ±0.15mm, except overall length and width ±0.10mm
3. An asterisk (*) in front of the marking code indicates prototype.

Tape and Reel information

Standard T/R size = 3000 units / reel. All dimensions are in millimeters



Product Compliance Information

ESD Sensitivity Ratings

Caution! ESD-Sensitive Device

ESD Rating:	Class :1A
Value:	Passes ≥ : 300 V
Test:	Human Body Model (HBM)
Standard:	JEDEC Standard JESD22-A114

MSL Rating

Not applicable. Hermetic package.

Solderability

Compatible with both lead-free (260 °C maximum reflow temperature) and tin/lead (245 °C maximum reflow temperature) soldering processes.

Refer to **Soldering Profile** for recommended guidelines.

RoHs Compliance

This part is compliant with EU 2002/95/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

This product also has the following attributes:

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A ($C_{15}H_{12}Br_4O_2$) Free
- PFOS Free
- SVHC Free

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

Web: www.triquint.com **Tel: 877 -800-8584**
Email: customer.support@qorvo.com

For information about the merger of RFMD and TriQuint as Qorvo:

Web: www.qorvo.com

For technical questions and application information: **Email:** flapplication.engineering@tqs.com

Important Notice

The information contained herein is believed to be reliable. TriQuint makes no warranties regarding the information contained herein. TriQuint assumes no responsibility or liability whatsoever for any of the information contained herein. TriQuint assumes no responsibility or liability whatsoever for the use of the information contained herein. The information contained herein is provided "AS IS, WHERE IS" and with all faults, and the entire risk associated with such information is entirely with the user. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for TriQuint products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.

TriQuint products are not warranted or authorized for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.