

869 MHz SMD SAW Filter



AFII-SW-0089-Q

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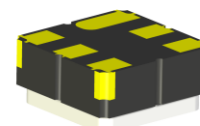
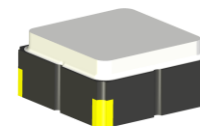
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3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

Description

Engineered for mission-critical IoT and automotive-grade telematics, this robust SAW filter meets the stringent AEC-Q200 qualification standard for reliability. Featuring an ultra-narrow 2 MHz bandwidth, it delivers exceptional out-of-band rejection greater than 45 dB to eliminate adjacent channel interference, despite a 3.0 dB insertion loss. Housed in a compact 3.0 x 3.0 x 1.4 mm package and capable of handling up to +20 dBm input power, this MSL Level 1 compliant component is the definitive choice for high-performance RF modules in Sub-GHz LoRa, Sigfox, and Wi-Fi HaLow applications for smart infrastructure and industrial monitoring.



Features

- AEC-Q200 Compliant
- Bandwidth: 2 MHz
- 3.0 x 3.0 x 1.4 mm in Size
- Insertion Loss: 3.0 dB
- Out-of-Band Rejection: > 45 dB
- Maximum Input Power: +20 dBm
- [RoHS Compliant | MSL Level 1](#)

Applications

- RF Modules
- Sub-GHz LoRa / Sigfox / Wi-Fi HaLow
- Internet of Things (IoT)
- Smart Metering
- Smart Lighting

Ordering Information

Part Number	Description
AFII-SW-0089-Q	869 MHz SMD SAW Filter on Cut Tape
AFII-SW-0089-Q-T	869 MHz SMD SAW Filter on Tape & Reel
AFII-SW-0089-Q-EVB	869 MHz SMD SAW Filter Evaluation Board

Note: Other options not listed may be available upon request via [Abracon online support](#)

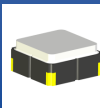


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Electrical Specification

Parameters	Minimum	Typical	Maximum	Units	Notes
Center Frequency (fc)	-	869	-	MHz	
Insertion Loss	-	3.0	3.5	dB	868 - 870 MHz
Amplitude Ripple	-	0.5	1.2	dB _{p-p}	868 - 870 MHz
Group Delay	-	127	146	ns	868 - 870 MHz
Group Delay Ripple	-	11	19	ns	868 - 870 MHz
Attenuation	45	50	-	dB	50 - 791 MHz
	45	50	-		791 - 835 MHz
	43	48	-		835 - 848 MHz
	30	41	-		848 - 862 MHz
	35	45	-		880 - 883 MHz
	49	54	-		883 - 1000 MHz
VSWR	-	1.5	2.0	-	868 - 870 MHz
DC Voltage	-	-	6	V	
Input Power	-	-	20	dBm	
Source Impedance (single ended) ⁽¹⁾	-	50	-	Ω	
Load Impedance (single ended) ⁽¹⁾	-	50	-	Ω	

Notes: (1) A matching network is unnecessary (refer to the Measurement Circuits section).

Mechanical Specification

Parameters	Specifications
Dimension	3.0 x 3.0 x 1.4 mm
Mounting Type	Surface Mount

Environmental Specification

Parameters	Specifications
Operating Temperature Range	-40°C ~ +85°C
Storage Temperature Range	-40°C ~ +85°C
MSL level	1
ESD	N/A



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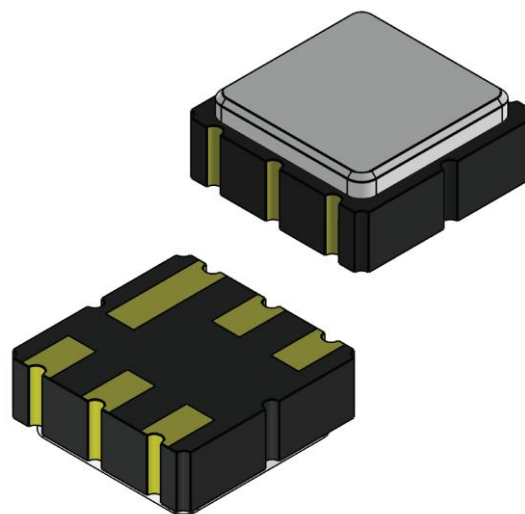
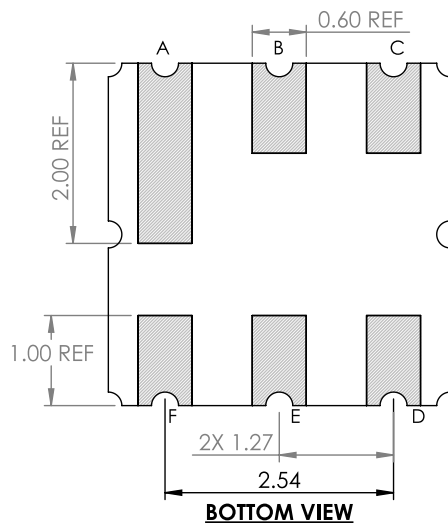
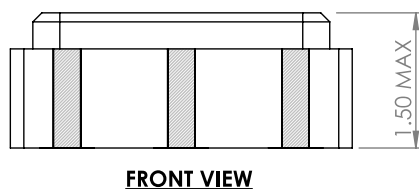
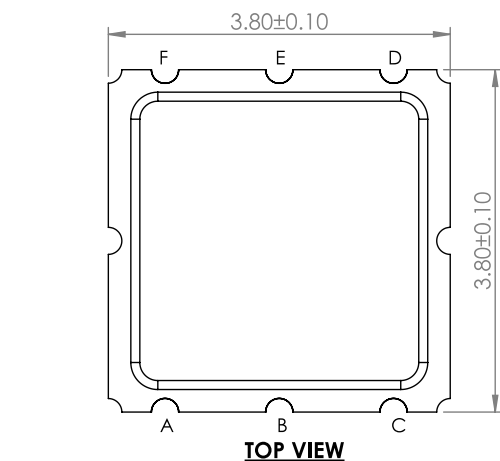


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3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

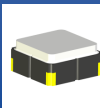
Product Dimensions



Unit : mm

Pin No.	Description
A, C, D, F	Ground
B	Input
E	Output

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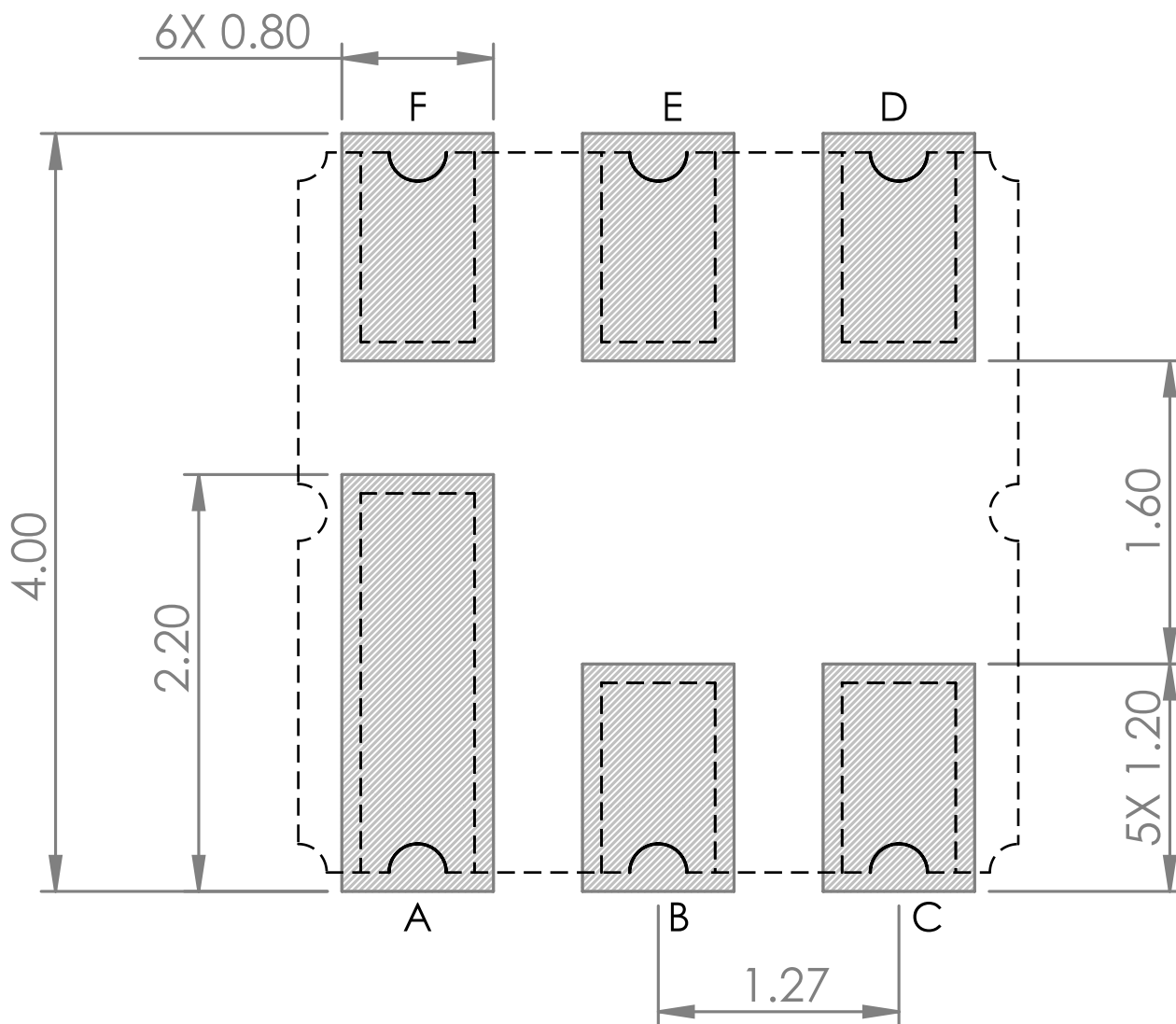


3.0 x 3.0 x 1.4 mm

RoHS Compliant

MSL Level = 1

Recommended Land Pattern



Unit: mm

Please note: The line width should be designed to achieve a 50-ohm characteristic impedance, depending on the PCB material and thickness. For technical assistance, please contact [Abracon online support](#) through our online support platform

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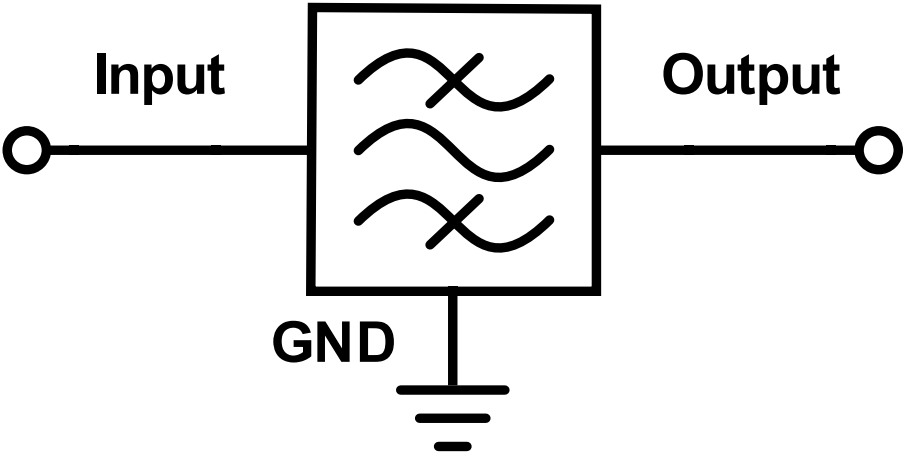


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3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

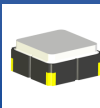
Measurement Circuit



Source & Load Impedance: 50 Ω

Pin No.	Description
B	Input Impedance: 50 Ω
E	Output Impedance: 50 Ω
A, C, D, F	Ground

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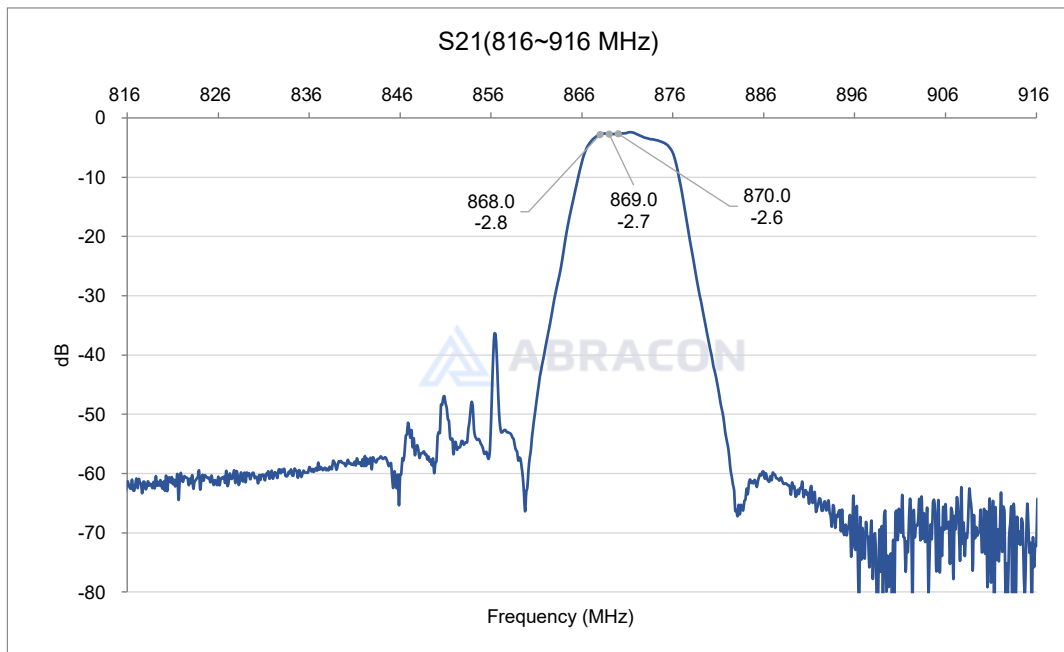
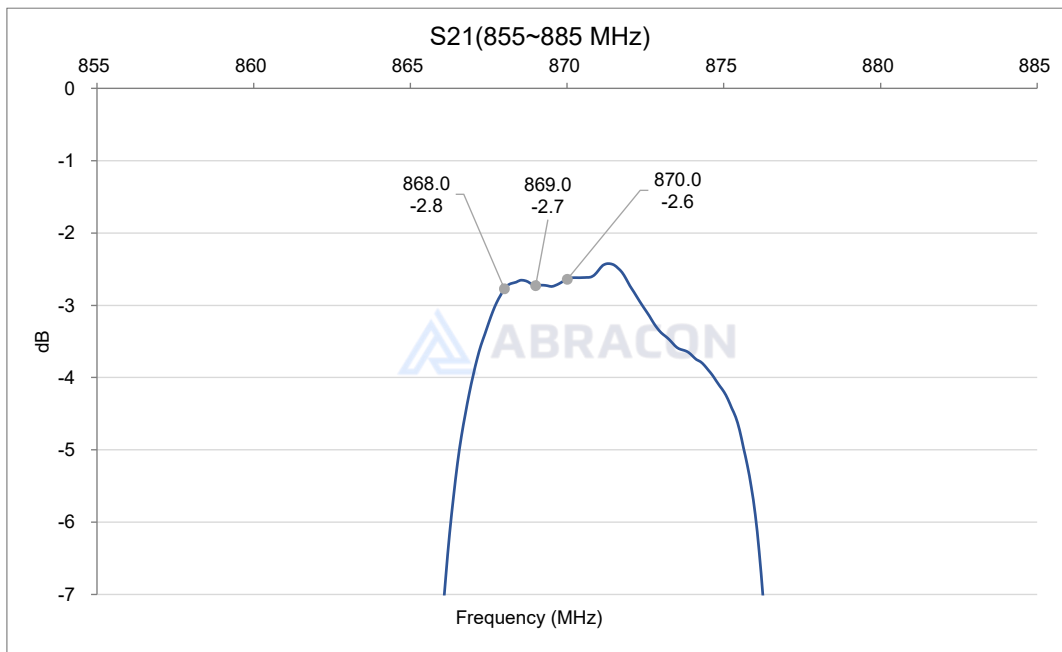
Check Inventory



3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

Frequency Characteristics

S21 narrow band

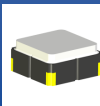


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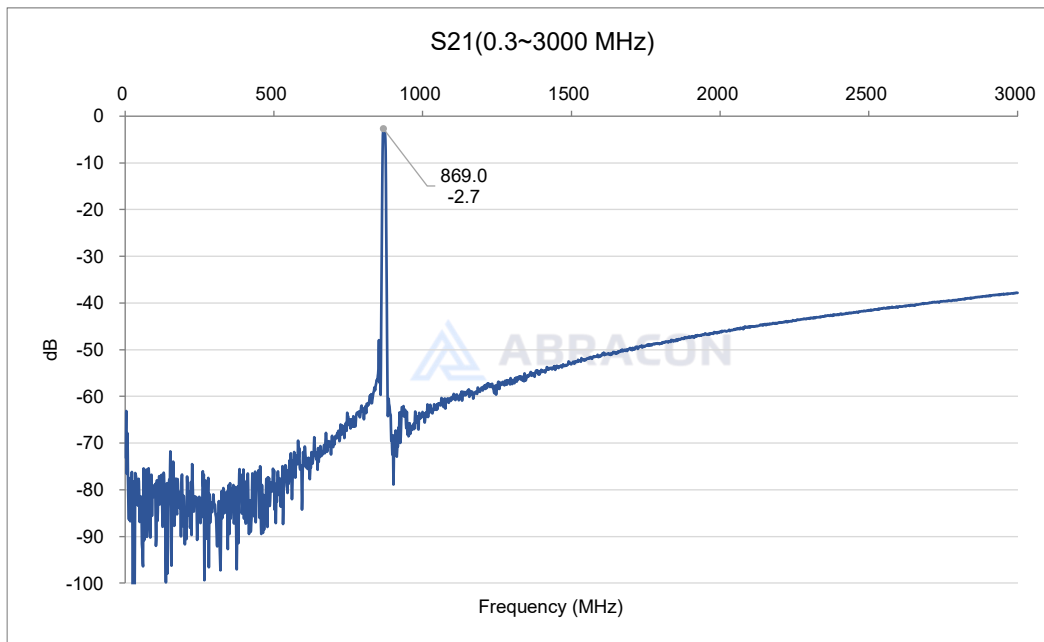


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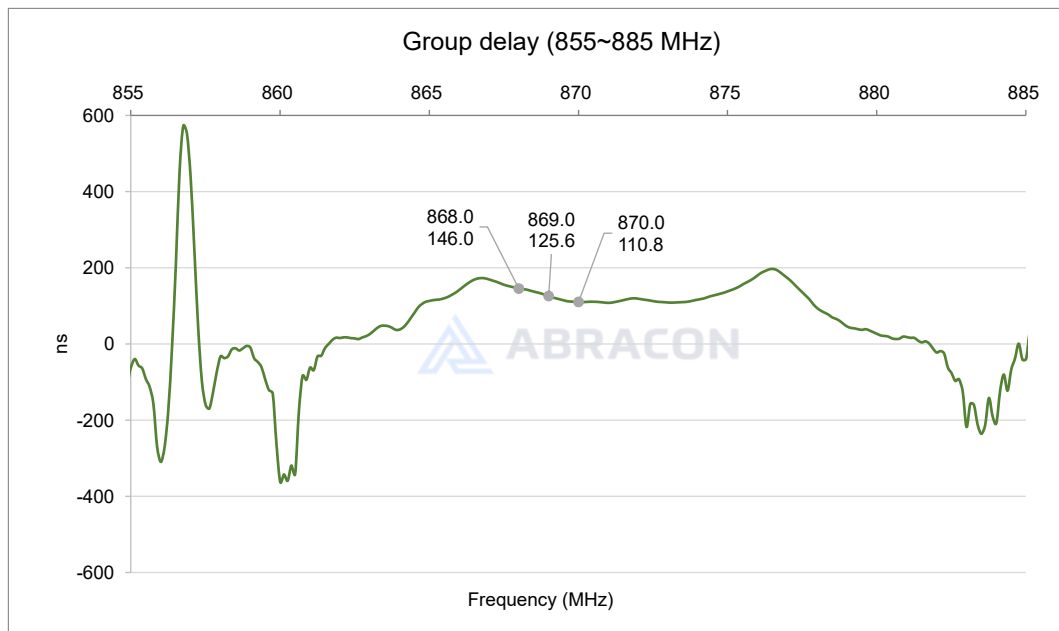


3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

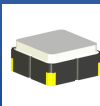
S21 wide band



Group Delay



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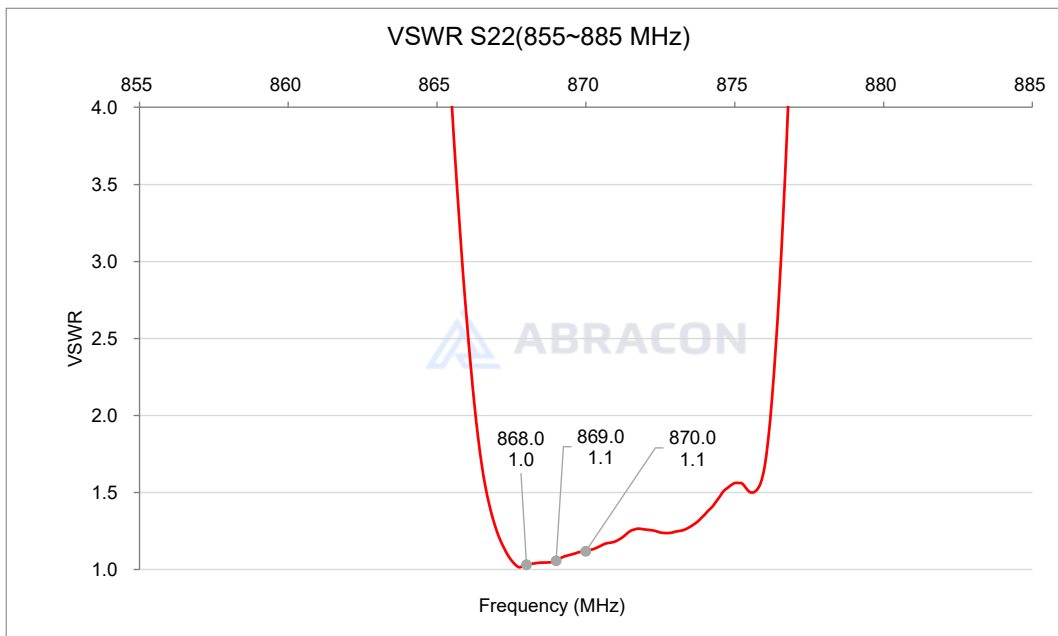
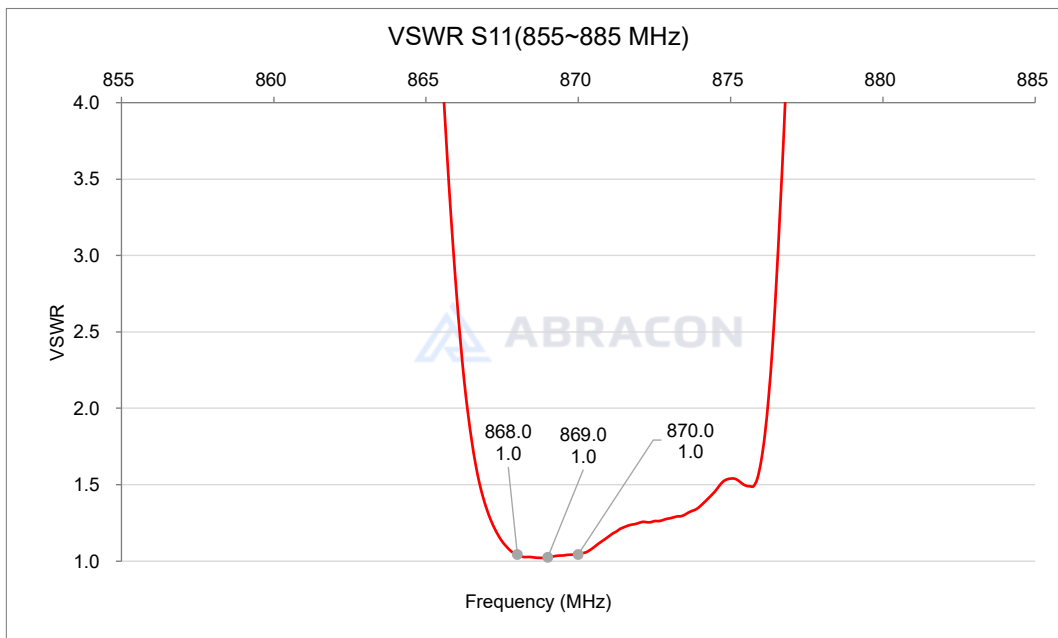


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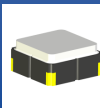


3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

VSWR (S11 & S22)



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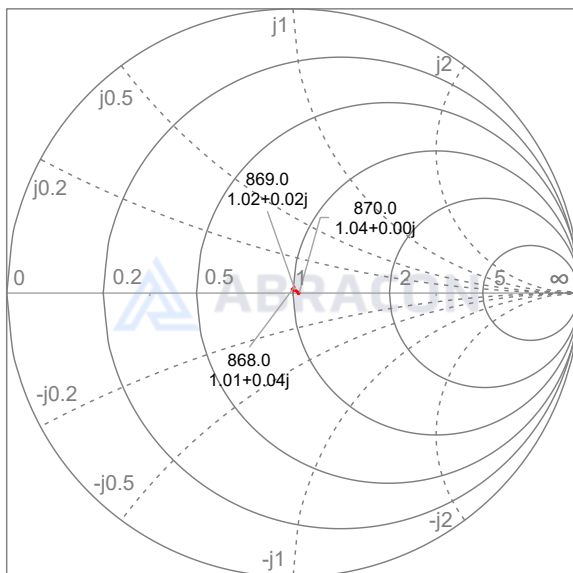
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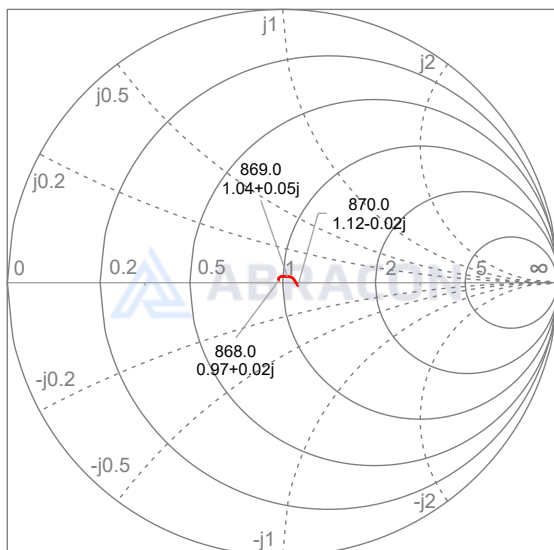
3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

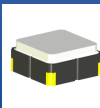
Smith Chart (S11 & S22)

Smith chart S11 (868~870MHz)



Smith chart S22 (868~870MHz)





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3.0 x 3.0 x 1.4 mm
RoHS Compliant
 MSL Level = 1

Reflow Profile [JEDEC J-STD-020]

Solder paste: Sn/3.0Ag/0.5Cu

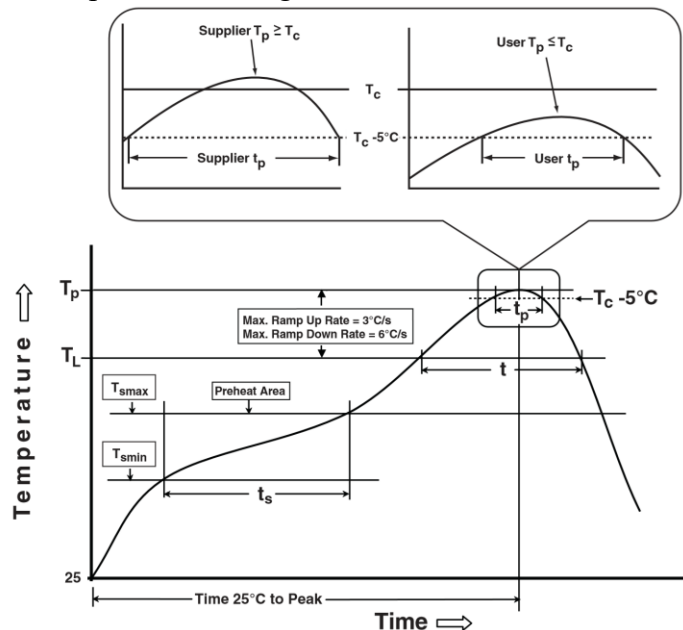


Table 1

SnPb Eutectic Process

Classification Temperatures (T_c)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥ 350
<2.5mm	235°C	220°C
≥ 2.5mm	220°C	220°C

Table 2

Pb-Free Process

Classification Temperatures (T_c)

Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
<1.6mm	260°C	260°C	260°C
1.6mm - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 – 120 sec.	60 – 90 sec.
Average ramp-up rate (T_{smax} to T_p)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T_L)	183°C	217°C
Time at Liquidous (T_L)	60 – 150 sec.	60 – 150 sec.
Peak package body temperature (T_p)*	See Table 1	See Table 2
Time (T_p)** within 5°C of the specified classification temperature (T_c)	20 sec.	10 sec.
Ramp-down rate (T_p to T_{smax})	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

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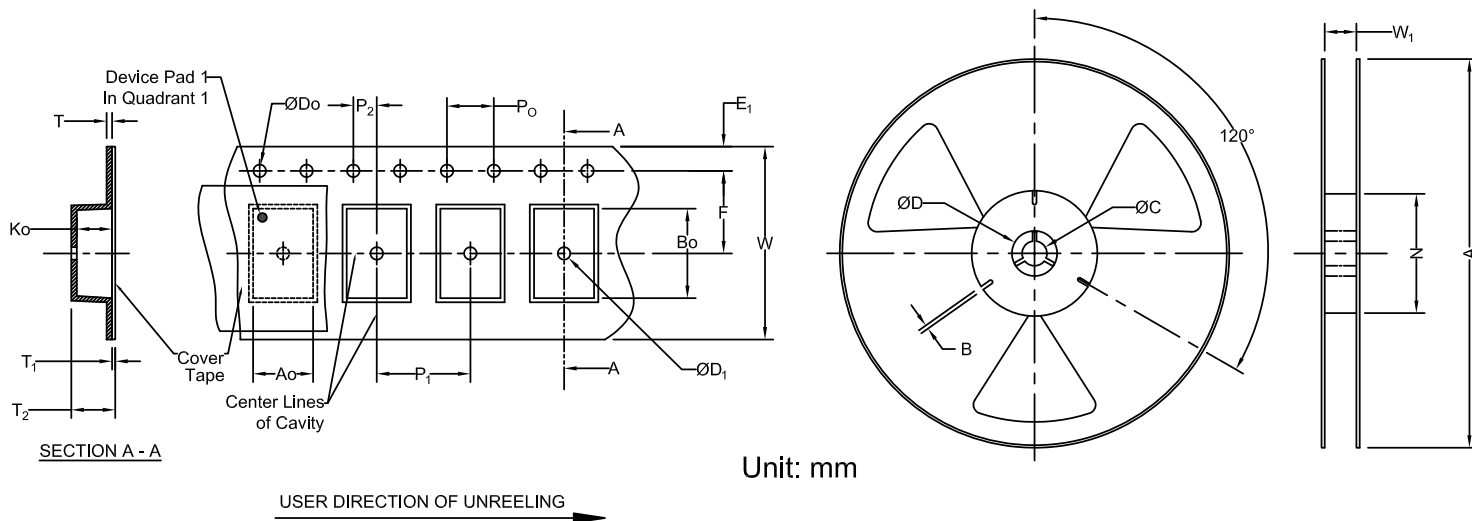
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3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

Packaging

Tape & Reel Dimension



Carrier Tape Specifications (mm)

E ₁	P ₀	F	P ₁	P ₂	W	A ₀	B ₀	K ₀	Reel Qty
1.75 ± 0.1	4.0 ± 0.1	5.5 ± 0.10	4.0 ± 0.1	2.0 ± 0.1	12.0 ± 0.3	3.3 ± 0.1	3.3 ± 0.1	1.4 ± 0.1	3,000

Reel Specifications (mm)

A	W ₁	N	B	C	D
330 +0/-3	15.5 ± 1	100 ± 0.5	2.0 ± 0.5	13 ± 0.2	20.2 ± 0.2

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