

866.5 MHz SMD SAW Filter



AFII-SW-0088

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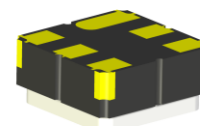
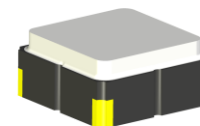
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3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

Description

Designed for long-range, low-power Sub-GHz communication, this robust bandpass filter is optimized for LoRa, Sigfox, and Wi-Fi HaLow protocols. With a precise 7 MHz bandwidth, it delivers excellent out-of-band rejection greater than 35 dB to minimize interference, while maintaining a low 2.3 dB insertion loss for optimal signal strength. Housed in a compact 3.0 x 3.0 x 1.4 mm package and rated for +18 dBm input power, this MSL Level 1 compliant filter is an ideal and reliable solution for enhancing the performance and reliability of IoT RF modules in smart metering and smart lighting networks.



Features

- Bandwidth: 7 MHz
- 3.0 x 3.0 x 1.4 mm in Size
- Insertion Loss: 2.3 dB
- Out-of-Band Rejection: > 35 dB
- Maximum Input Power: +18 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-0088	866.5 MHz SMD SAW Filter on Cut Tape
AFII-SW-0088-T	866.5 MHz SMD SAW Filter on Tape & Reel
AFII-SW-0088-EVB	866.5 MHz SMD SAW Filter Evaluation Board

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

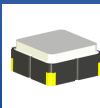


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Electrical Specification

Parameters	Minimum	Typical	Maximum	Units	Notes
Center Frequency (fc)	-	866.5	-	MHz	
Insertion Loss	-	2.3	3.0	dB	863 - 870 MHz
Amplitude Ripple	-	0.3	1.3	dB _{p-p}	863 - 870 MHz
Group Delay	-	65	191	ns	863 - 870 MHz
Group Delay Ripple	-	2.4	6.7	ns	863 - 870 MHz
Attenuation	45	49	-	dB	10 - 830 MHz
	22	35	-		830 - 850 MHz
	27	35	-		885 - 905 MHz
	45	49	-		905 - 950 MHz
	40	47	-		950 - 1500 MHz
VSWR	-	1.2	2.0	-	863 - 870 MHz
DC Voltage	-	-	3	V	
Input Power	-	-	18	dBm	
Source Impedance (single ended) ⁽¹⁾	-	50	-	Ω	
Load Impedance (single ended) ⁽¹⁾	-	50	-	Ω	
Temperature Coefficient of Frequency	-	-36	-	ppm/°C	

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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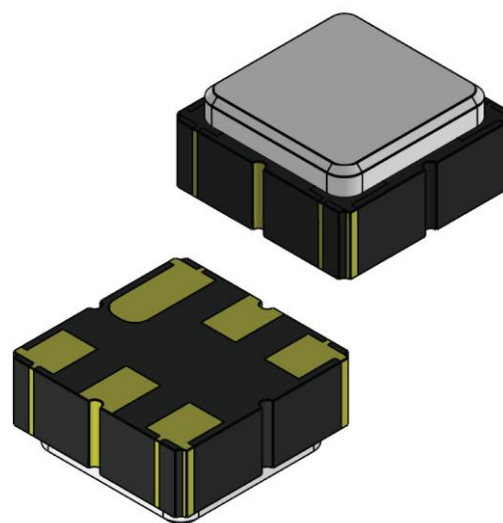
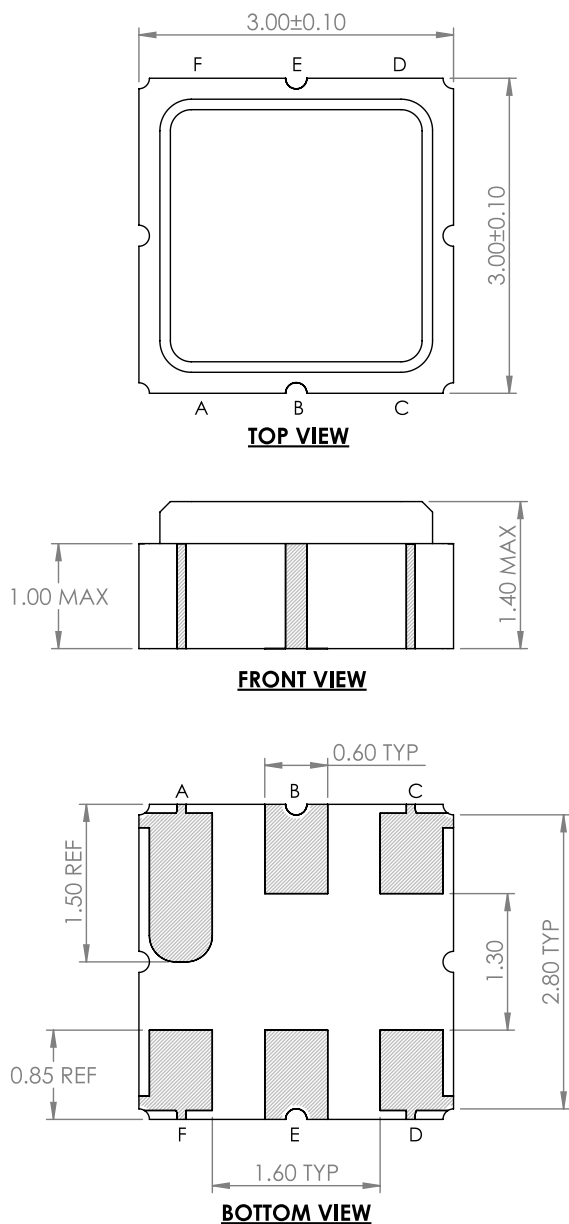


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3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

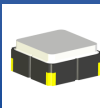
Product Dimensions



Unit : mm

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

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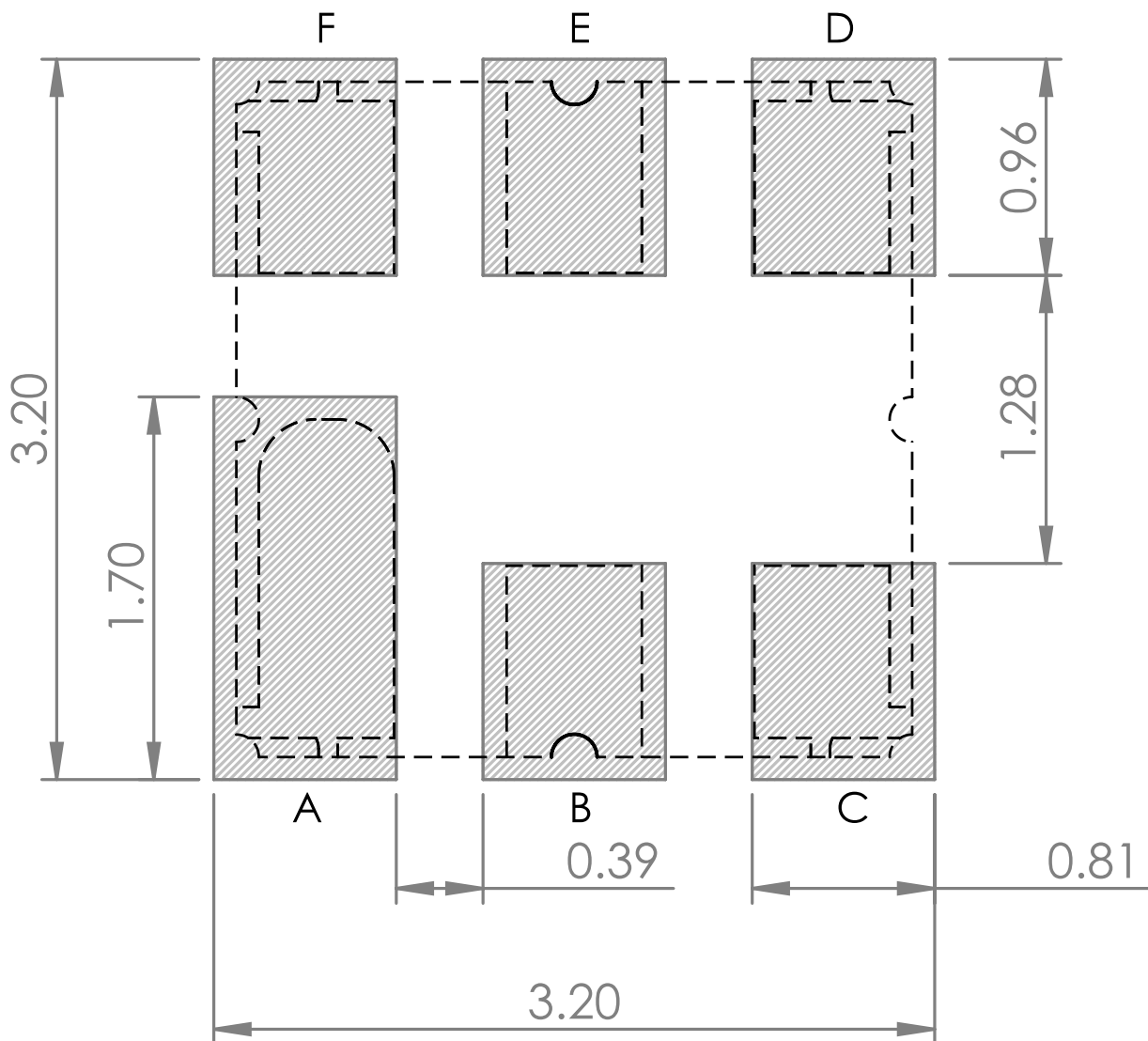


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3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

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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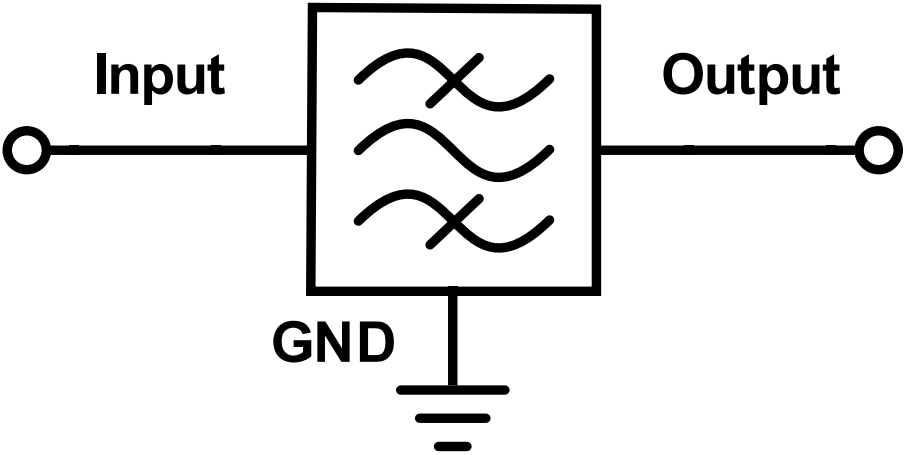


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3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

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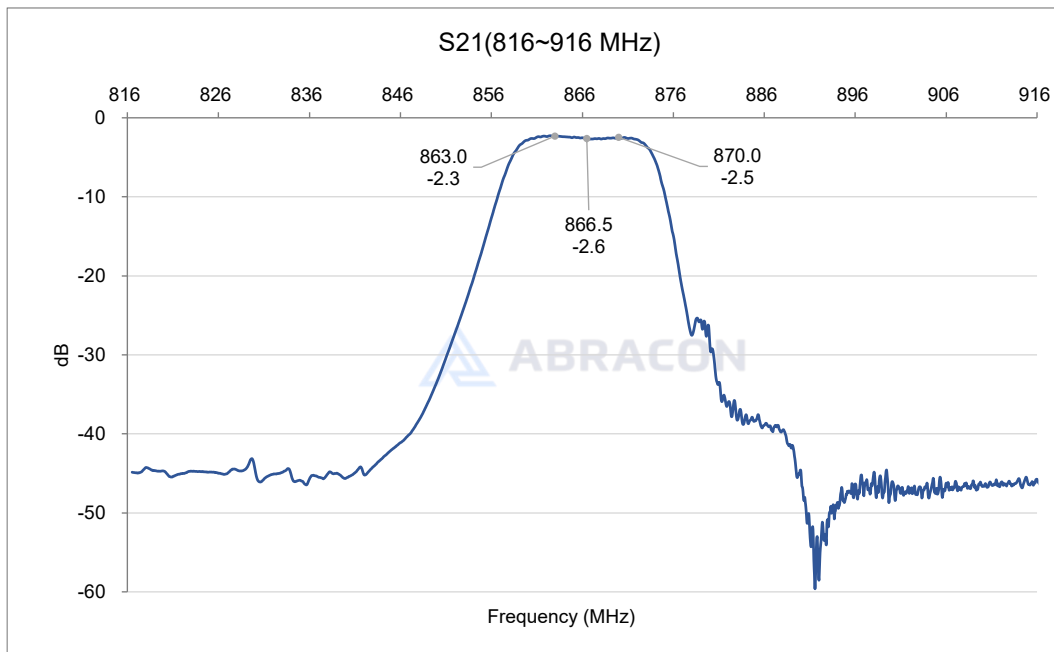
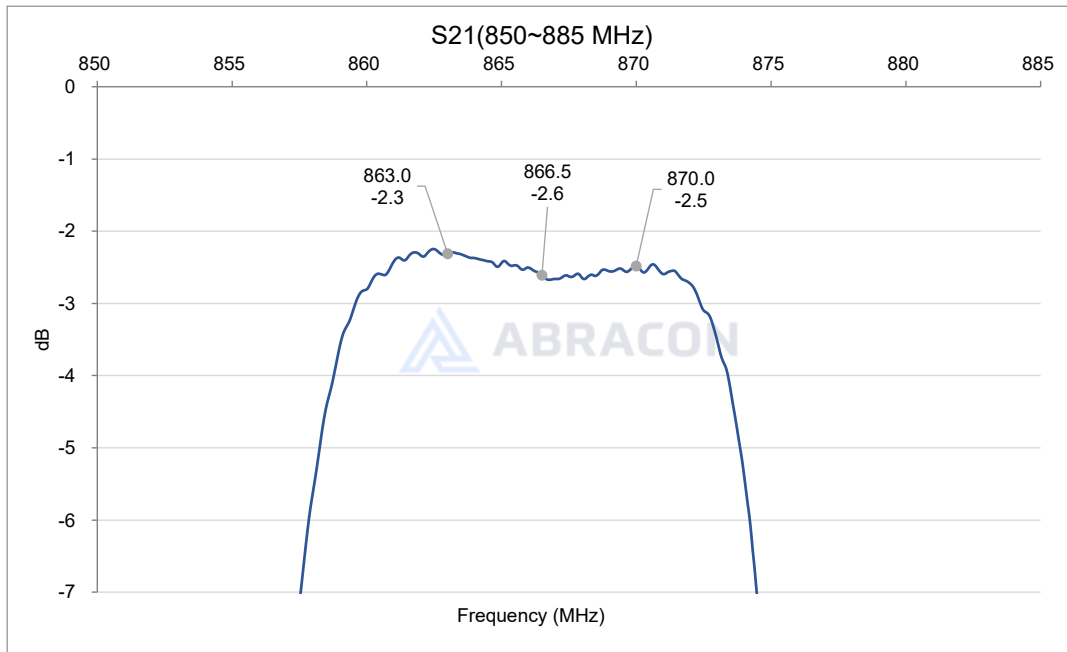
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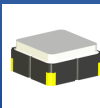
3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

Frequency Characteristics

S21 narrow band



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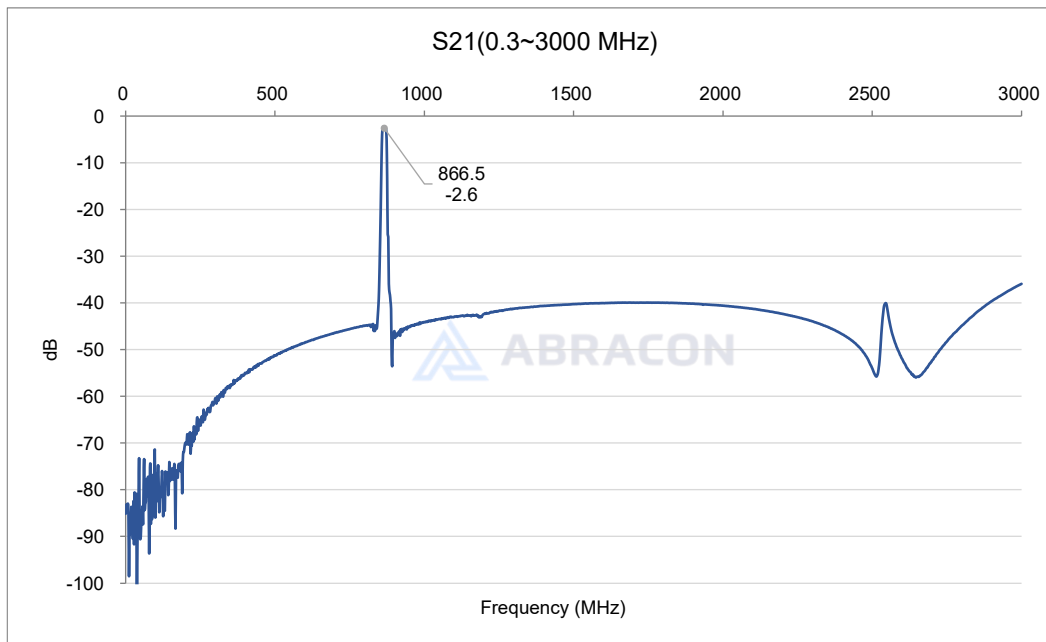


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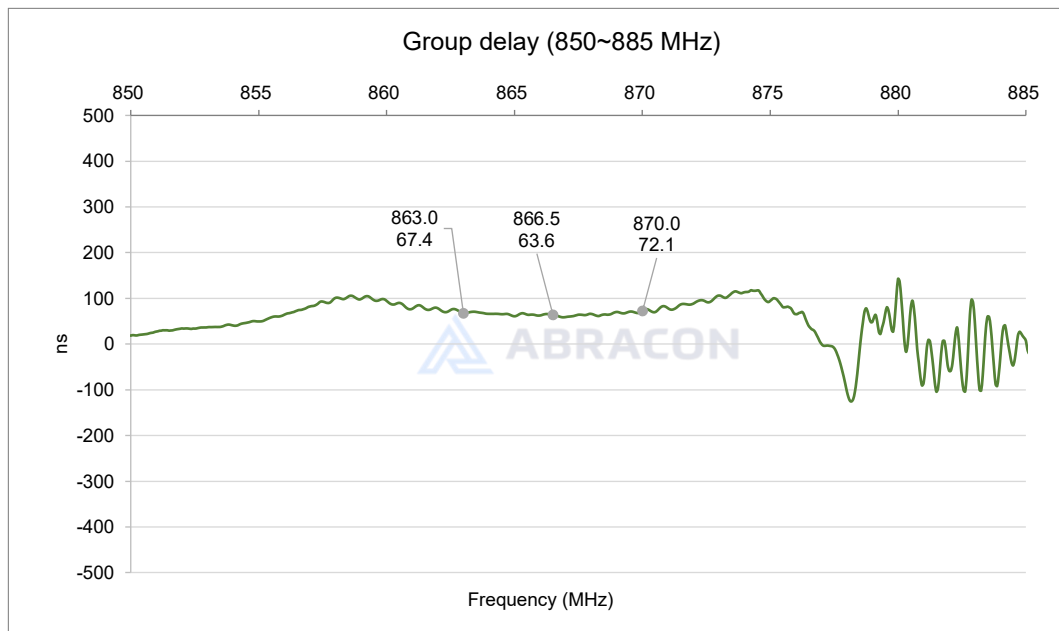


3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

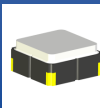
S21 wide band



Group Delay



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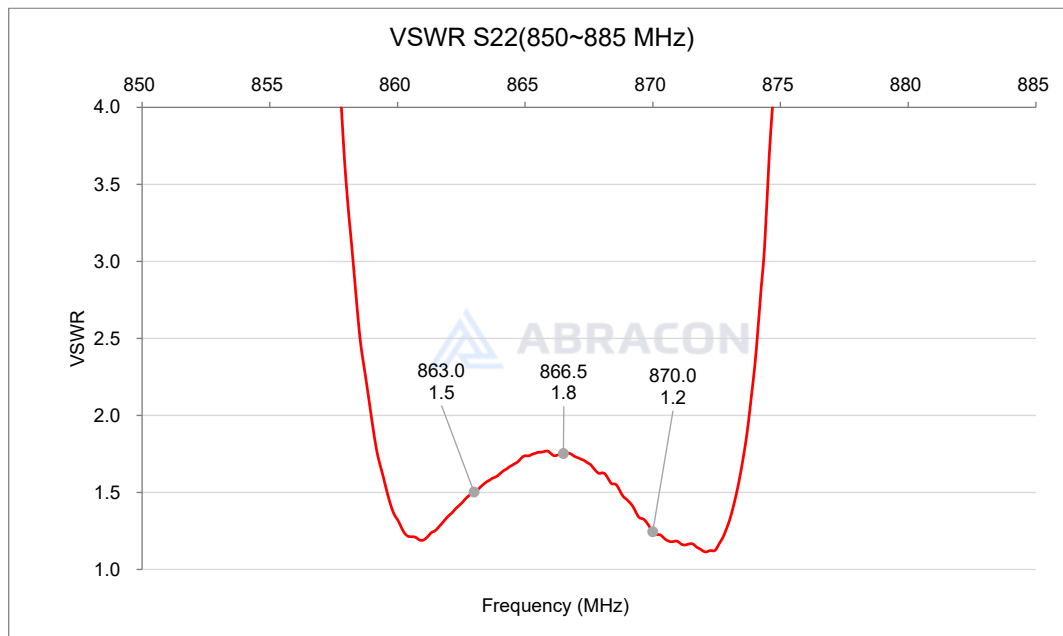
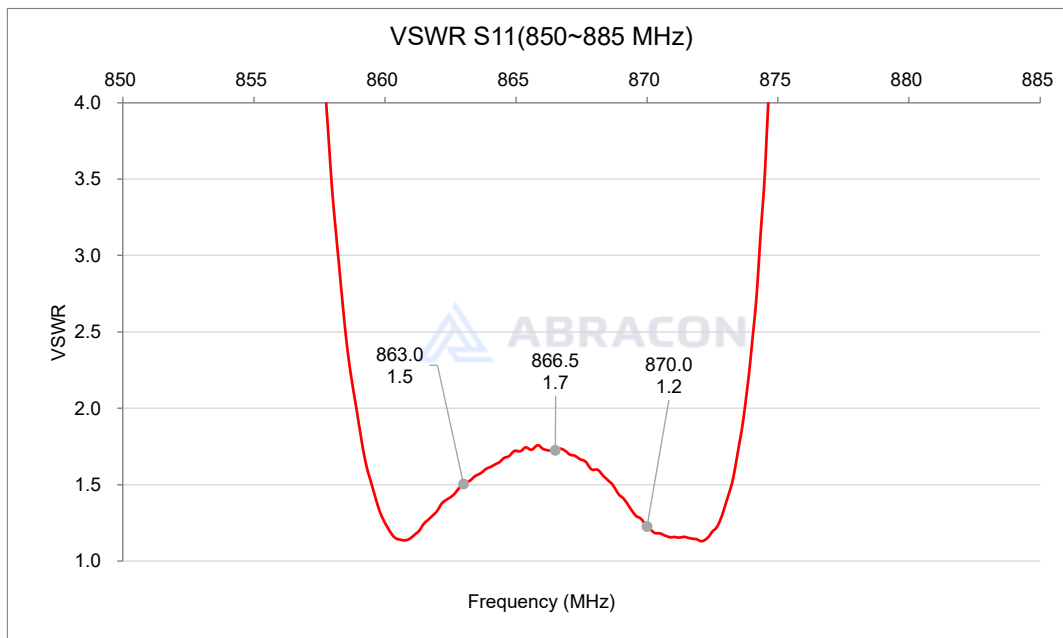


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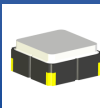


3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

VSWR (S11 & S22)



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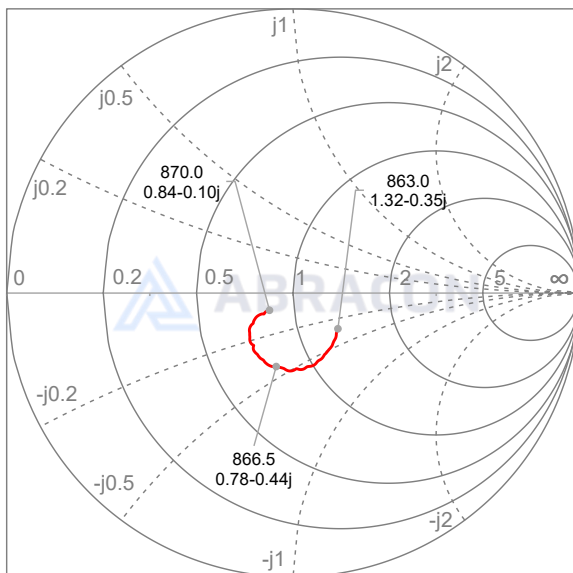
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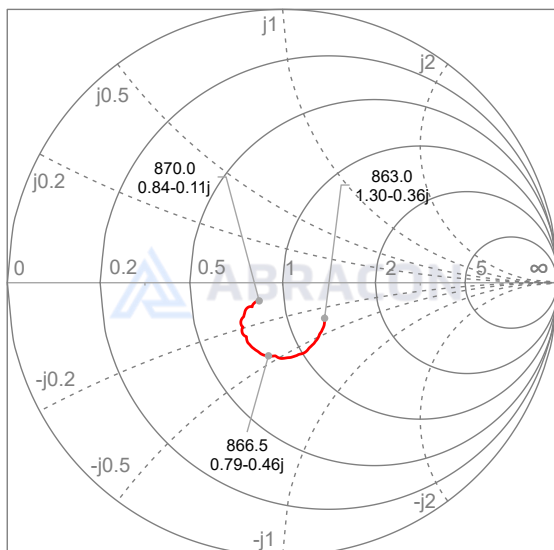
3.0 x 3.0 x 1.4 mm
RoHS Compliant
MSL Level = 1

Smith Chart (S11 & S22)

Smith chart S11 (863~870MHz)



Smith chart S22 (863~870MHz)



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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

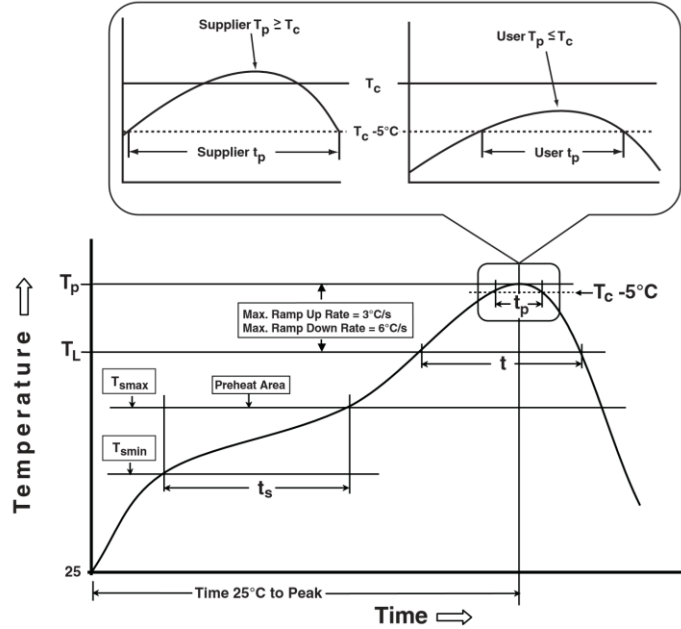


Table 1

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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