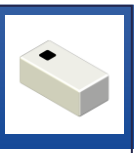
SMD 2450MHz Low Pass Ceramic Filter



AFII-LC-0083

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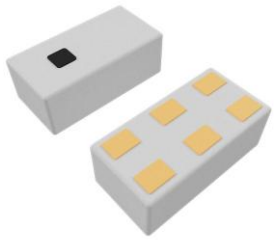
1.0 x 0.5 x 0.38 mm
RoHS Compliant
MSL Level = 1

Description

Setting a new industry benchmark for miniaturization and performance, this advanced harmonic rejection filter is housed in an ultra-compact 1.0 x 0.5 x 0.38 mm package. It achieves an exceptional blend of ultra-low 0.38 dB insertion loss and outstanding out-of-band rejection exceeding 47 dB at the 2nd and 3rd harmonics. Designed for 50-ohm systems, it is ideally positioned between PAs and antennas to dramatically suppress harmonics and improve spectral purity. Its MSL Level 1 rating ensures superior manufacturability for high-volume IoT, Bluetooth®, and 2.4GHz home automation devices, enabling cleaner signals and extended battery life.



Features

- 1.0 x 0.5 x 0.38 mm in Size
- Low Insertion Loss: 0.38 dB
- Out-of-Band Rejection: > 47 dB (at 2nd & 3rd harmonics)
- 50 Ohms Single-Ended Input & Output
- RoHS Compliant | MSL Level 1

Applications

- IoT, Wi-Fi, V2X, Wearables, ISM
- Bluetooth® / ZigBee® / Thread / Matter
- Suppress Harmonics and Improve Spectral Purity Between Power Amplifiers and Antennas
- Antenna Matching and Filtering in 2.4GHz Audio and Home Automation Applications

Ordering Information

Part Number	Description
AFII-LC-0083	SMD 2450MHz Low Pass Ceramic Filter on Cut Tape
AFII-LC-0083-T	SMD 2450MHz Low Pass Ceramic Filter on Tape & Reel
AFII-LC-0083-EVB	SMD 2450MHz Low Pass Ceramic Filter Evaluation Board

Note: Other options not listed may be available upon request via Abracon online support

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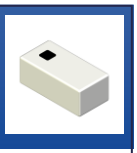

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RoHS Compliant
MSL Level = 1

Electrical Specification

Parameters	Minimum	Typical	Maximum	Units	Notes
Center Frequency (f_0)	-	2450	-	MHz	-
Passband	2400	-	2500	MHz	-
Insertion Loss (1)	-	0.38	0.4	dB	-
VSWR	-	-	1.06	-	-
Relative Attenuation (1) (Reference level: 0dB)	41	47	-	dB	2nd harmonics 4900MHz (4800 - 5000 MHz)
	53	55	-		3rd harmonics 7350MHz (7200 - 7500 MHz)
Amplitude Ripple (1)	-	0.01	-	dB	
Group Delay (1)	-	0.16	0.17	ns	
Group Delay Ripple (1)	-	0.002	0.004		
Source Impedance (2) (single ended)	-	50	-	Ω	-
Load Impedance (2) (single ended)	-	50	-	Ω	-
Power Capacity		2		W	

Notes: (1) Typical values are the average values within the corresponding frequency band.
(2) A matching network is unnecessary (refer to the Measurement Circuits section).

Mechanical Specification

Parameters	Specifications
Dimension	1.0 x 0.5 x 0.38 mm
Mounting Type	Surface Mount

Environmental Specification

Parameters	Specifications
Operating Temperature Range	-40ºC ~ +85ºC
Storage Temperature Range	-10ºC ~ +40ºC
MSL level	1
RoHS Complaint	Yes

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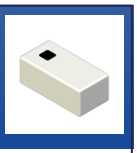

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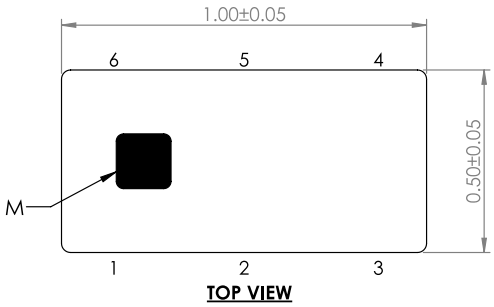
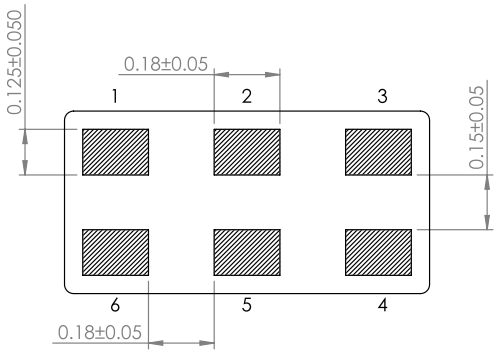
Product Dimensions



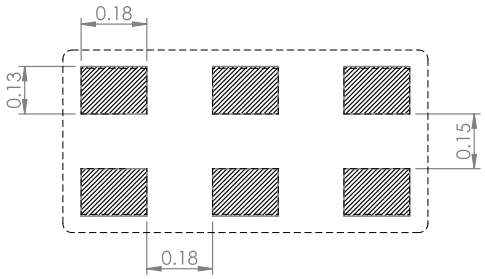
TOP VIEW

FRONT VIEW

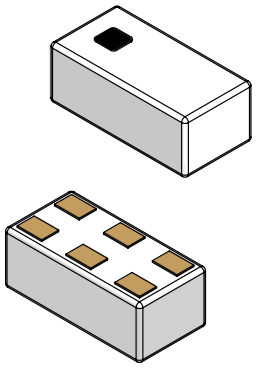


BOTTOM VIEW

RECOMMENDED LAND PATTERN



Pin #	Function
1, 3	NC
2, 5	GND
4, 6	IN/OUT
M	MARK



Unit: mm

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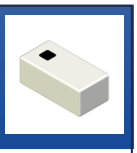

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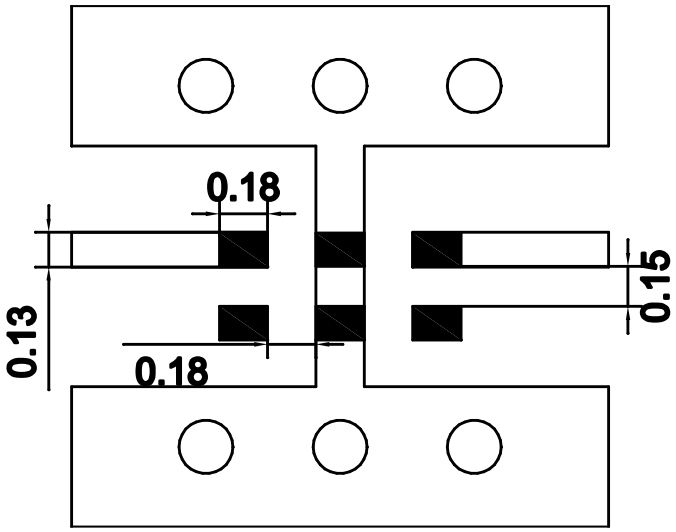
Recommended Land Pattern



Land

Through Hole Diameter: 0.2

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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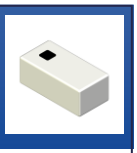

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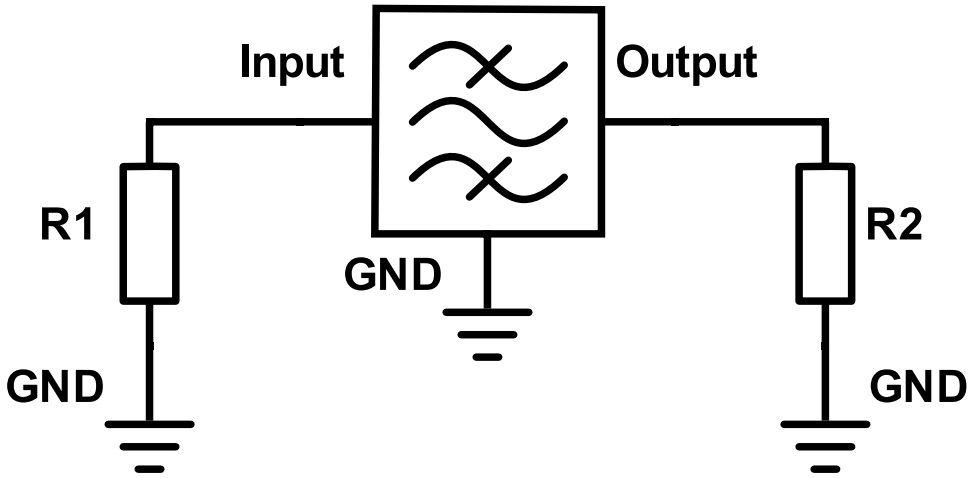
Measurement Circuit



Port	Matching Component
Input	R1: 50Ω
Output	R2: 50Ω

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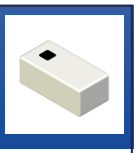

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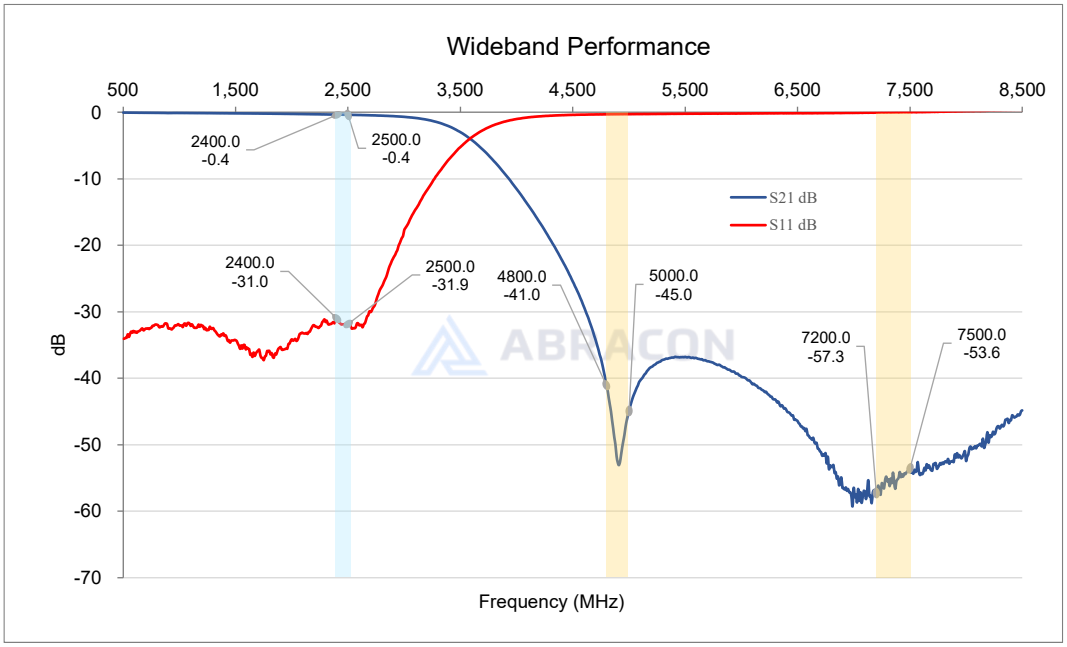
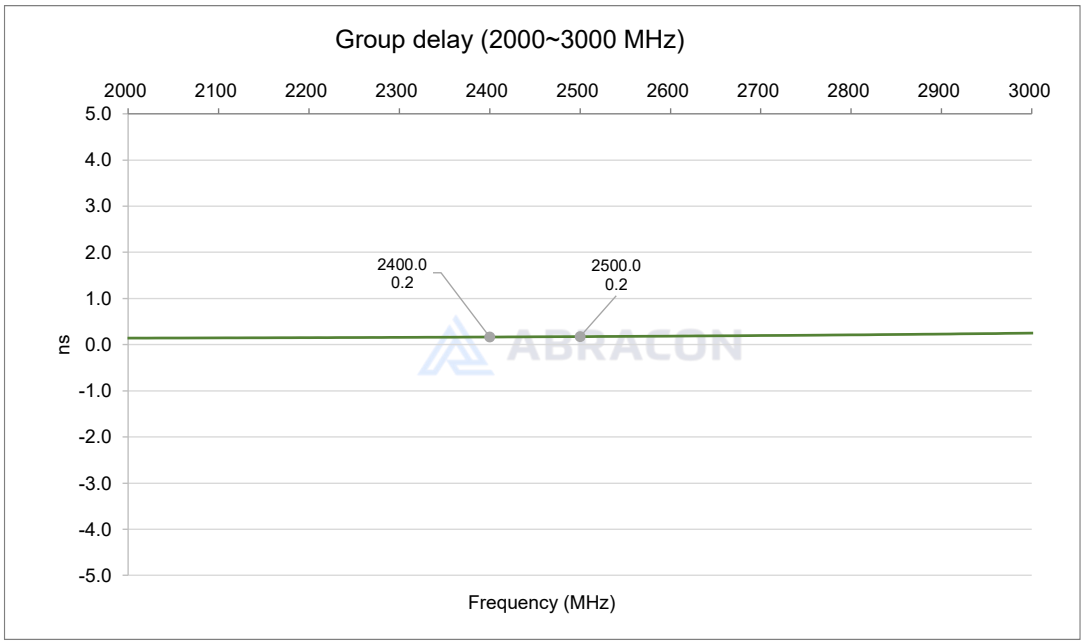
MSL Level = 1

Frequency Characteristics



Group Delay



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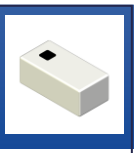

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MSL Level = 1

Reflow Profile [JEDEC J-STD-020]

Solder paste: Sn/3.0Ag/0.5Cu

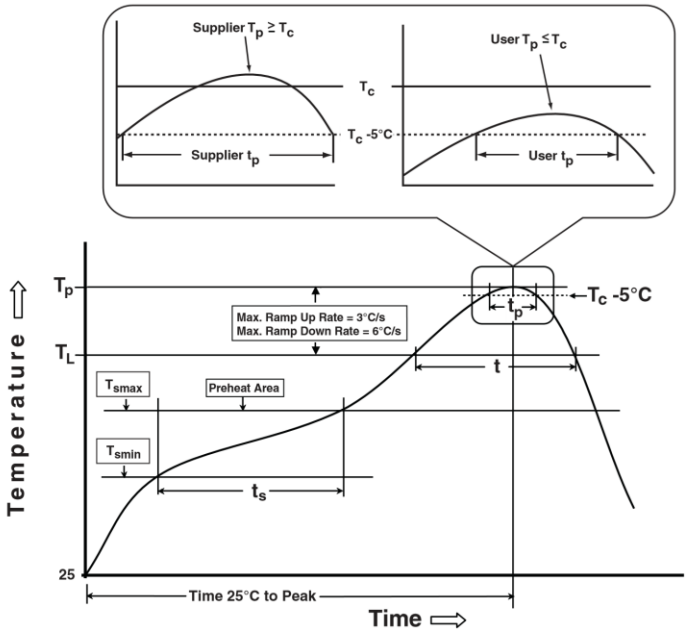

Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	**Volume mm³ <350**	**Volume mm³ ≧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 mm³ <350**	**Volume mm³ 350-2000**	**Volume mm³ >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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