

# 1223 MHz SMD SAW Filter



**ABSTS5A2-22NM024M**

Request Samples



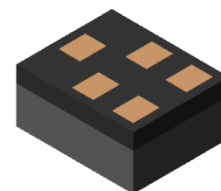
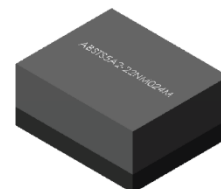
Check Inventory



**1.1 x 0.9 x 0.5 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 3**

## Description

This highly compact GNSS L2 band filter, measuring just 1.1 x 0.9 x 0.5 mm, delivers exceptional performance for high-precision positioning systems. It features a wide 52 MHz bandwidth and a low insertion loss of 1.4 dB, ensuring minimal signal degradation. With robust out-of-band rejection greater than 31 dB, it is ideally suited for RTK modules, automotive telematics, and autonomous vehicles, providing the reliable signal integrity required for accurate navigation and asset tracking in demanding applications. The component is RoHS compliant with an MSL Level 3 rating.



## Features

- Supports GNSS L2 Band
- Bandwidth: 52MHz
- just 1.1 x 0.9 x 0.5 mm in Size
- Low Insertion Loss: 1.4 dB
- Out-of-Band Rejection: > 31 dB
- Maximum Input Power: +10 dBm
- [RoHS Compliant](#) | [MSL Level 3](#)

## Applications

- High-Precision GNSS Modules
- RTK Systems
- Automotive Transportation & Telematics
- Asset Tracking / Fleet Management
- UAVs, Robotics & Autonomous Vehicles
- Micro-Mobility Solutions
- Precision Agriculture

## Ordering Information

Part Number	Description
ABSTS5A2-22NM024M	1223 MHz SMD SAW Filter on Tape & Reel
ABSTS5A2-22NM024M-EVB	1223 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( $f_c$ )	-	1223	-	MHz	-
VSWR	-	1.92	2.32		1197~ 1249 MHz
Insertion Loss	-	1.8	2.6	dB	1197~ 1249 MHz (-40°C ~ +85°C)
	-	1.8	2.8		1197~ 1249 MHz (-40°C ~ +105°C)
Amplitude Ripple <sup>(1)</sup>	-	0.3	1.5		1197~ 1249 MHz
Group Delay <sup>(1)</sup>	-	14.6	18.9	ns	1197~ 1249 MHz
Group Delay Ripple <sup>(1)</sup>	-	1.5	4.3	ns	1197~ 1249 MHz
Attenuation <sup>(2)</sup> (Reference level from 0 dB)	35	38	-	dB	880 ~ 920 MHz
	40	42	-		1710 ~ 1850 MHz
	40	42	-		1850 ~ 1920 MHz
	38	41	-		1920 ~ 1980 MHz
	30	34	-		2400 ~ 2500 MHz
DC Voltage	-	-	0	V	
Input Power	-	-	10	dBm	
Terminating Source Impedance	-	50	-	$\Omega$	
Terminating Load Impedance	-	50	-	$\Omega$	

Notes: (1) Averaged values of linear S-Parameters at +25°C

(2) A matching network is necessary (refer to the Measurement Circuits section)

## Mechanical Specification

Parameters	Specifications
Filter Dimension	1.1 x 0.9 x 0.5 mm
Mounting Type	Surface Mount

## Environmental Specification

Parameters	Specifications
Operating Temperature Range	-40°C ~ +105°C
Storage Temperature Range	-40°C ~ +105°C
MSL level	3
ESD	100V (MM), 200V (HBM)
RoHS Compliant	Yes



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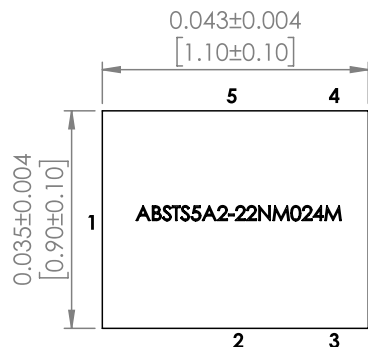


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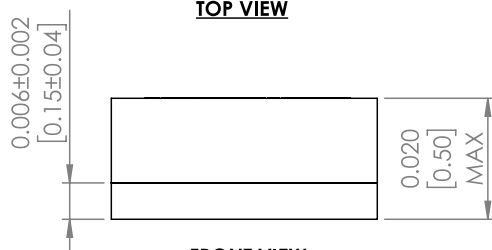


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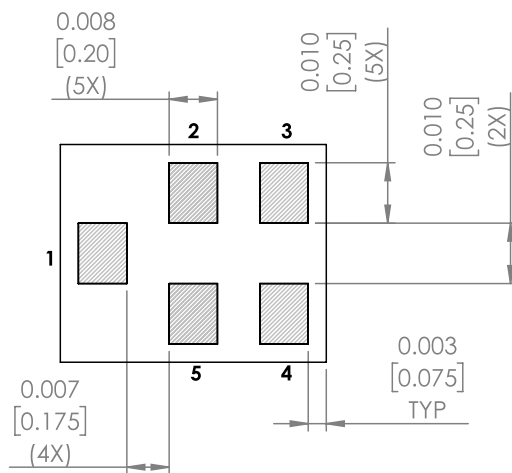
## Package Dimensions



**TOP VIEW**



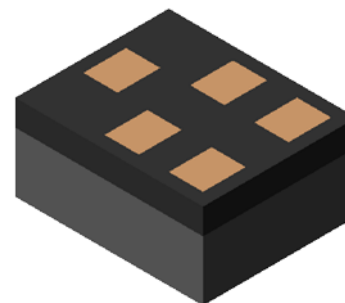
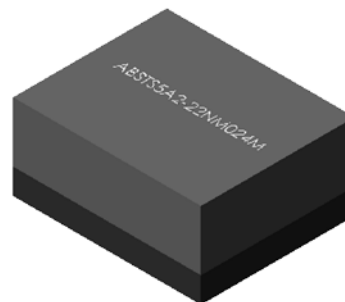
**FRONT VIEW**



**BOTTOM VIEW**

All tolerances are +/-0.05 mm unless otherwise specified  
Coplanarity : 0.1 mm max.

Pin Description	
1	Input
4	Output
2,3,5	Ground



Unit: inches [mm]

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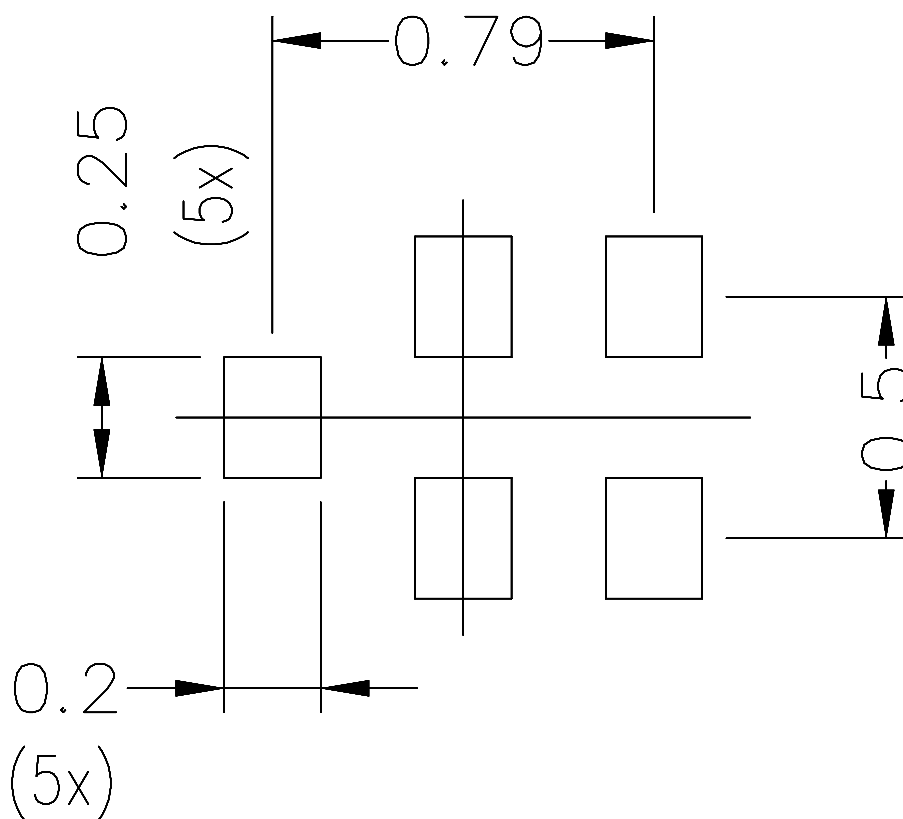


Check Inventory



1.1 x 0.9 x 0.5 mm  
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## 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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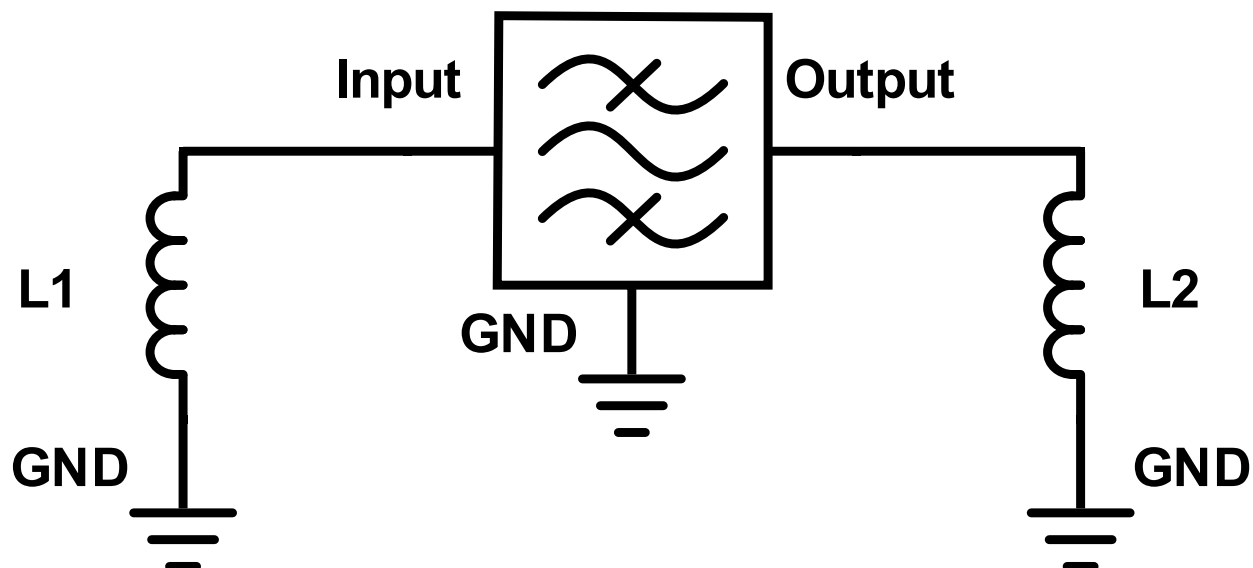


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1.1 x 0.9 x 0.5 mm  
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## Measurement Circuit



Port	Matching Component
Input (Pin 1)	L1: 12 nH
Output (Pin 4)	L2: 12 nH

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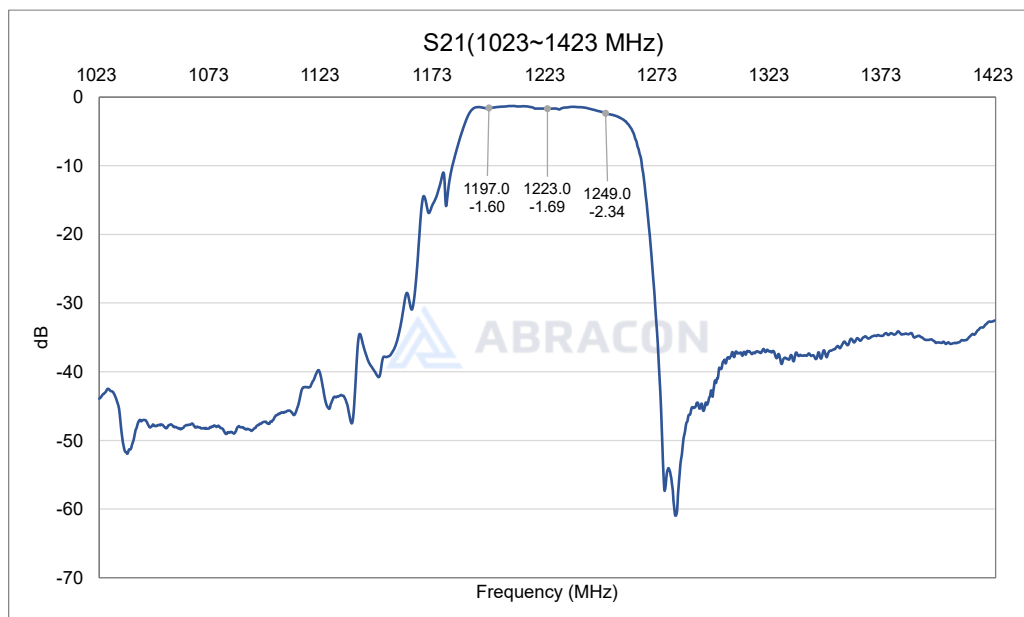
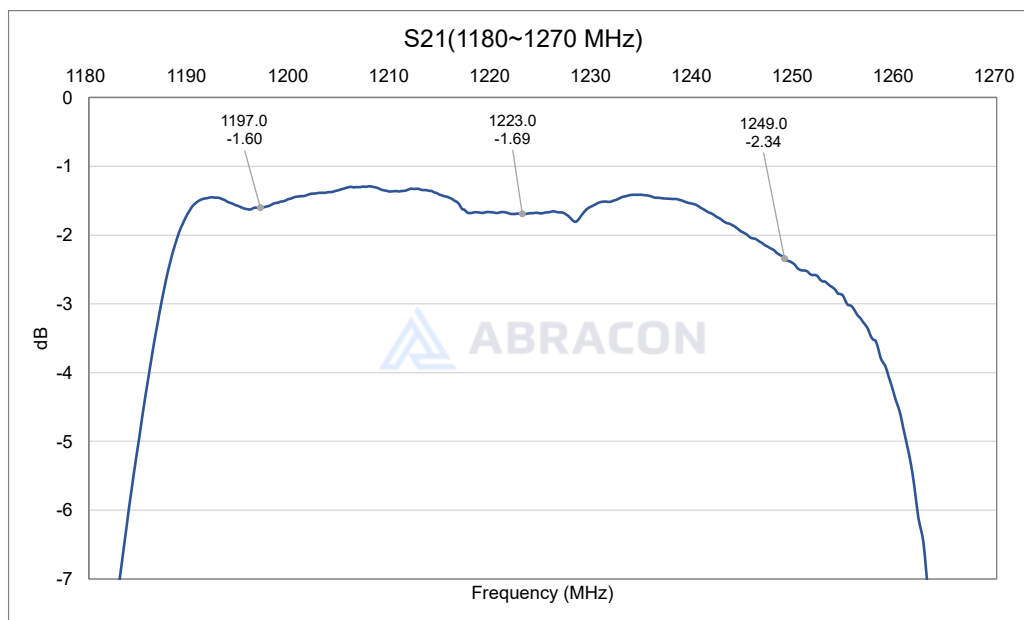
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**1.1 x 0.9 x 0.5 mm**  
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## Frequency Characteristics

### S21 Narrow Band



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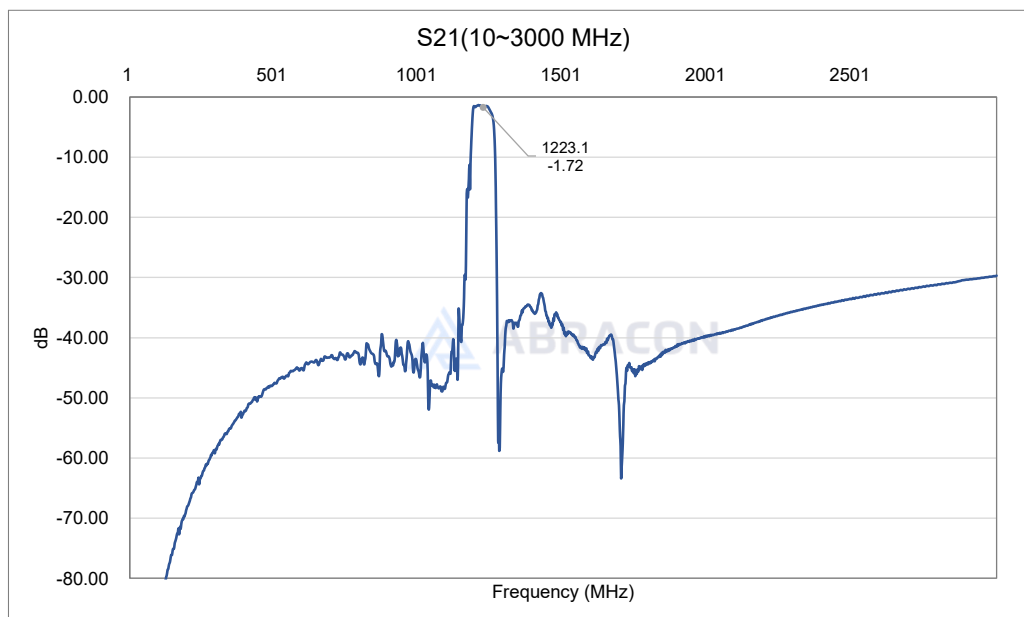


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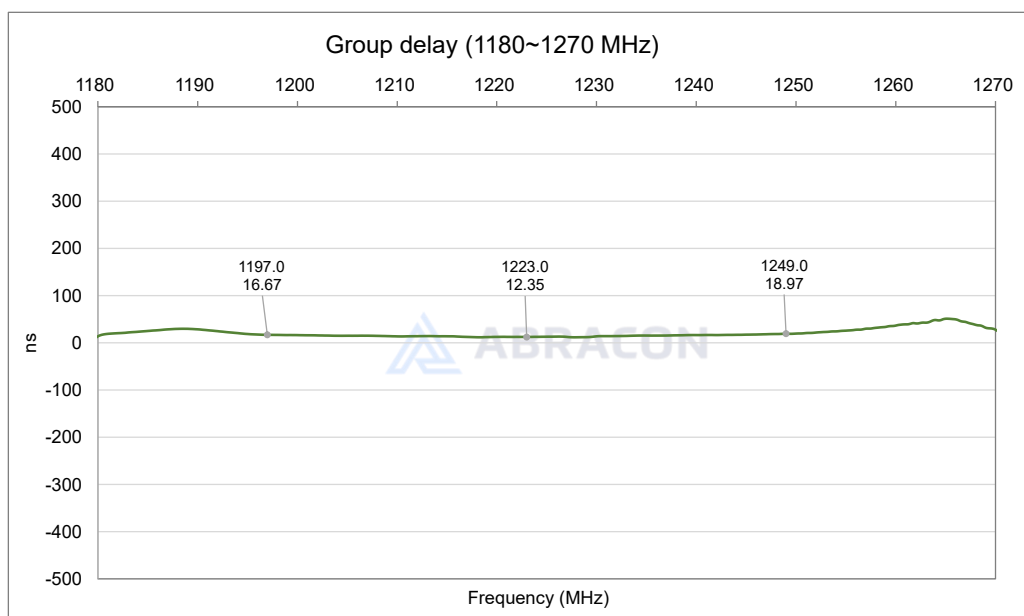


**1.1 x 0.9 x 0.5 mm**  
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## S21 Wide Band



## Group Delay



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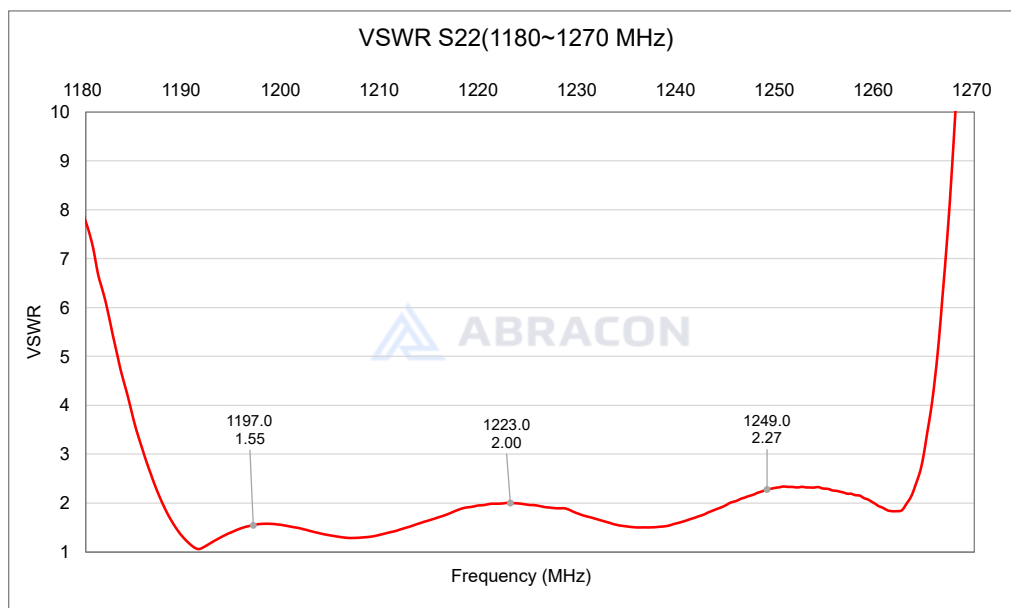
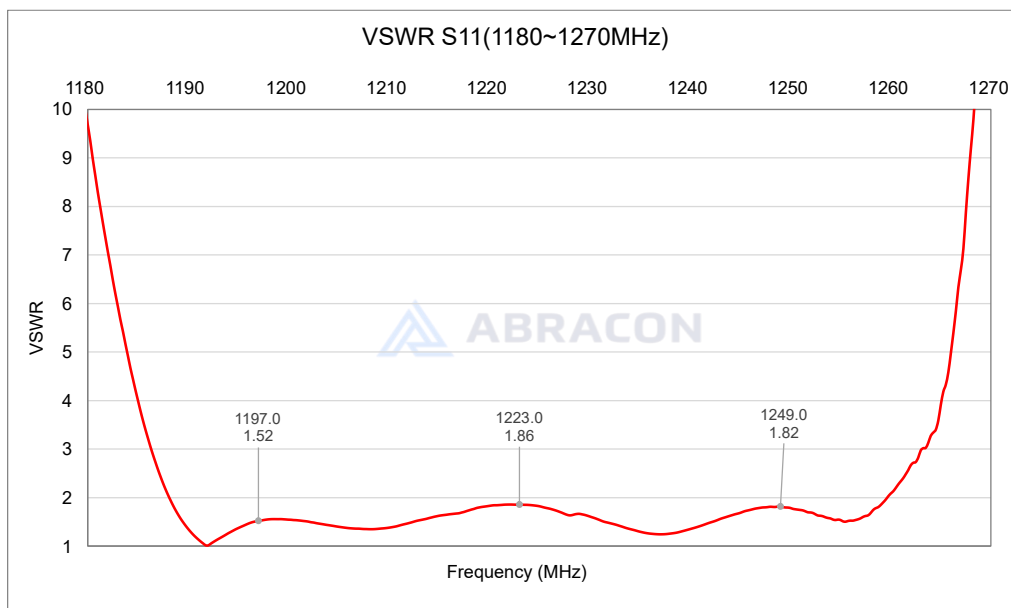


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**1.1 x 0.9 x 0.5 mm**  
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**MSL Level = 3**

VSWR (S11 & S22)



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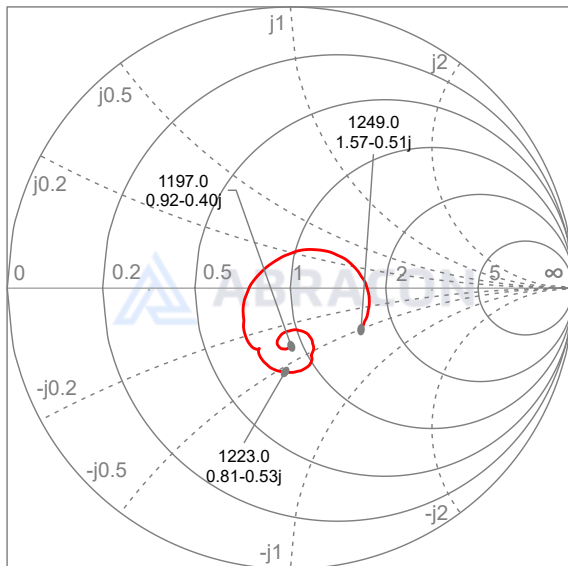
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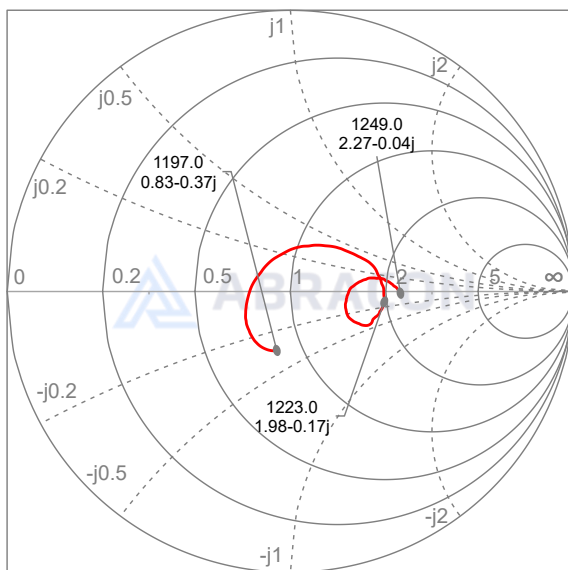
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MSL Level = 3

Smith Chart (S11 & S22)

Smith chart S11 (1197~1249MHz)



Smith chart S22 (1197~1249MHz)



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## Reflow Profile [JEDEC J-STD-020]

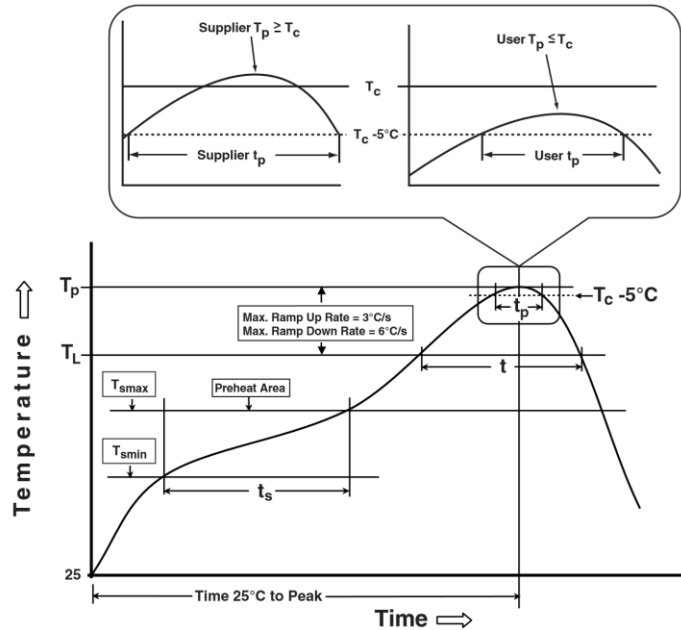


Table 1

### SnPb Eutectic Process

#### Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥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 <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >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	180°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	220°C
Time at Liquidous ( $T_L$ )	60 – 150 sec.	50 – 80 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.	20 ~ 40 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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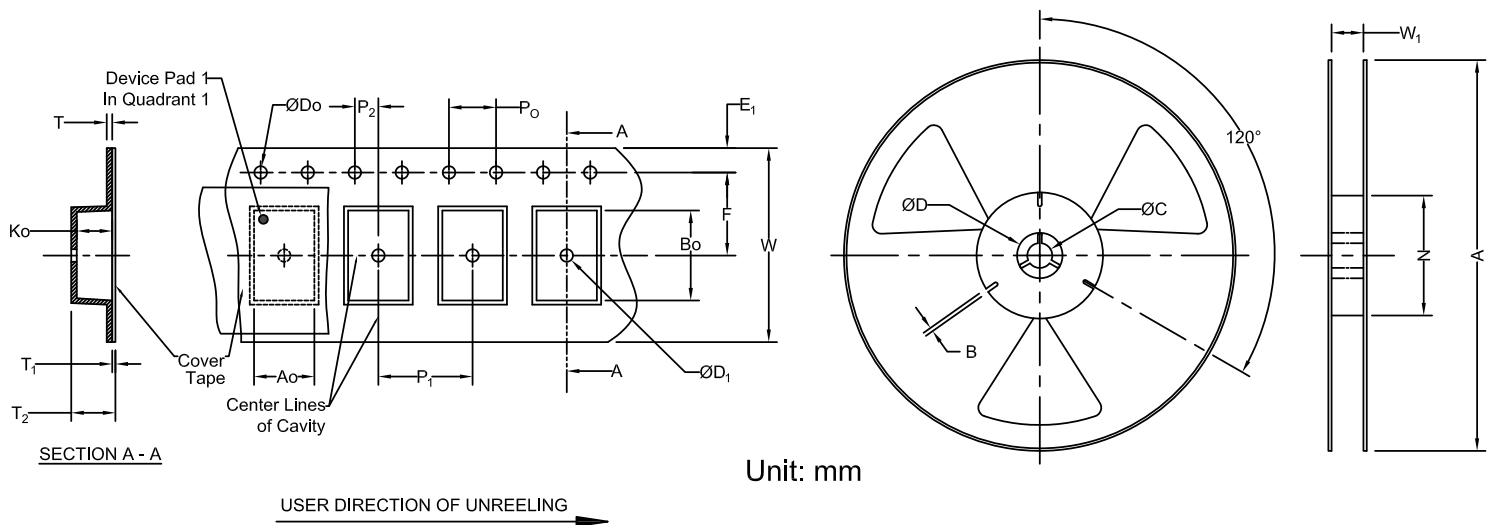


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**MSL Level = 3**

## Packaging

### Tape & Reel

#### 1. Tape & Reel Dimension



Unit: mm

Carrier Tape Specifications (mm)

Do	D <sub>1</sub>	E <sub>1</sub>	P <sub>0</sub>	P <sub>2</sub>	T	F	P <sub>1</sub>	W	A <sub>0</sub>	B <sub>0</sub>	K <sub>0</sub>	Reel Qty
1.55 ± 0.05	1.0 ± 0.05	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.05	0.2 ± 0.05	3.5 ± 0.05	4.0 ± 0.05	8.0 ± 0.3	1.47 ± 0.1	1.73 ± 0.1	0.75 ± 0.1	5,000

Reel Specifications (mm)

A	W <sub>1</sub>	N	C	D	B
330.0 ± 1.0	12.0 Typ.	100.0 ± 0.5	13.0 ± 0.3	20.2 Min.	2.0 ± 0.5

**ATTENTION:** Abracon LLC's products are Commercial-Off-The-Shelf ('COTS'), which are designed, intended, and validated for use in commercial, industrial, and automotive applications. The customer is responsible for testing and verifying the performance of an Abracon solution to meet their system-level requirements.



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