

SMD 1176.5/1582.5 MHz Dual-SAW Filter



AFII-SW-0021

Request Samples



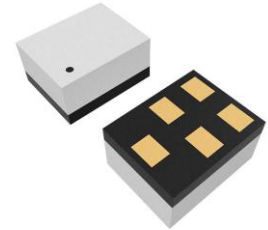
Check Inventory



1.4 x 1.1 x 0.6 mm
RoHS Compliant
MSL Level = 3

Description

This SMD Dual-SAW filter is engineered for GNSS L1/L5 band reception, supporting 1176.5/1582.5 MHz frequencies in a compact 1.4 x 1.1 x 0.6 mm package. Featuring low insertion loss of 1.6 dB (L5) and 2.3 dB (L1) with out-of-band rejection >28 dB typical, it ensures reliable multi-frequency positioning for RTK systems and high-precision GNSS modules. With 10 dBm power handling and -30°C to +80°C industrial-grade operation, this RoHS-compliant MSL Level 3 component is ideal for asset tracking, UAVs, robotics, and precision agriculture where dependable L1/L5 signal conditioning is essential.



Features

- GNSS L1/L5 Dual-SAW filter
- 1.4 x 1.1 x 0.6 mm in Size
- Low Insertion Loss: 1.6/2.3 dB (L5/L1)
- Out-of-Band Rejection: > 28 dB Typ.
- Operating Temperature: -30°C ~ +80°C
- Maximum Input Power: 10 dBm
- [RoHS Compliant](#) | [MSL Level 3](#)

Applications

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

Ordering Information

Part Number	Description
AFII-SW-0021	SMD 1176.5/1582.5 MHz Dual-SAW Filter on Cut Tape
AFII-SW-0021-T	SMD 1176.5/1582.5 MHz Dual-SAW Filter on Tape & Reel

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



5101 Hidden Creek Ln Spicewood TX 78669
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Electrical Specification

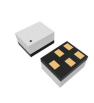
Parameters	Minimum	Typical	Maximum	Units	Notes
Center Frequency (fc)	-	1582.5	-	MHz	L1 Band
VSWR ⁽¹⁾	-	1.8	2.3	:1	1559 - 1606 MHz
Insertion Loss ⁽¹⁾ (B1I)	-	2.8	2.9	dB	1559.052 - 1563.144 MHz
Insertion Loss ⁽¹⁾ (L1)	-	2.3	2.4		1574.397 - 1576.443 MHz
Insertion Loss ⁽¹⁾ (E1)	-	2.6	2.9		1563.144 - 1587.696 MHz
Insertion Loss ⁽¹⁾ (G1)	-	2.9	3.5		1598.063 - 1605.37 MHz
Amplitude Ripple ⁽¹⁾	-	0.8	1.5	dB	1559 - 1606 MHz
Group Delay ⁽¹⁾	-	14.5	23.4	ns	1559 - 1606 MHz
Group Delay Ripple ⁽¹⁾	-	1.9	8.9	ns	1559 - 1606 MHz
Center Frequency (fc)	-	1176.45	-	MHz	L5 Band
VSWR ⁽¹⁾	-	1.9	2.5	:1	1164 - 1189 MHz
Insertion Loss ⁽¹⁾ (L5/E5a/B2a)	-	1.6	1.9	dB	1166.22 - 1186.68 MHz
Insertion Loss ⁽¹⁾ (IRNSS/NAVIC)	-	1.6	3.0		1164.45 - 1188.45 MHz
Amplitude Ripple ⁽¹⁾	-	0.6	1.5	dB	1164 - 1189 MHz
Group Delay	-	17.8	20.5	ns	1164 - 1189 MHz
Group Delay Ripple ⁽¹⁾	-	0.8	2.7	ns	1164 - 1189 MHz
Attenuation ⁽²⁾ (Reference level from 0 dB)	25	29	-	dB	100 - 1080 MHz
	20	28	-	dB	1080 - 1130 MHz
	25	30	-	dB	1230 - 1510MHz
	28	33	-	dB	1710 - 2000 MHz
	25	30	-	dB	2000 - 3000 MHz
Source Impedance ⁽³⁾ (single ended)	-	50	-	Ω	-
Load Impedance ⁽³⁾ (single ended)	-	50	-	Ω	-
Input Power Level	-	-	10	dBm	-
DC Voltage (V)	-	-	3	V	-

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

(2) Averaged values of linear S-Parameters at +25°C

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

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Mechanical Specification

Parameters	Specifications
Filter Dimension	1.4 x 1.1 x 0.6 mm
Mounting Type	Surface Mount

Environmental Specification

Parameters	Specifications
Operating Temperature (Unpackaged Component)	-30°C ~ +80°C
Storage Temperature (Unpackaged Component)	-40°C ~ +105°C
Storage Temperature in Packaging	+5°C ~ +40°C
Packaging Storage Relative Humidity	70% (Max.)
ESD	50V(MM), 100V(HBM)
MSL level	3
RoHS Compliant	Yes

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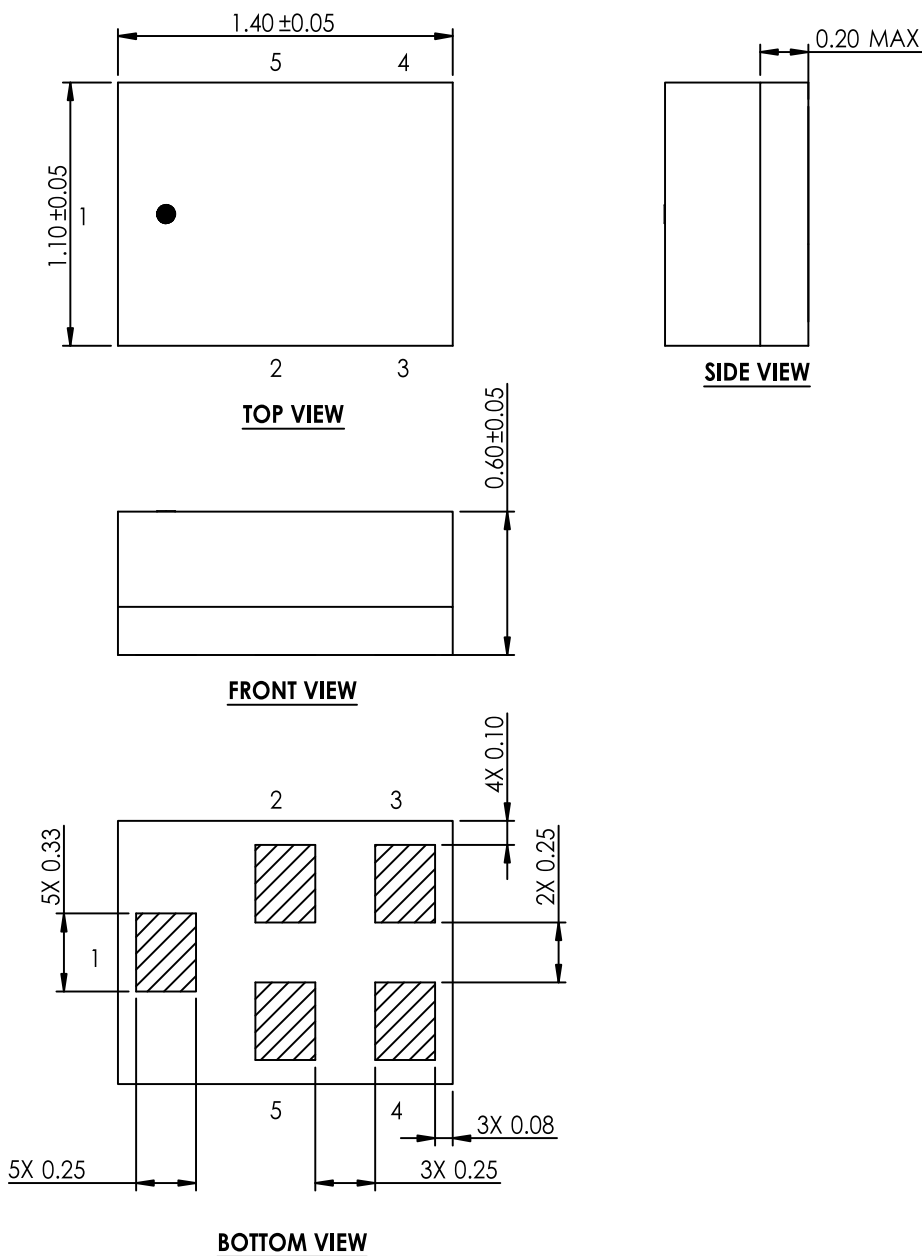


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Product Dimensions



Unit : mm

Pin No.	Description
1	Input
4	Output
2, 3, 5	Ground



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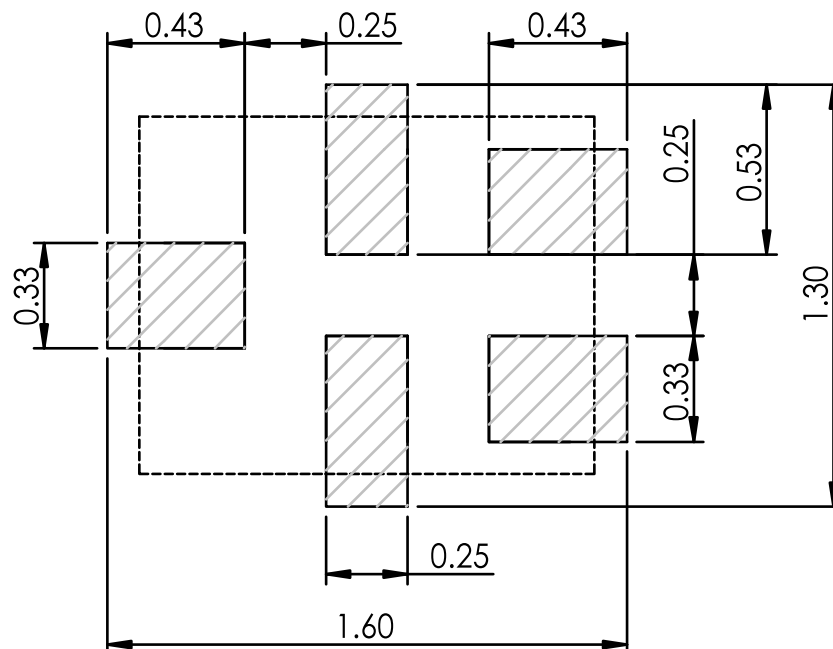
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Recommended Land Pattern

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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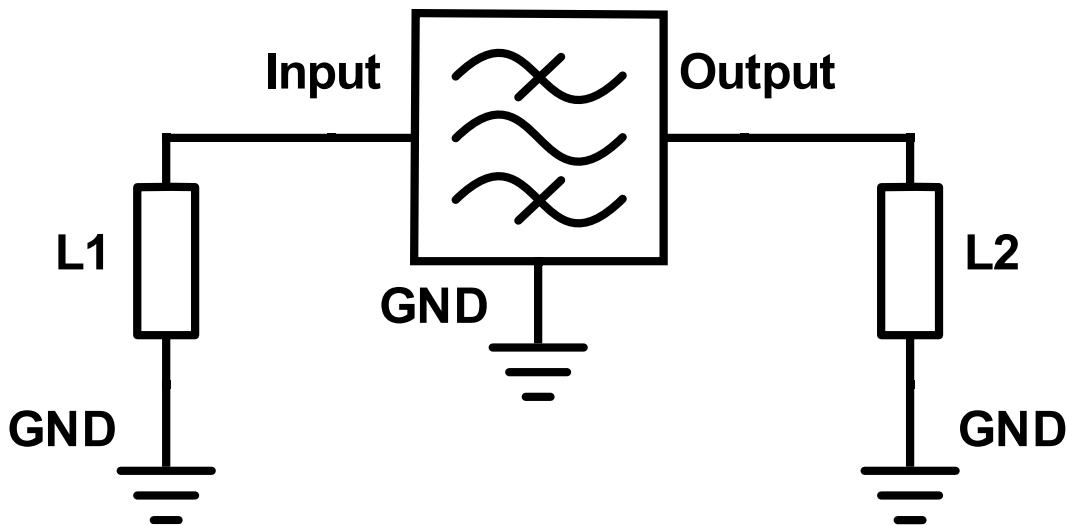


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Measurement Circuit



Port	Matching Component
Input (Pin 1)	L1: 5.2 nH
Output (Pin 4)	L2: 5.6 nH

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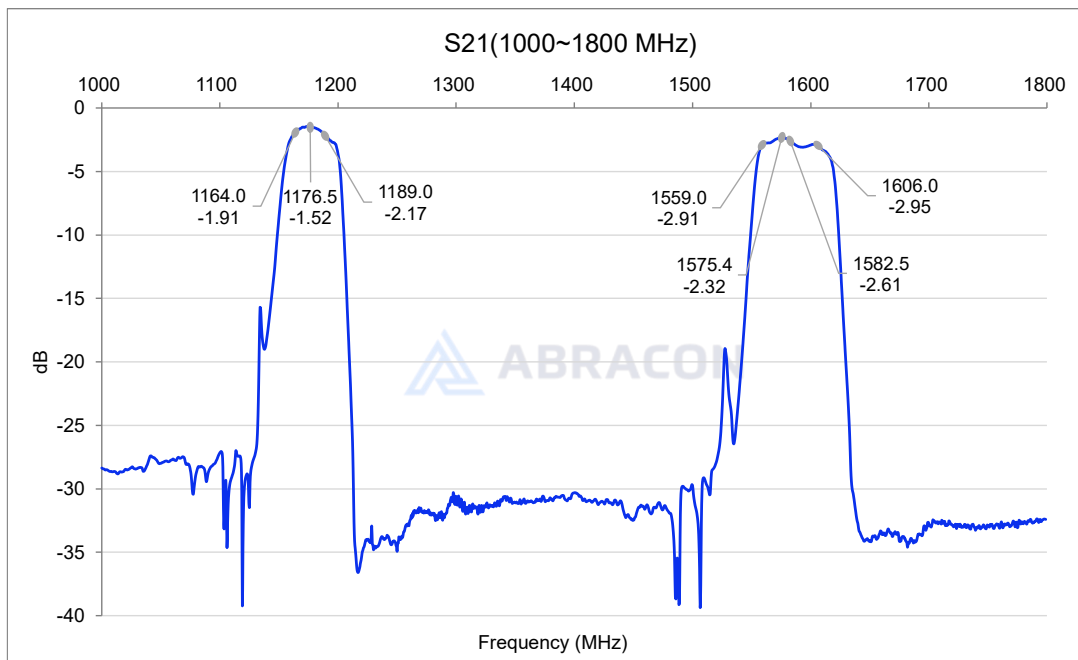
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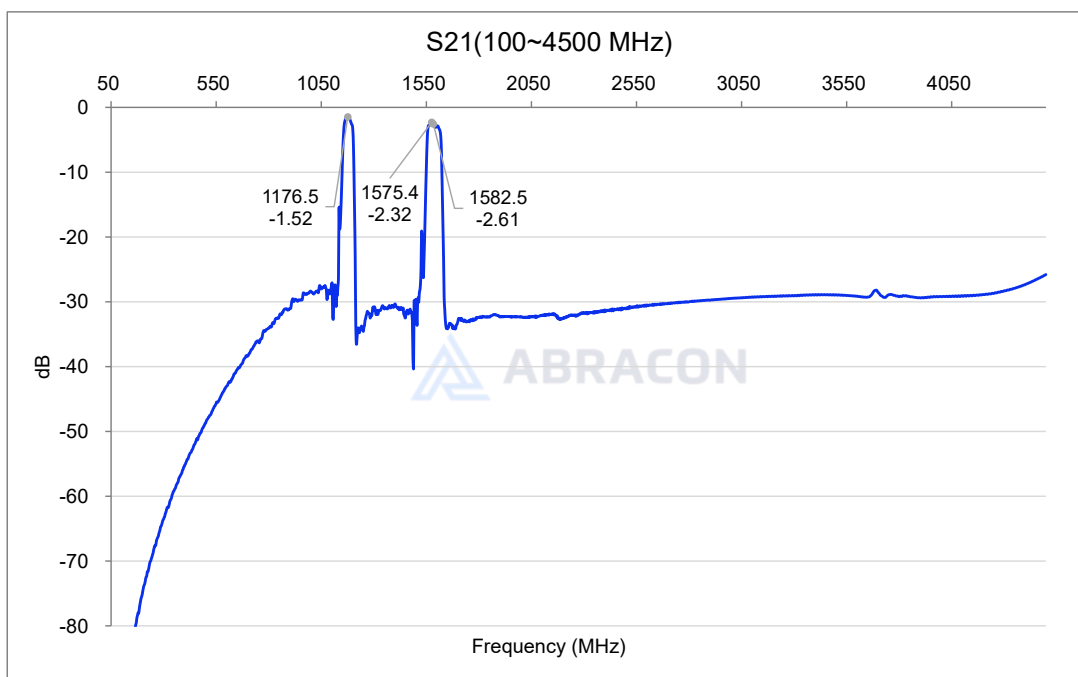
1.4 x 1.1 x 0.6 mm
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Frequency Characteristics

S21 narrow band



S21 wide band



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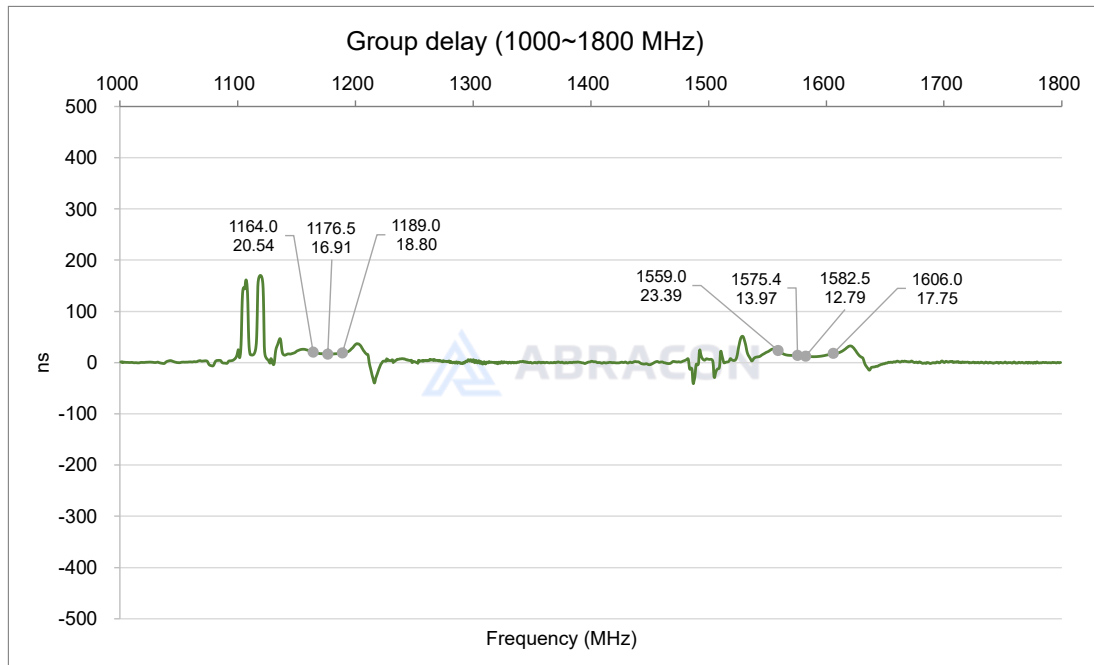


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Group Delay



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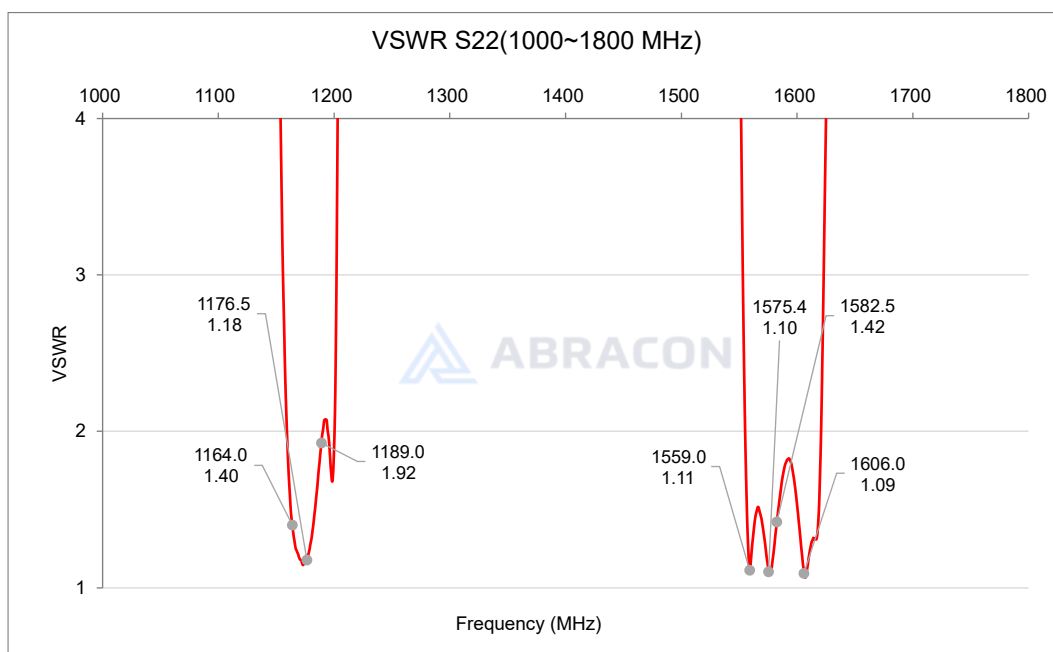
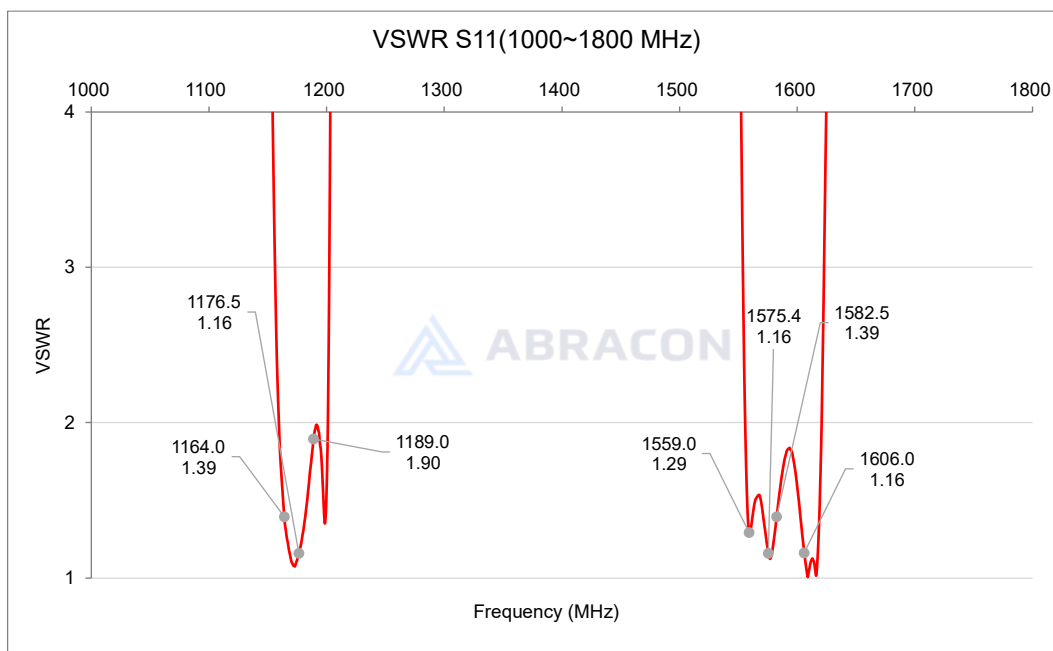


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VSWR (S11 & S22)



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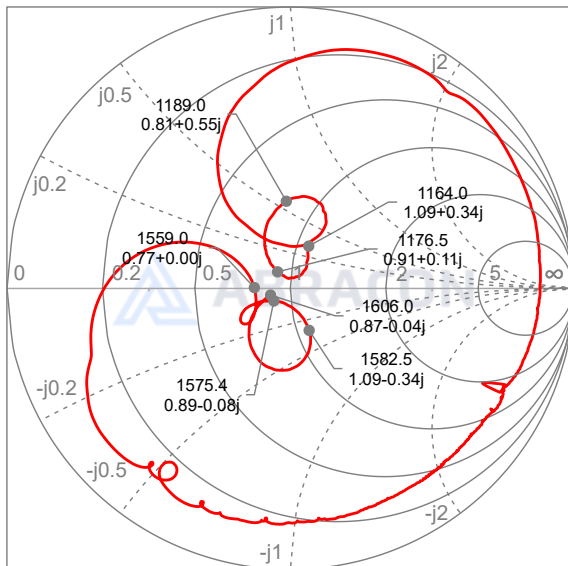
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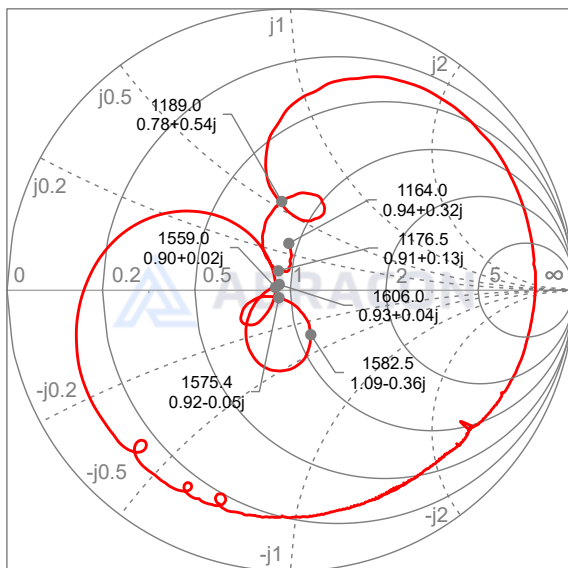
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Smith Chart (S11 & S22)

Smith chart S11 (1164~1606MHz)



Smith chart S22 (1164~1606MHz)



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Reflow Profile [JEDEC J-STD-020]

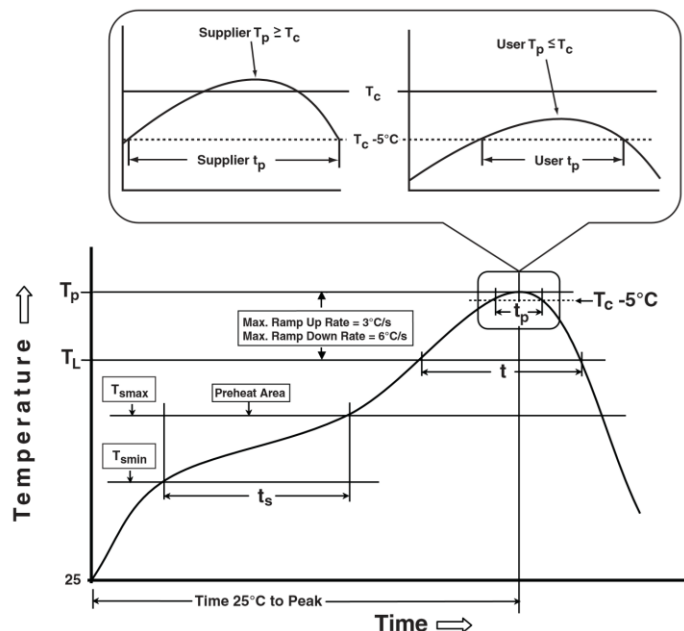


Table 1

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	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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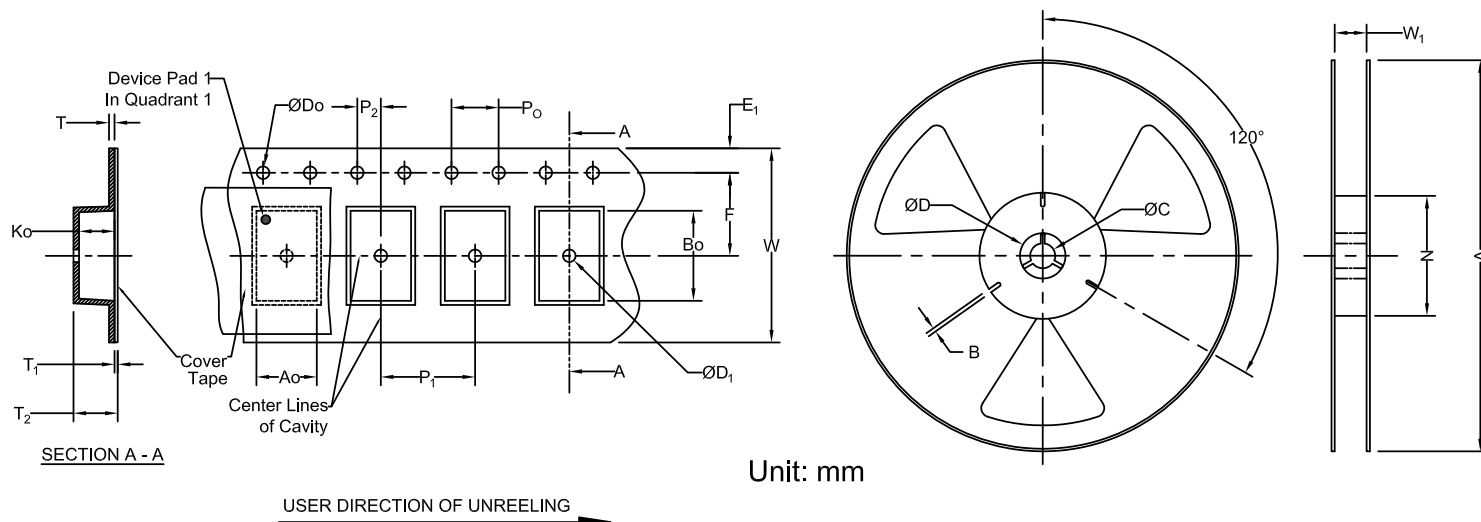
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Packaging

Tape & Reel Dimension



Carrier Tape Specifications (mm)

Do	D1	E1	P0	P2	T	F	P1	W	A0	B0	K0	Reel Qty
1.55 ± 0.05	1.0	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.05	0.2 ± 0.05	3.5 ± 0.05	4.0 ± 0.1	8.0 ± 0.3	1.47 ± 0.1	1.73 ± 0.1	0.75 ± 0.1	3,000

Reel Specifications (mm)

A	W1	N	C	B
178.0 ± 1.0	8.4	72.0 ± 1.0	13.0 ± 0.2	2.0

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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