

SMD 1176 MHZ SAW FILTER

AFII-SW-0060

Request Samples



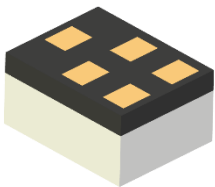
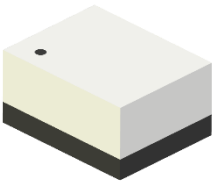
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1.4 x 1.1 x 0.7 mm
RoHS Compliant
MSL Level = 3

Description

Engineered for next-generation high-precision navigation, this ultra-miniature filter is optimized for the critical GNSS L5, E5a, and B2a bands. Its exceptionally compact 1.4 x 1.1 x 0.7 mm footprint is ideal for space-constrained designs. The component delivers outstanding performance with an ultra-low 1.4 dB insertion loss and high >35 dB out-of-band rejection, ensuring superior signal integrity. This makes it perfect for achieving centimeter-level accuracy in demanding RTK systems, autonomous vehicles, and precision agriculture equipment. It is RoHS compliant and rated MSL Level 3 for reliable manufacturing.



Features

- Supports GNSS L5/E5a/B2a Band
- 1.4 x 1.1 x 0.7 mm in Size
- Low Insertion Loss: 1.4 dB
- Out-of-Band Rejection: > 35 dB
- 50 Ohms Single-Ended Input & Output
- 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
AFII-SW-0060	SMD 1176 MHZ SAW FILTER on Cut Tape
AFII-SW-0060-T	SMD 1176 MHZ SAW FILTER on Tape & Reel
AFII-SW-0060-EVB	SMD 1176 MHZ SAW FILTER Evaluation Board

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

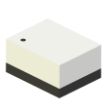


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Electrical Specification

Parameters	Minimum	Typical	Maximum	Units	Notes
Center Frequency(f_c)	-	1176	-	MHz	-
VSWR	-	1.8	2.3		1166.22 ~ 1186.68MHz
Insertion Loss ⁽¹⁾	-	1.4	1.6	dB	1166.22 ~ 1186.68MHz
Amplitude Ripple ⁽¹⁾	-	0.5	1.0		1166.22 ~ 1186.68MHz
Group Delay ⁽¹⁾	-	19	22		1166.22 ~ 1186.68MHz
Group Delay Ripple ⁽¹⁾	-	0.17	0.6	ns	1166.22 ~ 1186.68MHz
Attenuation ⁽²⁾ (Reference level from 0 dB)	30	35	-	dB	698 ~960 MHz
	30	35	-		1427 ~1463 MHz
	30	35	-		1700 ~2200 MHz
	34	40	-		2300 ~2400 MHz
	35	42	-		2400 ~2483 MHz
	35	42	-		2500 ~2690MHz
	30	45	-		2690 ~3000MHz
Source Impedance ⁽³⁾ (single ended)	-	50	-	Ω	-
Load Impedance ⁽³⁾ (single ended)	-	50	-	Ω	-
RF Power Dissipation	-	10	-	dBm	

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 unnecessary (refer to the Measurement Circuits section).

Mechanical Specification

Parameters	Specifications
Filter Dimension	1.4 x 1.1 x 0.7 mm
Mounting Type	Surface Mount

Environmental Specification

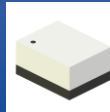
Parameters	Specifications
Operating Temperature Range	-30°C ~ +85°C
Storage Temperature Range	-40°C ~ +85°C
ESD (HBM)	>100 V
ESD (CDM)	>100 V
MSL level	3
RoHS Compliant	Yes



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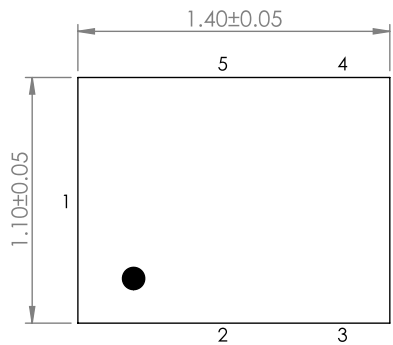


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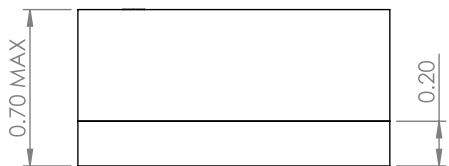


1.4 x 1.1 x 0.7 mm
RoHS Compliant
MSL Level = 3

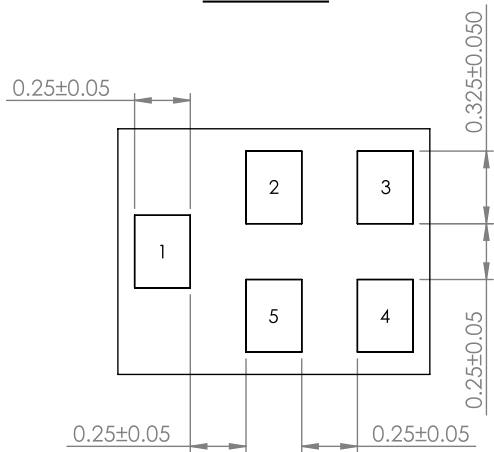
Product Dimensions



TOP VIEW



FRONT VIEW



BOTTOM VIEW

Unit : mm

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

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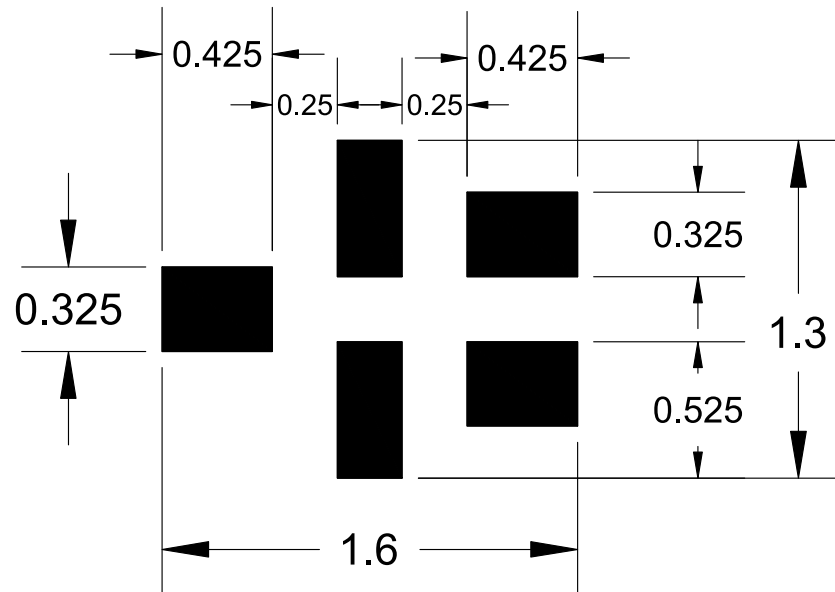


Check Inventory



1.4 x 1.1 x 0.7 mm
RoHS Compliant
MSL Level = 3

Recommended Land Pattern

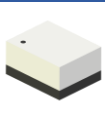


Land Pattern

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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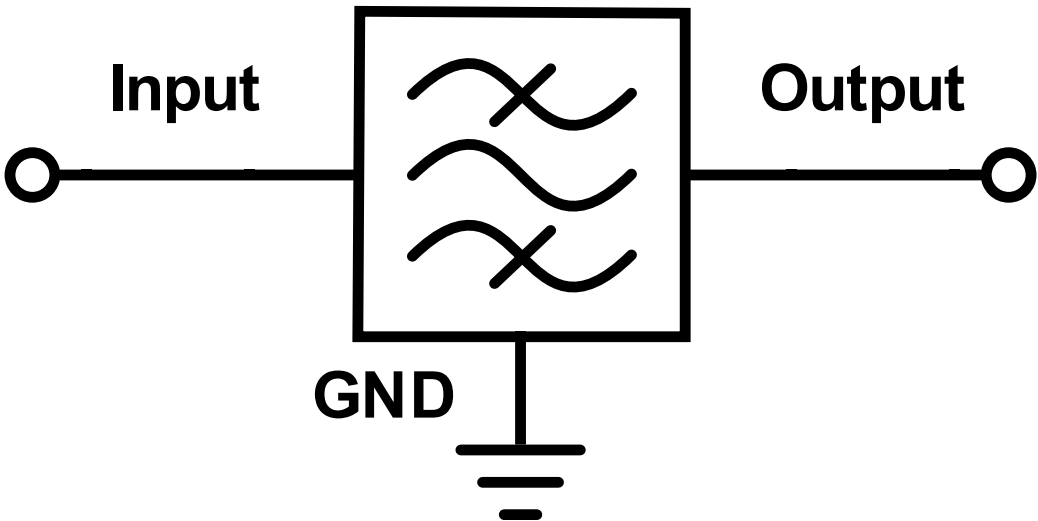


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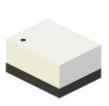
1.4 x 1.1 x 0.7 mm
RoHS Compliant
MSL Level = 3

Measurement Circuit



Pin No.	Description
1	Input Impedance: 50 Ω
4	Output Impedance: 50 Ω
2, 3,5	Ground

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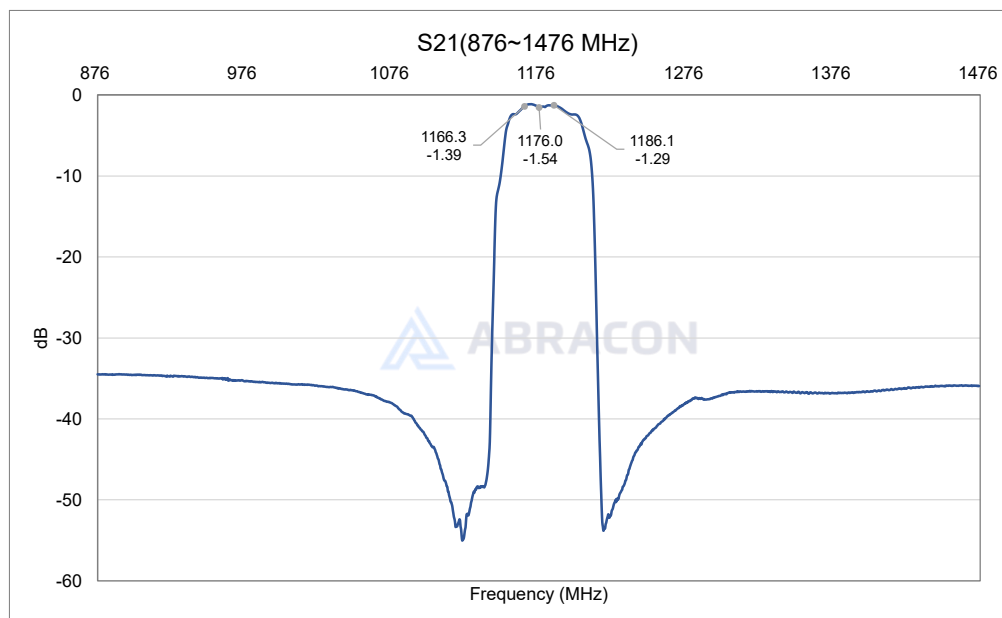
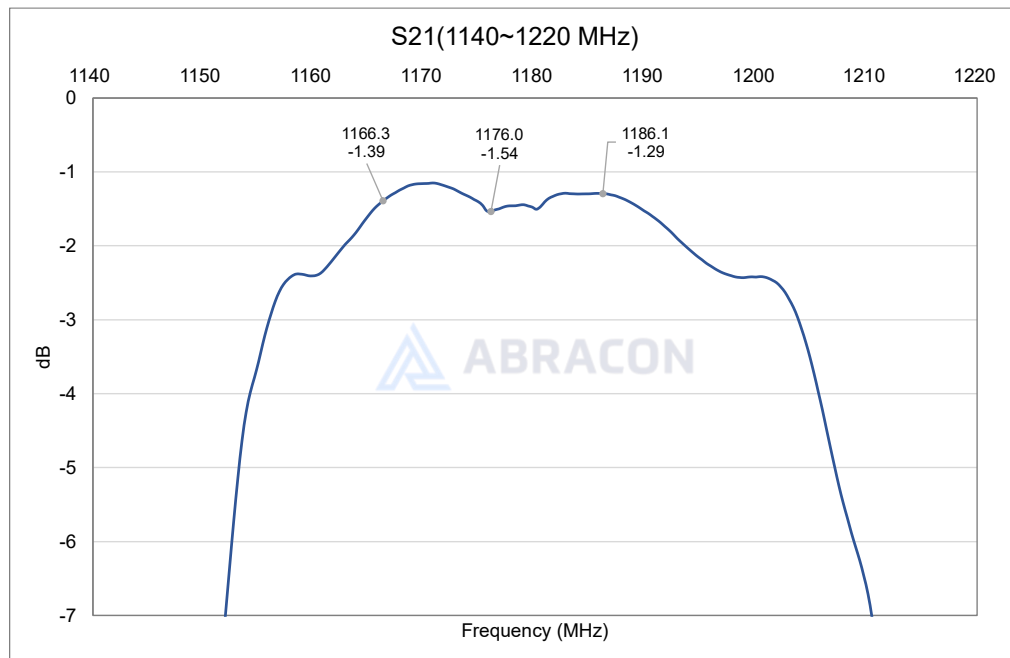
Check Inventory



1.4 x 1.1 x 0.7 mm
RoHS Compliant
MSL Level = 3

Frequency Characteristics

S21 narrow band

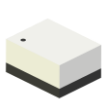


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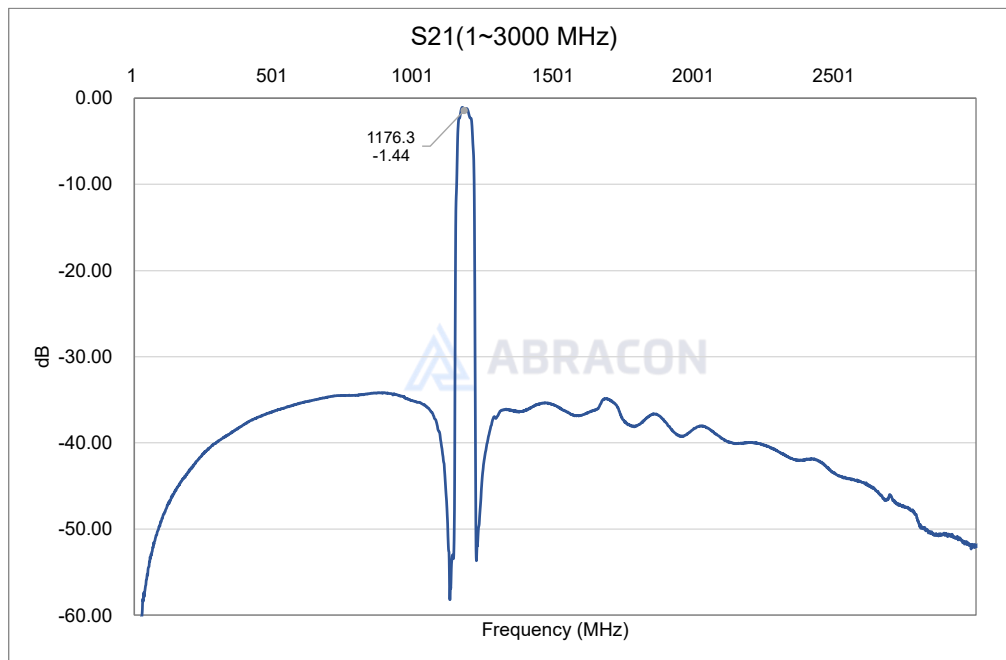


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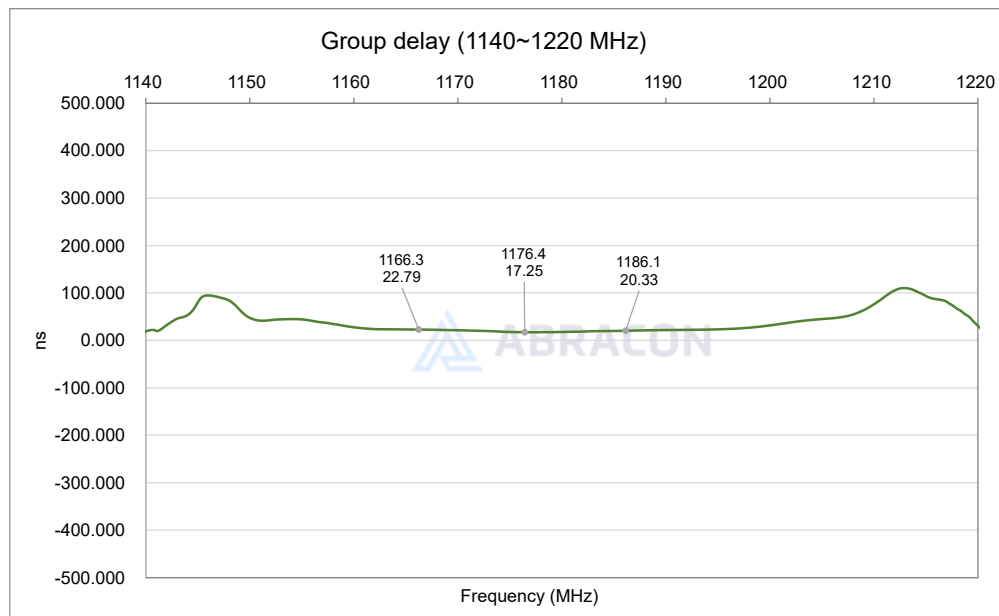


1.4 x 1.1 x 0.7 mm
RoHS Compliant
MSL Level = 3

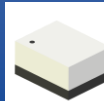
S21 Wide Band



Group Delay



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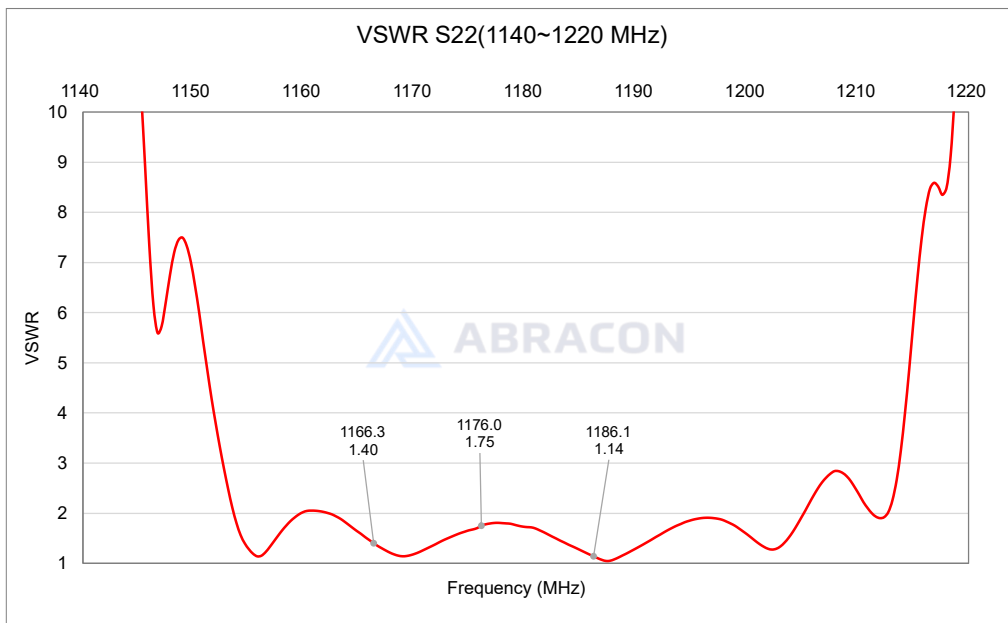
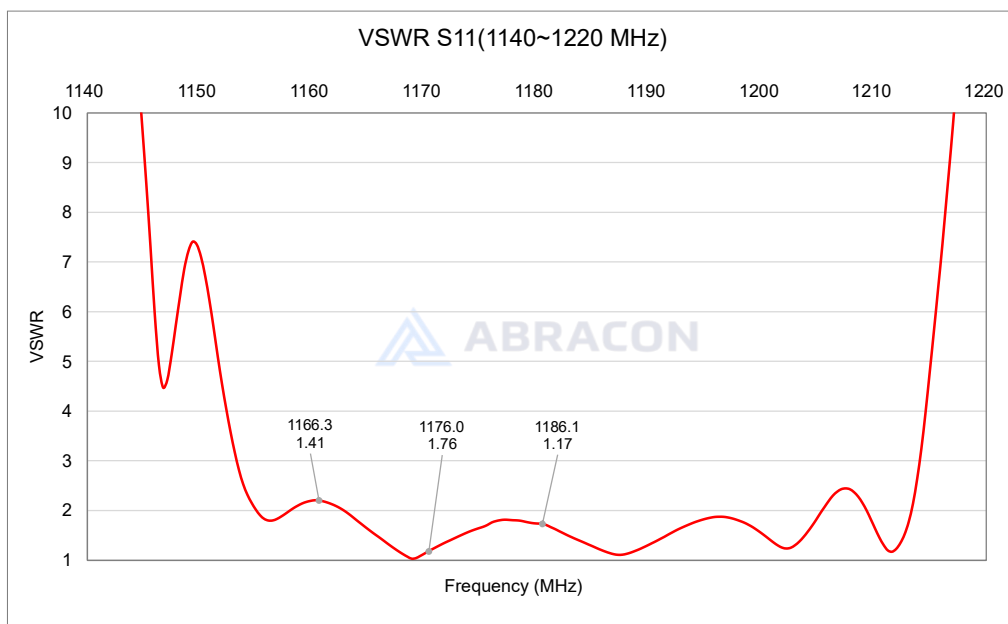


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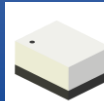


1.4 x 1.1 x 0.7 mm
RoHS Compliant
MSL Level = 3

VSWR (S11 & S22)



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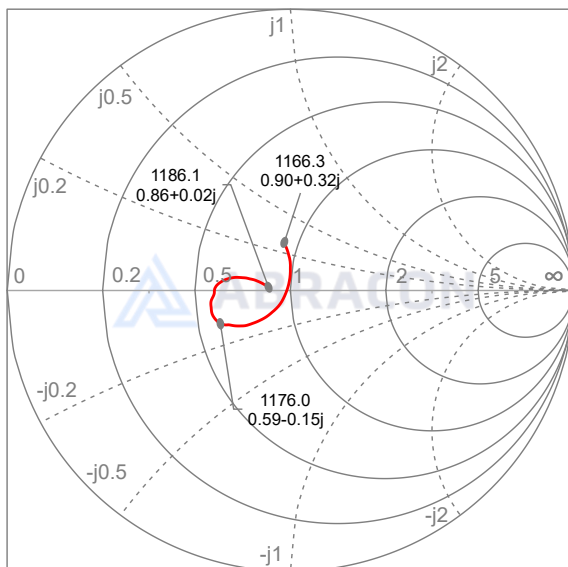
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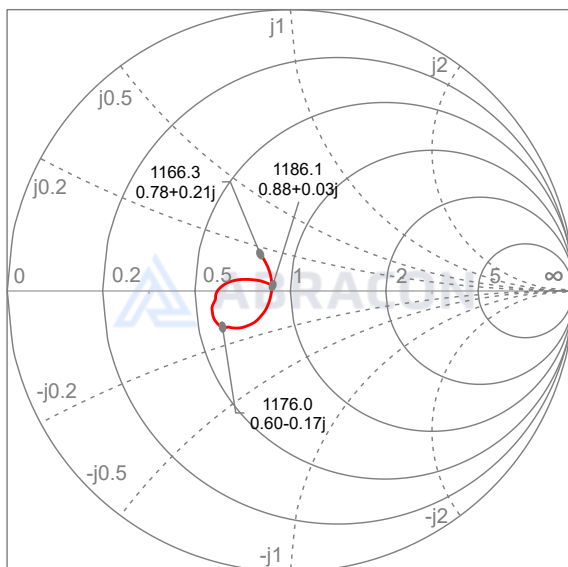
1.4 x 1.1 x 0.7 mm
RoHS Compliant
MSL Level = 3

Smith Chart (S11 & S22)

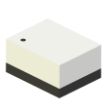
Smith chart S11 (1166~1186MHz)



Smith chart S22 (1166~1186MHz)



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Reflow Profile [JEDEC J-STD-020]

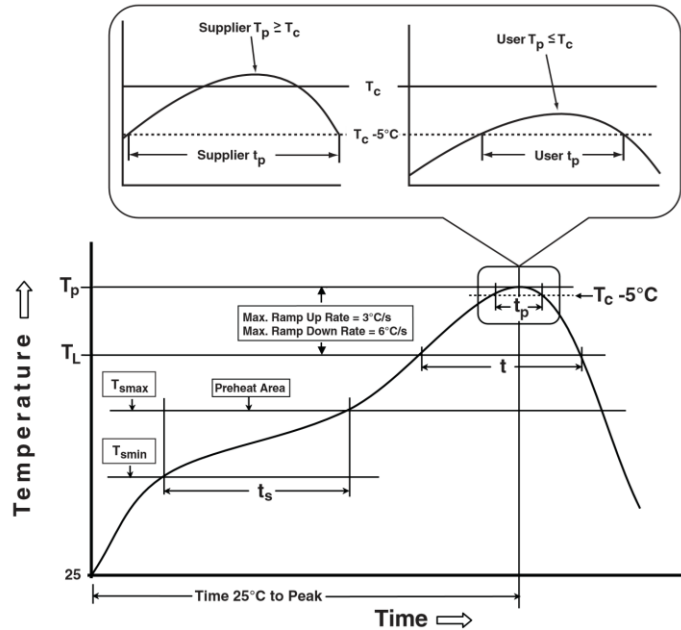


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)

Package Thickness	Volume mm^3 <350	Volume mm^3 ≥ 350
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	220°C	220°C

Table 2

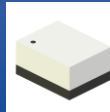
Pb-Free Process Classification Temperatures (T_c)

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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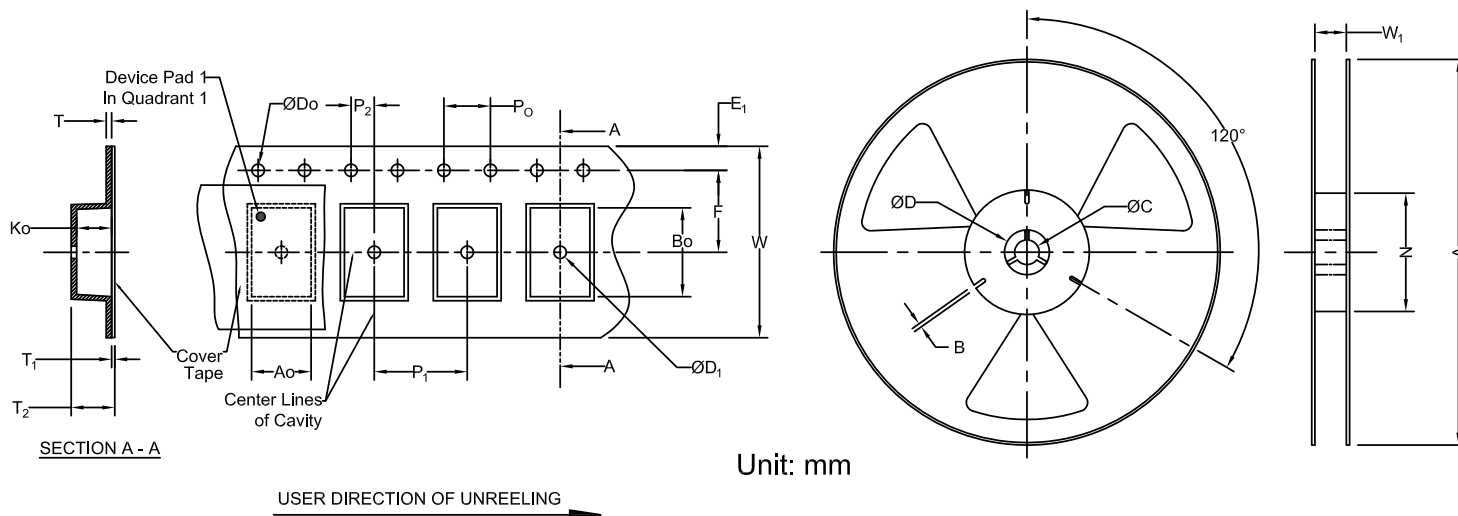
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1.4 x 1.1 x 0.7 mm
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MSL Level = 3

Packaging

Tape & Reel Dimension



Carrier Tape Specifications (mm)

Do	D1	E1	P0	P2	F	P1	W	A0	B0	K0	Reel Qty
1.55 ± 0.05	0.60 ± 0.05	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.05	3.5 ± 0.05	4.0 ± 0.1	8.0 ± 0.1	1.30 ± 0.05	1.60 ± 0.05	0.77 ± 0.05	5,000

Reel Specifications (mm)

A	W1	N	C
178.0 ± 1.0	8.48 ± 0.15	57.12 ± 0.15	13.12 ± 0.15

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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