GNSS L1/L2/L5/L6 SMD SAW DIPLEXER

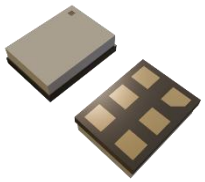
AFII-SW-0095-Q

Request Samples | Check Inventory

1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

Description

This AEC-Q200 compliant SAW diplexer delivers comprehensive multi-band GNSS coverage for next-generation positioning systems. Supporting L1 alongside combined L2/L5/L6 bands in an ultra-compact 1.5 x 1.1 x 0.38 mm package. Supporting L1 alongside L2/L5/L6 bands with low insertion loss of 1.3 dB (L1) and 1.7 dB (L2/L5/L6), it delivers excellent band separation with 29 dB typical out-of-band rejection. Rated for high-power +25 dBm operation across -40 to +105 °C, this RoHS-compliant MSL Level 1 component enables centimeter-level accuracy for automotive telematics, RTK systems, autonomous vehicles, and precision agriculture where robust multi-frequency performance in harsh environments is essential.



Features

- AEC-Q200 GNSS L1/L2/L5/L6 SAW Diplexer
- Compact Size: 1.5 x 1.1 x 0.38 mm
- Insertion Loss: 1.3 dB (L1) / 1.7 dB (L2/L5/L6)
- Out-of-Band Rejection: 29 dB (Typ.)
- Maximum Input Power: +25 dBm
- Extended Temperature -40 to +105 °C
- RoHS Compliant | MSL Level 1

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-0095-Q	GNSS L1/L2/L5/L6 SMD SAW DIPLEXER on Cut Tape
AFII-SW-0095-Q-T	GNSS L1/L2/L5/L6 SMD SAW DIPLEXER on Tape & Reel
AFII-SW-0095-Q -EVB	GNSS L1/L2/L5/L6 SMD SAW DIPLEXER EVB

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

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GNSS L1/L2/L5/L6 SMD SAW DIPLEXER

AFII-SW-0095-Q

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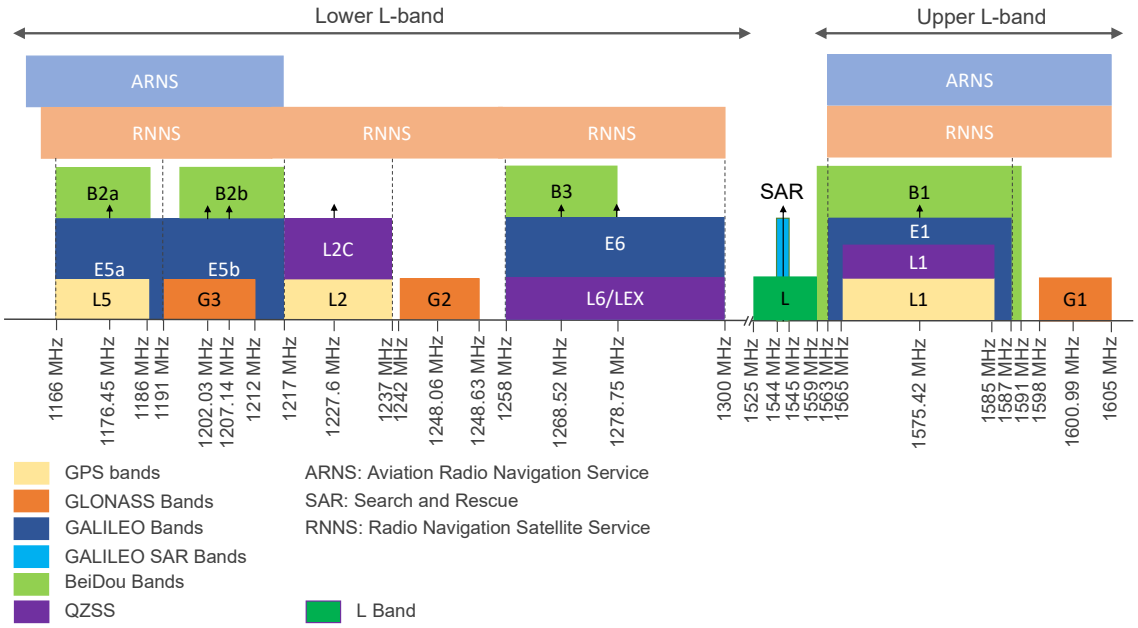
1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

GNSS Frequency Bands Covered				
GPS	L1 1575.42MHz	L2 1227.6MHz	L5 1176.45MHz	
	■	■	■	
GLONASS	G1 1598.06-1609.31MHz	G2 1242.93-1251.68MHz	G3 1202.025MHz	
	■	■	■	
Galileo	E1 1575.42MHz	E5a 1176.45MHz	E5b 1201.5MHz	E6 1278.75MHz
	■	■	■	■
BeiDou	B1 1561MHz	B2 1207.14MHz	B3 1268.52MHz	
	■	■	■	
QZSS	L1 1575.42MHz	L2 1227.6MHz	L5 1176.45MHz	L6 1278.75MHz
	■	■	■	■
IRNSS/NAVIC			L5 1176.45MHz	
			■	
SBAS	L1/E1/B1 1575.42MHz		L5/B2a/E5a 1176.45MHz	
	■		■	



Frequency allocation: GNSS systems, upper L bands and lower L bands

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GNSS L1/L2/L5/L6 SMD SAW DIPLEXER

AFII-SW-0095-Q

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1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

Electrical Specification

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency	1525		1610.485	MHz	GNSS L1/G1/B1/L
VSWR	-	1.7	2.0		1525 ~ 1610.485 MHz
Insertion Loss (1) (L)	-	1.7	2.0	dB	1525 ~ 1559 MHz
Insertion Loss (1) (B1)	-	1.3	1.9		1559.052 ~1563.144 MHz
Insertion Loss (1) (L1)	-	1.3	1.8		1565.19 ~ 1585.65 MHz
Insertion Loss (1) (G1)	-	1.4	2.0		1592.953 ~1610.485 MHz
Amplitude Ripple (1)	-	0.5	2.0	dB	1525 ~ 1610.485 MHz
Group Delay Ripple (1) (L)	-	6.4	16	ns	1525 ~ 1559 MHz
Group Delay Ripple (1) (B1)	-	1.2	7		1559.052 ~1563.144MHz
Group Delay Ripple (1) (L1)	-	4.6	7		1565.19 ~ 1585.65MHz
Group Delay Ripple (1) (G1)	-	6	10		1592.953 ~1610.485MHz
Attenuation (Reference level from 0 dB)	30	45	-	dB	100 ~ 885 MHz
	28	31	-		885 ~ 1100 MHz
	28	30	-		1100 ~ 1125 MHz
	27	29	-		1164.45 ~ 1299 MHz
	26.5	27	-		1325 ~ 1462.9 MHz
	15	23	-		1660 ~ 1680 MHz
	19	25	-		1680 ~ 2400 MHz
	23	25	-		2400 ~ 2700 MHz
	23	25	-		2700 ~ 3300 MHz
	21	23	-		3300 ~ 4200 MHz
	20	22	-		4200 ~ 5000 MHz
	19	21	-		5000 ~ 5925 MHz
	15	20	-		5925 ~ 7125 MHz
Source Impedance (2) (single ended)	-	50	-	Ω	3.6nH
Load Impedance (2) (single ended)	-	50	-	Ω	GNSS L1:5.6 nH GNSS L2/L5/L6:7.5 nH
RF Power Dissipation	-	25	-	dBm	-

Notes: (1) Averaged values of linear S-Parameters at +25ºC
(2) A matching network is necessary (refer to the Measurement Circuits section)

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GNSS L1/L2/L5/L6 SMD SAW DIPLEXER

AFII-SW-0095-Q

Request Samples | Check Inventory

1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency	1164.45	-	1299	MHz	GNSS L2/B2/L5/E5/L6
VSWR	-	1.9	2.0	:1	1164.45 ~ 1299 MHz
Insertion Loss (1) (L5)	-	2.3	2.6	dB	1164.45 ~ 1188.45 MHz
Insertion Loss (1) (B2b/E5b)	-	1.7	2.0		1196.91 ~ 1217.37 MHz
Insertion Loss (1) (L2)	-	1.7	2.0		1217.37 ~ 1237.83 MHz
Insertion Loss (1) (L6)	-	2.3	2.6		1237.83 ~ 1299 MHz
Amplitude Ripple	-	0.7	2.0	dB	11164 ~ 1299 MHz
Group Delay Ripple (1) (L5)	-	17	28	ns	1164.45 ~ 1188.45 MHz
Group Delay Ripple (1) (B2b/E5b)	-	3	5		1196.91 ~ 1217.37 MHz
Group Delay Ripple (1) (L2)	-	5	8		1217.37 ~ 1237.83 MHz
Group Delay Ripple (1) (L6)	-	26	42		1237.83 ~ 1299 MHz
Attenuation (Reference level from 0 dB)	30	44	-	dB	100 ~ 885 MHz
	25	28	-		885 ~ 1100 MHz
	15	27	-		1100 ~ 1125 MHz
	27	29	-		1325 ~ 1462.9 MHz
	27	29	-		1525 ~ 1610.485 MHz
	27	33	-		1660 ~ 1680 MHz
	26	28	-		1680 ~ 2400 MHz
	23	27	-		2400 ~ 2700 MHz
	23	25	-		2700 ~ 3300 MHz
	22	23	-		3300 ~ 4200 MHz
	19	21	-		4200 ~ 5000 MHz
	18	20	-		5000 ~ 5925 MHz
Source Impedance (2) (single ended)	-	50	-	Ω	3.6nH
Load Impedance (2) (single ended)	-	50	-	Ω	GNSS L1:5.6 nH GNSS L2/L5/L6:7.5 nH
RF Power Dissipation	-	25	-	dBm	-

Notes: (1) Averaged values of linear S-Parameters at +25ºC
(2) A matching network is necessary (refer to the Measurement Circuits section)

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1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

Mechanical Specification

Parameters	Specifications
Filter Dimension	1.5 x 1.1 x 0.38 mm
Mounting Type	Surface Mount
Additional Resources	Download STEP File, Package Drawing, 3D PDF

Environmental Specification

Parameters	Specifications
Operating Temperature Range	-40ºC ~ +105ºC
Storage Temperature Range	-40ºC ~ +105ºC
ESD Voltage (HBM)	＞100 V
ESD Voltage (MM)	＞50 V
MSL level	1
RoHS Compliant	Yes

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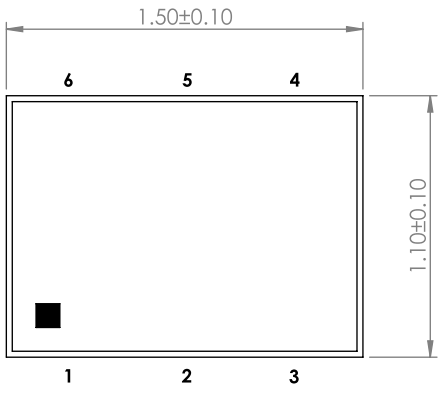
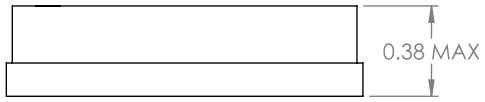
1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

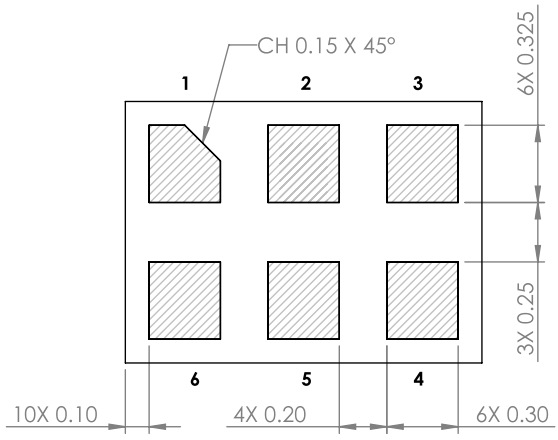
Product Dimensions



TOP VIEW

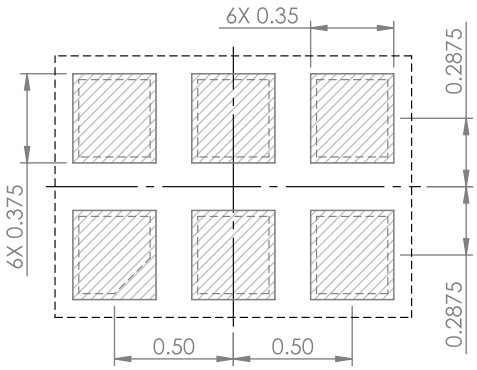


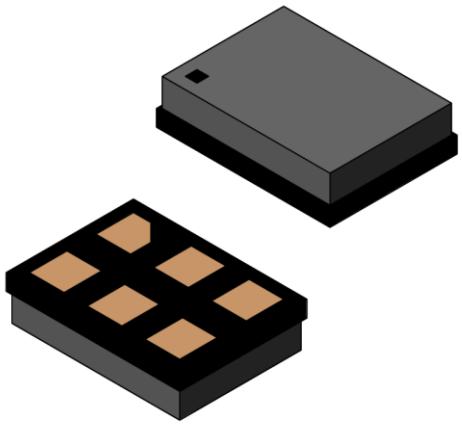
FRONT VIEW



BOTTOM VIEW

RECOMMENDED LAND PATTERN





Unit : mm

Pin No.	Description
2	Common Input
4	L5 Output
6	L1 Output
1, 3, 5	Ground

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GNSS L1/L2/L5/L6 SMD SAW DIPLEXER

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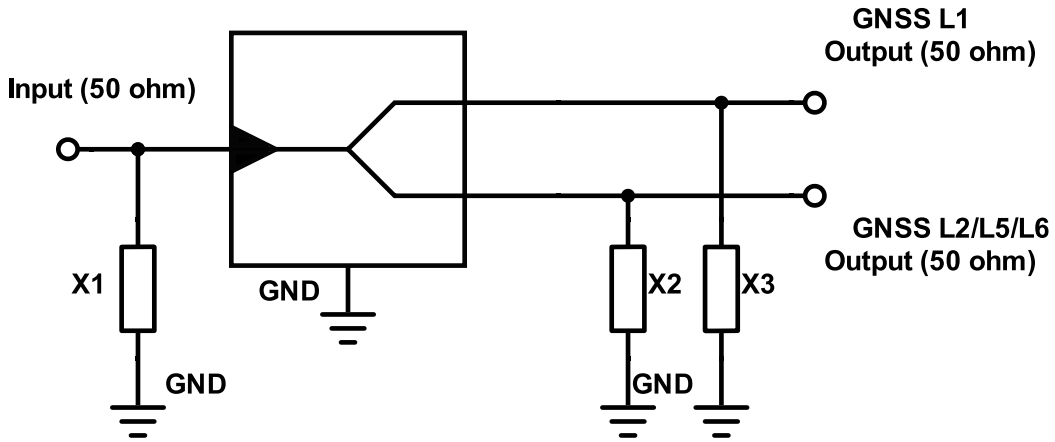
Request Samples | Check Inventory

1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

Measurement Circuit



Port	Matching Component
Input (Pin 2)	X1: 3.6 nH
GNSS L1 Output (Pin 6)	X3: 5.6 nH
GNSS L2/L5/L6 Output (Pin 4)	X2: 7.5 nH

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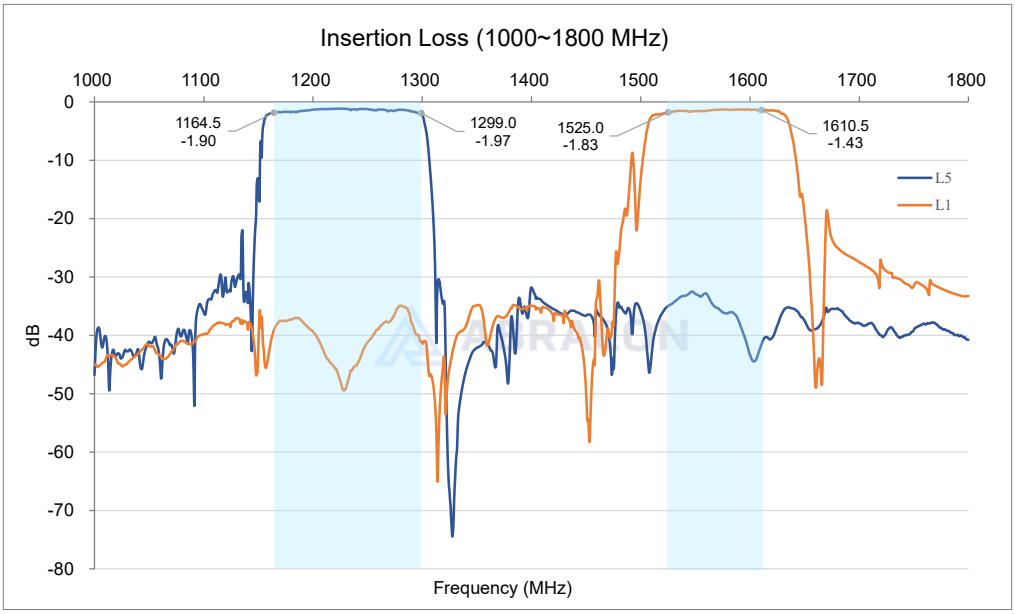
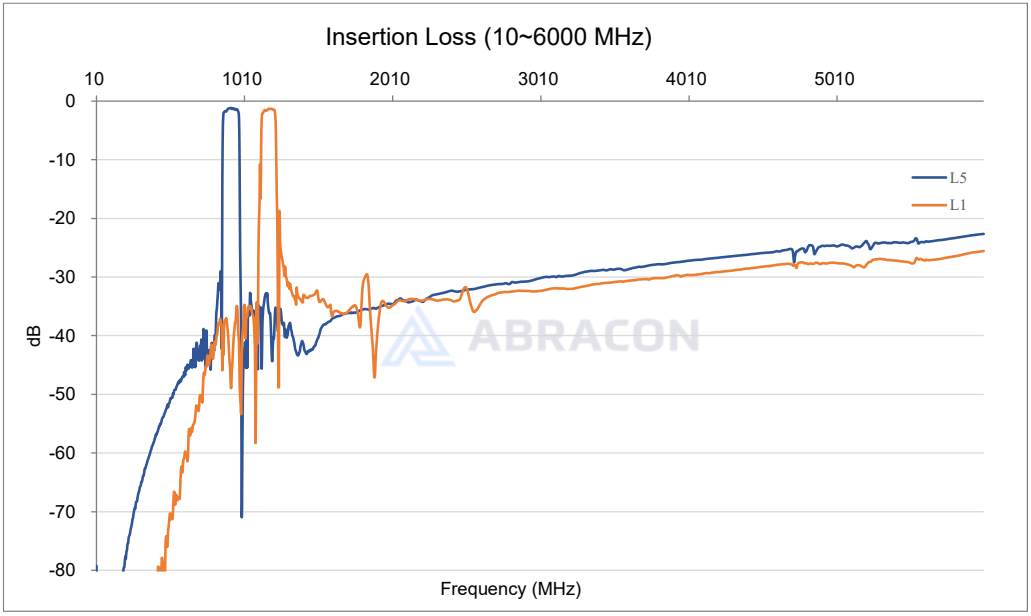
1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

Frequency Characteristics

Insertion Loss 1000 – 1800 MHz



Insertion Loss 10 - 6000MHz



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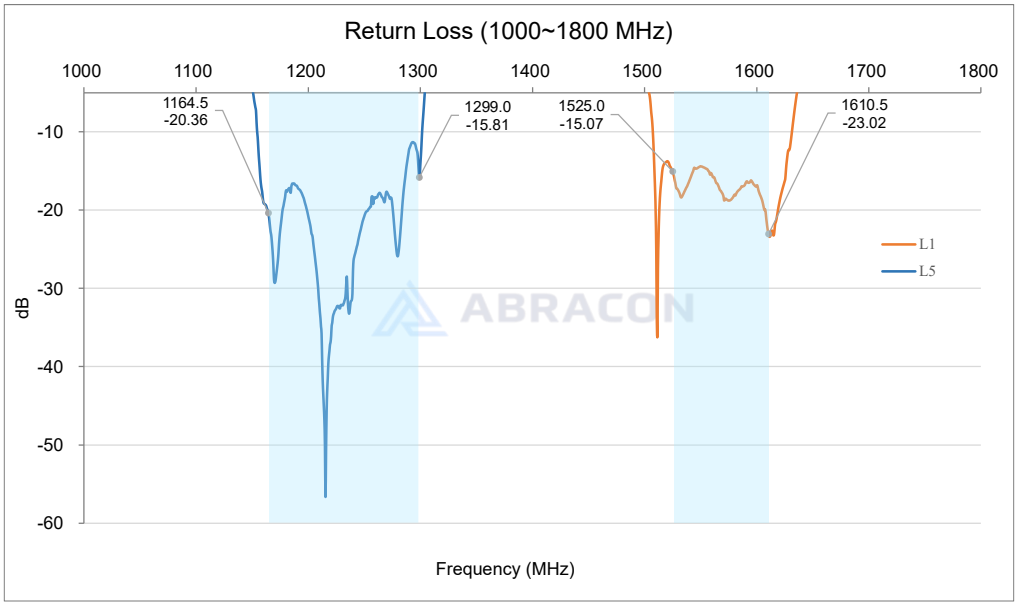
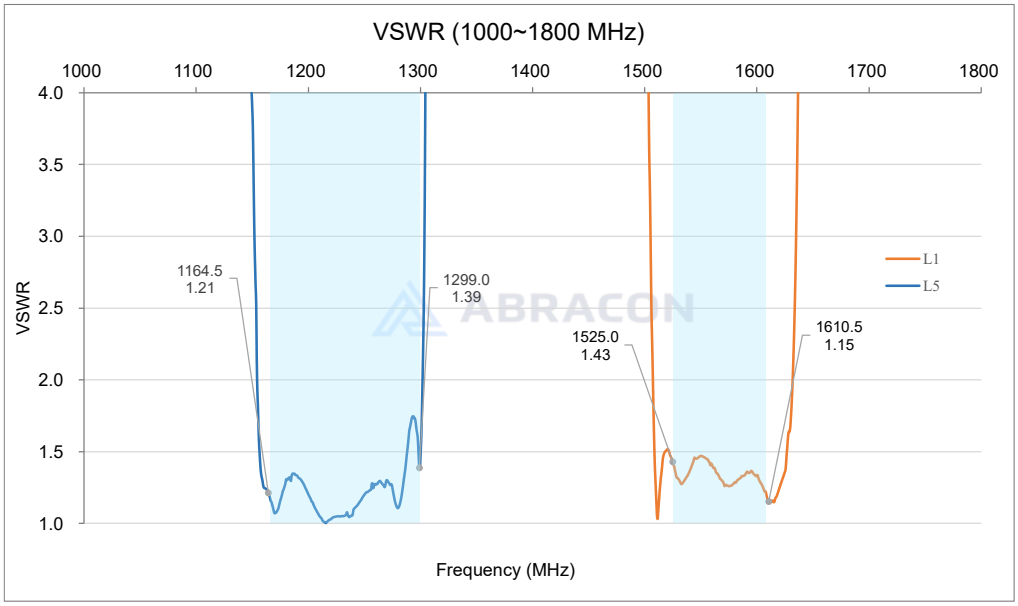
1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

Return Loss 1000 – 1800 MHz



VSWR 1000 - 1800MHz



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GNSS L1/L2/L5/L6 SMD SAW DIPLEXER

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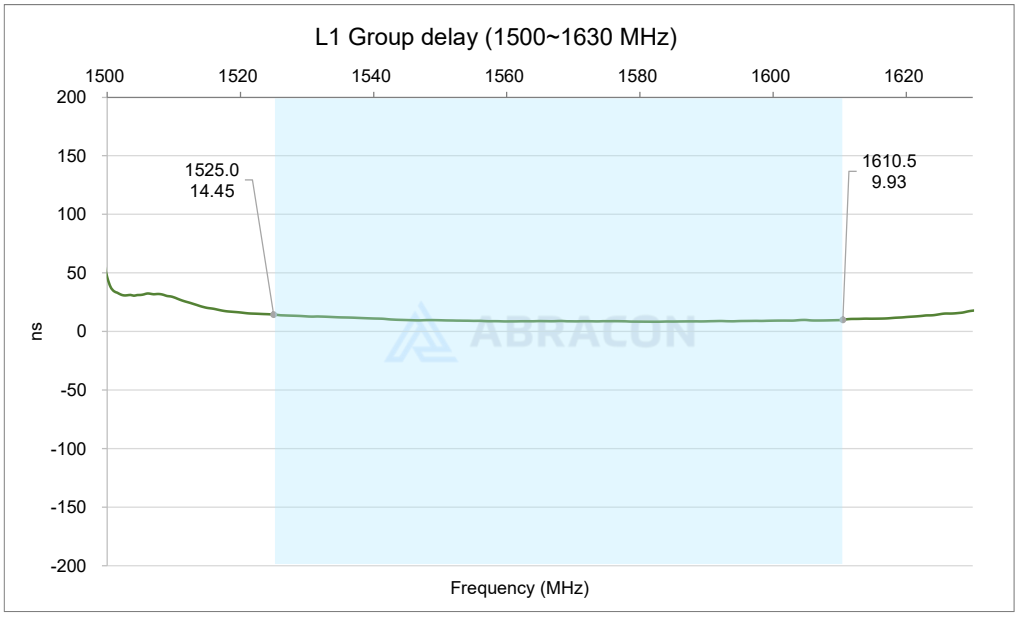
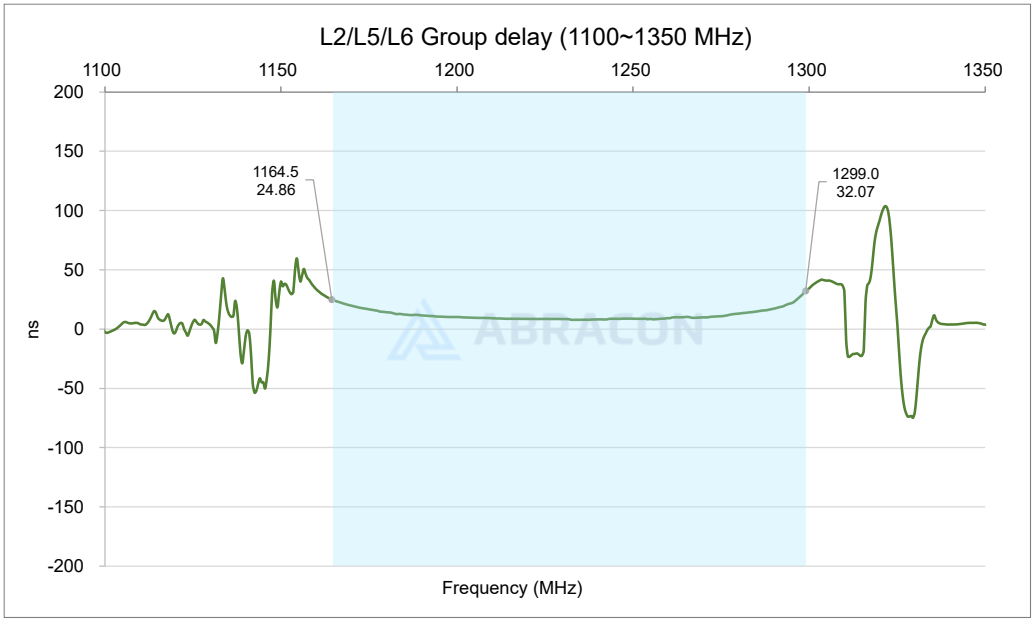
1.5 x 1.1 x 0.38 mm
RoHS Compliant
MSL Level = 1

Group Delay (L1)



Group Delay (L2/L5/L6)



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Request Samples | Check Inventory

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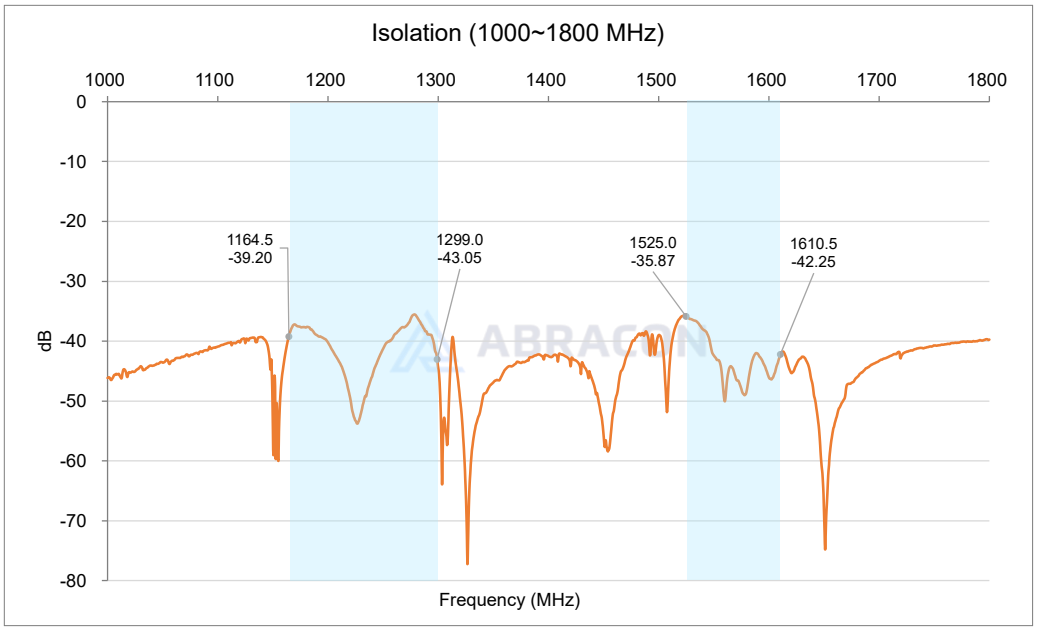
RoHS Compliant
MSL Level = 1

Isolation 1000 - 1800MHz



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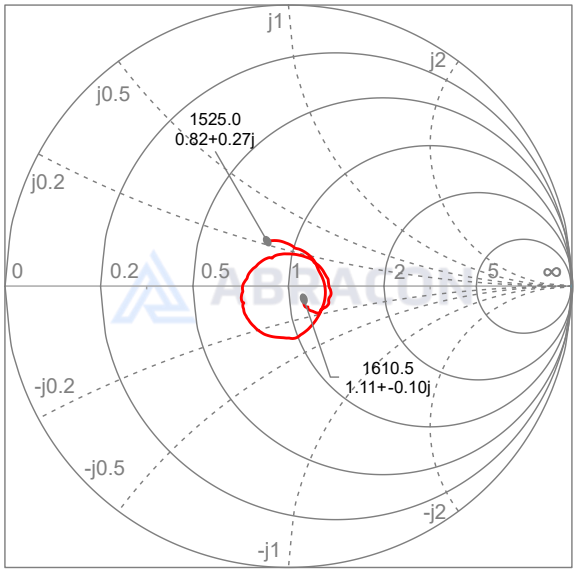
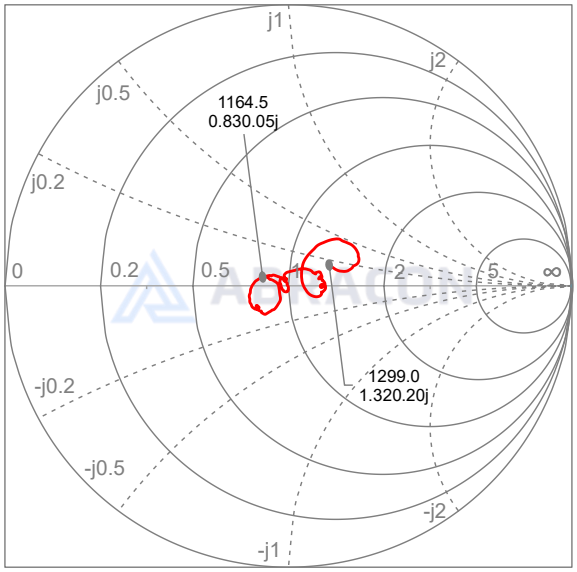
RoHS Compliant
MSL Level = 1

Smith Chart (L1 & L2/L5/L6)

Smith chart S11 (1525~1610MHz)



Smith chart S11 (1164~1299MHz)



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MSL Level = 1

Reflow Profile [JEDEC J-STD-020]

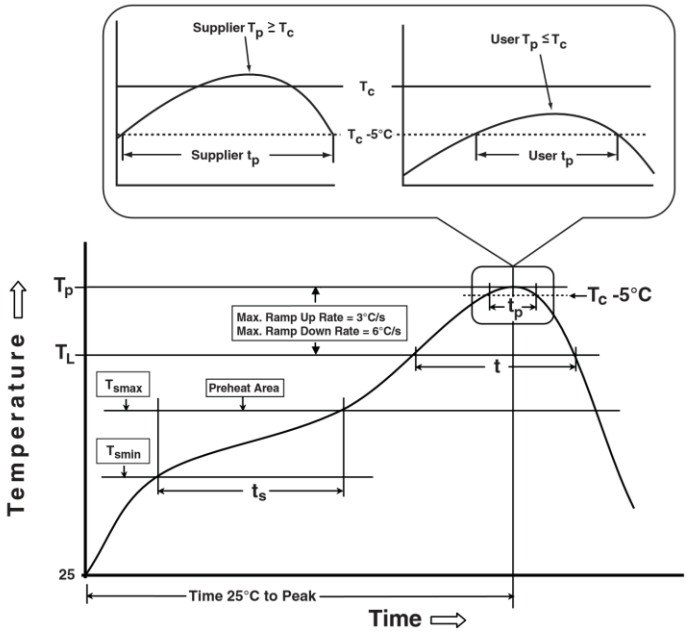

Table 1

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	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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