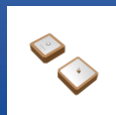


Compact GPS/Galileo L1 Passive Patch Antenna



APAE1575R1240ABDD1-T

Request Samples



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12.0 x 12.0 x 4.0 mm
RoHS Compliant
MSL Level = 1

Description

This GPS/Galileo L1 passive patch antenna delivers reliable positioning, making it ideal for space-constrained applications where traditional antennas cannot fit. Featuring 0.5 dBic peak gain with 31% efficiency and RHCP polarization, it ensures robust satellite reception through a simple through-hole mounting design. This RoHS-compliant MSL Level 1 antenna is perfect for slim UAVs, compact asset trackers, portable telematics devices, and infrastructure monitoring equipment where millimeter-thin profiles and lightweight integration are critical.



Features

- GPS/Galileo L1 Passive Patch Antenna
- Compact Size: 12.0 x 12.0 x 4.0 mm
- Peak Gain: 0.5 dBic
- High Efficiency: 31 %
- RHCP Polarization
- Through Hole Mounting
- [RoHS Compliant](#) | [MSL Level 1](#)

Applications

- GNSS Positioning & Navigation
- Asset Tracking & Fleet Management
- Aerospace, UAV, and Robotics
- Public Safety & Mission-Critical Systems
- Transportation & Telematics
- Industrial & Infrastructure Applications
- Research & Field Instrumentation

Ordering Information

Part Number	Description
APAE1575R1240ABDD1-T	Compact GPS/Galileo L1 Passive Patch Antenna

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



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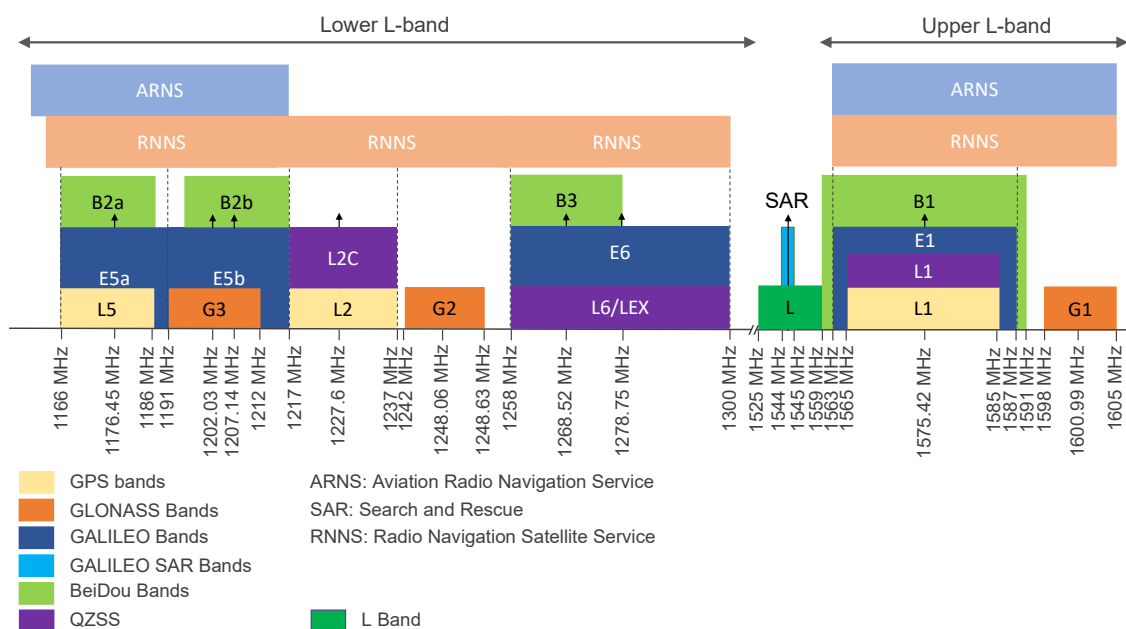
12.0 x 12.0 x 4.0 mm

RoHS Compliant

MSL Level = 1

GNSS Frequency Bands Covered

	L1 1575.42MHz	L2 1227.6MHz	L5 1176.45MHz	
GPS	■	□	□	
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	B1C 1575.42MHz ■	B1I 1561.098MHz □	B2a 1176.45MHz □	B2b 1207.14MHz □
QZSS	L1 1575.42MHz ■	L2 1227.6MHz □	L5 1176.45MHz □	L6 1278.75MHz □
IRNSS/NAVIC			L5 1176.45MHz □	
SBAS	L1/E1/B1C 1575.42MHz ■		L5/B2a/E5a 1176.45MHz □	



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



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Electrical Specification

Parameters	Typ.	Units	Note
Frequency	1575.42 (L1/E1)	MHz	-
VSWR	< 1.5	:1	-
Peak Gain	0.5	dBic	dBi = dBic + 3
Maximum Efficiency	31.8	%	-
Polarization	RHCP	-	(Right Hand Circular Polarization)
Nominal Impedance	50	Ω	-
Frequency Temperature Coefficient	20	ppm / °C	-

Note: All measurements were performed using a 50 x 50 mm ground plane in a free-space environment. Actual performance may vary depending on factors such as the ground plane, specific application, and surrounding environment.

Mechanical Specification

Parameter	Specification
Antenna Dimension	12.0 x 12.0 x 4.0 mm
Evaluation Board Dimension	50 x 50 mm
Mounting Type	Through Hole & Adhesive
Mounting Location	PCB Center Mounting
Material(s)	Ceramic
Weight	3.6 g

Environmental Specification

Parameter	Specification
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +105°C
Moisture Sensitivity Level	1
RoHS Compliance	Yes



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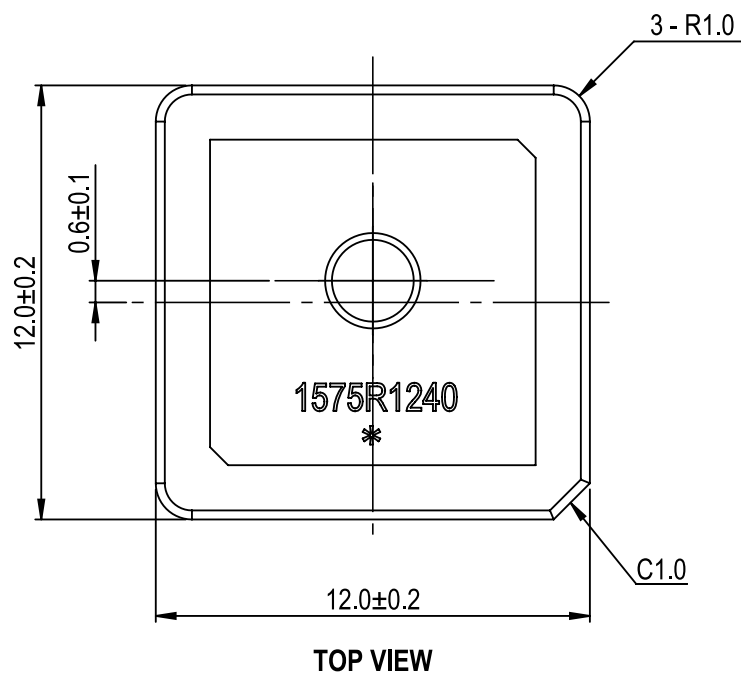
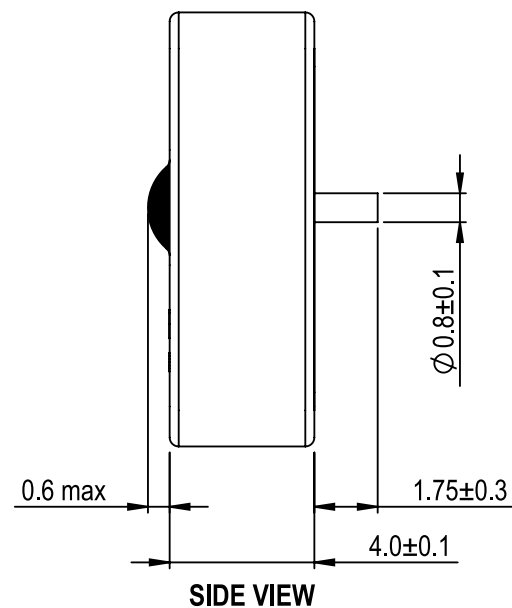
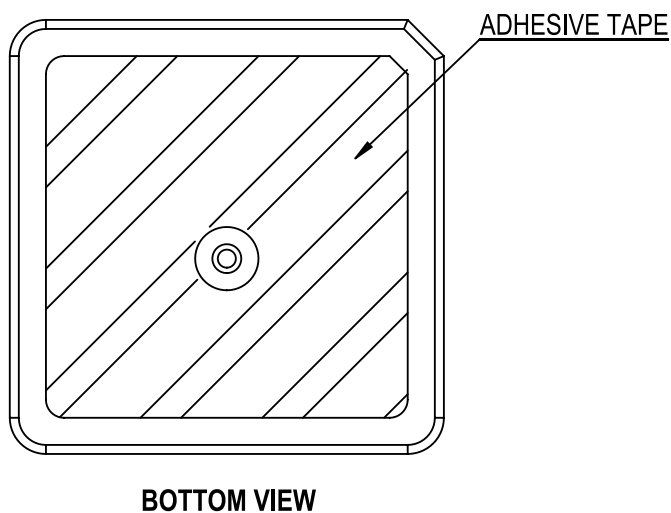


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12.0 x 12.0 x 4.0 mm
RoHS Compliant
MSL Level = 1

Product Dimensions



Unit: mm

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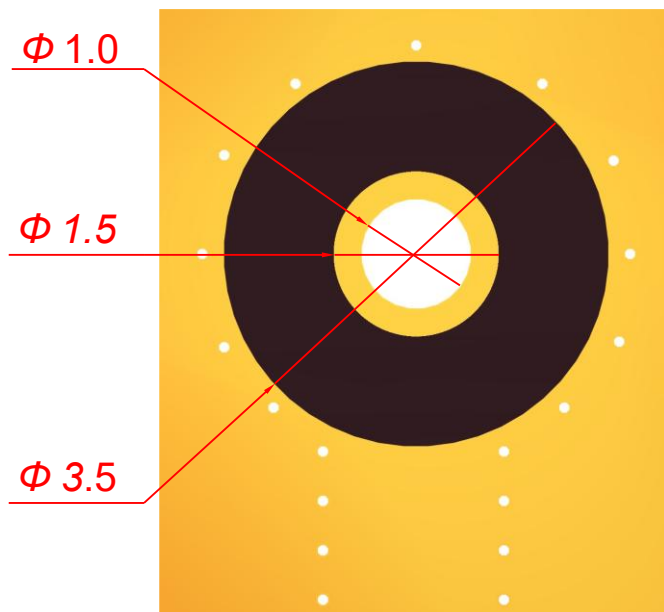
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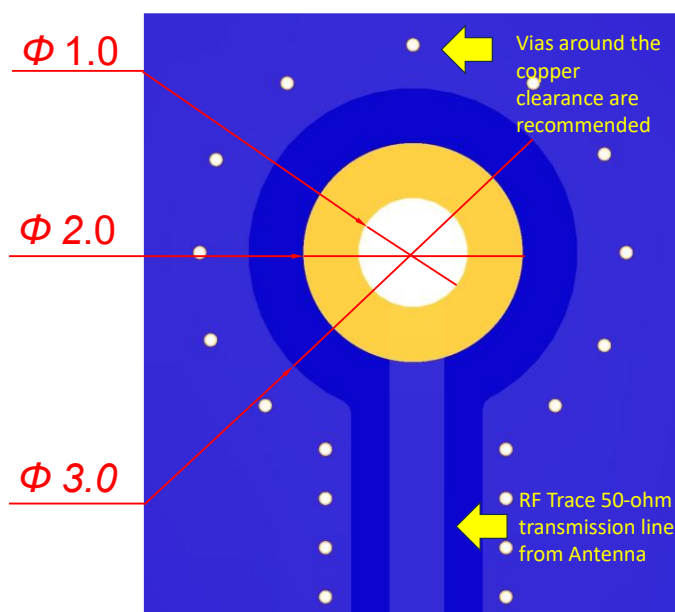
12.0 x 12.0 x 4.0 mm
RoHS Compliant
MSL Level = 1

Antenna Footprint & PCB Layout Guide

Top



Bottom



Unit: mm

Note: Antenna welding does not support reflow soldering, please use manual soldering, the recommended soldering time is $\leq 3s$, and the temperature is $390 \pm 20^\circ\text{C}$.

Transmission Line

The transmission line should be kept as short as possible and be designed to have a characteristic impedance of 50Ω. Abracon recommends using a Co-Planar Waveguide with Ground (CPWG), which dimensions can be derived by any trusted calculator, using the correct input for PCB materials and layer stack-up. calculator, using the correct input for PCB materials and layer stack-up.



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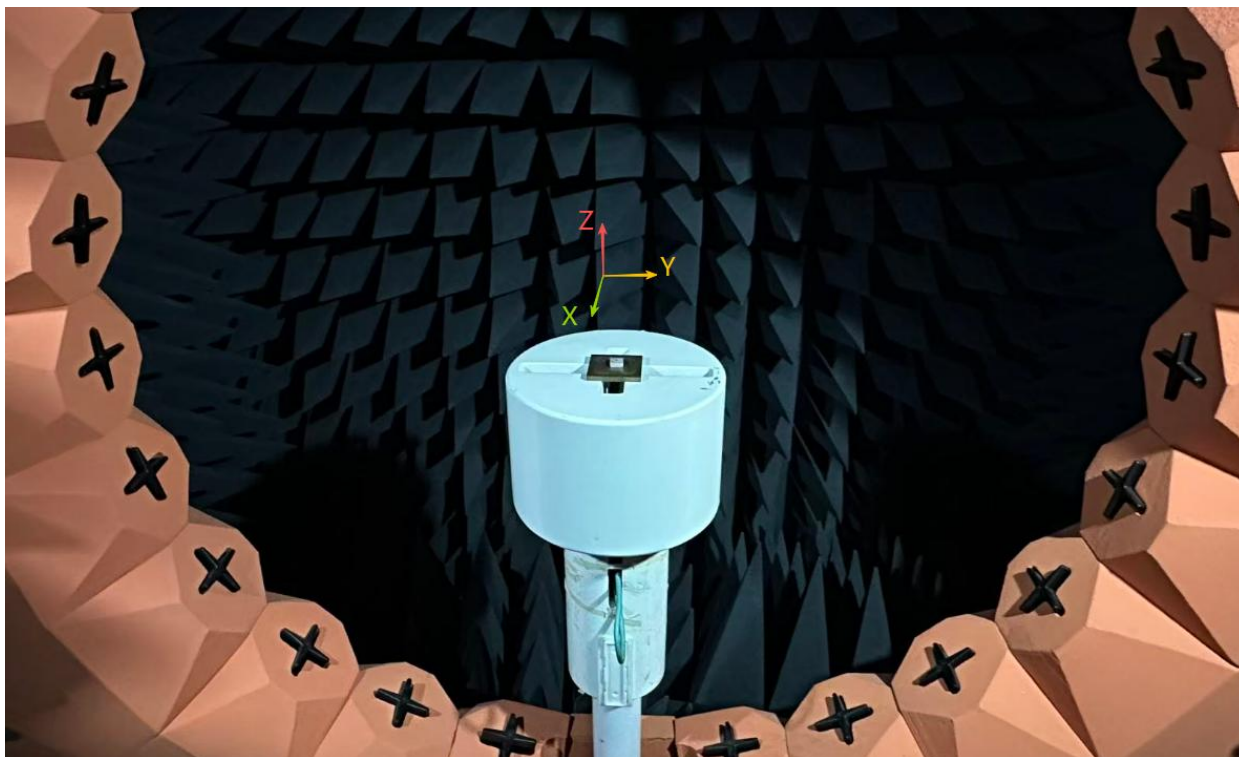


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12.0 x 12.0 x 4.0 mm
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Measurement Setup



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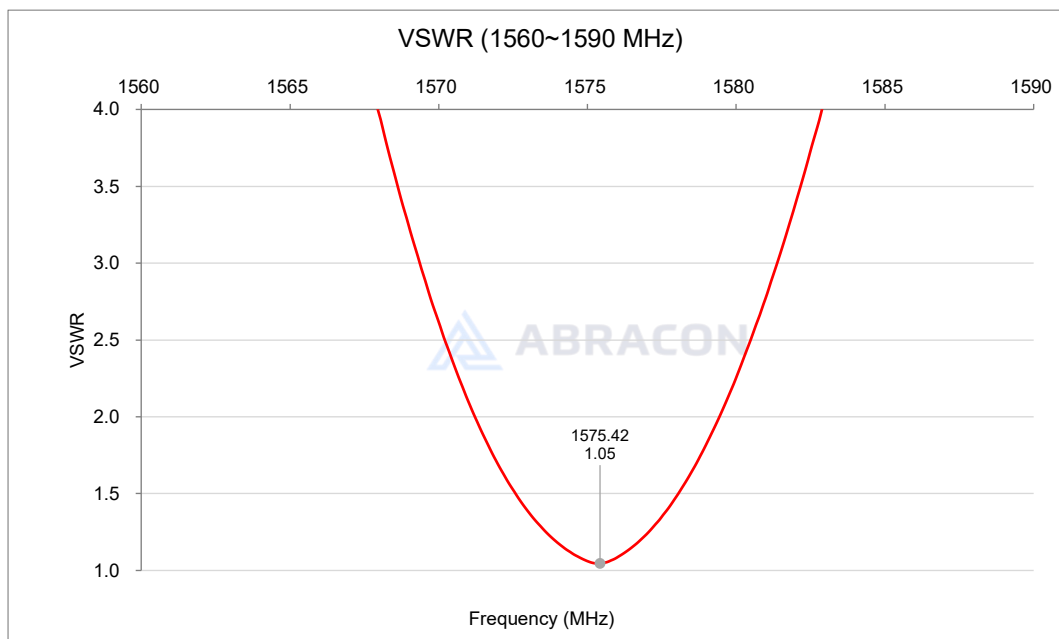
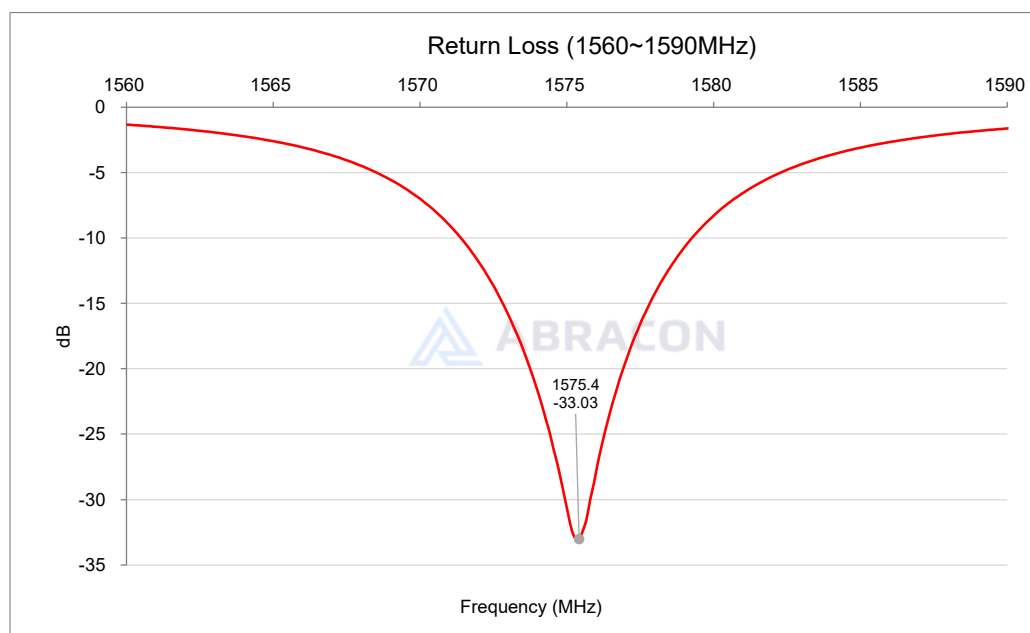


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12.0 x 12.0 x 4.0 mm
RoHS Compliant
MSL Level = 1

Reflection Characteristics – Return Loss & VSWR



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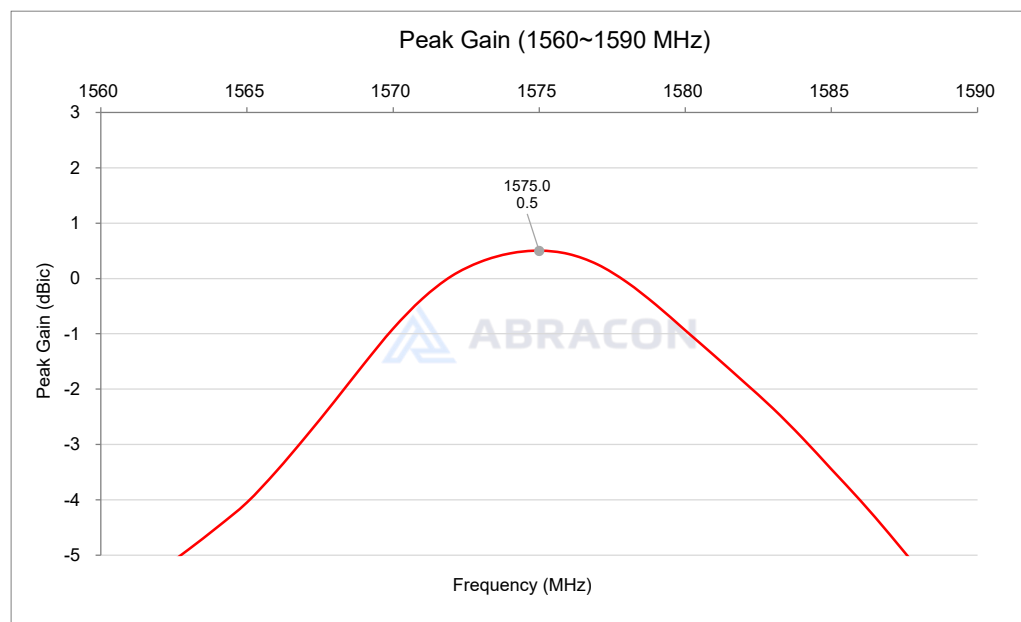


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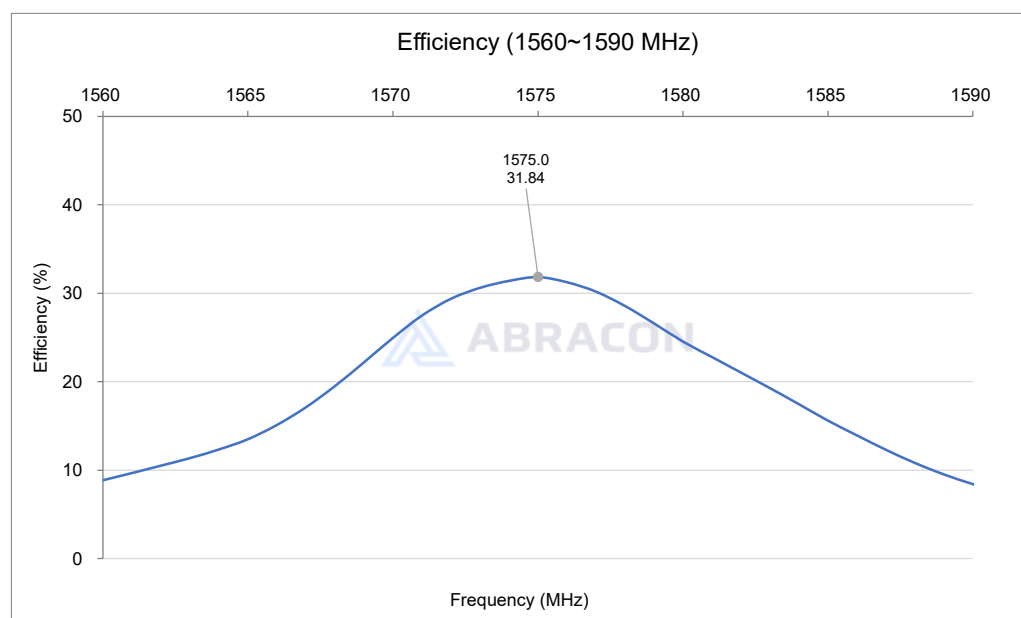
12.0 x 12.0 x 4.0 mm
RoHS Compliant
MSL Level = 1

Radiation Characteristics – Peak Gain



$\text{dBi} = \text{dBic} + 3\text{dB}$

Radiation Characteristics – Total Efficiency (%)



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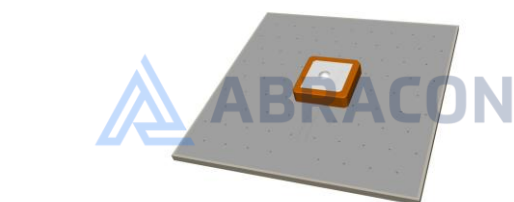
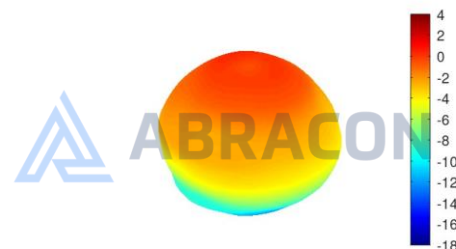
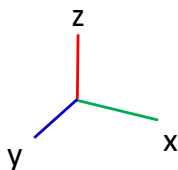
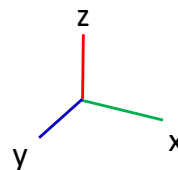
12.0 x 12.0 x 4.0 mm

RoHS Compliant

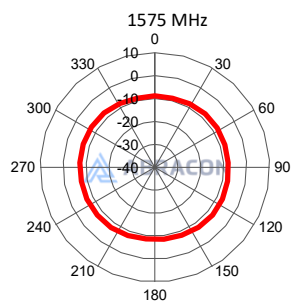
MSL Level = 1

Radiation Characteristics – 3D & 2D Pattern

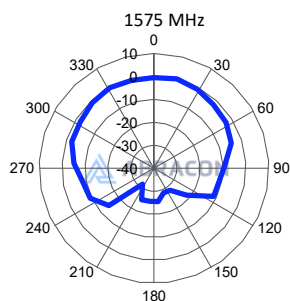
1575MHz



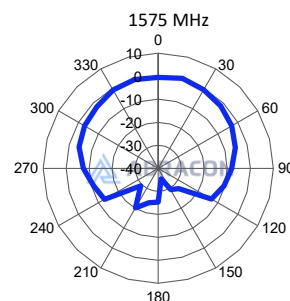
XY plane



XZ plane



YZ plane



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RoHS Compliant

MSL Level = 1

Packaging

50 pcs per tray

5 trays per inner box

1000 pcs (4 inner boxes) per carton

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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