



Miniature 2.4 GHz Vertical-Mount PCBA Antenna

Product Description

Parsec's PTA2.4-V is a miniature 2.4 GHz antenna for Bluetooth, ZigBee, and Wi-Fi with 6.4 x 15.05 x 0.15 mm (H x W x thickness) dimensions. The PTA2.4-V integrates easily with industry leading Bluetooth, ZigBee, and Wi-Fi transceiver chips with only a single direct connection typically required and is compatible with any transceiver operating from 2400 to 2483.5 MHz. The vertical orientation of the PTA2.4-V antenna minimizes the PCB area requirement. Ideal for products that require multiple antennas. Detailed product information and options are available under NDA. Patent pending.

Features

- **Frequency range: 2400 – 2483.5 MHz**
- **Omni-directional**
- **Small PCB area requirement: 2 x 16 mm**
- **Small ground plane requirement: 30 x 50 mm**
- **No external matching components needed**

Applications

- **M2M, IoT, OBD, Telematics Applications**
- **Mobile asset tracking, automotive connectivity & diagnostics, medical device connectivity**

Electrical Specifications

Parameter	Specification	Notes
Receive Frequency	2400MHz - 2440MHz – 2480 MHz	
Return Loss	-7 dB -16 dB -7 dB	Typical
Radiated Efficiency, η	50%	@ 2440 MHz. Maximum η degradation of 10% within 5 to 7 mm of human body
Peak Gain	4 dBi	@ 2440 MHz
Average Gain	0 dBi	@ 2440 MHz
Polarization	Linearly Polarized (LP)	

Notes:

1. Electrical specifications based on connection the host PCB with 30 x 75 mm solid ground plane.

Mechanical Specifications

Parameter	Specification	Notes
Dimensions	6.4 x 15.05 x 0.15 mm	H x W x thickness
Weight	0.5g	Maximum
Interfaces	Solder pads, through-hole slots	

Environmental Specifications

Parameter	Specification	Notes
Operating Temperature	-40°C to 85°C	
Storage Temperature	-40°C to 105°C	Maximum
Relative Humidity	95% RH, non-condensing at 65°C	

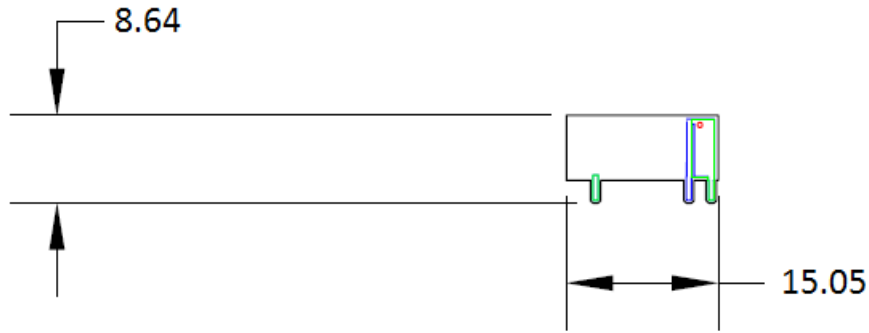


Figure 1. PTA2.4-V Outer Dimensions

Typical Performance

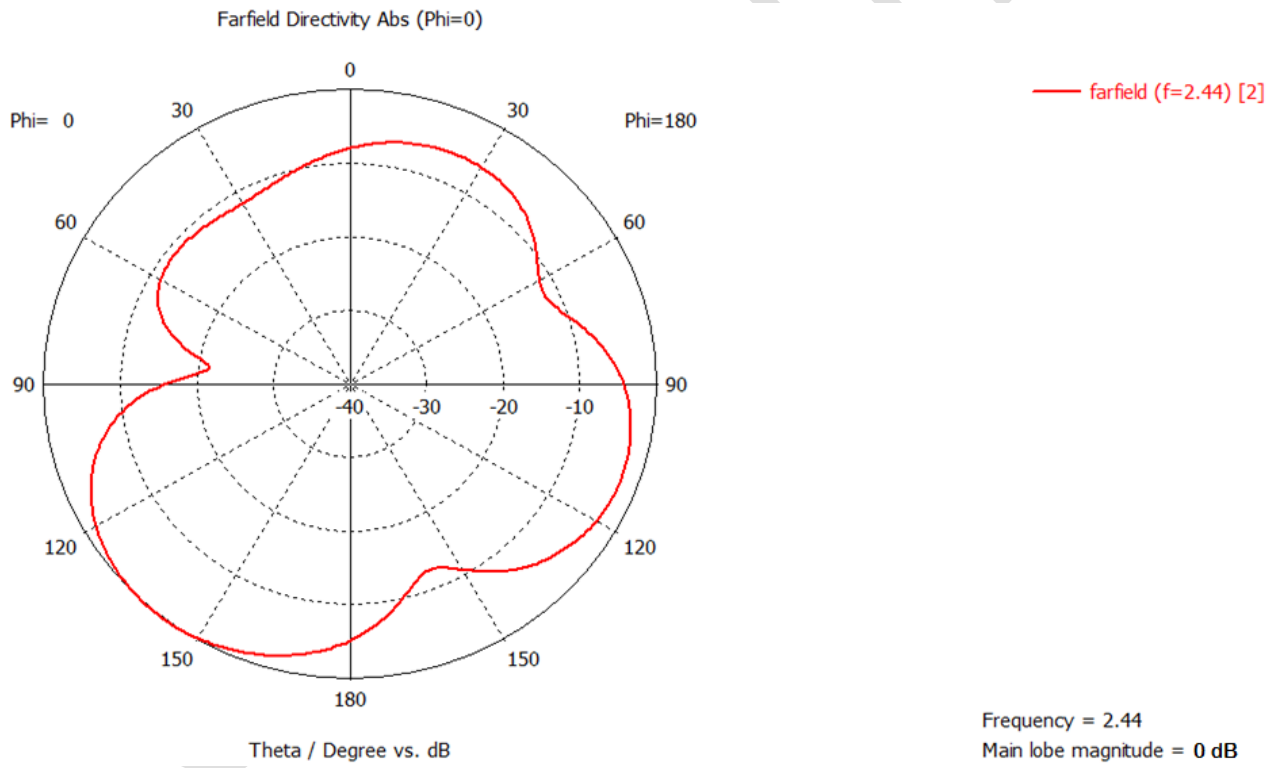


Figure 2. XZ Plane Radiation, $\phi = 0^\circ$

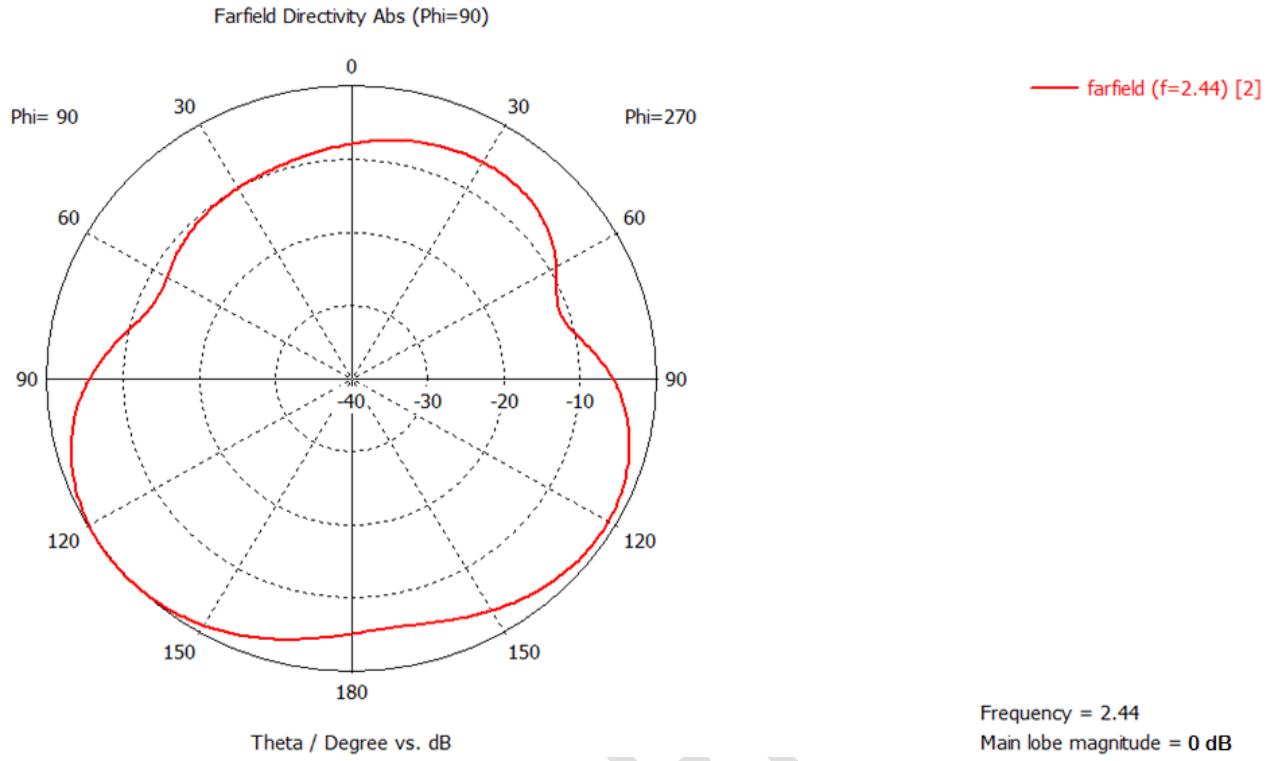


Figure 3. YZ Plane Radiation, $\phi=90^\circ$

CONFIDENTIAL

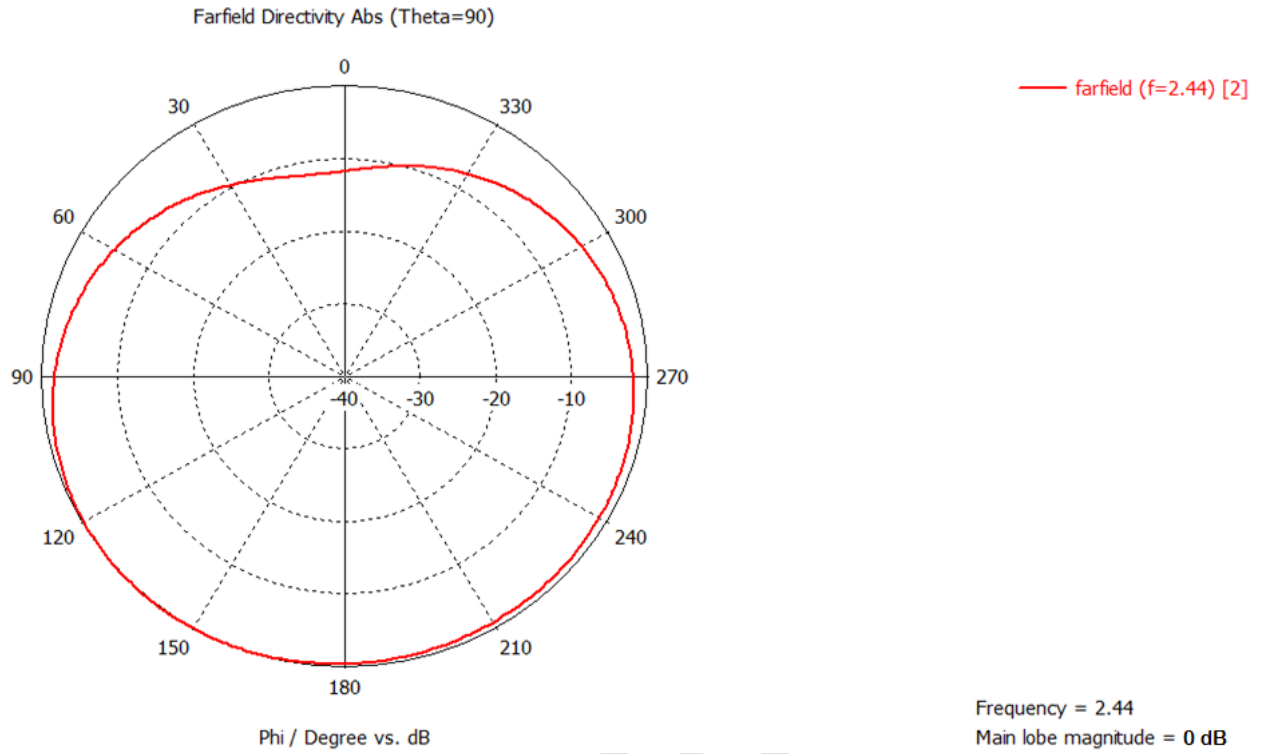


Figure 4. YZ Plane Radiation, $\theta = 90^\circ$

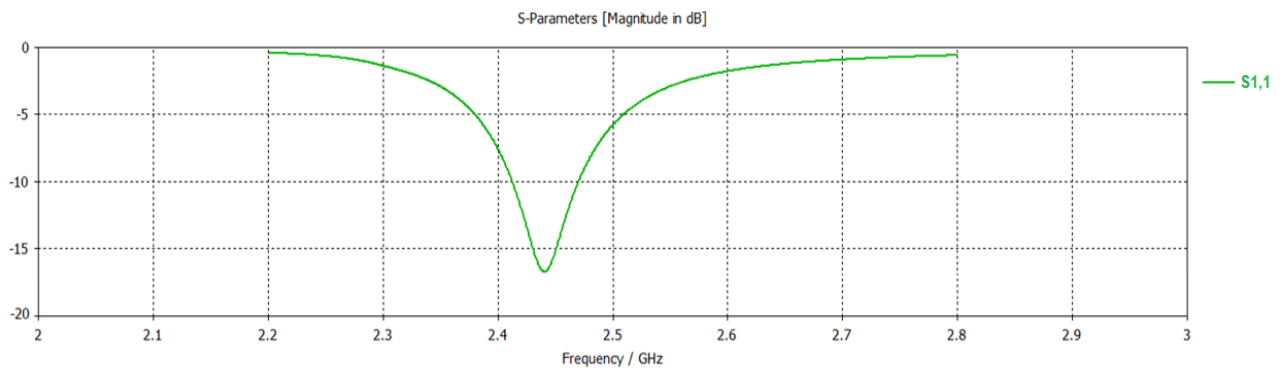


Figure 5. Return Loss vs. Frequency

Interface Dimensions

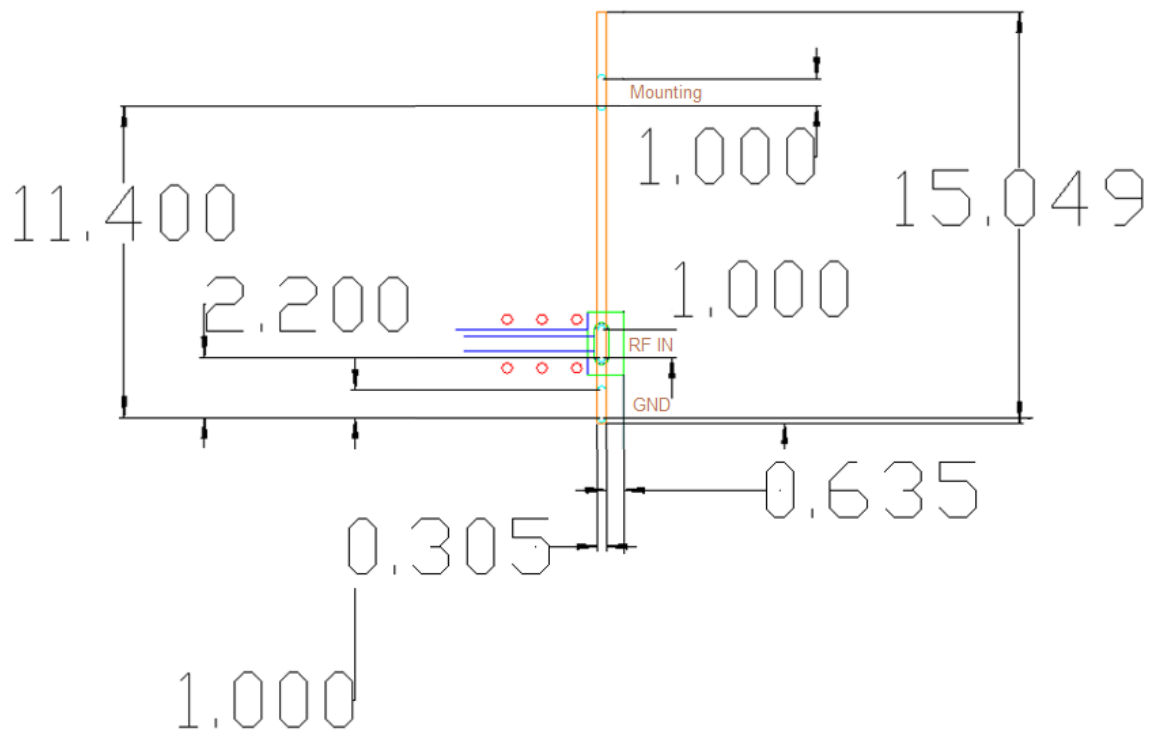


Figure 6. Recommended PCB Footprint

The PTA2.4-V, like all internal PCB mounted antennas, interacts with the PCB layout. For best performance the PTA2.4-V should be mounted near the edge of the PCB with the end of the antenna with the tab labeled “Mounting” closest to a corner and the opposite end of the antenna labeled “GND” pointing toward the center of the edge of the board. The PTA2.4-V was optimized for mounting on the short edge of a 30 mm x 75 mm PCB.

Assembly Guidelines

1.1 Solder Reflow Recommendation

This information is provided as a guideline to facilitate the successful implementation of a surface mount process customized to the user's requirements.

1.1.1 Solder Reflow Equipment

Recommendations provided are based on a 100% convection reflow oven capable of maintaining temperatures specified in Joint Industry Standard IPC/JEDEC J-STD-020E.

1.1.2 Reflow Profile

An optimized reflow profile depends on several factors such as the solder paste, board density, and type of reflow equipment used. Additional reflow information can be obtained from solder paste vendor data sheets. It is recommended that any reflow profile be characterized with a fully populated production PCB. Thermocouples can be used to record temperatures across the surface and any sensitive components on the PCB. Ensure that a thermocouple is placed in contact with the top surface of any moisture sensitive component to ensure maximum temperature is not exceeded. Maximum reflow temperature is 250°C. The temperature used to classify the MSL level appears on the MSL label on each shipping bag. PARSEC uses reflow profiles in accordance with IPC/JEDEC J-STD-020E for qualification. Maximum number of reflow cycles < 3.

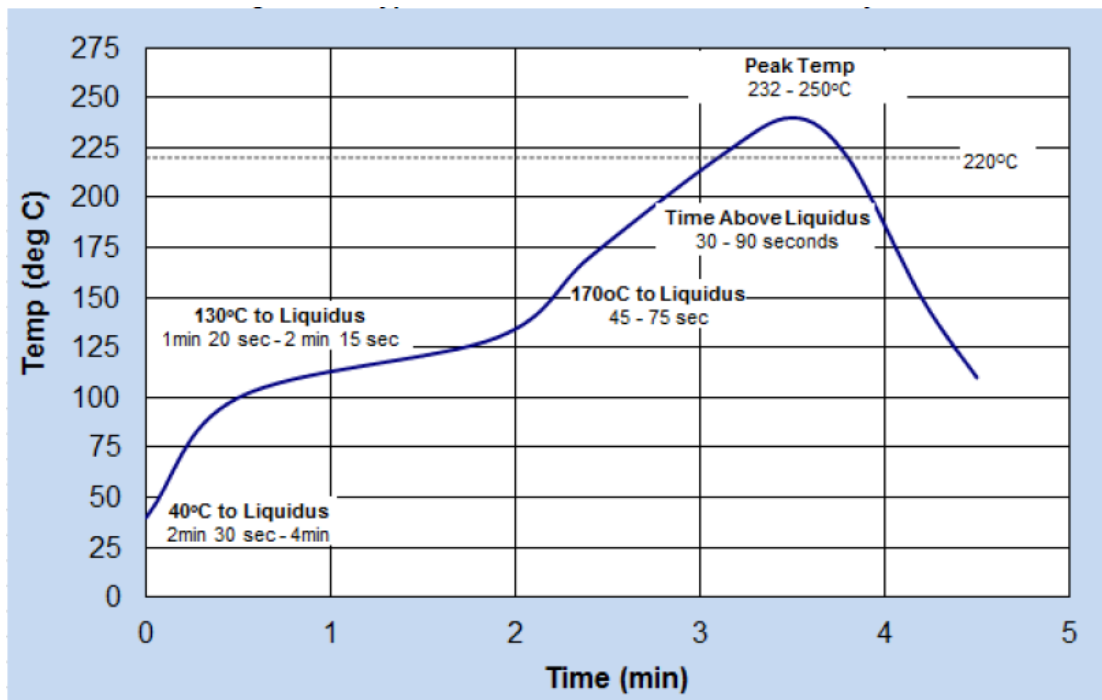
Reflow Profile Recommendation (IPC/JEDEC J-STD-020E)

Ramp-up rate	3°C/second max.
Preheat temperature	175 (±25) °C 120 seconds max.
Temperature maintained above 217°C	60-150 seconds
Time within 5°C of actual peak temperature	30 seconds
Peak temperature range	250 +0/-5°C
Ramp-down rate	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

Reflow Profile Recommendation

NOTE: An optimized reflow profile depends on several factors such as the solder paste, board density, and type of reflow equipment used.

The PARSEC recommended IPC/JEDEC J-STD-020E profile will need to be adjusted per the recommendations for specific solder paste specifications. For example, Alpha Assembly provides the following reflow profile with the Alpha OM338-T solder paste.



Typical Reflow Profile

1.1.3 Solder Paste

PARSEC recommends solder paste with the following properties: Alloy Type: Sn96.5/Ag3.0/Cu0.5 Metal Content: 88.5% Solder Particle Size: 45 μm to 25 μm A no-clean, type 3 solder paste is recommended since it is difficult to completely clean residues under low profile components after they have been soldered to the PCB. Eliminating residues reduces the possibility of solder bridging between non-connected pads. This condition is affected by time, temperature, and humidity and will not be visible during initial inspection after reflow.

1.1.4 Inspection

It is recommended that x-ray inspection be performed for any solder joints that are not visible after assembly.

The following analysis and inspection criteria have been shown to result in component attachments that pass all PARSEC package qualification procedures:

- Evaluate solder paste printing process. Measure print height, and paste slump.
- Perform visual inspection for excess solder on terminal pads before and after reflow.
- Perform x-ray to inspect for proper alignment, solder voids, solder balls, and solder bridging after reflow.
- Check for a minimum of 80% solder coverage on pad.
- There should be complete solder coverage on ground pads directly under die locations in component.
- Inspect for solder bridging or splatter between I/O pads.

Contact Information

Email: Sales@parsec-t.com

Web: www.parssec-t.com

Phone: 972-804-4600

Mail: Parsec Technologies, Inc.
820 Jupiter Rd.
Plano, Texas 75074

Ordering Information

Part Number PTA2.4-V

Packing for Shipment Partitioned trays in a protective box, qty. per box TBD.