

Datasheet

Part No: MPA.257.A

Description

WiFi Tri-Band 2.4 / 5.8 / 7.125GHz SMD Stamp Metal PIFA Antenna

Features:

Wi-Fi Tri Band SMD Stamp Metal PIFA Antenna Covering: 2.4/5.8-7/125GHz Dims: 24 x 5.4 x 4.9mm RoHS & Reach Compliant



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Changelog

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Introduction



The Taoglas MPA.257.A is a stamped metal Wi-Fi antenna for various Bluetooth and Wi-Fi applications. Engineered to cover 2.4, 5.8 and 7.125GHz bands, the antenna is suitable for Wi-Fi 6/7 applications allowing you to future proof your device design. The high-performance antenna, supplied on tape and reel, is designed to be mounted via SMD to the device PCB. The antenna is durable, and its robust construction makes it more resistant to physical damage in comparison to other antennas. The metals used in Taoglas' stamped antennas are recyclable, making them a more sustainable choice compared to other materials like plastics or composites.

The lightweight MPA.257.A has a compact form factor of just 24.5 x 4.9 x 5.9mm, making it suitable for modern electronic devices that require a small, efficient antenna design. The MPA.257.A requires a small keep out area of allowing it to be used where other antennas cannot. Many competitor products require large keep out areas and several matching components on much larger ground planes to operate with similar performance.

Typical applications that the MPA.257.A is suitable for include:

- Handheld Wi-Fi devices
- Smart Home and Office Automation
- Entertainment Systems with 4K / 8K Streaming, VR and AR
- Keyless entry systems and Access Control Systems
- Smart Telemedicine and Healthcare
- Industrial Automation and Predictive Maintenance Systems

Taoglas high-performance stamped metal antennas can be specifically tuned to customer-specific device environments, subject to NRE and MOQ. <u>Contact</u> your regional Taoglas customer support team to request these services or additional support to integrate and test this antenna's performance in your device.

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Specification

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| | | | Wi-F | i Electrical | | | | |
|--------------|--------------------|----------------|----------------------|-----------------|-----------|--------------|----------------------|------------------|
| Band | Frequency (MHz) | Efficiency (%) | Average Gain (dB) | Peak Gain (dBi) | Impedance | Polarization | Radiation Pattern | Max. input power |
| Wi-Fi - 2GHz | 2400-2500 | 60.1 | -2.21 | 1.50 | | | | |
| Wi-Fi - 5GHz | 5150-5850 | 65.0 | -1.87 | 3.78 | 50 Ω | Linear | Omni | 2W |
| Wi-Fi - 6GHz | 5925-7125 | 70.6 | -1.51 | 4.41 | | | | |

| | Mechanical |
|--------------|------------------|
| Dimensions | 24 x 5.4 x 4.9mm |
| Antenna Type | SMD |
| Material | Tin Plated |

| | Environmental |
|-----------------------|----------------------------|
| Operation Temperature | -40°C to 85°C |
| Storage Temperature | -40°C to 85°C |
| Relative Humidity | Non-condensing 65°C 95% RH |



Mechanical Drawing







| 7 | 7 | | |
|----|---|---|---|
| 74 | | 4 | |
| | | | L |
| | | | |

Packaging

1000pcs per reel 1pcs humidity indicator card 2pcs 3g desiccant



1 pcs per vacuum bag MSL label Cation label



1000pcs per box Box dimensions: 335 x 335 x 65mm Weight: 1.23Kg



4000pcs per carton Carton dimensions: 370 x 360 x 275mm Weight: 5.75Kg





Antenna Integration Guide

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The following is an example on how to integrate the MPA.257.A into a design. This antenna has 2 pins, where one pin is used for the RF Feed. Taoglas recommends using a minimum of 50x50mm ground plane (PCB) to ensure optimal performance.



Top view of PCB

Please find the Integration files in Altium, 2D formats and the 3D model for the MPA.257.A here: <u>https://www.taoglas.com/product/mpa-257-a-wi-fi-tri-band-2-4-5-8-7-125ghz-smd-stamp-metal-pifa-antenna/</u>



5.1 Schematic Symbol and Pin Definitions



The circuit symbol for the MPA.257.A is shown below. The antenna has 2 pins as indicated below.

| Pin | Description |
|-----|-------------|
| 1 | RF Feed |
| 2 | GND |



Above is a schematic symbol of MPA.257.A and a table of the pin definitions.



5.2 Schematic Layout

Matching components with the MPA.257.A are required for the antenna to have optimal performance in the spaces specified in the schematic below. Additional matching components may be necessary for your device, Taoglas recommends incorporating extra component footprints, forming a "Pi" network, for the MPA.257.A.



| Designator | Туре | Value | Manufacturer | Manufacturer Part Number |
|------------|----------|--------|--------------|-----------------------------|
| L1 | Inductor | 27nH | TDK | MLK1005S27NJT000 |
| R1 | Resistor | 0 Ohms | YAGEO | RC0402JR-070RL |



5.3 Antenna Footprint



5.4 Top Solder Paste





5.5 Top Solder Mask





5.6 Antenna Integration

The MPA.257.A should be placed in the centre, as close to the edge on the long side of the PCB as possible, to take advantage of the ground plane. The RF trace must maintain a 50 Ohm transmission line. A "Pi" Matching Network is recommended for the RF transmission line, the values and components for the matching circuit will depend on the tuning needed. Ground vias should be placed around the RF trace.





MPA.257.A antenna mounted on a PCB, showing transmission lines and integration notes.



5.7 Final Integration

The top side image shown below highlights the antenna transmission line. Taoglas recommends using a minimum of 50x50mm ground plane (PCB) to ensure optimal performance.



Top Side (MPA.257.A placement on 50x50mm PCB)



Bottom Side (MPA.257.A placement on 50x50mm PCB)







6.





. 5500

Frequency (MHz)

-9

-10 -10 2000











7.





Chamber Test Set-up

























Changelog for the datashee

SPE-24-8-249 – MPA.257.A

| Revision: B (Current | Version) |
|----------------------|-------------------------------------------------------------|
| Date: | 2025-01-29 |
| Notes: | Adding Antenna Integration Guide and packaging information. |
| Author: | Gary West |

Previous Revisions

| Revision: A (Initial F | Release) |
|------------------------|---------------------------|
| Date: | 2024-10-03 |
| Notes: | Initial Datasheet Release |
| Author: | Gary West |

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