TAOGLAS®


Datasheet

# Terrablast 25mm Patch Antenna

**Part No:**
WTSP.2400.25.4.A.40

**Description:**

Terrablast 25*25*4mm 2.4GHz Pin-Mount Patch Antenna

**Features:**

- Low profile – 4mm Height
- Pin Type Terrablast Patch Antenna
- 5.6g Ultra-Lightweight
- Peak Gain: 4.9dBi
- Efficiency: >60%
- Dimensions 25mm x 25mm x 4mm
- Ultra Impact Resistant
- Right Hand Circularly Polarized
- Manufactured and Tested in an TS16949 Certified Facility
- RoHS & REACH compliant

# 1. Introduction


This Terrablast WTSP.2400 2.4GHz Patch Antenna is a revolutionary antenna developed to meet the needs of UAV and Automotive industries. The right-hand circular polarized design is useful for constantly moving mobile applications where the orientation to the transmitter or receiver changes, ensuring a drop of only approx. 3dB from maximum performance compared to potential drops of 60dB or more if using a linear polarized solution. This substantially increases the reliability of the wireless connection. This patent pending antenna uses a new class of Taoglas polymer dielectric material which makes it more than 30% lighter than traditional ceramic antenna technologies.

Compared to using a traditional ceramic patch antenna of the same size, this Terrablast patch antenna weighs just 5.6g compared to an equivalent ceramic patch of 8.5g. The Terrablast material has ultra-impact resistant characteristics designed to withstand drops, falls and impacts making it ideal for applications such as UAV's, where the antenna's mechanical robustness following potential impacts is critical.

This antenna works well without modifications in most environments but can be tuned and further optimized to different ground-planes and enclosures if required. Custom antenna modifications, such as pin length modifications, are subject to possible NRE and minimum order quantity.

All Terrablast antennas undergo rigorous temperature, vibration and impact tests and exceed the highest ISO16750 standards for Road Vehicles—Environmental Conditions and Electrical testing for Electrical and Electronic equipment. Note the antenna is not suitable for SMD reflow processes. Recommendations for soldering are in Section 7.

For support to test and integrate Taoglas Terrablast technology please contact your regional Taoglas customer support team.

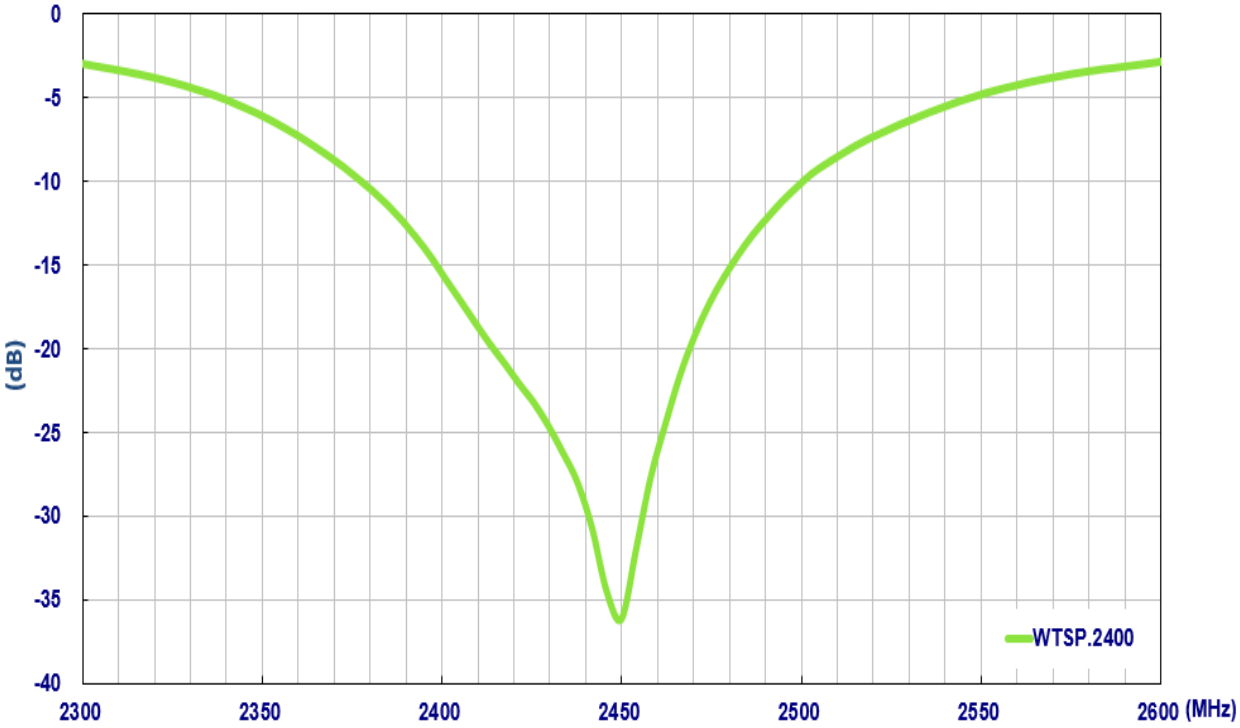
## 2. Specifications

| Electrical | |
|---|---|
| Frequency | 2400-2500MHz |
| Efficiency | 62.07% |
| Average Gain | -2.07dB |
| Peak Gain | 4.93dBi |
| Axial Ratio | ~ 4 @ Zenith |
| Polarization | RHCP |
| Impedance | 50 ohms |
| **Mechanical** | |
| Patch Dimension | 25mm x 25mm x 4mm |
| Pin Diameter | 0.9mm |
| Pin Length | 2.4mm |
| Weight | 5.6g |
| **Environmental** | |
| Storage Temperature | -40°C to 85°C |
| Operation Temperature | -40°C to 85°C |
| Humidity | Non-Condensing 65°C 95% RH |
| **Reliability Test** | |
| Low Temperature | -40°C, 24hrs |
| High Temperature | +85°C, 48hrs |
| Temperature Cycling | ISO16750 standard, total 240hrs |
| Temperature Step | ISO16750 standard, total 300mins |
| Drop Test | 12m passed |
| Shock | 10 shocks/ axis, 6 faces |
| Vibration | ISO16750 standard, 8 hours / axis |
| Pin pull force | >5kg-f |

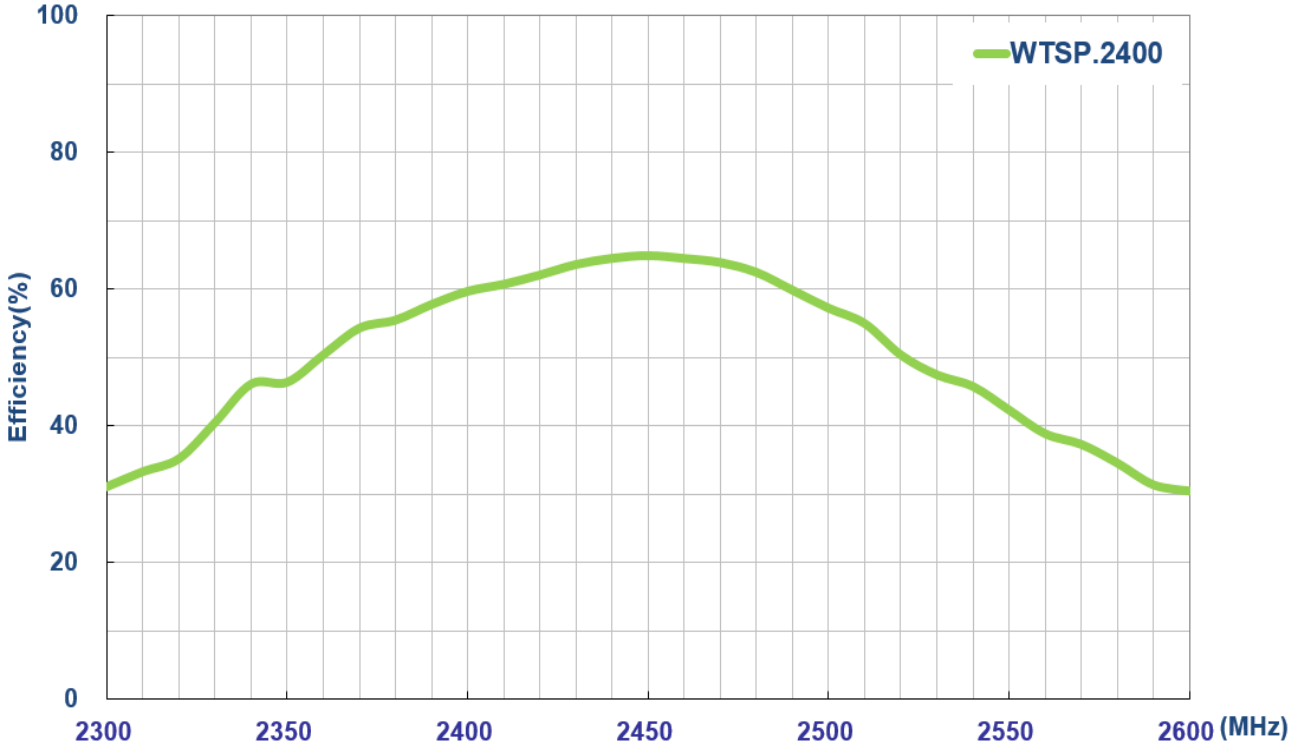
* Antenna properties were measured with the antenna mounted on 70*70mm Ground Plane

# 3. Antenna Characteristics

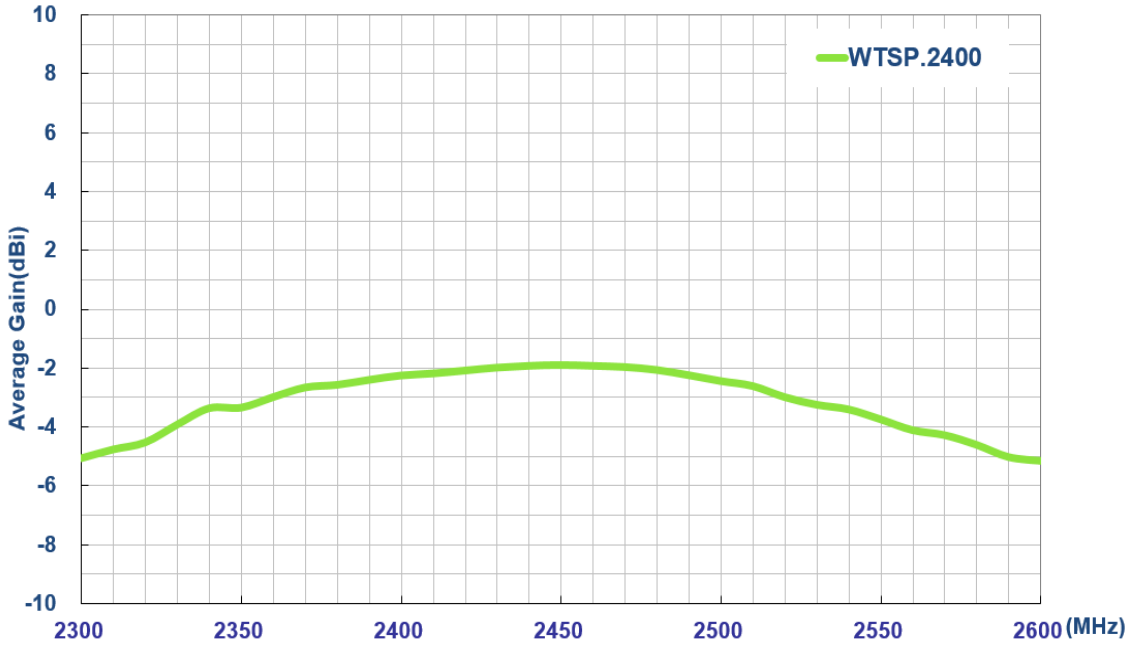
## 3.1 Return Loss



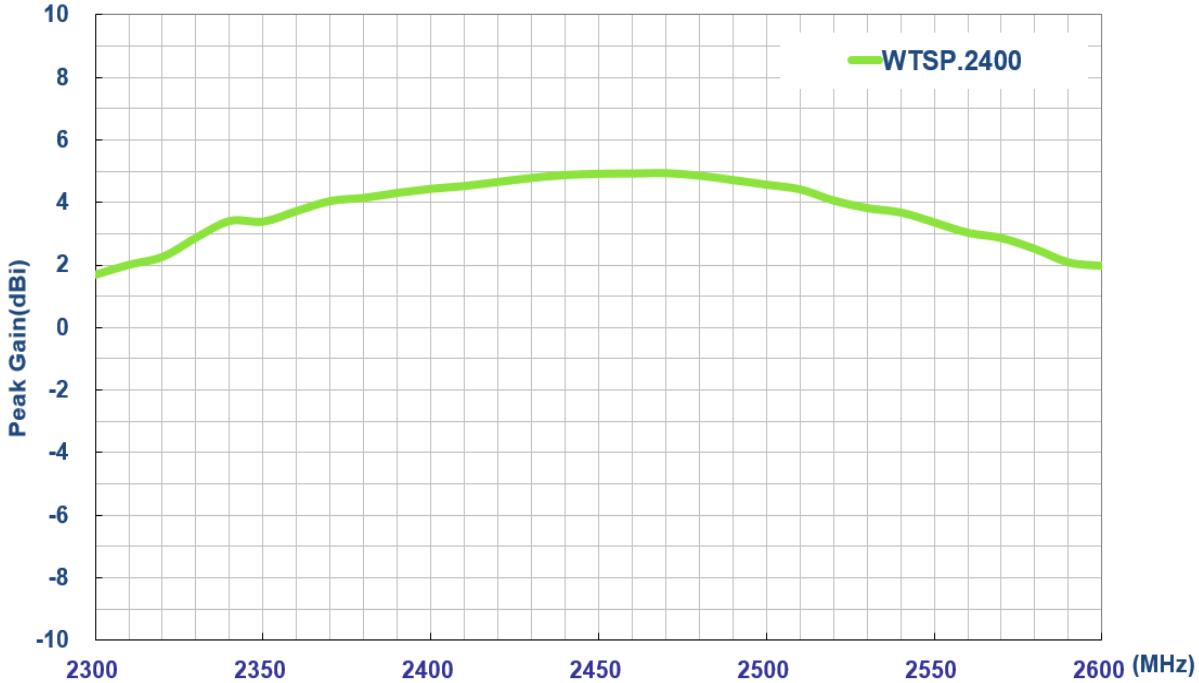

## 3.2 Efficiency



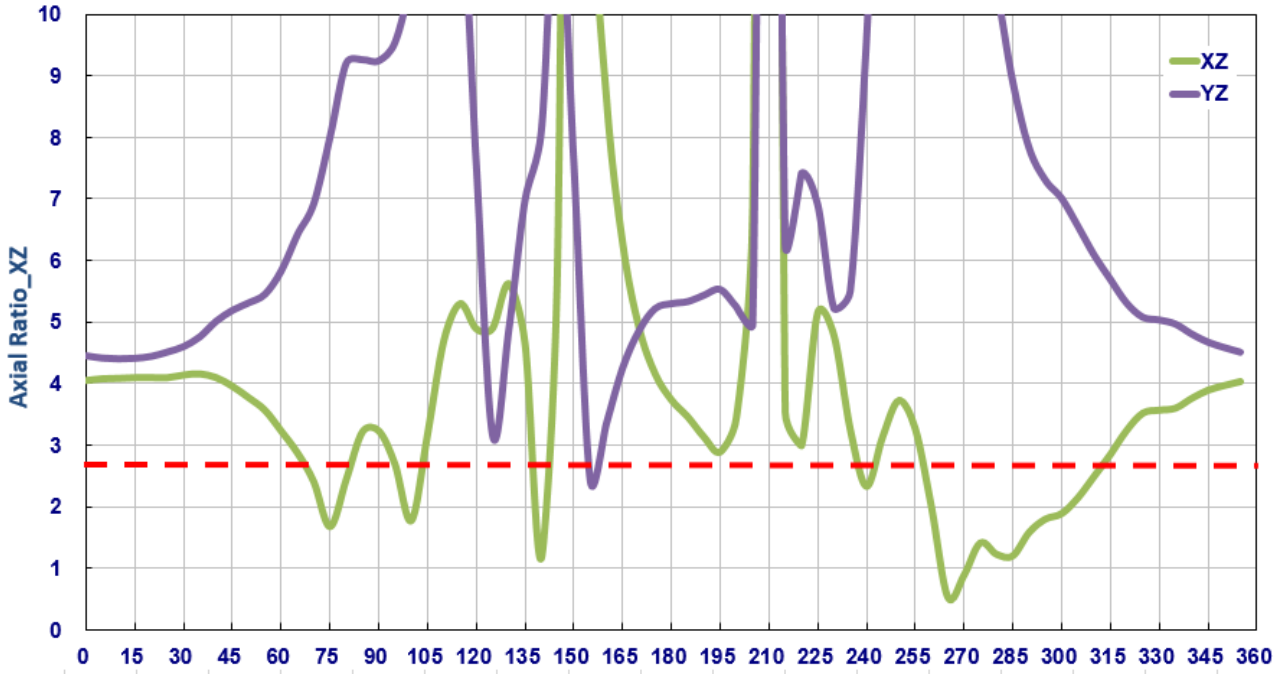
## 3.3 Average Gain




## 3.4 Peak Gain

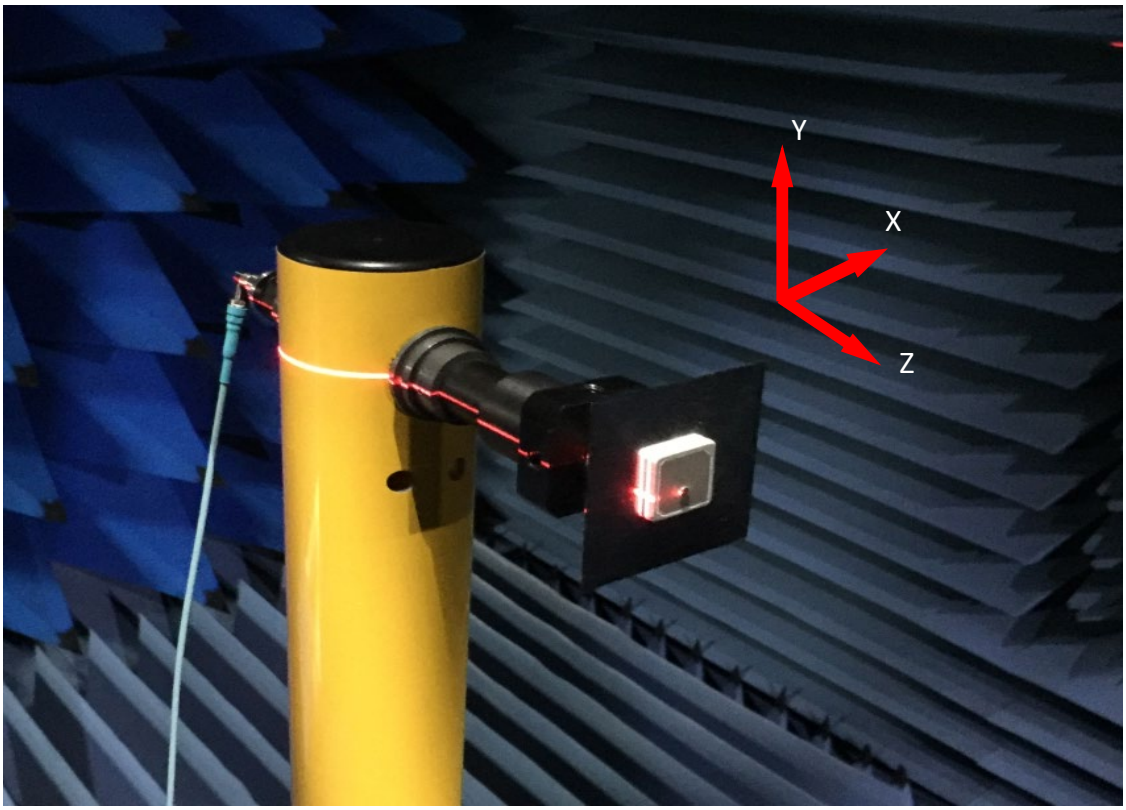


## 3.5 Axial Ratio



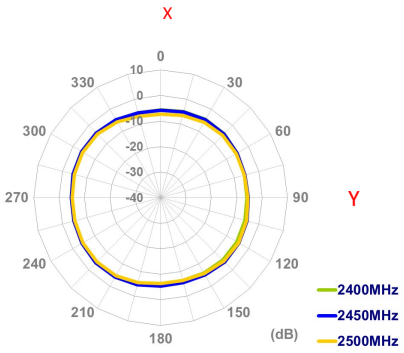
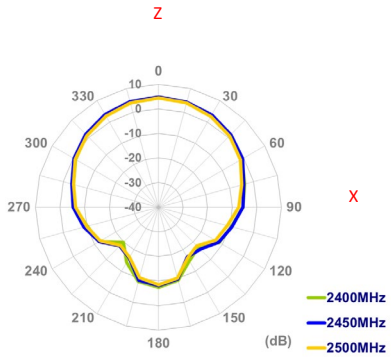
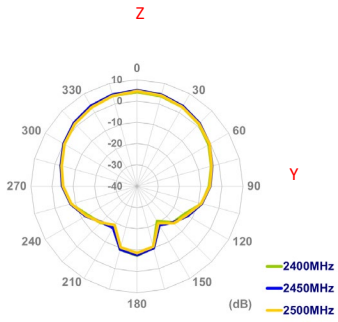
# 4. Radiation Patterns

## 4.1 Test Setup

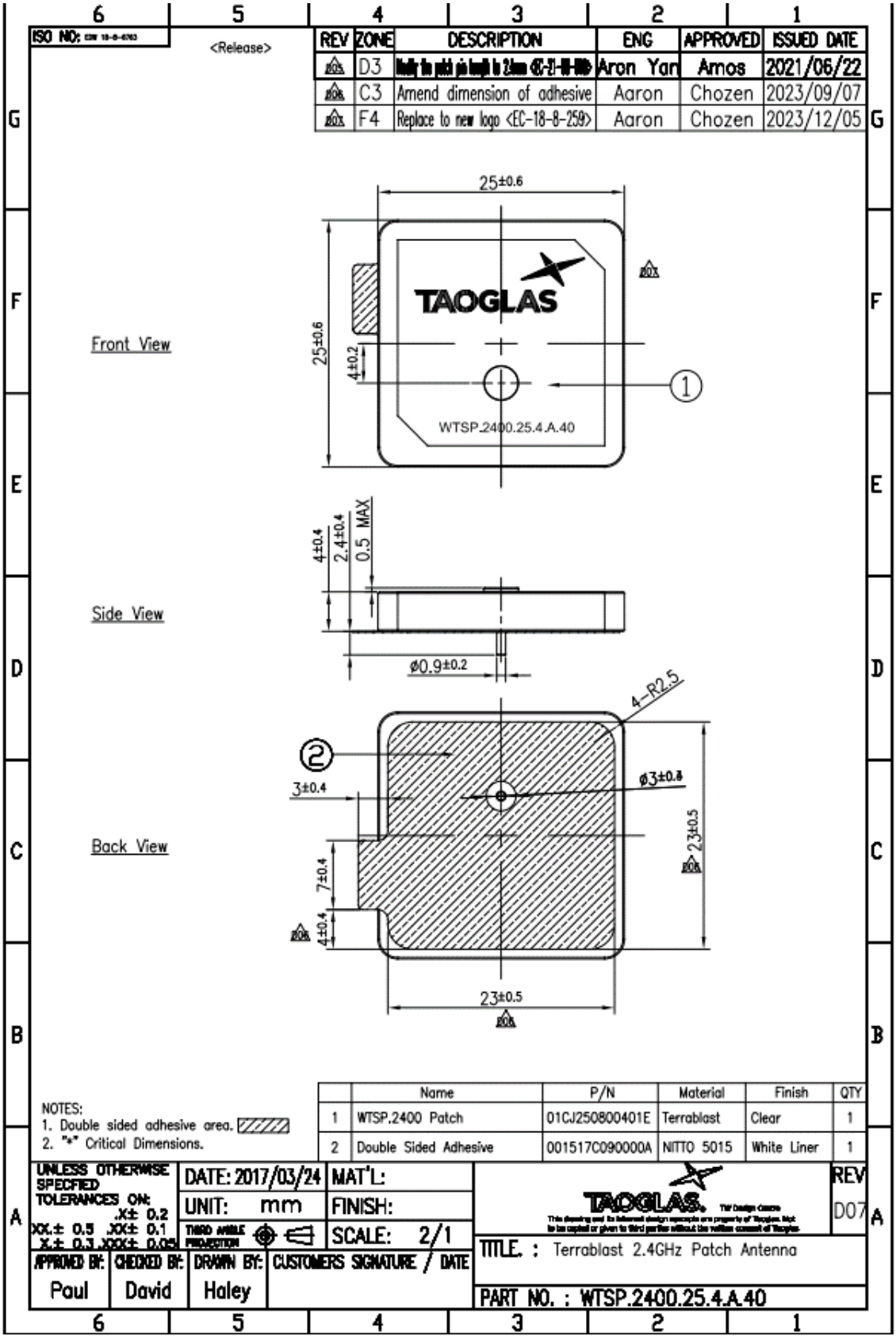



Tested on a 70x70mm ground plane

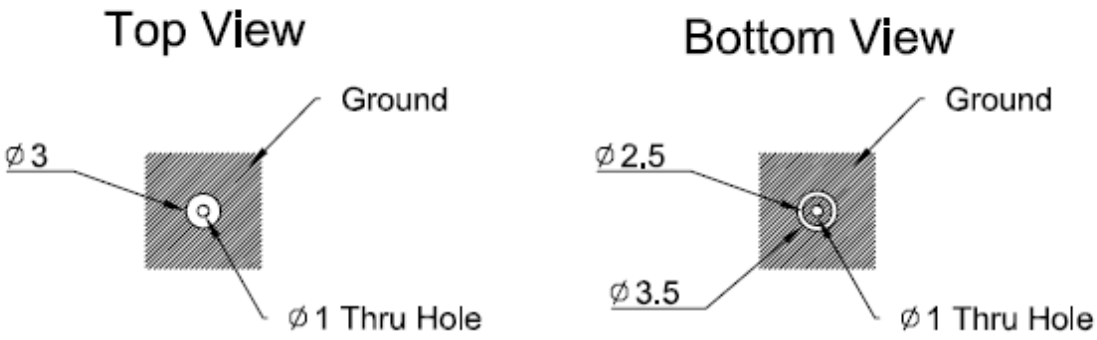
## 4.2 2D Radiation Patterns

| XY Plane | XZ Plane | YZ Plane |
|---|---|---|
|  |  |  |

# 5. Mechanical Drawing (Units: mm)



# 6. Footprint

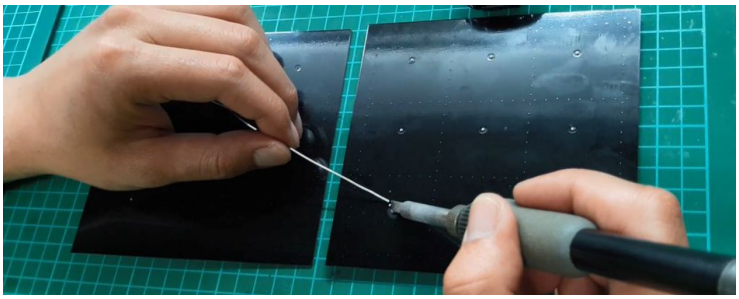



**Tolerance: +/- 0.20**
**Unit:mm**

# 7. Soldering Method Recommendation

## 7.1 Manual Hand Soldering

Soldering Temperature: 360-380°C
Soldering Duration: 3~4 seconds



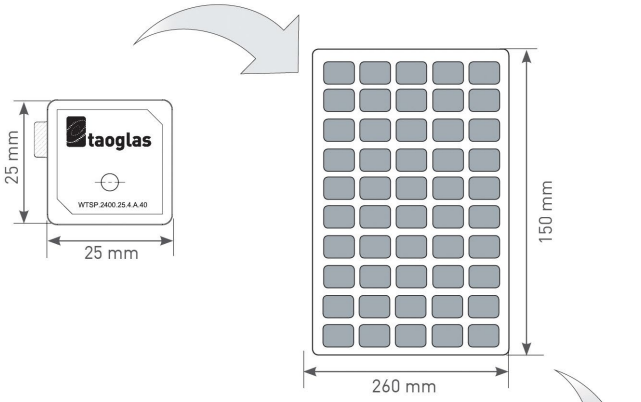
## 7.2 Automated Ferrochrome Soldering Machine

Soldering Temperature: 360-380°C
Soldering Duration: 3~4 seconds

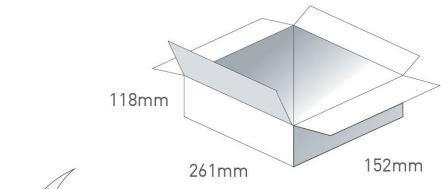
*Please note that this process will require a one-time fixture to be made for each PCB design, Example as per image above.*

# 8. Packaging

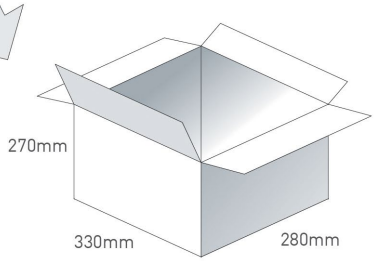
50 pcs WTSP.2400.25.4.40 per tray
Tray Dimensions - 260*150*30mm
Weight - 320g



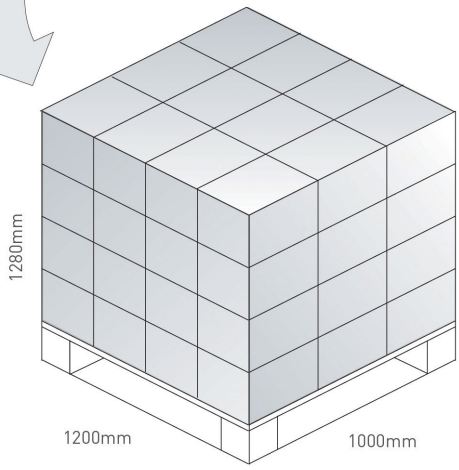

4 trays / 200 pcs WTSP.2400.25.4.40 per box
Box Dimensions - 261*152*118
Weight - 1.45Kg




800 pcs WTSP.2400.25.4.40 per Carton
Carton Dimensions - 330*280*270mm
Weight - 6.2kg




Pallet Dimensions 1200*1000*1280mm
48 Cartons per Pallet
12 Cartons per layer
4 Layers



Changelog for the datasheet

## SPE-18-8-016-B - WTSP.2400.25.4.A.40

| Revision: C (Current Version) | |
|---|---|
| Date: | 2024-05-14 |
| Changes: | Updated Mechanical Drawing |
| Changes Made by: | Conor McGrath |

**Previous Revisions**

| Revision: B | |
|---|---|
| Date: | 2020-12-04 |
| Changes: | Amending the soldering instructions and updating the datasheet to new format. |
| Changes Made by: | Gary West |

| Revision: A | |
|---|---|
| Date: | 2017-03-08 |
| Changes: | First Release |
| Changes Made by: | AW |

TAOGLAS®

www.taoglas.com