



# TAOGLAS®



# Datasheet

## Taoglas Reach Series - PCS.66.A

### Description:

Reach Low Profile Wideband 5G/4G SMD Antenna

### Features:

- Patent Pending Innovative Design
- High Efficiency Wideband Antenna, Covering 600 to 6000 MHz
- Supporting 5G FR1 Bands
- 600 MHz 5G/4G Band 71 Support
- Backwards Compatible with all 3G/2G applications
- Surface Mount Distribution – Supplied on Tape & Reel
- Dimensions: 32 x 25 x 1.6 mm
- RoHS & REACH Compliant

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# 1. Introduction



The Taoglas Reach series, are a revolutionary, low profile, small footprint, range of patent pending SMD mount PCB wide-band antennas. The PCS.66.A has been designed to cover all 5G bands, including all sub-6GHz deployments across the 600MHz to 6000MHz spectrum on a very small footprint of just 32 x 25mm. It also covers 3G and 2G bands to allow for fall-back when 5G/4G is not available.

The patent pending design uses printed circuit board material and innovative design techniques to deliver the highest efficiencies at all bands when mounted on the device's main PCB. The PCS.66.A is suitable for lower cost 5G/4G applications, especially IoT projects requiring wide bandwidth and comes supplied on tape and reel to allow it be mounted via 'pick & place' onto the PCB.

If tuning is required, it can also be tuned specifically depending on device environment. If PCB space is an issue, the Reach PCS.86, covering 791 – 6000MHz, could be an option with an even smaller footprint of just 32 x 16mm. Contact your local Taoglas customer support team for advice on integrating the Reach into your device.

## 1.1 Key Advantages

### 1. Highest efficiency in small footprint

A comparative antenna to the Reach, for example, metal/ceramic/FPC, would have much-reduced efficiency in this configuration due to their high substrate loss at high frequencies. Very high efficiency antennas are critical to 4G and 5G devices ability to deliver the stated data-speed rates of systems such as 5G and 4G.

### 2. Low profile

Many antennas require a large keep-out area in addition to the mechanical size to work correctly, which limits the usable PCB space. The Reach requires only .3 mm of additional keep-out, allowing board designers to maximize their PCB space.

### 3. Adaptable

The high radiation efficiency of the Reach over its entire operating bandwidth means that the total efficiency is only limited by the impedance mismatch loss. As a result, this antenna can be optimized via a matching network to the specific bands needed for any application. Efficiencies as high as 90% have been measured when the return loss is very high (-15 dB or more).

### 4. More resistant to detuning compared to other antenna integrations

If tuning is required it can be tuned for the device environment using a matching circuit, or other techniques on the main PCB itself. There is no need for new tooling, thereby saving money if customization is required.

### 5. Surface Mount Distribution (SMD)

Direct mount, 'on-board' antennas save on labor, cable and connector costs, leads to higher integration yield rates and reduces losses in transmission.

### 6. Minimum Transmission and Reception Losses

These are kept to an absolute minimum resulting in much improved OTA (over the air), i.e. TRP (Total Radiated Power) / TIS (Total Isotropic Radiation), device performance compared to similar efficiency cable and connector antenna solutions. This means it is an ideal antenna to be used for devices that need to pass for example USA carrier network approvals.

## 2. Specifications

| Electrical                |                            |                     |                   |           |            |           |                     |            |
|---------------------------|----------------------------|---------------------|-------------------|-----------|------------|-----------|---------------------|------------|
| Standard                  | 5G NR Band 71/LTE/GSM/CDMA | 5G NR Band 74,75,76 | LTE/GSM/HSPA/CDMA | UMTS/HSPA | Wi-Fi 2400 | LTE 2600  | 5G NR Band 77,78,79 | Wi-Fi 5800 |
| Operation Frequency (MHz) | 617-960                    | 1427-1518           | 1710-1990         | 1920-2170 | 2400-2500  | 2500-2700 | 3300-5000           | 5150-5850  |
| Peak Gain                 | 1.3 dBi                    | 2.5 dBi             | 3.2 dBi           | 3.5 dBi   | 3.5 dBi    | 5.7 dBi   | 5.5 dBi             | 3.5 dBi    |
| Average Gain              | -2.6 dB                    | -3.3 dB             | -1.6 dB           | -1.7 dB   | -2 dB      | -1.5 dB   | -1 dB               | -3.4 dB    |
| Efficiency                | 55%                        | 46%                 | 69%               | 68%       | 63%        | 70%       | 80%                 | 45%        |
| VSWR                      | <3.0:1                     |                     |                   |           |            |           |                     |            |
| Impedance                 | 50Ω                        |                     |                   |           |            |           |                     |            |
| Polarization              | Linear                     |                     |                   |           |            |           |                     |            |
| Radiation Properties      | Omni-directional           |                     |                   |           |            |           |                     |            |
| Max Input Power           | 5 W                        |                     |                   |           |            |           |                     |            |

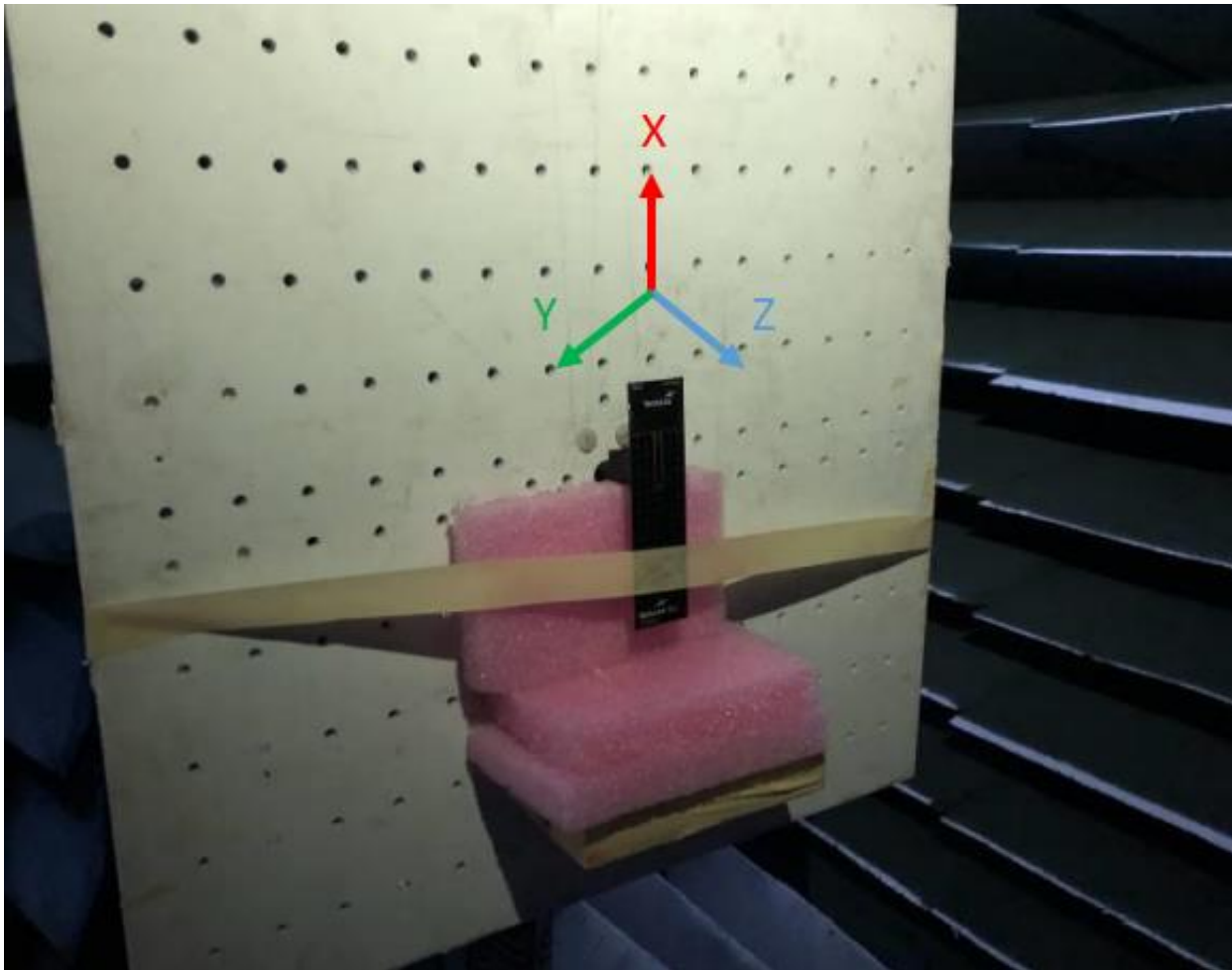
The Reach PCS.66.A antenna performance was measured on a 107x32 ground plane

| Mechanical    |                     |
|---------------|---------------------|
| Dimensions    | 32mm x 25mm x 1.6mm |
| Material      | PCB                 |
| Termination   | Solder Pad          |
| EVB Connector | SMA-Female          |

| Environmental          |                            |
|------------------------|----------------------------|
| Operation Temperature  | -40°C to 85°C              |
| Storage Temperature    | -40°C to 105°C             |
| Relative Humidity      | Non-condensing 65°C 95% RH |
| RoHs & REACH Compliant | Yes                        |

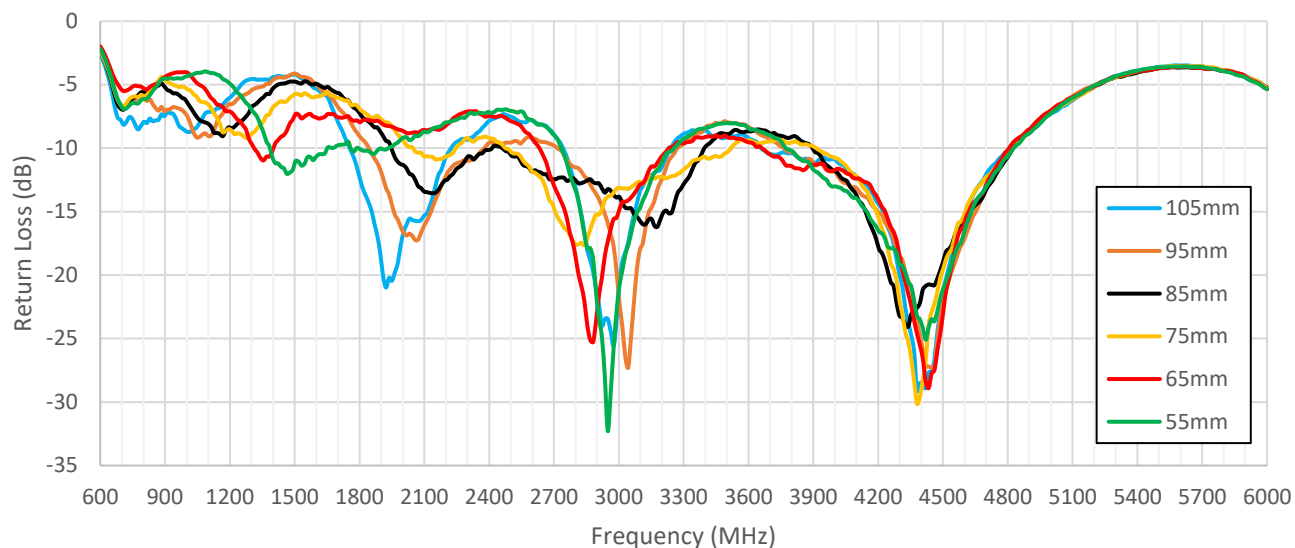
### 3. Antenna Characteristics

#### 3.1 Test Setup

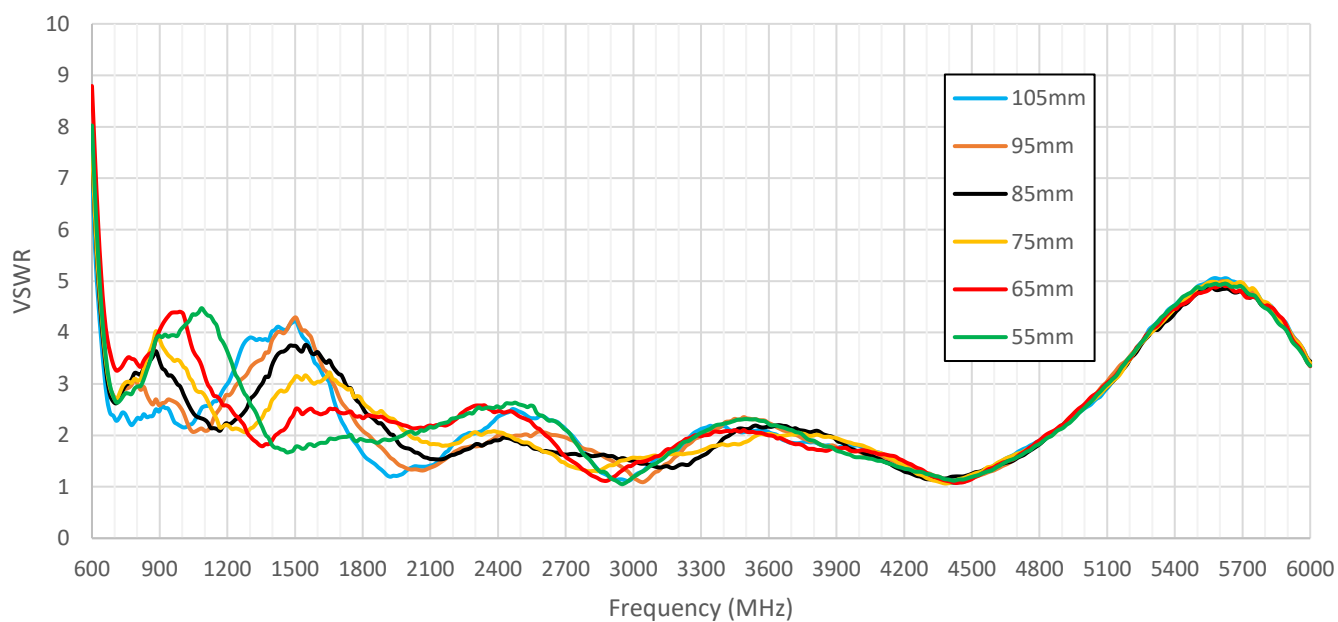


On Evaluation Board

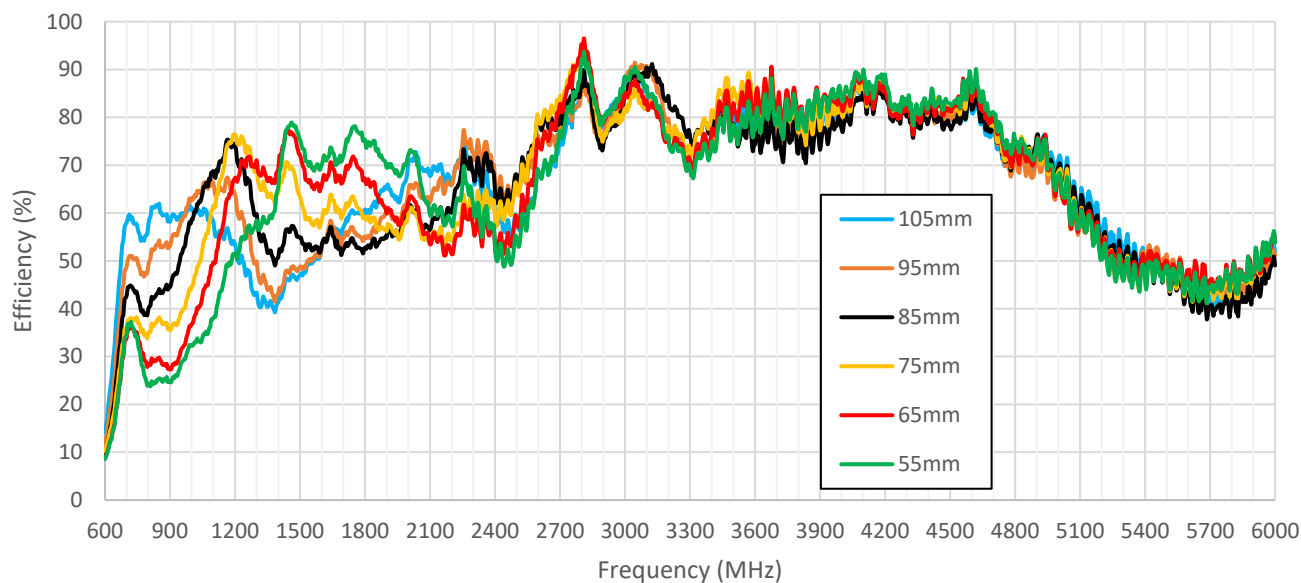
## 3.2 Return Loss



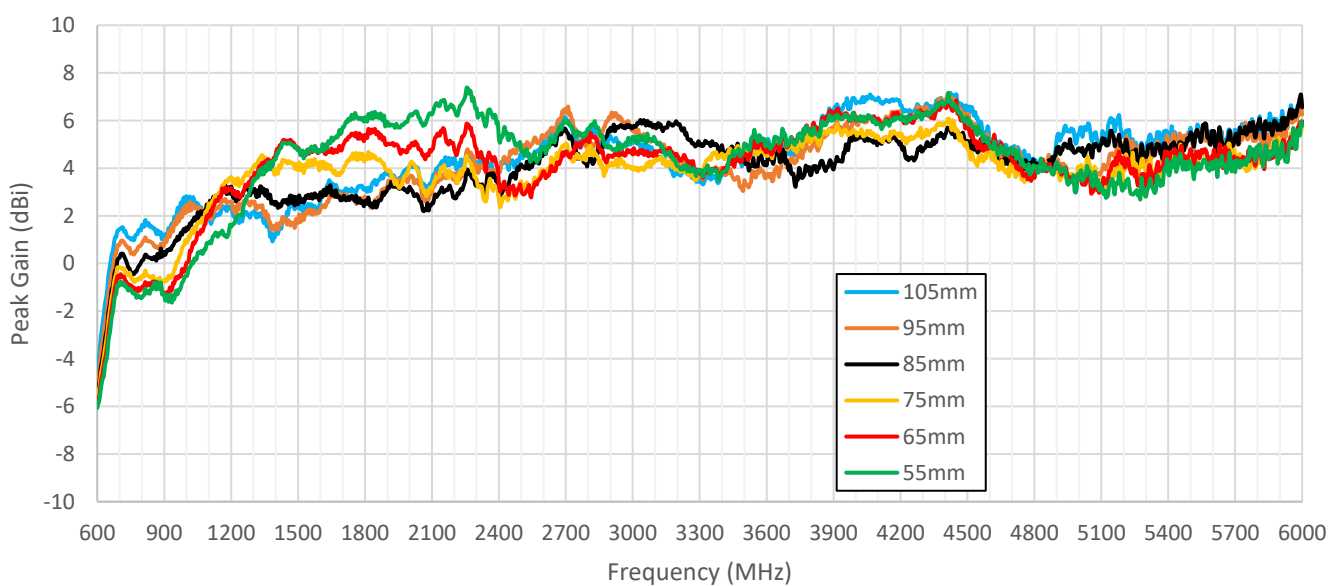
## 3.3 VSWR



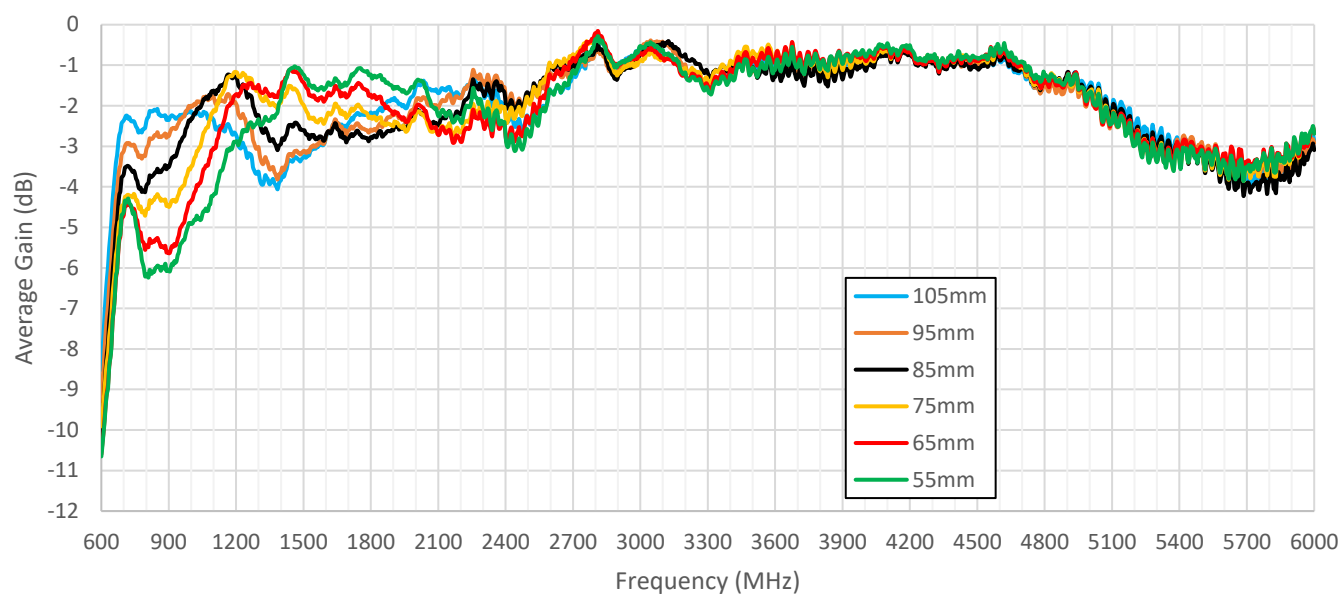
### 3.4 Efficiency



### 3.5 Peak Gain

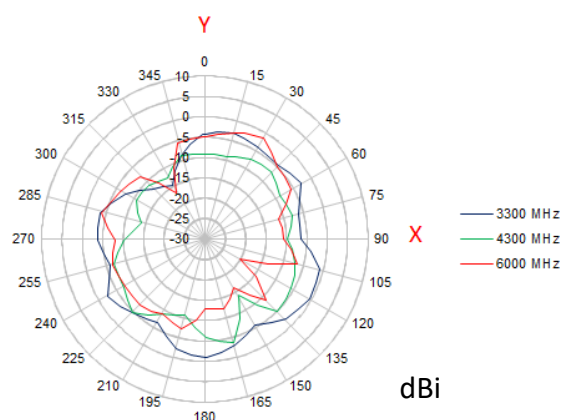
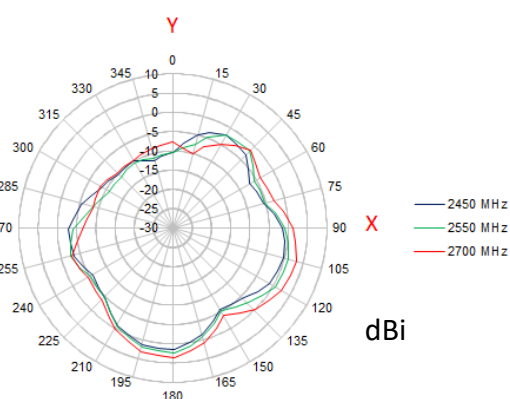
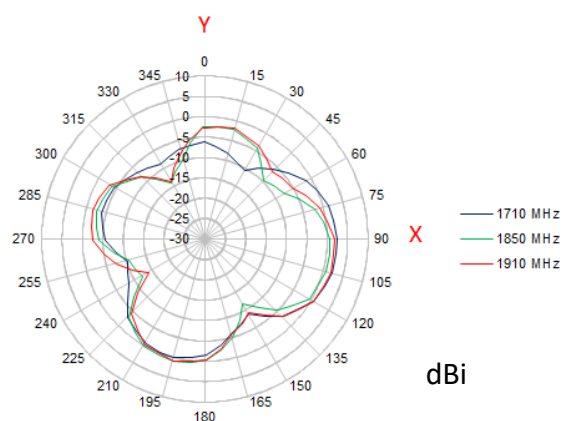
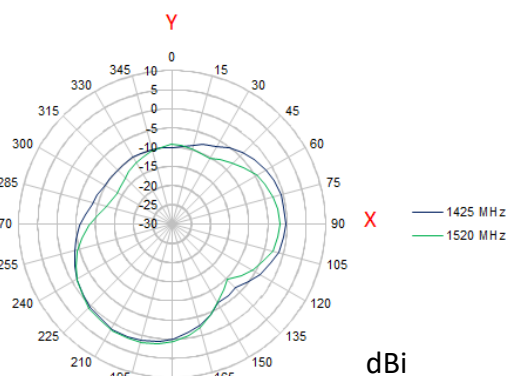
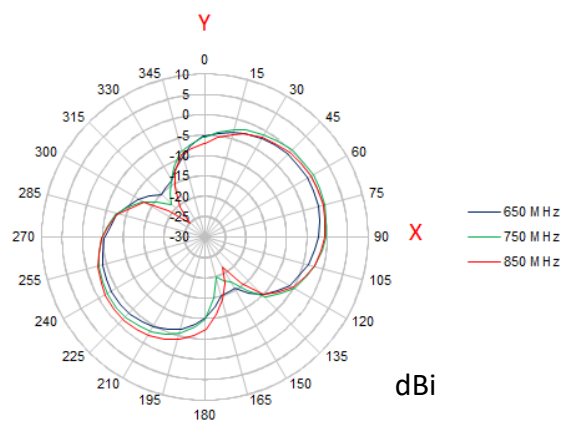


### 3.6 Average Gain

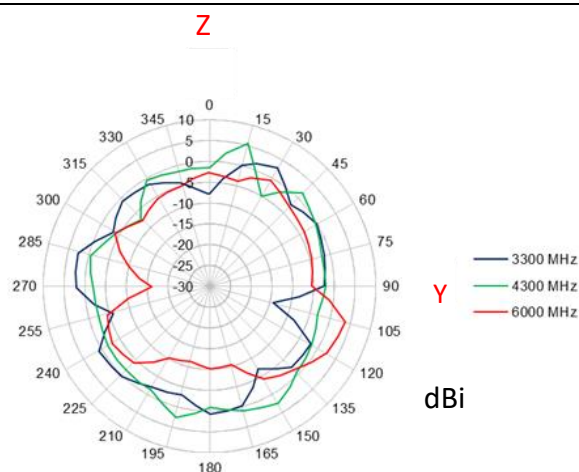
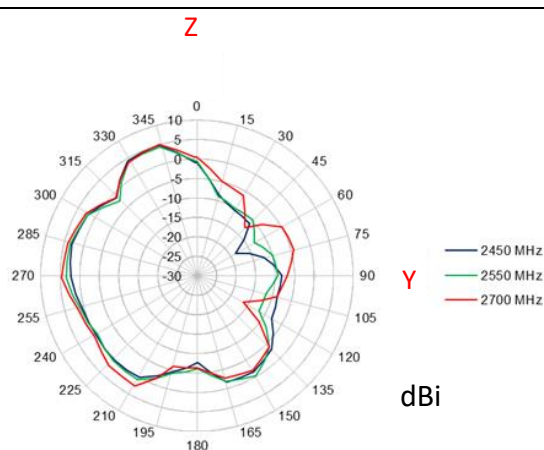
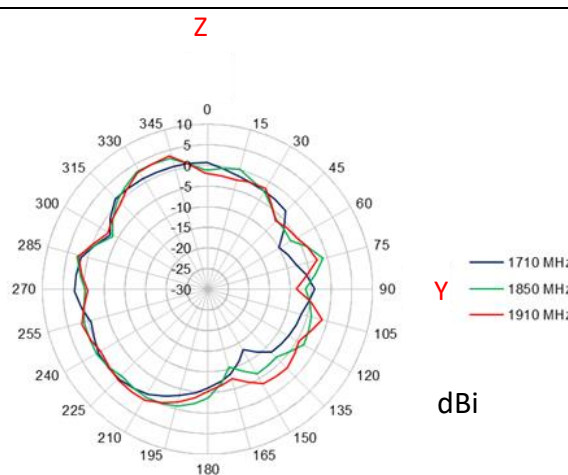
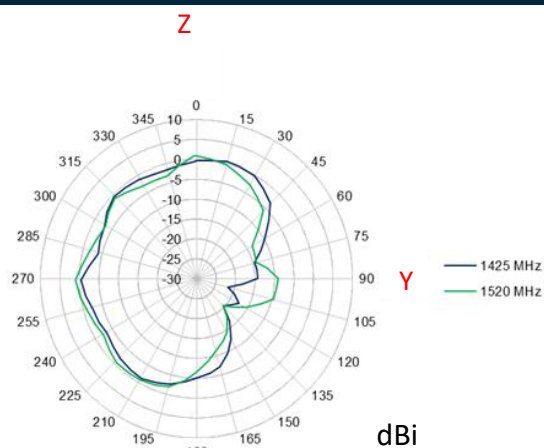
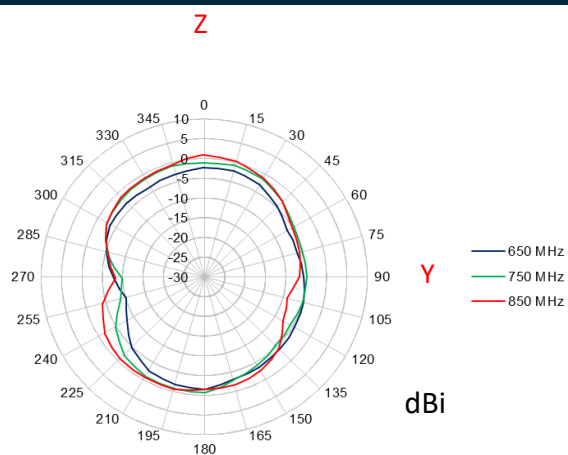


## 4. 2D Radiation Patterns (Measured on 130\*32mm EVB)

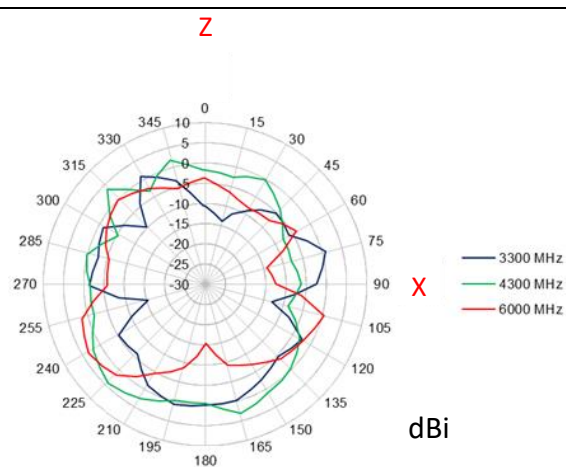
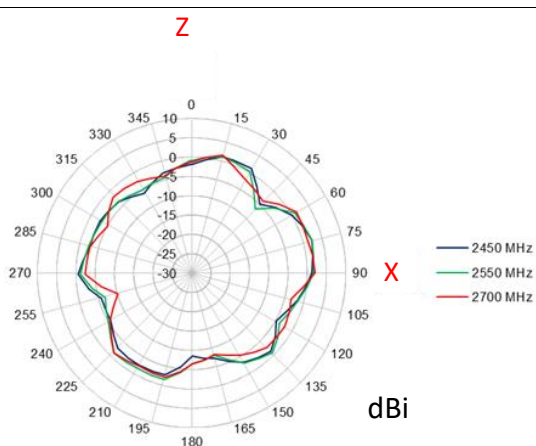
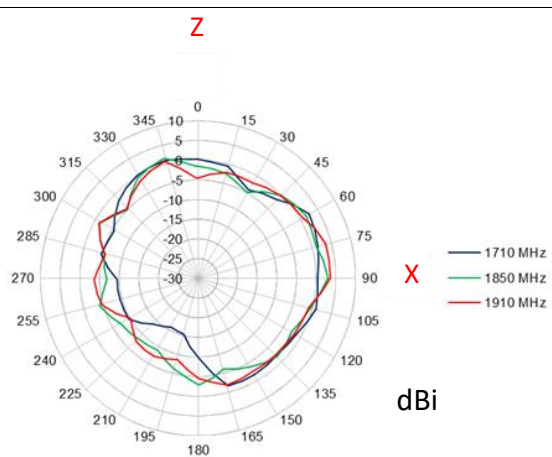
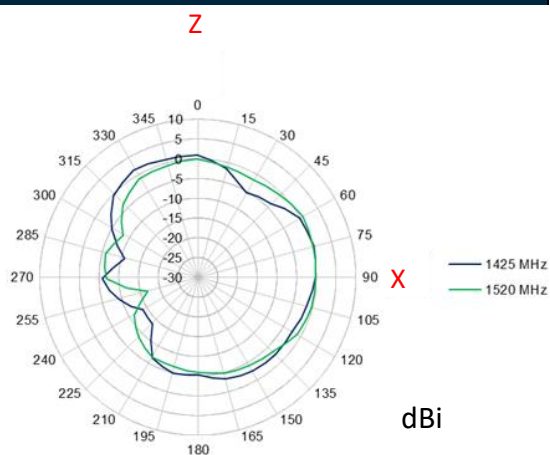
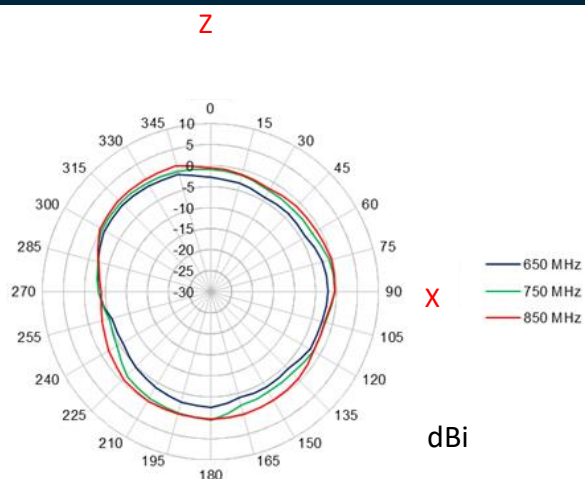
XY Plane



# YZ Plane



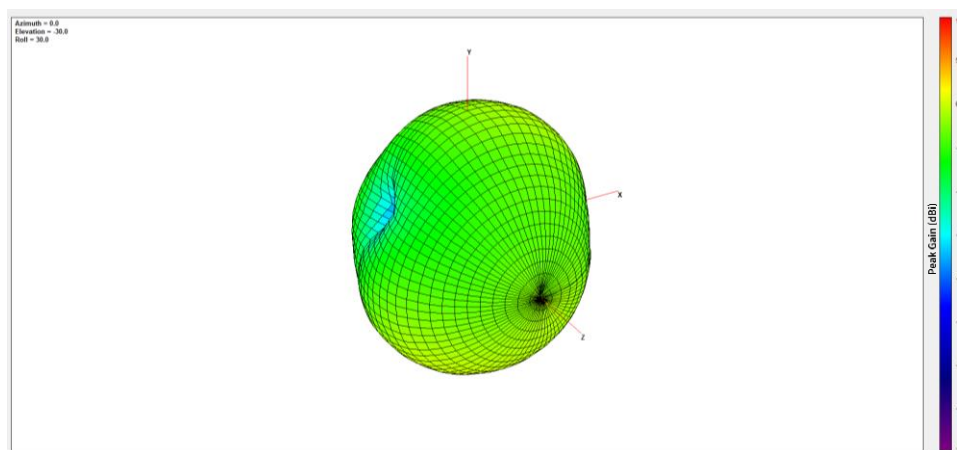
# XZ Plane



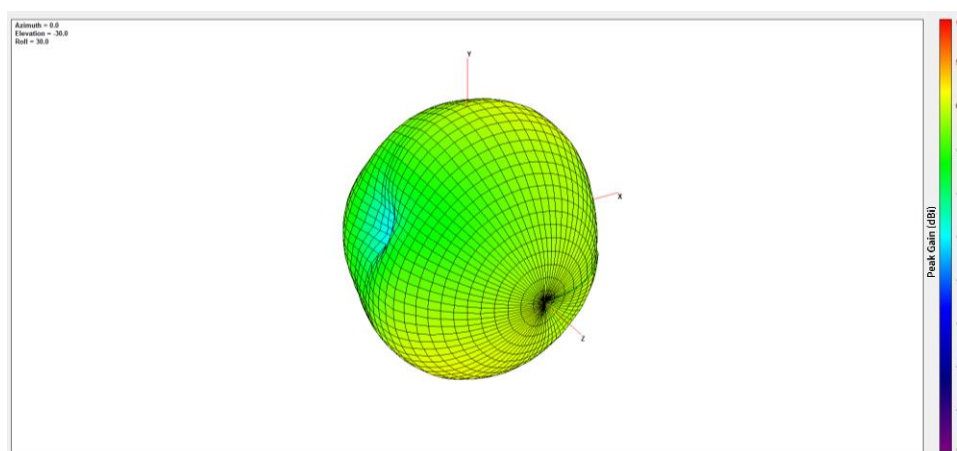
## 5. 3D Radiation Patterns

### 5.1 132\*32mm EVB

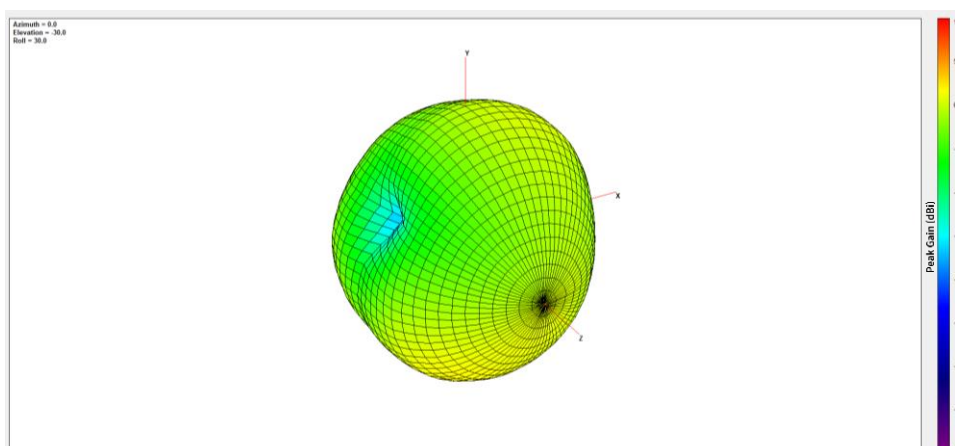
650 MHz



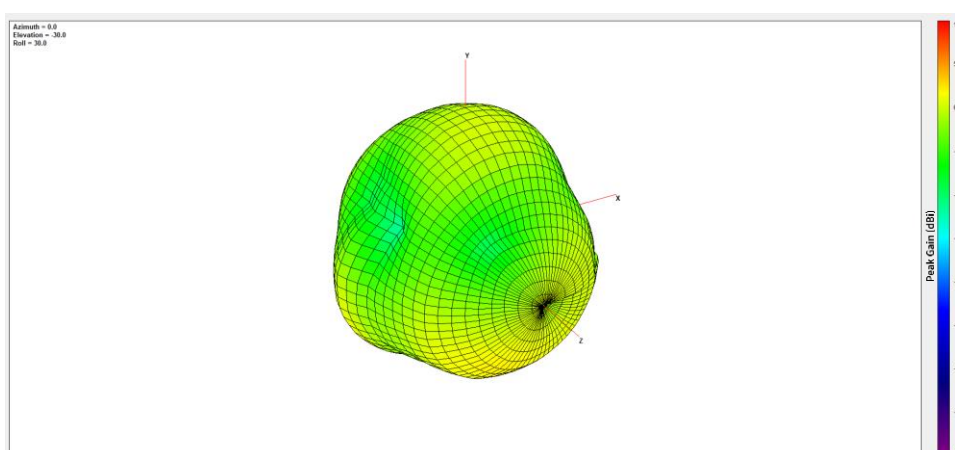
750 MHz



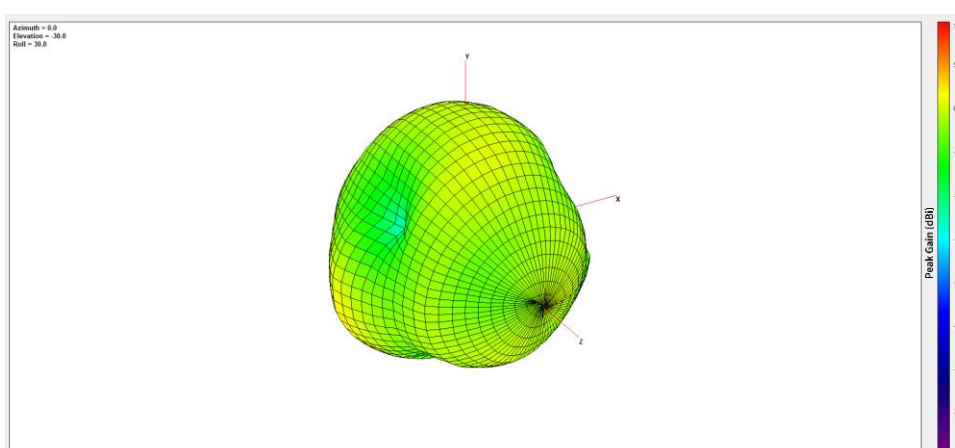
## 850 MHz



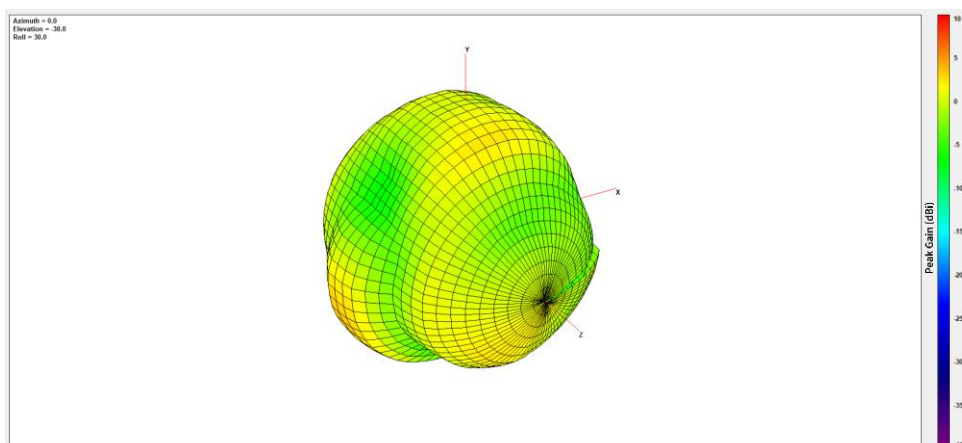
## 1425 MHz



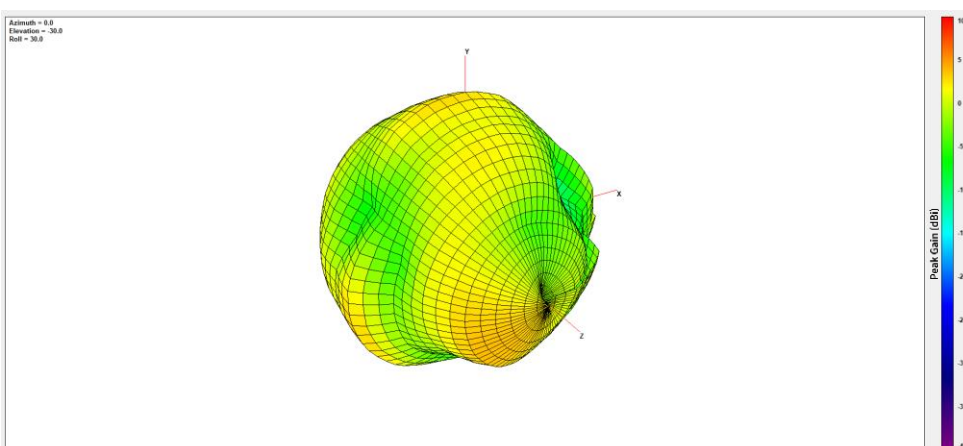
## 1520 MHz



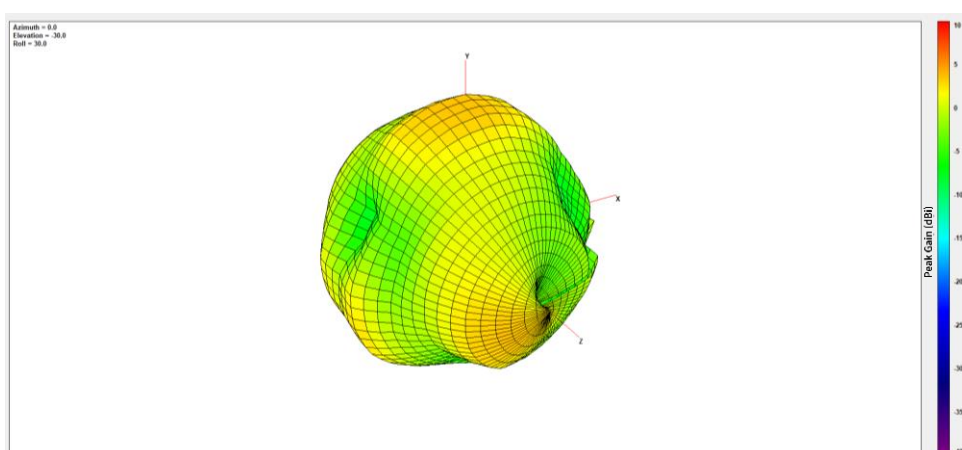
## 1710 MHz



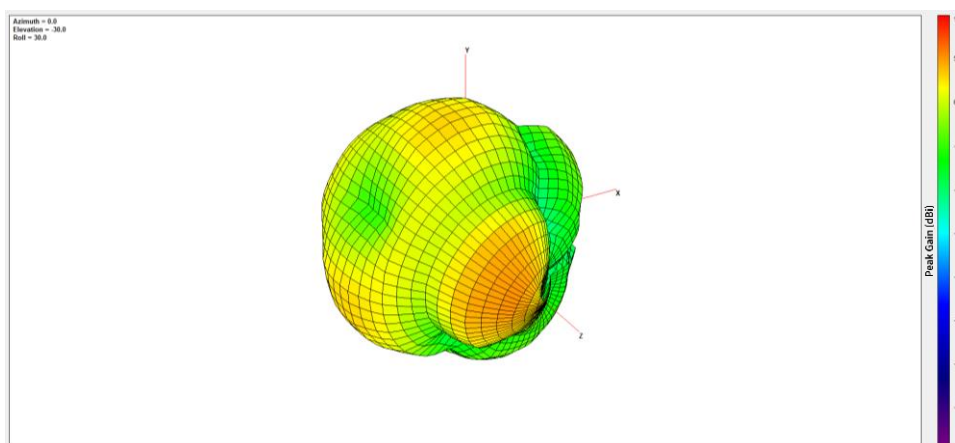
## 1850 MHz



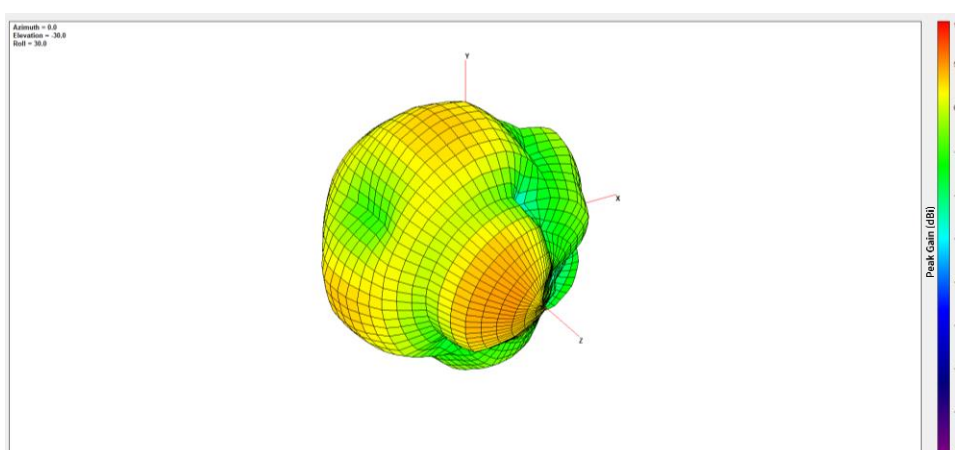
## 1910 MHz



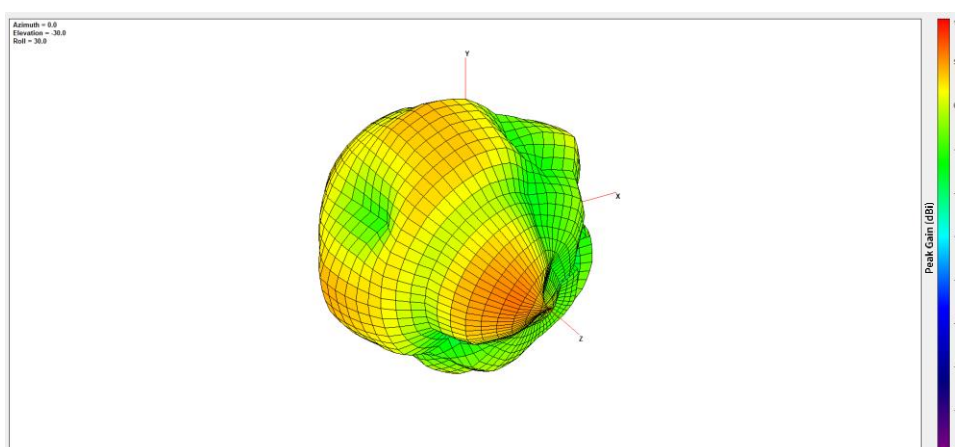
## 2450 MHz



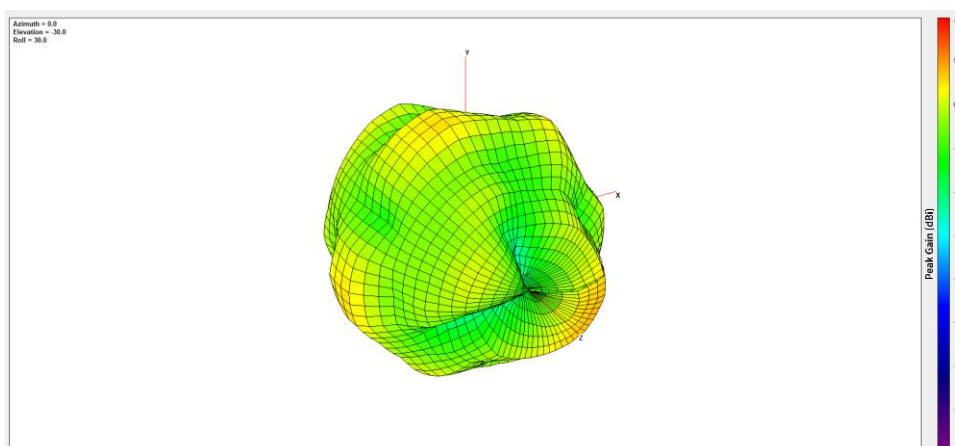
## 2550 MHz



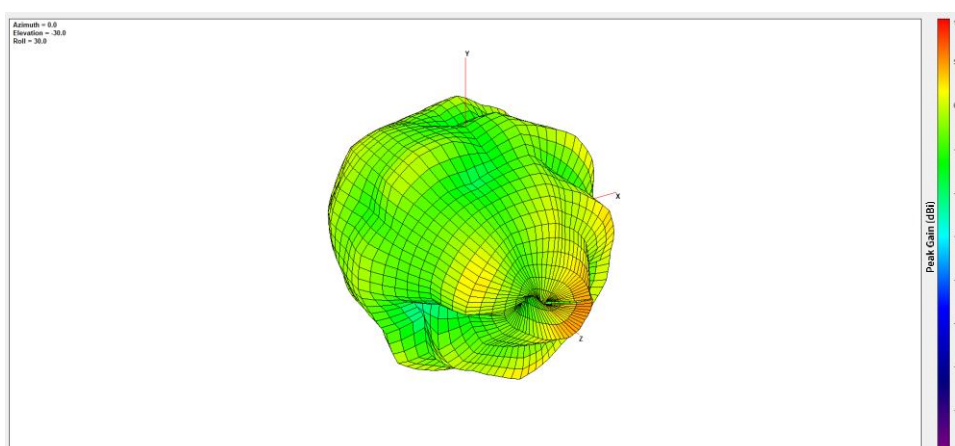
## 2700 MHz



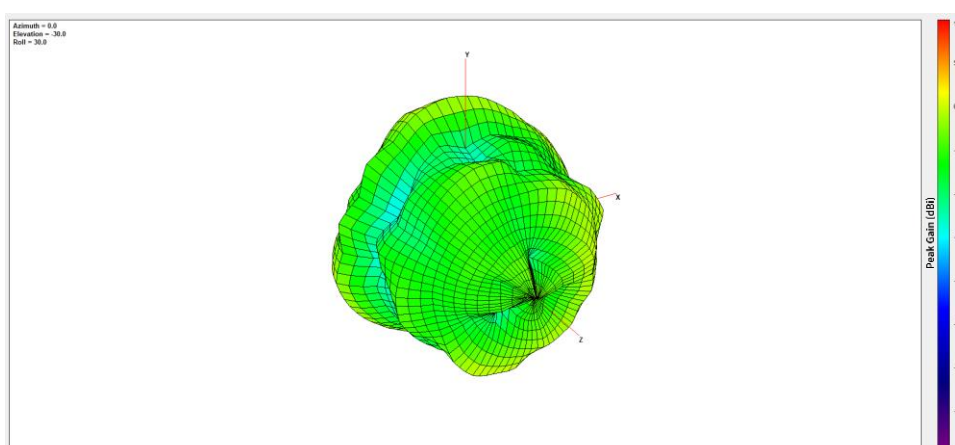
## 3300 MHz



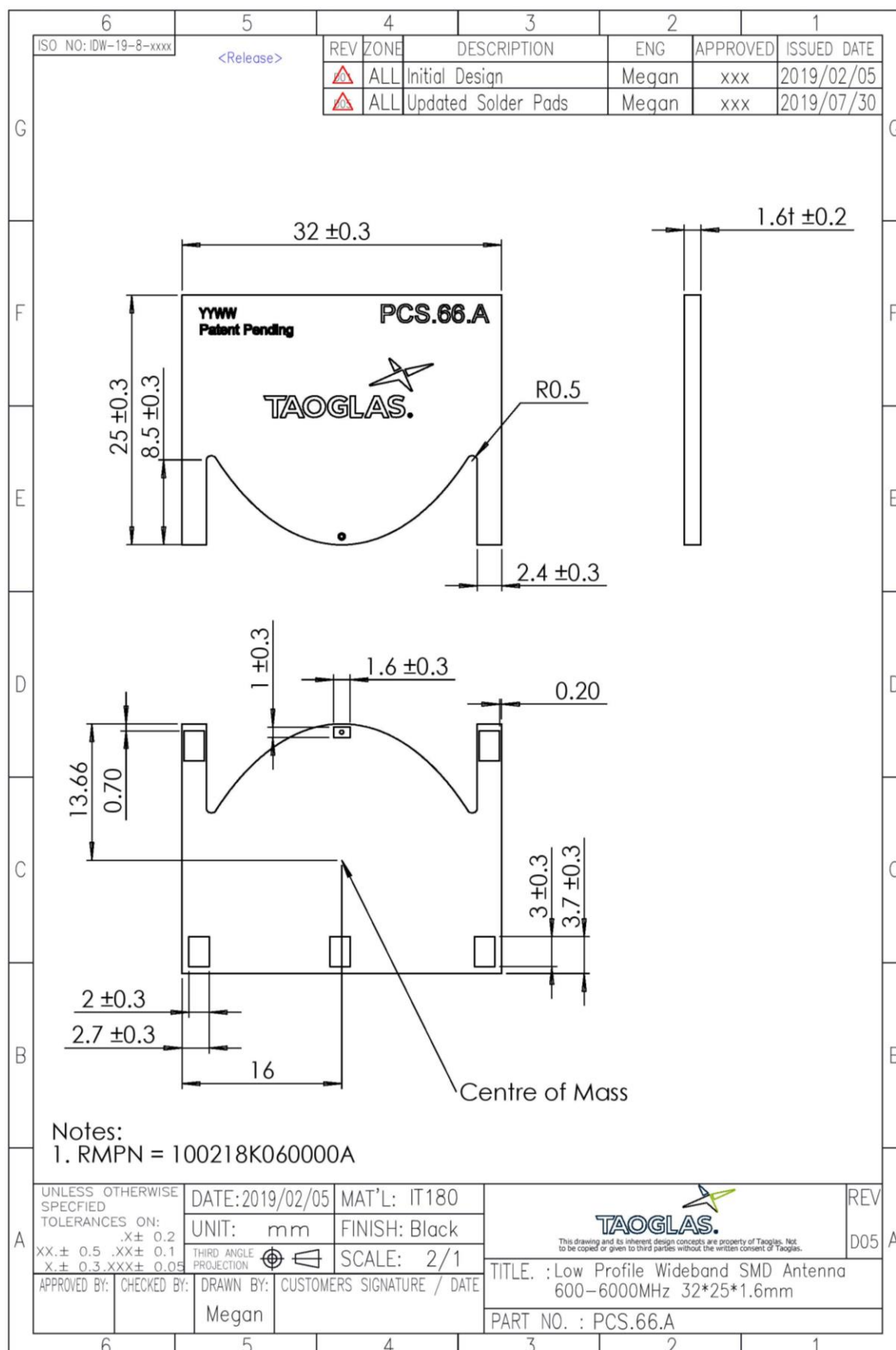
## 4300 MHz



## 6000 MHz

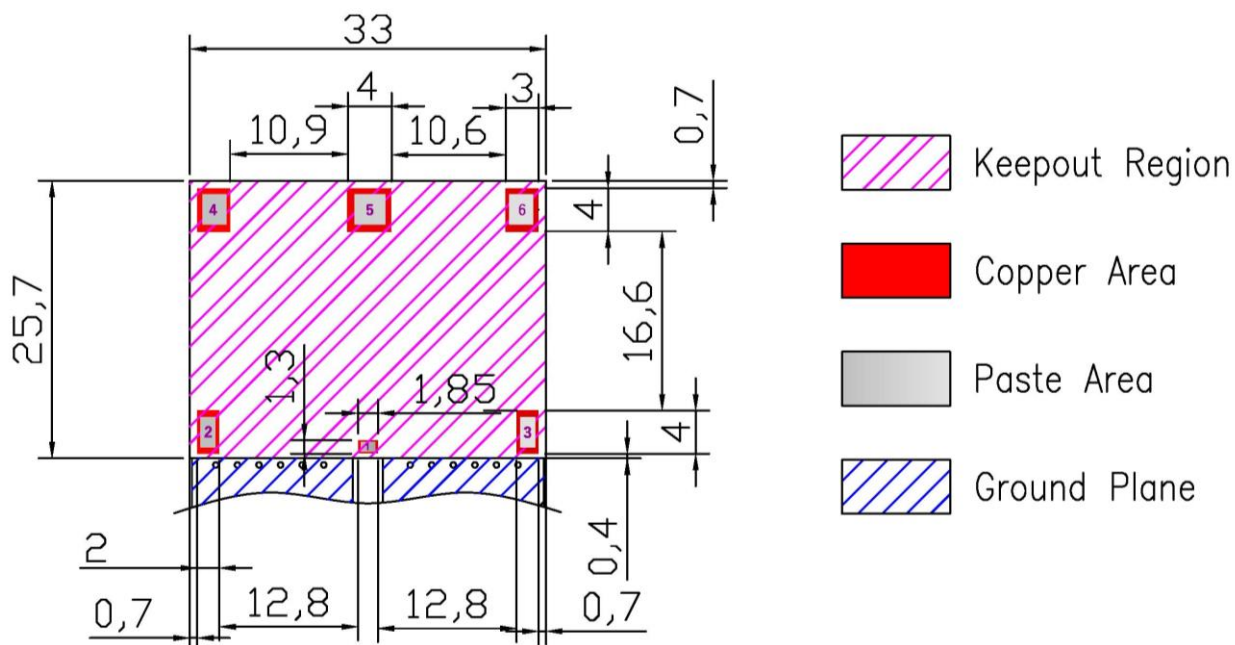


## 6. Mechanical Drawing (Units: mm)



## 7. Layout Dimensions

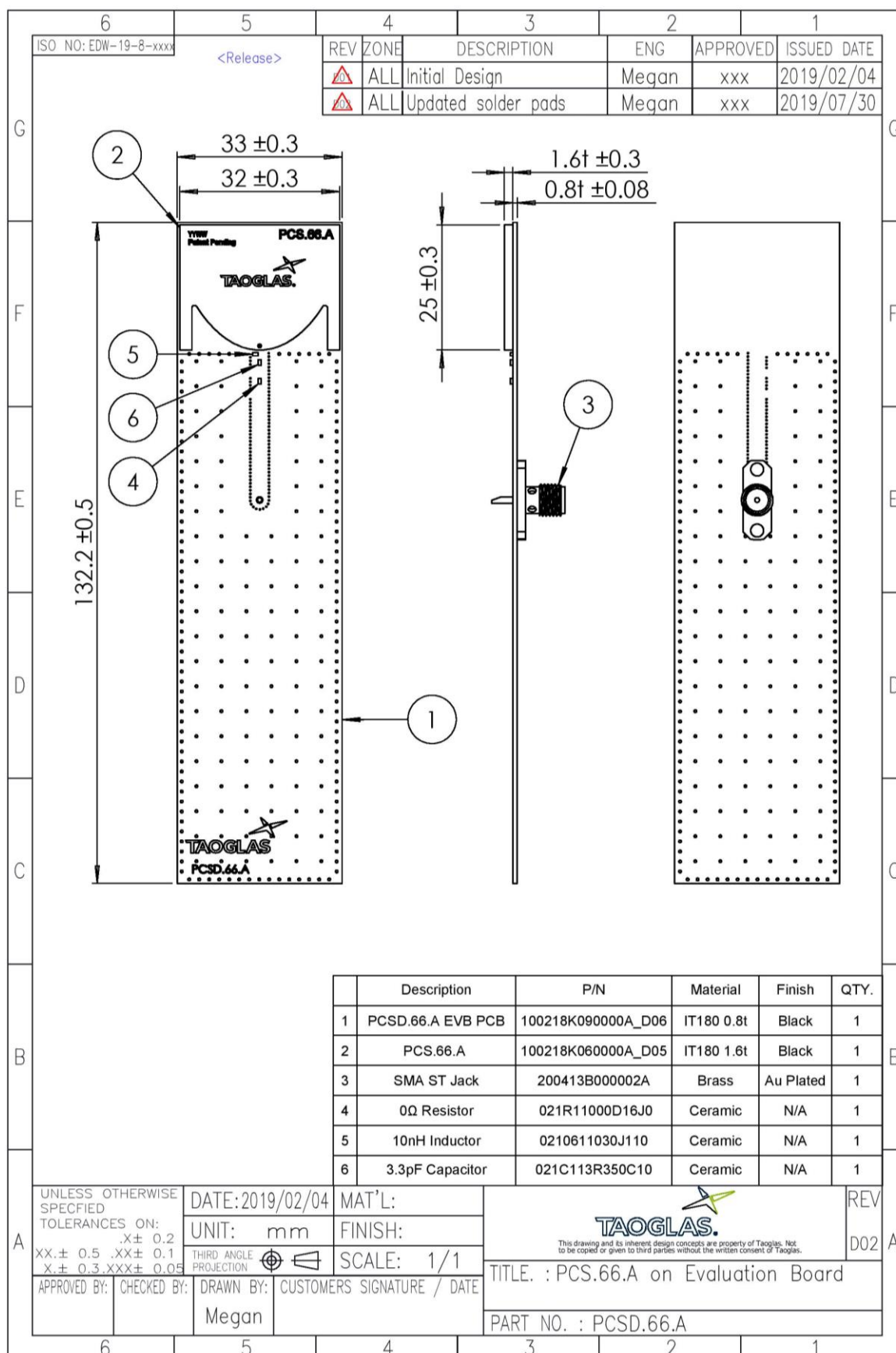
Pads 2 and 3 are the same size. Pads 4 and 6 are the same size. Pad 1 should be connected to a 50 ohm transmission line.



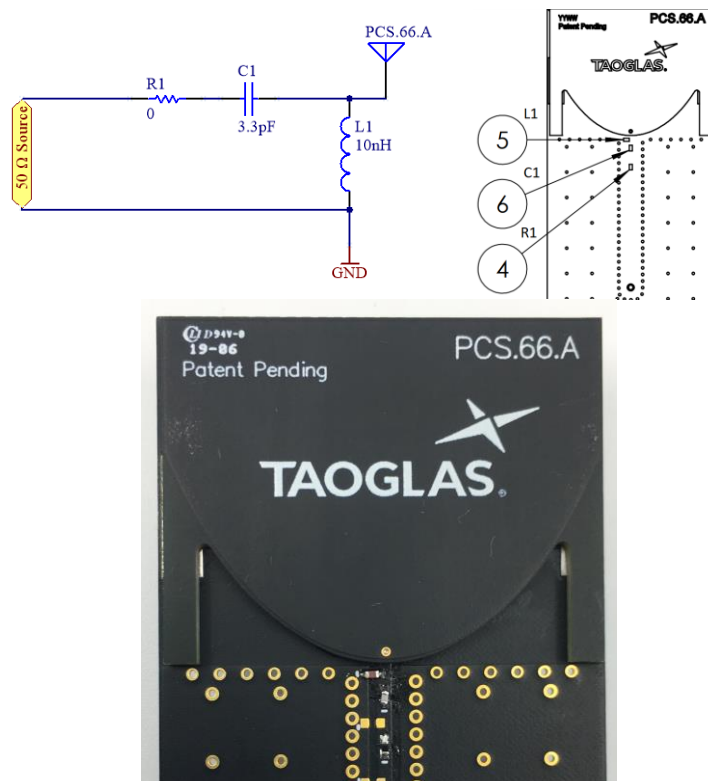
Note:

1. Ground Keepout should extend through any inner PCB layers and any sides around the antenna until the board edge to minimize coupling from feed to ground, except the side facing system ground
2. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow
3. The dimension tolerances should follow standard PCB manufacturing guidelines
4. Solder paste area is 75% of copper area dimensions
5. Centre of mass is 1.17mm offset in Y from geometric centre

## 8. EVB Drawing



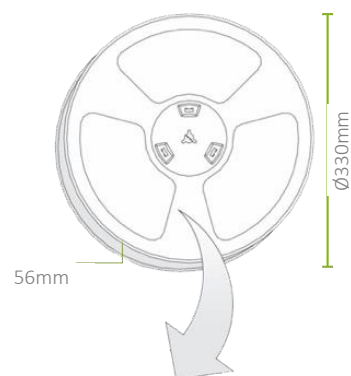
## 9. Matching Circuit



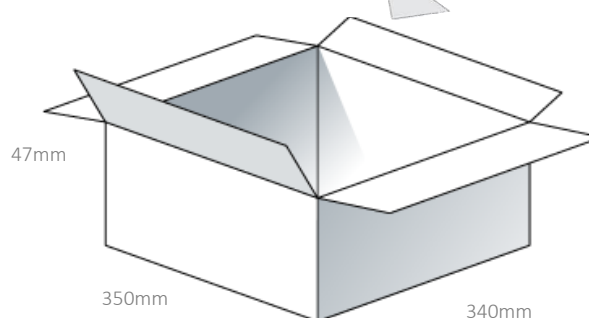
| Circuit Symbol | Size | Description                          |
|----------------|------|--------------------------------------|
| L1             | 0402 | 10nH inductor (L-07C10NJV6T)         |
| C1             | 0402 | 3.3pF Capacitor (GJM1555C1H3R3BB01D) |

## 10. Packaging

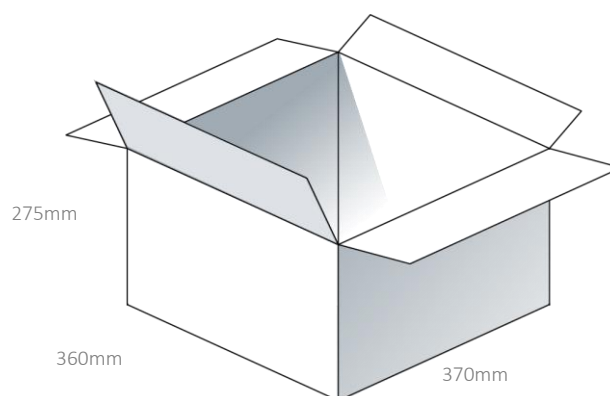
500pcs PCS.66.A per Tape & Reel  
Dimensions - Ø330\*56mm  
Weight – 2.2Kg



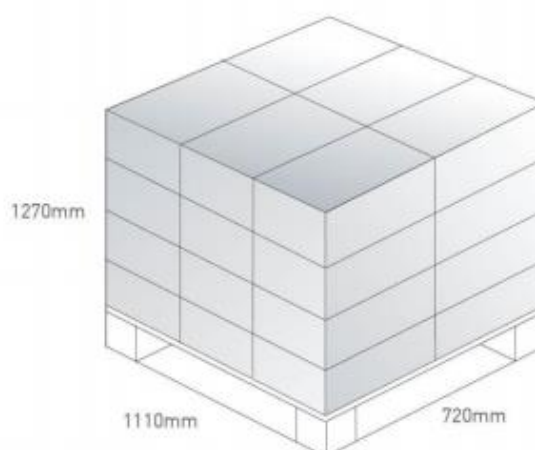
500pcs PCS.66.A per Box  
Dimensions - 350\*340\*85mm  
Weight – 2.3Kg



1500pcs PCS.66.A per Carton  
Dimensions - 360\*370\*275mm  
Weight – 7Kg



Pallet Dimensions:  
1100\*720\*1270mm  
24 Cartons Per Pallet  
6 Cartons Per Layer  
4 Layers



## Changelog for the datasheet

### SPE-19-8-012 – PCS.66.A

#### Revision: E (Current Version)

|                  |             |
|------------------|-------------|
| Date:            | 2020-01-02  |
| Changes:         | Updated     |
| Changes Made by: | Jack Conroy |

#### Previous Revisions

##### Revision: D

|                  |                                 |
|------------------|---------------------------------|
| Date:            | 2019-08-16                      |
| Changes:         | Updated Drawings and Pad Layout |
| Changes Made by: | Jack Conroy                     |

##### Revision: C

|                  |                  |
|------------------|------------------|
| Date:            | 2019-08-02       |
| Changes:         | Updated Drawings |
| Changes Made by: | Jack Conroy      |

##### Revision: B

|                  |                                             |
|------------------|---------------------------------------------|
| Date:            | 2019-04-26                                  |
| Changes:         | Updated Layout Dimensions & Added Packaging |
| Changes Made by: | Jack Conroy                                 |

##### Revision: A (Original Release)

|         |                           |
|---------|---------------------------|
| Date:   | 2019-02-22                |
| Notes:  | Initial Datasheet Release |
| Author: | Yu Kai Yeung              |



[www.taoglas.com](http://www.taoglas.com)



## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

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