

## SPECIFICATION

|              |                                                                                                                                                                                                         |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part No.     | : <b>MA671.A.CGH.003</b>                                                                                                                                                                                |
| Product Name | : Spartan Antenna 3in1 MA.671<br>Low Profile Screw-Mount (Permanent Mount)<br>Public Safety<br>3 * MIMO 4.5 ~ 4.9GHz antenna<br>2 x vertically polarized elements<br>1 x horizontally polarized element |
| Feature      | : IP67 Waterproof<br>High Efficiency / Peak Gain Outdoor Antenna<br>Standard 3M CFD-200 RP-SMA(M)<br>RoHS Compliant                                                                                     |



## **1. Introduction**

The Spartan MA671 Public Safety 3\*MIMO antenna is a low profile, heavy-duty, fully IP67 waterproof external M2M antenna for use in remote monitoring and public safety applications.

The Spartan 3 x MIMO antenna is unique in the market because it combines three 4.5~4.9GHz antenna elements in a heavy-duty structure with high efficiency in a low profile compact format. The antenna screws down permanently onto a roof or metal panel and can be pole or wall-mounted. Two of the antenna elements are vertically polarized and one is horizontally polarized to maximize diversity gain and MIMO throughput.

For industries such as remote monitoring, smart meter systems, construction equipment, public safety at only 40mm high, the Spartan provides an unobtrusive, robust, rugged antenna that is durable even in extreme environments.

## 2. Specification Table

| ELECTRICAL – V-pol. antenna 1 |                   |      |      |
|-------------------------------|-------------------|------|------|
| Frequency (GHz)               | 4.5               | 4.7  | 4.9  |
| Radiation Efficiency* (%)     | 45.7              | 45.2 | 41.6 |
| Peak Gain* (dBi)              | 4.1               | 3.2  | 3.02 |
| VSWR                          | 2 Max             |      |      |
| Polarization                  | Linear (Vertical) |      |      |
| Impedance                     | 50Ω               |      |      |

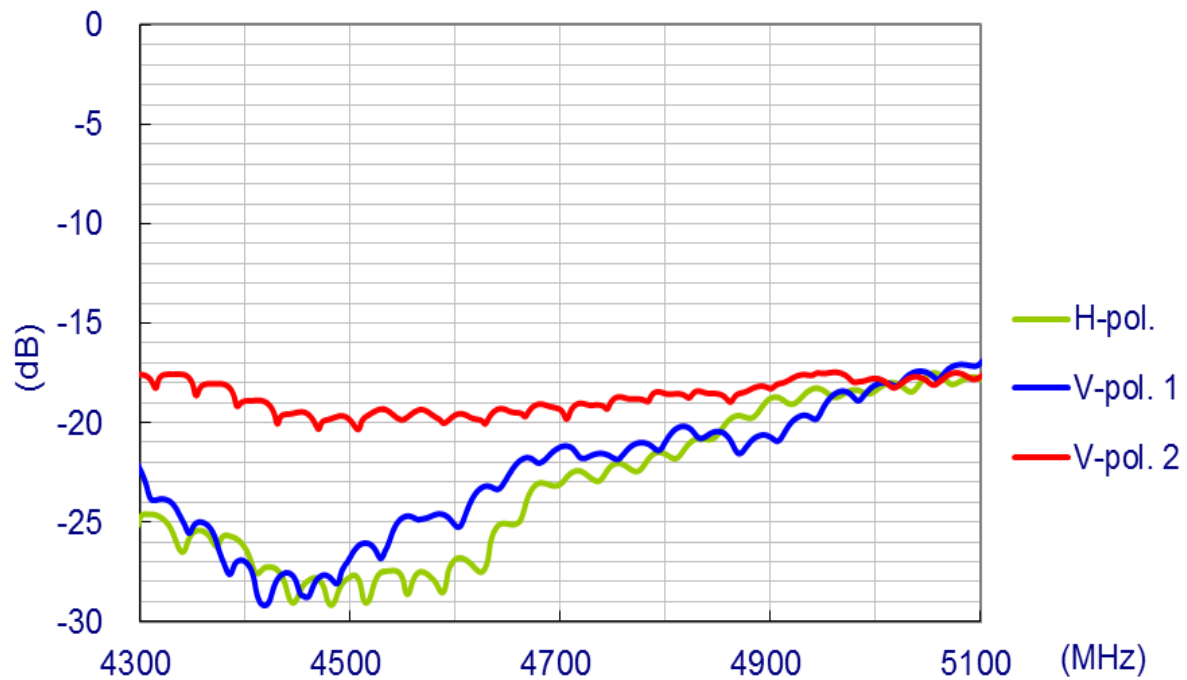
| ELECTRICAL – V-pol. antenna 2 |                   |      |      |
|-------------------------------|-------------------|------|------|
| Frequency (GHz)               | 4.5               | 4.7  | 4.9  |
| Radiation Efficiency* (%)     | 45.5              | 43.4 | 37.9 |
| Peak Gain* (dBi)              | 3.4               | 3.8  | 2.43 |
| VSWR                          | 2 Max             |      |      |
| Polarization                  | Linear (Vertical) |      |      |
| Impedance                     | 50Ω               |      |      |

| ELECTRICAL – H-pol. antenna |                     |       |      |
|-----------------------------|---------------------|-------|------|
| Frequency (GHz)             | 4.5                 | 4.7   | 4.9  |
| Radiation Efficiency* (%)   | 45.7                | 45.27 | 38.8 |
| Peak Gain* (dBi)            | 3.2                 | 4.4   | 3.4  |
| VSWR                        | 2 Max               |       |      |
| Polarization                | Linear (Horizontal) |       |      |
| Impedance                   | 50Ω                 |       |      |

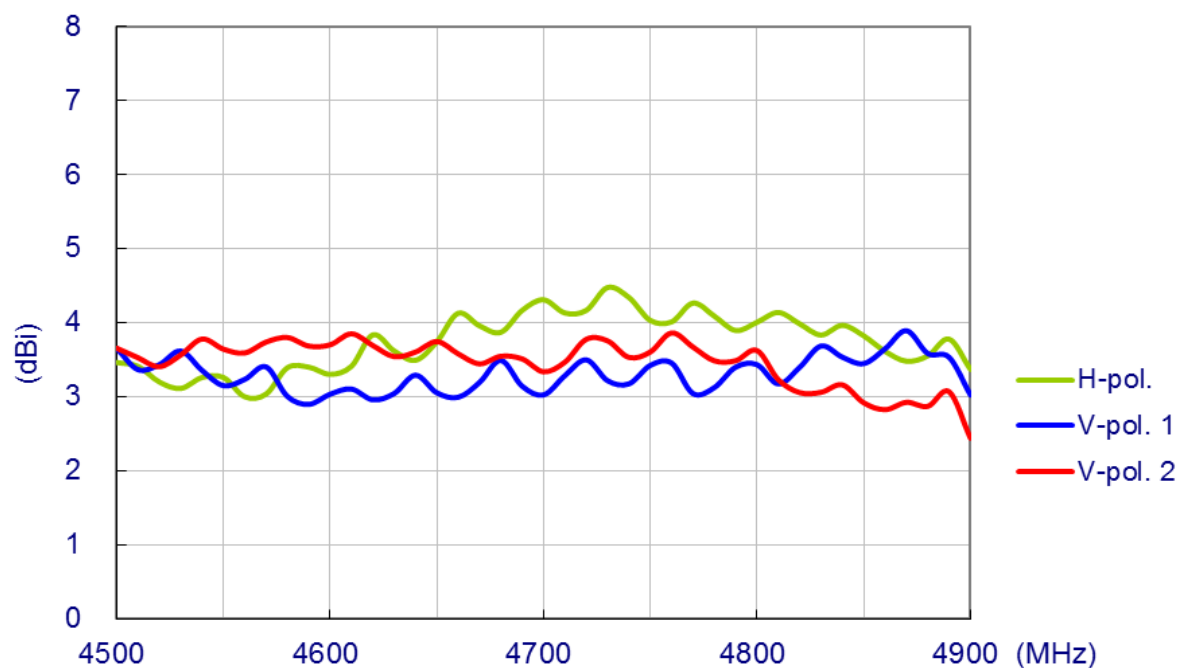
| MECHANICAL         |                              |
|--------------------|------------------------------|
| Antenna Dimensions | Height 50mm x Diameter 150mm |
| Casing             | PC                           |
| Base and thread    | Nickel Plated Zinc           |
| Waterproof         | IP67                         |
| ENVIRONMENTAL      |                              |
| Temperature Range  | -40°C to 85°C                |
| Humidity           | Non-condensing 65°C 95% RH   |

\* all measurements were conducted with 3m CFD200 cable

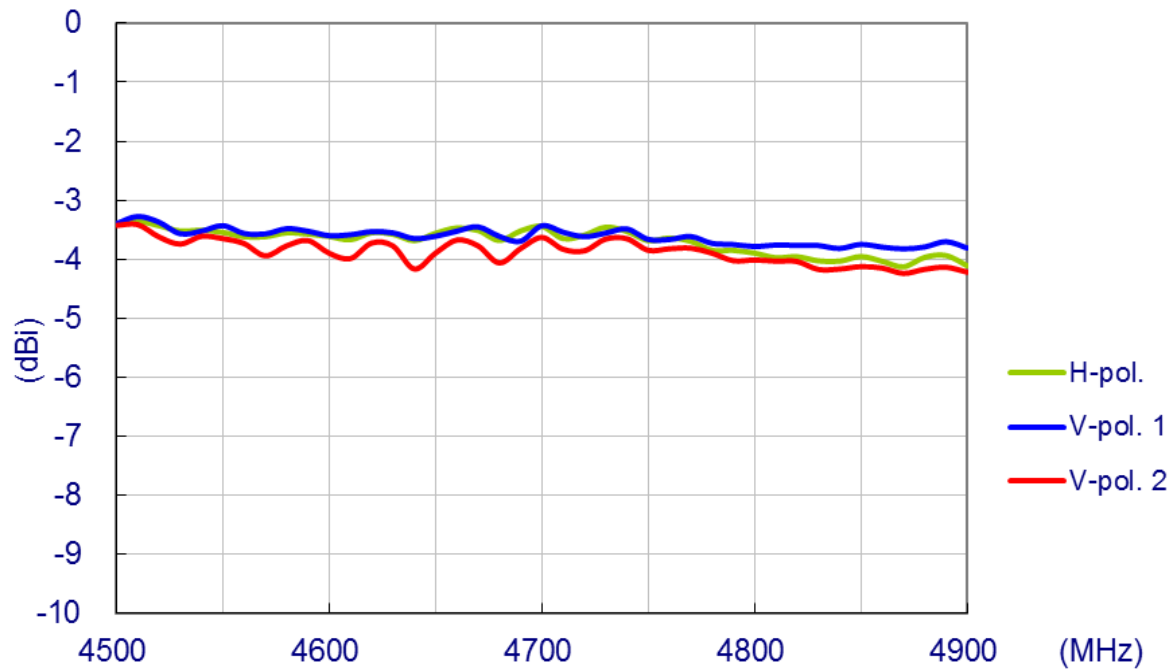
### 3. Return Loss



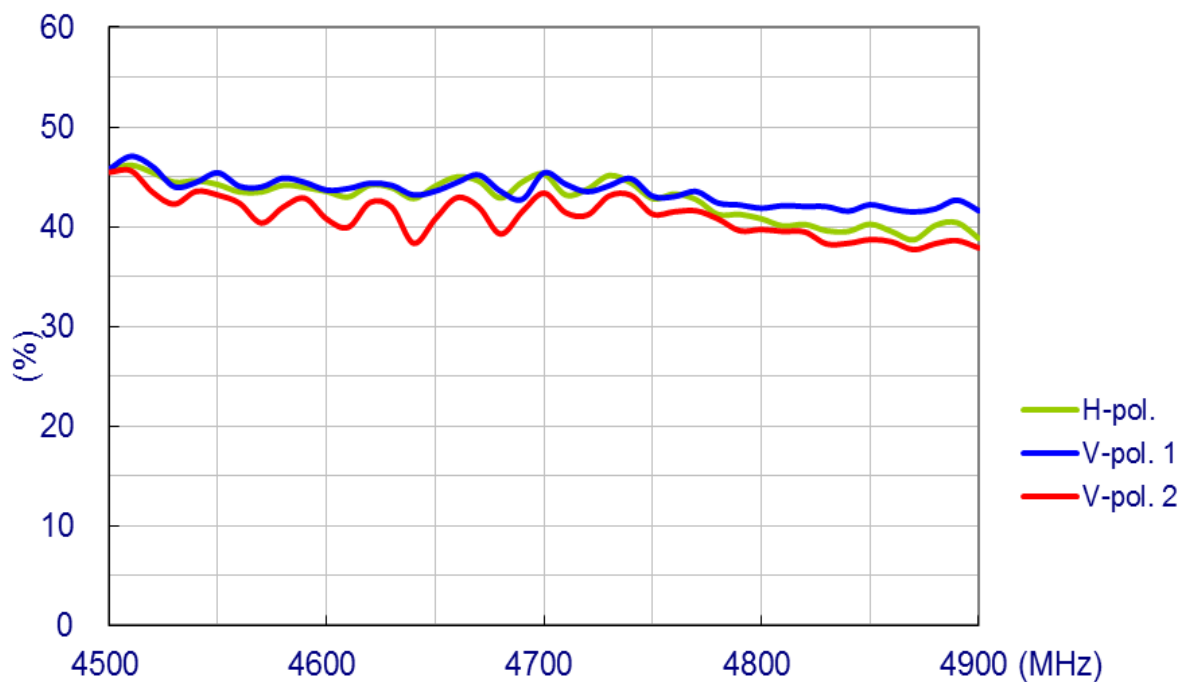
### 4. Maximum Gain



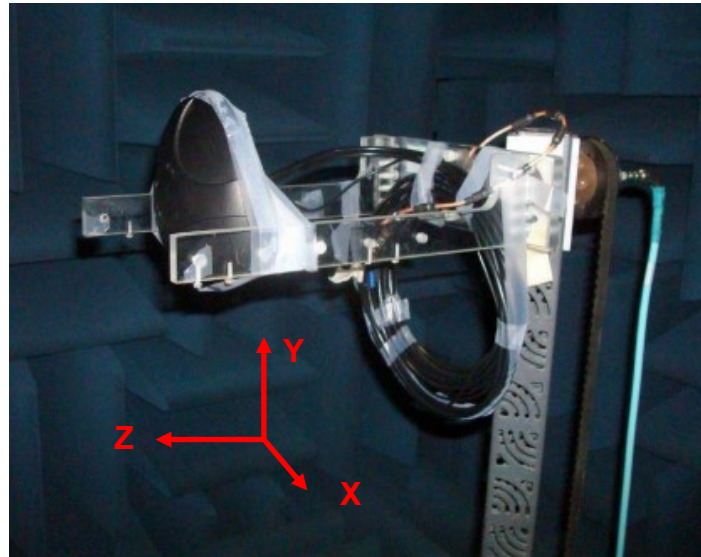
## 5. Average Gain



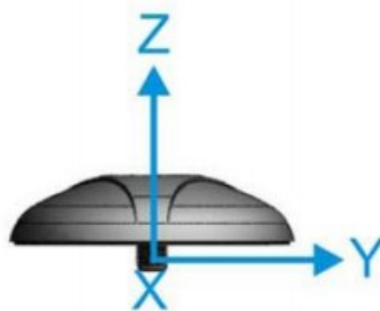
## 6. Efficiency



## 7. Antenna Radiation Patterns



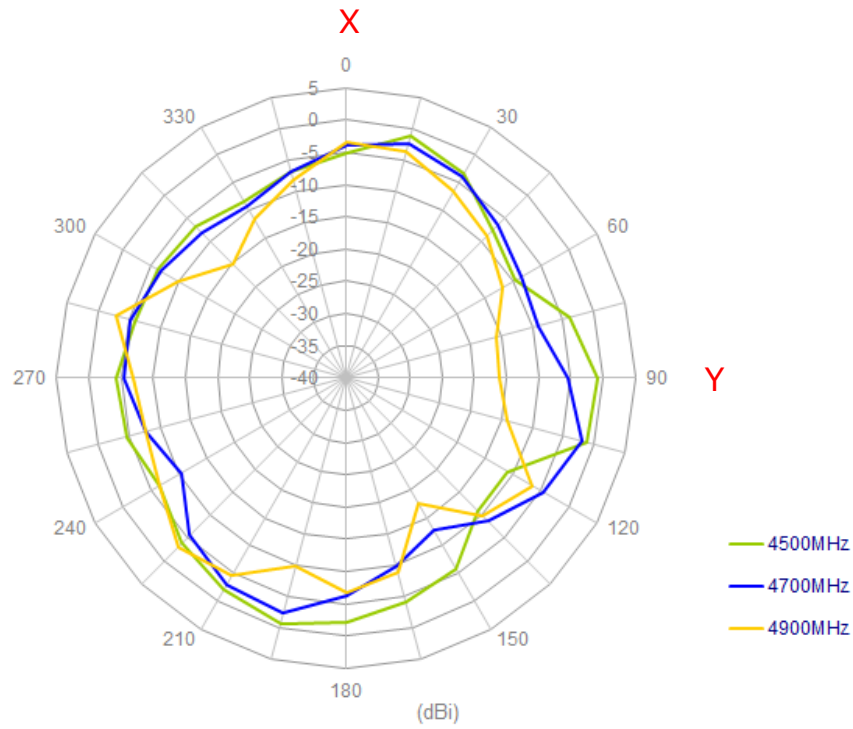
MA. 671 tested in CTIA approved 3D chamber



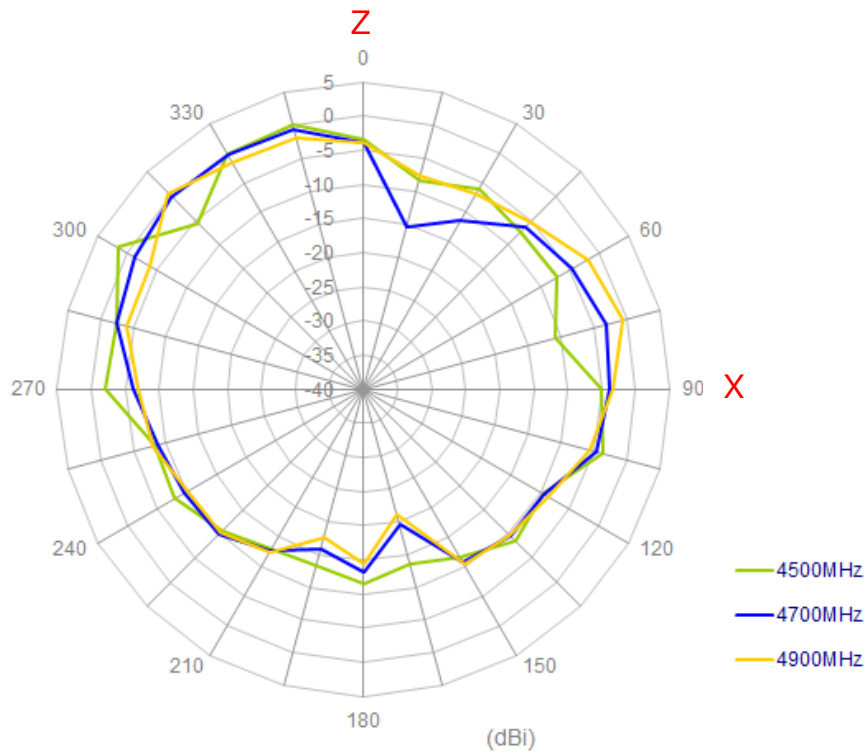
XYZ coordinates for reference

## 7.1 H-pol. antenna

### XY Plane

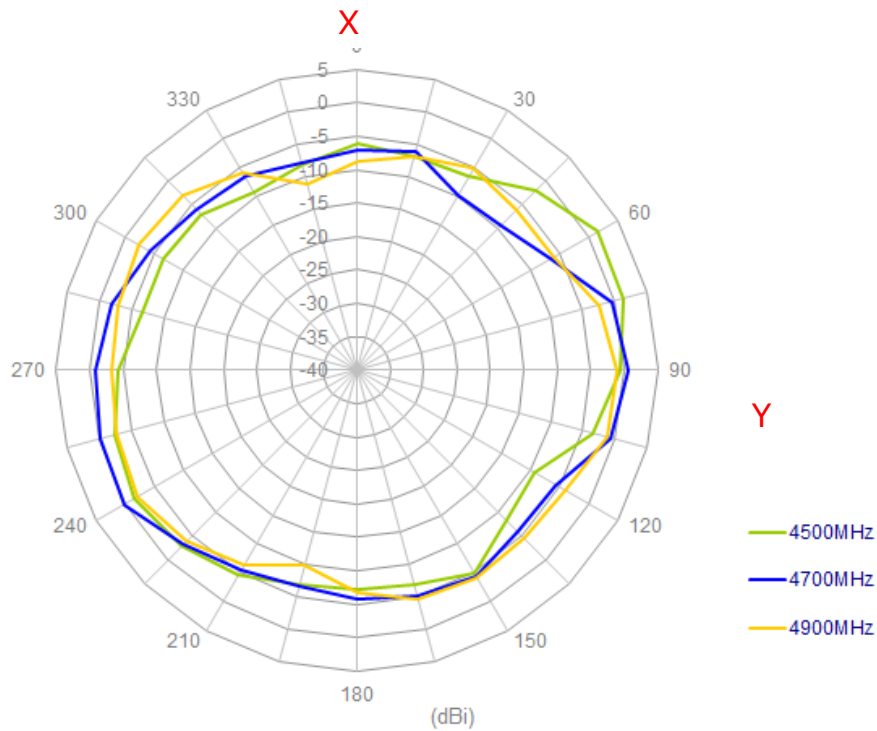


### XZ Plane

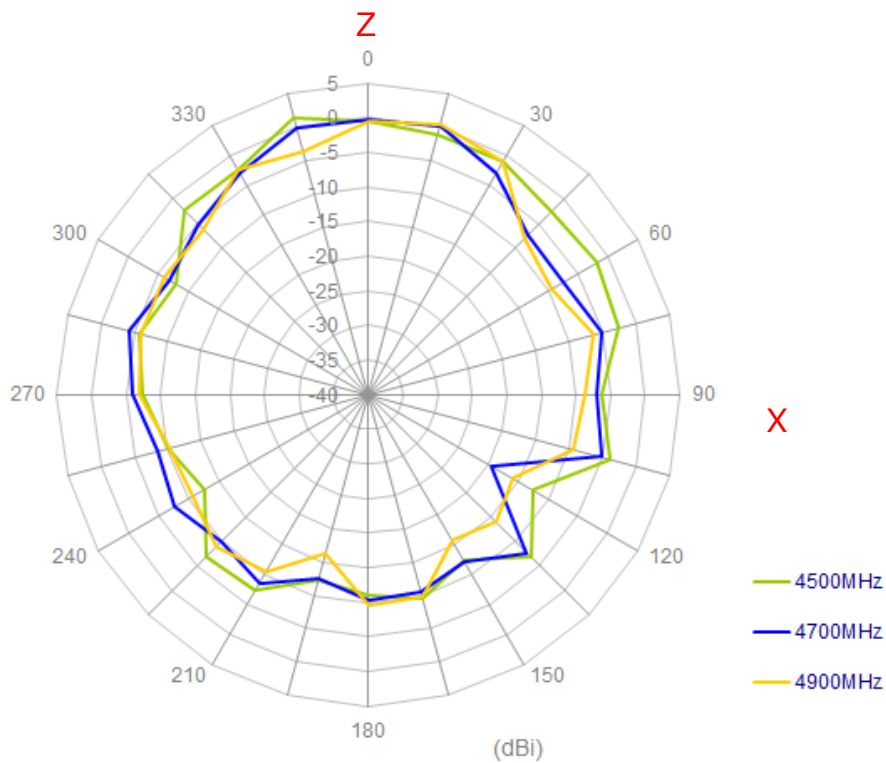


## 7.2 V-pol. 1 antenna

### XY Plane

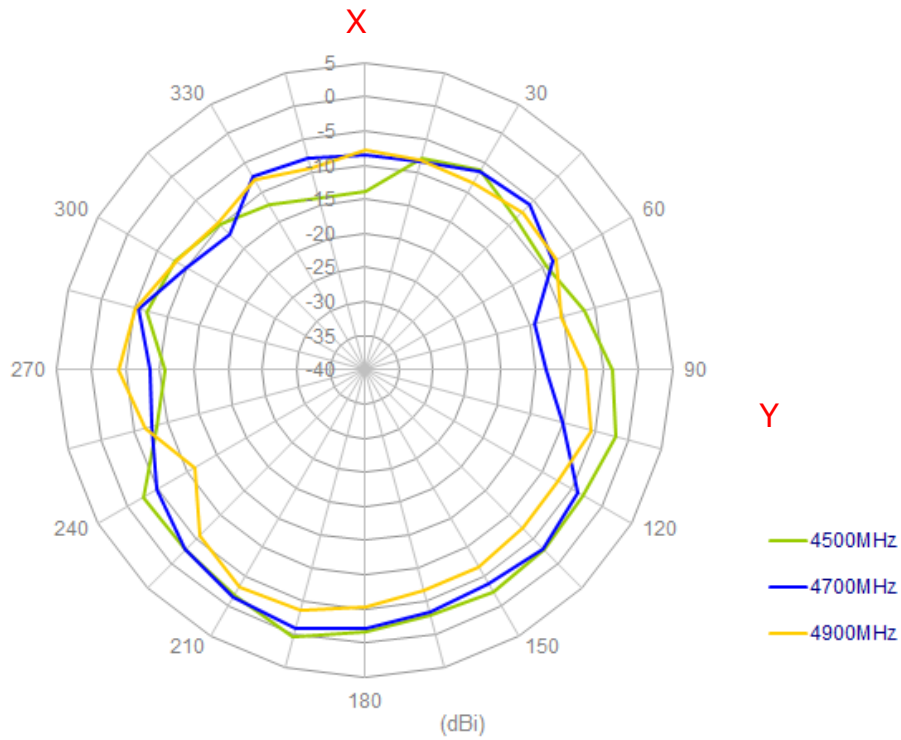


### XZ Plane

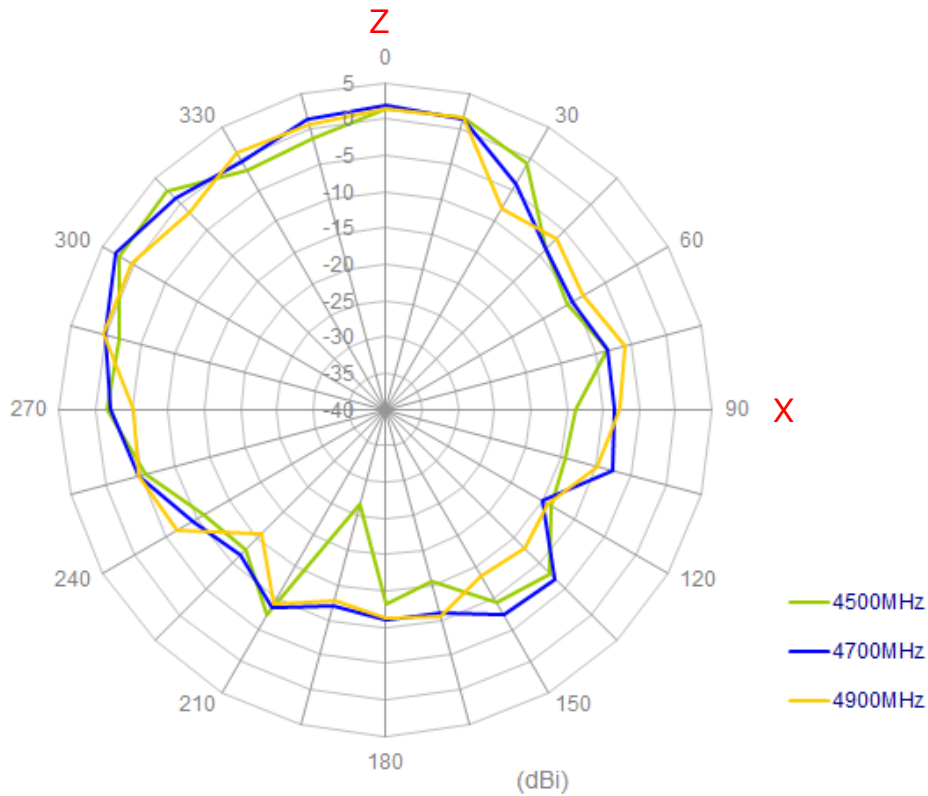


## 7.3 V-pol. 2 antenna

### XY Plane



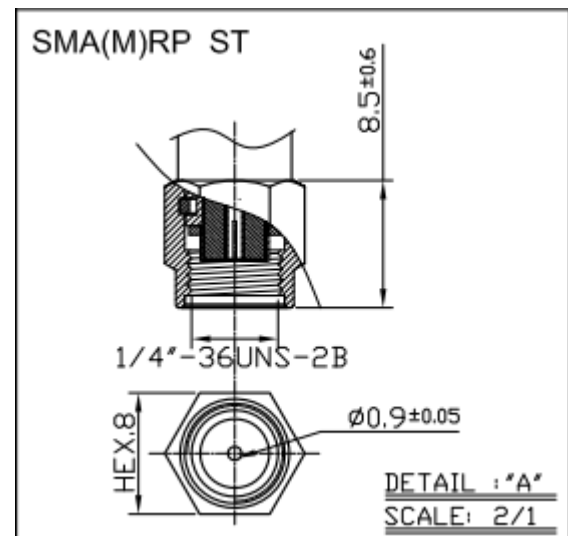
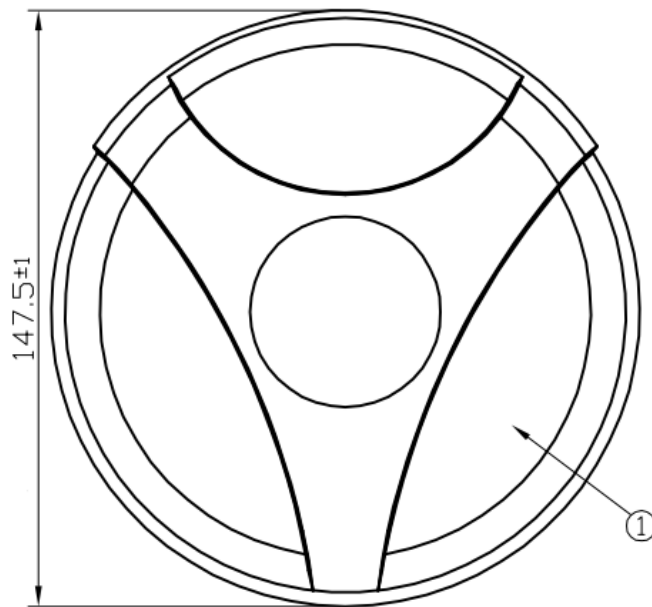
### XZ Plane



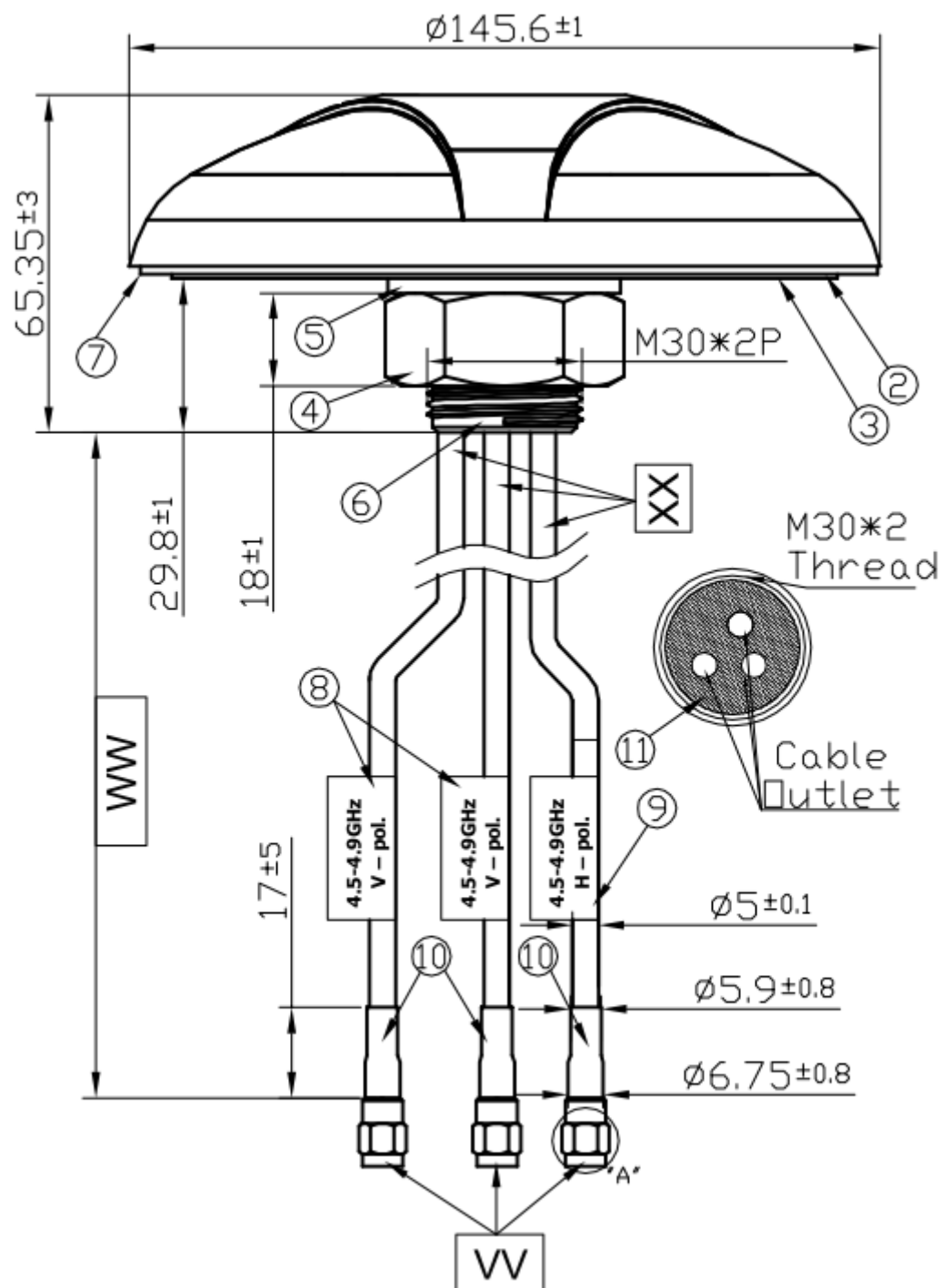
## 8. Cable attenuation

| Cable attenuation (dB/ 100M) |     |    |     |    |     |    |     |    |     |    |     |     |
|------------------------------|-----|----|-----|----|-----|----|-----|----|-----|----|-----|-----|
| GHz                          | 0.5 | 1  | 1.5 | 2  | 2.5 | 3  | 3.5 | 4  | 4.5 | 5  | 5.5 | 6   |
| CFD 200                      | 26  | 39 | 49  | 58 | 66  | 73 | -   | 86 | -   | 98 | -   | 109 |

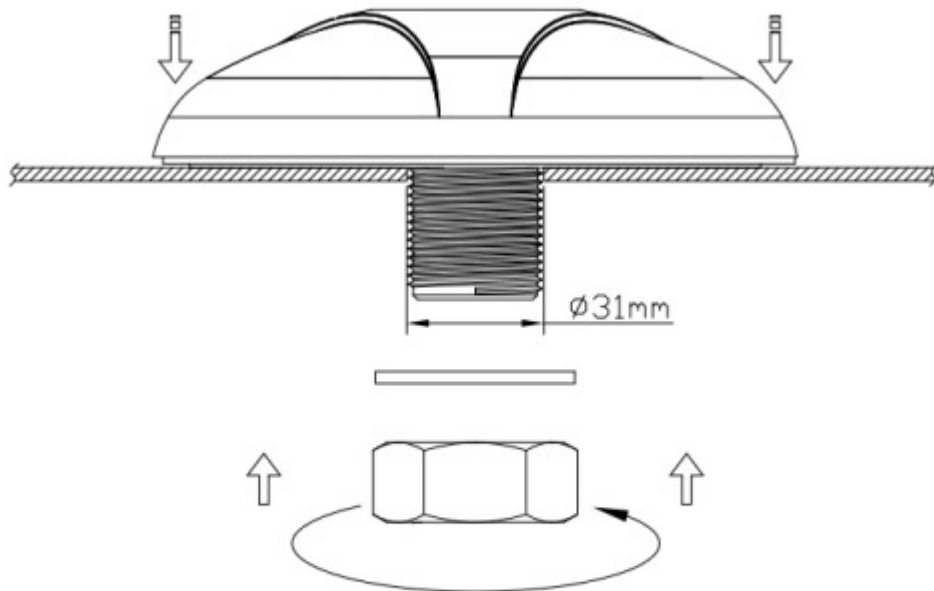
## 9. Mechanical Drawing



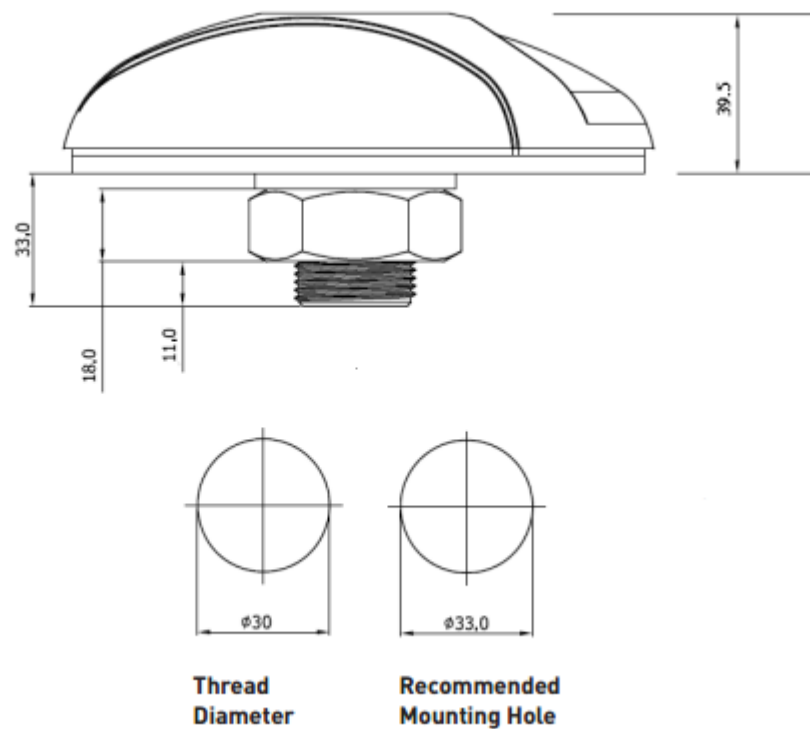
|    | Name                    | P/N                   | Material         | Finish      | QTY |
|----|-------------------------|-----------------------|------------------|-------------|-----|
| 1  | Housing                 | 000111F0000XXA        | PC 540           | Black       | 1   |
| 2  | Closed Cell Foam        | 001011F0300XXA        | CR 4305          | Black       | 1   |
| 3  | 3M Double Adhesive      | 001011F0300XXA        | 3M 9448 HK       | White Liner | 1   |
| 4  | M30 Nut                 | 000411F0000XXA        | Steel AISI 1215  | Ni Plated   | 1   |
| 5  | Washer                  | 000411F0100XXA        | Steel AISI 1215  | Ni Plated   | 1   |
| 6  | M30x 2 Thread 32L       | 000311F0000XXA        | Zinc Alloy       | Ni Plated   | 1   |
| 7  | Waterproof Rubber       | 000711F0000XXA        | Silicon          | Black       | 1   |
| 8  | 4.5-4.9 GHz V-pol.Label | 001012A000015A        | Matte Silver PET | Silver      | 2   |
| 9  | 4.5-4.9 GHz H-pol.Label | 001012A010015A        | Matte Silver PET | Silver      | 1   |
| 10 | Heat Shrink Tube        | 001311F0100XXA        | PE               | Black       | 3   |
| 11 | Rubber Stopper          | 000711F0000XXA        | Silicone Rubber  | Black       | 1   |
|    | Name                    | P/N                   | Spec             | Finish      | QTY |
| VV | Connector Type          | SMA.M.RP.ST.PLUG.G.WY | SMA(M)RP ST      | Gold        | 3   |
| WW | Cable Length            |                       | 3000±30mm        |             |     |
| XX | Cable Type              | 301412A000015A        | CFD 200          | Black       | 3   |



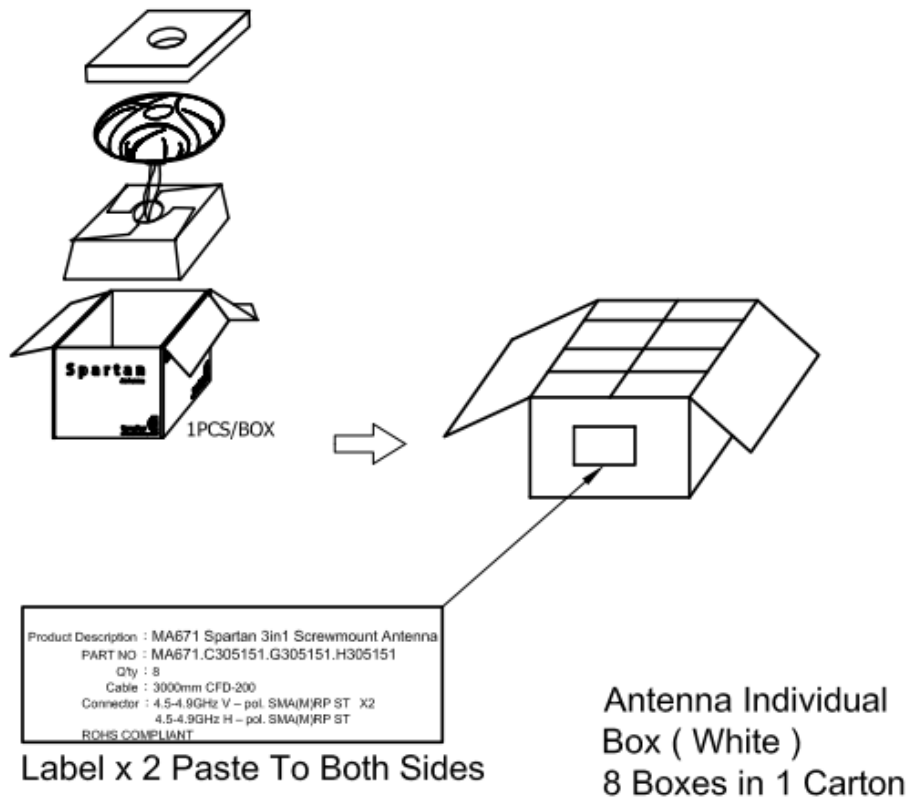
## 10. Installation

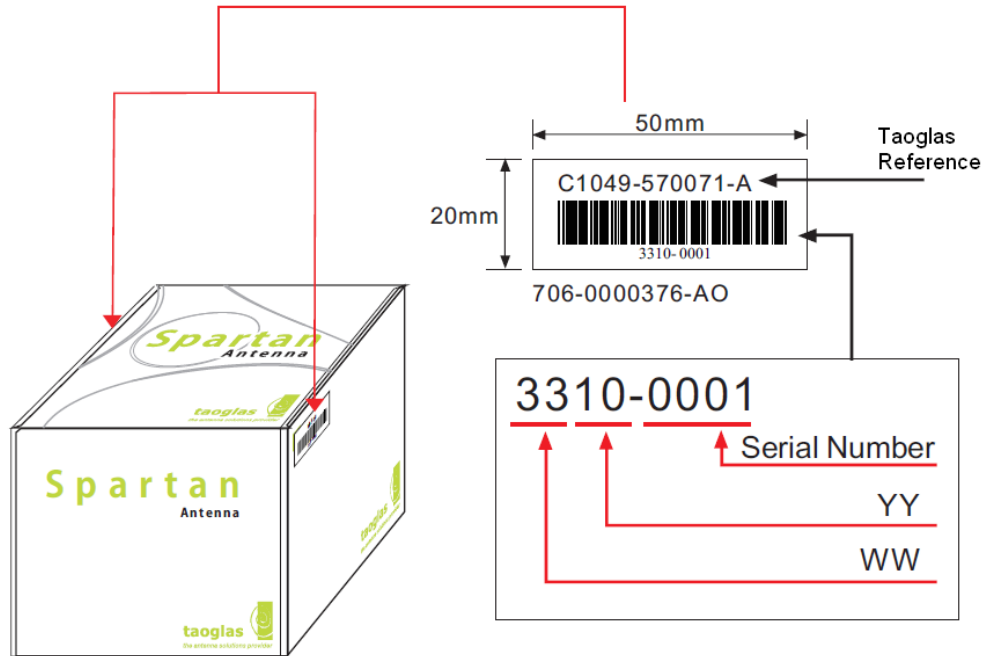


Recommended Torque for Mounting 49 N·m  
Maximum Torque for Mounting 58.8 N·m

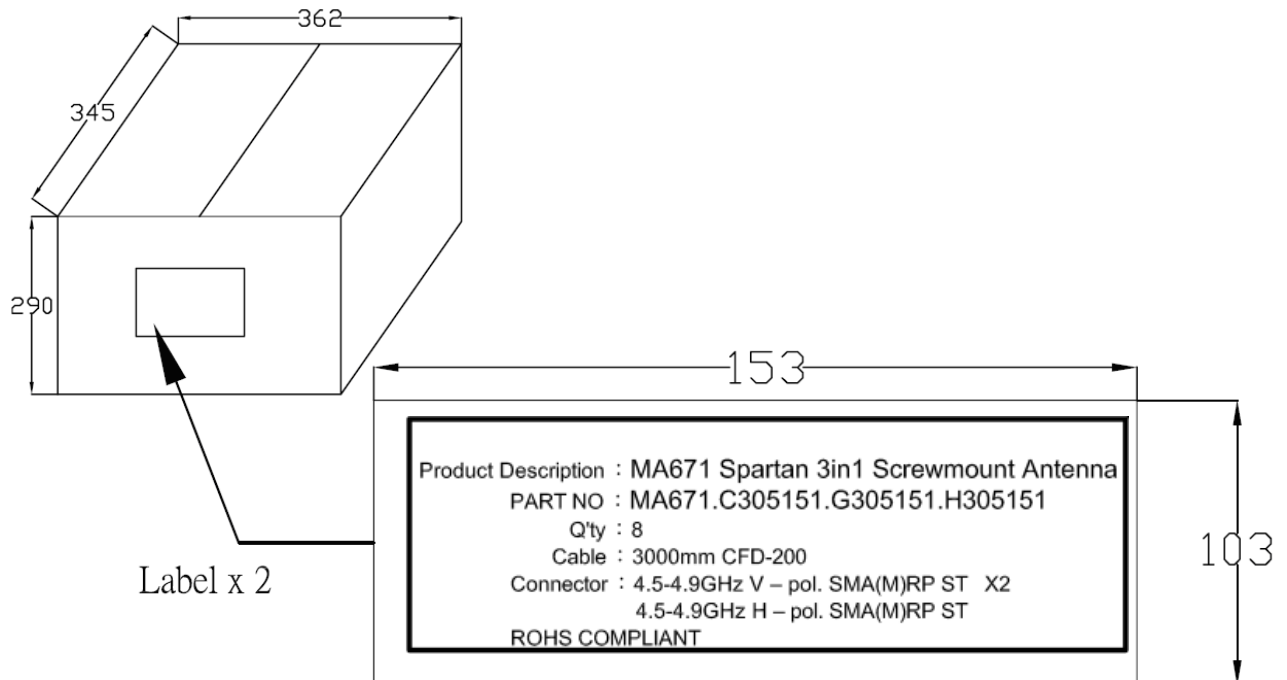


## 11. Packaging





8 boxes per carton



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