



# TAOGLAS®



# Datasheet

## Hercules

WS.01.B.305151

### Description:

Heavy Duty Screw Mount Antenna - Dual-Band 2.4 5.2GHz

### Features:

2.4GHz 5.2GHz suitable for ISM Bands/ZigBee/WLAN/Bluetooth

IEEE.802.11/IEEE.802.15

UV and Vandal Resistant ABS Housing

3m NFC-200 RP-SMA(M)

RoHS & Reach Compliant

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## 1. Introduction



WS.01 Hercules is a high efficiency, high gain thread mount dual band wireless antenna for external use on vehicles and outdoor assets worldwide. Omni-directional gain across both bands ensures constant reception and transmission making the WS.01 an ideal solution for a Zigbee Wireless Mesh for remote applications e.g. – remote metering.

It has been designed for heavy duty work with extra thick threads; with durable UV-resistant PVC housing is resistant to vandalism and direct attack. At only 29mm high it complies with the latest EU height restrictions directives for roof-mounted objects, whilst also enabling covert operation with a diameter of 49mm.

Many module manufacturers specify peak gain limits for any antennas that are to be connected to that module. Those peak gain limits are based on free-space conditions. In practice, the peak gain of an antenna tested in free-space can degrade by at least 1 or 2dBi when put inside a device. So ideally you should go for a slightly higher peak gain antenna than mentioned on the module specification to compensate for this effect, giving you better performance.

Upon testing of any of our antennas with your device and a selection of appropriate layout, integration technique, or cable, Taoglas can make sure any of our antennas' peak gain will be below the peak gain limits. Taoglas can then issue a specification and/or report for the selected antenna in your device that will clearly show it complying with the peak gain limits, so you can be assured you are meeting regulatory requirements for that module.

For example, a module manufacturer may state that the antenna must have less than 2dBi peak gain, but you don't need to select an embedded antenna that has a peak gain of less than 2dBi in free-space. This will give you a less optimized solution. It is better to go for a slightly higher free-space peak gain of 3dBi or more if available. Once that antenna gets integrated into your device, performance will degrade below this 2dBi peak gain due to the effects of GND plane, surrounding components, and device housing. If you want to be absolutely sure, contact Taoglas and we will test. Choosing a Taoglas antenna with a higher peak gain than what is specified by the module manufacturer and enlisting our help will ensure you are getting the best performance possible without exceeding the peak gain limits.

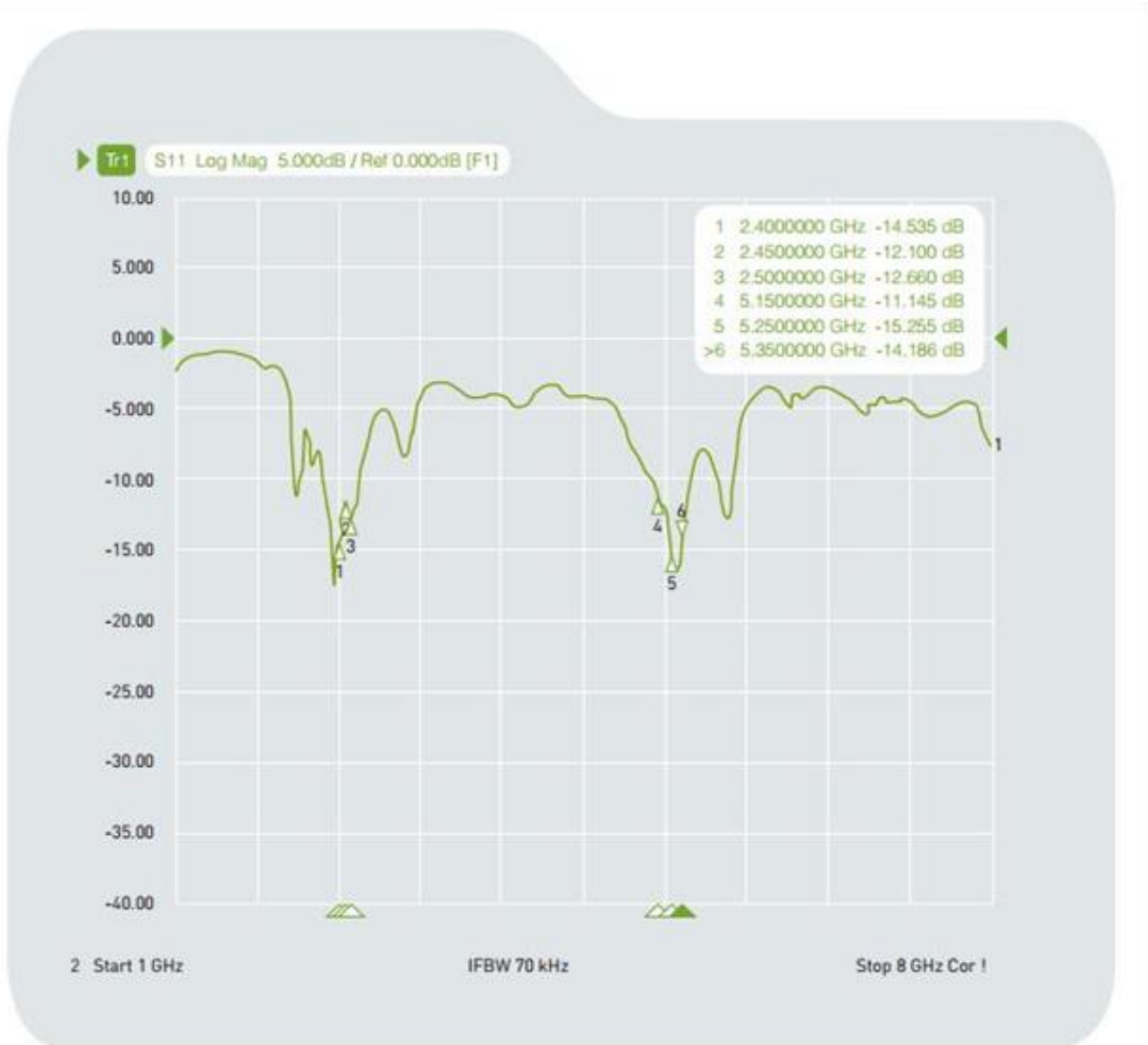
## 2. Specifications

Electrical						
Frequency (MHz)	2400	2450	2500	5150	5250	5350
VSWR						
	1.46	1.66	1.6	1.76	1.41	1.48
Return Loss(dB)						
	-14.5	-12.1	-12.7	-11.1	-15.3	-14.2
Efficiency (%)						
	63.27	68.90	66.43	49.95	41.64	47.47
Average Gain(dB)						
	-1.99	-1.62	-1.78	-3.01	-3.81	-3.24
Gain(dBi)						
	3.05	4.05	4.12	4.74	4.38	4.72
Impedance	50Ω					
Polarization	Linear - Horizontal					
Radiation Pattern	Omni					
Mechanical						
Height	29mm					
Base Diameter	49mm					
Thread Diameter	18mm					
Casing	UV Resistant PC					
Cable	3000mm NFC-200					
Connector	Reverse Polarity SMA Male Straight					
Recommended Mounting	24.5N·m					
Maximum Mounting Torque	29.4N·m					
Weather Proof Gasket	CR4305 foam with 3M9448B double-side adhesive					
Cable Pull	8KGf					

Environmental	
Corrosion	5% NaCl for 48hrs – Nickel plated steel base & thread
Thermal Shock	100 cycles -40°C to 85°C
Shock(Drop Test)	1m drop on concrete 6 axes
Temperature Range	-40°C to 85°C
Humidity	Non-condensing 65°C 95% RH

### 3. Antenna Characteristics

#### 3.1 Return Loss



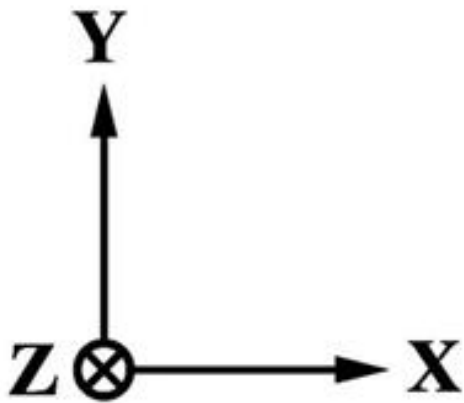
### 3.2 VSWR



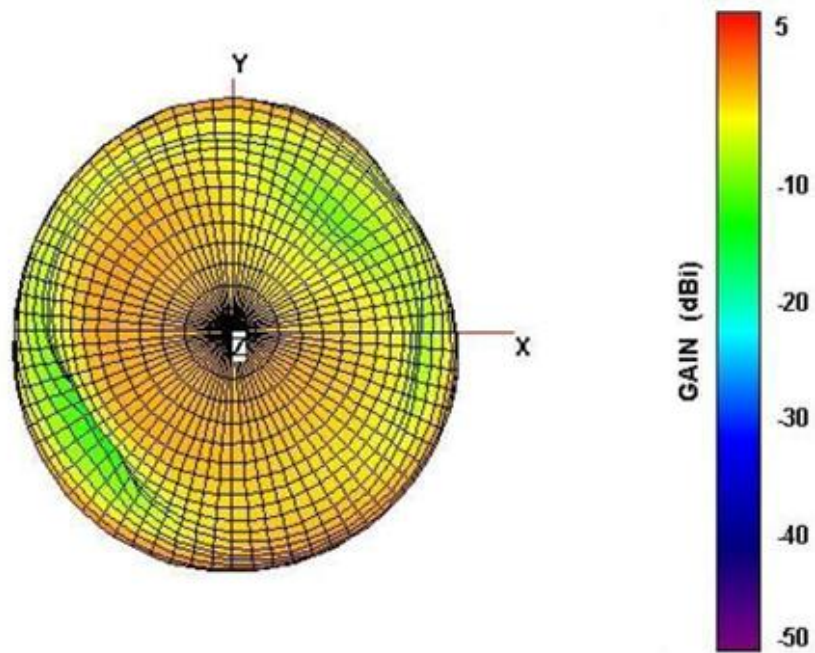


## 4. 3D Radiation Patterns

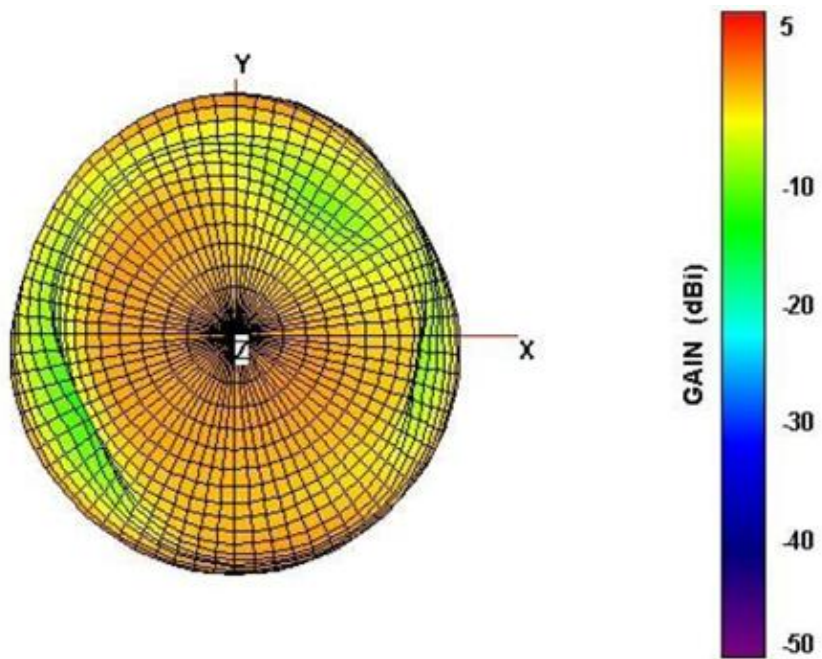
### 4.1 Test Setup



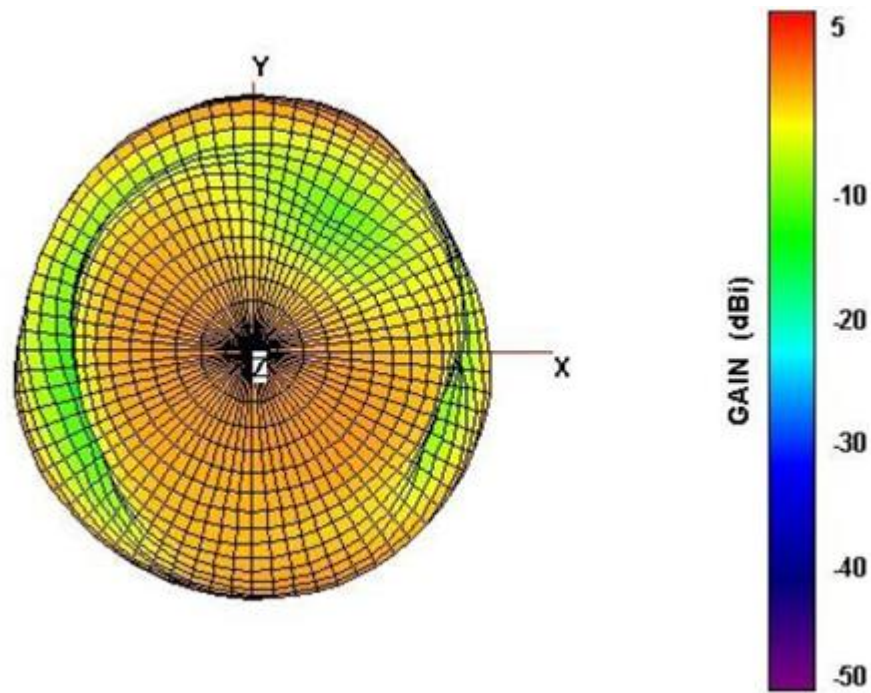
4.2 Data



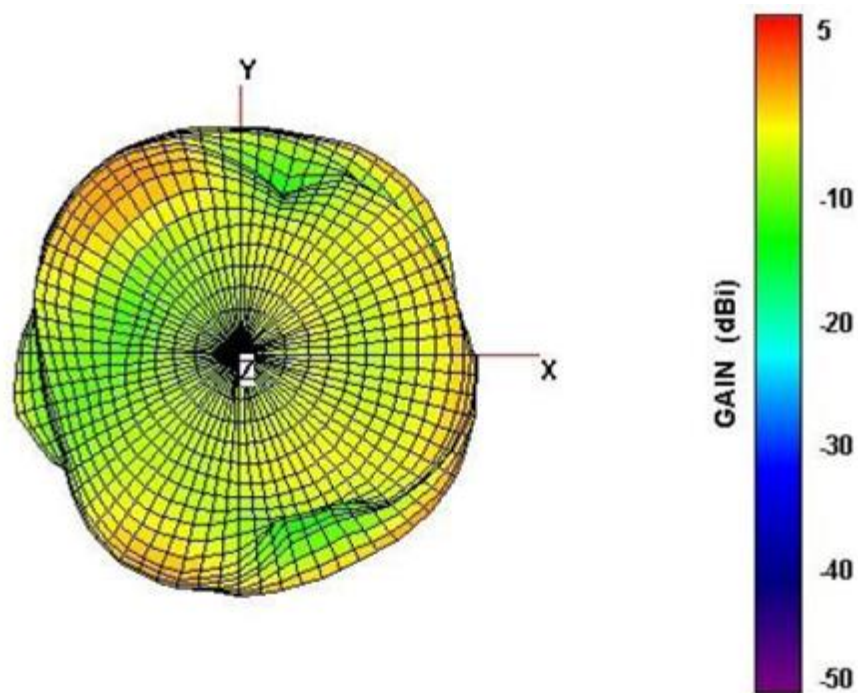
2.4GHz



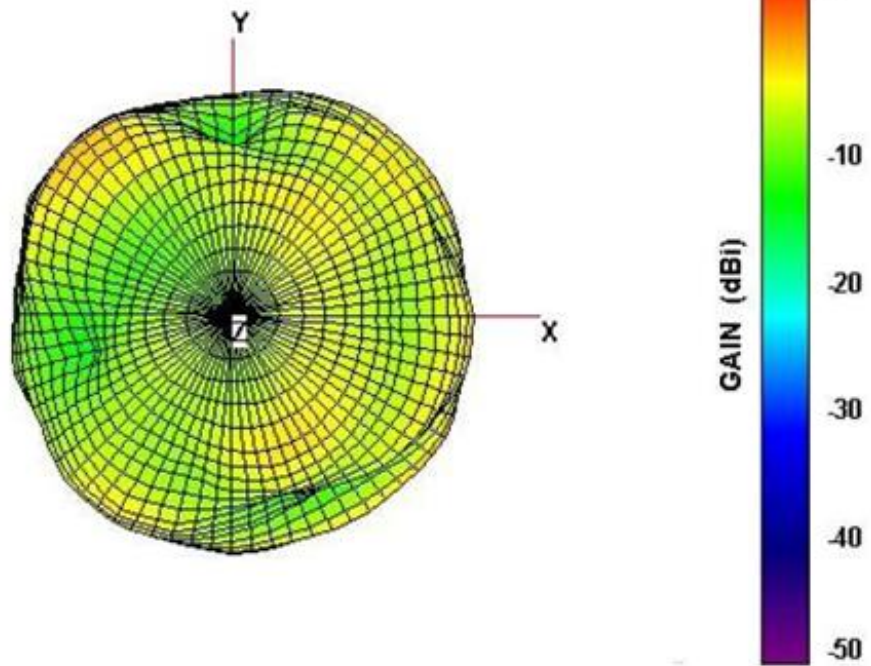
2.45GHz



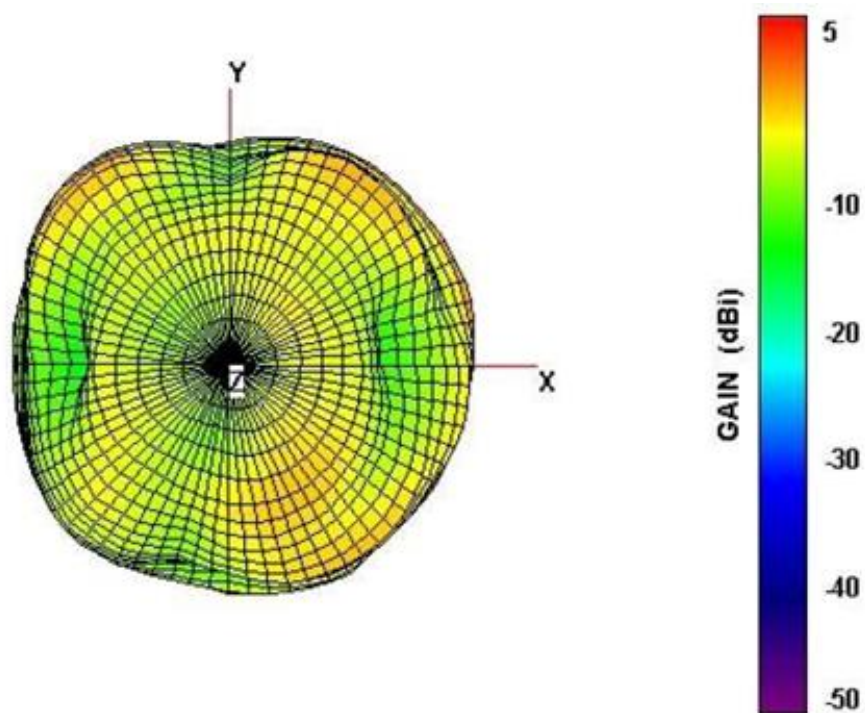
2.5GHz



5.15GHz

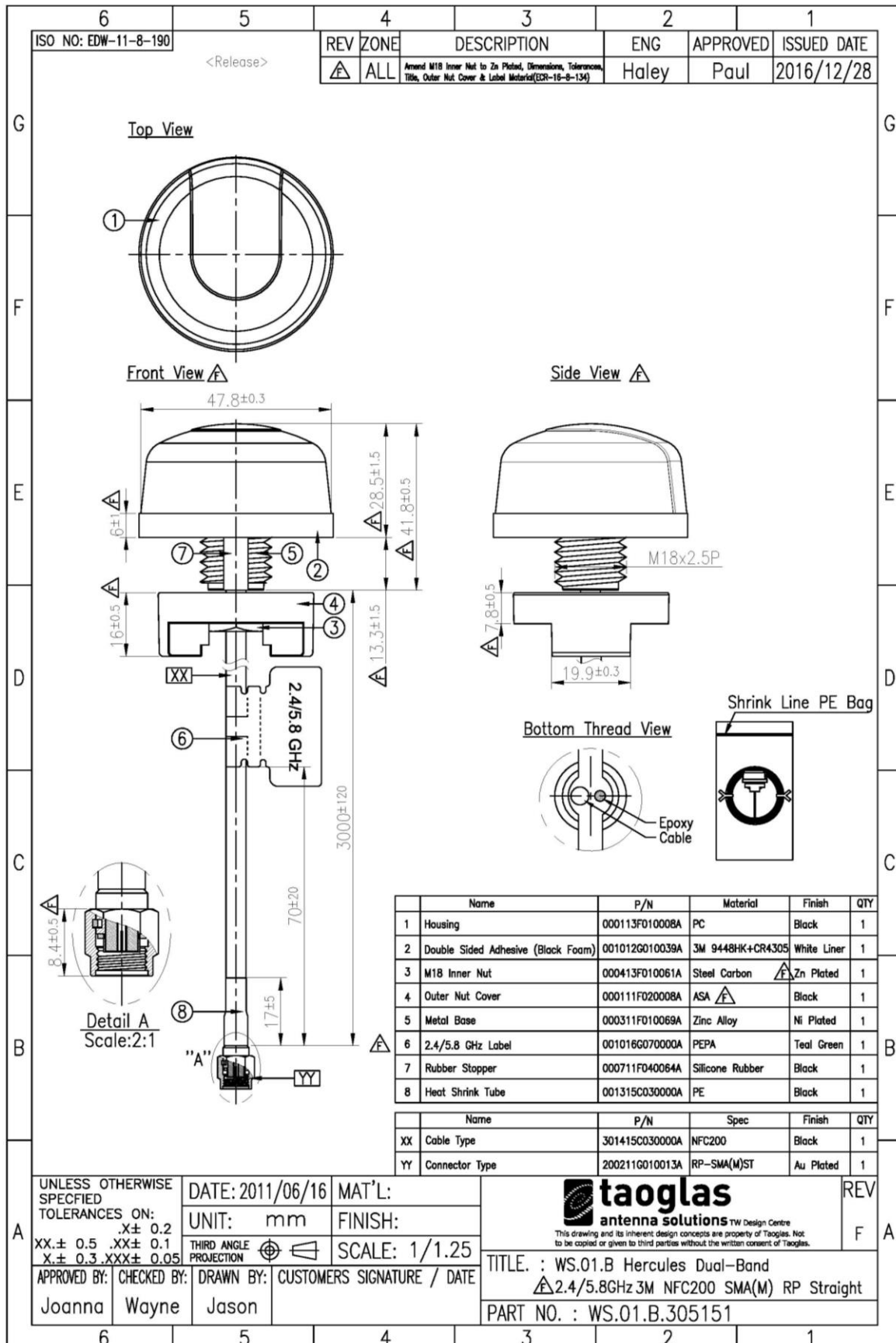


5.25GHz

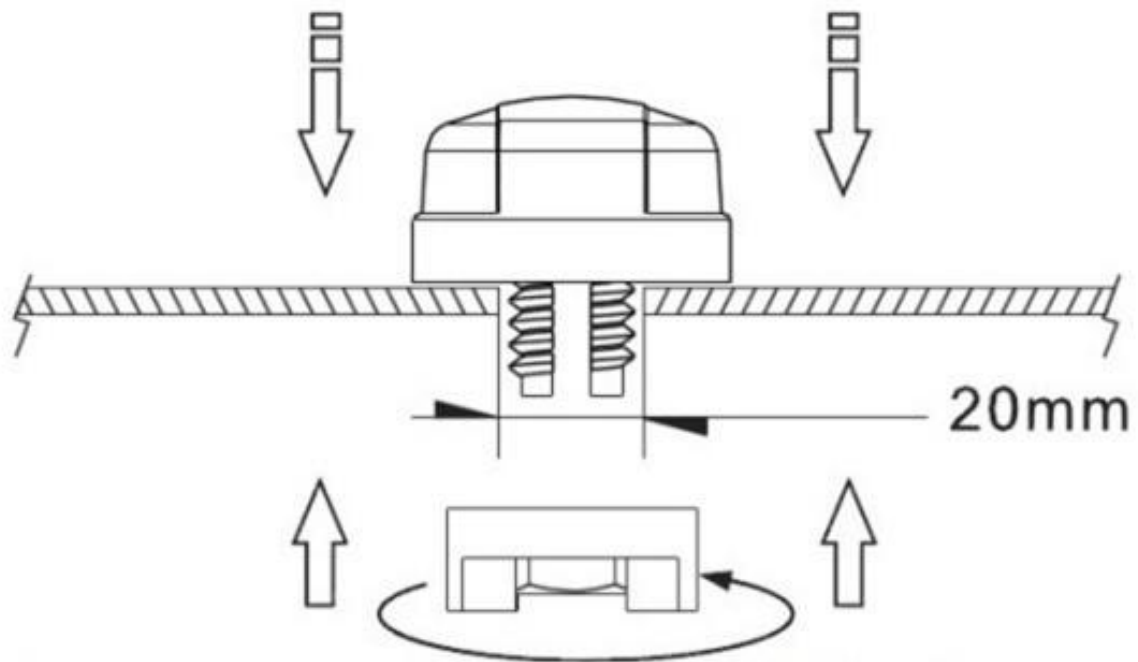


5.35GHz

# 5. Mechanical Drawing (Units: mm)



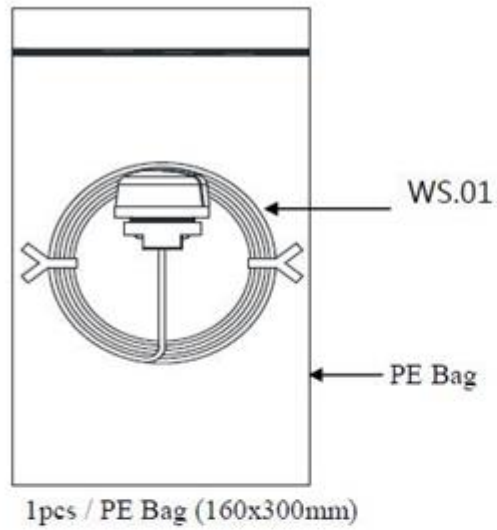
## 6. Installation



Recommended torque for Mounting is 24.5N·m  
 Maximum torque for mounting is 29.4N·m



## 7. Packaging



SPQ: 50pcs / Carton  
(390x260x330mm)



Changelog for the datasheet

**SPE-13-8-018 – WS.01.B.305151**

**Revision: G (Current Version)**

Date:	2019-03-05
Changes:	Updated drawing and template
Changes Made by:	Jack Conroy

**Previous Revisions**

**Revision: F**

Date:	5/2/2017
Changes:	Updated packaging as per PCN.
Changes Made by:	Jack Conroy

**Revision: A (Original First Release)**

Date:	2/6/2013
Notes:	
Author:	Aine Doyle

**Revision: E**

Date:	2018-03-27
Changes:	Updated with revised salt spray data and disclaimer
Changes Made by:	Andy Mahoney

**Revision: D**

Date:	8/24/2016
Changes:	Installation Guide Amended
Changes Made by:	Jack Conroy

**Revision: C**

Date:	8/6/2014
Changes:	Torque has been added
Changes Made by:	Aine Doyle

**Revision: B**

Date:	10/21/2013
Changes:	Amended drawing for cable
Changes Made by:	Aine Doyle



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**Previous Revisions (Continued)**




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