



# TAOGLAS®



# Datasheet

## Ulysses Miniature

**Part No:**  
AA.166.A.301111

**Description:**

Ulysses Ultra Low Profile Magnetic Mount GPS/GLONASS/Galileo/BeiDou Antenna

**Features:**

Magnetic Mount

Covers:

- GPS/QZSS (L1)
- Galileo (E1)
- GLONASS (G1)
- BeiDou (B1)

Cable: 3m RG-174

Connector: SMA(M)

IP67 Rated Enclosure

Dimensions: 37.8mm\*40.4mm\*10mm

RoHS & Reach Compliant

1. Introduction	3
2. Specifications	4
3. Antenna Characteristics	7
4. Radiation Patterns	12
5. Mechanical Drawing	17
6. Packaging	18
<hr/>	
Changelog	19

Taoglas makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Taoglas reserves all rights to this document and the information contained herein. Reproduction, use or disclosure to third parties without express permission is strictly prohibited.



# 1. Introduction



The Ulysses miniature ultra low profile (only 10mm in height) GNSS antenna is designed for applications which require high positioning accuracy by combining signals from GPS, GLONASS, Galileo and BeiDou systems. The tiny size of this antenna allows it to be used in very space restricted environments.

A high gain wide-band patch antenna on an integral ground delivers reliable performance. A fully IP67 waterproof rated and UV resistant enclosure allows use in outdoor environments. Mid SAW filter configuration eliminates potential LNA burn-out from nearby out of band radiated power bursts from other antennas that may be co-located nearby.

Typical Applications Include:

- Timing
- Precision Positioning for Robotics / Automotive
- Telematics
- Autonomous Routing

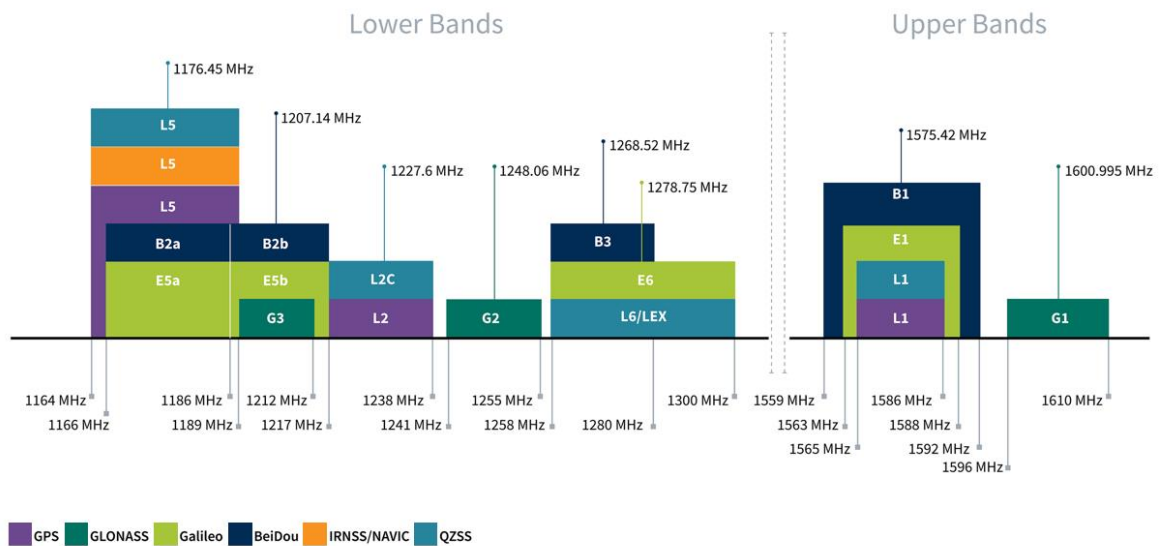
The antenna is manufactured to strict first tier Automotive quality controlled manufacturing process in IATF16949 approved facility. The cable and connector are fully customizable, contact your regional Taoglas customer support team for further information.

## 2. Specifications

GNSS Frequency Bands Covered						
GPS	L1	L2	L5			
	■	□	□			
GLONASS	G1	G2	G3			
	■	□	□			
Galileo	E1	E5a	E5b	E6		
	■	□	□	□		
BeiDou	B1	B2a	B2b	B3		
	■	□	□	□		
QZSS (Regional)	L1	L2C	L5	L6		
	■	□	□	□		
IRNSS (Regional)	L5					
	□					
SBAS	L1/E1/B1	L5/B2a/E5a	G1	G2	G3	
	■	□	■	□	□	

■ GNSS Frequency Bands Covered. □ GNSS Frequency Bands Not Covered.

\*SBAS systems: WASS(L1/L5), EGNOS(E1/E5a), SDCM(G1/G2/G3), SNAS(B1,B2a), GAGAN(L1/L5), QZSS(L1/L5), KAZZ(L1/L5).



GNSS Bands and Constellations

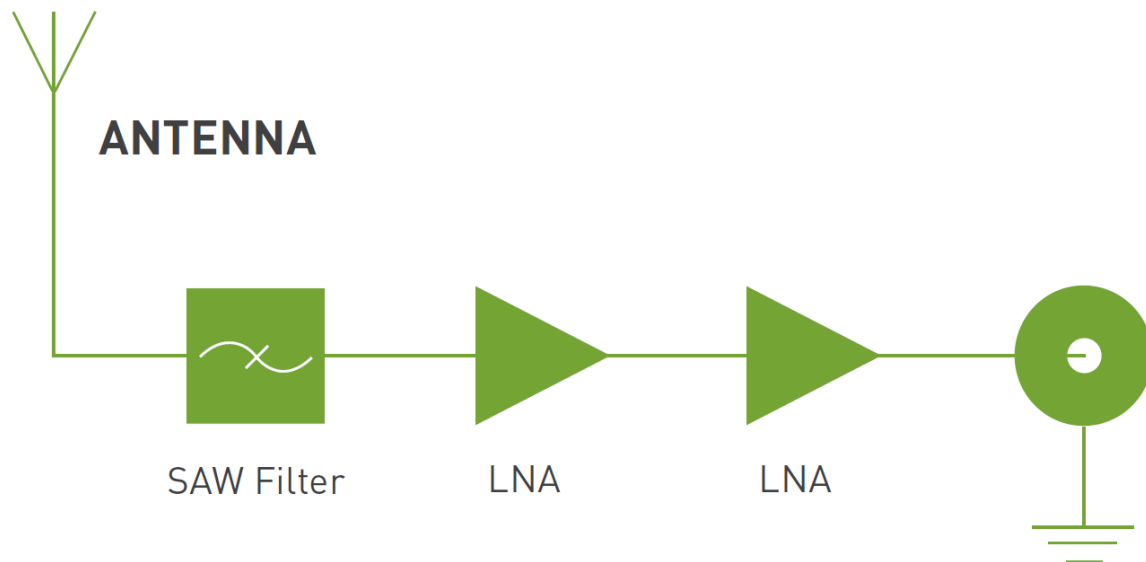
GPS-Galileo-GLONASS-BeiDou					
Center Frequency	Galileo E1	BeiDou	GPS	Galileo E2	GLONASS
	1559 MHz	1561 MHz	1575.42±1.023 MHz	1592 MHz	1602±5 MHz
Passive Antenna Efficiency (%)	46.13	51.33	34.56	49.74	44.55
Passive Antenna Average gain (dBi)	-3.36	-2.90	-4.61	-2.41	-3.51
Passive Antenna Peak gain	1.92	2.34	0.34	2.10	1.81
VSWR	<5				
Impedance	50Ω				
Axial Ratio	Galileo E1:28.94 Beidou:<27.29 GPS:<0.93 Galileo:< 7.76 GLONASS:< 16.15				
Polarization	RHCP				
LNA and Filter Electrical Properties					
Center Frequency	BeiDou:1561±2.046 MHz GPS:1575.42±1.023 MHz GLONASS:1602±5 MHz Galileo:1575.5±MHz				
Pout 1dB gain Compression point	-6dBm Min. -2 dbm Typ. (1561MHz,1575.42MHz,1602MHz,1559MHz-1592MHz)				
Output Impedance	50 Ohm				
VSWR	< 5:1				
Return Loss	-3 dB Max.				
LNA Gain, Current Draw, and Noise Figure @GPS	Frequency (MHz)	Voltage	LNA Gain(Typ)	Noise Figure(Typ)	
	1559	1.8-5.5V	31.37	3.24	
	1561		31.31	3.16	
	1575.42		29.75	2.66	
	1591		31.21	3.00	
	1602		30.43	2.97	

Mechanical	
Antenna Dimensions	40.4 x 37.8 x 10mm
Housing Material	UV Resistant ABS
Cable	3m RG-174
Connector	SMA(M)
Magnet force	
Environmental	
Operation Temperature	-40°C ~ +85°C
Storage Temperature	-40°C ~ +90°C
Humidity	Non-condensing 40°C 95% RH

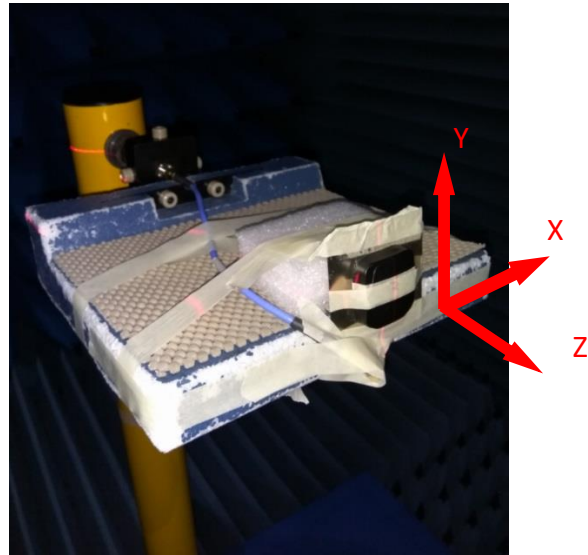
### 3. Antenna Characteristics

#### 3.1 GPS-GLONASS-GALILEO-BEIDOU Antenna

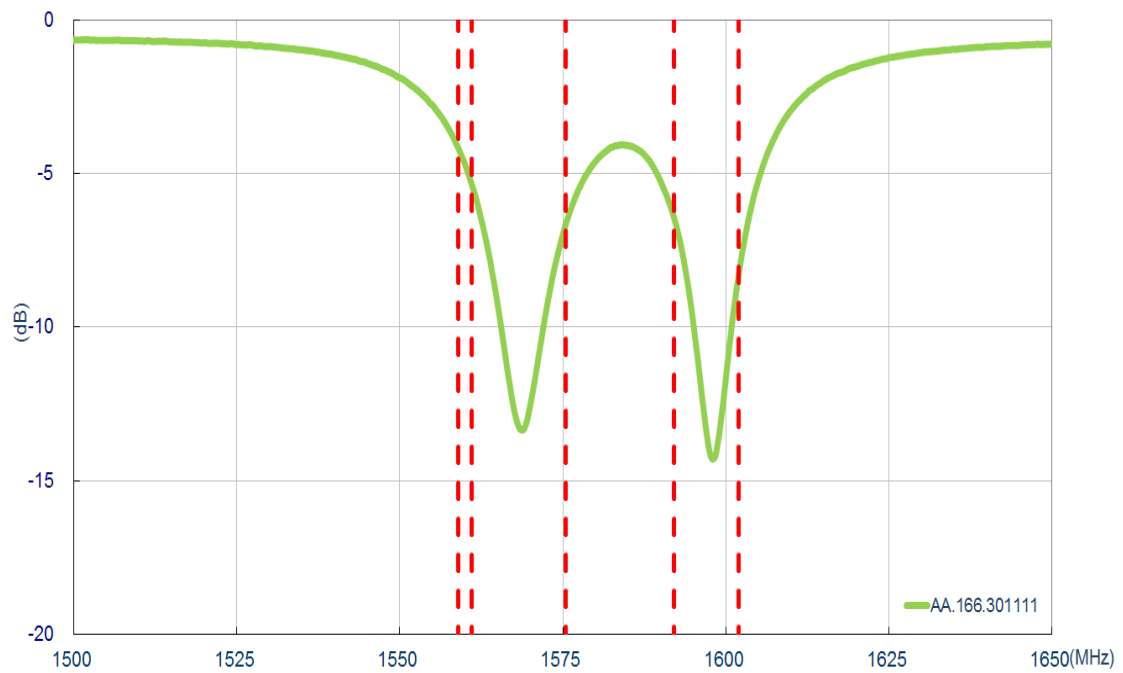
##### 3.1.1 Block Diagram (Active antenna)



### 3.1.2 Test Setup – Free Space

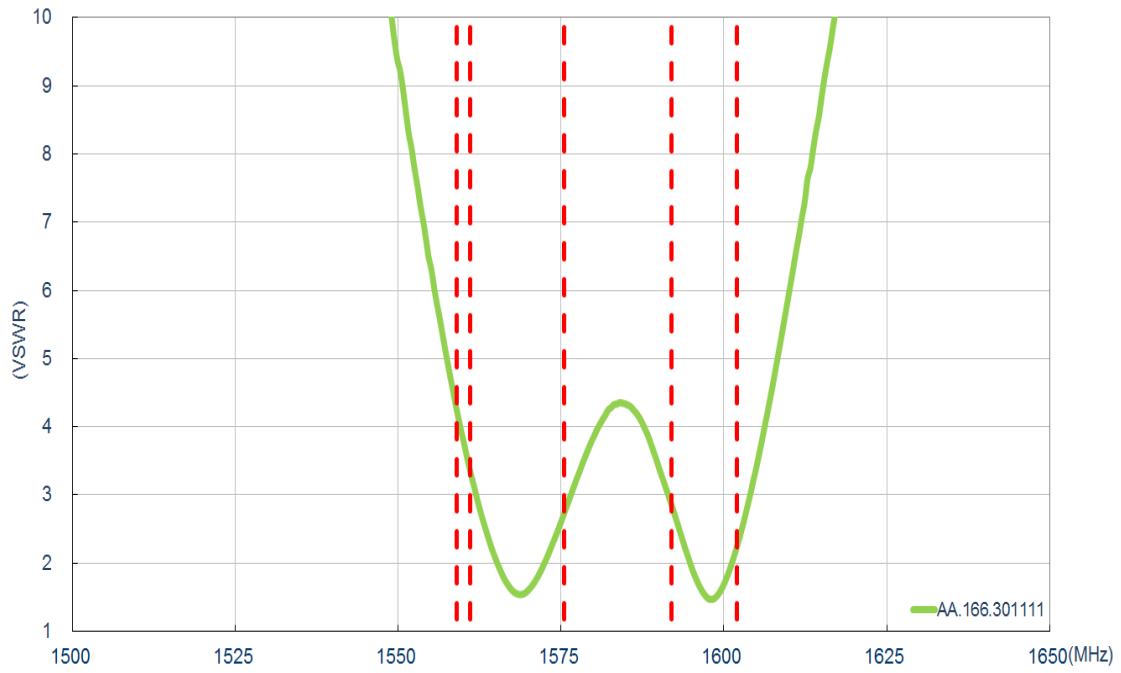


### 3.1.3 Return Loss (Passive antenna)

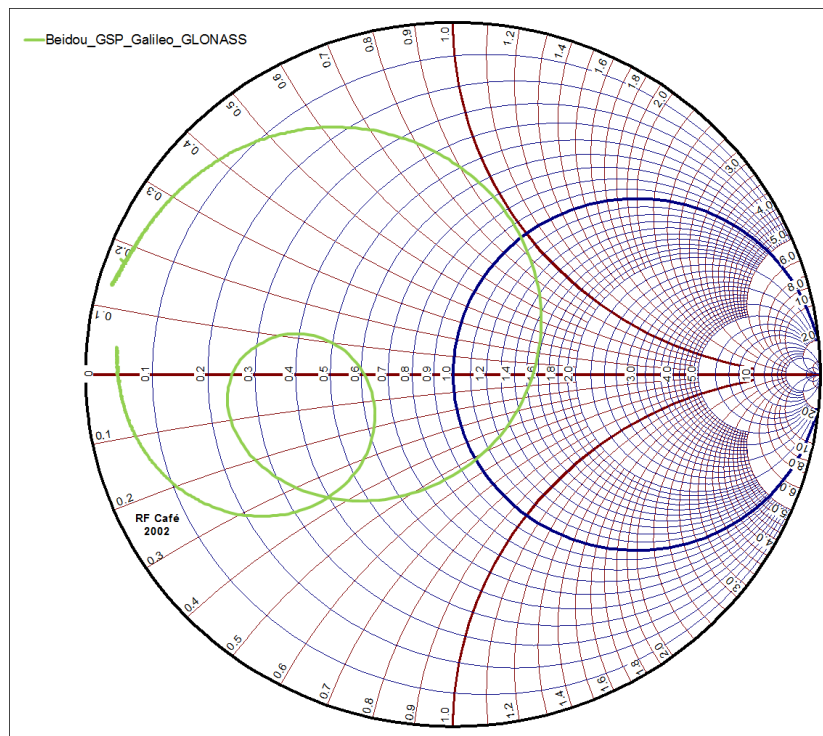




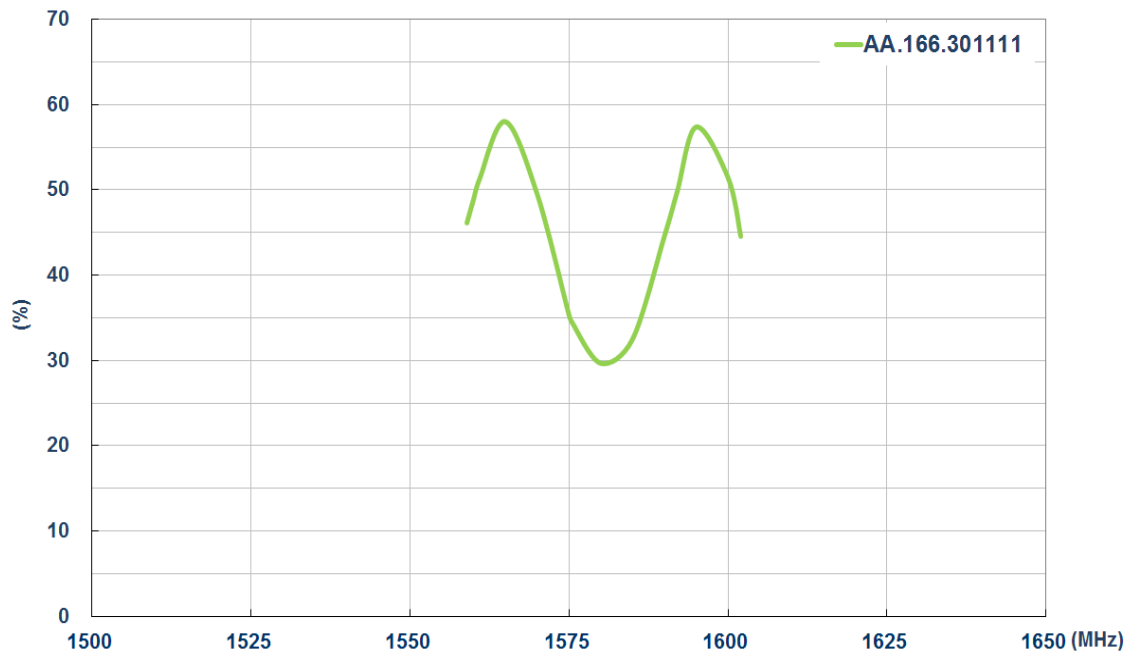
### 3.1.4 VSWR (Passive antenna)



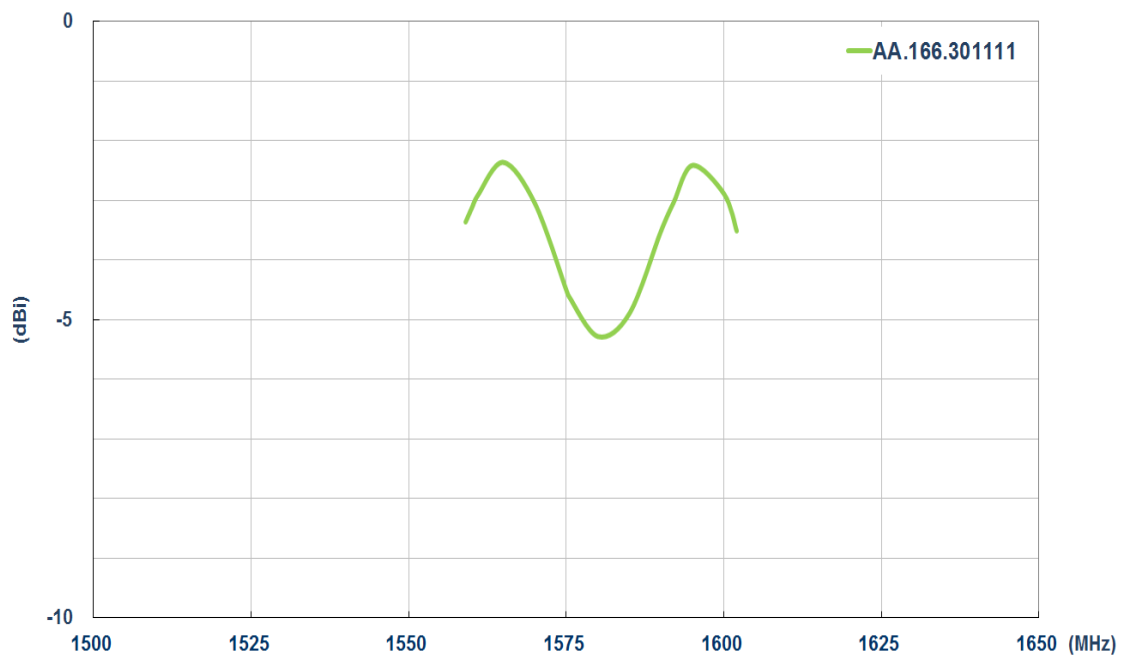
### 3.1.5 Smith Chart (Passive antenna)



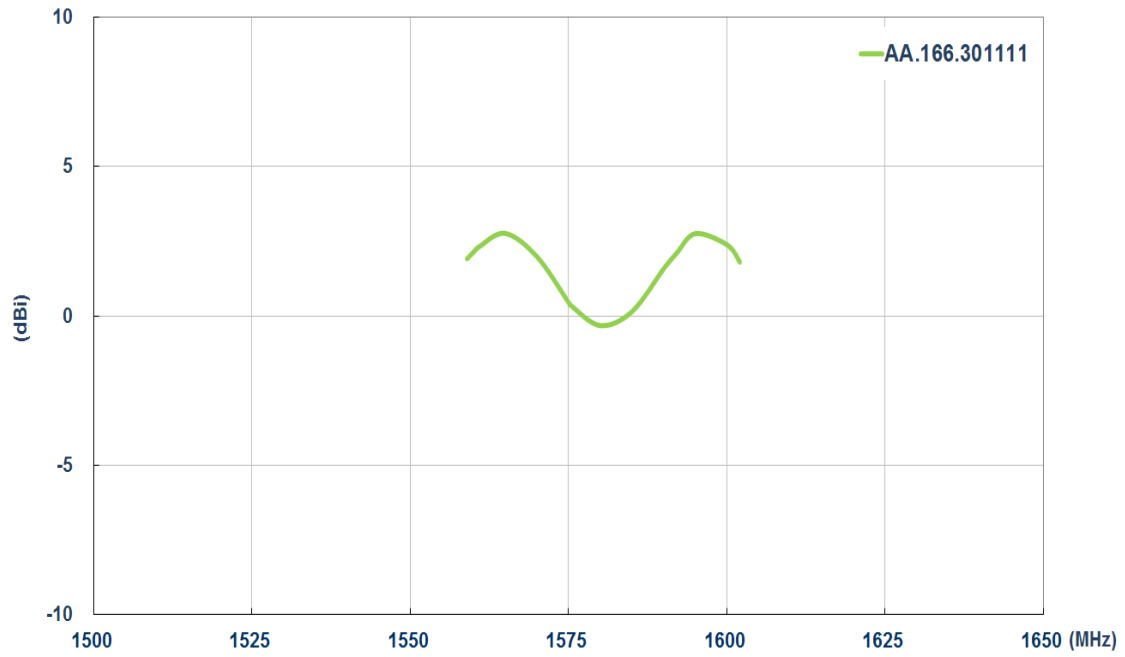
### 3.1.6 Efficiency (Passive antenna)



### 3.1.7 Average Gain (Passive antenna)



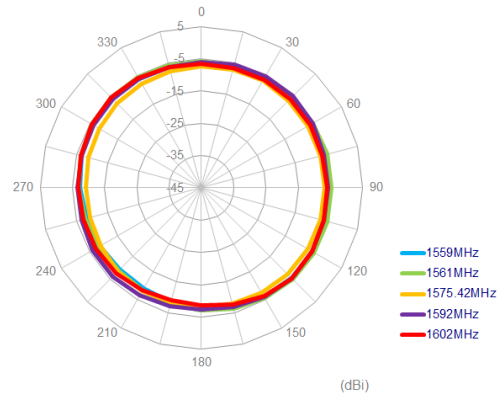
### 3.1.8 Peak Gain (Passive antenna)



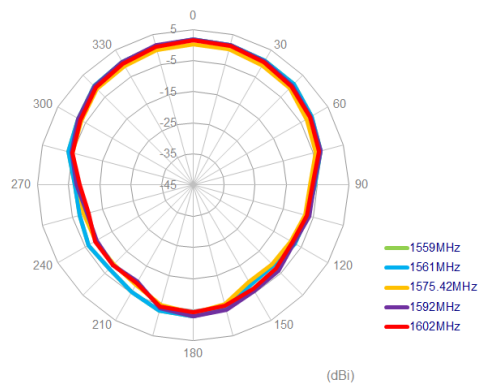
# 4. Radiation Pattern

## 4.1.1 2D Radiation pattern

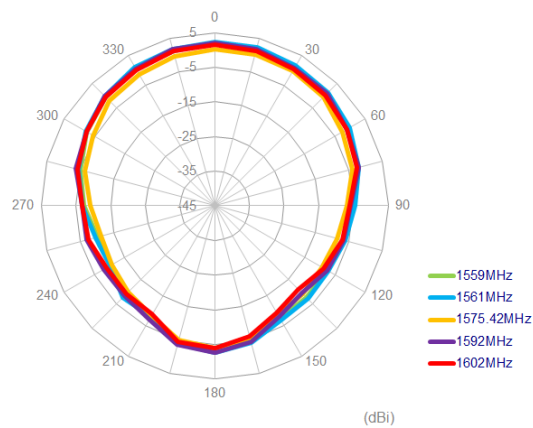
XY Plane



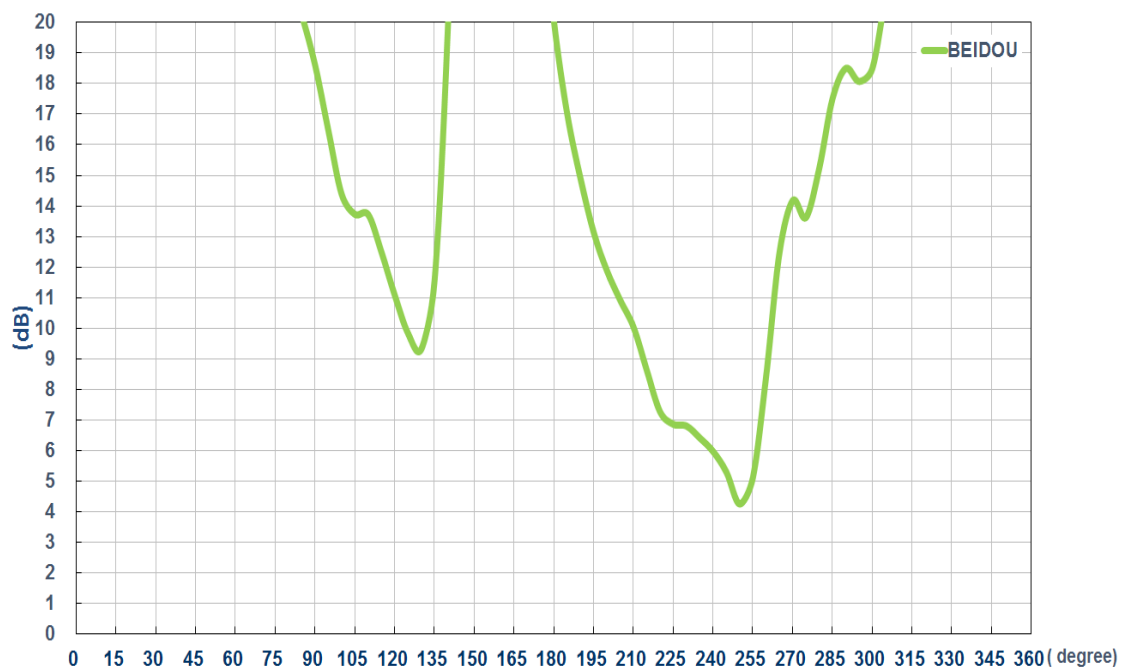
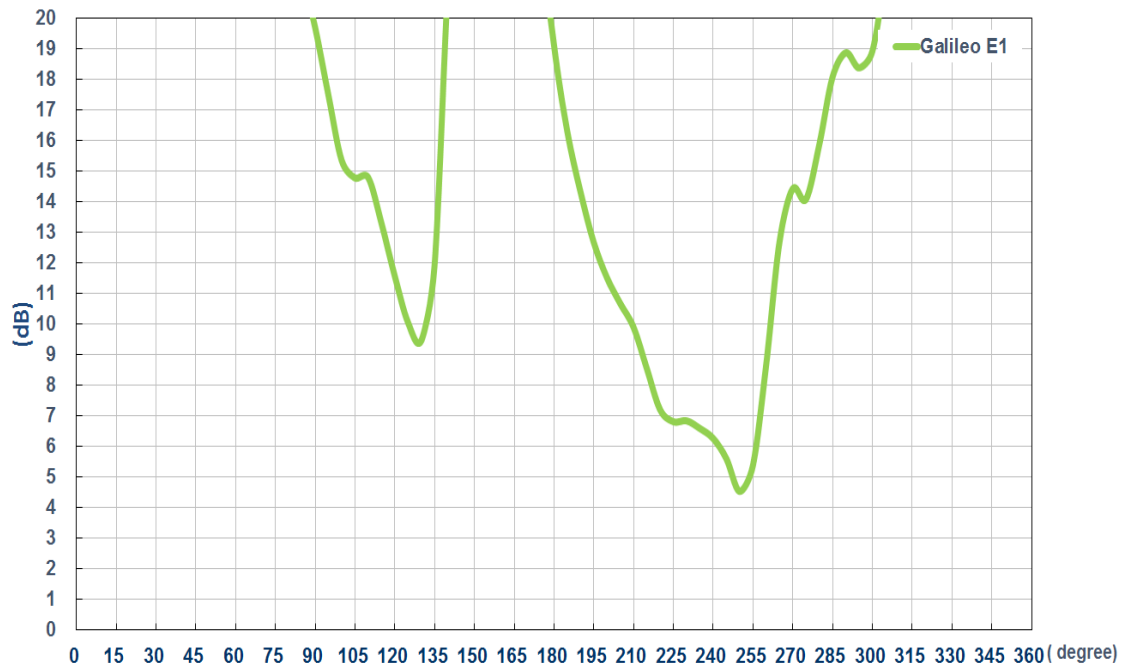
ZX Plane

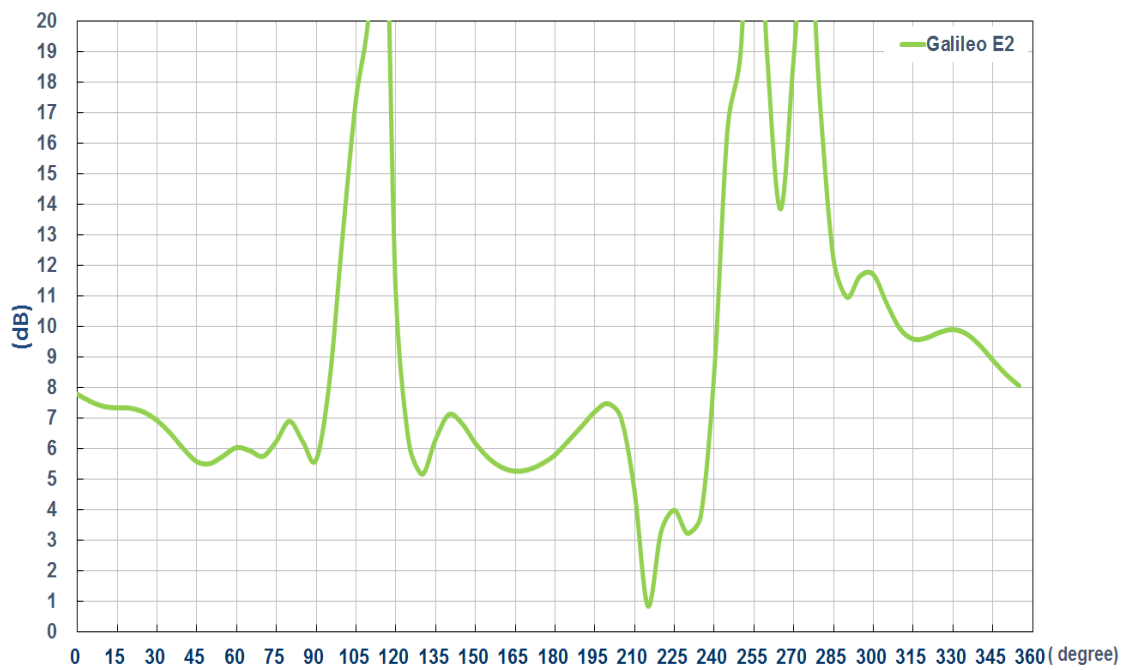
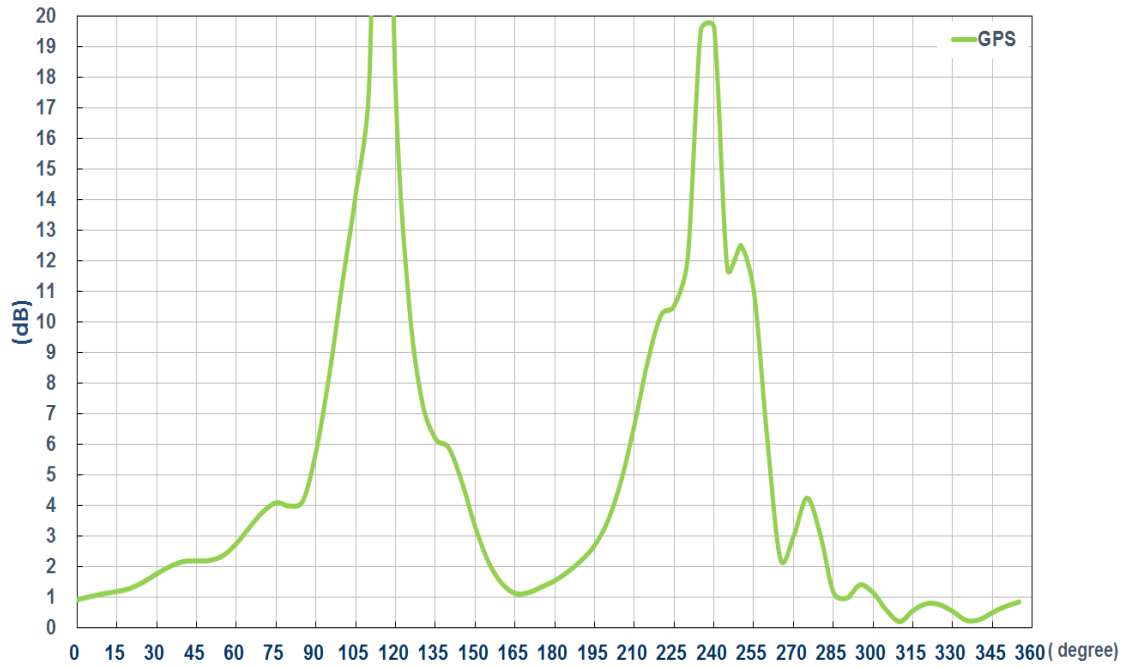


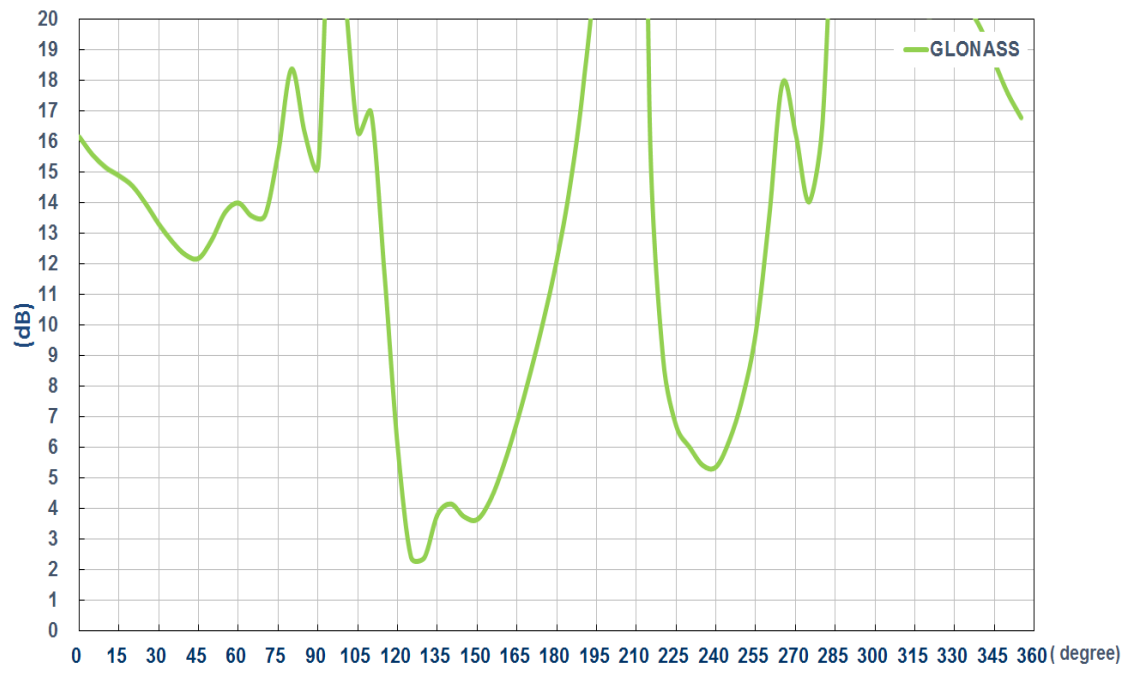
ZY Plane



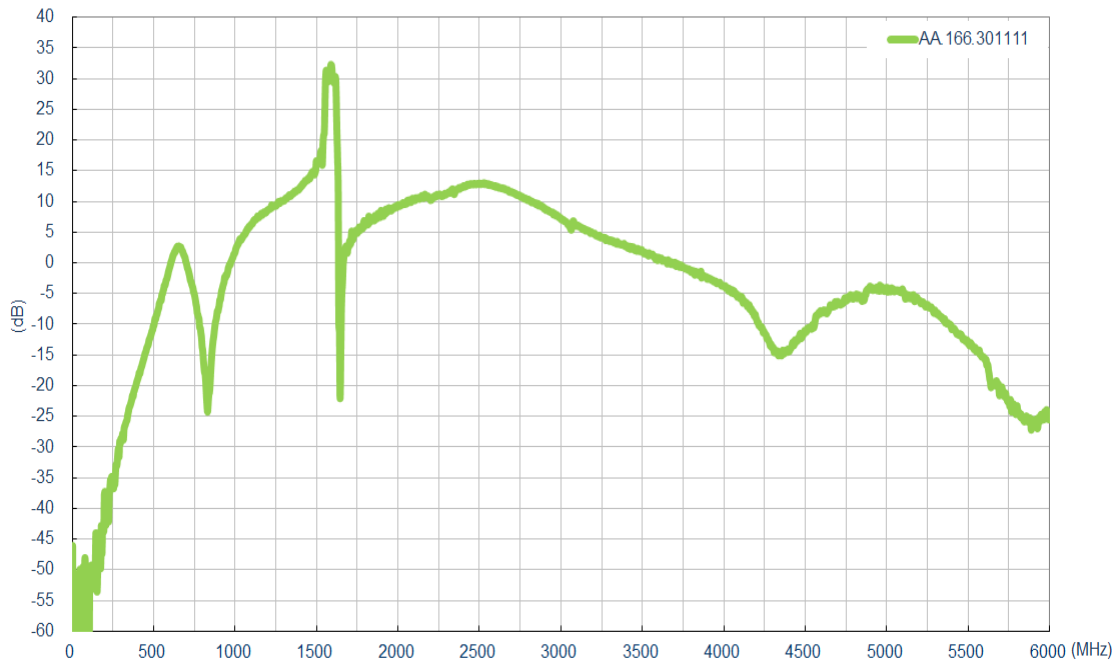
### 4.1.2 Axial Ratio Pattern (Passive antenna)



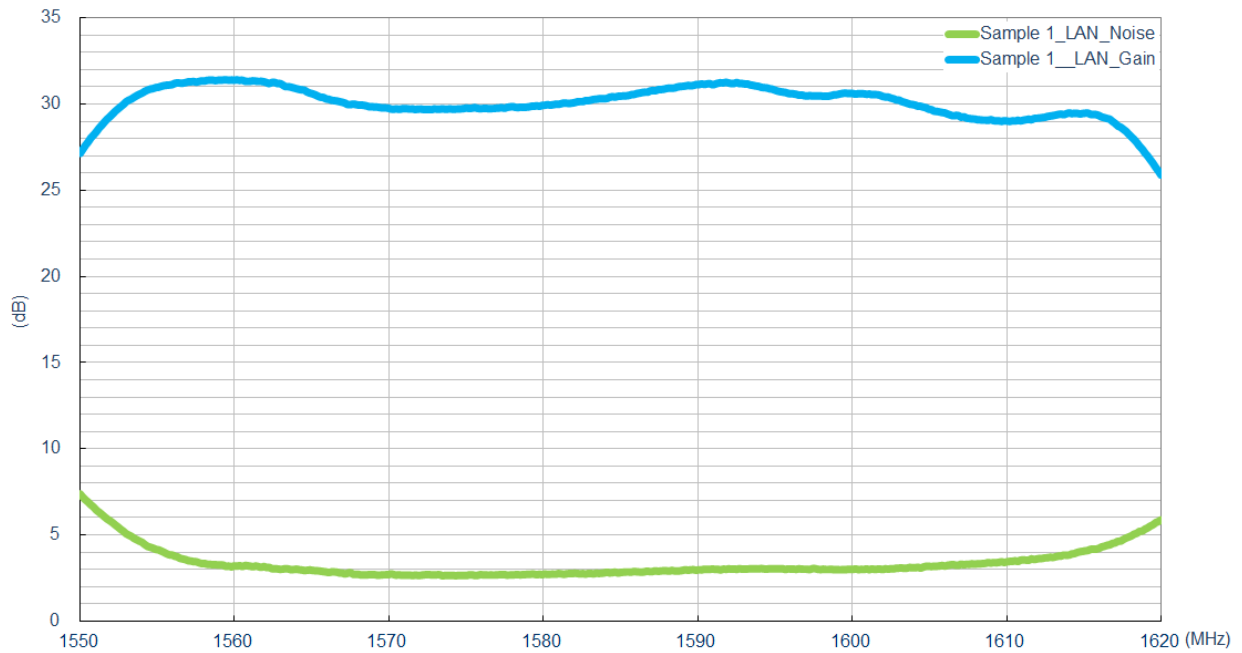




### 4.1.3 LNA Gain and Noise Figure (Active antenna)



LNA Gain@3.0V



LNA Noise Figure @3.0V



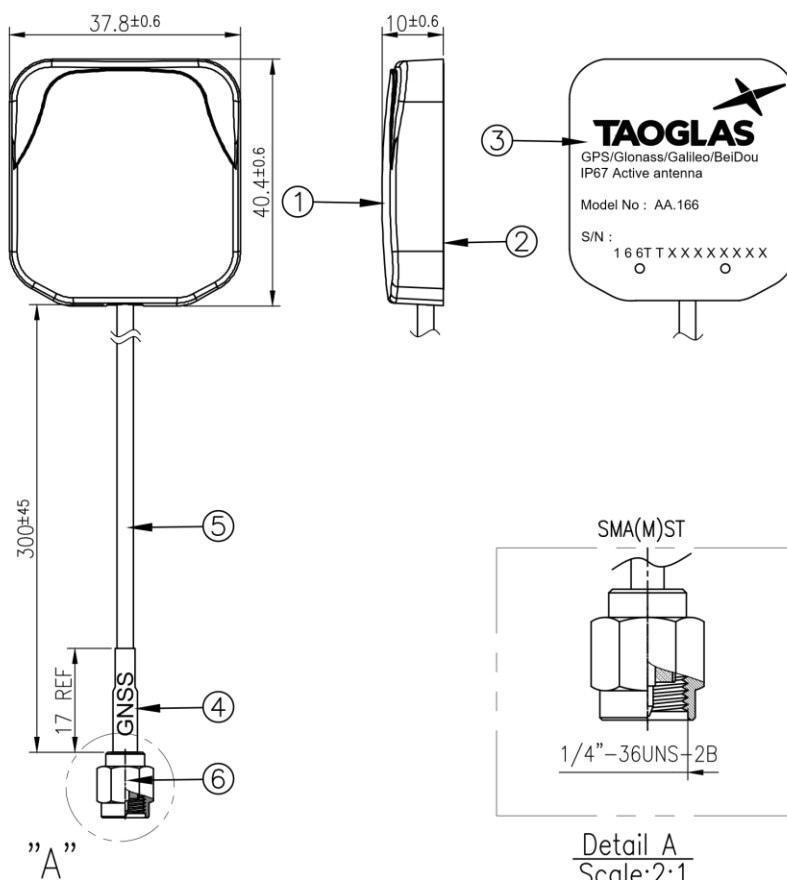
# 5. Mechanical Drawing (Units: mm)

ISO NO.: EDW-20-8-0874

STATE: Release

NOTES: 1. All material must be RoHS compliant.

REV.	DESCRIPTION	ENG.	APPROVED	DATE
001	Initial Design	Ruby	Clark	2020/10/06

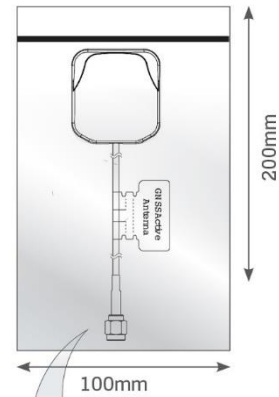


	Name	Material	Finish	QTY
1	Housing Top	ABS+PC	Black	1
2	Housing Bottom	ABS+PC	Black	1
3	Sticker	Gloss Silver PET	Silver	1
4	Heat Shrink Tube (HSS)	PE	Blue Tube/White Text	1
5	RG174 Coaxial Cable	PVC	Black	1
6	SMA(M)ST	Brass	Au Plated	1

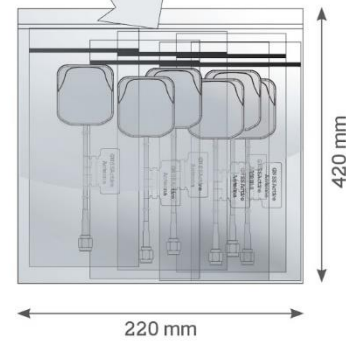
APPROVED BY: Clark	TW Design Centre This drawing and its inherent design concepts are property of Taoglas. Not to be copied or given to third parties without the written consent of Taoglas.
CHECK BY: Aaron	
DRAWN BY: Ruby	
DATE: 2020/10/06	TITLE : AA.166 Ulysses Miniature Magnetic Mount GPS/GLONASS /Galileo/BeiDou Antenna with 300mm RG-174 SMA(M)
UNLESS OTHERWISE SPECIFIED TOLERANCES ON:	PART NO. : AA.166.A.031111
THIRD ANGLE PROJECTION	UNIT: mm SCALE: 1:1 PAGES: 1/1 REV. D01

## 6. Packaging

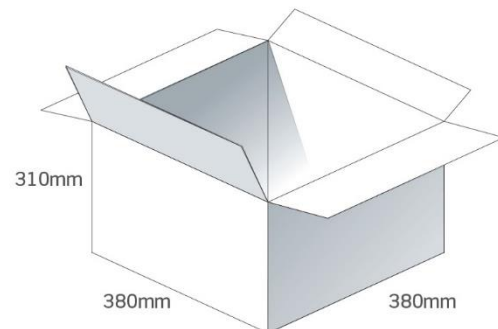
1 pcs AA.166.A.301111 per PE bag  
 PE Bag Dimensions - 100 x 200mm  
 Weight - 65g



10 PE bags per large PE bags  
 10 pcs AA.166.A.301111 per large PE bags  
 Carton Dimensions - 420 x 220mm  
 Weight - 0.65kg



10 Large PE bags per carton  
 100 pcs AA.166.A.301111 per carton  
 Carton Dimensions - 380 x 380 x 310mm  
 Weight - 7.5kg



Changelog for the datasheet

**SPE-17-8-096 – AA.166.A.301111**

**Revision: C (Current Version)**

Date:	2020-05-02
Changes:	Electrical Specifications Updated
Changes Made by:	Cesar Sousa

**Previous Revisions**

**Revision: B**

Date:	2019-11-27
Changes:	Electrical Specifications Updated
Changes Made by:	Jack Conroy

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

Date:	2018-01-02
Notes:	Initial Datasheet Release
Author:	Aine Doyle



**TAOGLAS®**

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

