



TAOGLAS®



Datasheet

GPSF.36.7.A.30

Part No:
GPSF.36.7.A.30

Description:

GPS L1/L2 36mm Single Feed Stacked Patch
Passive Antenna Low AR

Features:

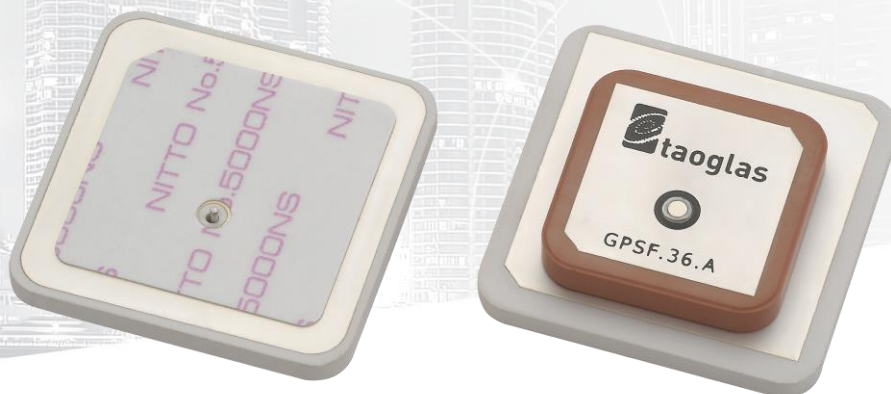
Highest Accuracy
Low Axial Ratio
GPS L1+L2 Band Operation
Single Feed Patch Assembly
Dimensions: 36*36*7mm
Tuned for Centre Positioning on a 70*70mm
Ground-plane
Through-Hole Mounting Pin Type
RoHS & REACH Compliant

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1. Introduction



The GPSF.36.7.A.30 is a 36x36mm ceramic GPS L1/L2 low profile, low axial-ratio, embedded stacked passive patch antenna with a 7mm height. It is designed as a high performance yet economical solution for highest accuracy centimeter level tracking in telematics applications.

Typical applicable industries are

- UAVs and Drones
- Transportation
- Autonomous Vehicles
- Marine
- Agriculture
- Navigation

This compact antenna exhibits excellent gain and radiation pattern stability on both L1 and L2 bands, improved reliability of a GPS fix in urban areas, better signal reception with more satellites acquired, and a quicker time to first fix.

The antenna has been tuned and tested on a 70 X 70 mm ground plane, working at GPS 1575.42MHz and L2 1227.6MHz, with 5.44dBi gain and 3.10dBi gain, respectively. It can be easily through-hole mounted on PCB via pin. The double-sided adhesive on the bottom of the patch helps to keep it in place while being assembled.

For further optimization to customer specific device environments, a custom tuned patch antenna and circuit integration service into your device can be supplied, subject to NRE and MOQ. Contact your regional Taoglas customer support team for this requirement, and for support to integrate and test this antenna's performance in your device.

2. Specifications

GNSS Frequencies 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
	■	□	■	■	□

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

Electrical		
	GPS L1	GPS L2
Center Frequency	1575.42 MHz	1227.60 MHz
Return loss (dB)	< -10	< -10
Efficiency (%)	91.30	67.57
Peak Gain (dBi)	5.44	3.10
Axial Ratio at Zenith (dB)	1.69	2.70
Impedance	50 Ohm	
Polarization	RHCP	

Mechanical		
	GPS L1	GPS L2
Ceramic Dimension	25*25*4mm	36*36*3 mm
Pin Diameter	0.80 mm	
Pin Length	1.50 mm	
PCB Dimension	70*70 mm	
Weight	23.4g	

Environmental	
Operation Temperature	-40°C to 85°C
Humidity	Non-condensing 65°C 95% RH

*Tested on square 70*70 mm ground-plane.

Field Test Result with 70*70mm ground plane

Frequency	GPS L1	GPS L2	Galileo E1	Galileo E5b	GLONASS G1	GLONASS G2	BeiDou B1I	BeiDou B2I
	1563-1587	1215-1239.6	1559-1591	1189-1214	1598-1605	1242-1249	1559-1563	1200-1214
Carrier-to-Noise Values(dB-Hz)	43.3	35.6	40.2	36.4	37.8	30.1	40	35.6
2*DRMS Positioning Accuracy (cm) without RTK	150	150	150	150	150	150	150	150
2*DRMS Positioning Accuracy (cm) with RTK	12	12	12	12	12	12	12	12
TTFF(s)	33	33	33	33	33	33	33	33
Group Delay @ Zenith Variation Across Single Constellation(ns)	2.2	12	2	12	20	5	2.2	12
Phase Centre Offset PCO (cm)	4	4.6	4	4.6	4	4.6	4	4
Phase Centre Variation PCV (mm)	0.5	0.4	0.8	14.5	0.8	0.5	0.7	2
Axial Ratio (dB)	2	10	8	20	16	20	5.5	20

*All outdoor measurements performed on the roof top of the Taoglas R&D Labs facility in Dublin Ireland.

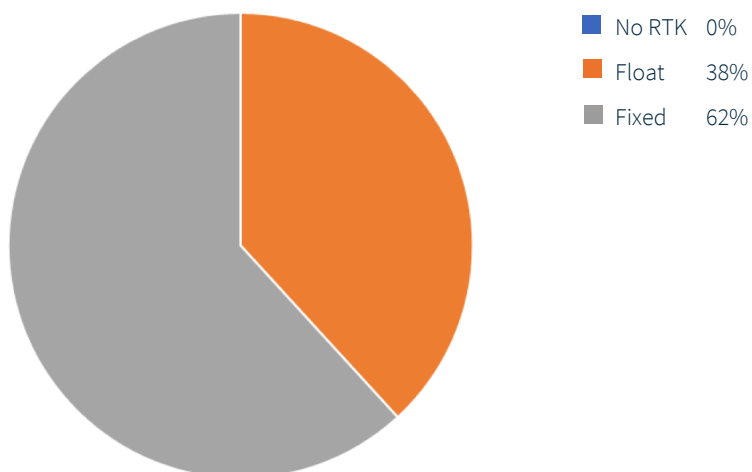
** Recommended Minimum C/No for Standard Precision Acquisition/ Tracking (dB-Hz): 26-30/ 12-15.

***Data Measured Free Space.

****Group Delay, PCO, PCV and Axial Ratio values includes Active Circuitry.

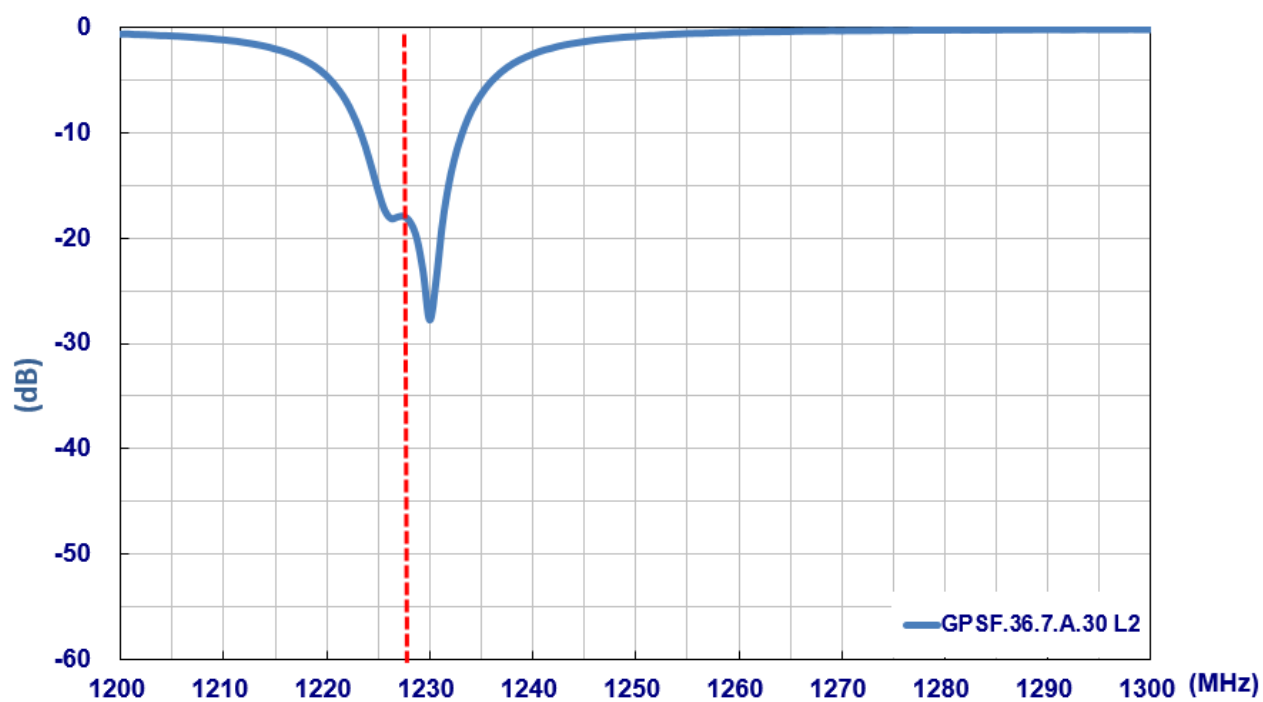
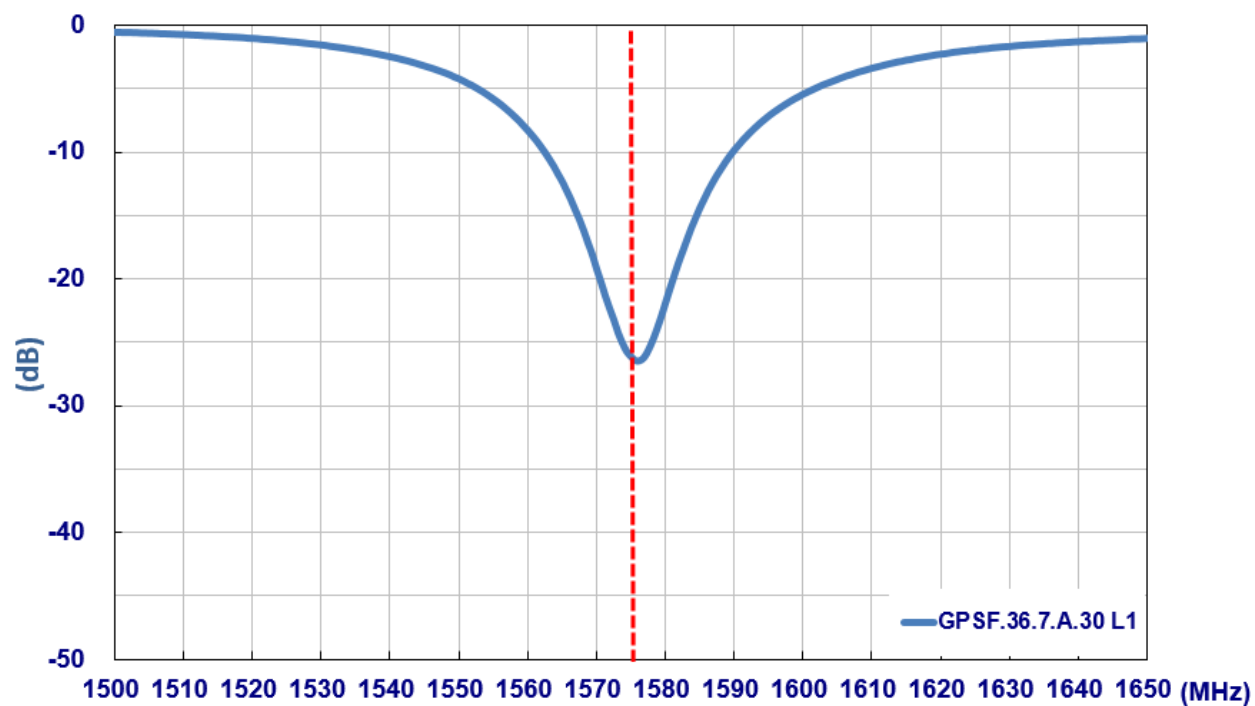
*****Ublox C099-F9P application board is used for Field test Measurements.

RTK AVAILABILITY

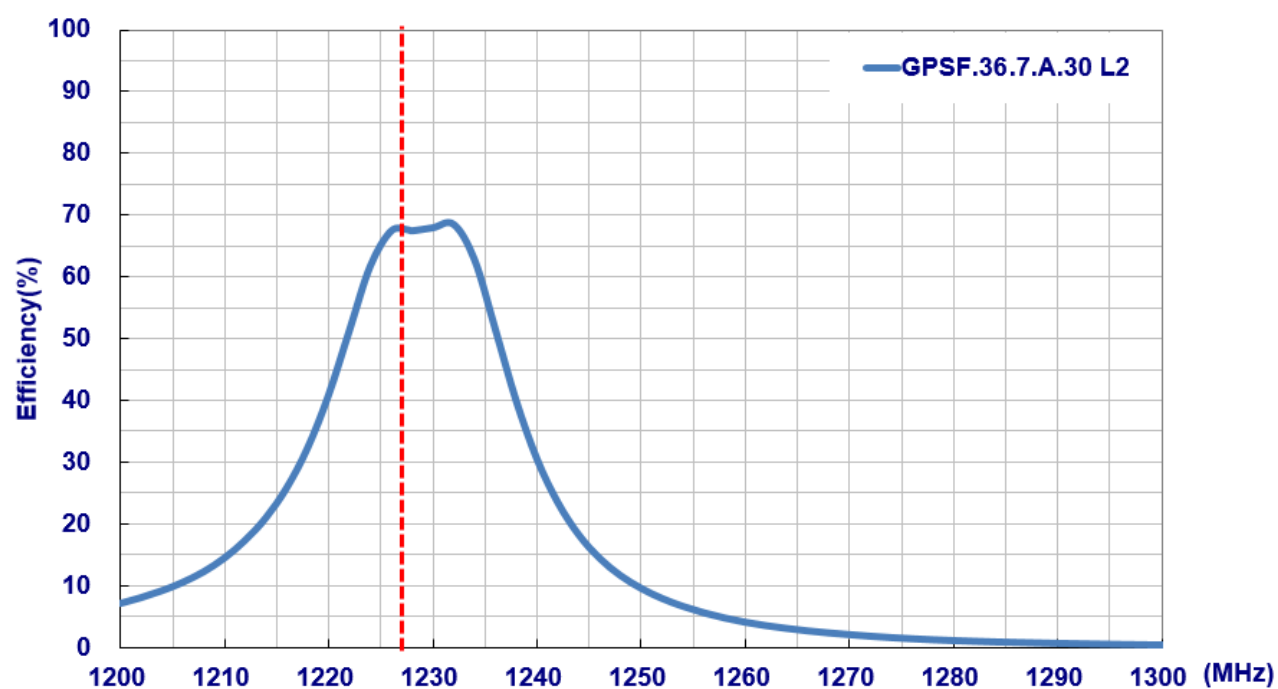
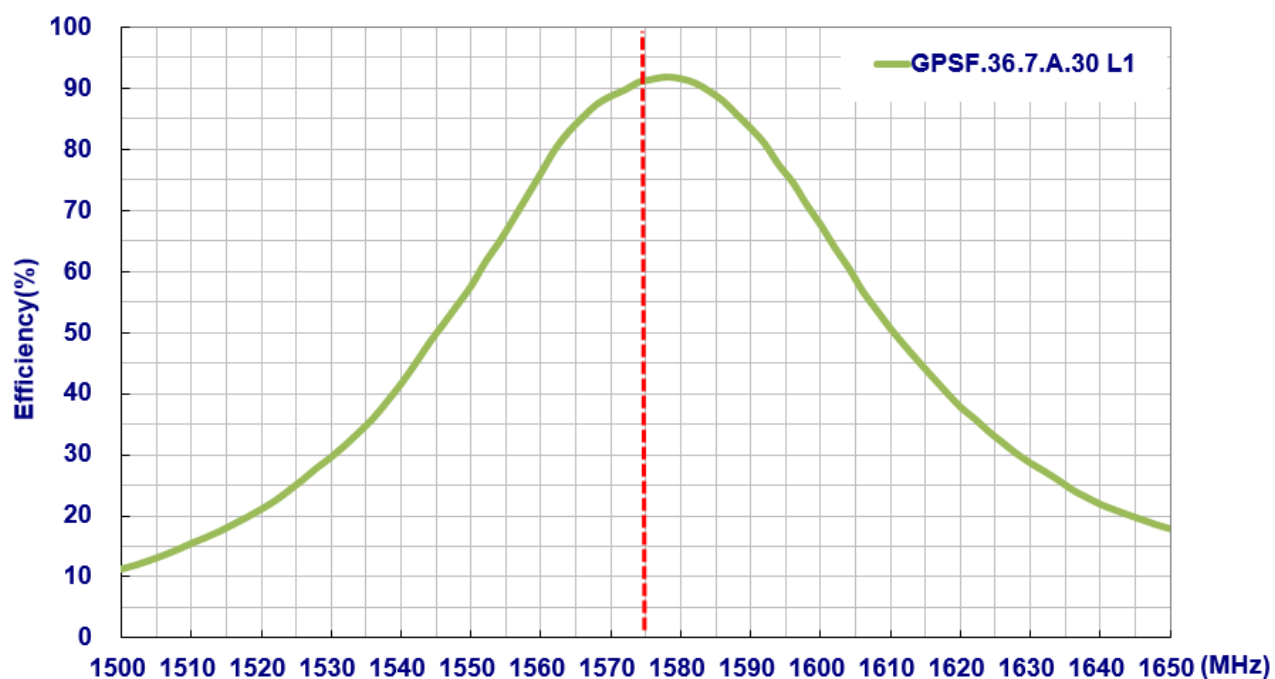


3. Antenna Characteristics

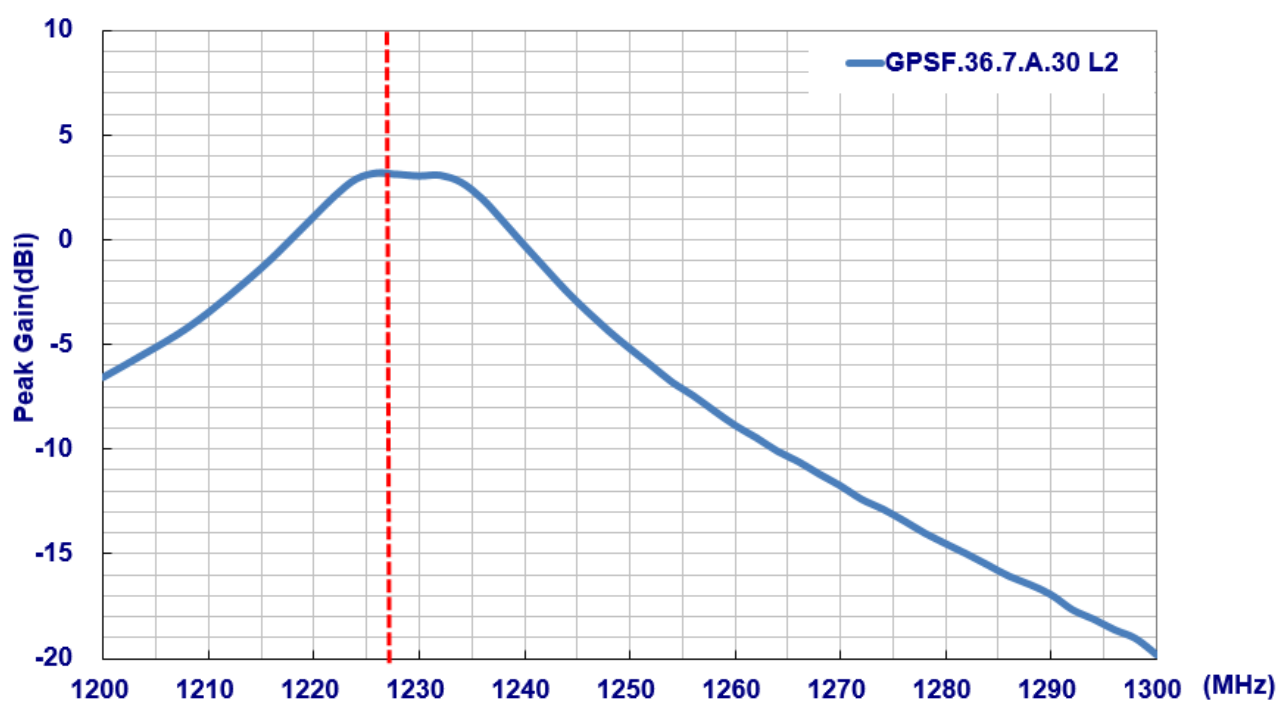
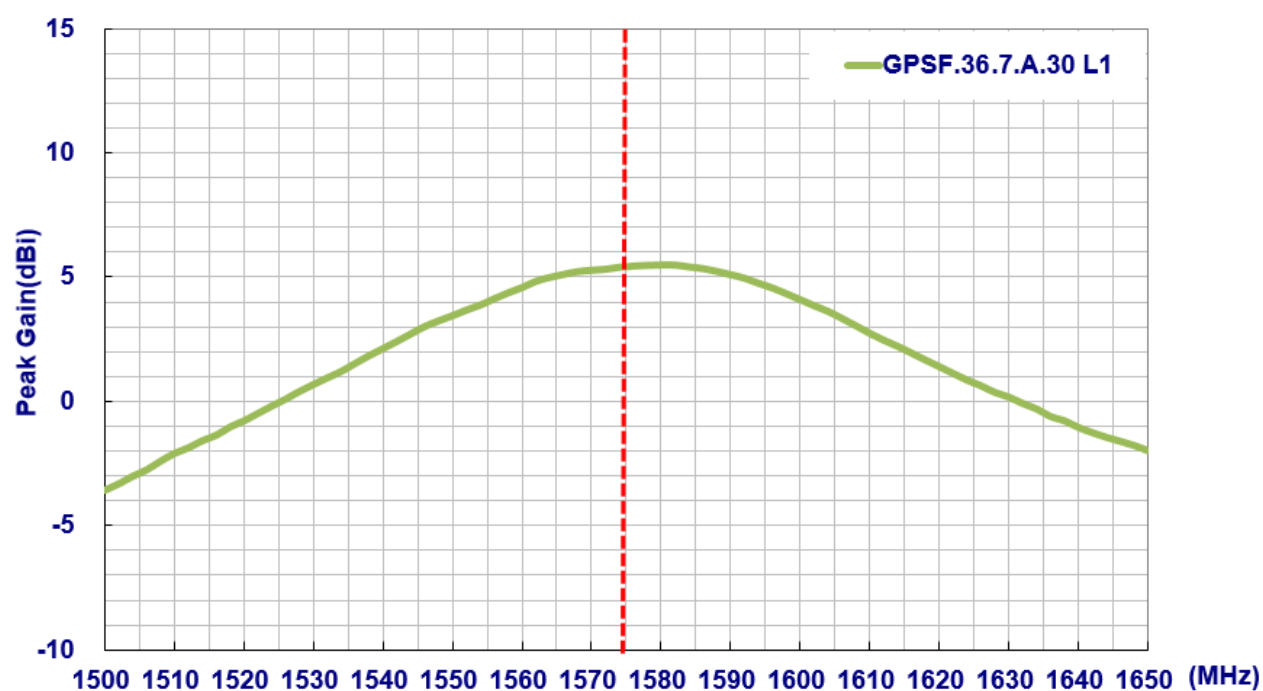
3.1 Return Loss



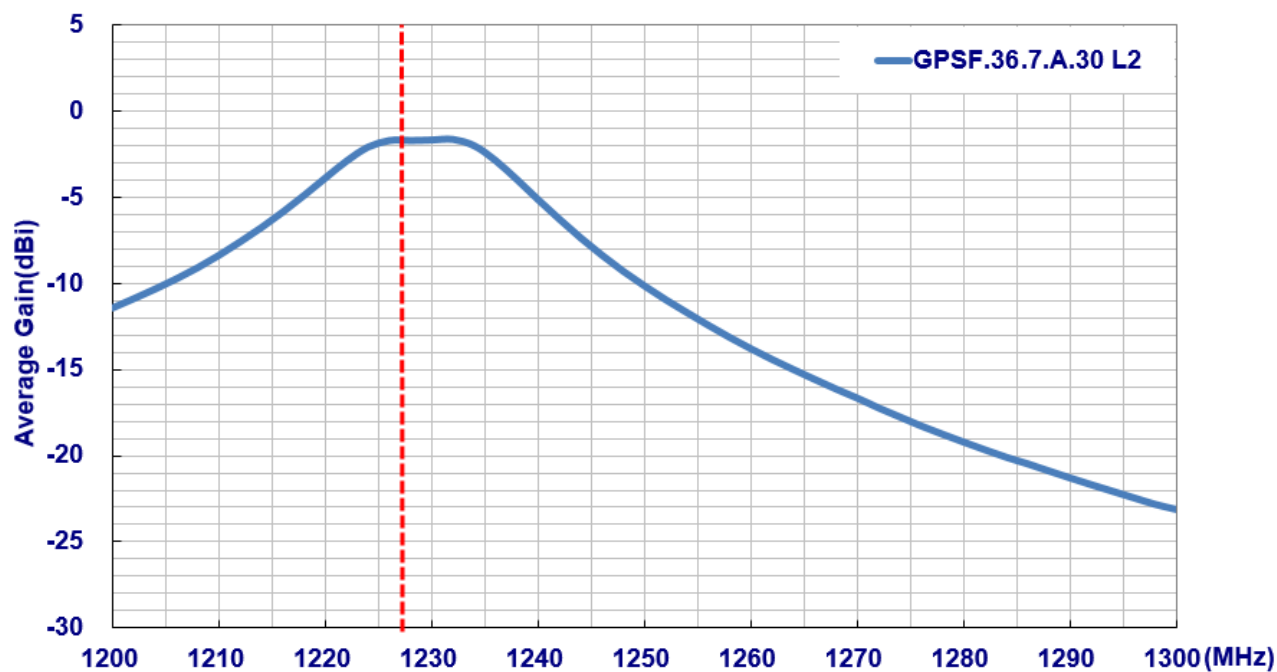
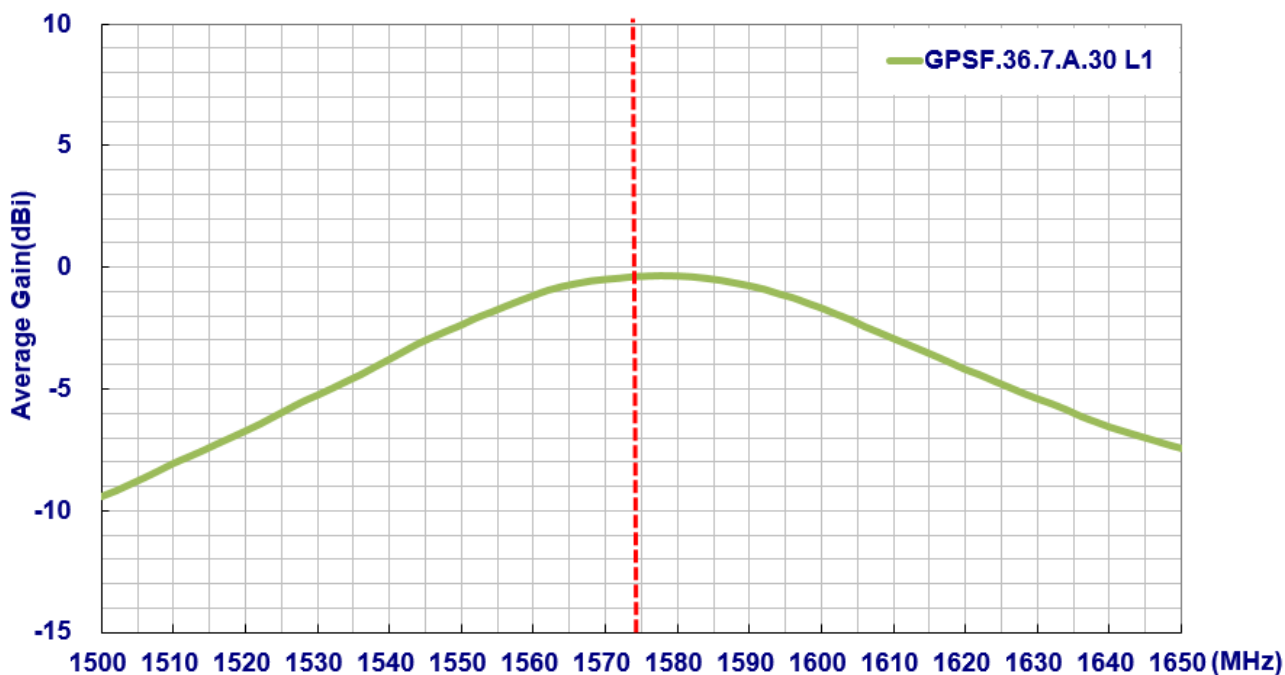
3.2 Efficiency



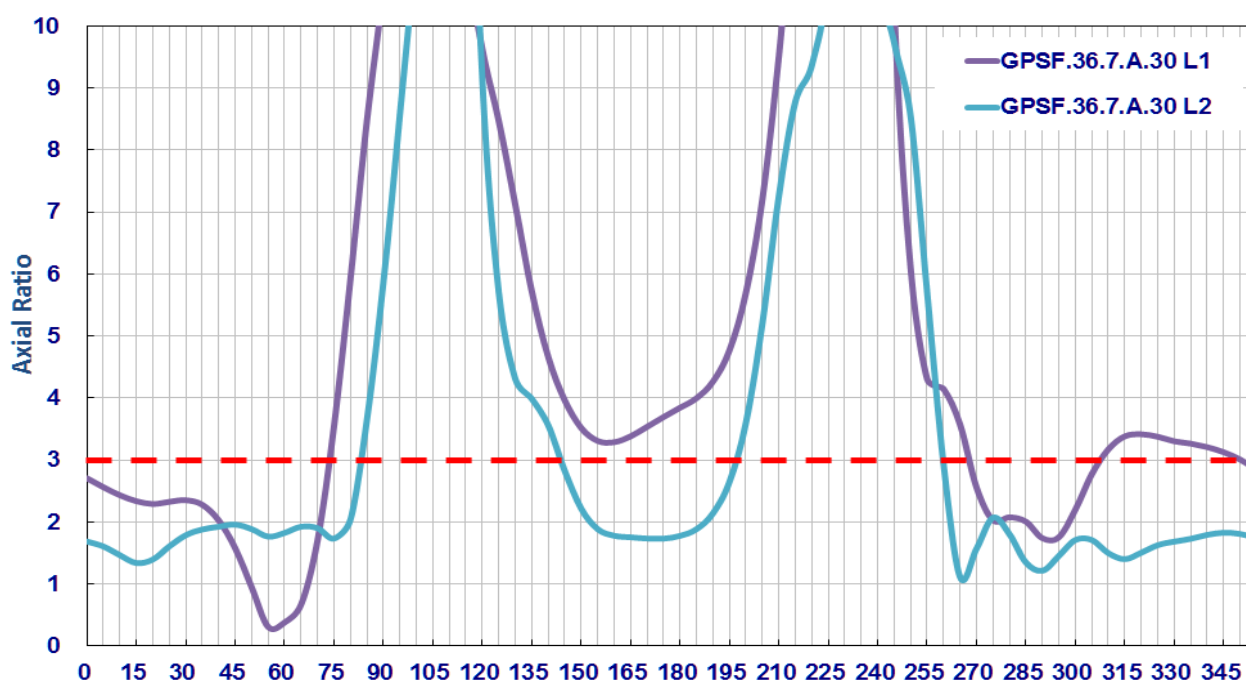
3.3 Peak Gain



3.4 Average Gain



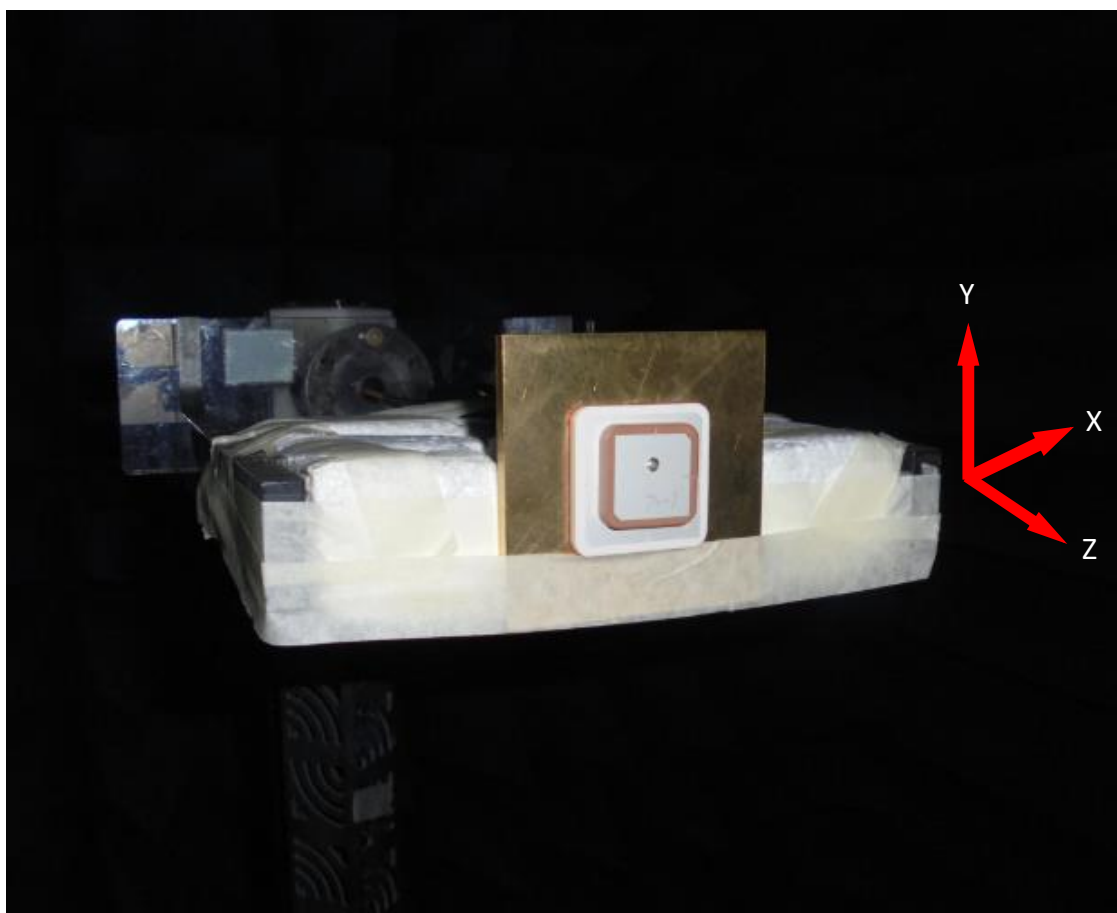
3.5 Axial Ratio



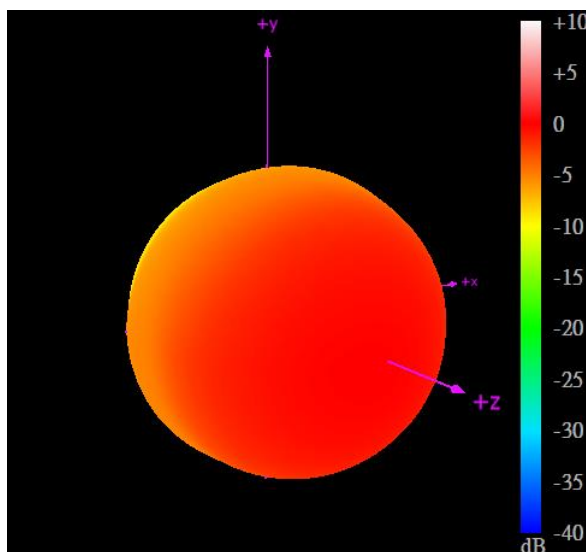
4. Radiation Patterns

4.1 Test Setup

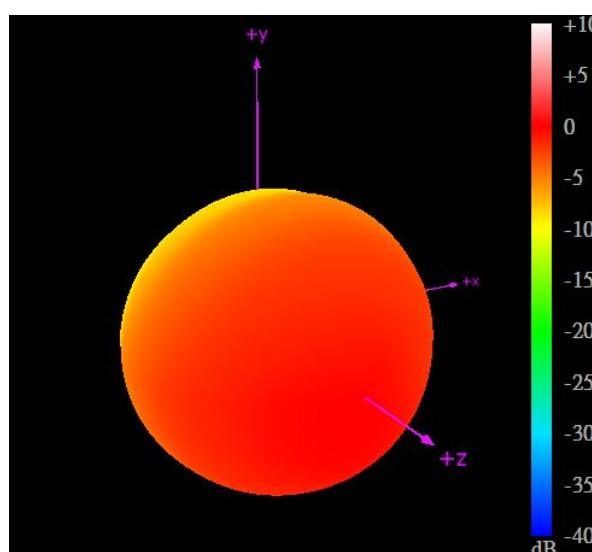
The GPSF.36.7.A.30 antenna is tested in free-space on a 70 mm X 70 mm ground plane in an Anechoic Chamber. The test setup is shown below.



4.2 3D and 2D Radiation Patterns

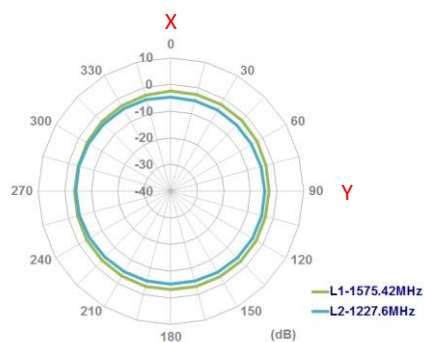


GPS L1 1575.42MHz

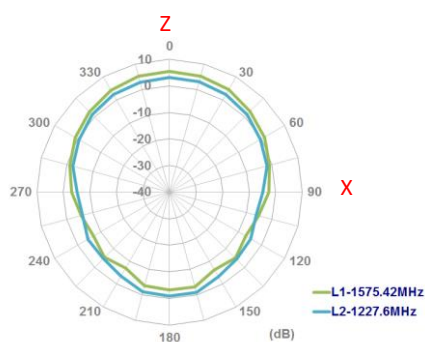


GPS L2 1227.6MHz

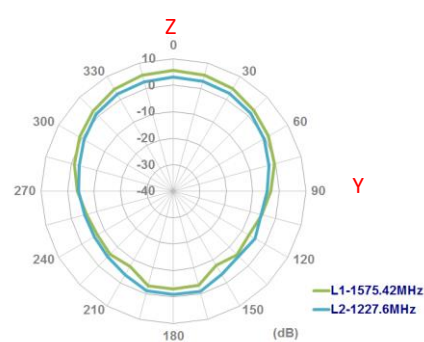
XY Plane



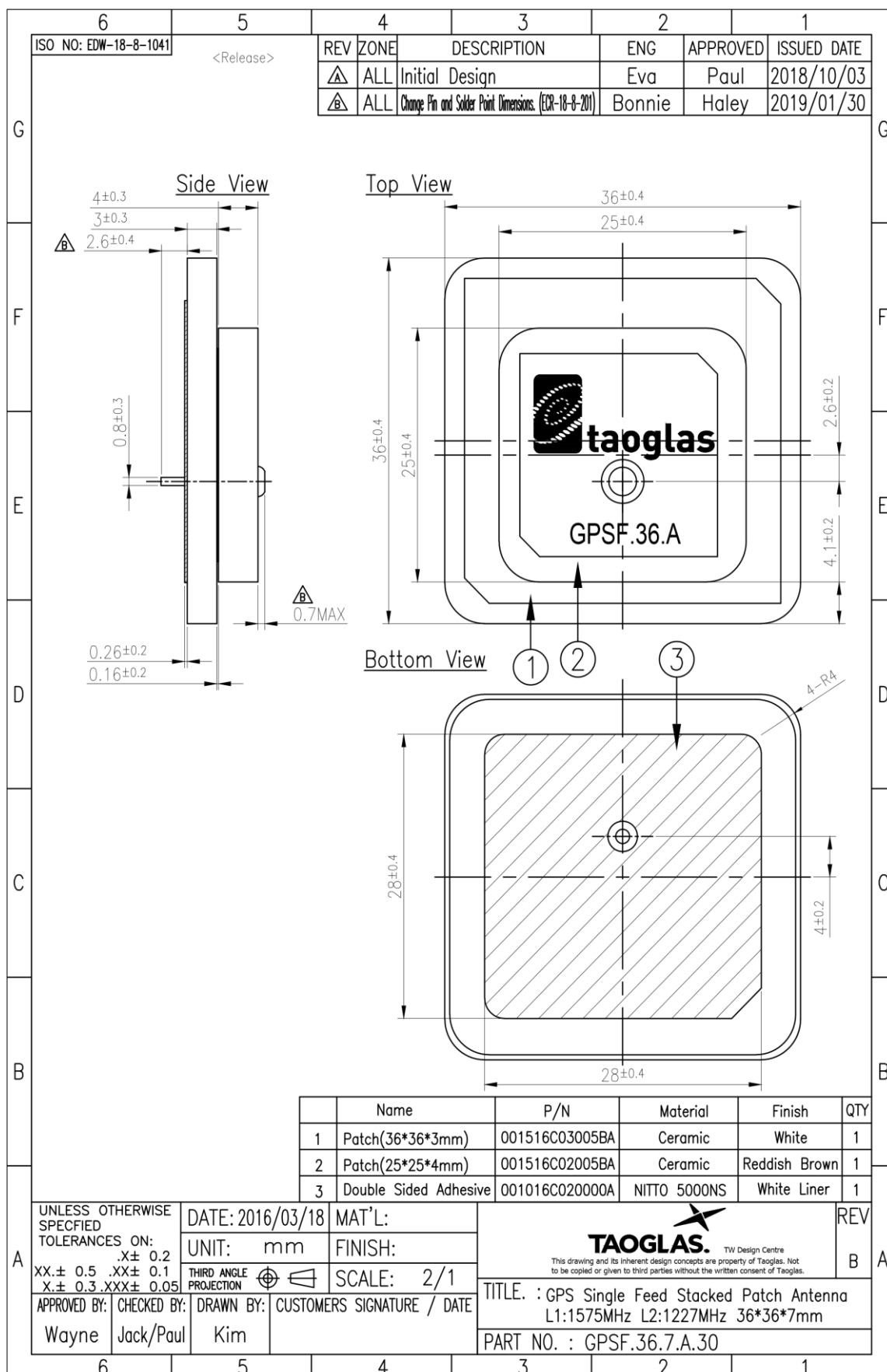
XZ Plane



YZ Plane



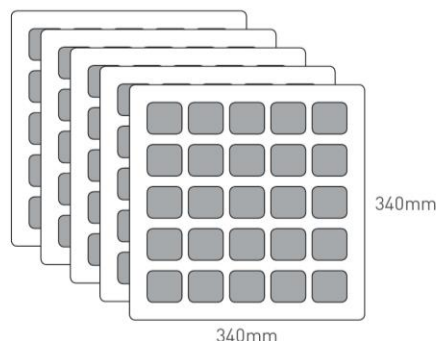
5. Mechanical Drawing (Units: mm)



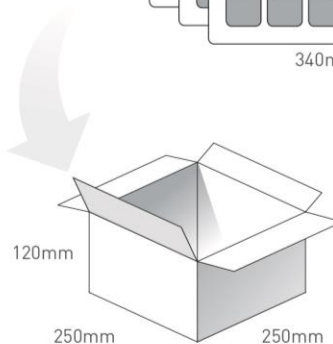
6. Packaging

Packaging Specifications

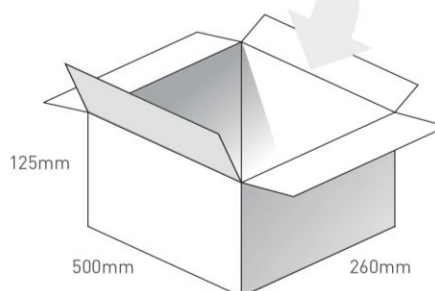
25 pcs GPSF.36.7.A.30 per tray
Each tray in vacumed PE bag
Tray Dimensions - 340*340*27mm
Weight - .7Kg per tray



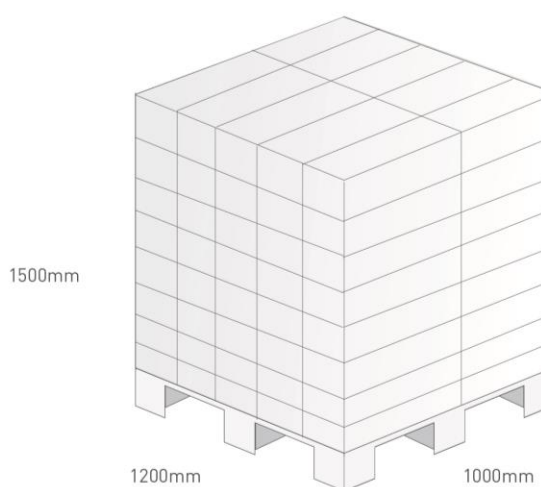
8 Trays per Carton - 200 pcs
Carton Dimensions - 250*250*120mm
Weight - 5.5Kg



400 pcs -Carton Dimensions - 500*260*125mm
Weight - 12Kg



Pallet Dimensions 1200*1000*1500mm
80 Cartons per Pallet
10 Cartons per layer
8Layers



Changelog for the datasheet

SPE-17-8-027 - GPSF.36.7.A.30

Revision: C (Current Version)

Date:	2019-12-08
Changes:	Amended GNSS data and drawing
Changes Made by:	Jack Conroy

Previous Revisions

Revision: B

Date:	2019-12-08
Changes:	Added GNSS Frequency Bands Matrix and RTK Test Data
Changes Made by:	Yu Kai Yeung

Revision: A (Original First Release)

Date:	2017-03-05
Notes:	Initial Release
Author:	Wayne Yang



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