Unictron Technologies Corp.

Antenna (EG-42W)

Indoor-Re-radiator (RK-20)

GNSS

RoHS Compliant

Product Name: RK-20W Series

Features:

- Compact size / low cost / high performance
- Permanently screw mount
- One external re-radiator for multiple, different GPS/ GLONASS/ BEIDOU/ GALILEO receivers
- Real-time GPS/GLONASS/BEIDOU/GALILEO satellites outdoor reception to an indoor environment
- Cable length extended as long as 40m RF cable
- Up to Re-radiating 30m radius in line-of-sight
- Customizable Cables and Connectors
- RoHS & REACH Compliant

Applications:

- GPS /GLONASS Re-Radiating in Labs / Retail Stores/ Factory Line

RK-20W Series

MODEL: RK-20W

Rev. Preliminary

I. Specifications:

(A)RK-20

Items	Specifications				
Passive Antenna Performance					
Application Bands	GPS L5	GPS L2	BeiDou L1	GPS L1	GLONASS L1
Frequencies (MHz)	1176	1227	1561	1575.42	1602
Efficiency (%)*	7.48	6.78	54.58	43.95	29.04
Average Gain (dB)*	-11.26	-11.69	-2.63	-3.57	-5.37
Peak Gain (dBi)*	-6.14	-11.69	3.24	2.48	0.69
Axial Ratio*	1.34	1.29	2.24	2.16	2.38
V.S.W.R*	< 2				
Return loss (dB)*	< -10				
Test Condition	Free Space				
Impedance (Ω)	50				
Polarization	R.H.C.P. (Right-Handed Circular Polarization)				
Active Antenna Performance					
Application Bands	GPS L5	GPS L2	BeiDou L1	GPS L1	GLONASS L1
Frequencies (MHz)	1176 ± 5	1227 ± 5	1561 ± 5	1575.42 ± 1.023	1602 ± 5
Gain (dB)*	37	38	37	39	36
Noise Figure (dB)*	1.4	1.3	1.5	1.5	1.6
Operation Voltage (V)	3.3 ~ 5.0				
Current Consumption (mA)*	20 ± 3				
Output Impedance (Ω)	50				

Out of Band Rejection			
Frequency (MHz)	600 ~ 1100	1350~1500	1650 ~ 3000
Out of Band Rejection (dB)	57	57	66
ESD Protection	+/- 8 KV (direct discharge) +/- 15KV (air discharge)		
Mechanical			
Dimension (mm)	φ 115(D) x 68.5(H)		
Connector	SMA90 (RAJ)		
Environmental Conditions			
Operation Temperature (°C)	-40 ~ +85		
Storage Temperature (°C)	-40 ~ +85		
Relative Humidity	95% non-condensing		

*Typical value

(B) EG-42W

Active Antenna Performance					
Application bands	GPS_L5	GPS_L2	BeiDou_L1	GPS_L1	GLONASS _L1
Frequencies (MHz)	1176 ± 5	1227 ± 5	1561 ± 5	1575.42 ± 1.023	1602 ± 5
Gain (dB)*	42	43	40	39	39
Noise Figure (dB)*	2.7	2.9	3.2	3.0	3.2
Operation Voltage (V)	3.3 ~ 5.0				
Current Consumption (mA)*	26 ± 3				
Output Impedance (Ω)	50				

Out of Band Rejection										
Application Bands	1176		1227		1561		1575.42		1602	
Frequencies (MHz)	500 ~ 1100	1270 ~ 1530	500 ~ 1100	1270 ~ 1530	1270 ~ 1530	1650 ~ 3000	1270 ~ 1530	1650 ~ 3000	1270 ~ 1530	1650 ~ 3000
Out of Band Rejection (dB)	67	47	68	48	45	68	44	67	44	67
ESD Protection										
Contact Discharge (KV)	± 8									
Air Discharge (KV)	± 15									
Physical Condition										
Dimension (mm)	φ138.4(D) x 50.0(H)									
Connector	TNC (SBJ)									
Weight (g)	331									

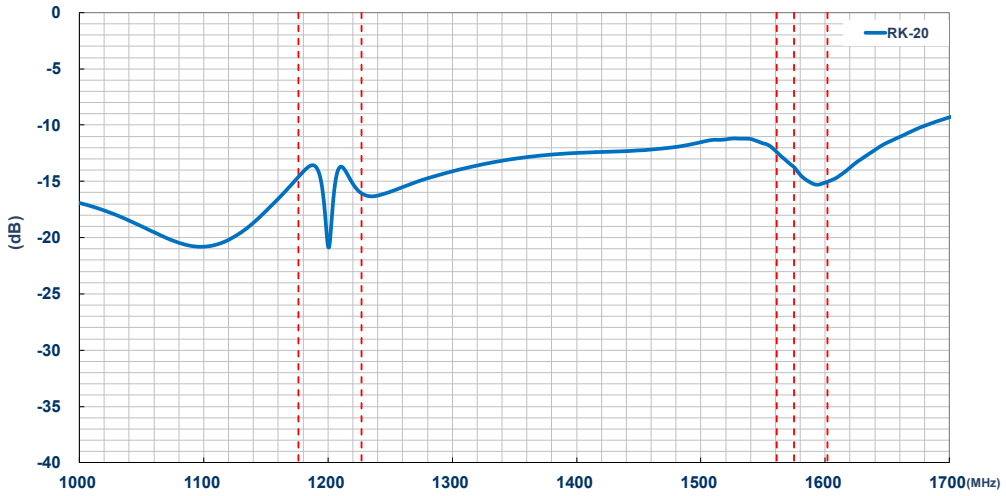
*Typical value

Environmental Conditions	
Operation Temperature	-40 ~ +85 ºC
Storage Temperature	-40 ~ +85 ºC
Waterproof	IP67
Relative Humidity	+40±2 ºC,90~95% R.H
Electronic Discharge	EN61000-4-2: 20KV Air-discharge；8KV Contact-discharge
Enclosure Rating	IEC 60529 standard: IP67
Solar Radiation	MIL-STD 810E, SAE 1961
Mechanical Shock	MIL-STD-810G, Method 516.6 a. Procedure I, Functional shock
Vibration	Antenna Non-Working 5G/30min Antenna Working 2.5G/30min
Chemical Resistance	Alcohol、Plastic and Vinyl cleaner、Glass cleaner、Saline Solution、Soapy water

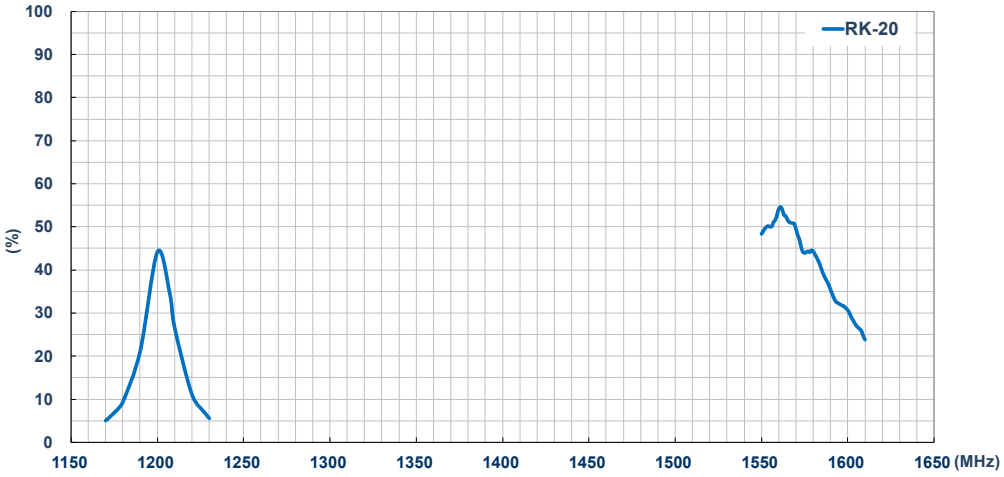
II. Electrical Properties:

(A)RK-20

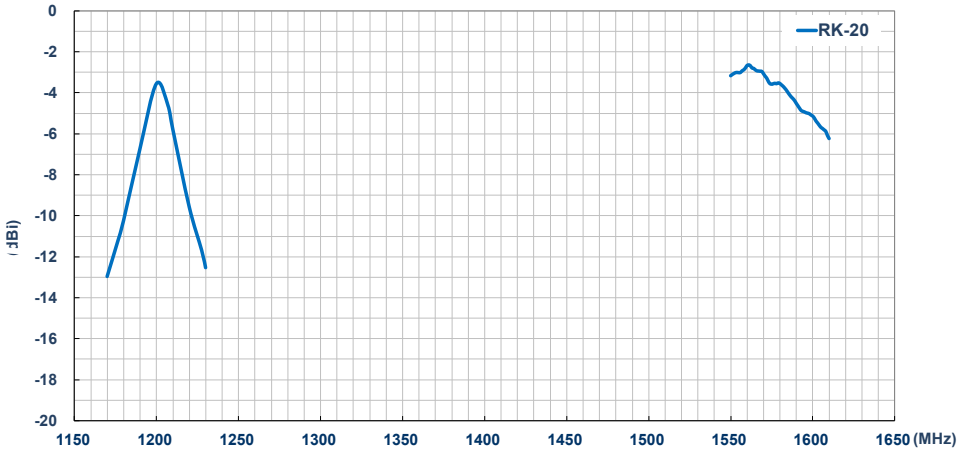
S11 (dB)



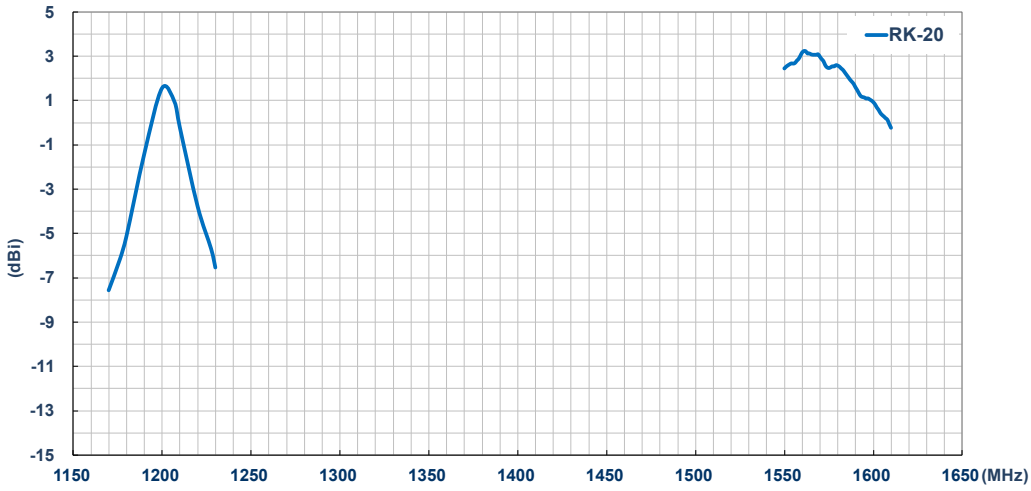
Efficiency (%)



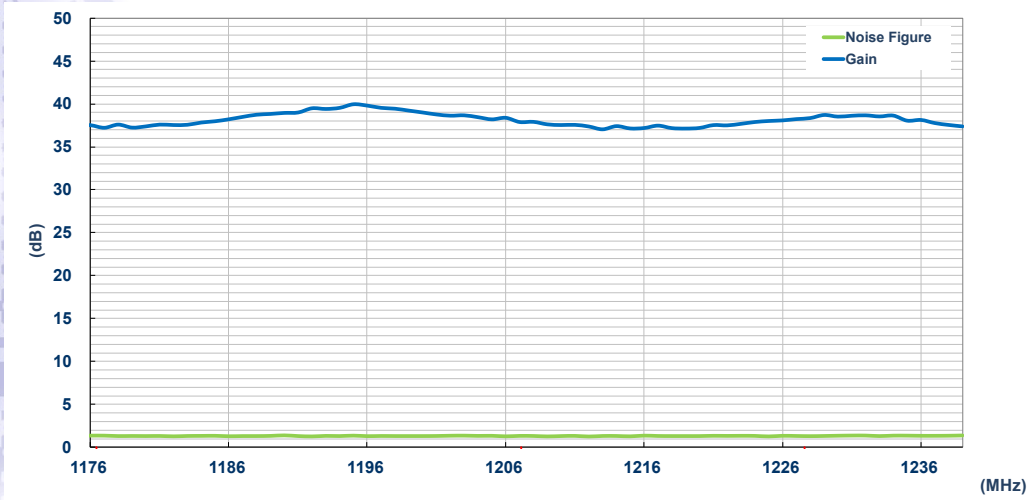
Average Gain (dB)



Peak Gain (dBi)



Noise Figure & Gain (dB)



5F., No. 83, Kewang Rd., Longtan Dist., Taoyuan City 32556, Taiwan (R.O.C.)
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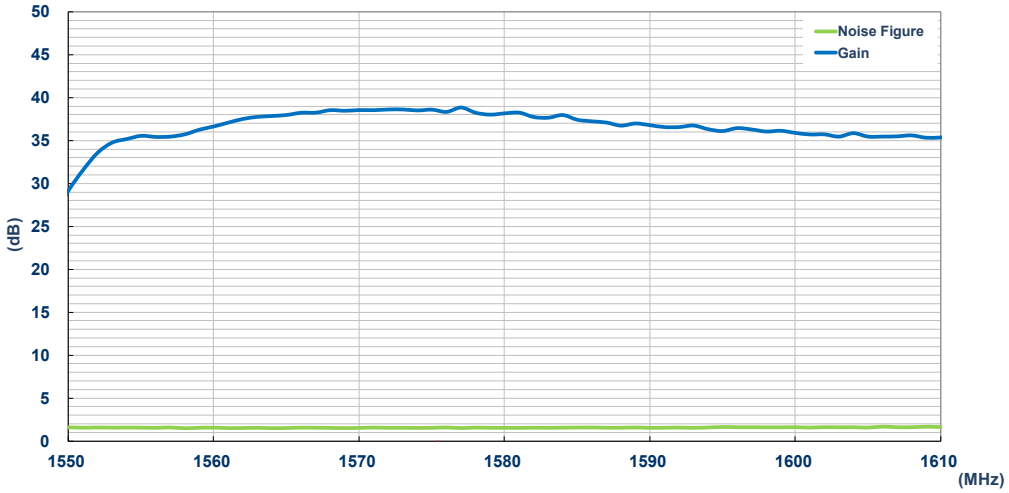
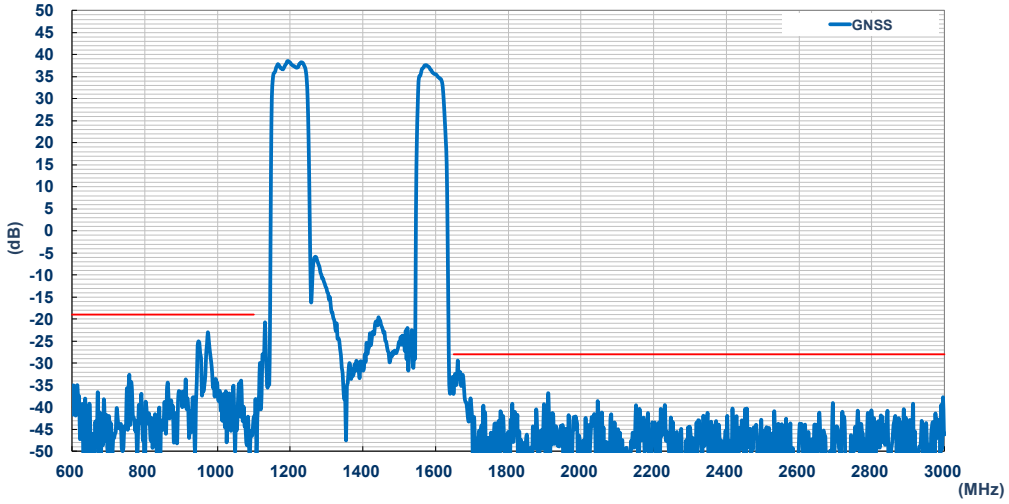
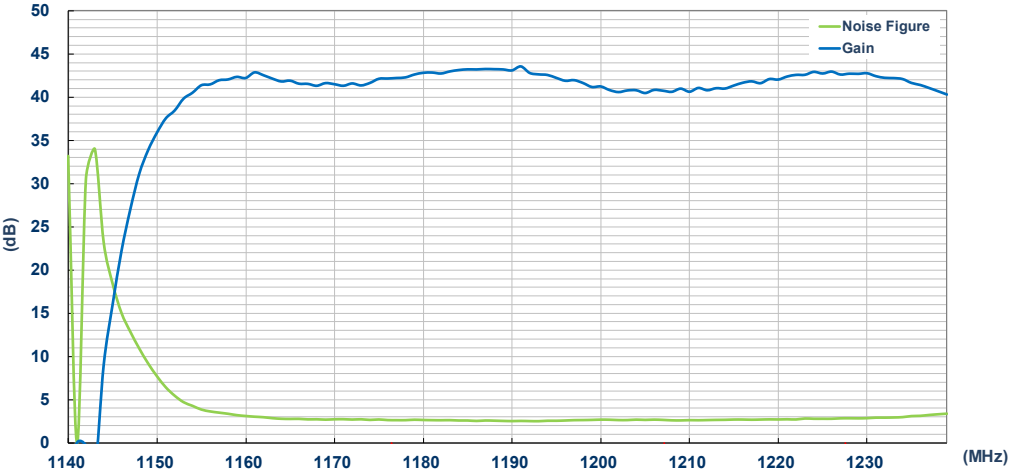


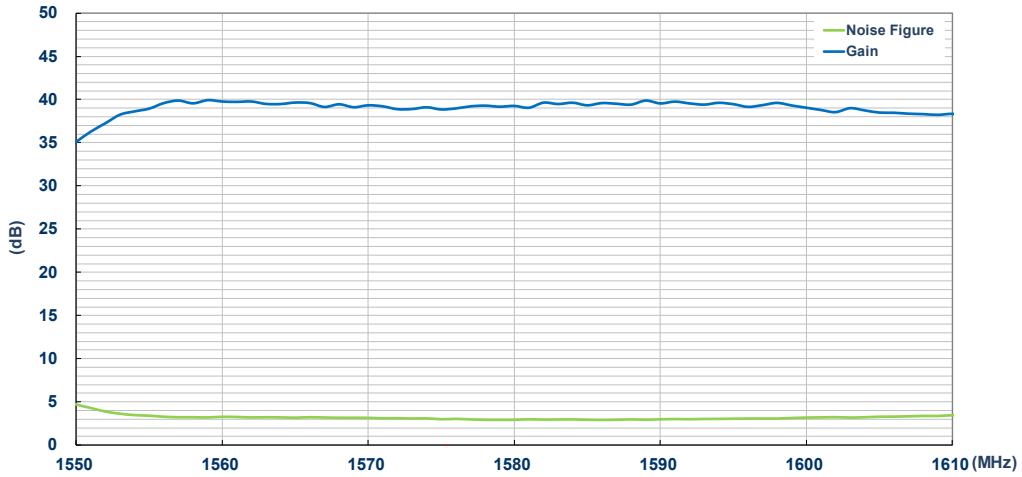
Out of Band Rejection (dB)



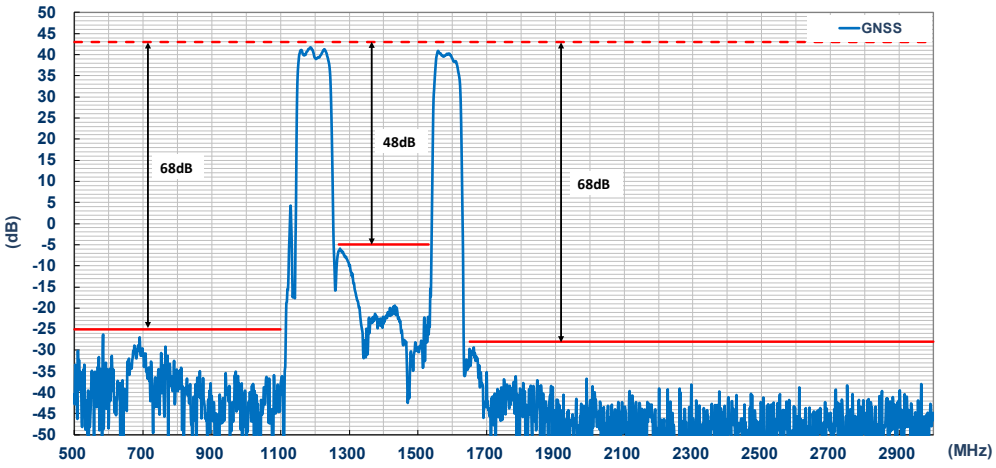
(B)EG-42W

Noise Figure & Gain (dB)





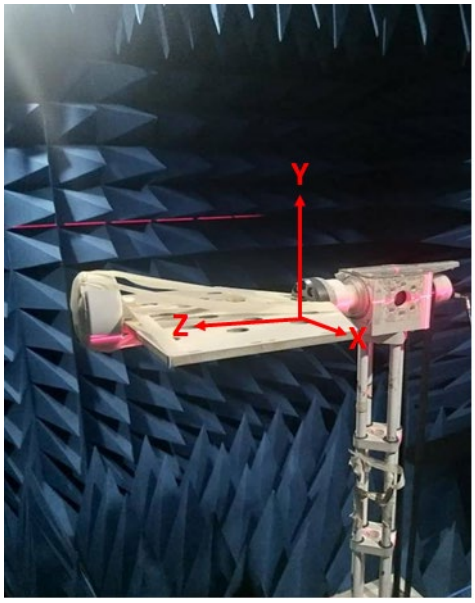
Out of Band Rejection (dB)



III. Antenna Radiation Pattern Measurement:

The antenna radiation patterns are measured in 3D Anechoic Chamber.
The measurement setup is as show below,

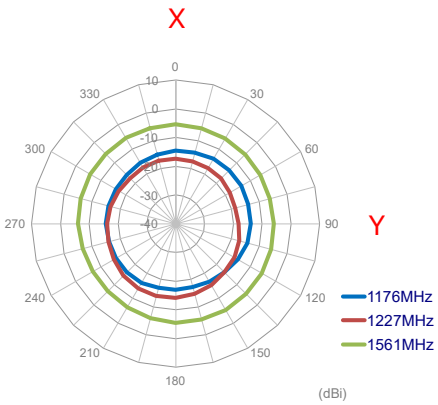
RK-20

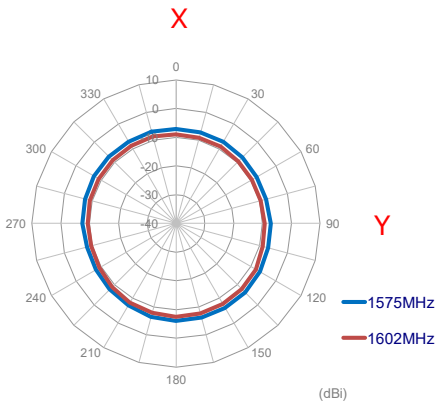


A) 2D Radiation Pattern:

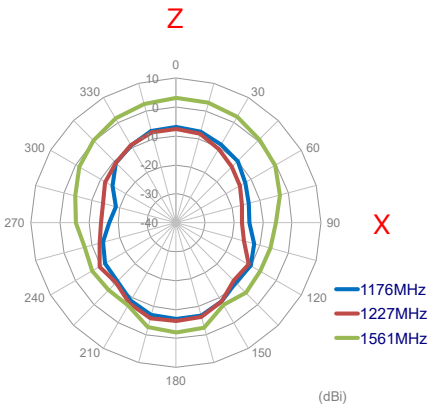
RK-20

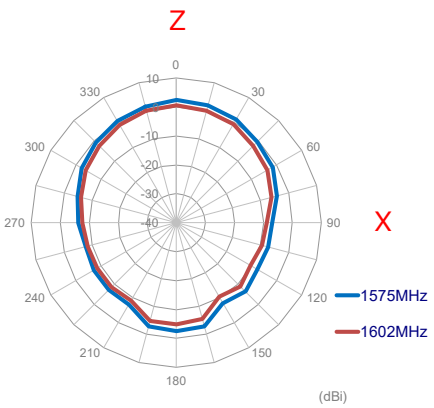
X-Y Plane



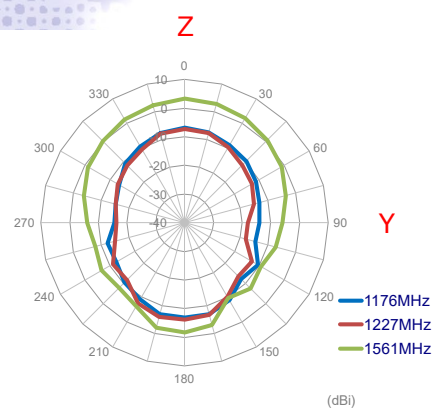


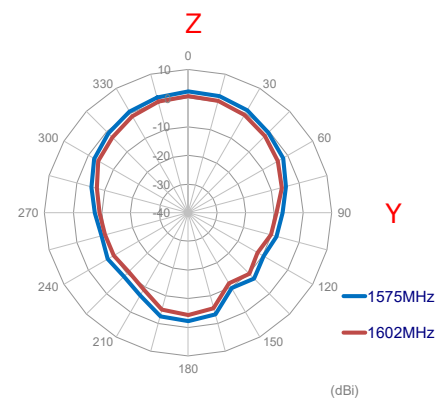
X-Z Plane





Y-Z Plane

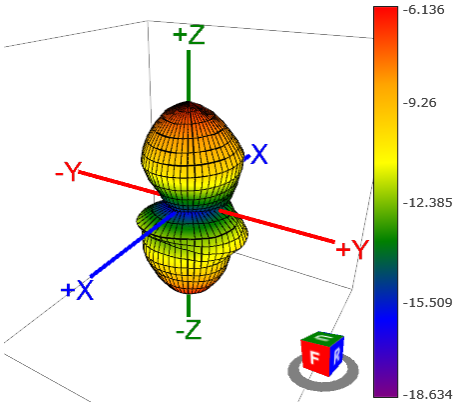




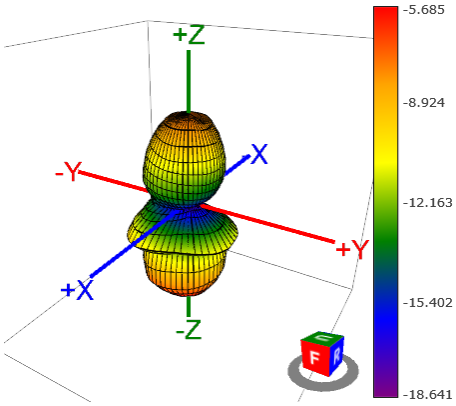
B) 3D Radiation Pattern:

RK-20

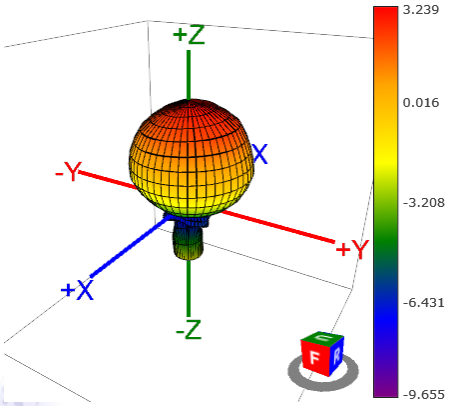
1176MHz



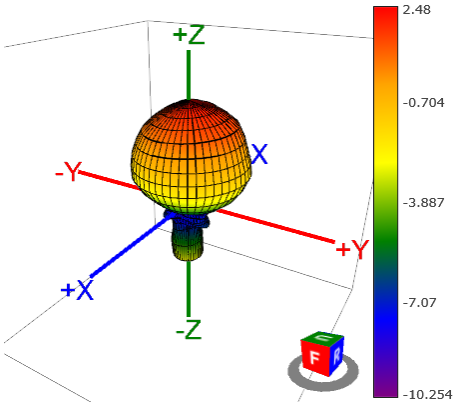
1227MHz



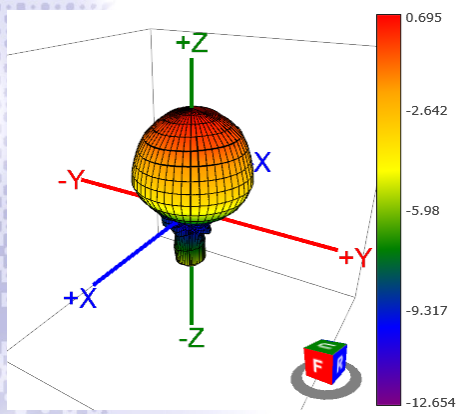
1561MHz



1575.42MHz

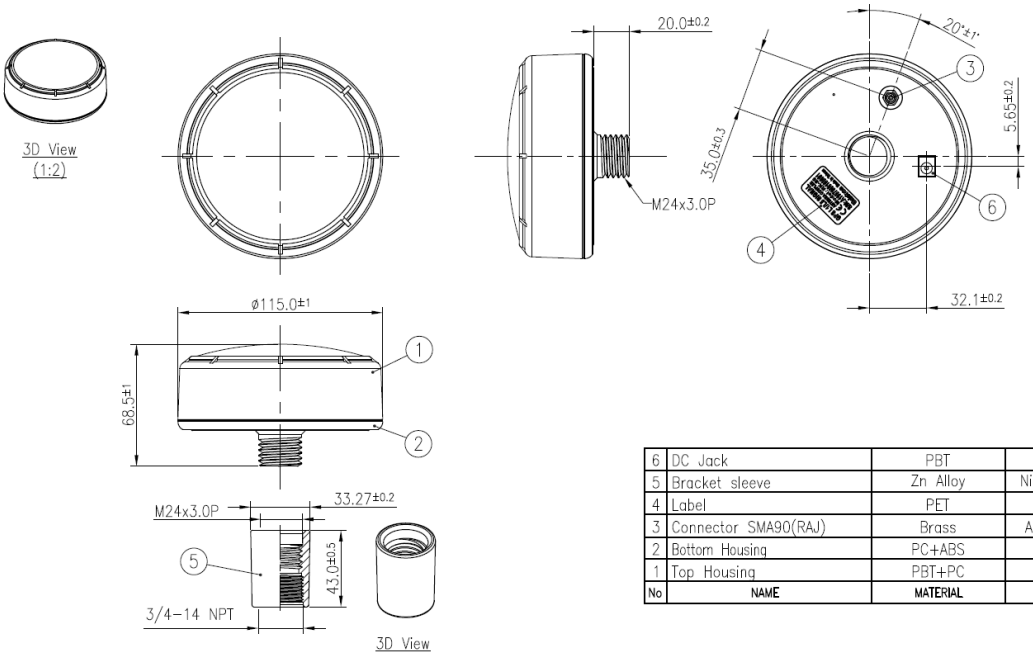


1602MHz



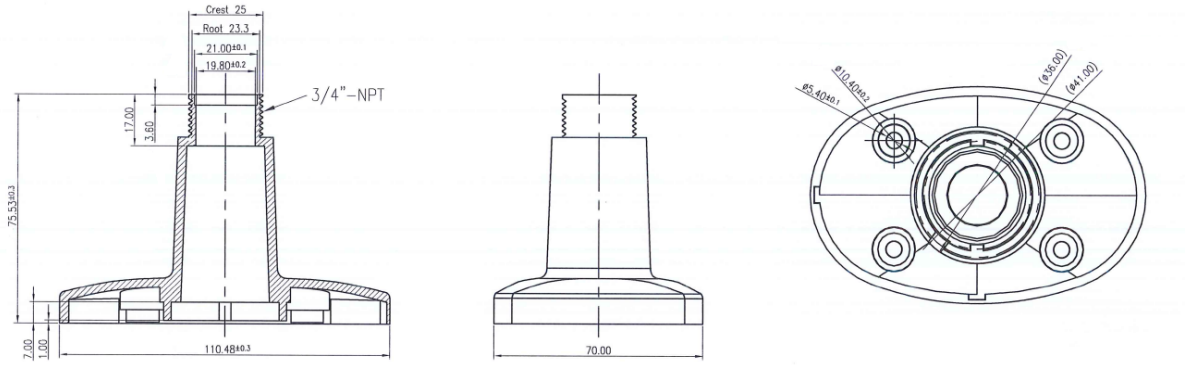
IV. Mechanical Drawing (Unit:mm):

RK-20

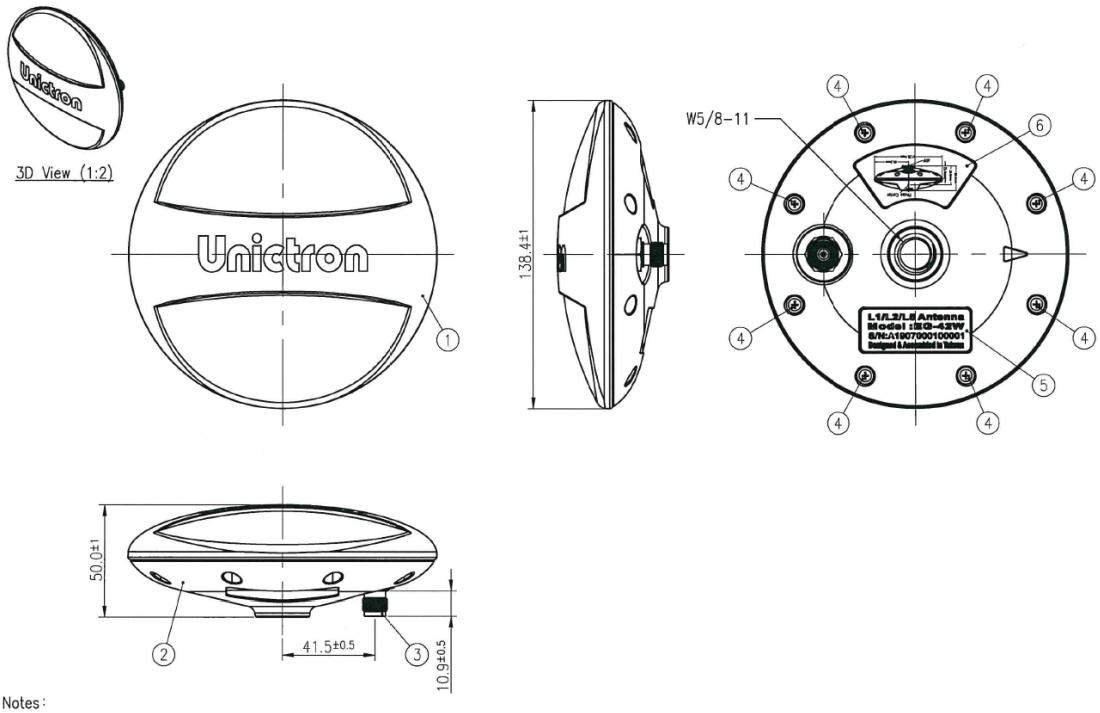


No	NAME	MATERIAL	FINISH	Q'TY
6	DC Jack	PBT	Black	1
5	Bracket sleeve	Zn Alloy	Ni Planting	1
4	Label	PET	Silver	1
3	Connector SMA90(RAJ)	Brass	Au Plated	1
2	Bottom Housing	PC+ABS	White	1
1	Top Housing	PBT+PC	White	1

RK-20 Bracket



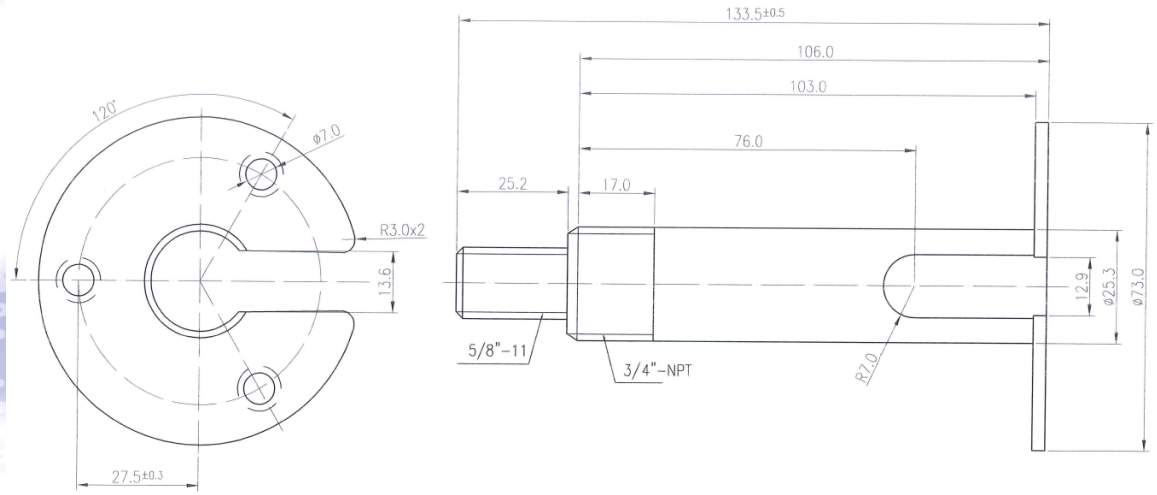
EG-42W



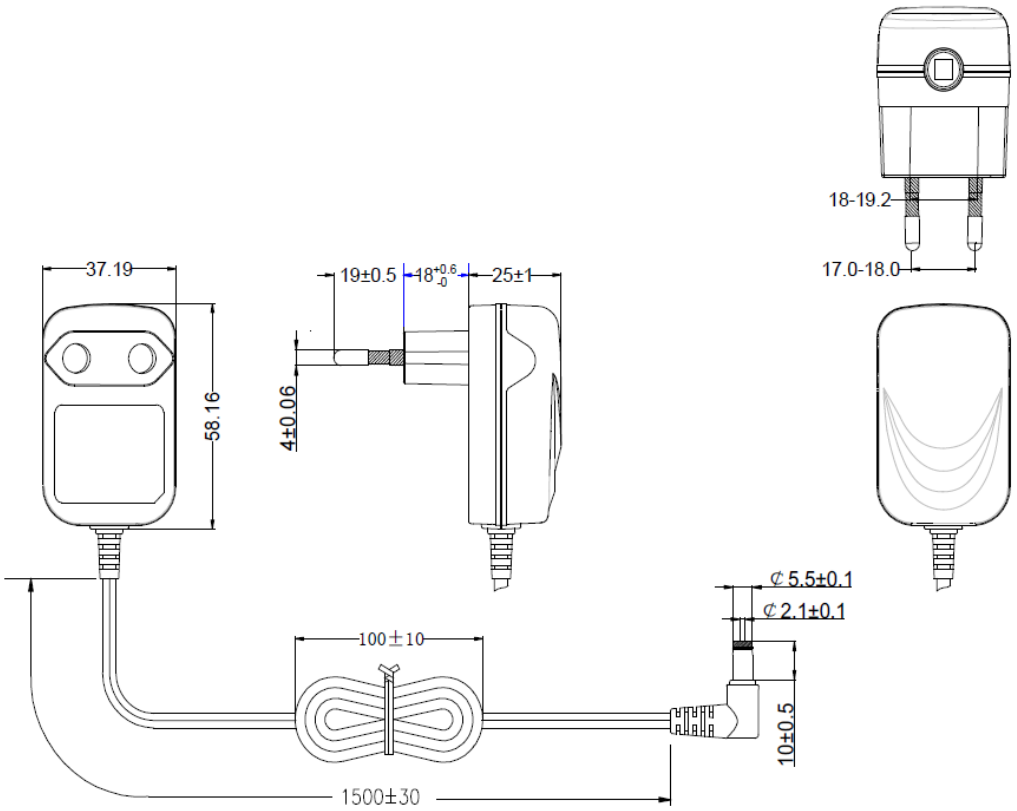
Notes:
1. All material must be RoHS compliant.
2. IP Code : IP67.

No	NAME	MATERIAL	FINISH	Q'TY
6	Label-2	PET	White	1
5	Label-1	PET	White	1
4	M3x10 Screw	Steel	Ni Plated	8
3	TNC(SBJ) Connector	Brass	Ni Plated	1
2	Bottom Base	Aluminum Alloy	Black	1
1	Top Housing	PC	White	1

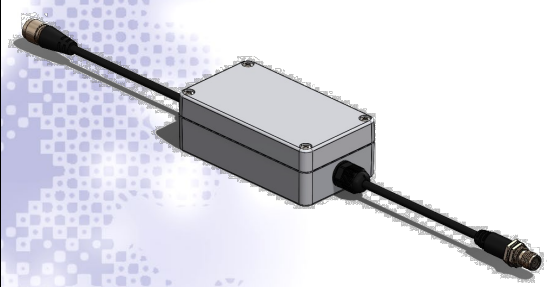
EG-42W Steel tube seat



Regulator



V. Package Include

 	**Antenna x 1** ● 138.4mm (dia.) x 50.0mm
	**Steel tube seat** ● Height: 133.5mm
	

RG58 Cable x 1

- Standard 40meters
- SMA(SP) to TNC(SP) Connector

Re-radiator x 1

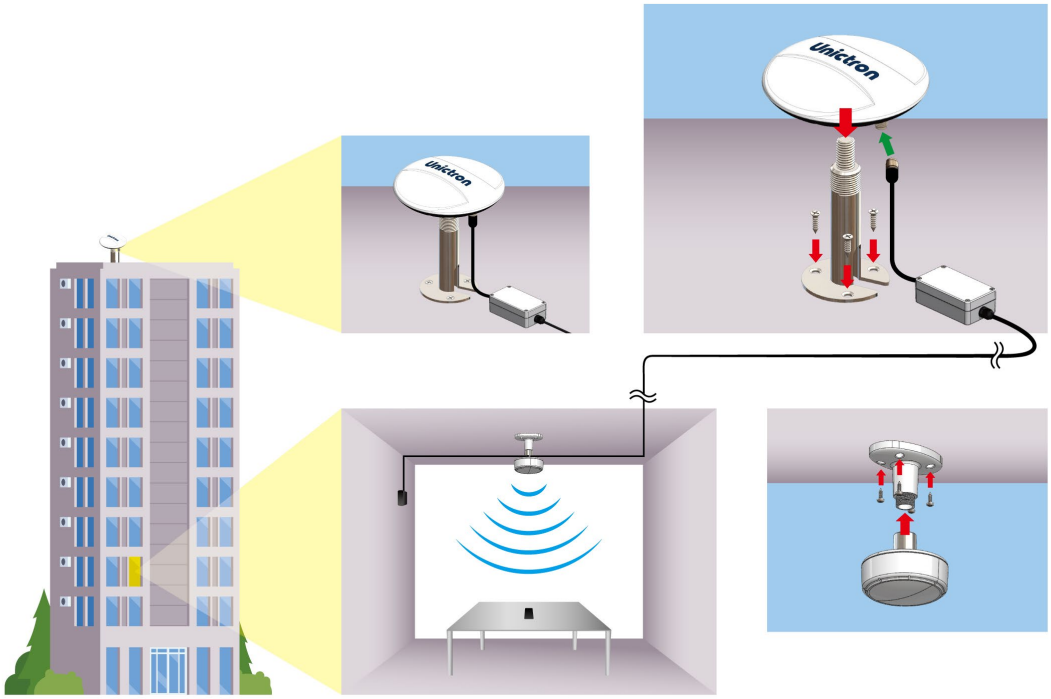
- 115mm (dia.) x 68.5mm (H)

Bracket x 1

- 110.48mm (dia.) x 75.53mm (H)
- PC+PBT / anti-UV

	**Regulator x 1** ● 58.16mm (L) x 37.19mm (W) x 25mm (H) ● Country dependent plug types

RK-20W Interconnection Diagram



Installation

1. Locate and mount the external antenna on the center roof of building horizontally with the best visibility of the sky.
2. Locate and mount the RK-20 to the ceiling with its cylinder facing and against the center of the testing bench.
3. Connect the external antenna with RG58 A/U RF cable to RK-20.
4. Power up the system by plugging the AC 115V (240V) to DC 7.5V~12V adapter.