SWB004 Combination Antenna

PN: SW20026EB56



Sunnyway Technology

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1. Electrical Specifications

Cable 1 Parameters

Tested with 20cm cable length - RG174 with C20N

Standards	**4G &3G&2G**	
Frequency range (MHz)	690~960MHz	1710~2690MHz
Peak Gain (dBi)	0.2~4.1dBi	-0.4~3.3dBi
Average Gain (dB)	-3.6~-1.2dB	-3.6~-2.1dB
VSWR	<3.8	<2.8
Return Loss	<-4.7	<-6.7
Efficiency (%)	43~75%	43 ~61%
Polarization mode	Linear	Linear
Radiation pattern	Omni-Directional	Omni-Directional
Output impedance (Ω)	50	50
Max. Input Power(W)	25	25

Cable 2 Parameters

Tested with 20cm cable length - RG174 with C20N

Standards	**4G &3G&2G**	
Frequency range (MHz)	690~960MHz	1710~2690MHz
Peak Gain (dBi)	0.3~3.0 dBi	0.5~4.2dBi
Average Gain (dB)	-3.0~-1.3dB	-2.9~-1.3dB
VSWR	<2.9	<1.7

Return Loss	<-6.4	<-12.1
Efficiency (%)	50~ 75%	51~ 73%
Polarization mode	Linear	Linear
Radiation pattern	Omni-Directional	Omni-Directional
Output impedance (Ω)	50	50
Max. Input Power(W)	25	25

Cable 3 Parameters

Tested with 20cm cable length - RG174 with C20N

Standards	**GPS&GLONASS&GALILEO&BEIDOU**		
Band (MHz)	1559MHz	1575.42MHz	1602MHz
Peak Gain (dBi)	3.24dBi	1.92dBi	2.65dBi
Average Gain (dB)	-1.88dB	-2.71dB	-2.36dB
VSWR	2.40	1.77	1.34
Return Loss	-7.69	-11.08	-16.61
Efficiency (%)	64.8%	53.6%	58.1%
Impedance(Ω)	50	50	50
Polarization	RHCP	RHCP	RHCP
Radiation Pattern	Hemispherical	Hemispherical	Hemispherical
Saw Filter	Pre-Filter	Pre-Filter	Pre-Filter
Active Gain (dB)	28dB	28dB	28dB
Noise-Figure(dB)	1dB(+25°C±10°C)	1dB(+25°C±10°C)	1dB(+25°C±10°C)

Supply Current(mA)	15mA	15mA	15mA
Supply Voltage(V)	1.5V-5.5V	1.5V-5.5V	1.5V-5.5V

2. Mechanical and Environmental Specification

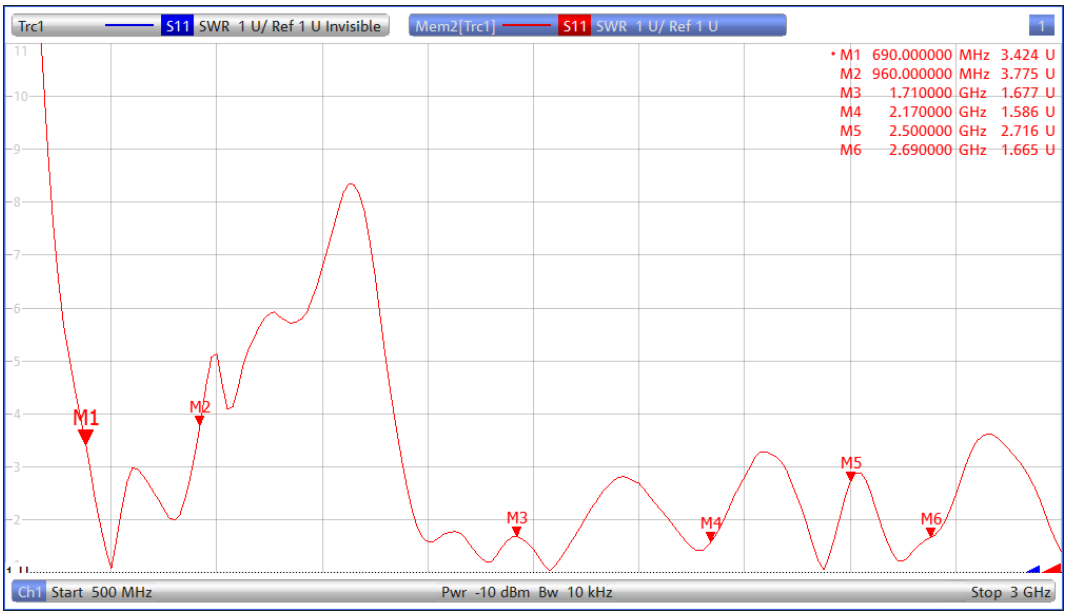
Mounting Type	**Screw lock**
Connector Type	RG174+SMA M
Antenna size(mm)	99.96 (φ) x 105.8 (H) x 3000 (Line length)
Material	External
Cable length(mm)	3000 (can be customized)
Operating Temperature (˚C)	- 40 ˚C ~ + 85 ˚C
Storage Temperature(˚C)	- 40 ˚C ~ + 85 ˚C

3. Antenna parameters

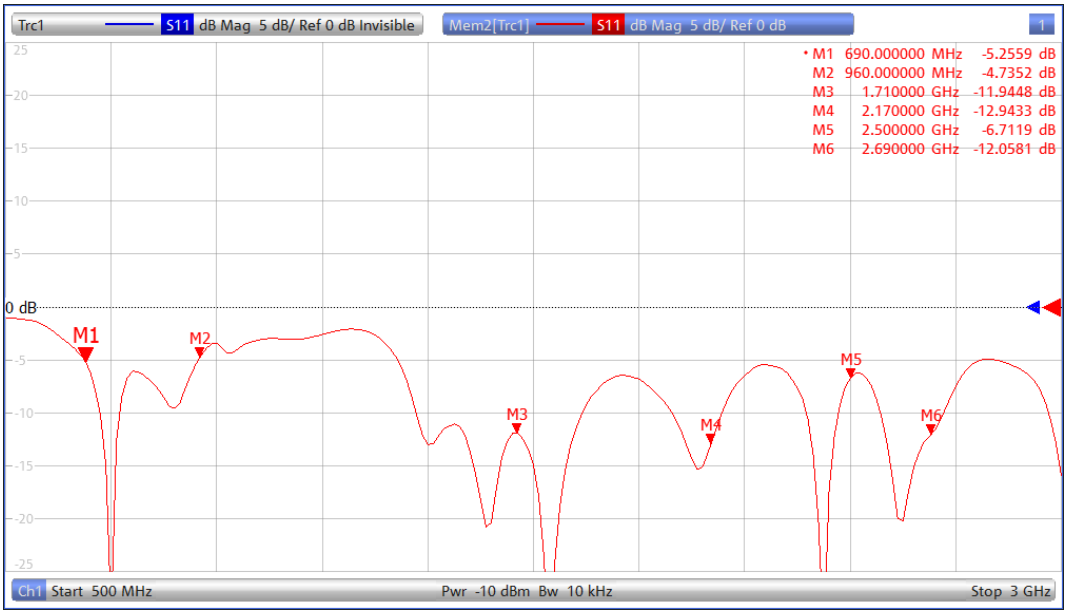
3.1 Cable 1: CELLULAR/LTE

FRE（MHz）	690	960	1710	2170	2500	2690
VSWR	3.42	3.77	1.67	1.58	2.71	1.66
Return Loss	-5.25	-4.73	-11.94	-12.94	-6.71	-12.05
Eff (%)	43.02	45.97	54.13	46.67	49.55	46.36
Average Gain(dB)	-3.66	-3.37	-2.67	-3.31	-3.05	-3.34

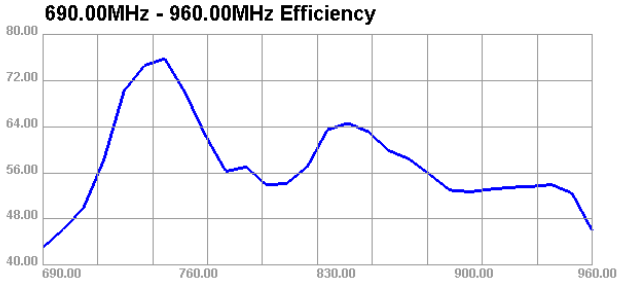
3.1.1 VSWR

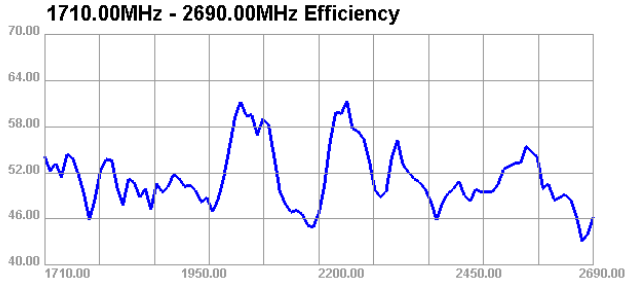


3.1.2 Return Loss

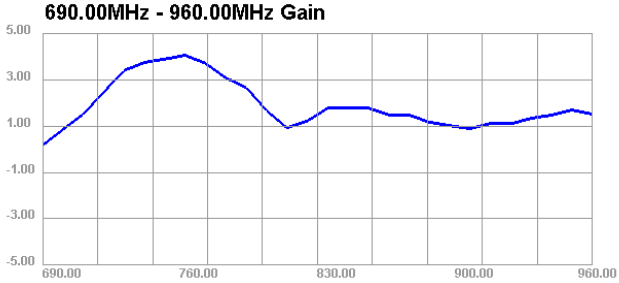


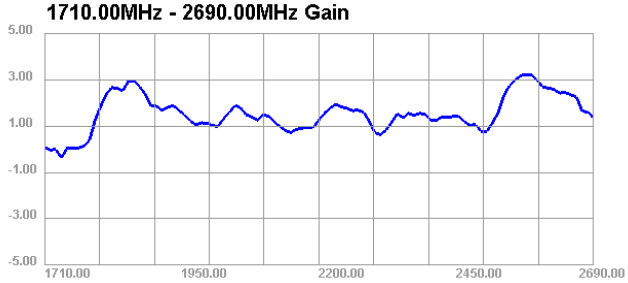
3.1.3 Efficiency





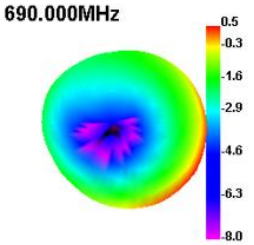
3.1.4 Gain



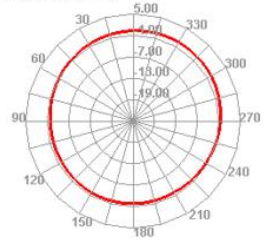


3.1.5 Directional pattern

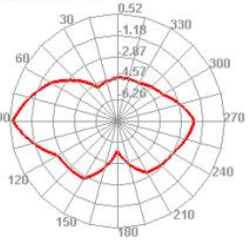
690.000MHz



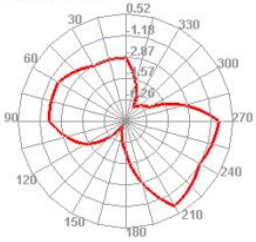
690.000MHz H



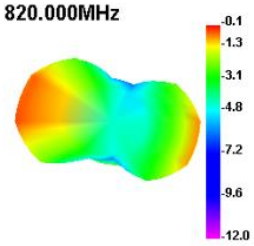
690.000MHz E1



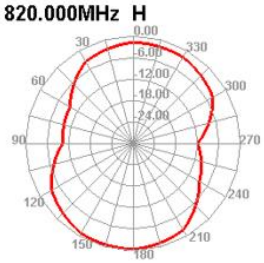
690.000MHz E2



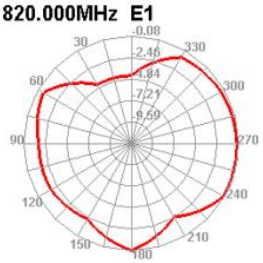
820.000MHz



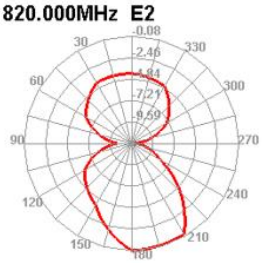
820.000MHz H



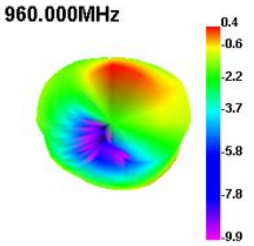
820.000MHz E1



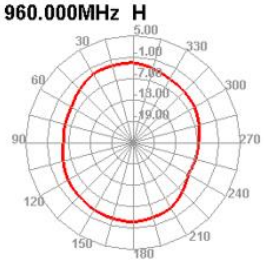
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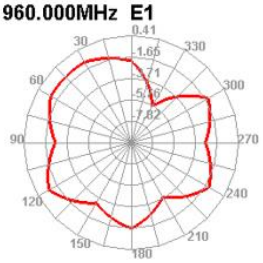
960.000MHz



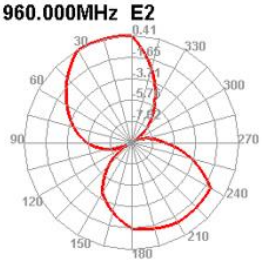
960.000MHz H



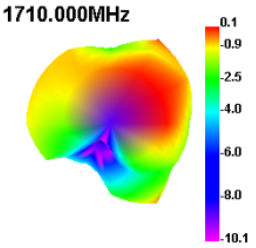
960.000MHz E1



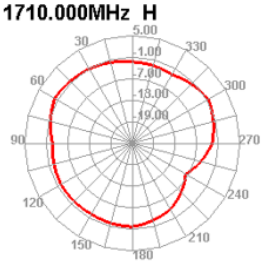
960.000MHz E2



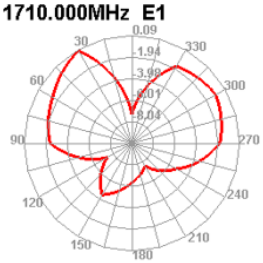
1710.000MHz



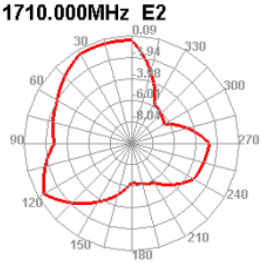
1710.000MHz H



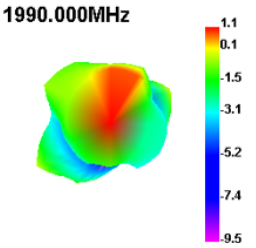
1710.000MHz E1



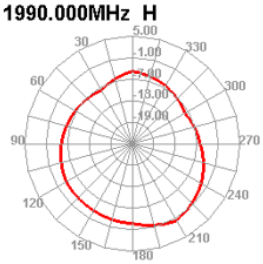
1710.000MHz E2



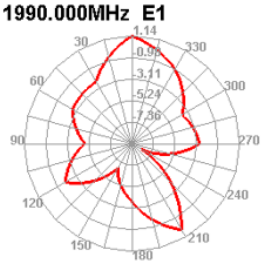
1990.000MHz



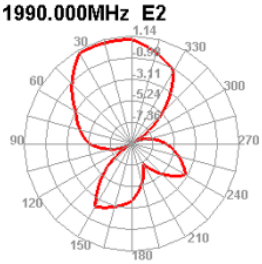
1990.000MHz H

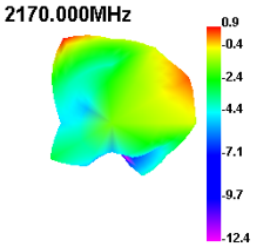


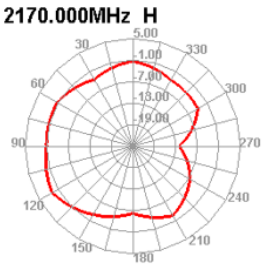
1990.000MHz E1

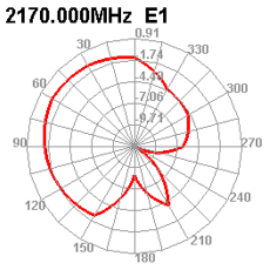


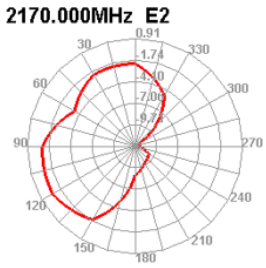
1990.000MHz E2

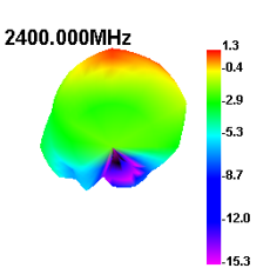


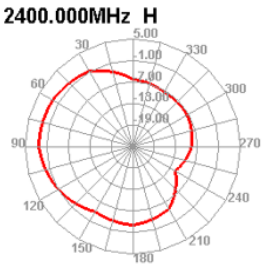

2170.000MHz
0.9
-0.4
-2.4
-4.4
-7.1
-9.7
-12.4

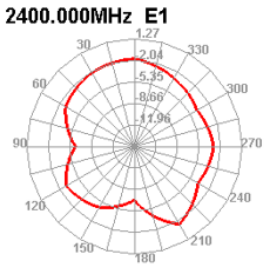

2170.000MHz H
5.00
1.00
-7.00
-13.00
-19.00

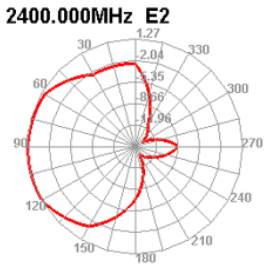

2170.000MHz E1
0.91
1.74
4.39
7.06
9.71

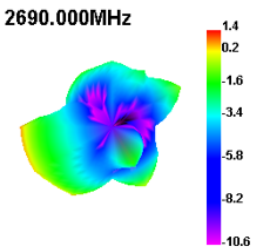

2170.000MHz E2
0.91
1.74
4.39
7.06
9.71

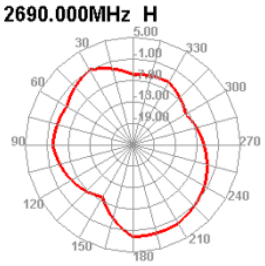

2400.000MHz
1.3
-0.4
-2.9
-5.3
-8.7
-12.0
-15.3

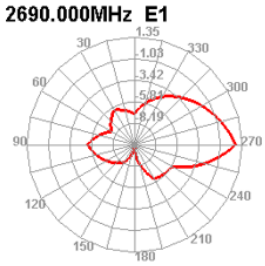

2400.000MHz H
5.00
1.00
-7.00
-13.00
-19.00

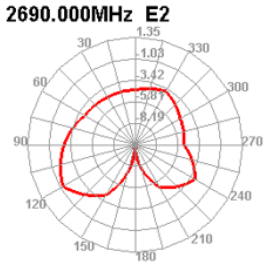

2400.000MHz E1
1.27
2.04
5.35
8.66
11.96


2400.000MHz E2
1.27
2.04
5.35
8.66
11.96


2690.000MHz
1.4
0.2
-1.6
-3.4
-5.8
-8.2
-10.6


2690.000MHz H
5.00
1.00
-7.00
-13.00
-19.00

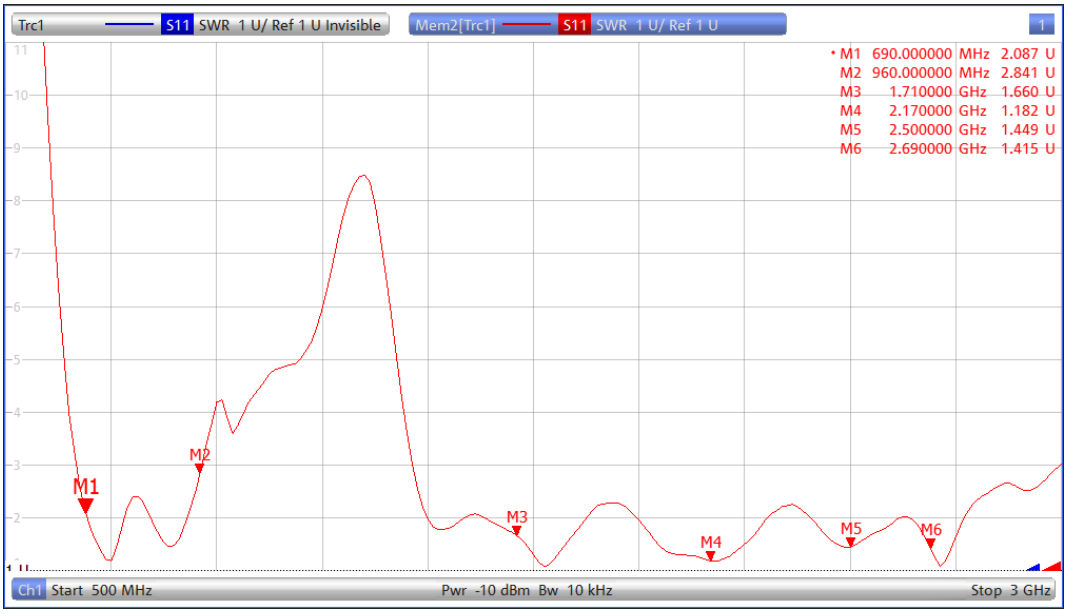

2690.000MHz E1
1.35
1.03
3.42
5.81
8.19


2690.000MHz E2
1.35
1.03
3.42
5.81
8.19

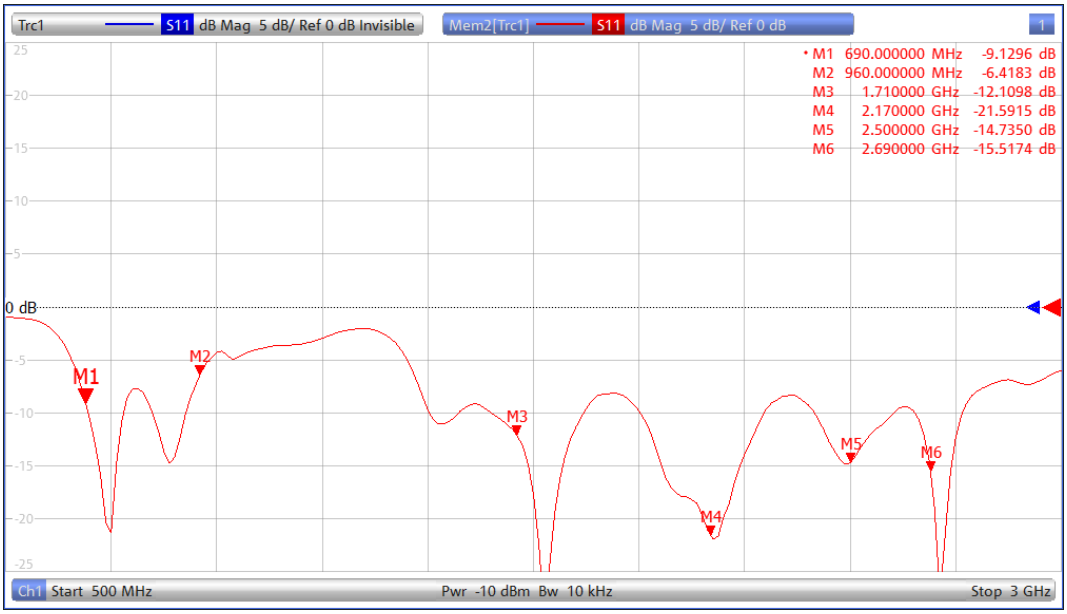
3.2 Cable 2: CELLULAR/LTE

FRE（MHz）	690	960	1710	2170	2500	2690
VSWR	2.08	2.84	1.66	1.18	1.44	1.41
Return Loss	-9.12	-6.41	-12.10	-21.59	-14.73	-15.51
Eff(%)	52.41	49.92	57.52	61.66	63.85	57.68
Average Gain(dB)	-2.81	-3.02	-2.4	-2.1	-1.95	-2.39

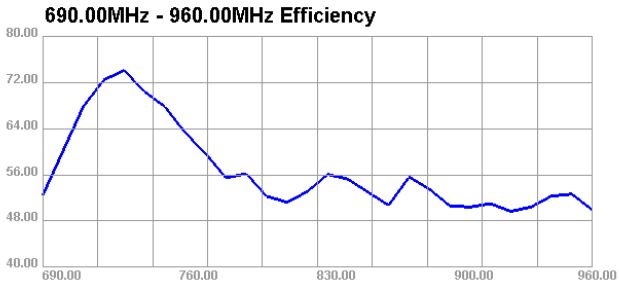
3.2.1 VSWR

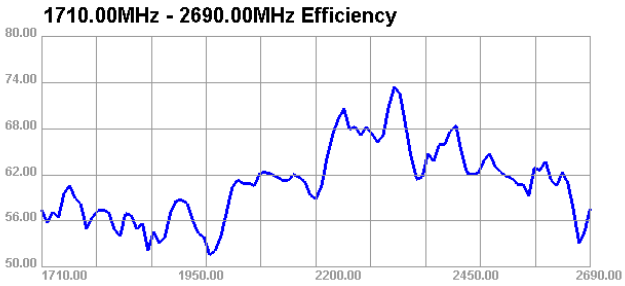


3.2.2 Return Loss

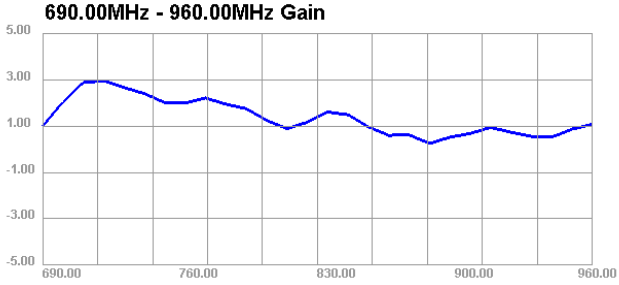


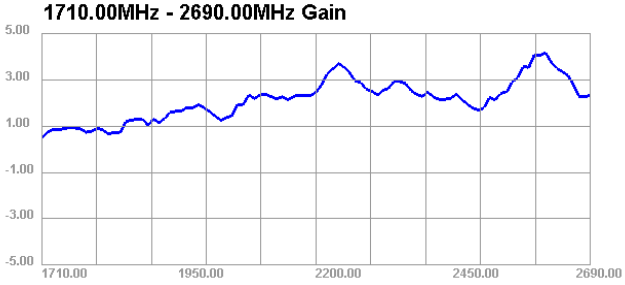
3.2.3 Efficiency





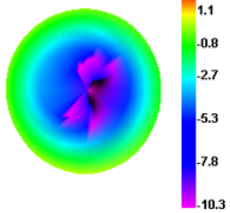
3.2.4 Gain



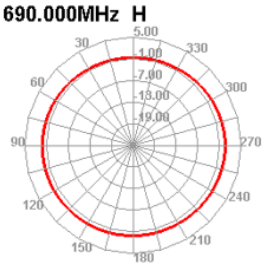


3.2.5 Directional Pattern

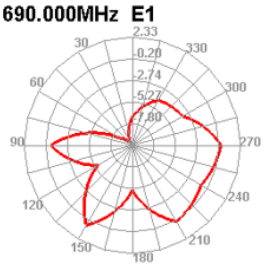
690.000MHz



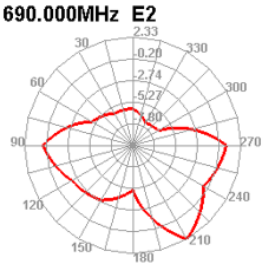
690.000MHz H



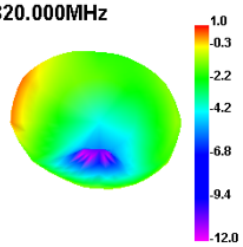
690.000MHz E1



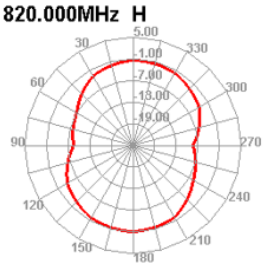
690.000MHz E2



820.000MHz



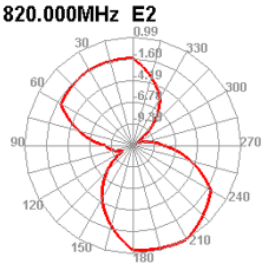
820.000MHz H



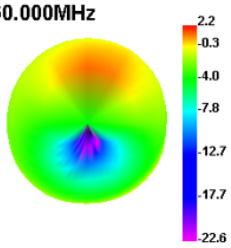
820.000MHz E1



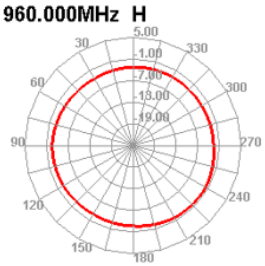
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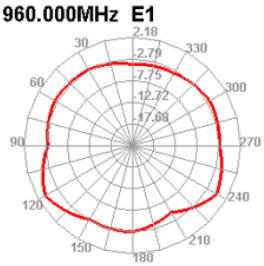
960.000MHz



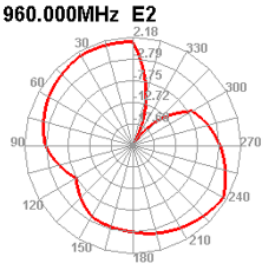
960.000MHz H



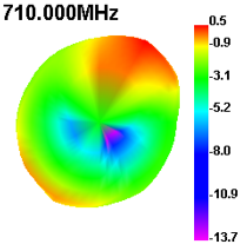
960.000MHz E1



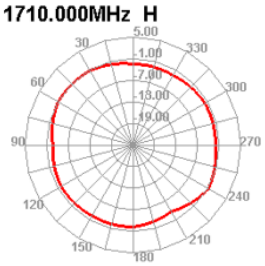
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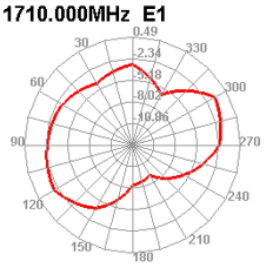
1710.000MHz



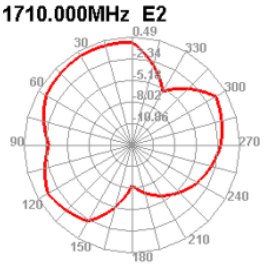
1710.000MHz H



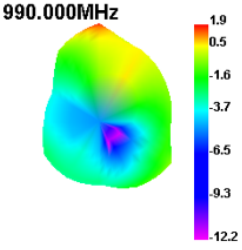
1710.000MHz E1



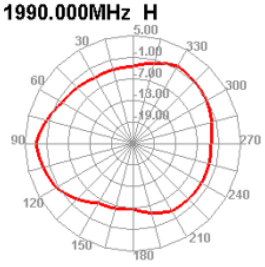
1710.000MHz E2



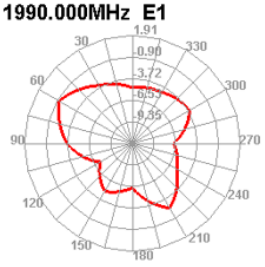
1990.000MHz



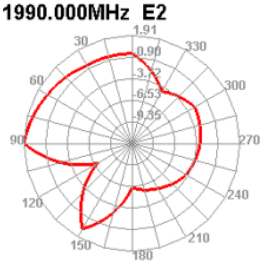
1990.000MHz H

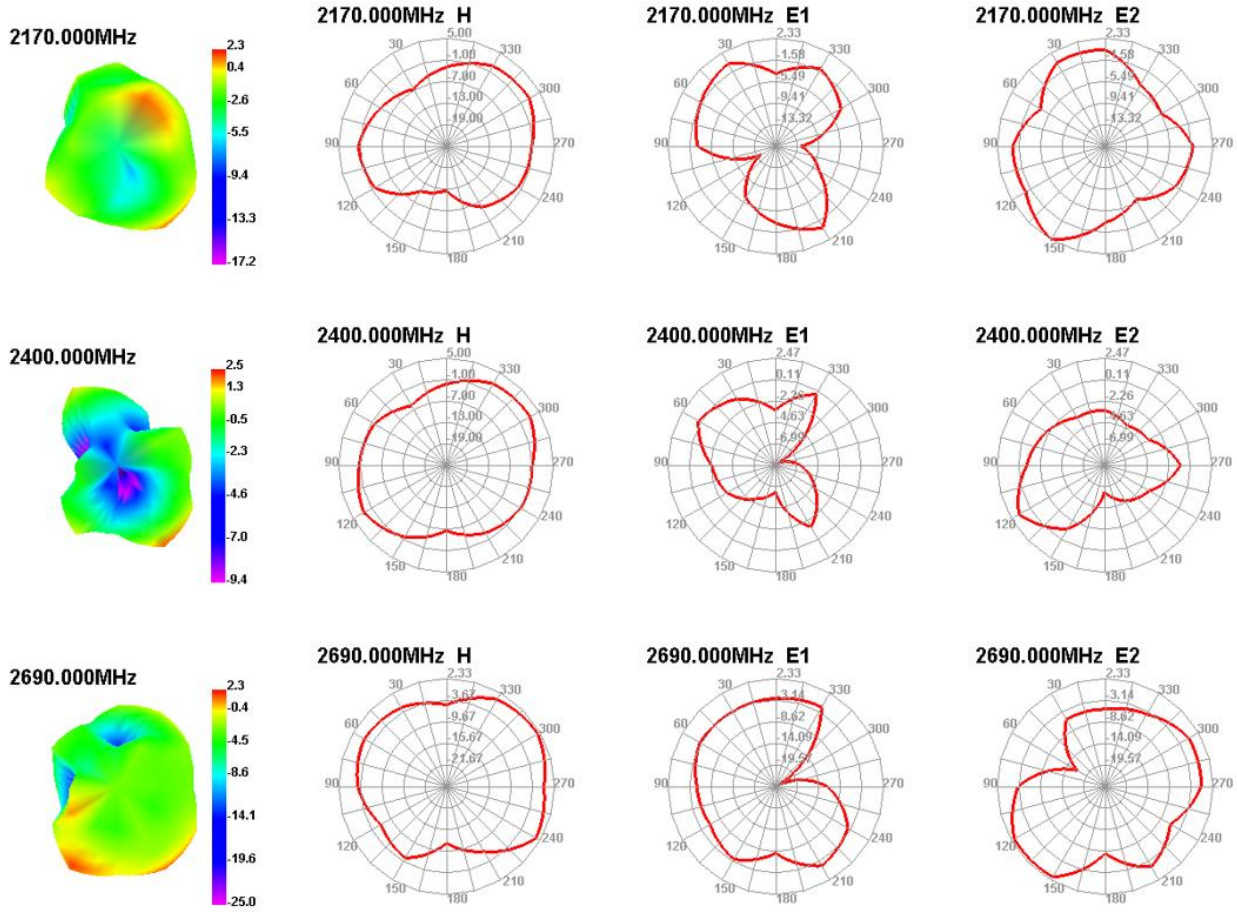


1990.000MHz E1

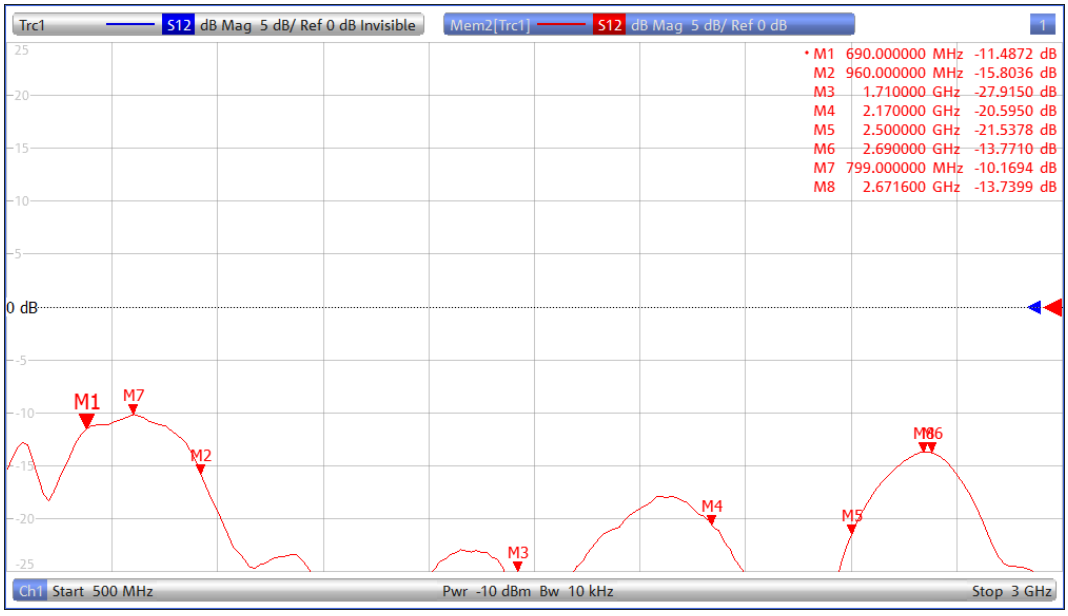


1990.000MHz E2





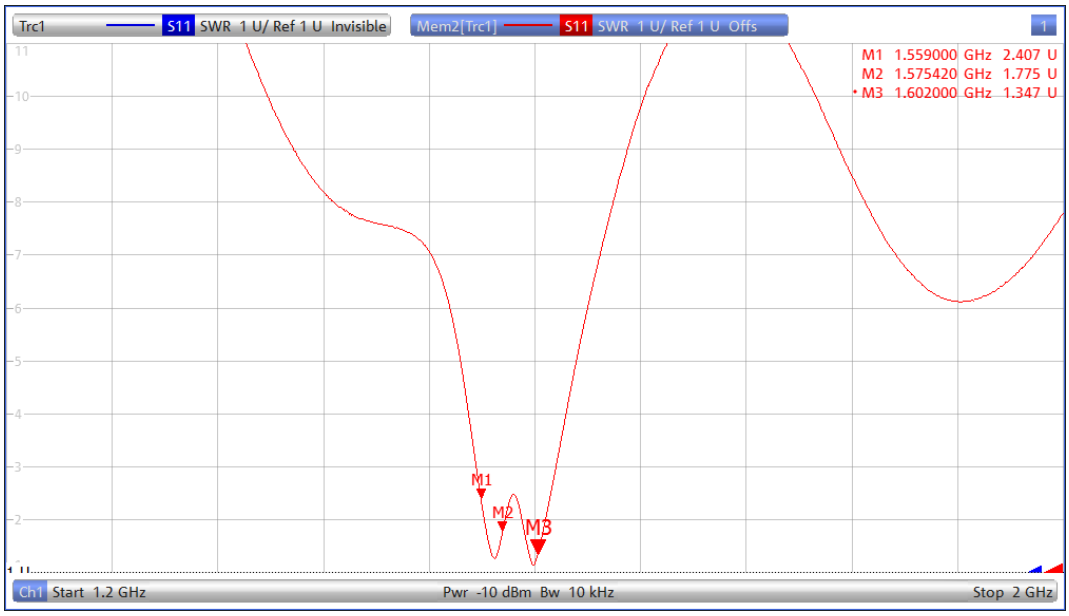
3.2.6 ISOLATION FOR CABLES 1 AND 2



3.3 Cable 3: GNSS

FRE（MHz）	1559	1575.42	1602
VSWR	2.40	1.77	1.34
Return Loss	-7.69	-11.08	-16.61
Eff (%)	64.8	53.6	58.1
Average Gain(dB)	-1.88	-2.71	-2.36

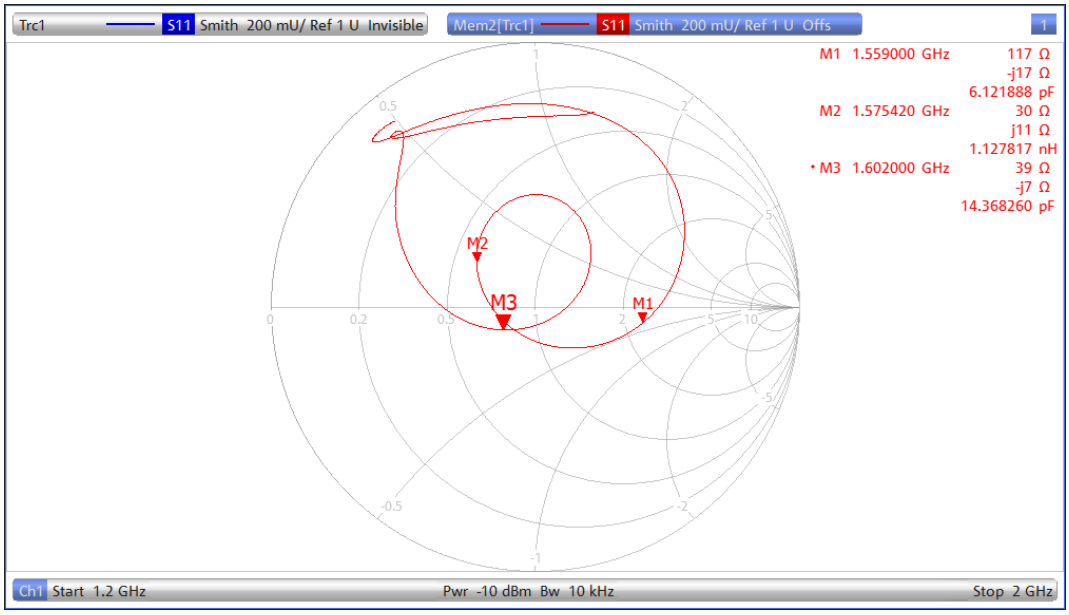
3.3.1 VSWR



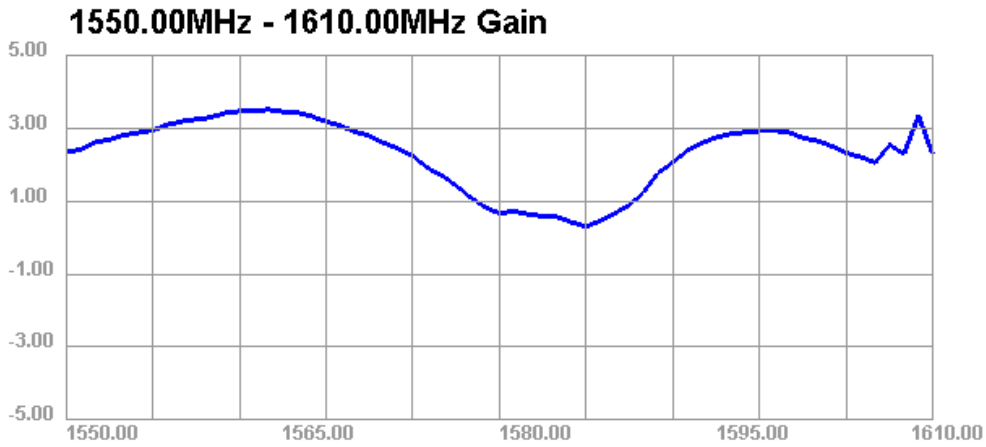
3.3.2 Return Loss



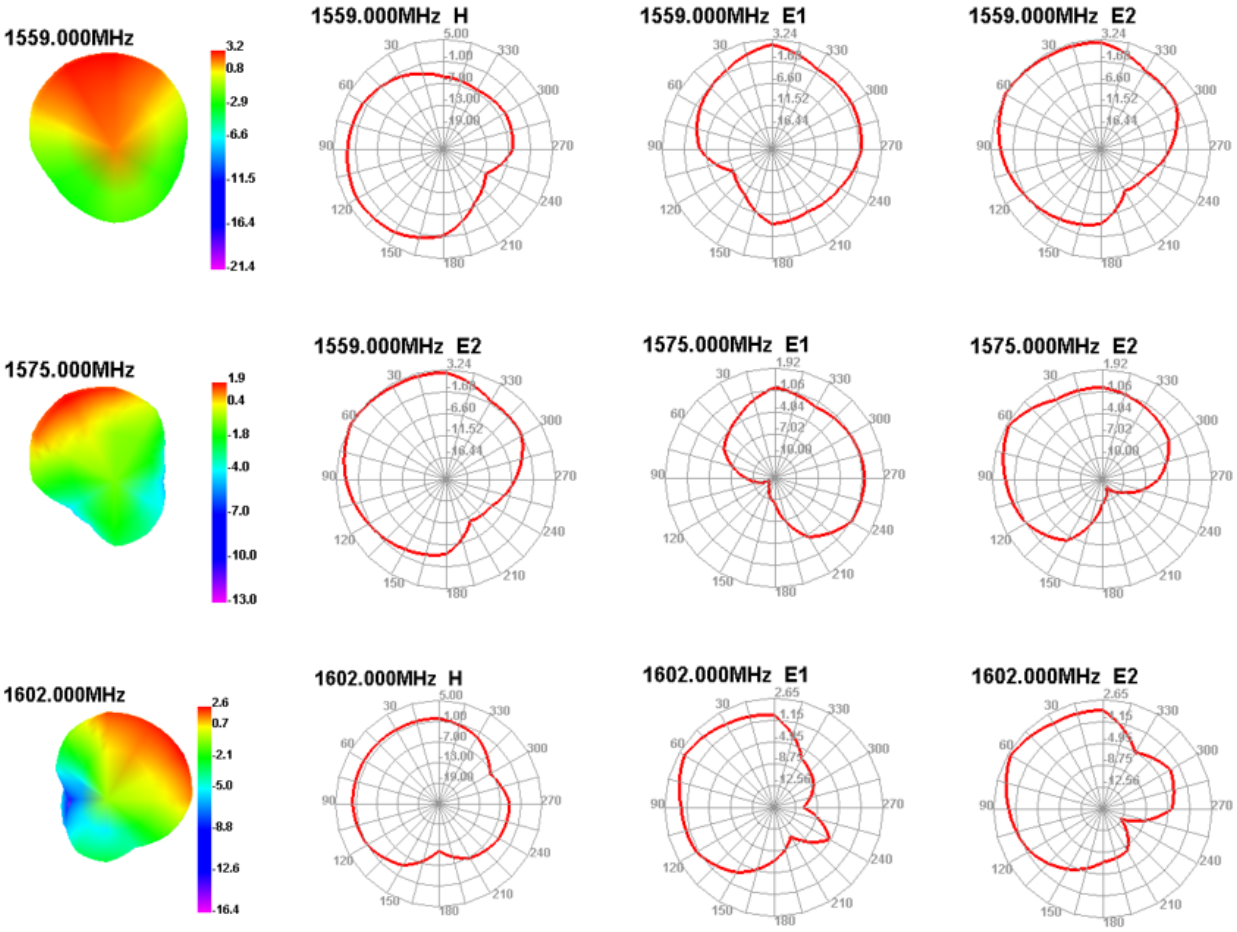
3.3.3 Smith



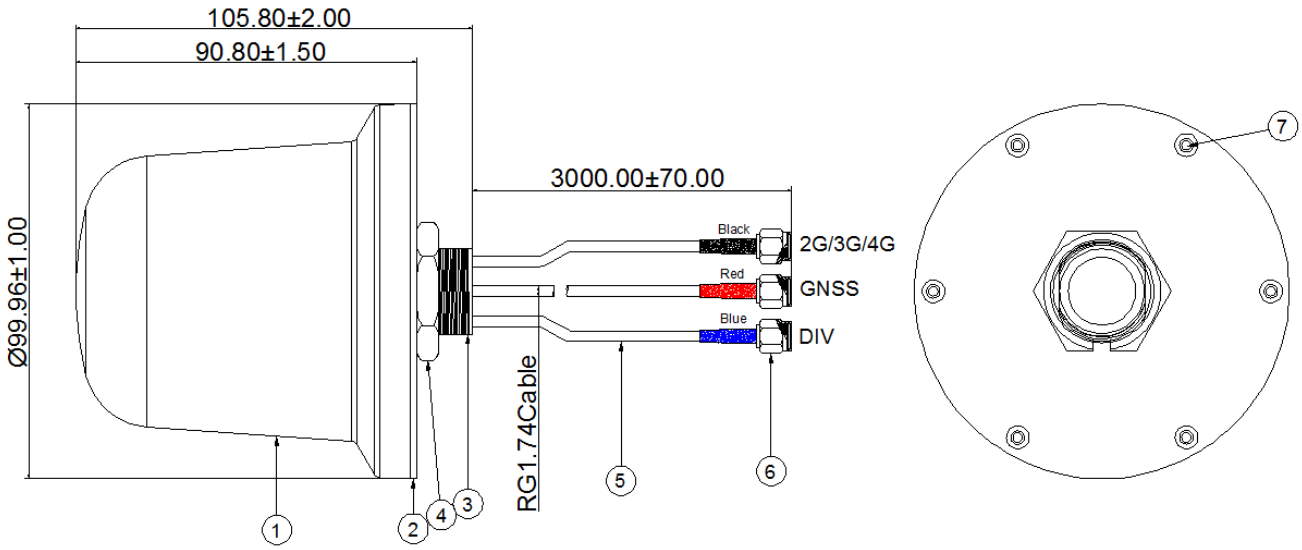
3.3.4 Gain



3.4.5 Directional pattern



4. Antenna Drawing



Series	Component name	Material	Color	Quantity
1	Upper Shell	SABIC PC 1414	black	1
2	Lower Shell	SABIC PC 1414	black	1
3	Screw	brass	Gold	1
4	Nuts	brass	Gold	1
5	Cable	RG174	black	3
6	SMA	brass	Gold	3
7	Screw	M3x5	black	6

Note: Cable Loss

20℃时衰减（允许误差15%） Attenuation constant at 20℃ （Permissible error 15%）	200MHz	dB/100m	39
	400MHz	dB/100m	58
	900MHz	dB/100m	90
	1500MHz	dB/100m	117
	1800MHz	dB/100m	128
	2000MHz	dB/100m	139
	2500MHz	dB/100m	156