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APPROVAL SHEET

프로젝트명(Project Name)	flexAU10-3.55G-4TC
제품명	CBRS_3.55~3.7GHz Celling Type Antenna
모델명	CBRS-Ceiling (AUC-n48)
Document Number	
Approval Code	
Revision	1.00
Date	2024-02-06

Approval	Charge	Check	Check	Approval
	김태윤	정호두	최창섭	신희성
㈜에치에프알	(인)	(인)	(인)	(인)
Suppliers	**Charge**	**Check**		**Approval**
	Kim.c.s	**Cha.s.m**		**Jung.j.w**
㈜케이디티	(인)	(인)	(인)	(인)

Revision History

Date	Rev. No.	Description	Auther	Check	Approval
24.02.06	1.0	Initial create	K.C.S	C.S.M	J.J.W

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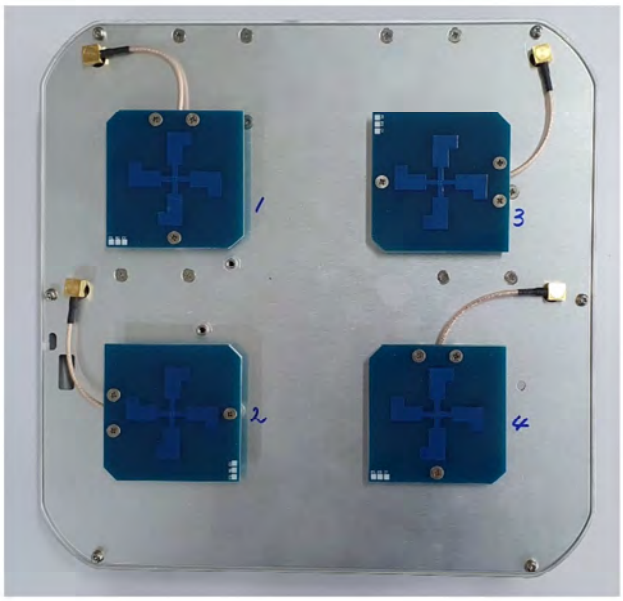
1. Specification

1.1 Product Spec

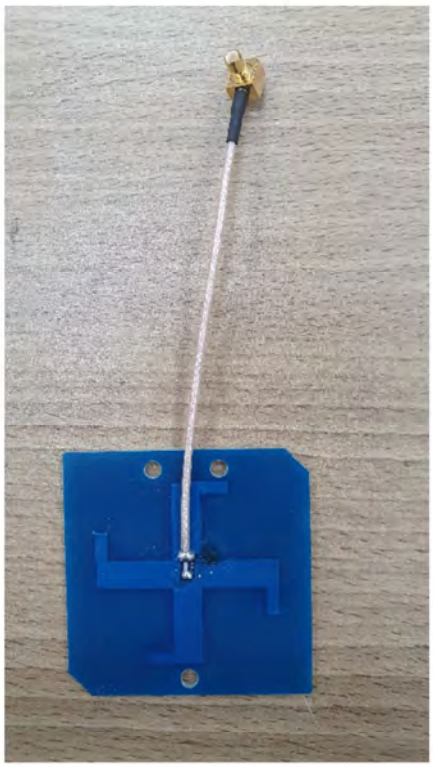
Electrical Specifications				
Frequency Range (MHz)	3550 ~ 3700			
V.S.W.R (Max)	2.0 :1			
Gain (Peak)	3 dBi (5.07dBi)			
Isolation	-20dB			
Input Impedance	50 (Ω)			
Polarization	Linear			
Mechanical Specifications				
Antenna Size (Width x Length x Height)	See drawing			
Connector	SMB(M) RA			
Cable Length	Port 1	Port 2	Port 3	Port 4
	105 mm	105 mm	105 mm	105 mm
Operation Temperature	-20 ~ 85 (℃)			
Operation Humidity	10 ~ 90 (%)			

1.2 Product Design

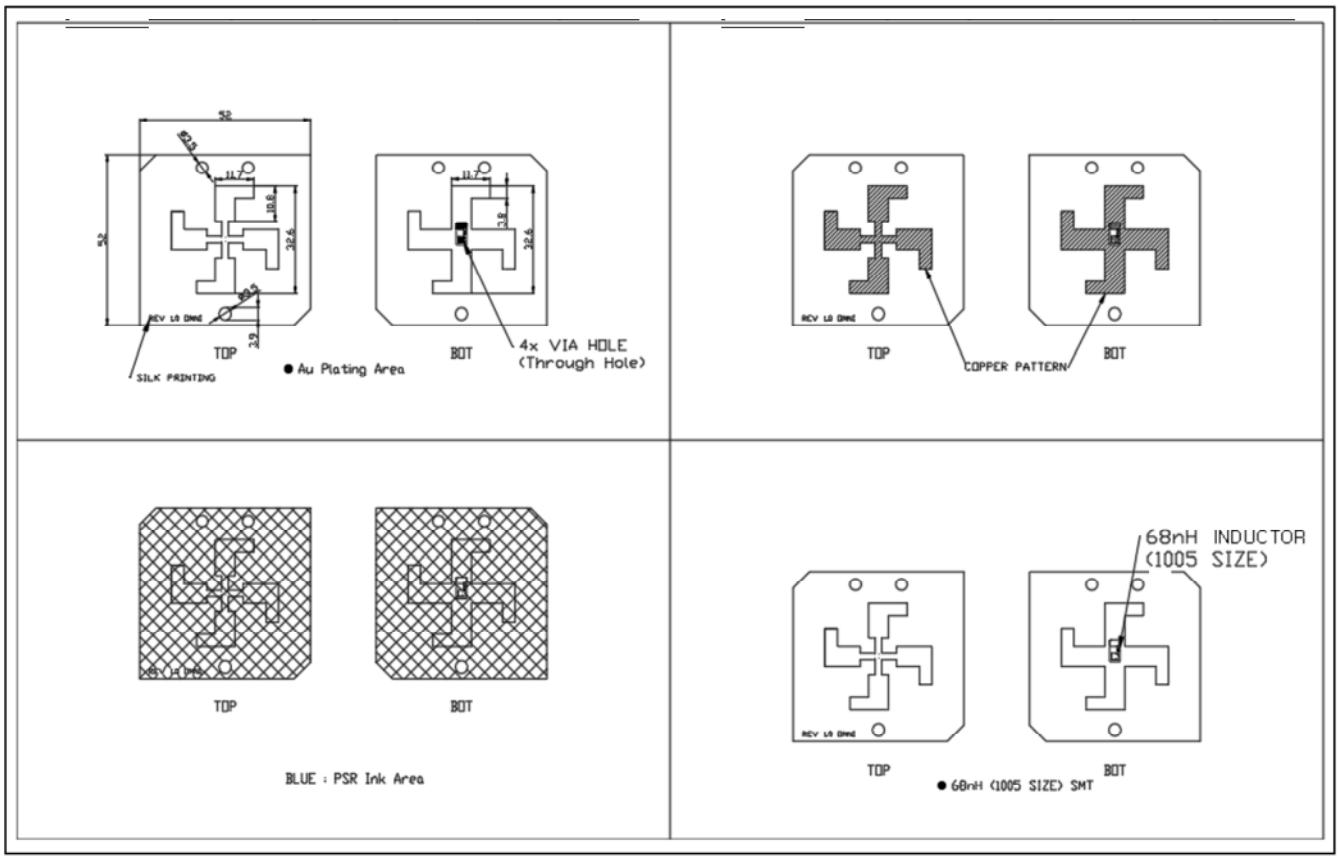
- Set Assembly



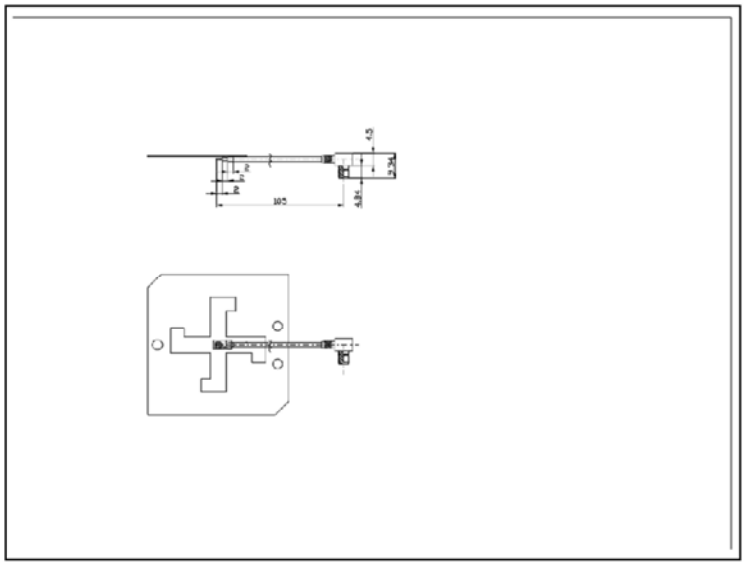
- Antenna



1.3 Product Drawing



Antenna PCB



Antenna PCB + Cable Assembly

2. Performance Test

2.1 Performance Test Specifiction

VSWR

Marker	Frequency	Spec	Data			
			Port1	Port2	Port3	Port4
1	3550MHz	Below 2.0	1.4340	1.2876	1.2861	1.1764
2	3625MHz	Below 2.0	1.4399	1.1246	1.3043	1.2772
3	3700 MHz	Below 2.0	1.5010	1.5683	1.4171	1.4814

Gain

Frequency	3550MHz				3625MHz				3700 MHz			
Data	Port1	Port2	Port3	Port4	Port1	Port2	Port3	Port4	Port1	Port2	Port3	Port4
	4.37	4.20	4.10	4.23	4.75	4.41	4.63	4.35	4.41	5.07	4.66	4.74
Spec	Above 3.0 dBi				Above 3.0 dBi				Above 3.0 dBi			

Isolation

Frequency	Spec	Data					
		Port1-Port2	Port1-Port3	Port1-Port4	Port2-Port3	Port2-Port4	Port3-Port4
3550~3700MHz	-20 이하	-31.242	-35.705	-29.977	-30.242	-30.404	-25.806

2.2 Inspection Procedure

2.2.1 V.S.W.R

Step 1.

Connect the antenna to Port 1 after the calibration of the Network Analyzer.

Step 2.

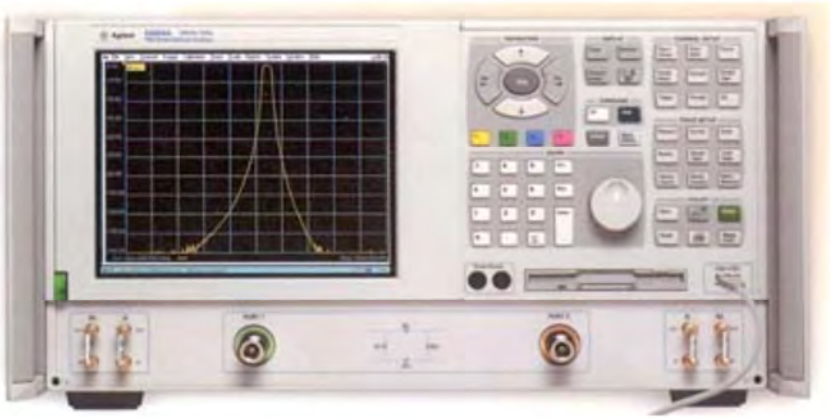
Set the marker of the Network Analyzer to the target frequency.

Step 3.

Measure the VSWR and verify that it meets the specifications.

Step 4.

Record the measurement data.



2.2.2 Gain and Radiation Patterns

Step 1

Calibrate the non-reflective chamber and the measurement system using a dipole antenna and a horn antenna.

Prepare software for system control.

Step 2.

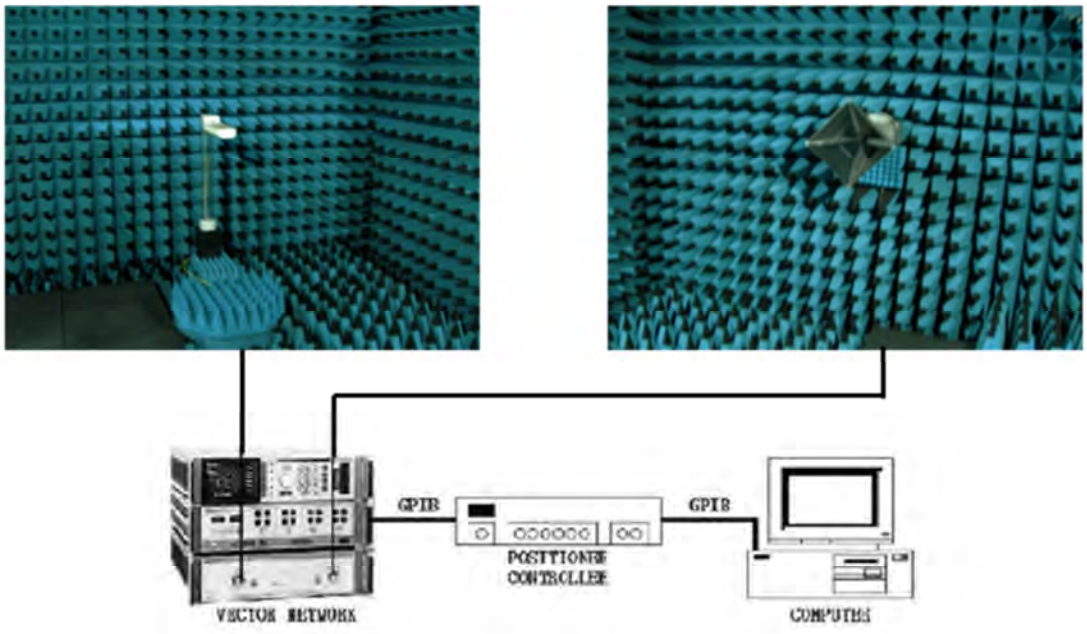
Mount the antenna to be measured in the non-reflective chamber mounting position.

Step 3.

Start the measurement software and proceed with the measurement.

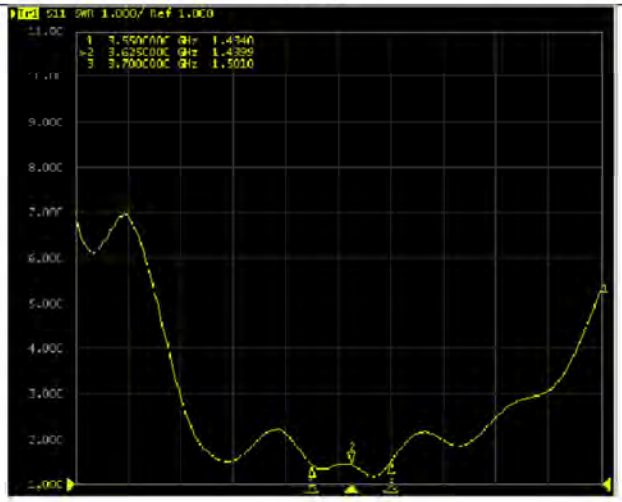
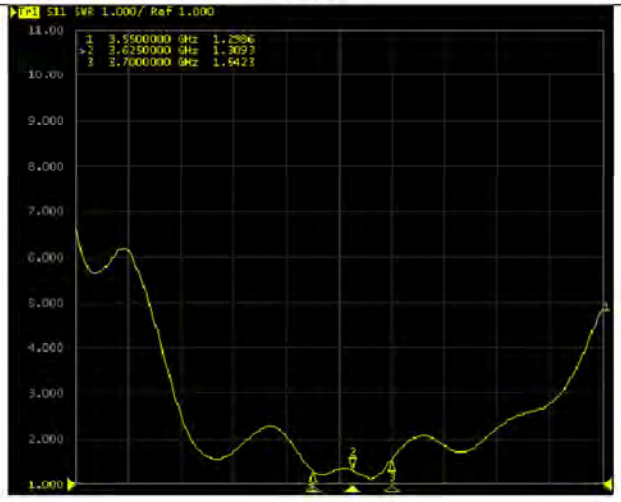
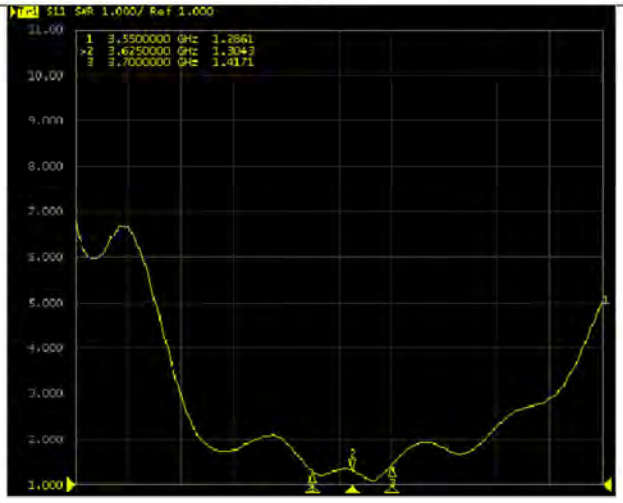
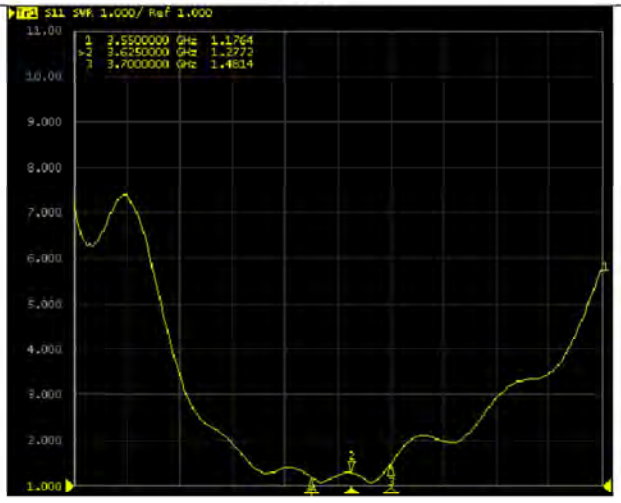
Step 4.

Record the measurement results.



2.3 Test Result

2.3.1 VSWR

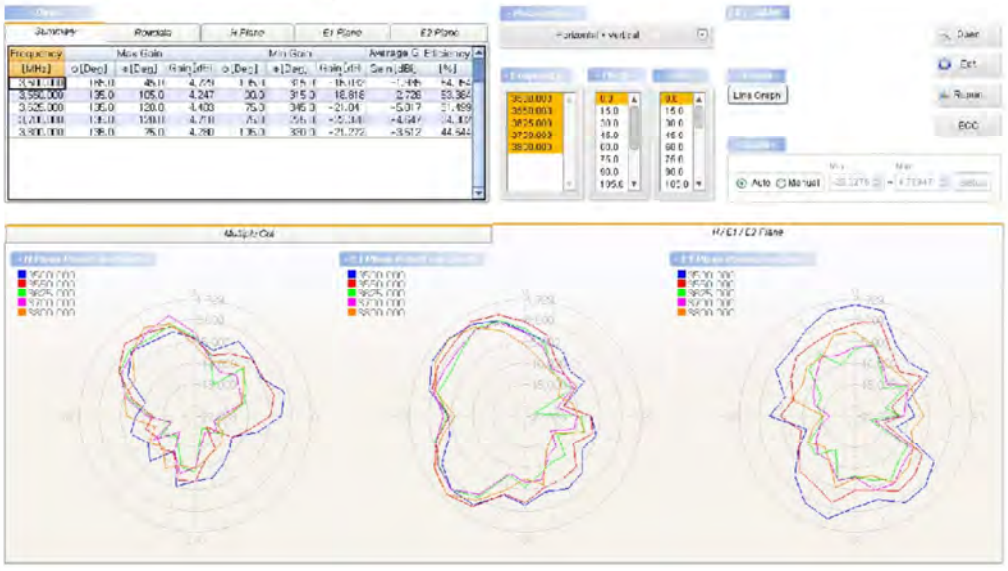
Port1	Port2
	
Port3	Port4
	

2.3.2 Gain, Radiation Patterns

ANT Port#1

	1	2	3	4	5
Frequency [MHz]	**3550**	**3600**	**3625**	**3650**	**3700**
Efficiency [dB]	**-2.64**	**-2.54**	**-2.30**	**-2.02**	**-2.62**
Efficiency [%]	**54.5**	**55.7**	**58.9**	**62.9**	**54.7**
TRG_θ [dB]	-4.92	-5.24	-5.20	-5.18	-6.40
$Gain_{\theta\ Peak}$ [dBi]	2.22	2.13	2.08	1.90	0.54
$Gain_{\theta\ Min}$ [dBi]	-30.70	-31.98	-45.83	-30.09	-34.67
TRG_φ [dB]	-6.51	-5.88	-5.42	-4.88	-4.98
$Gain_{\varphi\ Peak}$ [dBi]	2.69	2.47	2.66	3.28	3.02
$Gain_{\varphi\ Min}$ [dBi]	-37.72	-33.46	-29.27	-52.79	-36.58
UHRG [dB]	-3.44	-3.28	-3.01	-2.68	-3.21
UHRG/TRG [%]	83.01	84.27	84.89	85.79	87.24
H-Plane	-5.06	-5.67	-5.63	-5.81	-7.11
E1-Plane, AVG [dB]	-3.49	-3.90	-3.83	-3.93	-5.39
E2-Plane, AVG [dB]	-7.67	-6.94	-6.63	-6.20	-6.92
Peak Gain [dBi]	4.37	4.53	4.75	5.08	4.41
Directivity [dB]	7.00	7.07	7.04	7.10	7.03
Minimum Gain [dBi]	-23.70	-22.07	-19.50	-20.31	-20.95
Test Condition	FS				
Antenna Type					

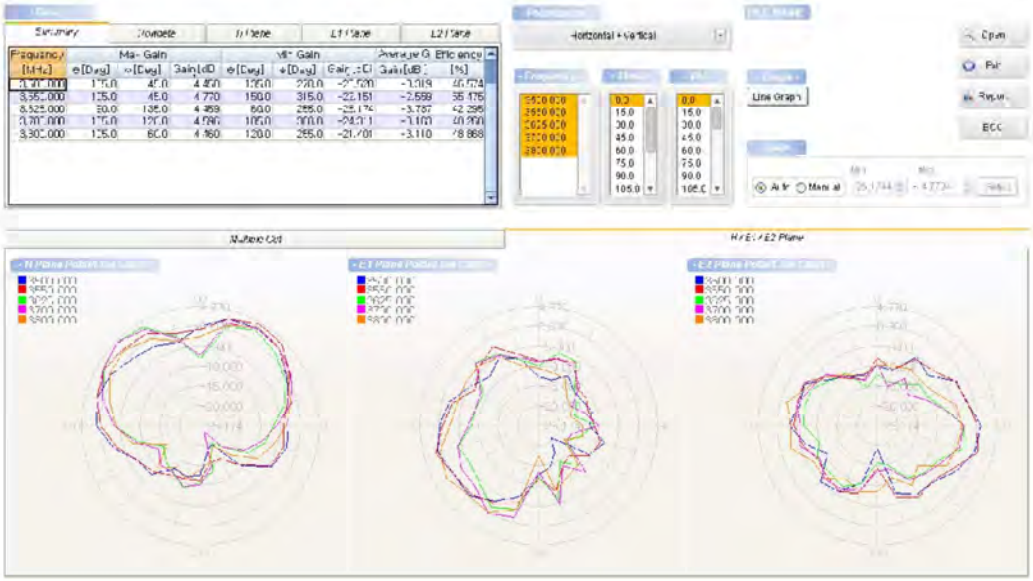
Average Efficiency	**-2.41 dB, 57.35 %**



ANT Port#2

	1	2	3	4	5
Frequency [MHz]	**3550**	**3600**	**3625**	**3650**	**3700**
Efficiency [dB]	**-2.78**	**-2.70**	**-2.55**	**-2.09**	**-2.25**
Efficiency [%]	**52.7**	**53.7**	**55.6**	**61.8**	**59.6**
TRG_{θ} [dB]	-4.70	-4.91	-4.92	-4.70	-5.36
$Gain_{\theta\ Peak}$ [dBi]	2.55	2.14	2.27	2.44	1.81
$Gain_{\theta\ Min}$ [dBi]	-26.84	-33.64	-43.58	-40.63	-33.29
TRG_{φ} [dB]	-7.26	-6.69	-6.32	-5.54	-5.16
$Gain_{\varphi\ Peak}$ [dBi]	1.21	1.66	1.87	2.23	2.63
$Gain_{\varphi\ Min}$ [dBi]	-29.69	-38.35	-27.80	-31.06	-30.35
UHRG [dB]	-3.79	-3.62	-3.42	-2.89	-2.92
UHRG/TRG [%]	79.18	80.86	81.95	83.16	85.72
H-Plane	-5.13	-5.86	-6.25	-6.48	-7.65
E1-Plane, AVG [dB]	-7.28	-6.50	-6.16	-5.65	-5.78
E2-Plane, AVG [dB]	-3.42	-3.57	-3.61	-3.31	-4.11
Peak Gain [dBi]	4.20	4.17	4.41	4.97	5.07
Directivity [dB]	6.98	6.87	6.96	7.06	7.31
Minimum Gain [dBi]	-19.32	-22.24	-23.47	-19.49	-19.52
Test Condition	FS				
Antenna Type					

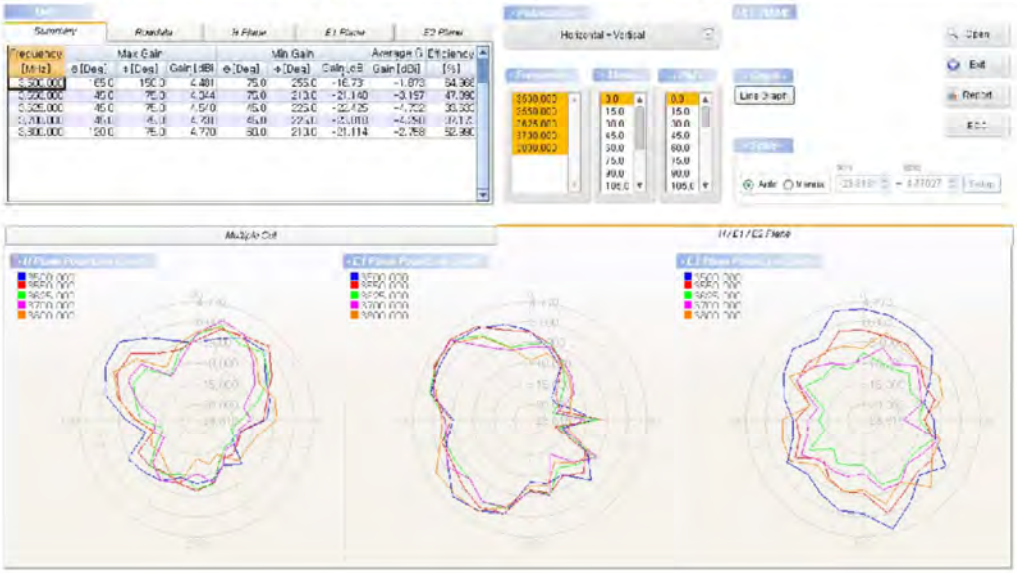
Average Efficiency	**-2.47 dB, 56.69 %**



ANT Port#3

	1	2	3	4	5
Frequency [MHz]	3550	3600	3625	3650	3700
Efficiency [dB]	-2.67	-2.57	-2.33	-2.02	-2.41
Efficiency [%]	54.1	55.4	58.4	62.8	57.4
TRG_θ [dB]	-4.71	-4.98	-4.92	-4.85	-5.75
$Gain_{\theta\ Peak}$ [dBi]	2.89	2.47	2.73	2.56	1.96
$Gain_{\theta\ Min}$ [dBi]	-35.97	-46.91	-32.99	-27.33	-34.22
TRG_φ [dB]	-6.92	-6.28	-5.81	-5.22	-5.11
$Gain_{\varphi\ Peak}$ [dBi]	1.13	1.09	2.01	2.54	2.66
$Gain_{\varphi\ Min}$ [dBi]	-36.73	-29.04	-31.33	-32.05	-37.12
UHRG [dB]	-3.47	-3.29	-3.01	-2.66	-2.95
UHRG/TRG [%]	83.09	84.68	85.52	86.33	88.45
H-Plane	-5.20	-5.81	-5.95	-6.06	-7.35
E1-Plane, AVG [dB]	-4.93	-4.36	-3.92	-3.61	-4.17
E2-Plane, AVG [dB]	-4.57	-4.99	-5.08	-5.19	-6.49
Peak Gain [dBi]	4.10	4.37	4.63	4.94	4.66
Directivity [dB]	6.76	6.94	6.96	6.95	7.07
Minimum Gain [dBi]	-18.65	-19.39	-18.95	-18.55	-19.10
Test Condition	FS				
Antenna Type					

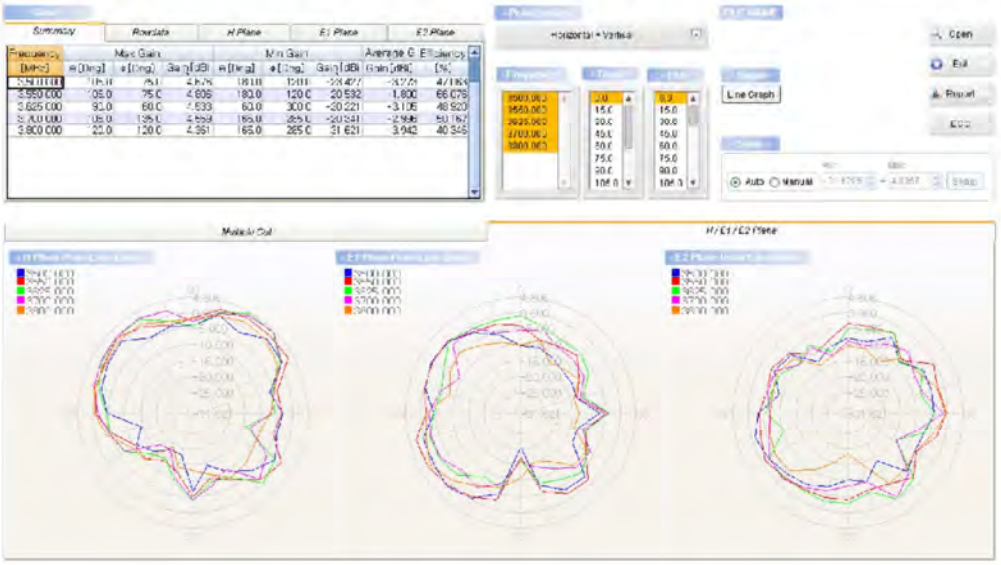
Average Efficiency	-2.39 dB, 57.63 %



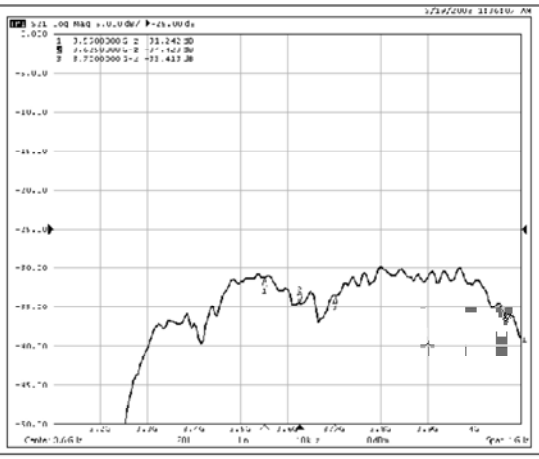
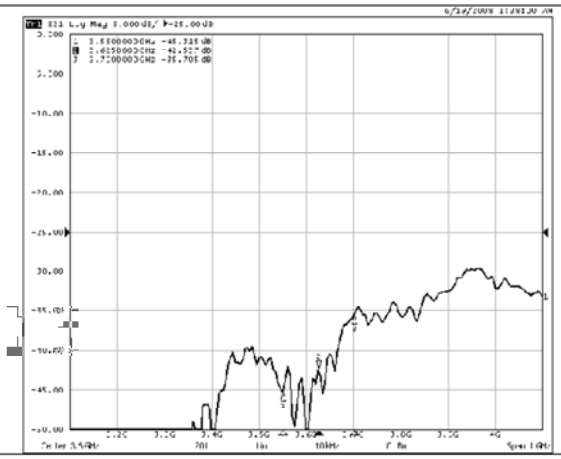
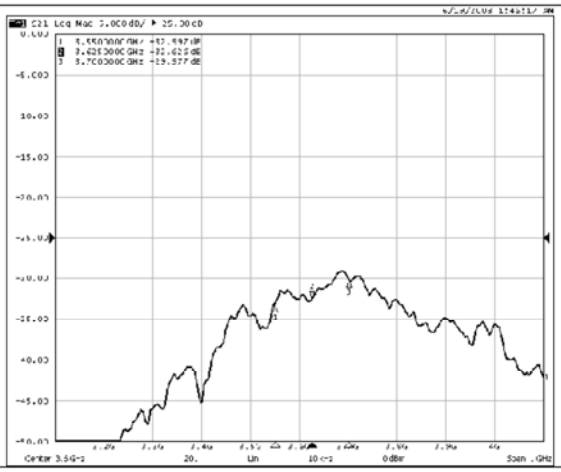
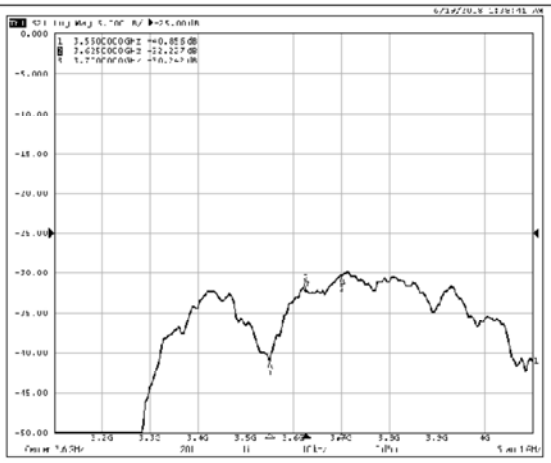
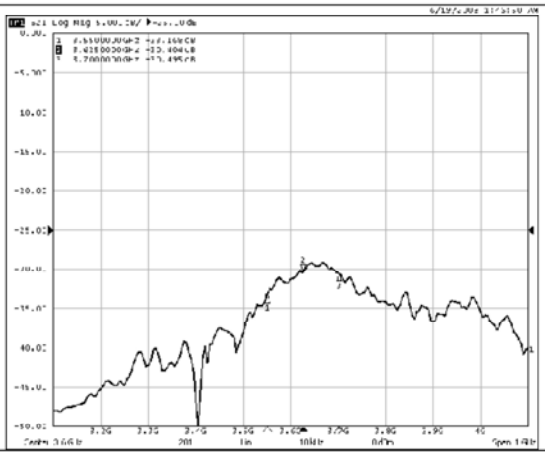
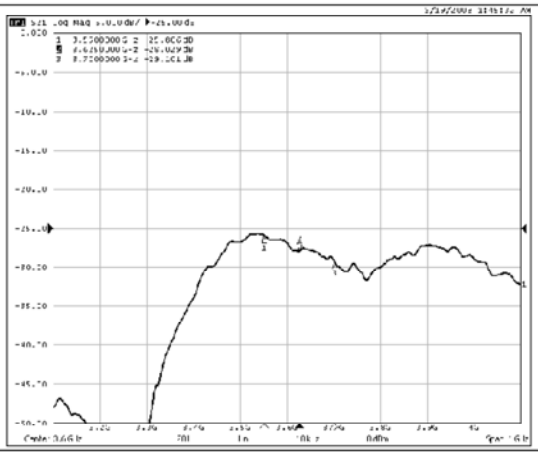
ANT Port#4

	1	2	3	4	5
Frequency [MHz]	3550	3600	3625	3650	3700
Efficiency [dB]	-1.99	-2.18	-2.14	-1.98	-2.28
Efficiency [%]	63.2	60.6	61.1	63.4	59.1
TRG_θ [dB]	-4.68	-4.96	-4.98	-5.01	-5.85
$Gain_{\theta\ Peak}$ [dBi]	2.33	2.06	1.82	2.28	1.64
$Gain_{\theta\ Min}$ [dBi]	-26.31	-25.55	-30.01	-26.73	-32.97
TRG_φ [dB]	-5.35	-5.43	-5.34	-4.97	-4.80
$Gain_{\varphi\ Peak}$ [dBi]	3.88	3.76	4.02	3.96	3.23
$Gain_{\varphi\ Min}$ [dBi]	-26.90	-27.96	-27.91	-32.95	-33.10
UHRG [dB]	-3.28	-3.39	-3.30	-3.07	-3.21
UHRG/TRG [%]	74.45	75.62	76.56	77.77	80.72
H-Plane	-5.62	-6.19	-6.20	-6.19	-7.00
E1-Plane, AVG [dB]	-3.60	-3.86	-3.93	-3.83	-4.74
E2-Plane, AVG [dB]	-5.54	-5.23	-4.94	-5.10	-5.48
Peak Gain [dBi]	4.23	4.15	4.35	4.33	4.74
Directivity [dB]	6.23	6.33	6.49	6.31	7.03
Minimum Gain [dBi]	-18.58	-23.58	-16.09	-15.55	-19.77
Test Condition	FS				
Antenna Type					

Average Efficiency	-2.11 dB, 61.46 %



2.3.3 Isolation

Port1-Port2	Port1-Port3
	
Port1-Port4	**Port2-Port3**
	
Port2-Port4	**Port3-Port4**
	

3. Reliability Test

3.1 Reliability Test Specification

3.1.1 Temperature Test

Maintain at 20°C for 48 hours and at +85°C for 48 hours without deformation and defects in appearance.

3.1.2 Humidity Test

After maintaining at +50℃ and 95% for 48 hours,
No apparent deformation or defects.

3.1.3 Thermal Shock Test

Conduct 24 cycle tests to maintain at +85℃ for 30 minutes and -40℃ for 30 minutes.
No apparent deformation or defects.

3.1.4 Salt Water Spray Test

After a 96-hour neglect test in an atmosphere saturated with a 5% salt solution at +35°C,
No apparent deformation or defects.

3.2 Reliability test result

3.2.1 Temperature Test

: PASS

3.2.2 Humidity Test

: PASS

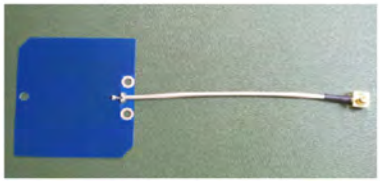
3.2.3 Thermal Shock Test

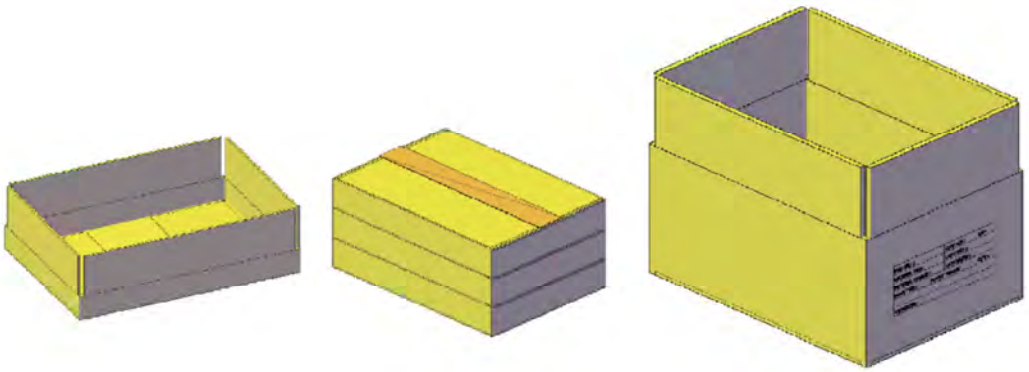
: PASS

3.2.4 Salt Water Spray Test

: PASS

4. Packing





	PART NAME	Q.TY
1	POLYBAG	20ea
2	INNER BOX (330*250*80mm)	500ea
3	OUTBOX (365*260*250mm)	1,500ea

Packing quantity can be changed for stability and efficiency.

5. RoHS DATA

5.1 Material Certificate (MSDS)

Submission separately

5.2 RoHS Data

Submission separately