

Hancom Teladin co.,Ltd

APPROVAL SHEET

MODEL	FREQUENCY
HW-MULTI-M-SW(5.2)-1.5M	800 ~ 960 MHz
	1710 ~1880 MHz
	1920 ~2170 MHz
	2500 ~2700 MHz



HANWOOL TECHNOLOGY CO., LTD
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ANTENNA SPECIFICATION

1. MODEL: HW- MULTI-M-SW(5.2)-1.5M

2. APPLICATION: This specification is provided for MAGNET MULTI MONOPOLE ANTENNA.

3 ANTENNA used condition

Portable Fixing Movement Out-door In-door Etc()

4. ANTENNA Dimension

Attached Dimension

5. Electrical specification and performance

Satisfied next data with real used or similar environment conditions.

No.	ELECTRICAL DATA	SPECIFICATIONS		REMARK
5. 1	FREQUENCY RANGE	800 ~ 960 MHz		
		1710 ~ 1880 MHz		
		1920 ~ 2170 MHz		
		2500 ~ 2700 MHz		
5. 2	IMPEDANCE	50 Ω NOMINAL		
5. 3	V. S. W. R	800 ~ 960 MHz	LESS THAN 4.0 : 1	Φ 70 PLANE
		1710 ~ 1880 MHz	LESS THAN 3.5 : 1	Φ 70 PLANE
		1920 ~ 2170 MHz	LESS THAN 3.0 : 1	Φ 70 PLANE
		2500 ~ 2700 MHz		Φ 70 PLANE
5. 4	GAIN (Min.)	800 ~ 960 MHz	1.0dBi	Excepted Cable Loss
		1710 ~ 1880 MHz	1.5 dBi	Excepted Cable Loss
		1920 ~ 2170 MHz	2.0 dBi	Excepted Cable Loss
		2500 ~ 2700 MHz	1.0 dBi	Excepted Cable Loss
5. 5	RADIATION PATTERN	OMNI - DIRECTIONAL		
5. 6	POLARIZATION	VERTICAL		

6. Mechanical specification and properties

No.	MECHANICAL	SPECIFICATIONS	REMARK
6. 1	SLEEVE	URETHANE	BLACK-COLOR
6. 2	UPPER BASE COVER	ABS	BLACK-COLOR
6. 3	LOWER BASE COVER	ABS	BLACK-COLOR
6. 4	SHRINKABLE TUBE	PO	WHITE-COLOR
6. 5	RG-174 COAXIAL CABLE		BLACK-COLOR
6. 6	KMS530(5.2) SW CONNECTOR	BRASS	Ni-PLATING
6. 7	ANTENNA TOTAL LENGTH	104.5 ± 2.0 mm	
6. 8	CABLE TOTAL LENGTH	1.5M ± 30 mm	

7. Reliability test and standards

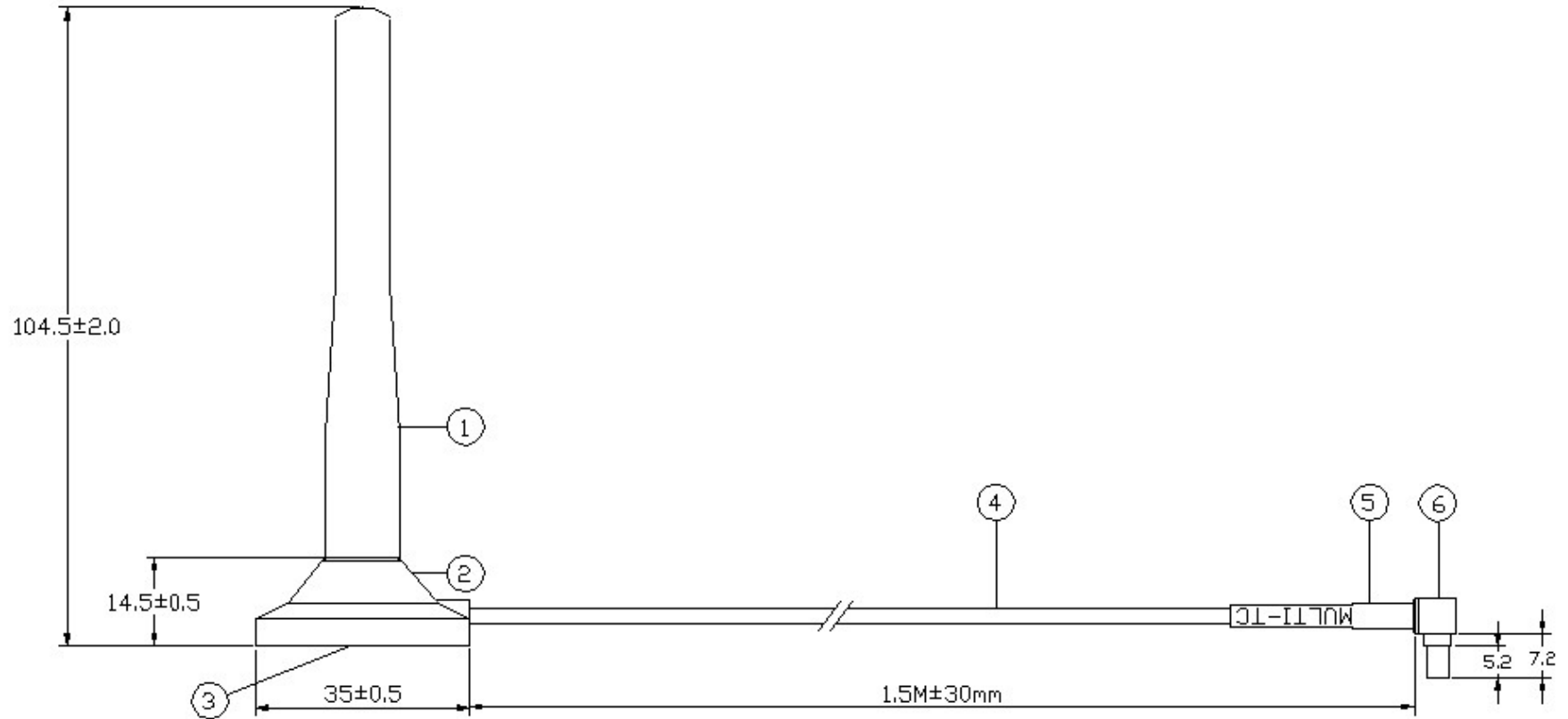
NO	TEST	TEST Method	Decision
1	Heat shock test	Temp.: -30°C(30min.)~50°C (30min.), 24 CYCLE	* No transform about antenna * Satisfy the Electrical specification and performance
2	High-Tem. storage	Temp.: 60°C , 48 Hour	
3	High-Humidity storage	Temp.: 60°C ,Humidity: 95% 48 Hour	
4	High-Tem. storage	Temp.: -40°C , 48 Hour	
5	Salt-spray	Salinity: 5% 48 Hour	

8. TEST and Q/C

This specification is according to fixed demands and suitable Hanwool technology Q/C provision.

But it is possible to skip No. 7 demands, after consultation with buyer.

TOL Unless Noted	DIMENSION	mm	No	DATE	REVISION	CHECKER
X. = ±0.5	SCALE		⚠	201 . . .		
X.X = ±0.1	MATERIAL		⚠	201 . . .		
X.XX = ±0.05	FINISH		⚠	201 . . .		



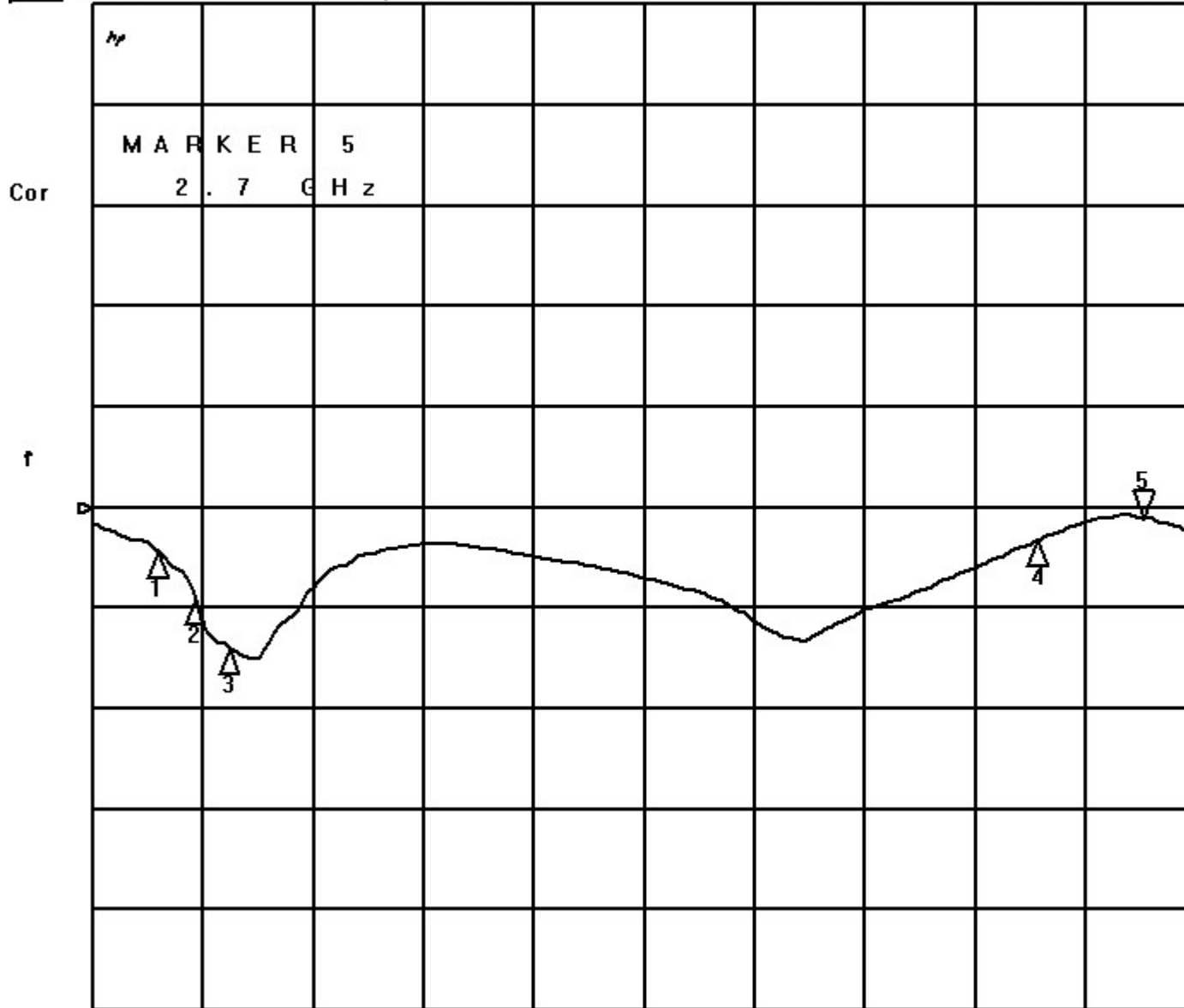
6	SWITCH(5.2) CONN.	BRASS	NI-PLATING
5	SHRINKABLE TUBE	PO	WHITE-COLOR
4	RG-174 COAX CABLE		BLACK-COLOR
3	LOWER BASE COVER	ABS	BLACK-COLOR
2	UPPER BASE COVER	ABS	BLACK-COLOR
1	SLEEVE	URETHANE	BLACK-COLOR
No.	PART NAME	MATERIAL	FINISH

TITLE	MULTI BAND MAGNET ANT. ASS'Y	MODEL	HW-MULTI-M-SW(5.2)-1.5M
Drawn	Checked	Approval	Date
Y.M ,KIM		C.G,NAM	2021.03.22
DWG No.	File Name		
210322-01	한컴텔라딘		

17 Jun 2015 05:21:04

[CH1] MEM LOG 10 dB/ REF 0 dB

5:- 1.0645 dB 2 700.000 000 MHz



CH1 Markers

1:- 4.4552 dB
824.000 MHz

2:- 9.0475 dB
894.000 MHz

3:- 13.928 dB
960.000 MHz

4:- 3.2120 dB
2.50000 GHz

START 700.000 000 MHz

STOP 2 800.000 000 MHz

17 Jun 2015 05:21:07

CHI MEM 1 UFS

5: 317.63 μ 394.00 μ 23.225 nH

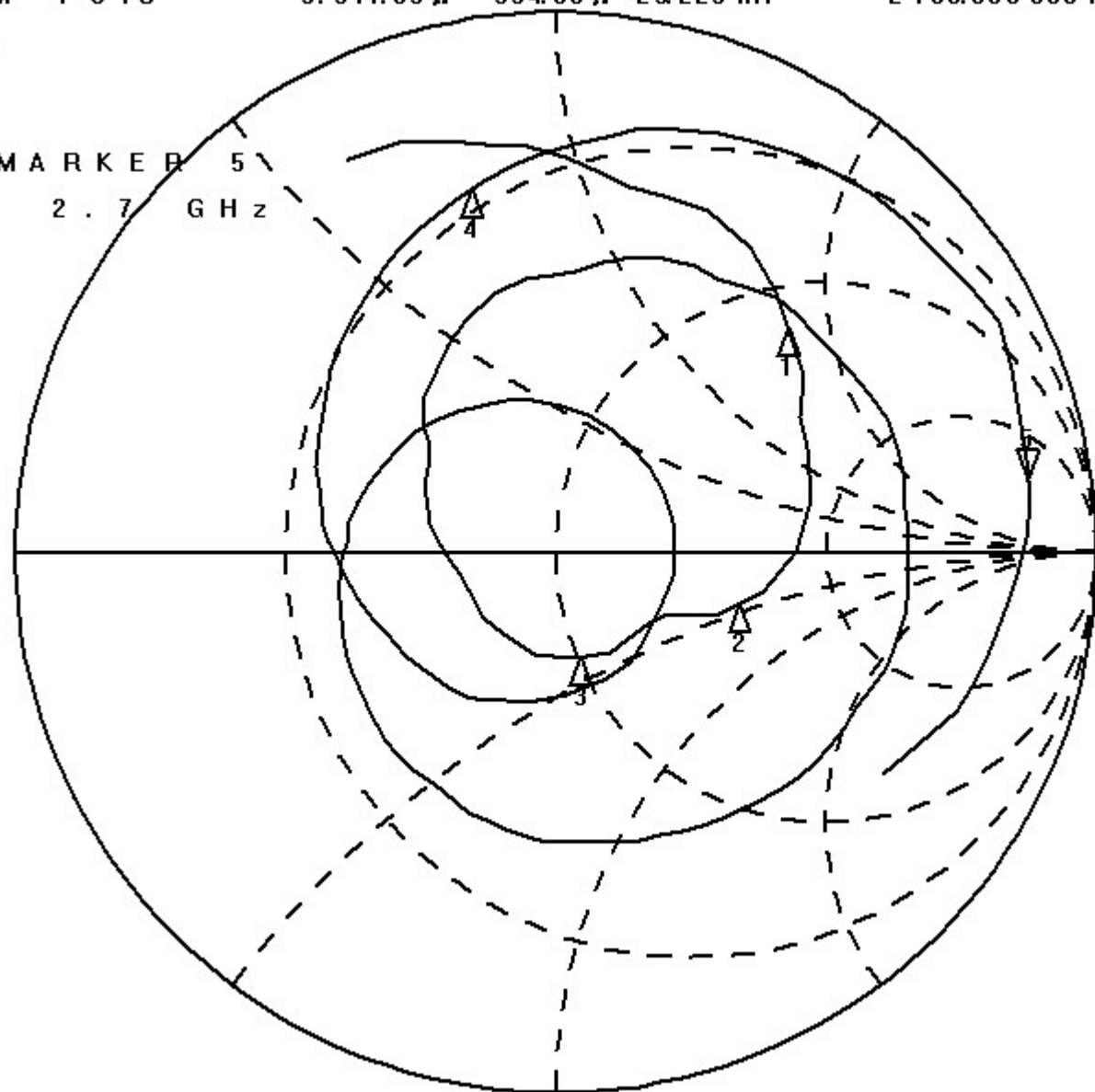
2 700.000 000 MHz

hp

MARKER 5
2.7 GHz

Cor

r



CHI Markers

1: 64.465 μ
83.516 μ
824.000 MHz

2: 98.473 μ
- 21.387 μ
894.000 MHz

3: 50.910 μ
- 20.498 μ
960.000 MHz

4: 14.643 μ
37.662 μ
2.50000 GHz

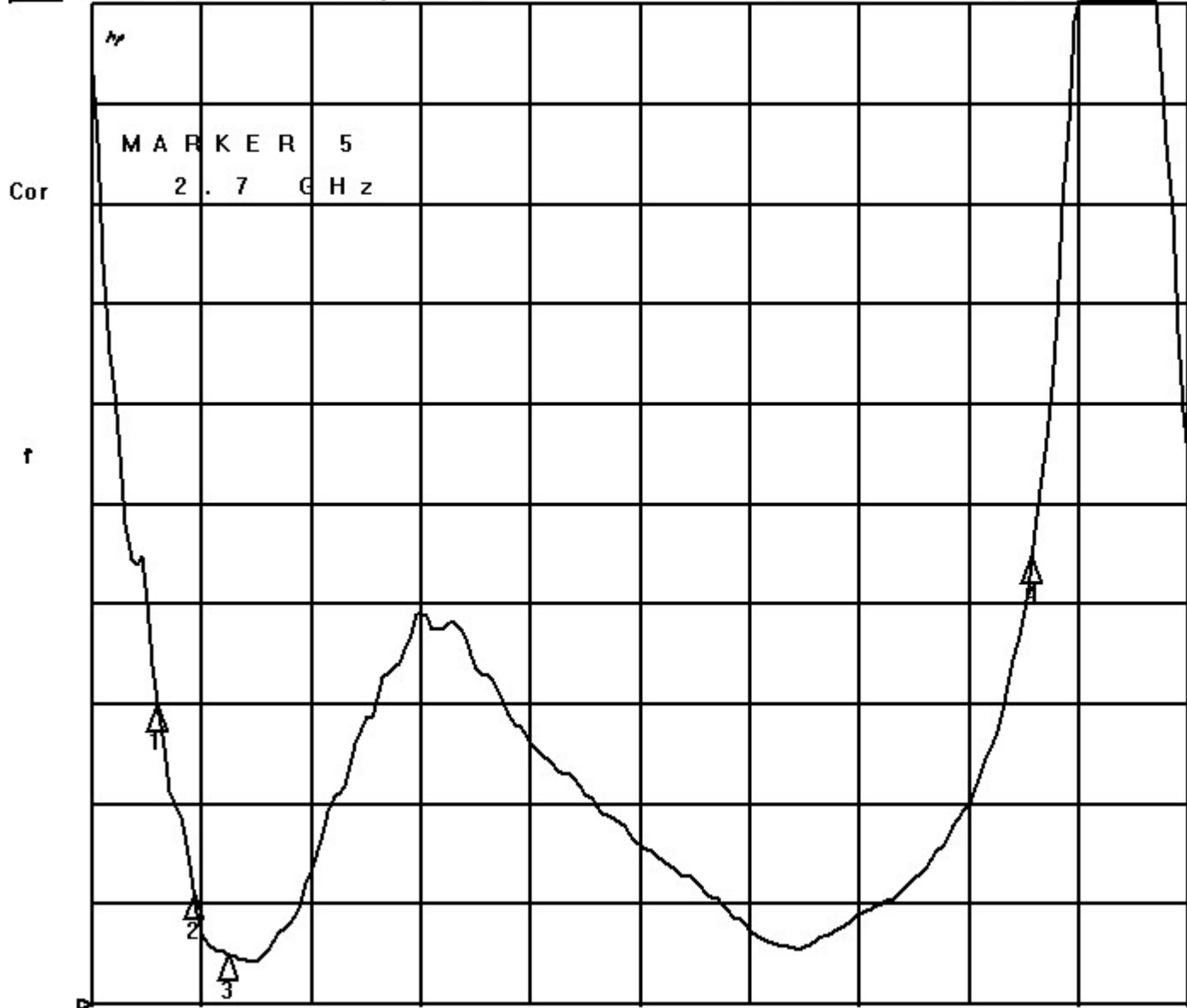
START 700.000 000 MHz

STOP 2 800.000 000 MHz

17 Jun 2015 05:21:12

[CH1] MEM SWR 1 / REF 1

5: 16.344 2 700.000 000 GHz



CH1 Markers

1: 3.9934
824.000 MHz

2: 2.1096
894.000 MHz

3: 1.5041
960.000 MHz

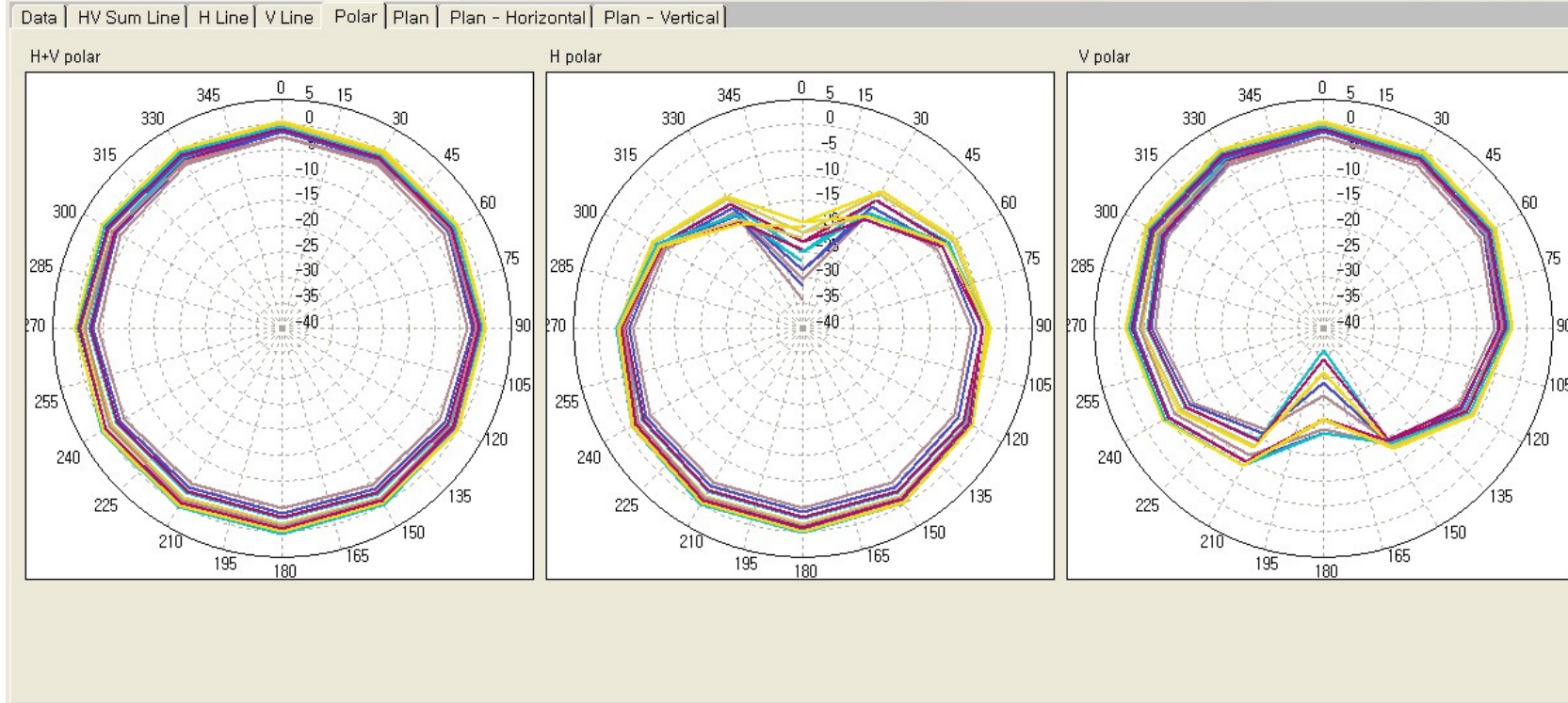
4: 5.4795
2.50000 GHz

START 700.000 000 MHz

STOP 2 800.000 000 MHz

2015-03-04 오후 4:12:33 KTM Calibration 800~960MHz Select Frequency CDMA Motor

Measurement Setup Angle Step 15 Measurement Pol H+V POL **START** **STOP** **EXIT** User Info Print



Hor+Ver | Horizontal | Vertical | H plan | E1 plan | E2 plan

	Frequency(MHz)	PeakValue	Theta(deg)	Phi(deg)	MinValue	Theta(deg)	Phi(deg)	3D Avg[dBi]	2D Avg[dBi]	Efficiency(%)
	824.000	1.170	75	15	-14.631	75	270	-2.975	0	50.181%
	835.000	2.095	75	15	-14.358	75	270	-2.066	0	61.852%
	849.000	2.815	75	15	-14.287	75	270	-1.282	0	74.099%
	869.000	2.001	75	0	-15.442	75	270	-2.008	0	62.685%
	880.000	2.962	75	0	-14.969	75	270	-1.086	0	77.510%
	894.000	3.034	75	0	-15.479	75	270	-0.988	0	79.286%

Frequency

Add Delete

Sort Save

File

Save as Open

Delete Screen capture

Result

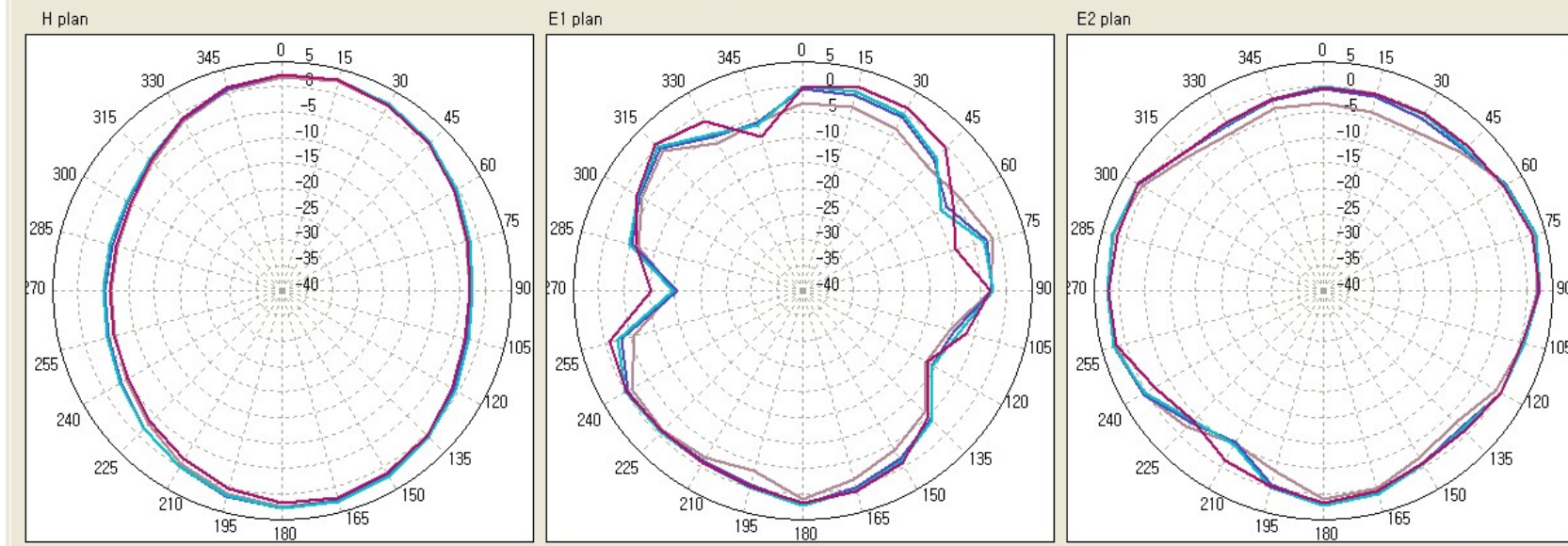
Summary Report

Select Graph 3D Graph

2015-03-04 오후 4:19:07 KTM Calibration 800~960MHz Select Frequency EGSM Motor

Measurement Setup Angle Step 15 Measurement Pol H+V POL **START** **STOP** **EXIT** User Info Print

Data | HV Sum Line | H Line | V Line | Polar | Plan | Plan - Horizontal | Plan - Vertical



Hor+Ver | Horizontal | Vertical | H plan | E1 plan | E2 plan

	Frequency(MHz)	PeakValue	Theta(deg)	Phi(deg)	MinValue	Theta(deg)	Phi(deg)	3D Avg[dBi]	2D Avg[dBi]	Efficiency(%)
	880.000	2.977	75	0	-14.808	75	270	-1.073	0	77.750%
	915.000	3.177	75	0	-15.361	75	270	-0.517	0	88.379%
	925.000	3.165	75	0	-14.745	75	270	-0.341	0	92.014%
	960.000	2.810	105	165	-11.842	120	90	-0.430	0	90.156%

Frequency

Add Delete

Sort Save

File

Save as Open

Delete Screen capture

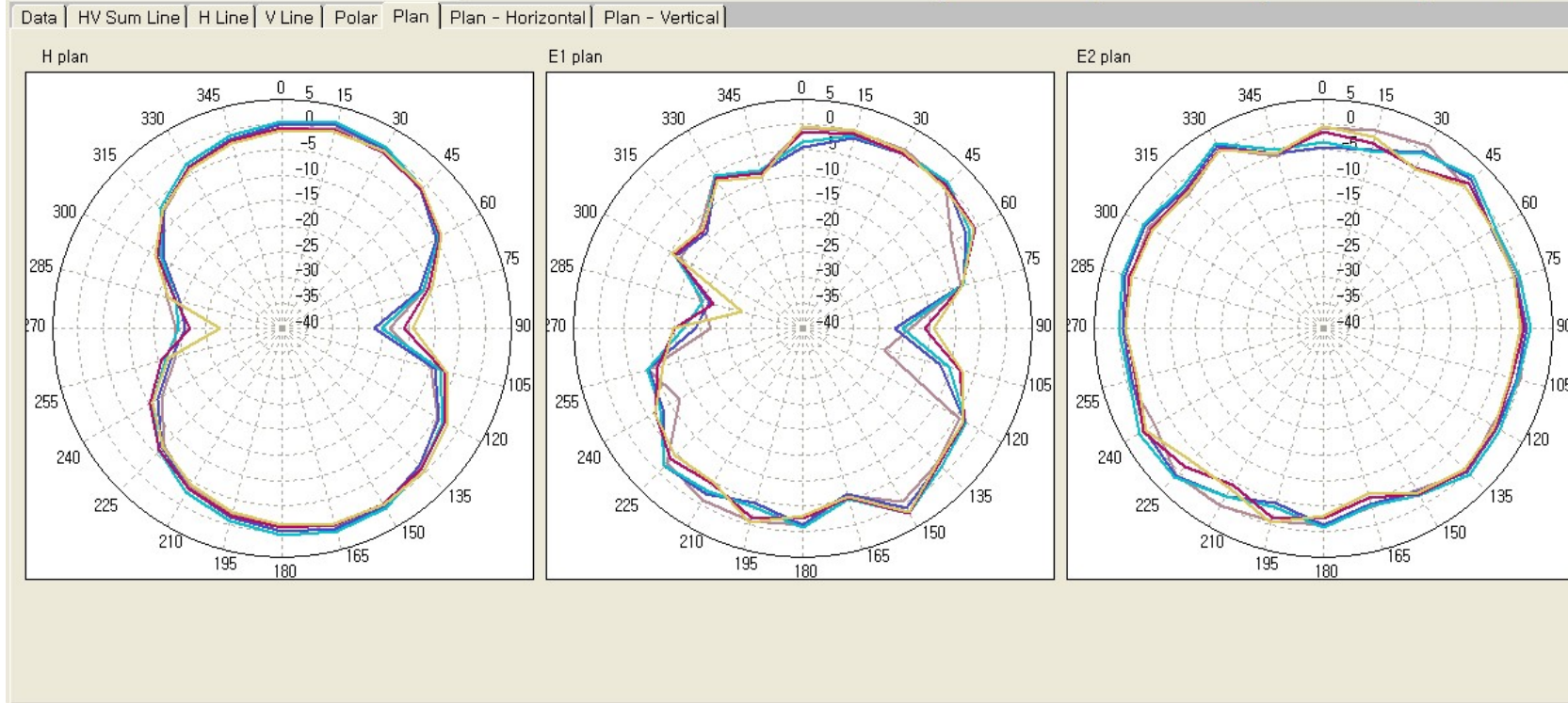
Result

Summary Report

Select Graph 3D Graph

2015-03-04 오후 4:26:50 **KTM** Calibration 1710~1880MHz Select Frequency DCS Motor

Measurement Setup Angle Step 15 Measurement Pol H+V POL **START** **STOP** **EXIT** User Info Print



Hor+Ver | Horizontal | Vertical | H plan | E1 plan | E2 plan

	Frequency(MHz)	PeakValue	Theta(deg)	Phi(deg)	MinValue	Theta(deg)	Phi(deg)	3D Avg[dBi]	2D Avg[dBi]	Efficiency(%)
	1710.000	1.931	135	150	-23.394	105	90	-2.184	0	60.201%
	1785.000	2.292	135	165	-21.912	90	90	-1.787	0	65.959%
	1805.000	2.859	135	165	-20.226	90	90	-1.194	0	75.606%
	1850.000	2.274	150	120	-21.951	90	270	-1.964	0	63.327%
	1880.000	2.314	150	120	-27.821	90	270	-2.114	0	61.172%

Frequency

Add Delete

Sort Save

File

Save as Open

Delete Screen capture

Result

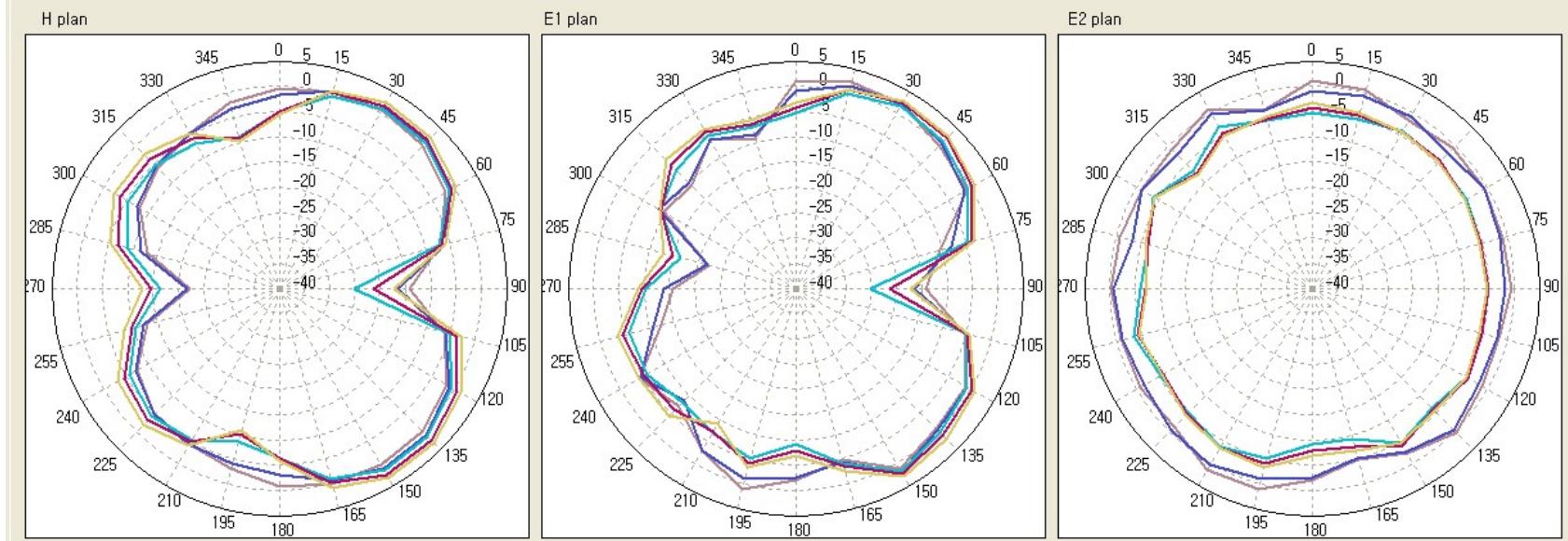
Summary Report

Select Graph 3D Graph

2021-01-05 오후 3:09:15 KTM Calibration 1710~2170MHz Select Frequency 1920~2170 Motor

Measurement Setup Angle Step 15 Measurement Pol H+V POL **START** **STOP** **EXIT** User Info Print

Data | HV Sum Line | H Line | V Line | Polar | Plan | Plan - Horizontal | Plan - Vertical



Hor+Ver | Horizontal | Vertical | H plan | E1 plan | E2 plan

	Frequency(MHz)	PeakValue	Theta(deg)	Phi(deg)	MirValue	Theta(deg)	Phi(deg)	3D Avg[dBi]	2D Avg[dBi]	Efficiency[%]
<input checked="" type="checkbox"/>	1920.000	3.014	15	135	-22.323	90	270	-1.432	0	71.575%
<input checked="" type="checkbox"/>	1990.000	2.889	60	135	-21.840	90	270	-1.347	0	72.994%
<input checked="" type="checkbox"/>	2110.000	2.108	60	135	-25.161	90	90	-2.407	0	57.183%
<input checked="" type="checkbox"/>	2140.000	2.701	30	105	-21.236	90	90	-1.660	0	67.923%
<input checked="" type="checkbox"/>	2170.000	3.333	90	150	-17.175	90	90	-0.993	0	79.193%

Frequency

Add Delete

Sort Save

File

Save as Open

Delete Screen capture

Result

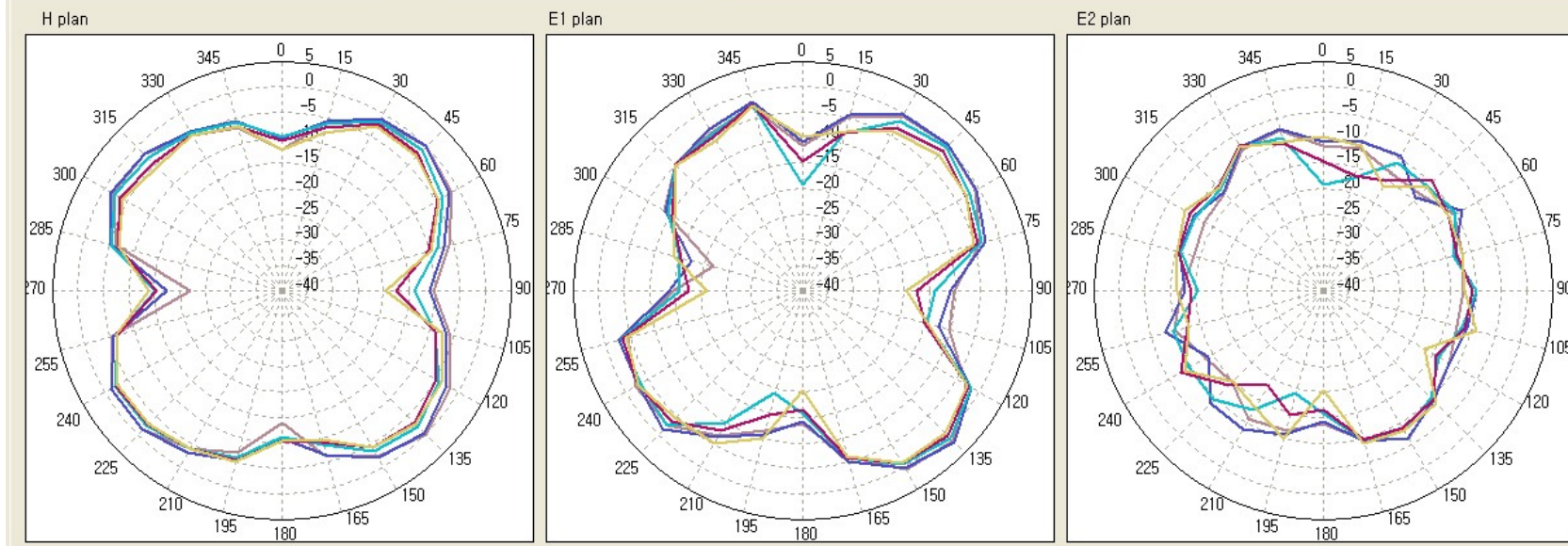
Summary Report

Select Graph 3D Graph

2015-03-04 오후 4:48:40 KTM Calibration WI-MAX Select Frequency WI-MAX Motor

Measurement Setup Angle Step 15 Measurement Pol H+V POL **START** **STOP** **EXIT** User Info Print

Data | HV Sum Line | H Line | V Line | Polar | Plan | Plan - Horizontal | Plan - Vertical



Hor+Ver | Horizontal | Vertical | H plan | E1 plan | E2 plan

	Frequency(MHz)	PeakValue	Theta(deg)	Phi(deg)	MinValue	Theta(deg)	Phi(deg)	3D Avg[dBi]	2D Avg[dBi]	Efficiency(%)
	2500.000	1.993	135	90	-22.028	90	270	-3.151	0	48.182%
	2550.000	2.198	135	90	-17.442	90	270	-2.819	0	52.017%
	2600.000	1.194	135	105	-20.028	15	345	-3.580	0	43.651%
	2650.000	0.554	135	105	-18.451	15	180	-4.157	0	38.225%
	2700.000	0.073	135	105	-21.226	75	270	-4.295	0	37.029%

Frequency

Add Delete

Sort Save

File

Save as Open

Delete Screen capture

Result

Summary Report

Select Graph 3D Graph