

GSM850/E-GSM900/DCS1800/PCS1900 Helical Antenna

1 . Explanation of Title :

W	T	H	4	3	0	0	3
(1)	(2)	(3)	(4)		(5)		

(1) System code :

(2) Area code :

(3) Product type :

(4) Customer code :

(5) Suffix :

2 . Summary :

This report is to account for the measurement setup and results of Quad-Band. The measurement setup includes reflection coefficient, pattern, and gain measurements.

DRAWING : RUF	DESIGNED BY : Jeffery	CHECKED BY : Jason	APPROVED BY : D.S.M
UNLESS OTHER SPECIFIED TOLERANCES ON :		TITLE:	SPK-WA-WTH43003
X= X.X= X.XX=		Part No.	112010003
REV. : A1	UNIT : mm	Document No.	

2 – 1 . Frequency Band :

Frequency	T _x (MHz)	R _x (MHz)
GSM/850E	824~849	870~894
GSM	880 ~ 915	925 ~ 960
DCS	1710 ~ 1785	1805 ~ 1880
PCS	1850~1909	1930~1990

3 . Measurement Setup :

(1) Reflection Coefficient Measurement :

(a) **Instrument** : Network Analyzer

(b) **Setup** :

- (I) Calibrate the Network Analyzer by one port calibration using O.S.L calibration kits.
- (II) Connect the antenna under test to the Network Analyzer.
- (III) Measure the S11(reflection coefficient) shown in Fig. 1.
- (IV) Generally, the S11 is less than –10dB to ensure the 90% power into antenna and only less than 10% power back to system.

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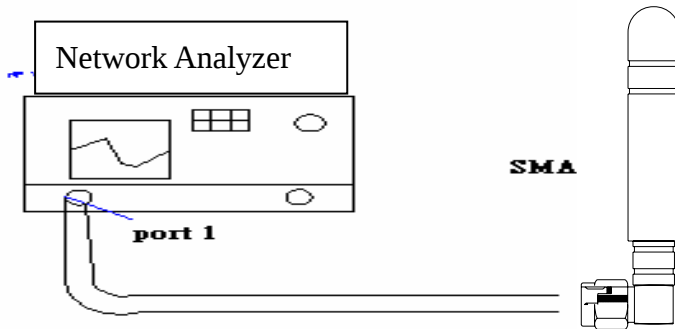


Fig.1

(2) Pattern measurement :

a . The S.P.K.'S anechoic chamber is a far-field measurement system with size of 7m×3.3m×3.3m. The quiet zone region is 30cm x 30cm x 30cm in the center of the rotator.

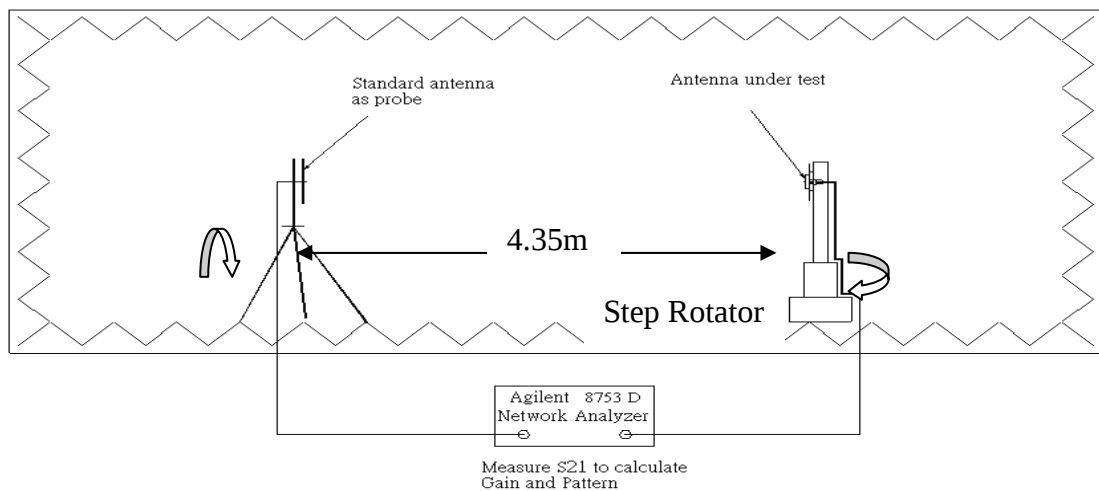


Fig.2 The interior components of the anechoic chamber

- b** . The probing antenna is the BBHA 9120 LFA 700MHz ~ 6GHz module (9120D horn antenna), which is placed in the one side of the chamber room. And the antenna under testing (AUT) is placed in the other side of the chamber. The distance between the probing antenna and the AUT is about 4m.
- c** . While we measure the radiation patterns by rotating AUT with 360 degrees and repeat again by replacing the AUT with the standard gain antenna under test, we compare both data and using a formula to obtain the gain of AUT. The standard gain antenna is a gain horn (BBHA 9120 LFA 700MHz~6GHZ).

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$$G_{AUT} = G_{stand} + P_{AUT} - P_{stand}$$

G_{AUT} : Gain of AUT

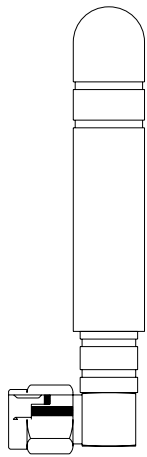
G_{stand} : Gain of Standard Gain Antenna

P_{AUT} : Measured Power of AUT

P_{stand} : Measured Power of Standard Gain Antenna

- d . The scanning method is CW wave with 6 degree by one step.
- e . We measure the radiation pattern in the free space situation at the lowest, middle and highest frequency for the H(X-Y) 、E1(Y-Z) planes, which defined in figure next page.

(3) Plane definition :



H-Plane



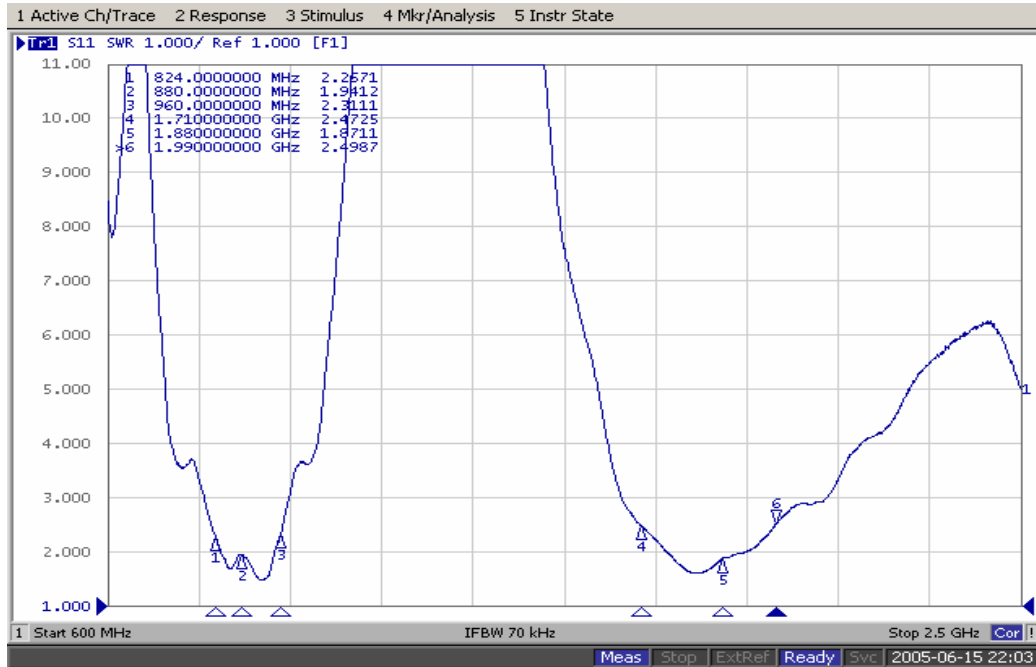
E1-Plane

Fig.3 The plane definition for H and E1 planes.

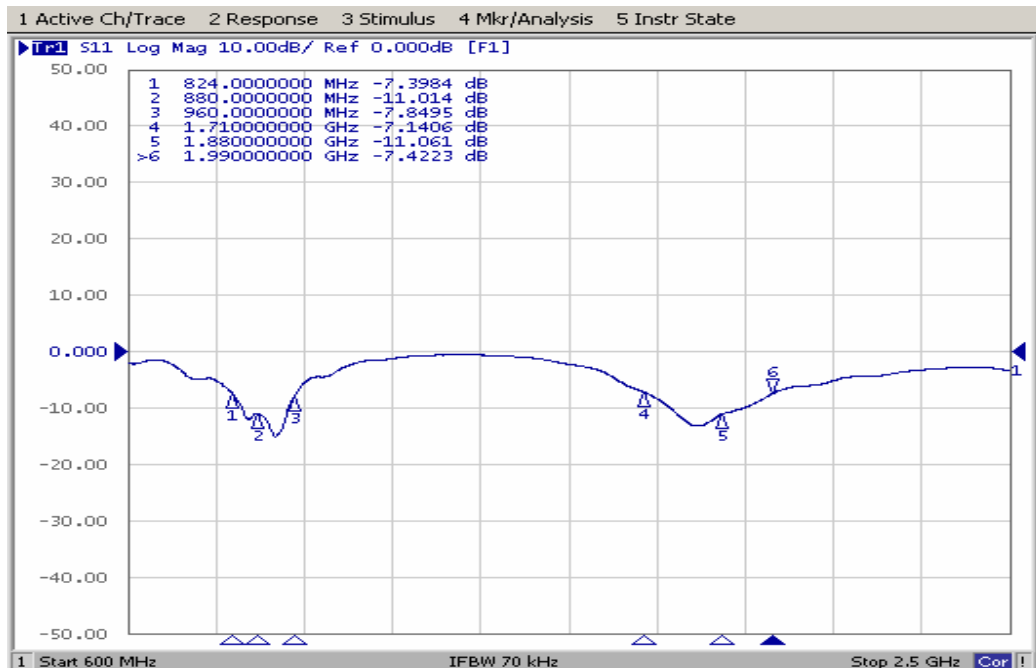
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4 . VSWR and Return loss :

4 – 1 VSWR Value



4 – 2 Return loss :



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	Frequency (MHz)				
VSWR	824MHz	960MHz	1710MHz	1880MHz	1990MHz
Value	≤ 3.0	≤ 3.0	≤ 3.0	≤ 3.0	≤ 3.0

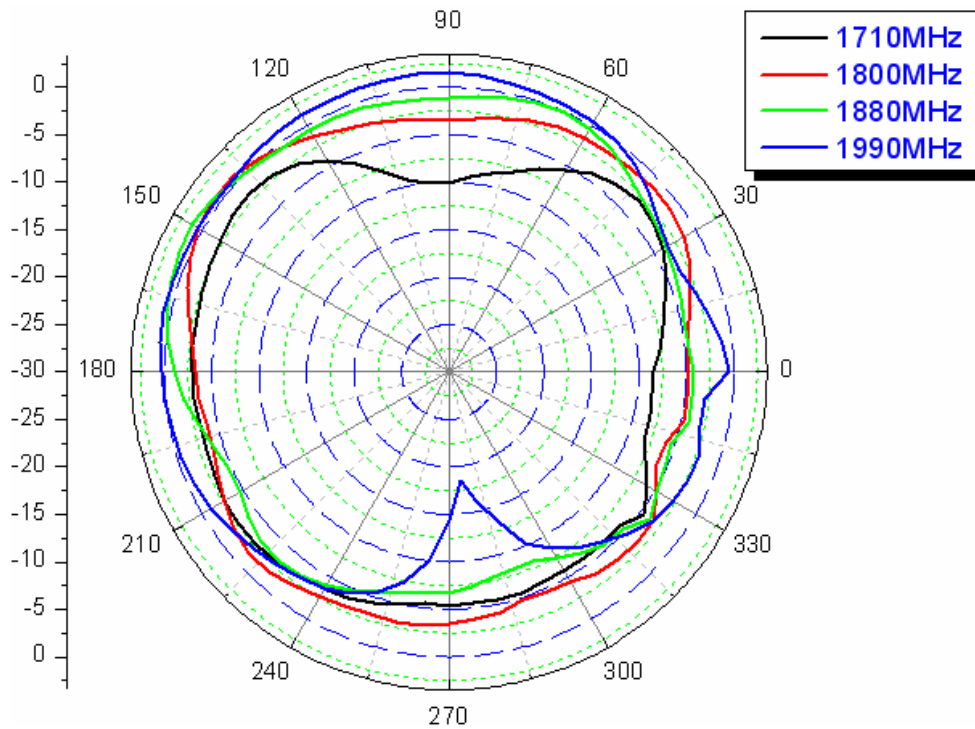
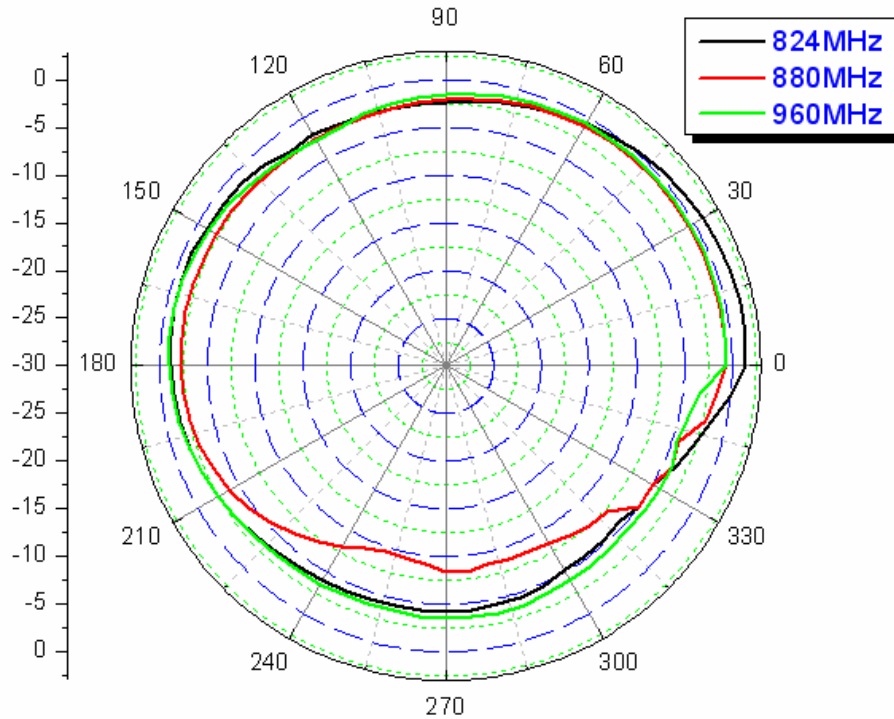
5. Gain and Radiation pattern :

5 – 1 Antenna Gain :

Frequency (MHz)	H Plane			E1 Plane		
Unit dBi	Max.	Min.	Avg.	Max.	Min.	Avg.
824	1.52	-5.61	-1.64	-0.45	-10.65	-4.09
880	-0.60	-9.54	-2.94	-1.88	-12.53	-4.42
960	-0.42	-4.52	-2.06	-1.36	-10.19	-4.47
1710	-1.89	-10.09	-3.62	-0.65	-13.31	-3.39
1800	0.79	-9.60	-2.60	1.20	-13.02	-2.30
1880	1.16	-10.93	-2.54	1.03	-11.55	-2.98
1990	1.57	-18.53	-1.21	1.44	-15.88	-2.22

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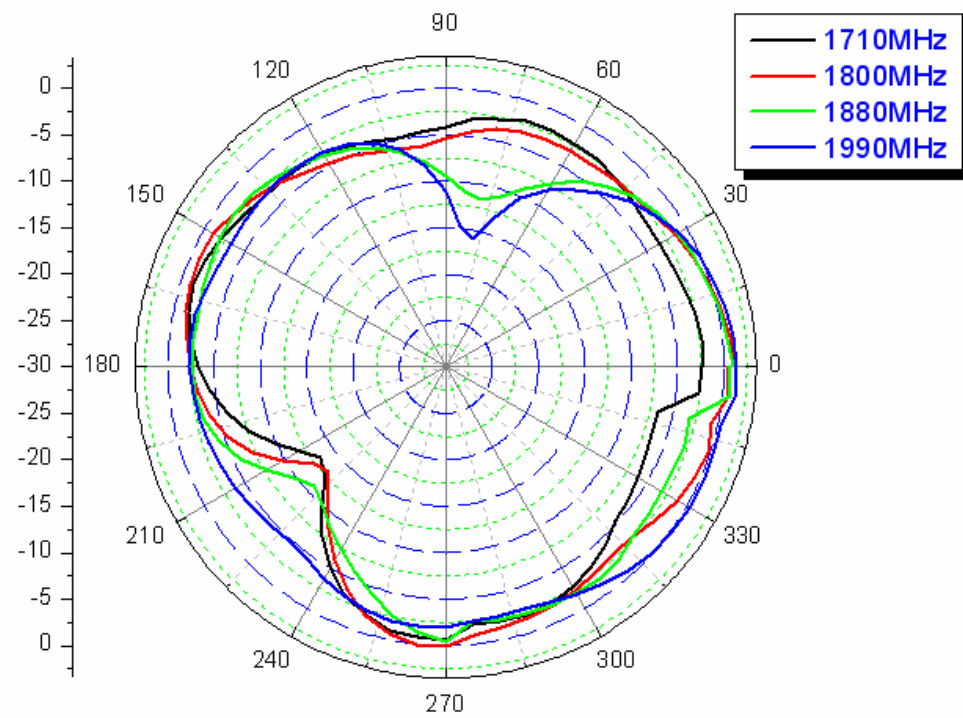
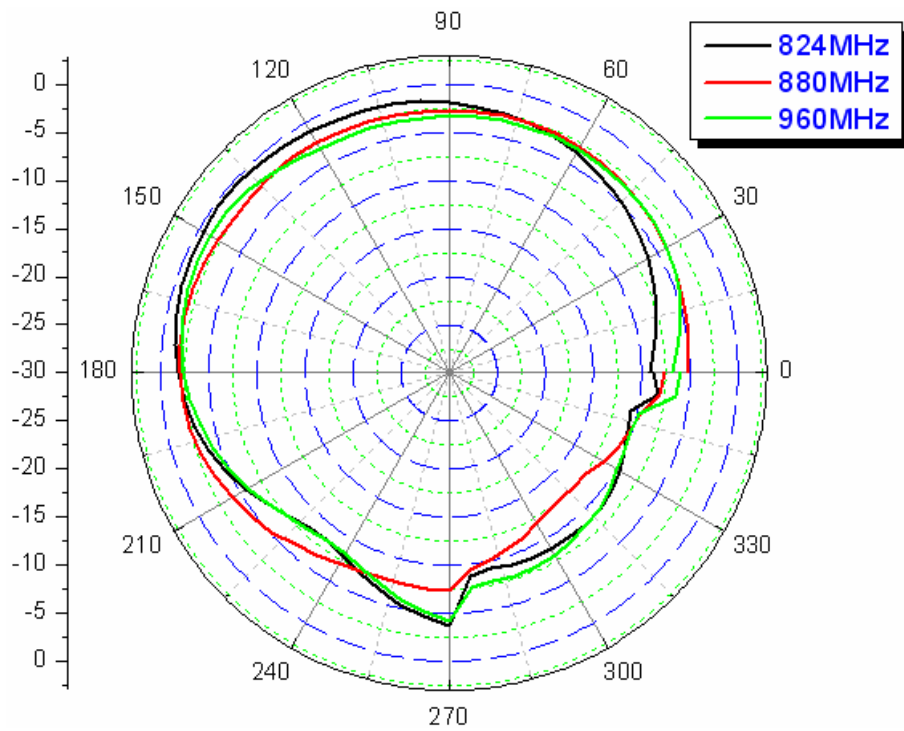
5 – 2 Radiation Patterns :



H-Plane

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E1-Plane

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6. Mechanical Specification :

6-1. Mechanical Configuration :

The appearance of the antenna is according to drawing Figure 6 - 1.

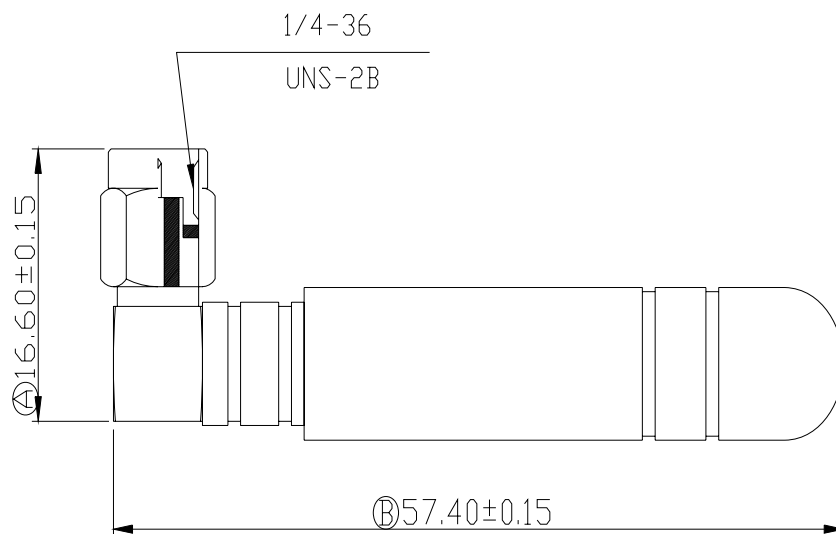


Figure 6-1 Antenna drawing

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