

Classification	Confidential
Date	Aug. 31 <sup>th</sup> 2012



## TF600TL

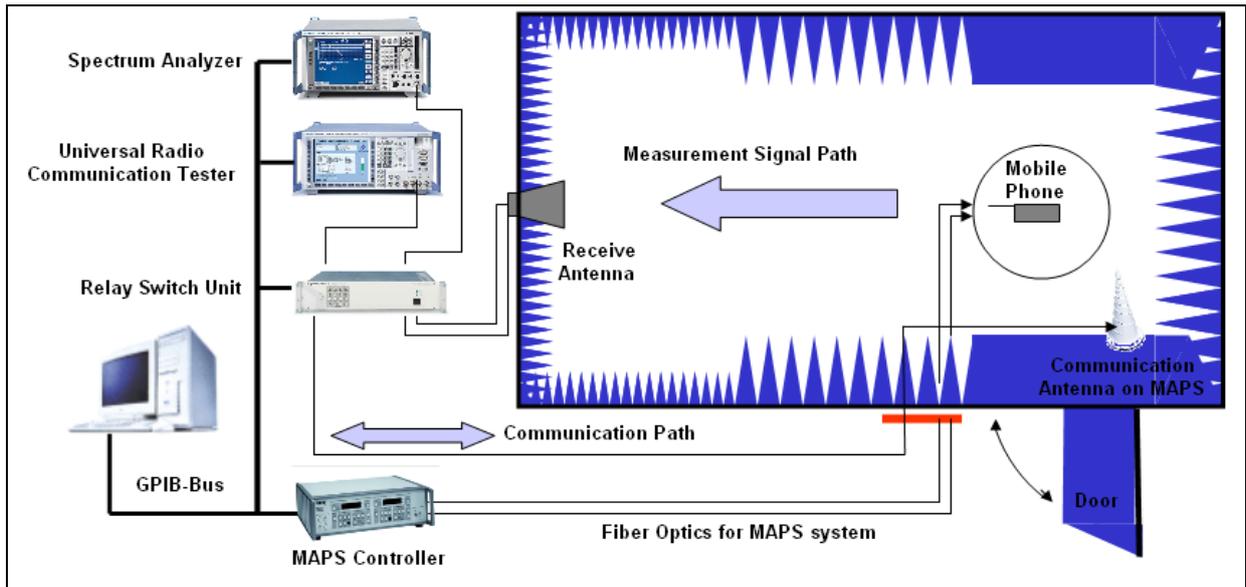
# Antenna Performance Report

Designed by: Steve Hsieh #3635  
Confirmed by: Giovanni Huang #5401

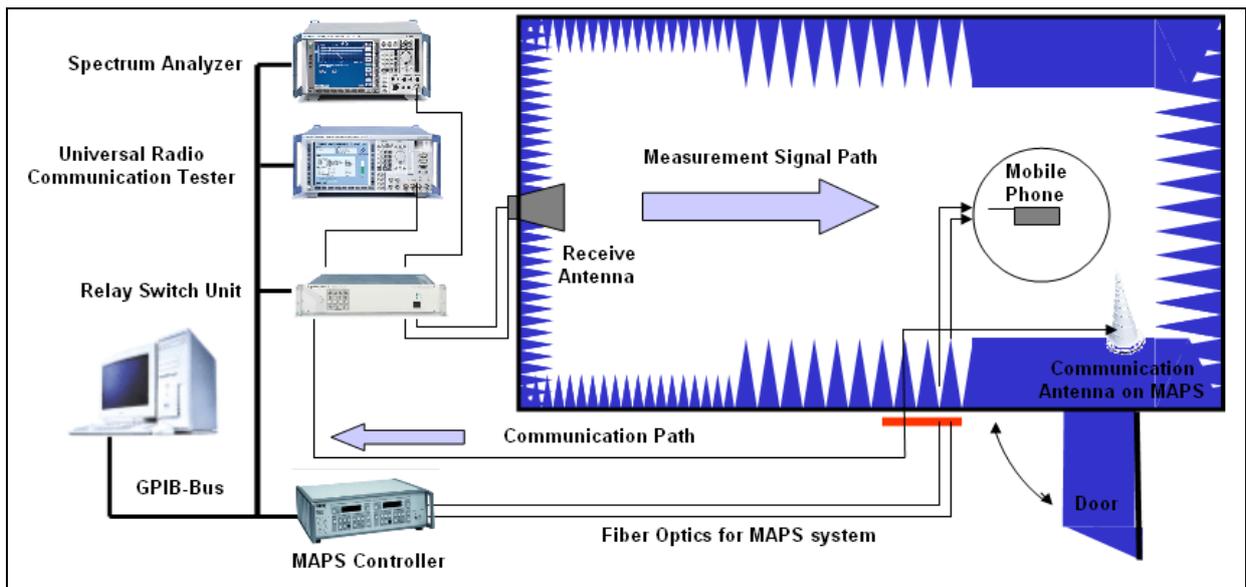
# 1 Measurement Methodology and Settings

All test results are under chamber environment of **ASUS Antenna Lab**. The basic methodology of getting the test result is following mostly the principles outlined in CTIA the test plan. <sup>[4]</sup>

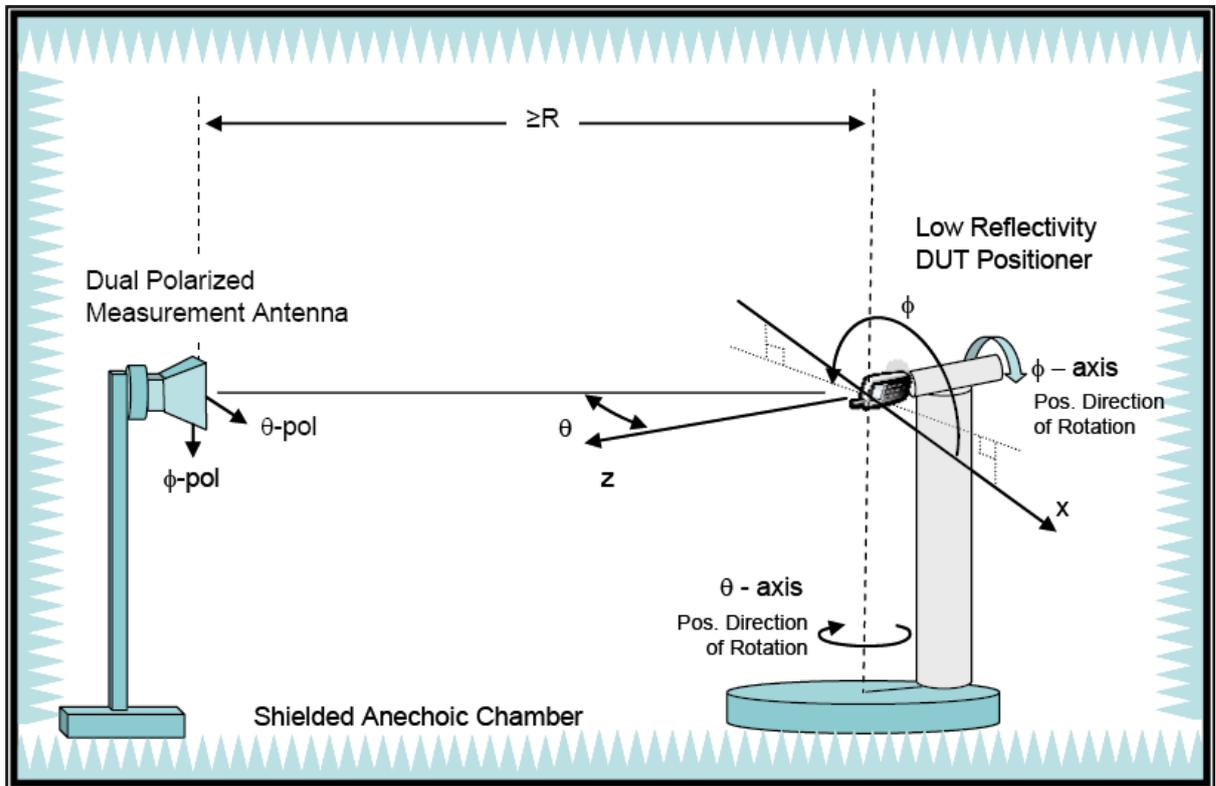
## 1.1 TRP (Total Radiation Power)



## 1.2 TIS (Total Isotropic Sensitivity)



# 1.3 Rectangular / Spherical Coordination of DUT



## 1.4 Equipment List

Description	Manufacturer	Model	Serial No.
Anechoic Chamber	ETS-Lindgren	AMS-8500	1036
MAPS Positioner	ETS-Lindgren	2015-72	N/A
Light Duty Mast Shaft Accessory	ETS-Lindgren	107354	N/A
Conical Log Spiral Communication Antenna	ETS-Lindgren	3102	00042655
Dual-Polarized Diagonal Horn Antenna	ETS-Lindgren	3164-04	00041919
SAM Phantom Head	ETS-Lindgren	IEEE SCC34	N/A
Positioner Controller	ETS-Lindgren	2090	00042680
RF Switch Module	R&S	TS-RSP	100122
Universal Radio Communication Test	R&S	CMU200	106387
Spectrum Analyzer	R&S	FSP 7	100330
Pattern Measurement Software	ETS-Lindgren	EMQuest™ EMQ-100	V1.06
Desktop Computer with Windows XP	DELL	N/A	N/A
Vector Network Analyzer	R&S	ZVM	100144
Sleeve Dipole	ETS-Lindgren	3126-836	00045587
Sleeve Dipole	ETS-Lindgren	3126-1800	00040647
Loop Antenna	ETS-Lindgren	3127-836	00034836
Loop Antenna	ETS-Lindgren	3127-1880	00034837

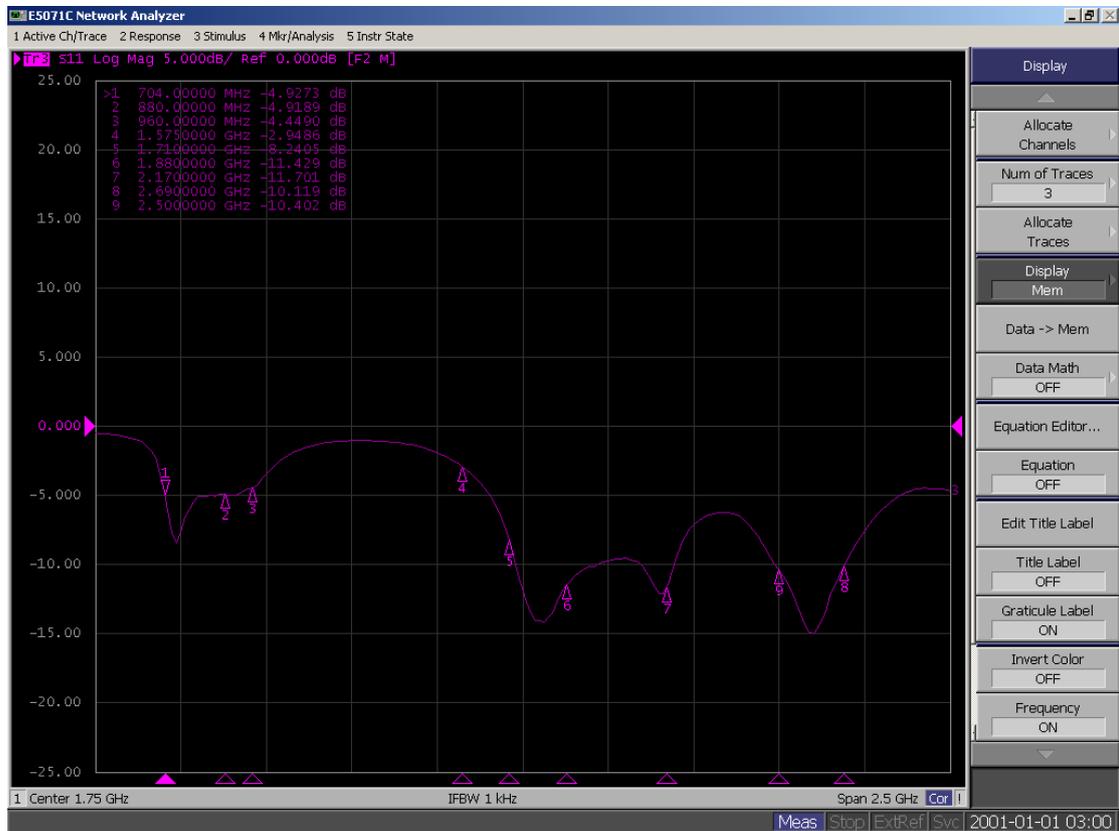
## 2 Detail Test Result

### 2.1 Main : LTE / GSM / WCDMA

#### 2.1.1 Efficiency

<b>LTE</b>						
Frequency (MHz)	704	714	724	734	744	754
Tot. Rad. Pwr. (dBm)	-7.16	-6.36	-5.55	-5.28	-6.35	-6.01
Efficiency (%)	19.24%	23.12%	27.86%	29.68%	23.17%	25.08%
Gain (dBi)	-3.96	-3.16	-2.15	-1.38	-1.94	-1.79
Frequency (MHz)	764	774	784	794	804	814
Tot. Rad. Pwr. (dBm)	-5.97	-5.68	-5.33	-5.51	-5.80	-5.59
Efficiency (%)	25.31%	27.05%	29.29%	28.12%	26.31%	27.63%
Gain (dBi)	-2.09	-1.98	-1.70	-2.00	-2.33	-2.24
<b>Low band : 850/900</b>						
Frequency (MHz)	824	836	849	869	880	881
Tot. Rad. Pwr. (dBm)	-5.60	-6.30	-6.24	-7.01	-6.83	-6.85
Efficiency (%)	27.55%	23.46%	23.78%	19.92%	20.77%	20.64%
Gain (dBi)	-2.42	-3.27	-3.05	-3.64	-3.33	-3.39
Frequency (MHz)	894	897	915	925	942	960
Tot. Rad. Pwr. (dBm)	-7.41	-7.35	-7.56	-8.09	-8.33	-8.63
Efficiency (%)	18.16%	18.41%	17.56%	15.54%	14.70%	13.71%
Gain (dBi)	-3.91	-3.80	-3.87	-4.37	-4.51	-5.21
<b>High Band : 1800/1900/2100~</b>						
Frequency (MHz)	1710	1747	1785	1805	1842	1850
Tot. Rad. Pwr. (dBm)	-4.02	-3.28	-3.40	-3.95	-4.32	-4.21
Efficiency (%)	39.60%	46.95%	45.73%	40.27%	36.98%	37.91%
Gain (dBi)	-0.16	0.50	-0.22	-0.53	-0.43	-0.25
Frequency (MHz)	1880	1900	1910	1920	1930	1950
Tot. Rad. Pwr. (dBm)	-4.75	-4.97	-5.09	-5.00	-5.07	-5.37
Efficiency (%)	33.53%	31.87%	30.99%	31.64%	31.10%	29.03%
Gain (dBi)	-0.54	-0.41	-0.41	-0.26	-0.27	-0.49
Frequency (MHz)	1960	1980	1990	2010	2018	2025
Tot. Rad. Pwr. (dBm)	-5.37	-5.45	-5.77	-5.73	-5.70	-5.81
Efficiency (%)	29.01%	28.53%	26.46%	26.73%	26.92%	26.22%
Gain (dBi)	-0.43	-0.26	-0.39	0.06	0.09	0.13
Frequency (MHz)	2110	2140	2170			
Tot. Rad. Pwr. (dBm)	-5.81	-5.52	-5.56			
Efficiency (%)	26.23%	28.06%	27.81%			
Gain (dBi)	-0.83	-0.68	-1.44			

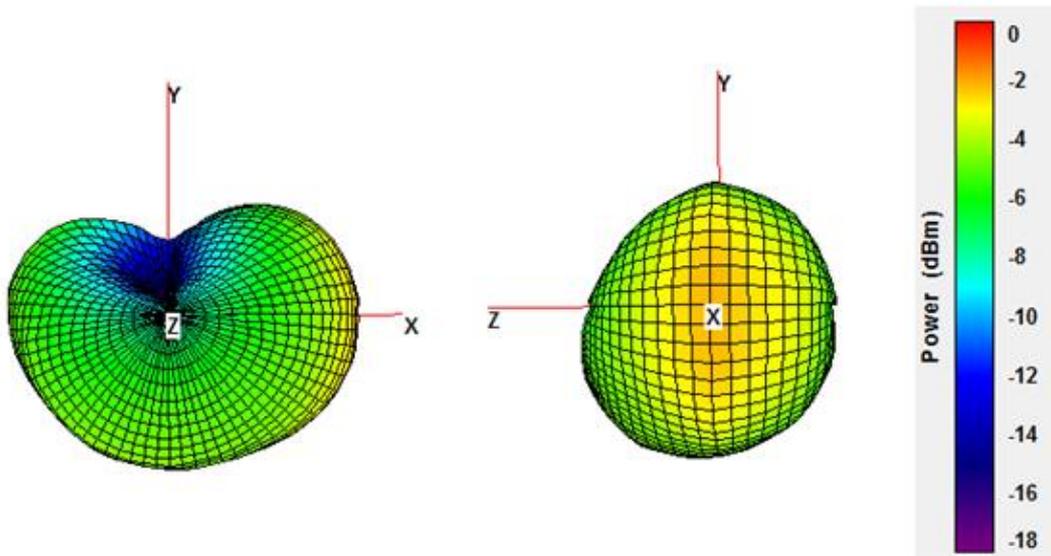
## 2.1.2 |S11|



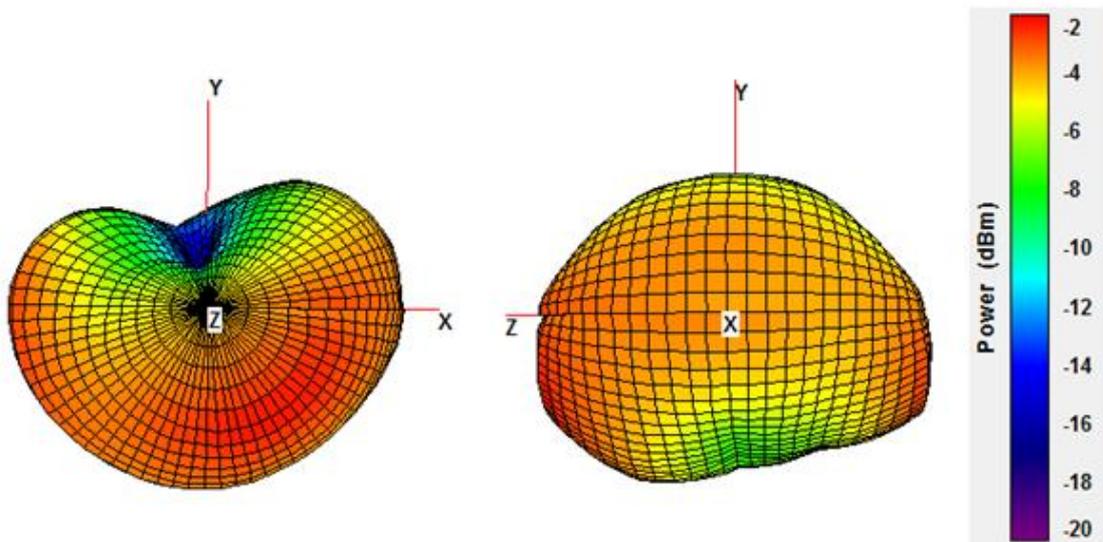
## 2.1.3 TRP / TIS

## 2.1.4 Radiation Pattern

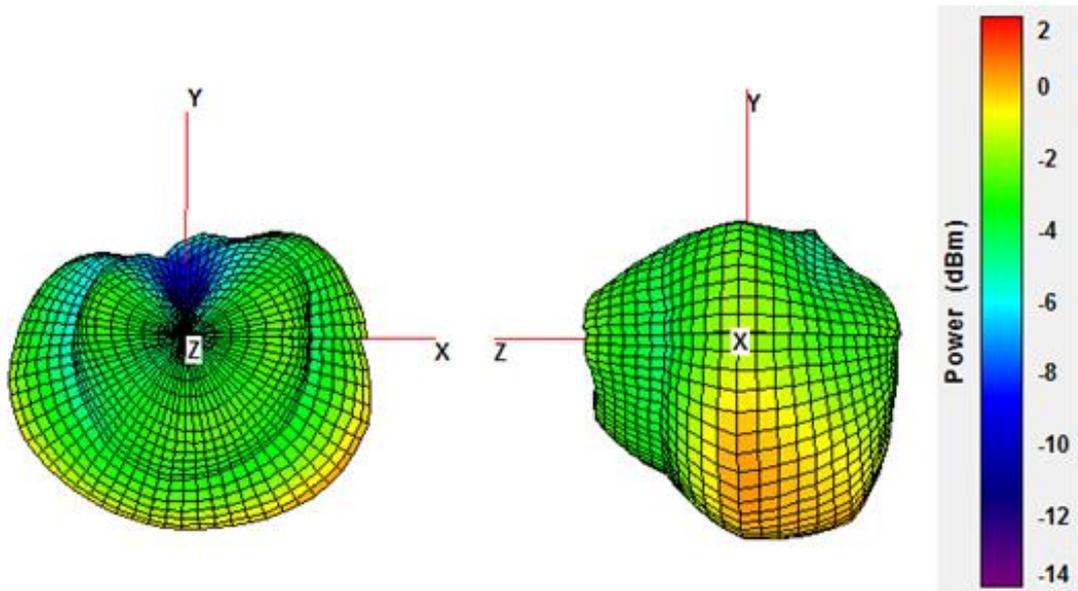
### 2.1.4.1 E-UTRA B17 / middle channel / free space



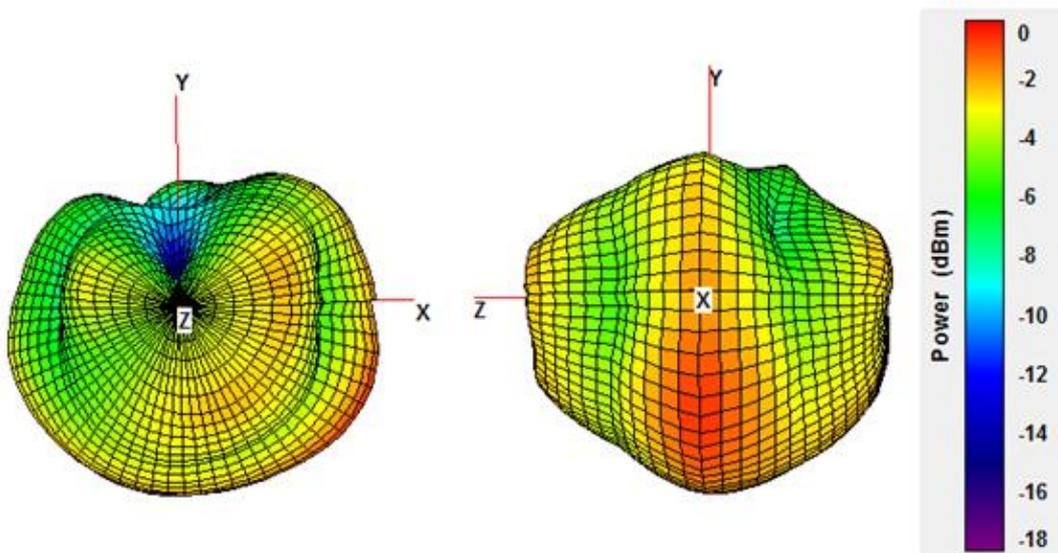
### 2.1.4.2 GSM 850 / middle channel / free space



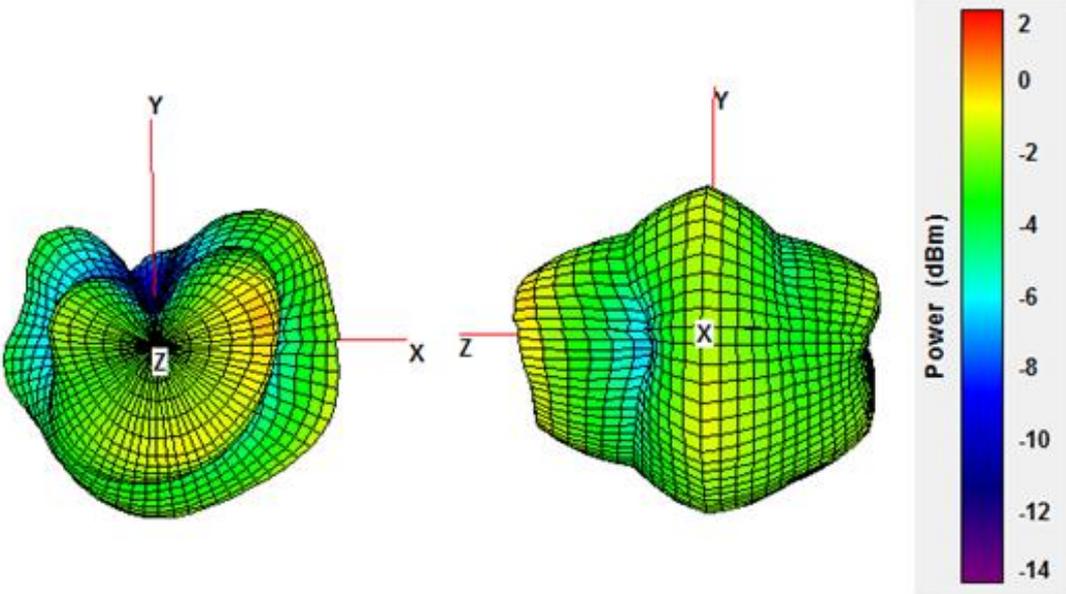
### 2.1.4.3 GSM 1800 / middle channel / free space



### 2.1.4.4 GSM 1900 / middle channel / free space



2.1.4.5 WCDMA B1 / middle channel / free space

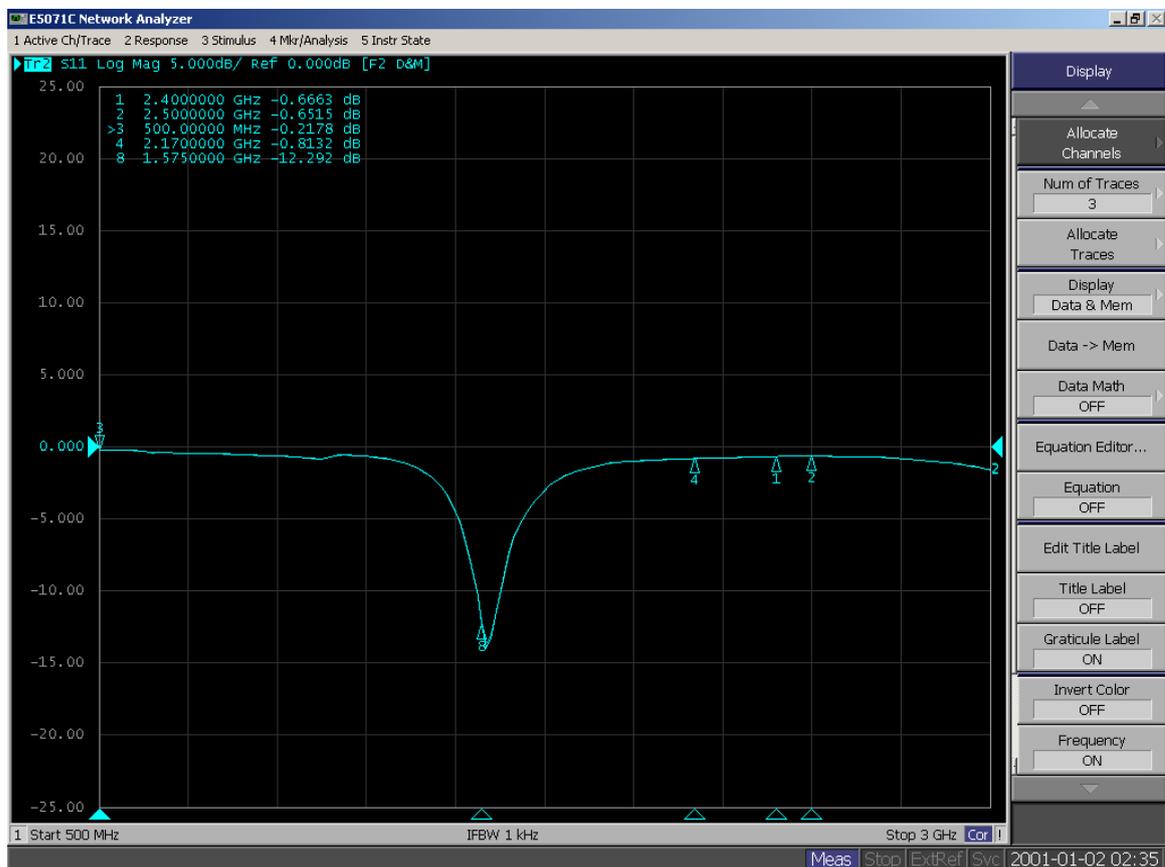


## 2.2 GPS

### 2.2.1 Efficiency

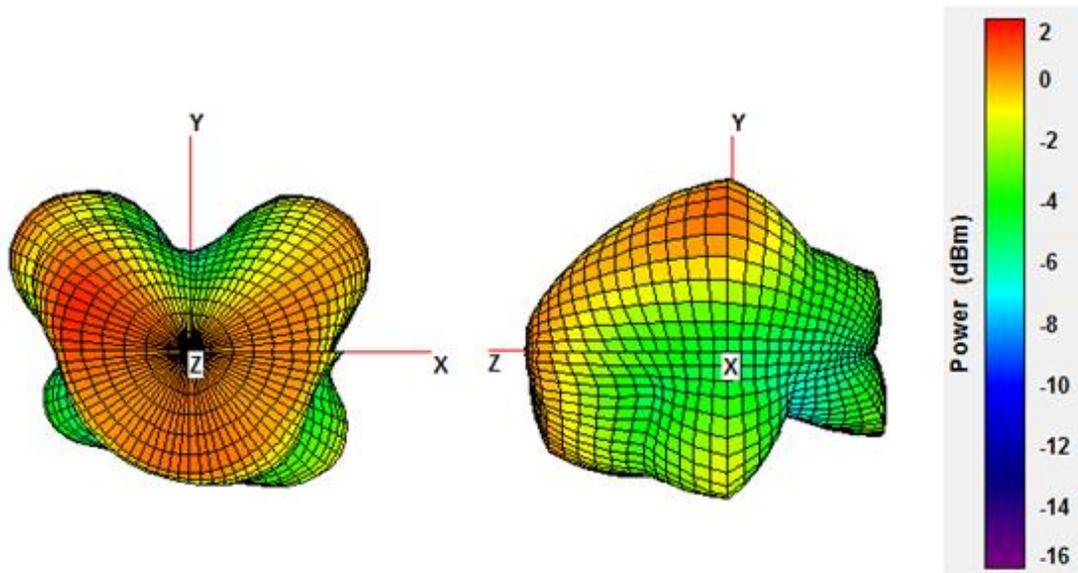
GPS					
Frequency (MHz)	1565	1570	1575	1580	1595
Tot. Rad. Pwr. (dBm)	-3.20	-3.28	-3.40	-3.36	-3.30
Efficiency (%)	47.86%	46.99%	45.71%	46.13%	46.77%
Gain (dBi)	1.58	1.61	1.63	1.62	1.60

### 2.2.2 |S11|



## 2.2.3 Radiation Pattern

### 2.2.3.1 L1 / free space

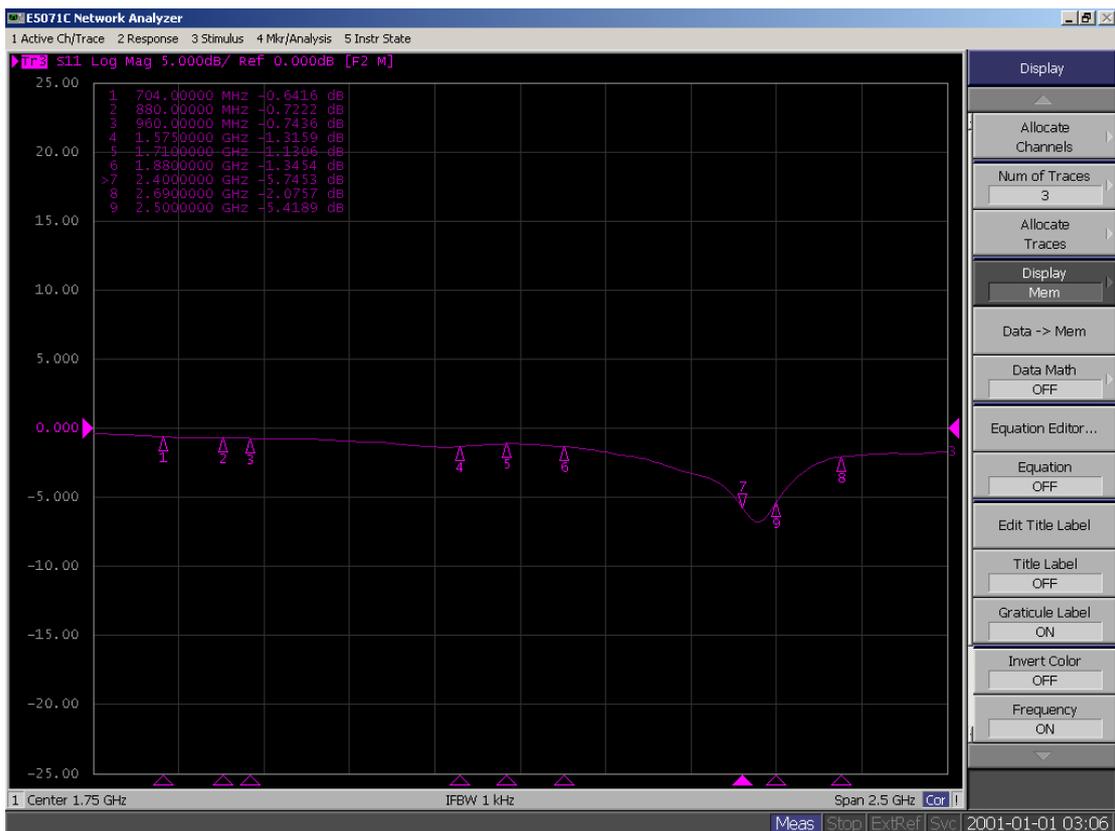


## 2.3 WiFi

### 2.3.1 Efficiency

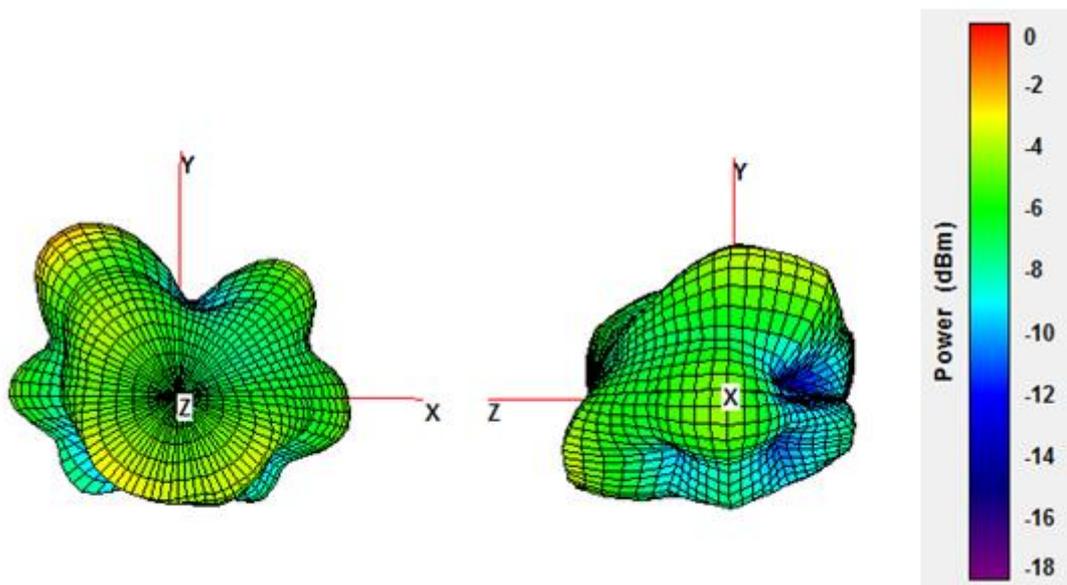
2.4GHz					
Frequency (MHz)	2400	2425	2450	2475	2500
Tot. Rad. Pwr. (dBm)	-5.14	-4.99	-4.89	-5.20	-5.72
Efficiency (%)	30.64%	31.67%	32.41%	30.21%	26.77%
Gain (dBi)	0.48	0.52	0.65	0.06	-0.55

### 2.3.2 |S11|



## 2.3.3 Radiation Pattern

### 2.3.3.1 802.11g / ch.6 / free space

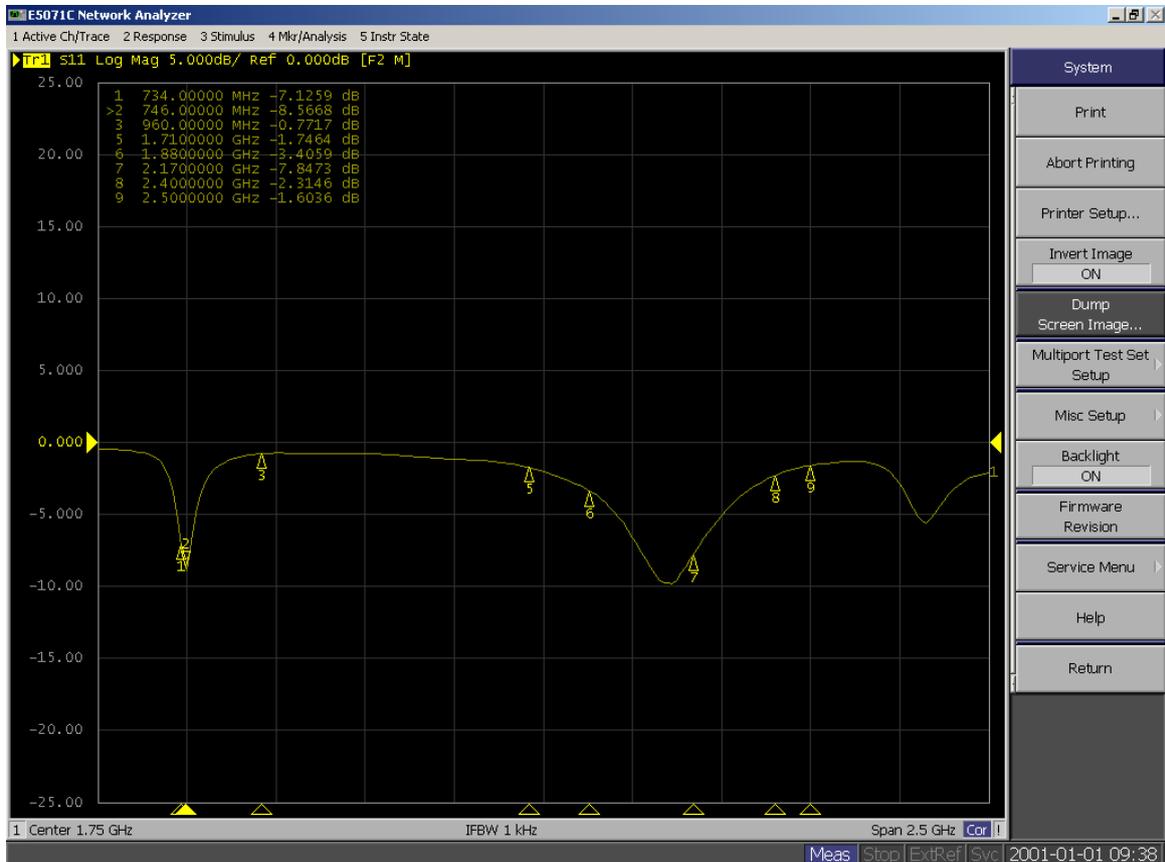


## 2.4 Diversity antenna

### 2.4.1 Efficiency

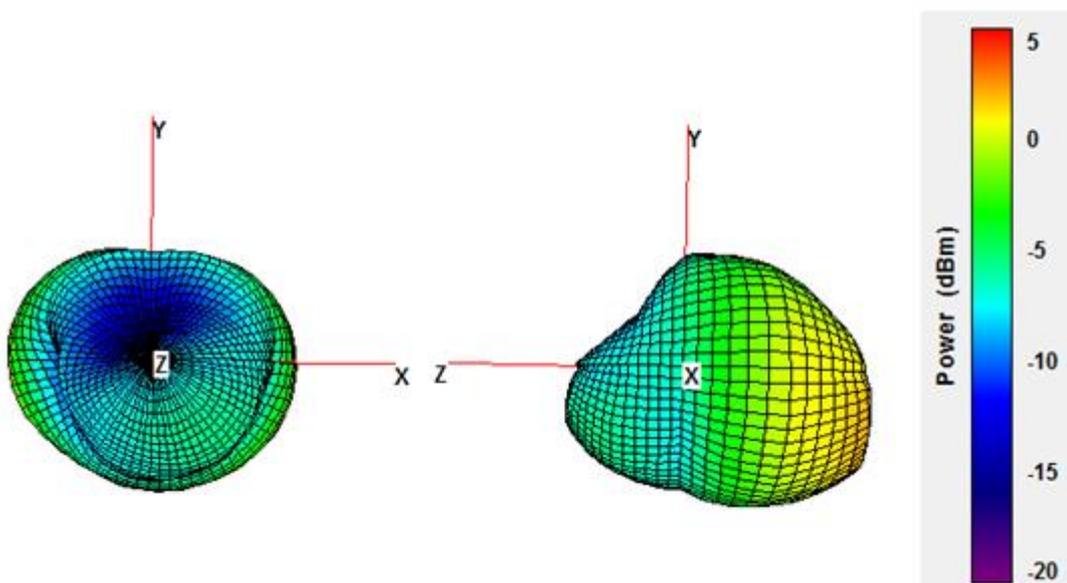
<b>LTE</b>						
Frequency (MHz)	704	714	724	734	744	754
Tot. Rad. Pwr. (dBm)	-7.40	-6.20	-4.10	-3.90	-3.80	-4.00
Efficiency (%)	18.20%	23.99%	38.90%	40.74%	41.69%	39.81%
Gain (dBi)	-1.00	0.17	2.27	2.37	2.22	1.85
<b>High Band : 1800/1900/2100~</b>						
Frequency (MHz)	1710	1747	1785	1805	1842	1850
Tot. Rad. Pwr. (dBm)	-9.06	-8.91	-8.12	-7.44	-6.85	-7.29
Efficiency (%)	12.42%	12.85%	15.42%	18.03%	20.65%	18.66%
Gain (dBi)	-5.45	-5.11	-3.92	-3.31	-3.19	-3.71
Frequency (MHz)	1880	1900	1910	1920	1930	1950
Tot. Rad. Pwr. (dBm)	-6.36	-6.21	-5.54	-5.57	-5.51	-4.93
Efficiency (%)	23.12%	23.93%	27.93%	27.73%	28.12%	32.14%
Gain (dBi)	-2.70	-2.43	-1.60	-1.46	-1.31	-0.65
Frequency (MHz)	1960	1980	1990	2010	2018	2025
Tot. Rad. Pwr. (dBm)	-4.90	-4.60	-4.00	-4.10	-3.63	-3.66
Efficiency (%)	32.36%	34.67%	39.81%	38.90%	43.35%	43.05%
Gain (dBi)	-0.72	-0.60	0.00	-0.24	0.05	-0.11
Frequency (MHz)	2110	2140	2170			
Tot. Rad. Pwr. (dBm)	-3.00	-2.92	-3.30			
Efficiency (%)	50.12%	51.05%	46.77%			
Gain (dBi)	2.60	2.60	2.22			

## 2.4.2 |S11|

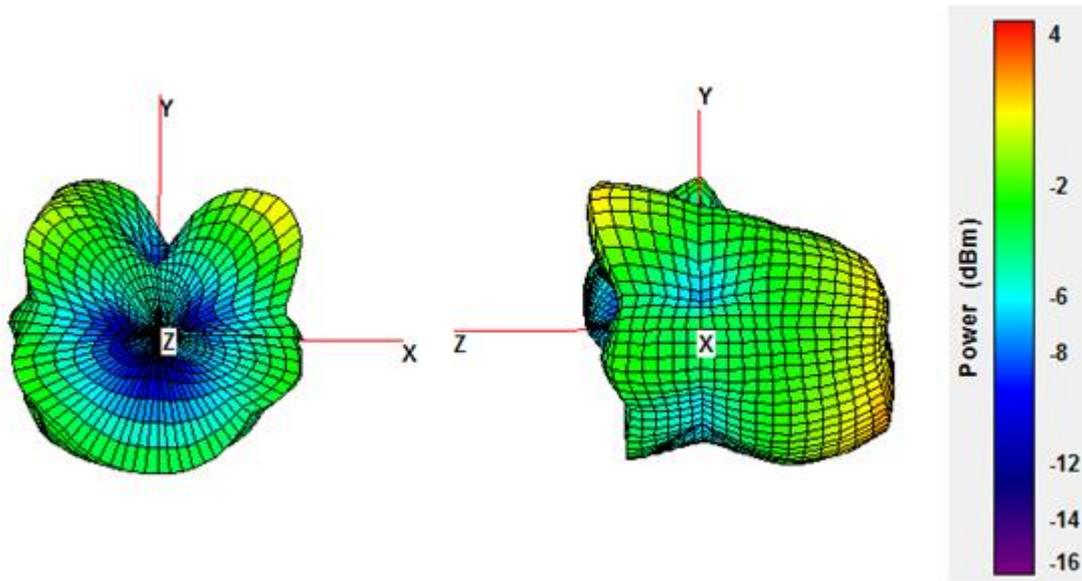


## 2.4.3 Radiation Pattern

### 2.4.3.1 E-UTRA B17 / middle channel / free space



### 2.4.3.2 E-UTRA B4 / middle channel / free space



## 3 Antenna Location

