

No.: SEKWANG 2007

Date : 2007. 3. 06

# PRODUCT SPECIFICATION

Product Name	ANTENNA
Customer	TELIAN
Model Name	MGQ9180
Provider	SEKWANG
Part No.	SKA702-0000AA

SEKWANG	Submitted	Checked	Checked	Approved

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## 1. Product History

No.	Data	Changes	Remark
1	07.03.06		
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## 2. Electrical Feature

### 2.1 Frequency Band

BAND	GSM850		GSM900		DCS1800		PCS	
FREQUENCY	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx
	824MHz ~ 849MHz	869MHz ~ 894MHz	880MHz ~ 915MHz	925MHz ~ 960MHz	1710MHz ~ 1785MHz	1805MHz ~ 1880MHz	1850MHz ~ 1910MHz	1930MHz ~ 1990MHz

### 2.2 Impedance

#### 2.2.1 Input Impedance

–  $R = 50\Omega$

#### 2.2.2 Measuring Method

By using Network Analyzer, connect the antenna installed handset to the reflection point of Analyzer and measure the impedance value within the designated frequency band.

### 2.3 Matching circuit

Matching Circuit is composed in free space of 2.1 frequency band while satisfying customer's requirements.

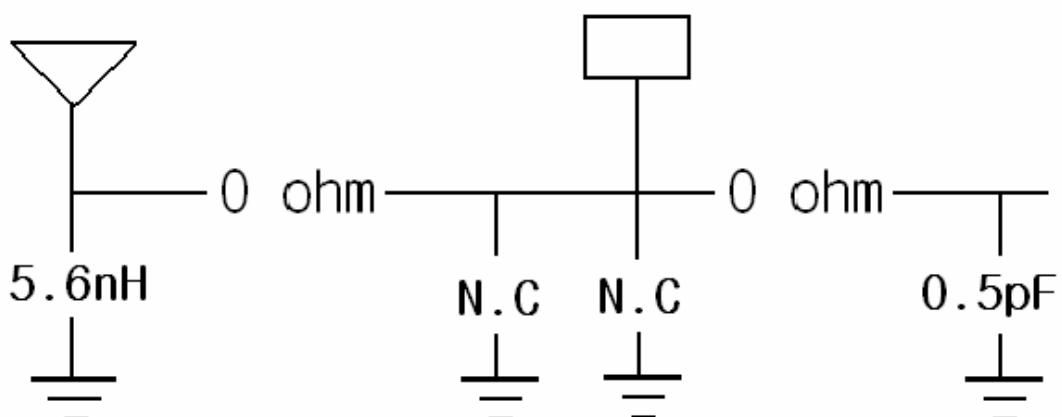


Figure 2.3.1 Matching circuit

## 2.4 VSWR

Impedance Matching optimization is performed under the below mentioned environment.

### 2.4.1. Free Space Environment

BAND	GSM		D PCS	
	824MHz	960MHz	1710MHz	1990MHz
DOWN	3.0:1	5:1	3.5:1	2:1
UP	3:1	4.5:1	5:1	2:1

### 2.4.2 Measuring Method

Connect (soldering)  $50\Omega$  semi-rigid coaxial cable to the  $50\Omega$  spot in handset. To minimize the loss of transmission, semi-rigid coaxial cable is used. Including PCB, the handset shouldn't be different from the one, which will be used for mass production.

Specification should be the same for all frequency bands. Free Space means that Handset is put on the surface of no conducting plastic.

## 2.5 Directive ness

Omni-directional (Horizontal)

BAND		GSM850	GSM900	DCS1800	PCS
S L I D E D O W N	Avg.	-4.78 dBi	-5.5 dBi	-8.2dBi	-8.62 dBi
	Peak	1.15 dBi	-0.65 dBi	-3.4 dBi	-3.67 dBi
SLIDE UP	Avg.	-4.1 dBi	-3.5 dBi	-6.6dBi	-3.86 dBi
	Peak	1.1 dBi	1.6dBi	-5.4dBi	-0.8 dBi

## 2.6 Maximum Power

- $P=2W$  under

### 3. Environment Test

#### 3.1 Operating Temperature Test

##### 3.1.1 Test Condition

Temperature =  $-30^{\circ}\text{C}$ ,  $+80^{\circ}\text{C}$

Duration time = 1 hour

##### 3.1.2 Requirements

After the test, the antenna must not have an outer damage, and also it must pass requirement shown in 2.4.

##### 3.1.3 Measuring Method

Antenna is kept at  $-30^{\circ}\text{C}$  for 1 hour and  $+80^{\circ}\text{C}$  for 1 hour and then passed test of 2.4

#### 3.2 Temperature Cycling Test

##### 3.2.1 Test Condition

- Low cycling Temperature TLC =  $-40^{\circ}\text{C}$
- High cycling Temperature THC =  $+80^{\circ}\text{C}$
- 1Cycle = 4 hours
- Test number = 10Cycle

##### 3.2.2 Requirements

After the test, the antenna must not have an outer damage, and also it must pass requirement shown in 2.4.

##### 3.2.3 Measuring Method

Antenna is kept at low temperature  $-40^{\circ}\text{C}$  for 2 hours and increase the temperature up to  $+80^{\circ}\text{C}$  within 2 hour and kept for another 2 hours at the same temperature will be 1 cycle. As shown in Figure 3.2.1 repeat 10 cycle and kept for 2 hour in normal temperature.

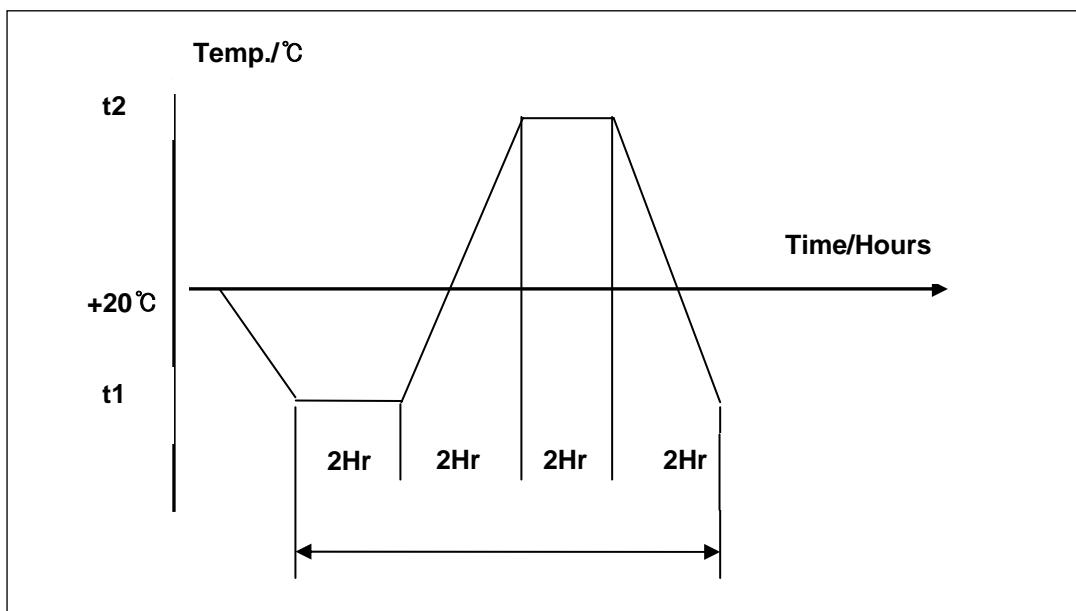


Figure 3.2.1 Temperature Cycling

### 3.3 Corrosion Resistance Test

#### 3.3.1 Test Condition

- NaCl = 90%
- Water Temperature = 60 °C
- Duration Time = 96 hours

#### 3.3.2 Requirements

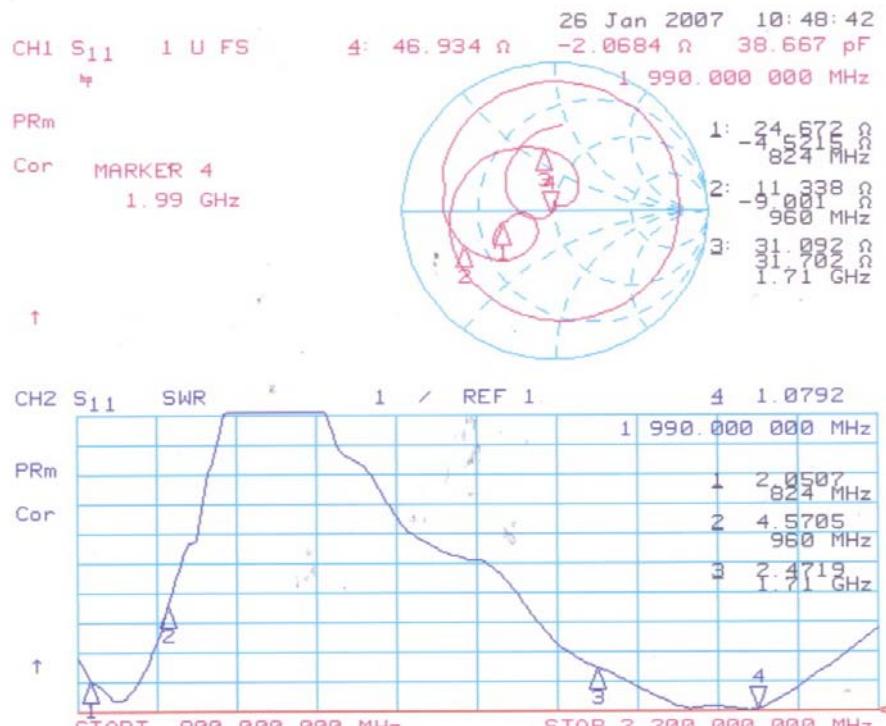
After the test, the antenna must not have an outer damage, and also it must pass requirement shown in 2.4.

#### 3.3.3 Measuring Method

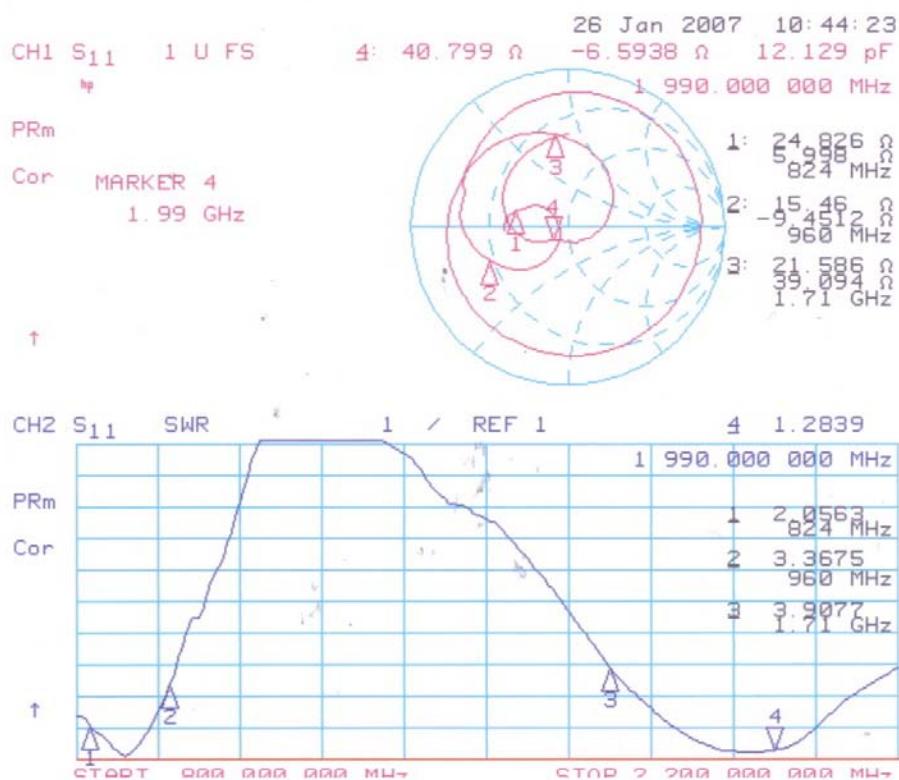
Antenna is soaked in sodium chloride solution at temperature +60 °C and 90%(NaCl) for 96 hours and dry out.

## 4. Electric Performance Data

### 4.1 Smith-Chart & VSWR



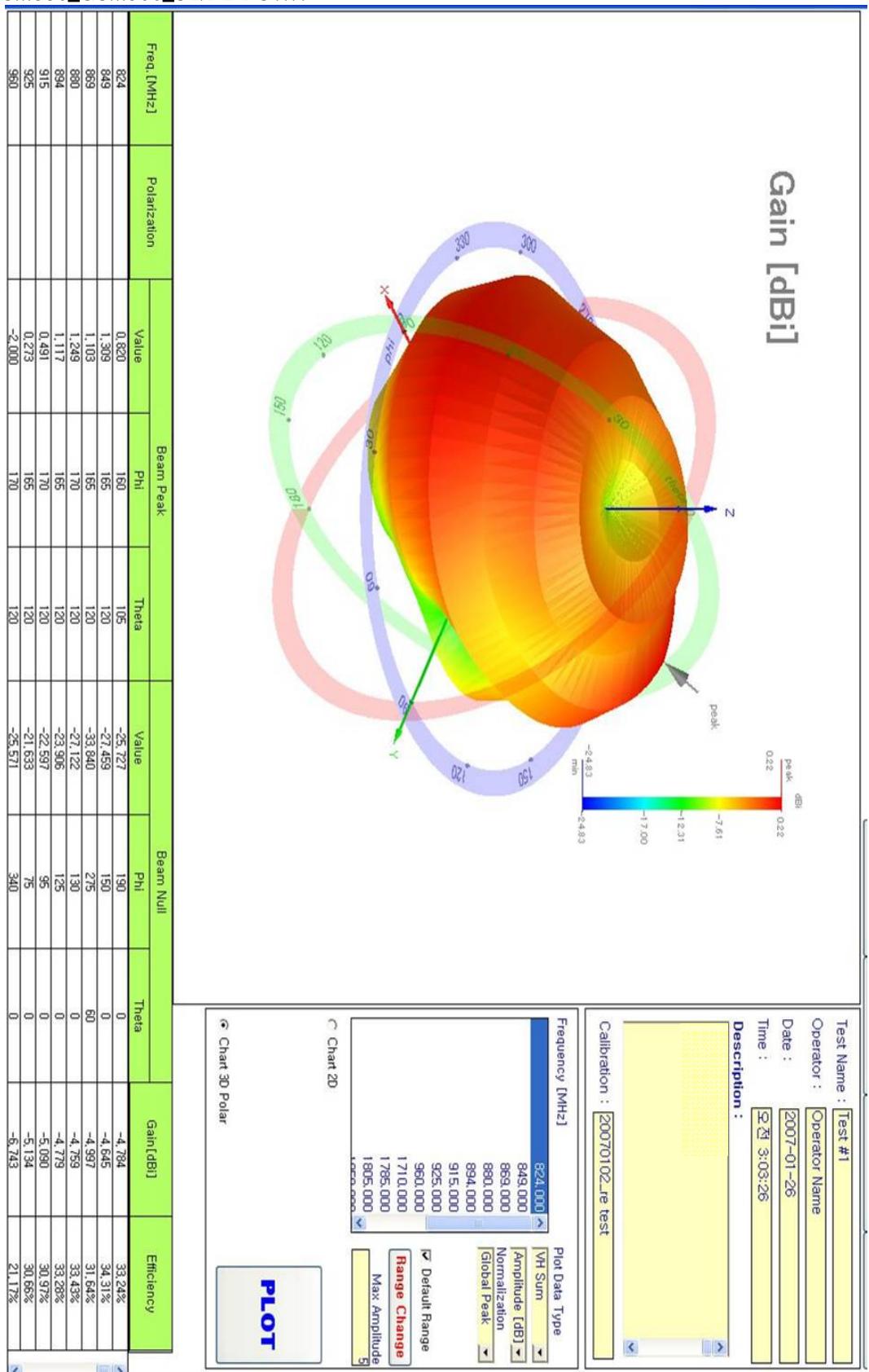
**SLIDE DOWN**



**SLIDE UP**

## 4.2 3D Gain Data

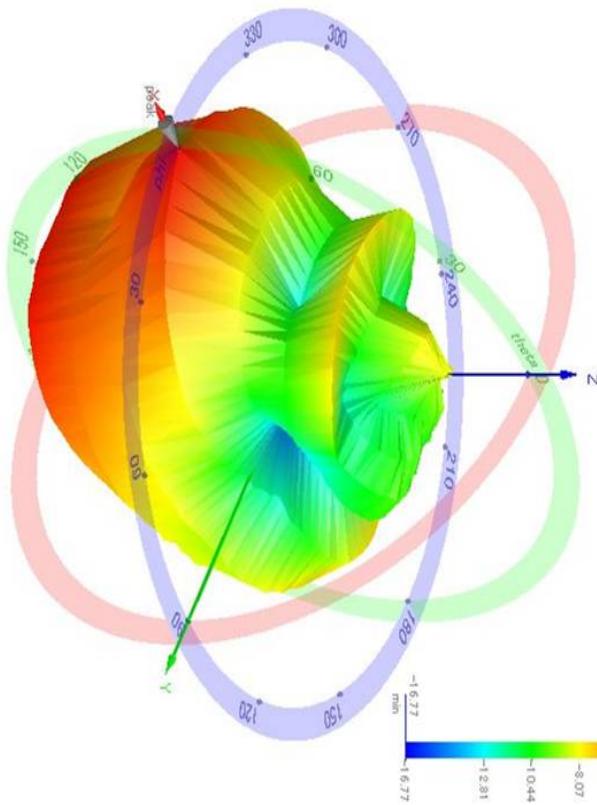
GSM850\_GSM900\_SLIDE DOWN



## DCS1800\_PCS\_SLIDE DOWN

### Gain [dBi]

peak: -4.11 dB  
-4.11  
-1.044  
-1.281  
-1.677  
-1.677 mm



Calibration : 20070102\_re test

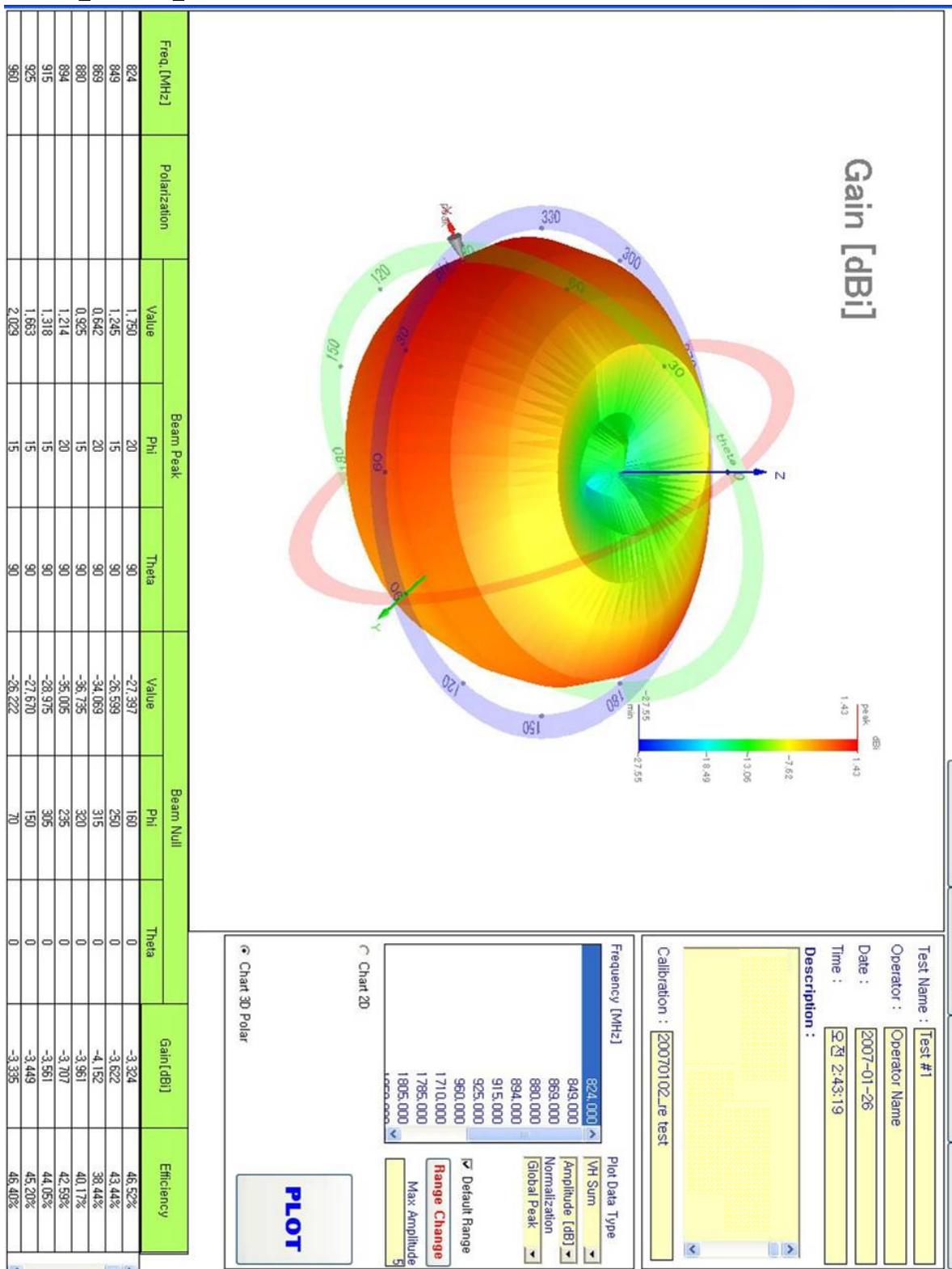
Frequency [MHz]	824.000	Plot Data Type	VH Sum
	849.000	Amplitude [dB]	5
	869.000	Normalization	
	880.000	Global Peak	
	894.000		
	915.000		
	925.000		
	950.000		
	970.000		
	170.000	<input checked="" type="checkbox"/> Default Range	
	1765.000	<input type="checkbox"/> Range Change	
	1805.000		
	1860.000		

Chart 20  
Chart 30 Polar

**PLOT**

Freq. [MHz]	Polarization	Beam Peak		Beam Null		Gain[dBi]	Efficiency
		Value	Phi	Value	Phi		
1710		-3.952	15	90	-16.775	65	12.80%
1765		-3.282	-15	60	-19.154	70	10.79%
1805		-2.844	-20	60	-17.468	75	10.45%
1850		-3.735	-15	50	-20.313	75	12.00%
1880		-3.809	-10	60	-23.126	65	10.50%
1910		-4.160	175	45	-34.844	235	15.00%
1930		-3.993	-160	135	-24.762	230	15.00%
1960		-3.641	-165	135	-22.188	140	12.00%

## GSM850\_GSM900\_SLIDE UP



## DCS1800\_PCS\_SLIDE UP

