

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		
2			
3			
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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.

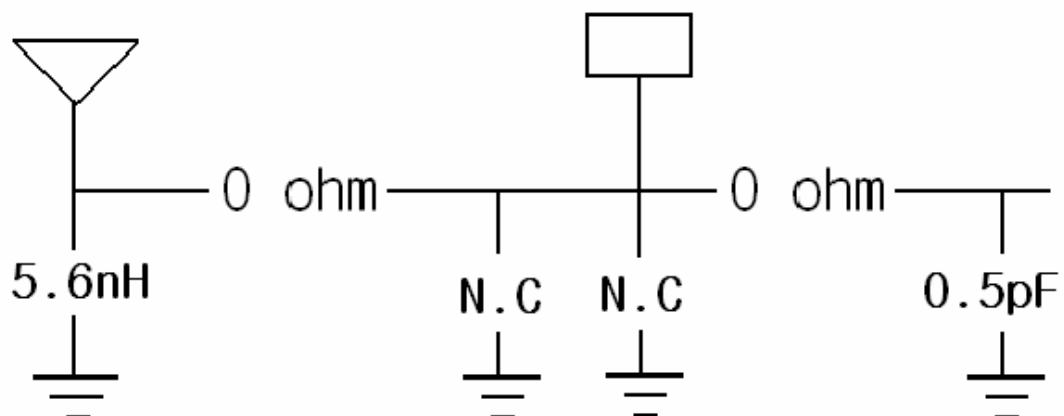


Figure 2.3.1 Matching circuit

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) 50Ω semi-rigid coaxial cable to the 50Ω 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°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°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°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°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.

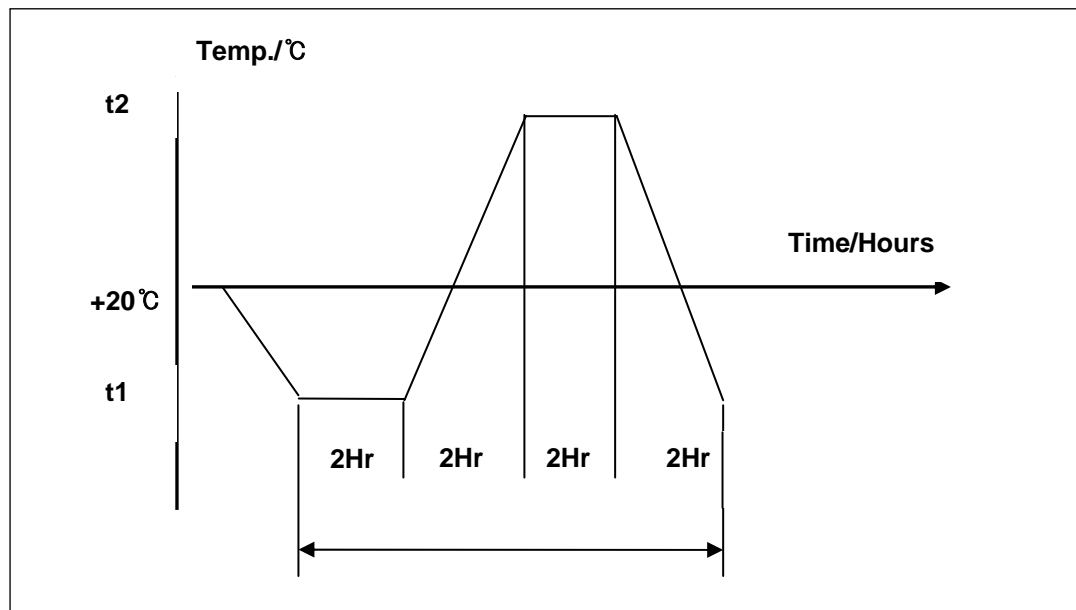


Figure 3.2.1 Temperature Cycling

3.3 Corrosion Resistance Test

3.3.1 Test Condition

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

3.3.2 Requirements

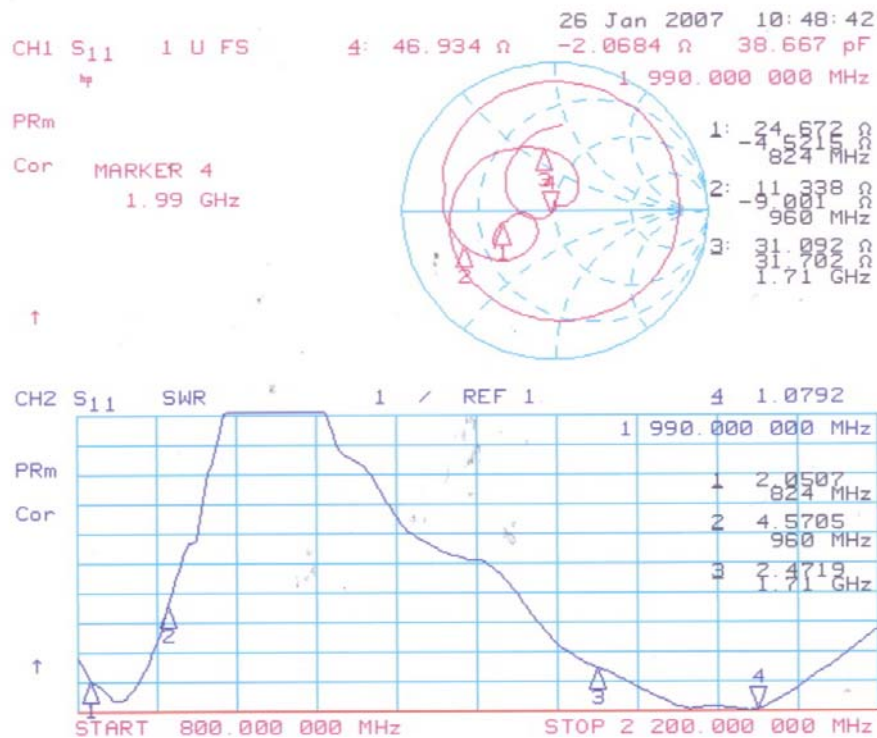
After the test, the antenna must not have an outer damage, and also it must pass requirement shown in 2.4.

3.3.3 Measuring Method

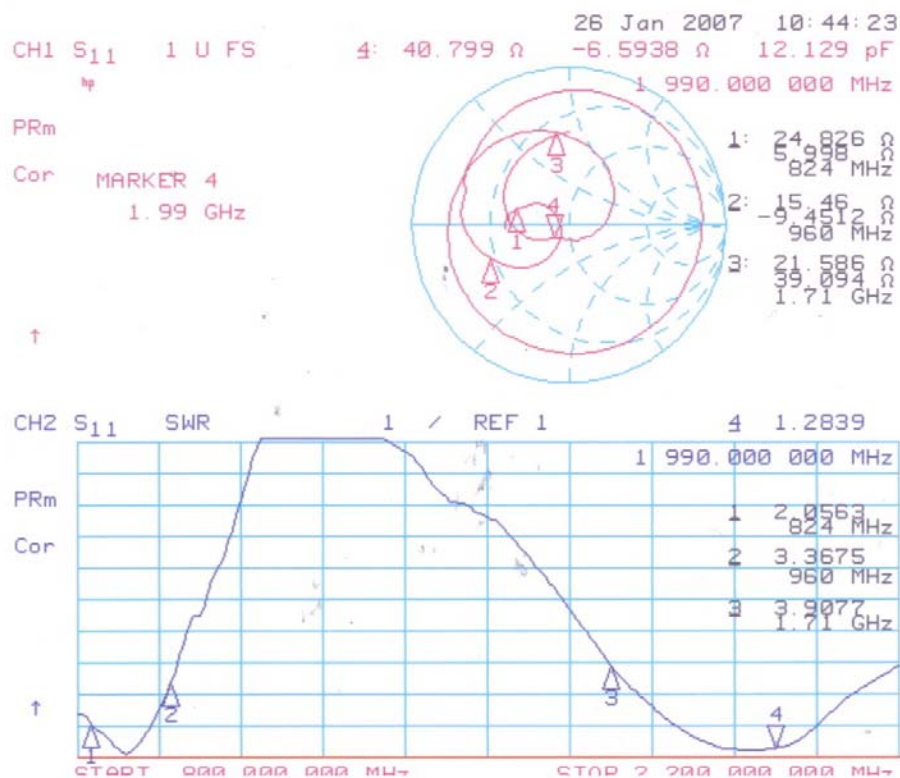
Antenna is soaked in sodium chloride solution at temperature $+60^\circ\text{C}$ and 90%(NaCl) for 96 hours and dry out.

4. Electric Performance Data

4.1 Smith-Chart & VSWR



SLIDE DOWN

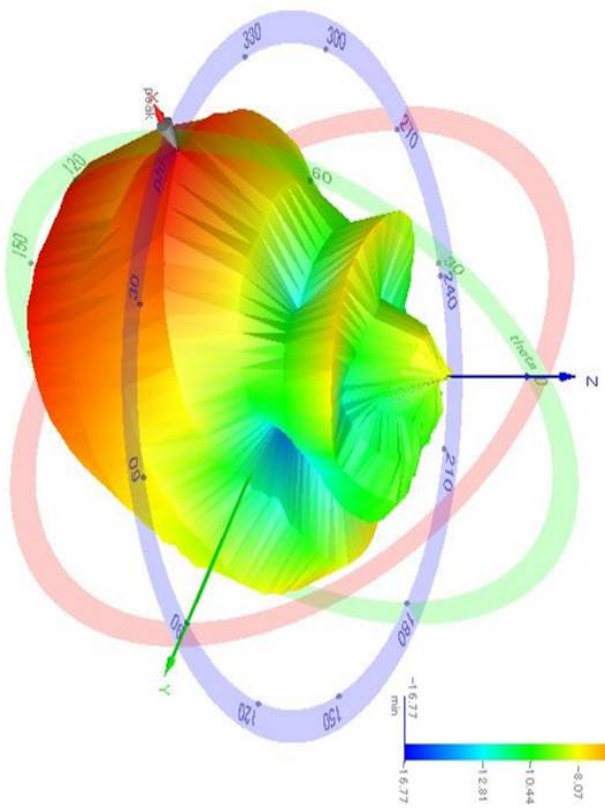


SLIDE UP

GSM850_GSM900_SLIDE DOWN



Gain [dBi]



Freq. [MHz]	Polarization	Beam Peak			Beam Null			Gain(dBi)		Efficiency
		Value	Phi	Theta	Value	Phi	Theta			
1710		-3.952	15	30	-16.775	65	105	-8.328		12.80%
1785		-3.282	-15	60	-19.154	70	105	-7.795		16.62%
1805		-2.844	-20	60	-17.458	75	105	-7.459		17.95%
1850		-3.735	-15	60	-20.313	75	120	-8.512		14.08%
1880		-3.809	-10	60	-23.726	65	105	-8.496		14.14%
1910		-4.160	175	45	-34.844	235	15	-8.721		13.42%
1930		-3.993	-160	135	-24.762	230	15	-8.648		13.65%
1960		-3.641	-165	135	-22.188	140	120	-8.627		13.72%

Test Name :

Operator :

Date :

Time :

Description :

Calibration :

Frequency [MHz]

824,000

849,000

869,000

880,000

894,000

915,000

925,000

960,000

1710,000

1785,000

1805,000

1960,000

Plot Data Type

VH Sum

Amplitude [dB]

Normalization

Global Peak

Default Range

Range Change

Max Amplitude

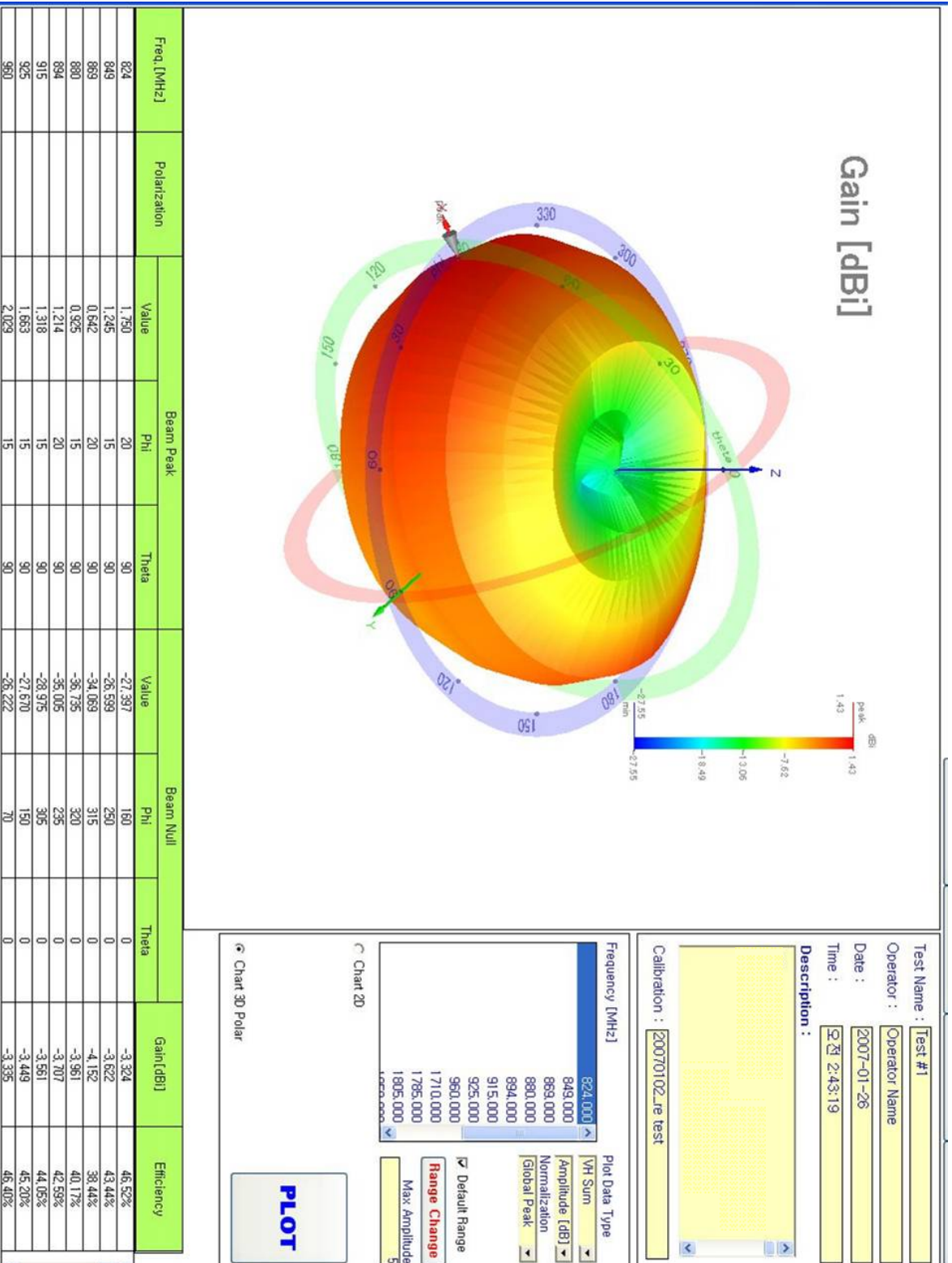
5

Chart 20

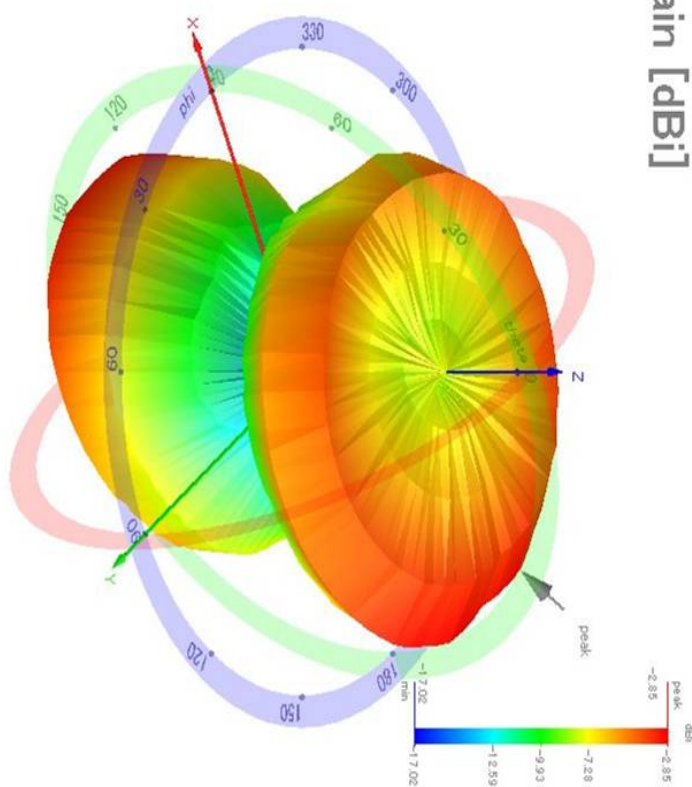
Chart 30 Polar

Plot

GSM850_GSM900_SLIDE UP



Gain [dBi]



Freq. [MHz]	Polarization	Beam Peak			Beam Null			Gain [dBi]	Efficiency
		Value	Phi	Theta	Value	Phi	Theta		
1710		-2.855	-165	120	-17.478	205	0	-7.644	17.20%
1785		-1.445	-165	120	-16.949	310	0	-6.542	22.17%
1805		-1.039	-165	120	-17.299	50	0	-5.885	25.96%
1850		-2.064	-5	45	-20.520	45	0	-6.282	23.54%
1880		-1.400	-165	120	-16.118	25	0	-5.605	27.51%
1910		-0.806	-175	120	-15.097	15	75	-5.384	28.95%
1930		-0.596	-175	120	-15.211	360	75	-5.261	29.78%
1960		-0.978	-170	120	-16.685	215	75	-5.416	28.74%

Test Name : Test #1

Operator : Operator Name

Date : 2007-01-26

Time : 오전 2:43:19

Description :

Calibration : 20070102_re test

Frequency [MHz]

824.000

849.000

869.000

880.000

894.000

915.000

925.000

960.000

1710.000

1785.000

1805.000

1800.000

Plot Data Type

VH Sum

Amplitude [dB]

Normalization

Global Peak

Default Range

Range Change

Max Amplitude

5

Chart 2D

Chart 3D Polar

PLOT