No.: SEKWANG 2007-4

Date : 2007. 4. 09

PRODUCT SPECIFICATION

Product Name	INTENNA
Customer	TELIAN
Model Name	MGQ3180 (I170)
Provider	SEKWANG
Part No.	SKA703-0000AA

SEKWANG	Submitted	Checked	Checked	Approved

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1. Product History

No.	Data	Changes	Remark
1	07.04.09	임시승인원	
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	1710MHz ~ 1785MHz	1805MHz ~ 1880MHz	1710MHz ~ 1785MHz	1710MHz ~ 1785MHz	1850MHz ~ 1910MHz	1930MHz ~ 1990MHz

2.2 Impedance

2.2.1 Input Impedance

- R =50Ω

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.

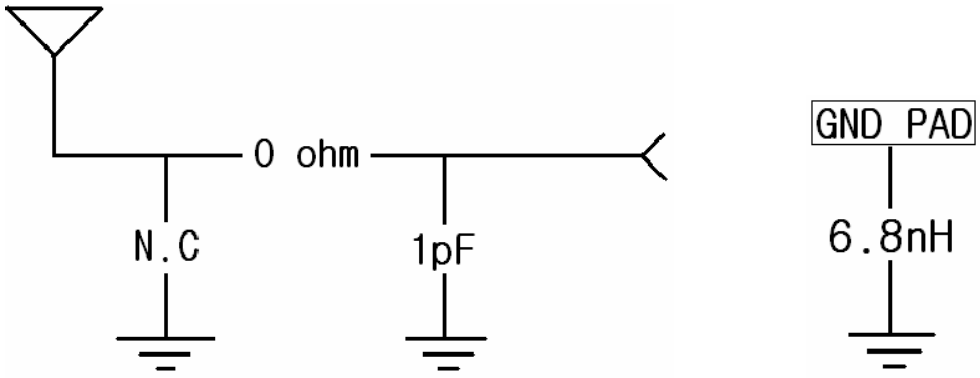


Figure 2.3.1 Matching circuit

2.4 VSWR

Impedance Matching optimization is performed under the below mentioned environment.

2.4.1. Free Space Environment

BAND	GSM850		GSM900		DCS1800		PCS	
VSWR	824MHz	894MHz	880MHz	960MHz	1710MHz	1880MHz	1850MHz	1990MHz
	5.5:1	-	-	3.5:1	5.0:1	-	-	4.5:1

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
G A I N	Avg.	-6.65 dBi	-4.84 dBi	-5.25 dBi	-5.62 dBi
	Peak	-3.00 dBi	-1.82 dBi	-0.79 dBi	-1.50 dBi

2.6 Maximum Power

- P=2W under

3. Environment Test

3.1 Operating Temperature Test

3.1.1 Test Condition

Temperature = -30℃, +80℃

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℃ for 1 hour and +80℃ for 1 hour and than passed test of 2.4

3.2 Temperature Cycling Test

3.2.1 Test Condition

- Low cycling Temperature TLC = -40℃
- High cycling Temperature THC = +80℃
- 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℃ for 2 hours and increase the temperature up to +80℃ 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.

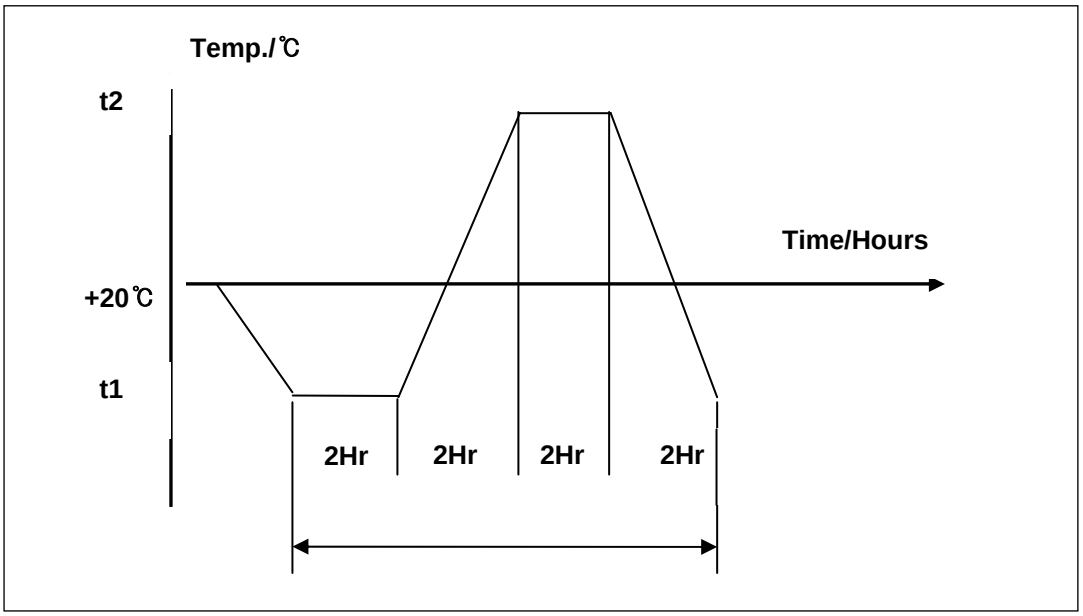


Figure 3.2.1 Temperature Cycling

3.3 Corrosion Resistance Test

3.3.1 Test Condition

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

3.3.2 Requirements

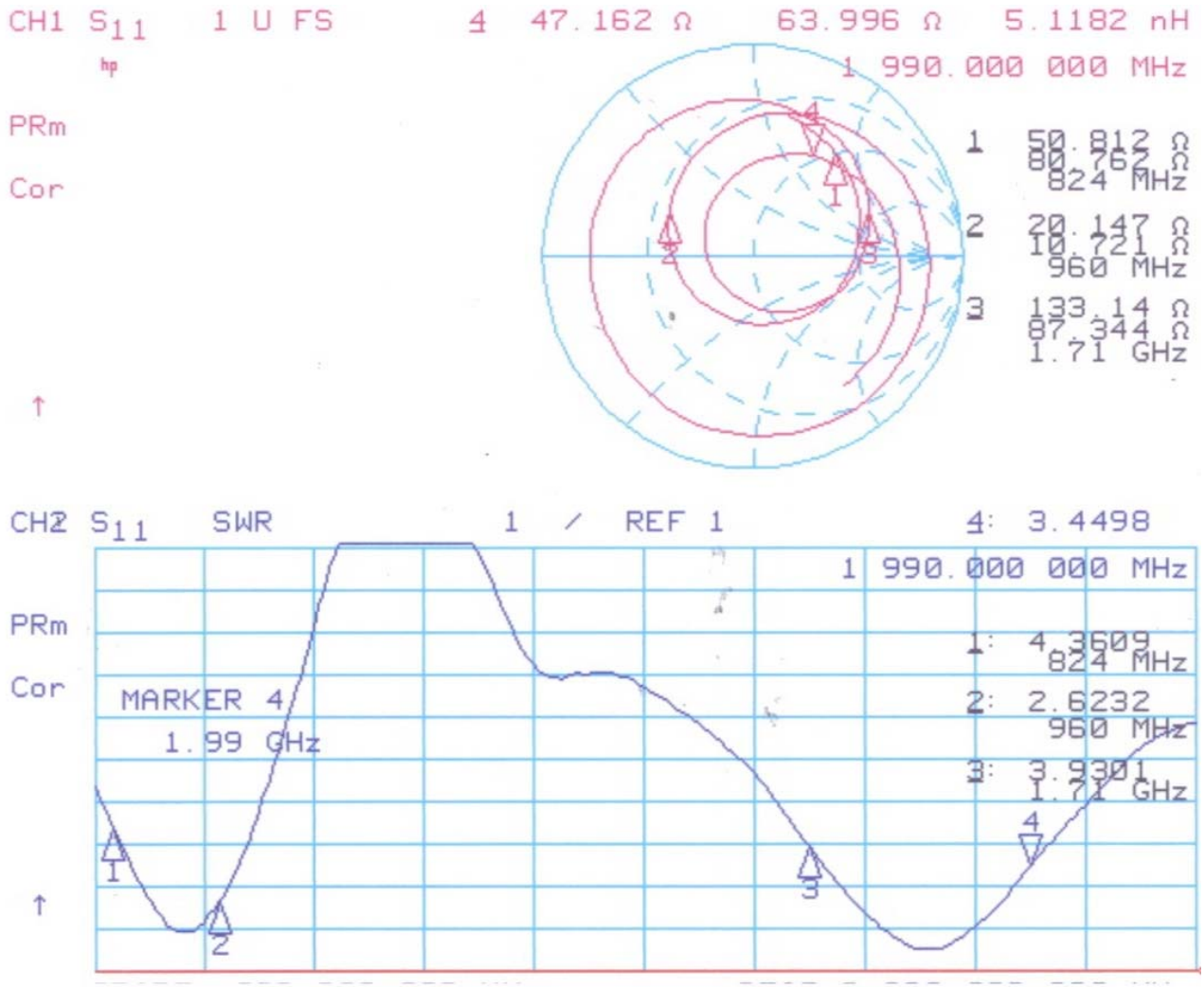
After the test, the antenna must not have an outer damage, and also it must pass requirement shown in 2.4.

3.3.3 Measuring Method

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

4. Electric Performance Data

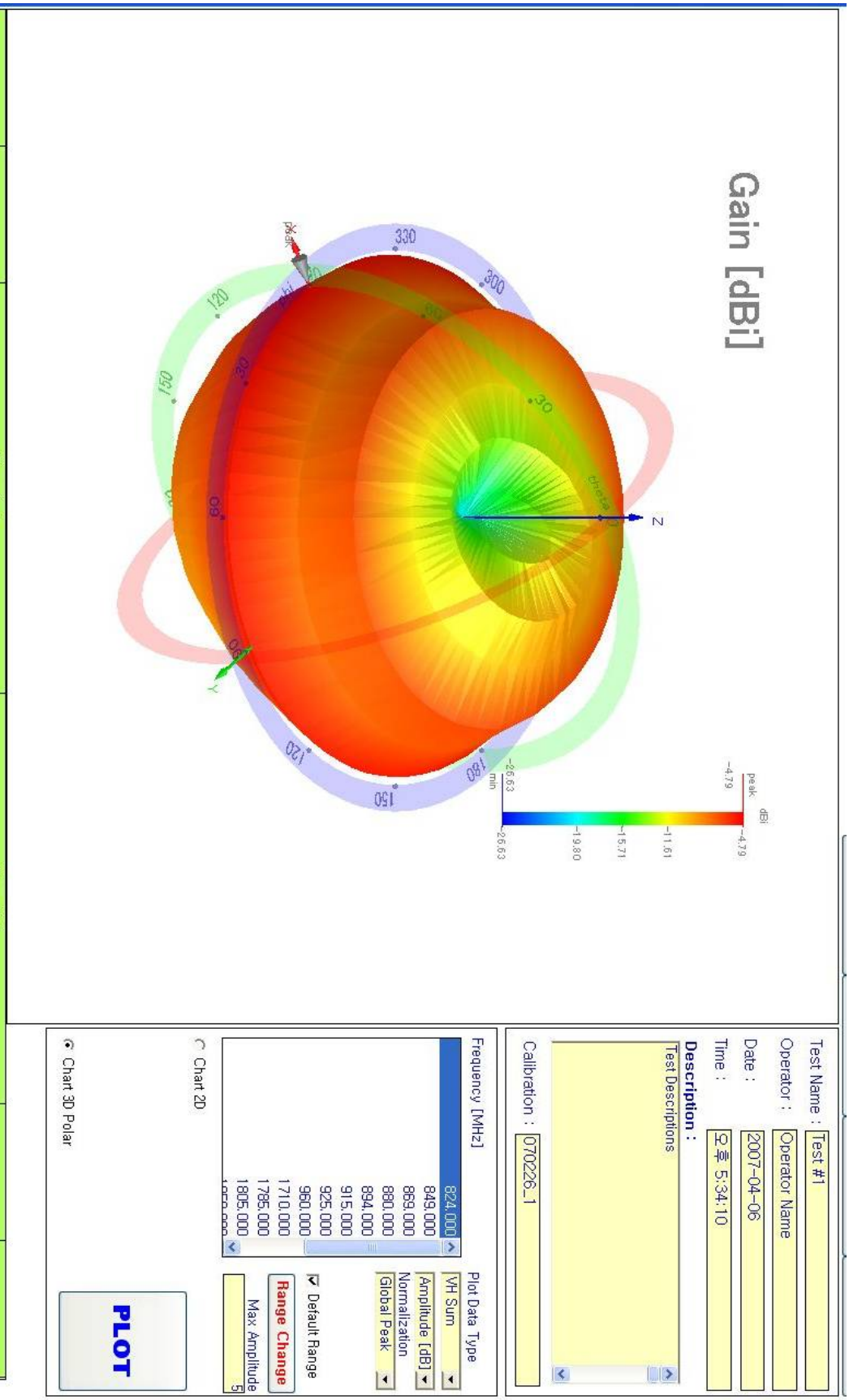
4.1 Smith-Chart & VSWR



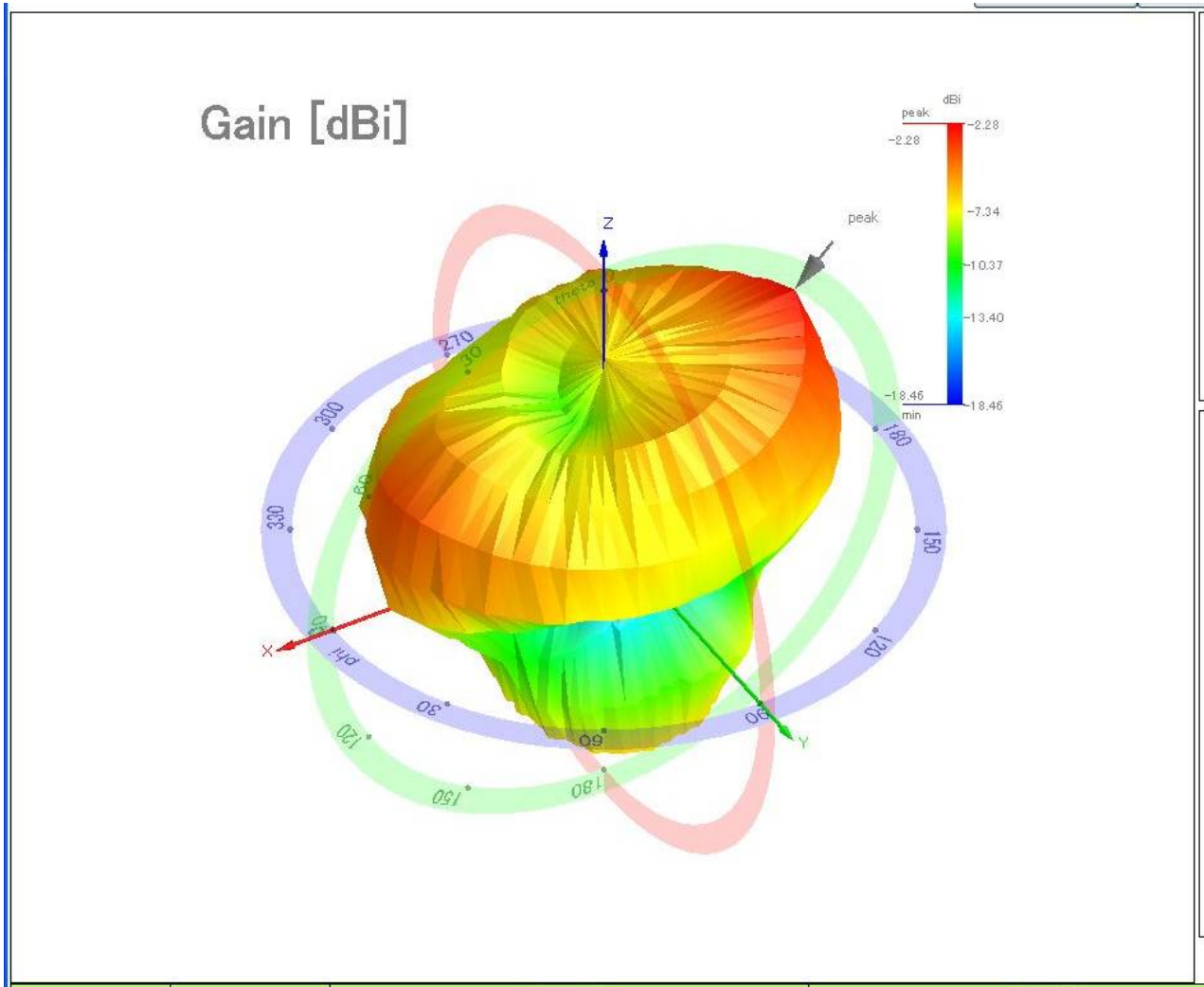
GSM900,DCS1800_CLOSE

4.2 3D Gain Data

GSM850_GSM900



Freq.[MHz]	Polarization	Beam Peak			Beam Null			Gain[dBi]	Efficiency
		Value	Phi	Theta	Value	Phi	Theta		
824		-4.114	90	90	-26.441	45	0	-8.001	15.85%
849		-3.389	60	90	-27.659	240	180	-7.300	18.62%
869		-2.571	35	90	-31.571	205	0	-6.228	23.83%
880		-2.220	40	90	-28.869	205	0	-5.595	27.57%
894		-1.950	30	90	-26.728	230	0	-5.095	30.94%
915		-1.722	145	75	-21.737	215	0	-4.682	34.02%
925		-1.239	145	75	-20.450	270	0	-4.093	38.97%
960		-2.149	-70	75	-18.325	30	0	-5.024	31.45%



Test Name : Test #1
Operator : Operator Name
Date : 2007-04-06
Time : 오후 5:34:10
Description :
Test Descriptions
Calibration : 070226_1

Frequency [MHz]
824.000
849.000
869.000
880.000
894.000
915.000
925.000
960.000
1710.000
1785.000
1805.000

Plot Data Type
VH Sum
Amplitude [dB]
Normalization
Global Peak
Default Range
Range Change
Max Amplitude
5
Chart 2D
Chart 3D Polar
PLOT

Freq. [MHz]	Polarization	Beam Peak			Beam Null			Gain[dBi]	Efficiency
		Value	Phi	Theta	Value	Phi	Theta		
1710		-1,655	160	135	-18,708	130	75	-6,497	22,40%
1785		-0,694	160	135	-17,725	110	75	-5,100	30,91%
1805		-0,552	160	135	-18,019	100	90	-4,784	33,24%
1850		-0,670	160	135	-20,533	115	90	-5,075	31,08%
1880		-0,274	155	135	-16,631	125	90	-4,639	34,37%
1910		-1,119	155	135	-15,156	125	90	-5,353	29,15%
1930		-1,264	160	135	-13,956	120	90	-5,312	29,43%
1990		-2,993	160	135	-16,385	120	90	-6,766	21,06%

DCS1800_PCS1900