

No.: SEKWANG 2007

Date : 2007. 1. 26

PRODUCT SPECIFICATION

Product Name	ANTENNA
Customer	TELIAN
Model Name	MGQ7180
Provider	SEKWANG
Part No.	SKA701-0000AA

SEKWANG	Submitted	Checked	Checked	Approved

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1. Product History

No.	Data	Changes	Remark
1	07.1.26	Approval	
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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.

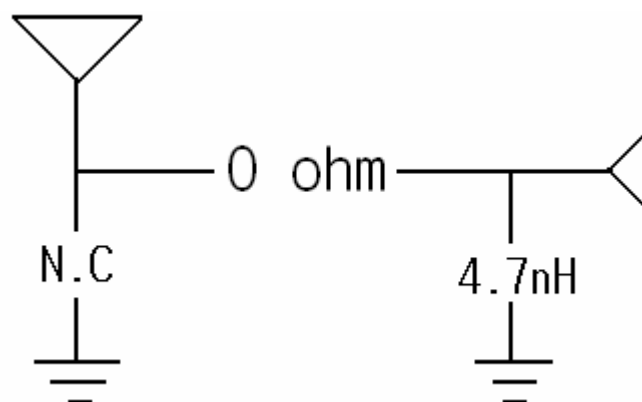


Figure 2.3.1 Matching circuit

2.4 VSWR

Impedance Matching optimization is performed under the below mentioned environment.

2.4.1. Free Space Environment

BAND	GSM850		GSM900		DCS1800		PCS	
	824MHz	894MHz	880MHz	960MHz	1710MHz	1880MHz	1850MHz	1990MHz
CLOSE	3.0:1	4.5:1	4.0:1	9.5:1	3.0:1	3.0:1	3.0:1	3.0:1
OPEN	2.5:1	3.5:1	3.0:1	6.5:1	3.0:1	3.0:1	3.0:1	3.0:1

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
C L O S E	Avg.	-5.98 dBi	-7.47 dBi	-4.14 dBi	-4.45 dBi
	Peak	-2.01 dBi	-3.56 dBi	0 dBi	0.37 dBi
O P E N	Avg.	-4.31 dBi	-5.37 dBi	-3.42 dBi	-3.86 dBi
	Peak	-0.49 dBi	-1.59 dBi	1.11 dBi	0.78 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.

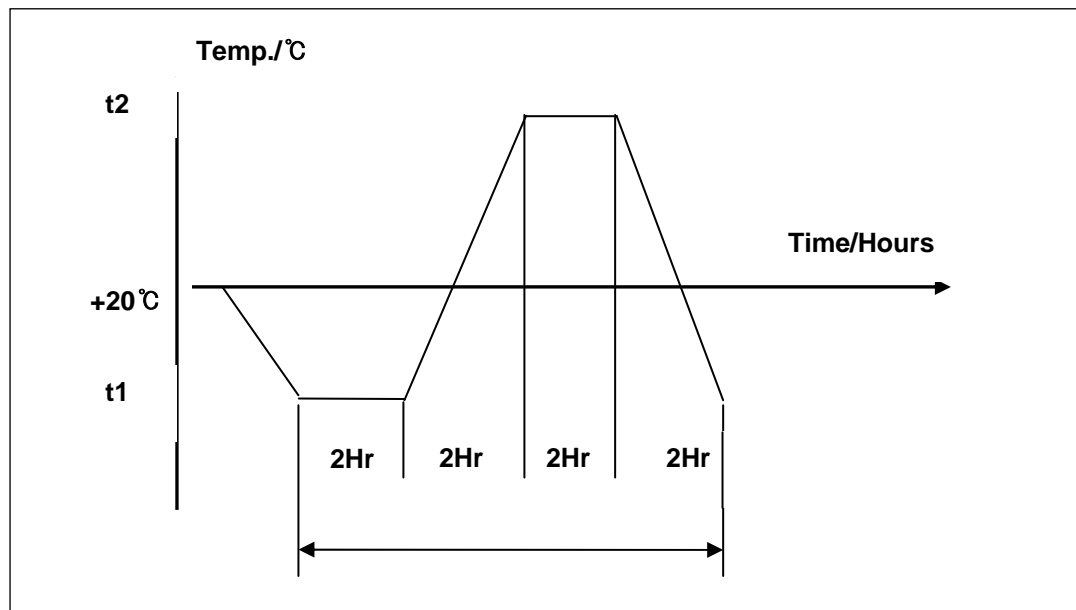


Figure 3.2.1 Temperature Cycling

3.3 Corrosion Resistance Test

3.3.1 Test Condition

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

3.3.2 Requirements

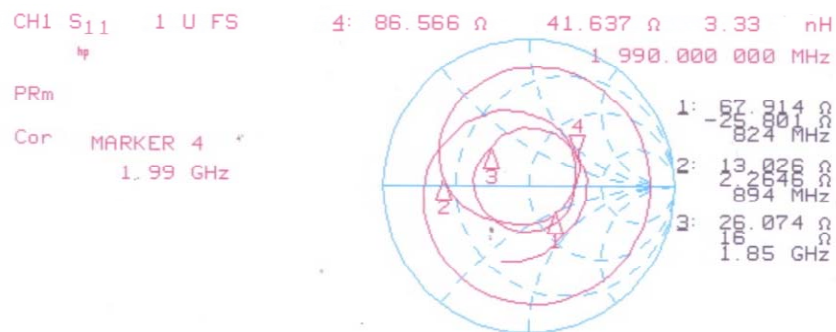
After the test, the antenna must not have an outer damage, and also it must pass requirement shown in 2.4.

3.3.3 Measuring Method

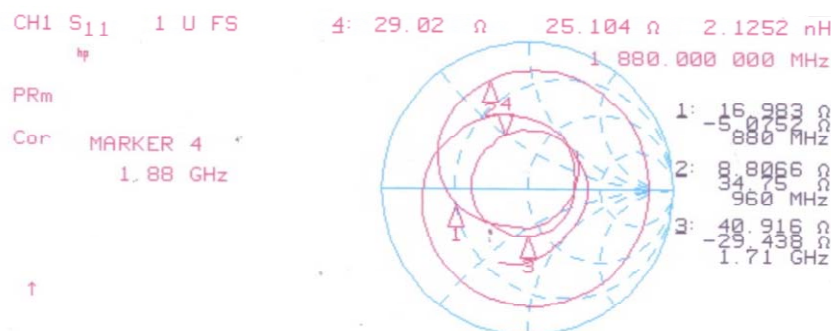
Antenna is soaked in sodium chloride solution at temperature $+60^\circ\text{C}$ and 90%(NaCl) for 96 hours and dry out.

4. Electric Performance Data

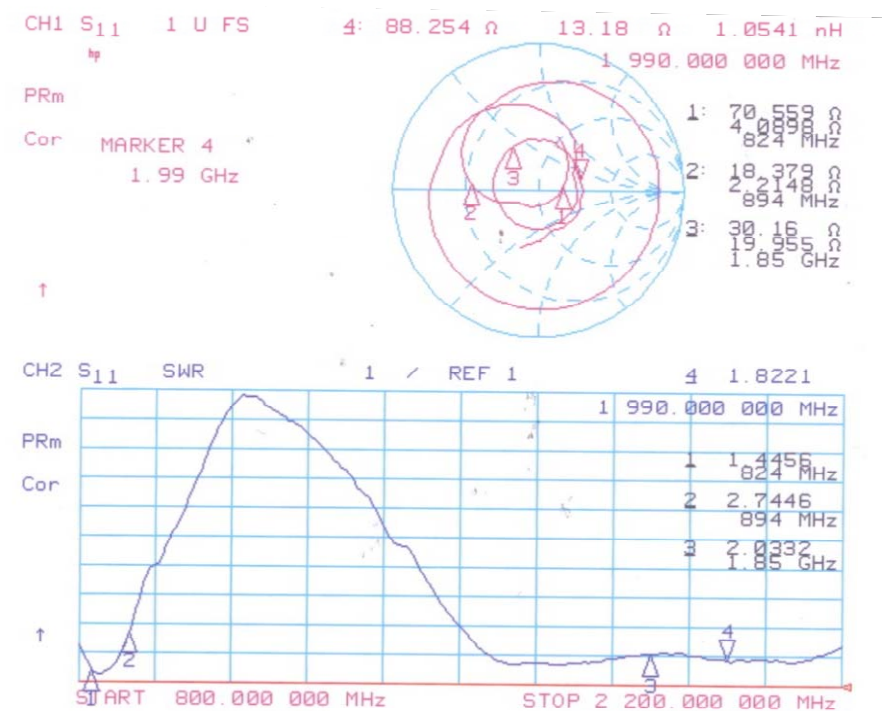
4.1 Smith-Chart & VSWR



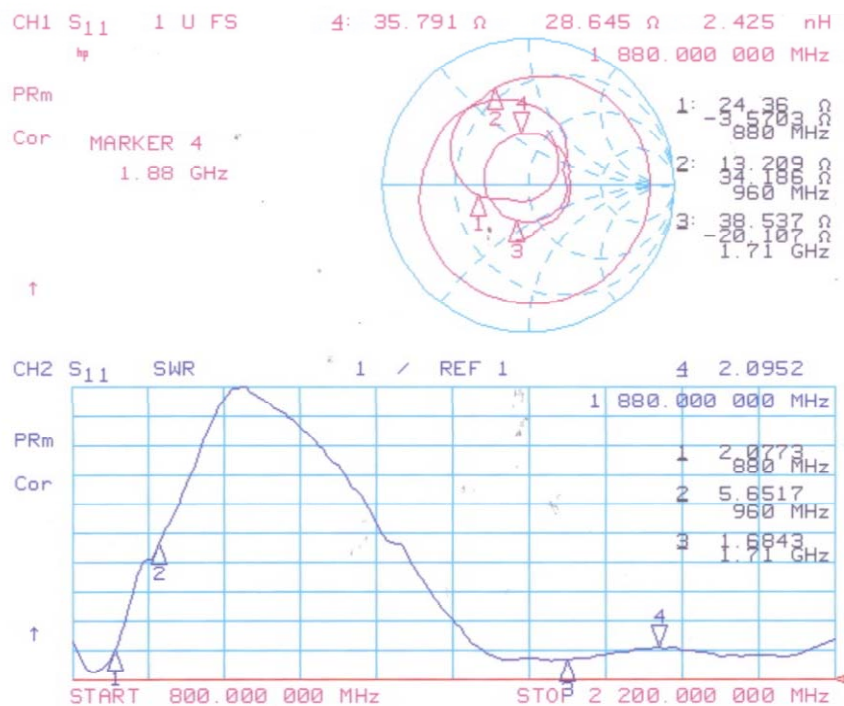
GSM850,DCS1900_CLOSE



GSM900,DCS1800_CLOSE



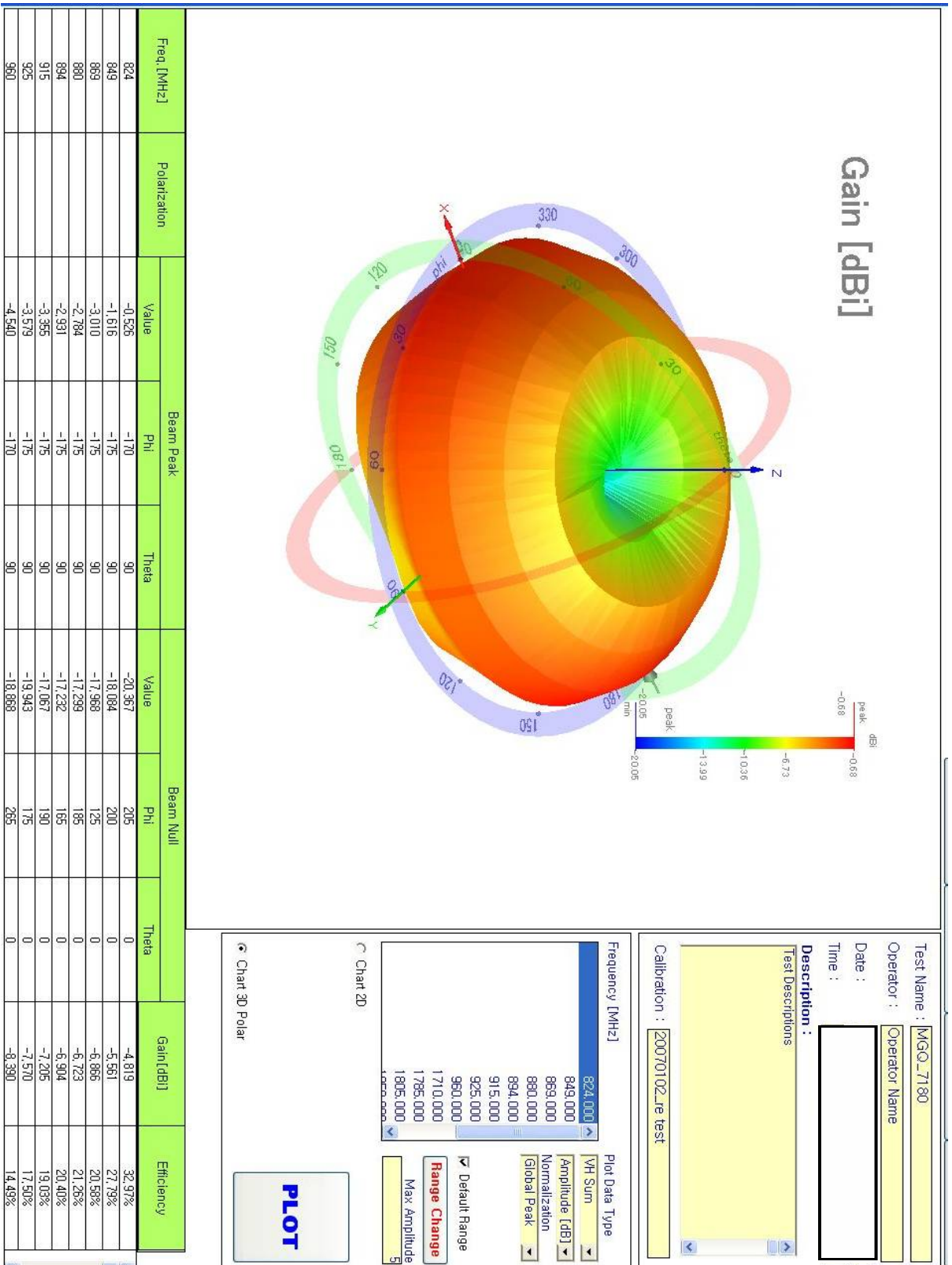
GSM850,DCS1900_OPEN



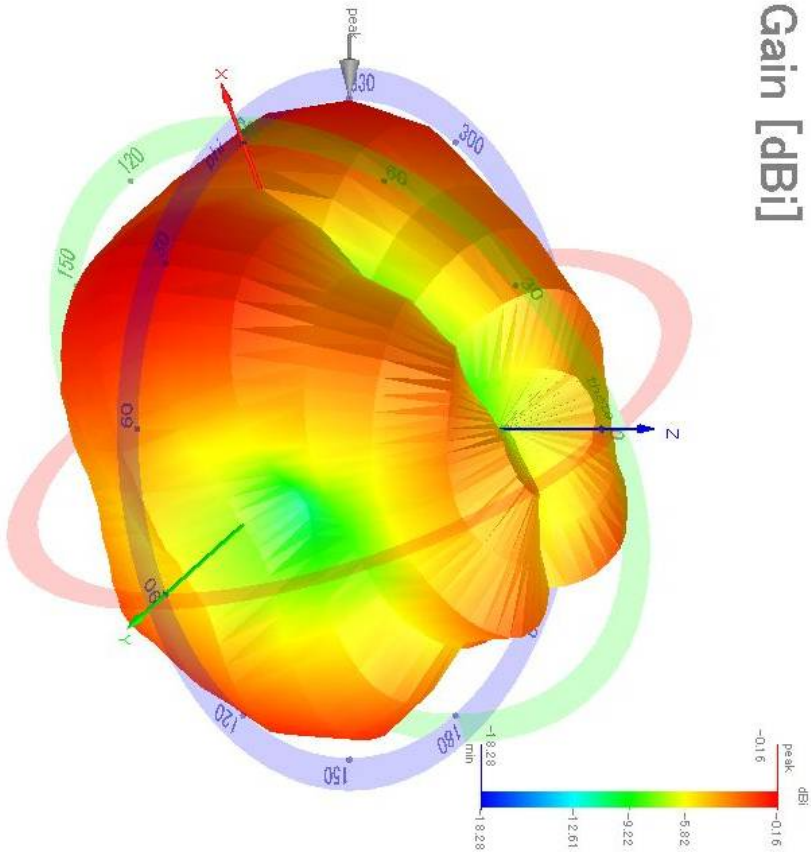
GSM900,DCS1800_OPEN

4.2 3D Gain Data

GSM850_GSM900_CLOSE



Gain [dBi]



Freq. [MHz]	Polarization	Beam Peak			Beam Null		Gain[dBi]	Efficiency
		Value	Phi	Theta	Value	Phi		
1710		-0.166	-30	90	-18.477	240	-4.452	35.88%
1785		-0.125	155	60	-16.518	245	-3.836	41.34%
1805		-0.472	160	60	-18.027	245	-4.151	38.45%
1850		0.420	-145	75	-20.087	245	-4.168	38.30%
1880		0.761	-150	75	-20.080	290	-4.132	38.62%
1910		0.026	-145	75	-22.627	290	-4.780	33.27%
1930		0.545	-145	75	-23.944	260	-4.328	36.91%
1990		0.539	-145	75	-19.145	275	-4.540	35.15%

Test Name : MGO_7180

Operator : Operator Name

Date :

Time :

Description : Test Descriptions

Calibration : 20070102_re test

Frequency [MHz]

Plot Data Type

VH Sum

Amplitude [dB]

Normalization

Global Peak

824,000

849,000

869,000

880,000

894,000

915,000

925,000

960,000

1710,000

1785,000

1805,000

1820,000

Range Change

Max Amplitude

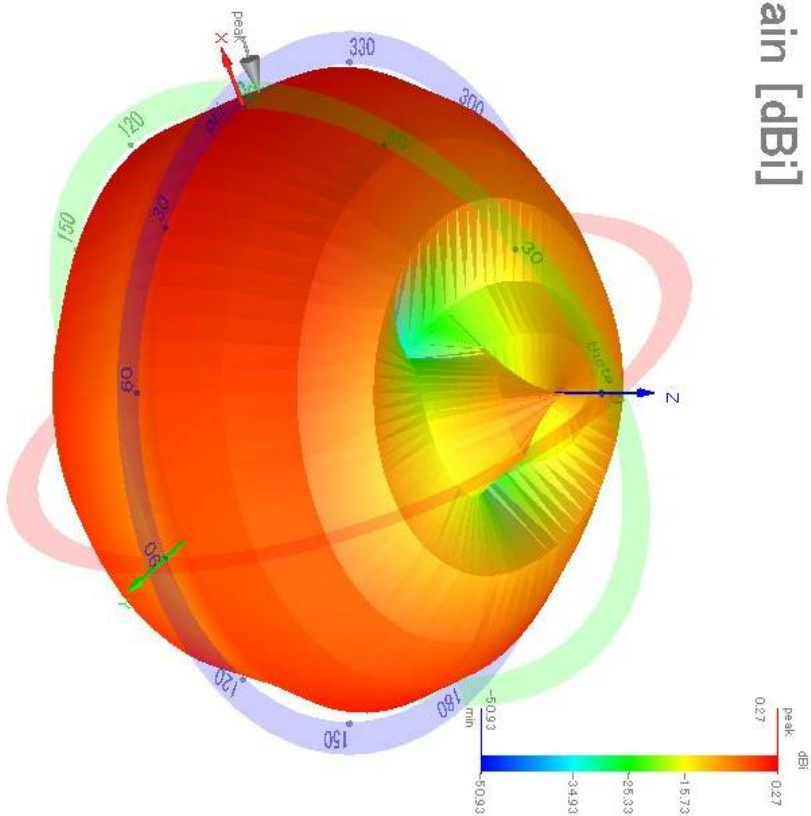
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Chart 2D

Chart 3D Polar

PLOT

Gain [dBi]



Freq. [MHz]	Polarization	Beam Peak			Beam Null			Gain[dBi]	Efficiency
		Value	Phi	Theta	Value	Phi	Theta		
824		-0.032	5	90	-51.233	10	0	-3.768	42.10%
849		-0.266	-180	120	-33.790	180	0	-4.082	39.06%
869		-0.900	-180	105	-44.891	180	0	-4.779	33.27%
880		-0.621	180	105	-39.738	0	0	-4.536	35.19%
884		-0.773	180	105	-37.449	0	15	-4.642	34.34%
915		-0.838	180	105	-32.392	0	15	-4.966	34.95%
925		-1.572	-180	105	-34.887	5	15	-5.202	30.19%
960		-3.342	-85	120	-38.108	0	15	-7.194	19.08%

Test Name : MGO_7180

Operator : Operator Name

Date :

Time :

Description :

Test Descriptions

Calibration : 20070102_re test

Frequency [MHz]

Plot Data Type

H-Pol

Normalization

Global Peak

Default Range

Range Change

Max Amplitude

824.000

849.000

869.000

880.000

894.000

915.000

925.000

960.000

1710.000

1785.000

1805.000

1805.000

1805.000

1805.000

1805.000

1805.000

1805.000

1805.000

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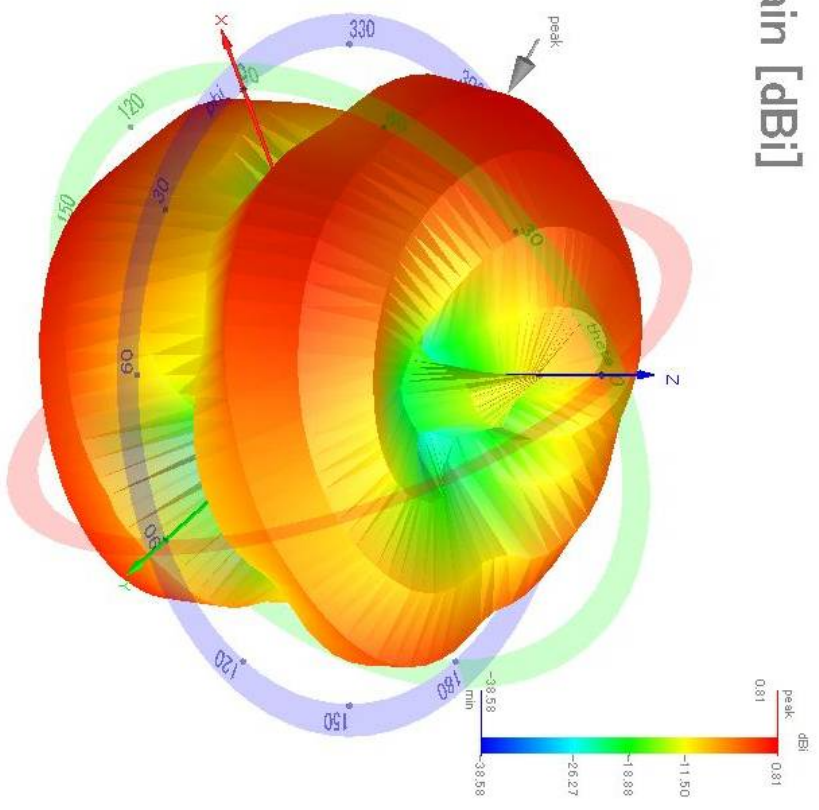
1805.000

Chart 2D

PLOT

Chart 3D Polar

Gain [dBi]



Freq. [MHz]	Polarization	Beam Peak			Beam Null			Gain[dBi]	Efficiency
		Value	Phi	Theta	Value	Phi	Theta		
1710		0.822	40	60	-38.571	185	0	-3.523	44.43%
1785		1.409	35	60	-40.715	170	0	-3.068	49.34%
1805		1.158	40	60	-38.855	-30	30	-3.366	46.07%
1850		1.052	35	60	-34.513	-10	15	-3.671	42.94%
1880		1.102	40	60	-39.524	-10	15	-3.764	42.03%
1910		0.443	40	60	-42.252	-15	30	-4.294	37.20%
1930		0.986	40	60	-41.357	-15	30	-3.727	42.40%
1990		0.652	40	60	-49.236	-10	15	-3.781	41.87%

Test Name : MGO_7180

Operator : Operator Name

Date :

Time :

Description :

Test Descriptions

Calibration : 20070102_re test

Frequency [MHz]

Plot Data Type

H-Pol

Normalization

Global Peak

Range Change

Max Amplitude

5

Chart 2D

Chart 3D Polar

PLOT