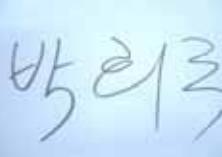
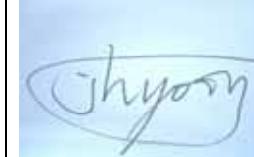


ANTENNA SPECIFICATION		DATE	2005-11-07	Rev.	IR
MODEL	CDM-9945 (Blue tooth)	TYPE	Built in Antenna	PAGE	1 / 21

APPROVAL SHEET

- ▷ Type : Built in Antenna
- ▷ Serial No. :
- ▷ Bend : Blue tooth
- ▷ Model : CDM-9945

Customer	Prepared by	Reviewed by		Approved by
Supplier	Prepared by	Checked by	Reviewed by	Approved by
				
	/	/	/	/

- ▷ Supplier : MRW Communications, Ltd
- ▷ Address : 137-7, Okum-ri, Tanhyon-myon , Paju-shi , Kyunggi-Do , Korea
- ▷ Telephone : +82-31-940-9003
- ▷ Fax. : +82-31-940-9696

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1. Approval Check List

Approval Check List				
NO	DATE	CHANGE CONTENTS	CHANGE CAUSE	REV
1	2005-11-07	Initial Release	-	IR
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

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2. Technical Specifications

2.1 Electrical Specifications

Frequency	Blue tooth	
	2400 MHz	2484 MHz
Folder Close	2.5 : 1	2.5 : 1
Folder Open	2.5 : 1	2.5 : 1

Frequency	Gain	Remark		
Blue tooth (Peak)	2400 MHz	- 5.00 dBi	AZIMUTH	Folder Close
	2484 MHz	- 5.00dBi		
	2400 MHz	- 5.00 dBi	AZIMUTH	Folder Open
	2484 MHz	- 5.00 dBi		

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2.2 Mechanical Specifications

Length	See the drawing
Temperature	-40°C ~ +70°C
Connector type	Screw

2.3 Packing Specifications

Description	Q'ty	Material	Remark
Tray	50EA	P.P	
Air Vinyl	-	Polyester	
Inner Box	20EA	SW 1 (A)	17.4Kgf/50mm min.
Master Carton Box	1,000EA	DW 1(A)	25.4Kgf/50mm min.

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3. Test Equipment

The equipment for antenna test is as follows,

- ◆ Network Analyzer (HP8752C) to measure the V.S.W.R., Standing wave ratio(SWR) and impedance bandwidth of antenna
- ◆ Standard horn antennas adjustable to the Bluetooth bands
- ◆ Anechoic Chamber installed the cables, connectors and equipments for measurements
- ◆ Digimatic Caliper to measure the dimensions
- ◆ Push/Pull gauge to measure the pulling forces
- ◆ Climatic Chamber for environmental tests

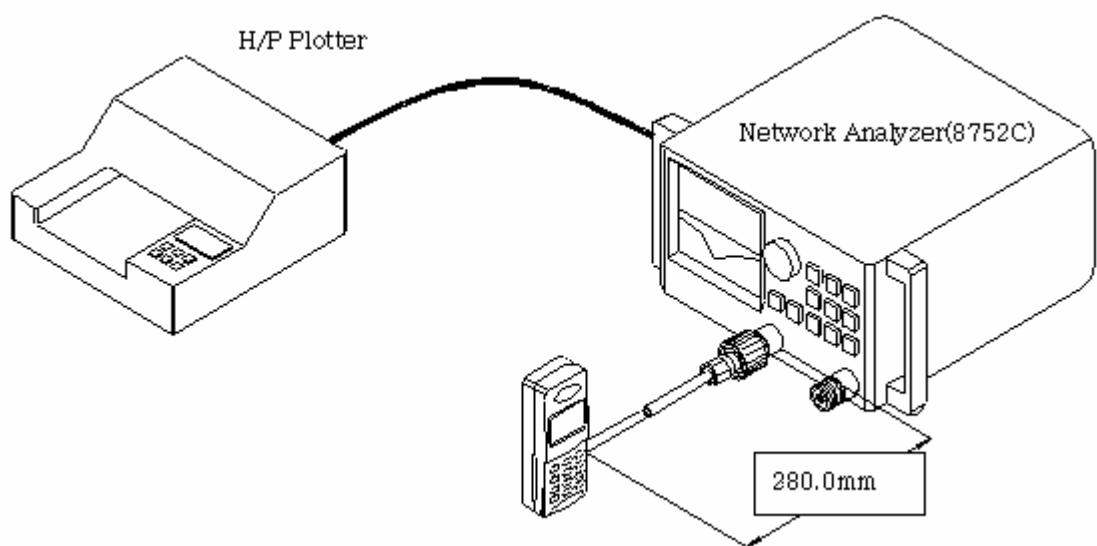
ANTENNA SPECIFICATION		DATE	2005-11-07	Rev.	IR
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4. Electrical Demands

4.1 V.S.W.R

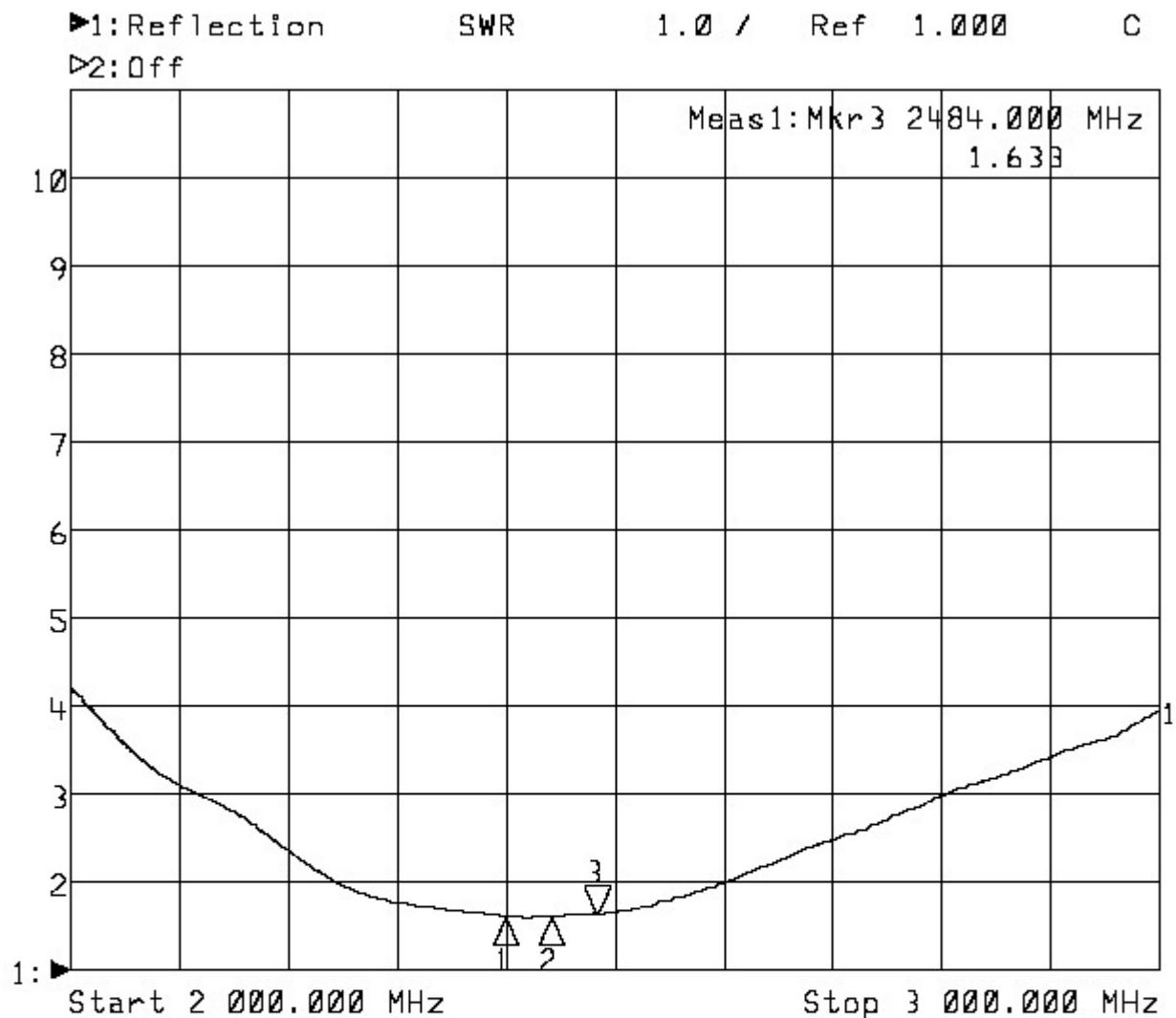
The V.S.W.R characteristics must be satisfied the electrical demands with folder open and closed state in the below table.

Frequency	Blue tooth	
	2400 MHz	2484 MHz
Folder Close	2.3 : 1	2.3 : 1
Folder Open	2.5 : 1	2.5 : 1



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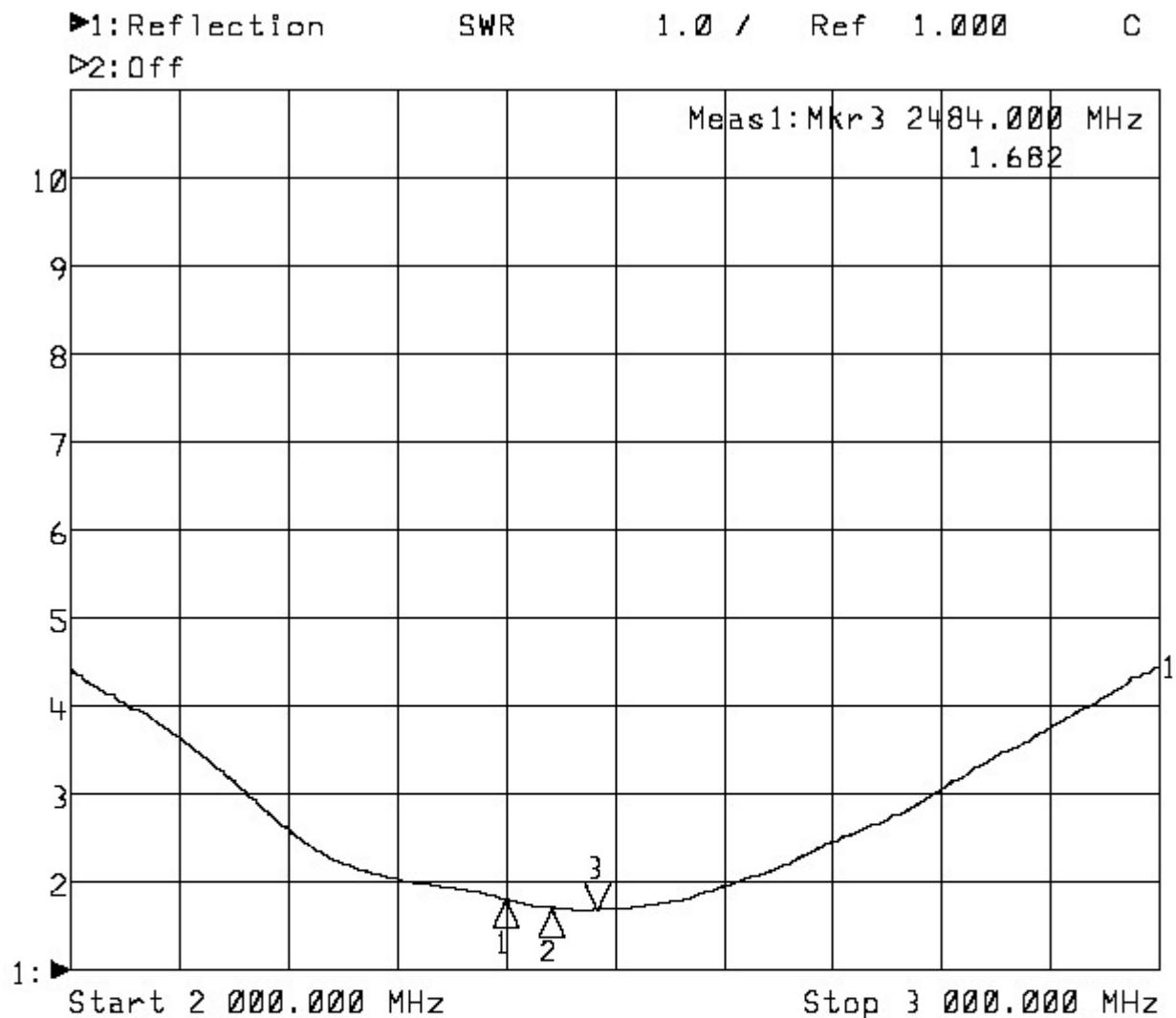
V.S.W.R <Folder Close>



1: Mkr (MHz)	2: Mkr (MHz)	dB
1: 2400.0000		1.606
2: 2442.0000		1.610
3: 2484.0000		1.633

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V.S.W.R. <Folder Open>



1: Mkr (MHz)	2: Mkr (MHz)	dB
1: 2400.0000	1.802	
2: 2442.0000	1.705	
3: 2484.0000	1.682	

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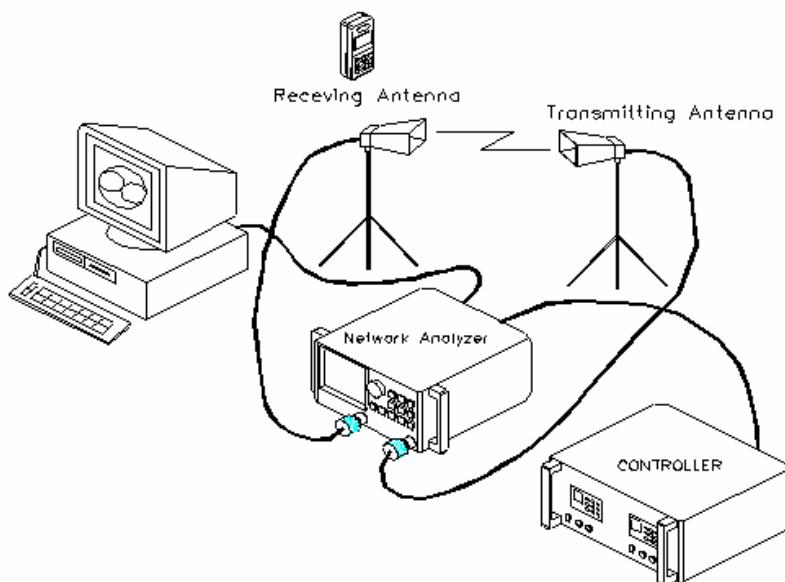
4.2 Radiation Pattern

The radiation pattern must have the omni-directional characteristic in GSM Band and DCS Band and PCS Band.

4.3 Gain

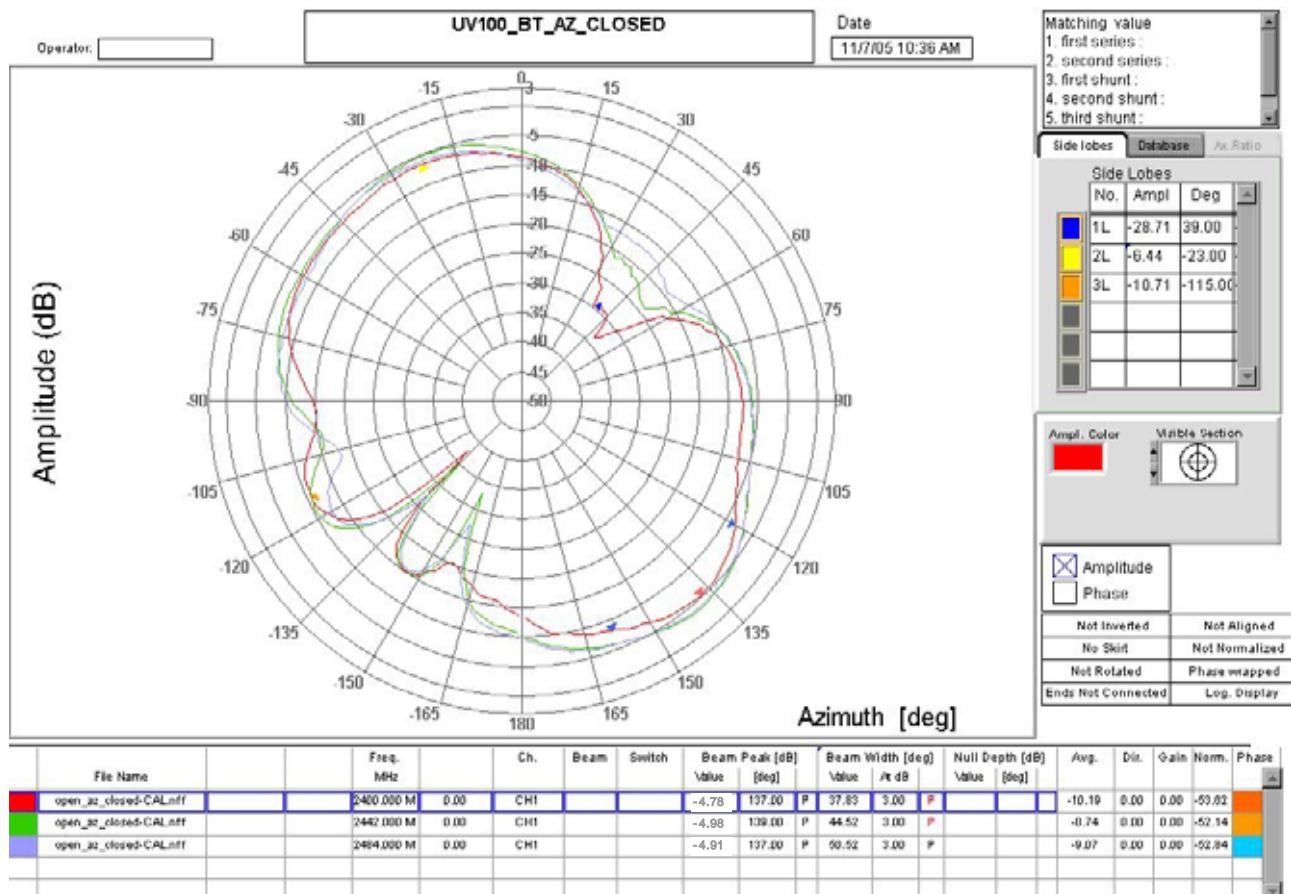
The gain is expressed as dBi. with condition (E2, H-Plane), the minimum Gain of antenna must be satisfied the electrical demands in the below table.

	Frequency	Gain	Remark	
Blue tooth (Peak)	2400 MHz	- 4.78 dBi	AZIMUTH	Folder Close
	2484 MHz	- 4.91 dBi		
	2400 MHz	- 4.84 dBi	AZIMUTH	Folder Open
	2484 MHz	- 4.94 dBi		



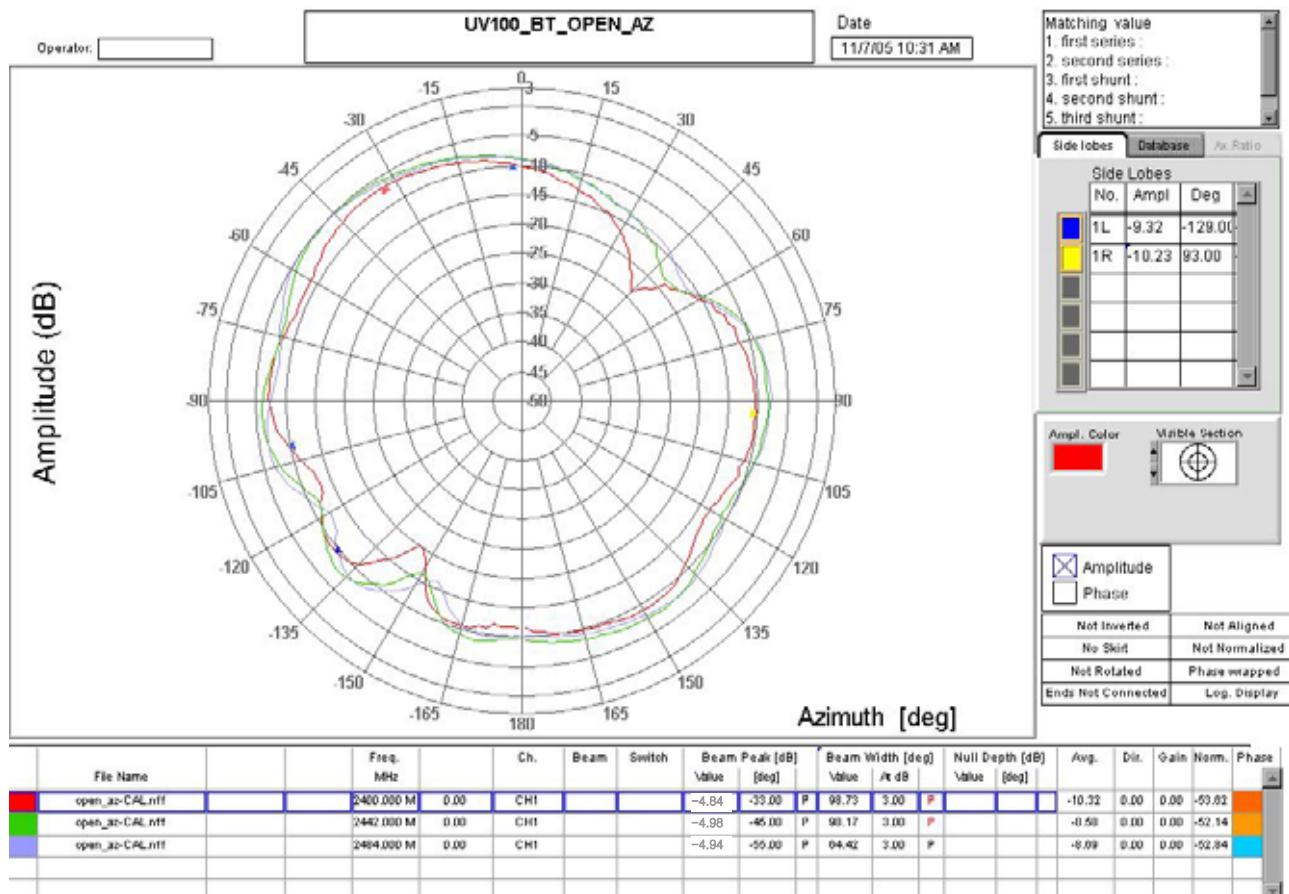
ANTENNA SPECIFICATION			DATE	2005-11-07	Rev.	IR
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Gain < AZIMUTH , Folder Close>



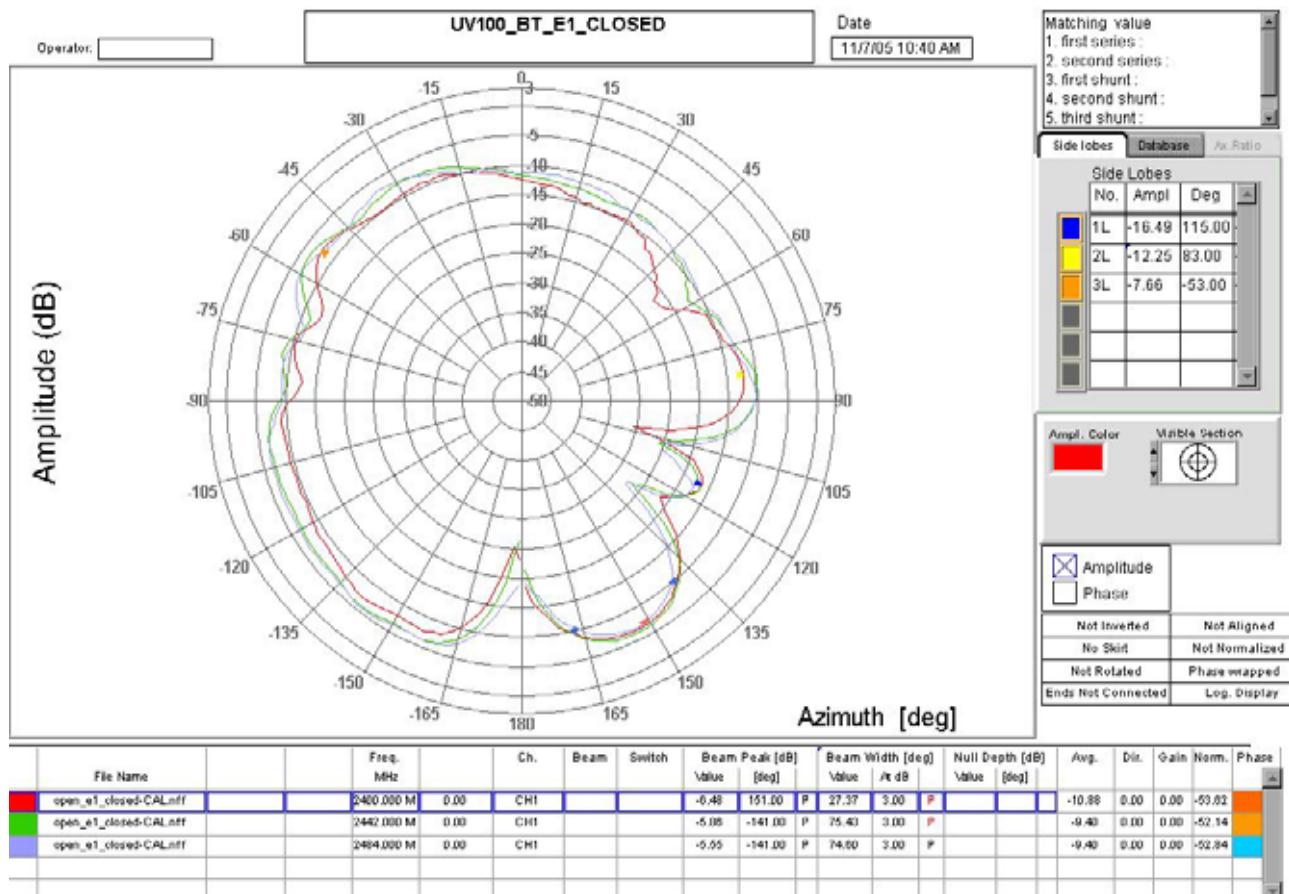
ANTENNA SPECIFICATION		DATE	2005-11-07	Rev.	IR
MODEL	CDM-9945 (Blue tooth)	TYPE	Built in Antenna	PAGE	12 / 21

Gain < AZIMUTH , Folder Open>



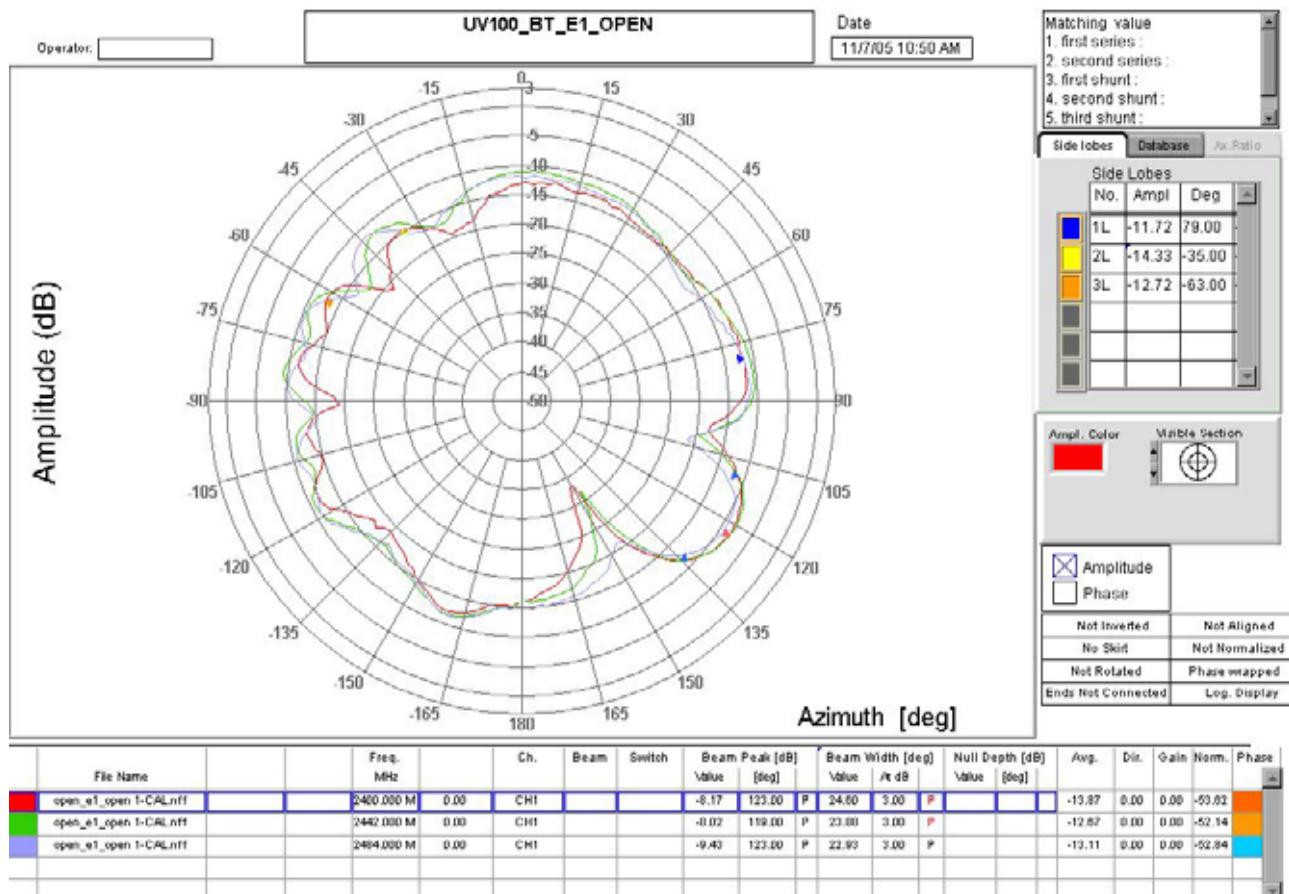
ANTENNA SPECIFICATION			DATE	2005-11-07	Rev.	IR
MODEL	CDM-9945 (Blue tooth)		TYPE	Built in Antenna	PAGE	13 / 21

Gain < E1 , Folder Close>



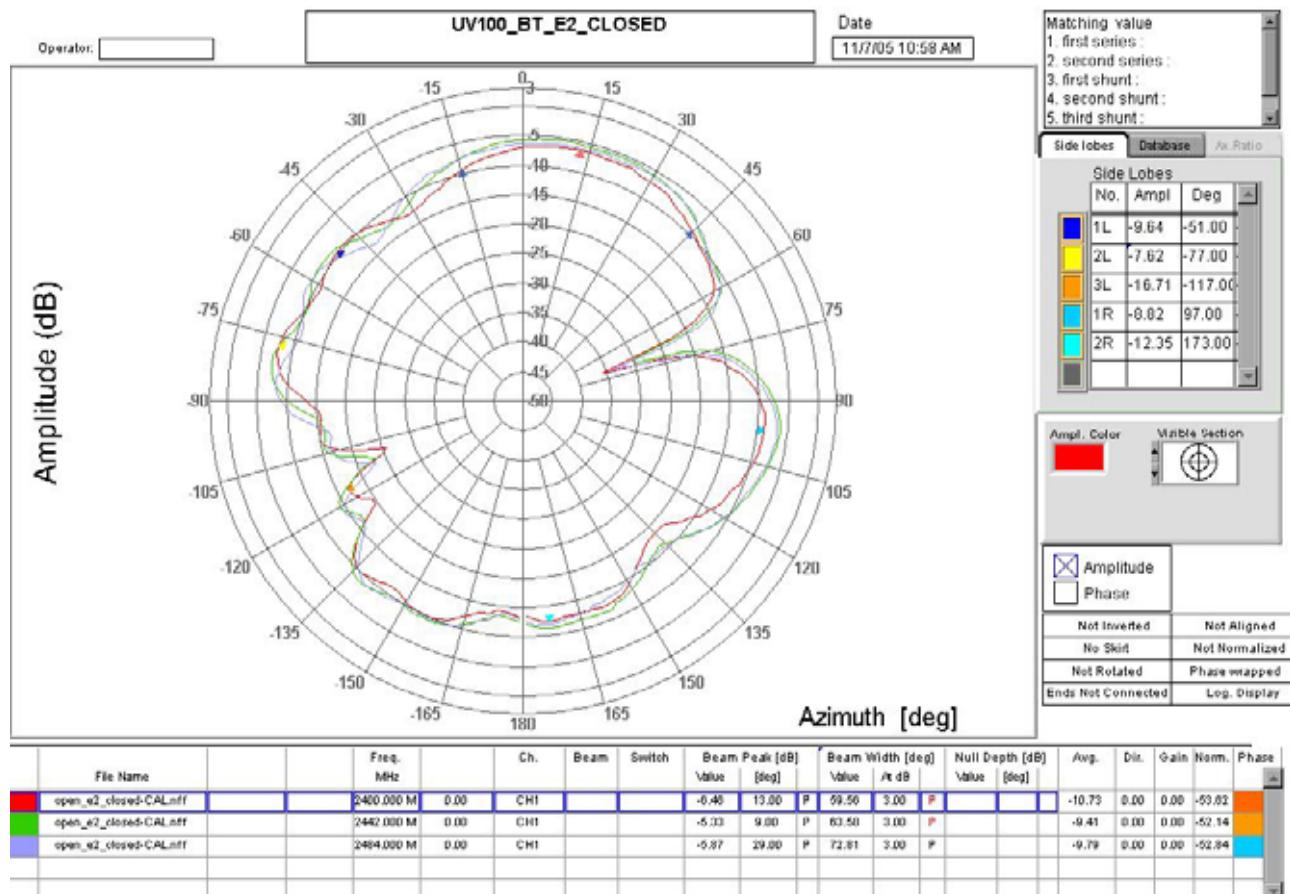
ANTENNA SPECIFICATION			DATE	2005-11-07	Rev.	IR
MODEL	CDM-9945 (Blue tooth)		TYPE	Built in Antenna	PAGE	14 / 21

Gain < E1 , Folder Open>



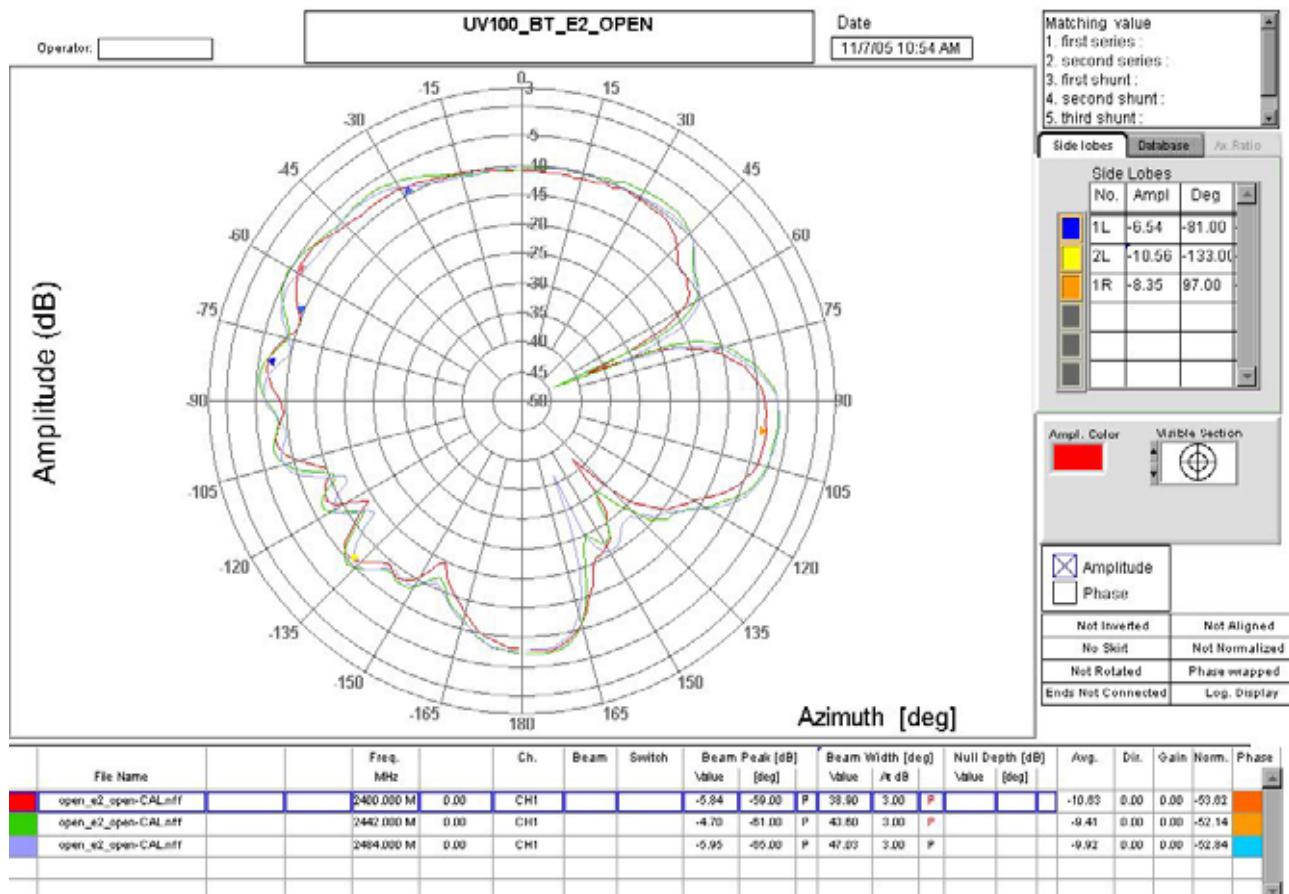
ANTENNA SPECIFICATION			DATE	2005-11-07	Rev.	IR
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Gain < E2 , Folder Close>



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Gain < E2 , Folder Open>



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5. Mechanical Demands

5.1 Contact Part Operate Force Test

The antenna Contact Pin from inside (tolerance inclusion) working distance 50~450 g/f must maintain.

(The working distance of the antenna is with the lower part plan together 0.5mm~1.80mm.)

5.2 Drop Test

The antenna is attached to the handset. The handset is dropped with the antenna downward onto a concrete surface at 1.5 m height and angle D(45°). The number of drop is 2 times.

After the test, the original shape shall be possible to restore. The antenna shall satisfy the electrical demands.

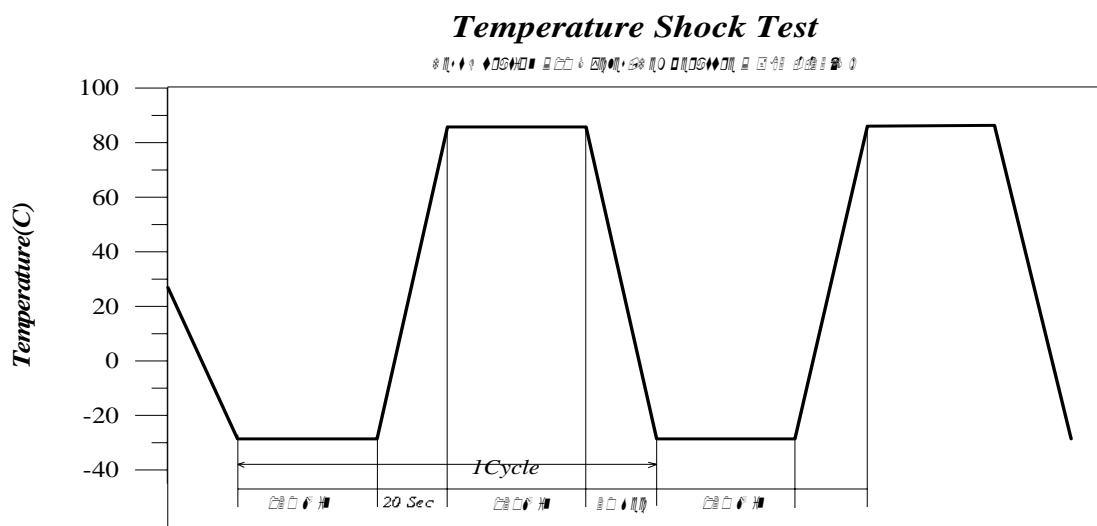
ANTENNA SPECIFICATION		DATE	2005-11-07	Rev.	IR
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6. Environmental Demands

6.1 Thermal Shock

The antenna shall withstand 10 repeated cycles of 120 minutes at -25°C and 120 minutes at +85°C with a maximum transition time between temperature extremes of 20 seconds.

The antenna shall satisfy the electrical specification after the test. The antenna shall have no deterioration after the test.



6.2 Temperature Cycling

The antenna is placed in the temperature chamber with -40 for 3 hours and measured after taking out of chamber.

After that, the antenna is again placed in the temperature chamber with +70°C for 3 hours and measured after taking out of chamber.

The antenna shall not be any visible damage and it shall meet electrical spec.

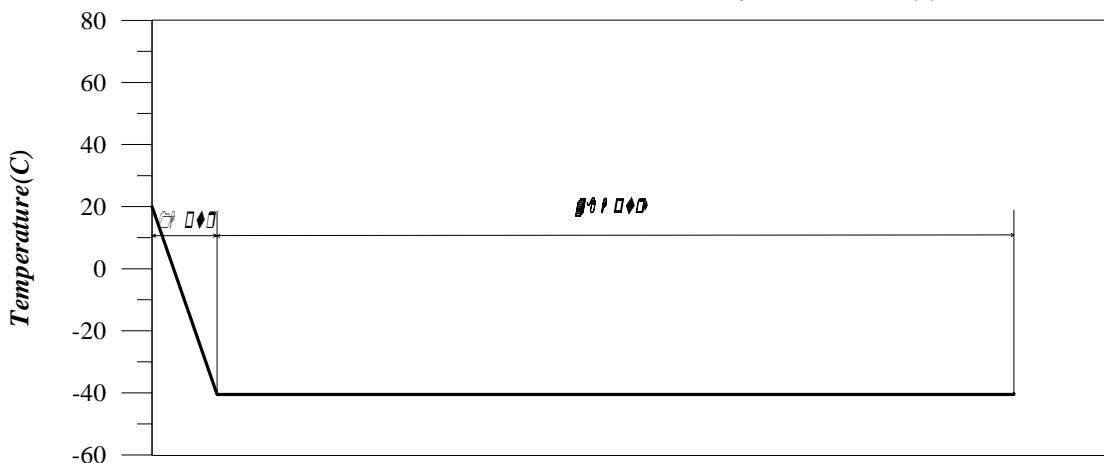
ANTENNA SPECIFICATION		DATE	2005-11-07	Rev.	IR
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6.3 Low Temperature Test

The antenna is placed in the temperature chamber with -40°C for 48 hours and measured after taking out of chamber. The antenna shall not be any visible damage and it shall meet electrical spec.

Low Temperature Test

Duration : 48 Hours, Temperature : -40°C



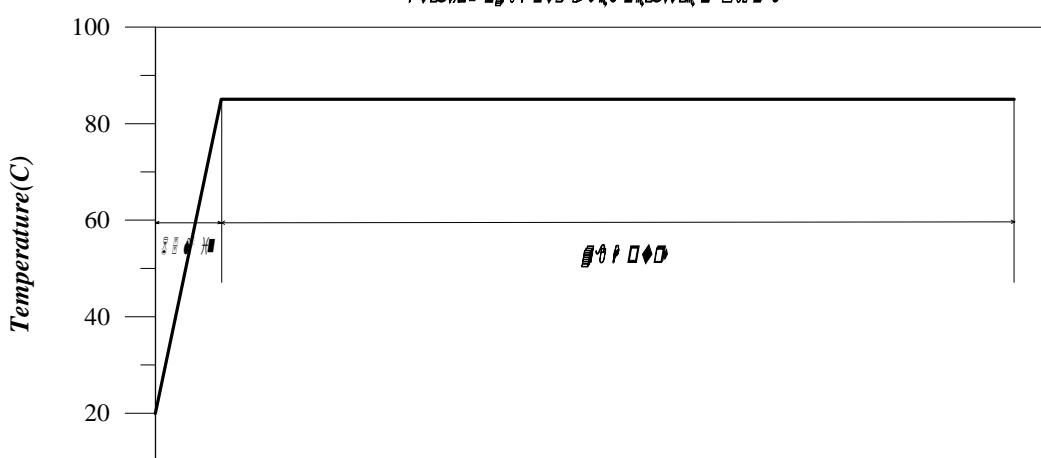
6.4 High Temperature Test

The antenna is placed in the temperature chamber and test it under below condition and measured it after taking out of chamber.

The antenna shall not be any visible damage and it shall meet electrical spec.

High Temperature Test

100 90 80 70 60 50 40 30 20



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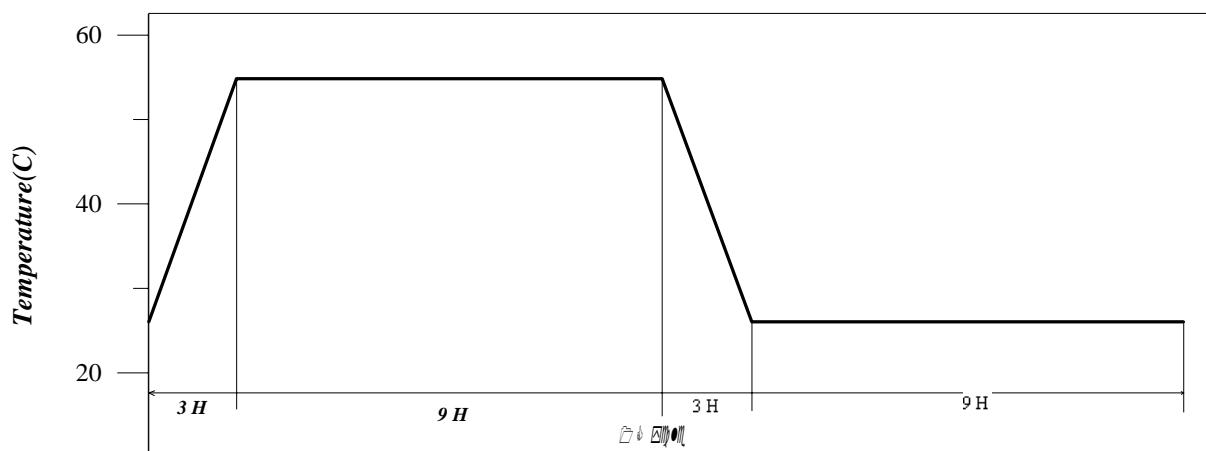
6.5 Humidity Test

The antenna is placed in the temperature chamber and test it under below condition and measured it after taking out of chamber.

The antenna shall not be any visible damage and it shall meet electrical spec.

Temperature Change in High Humidity

01 02 03 04 05 06 07 08 09 010 011 012 013 014 015 016 017 018 019 020 021 022



6.6 Salt Spray Test

The antenna shall be exposed for 48 hours at +35°C to a 5% Sodium Chloride fog and have no appearance or function changes after the test.

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7. Antenna Drawing

