Antenna Specifications

Model	P9060_BT/WIFI	Date	2011.04.18
Part No.	AWF110A7	Part App. No.	AWF110A7
Rev.	IR	Customer	PANTECH
Section	■ WS 2`ND		
System	Mobile phone for AT&T		
Note	BT / WIFI ANTENNA		

PANTECH		Checked By R&D RF	Checked By R&D Mech	Checked By	Reviewed By
	Name				
	Signature				
AT&C		Checked By R&D RF	Checked By R&D Mech	Checked By QA	Approved By
	Name	Bae Dong-Oh	Cho JeaBum	PARK SUNG KI	KIM CHANG RAE
	Signature				

Prepared	Model	Type	Date	Document No	AT&C Rev.	Customer.
AT&C	P9060_BT/WIFI	FPCB	2011.04.18	-	IR	PANTECH

Table of Contents

1. Approval History

Prepared	Model	Type	Date	Document No	AT&C Rev.	Customer.
AT&C	P9060_BT/WIFI	FPCB	2011.04.18	-	IR	PANTECH

Approval History

NO	DATA	Reason	REV
1	2011.04.18	-	IR
2			
3			
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10			
11			
12			
13			
14			
15			
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17			

2. GENERAL

Prepared	Model	Type	Date	Document No	AT&C Rev.	Customer.
AT&C	P9060_BT/WIFI	FPCB	2011.04.18	-	IR	PANTECH

2.1 PROCUCT DESCRIPTION

TYPE	FPCB PIFA

2.2 PART No.

AT&C Part No.	AWF110A7
Part No.	AWF110A7

2.3 PRINT ACCEEPTANCE

Sample and a Page one drawing was sent to customer. When they are approval From should be completed, signed, and sent back to AT&C before further mass Production batches can be delivered.

2.4 UNITS, DEFINITIONS, AND ABBREVIATIONS

Unless otherwise stated, SI unite are used.

Tx	Transmit Band
Rx	Receive Band
PCB	Printed Circuit Board
VSWR	Voltage Standing Wave Ratio
CW	Continuous Wave
G	Acceleration of gravity(appox. 9.8 ㎨)
RH	Relative Humidity

2.4.1 " Without mechanical Damage"
Implies full mechanical functionality according to specification and compliance with visual requirements according to specification drawing.

2.4.2 " Without permanent mechanical damage"
As above but allows reversible misalignment or deformation and minor visual damage (no through-cuts or holes)

2.4.3 " Unimpaired functionality"
Implies full mechanical functionality according to specification but allows visual damage (no though-cut or hole)

2.5 INTERFACE

All properties are guaranteed under the condition that antenna/handset interface is designed in accordance with instructions provided by AT&C. the whole

interface should be included in the specification. Functionality with other equipment (such as couplers etc.) is not guaranteed unless this has been agreed upon separately.

2.6 CONDITION

Unless otherwise stated all temperature are ±3 ℃and all RH tolerance ±5 ℃units.
Unless otherwise stated all values are valid at ±20 ℃and 50%RH
Unless otherwise stated all values are valid for the radio defined in 2.4

3. ELECTRICAL PROPERTIES

3.1 SAMPLES SIZE

All the tests will be conducted as below :
I. The VSWR will be measured for 30 Sample and CPK analysis will be conducted.
II. The radiation pattern will be measured on one sample.

3.2 FREQUENCY BAND

BT / WIFI
2400Mhz ~ 2500Mhz

3.3 IMPEDANCE

3.3.1 Nominal Value : 50ohm
3.3.2 Method
AT&C will supply engineering assistance to assistance to ensure that the impedance over the frequency band is as close to 50 ohms as possible after matching.

3.4 THE RADIO(PHONE/HANDSET)

3.4.1 Radio Revision

Model Name	P9060_BT / WIFI

3.4.2 Matching circuit
Values of components were for reference here, final value pending to tune by customer themselves.

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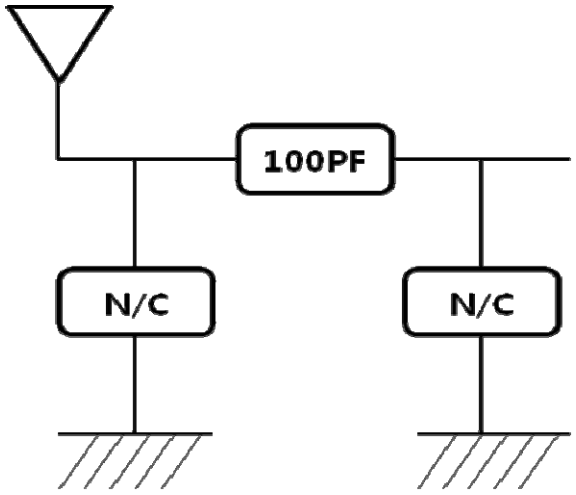
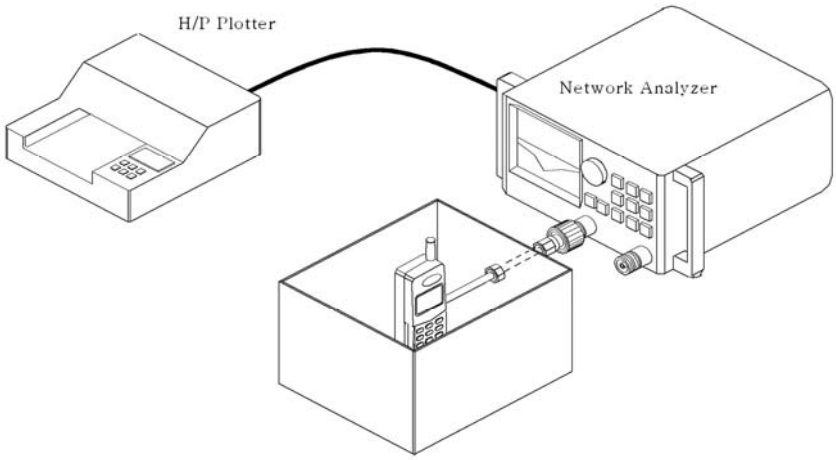


3.5 VSWR

3.5.1 Method of Measurement

A 50ohms coaxial cable is connected(soldered) to the 50 ohms feeding point on the PCB.the connection of the coaxial cable is done so as to introduce a minimum of mismatch. In other end, the coaxial cable is connected to a network analyzer. The analyzer is calibrated so that reference plane is at the 50 ohms feeding point. The radio, including the PCB must not any significant way differ from the mass produced radio, E.G. the antenna feeding parts have to be equivalent to the part in mass production.
Free space means that the radio is attached to a nonconductive surface.



3.5.2 Electrical performance Assurance.

In order to guarantee the specified electrical performance in mass production the following procedure is used (example. given for single band antenna.)
During the development phase, two antennas are selected; on defining the lowest allowable resonance frequency (when measured on the handset),

marked "low freq" an one defining the highest allowable resonance frequency, marked "high freq" See Frgure-2 These antennas are reference antennas. These antennas are then measured on a ground plane used in mass production and define the highest and lowest allowable resonance frequencies on this ground plane and each produced antenna is automatically tested on this ground plane.

3.6 ELECTRICAL SPECIFICACTION & TEST DATA

Electrical Spec.		BT / WiFi	
		2.400MHz	2.500MHz
VSWR	PHONE	Less than 3.02:1	Less than 3.7:1
	JIG	-	-

		BT / WiFi					
		2.400Mhz	2.420Mhz	2.440Mhz	2.460Mhz	2.480Mhz	2.500Mhz
Peak. Gain	H	-2.77	-4.00	-3.81	-3.62	-5.20	-5.98
	E1	-1.11	-2.20	-1.92	-1.75	-3.28	-3.76
	E2	-1.59	-2.79	-2.26	-1.77	-3.31	-4.21

TEST DATA		BT / WiFi	
		2.400MHz	2.500MHz
VSWR	PHONE	2.017	2.663
	JIG	-	-

		BT / WiFi					
		2.400Mhz	2.420Mhz	2.440Mhz	2.460Mhz	2.480Mhz	2.500Mhz
Peak Gain	H	-1.77	-3.00	-2.81	-2.62	-4.20	-4.98
	E1	-0.11	-1.20	-0.92	-0.75	-2.28	-2.76
	E2	-0.59	-1.79	-1.26	-0.77	-2.31	-3.21

[VSWR]

Antenna Internal Description

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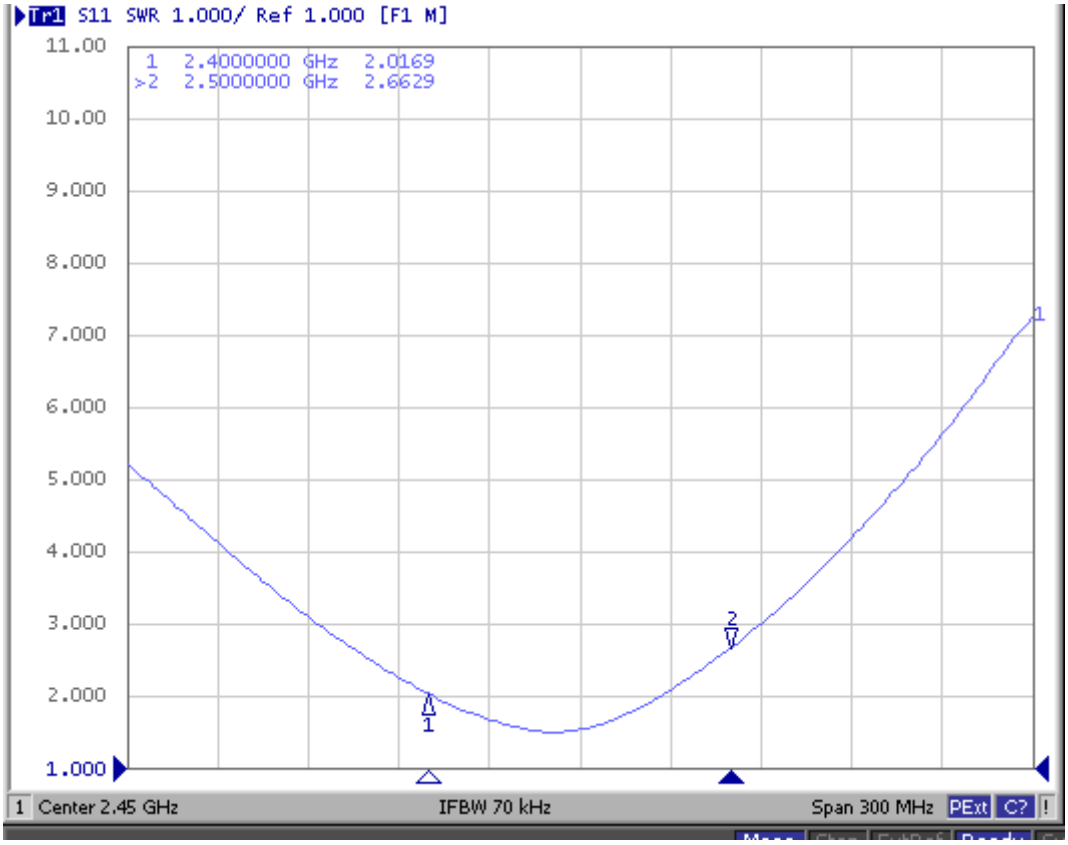


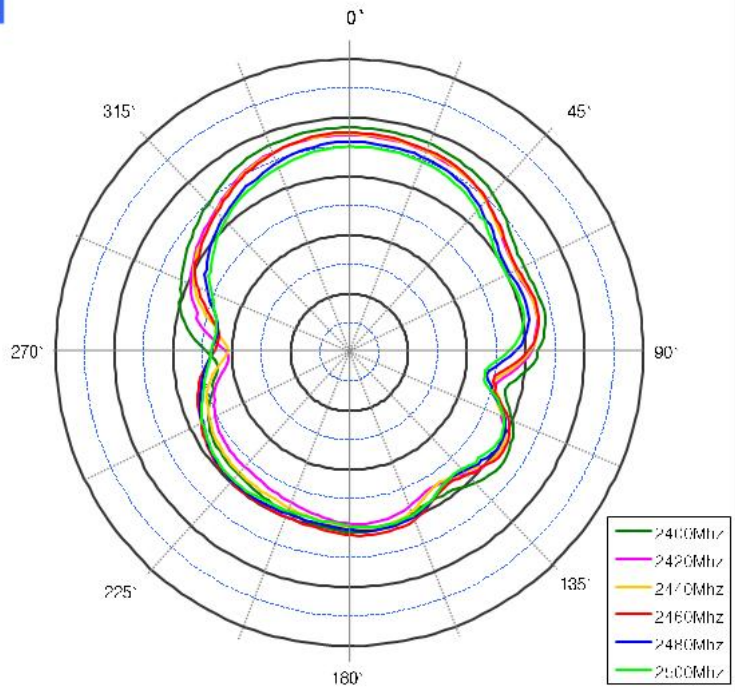
(HAND SET)

Prepared	Model	Type	Date	Document No	AT&C Rev.	Customer.
AT&C	P9060_BT/WIFI	FPCB	2011.04.18	-	IR	PANTECH

Gain & Radiation Pattern

Model Name:	FileName
Test Band :	BT / WIFI
Test Date :	
Tester Name:	
User Name :	
Memo :	

Frequency	Max.	Min.	Avg.	Beam Peak
2400Mhz	-1.77	-17.36	-6.39	2`
2420Mhz	-3.00	-19.42	-7.87	358`
2440Mhz	-2.81	-19.27	-7.79	358`
2460Mhz	-2.62	-17.61	-7.45	358`
2480Mhz	-4.20	-17.33	-8.79	4`
2500Mhz	-4.98	-16.96	-9.43	6`

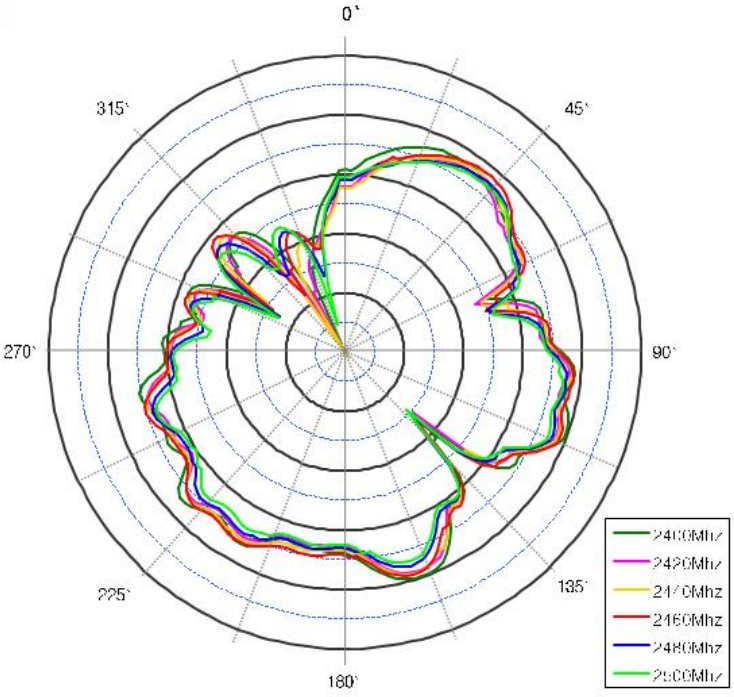


(H-Plan)

Gain & Radiation Pattern

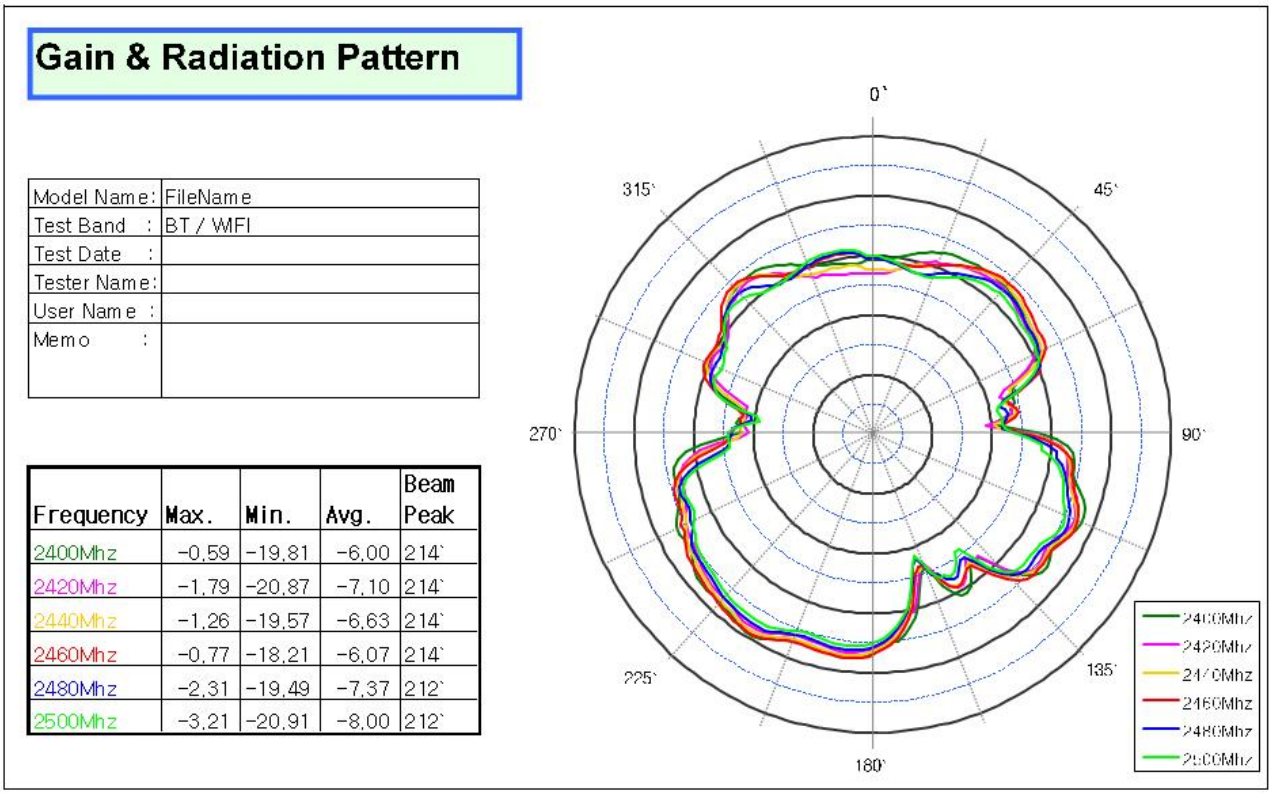
Model Name:	FileName
Test Band :	BT / WIFI
Test Date :	
Tester Name:	
User Name :	
Memo :	

Frequency	Max.	Min.	Avg.	Beam Peak
2400Mhz	-0.11	-38.77	-5.38	160`
2420Mhz	-1.20	-37.57	-6.54	162`
2440Mhz	-0.92	-41.11	-6.15	162`
2460Mhz	-0.75	-28.27	-5.62	164`
2480Mhz	-2.28	-27.29	-6.88	112`
2500Mhz	-2.76	-35.13	-7.43	100`



(E1-Plan)

Prepared	Model	Type	Date	Document No	AT&C Rev.	Customer.
AT&C	P9060_BT/WIFI	FPCB	2011.04.18	-	IR	PANTECH



(E2_Plan)

4. MECHANICAL PROPERTIES

Prepared	Model	Type	Date	Document No	AT&C Rev.	Customer.
AT&C	P9060_BT/WIFI	FPCB	2011.04.18	-	IR	PANTECH

4.1 SAMPLES SIZE

All the tests will be conducted on 20 samples.

4.2 APPEARANCE

The appearance shall be according to specification drawing

4.3 CTQ

4.4 DROP TEST

4.4.1 Post Test Requirements

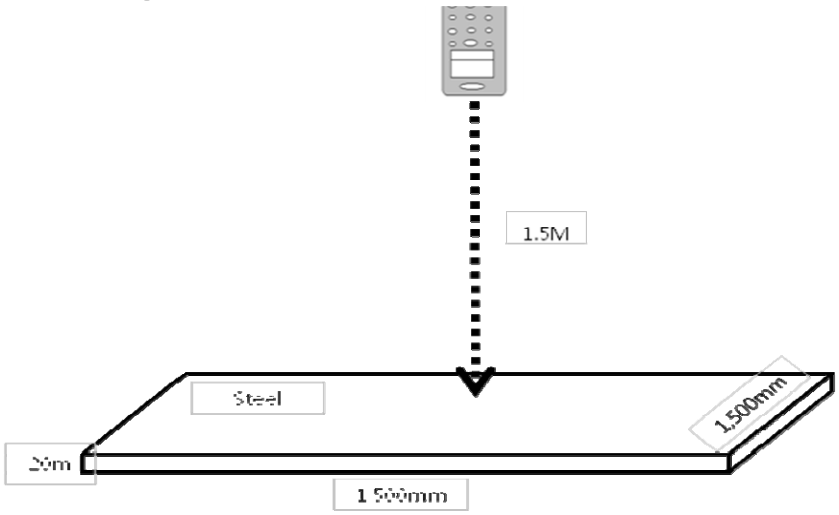
The antenna satisfies the electrical data.

4.4.2 Procedure

The antenna is attached to handset
(if available, otherwise to test fixture of equal weight).
The handset is dropped, with antenna pointing down, onto a steel surface.

Drop height	1.5m
Handset weight	95g
Cycle	5Cycle
Angle	Handset is falling without any steering antenna should hit the steel surface. Test in each six(6) angles of the handset (1500x1500x20mm thick steel plate)

4.4.3 Equipment settings



5. ENVIRONMENTAL RESISTANCE PROPERTIES

5.1 SAMPLE SIZE

All the tests will be conducted on 5sample of set JIG and 10samples of test jig

5.2 HIGH TEMPERATURE

Temperature	+ 85℃
Time	Each 96 hours

5.2.1 Post Test Requirement

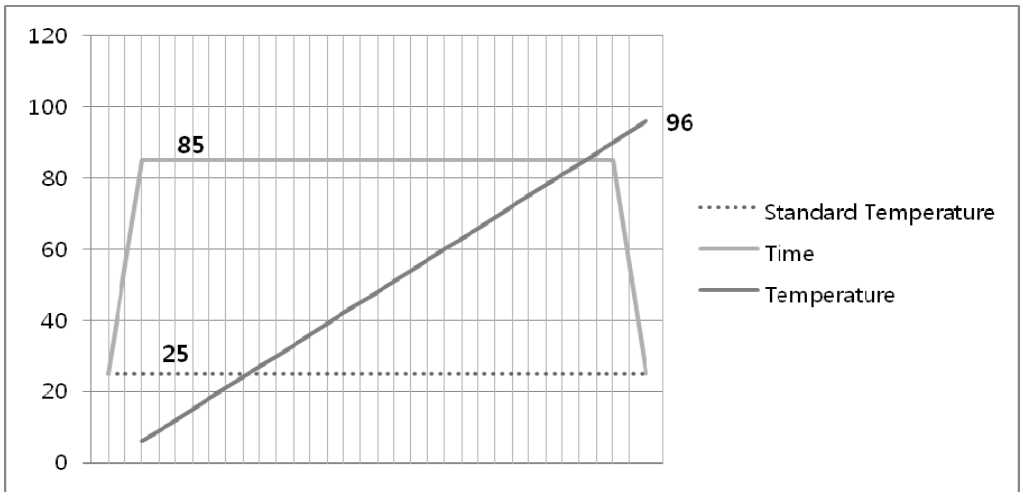
5.2.2 No visual, fitting or mold changes have been observed after the test.

Test antenna satisfied the electrical data

5.2.3 Procedure

Set temperature to +85℃ per one hour. Keep the temperature for 96 hours.

5.2.4 Equipment settings



5.3 LOW TEMPERATURE

Temperature	-35℃
Time	Each 96 hours

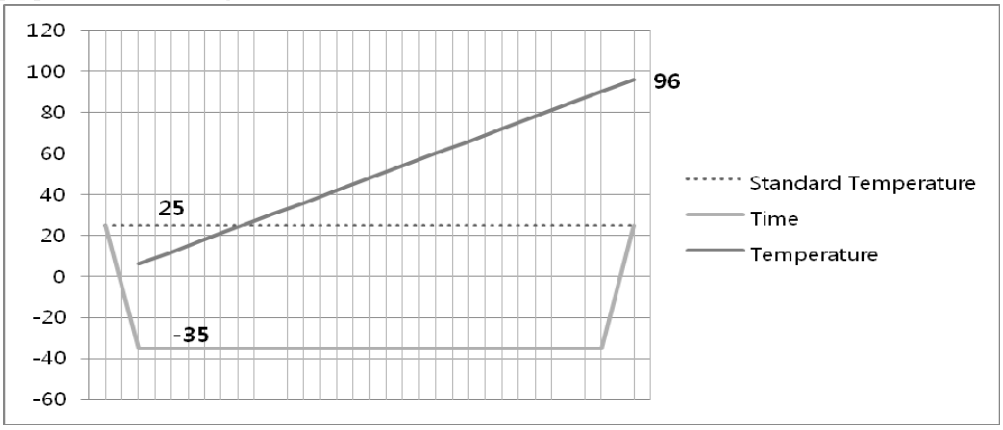
5.3.1 Post Test Requirement

No visual, fitting or mold changes have been observed after the test.
Test antenna satisfied the electrical data

5.3.3 Procedure

Set temperature to -35℃ per one hour. Keep the temperature for 96 hours.

5.3.4 Equipment settings



5.4 HUMIDITY

5.4.1 Condition : 85℃±5%RH / +85℃

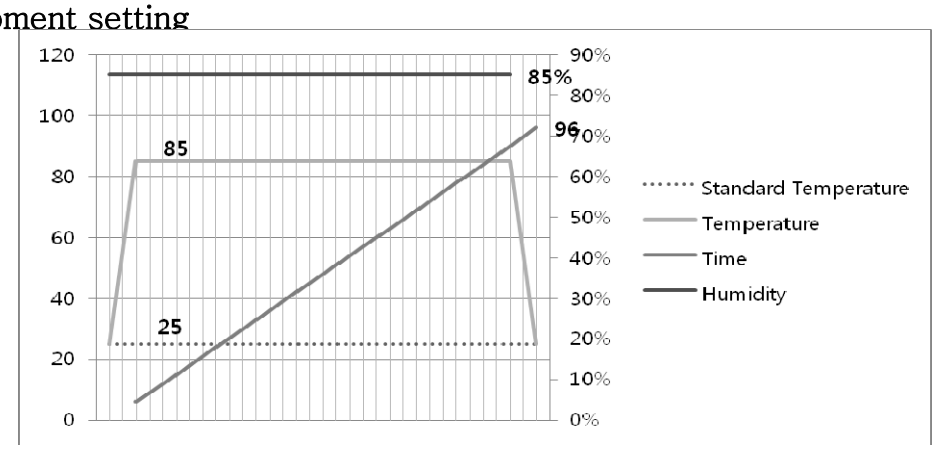
5.4.2 Post Test Requirements

No visual, fitting or mold change have been observed after the test.
The antenna satisfied the electrical data.

5.4.3 Procedure

Set temperature & humidity to +85℃/ 85% per one hour. Keep the temperature & humidity for 96 hours

5.4.4 Equipment setting



5.5 SALT SPRAY

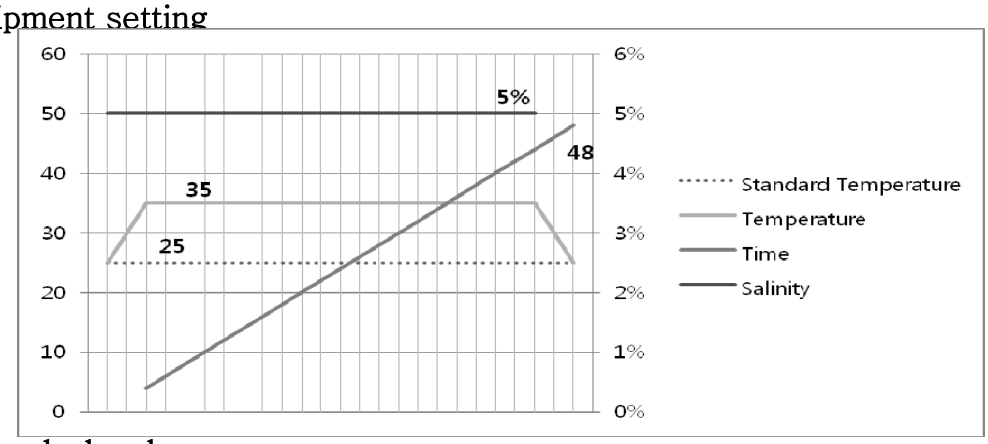
5.5.1 Post Test Requirements

No visual, fitting or mold changes have been observed after the test.
Test antenna satisfied the electrical data

5.5.2 Procedure

The antenna is placed in an atmosphere saturated by 5% (by weight) sodium chloride solution for 48 hours at + 35 ℃

5.5.3 Equipment setting



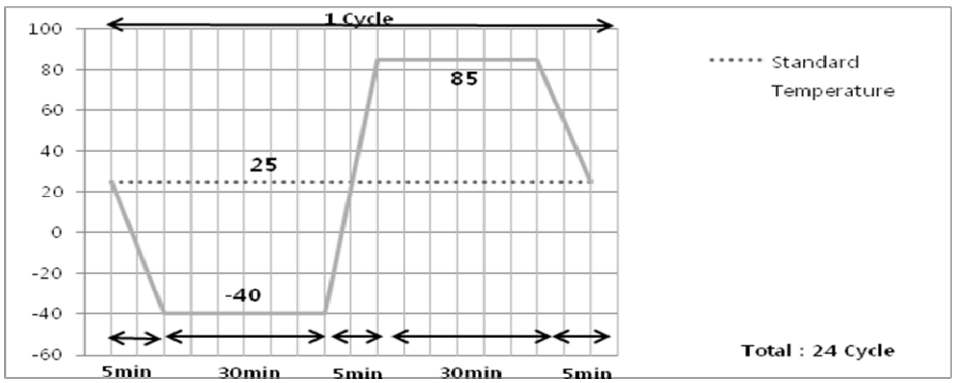
5.6 Thermal shock

5.6.1 Post Test Requirements

No visual, fitting or mold changes have been observed after the test.
Test antenna satisfied the electrical data

5.6.2 Procedure

The antenna is placed in a climatic chamber. The temperature is cycle as follows : The temperature is kept constant at -40℃ for 30 minutes and is kept constant at + 85 ℃for another 30 minutes.
This procedure is repeated 24 times.



6. SPECIFICATIONS DRAWINGS

6.1 Part List

No.	PART NAME	Material	Description	Quantity
1	FPCB	CCL	INNOX	1

2	Tape	300A100	KGK 0.1T	1

6.2 Assembly Drawing

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