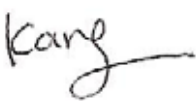




Antenna Specifications

(iM Main)

Pantech Co.,Ltd		Checked By R&D RF	Checked By R&D Mech	Checked By	Reviewed By	Approved By
	Name					
	Signature					

Laird Technologies Korea		Checked By R&D RF	Checked By R&D Mech	Checked By QA	Approved By
	Name	Sunny Kang	Truman Lee	Eugene Park	Tommy Goh
	Signature				

Supplier: Laird Technologies Korea
Address: 4th Floor, Woorim Lions Valley A, 371-28, Gasan-dong, Geumcheon-gu,
Seoul, Korea(Zip Code : 153-786)
Telephone: +82 – 2 – 830 - 2095
Sales Representative : Hyuk-Jin Han

Product Family:	Internal Antenna	
Model Name :	iM Main	
Maker Part No.:	712189.0001	Revision: 1.0
Customer :	Pantech Co., Ltd	
Customer Part No. :	53C03000152	Revision: 1.0

Purpose

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The information contained herein is the property of **Laird Technologies Korea**, and is intended solely for contractual use between **Laird Technologies Korea** and **Pantech Co., Ltd**

The product specification is a complete description of the product only together with the specification drawing.

Approval History

REV	Date	Front	After	Reason
1.0	Mar. 14 th 2008	-	-	Initial release



Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

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1 GENERAL

1.1 PRODUCT DESCRIPTION

An Internal Antenna System.

1.2 PART No.

Laird Technologies Korea Part No. **712189.0001**

1.3 PRINT ACCEPTANCE

Samples and a page one drawing was sent to customer. When they are approved, the approval form should be completed, signed, and sent back to Laird Technologies Korea before further mass production batches can be delivered.

1.4 UNITS, DEFINITIONS, AND ABBREVIATIONS

Unless otherwise stated, SI units are used.

Tx	Transmit Band
Rx	Receive Band
PCB	Printed Circuit Board
VSWR	Voltage Standing Wave Ratio
dBi	Antenna gain in dB (Isotropic)
CW	Continuous Wave
g	Acceleration of gravity (approx. 9.8 m/s ²)
RH	Relative Humidity

1.4.1 “Without mechanical damage”

Implies full mechanical functionality according to specification and compliance with visual requirements according to specification drawing.

1.4.2 “Without permanent mechanical damage”

As above but allows reversible misalignment or deformation and minor visual damage (no through-cuts or holes).

1.4.3 “Unimpaired functionality”

Implies full mechanical functionality according to specification but allows visual damage (no through-cuts or holes).

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1.5 INTERFACE

All properties are guaranteed under the condition that antenna/handset interface is designed in accordance with instructions provided by Laird Technologies Korea. 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.

1.6 CONDITIONS

Unless otherwise stated all temperature tolerances are ± 3 and all RH tolerances are ± 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

1.7 COORDINATE SYSTEM

The coordinate system for the phone is defined as follows:

- Origin is in center of gravity.
- Positive X axis is perpendicular to, and directed from the front plane.
- Positive Y axis is perpendicular to, and directed from the right side plane (as seen from front).
- Positive Z axis is perpendicular to, and directed from the top plane.

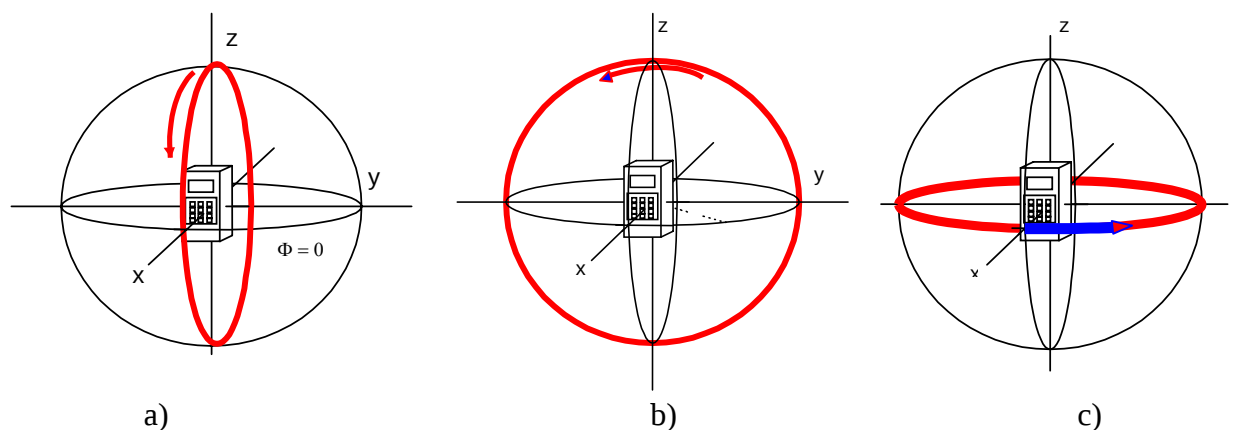


Figure 1-1: a) E_2 -plane b) E_1 -plane c) H-plane

1.8 OPERATING TEMPERATURE

Range : -30°C. to 70°C.

1.9 STORAGE TEMPERATURE

Range : -30°C. to 70°C. (component only)



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1.10 HANDLING CONDITIONS

Operator should follow handling conditions as below.

1. Handle with care. (wear gloves)
2. Do not press too much or bend the product.
3. Do not touch the contact area.
4. Follow general instructions for handling goods in your working place in regard to others that is not mentioned above.

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2 ELECTRICAL PROPERTIES

2.1 SAMPLES SIZE

All the tests will be conducted as below:

- The VSWR will be measured for 30 samples and a Cpk analysis will be conducted,
- The radiation patterns will be measured on one sample.

2.2 FREQUENCY BANDS

CDMA : Tx: 824 – 849 MHz
Rx: 869 – 894 MHz
PCS : Tx: 1850 – 1910 MHz
Rx: 1930 – 1990 MHz

2.3 IMPEDANCE

2.3.1 *Nominal Value: 50 Ohms*

2.3.2 *Method*

Laird Technologies Korea will supply engineering assistance to ensure that the impedance over the frequency bands is as close to 50 ohms as possible after matching.

2.4 THE RADIO (PHONE / HANDSET)

2.4.1 *Radio Revision*

Model Name : PANTECH iM

2.4.2 *Matching circuit*

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

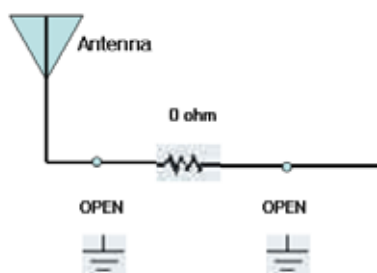


Figure 2-1 Matching Circuit

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

2.5 VSWR

2.5.1 Method of Measurement using passive phone (engineering)

A 50 ohms 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 the other end, the coaxial cable is connected to a network analyzer. The analyzer is calibrated so that the reference plane is at the 50 ohms feeding point. The radio, including the PCB must not in any significant way differ from the mass produced radio, e.g. the antenna feeding parts have to be equivalent to the parts in mass production. Free space means that the radio is attached to a nonconductive surface.

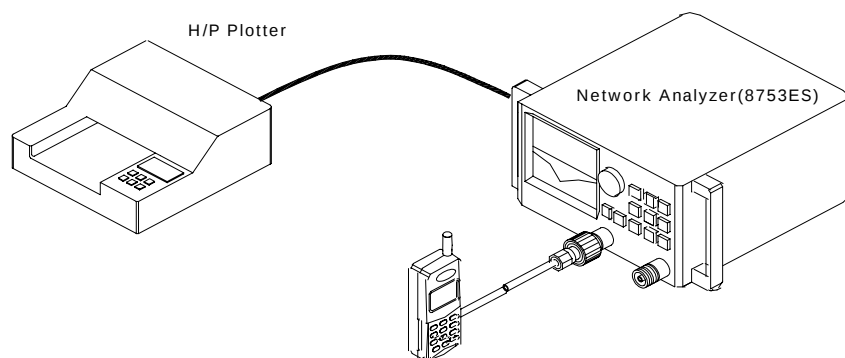


Figure 2-2 VSWR Measurement System

2.5.2 Method of Measurement using jig (production)

In mass production, it is not practical to use the handset supplied by customer. Laird Technologies Korea will design a representative production test fixture for use on the process that require electrical test. The result of the fixture will be correlated to the results obtained on the customer's handset.

2.5.3 Electrical Performance Assurance

In order to guarantee the specified electrical performance in mass production the following procedure is used (example given for a single band antenna). During the development phase, two antennas are selected; one defining the lowest allowable resonance frequency (when measured on the handset), marked "low freq.", and one defining the highest allowable resonance frequency, marked "high freq.", see Figure 2-3.

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.

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Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

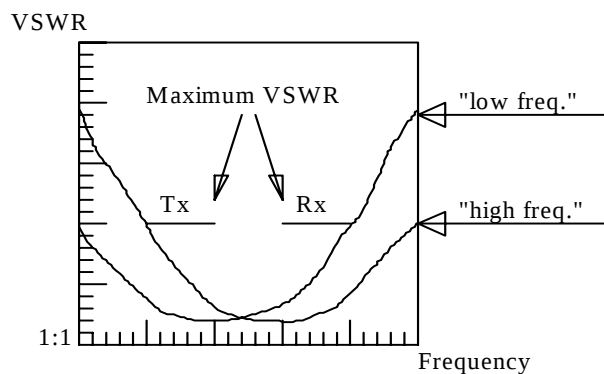


Figure 2-3 Reference antennas defining the lowest and highest

2.6 GAIN (PEAK AND AVERAGE)

Below typical antenna gain values are based on the Horn antenna measurement.

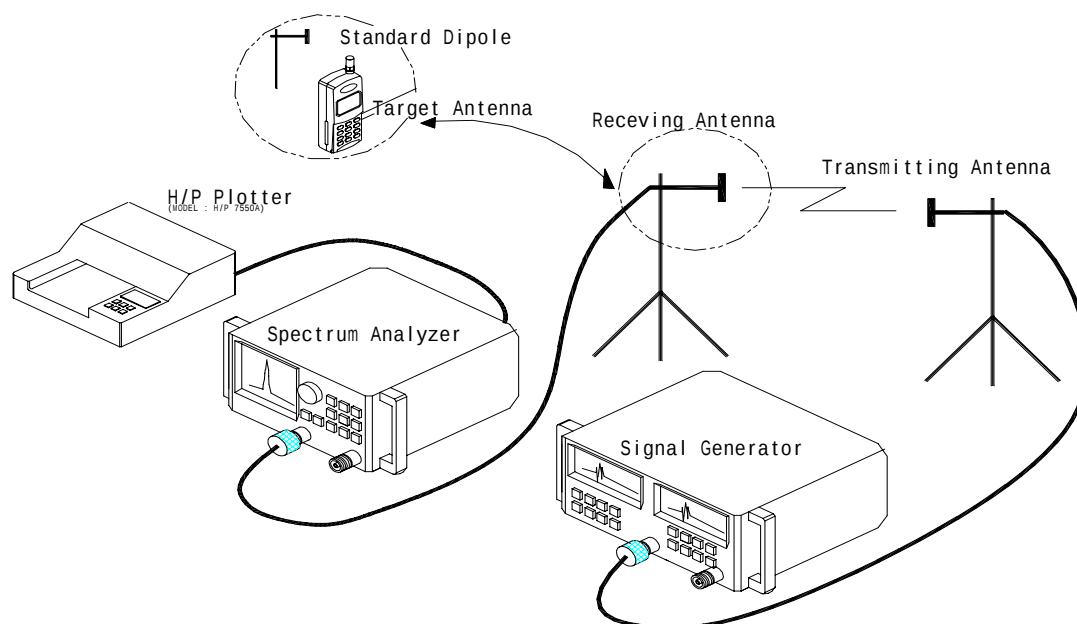


Figure 2-4 Gain Measurement System



Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

2.7 POWER RATING

2.7.1 Maximum Value

$$P=2W \text{ (CW)}$$

2.7.2 Post Test Requirements

Nor mechanical damage neither electrical performance reduction should be observed after the test.

2.7.3 Method of Measurement

The connection is done according to 2.5. The specified power, P, is applied for 10 minutes at the middle frequency of each Tx band defined in 2.2. Immediately after the test the VSWR is measured.

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2.8 ELECTRICAL SPECIFICATION & TESJIGT DATA & JIG DATA

Electrical Spec.		CDMA		PCS	
		824 MHz	894 MHz	1850 MHz	1990 MHz
VSWR	Down	Less than 4.5 : 1	Less than 3.0 : 1	Less than 4.5 : 1	Less than 3.0 : 1
	Up	Less than 4.0 : 1	Less than 2.5 : 1	Less than 4.5 : 1	Less than 2.5 : 1

			CDMA		PCS	
			824~849 MHz	869~894 MHz	1850~1910 MHz	1930~1990 MHz
Avg. gain(min)	Down	H	-6.5 dBi	-5.5 dBi	-9.5 dBi	-8.0 dBi
		E1	-9.0 dBi	-9.0 dBi	-8.5 dBi	-7.5 dBi
		E2	-9.5 dBi	-8.0 dBi	-11.5 dBi	-12.0 dBi
	Up	H	-5.5 dBi	-5.5 dBi	-9.5 dBi	-8.0 dBi
		E1	-8.0 dBi	-8.5 dBi	-6.5 dBi	-6.0 dBi
		E2	-9.0 dBi	-8.0 dBi	-8.0 dBi	-10.0 dBi

(Value : More than XX dBi)

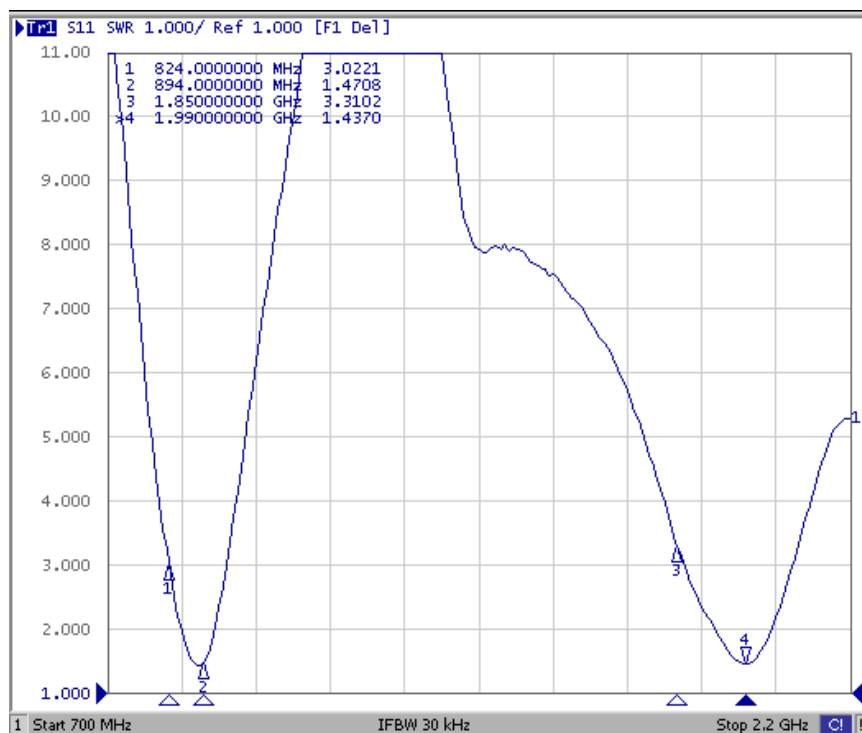
Test Data		CDMA		PCS	
		824 MHz	894 MHz	1850 MHz	1990 MHz
VSWR	Down	3.0 : 1	1.5 : 1	3.3 : 1	1.4 : 1
	Up	2.6 : 1	1.2 : 1	2.9 : 1	1.2 : 1

			CDMA		PCS	
			824~849 MHz	869~894 MHz	1850~1910 MHz	1930~1990 MHz
Avg. gain(min)	Down	H	-4.9 dBi	-4.0 dBi	-8.1 dBi	-6.7 dBi
		E1	-7.6 dBi	-7.6 dBi	-7.1 dBi	-5.9 dBi
		E2	-8.0 dBi	-6.6 dBi	-9.9 dBi	-10.3 dBi
	Up	H	-4.1 dBi	-3.9 dBi	-7.9 dBi	-6.3 dBi
		E1	-6.7 dBi	-7.0 dBi	-4.9 dBi	-4.4 dBi
		E2	-7.4 dBi	-6.5 dBi	-6.7 dBi	-8.5 dBi

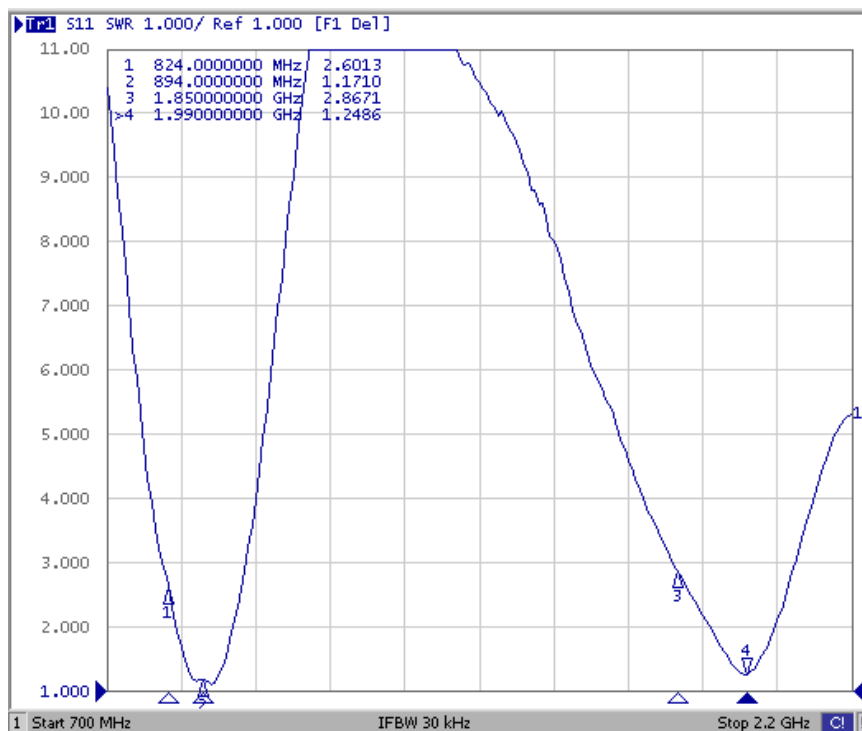
JIG Spec.		CDMA		PCS	
		824 MHz	894 MHz	1850 MHz	1990 MHz
VSWR		Less than 5.0 : 1	Less than 2.5 : 1	Less than 4.0 : 1	Less than 4.0 : 1

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
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- VSWR

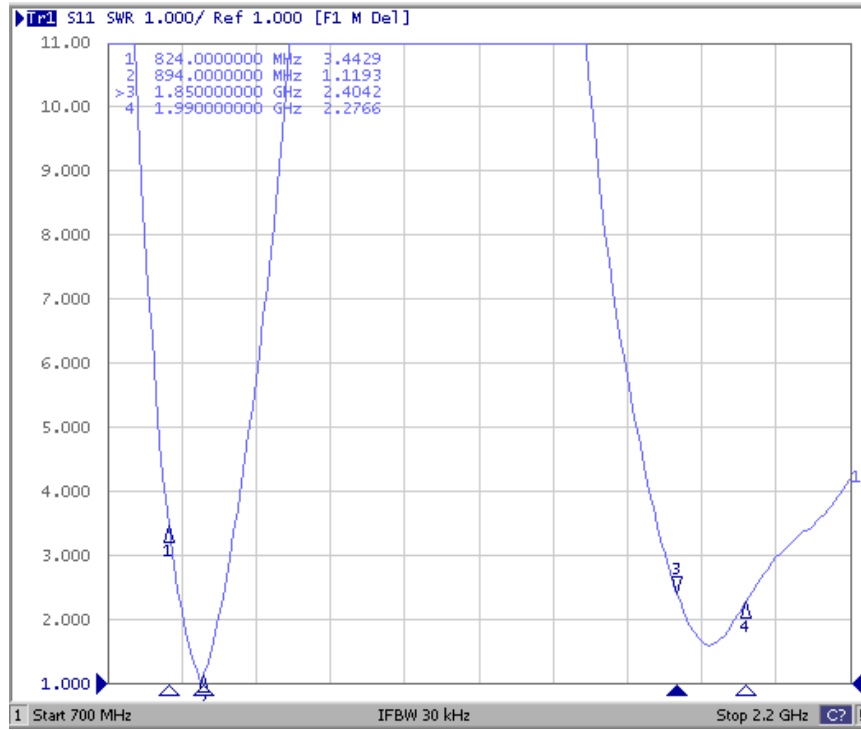


Slide Down



Slide Up

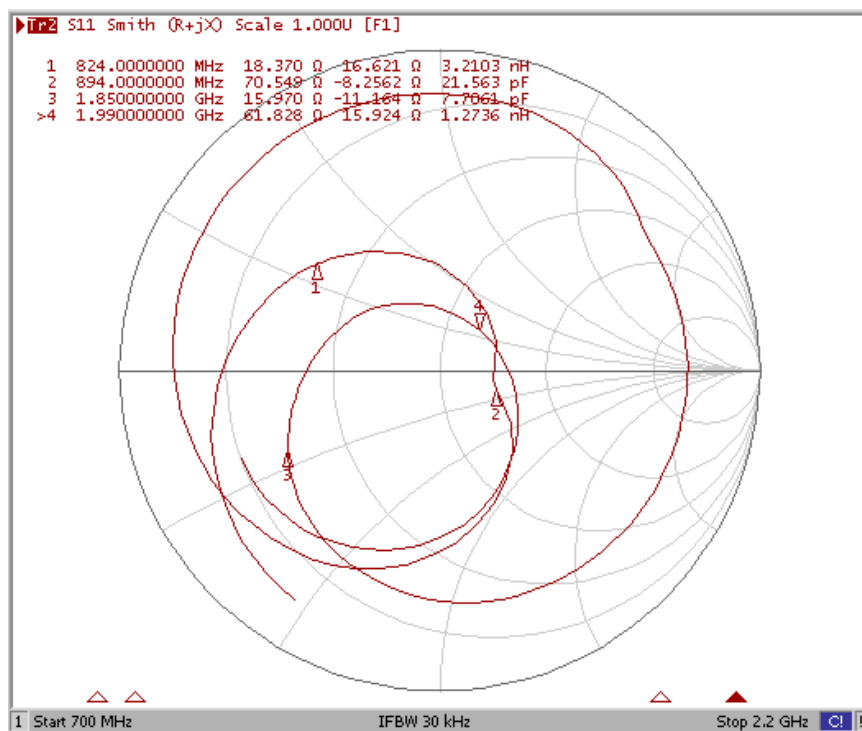
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Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA



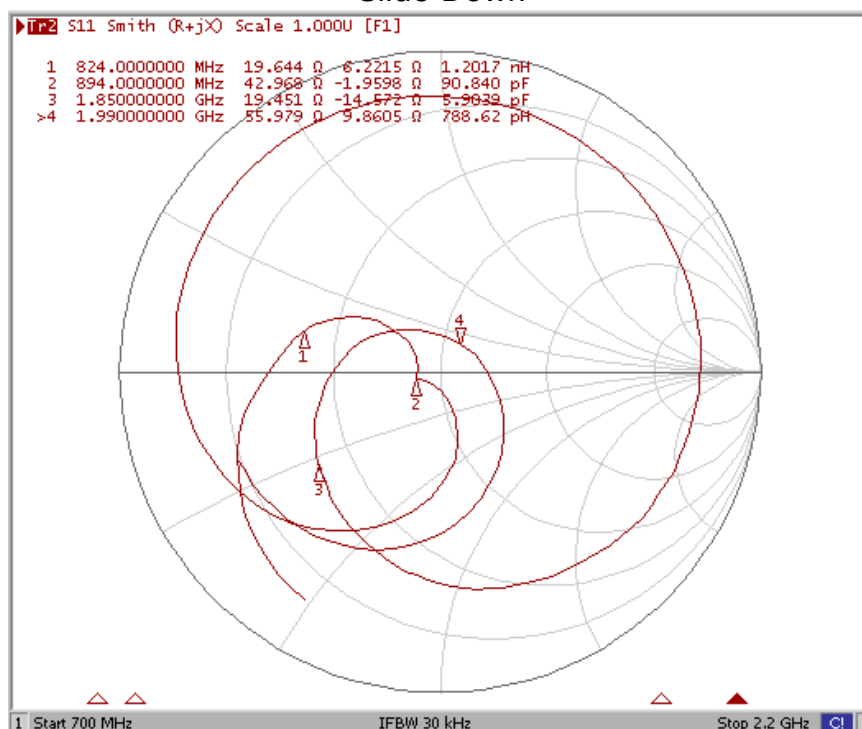
JIG Data

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

- Smith Chart



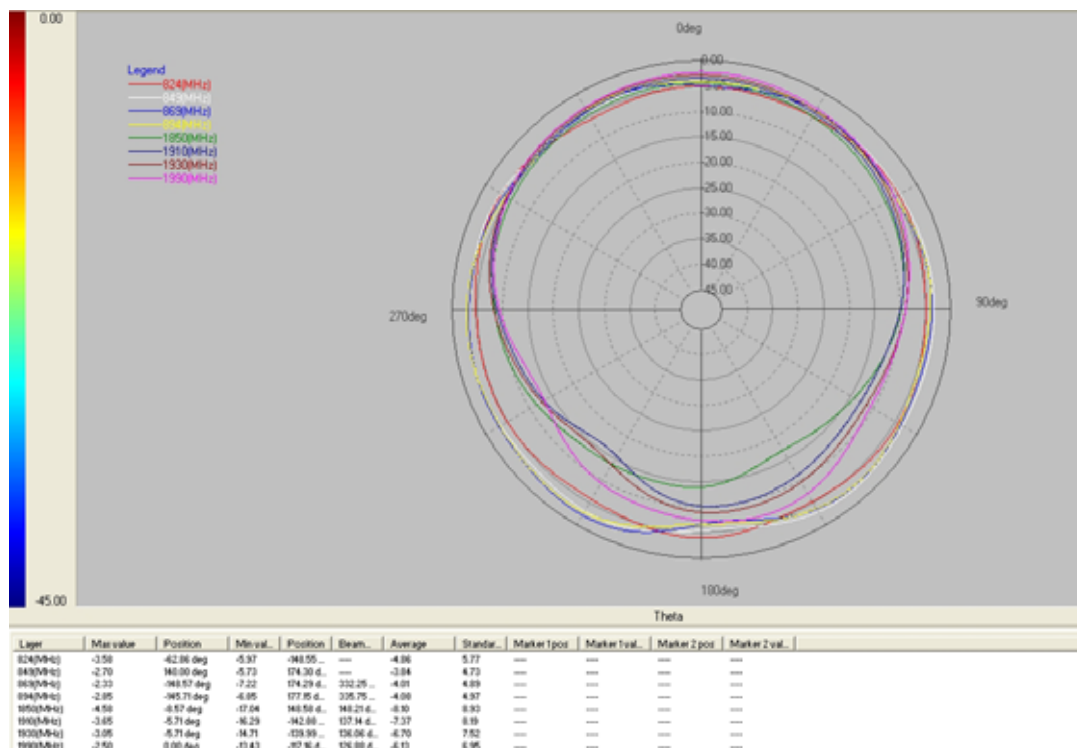
Slide Down



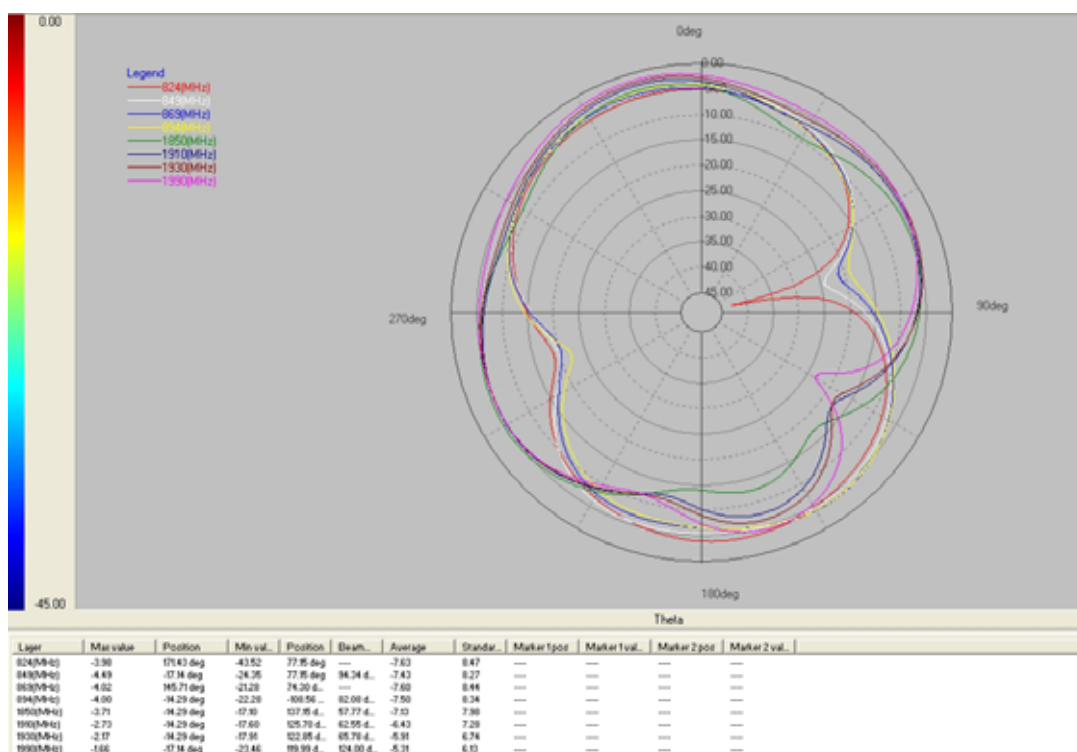
Slide Up

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

- Radiation Pattern (Slide Down)

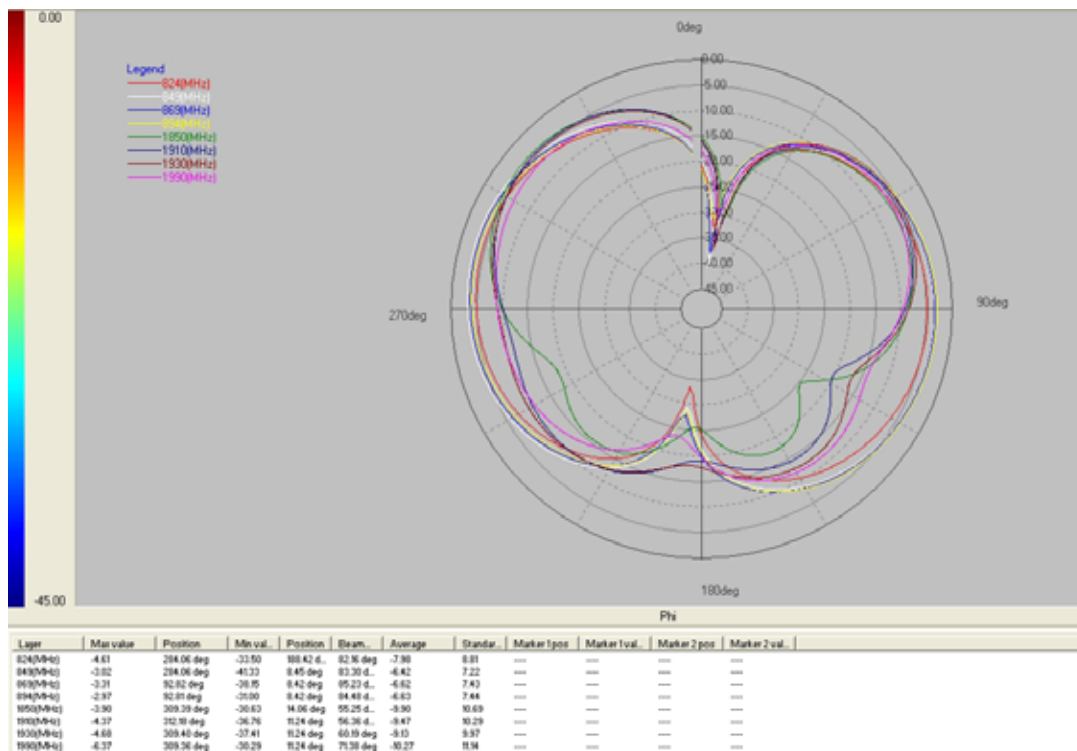


H Plane



E1 Plane

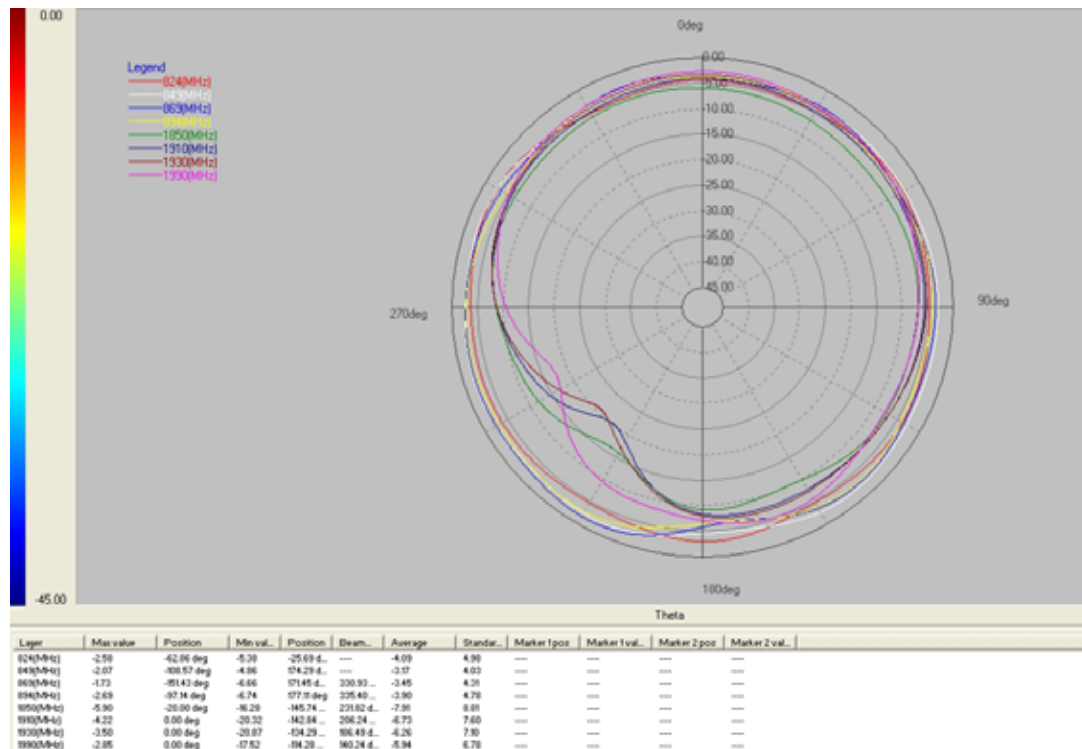
Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA



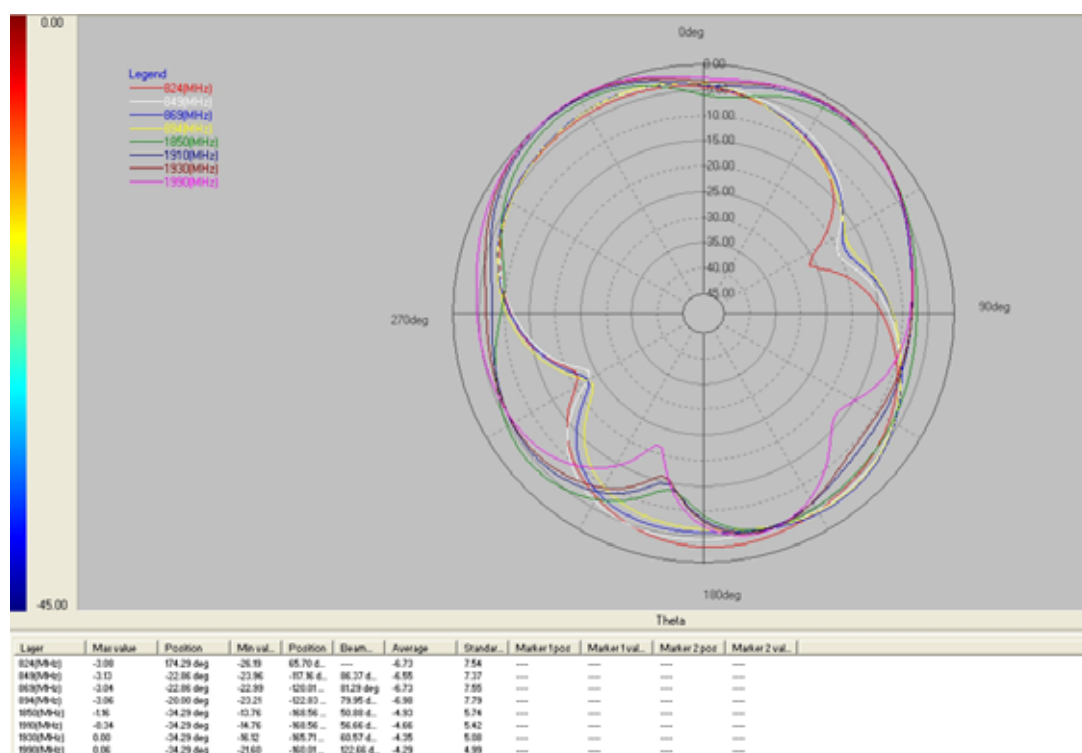
E2 Plane

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

- Radiation Pattern (Slide Up)

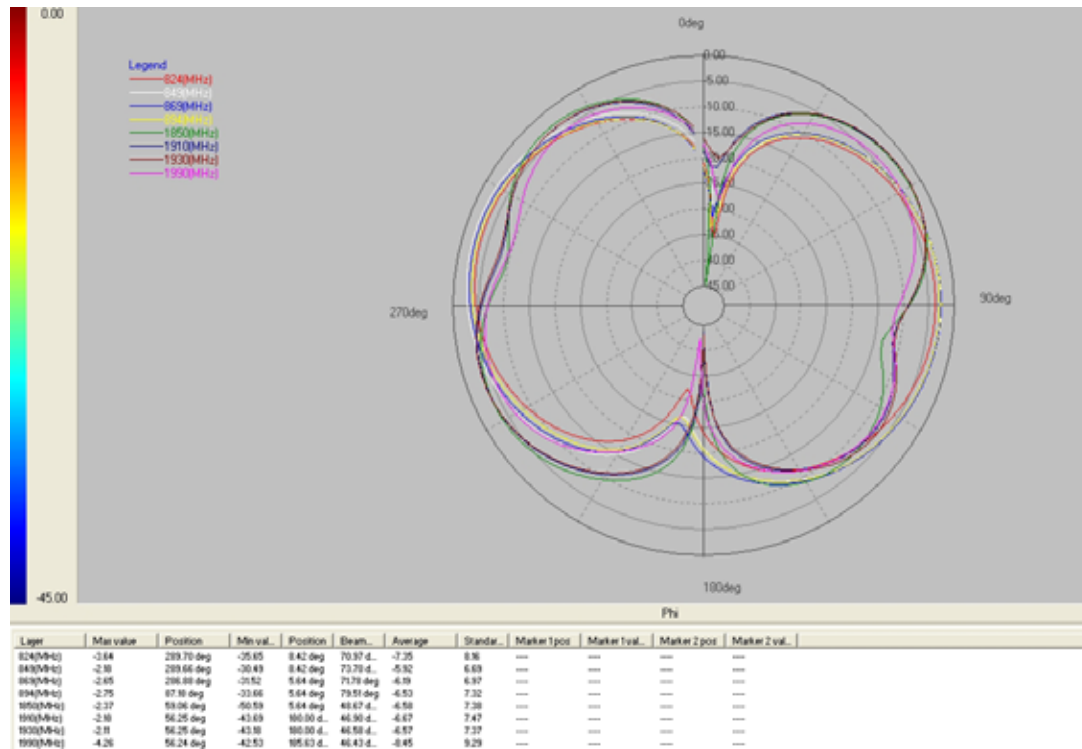


H Plane



E1 Plane

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA



E2 Plane

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

3 MECHANICAL PROPERTIES

3.1 SAMPLES SIZE

All the tests will be conducted on 5 samples.

3.2 APPEARANCE

The appearance shall be according to specification drawing (see 7).

3.3 CTQ

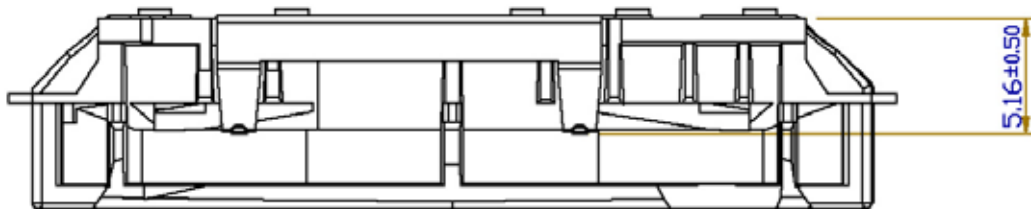


Figure 3-1: Dimension of CTQ

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Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

3.4 DROP TEST

3.4.1 Post Test Requirements

The antenna satisfies the electrical data .

3.4.2 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: 100.0g
Cycle: 2 Cycles
Angle: Handset is falling without any steering antenna should hit the steel surface. Test in each six (6) angles of the handset (1500 x 1500 x 20 mm thick steel plate)

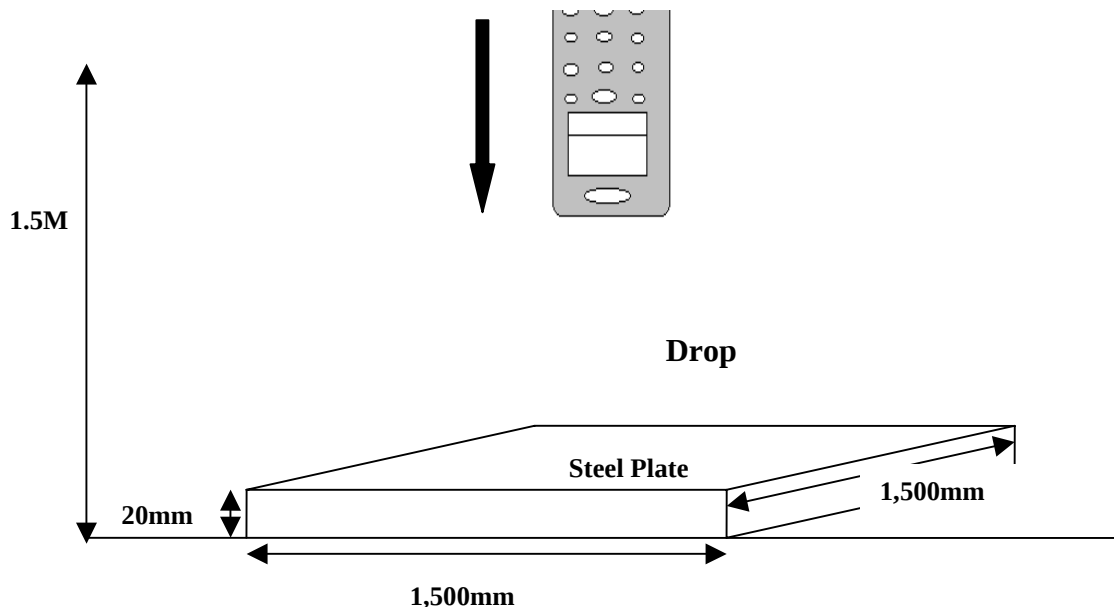


Figure 3-2: Drop

3.5 CONTACT FORCE

3.5.1 Post Test Requirements

The antenna satisfies the electrical and mechanical data.

3.5.2 Procedure

Measure reaction force of the antenna spring contacts with 250±150g.f

Place the Antenna on the contact force measuring device, fix the antenna, and press on the top contact point to the height of PCB contact area. The force shall be in 250±150g.f

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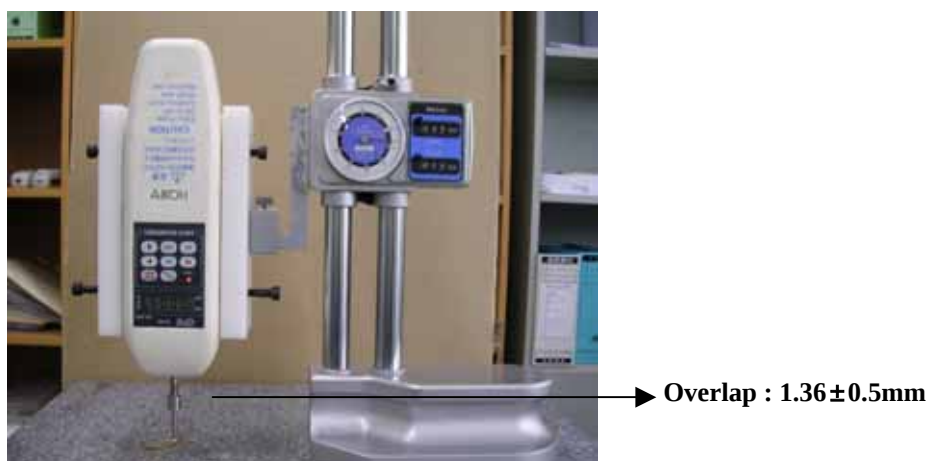


Figure 3-3: Contact Force

3.6 CONTACT RESTITUTION TEST

3.6.1 Post Test Requirements

The antenna satisfies the electrical and mechanical data.

3.6.2 Procedure

Measure reaction force of the antenna spring contacts with overlap($1.36 \pm 0.5\text{mm}$) by 500 times. And then deformation is not more than 20%.

Place the antenna on the contact force measure device fix the antenna, and press on the top contact point to the height of PCB contact area antenna contact should have no more than 20% of shape change after 500 cycles of the performed test.

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4 ENVIRONMENTAL RESISTANCE PROPERTIES

4.1 SAMPLES SIZE

All the tests will be conducted on 5 samples.

4.2 HIGH TEMPERATURE

Temperature	+ 80
Time	Each 48 hours

4.2.1 Post Test Requirements

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

4.2.2 Procedure

Set temperature to +80 per one hour. Keep the temperature for 48 hours.

4.3 LOW TEMPERATURE

Temperature	-40
Time	Each 48 hours

4.3.1 Post Test Requirements

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

4.3.2 Procedure

Set temperature to -40 per one hour. Keep the temperature for 48 hours.

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4.4 HUMIDITY

4.4.1 *Condition: 90 RH / +70 °C*

4.4.2 *Post Test Requirements*

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

4.4.3 *Procedure*

Set temperature & humidity to +70 /90% per one hour. Keep the temperature & humidity for 48 hours.

4.5 SALT SPRAY

4.5.1 *Post Test Requirements*

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

4.5.2 *Procedure*

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

4.6 THERMAL SHOCK

4.6.1 *Post Test Requirements*

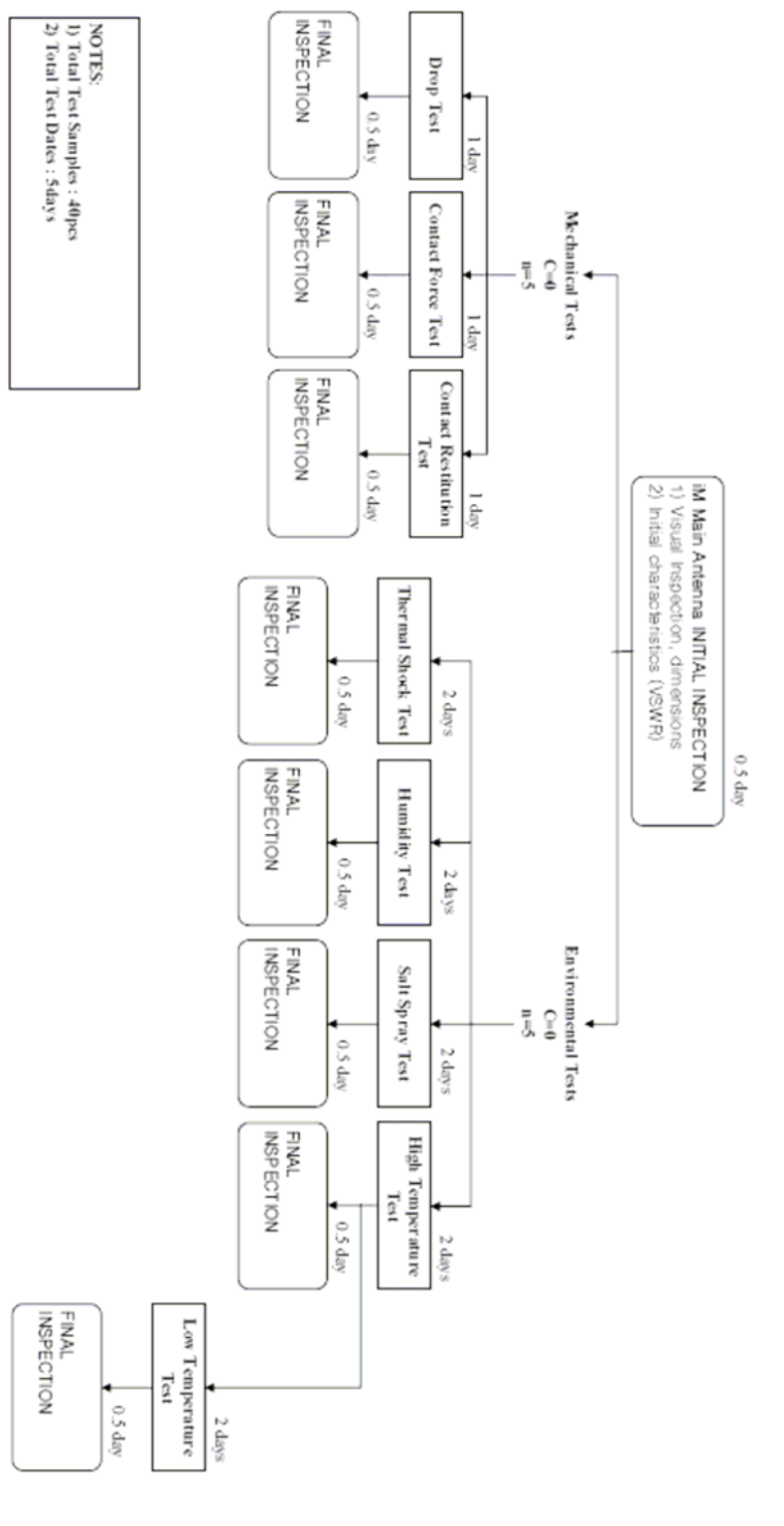
No visual, fitting or mold changes have been observed after the test. The antenna satisfied the electrical data.

4.6.2 *Procedure*

The antenna is placed in a climatic chamber. The temperature is cycled as follows: The temperature is kept constant at -40°C for 1hour and is kept constant at +85°C for another 1hour. This procedure is repeated 24times.

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5. TEST FLOWCHART



Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
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6. PACKAGING

Antenna to be individually placed in compartmentalized plastic tray. All the sizes and quantities are to be decided.

- 1 Tray = 60 Antennas
- 1 Box = 22 Tray = 1,320 Antennas

-		Quantity	Size			remark
1	Tray	22/1,320	380	280	160 (mm)	60EA Antennas Add empty tray above top of product
2	Carton Box	1/1,320	415	305	255 (mm)	22EA Tray = 1,320EA Antennas
3	Pad	2/1,320	385	285 (mm)		-

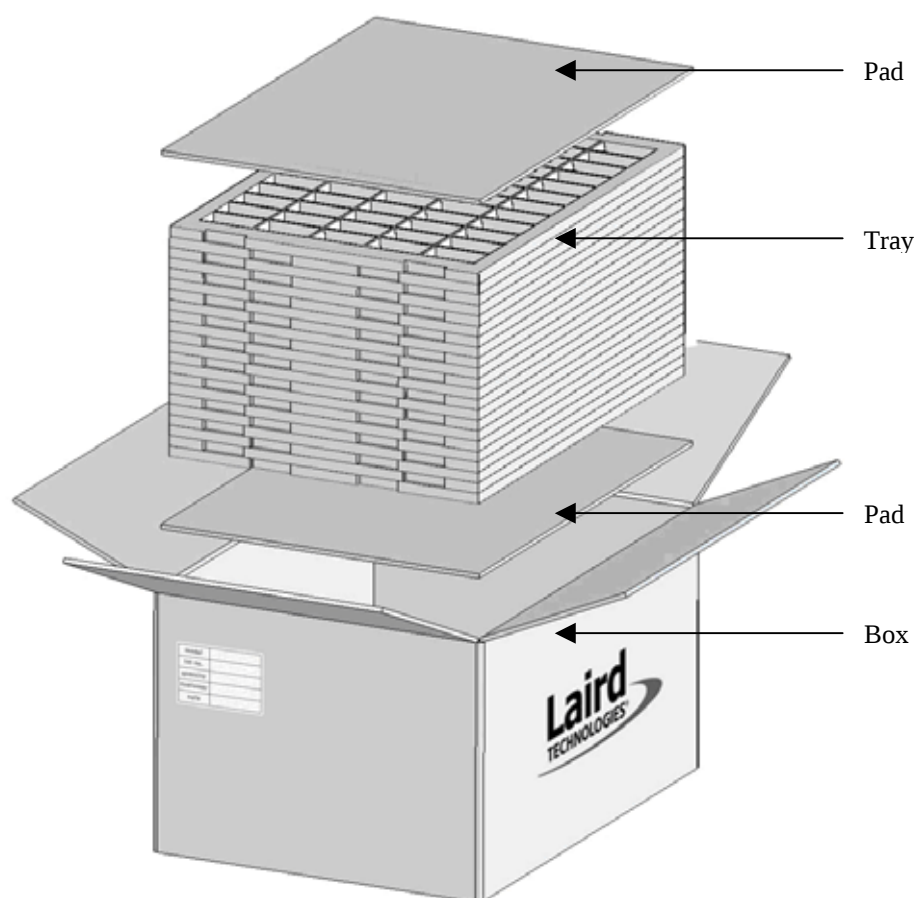


Figure 6-1: Packing

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

7. SPECIFICATION DRAWINGS AND PART INFO.

7.1 PART LIST

No.	PART NAME	Material	LTK No.	Quantity	Provider	Origin country
1	iM, main Antenna	-	712189.0001	1	Laird Tech.	Korea
1-1	Sheet metal	SUS 301	712190	1	Poongsan Co.	Korea
1-2	carrier	PC HF1023IM G7630	712191	1	Cheil industries	Korea

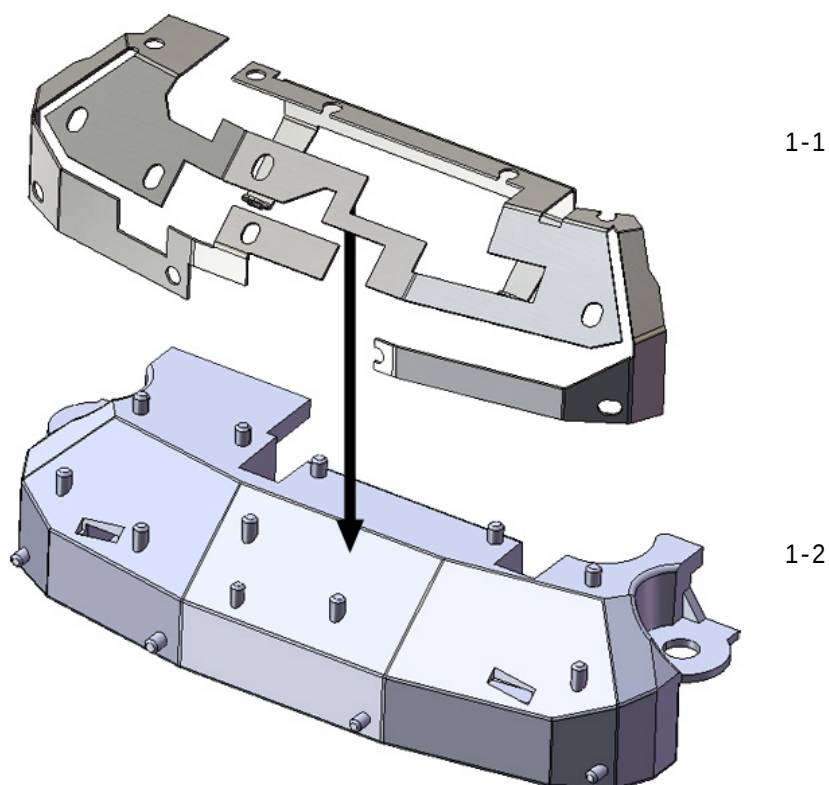
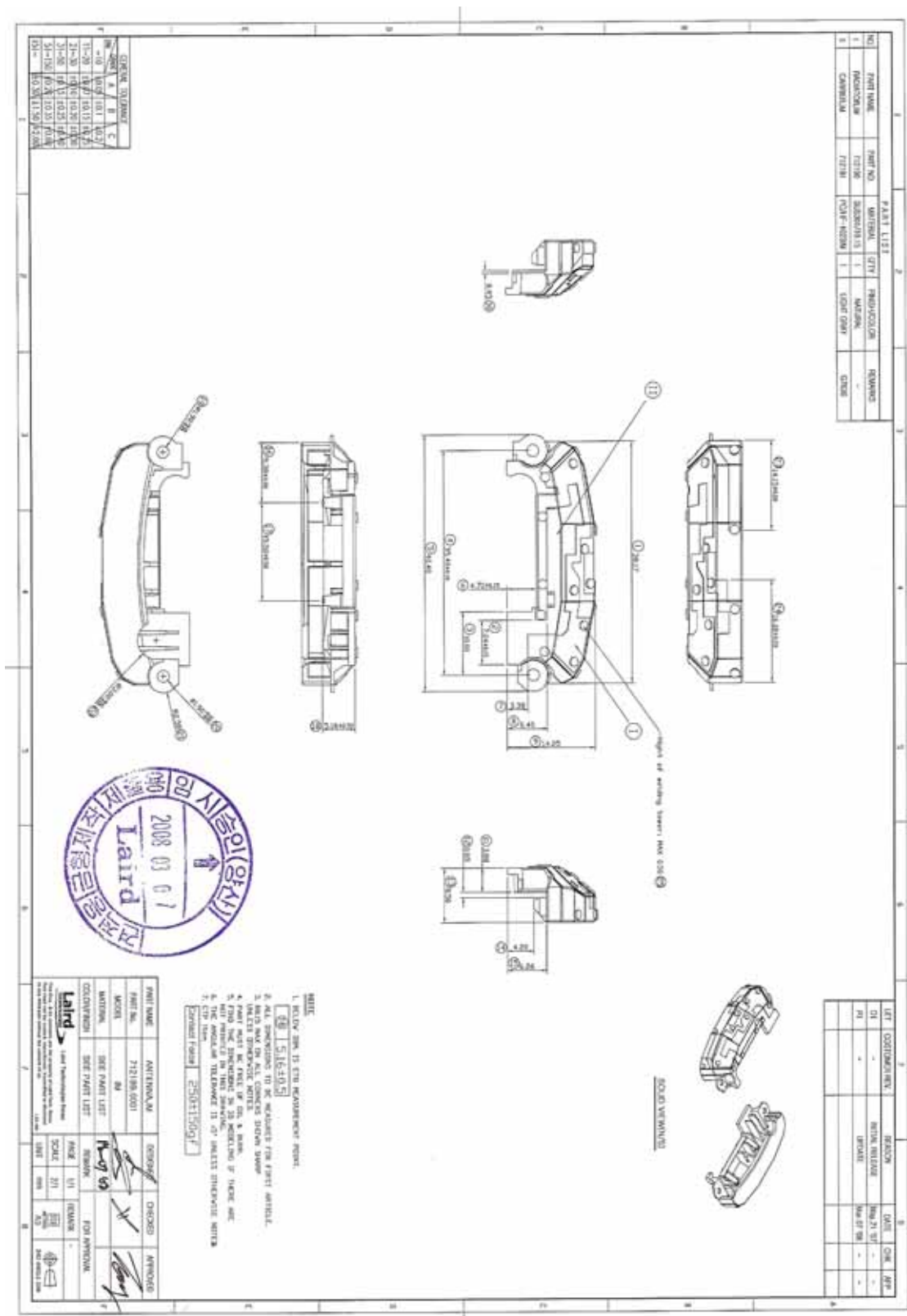


Figure 7-1: Simple Exploded View

Specification No.	Description		
2008-B4-PS007	iM Main- Antenna Product Specification		
Customer	Date	Rev	Reference
Pantech Co., Ltd	Mar. 14, 2008	1.0	NA

7.2 PRODUCT DRAWING



Specification No.	Description		
2008-B4-PS007	iM Main- Antenna Product Specification		
Customer	Date	Rev	Reference
Pantech Co., Ltd	Mar. 14, 2008	1.0	NA

7.3 INJECTION MOLD CONDITION TABLE

작업 표준서

설비명	호기	형상	체력	작성	검토	승인
사출성형기	6호기	110 TON		작성일자: 08. 03. 12		

일반사항

고객명	레이드	모델명	IM
품번		품명	CARRIER
금형번호		금형치수	
C/V수	1X1	중량	제품
원재료명	GRADE	COLOR	비고(착색)
PC	HF1023IM	G7630	
HOPER건조온도	100 ℃	예비건조시간	시간
형체력	110	Kgf/cm ²	형체거리
에젝터	선택	회수	수량
	A	3	1
취출기 사용	유	무	취출 JIG
			프름받지
			ON
			OFF

제품형상

No	개정일자	개정내용	확인
0			
1			
2			
3			

작업조건

구분	사출압력(Kgf/cm ²)	사출속도(%)	전환위치(mm)	계량위치
1차	35±5	30±5	30±5	계량위치
2차	40±5	40±5	10±5	계량압력
3차	±5	±5	±5	계량속도
4차	±5	±5	±2	강제후퇴
5차	±5	±5	±5	잔량
보압	±5	±5	±5	±2
구분	실린더 온도(℃)	히트온도(℃)	사출시간(초)	온도조절기
NH	290±10		사출1	1.2 ±2 고정속
H1	295±10		보입1	가동속
H2	290 ±10		보입2	0.5
H3	275 ±10		냉각	5 ±2 고정속
H4			합계	±2 가동속

MEMO

- 미성형이 없을 것
- 초물 양산시 초기 불량은 방청제 제거시 까지(약 10~15Shot)

정도 생산 후 초물 검사에 준하여 검사 후 양산 진행 할 것

대성정밀

(A4)



Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
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8. STORAGE CONDITIONS

1. Keep the storage temperature specification
2. Maintain proper humidity
3. Stack up boxes on palette
4. Follow general rule regarding others that is not mentioned above

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9. MANUFACTURING PROCESS

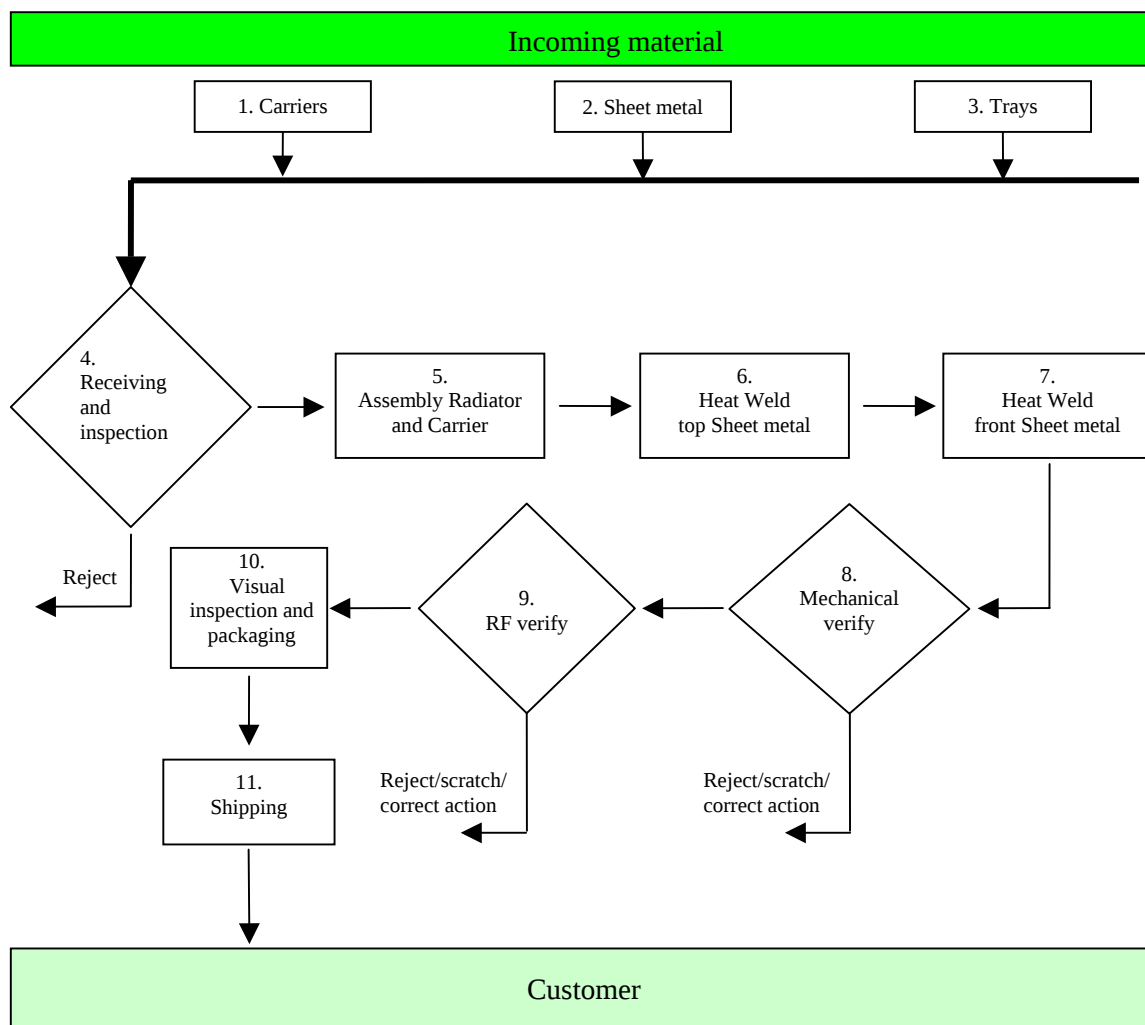


Figure 9-1: Manufacturing Process

Pos.	Process step/ operation	Sub process	Inspection and test/ control characteristic	Test equipment/ method	Sample size/ freq.	Responsible function	Work/ inspection instruction	Data file/ Result document	Corrective actions
1	Receiving of Carrier	Incoming	Right material and quantity	Visual	Every lot	Incoming goods	<Ref.>	File at receiving department	Handling and claim procedures of incorrect parts
2	Receiving of Sheet metal	Incoming	Right material and quantity	Visual	Every lot	Incoming goods	<Ref.>	File at receiving department	Handling and claim procedures of incorrect parts
3	Receiving of Trays	Incoming	Right material and quantity	Visual	Every lot	Incoming goods	<Ref.>	File at receiving department	Handling and claim procedures of incorrect parts
4.1	Incoming Inspection	Inspection of Sheet metal	Measure critical dimensions	Measurement microscope	Sample based	Incoming inspection	<Ref.>	File at incoming inspection	Handling and claim procedures of incorrect parts
4.2		Inspection of Carrier	Measure critical dimensions	Measurement microscope	Sample based	Incoming inspection	<Ref.>	File at incoming inspection	Handling and claim procedures of incorrect parts
4.3		Inspection of Tray	Check for broken or bent trays	Visual	Sample based	Incoming inspection	<Ref.>	Not recorded	Handling and claim procedures of incorrect parts
5	Assembly of Sheet metal on carrier		Visual inspection of assembly	Visual	100%	Operator	<Ref.>	Not recorded	Scrap incorrect parts
6	Heat weld top side		Visual inspection of Heat welding	Visual	100%	Operator	<Ref.>	Not recorded	Scrap incorrect parts
7	Heat weld front side		Visual inspection of Heat welding	Visual	100%	Operator	<Ref.>	Not recorded	Scrap incorrect parts
8	Mechanical verification	Measure Heat welding tower.	Measure height	Measurement microscope	Sample based	Operator	<Ref.>	Stored in Rectron system	Re-measure 100% of antennas since last measurement
9	RF verification	Measure s11	Deviation from reference antenna	RF Jig +VNA	Sample based	Operator	<Ref.>	Stored in Rectron system	Re-measure 100% of antennas since last measurement
10	Visual inspection and packing		Correct number of antennas in tray	Visual	100%	Operator	<Ref.>	Not recorded	Fill tray if needed.
11	Shipping		Correct number of antennas. Correct shipping address	Visual	100%	Shipping department	<Ref.>	Not recorded	Correct number of antennas or address if needed.

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10. TEST REPORT

Test Report			Tested By	Approved By	
					
1. Test Summary			Date : 14-Mar-08		
Report No	2008-B4-TR007	Test Date	3/11 ~ 3/14	Tested By	Kisu Byun
Test Purpose	Qualification for IM (Main), Internal Antenna				
Model	IM (Main)	Type	Internal Antenna	Customer	Pantech
Test Category	☒ Electrical ☒ Mechanical ☒ Environmental ☐ Coating Requirements				
Parts Description	1. Carrier : PC HF1023IM (G7630) 2. Sheet Metal : SUS 301				
Test Result	☐ ACCEPT ☒ REJECT				
2. Test Requirements					
No	Test	Test Method & Conditions	Requirements	Result	Remark
1	DROP TEST	Antenna Specifications 3.3	– All tests shall be performed according to test conditions as provided by antenna specifications. – There shall be no visual deterioration, and unbroken without any deformation. – No appreciable degradation pre / post electrical performance.	OK	
2	CONTACT FORCE TEST	Antenna Specifications 3.4		OK	
3	CONTACT RESTITUTION TEST	Antenna Specifications 3.5		OK	
4	HIGH TEMPERATURE TEST	Antenna Specifications 4.2		OK	
5	LOW TEMPERATURE TEST	Antenna Specifications 4.3		OK	
6	HUMIDITY TEST	Antenna Specifications 4.4		OK	
7	SALT SPRAY TEST	Antenna Specifications 4.5		NG	Wire Cutting
8	THERMAL SHOCK TEST	Antenna Specifications 4.6		OK	
3. Remark					
* Parts Description 1. Sheet Metal : Wire Cutting Sample 2. Carrier : QDM Sample					

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
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TEST RESULT										Page 1/8	
1. Drop Test											
1) Test Requirements											
Test	Test Method & Conditions								Requirements		
DROP TEST	- Height : 1.5m - Weight : 101.2g - Cycle : 2Cycle (Total 12 Times)								- All tests shall be performed according to test conditions as provided by antenna specifications. - There shall be no visual deterioration, and unbroken without any deformation. - No Appreciable Degradation Pre / Post Electrical Performance		
Equipment	Drop Tester										
2) Test Result											
- OPEN											
No	Sample	Before (VSWR)				After (VSWR)				Result	
		JIG				JIG				Appearan- ce	Electrical
		824Mhz	894Mhz	1850Mhz	1990Mhz	824Mhz	894Mhz	1850Mhz	1990Mhz		
		5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1	5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1		
1	X1	3.4456	1.0533	2.2574	2.1320	3.0540	1.1356	2.0715	2.2980	OK	OK
	X2	3.4566	1.1419	2.1122	2.0599	3.3271	1.0866	2.2489	2.1534	OK	OK
	X3	3.2206	1.1914	2.2277	2.2643	3.3207	1.0888	2.3443	2.0796	OK	OK
	X4	3.5249	1.1940	2.1934	2.1953	3.6198	1.2472	2.1150	1.9756	OK	OK
	X5	3.1061	1.1321	2.3086	2.0060	3.3572	1.0897	2.2513	2.1762	OK	OK
	USL	2.0	2.5	4.0	4.0	5.0	2.5	4.0	4.0		
	LSL										
	X	3.351	1.143	2.220	2.132	3.336	1.130	2.206	2.137		
	Max	3.525	1.194	2.309	2.264	3.620	1.247	2.344	2.298		
	Min	3.106	1.053	2.112	2.006	3.054	1.087	2.072	1.976		
	R	0.419	0.141	0.196	0.258	0.566	0.161	0.273	0.322		
	StDev	0.178	0.057	0.074	0.103	0.201	0.069	0.111	0.119		
■ ACCEPT □ REJECT											
3) Remark											



Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
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TEST RESULT								Page	2/8
2. Contact Force Test									
1) Test Requirements									
Test		Test Method & Conditions					Requirements		
CONTACT FORCE TEST		- Force shall be 250±150gf - Press on the top contact point to the height of PCB contact area.					- All tests shall be performed according to test conditions as provided by antenna specifications. - There shall be no visual deterioration, and unbroken without any deformation. - No Appreciable Degradation Pre / Post Electrical Performance		
Equipment		Contact Force Tester							
2) Test Result									
Inspection		Spec	X1	X2	X3	X4	X5	Remark	
Force Data	Contact A	250gf ± 150gf	203	219	218	234	211		
	Contact B		213	228	222	229	217		
Appearance			OK	OK	OK	OK	OK		
Result			OK	OK	OK	OK	OK		
☒ ACCEPT ☐ REJECT									
3) Remark									

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

TEST RESULT											Page 3/8
3. Contact Restitution Test 1) Test Requirements											
Test	Test Method & Conditions						Requirements				
CONTACT RESTITUTION TEST	• Cycle : 500 Times • Deformation is not more than 20%						• All tests shall be performed according to test conditions as provided by antenna specifications. • There shall be no visual deterioration, and unbroken without any deformation. • No Appreciable Degradation Pre / Post Electrical Performance				
Equipment	Contact Force Tester										
2) Test Result											
Inspection	1		2		3		4		5		Remark
Contact Position	Contact A	Contact B	Contact A	Contact B	Contact A	Contact B	Contact A	Contact B	Contact A	Contact B	
Before	5.13	5.24	5.18	5.21	5.20	5.16	5.23	5.27	5.17	5.20	
After (500 Times)	4.98	5.08	5.02	5.10	5.03	5.00	5.05	5.09	5.04	5.03	
Deformation Ratio	15.0%	16.0%	16.0%	11.0%	17.0%	16.0%	18.0%	18.0%	13.0%	17.0%	
Appearance	OK		OK		OK		OK		OK		
Result	OK		OK		OK		OK		OK		
■ ACCEPT □ REJECT											
3) Remark											

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

TEST RESULT										Page	4/8
4. High Temperature Test											
1) Test Requirements											
Test	Test Method & Conditions								Requirements		
HIGH TEMPERATURE TEST	- Temperature : +80 - Times : 48 hours. - And then return to normal temperature & humidity for 2hours.								- All tests shall be performed according to test conditions as provided by antenna specifications. - There shall be no visual deterioration, corrosion, oxidation cracking or deformation. - No Appreciable Degradation Pre / Post Electrical Performance		
Equipment	High Temperature Chamber										
2) Test Result											
- OPEN											
No	Sample	Before (VSWR)				After (VSWR)				Result	
		JIG				JIG				Appearan- ce	Electrical
		824Mhz	894Mhz	1850Mhz	1990Mhz	824Mhz	894Mhz	1850Mhz	1990Mhz		
		5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1	5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1		
1	X1	3.4667	1.0874	2.0851	2.5336	3.0691	1.0843	2.3451	2.5451	OK	OK
	X2	3.3046	1.0675	2.4257	2.4285	3.6196	1.0651	2.3615	2.1020	OK	OK
	X3	3.1163	1.0505	2.3849	2.3737	3.2964	1.1352	2.1463	2.3345	OK	OK
	X4	3.3803	1.1419	2.1623	1.9926	3.0699	1.1898	2.1821	2.0094	OK	OK
	X5	3.0765	1.0540	2.1741	2.2828	3.2875	1.1158	2.2938	1.9842	OK	OK
	USL	2.0	2.5	4.0	4.0	5.0	2.5	4.0	4.0		
	LSL										
	X	3.269	1.080	2.246	2.322	3.269	1.118	2.266	2.195		
	Max	3.467	1.142	2.426	2.534	3.620	1.190	2.362	2.545		
	Min	3.077	1.051	2.085	1.993	3.069	1.065	2.146	1.984		
	R	0.390	0.091	0.341	0.541	0.551	0.125	0.215	0.561		
	StDev	0.168	0.037	0.150	0.205	0.226	0.048	0.097	0.240		
■ ACCEPT □ REJECT											
3) Remark											

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

TEST RESULT										Page 5/8	
5. Low Temperature Test											
1) Test Requirements											
Test	Test Method & Conditions						Requirements				
LOW TEMPERATURE TEST	- Temperature : -40 - Times : 48 hours. - And then return to normal temperature & humidity for 2hours.						- All tests shall be performed according to test conditions as provided by antenna specifications. - There shall be no visual deterioration, corrosion, oxidation cracking or deformation. - No Appreciable Degradation Pre / Post Electrical Performance				
Equipment	Low Temperature Chamber										
2) Test Result											
- OPEN											
No	Sample	Before (VSWR)				After (VSWR)				Result	
		JIG				JIG				Appearan- ce	Electrical
		824Mhz	894Mhz	1850Mhz	1990Mhz	824Mhz	894Mhz	1850Mhz	1990Mhz		
		5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1	5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1		
1	X1	3.3146	1.1057	2.1549	2.2847	3.3754	1.0496	2.2566	2.3080	OK	OK
	X2	3.3961	1.0954	2.2102	2.2314	3.4000	1.0571	2.2611	2.2622	OK	OK
	X3	3.3520	1.0975	2.1551	2.3000	3.4089	1.0565	2.2474	2.3101	OK	OK
	X4	3.3826	1.0689	2.2305	2.2136	3.4472	1.0783	2.2775	2.2221	OK	OK
	X5	3.4576	1.0727	2.1581	2.2831	3.5934	1.0826	2.1964	2.3505	OK	OK
	USL	2.0	2.5	4.0	4.0	5.0	2.5	4.0	4.0		
	LSL										
	X	3.381	1.088	2.182	2.263	3.445	1.065	2.248	2.291		
	Max	3.458	1.106	2.231	2.300	3.593	1.083	2.278	2.351		
	Min	3.315	1.069	2.155	2.214	3.375	1.050	2.196	2.222		
	R	0.143	0.037	0.076	0.086	0.218	0.033	0.081	0.128		
	StDev	0.053	0.016	0.036	0.038	0.087	0.015	0.031	0.049		
■ ACCEPT □ REJECT											
3) Remark											

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TEST RESULT										Page	6/8
6. Humidity Test											
1) Test Requirements											
Test	Test Method & Conditions								Requirements		
HUMIDITY TEST	- Temperature : + 70 - Humidity : 90% - Times : 48 hours. - And then return to normal temperature & humidity for 2hours.								- All tests shall be performed according to test conditions as provided by antenna specifications. - There shall be no visual deterioration, corrosion, oxidation cracking or deformation. - No Appreciable Degradation Pre / Post Electrical Performance		
Equipment	Temperature & Humidity Chamber										
2) Test Result											
- OPEN											
No	Sample	Before (VSWR)				After (VSWR)				Result	
		JIG				JIG				Appearan- ce	Electrical
		824Mhz	894Mhz	1850Mhz	1990Mhz	824Mhz	894Mhz	1850Mhz	1990Mhz		
		5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1	5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1		
1	X1	3.3289	1.0989	2.1971	2.2349	3.5409	1.0943	2.2089	2.2671	OK	OK
	X2	3.4258	1.1063	2.1756	2.2844	3.5361	1.0767	2.1203	2.3473	OK	OK
	X3	3.4322	1.0903	2.2496	2.1837	3.6355	1.1141	2.2575	2.2055	OK	OK
	X4	3.4239	1.0977	2.2542	2.1978	3.4792	1.0837	2.1468	2.2981	OK	OK
	X5	3.2925	1.1038	2.1723	2.2810	3.5646	1.0691	2.3544	2.2078	OK	OK
	USL	2.0	2.5	4.0	4.0	5.0	2.5	4.0	4.0	/	
	LSL										
	X	3.381	1.099	2.210	2.236	3.551	1.088	2.218	2.265		
	Max	3.432	1.106	2.254	2.284	3.636	1.114	2.354	2.347		
	Min	3.293	1.090	2.172	2.184	3.479	1.069	2.120	2.206		
	R	0.140	0.016	0.082	0.101	0.156	0.045	0.234	0.142		
	StDev	0.065	0.006	0.040	0.046	0.057	0.017	0.093	0.061		
■ ACCEPT □ REJECT											
3) Remark											

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TEST RESULT										Page	7/8
7. Salt Spray Test											
1) Test Requirements											
Test	Test Method & Conditions						Requirements				
SALT SPRAY TEST	- Temperature : +35 - Salinity : NaCl solution 5% by weight. - Times : 48 hours.						- All tests shall be performed according to test conditions as provided by antenna specifications. - There shall be no visual deterioration, corrosion, oxidation cracking or deformation. - No Appreciable Degradation Pre / Post Electrical Performance				
Equipment	Salt Spray Chamber										
2) Test Result											
- OPEN											
No	Sample	Before (VSWR)				After (VSWR)				Result	
		JIG				JIG				Appearan- ce	Electrical
		824Mhz	894Mhz	1850Mhz	1990Mhz	824Mhz	894Mhz	1850Mhz	1990Mhz		
		5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1	5.0 : 1	2.5 : 1	4.0 : 1	4.0 : 1		
1	X1	3.5190	1.0678	2.2086	2.2026	3.3614	1.0585	2.1364	2.3875	NG	OK
	X2	3.4996	1.0620	2.2616	2.1638	3.3745	1.0716	2.1982	2.5317	NG	OK
	X3	3.3981	1.0743	2.1571	2.2502	3.2801	1.0685	2.1430	2.4220	NG	OK
	X4	3.4031	1.0683	2.1151	2.3168	3.3152	1.0912	2.2048	2.5531	NG	OK
	X5	3.3505	1.0697	2.1561	2.2850	3.2869	1.1562	2.0991	2.3280	NG	OK
	USL	2.0	2.5	4.0	4.0	5.0	2.5	4.0	4.0		
	LSL										
	X	3.434	1.068	2.180	2.244	3.324	1.089	2.156	2.444		
	Max	3.519	1.074	2.262	2.317	3.375	1.156	2.205	2.553		
	Min	3.351	1.062	2.115	2.164	3.280	1.059	2.099	2.328		
	R	0.169	0.012	0.147	0.153	0.094	0.098	0.106	0.225		
	StDev	0.072	0.004	0.057	0.062	0.043	0.039	0.045	0.096		
□ ACCEPT ■ REJECT											
3) Remark											
1. Sheet Metal : Wire Cutting Sample											

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
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11. DIMENSION MEASUREMENT DATA

IM (Main) _ Dimension Measurment Data														
Dimension													Visual	Result
No.	-	-	-	-	-	-	-		CTQ		-	-		
	1	3	4	5	6	9	13	17	18	18	19	20		
Spec.	38.17	10.00	35.40	40.40	4.70	14.05	8.50	15.50	5.16	5.16	φ1.90	φ1.90		
Print tol(+)	0.25	0.1	0.1	0.25	0.15	0.15	0.1	0.5	0.5	0.5	0.1	0.1		
Print tol(-)	0.25	0.1	0.1	0.25	0.15	0.15	0.1	0.5	0.5	0.5	0.05	0.05		
Instrument	V/M	V/M	V/M	V/M	V/M	V/M	V/C	V/M	V/M	V/M	V/M	V/M		
1	38.13	10.00	35.34	40.34	4.69	14.16	8.49	15.54	5.12	5.15	1.89	1.87	OK	OK
2	38.11	9.99	35.33	40.32	4.69	14.12	8.50	15.51	5.19	5.26	1.88	1.87	OK	OK
3	38.13	10.01	35.33	40.33	4.65	14.11	8.51	15.48	5.16	5.22	1.88	1.87	OK	OK
4	38.13	10.02	35.34	40.34	4.65	14.12	8.48	15.50	5.21	5.27	1.87	1.88	OK	OK
5	38.13	9.99	35.34	40.32	4.67	14.13	8.49	15.48	5.24	5.22	1.87	1.88	OK	OK
6	38.12	10.01	35.34	40.35	4.68	14.15	8.49	15.49	5.23	5.20	1.88	1.87	OK	OK
7	38.11	10.02	35.34	40.35	4.66	14.14	8.50	15.51	5.23	5.25	1.88	1.88	OK	OK
8	38.11	9.99	35.34	40.33	4.67	14.13	8.50	15.49	5.15	5.26	1.88	1.87	OK	OK
9	38.12	10.00	35.34	40.34	4.69	14.15	8.51	15.48	5.21	5.21	1.89	1.88	OK	OK
10	38.12	10.01	35.35	40.34	4.67	14.14	8.50	15.51	5.17	5.20	1.89	1.87	OK	OK
11	38.13	10.00	35.35	40.34	4.68	14.12	8.49	15.50	5.19	5.22	1.88	1.88	OK	OK
12	38.12	10.03	35.34	40.33	4.68	14.14	8.48	15.53	5.13	5.18	1.88	1.88	OK	OK
13	38.14	9.99	35.35	40.34	4.67	14.11	8.48	15.52	5.18	5.20	1.87	1.88	OK	OK
14	38.12	10.00	35.34	40.33	4.66	14.13	8.50	15.51	5.18	5.23	1.88	1.87	OK	OK
15	38.14	10.02	35.34	40.32	4.68	14.13	8.50	15.53	5.15	5.18	1.88	1.87	OK	OK
16	38.11	10.02	35.34	40.32	4.67	14.16	8.50	15.49	5.21	5.27	1.87	1.87	OK	OK
17	38.13	10.02	35.33	40.32	4.68	14.12	8.49	15.51	5.22	5.27	1.88	1.88	OK	OK
18	38.12	10.01	35.34	40.35	4.66	14.14	8.51	15.51	5.22	5.22	1.89	1.87	OK	OK
19	38.14	10.02	35.35	40.34	4.67	14.14	8.49	15.50	5.18	5.23	1.88	1.87	OK	OK
20	38.13	10.00	35.34	40.34	4.68	14.14	8.51	15.51	5.24	5.19	1.88	1.88	OK	OK
USL	38.42	10.10	35.50	40.65	4.85	14.20	8.60	16.00	5.66	5.66	2.00	2.00		
LSL	37.92	9.90	35.30	40.15	4.55	13.90	8.40	15.00	4.66	4.66	1.85	1.85		
Xbar	38.12	10.01	35.34	40.33	4.67	14.14	8.50	15.53	5.19	5.22	1.88	1.88		
Max	38.14	10.03	35.35	40.35	4.69	14.16	8.51	15.54	5.24	5.27	1.89	1.88		
Min	38.11	9.99	35.33	40.32	4.65	14.11	8.48	15.48	5.12	5.15	1.87	1.87		
R	0.03	0.04	0.02	0.03	0.04	0.05	0.03	0.06	0.12	0.12	0.02	0.01		
StDev	0.010	0.013	0.006	0.011	0.012	0.015	0.010	0.017	0.036	0.034	0.006	0.005		
Cpk	6.83	2.46	2.23	5.86	3.38	1.50	3.22	9.70	4.36	4.29	1.54	1.60		

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

12. ROHS REPORT

12.1 CARRIER



Test Report No. F690501/LF-CTSAYA07-28055R1

Issued Date: December 17, 2007 Page 1 of 3

To: DAE SANG
783 Wonsi-dong
Danwon-gu
Ansan-city
GYEONGGI-DO 429-110
Korea

The following merchandise was submitted and identified by the client as :

Product Name : HF1023IM(G7630)
SGS File No. : AYA07-28055R1
Received Date : December 11, 2007
Test Performing Date : December 12, 2007
Test Performed : SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results : For further details, please refer to following page(s)
Buyer(s) : SAMSUNG, LG
Comments : This Report cancels and supersedes the Report No. F690501/LF-CTSAYA07-28055 dated December 17, 2007 issued by SGS Testing Korea Co., Ltd.
The sample description (or commodity) had changed from PC to HF1023IM-G7630by client's request.

SGS Testing Korea Co. Ltd.

Pluto Kim
Monet Jeong
Billy Oh / Testing Person



Jeff Jang / Chemical Lab Mgr

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA



Test Report No. F690501/LF-CTSA07-28055R1

Issued Date: December 17, 2007 Page 2 of 3

Sample No. : AYA07-28055R1.001

Sample Description : HF1023IM(G7630)

Item No./Part No. : HF1023IM(G7630)

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	5	N.D.
Mercury (Hg)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	US EPA 3060A(1996), US EPA 7196A(1992), UV	1	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tri bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Monobromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tri bromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.

NOTE: (1) N.D. = Not detected,(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) Negative = Undetectable / Positive = Detectable

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Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

SGS

Test Report No. F690501/LF-CTSAYA07-28055R1

Issued Date: December 17, 2007 Page 3 of 3

Picture of Sample as Received:

Sample Color : Gray



*** End ***

- NOTE:
- (1) N.D. = Not detected.(<MDL)
 - (2) mg/kg = ppm
 - (3) MDL = Method Detection Limit
 - (4) - = No regulation
 - (5) ** = Qualitative analysis (No Unit)
 - (6) Negative = Undetectable / Positive = Detectable

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Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

12.2 SHEET METAL



802-64 JigJ-dong, Dongdaemun-gu, Seoul, Korea, 130-864
Tel: +82-2-3299-8006/9 Fax: +82-2-3299-8150/1
www.fiti.re.kr

TEST REPORT

APPLICANT : MILLENNIUM TECH CO., LTD.

REPORT NO. : N215-08-00113

SAMPLE RECEIVED DATE : 2008-02-21

TEST STARTED DATE : 2008-02-21

REPORT ISSUED DATE : 2008-02-27

PAGE : 1 OF 2

SAMPLE DESCRIPTION : ONE(1) PIECE OF SUBMITTED CUTTING SAID TO BE SUS 301.

TEST CONDUCTED : AS REQUESTED BY THE APPLICANT, FOR DETAILS PLEASE SEE ATTACHED PAGES.

* THE ATTACHED TEST RESULT WAS CONDUCTED WITH 2002/95/EC RoHS(Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) REGULATION FOR ELECTRONIC PRODUCT.

MANAGER OF THE DEPT. OF
ECO-TESTING CENTER

Boo Won Kang

BOO WON, KANG

EXECUTIVE DIRECTOR

Woo Jung Shim

WOO-JUNG SHIM

FITI TESTING & RESEARCH INSTITUTE

e-DOCUMENT SERVICE

The test results contained in this report are limited to results on the sample(s) that is provided by the client and are not necessary indication or representation of the quality of the product which the sample(s) was taken or of all products. Results contained in this report are not based on the quality verification of sample by the FITI quality verification program unless specifically requested by the client. Further use of the results of this report is prohibited unless allowed under a separate agreement set forth in an official document that is established between the client described on this label and the FITI.

Specification No. 2008-B4-PS007	Description iM Main- Antenna Product Specification		
Customer Pantech Co., Ltd	Date Mar. 14, 2008	Rev 1.0	Reference NA

REPORT NO. : N215-08-00113
PAGE : 2 OF 2

TEST CONDUCTED

TEST RESULT

(01) HEAVY METAL'S CONTENT : mg/kg

ELEMENT	TEST RESULTS	TEST METHOD	DETECTION LIMIT
CADMIUM (Cd)	NOT DETECTED	USEPA 3050B	1mg/kg
LEAD (Pb)	NOT DETECTED	USEPA 3052	
MERCURY (Hg)	NOT DETECTED	USEPA 3052	
CHROMIUM VI (Cr VI)	NOT DETECTED	USEPA 3080A	0.1mg/kg

NOTE) WITH REFERENCE TO EACH TEST METHOD FOLLOWED BY ACID/ALKALINE DIGESTION AND MEASURED BY
INDUCTIVELY COUPLED PLASMA SPECTROMETRY(ICP) AND UV-VIS SPECTROMETER.

SAMPLE PHOTO :

