Product Specification

RS151 2.4/5GHz Dual PCB Antenna

(ARTS-RWPM-321)

Supplier : ART SIGNAL Co.,LTD.
R&D Center : 1008-A, Woolim Lion's Valley 2nd, 146-8, Sangdaewon-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea.
Tel : 070-4414-7188 **Fax :** 031-734-7188

ANTENNA APPROVAL

Product Name	**PCB Type Antenna**
Model Name / Freq.	**RS151 / 2400~2485,5150~5000MHz**
Antenna PART No.	**ARTS-RWPM-321**
Customer PART No.	
Customer	**(주)Citech**
Supplier	**(주)ARTSIGNAL**

RF PART		ME PART		QA PART	
Submitted	**Approval**	**Submitted**	**Approval**	**Submitted**	**Approval**
					

Table of Contents

1.Log of Changes

NO	Date	Mark	Changes	Remark	Rev.
1	2024.03.28				1.0
2	2024.04.16		Change to Drawing, Passive Data		1.1
3	2024.05.14		Add to Cable Data		1.2
4					
5					
6					
7					

2.PART NUMBER LIST

No.	PART NO.	Color & Appearance	ART-SIGNAL Antenna Product Number	Remark
1	RS151 2.4/5GHz DualPCB Ant	PCB : Green Case : Black	ARTS-RWPM-321	
2				
3				
4				
5				
6				

3. Product Description & Terminology

3.1 Description

This is the product specification of Internal Antenna applied to Set.

3.2 Product Number

ART SIGNAL Antenna Part Number **ARTS-RWPM-321**

3.3 Unit, Definitions & Abbreviations

SI unit will be used, unless any specialties are announced

Tx	Transmit Band
Rx	Receive Band
PCB	Printed Circuit Board
VSWR	Voltage Standing Wave Ratio
dBi	Antenna gain in dB relative to a isotropic antenna
Room Temperature	+20 ± 3℃
CW	Clock Wise
g	Acceleration of gravity 9.82 m/s²
RH	Relative Humidity
gf / kgf	Gram weight (1gf=980.665dyn) / Kilogram weight (1kgf=9.80665N)
Ph	Potential of hydrogen
F	Force
T	Torque

3.4 Co-ordinates System

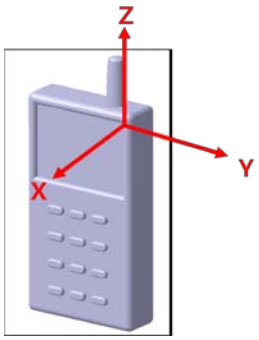


Figure 3.4.1 Coordinate within the Handset

4. Electrical Properties

4.1 Specification

Item		Specifications
Antenna	Center Frequency	2400~2485, 5150~5900 ±1MHz
	Band Width	85,750 MHz
	Polarization	Vertical
	Dimension	85.00mm * 17.00mm * 14T
	Working Temperature	-40~85°C
	Storage Temperature	-20~80°C
Mechanical	Connector	RPSMA (male)
	Radome Material	FR-4, PC

4.2 Impedance

4.2.1 Nominal Impedance

- R = 50Ω

4.2.2 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. Testing is corresponded to the figure 4.2.1

Figure 4.2.1 Test by network analyzer

4.3 Matching Circuit

Matching Circuit is composed in free space of 4.1 frequency band while satisfying customer's Requirements. Matching Circuit is corresponded to the figure 4.3.1

No Matching

4.4 V.S.W.R

Impedance Matching optimization is performed under the below mentioned environment.

4.4.1 Free Space Environment

Mode \ Service(MHz)		2400	2485	5150	5850
VSWR	**TEST DATA**	**1.75**	**1.71**	**1.80**	**1.57**
	SPEC	**2.25**	**2.21**	**2.30**	**2.07**

4.4.2 Measuring Method

Connect(soldering) 50Ω copper cable to the 50Ω spot in handset. To minimize the loss of transmission, copper 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.

4.5 Directive ness

Omni-directional

4.6 Gain

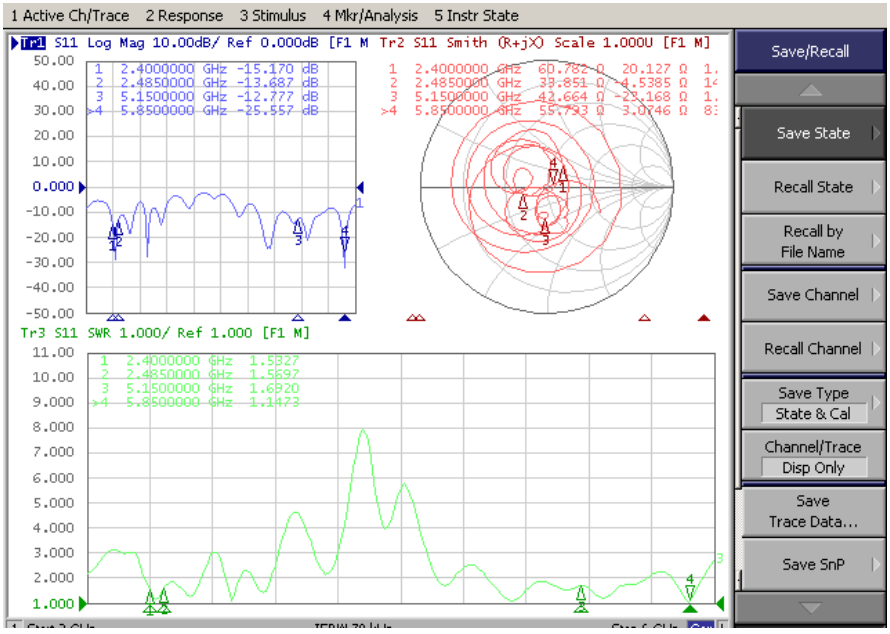
Free Space

Service(MHz) / Mode(dBi)	2.4G Antenna				
Freq.(MHz)	2400	2420	2440	2460	2485
PEAK	2.56	2.52	2.72	2.76	2.48
AVG	**-0.72**	**-0.65**	**-0.47**	**-0.45**	**-0.61**
SPEC	**-1.22**	**-1.15**	**-0.97**	**-0.95**	**-1.11**

Service(MHz) / Mode(dBi)	5G Antenna								
Freq.(MHz)	5150	5250	5350	5450	5550	5650	5750	5850	5900
PEAK	3.07	2.58	3.16	2.23	2.73	2.31	1.56	2.45	1.13
AVG	**-1.12**	**-1.61**	**-1.10**	**-1.75**	**-1.58**	**-1.95**	**-2.48**	**-1.18**	**-2.60**
SPEC	**-1.62**	**-2.11**	**-1.60**	**-2.25**	**-2.08**	**-2.45**	**-2.98**	**-1.68**	**-3.10**

5. Electric Efficiency

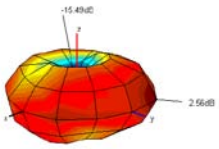
5.1 ANT-VSWR, Return loss, Smith Chart



5.2 Radiation Pattern (XY-Plane)

	1	2	3	4	5
Frequency [MHz]	2400	2420	2440	2460	2485
Efficiency [dB]	-0.72	-0.65	-0.47	-0.45	-0.61
Efficiency [%]	84.7	86.1	89.8	90.1	87.0
TRG$_{\theta}$[dB]	-1.72	-1.75	-1.62	-1.70	-2.20
Gain$_{\theta Peak}$[dB]	2.23	2.19	2.41	2.55	2.30
Gain$_{\theta Min}$[dB]	-22.02	-24.90	-34.15	-33.27	-28.31
TRG$_{\varphi}$[dB]	-7.59	-7.17	-6.80	-6.48	-5.73
Gain$_{\varphi Peak}$[dB]	-0.39	0.14	0.64	1.06	1.90
Gain$_{\varphi Min}$[dB]	-28.41	-25.81	-25.34	-26.28	-25.01
UHRG [dB]	-4.06	-4.10	-4.00	-4.08	-4.41
UHRG/TRG [%]	46.3	45.2	44.3	43.4	41.6
H-Plane	0.70	0.70	0.89	0.92	0.52
E1-Plane, AVG [dB]	-3.76	-3.81	-3.76	-3.97	-4.64
E2-Plane, AVG [dB]	-2.11	-1.98	-1.66	-1.53	-1.78
Peak Gain [dB]	2.56	2.52	2.72	2.76	2.48
Directivity [dB]	3.29	3.17	3.19	3.21	3.08
Minimum Gain [dB]	-15.49	-15.43	-15.17	-15.85	-14.81

2400



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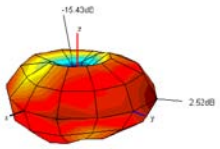

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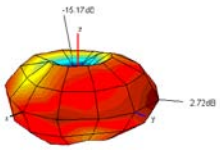

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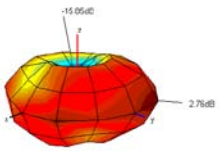

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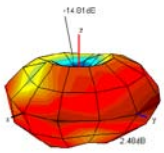
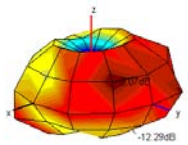


ART SIGNAL Antenna Total Solution	Description: RS151 2.4/5GHz Dual PCB Antenna Product Specification			
	Specification No.: ARTS-RWPM-321	Customer.: ㈜Citech	Rev.: 1.2	Date: May. 14, 2024

	6	7	8	9	10	11	12	13	14
Frequency [MHz]	**5150**	**5250**	**5350**	**5450**	**5550**	**5650**	**5750**	**5850**	**5900**
Efficiency [dB]	**-1.12**	**-1.61**	**-1.10**	**-1.75**	**-1.58**	**-1.95**	**-2.48**	**-1.18**	**-2.60**
Efficiency [%]	**77.2**	**69.1**	**77.6**	**66.9**	**69.5**	**63.8**	**56.5**	**76.2**	**54.9**
TRG$_{\theta}$[dB]	-3.13	-3.22	-2.69	-2.98	-2.64	-3.03	-3.57	-2.05	-3.40
Gain$_{\theta Peak}$[dB]	1.54	1.34	3.02	2.11	2.51	2.04	1.06	2.38	1.06
Gain$_{\theta Min}$[dB]	-14.66	-17.86	-14.78	-15.38	-13.64	-22.19	-24.21	-28.15	-36.57
TRG$_{\varphi}$[dB]	-5.43	-6.69	-6.25	-7.81	-8.22	-8.53	-9.01	-8.59	-10.34
Gain$_{\varphi Peak}$[dB]	0.01	-1.20	-1.06	-2.79	-3.18	-3.46	-4.69	-2.91	-5.56
Gain$_{\varphi Min}$[dB]	-24.18	-43.52	-23.62	-24.20	-32.37	-31.31	-20.74	-30.74	-31.17
UHRG [dB]	-3.77	-4.33	-3.85	-4.52	-4.23	-4.56	-5.04	-3.70	-5.16
UHRG/TRG [%]	54.4	53.5	53.1	52.7	54.3	54.9	55.4	55.9	55.5
H-Plane	-1.91	-2.19	-2.00	-2.33	-2.02	-2.27	-2.68	-1.01	-2.10
E1-Plane, AVG [dB]	-4.84	-4.47	-3.53	-3.40	-3.01	-3.47	-4.04	-2.46	-3.97
E2-Plane, AVG [dB]	-2.64	-2.97	-1.82	-2.20	-1.92	-2.34	-3.37	-1.79	-3.37
Peak Gain [dB]	3.07	2.58	3.16	2.23	2.73	2.31	1.56	2.45	1.13
Directivity [dB]	4.19	4.19	4.26	3.97	4.31	4.26	4.04	3.63	3.73
Minimum Gain [dB]	-12.29	-9.64	-12.10	-13.73	-11.16	-17.16	-13.92	-16.05	-18.11

5150



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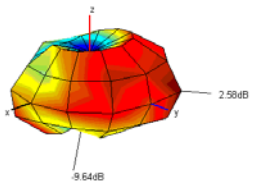

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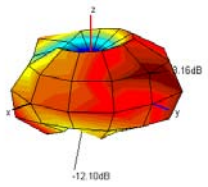
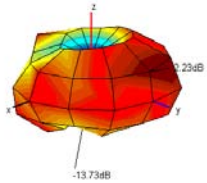


5450



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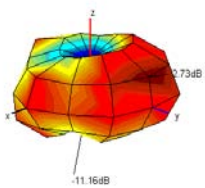

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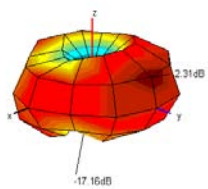

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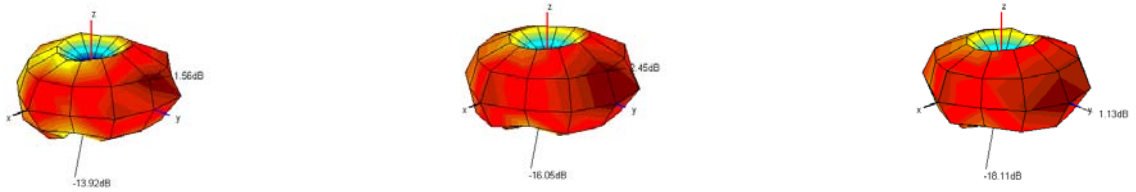
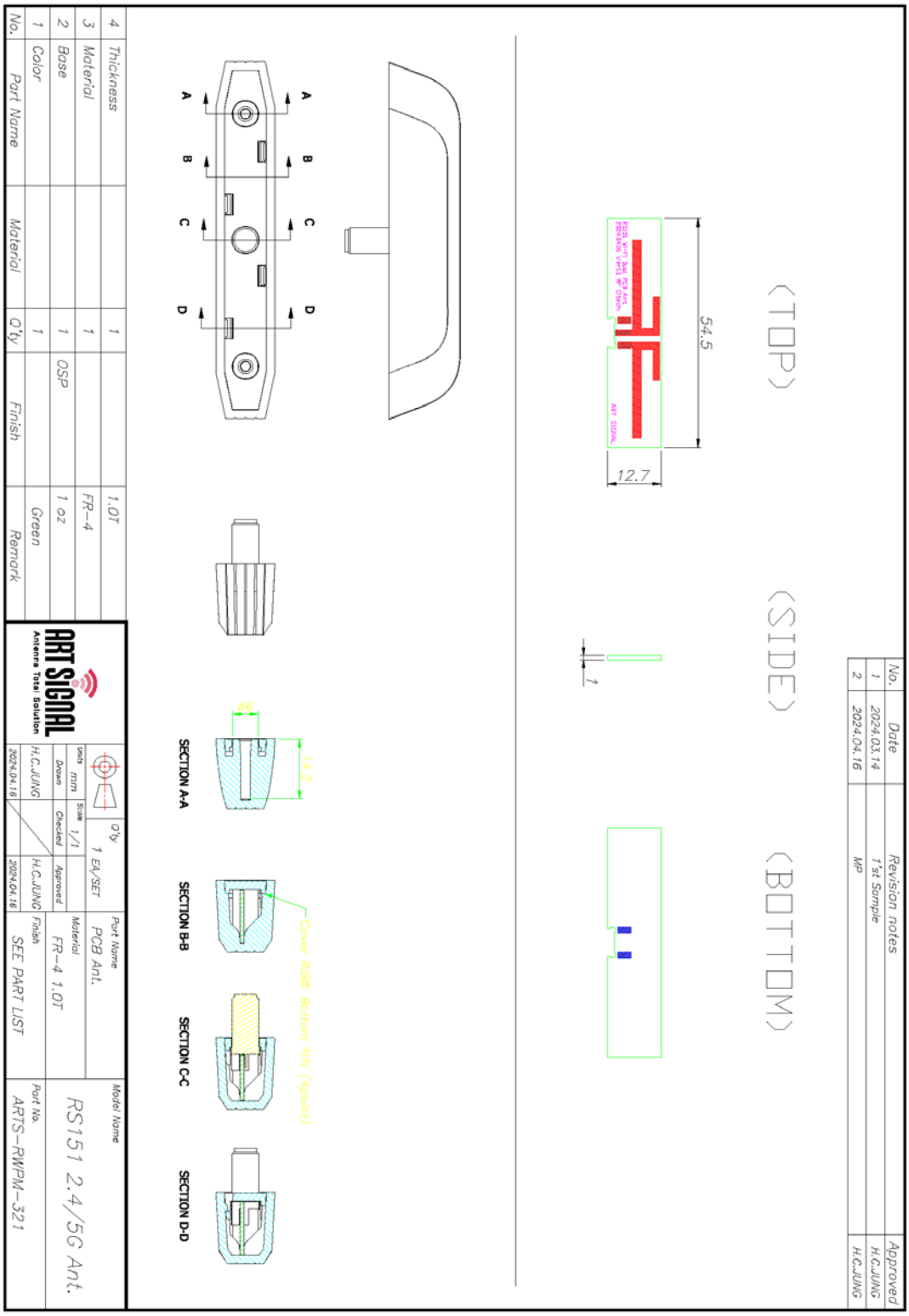
5750 **5850** **5900**



3D GAIN (H/E1/E2-plane)

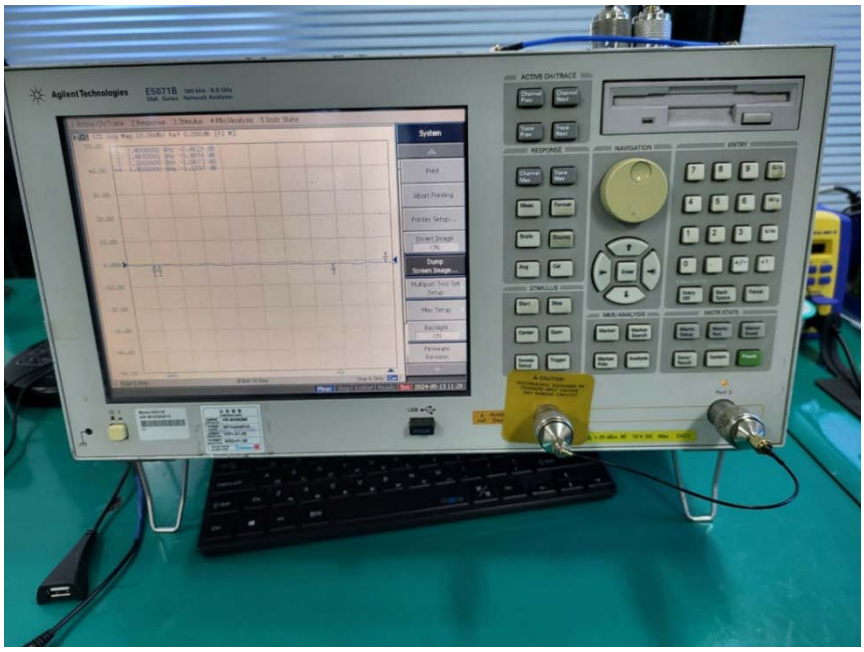
6. Mechanical Drawing

6.1 PCBAnt



7. SMA to IPEX Cable

7.1 Dimension

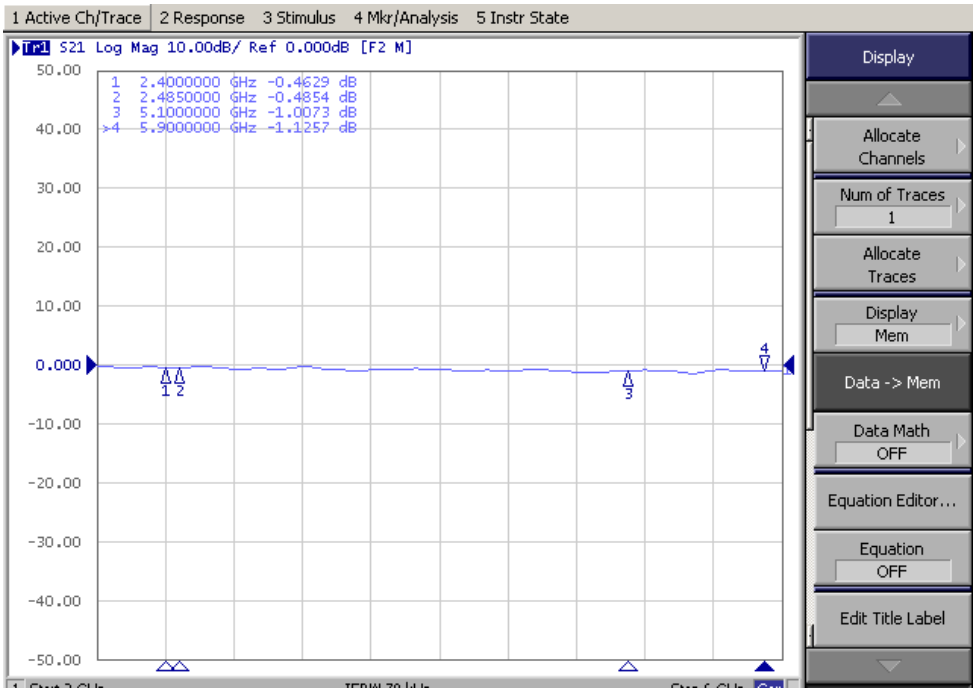


Test by network analyzer

7.2 Specification

Item		Specifications
Cable Ass'y	Frequency	2000 ~ 6000MHz
	Band Width	-
	Polarization	-
	Dimension	150mm*1.37Ø
	Working Temperature	-40~60℃
	Storage Temperature	-20~40℃
Mechanical	Connector	RPSMA (female) , MHF1(U.FL Cable, IPEX)
	Radome Material	-

7.3 Loss



Frequecy(MHz)	2400	2485	5100	5900
Loss(dB)	< 0.46	< 0.48	< 1.00	< 1.12

8. OQC Report Format

Customer		Customer P/N		PO No.	
Type		Maker P/N		Delivery q'ty	
Band		ARTS P/N		Delivery date	

Test date

Sample test standard : MIL-STD-105E(G Ⅱ) AQL=(CRI:0 MAJ:0.4 MIN:1.0)

Test method A:Total test B:Sample test C:Integer test D:Special test Test Q'ty : 20EA

Item	Test contents	Test standard		Test method	Test result 1	2	3	4	5	P/F
Visual test (B: Sample test)	CASE-No contaminants			Visual test						
	CASE-No scratch			Visual test						
Dimension test (B: Sample test)	Antenna length	1		V/C						
		2		V/C						
Performance test (B: Sample test)	Freqency(VSWR)	2400MHz		Network analyzer						
		2485 MHz								
		5150MHz								
		5900 MHz								
Etc. (A: Total test)	Packaging status	No box damage		Visual test						
	Q'ty test	No loss		counting						
Final				[ ]PASS [ ]REJECT						

Write	Examine	Approval

※ When defective products are found, a full test is conducted.

NOTE: 1. This record is kept for 3 yesrs.

2. Please using the specified inspection equipment and inspection method.

3. Please refer to this shipment report when inspecting goods upon receipt.

9. ROHS

-Refer to Attached file