



Product Specification

RS151 2.4/5GHz Dual PCB Antenna (ARTS-RWPM-321)

Supplier : ART SIGNAL Co.,LTD.

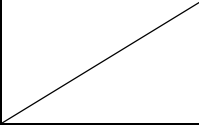
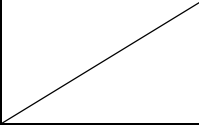
R&D Center : 1008-A, Woolim Lion's Valley 2nd, 146-8, Sangdaewon-dong,
Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea.

Tel : 070-4414-7188 **Fax :** 031-734-7188

	Description			
	RS151 2.4/5GHz Dual PCB Antenna Product Specification			
Specification No.	Customer.	Rev.	Date	
ARTS-RWPM-321	(주)Citech	1.1	Apr. 16, 2024	

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)아트시그널

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



이 문서는 (주)아트시그널에서 대외비로 발행 되었으며, (주)아트시그널의 사전 허가 없이 이 서류의 일부분 또는 전체를 재 발행 하지 않는다. 여기서 포함하고 있는 정보는 (주)아트시그널의 소유이며, 제출된 목적 이외의 용도나 (주)아트시그널의 사전 허가 없이 일부 또는 전체가 공개되지 않는다.

 Antenna Total Solution	Description			
	RS151 2.4/5GHz Dual PCB Antenna Product Specification			
Specification No.	Customer.	Rev.	Date	
ARTS-RWPM-321	 Citech	1.1	Apr. 16, 2024	

Table of Contents

1 Log of Changes.....	4
2 Part Number List.....	4
3 Product Description& Terminology.....	5
3.1 Description.....	5
3.2 Product Number	5
3.3 Units, Definitions & Abbreviations.....	5
3.4 Co-ordinates System	5
4 Electrical Properties.....	6
4.1 Specification.....	6
4.2 Impedance.....	6
4.3 Matching Circuit.....	7
4.4 V.S.W.R.....	7
4.5 Directive ness	7
4.6 Gain.....	8
5 Electric Performance data	8
5.1 V.S.W.R.....	8
5.2 Radiation Pattern	9~11
6 Mechanical Drawing	12
6.1 PCB ANT	12
7 OQC Report Format.....	13
8 ROHS.....	14

 Antenna Total Solution	Description			
	RS151 2.4/5GHz Dual PCB Antenna Product Specification			
Specification No.	Customer.	Rev.	Date	
ARTS-RWPM-321	 Citech	1.1	Apr. 16, 2024	

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					
4					
5					
6					
7					

2. PART NUMBER LIST

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

 Antenna Total Solution	Description			
	RS151 2.4/5GHz Dual PCB Antenna Product Specification			
Specification No.	Customer.	Rev.	Date	
ARTS-RWPM-321	 Citech	1.1	Apr. 16, 2024	

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°C
CW	Clock Wise
g	Acceleration of gravity 9.82 m/s ²
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

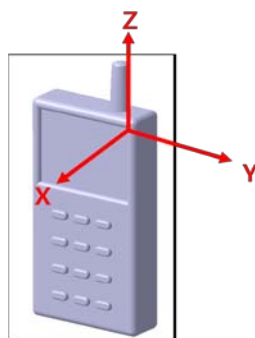


Figure 3.4.1 Coordinate within the Handset

 Antenna Total Solution	Description			
	Specification No.	Customer.	Rev.	Date
	ARTS-RWPM-321	 Citech	1.1	Apr. 16, 2024

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	SMA Female
	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

 Antenna Total Solution	Description			
	RS151 2.4/5GHz Dual PCB Antenna Product Specification			
Specification No.	Customer.	Rev.	Date	
ARTS-RWPM-321	 Citech	1.1	Apr. 16, 2024	

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

Service(MHz)		2400	2485	5150	5850
Mode					
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

 Antenna Total Solution	Description			
	RS151 2.4/5GHz Dual PCB Antenna Product Specification			
Specification No.	Customer.	Rev.	Date	
ARTS-RWPM-321	 Citech	1.1	Apr. 16, 2024	

4.6 Gain

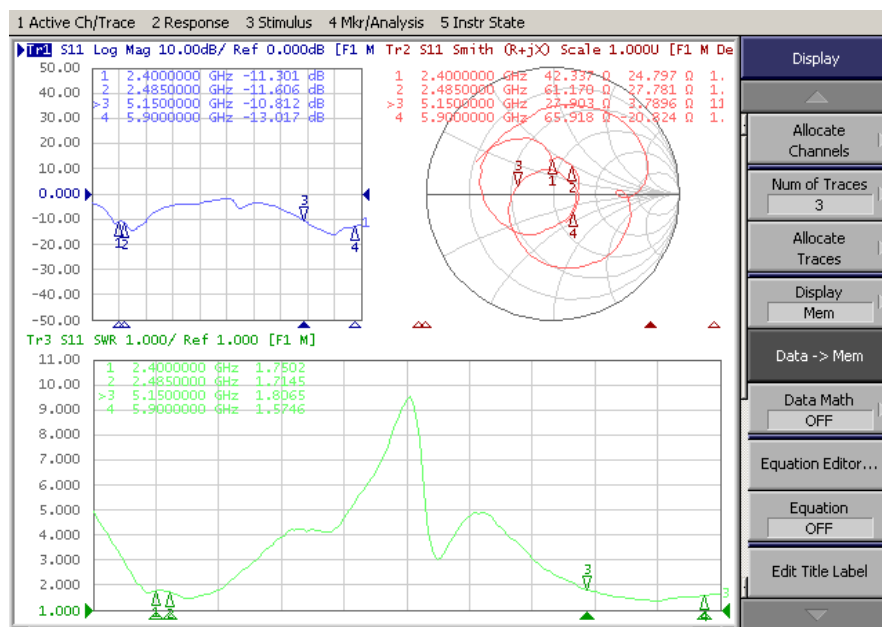
Free Space

Service(MHz) Mode(dBi)	2.4G Antenna				
Freq.(MHz)	2400	2420	2440	2460	2485
PEAK	2.48	2.86	3.33	3.39	3.14
AVG	-0.46	-0.27	0.04	0.03	-0.46
SPEC	-0.96	-0.77	-0.54	-0.53	-0.96

Service(MHz) Mode(dBi)	5G Antenna									
	Freq.(MHz)	5150	5250	5350	5450	5550	5650	5750	5850	5900
PEAK		5.22	5.50	6.37	5.75	5.94	5.13	4.00	4.88	4.41
AVG		-1.17	-1.75	-0.82	-1.69	-1.41	-1.95	-2.43	-1.86	-2.35
SPEC		-1.67	-2.25	-1.32	-2.19	-1.91	-2.45	-2.93	-2.36	-2.85

5.Electric Efficiency

5.1 ANT-VSWR, Return loss, Smith Chart

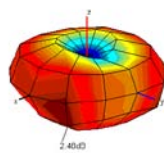


 Antenna Total Solution	Description			
	Specification No.	Customer.	Rev.	Date
	ARTS-RWPM-321	 Citech	1.1	Apr. 16, 2024

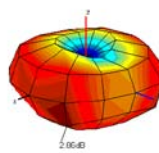
5.2 Radiation Pattern (XY-Plane)

	1	2	3	4	5
Frequency [MHz]	2400	2420	2440	2460	2485
Efficiency [dB]	-0.46	-0.27	0.04	0.03	-0.46
Efficiency [%]	90.0	94.0	100.9	100.7	89.9
TRG _θ [dB]	-0.79	-0.61	-0.31	-0.34	-0.93
Gain _{θPeak} [dB]	1.73	2.05	2.44	2.45	1.89
Gain _{θMin} [dB]	-33.31	-29.05	-26.40	-22.31	-19.28
TRG _φ [dB]	-11.82	-11.43	-11.03	-10.83	-10.33
Gain _{φPeak} [dB]	-3.28	-2.86	-2.49	-2.40	-2.00
Gain _{φMin} [dB]	-33.27	-29.77	-35.01	-33.59	-42.31
UHRG [dB]	-3.73	-3.61	-3.35	-3.40	-3.98
UHRG/TRG [%]	47.1	46.3	45.9	45.4	44.5
H-Plane	0.83	0.98	1.26	1.26	0.67
E1-Plane, AVG [dB]	-1.55	-1.35	-1.02	-0.99	-1.54
E2-Plane, AVG [dB]	-3.26	-3.13	-2.87	-2.95	-3.55
Peak Gain [dB]	2.48	2.86	3.33	3.39	3.14
Directivity [dB]	2.94	3.13	3.29	3.36	3.60
Minimum Gain [dB]	-14.38	-14.41	-13.96	-13.71	-13.48

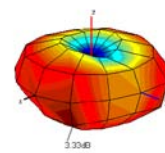
2400



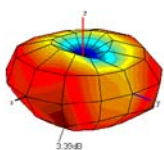
2420



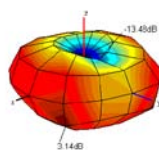
2440



2460



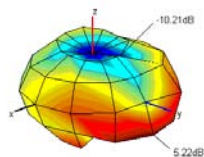
2485



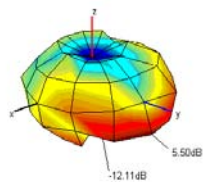
 Antenna Total Solution	Description RS151 2.4/5GHz Dual PCB Antenna Product Specification			
	Specification No. ARTS-RWPM-321	Customer.  Citech	Rev. 1.1	Date Apr. 16, 2024

	6	7	8	9	10	11	12	13	14
Frequency [MHz]	5150	5250	5350	5450	5550	5650	5750	5850	5900
Efficiency [dB]	-1.17	-1.75	-0.82	-1.69	-1.41	-1.95	-2.43	-1.86	-2.35
Efficiency [%]	76.5	66.8	82.7	67.7	72.3	63.8	57.1	65.2	58.2
TRG _θ [dB]	-2.87	-3.10	-2.22	-2.84	-2.43	-2.94	-3.34	-2.57	-3.06
Gain _{θPeak} [dB]	4.89	5.00	5.97	5.43	5.62	4.77	3.58	4.61	4.10
Gain _{θMin} [dB]	-20.86	-25.13	-33.12	-26.68	-23.62	-21.64	-22.01	-20.58	-21.86
TRG _φ [dB]	-6.05	-7.48	-6.43	-8.01	-8.19	-8.88	-9.68	-10.08	-10.55
Gain _{φPeak} [dB]	2.02	0.49	1.94	0.55	0.46	-0.61	-0.98	-0.94	-1.09
Gain _{φMin} [dB]	-18.48	-24.58	-33.69	-33.85	-30.20	-37.62	-33.73	-28.81	-33.86
UHRG [dB]	-5.62	-6.55	-5.63	-6.45	-6.13	-6.58	-6.91	-6.37	-6.87
UHRG/TRG [%]	35.9	33.1	33.1	33.5	33.7	34.5	35.7	35.4	35.3
H-Plane	-2.89	-3.11	-1.99	-2.53	-1.86	-2.18	-2.44	-1.49	-2.01
E1-Plane, AVG [dB]	-4.80	-5.09	-4.07	-4.53	-4.34	-4.79	-5.02	-4.19	-4.63
E2-Plane, AVG [dB]	-3.32	-3.58	-3.12	-4.01	-3.68	-4.25	-4.85	-3.74	-4.22
Peak Gain [dB]	5.22	5.50	6.37	5.75	5.94	5.13	4.00	4.88	4.41
Directivity [dB]	6.39	7.25	7.19	7.44	7.35	7.09	6.43	6.74	6.76
Minimum Gain [dB]	-10.21	-12.11	-12.52	-14.78	-15.60	-15.63	-18.41	-17.54	-13.21

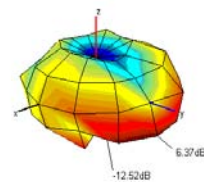
5150



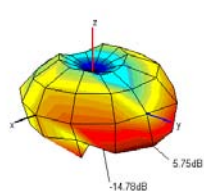
5250



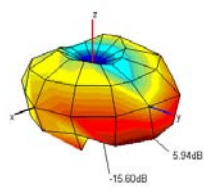
5350



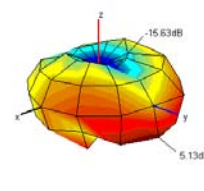
5450



5550



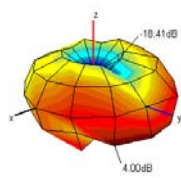
5650



 Antenna Total Solution	Description		
	RS151 2.4/5GHz Dual PCB Antenna Product Specification		
Specification No.	Customer.	Rev.	Date
ARTS-RWPM-321	 Citech	1.1	Apr. 16, 2024

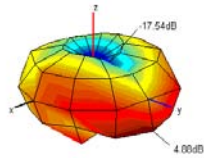
5750

10



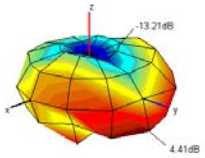
5850

10



5900

10



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

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

7. SMA to IPEX Cable

7.1 Dimension



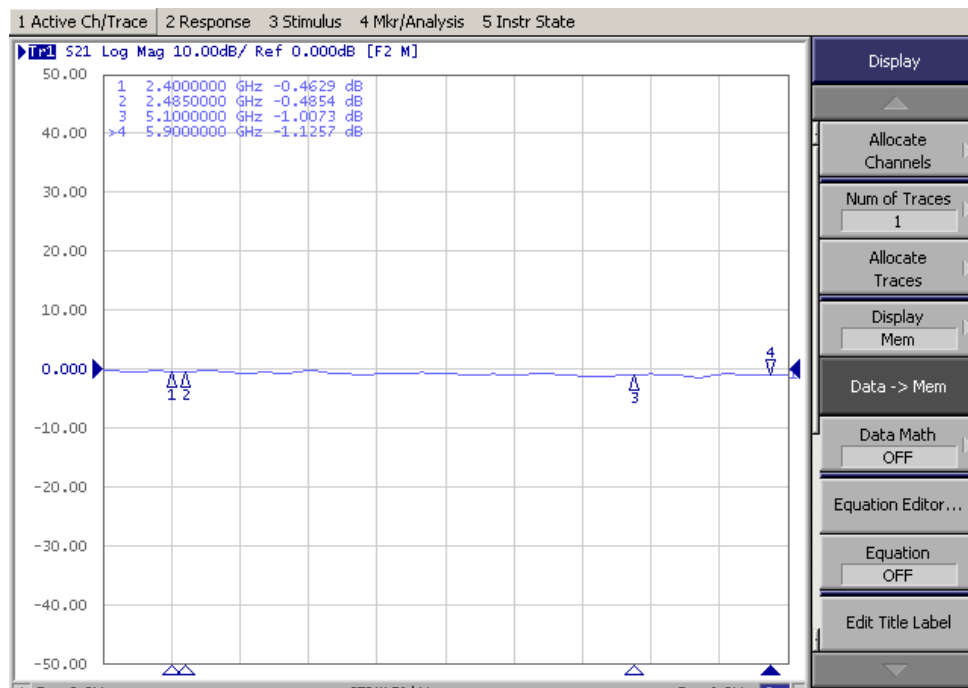
Test by network analyzer

 Antenna Total Solution	Description			
	Specification No.	Customer.	Rev.	Date
	ARTS-RWPM-321	 Citech	1.2	May. 14, 2024

7.2 Specification

Item	Specifications	
Cable Ass'y	Frequency	2000 ~ 6000MHz
	Band Width	-
	Polarization	-
	Dimension	150mm*1.13Ø
	Working Temperature	-40~60°C
	Storage Temperature	-20~40°C
Mechanical	Connector	SMA Male , MHF1(U.FL Cable, IPEX)
	Radome Material	-

7.3 Loss



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

 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

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

샘플검사표준: MIL-STD-105E(G II) AQL=(CRI:0 MAJ:0.4 MIN:1.0)																
검사방법 A:전수검사 B:샘플검사 C:정수검사 D:특수검사 검사수량: 20EA																
항목	검사내용	검사표준		검사방법	검사 결과					판정						
					1	2	3	4	5							
외관검사 (B:샘플 검사)	CASE-오염물질 없을것			육안검사												
	CASE-스크래치 없을 것			육안검사												
치수검사 (B:샘플 검사)	안테나 총길이	1		V/C												
		2		V/C												
전기 및 기계 성능 검사 (B:샘플 검사)	주파수(VSWR)	2400MHz		네트워크 분석기												
		2485 MHz														
		5150MHz														
		5900 MHz														
기타 (A:전수검사)	포장상태	박스훼손 없을 것		육안검사												
	수량검사	결량 없을 것		수작업 카운팅												
최종판정					[]PASS []REJECT											

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

9. ROHS

-Refer to Attached file