

Data Sheet

Type

:

Ceramic Patch Antenna

Amotech Part No.

:

ASRDSQ25I-84-SXM-D1000

Customer Part No.

:

SDARS

	Designed	Checked		Approved
	-			
Date	. .	. .	. .	. .

Revision no	Content	Page	Date	Name
0	First, documented	-	2022.06.03	Y.C Choi
1	Change of the golden sample	-	2022.12.08	H.B Bong

RoHS	■ HEAD OFFICE 5B-1L, 617, NAMCHON-DONG, NAMDONG-GU, INCHOEN-CITY, KOREA TEL : 82-32-821-0363 FAX : 82-32-811-0283 ■ CHINA FACTORY WAISHANGGONGYEYUAN HIGH NEW TECHNOLOGY DEVELOPMENT AREA ZIBO SHANDONG P.R.CHINA 255086 TEL: 86-0533-358-7691 FAX: 86-0533-358-7689	Designed	Checked		Approved
		. .	. .	. .	. .

1. Specification

1.1 Electrical characteristic

No	Item	Specification	Unit	Remarks
1	frequency(fc)	2320.00 ~ 2345.00	MHz	Notes : 1)
		2344.00 ± 7.00	MHz	Notes : 2)
2	Return Loss @ Fc	Typ. 15.0	- dB	Notes : 1)
		Min. 15.0	- dB	Notes : 2)
3	Gain @ Fc	Refer to Page 3, 4	dBic / dBi	Notes : 1)
4	Polarization	LHCP	-	-
5	Impedance	50	Ω	-

※ Notes: 1) Measured on Dia.1000mm FR4 ground plane with adhesive tape.

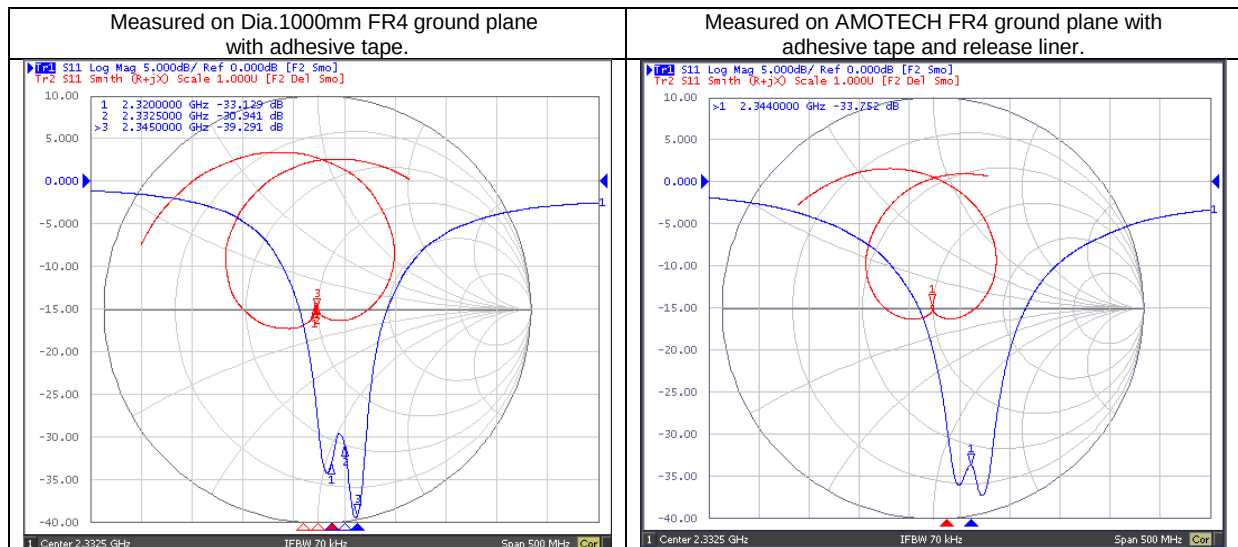
Notes: 2) Measured on AMOTECH FR4 ground plane with adhesive tape and release liner.

- Fc is mid Point of loop/cusp in smith chart.

- All Products in Mass Production Pass through the Inspection Process (100%)

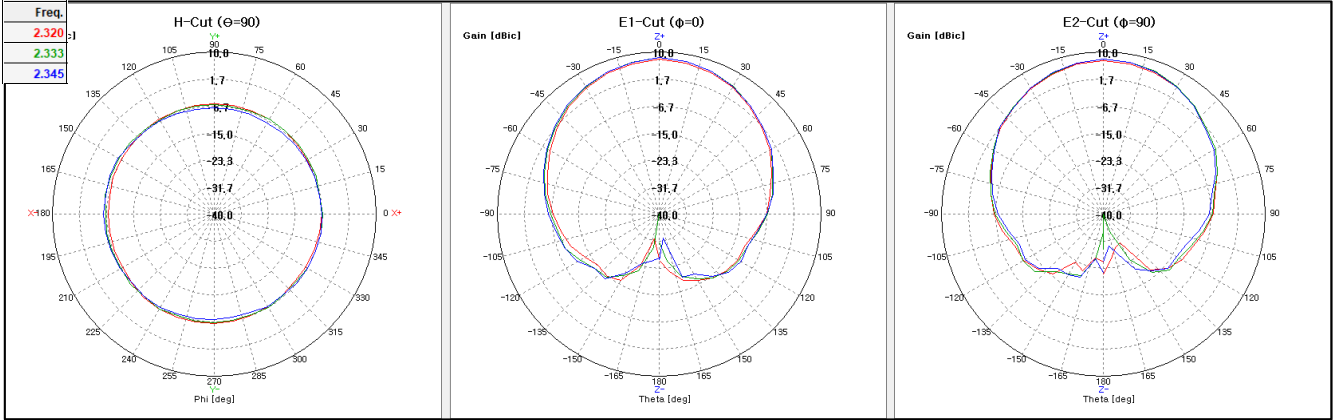
➔ Inspection List : Frequency(MHz), Return Loss(-dB)

1.2 Typical S11 (Log mag & Smith chart)



1.3.1 Left Hand Circular Polarization(LHCP) 2D Radiation Patterns

※ Measured on Dia.150mm ground Plane with adhesive tape.

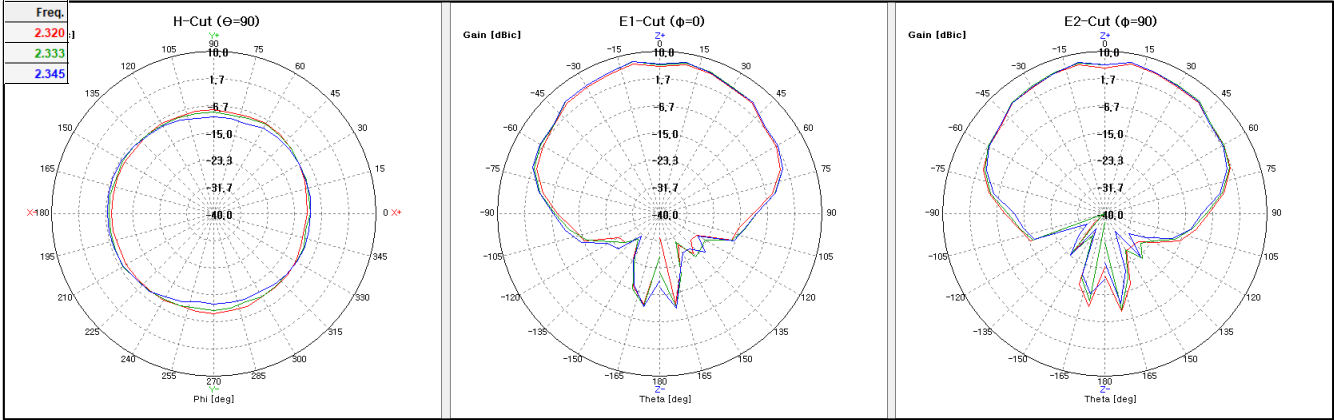


1.3.2 Left Hand Circular Polarization(LHCP) Gain & VP Gain

Parameter			Frequency								
Polar.	Spec.	Angle	2320.00 MHz			2332.50 MHz			2345.00 MHz		
			Avg.Gain	Max	Min	Avg.Gain	Max	Min	Avg.Gain	Max	Min
LHCP	2dBic	90	7.39	7.77	7.20	7.75	8.18	7.57	7.73	8.21	7.58
		80	7.10	7.36	6.78	7.46	7.69	7.14	7.44	7.78	7.18
		70	6.23	6.52	5.91	6.60	6.89	6.26	6.57	6.91	6.26
	4dBic	60	4.96	5.26	4.66	5.31	5.60	4.93	5.27	5.52	4.82
		50	3.28	3.59	2.95	3.62	3.87	3.15	3.54	3.94	2.90
	2dBic	40	1.39	1.57	1.10	1.76	2.05	1.52	1.67	2.26	1.10
		30	-0.53	0.12	-1.05	-0.28	0.16	-0.89	-0.44	0.10	-1.22
VP(LP)	-3 dBic	20	-3.02	-2.39	-3.77	-2.68	-2.29	-3.28	-2.71	-2.10	-3.38
		10	-6.42	-5.00	-8.28	-6.13	-4.68	-7.66	-6.23	-3.95	-8.45
		0	-7.57	-5.89	-9.70	-7.35	-5.78	-9.21	-7.68	-5.10	-10.51

1.3.3 Left Hand Circular Polarization(LHCP) 2D Radiation Patterns

※ Measured on Dia.1000mm ground Plane with adhesive tape.



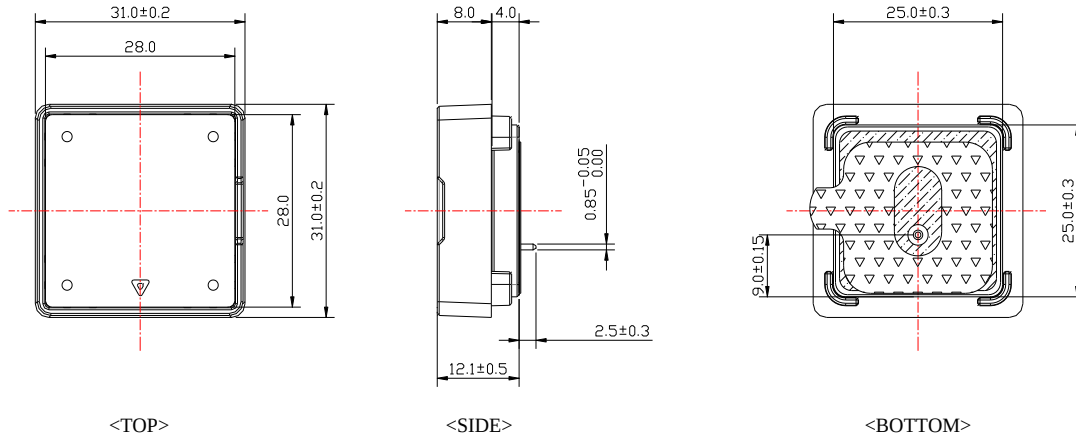
1.3.4 Left Hand Circular Polarization(LHCP) Gain & VP Gain

Parameter			Frequency								
Polar.	Spec.	Angle	2320.00 MHz			2332.50 MHz			2345.00 MHz		
			Avg.Gain	Max	Min	Avg.Gain	Max	Min	Avg.Gain	Max	Min
LHCP	2dBic	90	5.05	5.27	4.78	5.75	5.92	5.52	5.87	6.04	5.62
		80	6.58	6.86	6.29	7.20	7.47	6.93	7.30	7.68	7.00
		70	5.81	6.00	5.60	6.18	6.33	6.04	6.07	6.19	5.98
	4dBic	60	4.73	5.19	4.45	5.20	5.58	4.80	5.05	5.47	4.55
		50	4.58	4.91	4.26	4.98	5.34	4.61	4.78	5.24	4.31
	2dBic	40	2.16	2.83	1.53	2.46	3.14	1.72	2.31	2.92	1.63
		30	1.80	2.54	1.15	2.19	2.74	1.36	2.05	2.89	1.16
VP(LP)	-3 dBic	20	0.26	1.21	-0.78	0.59	1.50	-0.59	0.41	1.75	-1.23
		10	-2.66	-1.17	-4.70	-2.33	-0.95	-4.27	-2.62	-0.09	-5.40
		0	-7.70	-5.57	-10.57	-7.48	-5.67	-9.96	-7.66	-4.54	-11.48

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2. Mechanical Outline

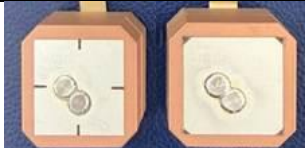
2.1 Dimension



Note

1. Unit : mm
2. All Around Both Sides Typ. 0.3 Chamfer
3. Attach the Antenna on PCB without tape Release Liner

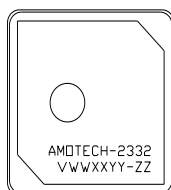
2.2 Tuning : Top & Bottom (Manual Tuning (Diamond tip dill bit) & Laser Tuning)

Tuning Method	Manual Tuning (Diamond tip dill bit)		Laser Tuning	
				

2.3 Mechanical characteristic

No	Item	Specification	Unit	Remarks
1	Dielectric constant	9.5 ± 0.5	-	-
2	Electrode (Top and Bottom)	Silver	-	-
3	Probe	brass	-	-
4	Adhesive tape thickness	Double sided adhesive tape	mm	Tesa-61325
5	Carrier	PC	-	
6	2 nd Radiator	SUS	-	-

2.4 Marking



- V : Line section
- WW : Year
- XX : Month
- YY : Day
- ZZ : Serial number of daily

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3. Reliability Test

No	Item	Test condition	Requirement
1	Drop Test	1. Place antenna on set 2. 1.5m height 3. Drop 5 times	1. No Visible defect 2. S11 change rate ($\Delta f_c < 0.2\%$)
2	Vibration Test	1. 5-55-5 Hz, 1 Octave/min, Amp.=1.5mm, acceleration=2g, Crossover Freq.=18 Hz, Hold time = 2H.R	1. No Visible defect 2. S11 change rate ($\Delta f_c < 0.2\%$)
3	Humidity	1. 60°C, 95%RH, 96Hr	1. No Visible defect 2. S11 change rate ($\Delta f_c < 0.2\%$)
4	Thermal Shock	1. +105°C(30min) → -40°C (30min) 2. 10 cycle	1. No Visible defect 2. S11 change rate ($\Delta f_c < 0.2\%$)
5	High Temperature Resistance	1. +105°C, 96Hr	1. No Visible defect 2. S11 change rate ($\Delta f_c < 0.2\%$)
6	Low Temperature Resistance	1. -40°C, 96Hr	1. No Visible defect 2. S11 change rate ($\Delta f_c < 0.2\%$)
7	Adhesion Strength of Soldering	1. Used of pull push gauge.	1. Spec(min. 5kgf)

※ The sample must satisfy Requirement after 24 hours of test

※ Be base on IEC Climatic category (IEC68-1) -40°C / +90°C / 56h

4. Soldering Condition

- Wettability to IEC 68-2-58 : $\geq 75\%$ (After Aging)

4.1 Manual Soldering(By Iron) – Pb free

- Soldering Temperature : 360°C $\pm$ 5°C, 5sec max.
(Solder : Sn/Ag/Cu:96.5/3.0/0.5)

- Must comply with above soldering condition to prevent from degradation of antenna performance.

5. Caution and Warranty

5.1 Electrode metallizations are unprotected silver and will tarnish during storage due to sulphuric compounds (namely H₂S) in the atmosphere. Elevated temperature and humidity will accelerate this process. Human skin contact, wool etc. also cause tarnishing. This has no effect whatsoever on the electrical performance of the patches. Tarnishing of the silver plated feed pins may affect solderability. Because of this normal and to be expected process, AMOTECH accepts no warranty claims for tarnished products.

AMOTECH uses vacuum packaging to reduce atmospheric influence and to extend shelf life.

5.2 Ceramic Patch Antennas must avoid shock and drop, to prevent cracking of the antenna.

5.3 Ceramic Patch Antennas should be used within 6 months after delivery, antennas older than 6 months should be checked for solderability before using

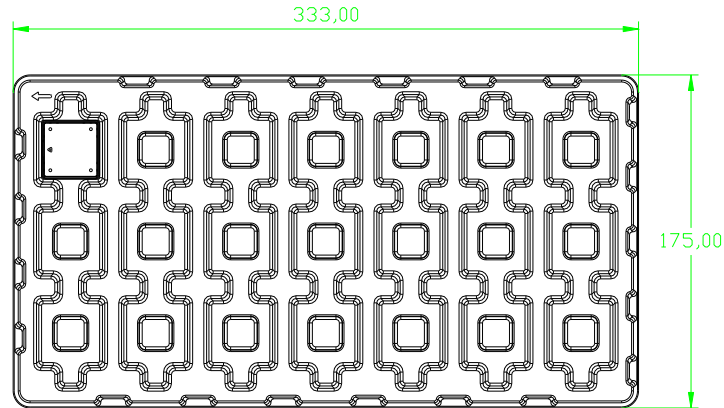
5.4 If you plan to re-use the products that be taken out from packaging. Suggest to re-pack them within 48 hours by re-seal to prevent discoloration.

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6. Package

6.1 Tray

- Quantity



- 21ea/tray

6.2 Inner box

- Dimension: 370 (W) x 195 (D) x 130 (T) (mm)
- Quantity : 5 tray (21ea / tray × 5 tray = 105 ea)



6.3 Outer box

- Dimension : 390 (W) x 620 (D) x 150 (T) (mm)
- Quantity : 3 inner box (105ea / inner box × 3 inner box = 315 ea)

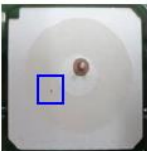


DOC. No.	15-Tuning Boundary-001	(25 by 25 type = Ceramic Patch) Manual top tuning procedure				Written by	Checked by	Approved by
Standard process	Mearsurement process							
Product	Ceramic Patch Antenna							
Written by	Q.A PART							
Original Date	2015. 12. 14	Rev. No.	1	Rev. Date	2018. 02. 07	Page	1/1	

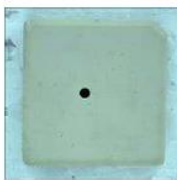
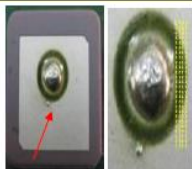
Top Tuning method 1	Top Tuning method 2	Top Tuning method 3
◆ Tuning standard - Tuning Point: Max 4 points only with method1 - Tuning Length : $a \leq 2.00\text{mm}$ - Tuning Wide: $W1 \leq 1.00\text{mm}$	◆ Tuning standard - Tuning Point: Max 4 points only with method2 - Tuning Length: $b \leq 4.00\text{mm}$ - Tuning Wide: $W2 \leq 1.00\text{mm}$	◆ Tuning standard - Tuning Point: Max 2 points only with method3 - Tuning Wide: $W3 \leq 1.00\text{mm}$
◆ The above criteria is for only tuning which is the manual mark by worker. The tuning made in Ag printing process is not applied to the above criteria. ◆ Total tuning points with all above 3 methods : Max 4 points ◆ Criteria of defective parts - If tuned antennas do not meet above standard, Amotech will regard them as defective part		

Doc No.	10Patch-Boundary-001	(25 by 25 type = Ceramic Patch) Manual Bottom tuning procedure				Written by	Checked by	Approved by
Process	Appearance Inspect							
Product	25 by 25 type = Ceramic Patch							
Write Dept	Quality Dept.							
Origin Date	2017. 07. 18	Rev. No.	0	Rev. Date	-	Page	1/1	

Bottom Tuning method 1	Bottom Tuning method 2
◆ Tuning standard - Tuning Point : Max 4 points only with method1 - Tuning Length : $a \leq 5.0\text{mm}$ - Tuning Wide : $W1 \leq 1.0\text{mm}$	◆ Tuning standard - Tuning Point: Max 4 points only with method2 - Tuning Wide: $W2 \leq 2.50\text{mm}$
◆ The above criteria is for only tuning which is the manual mark by worker. The tuning made in Ag printing process is not applied to the above criteria. ◆ Total tuning points with all above 2 methods : Max 4 points ◆ Criteria of defective parts - If tuned antennas do not meet above standard, AMOTECH will regard them as defective part.	

Doc No.	10Patch-Boundary-001	Limited Boundary (No Printing / Scratch)					Write	Check	Approve
Process	Appearance Inspect								
Product	All Model						2022/10	2022/10	2022/10
Write Dept	Quality Dept.								
Origin Date	2010. 02. 08	Revision Date	2022.10.31	Revision No	3	Page	1 / 4		
Item	O K			N G			Etc		
No Printing									
	No printing must have entered allow SPEC. [SPEC : No limit on the number of size≤1mm / 1mm<size≤ 2mm:Allow Q'ty:2ea / 2mm<size:NG]								
Item	O K			N G			Etc		
Scratch									
	Handle badness if there is <u>shape that rake</u> with picture.								
Noted items									

Doc No.	10Patch-Boundary-001	Limited Boundary (Foreign body)						Write	Check	Approve	
Process	Appearance Inspect										
Product	All Model							2022/10	2022/10	2022/10	
Write Dept	Quality Dept.										
Origin Date	2010. 02. 08	Revision Date	2022.10.31	Revision No	3	Page	2 / 4				
Item	O K				N G				Etc		
Foreign body (Bottom)											
	The protruding foreign body is NG, and the non-protruding Foreign body must have entered allow SPEC [W, L SPEC : No limit on the number of size≤2mm / 2mm<size≤ 3mm:Allow Q'ty:2ea / 3mm<size:NG] [H SPEC : If the Foreign Body is thicker than the Tape(Adhesive + Release Liner)Thickness, treat them as defective]										
Item	O K				N G				Etc		
Foreign body (Top)											
	Foreign body must have entered allow SPEC. [SPEC : No limit on the number of size≤1mm / 1mm<size≤ 2mm:Allow Q'ty:2ea / 2mm<size:NG]										
Noted items											

Doc No.	10Patch-Boundary-001	Limited Boundary (Chipping / Solder ball)					
Process	Appearance Inspect						
Product	All Model						
Write Dept	Quality Dept.						
Origin Date	2010. 02. 08	Revision Date	2022.10.31	Revision No	3	Page	3 / 4
Item	O K			N G		Etc	
Chipping							
							
Chipping must have entered allow SPEC. [SPEC : No limit on the number of chipping≤1mm / 1mm<chipping size≤ 2mm:Allow Q'ty:2ea / 2mm<chipping:NG]							
Item	O K		N G		N G		Etc
Solder ball							
							
Solder vall must have entered allow SPEC. [SPEC : Solder ball ≤ 0.3mm]			Solder ball of GND size irrelatively badness.				
Noted items							