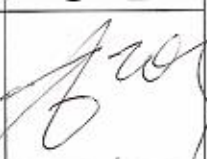


APPROVAL SHEET

Multilayer Chip Antenna

Part No. : ALA931C5

Carpoint			

AMOTECH	Written	Checked		Approved
	 6/11	 6/11	 6/11	 6/11

2007. 06. 11

AMOTECH Co., LTD.

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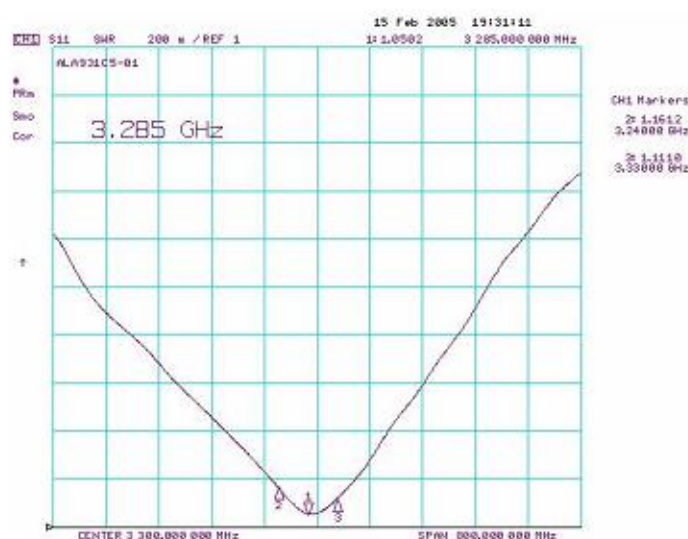
1. Revision History

Date	Title	Content	Page
2007. 06. 11		New drawing up	

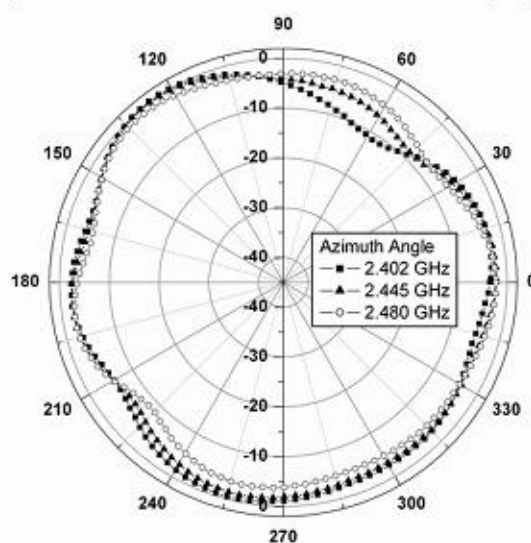
2. Specification

2.1 Electrical Specification

	Item	Spec		Remark
1	Frequency range	2.4 ~ 2.49 GHz		ISM band
2	VSWR	Max 2.5:1 @ 3280±45 MHz		Measured on manual jig
3	Radiation Gain	Avg.	-3.5 dBi	Measured on reference testboard
		Peak	0 dBi	
4	Radiation Pattern	Omni-directional		
5	Impedance	Nominal 50 Ω		



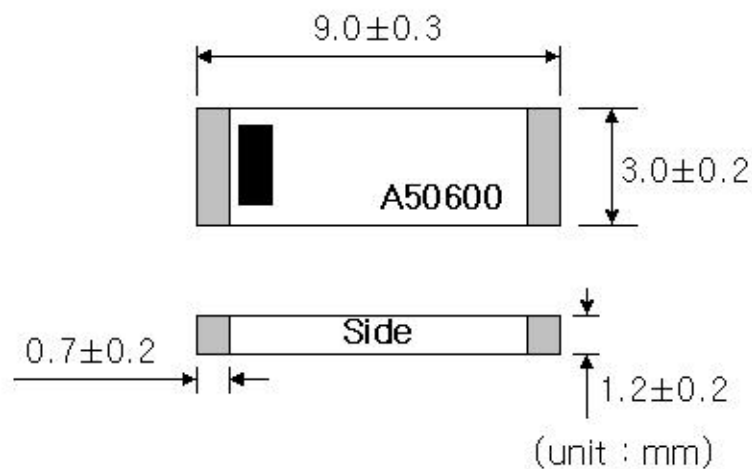
[VSWR : Measured data on a manual jig]



[Radiation Gain : Measured azimuth data on reference testboard]

2.2 Mechanical Specification

	Item	Spec		Unit
1	Size	W	9.0 ± 0.3	mm
		D	3.0 ± 0.2	
		H	1.2 ± 0.2	
2	Weight	97 ± 9		mg
3	Operation Temp.	$-30 \sim +70$		°C
4	Storage Temp.	$-40 \sim +85$		°C



[Dimensions]

2.3 Part No. & Lot No.

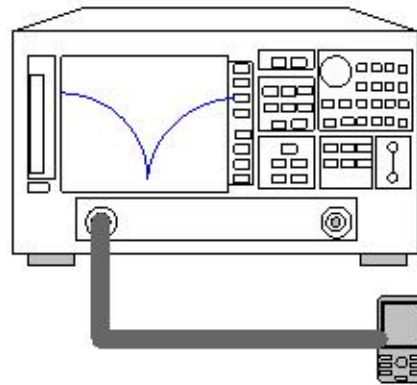
Part No.	<u>ALA</u> (1)	931 (2)	<u>C5</u> (3)
(1) : Amotech LTCC Antenna			
(2) : Chip size			
(3) : Version & Frequency			

Lot No.	<u>MA</u> (1)	<u>09</u> (2)	<u>A5</u> (3)	<u>0506</u> (4)	<u>01</u> (5)
(1) : Mass-product Antenna					
(2) : Chip size					
(3) : Version & Frequency					
(4) : Date (year/month)					
(5) : Order of Production					

3. Test Method of Electrical Characteristic

3.1 VSWR Measurement

Equipment : Network Analyzer 8753ES

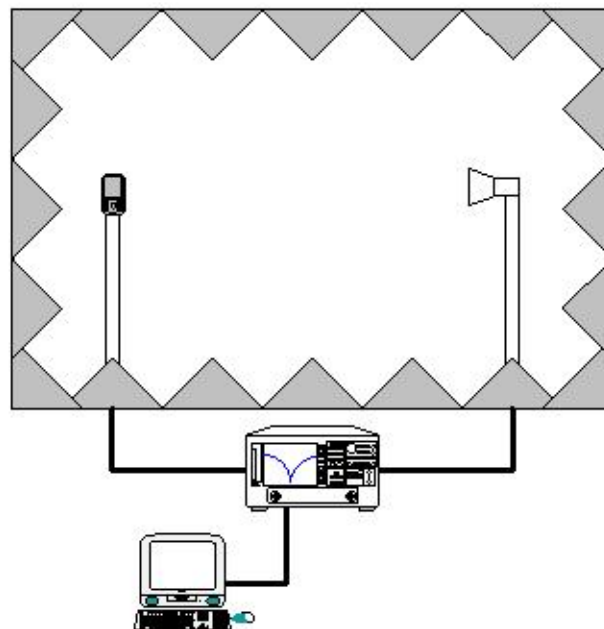


[Test Procedure]

- ㊸ Set up a network analyzer as shown set-up diagram.
- ㊹ Calibration on $f_0 \pm 400$ MHz, verify that return loss is under -55 dB with 50 ohm termination.
- ㊺ Connect AUT to port-cable, measure maximum value of VSWR on operating frequency range.

3.2 Radiation Gain Measurement

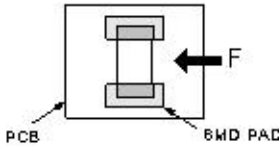
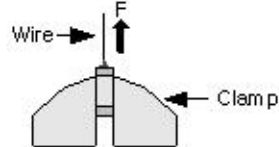
Equipment : Anechoic Chamber(8*4*4 size), Network Analyzer 8753ES



[Test Procedure]

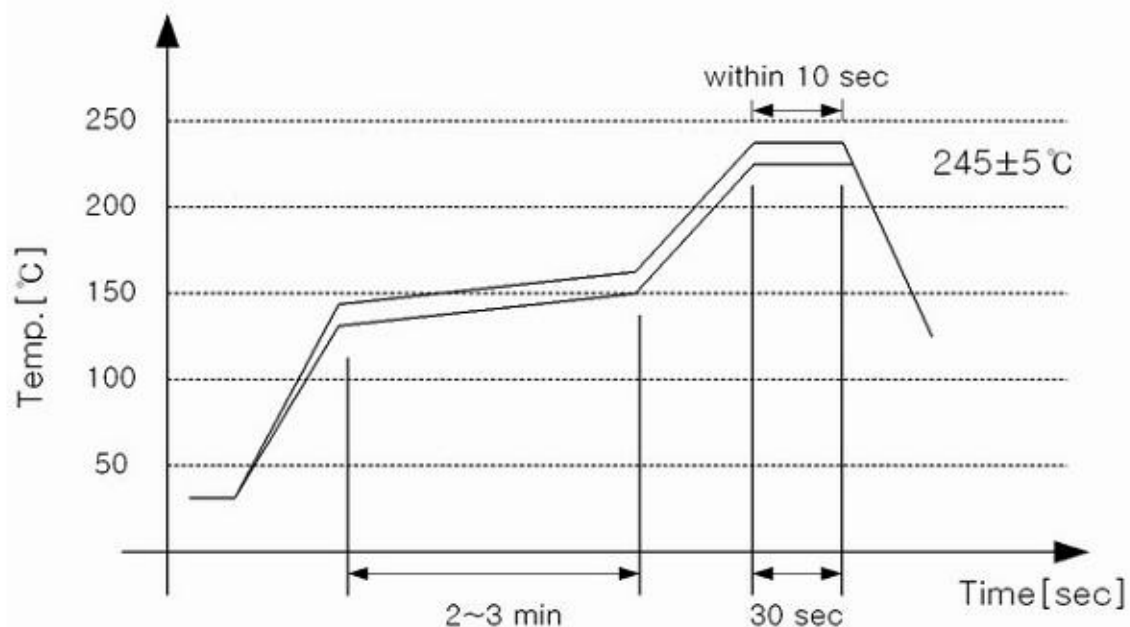
- ㊸ Calibrate with a standard horn antenna.
- ㊹ Set frequency range, measure gain factor after setting AUT as shown diagram

4. Reliability Test

No	ITEM	TEST CONDITION	TEST REQUIREMENTS
1	Adhesive Strength of Termination	1, Applied force on SMD chip till detached point from PCB, 	1, No mechanical damage by forces applied on the right, 2, Strength (F) > 7 kgf
2	Tensile Strength	1, Wire : 0,6~0,8 tined Cu wire 	1, No mechanical damage by forces applied on the right, 2, Strength (F) > 3 kgf
3	Thermal Shock (Temperature Cycle)	1, 1 cycle / step 1 : $-40 \pm 3^{\circ}\text{C}$, 30 min step 2 : $+125 \pm 3^{\circ}\text{C}$, 30 min 2, Number of cycle : 30 3, Measure after left for 48 hrs min, at room temperature	1, No visual damage 2, Within electric spec (VSWR)
4	High Temperature Resistance	1, Temperature : $+125 \pm 5^{\circ}\text{C}$ 2, Time : 1000 ± 24 hrs 3, Measure f_0 after left for 24 hrs min, at room temperature	1, No visual damage 2, Within electric spec (VSWR)
5	Low Temperature Resistance	1, Temperature : $-40 \pm 5^{\circ}\text{C}$ 2, Time : 1000 ± 24 hrs 3, Measure f_0 after left for 48 hrs min, at room temperature	1, No visual damage 2, Within electric spec (VSWR)
6	Humidity (Steady Condition)	1, Humidity : 85 % RH 1, Temperature : $+85 \pm 3^{\circ}\text{C}$ 2, Time : 1000 ± 24 hrs 3, Measure f_0 after left for 48 hrs min, at room temperature	1, No visual damage 2, Within electric spec (VSWR)

5. Soldering Condition (Recommend)

5.1 Soldering Profile (Pb-free)



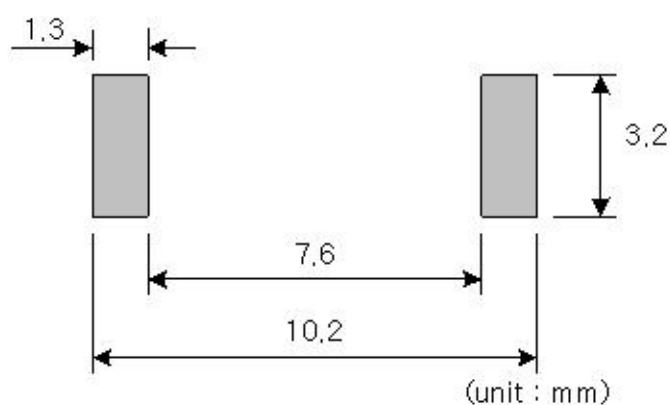
This product is designed for reflow soldering only. Do not use flow (wave) soldering.

① Use non-activated flux (Cl content 0.2% max.)

② Follow the recommended soldering conditions to avoid damage.

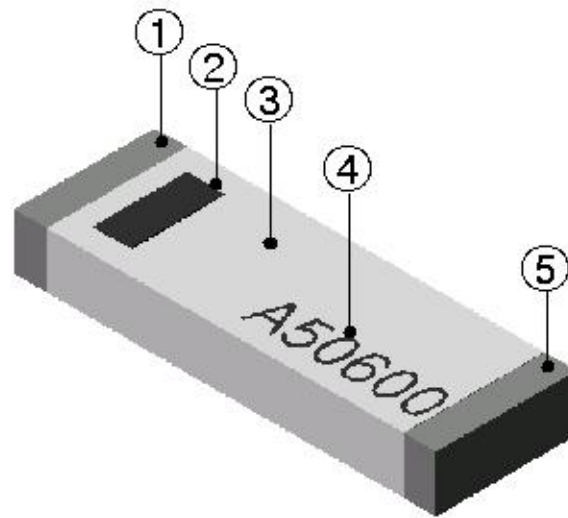
③ Reflow-cycle is max, 3 times.

5.2 PCB Land-pattern Design Guide



6. Structure and Material

6.1 Structure and Material



	Name	Function	Material
1	External Electrode	Soldering, Input Port	Ag/Ni/Sn
2	Direction index	Indication of Input Port	Ceramic
4	Ceramic Body	-	Ceramic
3	Model No. index	-	Ceramic
5	External Electrode	Soldering	Ag/Ni/Sn

6.2 Equivalent Symbol



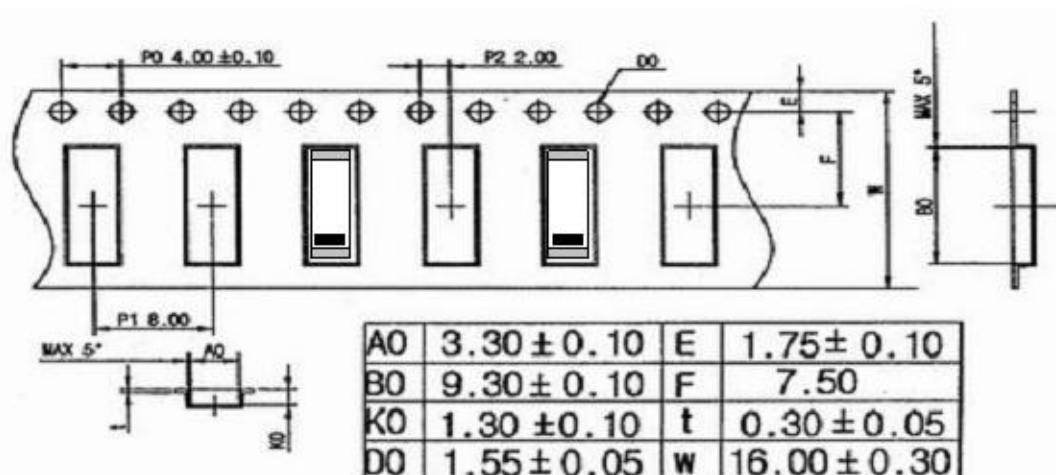
7. Storage Condition

- A. Storage environment must be at an ambient temperature of 15~35℃ and an ambient humidity of 45~75 % RH. (MSL Level 2)
- B. Chip antenna can experience degradation of termination solderability when subjected to high temperature of humidity, or if exposed to sulfur or chlorine gases.
- C. Avoid mechanical shock (ex. falling) to the chip antenna to prevent mechanical cracking inside of the ceramic dielectric due to its own weight.

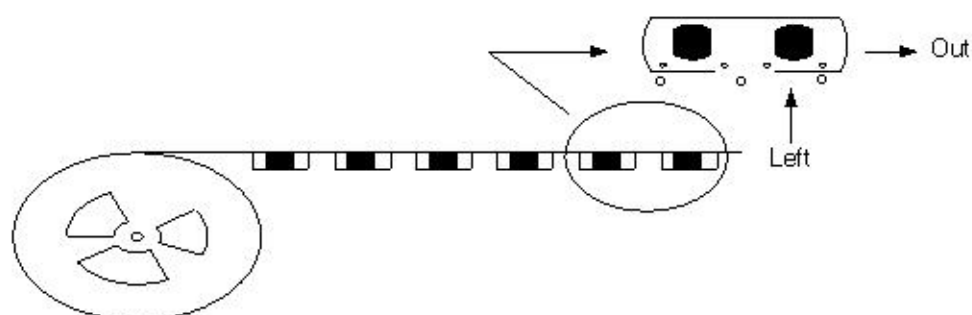
8. Packing

8.1 Carrier tape

8.1.1 Dimension of Carrier Tape

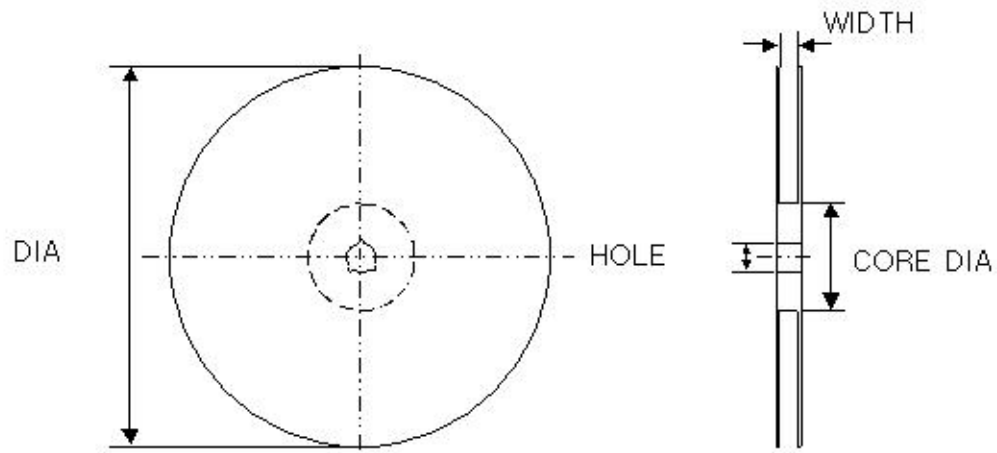


8.1.2 Chip Position on Carrier Tape



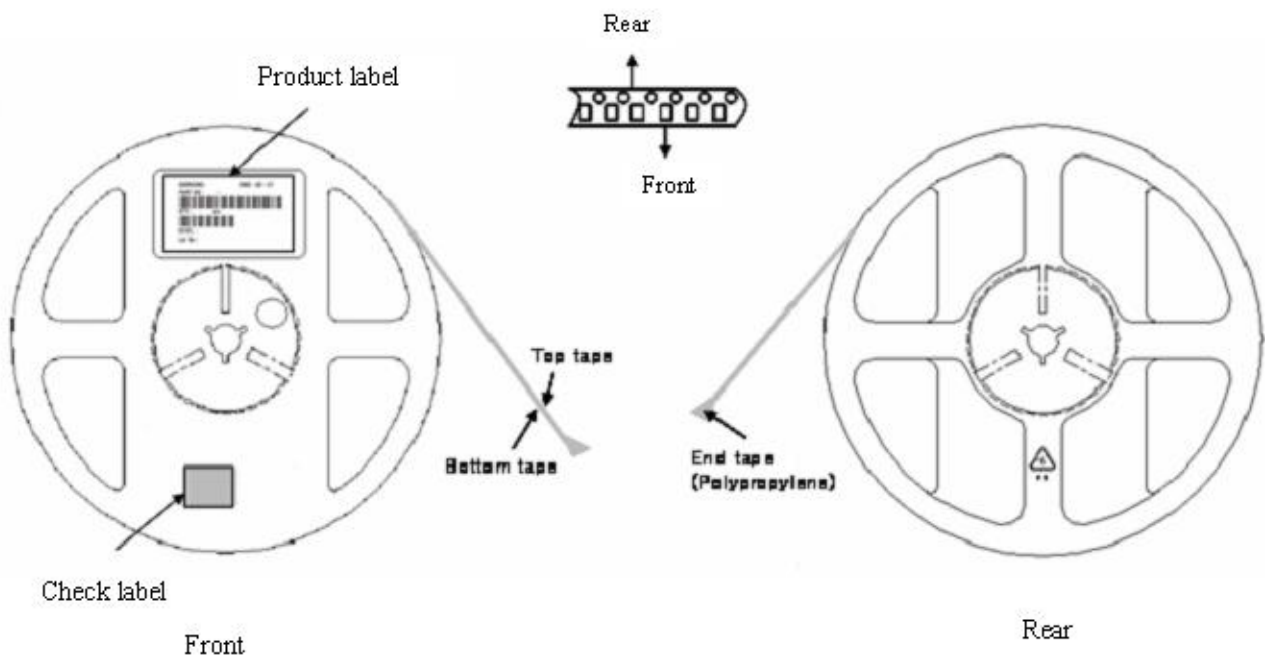
8.2 Reel

8.2.1 Dimension



ITEM	DIA	WIDTH	CORE DIA	HOLE
Value(mm)	180.0 +0, -3	17.0 ± 0.3	60.0 ± 1	13.0 ± 0.5

8.2.2 Label and Winding Method



8.3 Box Packing

8.3.1 Small Box

Size : 185 (W) × 183 (D) × 70 (T) (mm³)

Qty : 3 reel (1,000 ea/reel × 3 reel = 3000 ea)



8.3.2 Middle Box

Size : 365 (L) × 200 (W) × 200 (H) (mm³)

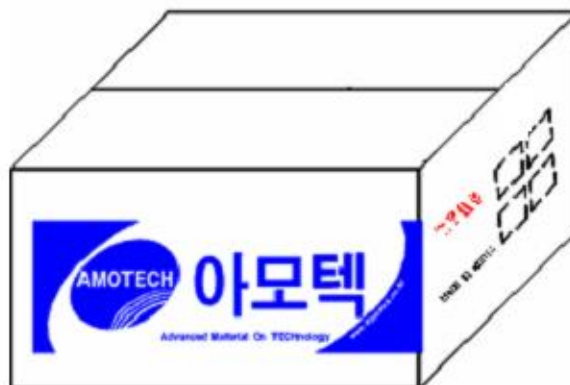
Qty : 5 small box (3,000 ea/small box × 5 small box = 15,000 ea)



8.3.3 Large Box

Size : 390 (L) × 390 (W) × 280 (H) (mm³)

Qty : 14 small box (3,000 ea/ small box × 14 small box = 42,000 ea)



9. Manufacture and Place

9.1 Manufacture

Amotech Co., Ltd

9.2 Place

5B 1L, Namdong Industrial Complex, 617 Namchondong, Namdonggu,
Incheon, Korea