

Appendix 9.

Antenna specification

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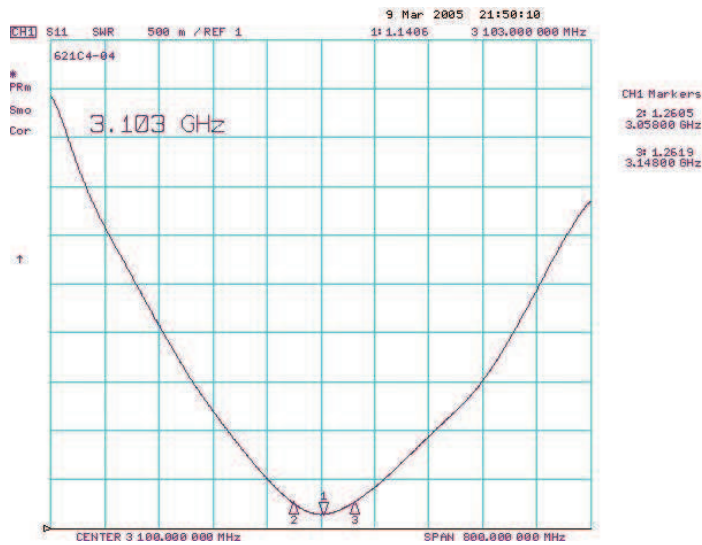
1. Revision Record

Date	Title	Content	Remark
2009.03.05		New drawing up	

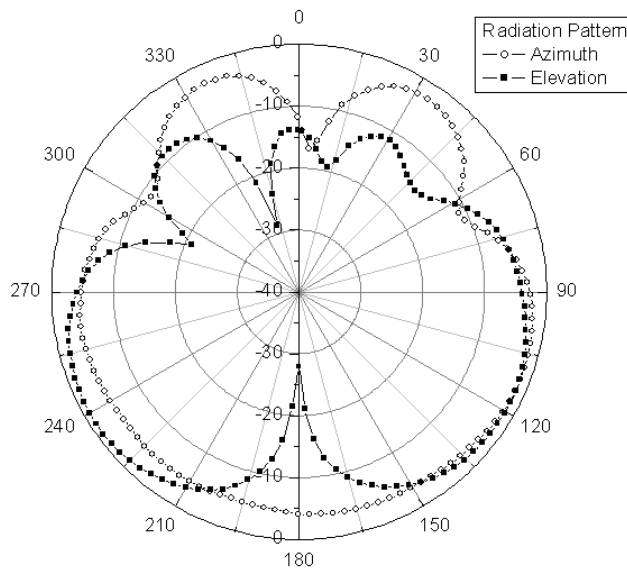
2. Specifications

2.1 Electrical specifications

No	Item	Spec.	Remark
1	Frequency Range	2400~2500	ISM Band
2	VSWR	Max. 2.5 : 1 @ 3103±45 MHz	On manual jig
3	Radiation Gain	Max. 0 dBi @azimuth co-pol.	Measured after matching on testboard
4	Radiation Pattern	Omni-directional	
5	Impedance	Nominal 50 Ω	



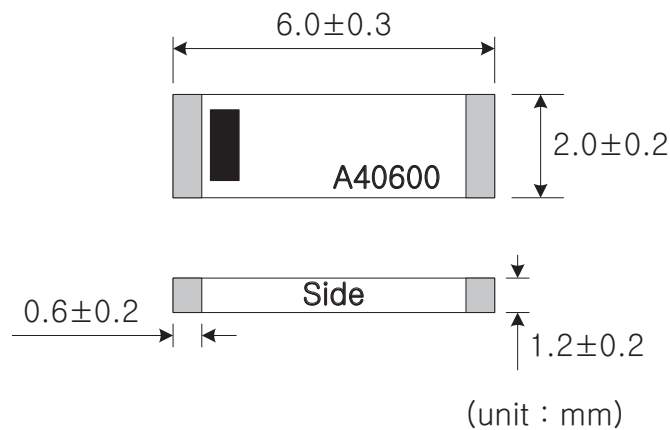
[VSWR : measured on manual jig]



[Radiation Gain : Measured on Ref. Board]

2.2 Mechanical specifications

No	Item	Spec.		Unit
1	Dimensions	W	6.0 ± 0.3	mm
		D	2.0 ± 0.2	
		H	1.2 ± 0.2	
2	Unit Weight	46 ± 5		mg
3	Operation Temp.	$-30 \sim +70$		°C
4	Storage Temp.	$-40 \sim +85$		°C



[Chip Antenna dimension]

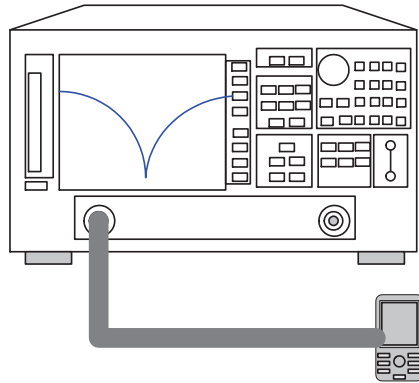
2.3 Index method of Part No. & Lot No.

Part No.	<u>ALA</u> (1)	621 (2)	<u>C4</u> (3)		
(1) : Amotech Antenna					
(2) : Chip size					
(3) : Version & frequency					
Lot No.	<u>MA</u> (1)	<u>06</u> (2)	<u>A4</u> (3)	<u>0506</u> (4)	<u>01</u> (5)
(1) : Mass product Antenna					
(2) : Chip size					
(3) : Version & frequency					
(4) : Y/M					
(5) : Serial No. of product					

3. Test Method

3.1 VSWR

Equipment : Network Analyzer 8753ES

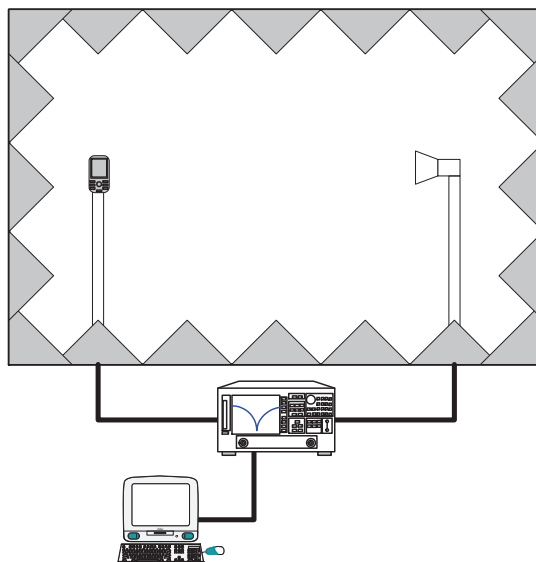


[Test procedure]

- a) Setup as shown picture.
- b) Calibrate Network Analyzer in frequency range of $f_0 \pm 400$ MHz, verify that the value of return loss(S_{11}) is under -55 dB with termination(50ohm)
- c) After connect a mobile set or manual jig for single chip antenna to Network Analyzer, measure the max. value of VSWR in frequency range of spec.

3.2 Radiation gain

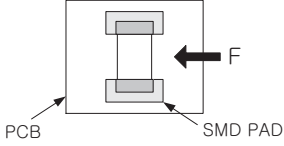
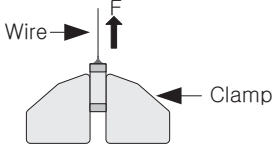
Equipment : Anechoic chamber , Network Analyzer 8753ES



[Test procedure]

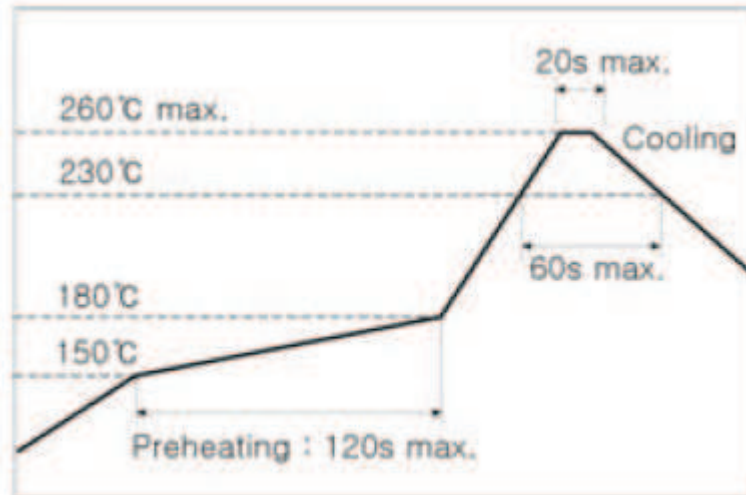
- a) Calibrate network analyzer and anechoic chamber using reference horn antenna.
- b) Set-up operation software (frequency, angle step, etc.)
- c) After connecting AUT on holder, measure radiation gain.

4. Reliability Test

No	ITEM	TEST CONDITION	TEST REQUIREMENTS
1	Adhesive Strength of Termination	<p>1. Applied force on SMD chip till detached point from PCB.</p> 	<p>1. No mechanical damage by forces applied on the right. 2. Strength (F) > 5 kgf</p>
2	Tensile Strength	<p>1. Wire : 0.6~0.8 tined Cu wire</p> 	<p>1. No mechanical damage by forces applied on the right. 2. Strength (F) > 3 kgf</p>
3	Thermal Shock (Temperature Cycle)	<p>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</p>	<p>1. No visual damage 2. Within electric spec (VSWR)</p>
4	High Temperature Resistance	<p>1. Temperature : $+125 \pm 5^\circ\text{C}$ 2. Time : 1000 ± 24 hrs 3. Measure f_c after left for 24 hrs min. at room temperature</p>	<p>1. No visual damage 2. Within electric spec (VSWR)</p>
5	Low Temperature Resistance	<p>1. Temperature : $-40 \pm 5^\circ\text{C}$ 2. Time : 1000 ± 24 hrs 3. Measure f_c after left for 48 hrs min. at room temperature</p>	<p>1. No visual damage 2. Within electric spec (VSWR)</p>
6	Humidity (Steady Condition)	<p>1. Humidity : 85 % RH 1. Temperature : $+85 \pm 3^\circ\text{C}$ 2. Time : 1000 ± 24 hrs 3. Measure f_c after left for 48 hrs min. at room temperature</p>	<p>1. No visual damage 2. Within electric spec (VSWR)</p>

5. Soldering Recommend

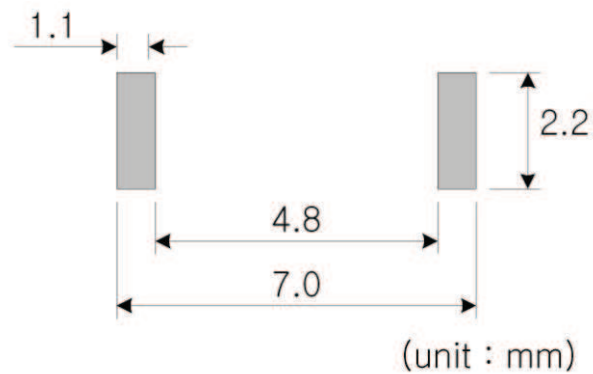
5.1 Reflow profile for Pb-free



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

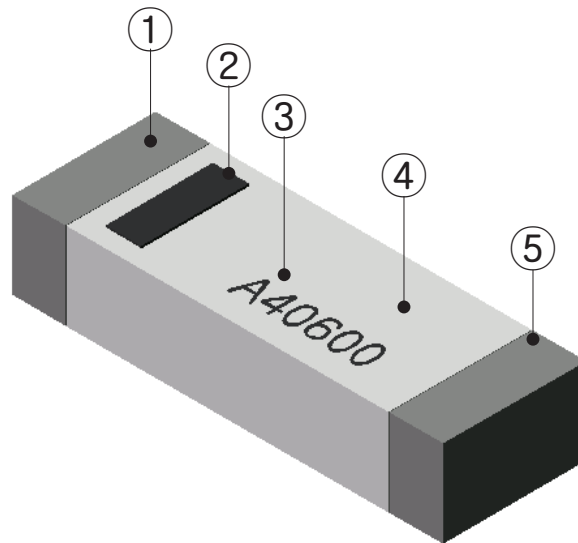
- ① Use non-activated flux (Cl content 0.2% max.)
- ② Follow the recommended soldering conditions to avoid damage.
- ③ Reflow-cycle is max. 3 times.

5.2 PCB land pattern



6. Structure and Material

6.1 Material



No	Part	Function	Material
1	External Electrode	Soldering, Feeding	Ag/Ni/Sn
2	Direction Index	Feeding Index	Ceramic
3	Ceramic Body	-	Ceramic
4	Text	Part No. Index	Ceramic
5	External Electrode	Soldering	Ag/Ni/Sn

6.2 Equivalent symbol

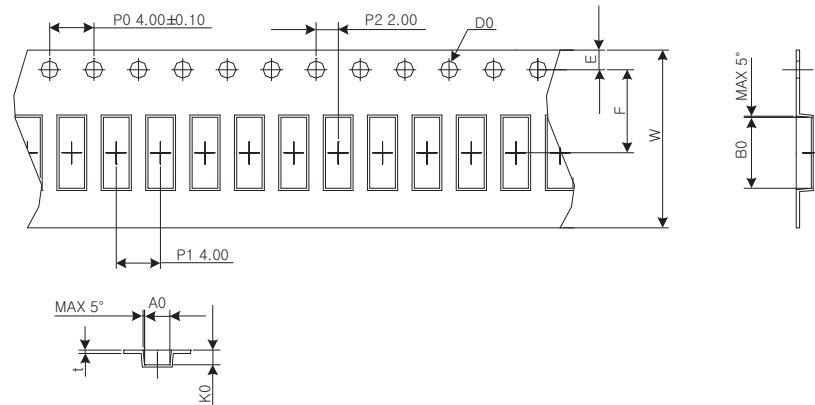


7. Cautions

- ① Storage environment must be at ambient temperature of 15~35°C and ambient humidity of 45~75 % RH. (MSL Level 2)
- ② Chip antenna can experience degradation of termination solder ability when subjected to high temperature of humidity, or if exposed to sulfur or chlorine gases.
- ③ Avoid mechanical shock (ex. falling) to the chip antenna to prevent mechanical cracking inside of the ceramic dielectric due to its own weight.

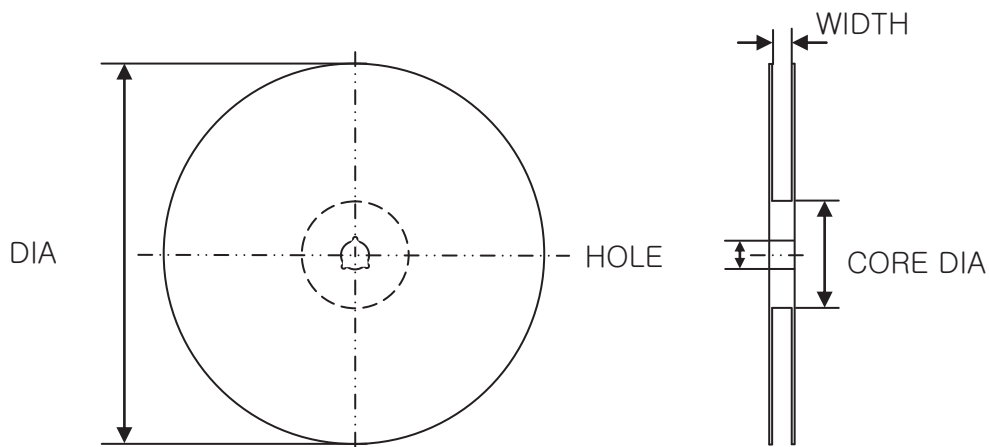
8. Packing Method

8.1 Carrier-tape



A0	2.30 ± 0.10	E	1.75 ± 0.10
B0	6.40 ± 0.10	F	7.50
K0	1.35 ± 0.10	t	0.30 ± 0.05
D0	1.55 ± 0.05	W	16.00 ± 0.30

8.2 Reel



item	DIA	WIDTH	CORE DIA	HOLE
dimension(mm)	180.0 ± 0.3	17.0 ± 0.3	60.0 ± 1	13.0 ± 0.5

8.3 Packing box

8.3.1 Small box

Size : 183 (W) x 75 (D) x 185 (H) (mm)

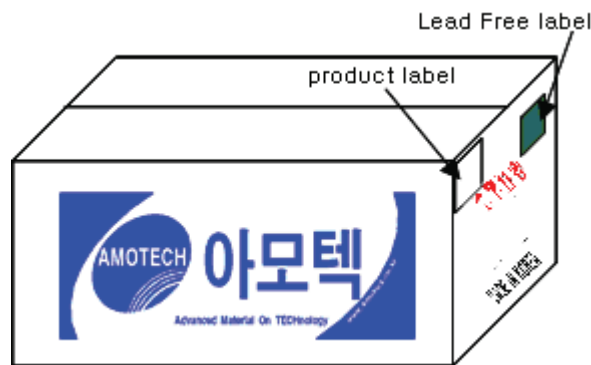
Q'TY : 3 reel (2,000 ea/reel × 3 reel = 6,000 ea)



8.3.2 Middle box

Size : 365 (W) x 200 (D) x 200 (H) (mm)

Q'TY : 5 small box(6,000 ea/small box × 5 small box = 30,000 ea)



8.3.3 Large box

Size : 390 (W) x 390 (D) x 280 (H) (mm)

Q'TY : 14 small box(6,000 ea/ small box × 14 small box = 84,000 ea)

