

# AT1608 Series

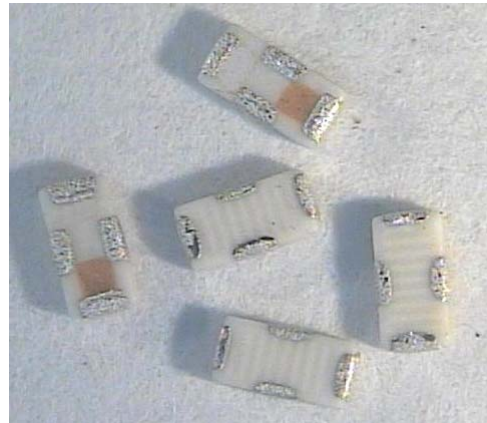
## Multilayer Chip Antenna

### Features

- ❖ Monolithic SMD with small, low-profile and light-weight type.
- ❖ Wide bandwidth
- ❖ RoHS compliant

### Applications

- ❖ 2400~2500MHz ISM Band Systems



### Specifications

Part Number	Frequency Range (MHz)	Peak Gain (dBi typ.)	Average Gain (dBi typ.)	VSWR	Impedance
<b>AT1608</b> <b>-A2R4NAA_</b>	2400~2480	0.5 (XZ-total)	-2.0 (XZ-total)	3 max.	50 Ω

(\*Electrical specification is defined by the measurement of Scenario#1)

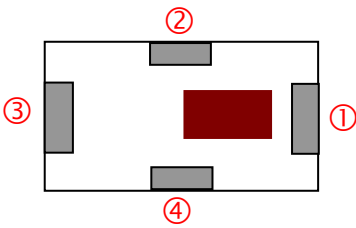
Q'ty/Reel (pcs) : 4,000 pcs  
 Operating Temperature Range : -40 ~ +85 °C  
 Storage Temperature Range : -40 ~ +85 °C  
 Storage Period : 12 months max.  
 Power Capacity : 2W max.

### Part Number

AT   1608   -   A   2R4   NAA   □   □  
 ①   ②   ③   ④   ⑤   ⑥   ⑦

① Type	AT : Antenna	② Dimensions ( L x W )	1.6x 0.8 mm
③ Material Code	A	④ Frequency Range	2R4=2400MHz
⑤ Specification Code	NAA	⑥ Packaging	T: Tape & Reel B: Bulk
⑦ Soldering	/LF=lead-free		

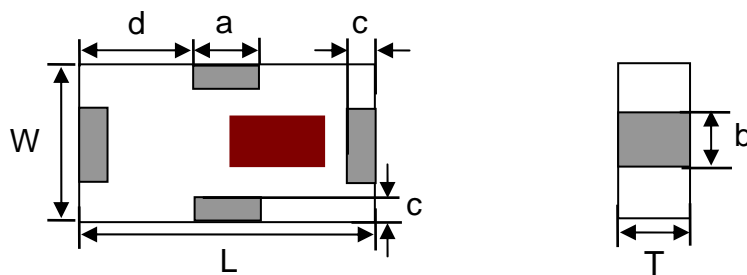
## Terminal Configuration



Scenario#1: Antenna on the edge side of PCBA			
No.	Terminal Name	No.	Terminal Name
①	Feeding Point	③	NC
②	GND	④	GND

Scenario#2: Antenna on the corner of PCBA			
No.	Terminal Name	No.	Terminal Name
①	Feeding Point	③	NC
②	NC	④	NC

## Dimensions and Recommended PC Board Pattern

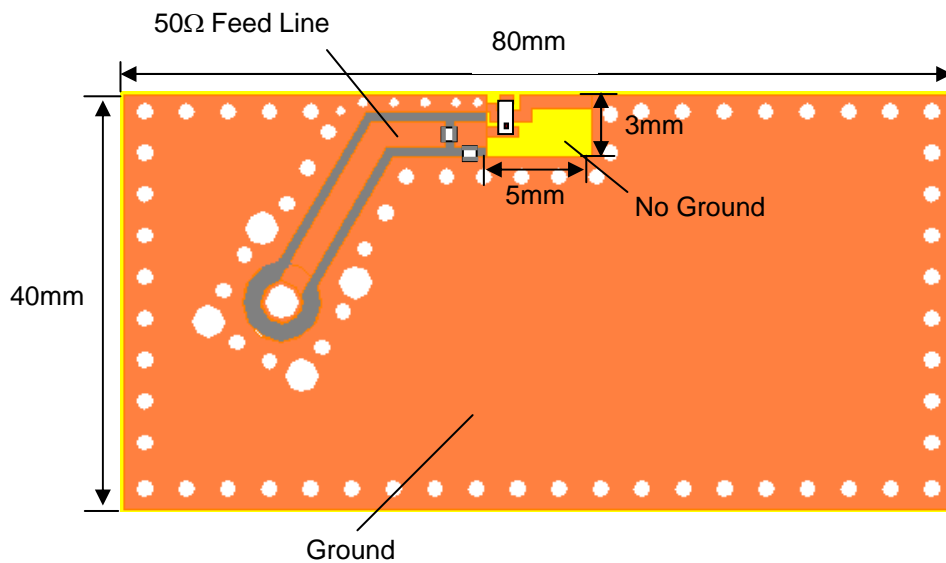


Unit : mm

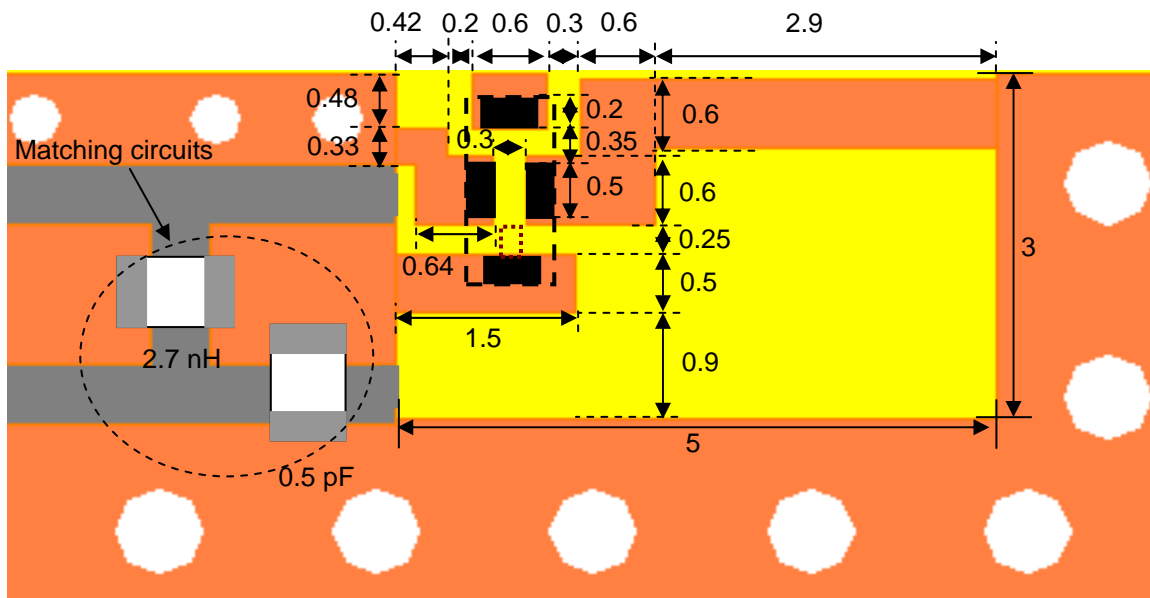
Mark	L	W	T	a	b	c	d
Dimensions	1.6 ± 0.1	0.8 ± 0.1	0.4 ± 0.1	0.5 ± 0.1	0.5 ± 0.1	0.2 ± 0.05	0.55 ± 0.1

**Typical Electrical Characteristics for Scenario#1 (T=25°C)**

❖ Test Board-Scenario#1



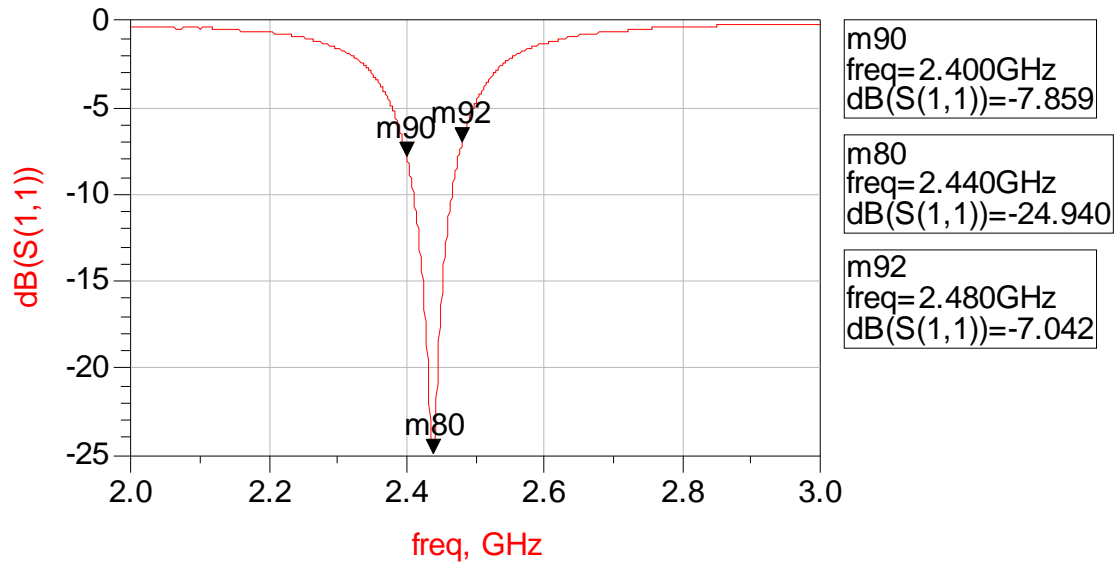
❖ Antenna Footprint With matching- Scenario#1 (Unit in mm)



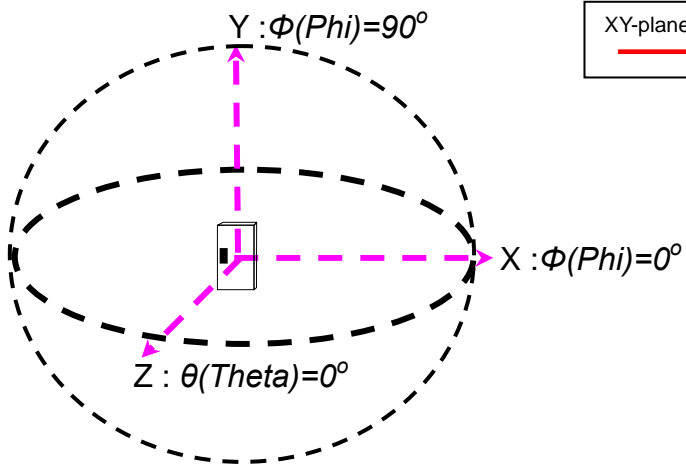
(Matching circuit and component values will be different, depending on PCB layout)

\*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

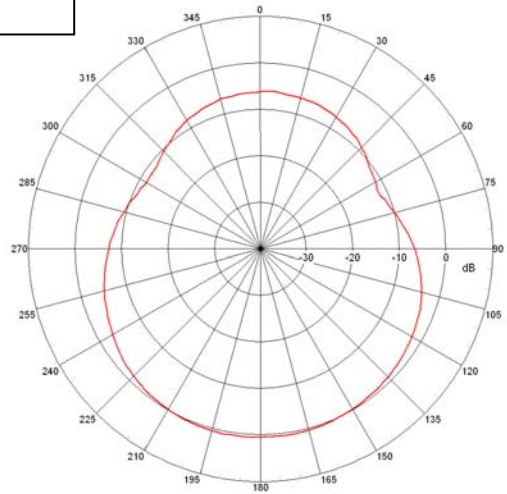
❖ Return Loss (with matching)- Scenario#1



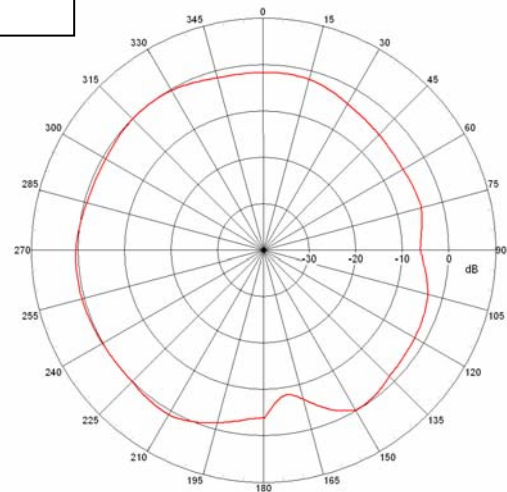
❖ Radiation Patterns- Scenario#1 (Antenna Efficiency: 50 %)



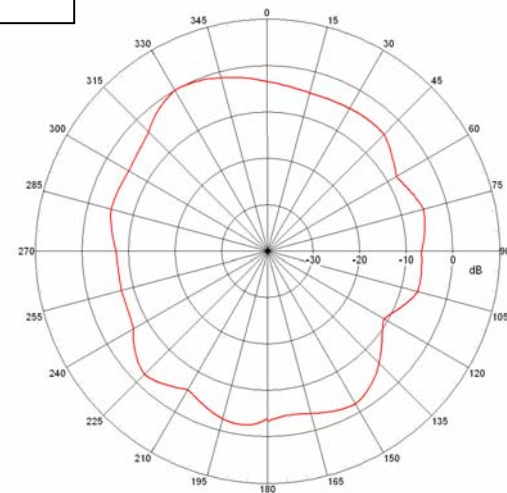
XY-plane @2440MHz  
— Total



XZ-plane @2440MHz  
— Total

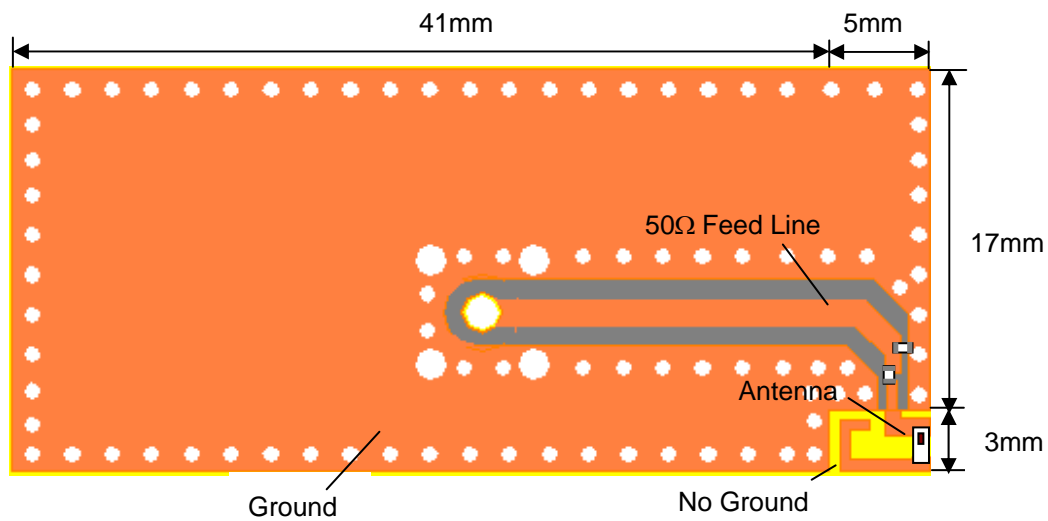


YZ-plane @2440MHz  
— Total

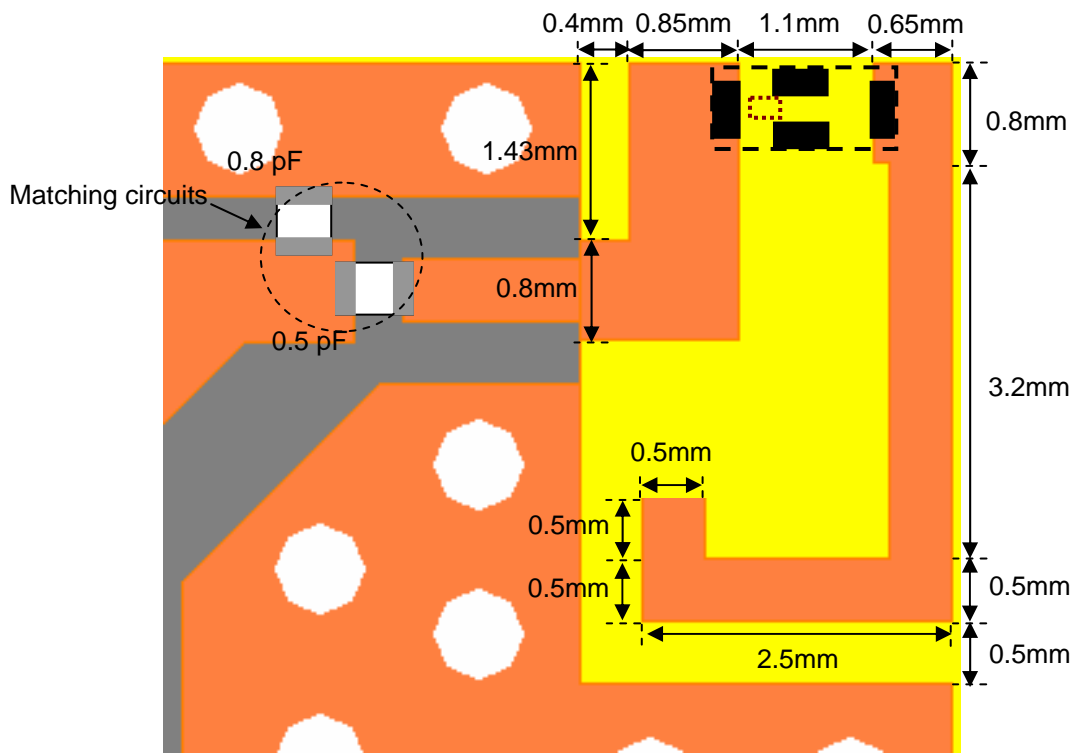


**Typical Electrical Characteristics for Scenario#2 (T=25°C)**

❖ Test Board- Scenario#2



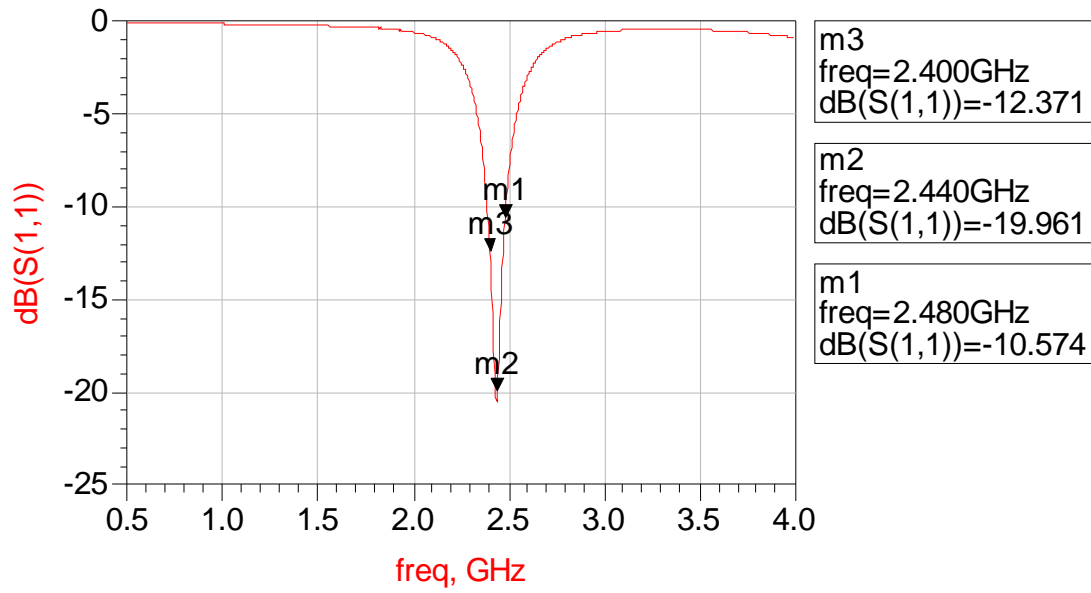
❖ Antenna Footprint With matching- Scenario#2



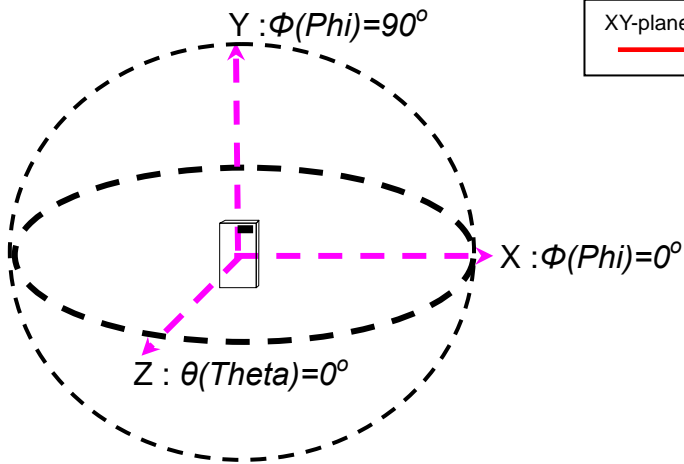
(Matching circuit and component values will be different, depending on PCB layout)

\*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

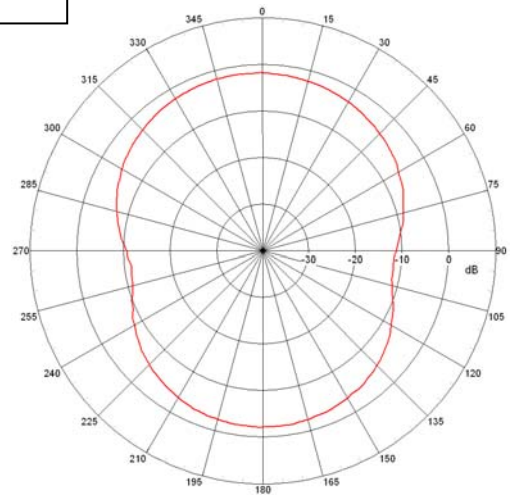
❖ Return Loss (with matching)- Scenario#2



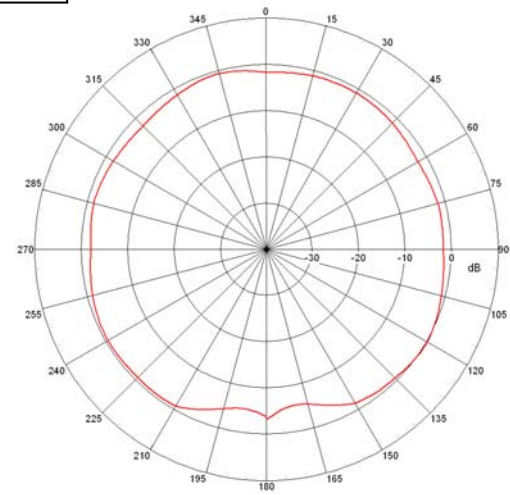
❖ Radiation Patterns- Scenario#2 (Antenna Efficiency: 50 %)



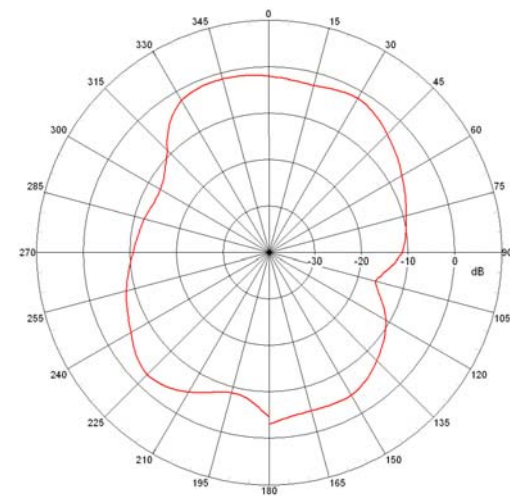
XY-plane @2440MHz  
— Total



XZ-plane @2440MHz  
— Total



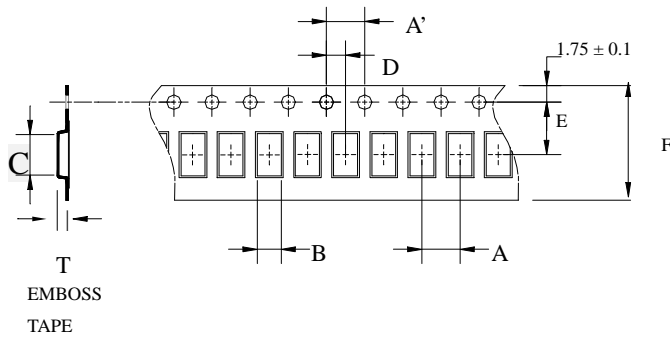
YZ-plane @2440MHz  
— Total





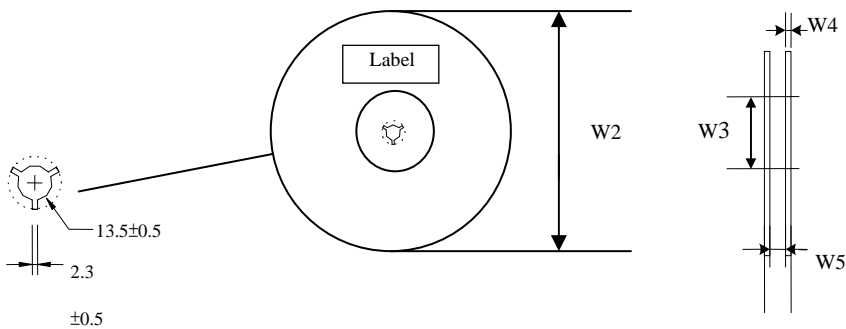
## Taping Specifications

### ❖Tape & Reel Dimensions (Unit: mm) vs. Quantity (pcs)



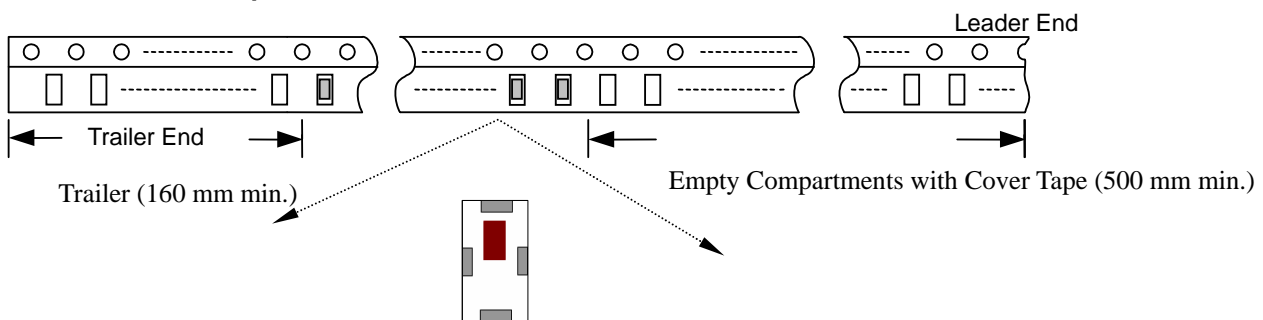
Type	A	A'	B	C	D	E	F	T	Quantity/per reel	Tape material
AT1608	4.0± 0.1	4.0± 0.1	0.95± 0.1	1.80± 0.1	2.0± 0.1	3.5± 0.1	8.0± 0.1	0.60± 0.03	4,000pcs	Paper

### ❖Reel Dimensions (Unit: mm)

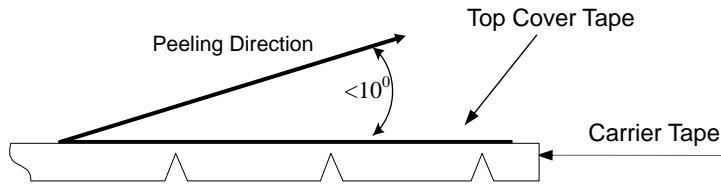


Type	W2	W3	W4	W5
AT1608	178±1	60±1	1.4±0.2	9.0±0.3

### ❖Leader and Trailer Tape



❖ **Peel-off Force**



Peel-off force should be in the range of 0.1 – 0.6 N at a peel-off speed of  $300 \pm 10$  mm/min .

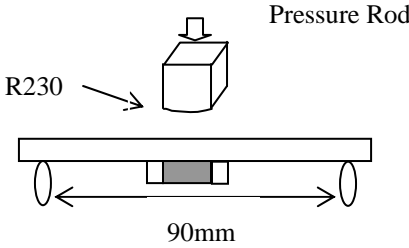
❖ **Storage Conditions**

- (1) Temperature: 5 ~35°C, relative humidity (RH): 45~75%.
- (2) Non-corrosive environment

**Notes**

❖ The contents of this data sheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.

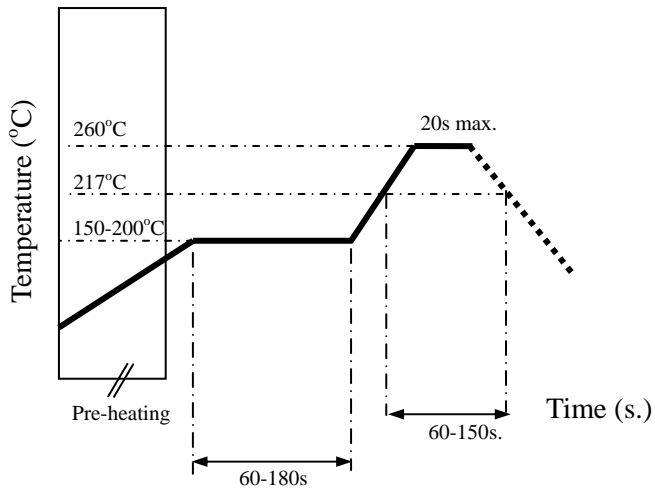
## Mechanical & Environmental Characteristics

Item	Requirements	Procedure
Solderability	<ol style="list-style-type: none"> <li>No apparent damage</li> <li>More than 95% of the terminal electrode shall be covered with new solder</li> </ol>	<ol style="list-style-type: none"> <li>Preheat: <math>120 \pm 5^\circ\text{C}</math></li> <li>Solder: <math>245 \pm 5^\circ\text{C}</math> for <math>5 \pm 1</math> sec</li> </ol>
Soldering strength (Termination Adhesion)	<ol style="list-style-type: none"> <li>1kg minimum</li> </ol>	<ol style="list-style-type: none"> <li>Solder specimen onto test jig.</li> <li>Apply push force at 0.5mm/s until electrode pads are peeled off or ceramic are broken. Pushing force is applied to longitude direction.</li> </ol>
Deflection (Substrate Bending)	<ol style="list-style-type: none"> <li>No apparent damage</li> </ol>	<ol style="list-style-type: none"> <li>Solder specimen onto test jig (FR4, 0.8mm) using the recommend soldering profile.</li> <li>Apply a bending force of 2mm deflection.</li> </ol> 
Heat/Humidity Resistance	<ol style="list-style-type: none"> <li>No apparent damage</li> <li>Fulfill the electrical specification after test</li> </ol>	<ol style="list-style-type: none"> <li>Temperature: <math>85 \pm 2^\circ\text{C}</math></li> <li>Humidity: 90% ~ 95% RH</li> <li>Duration: <math>1000 \pm 48</math>hrs</li> <li>Recovery: 1-2hrs</li> </ol>
Thermal shock (Temperature Cycle)	<ol style="list-style-type: none"> <li>No apparent damage</li> <li>Fulfill the electrical specification after test</li> </ol>	<ol style="list-style-type: none"> <li>One cycle/step 1 : <math>125 \pm 5^\circ\text{C}</math> for 30 min step 2 : <math>-40 \pm 5^\circ\text{C}</math> for 30 min</li> <li>No of cycles : 100</li> <li>Recovery: 1-2 hrs</li> </ol>
Low Temperature Resistance	<ol style="list-style-type: none"> <li>No apparent damage</li> <li>Fulfill the electrical specification after test</li> </ol>	<ol style="list-style-type: none"> <li>Temperature: <math>-40 \pm 5^\circ\text{C}</math></li> <li>Duration: <math>500 \pm 24</math>hrs</li> <li>Recovery: 1-2hrs</li> </ol>

## Soldering Conditions

### ❖ Typical Soldering Profile for Lead-free Process

Reflow Soldering :



## Notes

❖ The contents of this data sheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.

### **Advanced Ceramic X Corp.**

16 Tzu Chiang Road, Hsinchu Industrial District Hsinchu Hsien 303, Taiwan

TEL:886-3-5987008 FAX:886-3-5987001

E-mail: [acx@acxc.com.tw](mailto:acx@acxc.com.tw)

<http://www.acxc.com.tw>