ACX
Advanced Ceramic X

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
AT1608-A2R4ZM31_	2400~2500	0.4 (XZ-total)	-2.1 (XZ-total)	3 max.	50 Ω

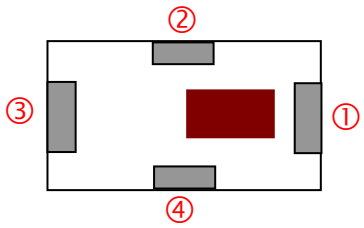
Q'ty/Reel (pcs) : 4,000 pcs
Operating Temperature Range : -40 ~ +85 °C
Storage Temperature Range : -40 ~ +85 °C
Storage Period : 12 months max.
Power Capacity : 3W max.

Part Number

AT	1608	-	A	2R4	ZM31	□	□
①	②		③	④	⑤	⑥	⑦

① Type	AT : Antenna	② Dimensions (L × W)	1.6× 0.8 mm
③ Material Code	A	④ Frequency Range	2R4=2400MHz
⑤ Specification Code	ZM31	⑥ Packaging	T: Tape & Reel B: Bulk
⑦ Soldering	/LF=lead-free		

Terminal Configuration



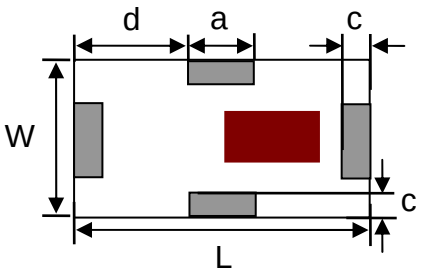
<Top view>

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

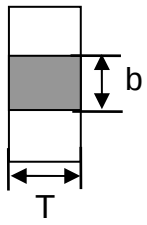
Scenario#2: Antenna on the corner of PCBA			
No.	Terminal Name	No.	Terminal Name
①	Feeding Point	③	NC
②	NC	④	NC

Dimensions and Recommended PC Board Pattern

Unit : mm



<Top view>

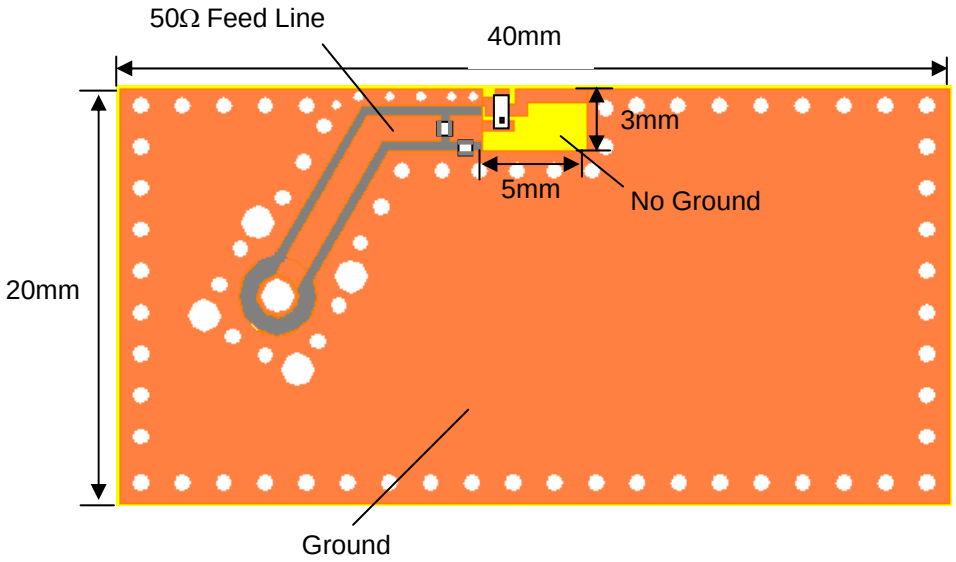


<Side view>

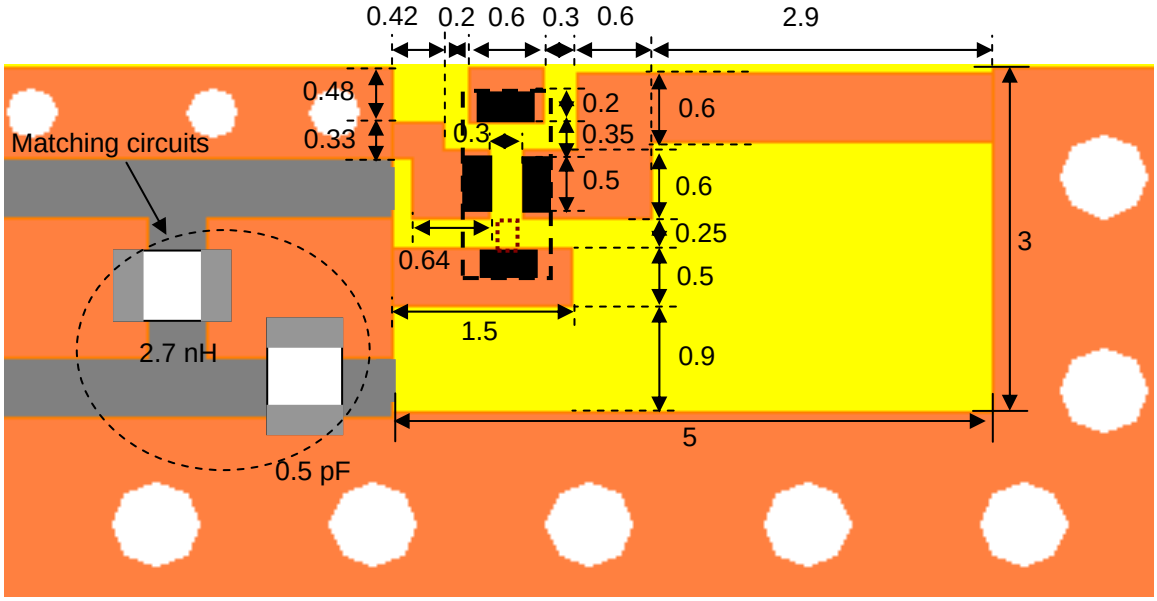
Mark	L	W	T	a	b	c	d
Dimensions	1.6 ± 0.1	0.8 ± 0.1	0.4 ± 0.1	0.5± 0.1	0.5± 0.1	0.2 ± 0.05	0.55 ± 0.1

Typical Electrical Characteristics (T=25°C)

❖Test Board-Scenario#1



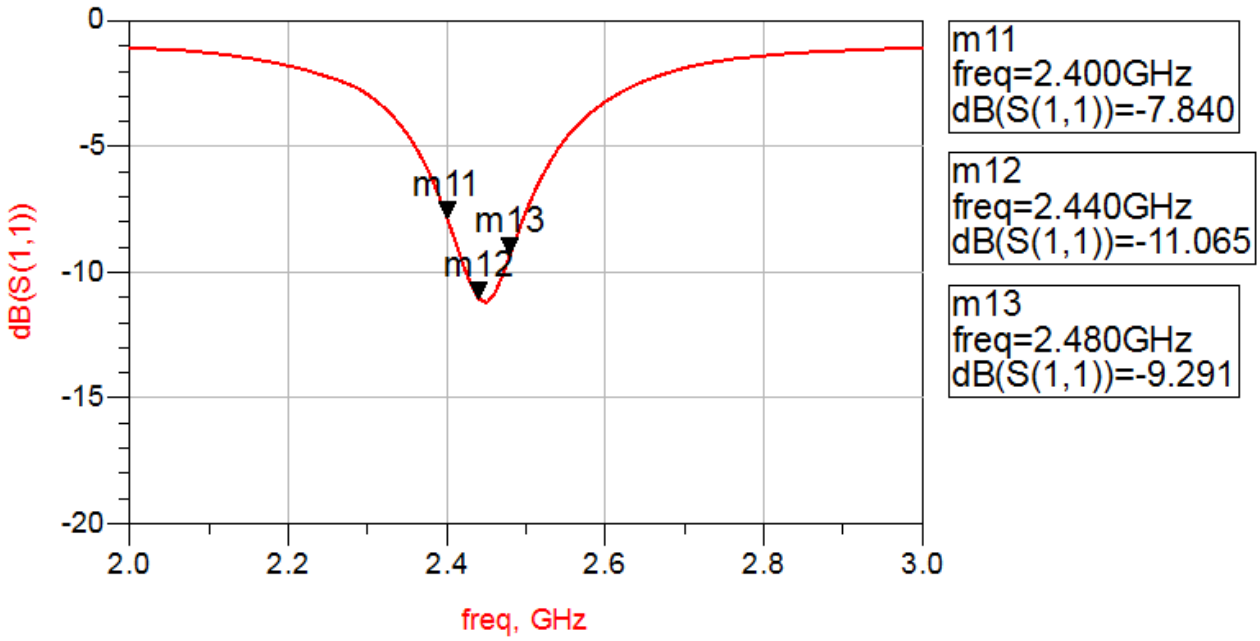
❖Antenna Footprint With matching- Scenario#1 (Unit in mm)



(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.

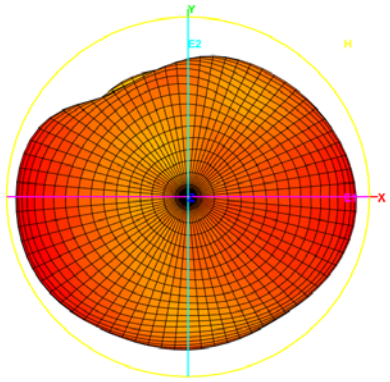
❖Return Loss (with matching)



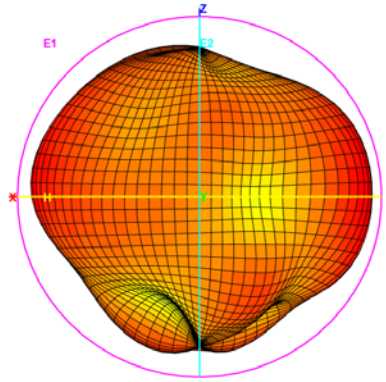
2D .3Dtest data:

Frequency	Efficiency (%)	Gain.(dBi)
2400MHz	51.17	-1.84
2410MHz	51.52	-1.69
2420MHz	54.20	-1.96
2430MHz	51.29	-1.02
2440MHz	47.64	-0.08
2450MHz	47.86	0.40
2460MHz	46.56	-1.89
2470MHz	47.53	-1.92
2480MHz	48.98	-1.78
2490MHz	50.23	-1.83
2500MHz	45.81	-1.51

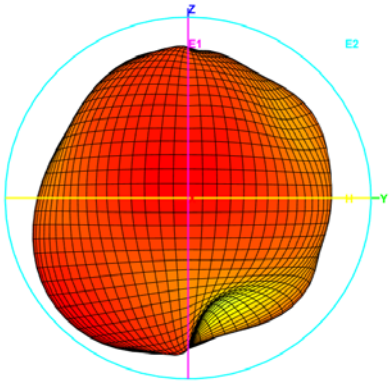
Total_3D_H_2.4GHz



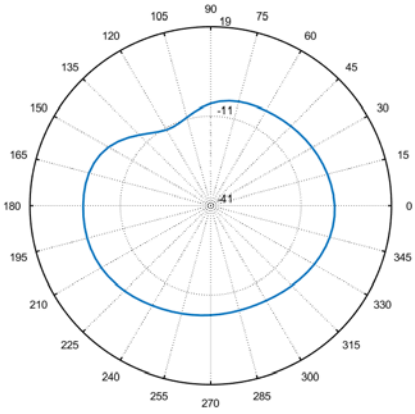
Total_3D_E1_2.4GHz



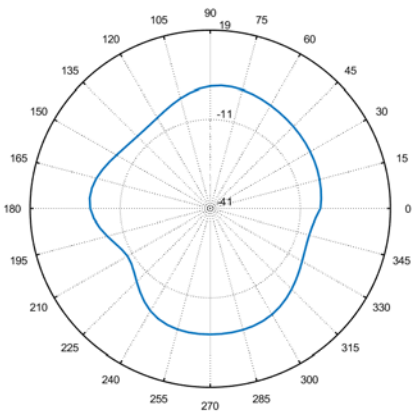
Total_3D_E2_2.4GHz



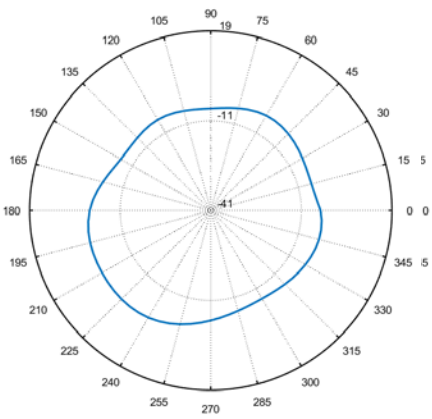
Total_Polar_H_2.4GHz



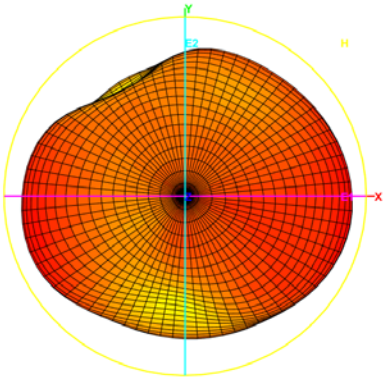
Total_Polar_E1_2.4GHz



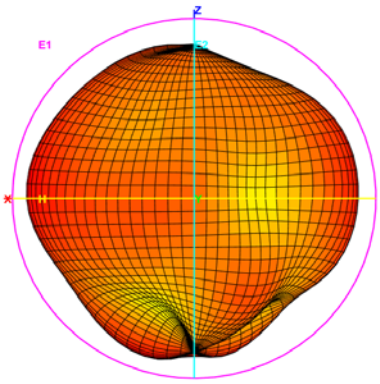
Total_Polar_E2_2.4GHz



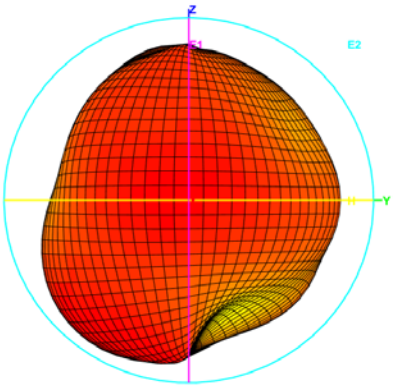
Total_3D_H_2.45GHz



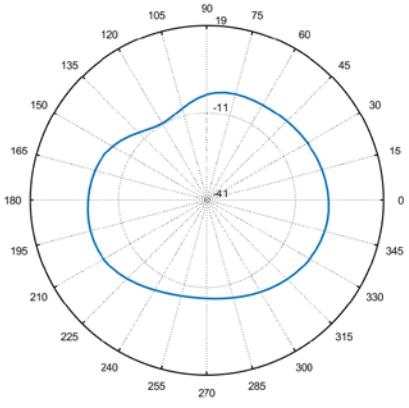
Total_3D_E1_2.45GHz



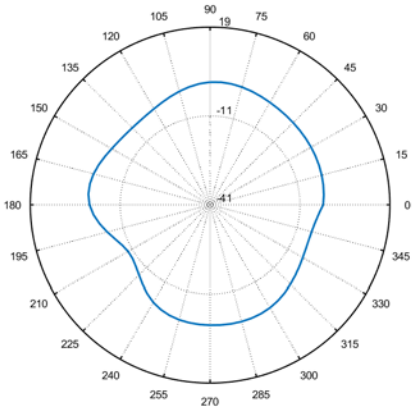
Total_3D_E2_2.45GHz



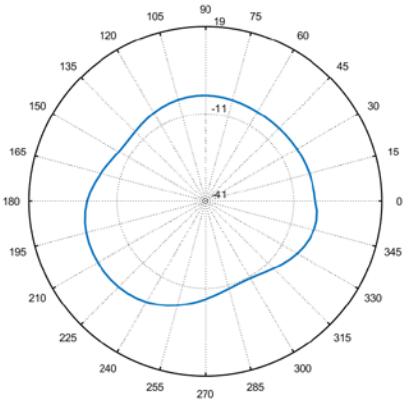
Total_Polar_H_2.45GHz



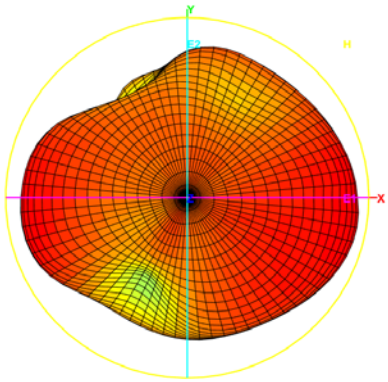
Total_Polar_E1_2.45GHz



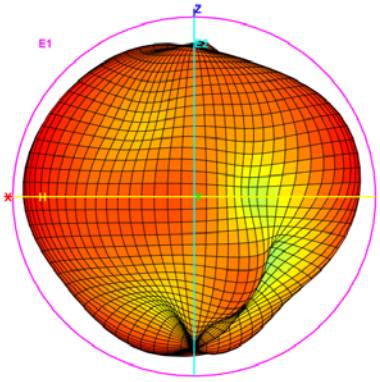
Total_Polar_E2_2.45GHz



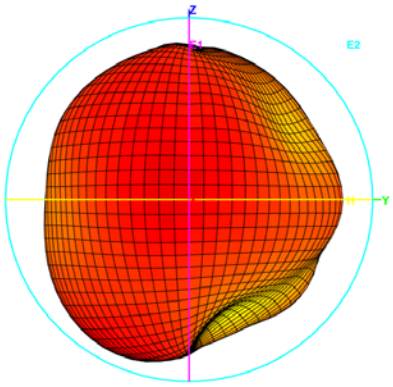
Total_3D_H_2.5GHz



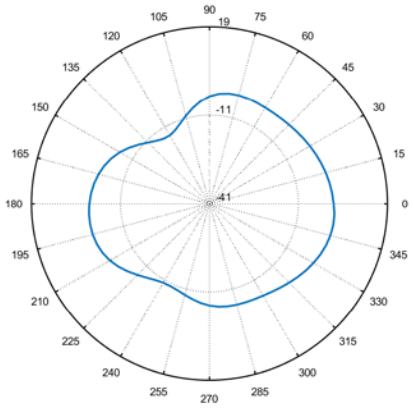
Total_3D_E1_2.5GHz



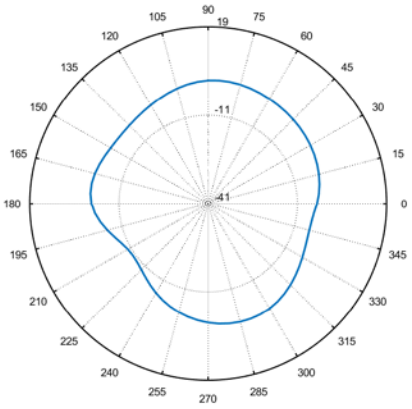
Total_3D_E2_2.5GHz



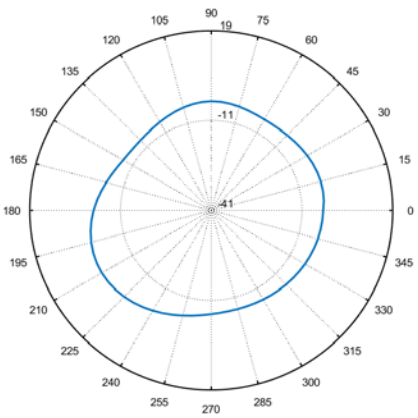
Total_Polar_H_2.5GHz



Total_Polar_E1_2.5GHz

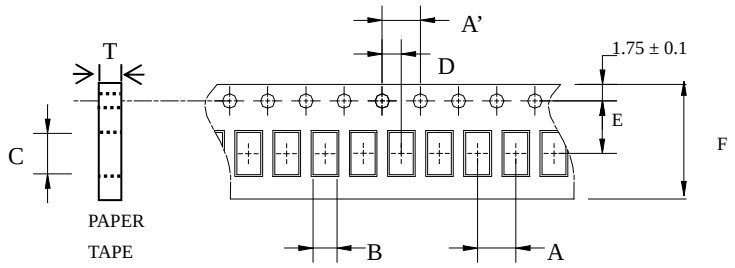


Total_Polar_E2_2.5GHz



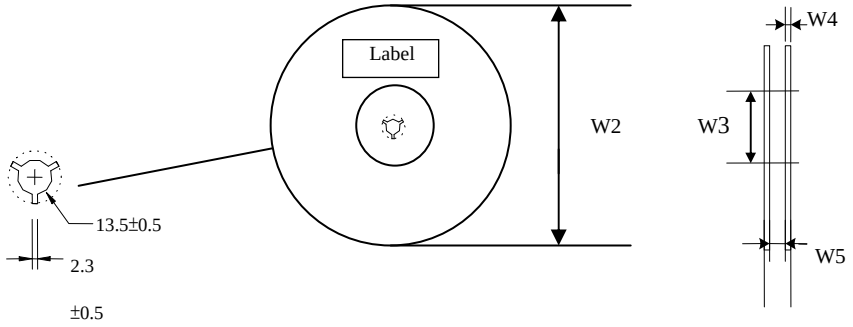
Taping Specifications

❖Tape & Reel Dimensions (Unit: mm)



Type	A	A'	B	C	D	E	F	T	Quantity/per reel	Tape material
1608	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

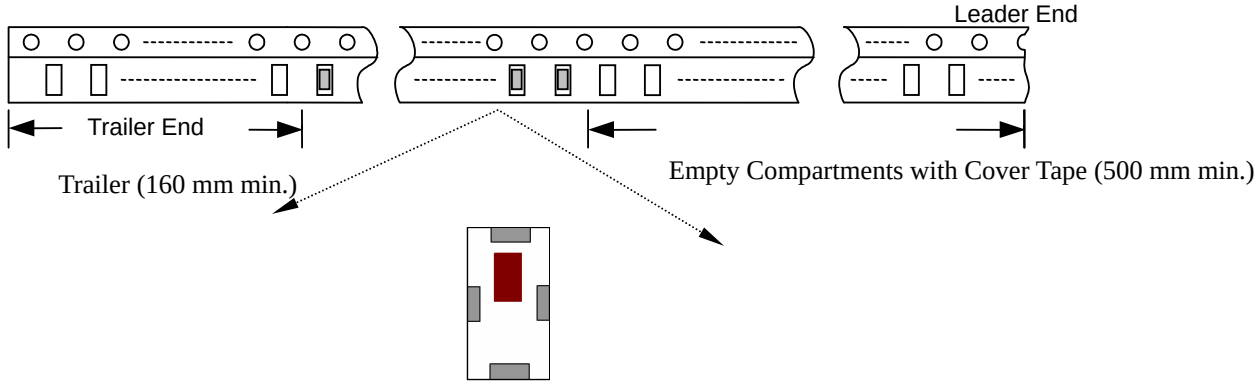
❖Reel Dimensions (Unit: mm)



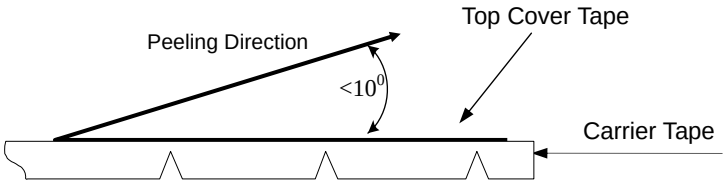
Label: Customer's Name,
ACX P/N, Q'ty, Date,
ACX Corp.

Type	W2	W3	W4	W5
1608	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±10 mm/min .

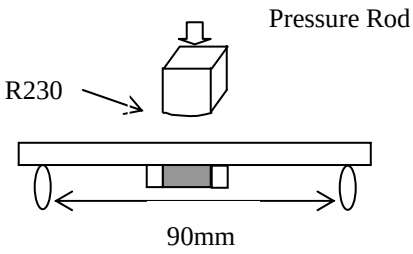
❖**Storage Conditions**

(1) Temperature: 5 ~35℃, 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.

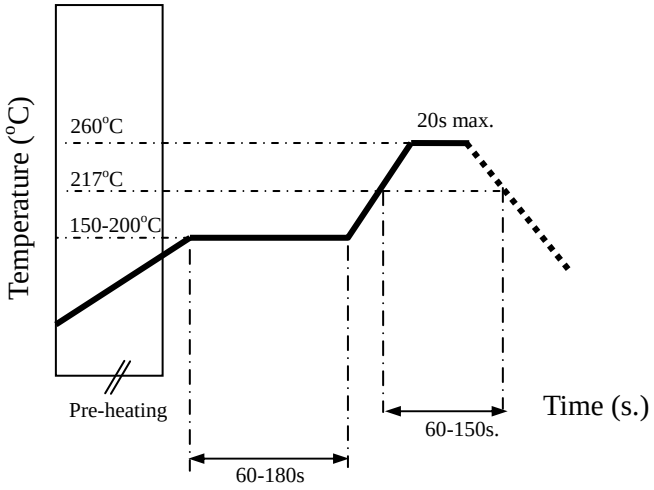
Mechanical & Environmental Characteristics

Item	Requirements	Procedure
Solderability	1. No apparent damage 2. More than 95% of the terminal electrode shall be covered with new solder	1. Preheat: 120± 5 °C 2. Solder: 245± 5°C for 5± 1 sec
Soldering strength (Termination Adhesion)	1. 10N minimum	1. Solder specimen onto test jig. 2. Apply push force at 0.5mm/s until electrode pads are peeled off or ceramic are broken. Pushing force is applied to longitude direction.
Deflection (Substrate Bending)	1. No apparent damage	1. Solder specimen onto test jig (FR4, 0.8mm) using the recommend soldering profile. 2. Apply a bending force of 2mm deflection. 
Heat/Humidity Resistance	1. No apparent damage 2. Fulfill the electrical specification after test	1. Temperature: 85± 2°C 2. Humidity: 90% ~ 95% RH 3. Duration: 1000±48hrs 4. Recovery: 1-2hrs
Thermal shock (Temperature Cycle)	1. No apparent damage 2. Fulfill the electrical specification after test	1. One cycle/step 1：125 ± 5°C for 30 min step 2：- 40 ± 5°C for 30 min 2. No of cycles：100 3. Recovery:1-2 hrs
Low Temperature Resistance	1. No apparent damage 2. Fulfill the electrical specification after test	1. Temperature: -40± 5 °C 2. Duration: 500 ±24hrs 3. Recovery: 1-2hrs

Soldering Conditions

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

Reflow Soldering :



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