ACX
Advanced Ceramic X

AT7020 Series

Multilayer Chip Antenna

Features

❖ Monolithic SMD with small, low-profile and light-weight type.

❖ Wide bandwidth

Applications

❖2.4GHz WLAN, Home RF, Bluetooth Modules, etc.

Specifications

Part Number	Operating Frequency (MHz)	Peak Gain (dBi typ.)	Average Gain (dBi typ.)	VSWR	Impedance
AT7020 -E3R0HBA_	2400~2500	1.3dBi (XZ-V)	-0.5dBi (XZ-V)	2 max.	50 Ω

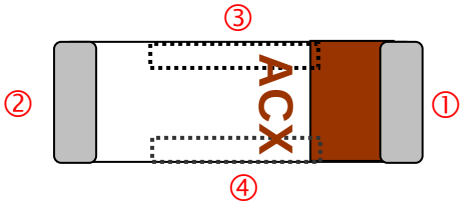
Q'ty/Reel (pcs) : 1,000 pcs
Operating Temperature Range : -40 ~ +85 °C
Storage Temperature Range : +5 ~ +35 °C, Humidity 45~75%RH
Storage Period : 12 months max.
Power Capacity : 2W max.

Part Number

AT ① 7020 ② - E ③ 3R0 ④ HBA ⑤ □ ⑥ □ ⑦

① Type	AT : Antenna	② Dimensions (L × W)	7.0× 2.0 mm
③ Material Code	E	④ Initial center frequency	3R0=3000MHz
⑤ Specification Code	HBA	⑥ Packaging	T: Tape & Reel B: Bulk
⑦ Soldering	=lead-containing /LF=lead-free		

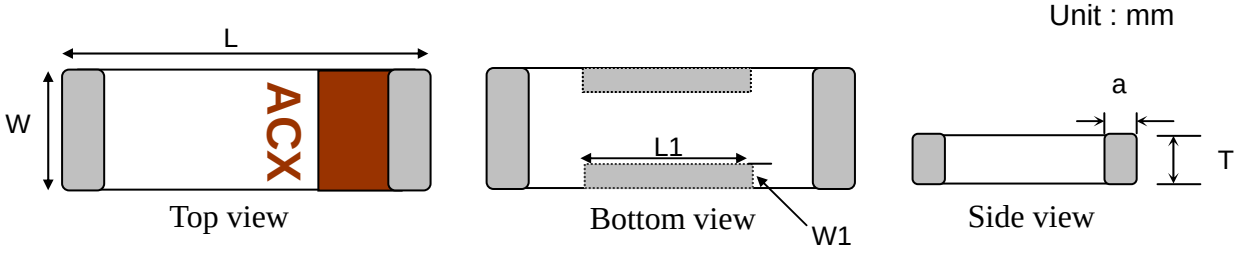
Terminal Configuration



No.	Terminal Name	No.	Terminal Name
①	Feeding Point	③	NC
②	NC	④	NC

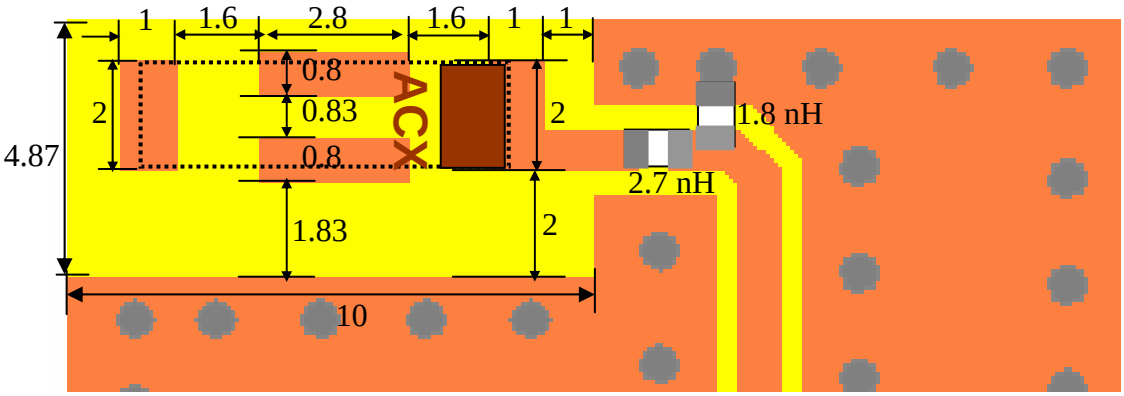
Dimnsions and Recommended PC Board Pattern

Unit : mm



Mark	L	W	L1	W1	T	a
Dimensions	7.0±0.2	2.0±0.2	2.6±0.2	0.5±0.2	2.0+ 0.1/-0.2	0.5±0.3

❖With Matching Circuits (Unit in mm)

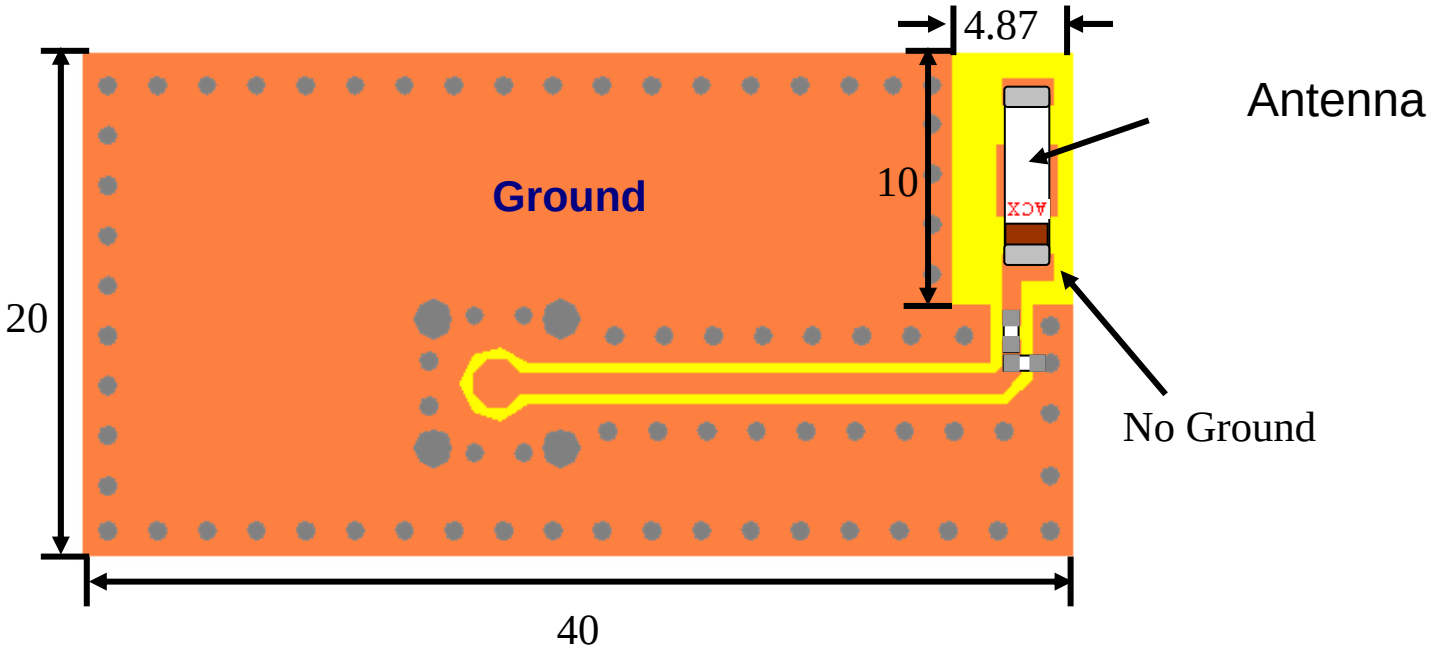


(Matching circuit and component values will be different, depending on PCB layout)

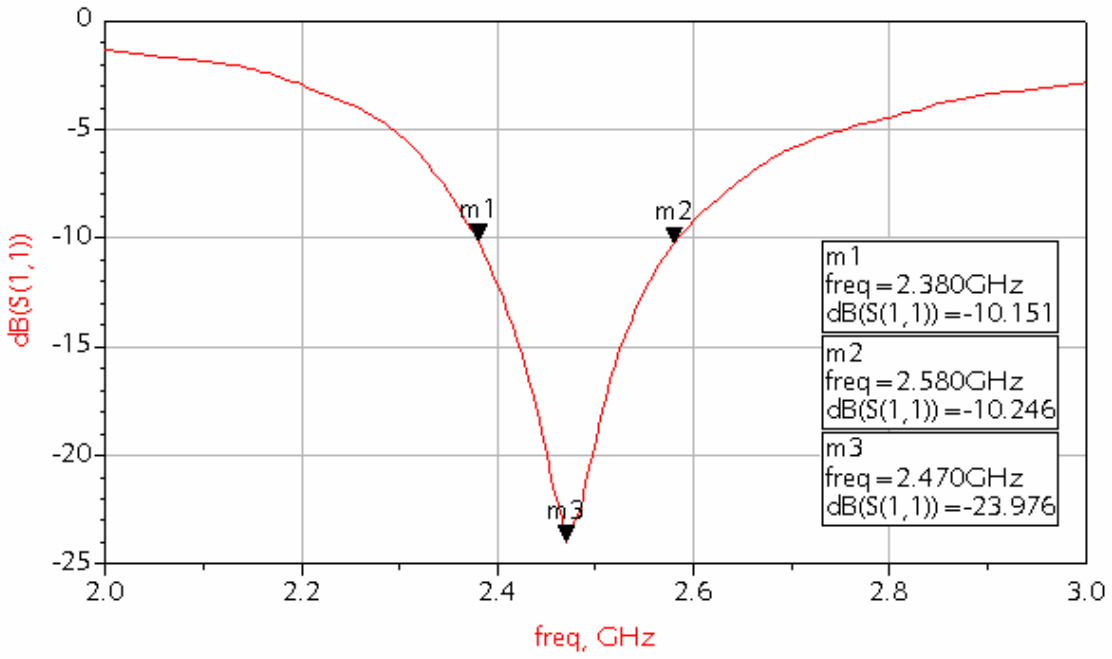
*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

Typical Electrical Characteristics (T=25°C)

❖ Test Board (Unit in mm)

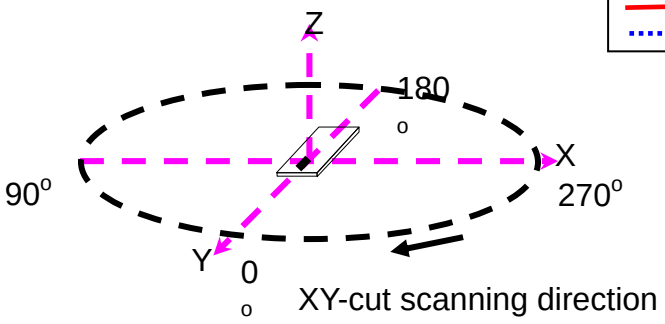


❖ Return Loss/With Matching Circuits

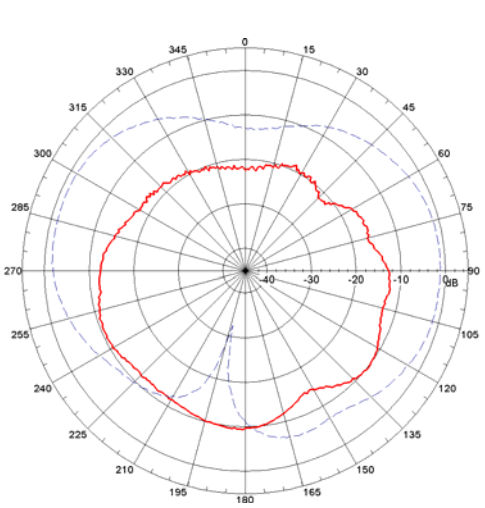


❖ Radiation Patterns

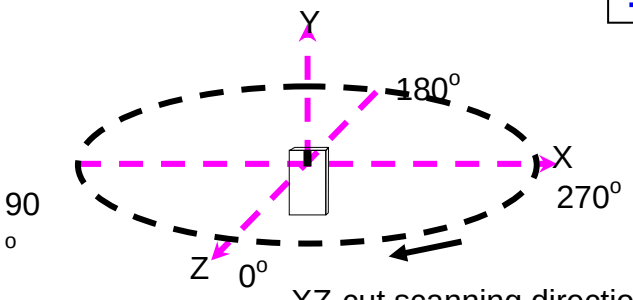
XY-V/XY-H



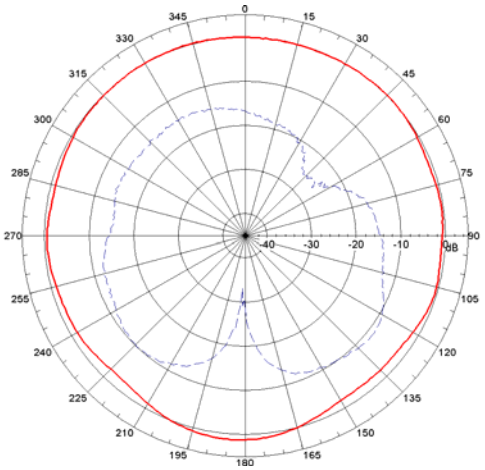
XY-cut scanning direction



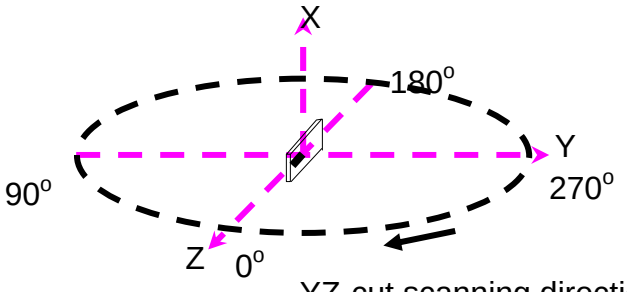
XZ-V/XZ-H



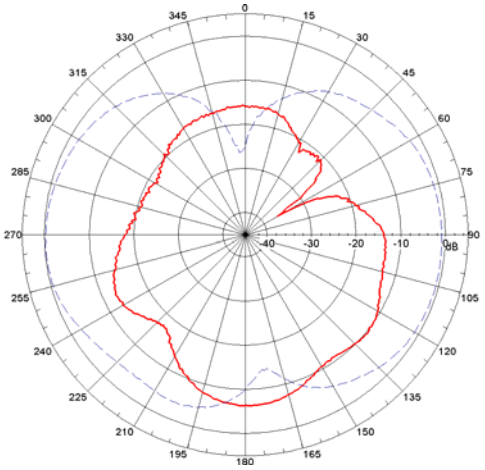
XZ-cut scanning direction



YZ-V/YZ-H

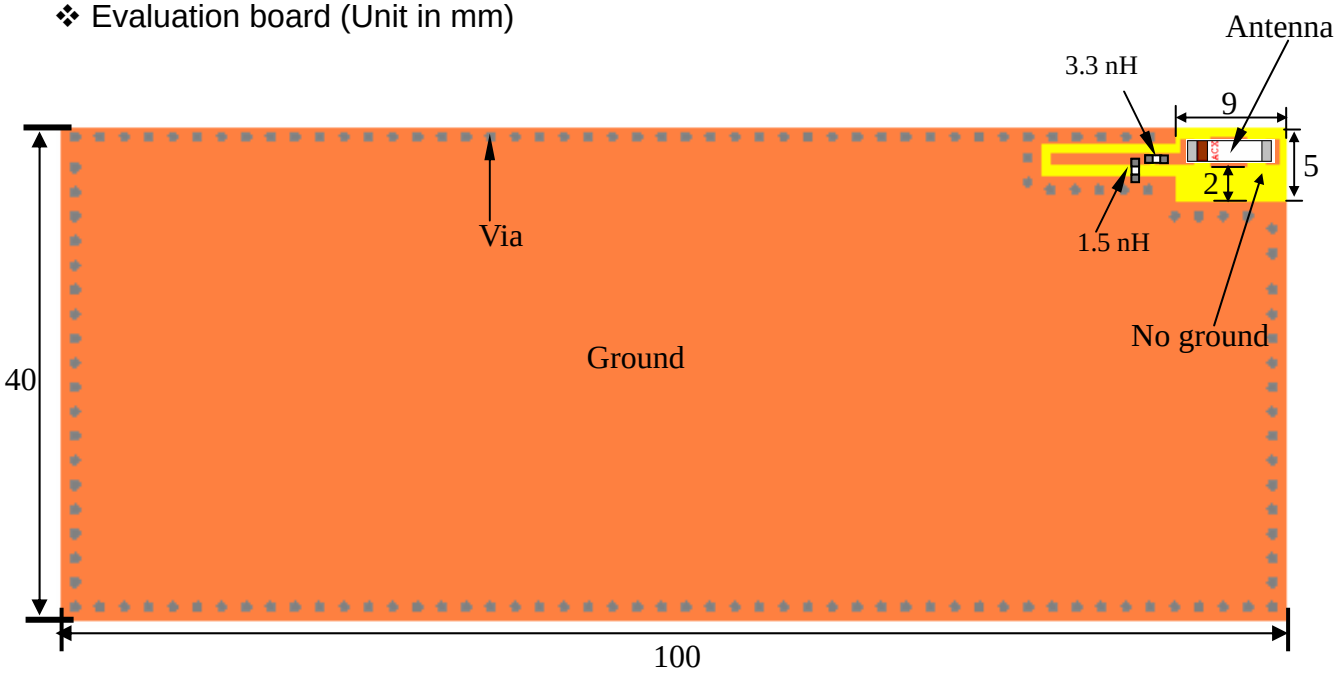


YZ-cut scanning direction

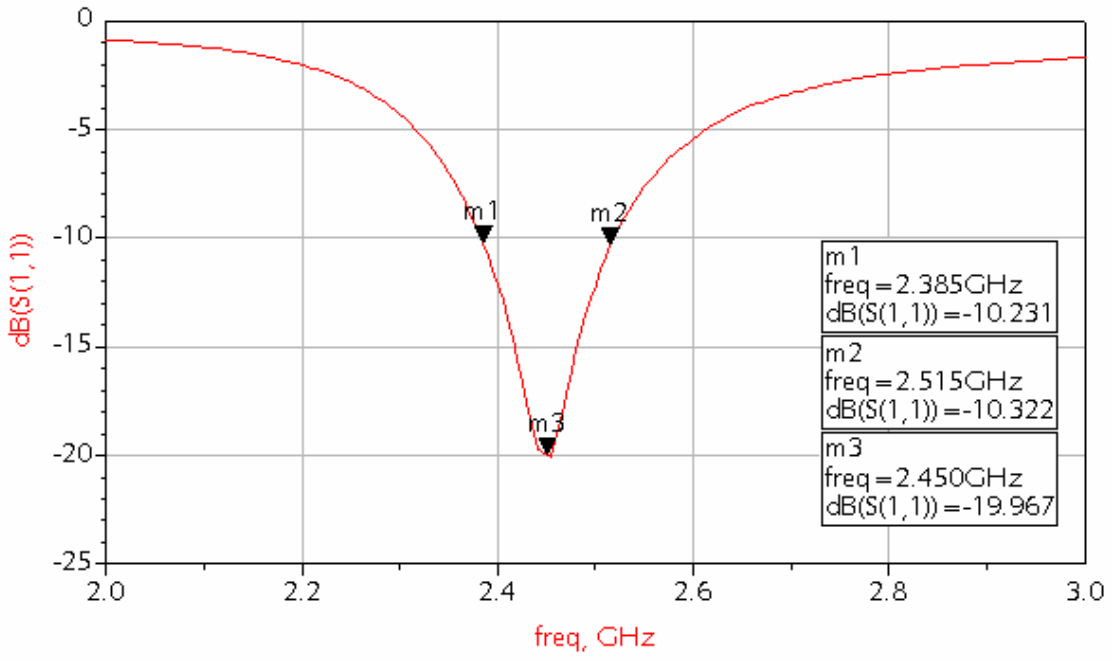


AT7020-E3R0HBA on mobile phone layout

❖ Evaluation board (Unit in mm)

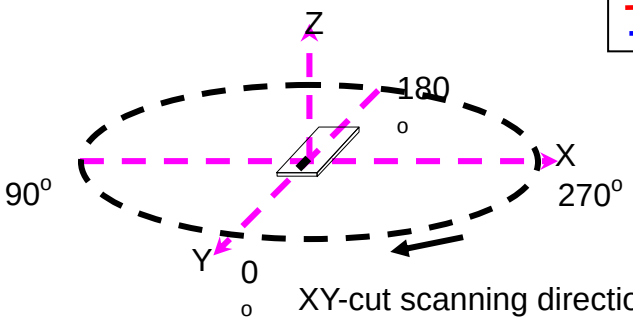


❖ Return Loss/With Matching Circuits

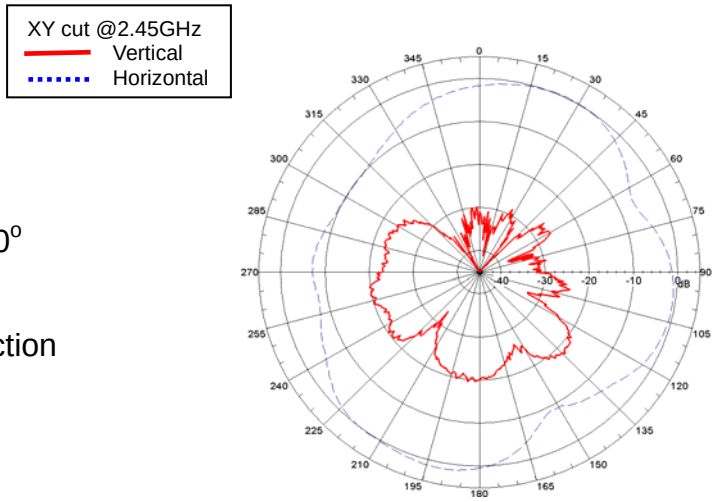


❖ Radiation Patterns

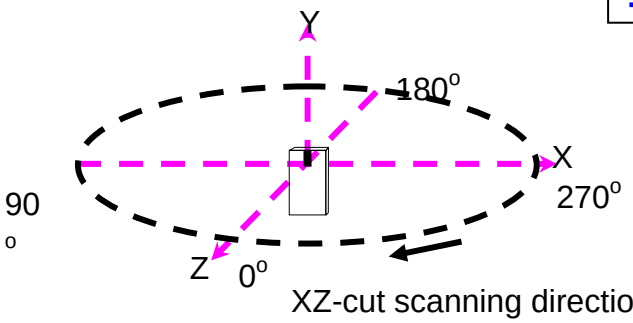
XY-V/XY-H



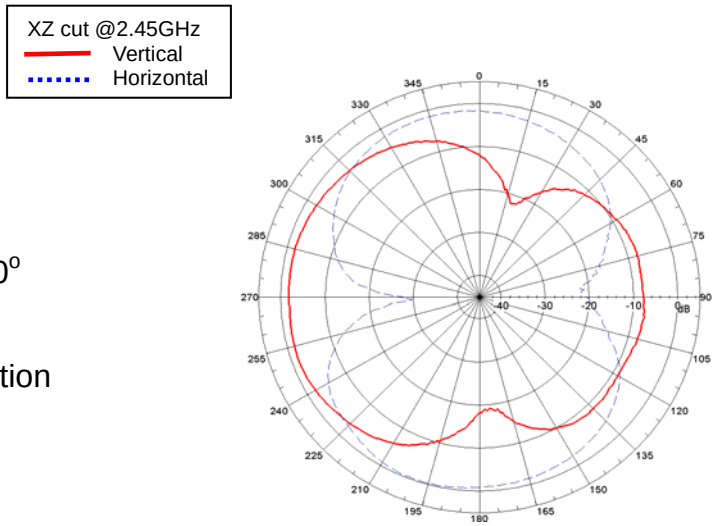
XY-cut scanning direction



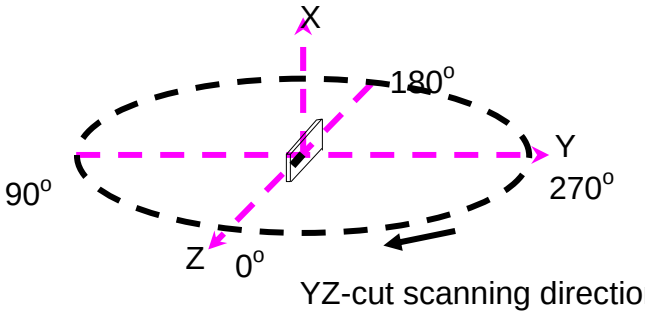
XZ-V/XZ-H



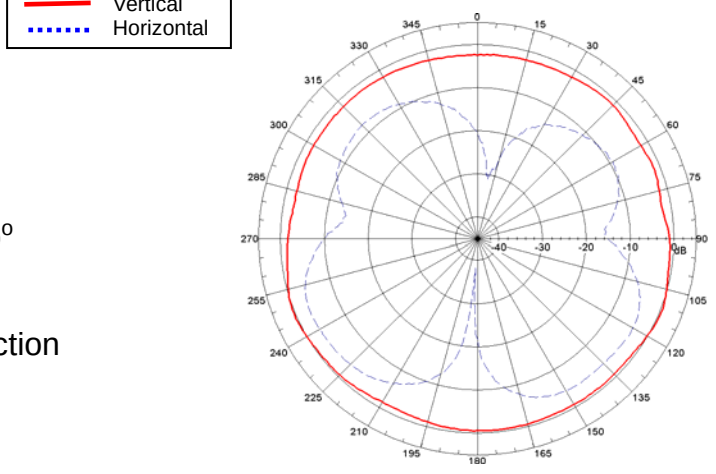
XZ-cut scanning direction



YZ-V/YZ-H

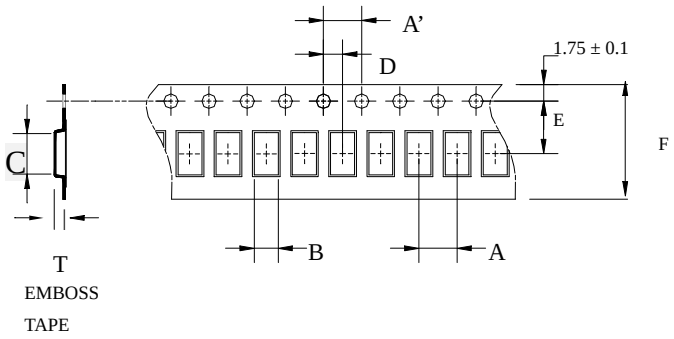


YZ-cut scanning direction



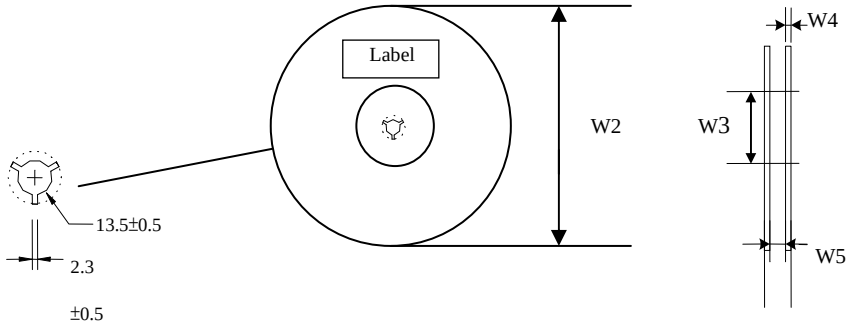
Taping Specifications

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



Type	A	A'	B	C	D	E	F	T	Quantity/per reel	Tape material
AT7020	4.0± 0.1	4.0± 0.1	2.3± 0.1	7.3± 0.1	2.0± 0.05	5.5± 0.1	12.0± 0.1	2.20± 0.1	1,000pcs	Plastic (Embossed)

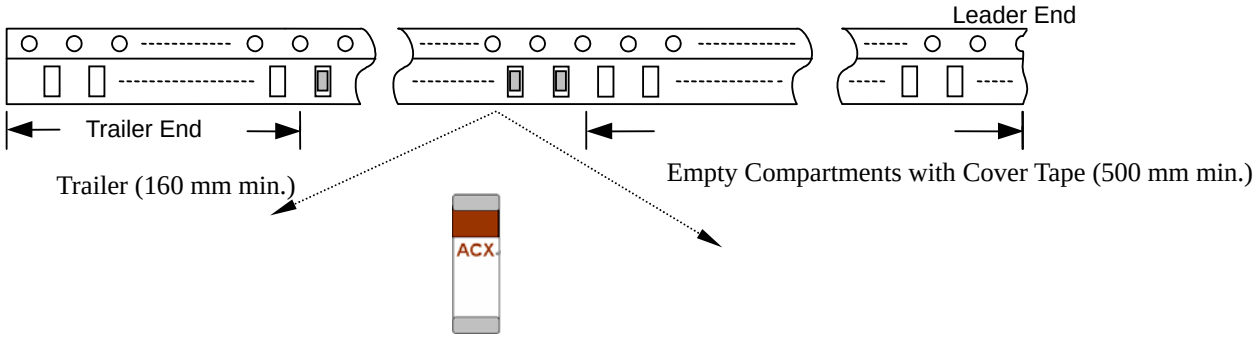
❖Reel Dimensions (Unit: mm)



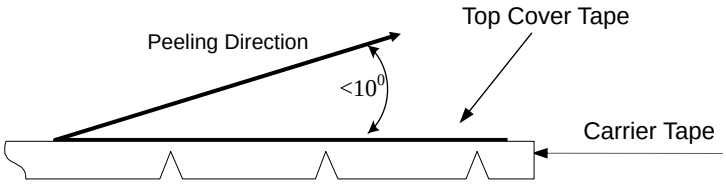
Label: Customer's Name,
ACX P/N, Q'ty, Date,
ACX Corp.

Type	W2	W3	W4	W5
AT7020	178±1	60±1	1.4±0.2	17±0.5

❖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**

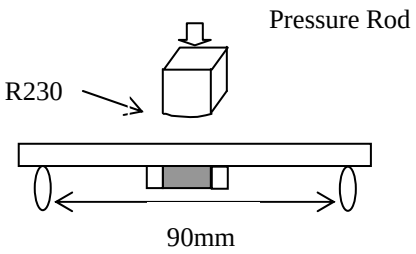
(1) Temperature: 15 ~35℃, relative humidity (RH): 45~75%.

(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.

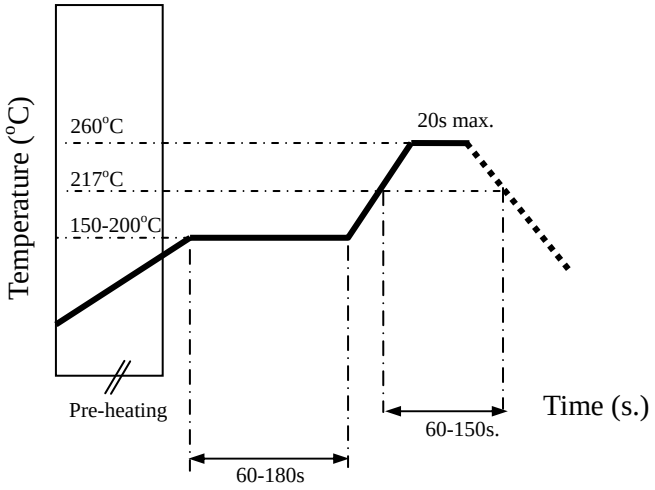
Mechanical & Environmental Characteristics

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. 1kg 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 1mm 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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