

AD1608 Series

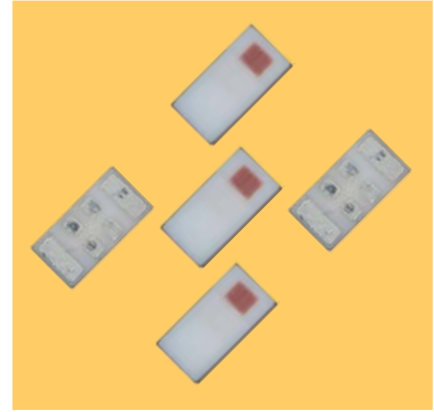
Multilayer Chip Antenna

Features

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

Applications

- ❖ Dual-band 2.4/5.5 GHz WLAN



Specifications

Part Number	Frequency Range (MHz)	Peak Gain (dBi typ.)	Average Gain (dBi typ.)	VSWR	Impedance
AD1608 -A2455AA_	2400~2480	1.0(XZ-Total)	-3.5(XZ-Total)	6.5 max.	50 Ω
	5150~5850	4.0(XZ-Total)	-2.5(XZ-Total)	4.5 max.	50 Ω

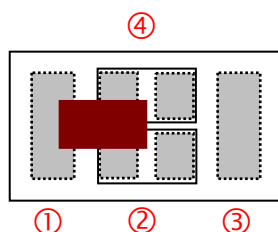
Q'ty/Reel (pcs) : 4,000 pcs
 Operating Temperature Range : -40 ~ +85 °C
 Storage Temperature Range : -40 ~ +85 °C
 Storage Period : 12 months max.
 Power Capacity : 3W max.

Part Number

AD 1608 - A 2455 AA □ □
 ① ② ③ ④ ⑤ ⑥ ⑦

① Type	AD : Dual-band Antenna	② Dimensions (L × W)	1.6× 0.8 mm
③ Material Code	A	④ Frequency Range	2455=2400/5500 MHz
⑤ Specification Code	AA	⑥ Packaging	T: Tape & Reel B: Bulk
⑦ Soldering	/LF=lead-free		

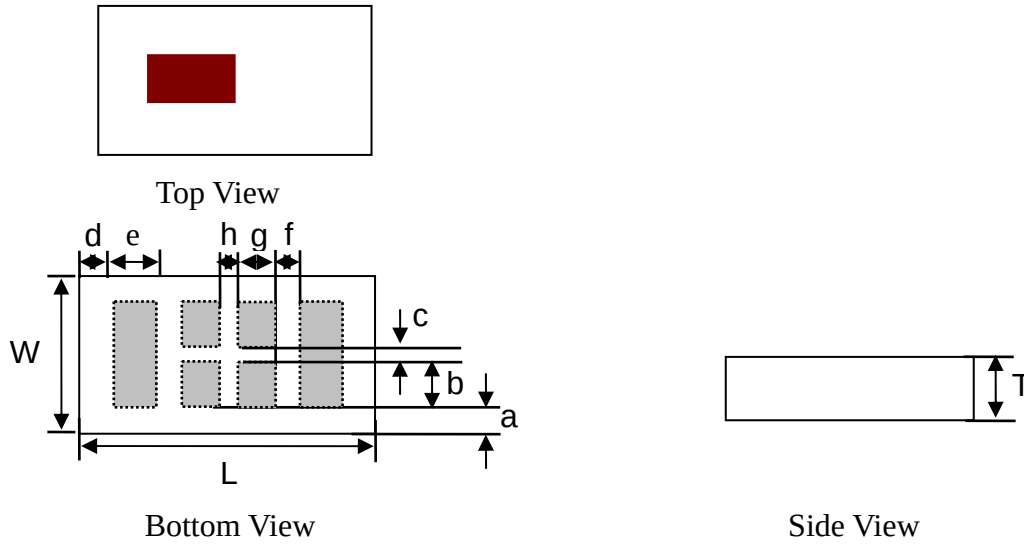
Terminal Configuration



No.	Scenario#1 Terminal Name	No.	Scenario#2 Terminal Name
①	GND	①	GND
②	Feed	②	NC
③	NC	③	NC
④	NC	④	Feed

Dimensions

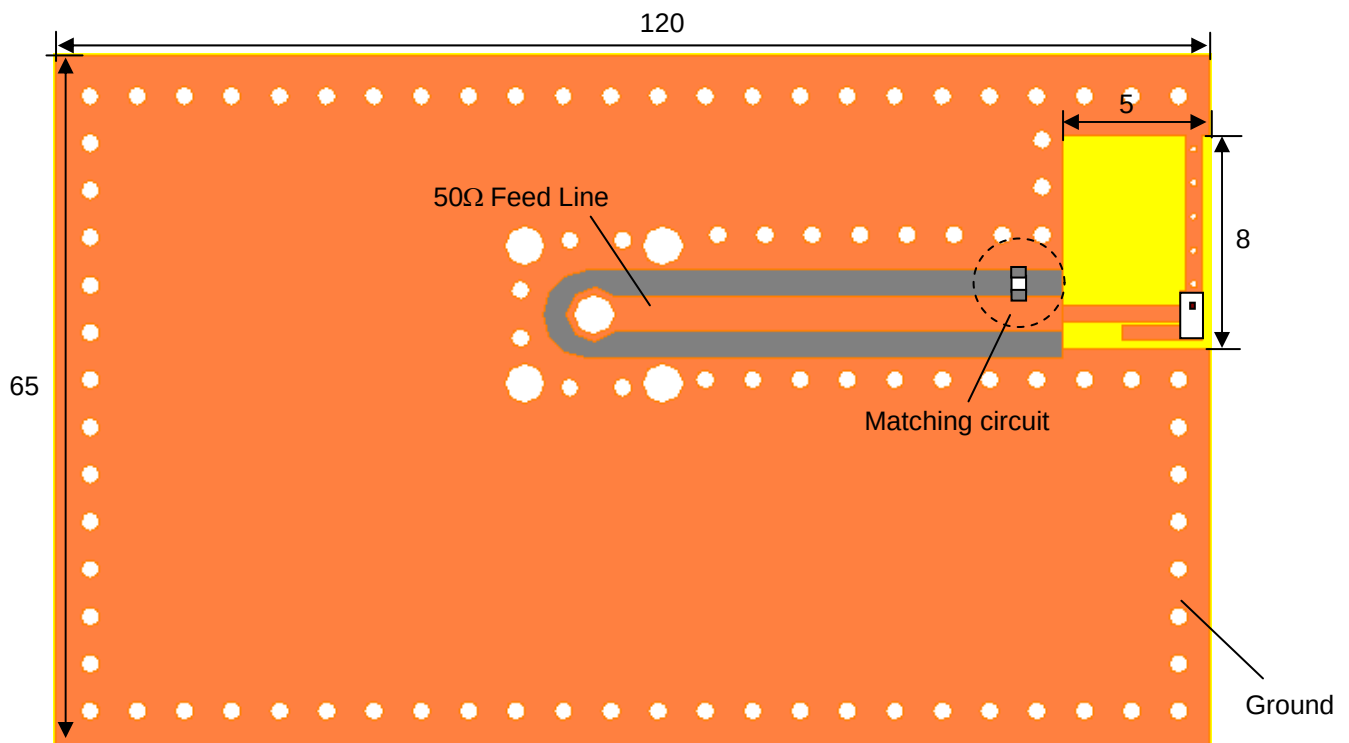
Unit: mm



Mark	L	W	T	a	b	c	d	e	f	g	h
Dimensions	1.6 ±0.1	0.8 ±0.1	0.4 max	0.086 ±0.1	0.208 min	0.2 ±0.03	0.085 ±0.03	0.215 ±0.05	0.25 ±0.05	0.15 min	0.2 ±0.03

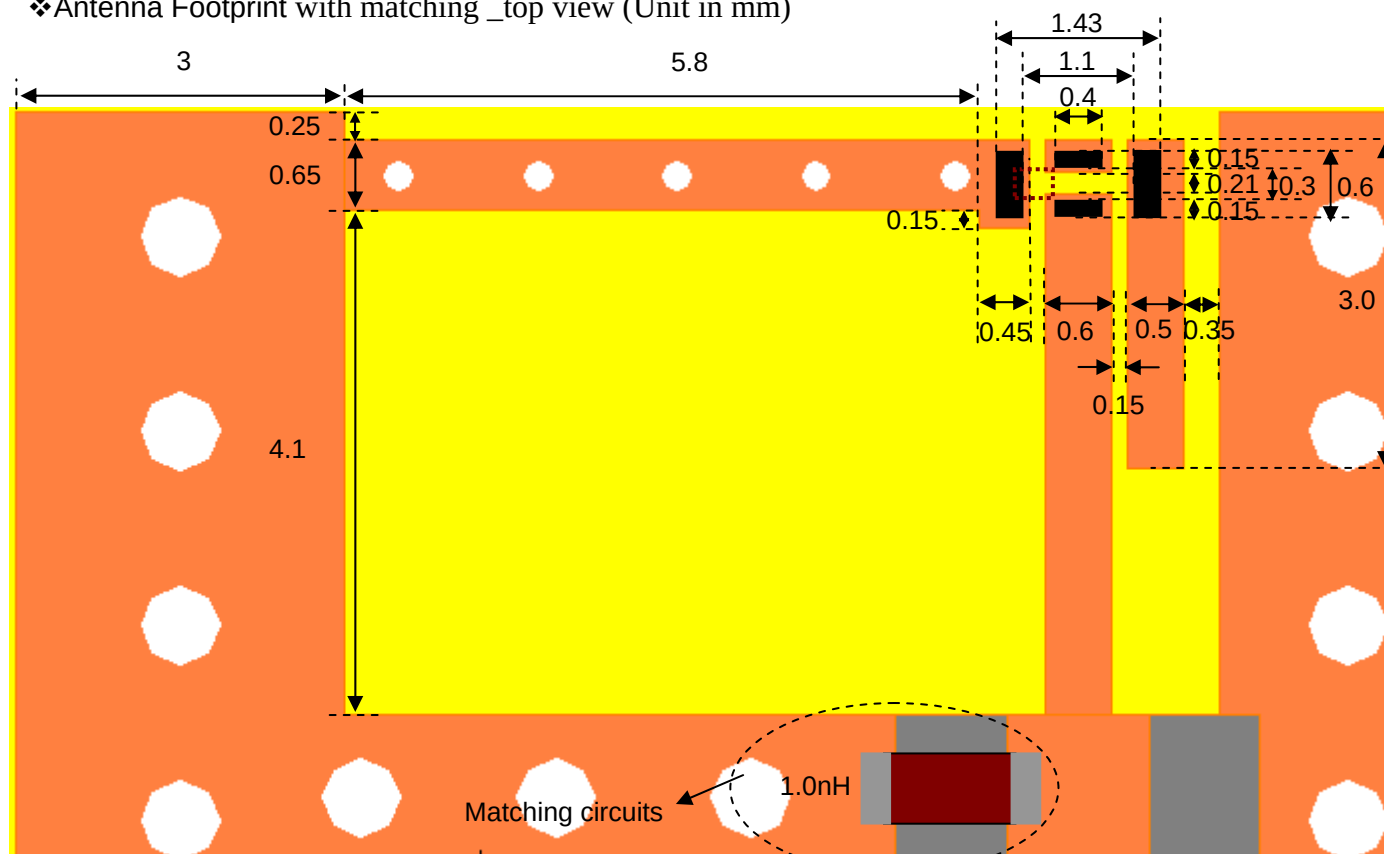
Typical Electrical Characteristics (T=25°C)

❖ Test Board –Type A (Scenario#1)

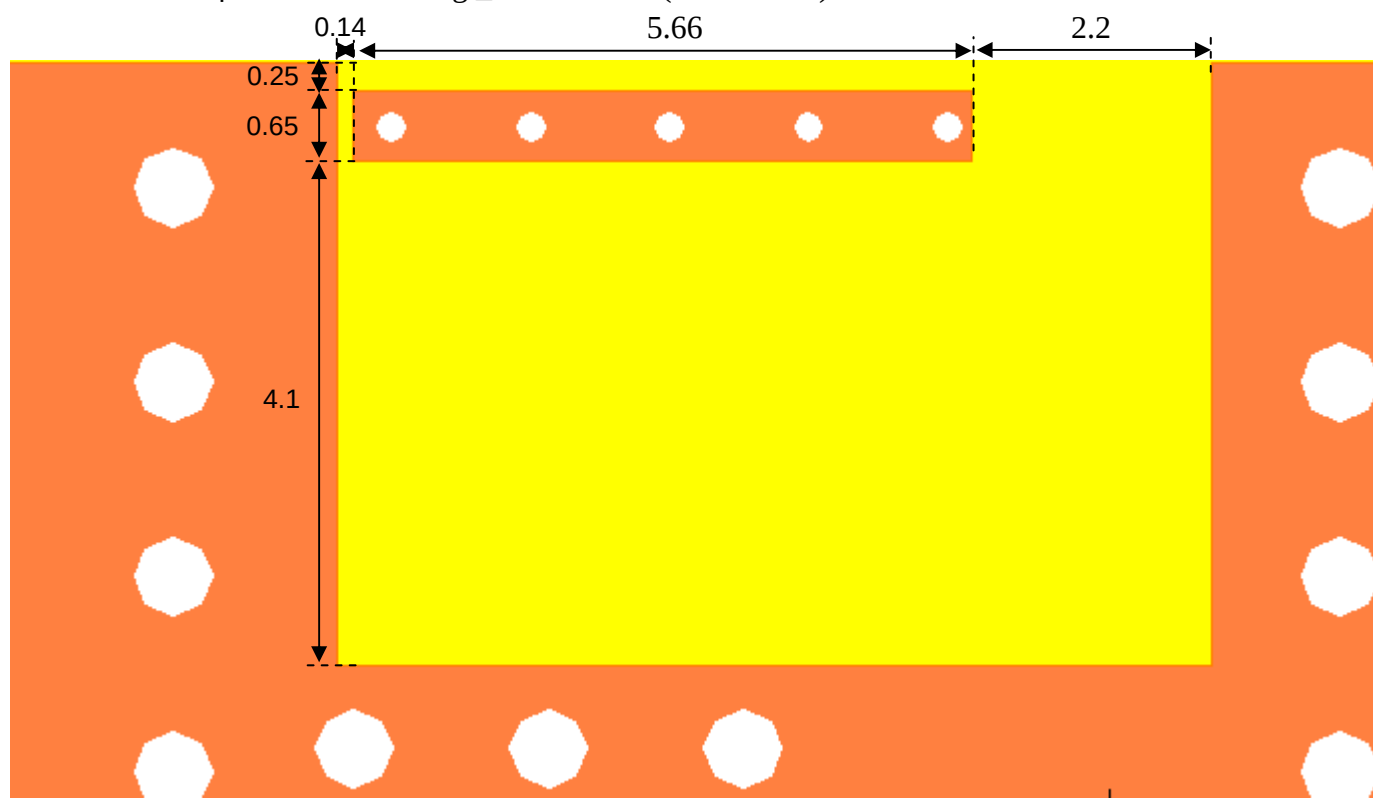


*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

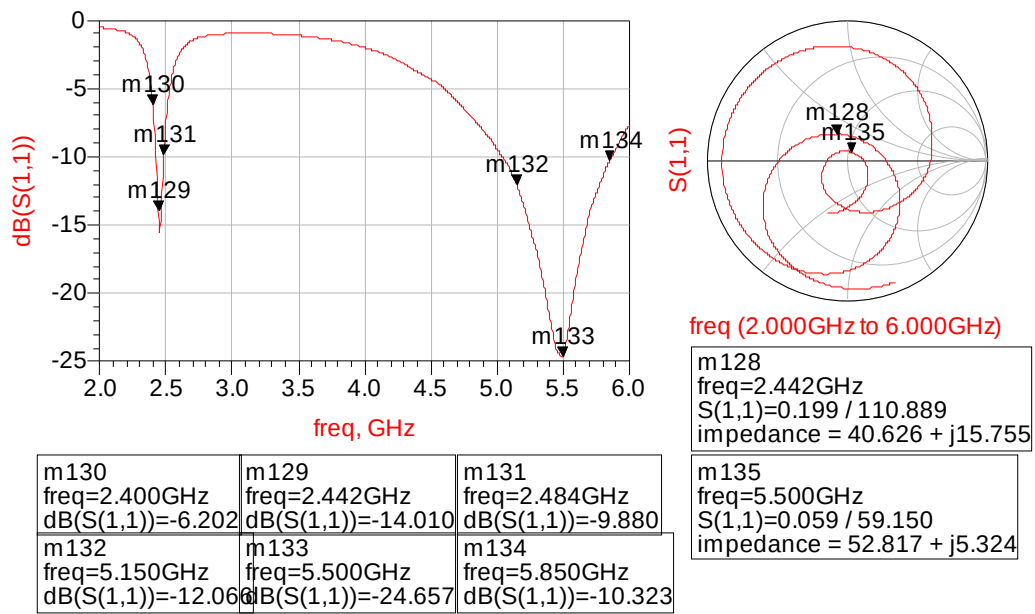
❖Antenna Footprint with matching _top view (Unit in mm)



❖Antenna Footprint with matching _bottom view (Unit in mm)

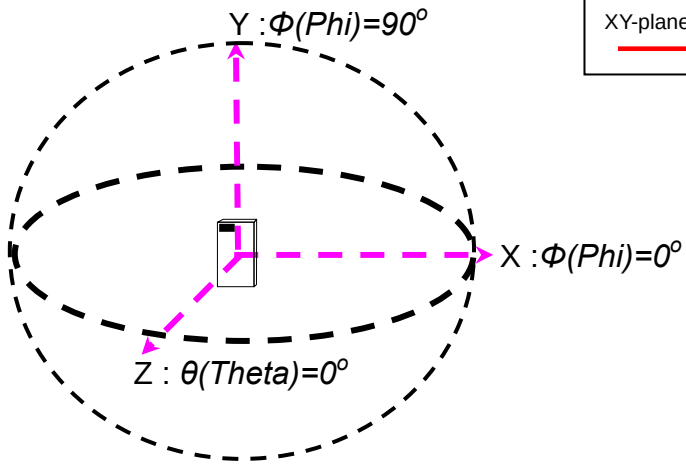


❖ Return Loss (with matching)

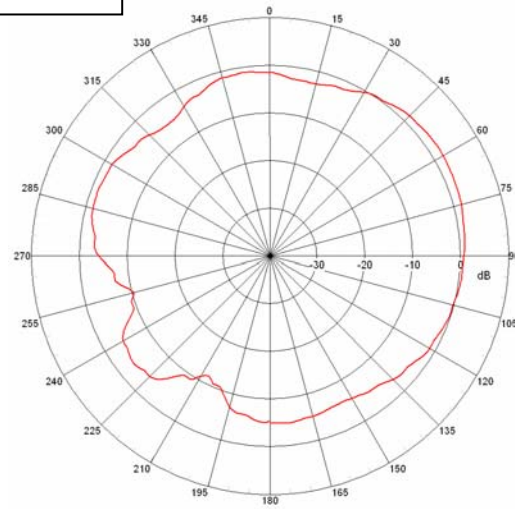


❖ Radiation Patterns@2.44GHz

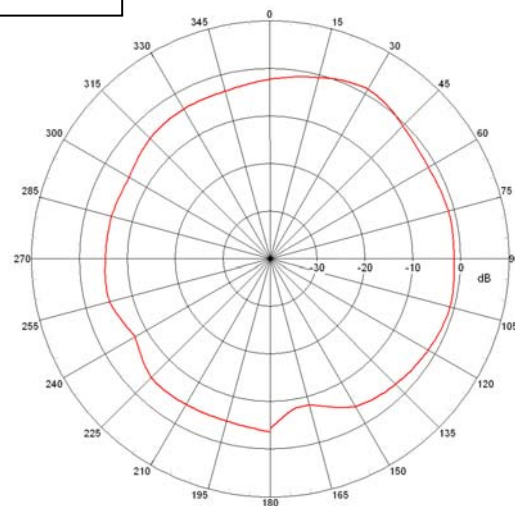
(Antenna Efficiency 42%@ 2.4GHz ; 60%@2.44GHz ; 56%@2.48GHz)



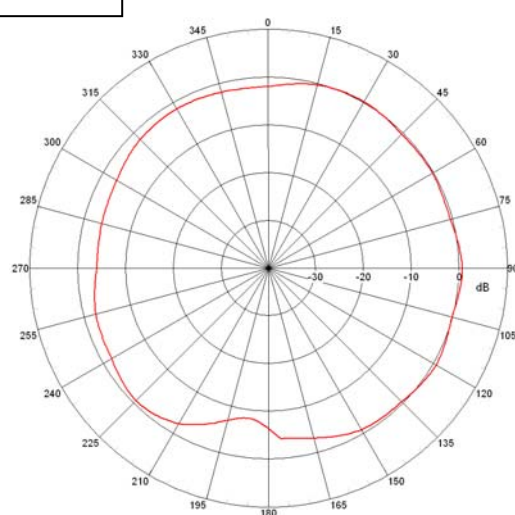
XY-plane @2440MHz
— Total



XZ-plane @2440MHz
— Total

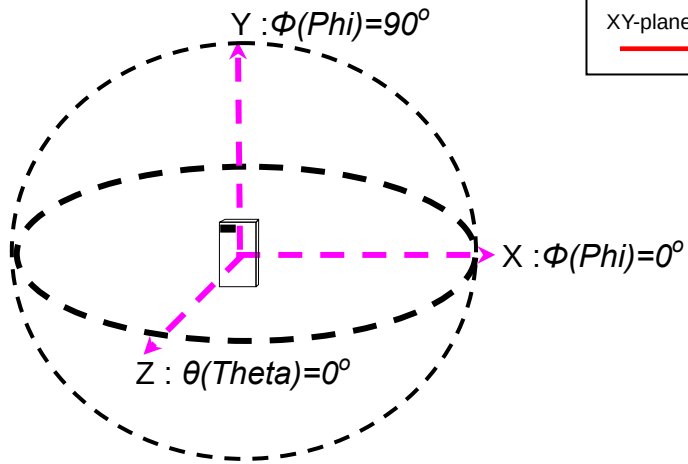


YZ-plane @2440MHz
— Total

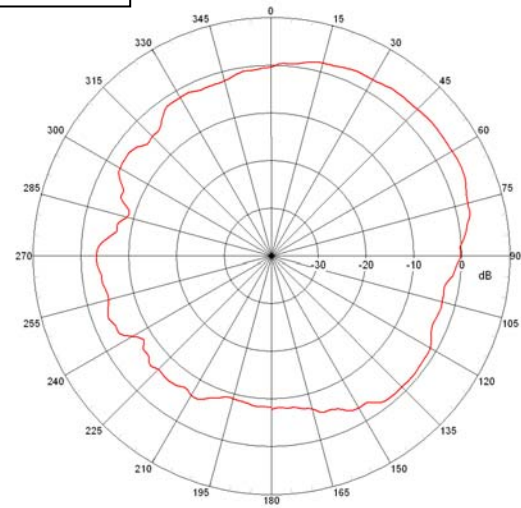


❖ Radiation Patterns@5.5GHz

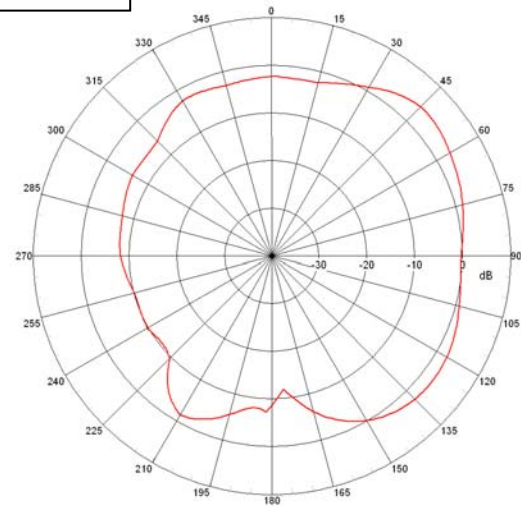
(Antenna Efficiency 78%@ 5.15GHz ; 86%@5.5GHz ; 76%@5.85GHz)



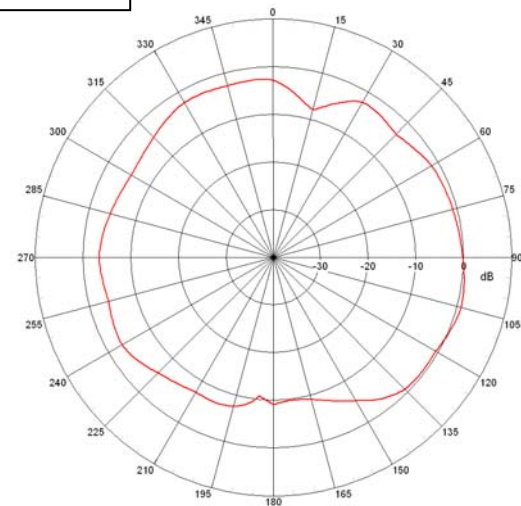
XY-plane @5500MHz
— Total



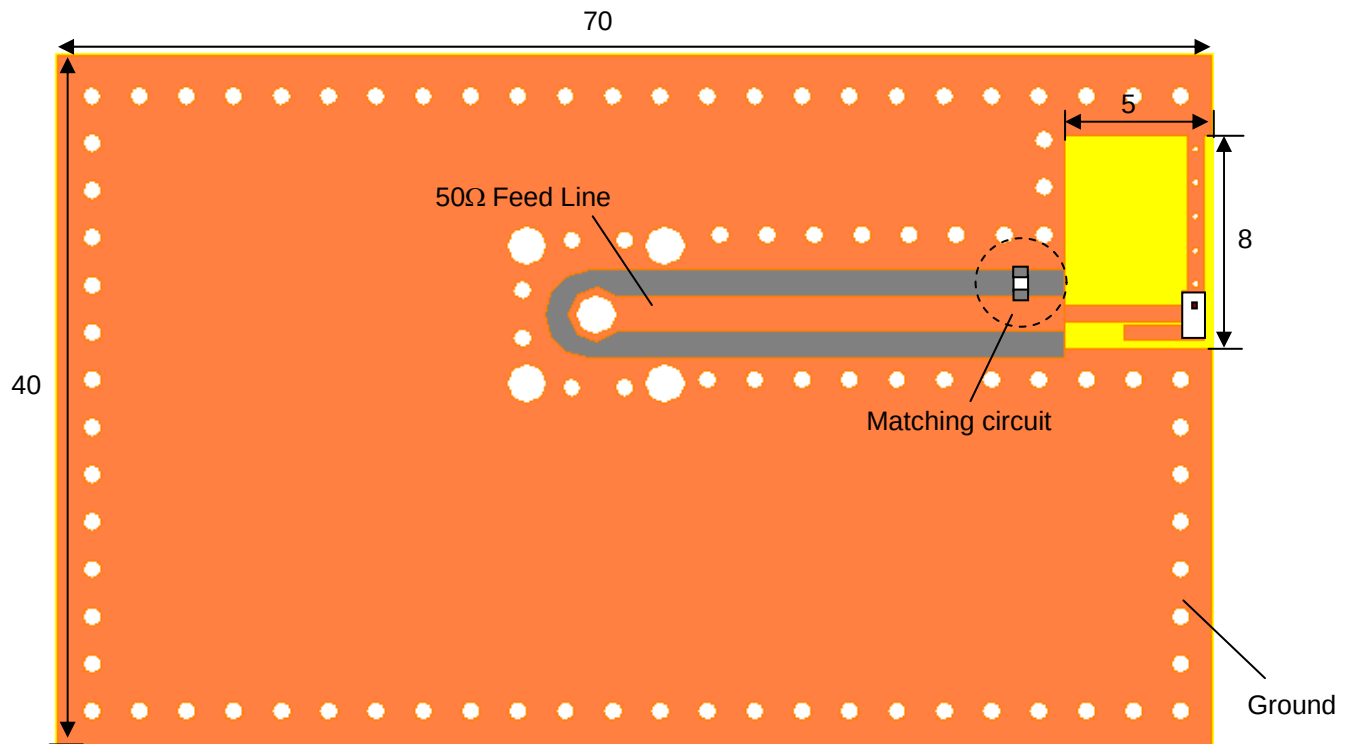
XZ-plane @5500MHz
— Total



YZ-plane @5500MHz
— Total

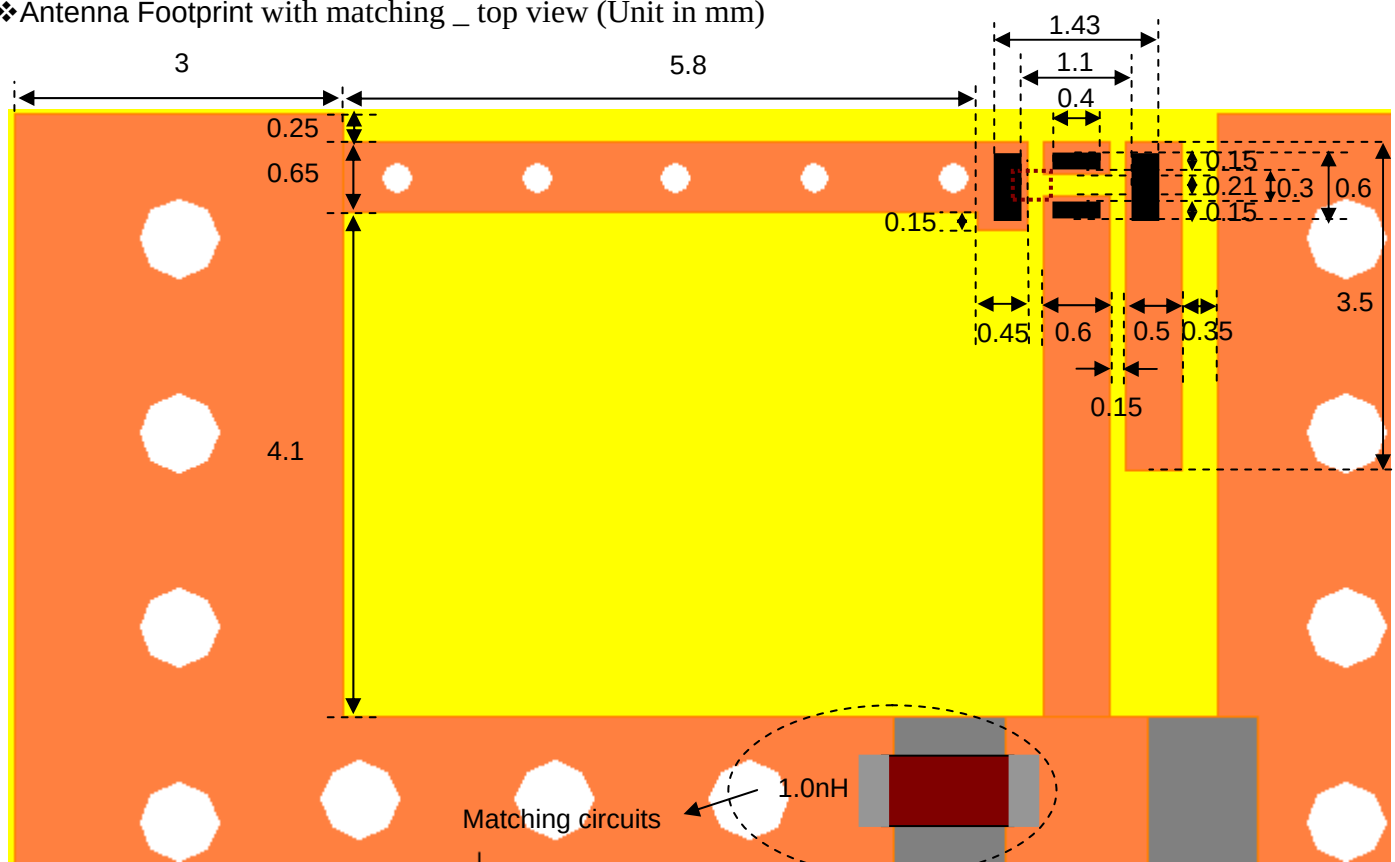


❖Test Board-Type B (Scenario#1)

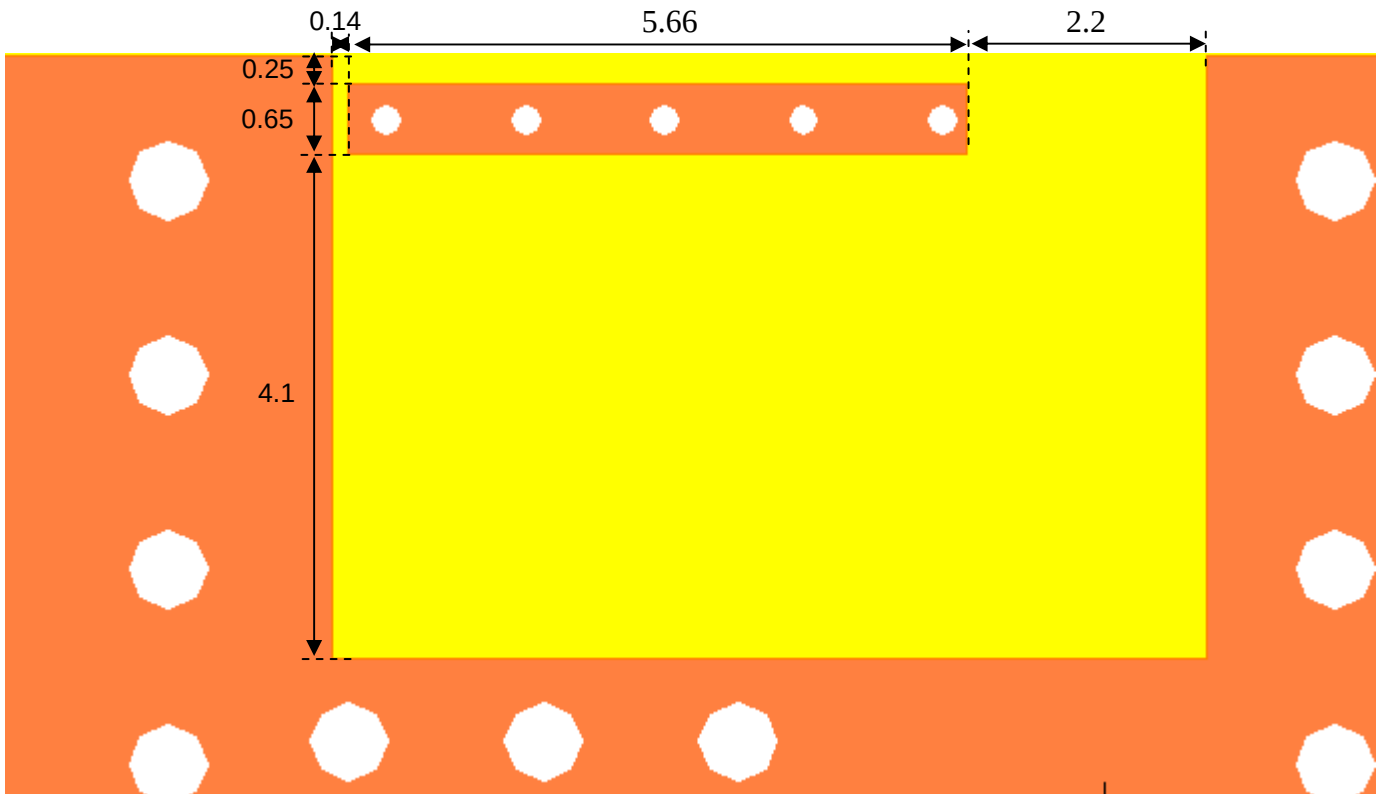


*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

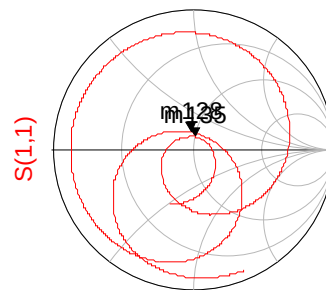
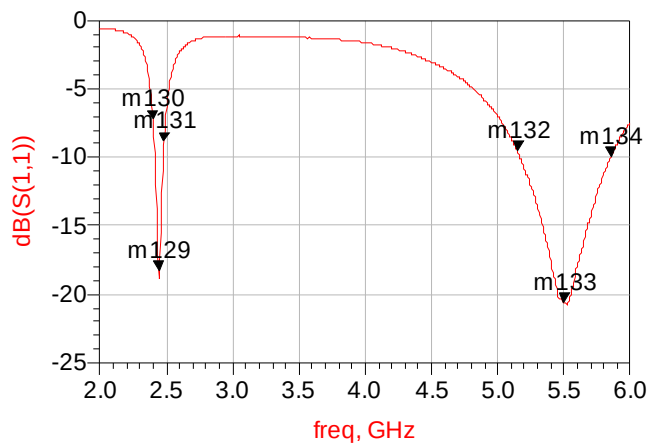
❖Antenna Footprint with matching _ top view (Unit in mm)



❖ Antenna Footprint with matching _ bottom view (Unit in mm)



❖ Return Loss (with matching)



freq (2.000GHz to 6.000GHz)

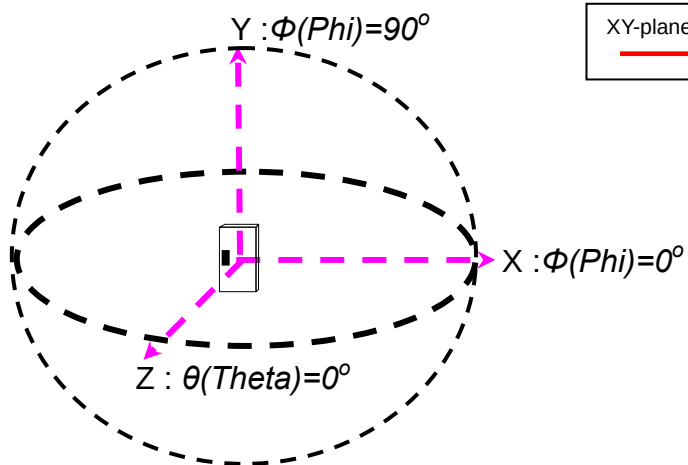
m128
freq=2.442GHz
S(1,1)=0.122 / 95.014
impedance = 47.527 + j11.753

m130 freq=2.400GHz dB(S(1,1))=-7.250	m129 freq=2.442GHz dB(S(1,1))=-18.254	m131 freq=2.484GHz dB(S(1,1))=-8.854
m132 freq=5.150GHz dB(S(1,1))=-9.557	m133 freq=5.500GHz dB(S(1,1))=-20.673	m134 freq=5.850GHz dB(S(1,1))=-10.013

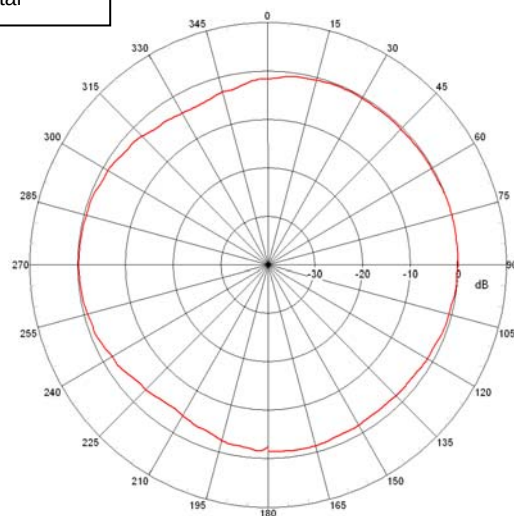
m135
freq=5.500GHz
S(1,1)=0.093 / 81.368
impedance = 50.543 + j9.329

❖ Radiation Patterns@2.44GHz

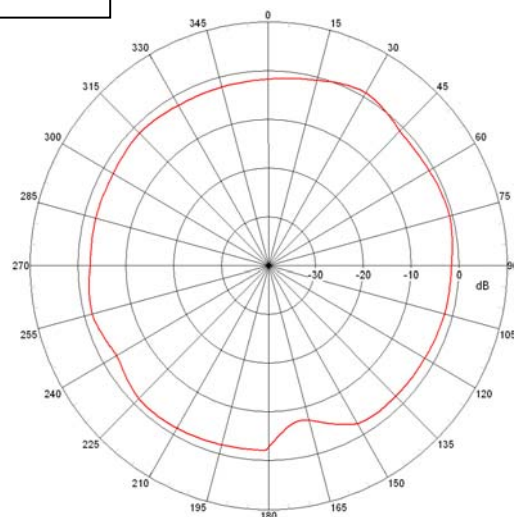
(Antenna Efficiency 48%@ 2.4GHz ; 66%@2.44GHz ; 60%@2.48GHz)



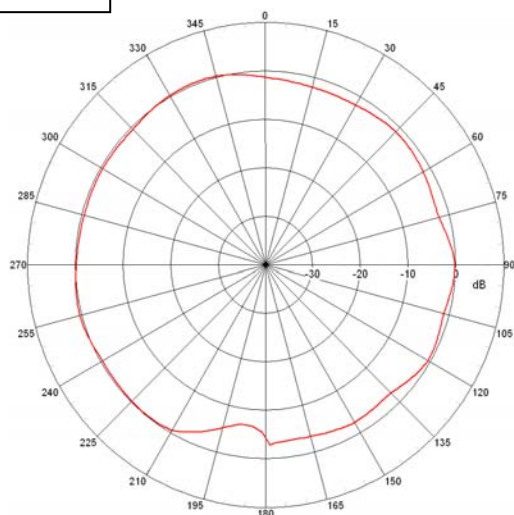
XY-plane @2440MHz
— Total



XZ-plane @2440MHz
— Total

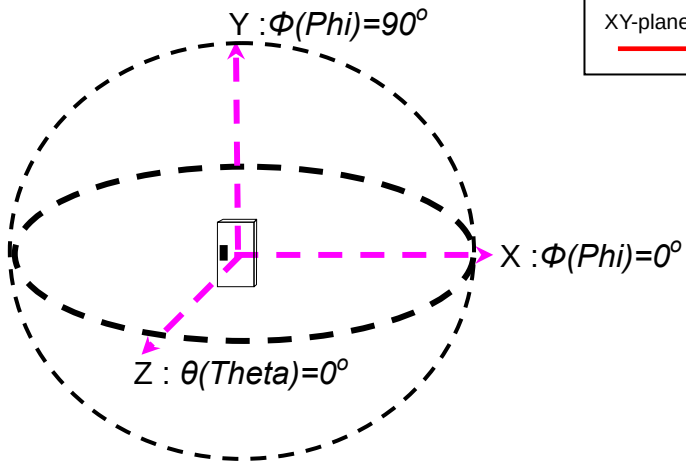


YZ-plane @2440MHz
— Total

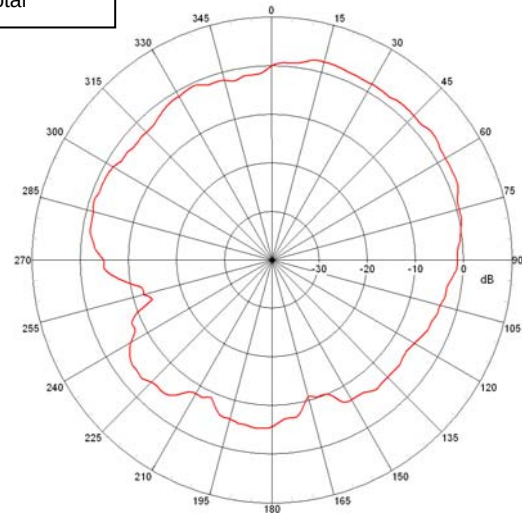


❖ Radiation Patterns@5.5GHz

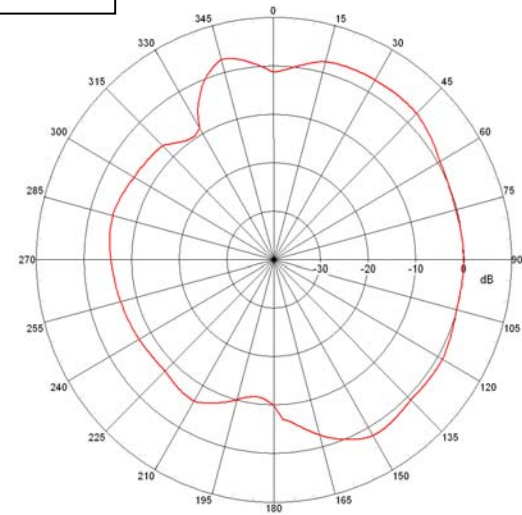
(Antenna Efficiency 70%@ 5.15GHz ; 79%@5.5GHz ; 67%@5.85GHz)



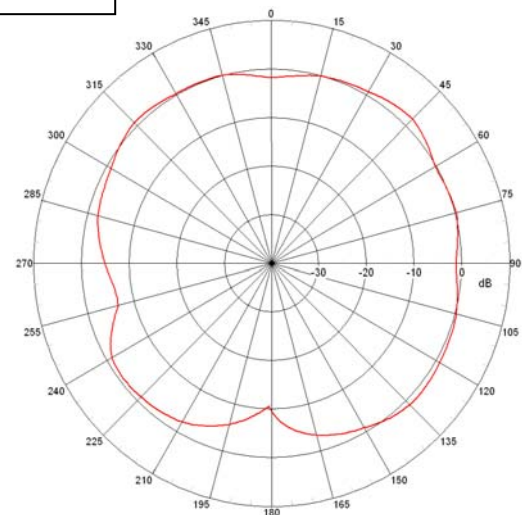
XY-plane @5500MHz
— Total



XZ-plane @5500MHz
— Total

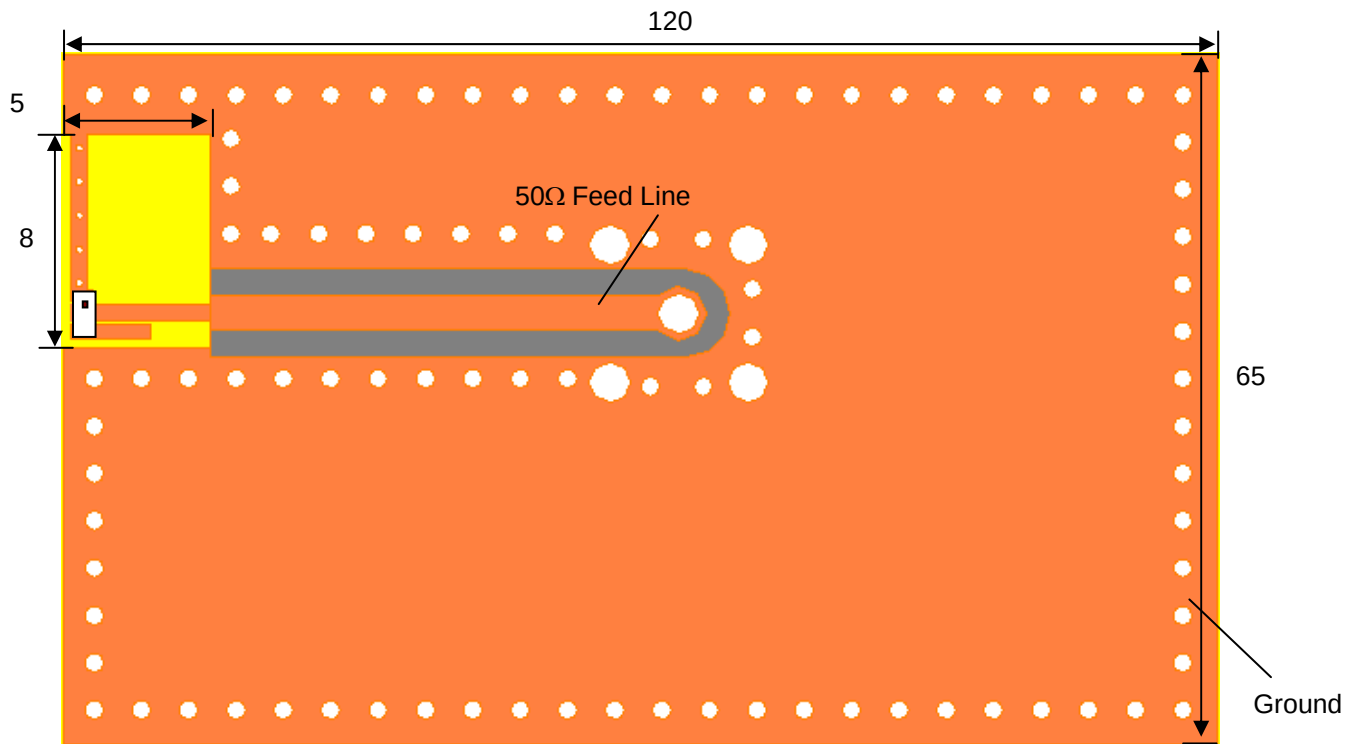


YZ-plane @5500MHz
— Total



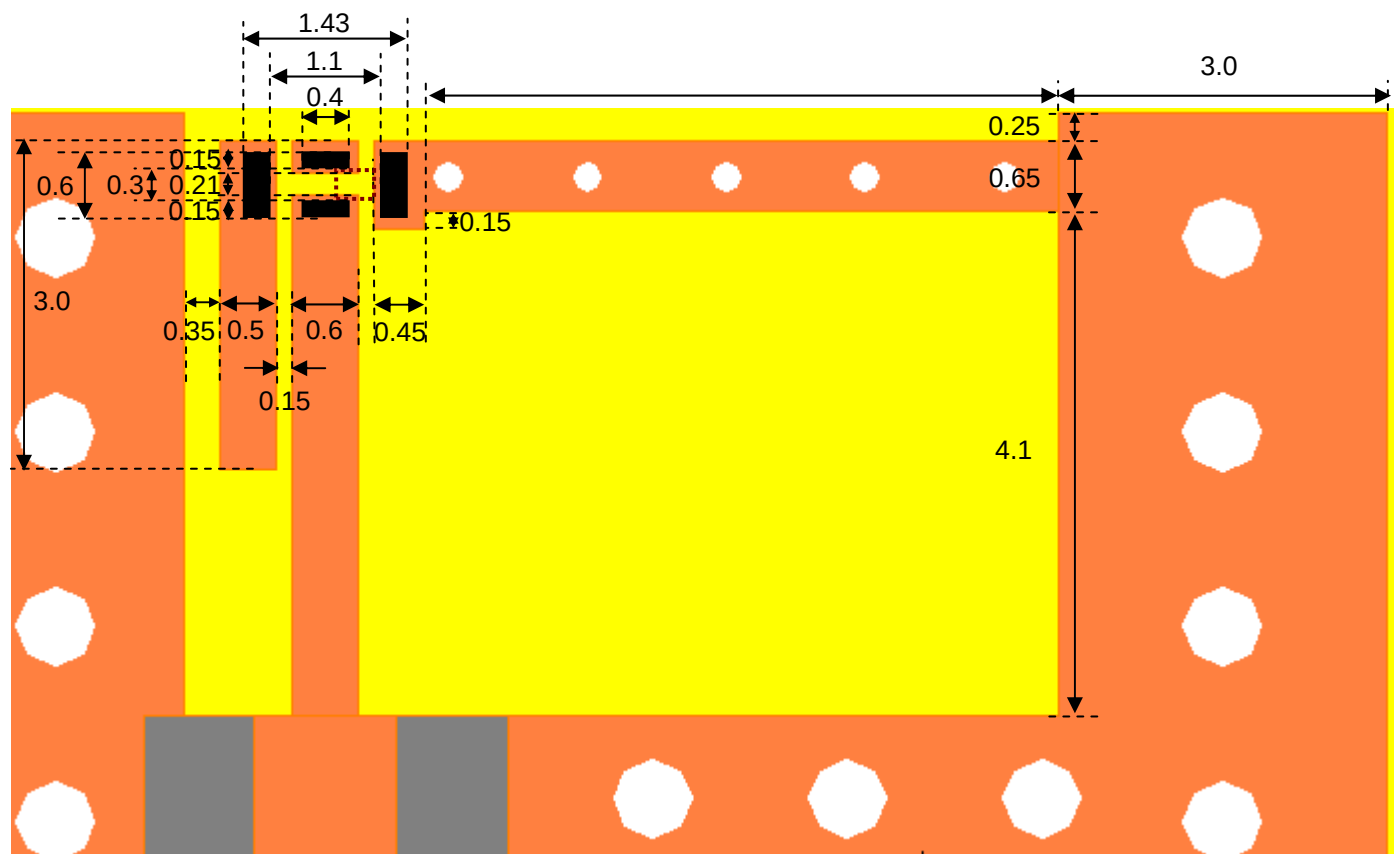
Application note of Scenario#2

❖ Test Board –Type A (Scenario#2)



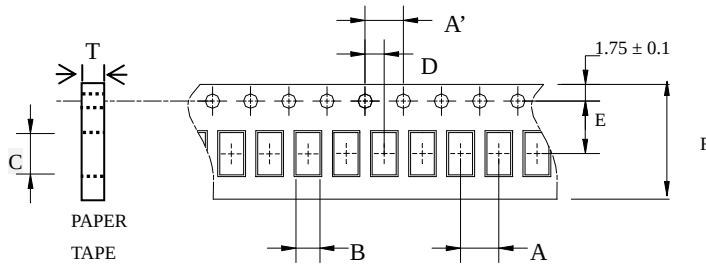
*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

❖ Antenna Footprint with matching _top view (Unit in mm)



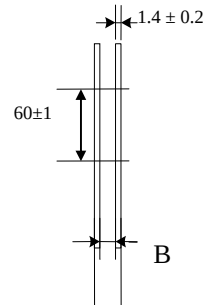
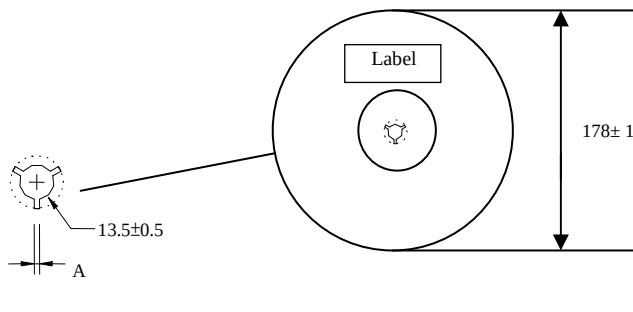
Taping Specifications

❖Tape Dimensions (Unit: mm) & Quantity



Type	A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
1608	4.0±	4.0±	0.95±	1.80±	2.0±	3.5±	8.0±	0.60±	4,000pcs	Paper
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.03		

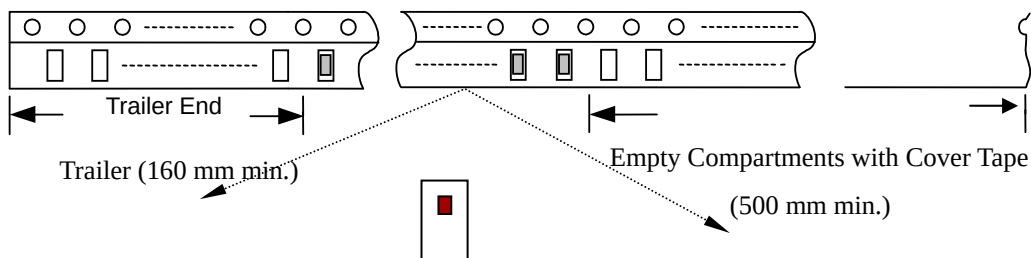
❖Reel Dimensions (Unit: mm)



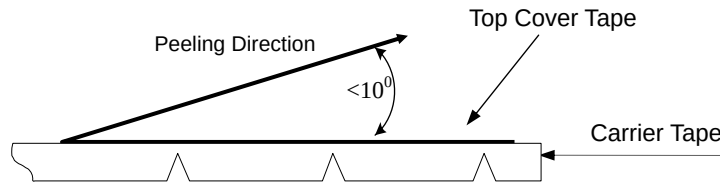
Label: Customer's Name,
ACX P/N, Q'ty, Date,
ACX Corp.

Type	A	B
1608	2.3±0.5	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 .

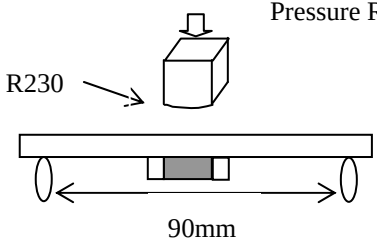
❖ Storage Conditions

- (1) Temperature: 5 ~35°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.

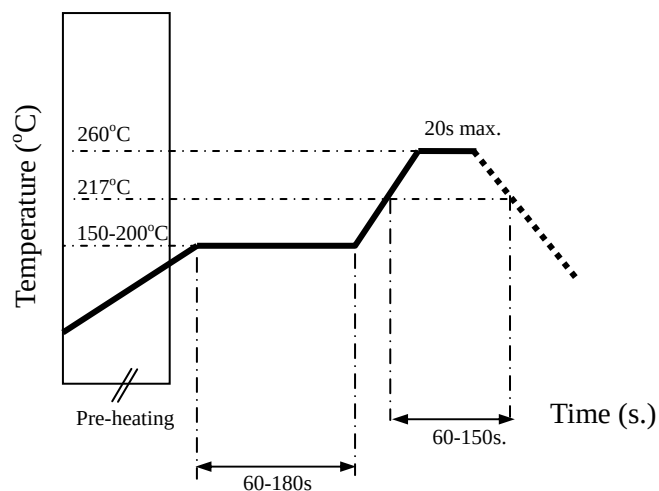
Mechanical & Environmental Characteristics

Item	Requirements	Procedure
Solderability	- No apparent damage - More than 95% of the terminal electrode shall be covered with new solder	- Preheat: $120 \pm 5^{\circ}\text{C}$ - Solder: $245 \pm 5^{\circ}\text{C}$ for 5 ± 1 sec
Soldering strength (Termination Adhesion)	10N minimum	- Solder specimen onto test jig. - 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)	No apparent damage	- Solder specimen onto test jig (FR4, 1.6mm) using the recommend soldering profile. - Apply a bending force of 2mm deflection 
Heat/Humidity Resistance	- No apparent damage - Fulfill the electrical specification after test	- Temperature: $85 \pm 2^{\circ}\text{C}$ - Humidity: 90% ~ 95% RH - Duration: 1000 ± 48hrs - Recovery: 1-2hrs
Thermal shock (Temperature Cycle)	- No apparent damage - Fulfill the electrical specification after test	- One cycle/step 1 : $125 \pm 5^{\circ}\text{C}$ for 30 min step 2 : $-40 \pm 5^{\circ}\text{C}$ for 30 min - No of cycles : 100 - Recovery: 1-2 hrs
Low Temperature Resistance	- No apparent damage - Fulfill the electrical specification after test	- Temperature: $-40 \pm 5^{\circ}\text{C}$ - Duration: 500 ± 24hrs - Recovery: 1-2hrs

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