

AD1608 Series

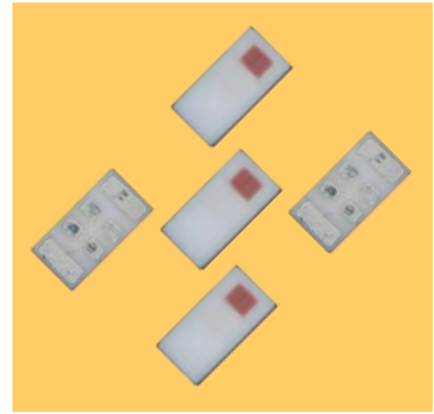
Multilayer Chip Antenna

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

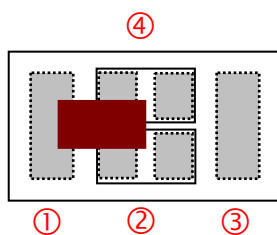
Q'ty/Reel (pcs) : 4,000 pcs
 Operating Temperature Range : -40 ~ +85 °C
 Storage Temperature Range : -40 ~ +85 °C
 Storage Period : 12 months max.
 Power Capacity : 3W max.

Part Number

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

① Type	AD : Dual-band Antenna	② Dimensions (L x W)	1.6x 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		

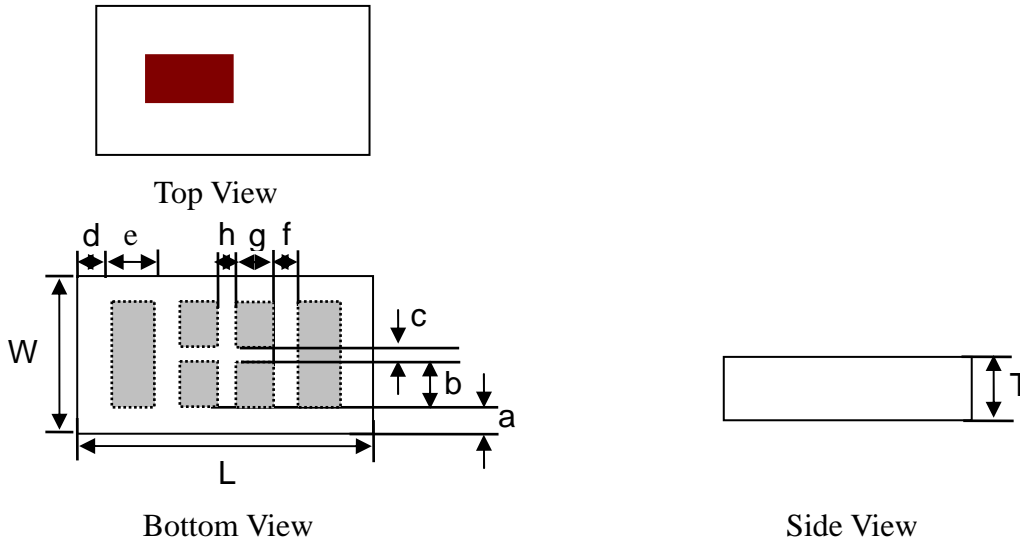
Terminal Configuration



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

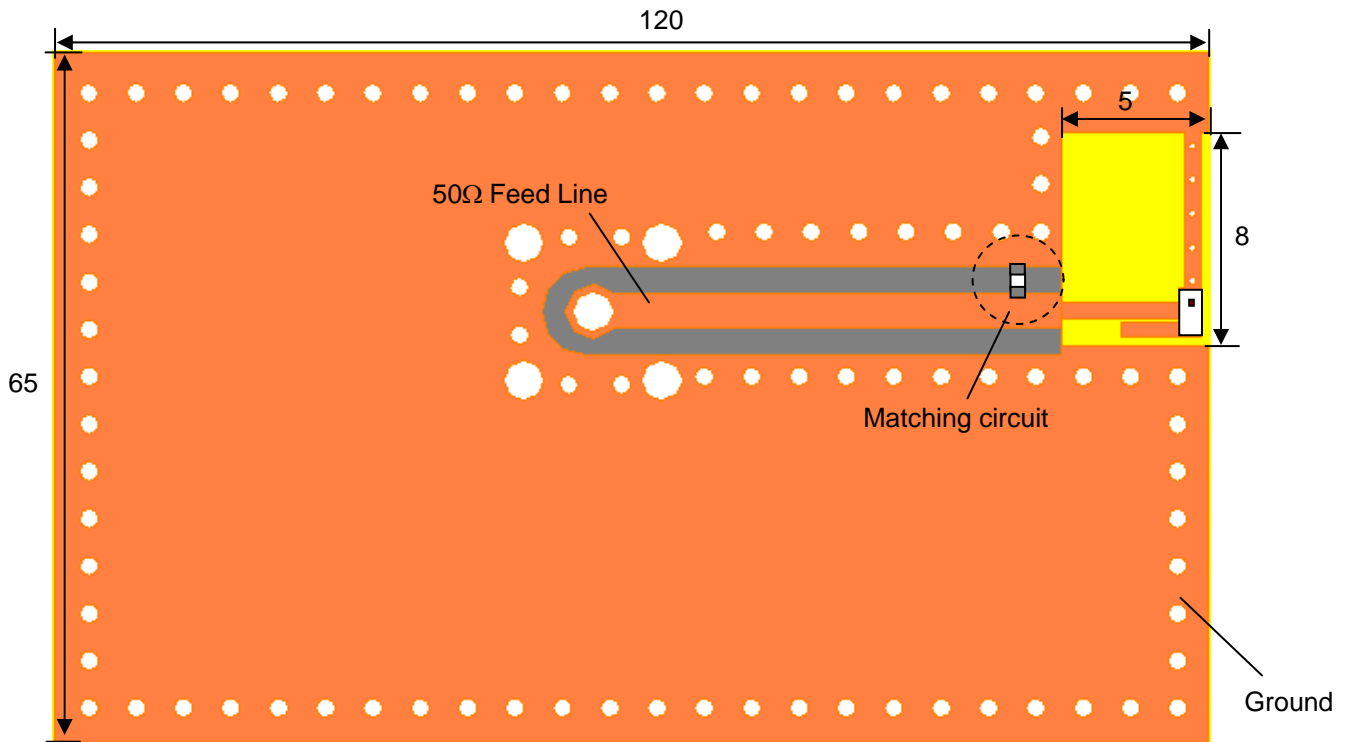
Unit: mm



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

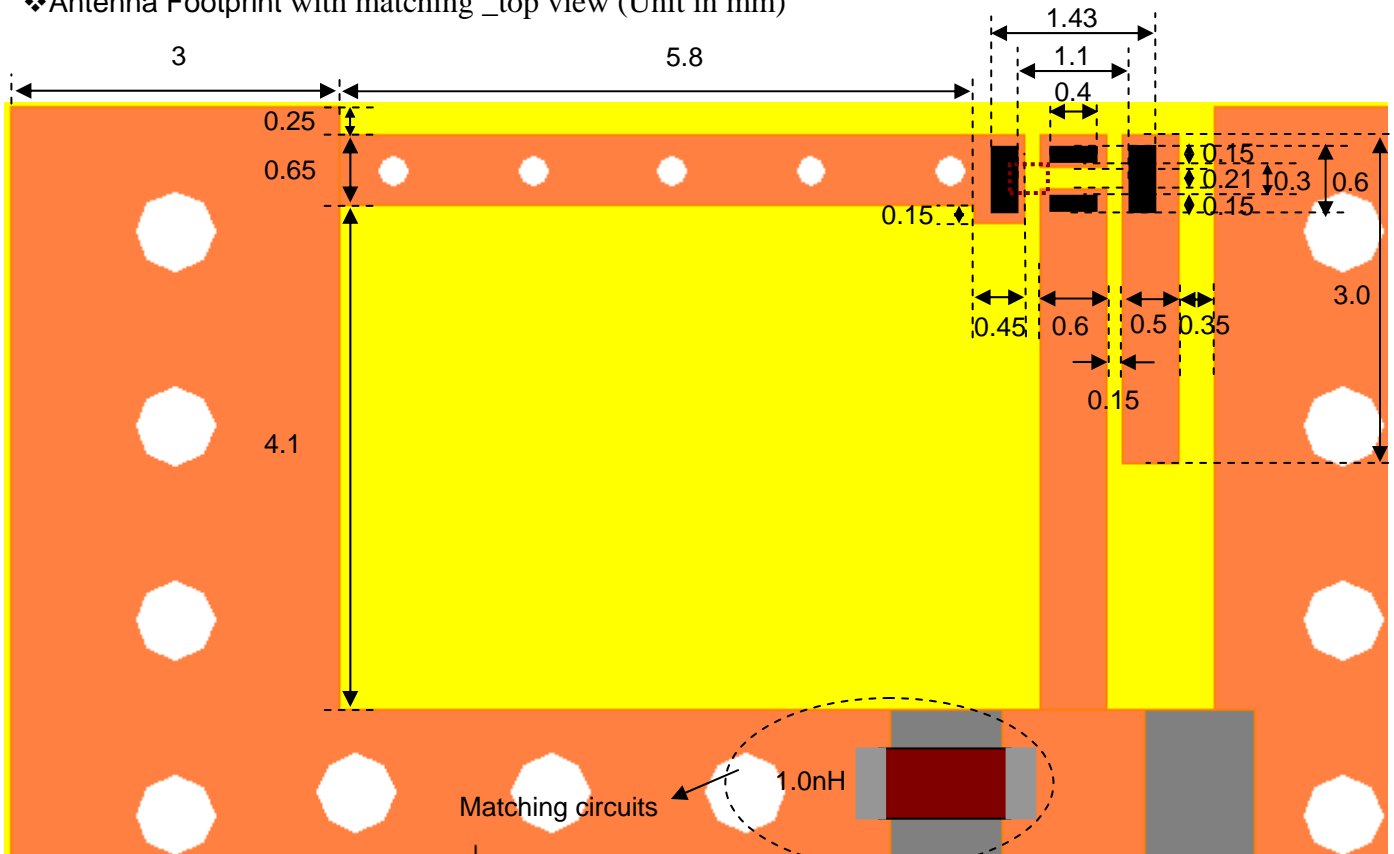
Typical Electrical Characteristics (T=25°C)

❖ Test Board –Type A (Scenario#1)

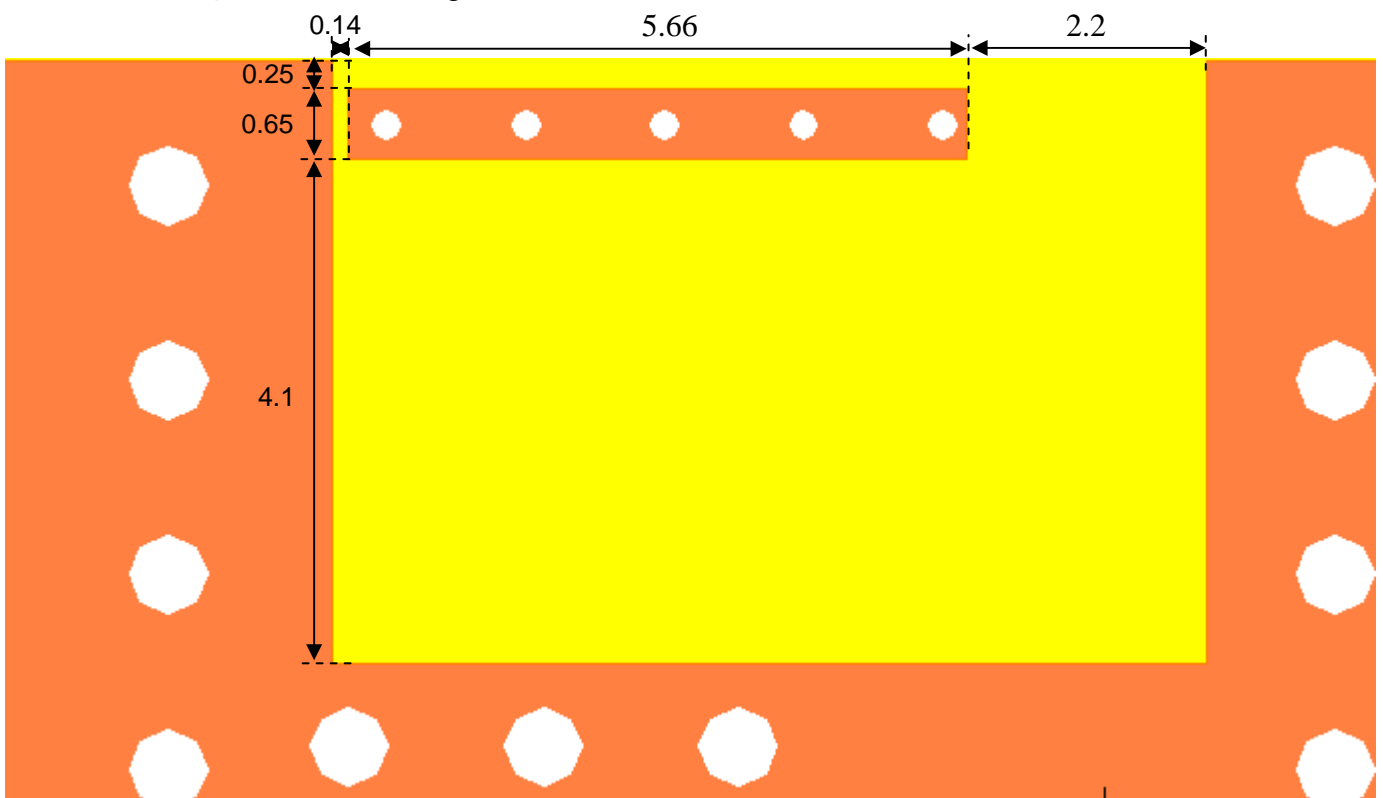


*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

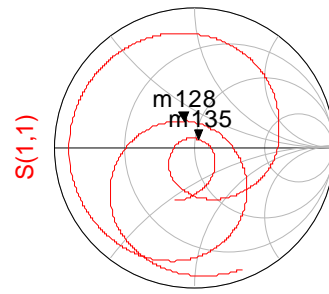
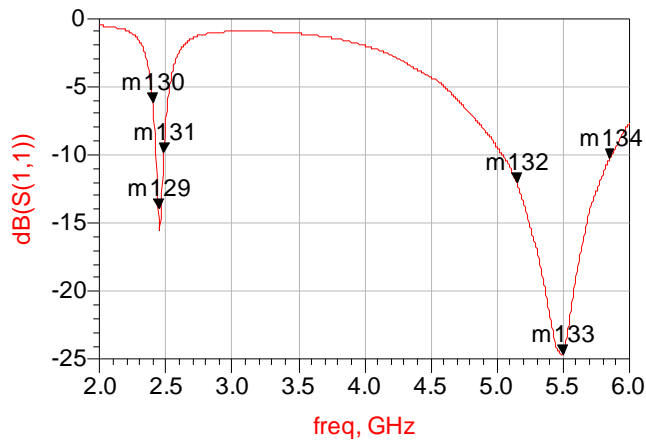
❖ Antenna Footprint with matching _top view (Unit in mm)



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



❖ Return Loss (with matching)



freq (2.000GHz to 6.000GHz)

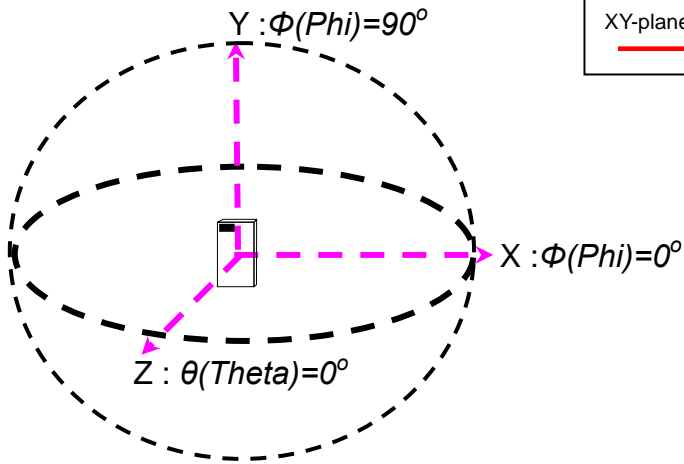
m130 freq=2.400GHz dB(S(1,1))=-6.202	m129 freq=2.442GHz dB(S(1,1))=-14.010	m131 freq=2.484GHz dB(S(1,1))=-9.880
m132 freq=5.150GHz dB(S(1,1))=-12.066	m133 freq=5.500GHz dB(S(1,1))=-24.657	m134 freq=5.850GHz dB(S(1,1))=-10.323

m128
freq=2.442GHz
S(1,1)=0.199 / 110.889
impedance = 40.626 + j15.755

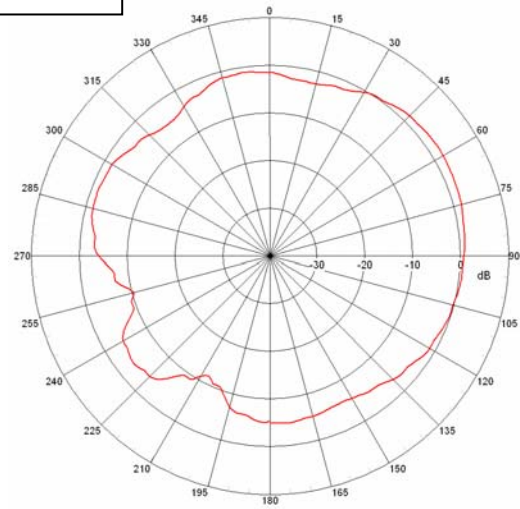
m135
freq=5.500GHz
S(1,1)=0.059 / 59.150
impedance = 52.817 + j5.324

❖ Radiation Patterns @ 2.44GHz

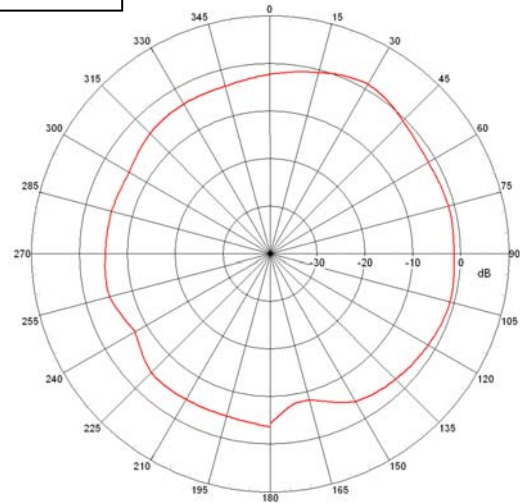
(Antenna Efficiency 42% @ 2.4GHz ; 60% @ 2.44GHz ; 56% @ 2.48GHz)



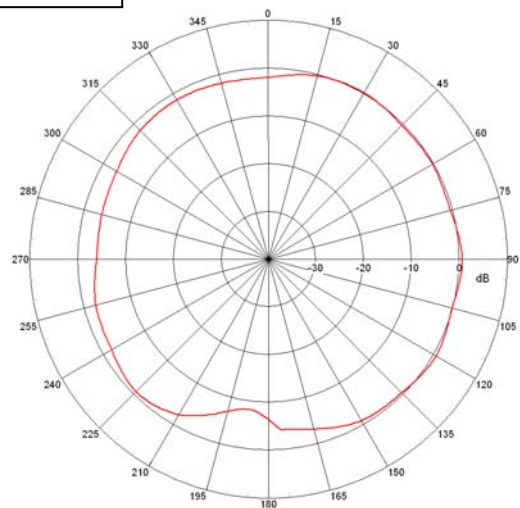
XY-plane @ 2440MHz
— Total



XZ-plane @ 2440MHz
— Total

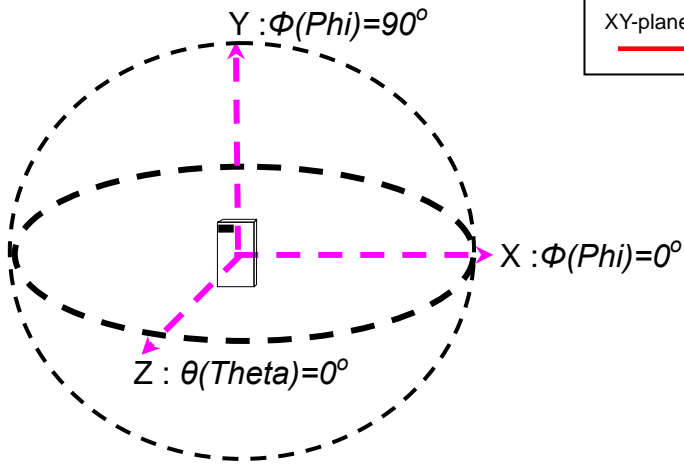


YZ-plane @ 2440MHz
— Total

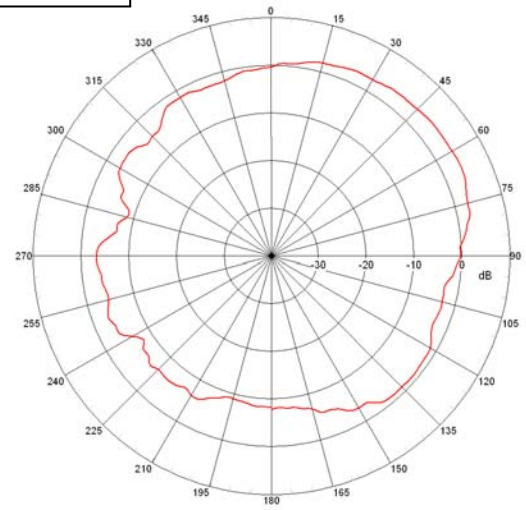


❖ Radiation Patterns @ 5.5GHz

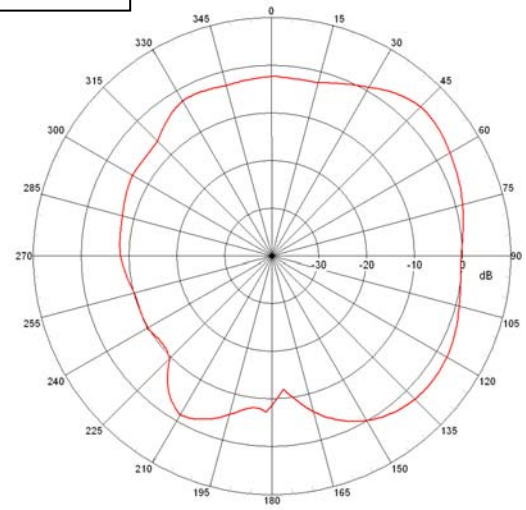
(Antenna Efficiency 78% @ 5.15GHz ; 86% @ 5.5GHz ; 76% @ 5.85GHz)



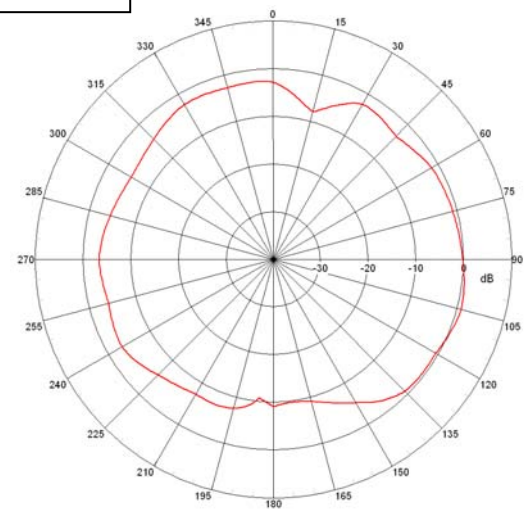
XY-plane @5500MHz
— Total



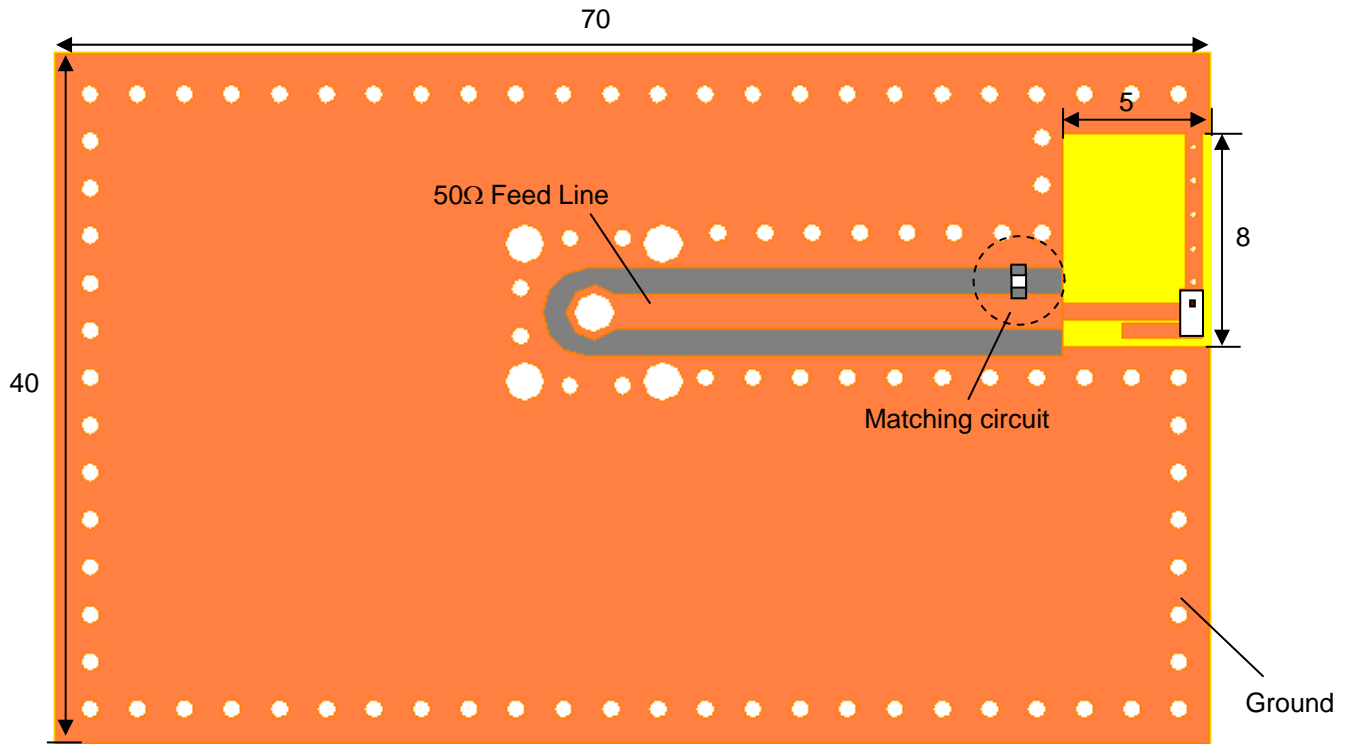
XZ-plane @5500MHz
— Total



YZ-plane @5500MHz
— Total

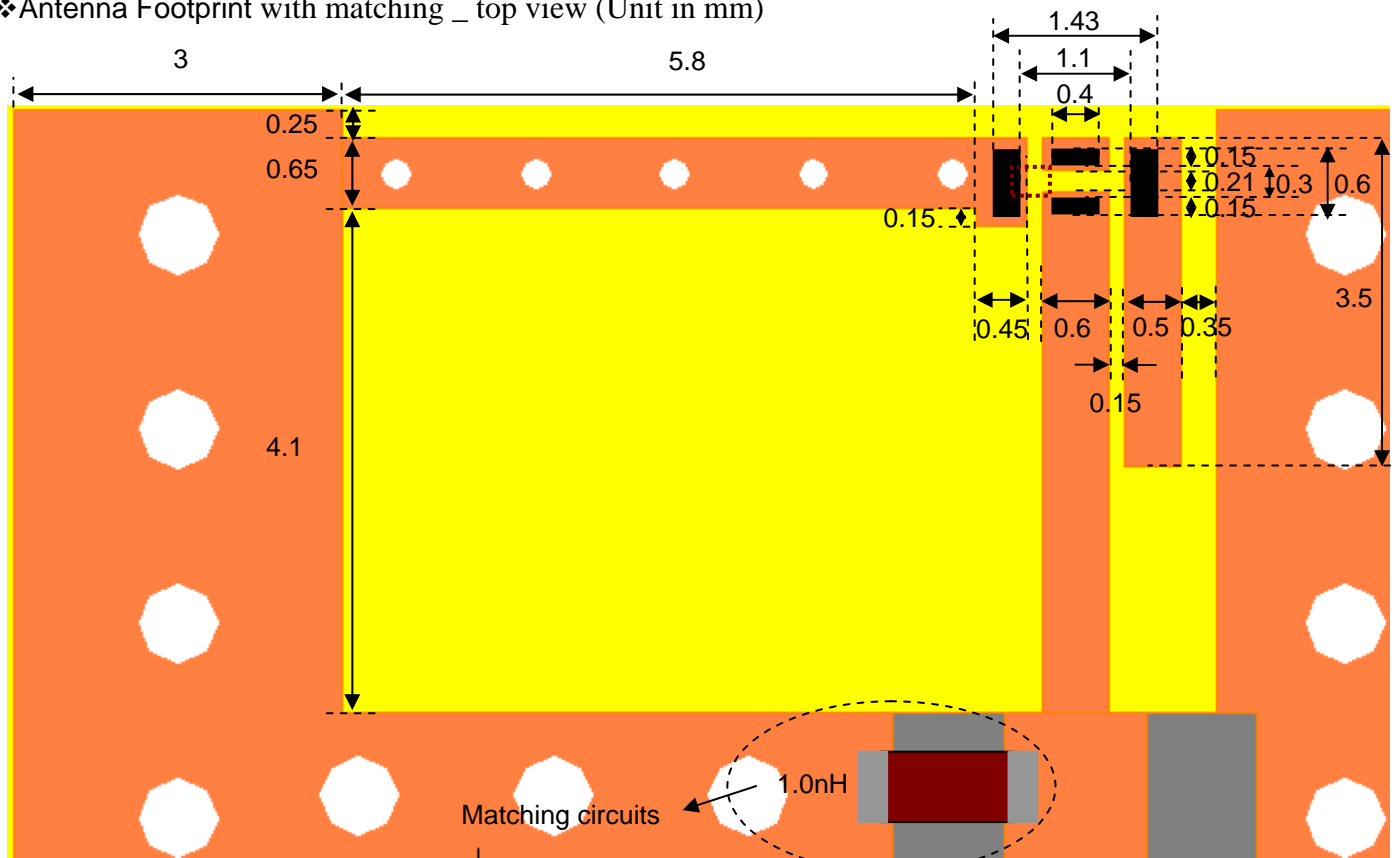


❖ Test Board-Type B (Scenario#1)

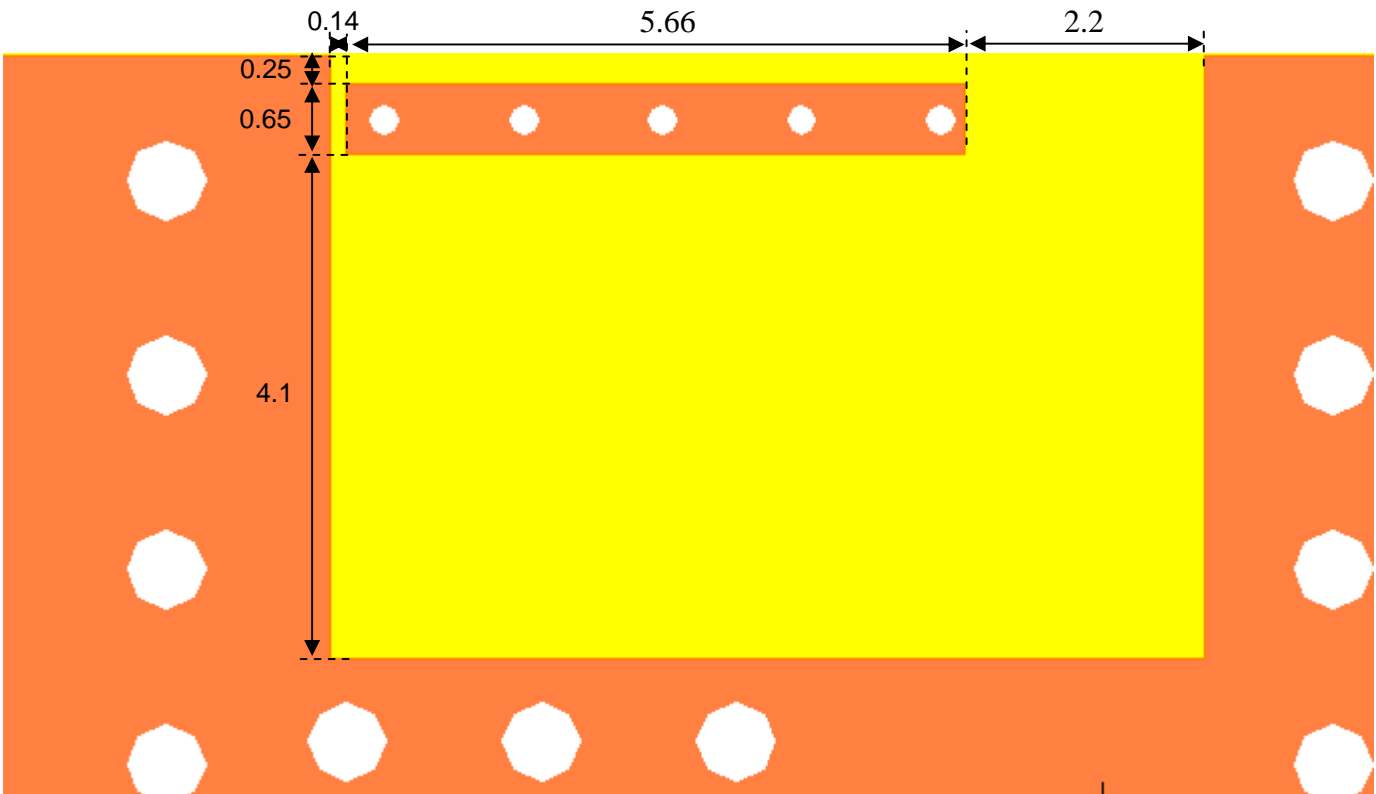


*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

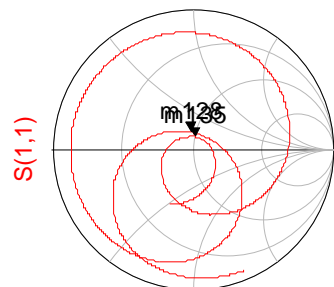
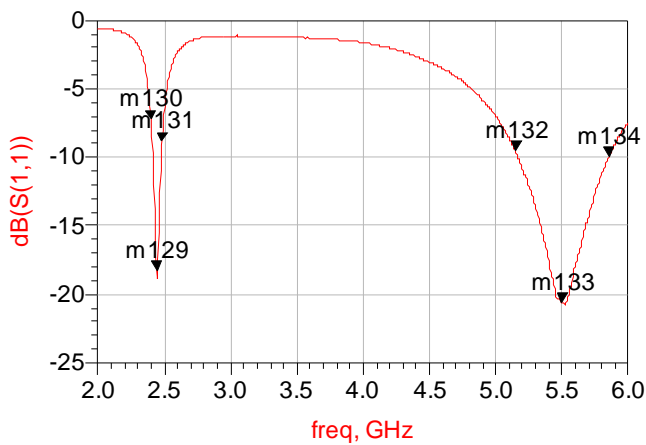
❖ Antenna Footprint with matching _ top view (Unit in mm)



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



❖ Return Loss (with matching)



freq (2.000GHz to 6.000GHz)

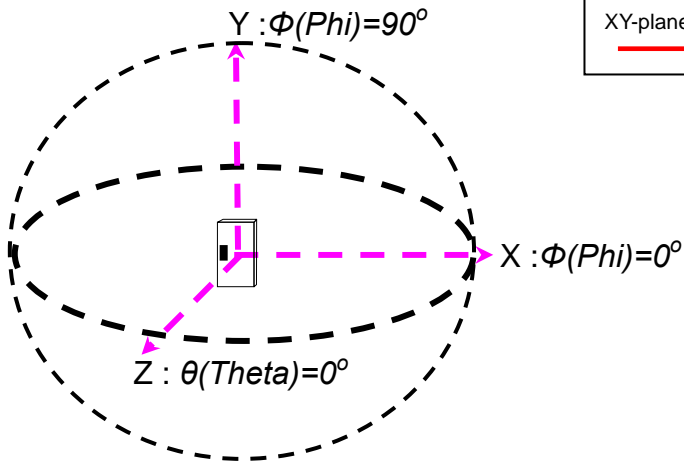
m128
freq=2.442GHz
S(1,1)=0.122 / 95.014
impedance = 47.527 + j11.753

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

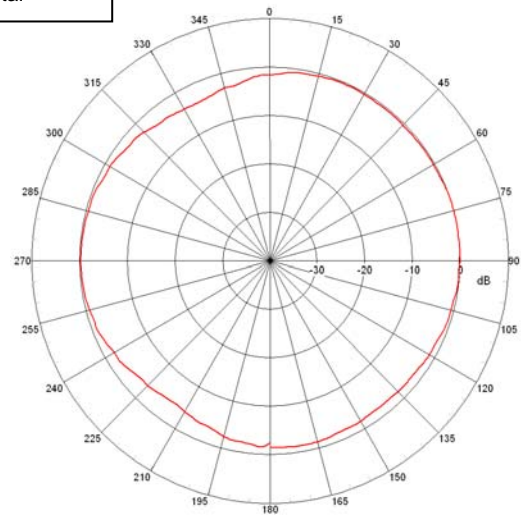
m135
freq=5.500GHz
S(1,1)=0.093 / 81.368
impedance = 50.543 + j9.329

❖ Radiation Patterns @ 2.44GHz

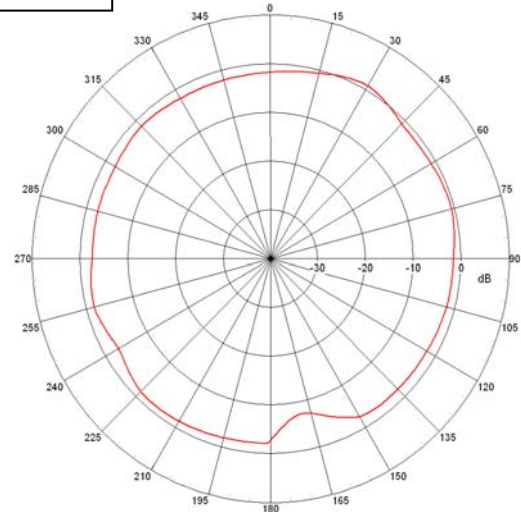
(Antenna Efficiency 48% @ 2.4GHz ; 66% @ 2.44GHz ; 60% @ 2.48GHz)



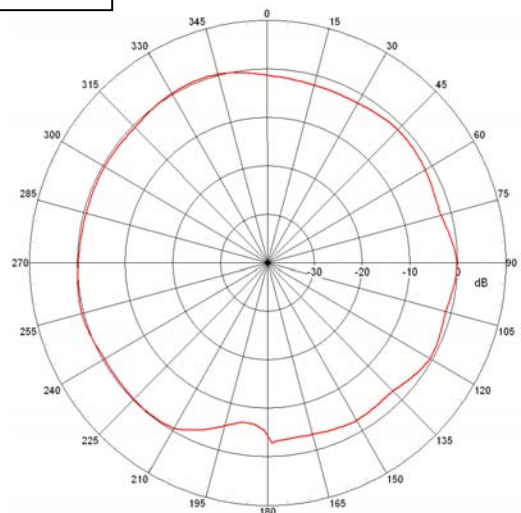
XY-plane @2440MHz
— Total



XZ-plane @2440MHz
— Total

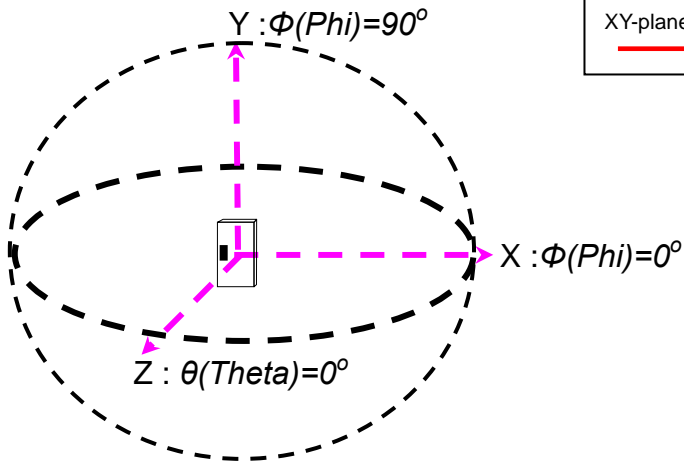


YZ-plane @2440MHz
— Total

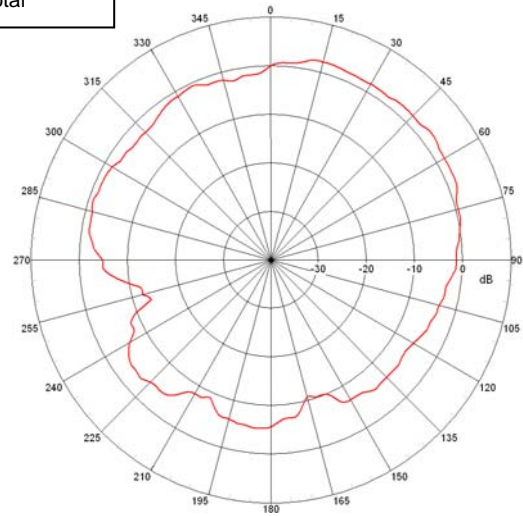


❖ Radiation Patterns@5.5GHz

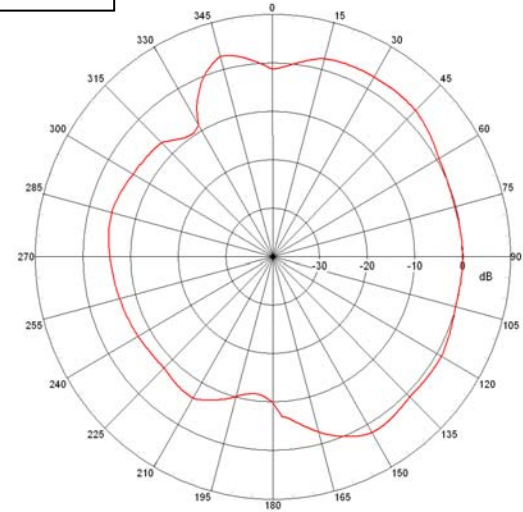
(Antenna Efficiency 70% @ 5.15GHz ; 79% @5.5GHz ; 67% @5.85GHz)



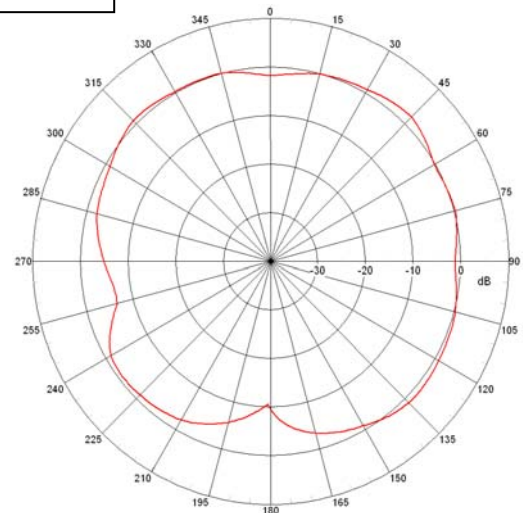
XY-plane @5500MHz
— Total



XZ-plane @5500MHz
— Total

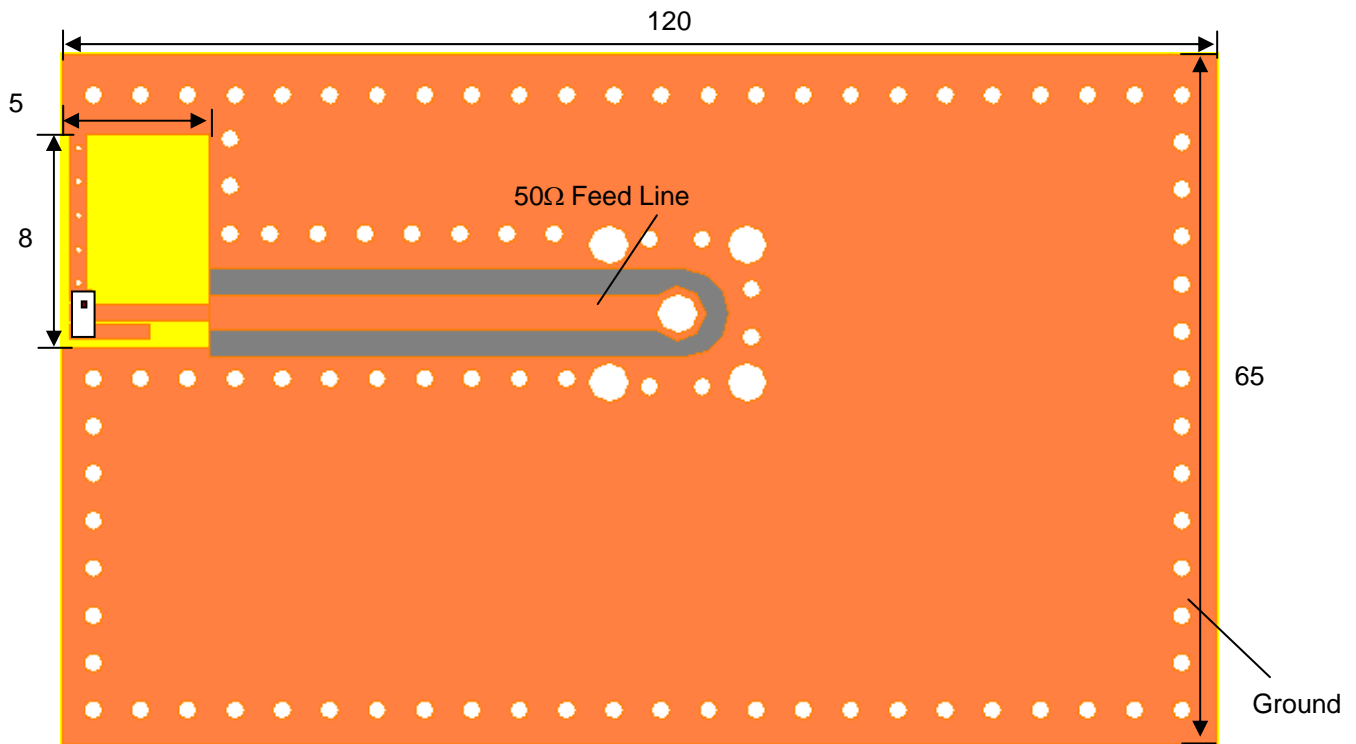


YZ-plane @5500MHz
— Total



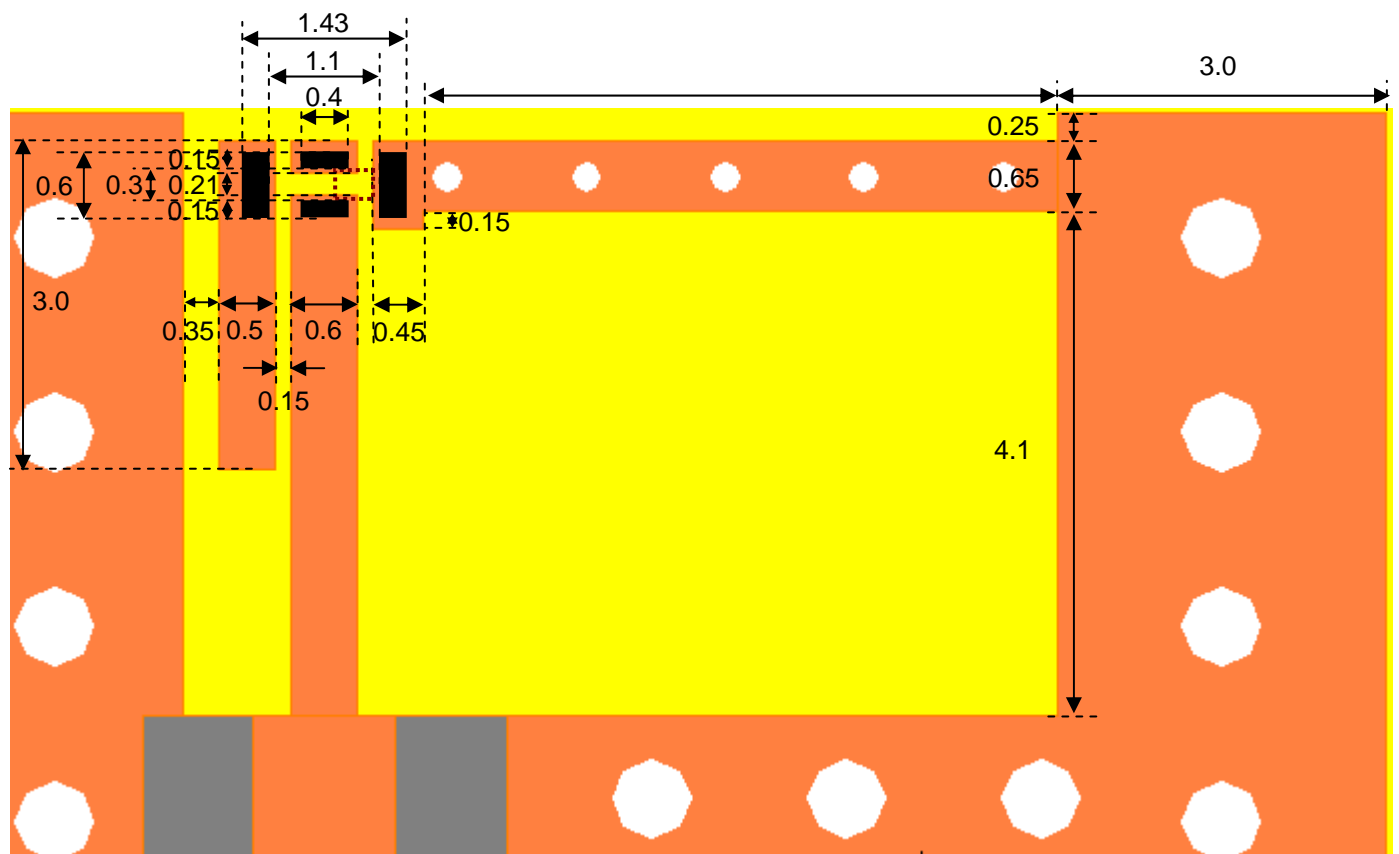
Application note of Scenario#2

❖ Test Board –Type A (Scenario#2)



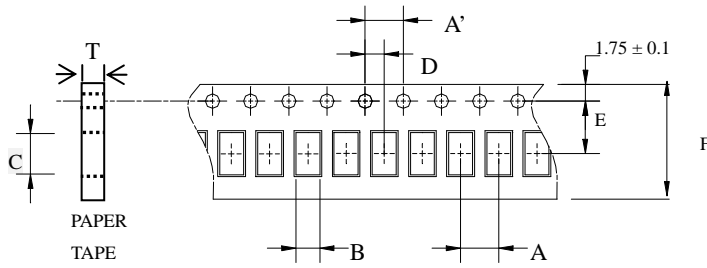
*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.

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



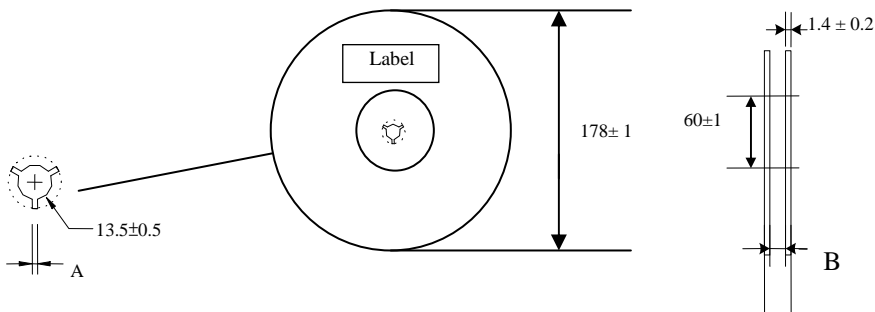
Taping Specifications

❖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		

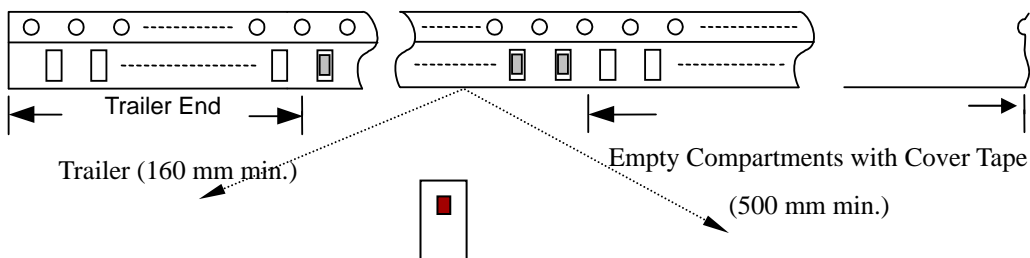
❖Reel Dimensions (Unit: mm)



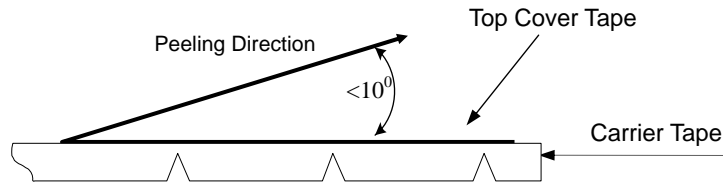
Label: Customer's Name,
ACX P/N, Q'ty, Date,
ACX Corp.

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 .

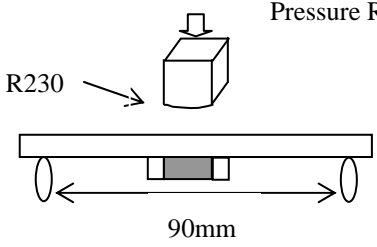
❖ **Storage Conditions**

- (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.

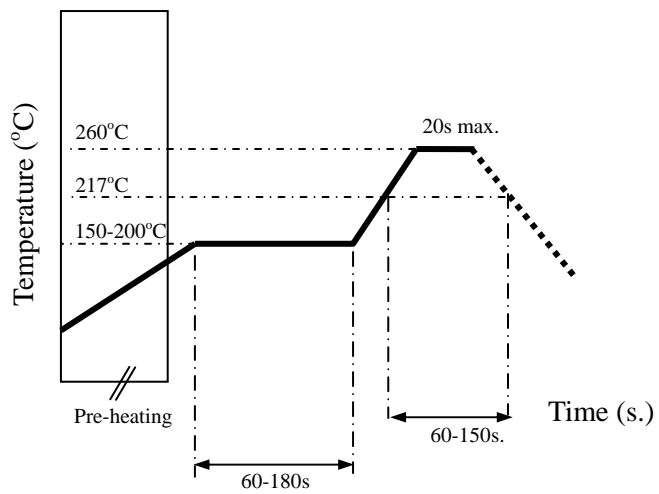
Mechanical & Environmental Characteristics

Item	Requirements	Procedure
Solderability	<ol style="list-style-type: none"> No apparent damage More than 95% of the terminal electrode shall be covered with new solder 	<ol style="list-style-type: none"> Preheat: $120 \pm 5^\circ\text{C}$ Solder: $245 \pm 5^\circ\text{C}$ for 5 ± 1 sec
Soldering strength (Termination Adhesion)	<ol style="list-style-type: none"> 10N minimum 	<ol style="list-style-type: none"> 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)	<ol style="list-style-type: none"> No apparent damage 	<ol style="list-style-type: none"> Solder specimen onto test jig (FR4, 1.6mm) using the recommend soldering profile. Apply a bending force of 2mm deflection 
Heat/Humidity Resistance	<ol style="list-style-type: none"> No apparent damage Fulfill the electrical specification after test 	<ol style="list-style-type: none"> Temperature: $85 \pm 2^\circ\text{C}$ Humidity: 90% ~ 95% RH Duration: 1000 ± 48hrs Recovery: 1-2hrs
Thermal shock (Temperature Cycle)	<ol style="list-style-type: none"> No apparent damage Fulfill the electrical specification after test 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> No apparent damage Fulfill the electrical specification after test 	<ol style="list-style-type: none"> Temperature: $-40 \pm 5^\circ\text{C}$ Duration: 500 ± 24hrs Recovery: 1-2hrs

Soldering Conditions

❖ Typical Soldering Profile for Lead-free Process

Reflow Soldering :



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