

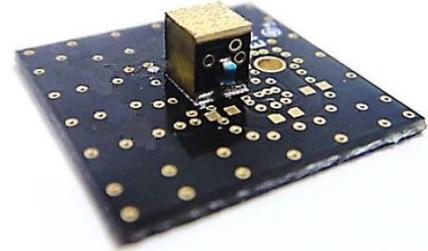
NGRV3030UW2R442G1TRF

2.4 GHz WIFI / Bluetooth Vertical Chip Antenna



Features

- No ground clearance requirement
- Stable and reliable performances
- Vertical Polarization
- SMT processes compatible
- Ideal for hearing aid applications*
- RoHS Compliant



Applications

- Wireless earbuds
- Wearable device
- ISM 2.4 GHz
- ZigBee / BLE

Specifications

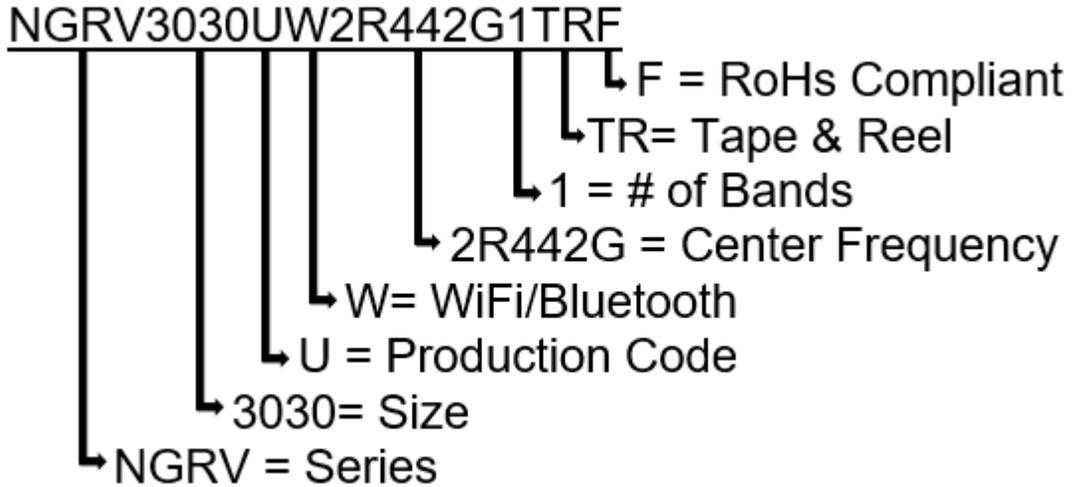
Electrical	
Frequency Range	2400 ~ 2500MHz
Center Frequency	2442 MHz
Peak Gain @ CF	-0.4 dBi typ.
Efficiency @ CF	25.6% typ.
V.S.W.R @ CF	2 Max.
Maximum Input Power	2 W
Polarization	Vertical
Impedance	50Ω
Environmental	
Operating Temperature	-40°C~+85°C
Storage Temperature	-5°C~+40°C -40°C~+85°C - After mounting on PCB
Relative Humidity	10% to 75% - Operating & Storage after mounting on PCB 20% to 75% - Storage
Shelf Life	1 year
RoHs Compliant	Yes

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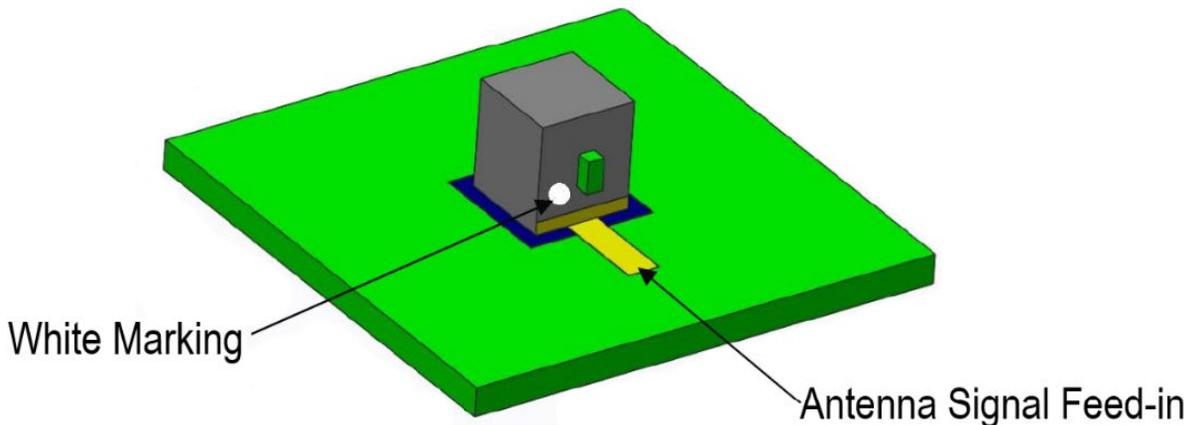
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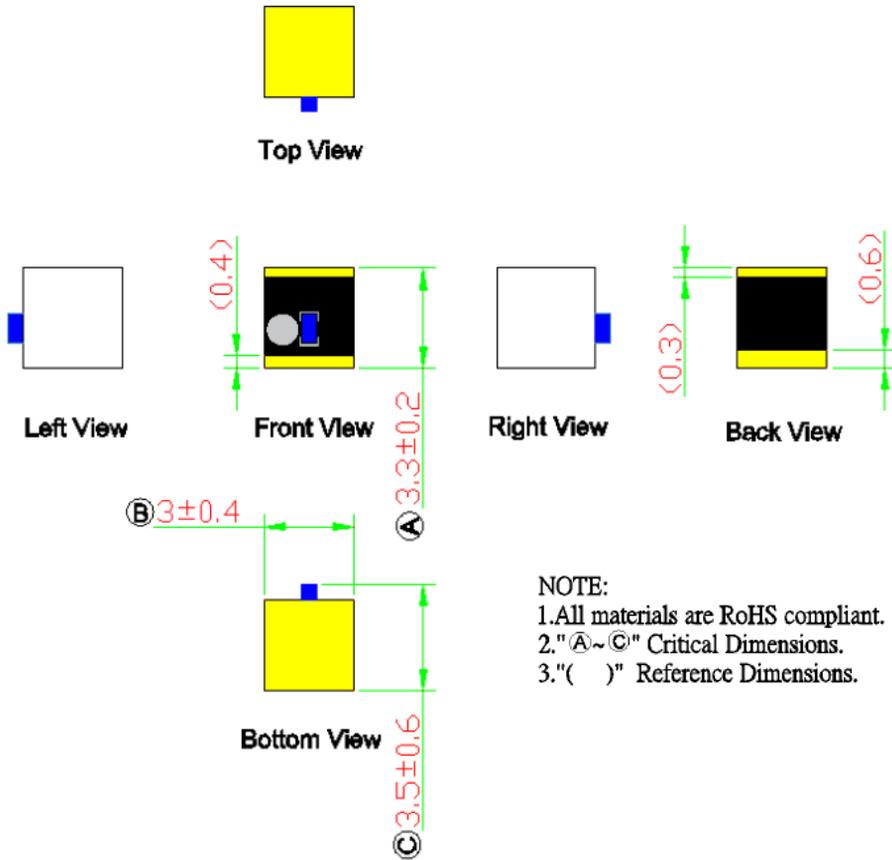
Part Number Breakdown



Signal Feed-in Direction



Dimension Drawing



NOTE:
 1. All materials are RoHS compliant.
 2. "A~C" Critical Dimensions.
 3. "()" Reference Dimensions.

Dimensions (mm) & Mechanical

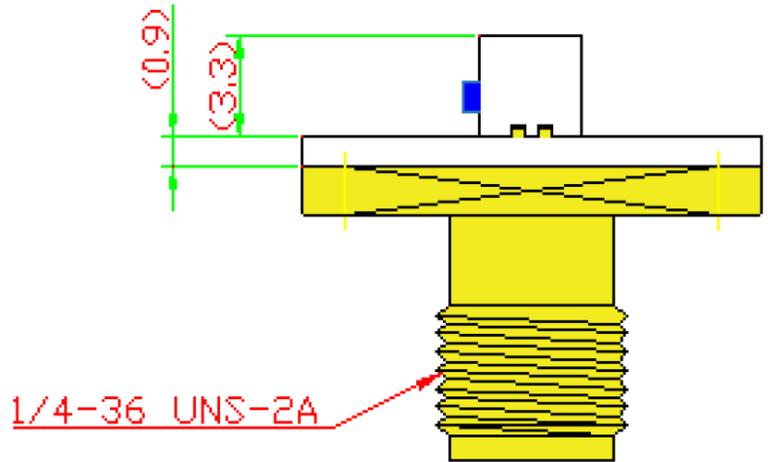
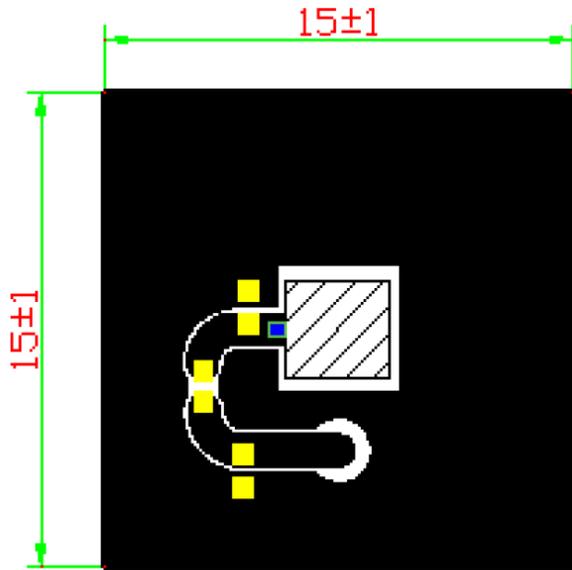
Body Length (A)	3.0 ± 0.4
Width (B)	3.0 ± 0.4
Thickness (C)	3.3 ± 0.2
Connection Type	SMT
Ground Plane	15 mm x 15 mm
Material	FR4

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Evaluation Board



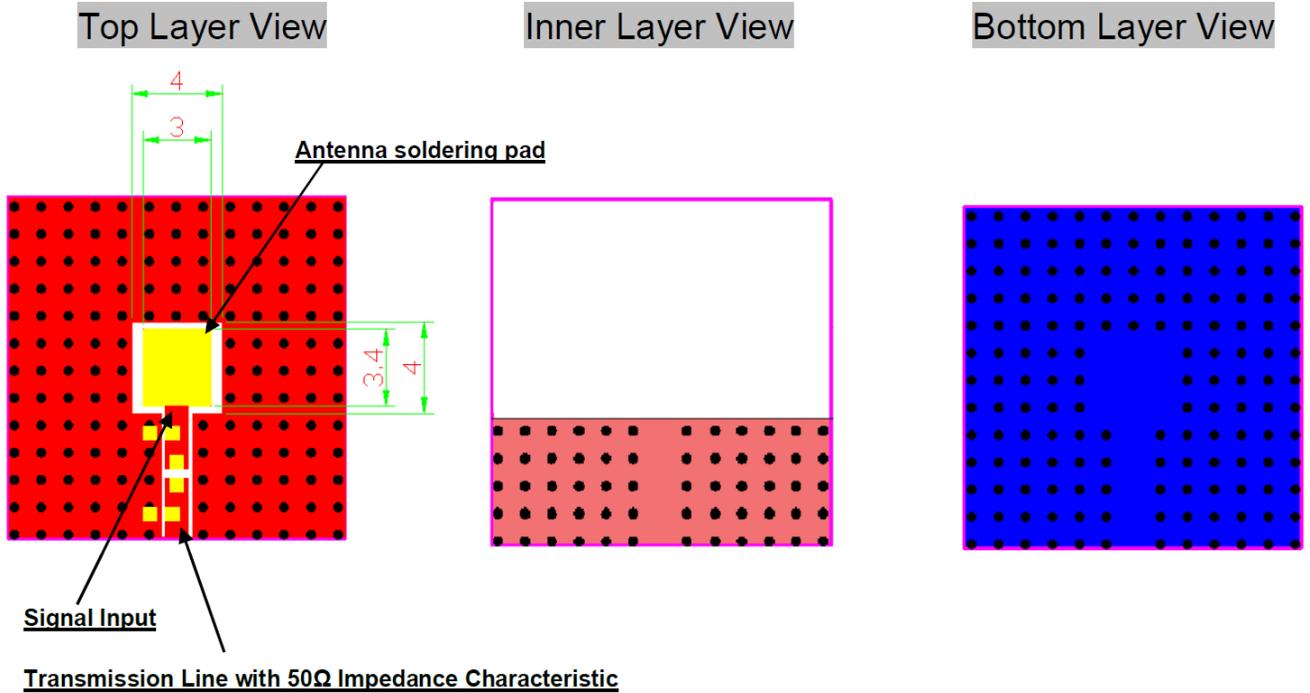
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Solder Land Pattern

The gold areas represent the solder land pattern. Any recommendations on the matching circuit will be provided according to the customer's installation conditions.

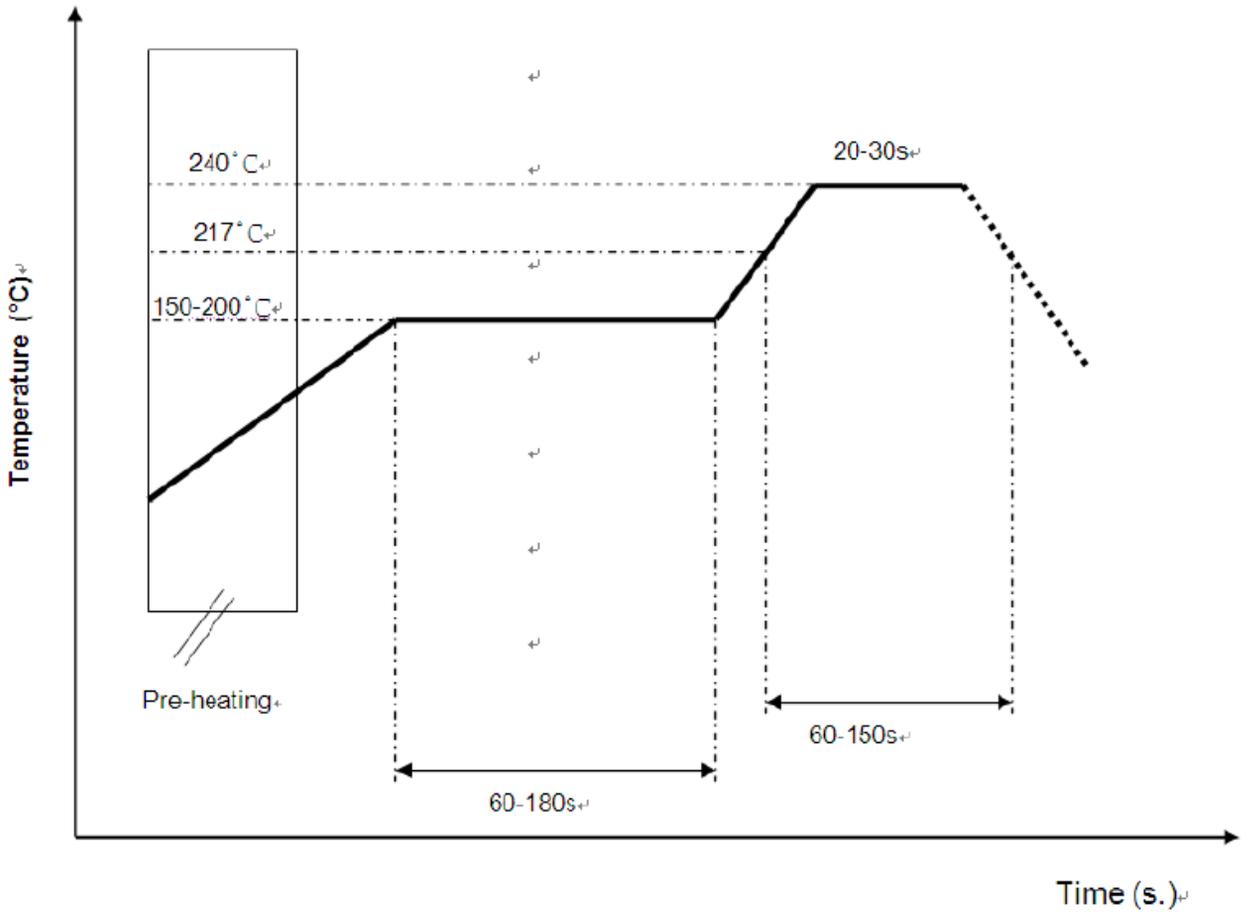


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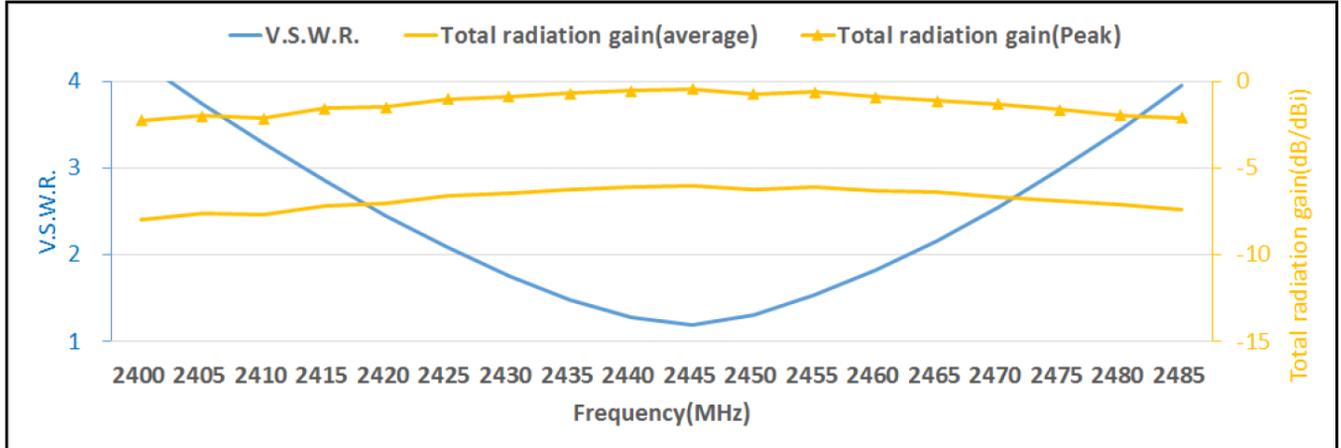
Soldering Conditions



* Recommended solder paste alloy: SAC305 (Sn96.5 /Ag3 /Cu0.5) Lead Free solder paste.

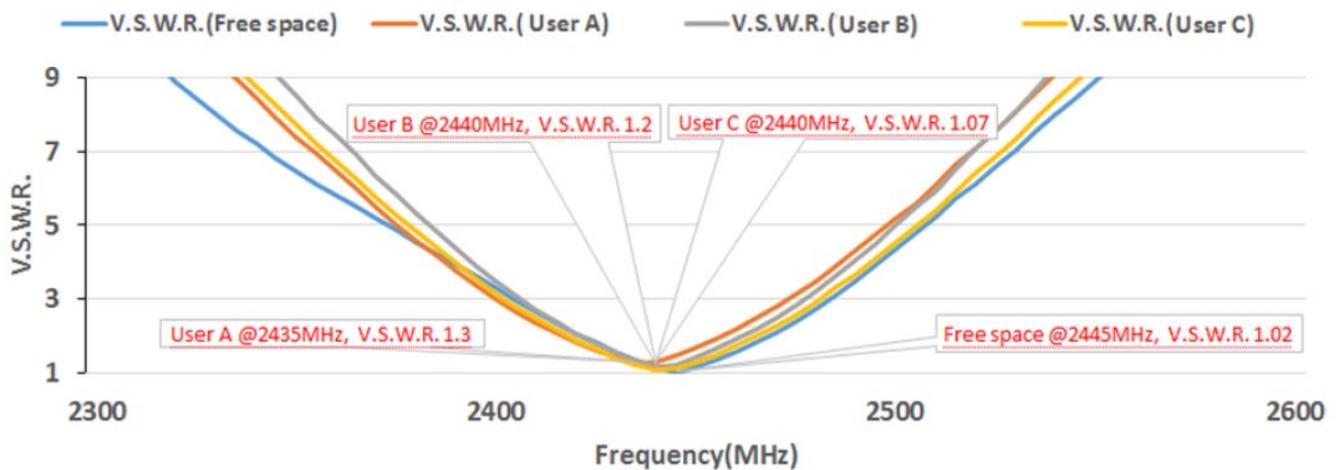


Frequency vs. VSWR and Total Radiation Gain



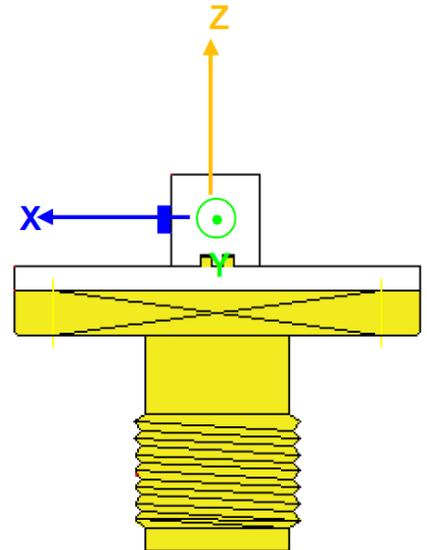
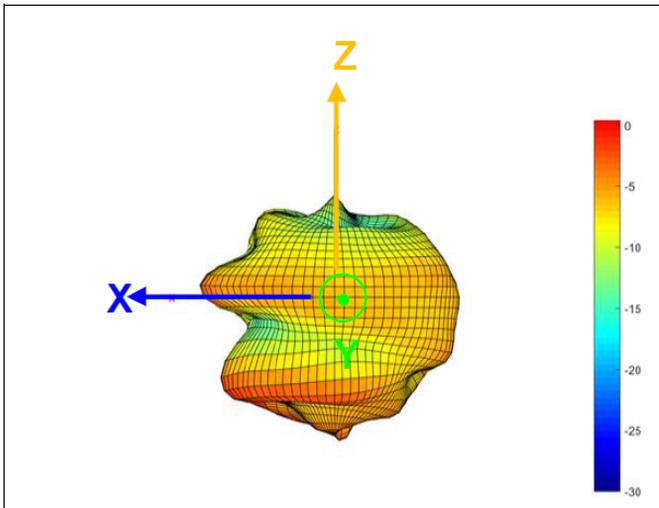
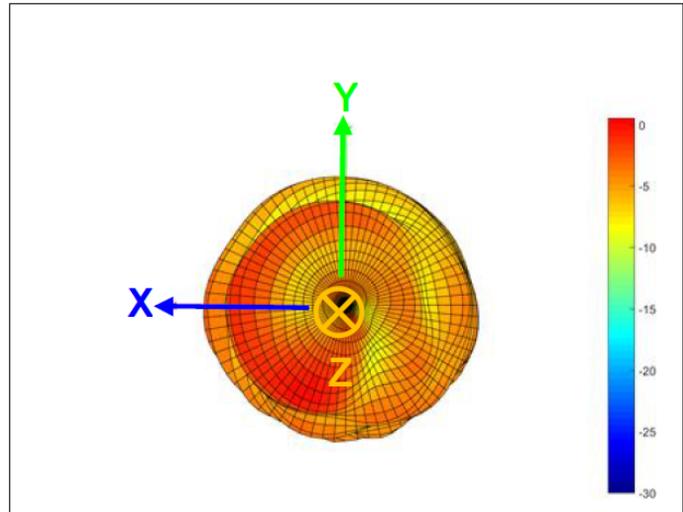
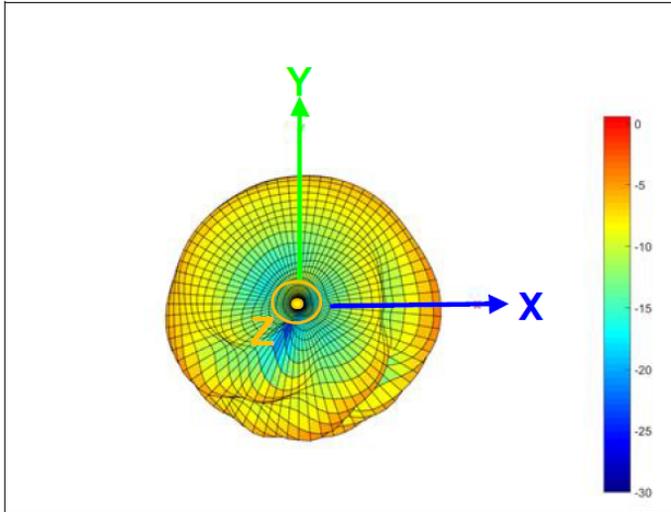
The Effects of Human Body Influence on Resonate Frequency and VSWR

- This vertical antenna shows lower VSWR, and more consistent performance compared to a monopole antenna

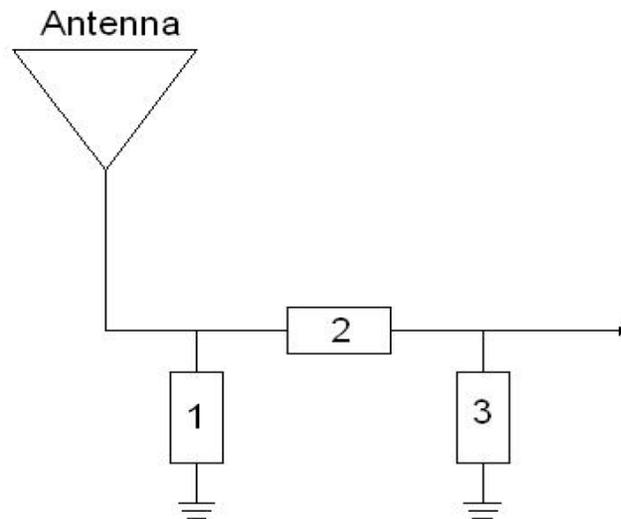
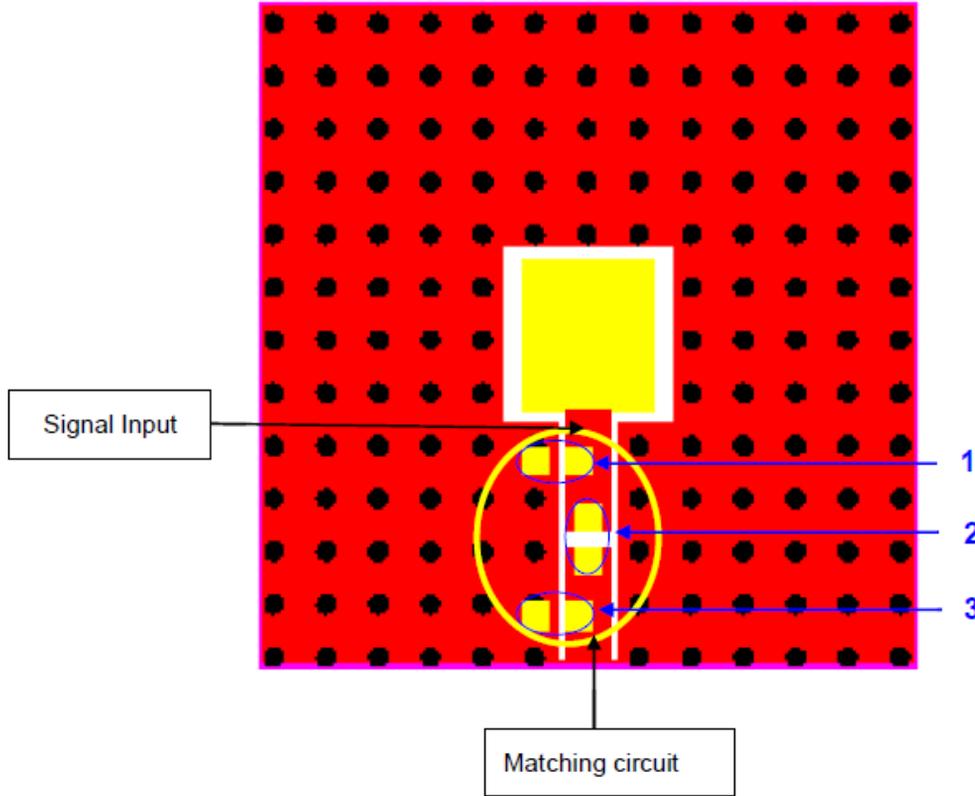


3D Radiation Gain Pattern

3D Gain Radiation @ 2442 MHz (unit: dBi)



Frequency Tuning and Matching Circuit



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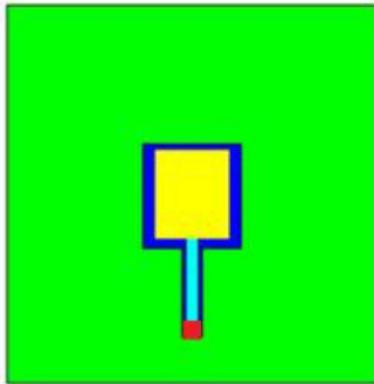
System Matching Circuit Component

Location	Description	Tolerance	NIC Part Number
1	1.8nH, (0402)	±0.1 nH	NML04B1N8TRF
2	4.7nH, (0402)	±0.1 nH	NML04B4N7TRF
3	N/A	-	-

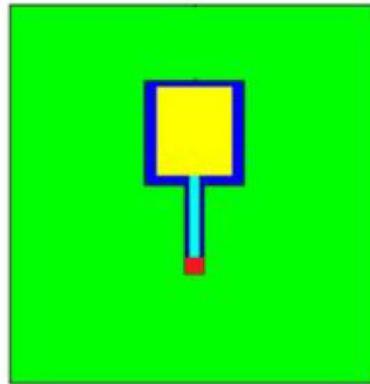
Typical Efficiency Values @ 2442 MHz for Various Placements

The below typical efficiency value represented antenna's performance when antenna was installed at various placements on the evaluation board which has no ground clearance on opposite side

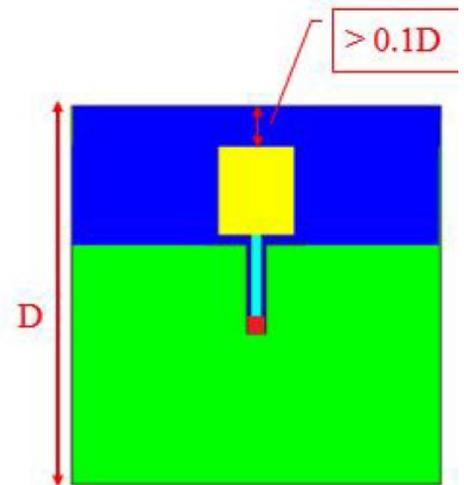
Placement A



Placement B



Placement C



Placement	Efficiency (%)	Recommended scenario of installation
A	25.6*	IoT, ISM, BLE, ZigBee device
B	29.4*	
C	36.2*	Wireless earbud, smart watch

*Measured with a 15x15 mm evaluation board.

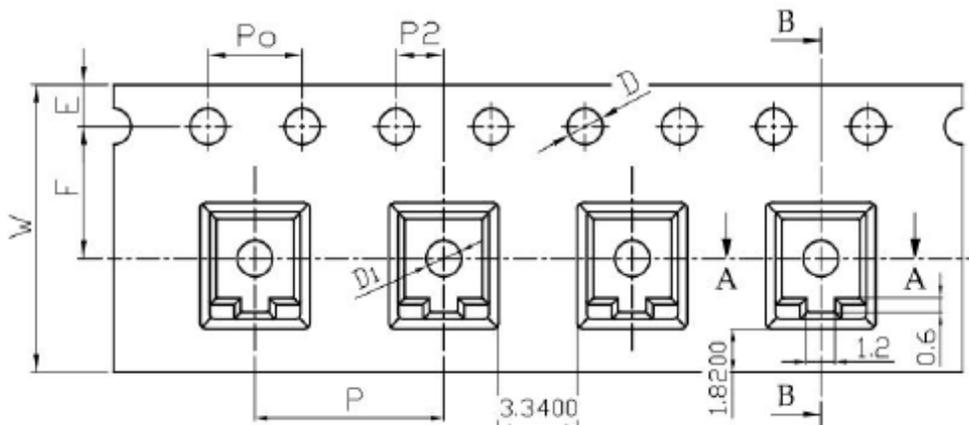
For placement A & B, the antenna is polarized in vertical polarization. We encourage you to use antenna for this placement when antenna is installed on a PCB which is not available to have antenna ground clearance, i.e. IoT, ISM, BLE, ZigBee devices, etc. where metal/battery/display covers entire area of opposite side of PCB.

For placement C, we encourage you to use antenna for this placement when antenna is installed in wearable devices, i.e. wireless earbud, smart watch, etc.

Packing

- (1) Quantity/Reel: 2000 pcs/Reel
- (2) Plastic tape: Black Conductive Polystyrene.

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	12.00	±0.30
P	8.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
D1	1.50	±0.10
P ₀	4.00	±0.10
10P ₀	40.00	±0.20