LoRa

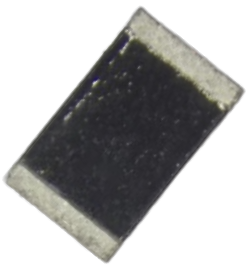
ST0643-00-N01-A

Amphenol

Datasheet

433MHz

Chip Antenna / Embedded



5 X 3 X 0.5 mm

Chip Antenna

Features:

This is a small size, high performance, low profile LoRa antenna with low frequency of 433MHz.

Applications:

- LoRa
- LPWAN
- RFID
- Remote Monitoring
- Handheld Devices
- Healthcare

RoHS

Electrical Specifications

Antenna Characteristics

Antenna Type	Radiation Pattern	Polarization	Max. Input Power	Impedance
Chip Antenna	Omni	Linear	1W	50Ω

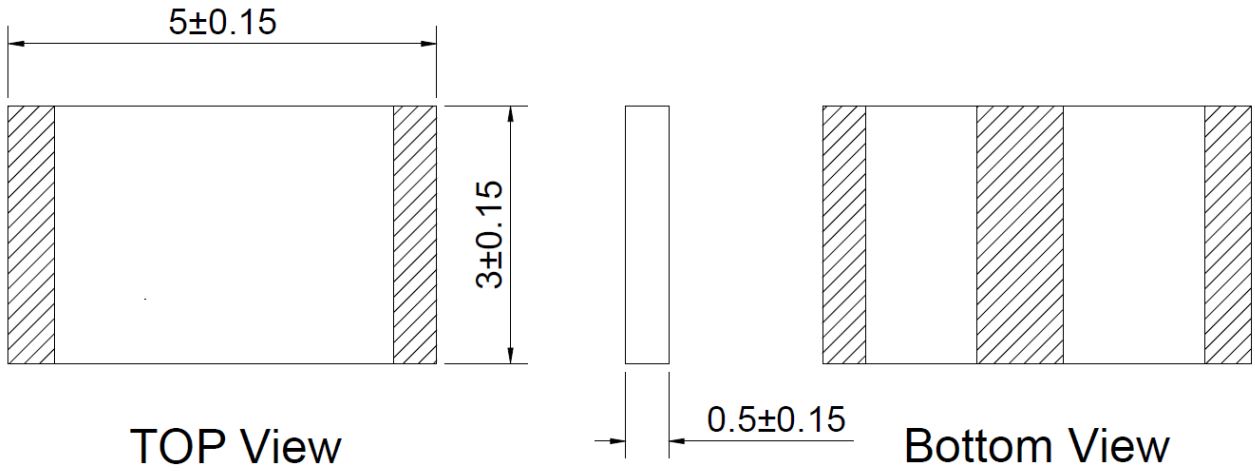
Frequency (MHz)	**433**
Return Loss (dB)	< -10
Peak Gain (dBi)	0.9
Average Gain (dB)	-1.8
Efficiency (%)	66

Mechanical Specifications	
Environmental	
Temperature Range (˚C)	-25 to 70
Humidity	Non-condensing 65°C 95% RH
RoHS Compliant	

Part Number	Dimension (mm)	Weight (g)	Material
ST0643-00-N01-A	5.0 X 3.0 X 0.5	0.02	Ceramic

Mechanical Drawing

Unit : mm



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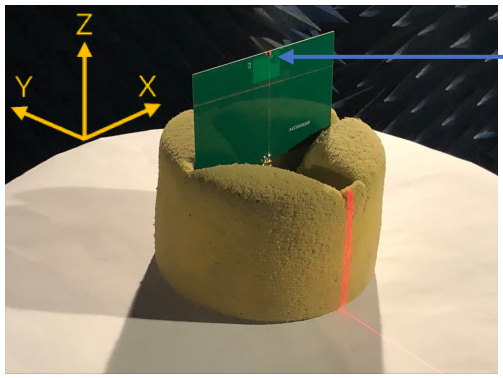
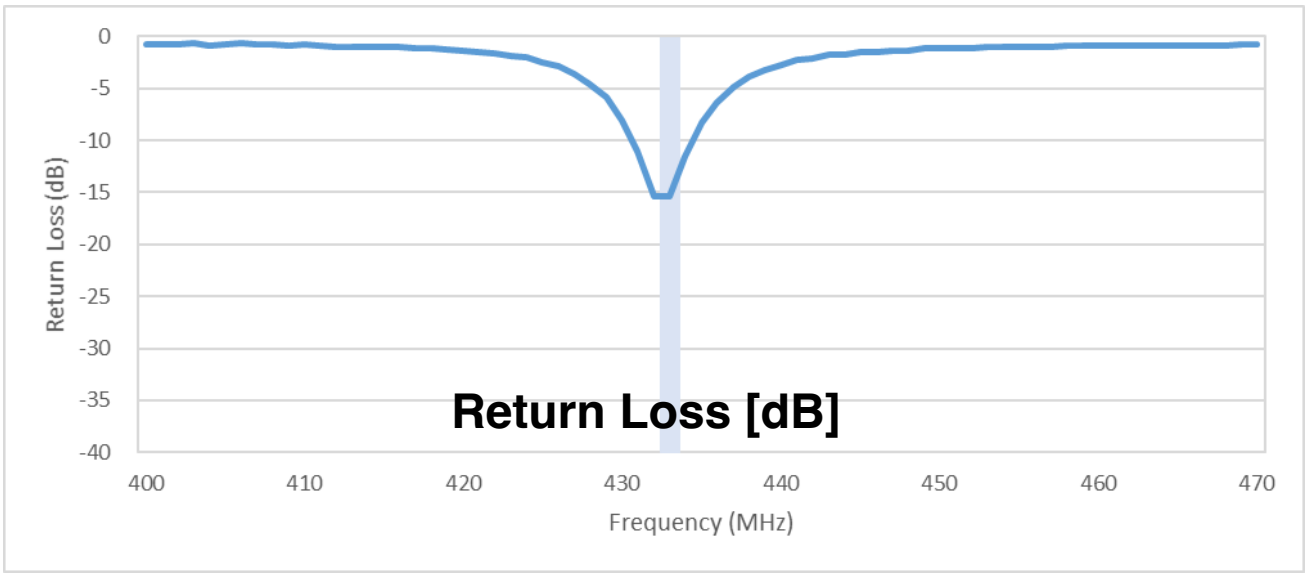
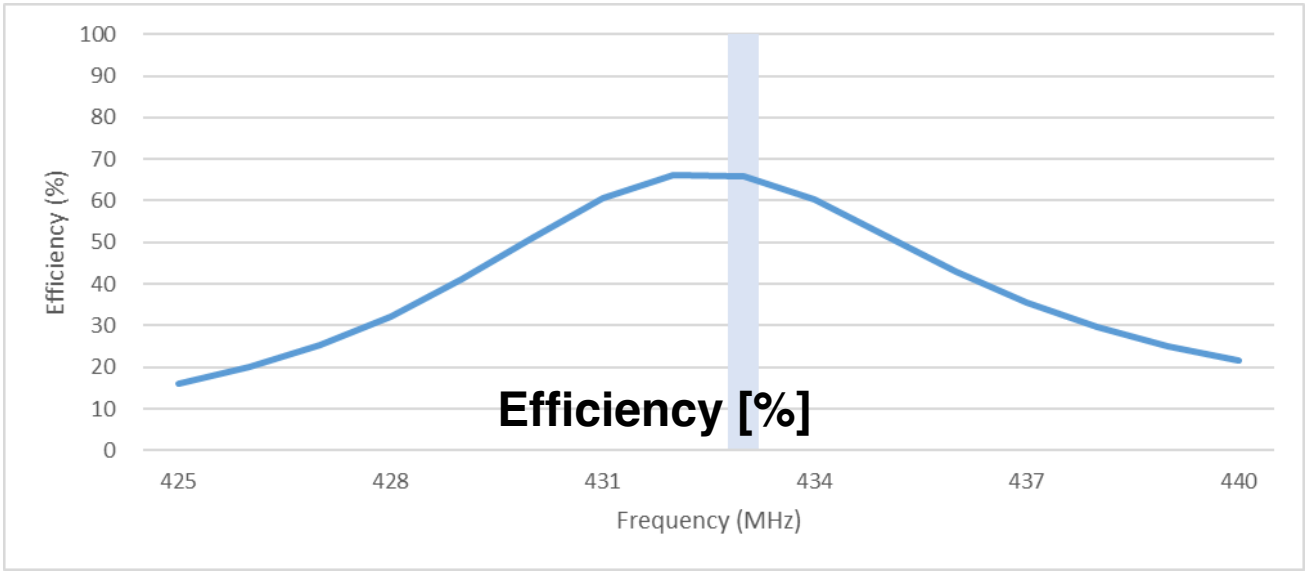
Antenna Testing Includes Evaluation Board



Test setup, measurement performed in 3D anechoic chamber.

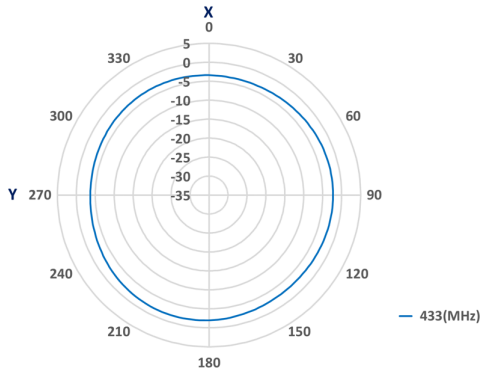




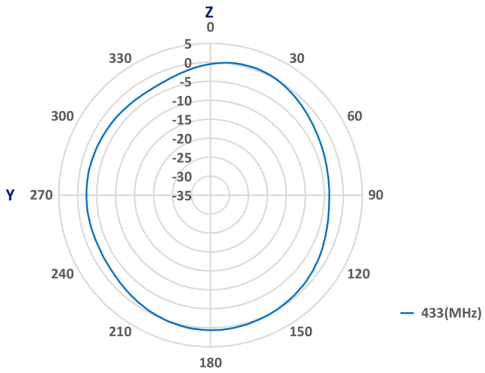
Blue background represents frequency response.

Radiation Pattern - Free Space

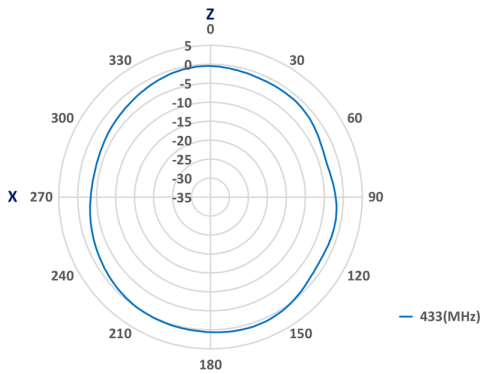
XY - Plane



YZ - Plane

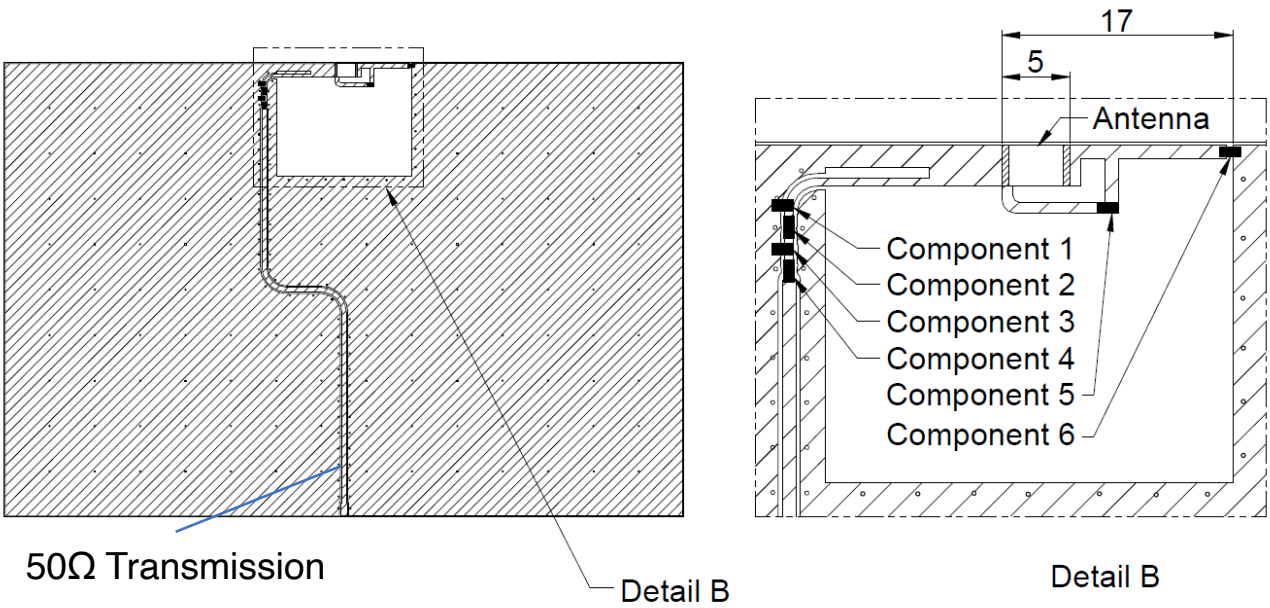


XZ - Plane



Matching Circuit Design

Unit : mm



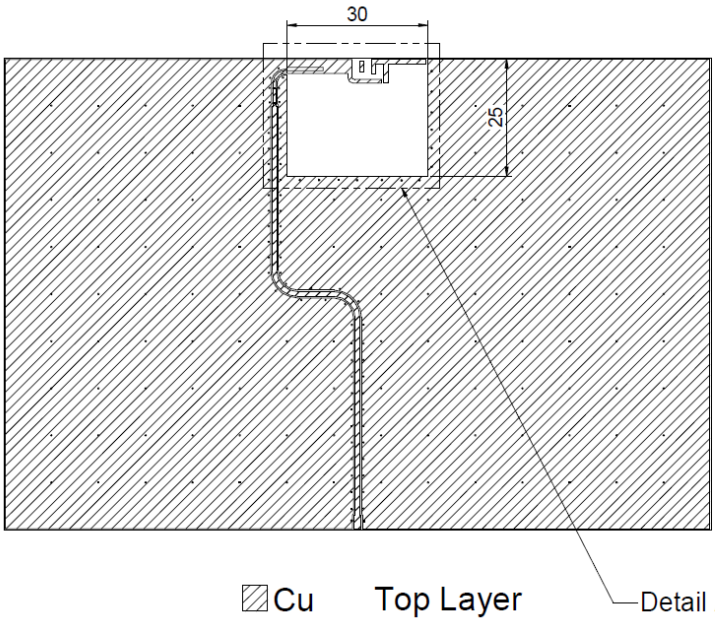
* To make the antenna have this resonance, must be matched with matching circuit.
* The matching component may be slightly different than that show depending ondistance to ground plane, dielectric constant of PCB, and PCB material thickness.

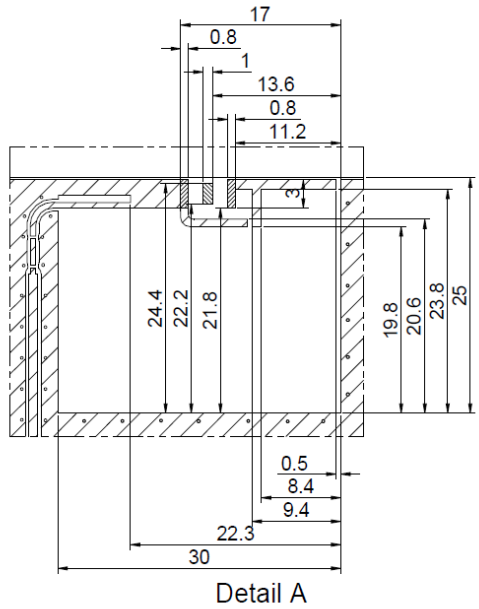
Circuit Matching Components

Circuit Symbol	Size	Description
Component 1	0402	None
Component 2	0402	2.7nH Inductance
Component 3	0402	0.5pF Capacitor
Component 4	0402	0Ohm Resistance
Component 5	0402	20pF Capacitor
Component 6	0402	1pF Capacitor

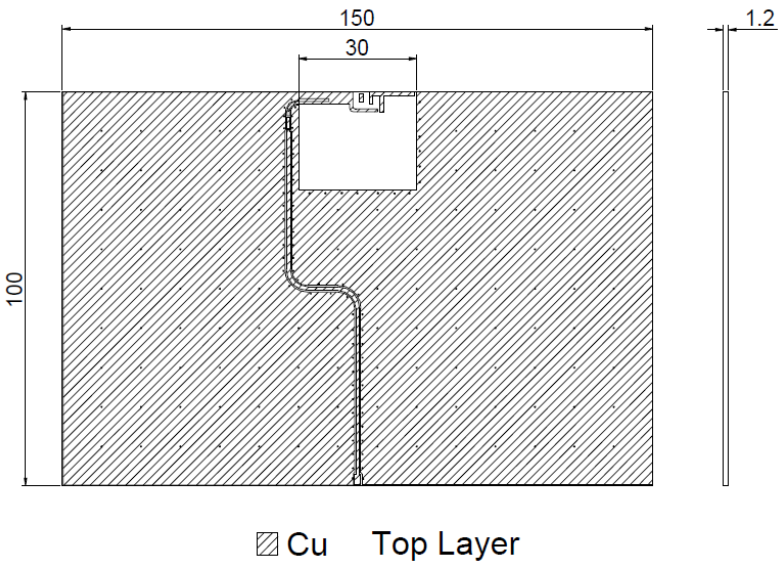
Clearance Area Design

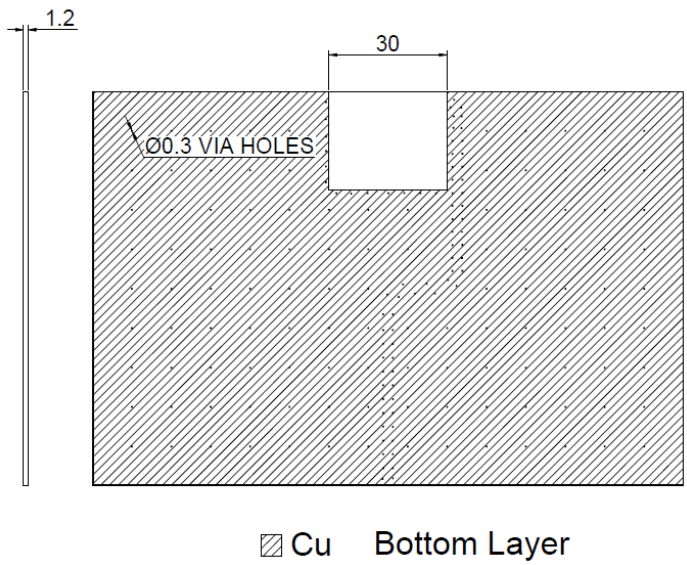
Unit : mm





Evaluation Board





Base Material : FR-4

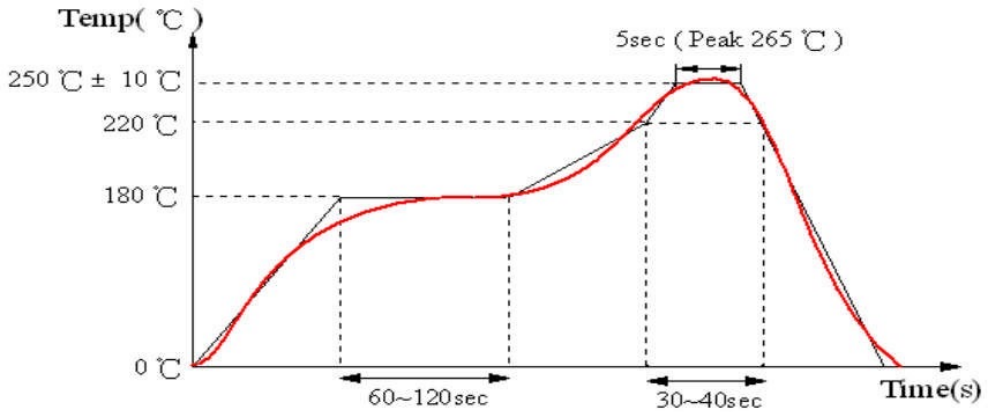
Recommended Reflow Temperature Profile

Flux :

- Use rosin flux, prohibit the use of strong acid flux with halide content exceeding 0.2wt%.
- Use pure tin solder.

Reflow Soldering Conditions :

- During preheating, the maximum temperature difference between the surface of the product and the solder is not allowed to exceed 150˚C.
- When cooling down after soldering, the temperature difference between the surface of the product and the solvent is not allowed to exceed 100˚C.
- Insufficient preheating may cause cracks on the product surface, resulting in a decline in product quality.



The graphic shows temperature profile component assembly process in reflow ovens.

Soldering With Iron

Soldering condition

Item	The conditions
Pre-heating	150˚C, 1 Minute
Tip temperature	350˚C Max.
Soldering iron output	80W Max.
End of soldering	Φ3mm Max.
Soldering time	3 Seconds Max.

Revisions				
Rev.	Description	Date	ECN	Approval
A	Initial Release	2022-12-26	ST0643-00-N01-A-RA00	ATC