

## Datasheet

## 915MHz

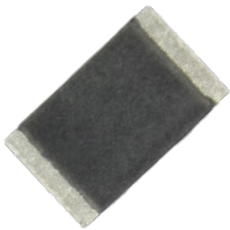
Chip Antenna / Embedded

Features:

This is a small size, high performance, low profile LoRa antenna with low frequency of 915MHz.

Applications:

- Sigfox
- Lora
- LPWAN
- RFID
- Remote Monitoring
- Healthcare



5 X 3 X 0.5 mm

Chip Antenna



## Electrical Specifications

## Antenna Characteristics

Antenna Type	Radiation Pattern	Polarization	Max. Input Power	Impedance
Chip Antenna	Omni	Linear	1W	50Ω
Frequency (MHz)		915~919		
Return Loss (dB)		< -10		
Peak Gain (dBi)		1.8		
Average Gain (dB)		-1.8		
Efficiency (%)		65		

Mechanical Specifications

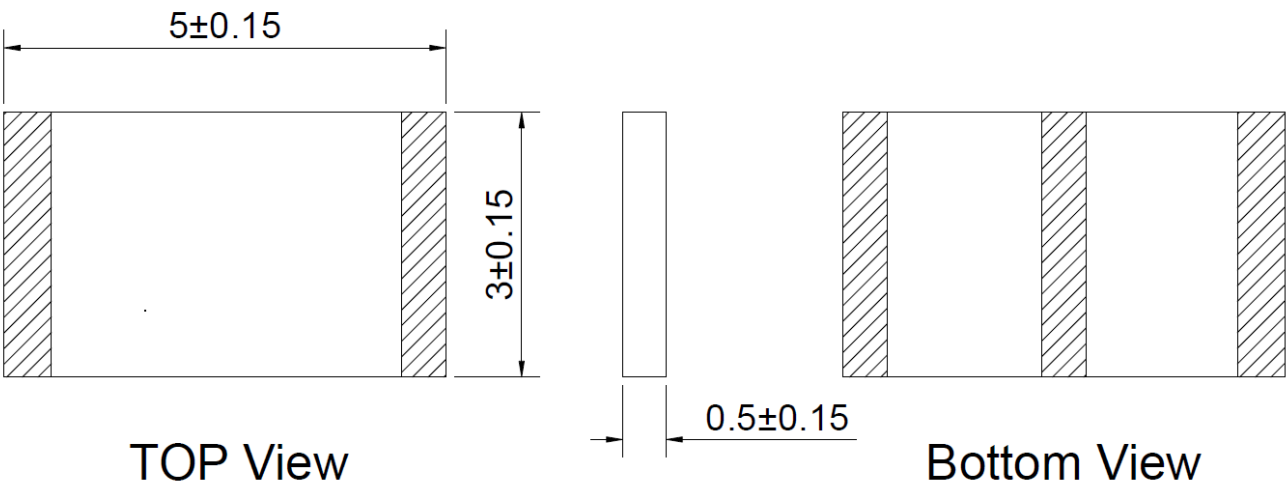
Environmental

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

Part Number	Dimension (mm)	Weight (g)	Material
ST0643-00-N02-A	5.0 X 3.0 X 0.5	0.02	Ceramic

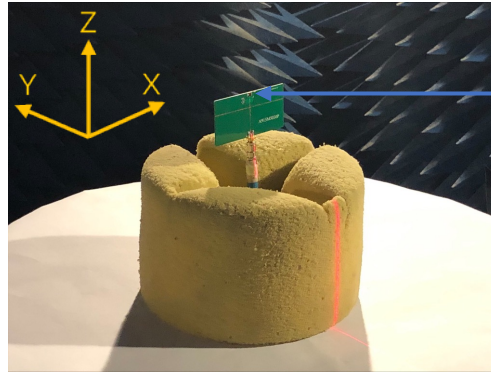
Mechanical Drawing

Unit : mm



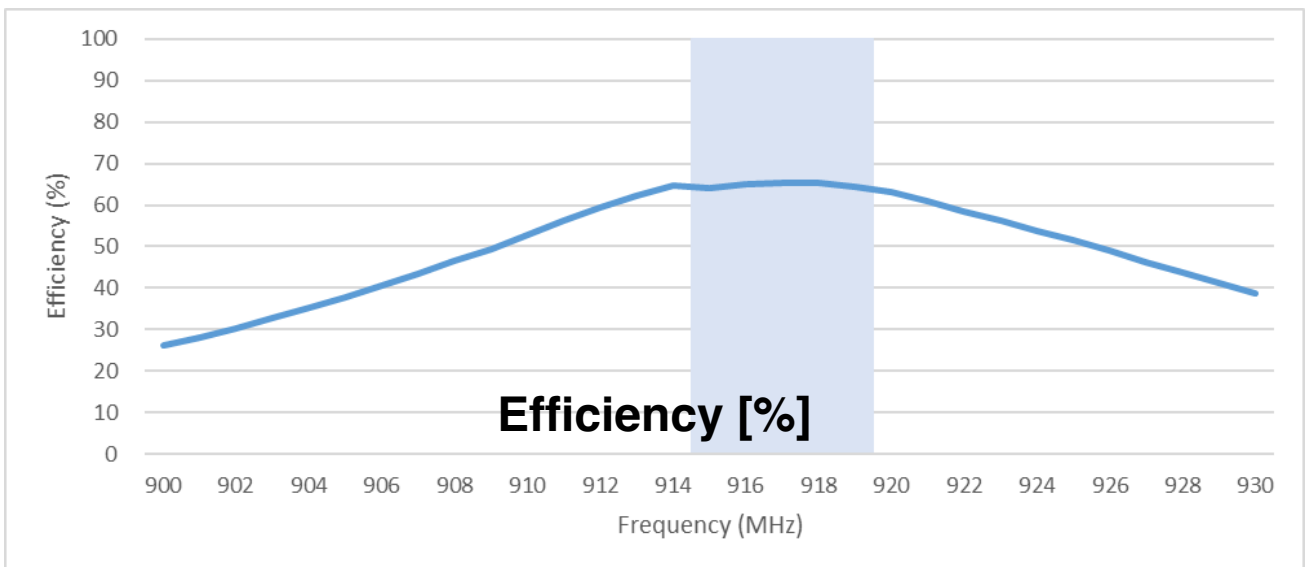
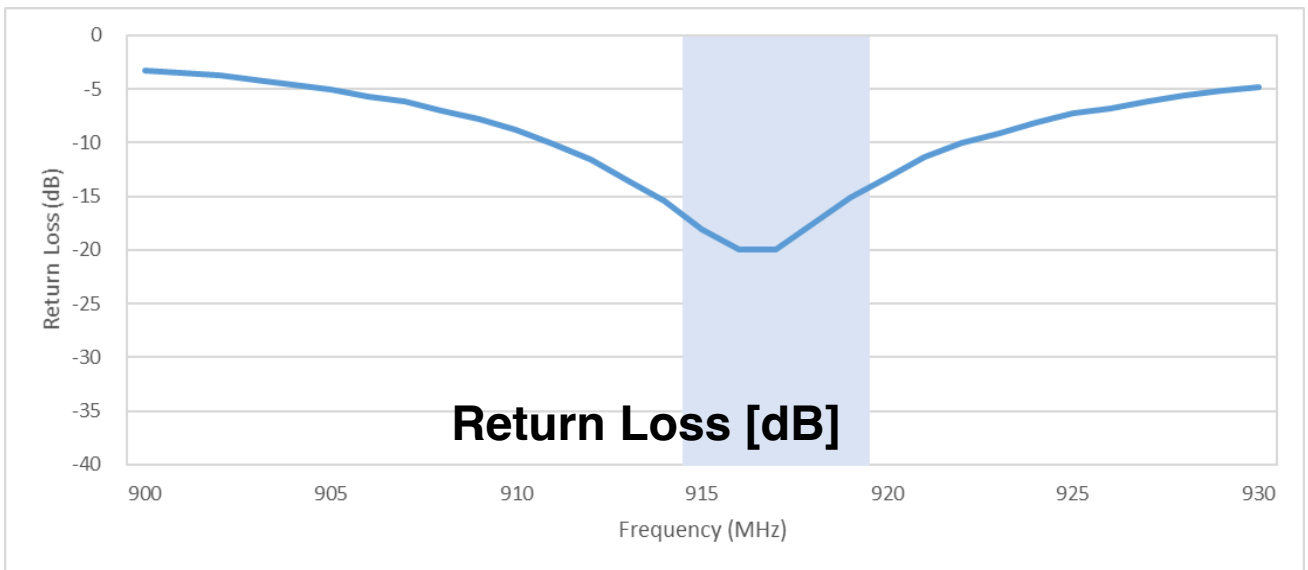
ST0643-00-N02-A

## Antenna Testing Includes Evaluation Board



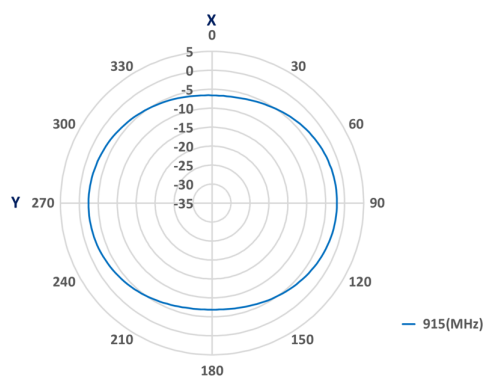
ST0643-00-N02-A

Test setup, measurement performed in 3D anechoic chamber.

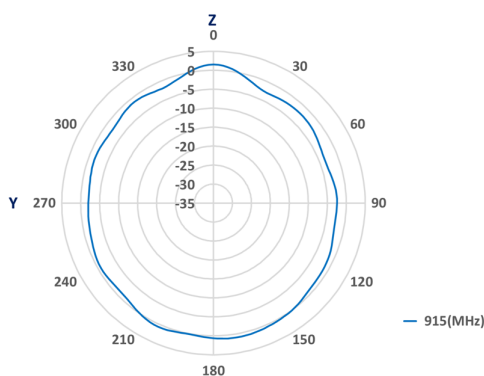


Blue background represents frequency response.

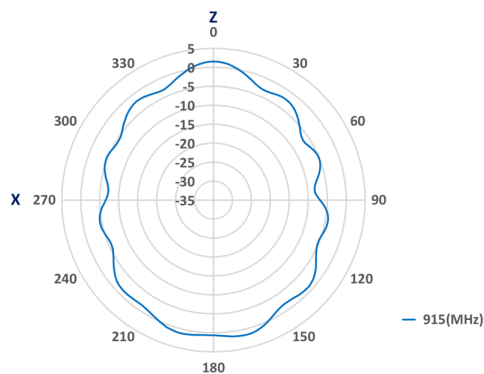
## XY - Plane



## YZ - Plane

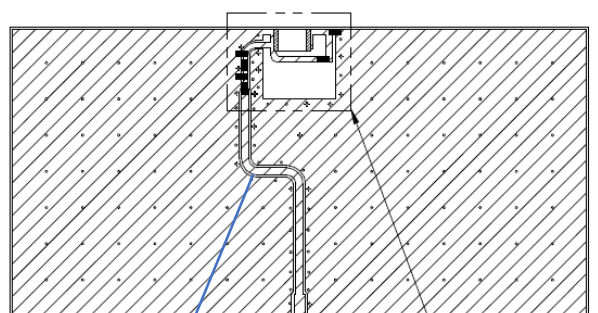


## XZ - Plane



## Matching Circuit Design

Unit : mm



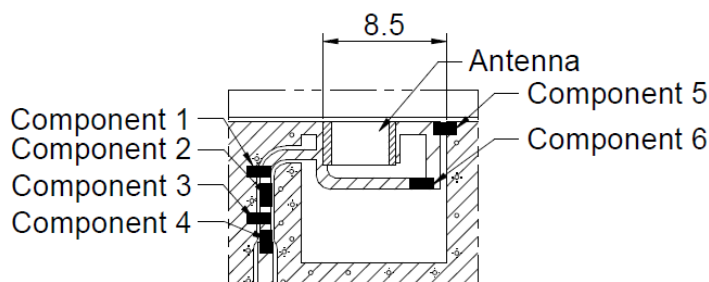
50Ω Transmission

Detail B



Cu

Top Layer



Detail B

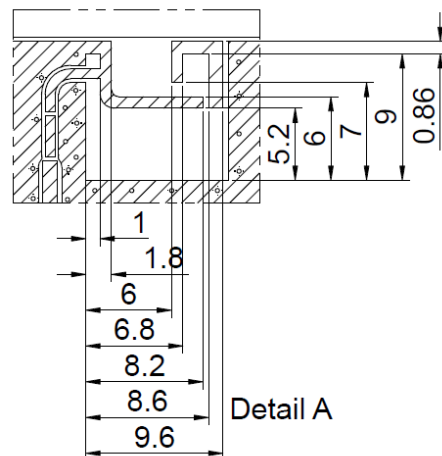
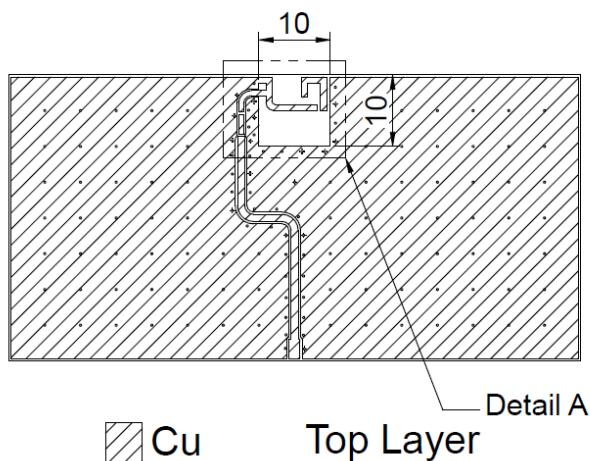
- \* To make the antenna have this resonance, must be matched with matching circuit.
- \* The matching component may be slightly different than that show depending on distance to ground plane, dielectric constant of PCB, and PCB material thickness.

### Circuit Matching Components

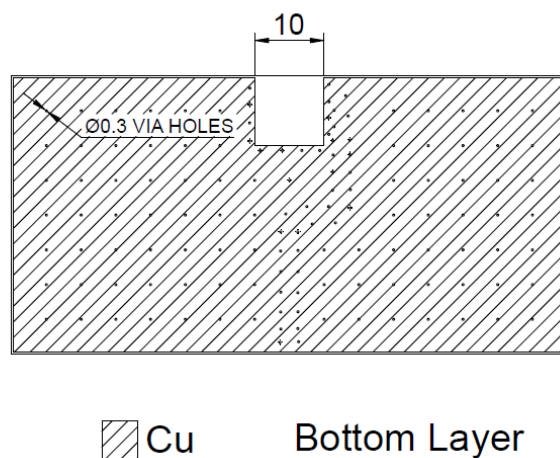
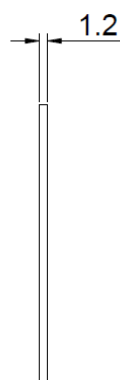
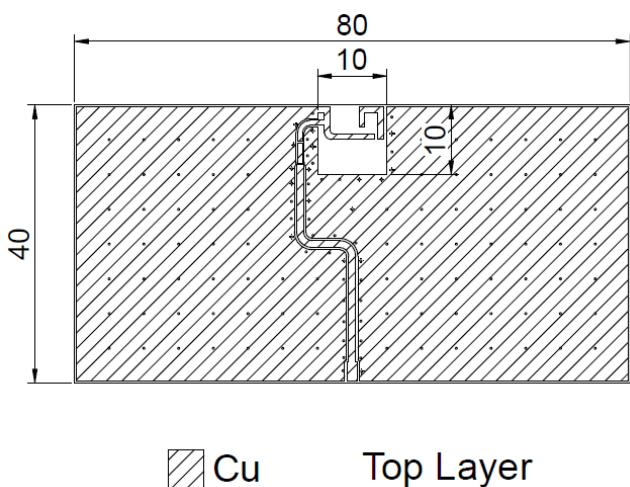
Circuit Symbol	Size	Description
Component 1	0402	None
Component 2	0402	2.7nH Inductance
Component 3	0402	0.2pF Capacitor
Component 4	0402	00hm Resistance
Component 5	0402	18pF Capacitor
Component 6	0402	1pF Capacitor

## Clearance Area Design

Unit : mm



## Evaluation Board



Base Material : FR-4

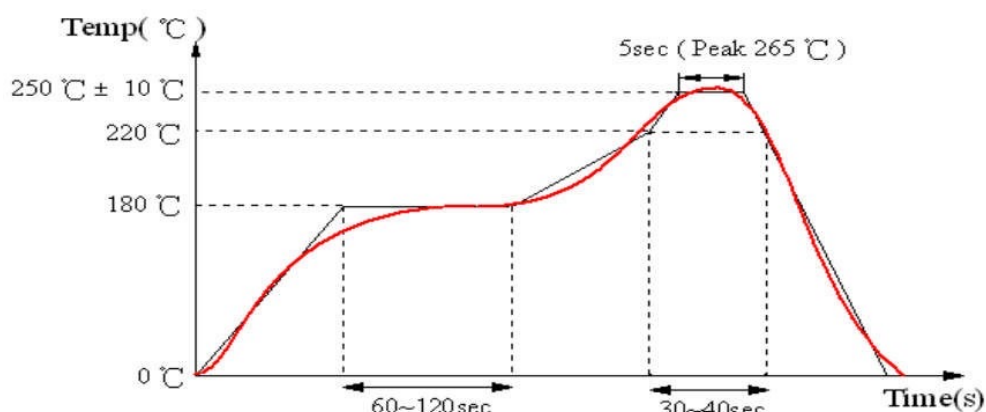
## Recommended Reflow Temperature Profile

### 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-N02-A-RA00	ATC

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