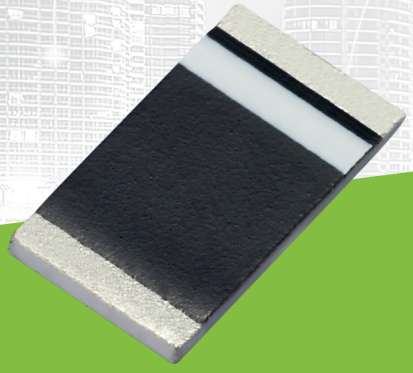
TAOGLAS



Datasheet

ILA.09 915MHz 5*3*0.5mm -0.5dBi Ceramic Loop Antenna

Part No:
ILA.09

Description:

915MHz Embedded Ceramic Loop Antenna for ISM/Lora/LPWAN/Sigfox

Features:

High Efficiency
Omnidirectional
Low profile
Tiny Size
Dims: 5.0*3.0*0.5mm
Surface-Mount
RoHS & REACH Compliant

1. Introduction

The ILA.09 is a new 915MHz ISM band embedded ceramic loop antenna from Taoglas featuring good efficiency of 55% at the center of the band. It is the perfect solution for the growing number of devices using the 915MHz band such as Sigfox and LoRa applications in the US, or in metering application.

This antenna works best when placed at the center of the board edge. The ILA.09 antenna, at 5*3*0.5mm, is low profile and would be suitable for devices with space constraints. The ILA.09 is delivered on tape and reel and now allows M2M customers to use an omnidirectional SMT antenna. The omnidirectional radiation characteristics allow for excellent performance regardless of device orientation. This is especially useful for devices that are not fixed in one particular spot during use. When there is little PCB space available for antenna placement, but high performance is required, the ILA.09 is the ideal choice.

The antenna is manufactured in a TS16949 first tier automotive approved facility and has passed the most stringent reliability testing. Since it is SMD, it is much easier to integrate and more reliable in high volume production compared to helical antennas which are cumbersome to install and subject to variability due to the need for manual assembly.

For further optimization to customer-specific device environments and for support to integrate and test this antennas performance in your device, contact your regional Taoglas Customer Services Team.

Applications:

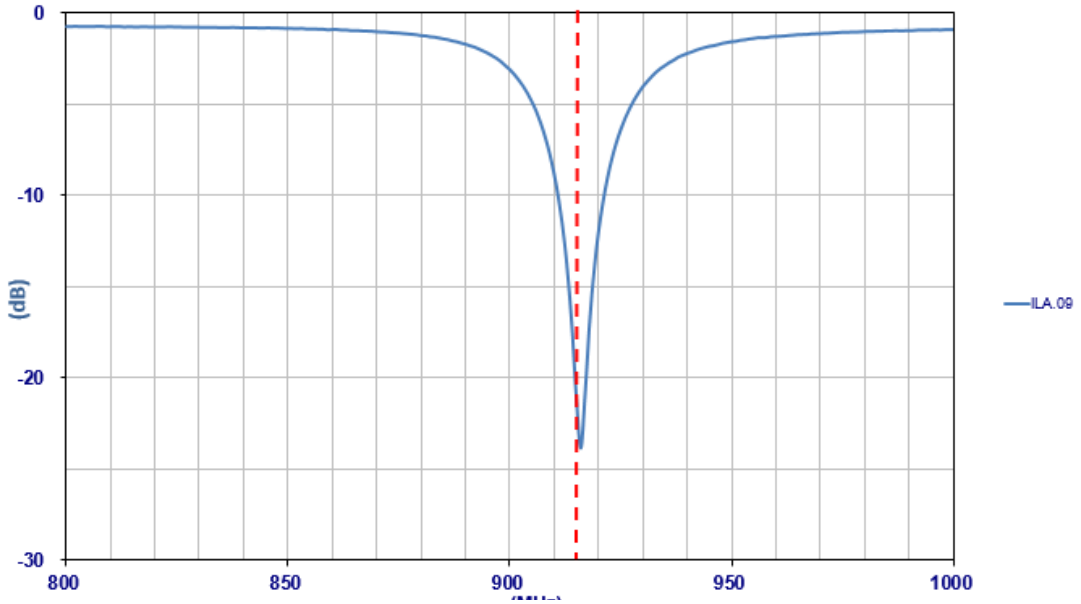
Sigfox
Lora
LPWAN
Automated Meter Reading (AMR)
Radio Frequency Identification (RFID)
Remote Monitoring
Healthcare
Sensing
Alarm Systems
Handheld Devices

2. Specifications

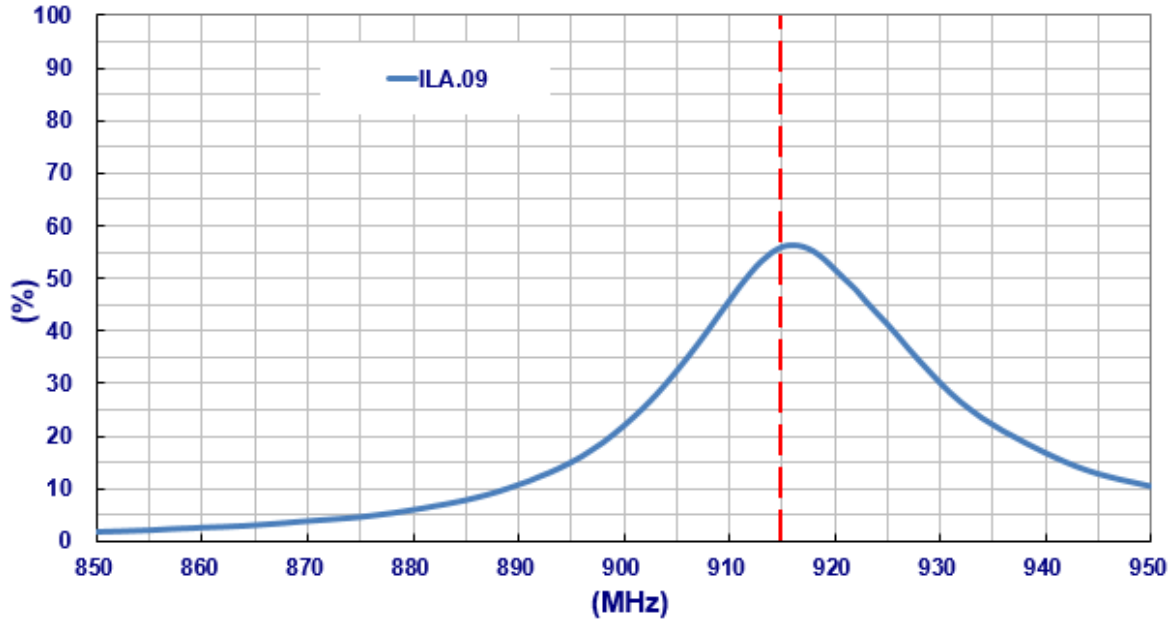
Antenna			
Frequency (MHz)	902	915	928
Efficiency (%)			
80 x 40 mm Ground Plane	25.66	55.93	34.45
Peak Gain (dBi)			
80 x 40 mm Ground Plane	-3.00 dBi	0.39 dBi	-1.78 dBi
Max Return Loss (dB)	< -3	< -10	<-3
Impedance (Ω)	50Ω		
Polarization	Linear		
Input Power(W)	2		
Mechanical			
Dimensions (mm)	5.0 x 3.0 x 0.5		
Ground plane (mm)	80 x 40		
Weight (g)	0.02		
Environmental			
Temperature Range	-40°C to 85°C		
Storage Temperature	-40°C to 85°C		
Humidity	20% to 70%		
Moisture Sensitivity Level	3 (168 Hours)		

3. Antenna Characteristics

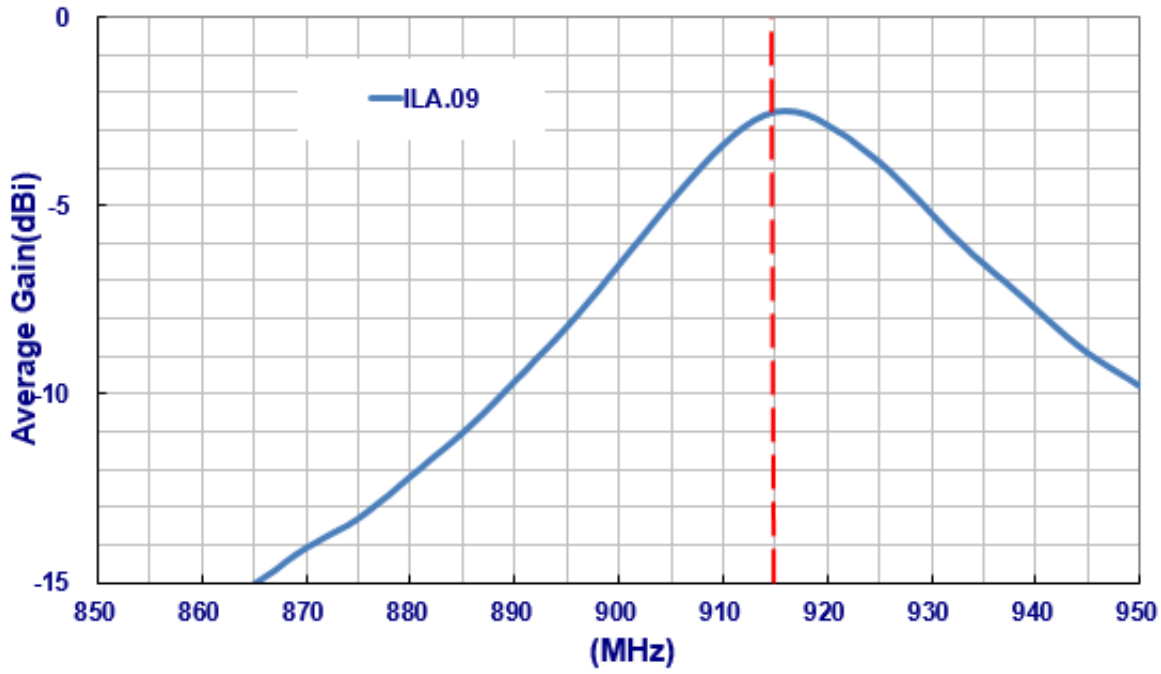
3.1 Return Loss



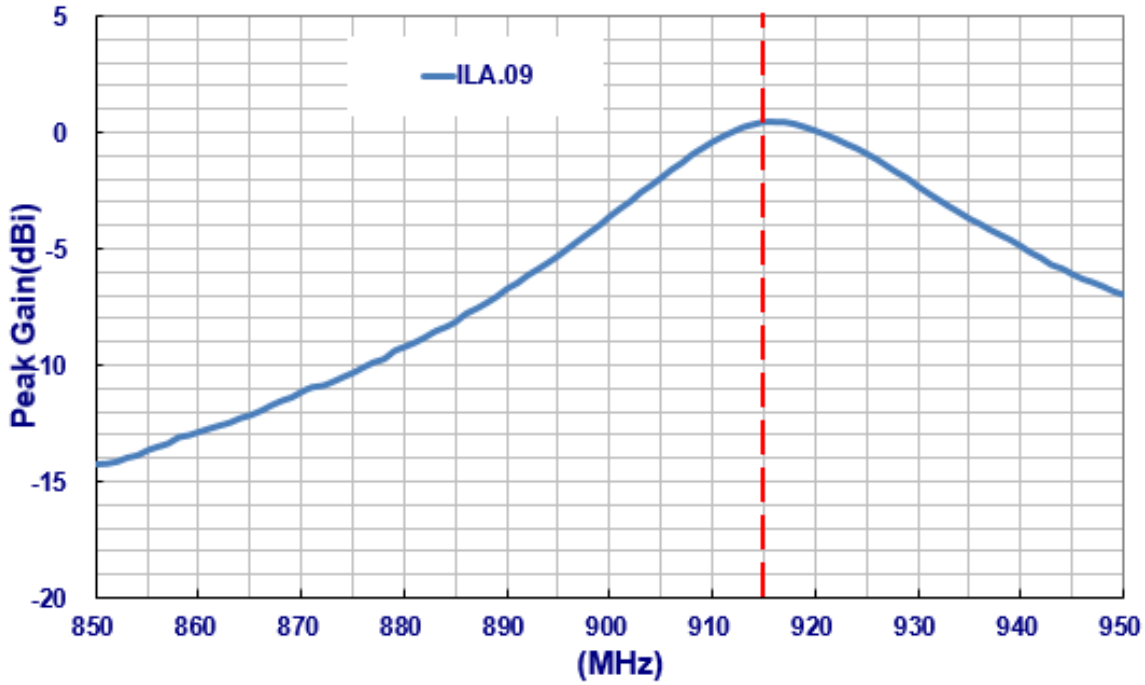
3.2 Efficiency



3.3 Average Gain

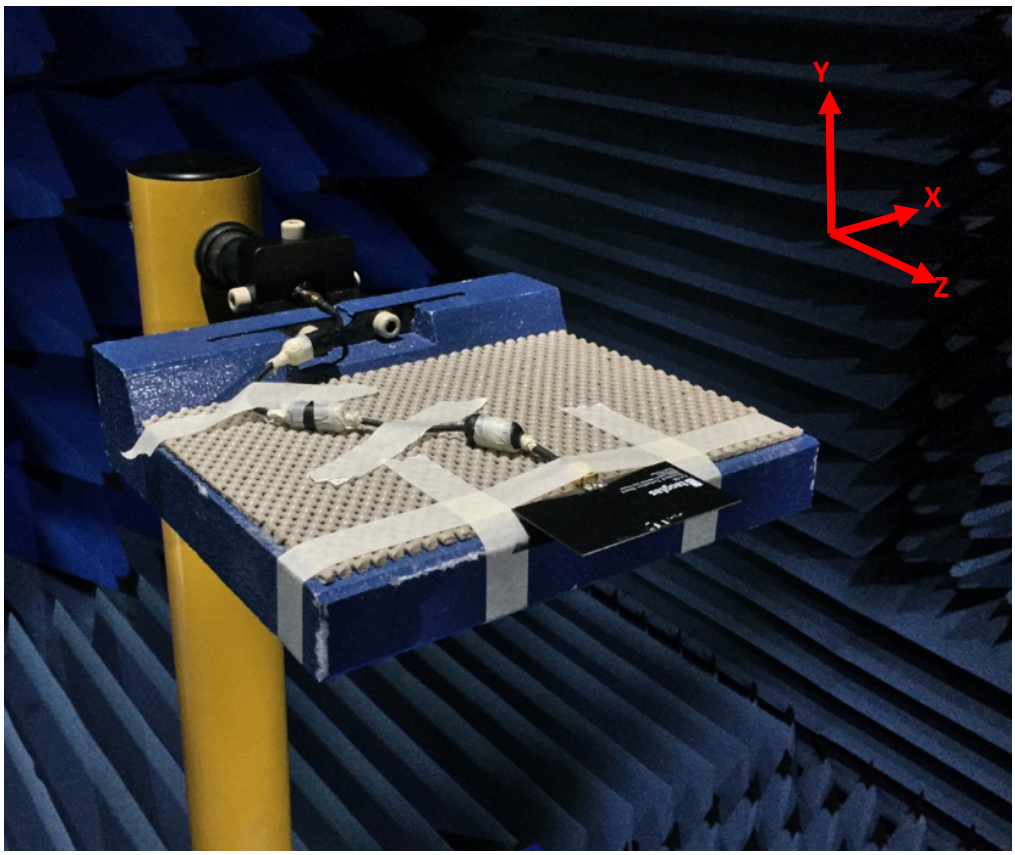


3.4 Peak Gain



4. Radiation Patterns

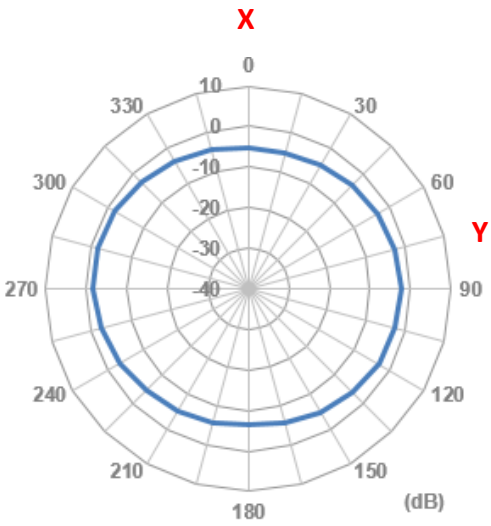
4.1 Test Setup – Antenna on Evaluation Board



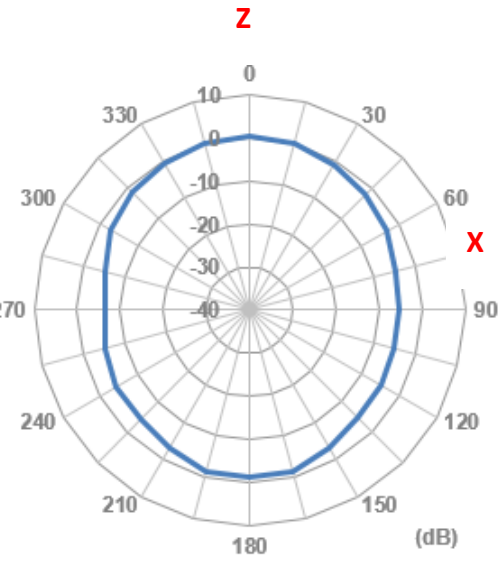
4.2 2D Radiation Pattern

915 MHz

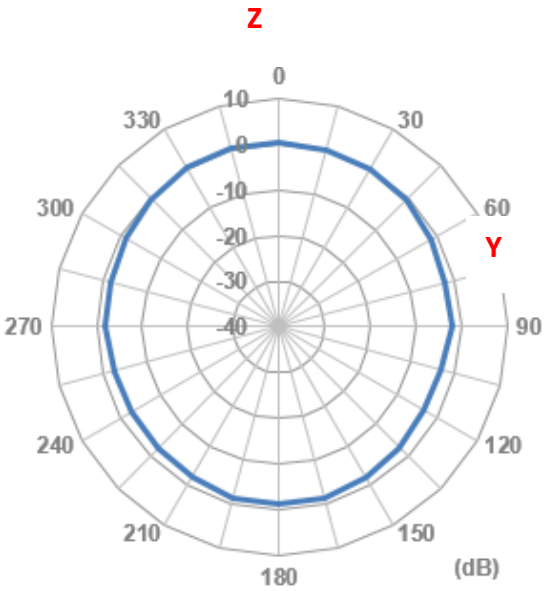
XY Plane



XZ Plane

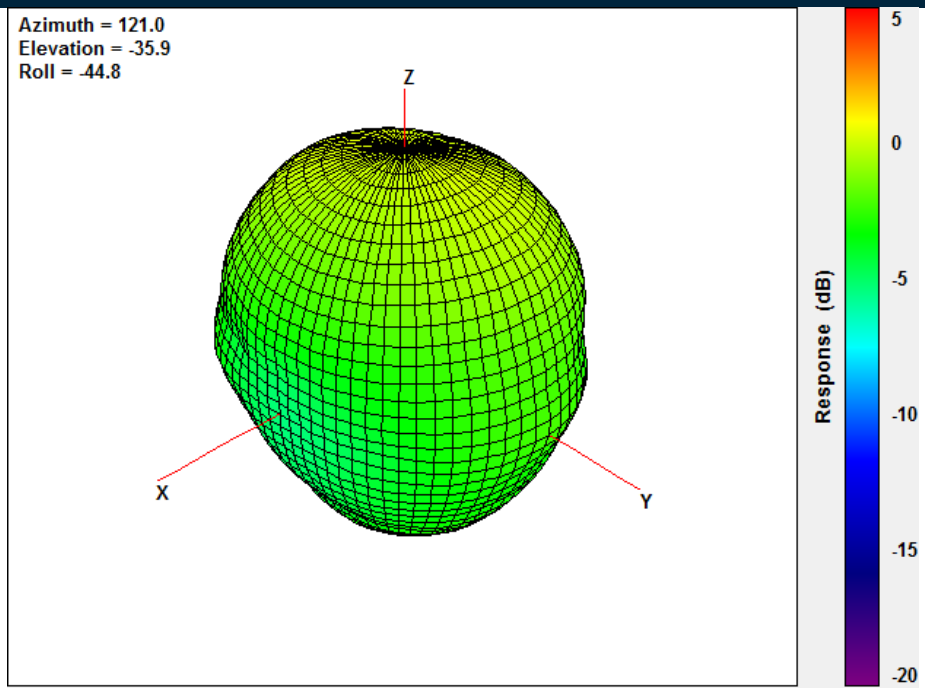


YZ Plane



4.3 3D Radiation Pattern

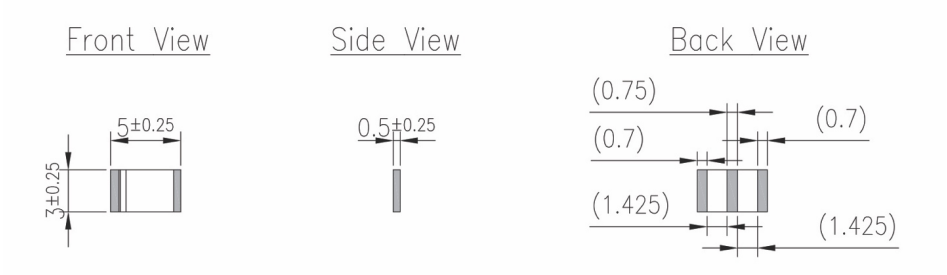
915 MHz



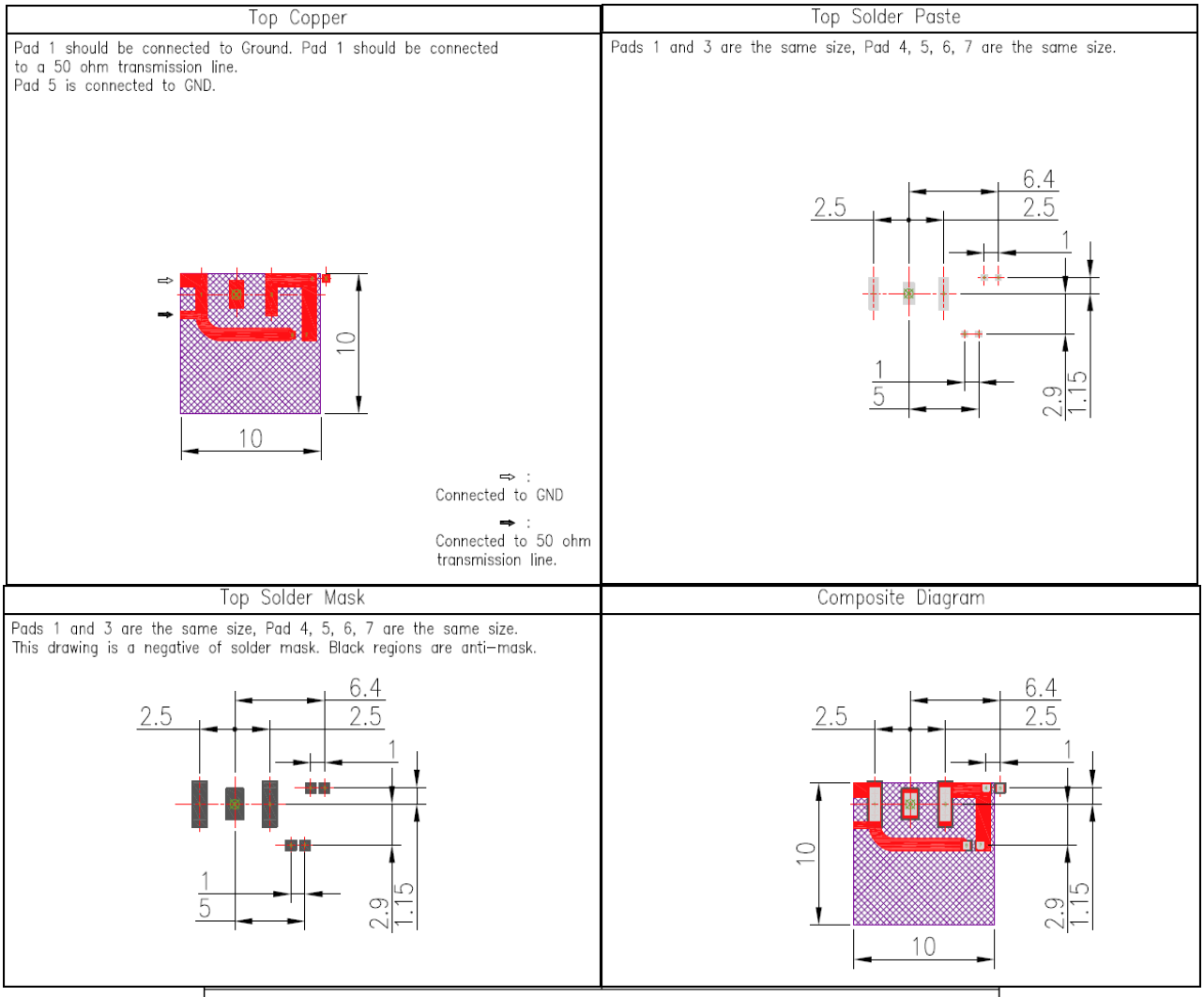
5. Mechanical Drawing – Antenna

5.1 Antenna Dimension and Drawing

Unit: mm



5.2 Antenna Footprint

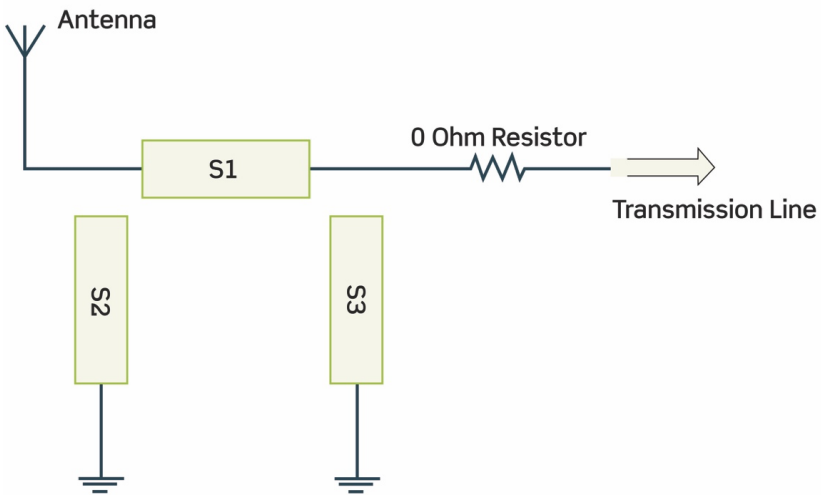


NOTE:
1. Ag Plated area
2. Solder Mask area
3. Copper area
4. Paste area
5. Keepout Region area
6. Ground keepout should extend through all layers to minimize coupling from RF feed to ground.
7. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow.
8. The dimension tolerances should follow standard PCB manufacturing guidelines.

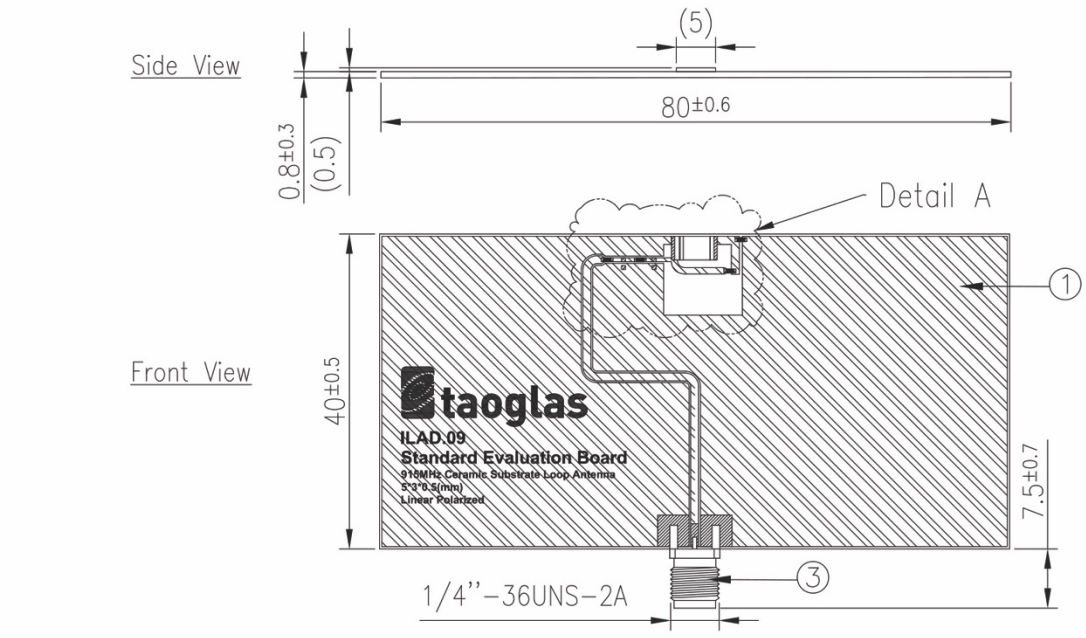
*Taoglas is able to provide CAD drawing file to customers for evaluation.

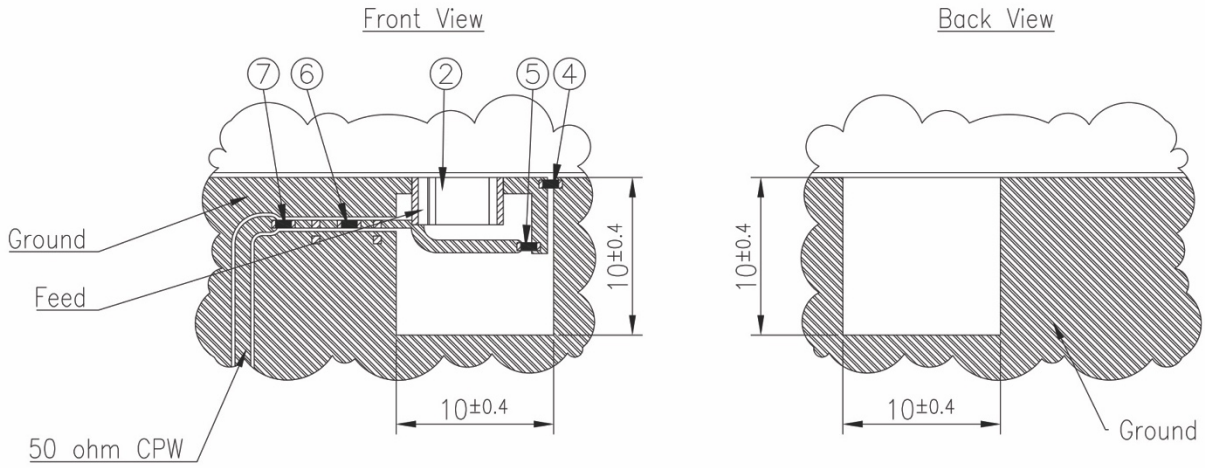
5.2 Matching Circuit

Like all antennas, surrounding components, enclosures, and changes to the GND plane dimensions can alter performance. A pi-matching network like the one shown below is required incase adjustments need to be made. The antenna EVB has the same matching network. The components on the EVB are a good starting point for a new design, but will need to be adjusted upon integration for best performance. The zero ohm resistor is needed to solder down a coax pigtail to make measurements with a vector network analyzer.



6. Mechanical Drawing – Evaluation Board

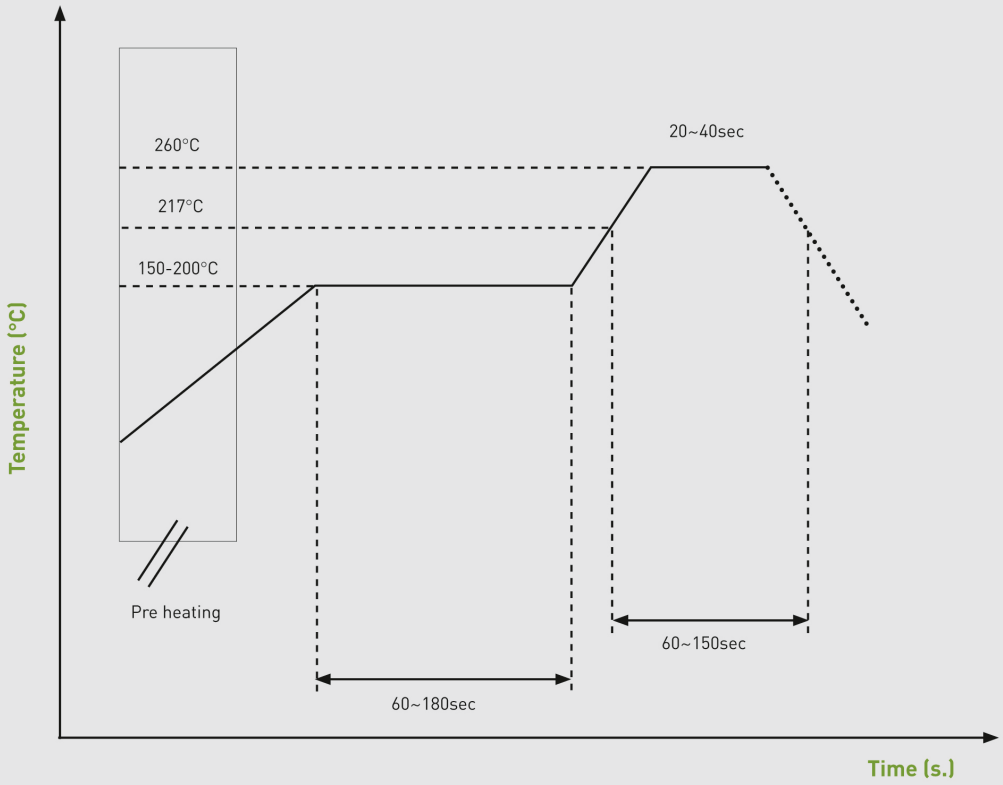




	Name	Material	Finish	QTY
1	ILAD.09 EVB Board	Composite	Black	1
2	ILA.09 Chip Antenna	Ceramic	N/A	1
3	SMA(F) ST	Brass	Au Plated	1
4	Capacitor 3.9pF (0402)	Ceramic	N/A	1
5	Capacitor 2.2pF (0402)	Ceramic	N/A	1
6	Inductor 1.8nH (0402)	Ceramic	N/A	1
7	Capacitor 22pF (0402)	Ceramic	N/A	1

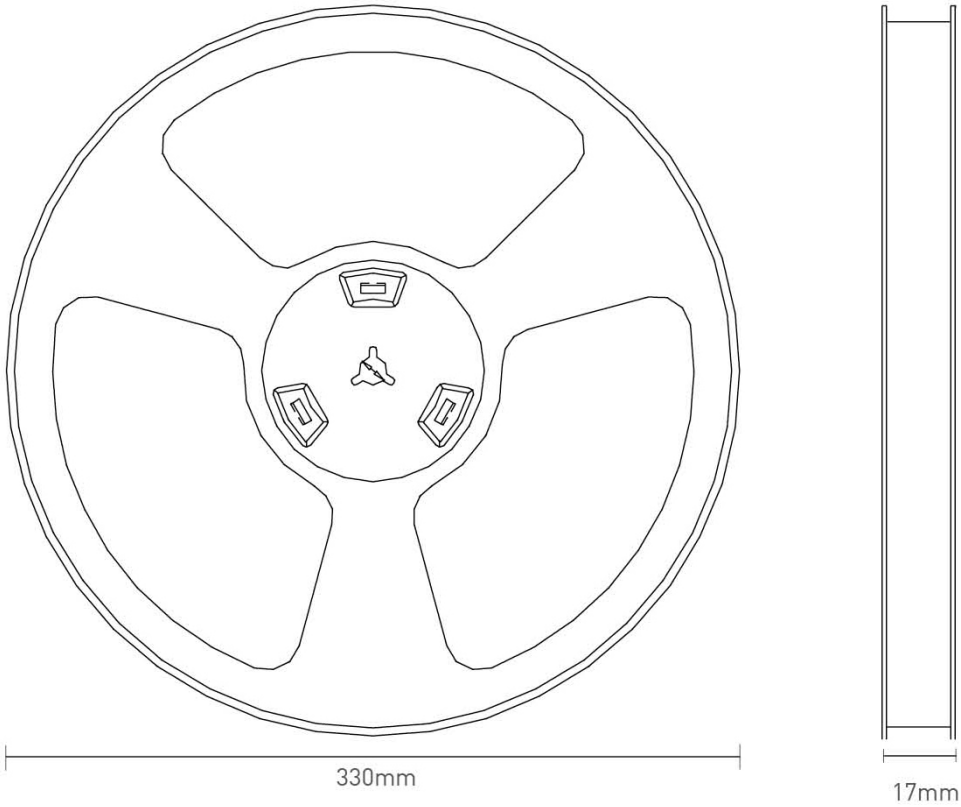
7. Soldering Conditions

Typical Soldering profile for lead-free process:

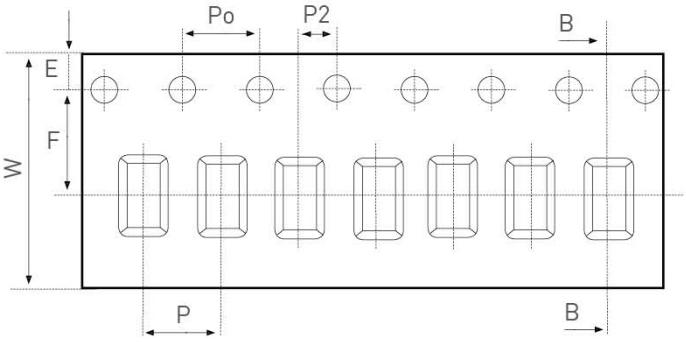


9. Packaging

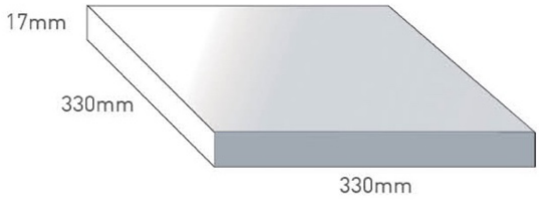
6000 pcs ILA.09 per tape & reel
Dimensions - 330*330*17mm
Weight - 680g



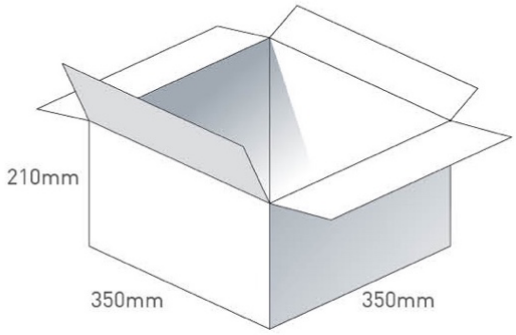
Tape Dimensions (unit: mm)		
Feature	Spec	Tolerances
W	12.00	±0.30
P	4.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
Po	4.00	±0.10
10Po	40.00	±0.10



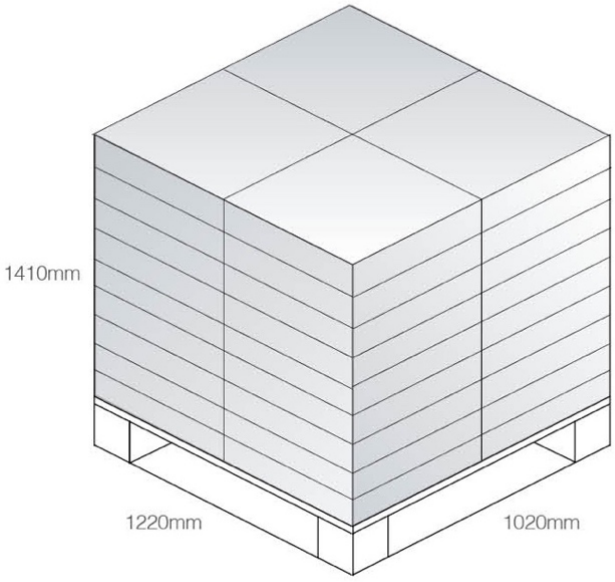
6000 pcs ILA.09
1 reel in small inner box
Dimensions - 330*330*17
Weight - 680g



9 boxes / 54000 pcs in one carton
Carton Dimensions - 350*350*210mm
Weight - 6.69Kg



Pallet Dimensions 1220*1020*1410mm
36 Cartons per Pallet
4 Cartons per layer
9 Layers



Changelog for the datasheet

SPE-16-8-051 – ILA.09

Revision: B (Current Version)	
Date:	2021-10-31
Changes:	Format Change, MSL
Changes Made by:	Erik Landi

Previous Revisions

Revision: A (Original First Release)	
Date:	2016-05-17
Notes:	Initial Release
Author:	STAFF

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