



TAOGLAS®



Datasheet

Low Profile and High Efficiency 915 MHz ISM Band Loop Antenna

Part No:
ILA.01

Description:

915 MHz ISM Band Loop Antenna

Features:

Small size antenna, low profile, and high efficiency
915 MHz ISM Band
1 dBi Peak Gain
10 x 3.2 x 0.5 mm size
SMT Compatible
RoHS & REACH Compliant

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1. Introduction



The ILA.01 is a 915 MHz ISM band antenna with excellent efficiency, 60% at the center frequency and 45% at the band edges. This antenna works the best when placed at the center of the board edge. The antenna, at 10 x 3.2 x 0.5 mm, is low profile and would be suitable for devices with space constraints. The ILA.01 is delivered on tape and reel and now allows M2M customers to use an omni-directional SMT antenna. The omni-directional 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.01 is the ideal choice.

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

Applications:

Automated Meter Reading (AMR)

Radio Frequency Identification (RFID)

Remote Monitoring

Healthcare

Sensing

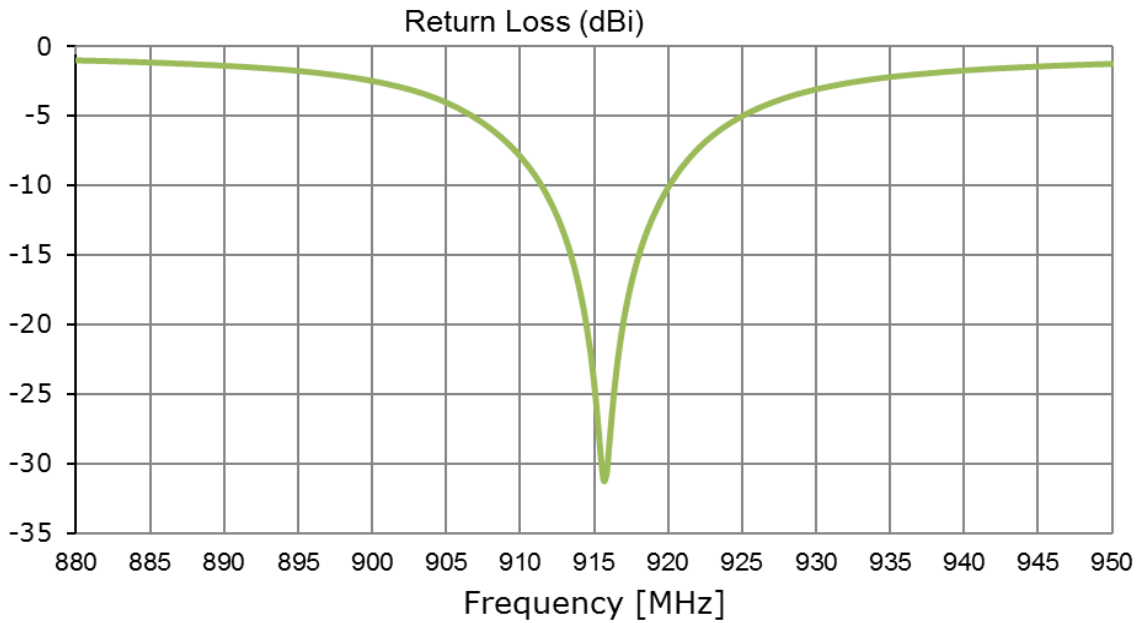
915 MHz Applications

2. Specifications

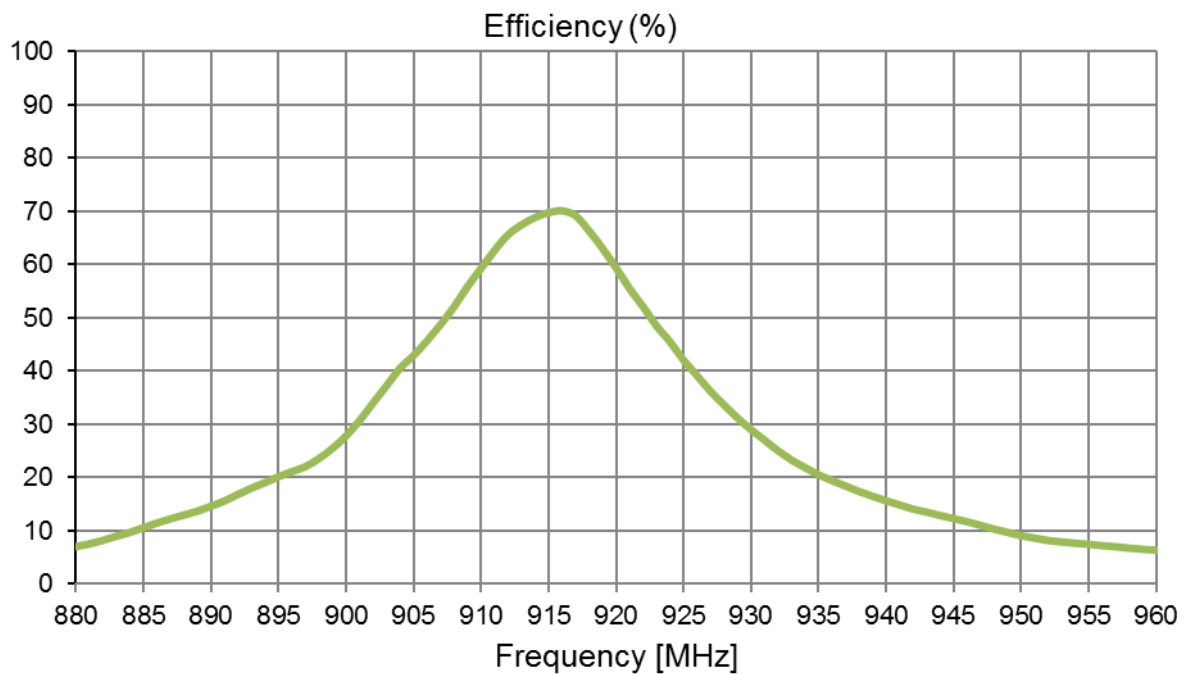
Antenna	
Frequency (MHz)	902-928 MHz (ISM)
Efficiency (%)	
80 x 40 mm Ground Plane	50 (typical)
Average Gain (dB)	
80 x 40 mm Ground Plane	-5 dB
Peak Gain (dBi)	
80 x 40 mm Ground Plane	1.5 dBi
Max Return Loss (dB)	-2.8 dB
VSWR	6:1
Impedance (Ω)	50 Ω
Polarization	Linear
Radiation Pattern	Omni
Input Power(W)	5
Mechanical	
Dimensions (mm)	10 x 3.2 x 0.5
Required Space (mm)	11 x 10.4
Material	Ceramic
EVB Connector	SMA(F)
Environmental	
Temperature Range	-40°C to 85°C
Storage Temperature	-40°C to 105°C
Humidity	40% to 95%
Moisture Sensitivity Level	3 (168 Hours)

3. Antenna Characteristics

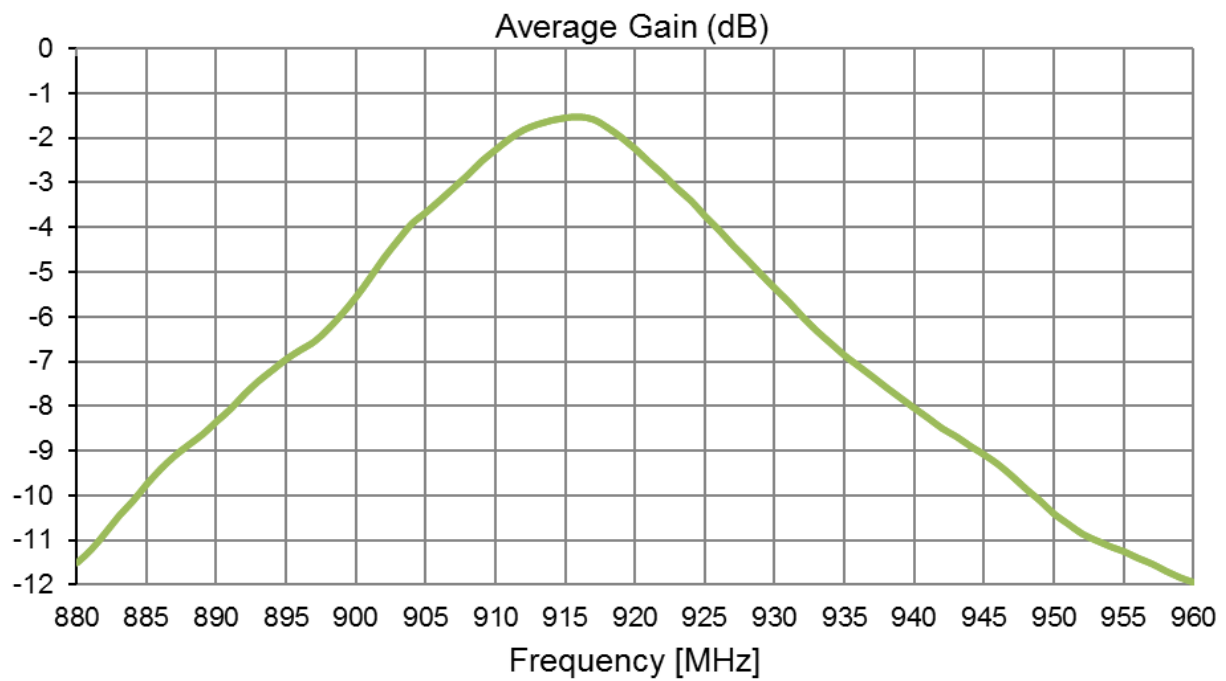
3.1 Return Loss



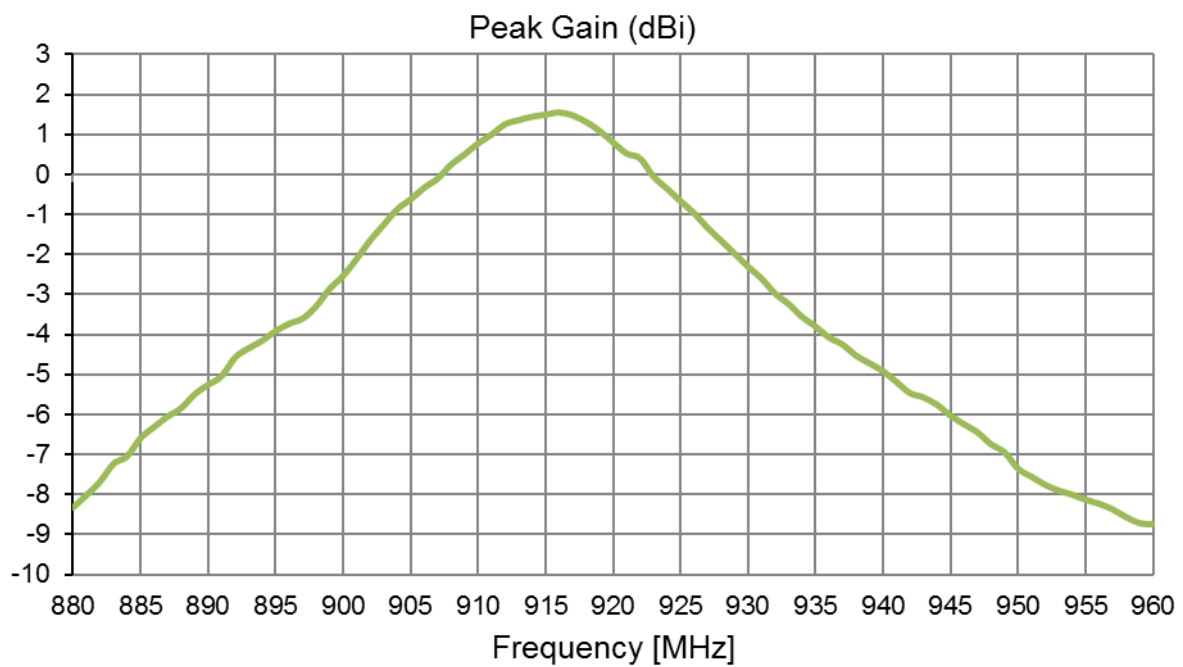
3.2 Efficiency



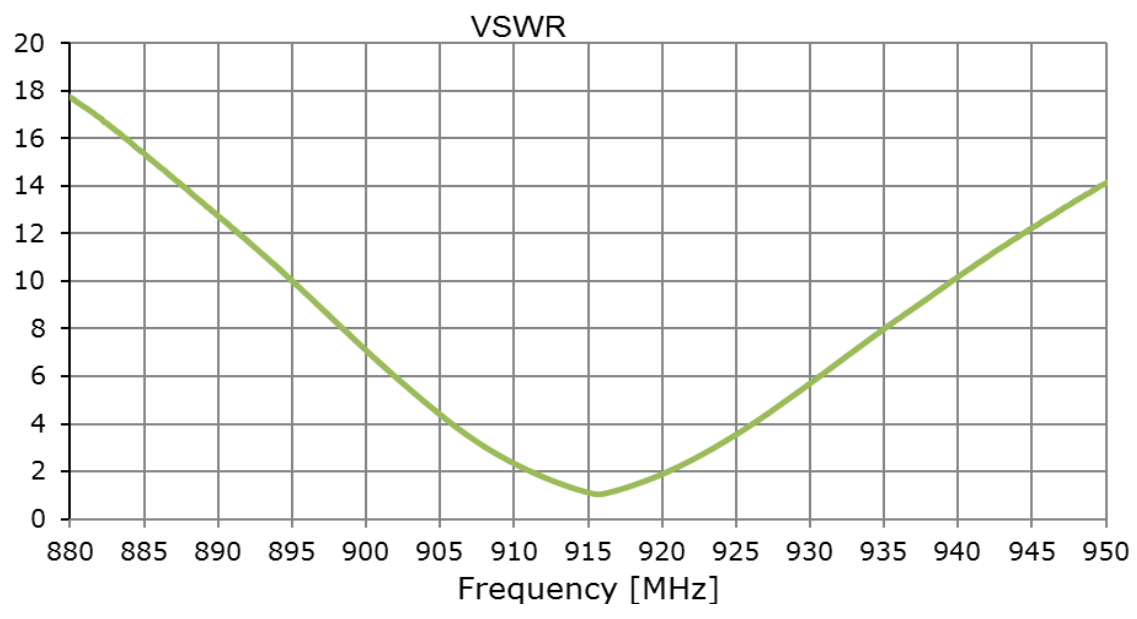
3.3 Average Gain



3.4 Peak Gain

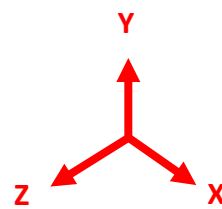
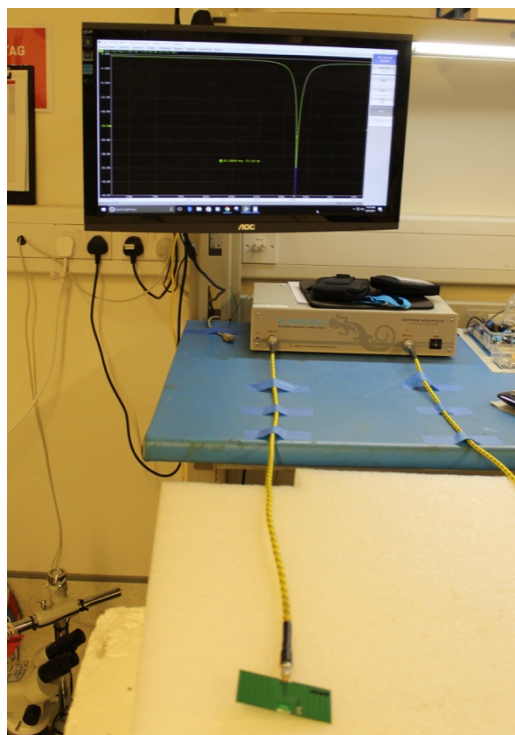
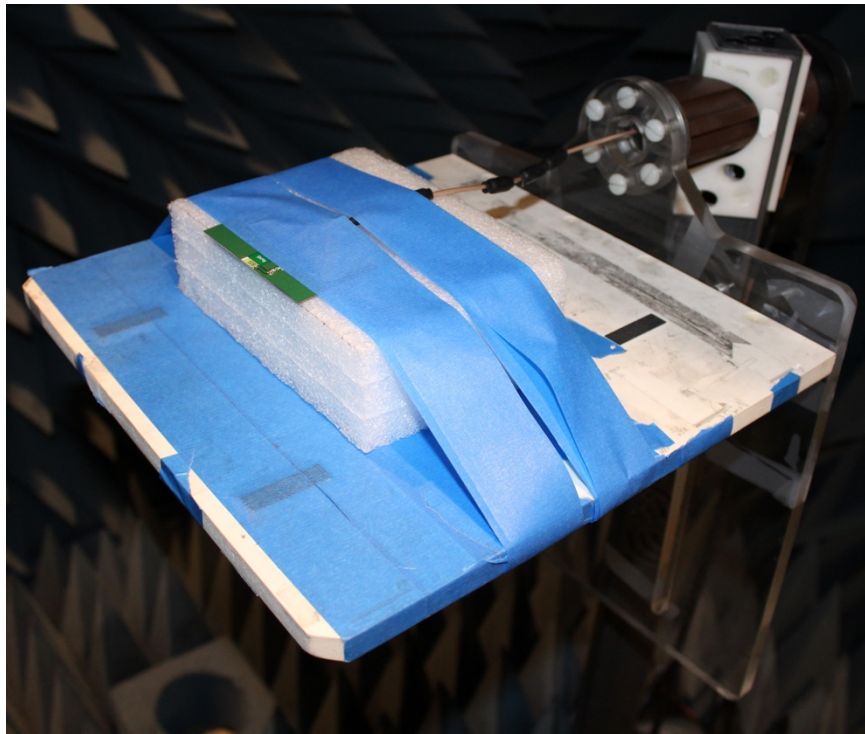


3.5 VSWR



4. Radiation Patterns

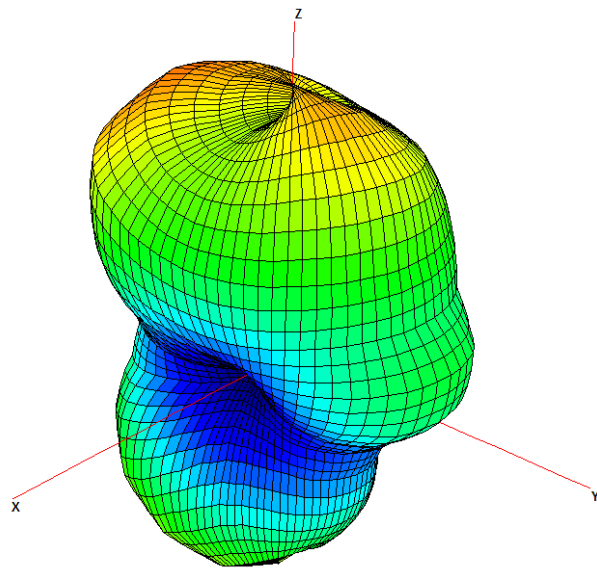
4.1 Test Setup – Antenna on Evaluation Board



4.3 3D Radiation Pattern

915MHz

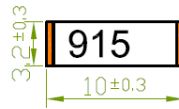
Azimuth = 113.6
Elevation = -34.3
Roll = -54.5



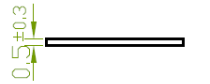
5. Mechanical Drawing – Antenna

5.1 Antenna Dimension and Drawing

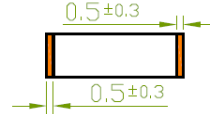
Top View



Side View



Bottom View



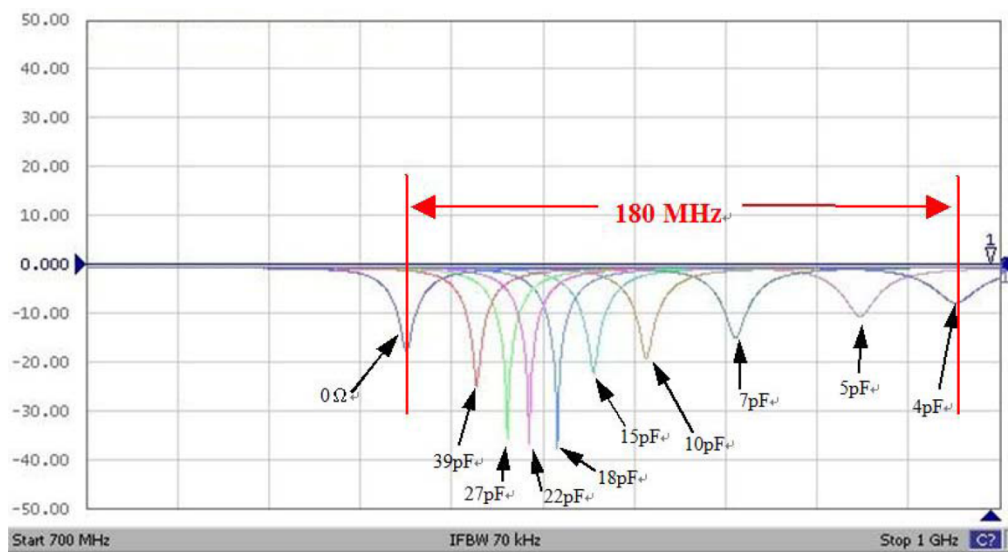
Unit: mm

5.2 Antenna Footprint

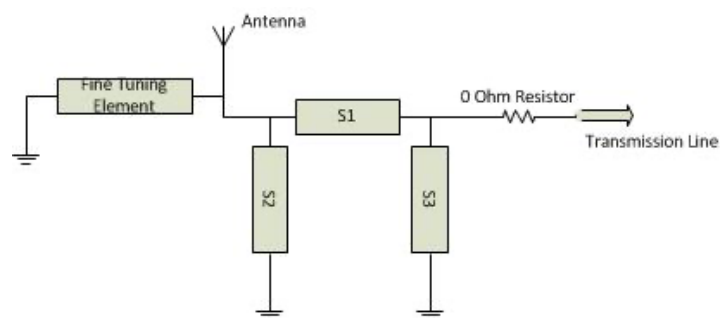
Foot Print																
Top Copper	Top Solder Paste															
<p>All pads should be connected to GND. Pad 1 should be connected to a 50 ohm transmission line. Pad 3 and pad 4 are reserved for tuning element.</p>																
Top Solder Mask	Composite Diagram															
<p>This drawing is a negative of solder mask. Black regions are anti-mask.</p>																
<p>NOTE:</p> <table border="0"> <tr> <td>1. Ag Plated area</td> <td></td> <td>6. Ground keepout should extend through all layers to minimize coupling from RF feed to ground.</td> </tr> <tr> <td>2. Solder Mask area</td> <td></td> <td>7. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow.</td> </tr> <tr> <td>3. Copper area</td> <td></td> <td>8. The dimension tolerances should follow standard PCB manufacturing guidelines.</td> </tr> <tr> <td>4. Paste area</td> <td></td> <td></td> </tr> <tr> <td>5. Keepout Region area</td> <td></td> <td></td> </tr> </table>		1. Ag Plated area		6. Ground keepout should extend through all layers to minimize coupling from RF feed to ground.	2. Solder Mask area		7. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow.	3. Copper area		8. The dimension tolerances should follow standard PCB manufacturing guidelines.	4. Paste area			5. Keepout Region area		
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5. Keepout Region area																

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

5.2 Matching Circuit

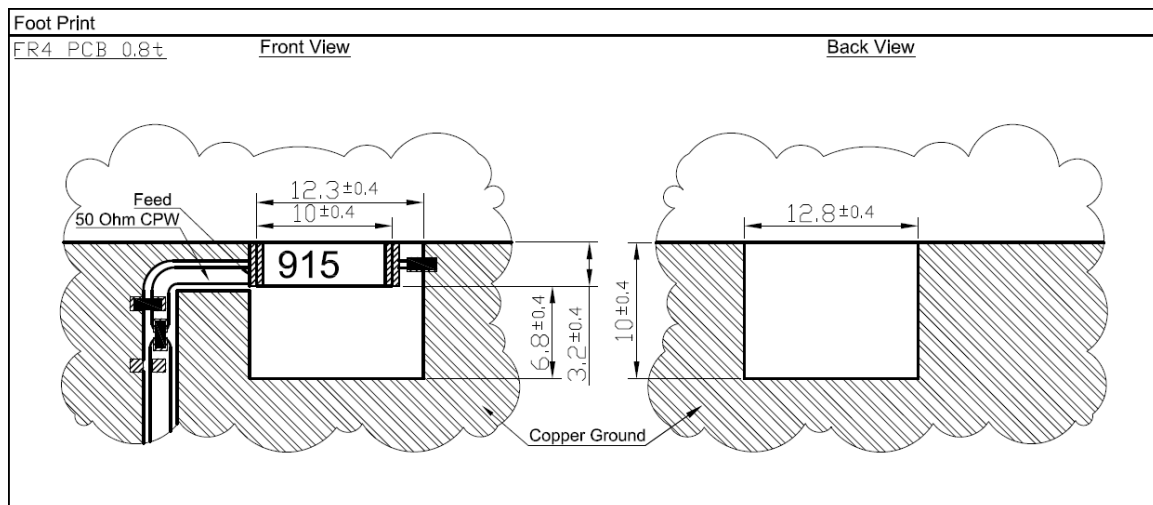
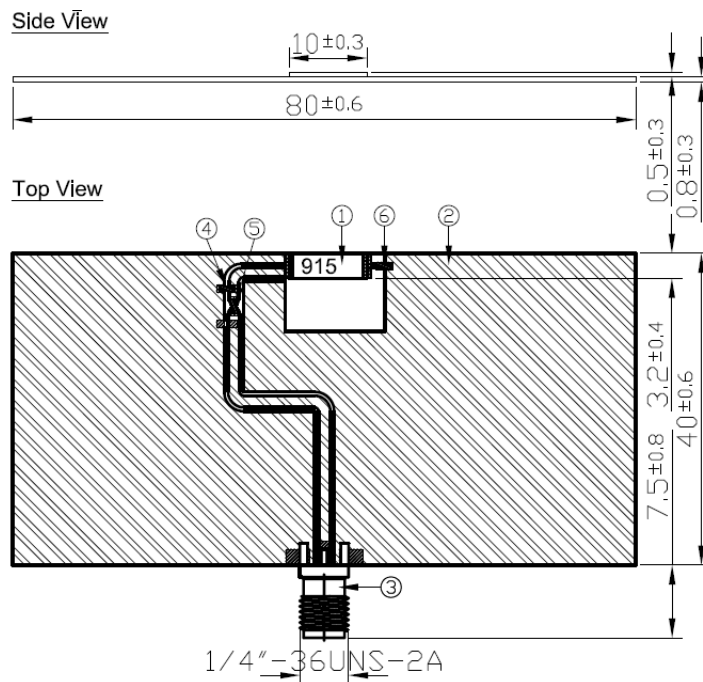


This antenna includes a fine-tuning element (as shown in the land patterns above) that can be used to slightly shift antenna resonance.



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 in case adjustments need to be made. The antenna EVB has a similar 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 for the ability to solder down a coax pigtail to make measurements with a vector network analyzer.

6. Mechanical Drawing – Evaluation Board



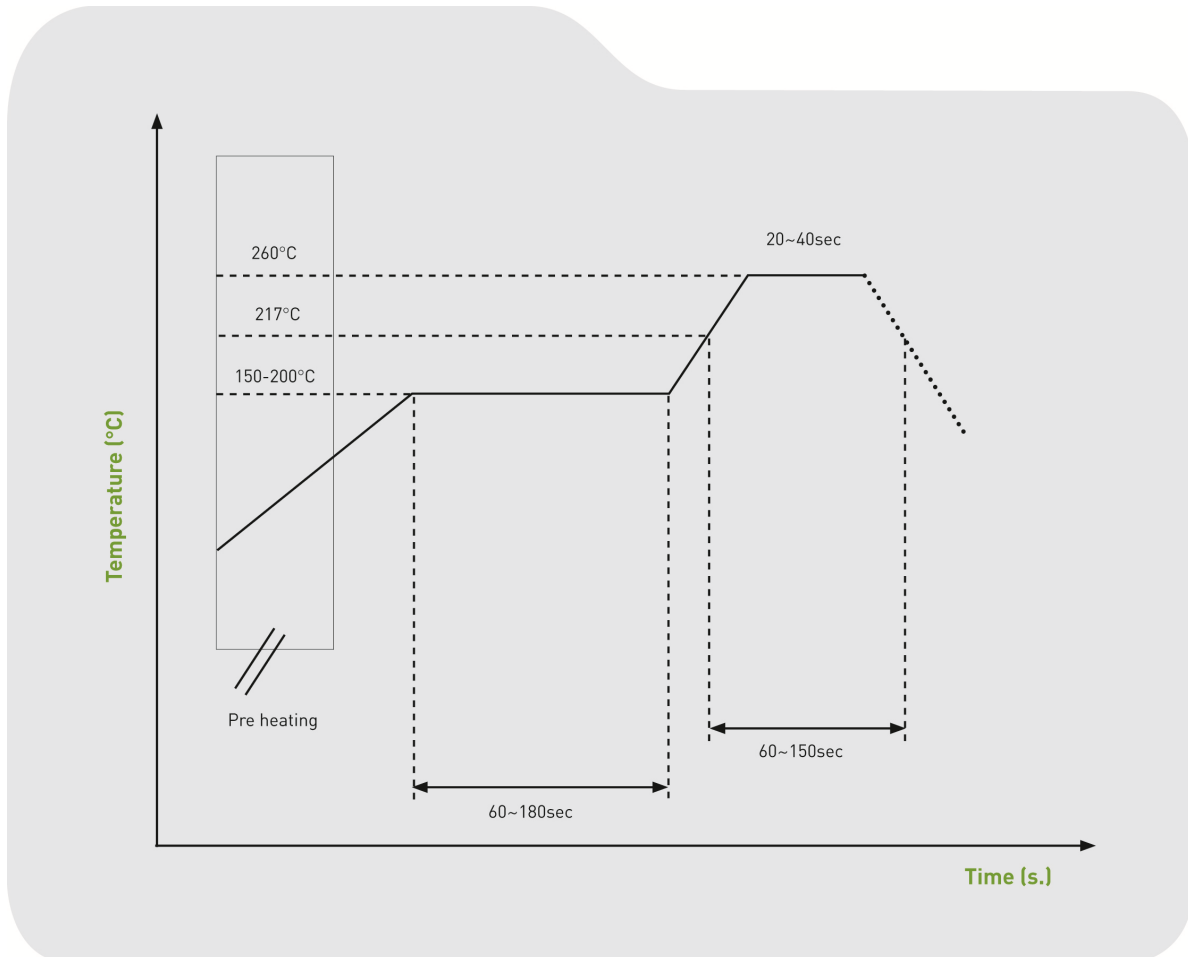
NOTES:

1. Solder Area
2. Logo & Text Ink Printing : Black
3. Copper
4. Matching Component
5. Component 6 is the tuning element of this antenna. $\varnothing 0.3$

	Name	P/N	Material	Finish	QTY
1	ILA.01 Antenna	001513F000012A	Ceramic	N/A	1
2	ILA.01 EVB Board	100213F000012A	FR4 0.8t	Green	1
3	SMA(F) ST	200413F000012A	Brass	Gold	1
4	Capacitor 4.3pF (0402)	001514F020012A	Ceramic	N/A	1
5	Resistor 0Ω (0402)	001511J010012A	Ceramic	N/A	1
6	Capacitor 10pF (0402)	001514F010012A	Ceramic	N/A	1

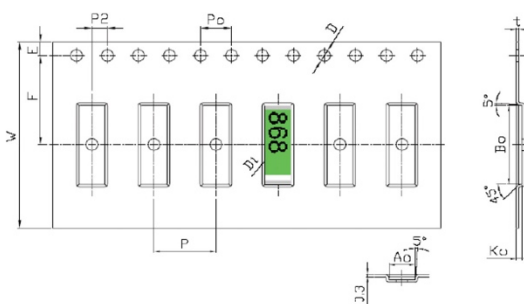
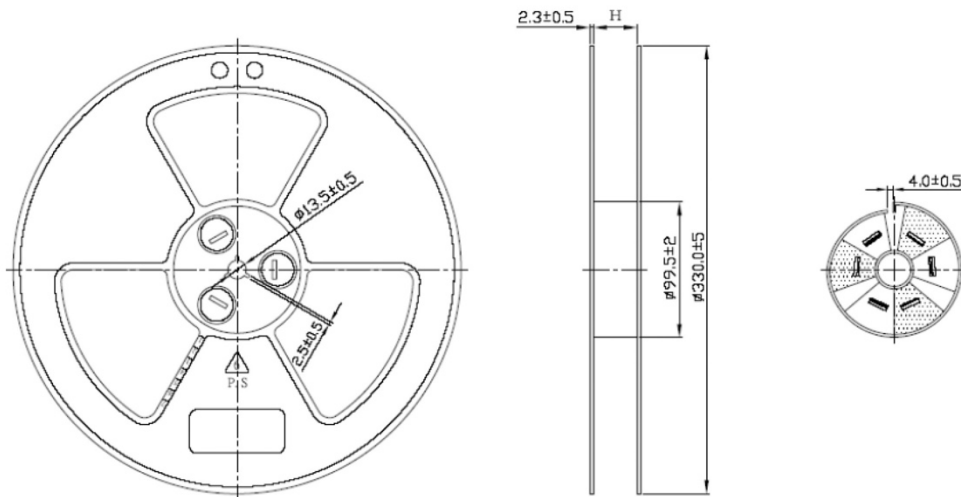
7. Soldering Conditions

Typical Soldering profile for lead-free process:



9. Packaging

6000 pcs ILA.01 reel
 Dimensions - 420*380mm
 Weight -1050g



Tape Dimensions(unit: mm)

Feature	Specifications	Tolerances
W	24.00	±0.30
P	8.00	±0.10
E	1.75	±0.10
F	11.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 0.00
D1	1.50	±0.10
Po	4.00	±0.10
10Po	40.00	±0.20

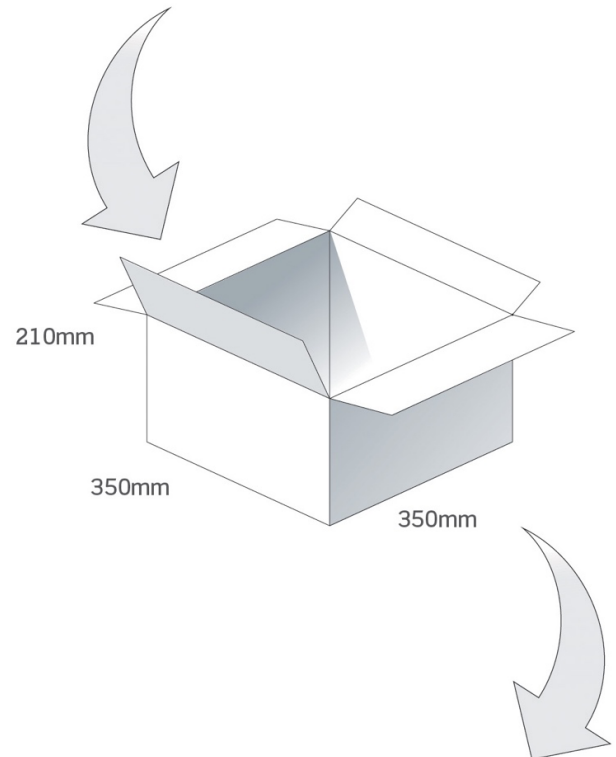
Pocket Dimensions(unit: mm)

Feature	Specifications	Tolerances
Ao	3.40	±0.10
Bo	10.20	±0.10
Ko	0.70	±0.10
t	0.30	±0.05

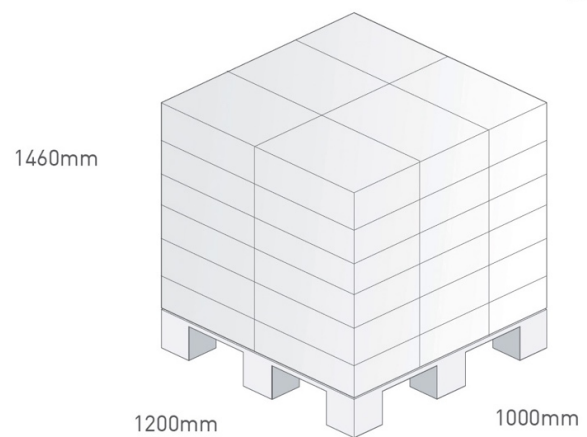
6000 pcs ILA.01 reel
Dimensions - 420*380mm
Weight -1050g



6 reels, 36000pcs
in one carton
Carton Dimensions - 350*350*210mm
Weight - 7.1Kg



Pallet Dimensions 1200*1000*1460mm
36 Cartons per Pallet
6 Cartons per layer
6 Layers



Changelog for the datasheet

SPE-12-8-079 – ILA.01

Revision: G (Current Version)	
Date:	2021-10-28
Changes:	Format Change, MSL
Changes Made by:	Erik Landi

Previous Revisions

Revision: F	
Date:	2017-10-23
Changes:	Packing drawing updated
Changes Made by:	Carol Faughnan

Revision: A (Original First Release)	
Date:	2012-05-08
Notes:	Initial Release
Author:	STAFF

Revision: E	
Date:	2017-04-21
Changes:	
Changes Made by:	STAFF

Revision: D	
Date:	2016-09-12
Changes:	
Changes Made by:	STAFF

Revision: C	
Date:	2014-08-19
Changes:	EVB & Footprint
Changes Made by:	AINE DOYLE

Revision: B	
Date:	2012-06-27
Changes:	
Changes Made by:	STAFF



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