

Datasheet



Low Profile and High Efficiency 868 MHz ISM Band Loop Antenna

Part No:
ILA.02

Description:

868 MHz ISM Band Loop Antenna

Features:

Small size antenna, low profile, and high efficiency
868 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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QUALITY MANAGEMENT SYSTEM
IATF16949

1. Introduction



The ILA.02 is a 868 MHz ISM band antenna featuring an excellent efficiency of 60% across the band. 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.02 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.02 is the ideal choice.

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:

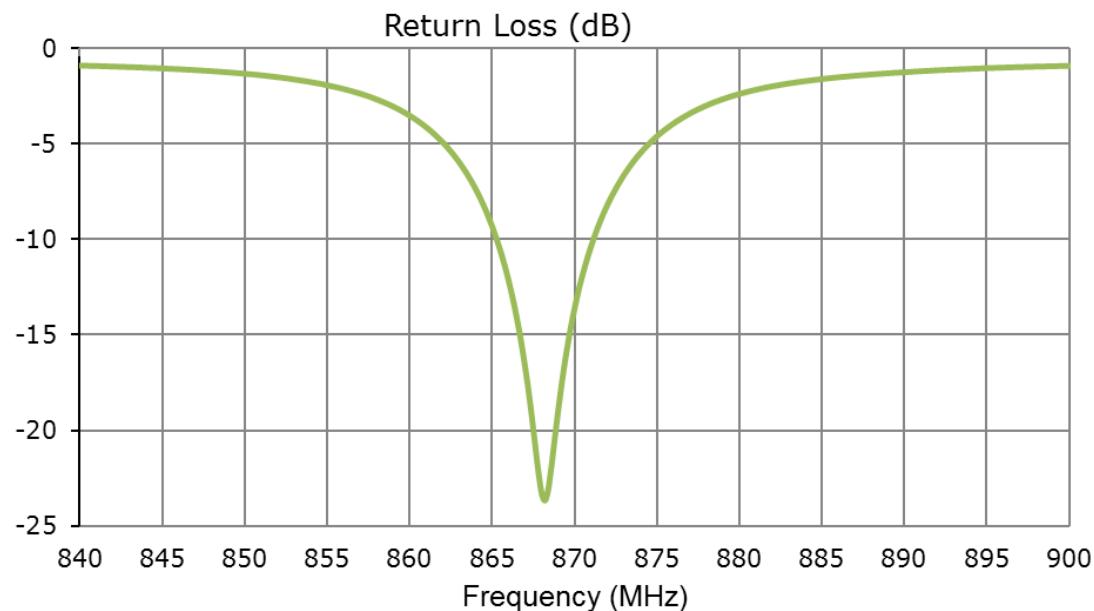
- Automated Meter Reading (AMR)
- Radio Frequency Identification (RFID)
- Remote Monitoring
- Healthcare
- Sensing
- 868 MHz Applications

2. Specifications

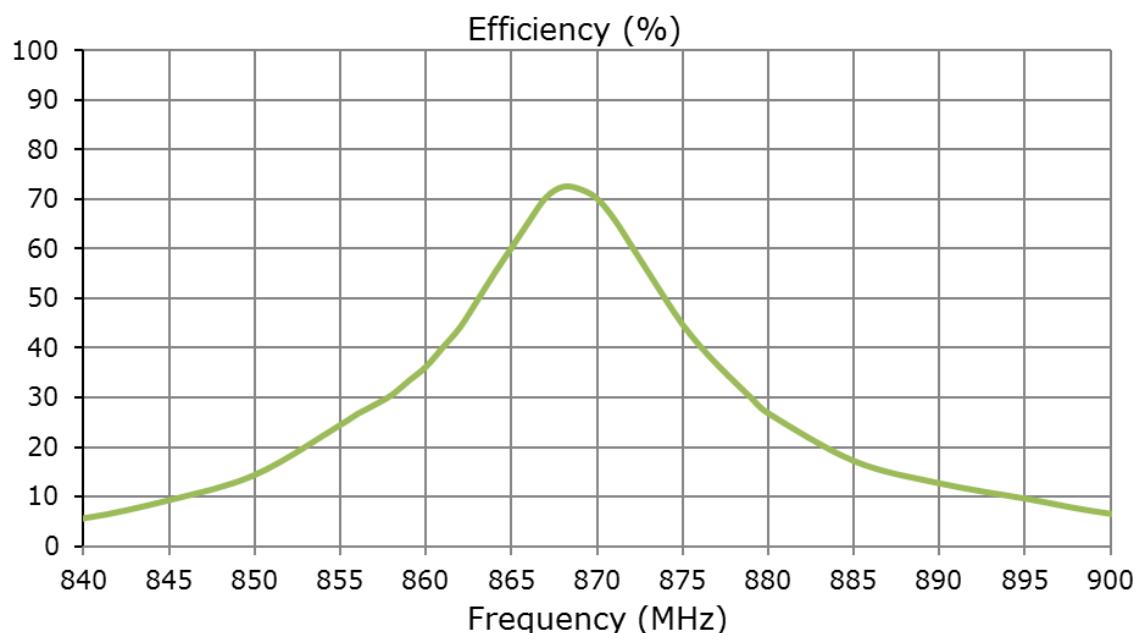
Antenna	
Frequency (MHz)	868-870 MHz (ISM)
Efficiency (%)	
80 x 40 mm Ground Plane	70 (typical)
Average Gain (dB)	
80 x 40 mm Ground Plane	-1.5 dB
Peak Gain (dBi)	
80 x 40 mm Ground Plane	1.5 dBi
Max Return Loss (dB)	-10 dB
VSWR	2:1
Impedance (Ω)	50 Ω
Polarization	Linear
Radiation Pattern	Omni
Input 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

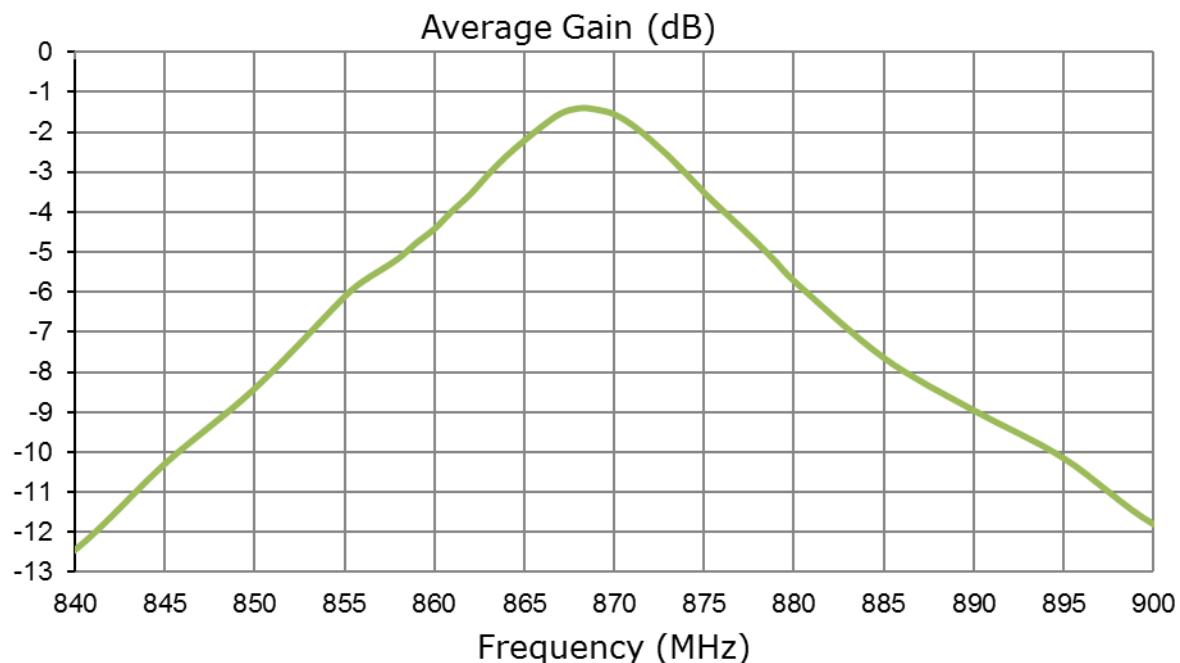
3.1 Return Loss



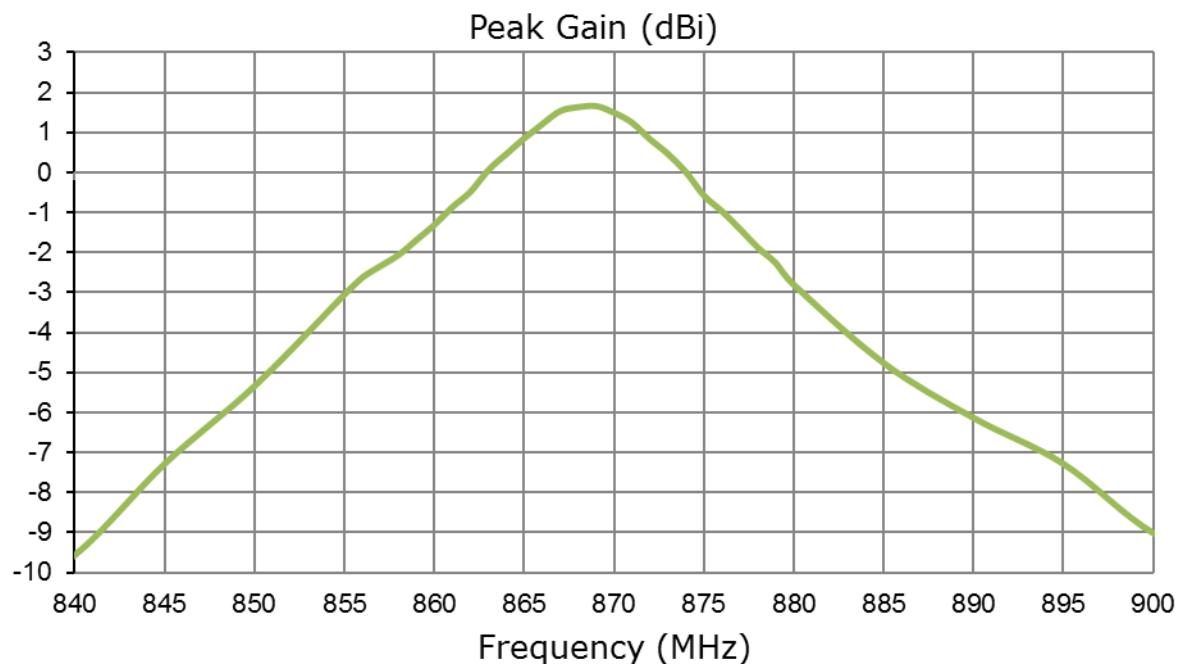
3.2 Efficiency



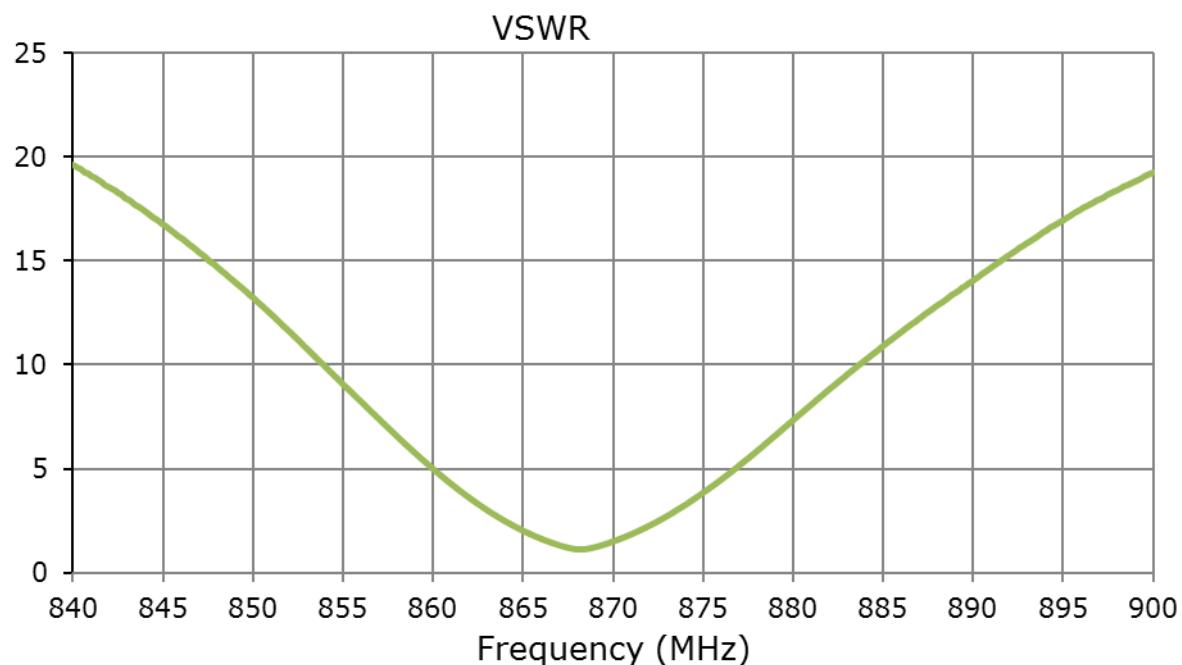
3.3 Average Gain



3.4 Peak Gain

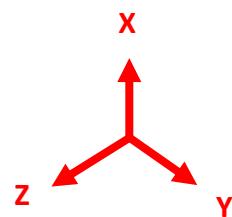
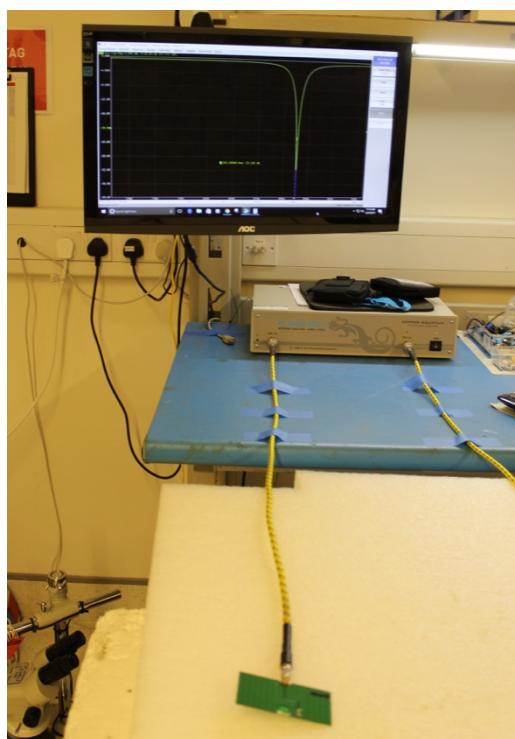
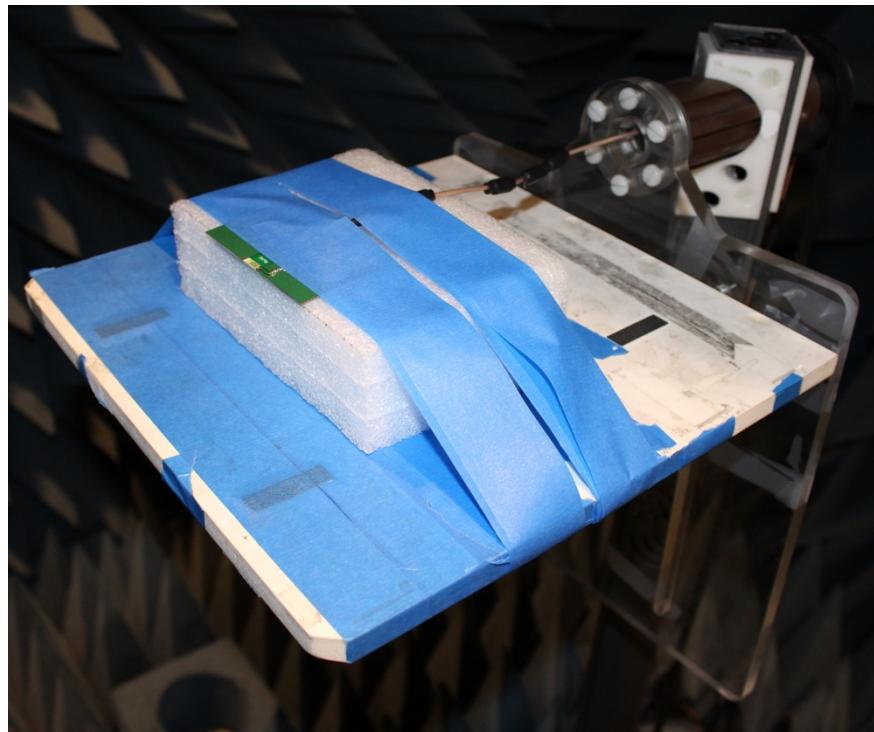


3.5 VSWR



4. Radiation Patterns

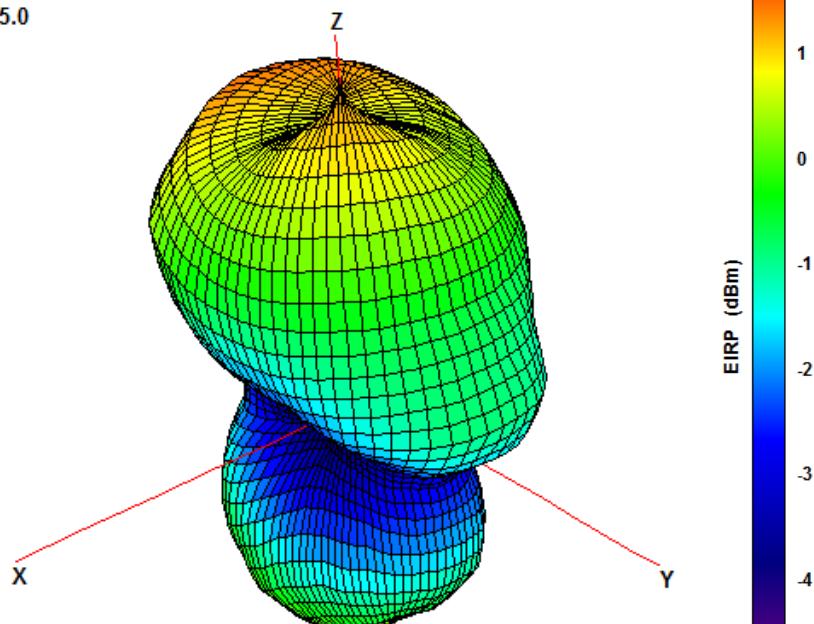
4.1 Test Setup – Antenna on Evaluation Board



4.3 3D Radiation Pattern

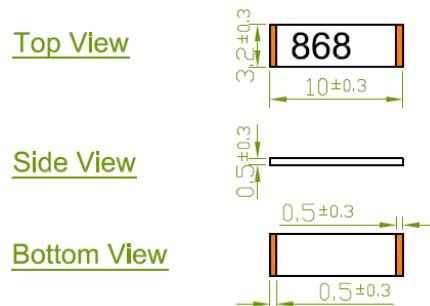
868 MHz

Azimuth = 120.0
Elevation = -45.0
Roll = -45.0



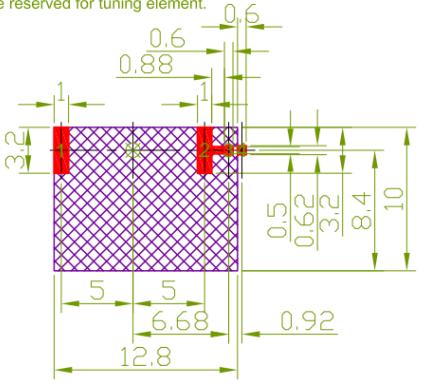
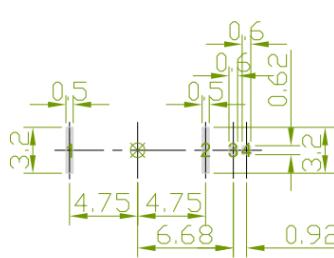
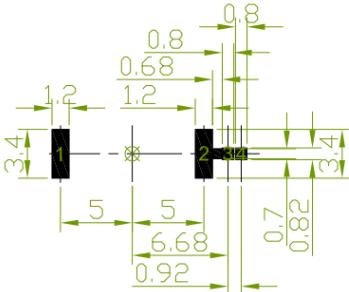
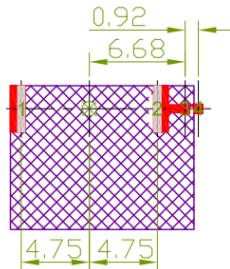
5. Mechanical Drawing – Antenna

5.1 Antenna Dimension and Drawing



Unit: mm

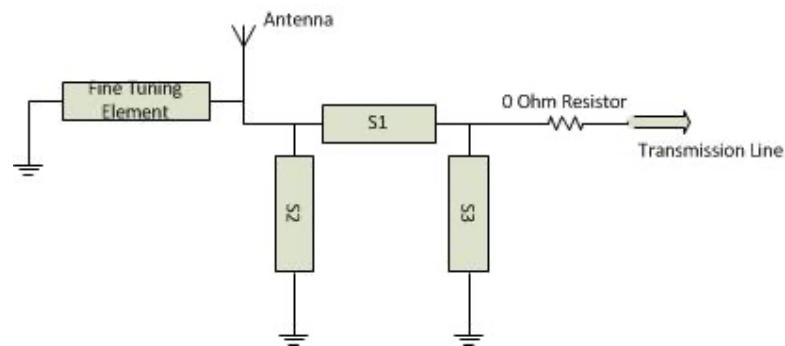
5.2 Antenna Footprint

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> 	
<p>This drawing is a negative of solder mask. Black regions are anti-mask.</p> 	<p>Composite Diagram</p> 
<p>NOTE:</p> <ul style="list-style-type: none"> 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.

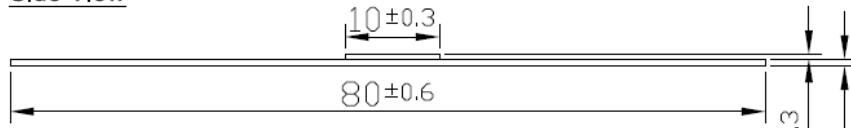
5.2 Matching Circuit

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 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 pigtails to make measurements with a vector network analyzer.

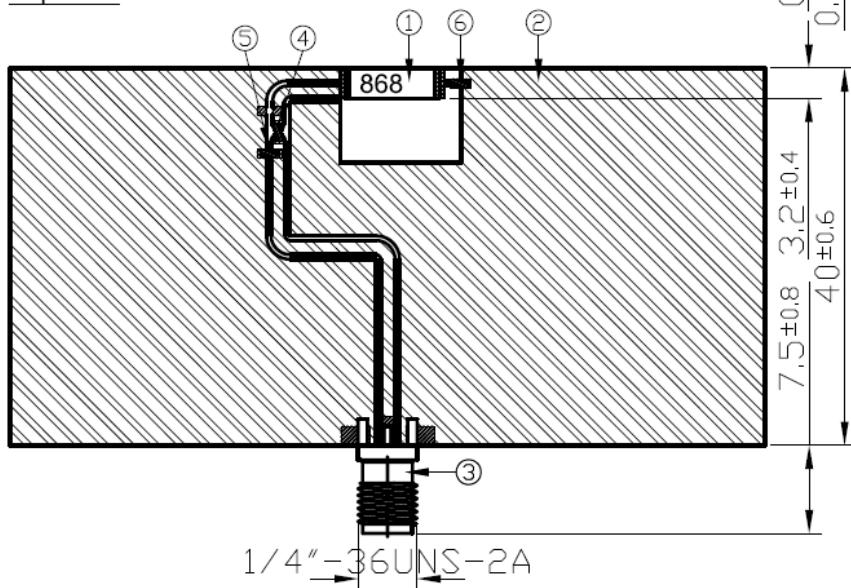


6. Mechanical Drawing – Evaluation Board

Side View



Top View

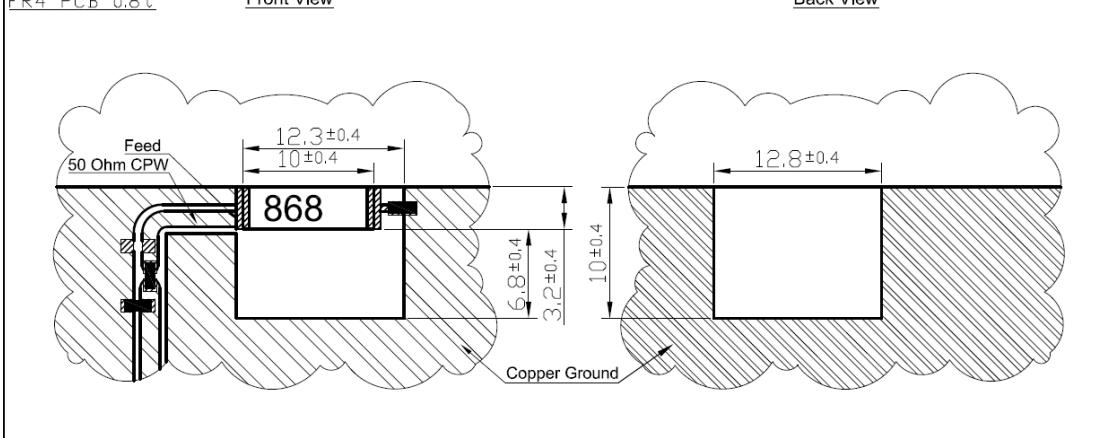


Foot Print

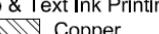
FR4 PCB 0.8t

Front View

Back View



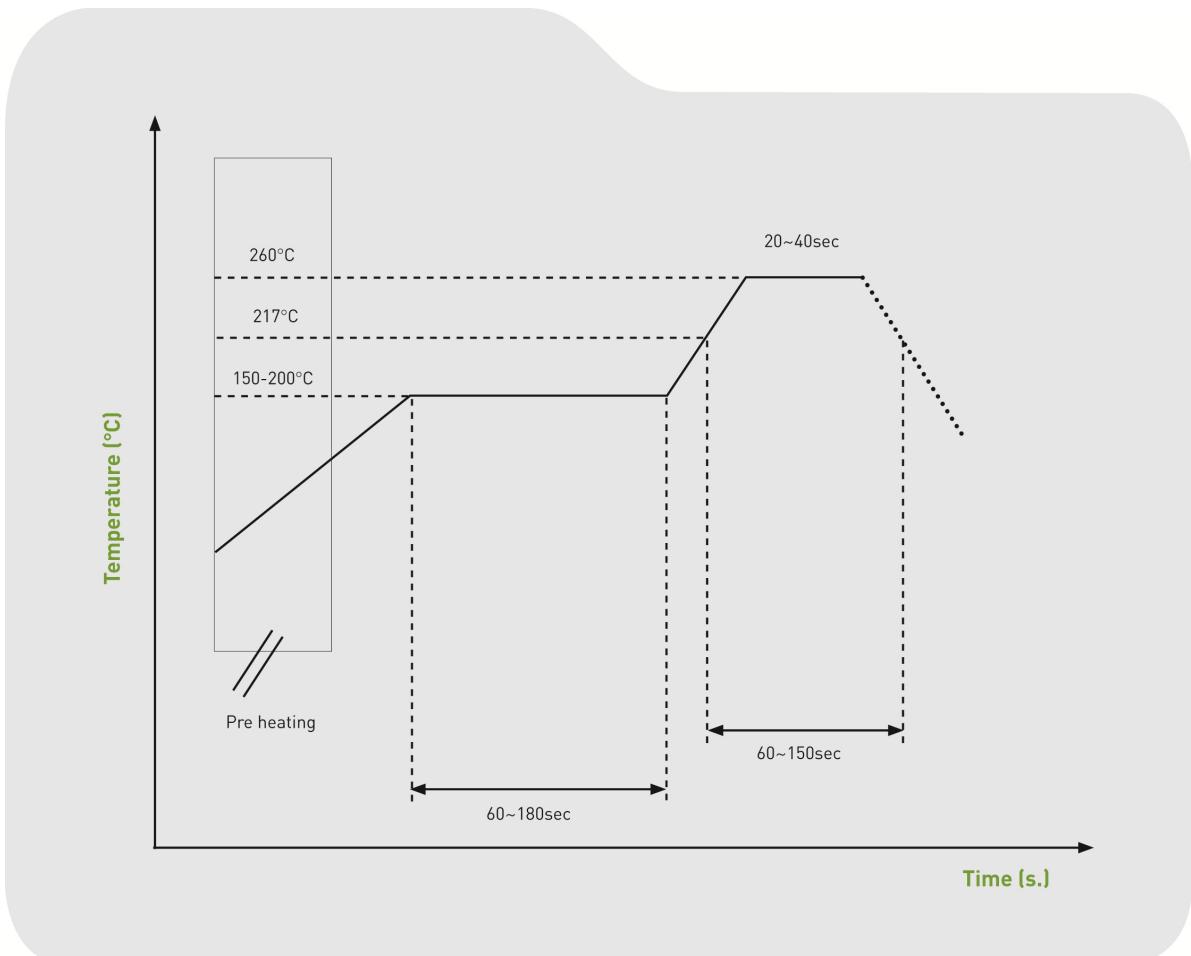
NOTES:

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

	Name	P/N	Material	Finish	QTY
1	ILA.02 Antenna	001513C000012A	Ceramic	N/A	1
2	ILA EVB Board	100213F000012A	FR4 0.8t	Green	1
3	SMA(F) ST	200413F000012A	Brass	Gold	1
4	Resistor 0Ω (0402)	001511J010012A	Ceramic	N/A	1
5	Capacitor 5pF (0402)	001514F030012A	Ceramic	N/A	1
6	Capacitor 15pF (0402)	001514F040012A	Ceramic	N/A	1

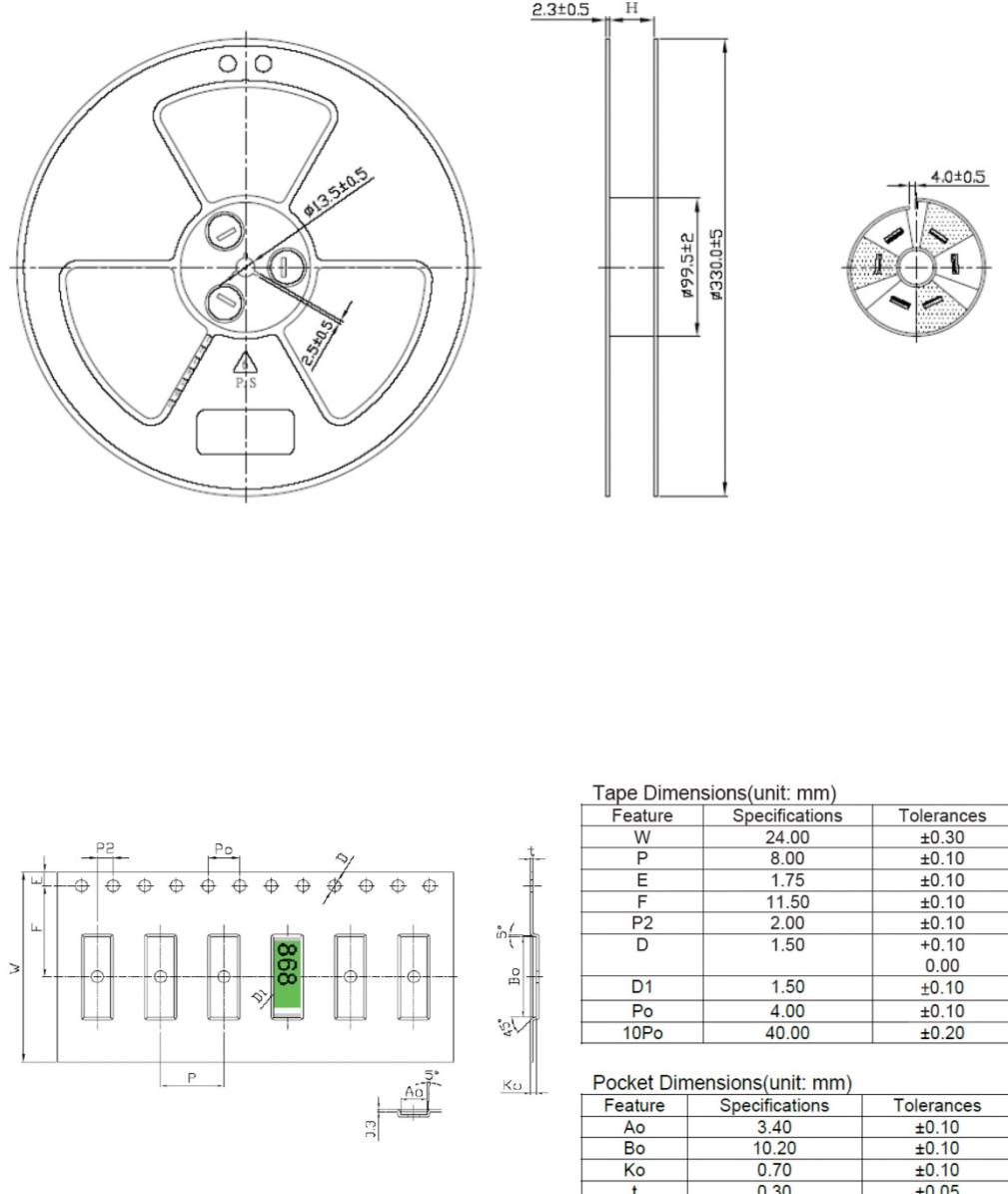
7. Soldering Conditions

Typical Soldering profile for lead-free process:

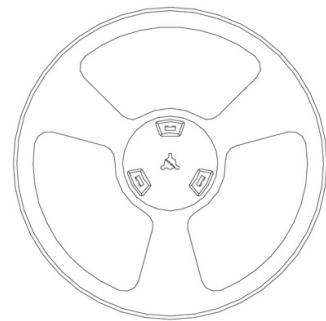


9. Packaging

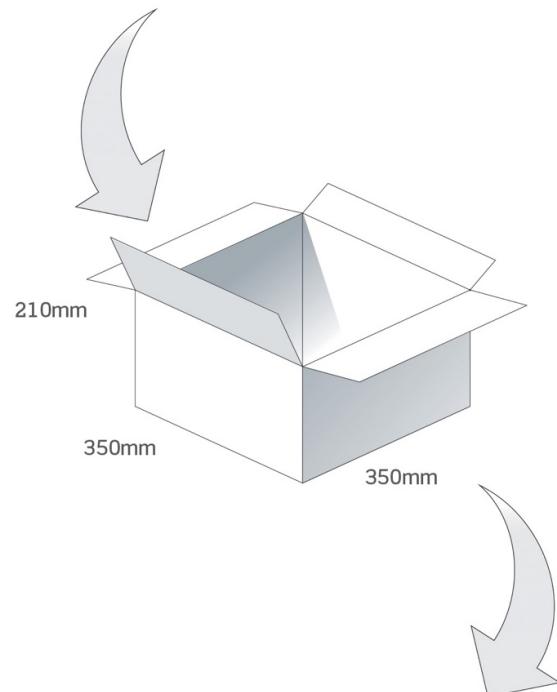
6000 pcs ILA.02 reel
 Dimensions - 420*380mm
 Weight -1030g



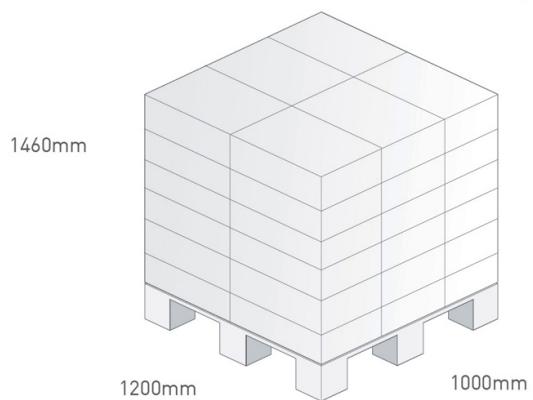
6000 pcs ILA.02 reel
 Dimensions - 420*380mm
 Weight - 1030g



6 reels, 36000pcs
 in one carton
 Carton Dimensions - 350*350*210mm
 Weight - 7Kg



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



Changelog for the datasheet

SPE-12-8-080- ILA.02

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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