

SWD027

PN: SZ23399IA54



Key Features:

- Frequency for 433MHz
- SMD Compliant
- Ceramics
- Impedance 50 Ohm

Typical Applications:

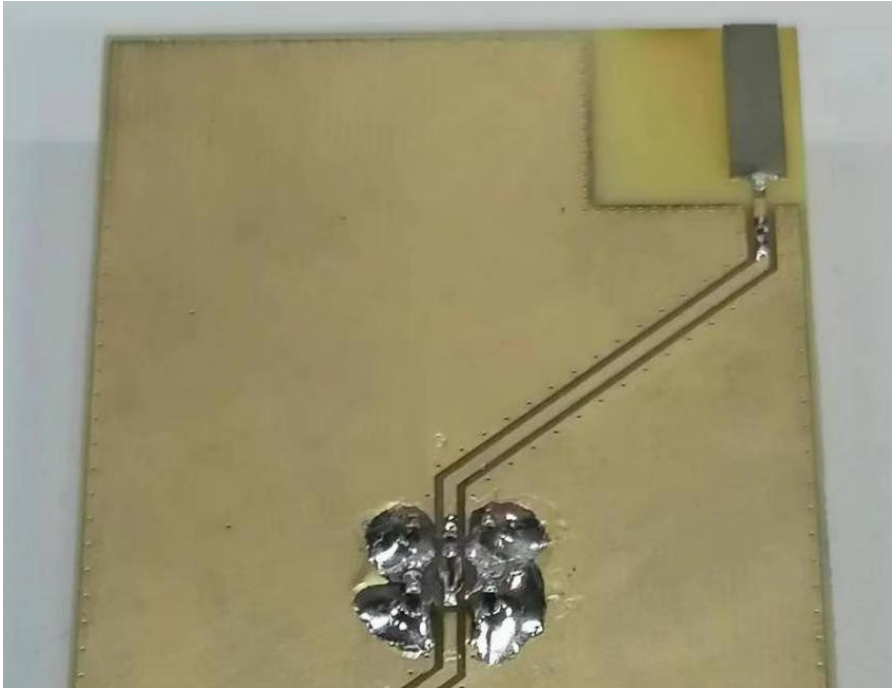
- Home safety and alarm
- Home automation
- Metering
- Industrial control
- Others

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1. Introduction



The Sunnyway SWD027 is a 433MHz ceramic SMD antenna

SWD027 is a suitable antenna for systems such as home security and alarm, home automation, metering, remote control, industrial control, and other 433MHz applications

Typical applications:

- Home safety and alarm
- Home automation
- Metering
- Industrial control
- Others

Contact Sunnyway Customer Support Team for quick and professional support from our senior engineering team on integration and matching of the antenna to your device.

2. Specification

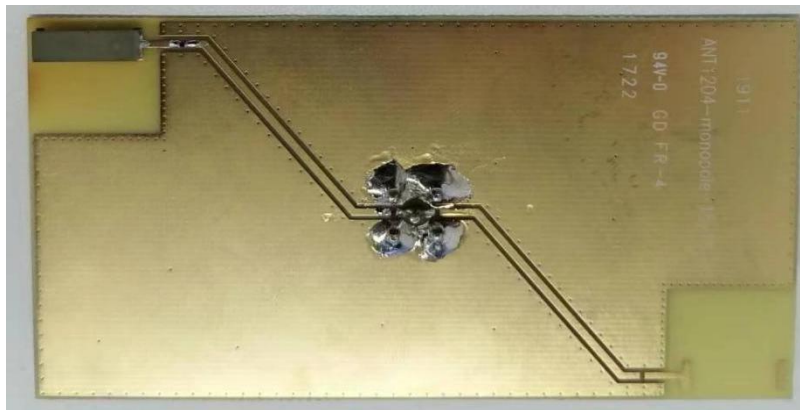
Electrical			
Standards	ISM-433MHz		
Frequency range (MHz)	431	433	435
Peak Gain (dBi)	-0.58	-0.47	-1.32
Average Gain (dB)	-4.81	-4.51	-5.09
VSWR	1.42	1.45	1.89
Return Loss	-15.23	-14.81	-10.18
Efficiency (%)	33.06	35.36	30.98
Polarization mode	Linear		
Radiation pattern	Omni-Directional		
Output impedance (Ω)	50		
Max. Input Power(W)	5		

All parameters are measured with Sunnyway's EVK

Mechanical	
Mounting Type	SMD
Antenna size(mm)	12.0(L) x 4.0(W) x 1.6(H)
Material	Ceramics
Environmental	
Operating Temperature (°C)	- 20 °C ~ + 65 °C
Storage Temperature(°C)	-20 °C ~ + 65 °C

3. Antenna Characteristics

3.1 Test Setup

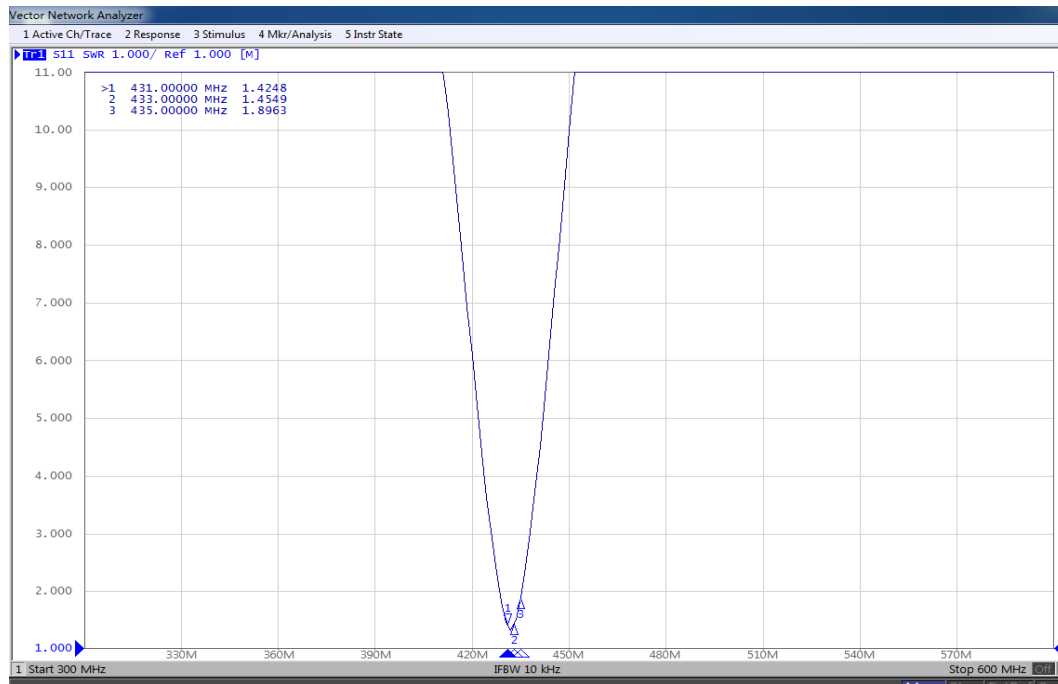


Sunnyway's EVK

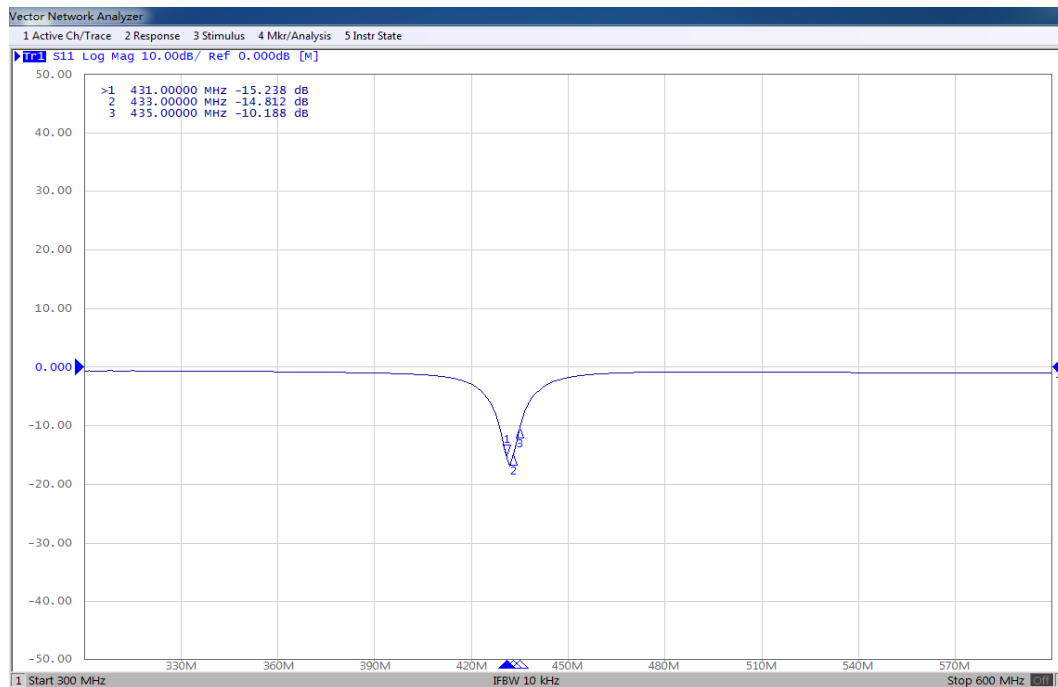
3.2 General Data

FRE (MHz)	431	433	435
VSWR	1.42	1.45	1.89
Return Loss	-15.23	-14.81	-10.18
Eff (%)	33.06	35.36	30.98
Peak Gain (dBi)	-0.58	-0.47	-1.32

3.3 VSWR



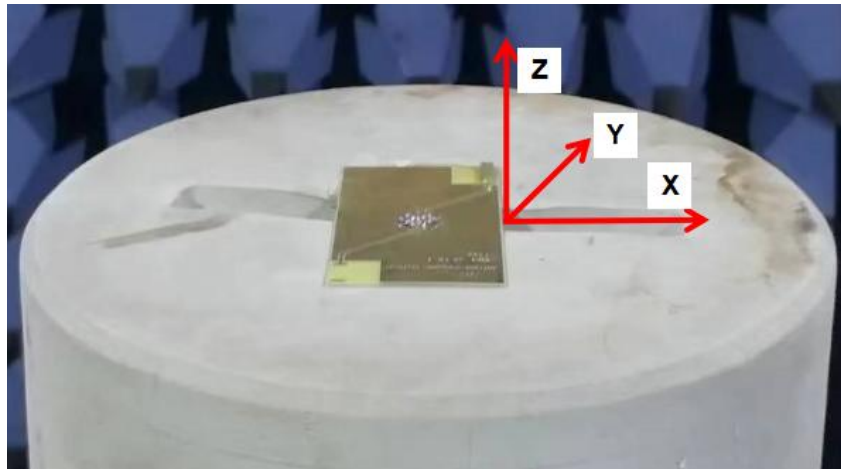
3.4 Return Loss



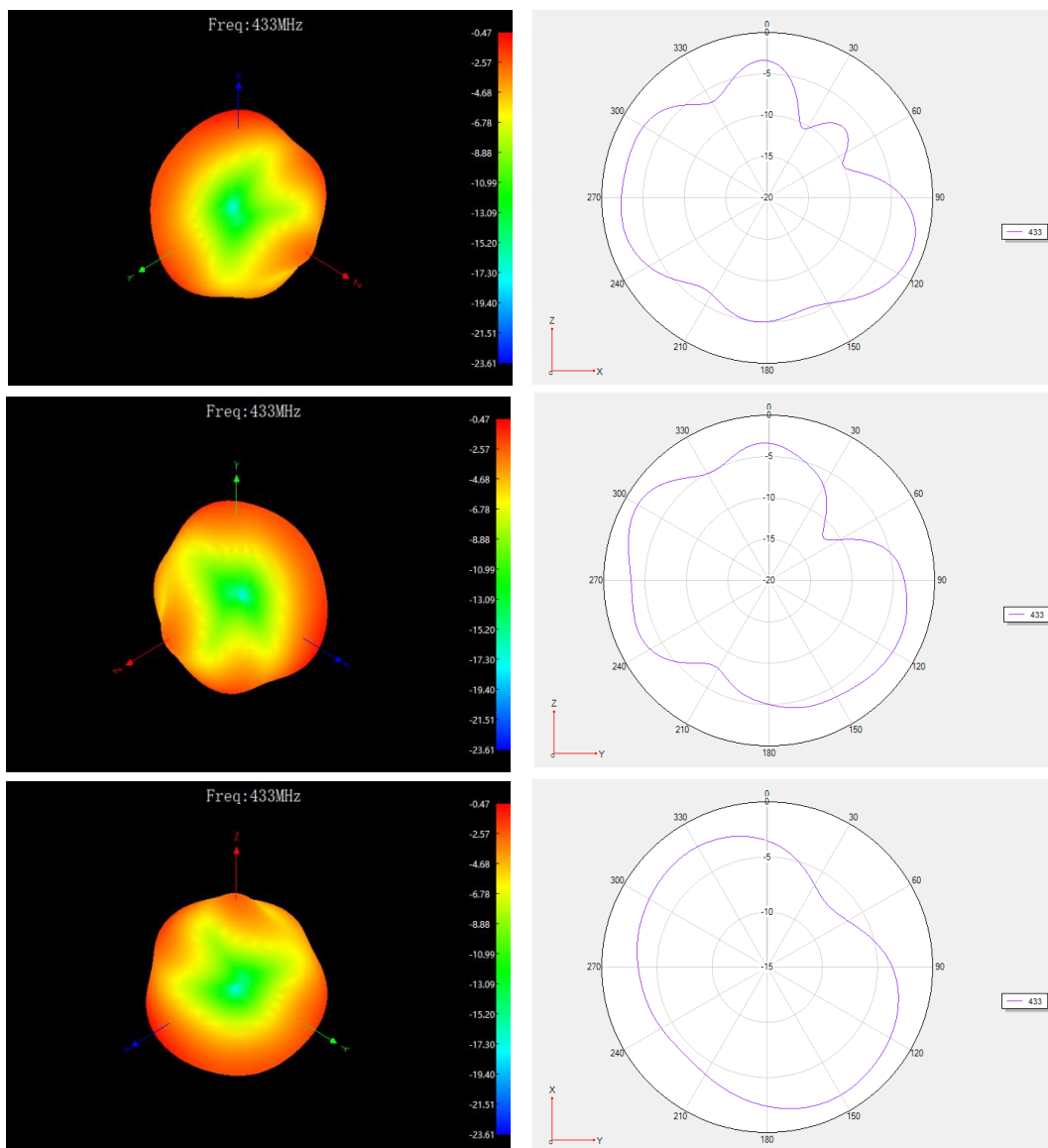
3.5 Efficiency and Gain

Frequency/Mhz	Efficiency / %	Efficiency / dB	MaxGain/dBi
420	17.74	-7.51	-4.79
421	17.47	-7.58	-4.91
422	18.61	-7.30	-4.42
423	20.8	-6.82	-3.6
424	22.67	-6.45	-2.95
425	22.6	-6.46	-2.94
426	23.03	-6.38	-2.82
427	22.67	-6.45	-2.94
428	23	-6.38	-2.87
429	24.7	-6.07	-2.42
430	27.65	-5.58	-1.67
431	33.06	-4.81	-0.58
432	35.25	-4.53	-0.16
433	35.36	-4.51	-0.47
434	30.44	-5.17	-1
435	30.98	-5.09	-1.32
436	26.18	-5.82	-2.33
437	24	-6.20	-2.83
438	23.35	-6.32	-2.88
439	21.22	-6.73	-2.75
440	20.3	-6.93	-2.84

4. Radiation Patterns



433MHz 3D and 2D Radiation Patterns

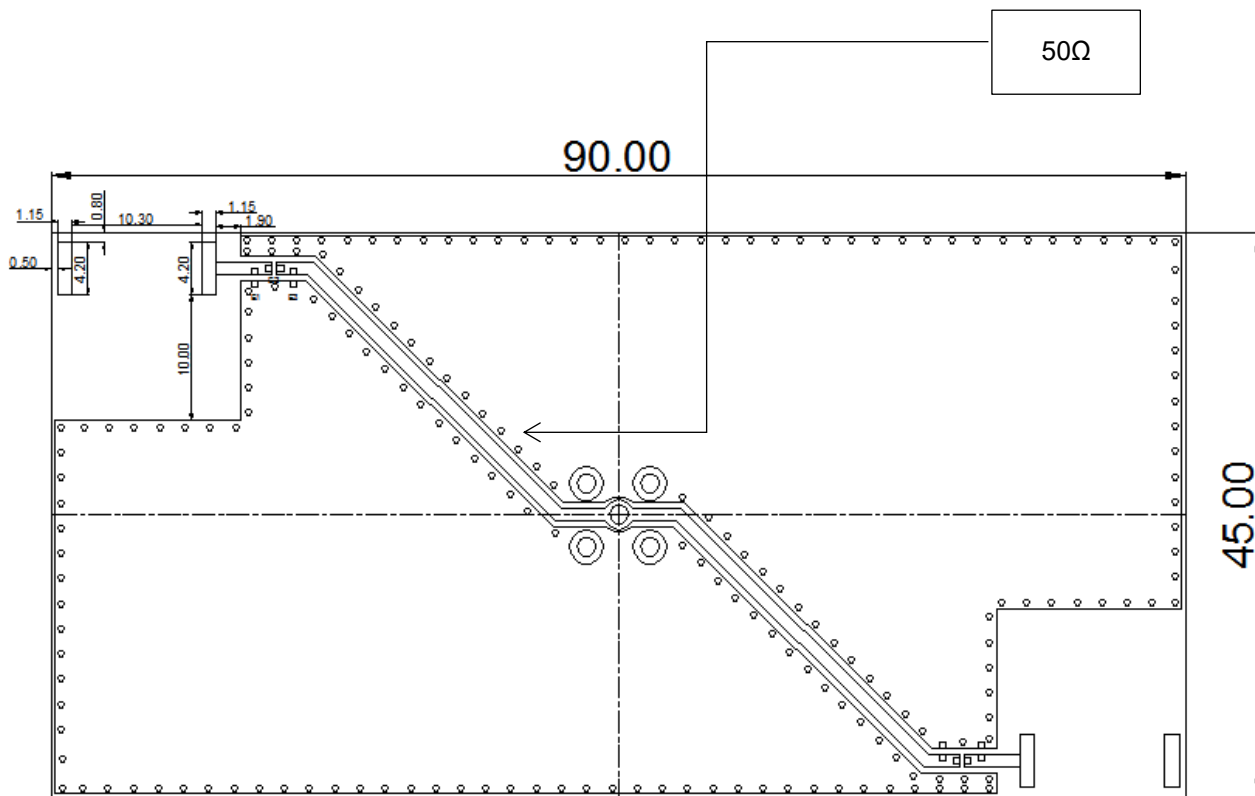


5. Integration Guide

5.1 Transmission Line

The characteristic impedance of all transmission lines shall be designed as 50 Ω .

- The length of the transmission lines should be kept to as short as possible
- Any other part of the RF system, such as transceiver, power amplifiers, etc., shall also be designed with an impedance of 50 Ω



5.2 Schematic symbol and Pin definition

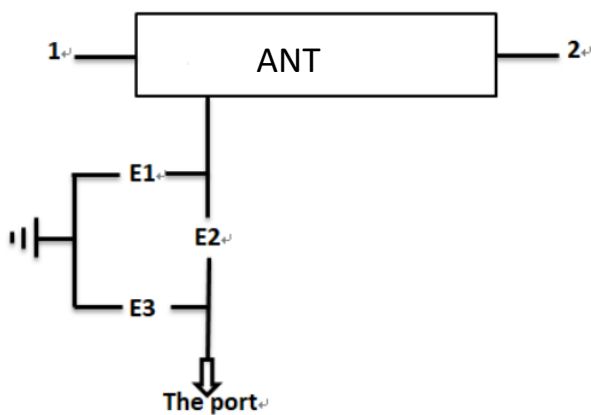
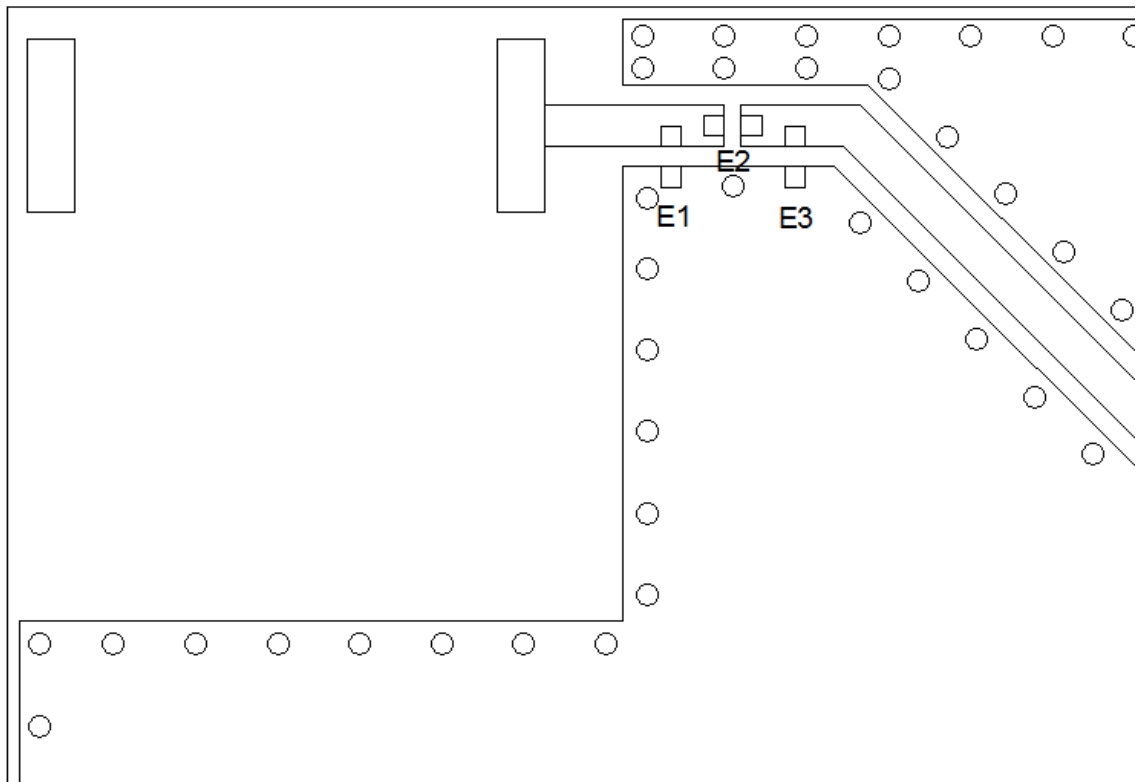
The pin assignment for the SWD027 antenna are as follows. The antenna has 2 pins and only one work. All other pins are designed for mechanical strength.



Pin No.	Description
1	Feed
2	Not used (Mechanical only)

5.3 Matching Circuit

The antenna requires a matching circuit that must be optimized for each product. The matching circuit will require up to three components and the following circuit should be designed into the host PCB. Not all components may be required but should be included as a precaution. The matching network must be placed close to the antenna feed to ensure it is more effective in tuning the antenna.

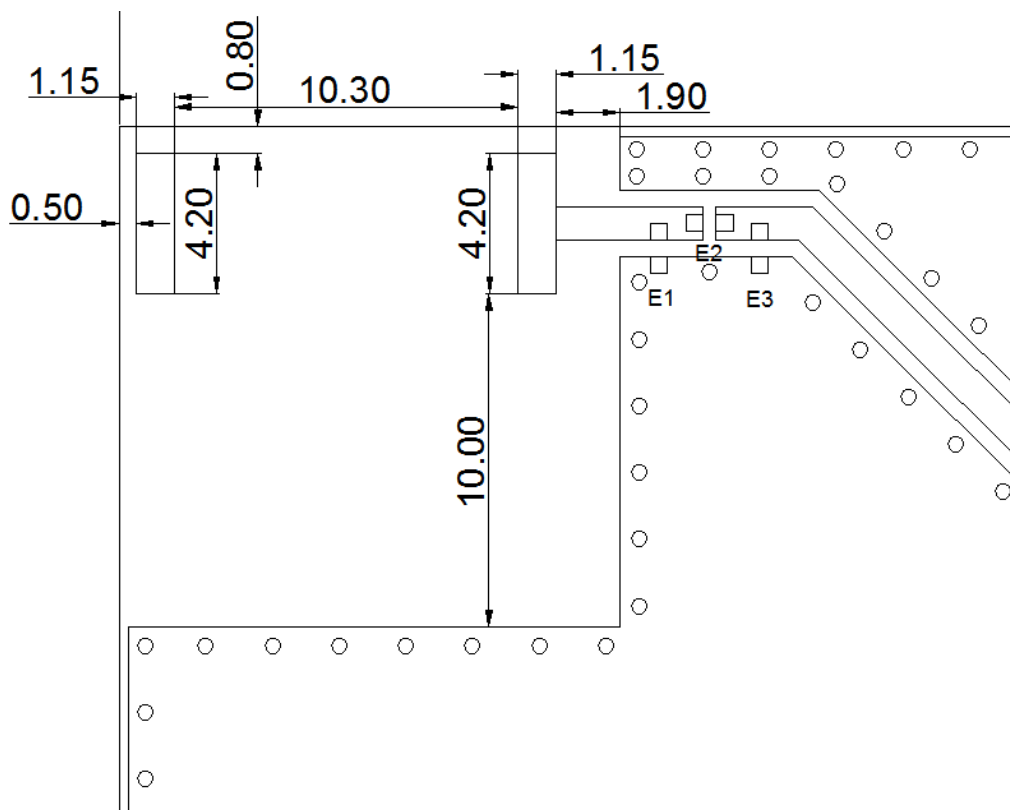
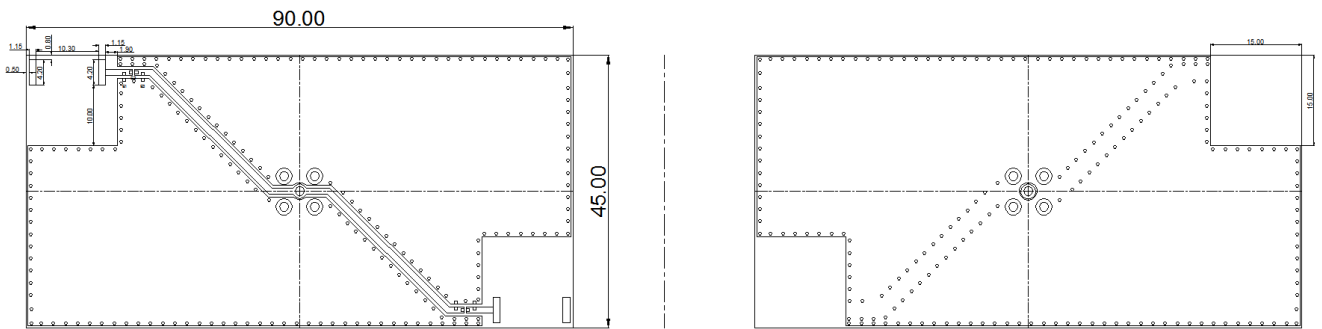


Pin No.	Value
E1	N/A
E2	0Ω
E3	N/A

Below shows the antenna footprint and clearance through ALL layers on the PCB. Only the antenna pads and connections to feed and GND are present within this clearance area. This clearance area includes the bottom side and ALL internal layers on the PCB.

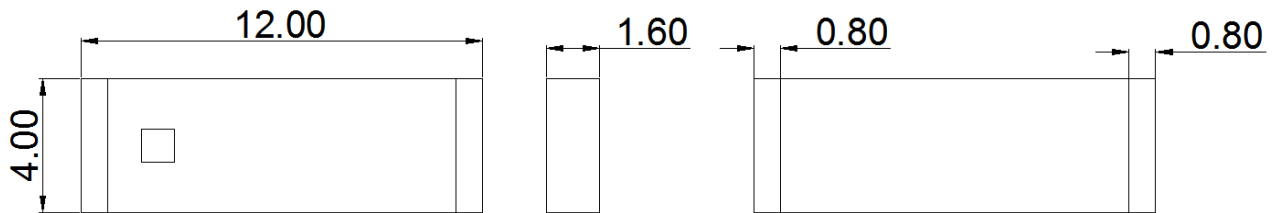


5.5 Evaluation Kit



6. Antenna Drawing

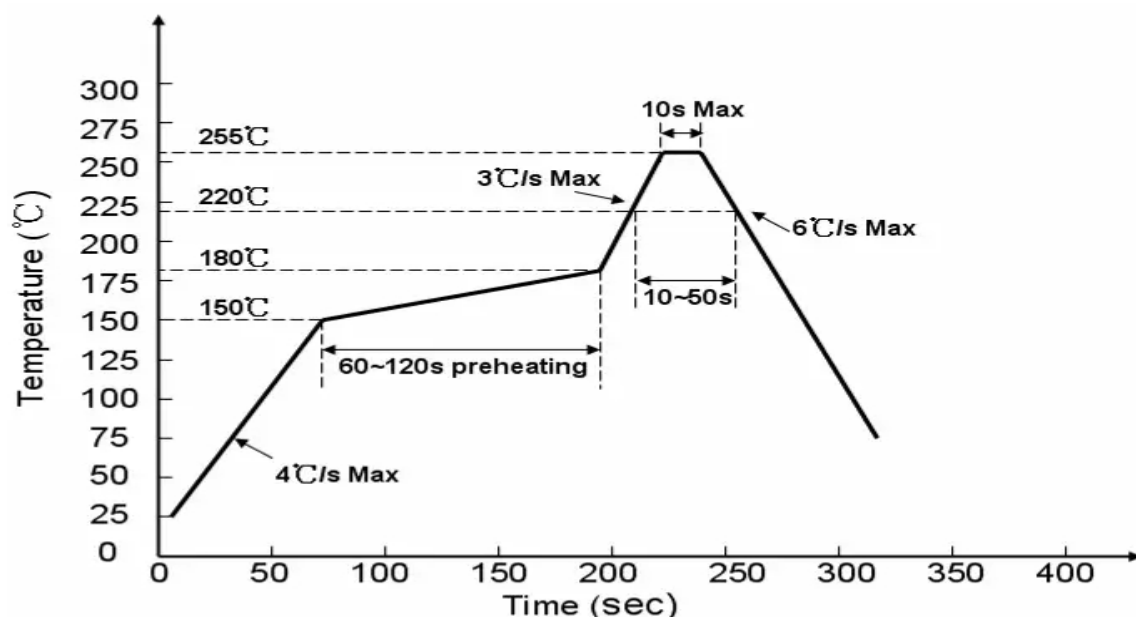
Unit: mm



7. Soldering Temperature

PHASE	PROFILE FEATURES	PB-Free Assembly(max.)
RAMP-UP	Avg.Ramp-up Rate(Tsmax to Tp)	3°C/second(max.)
PREHEAT	Temperature Min(Tsmin) Temperature Max(Tsmax) Time(tsmin to tsmax)	150°C 180°C 120seconds max
REFLOW	Temperature(TL) Total Time above TL(tl)	210°C 50seconnds max
PEAK	Temperature(Tp) Time(tp)	260°C 10seconnds max
RAMP-DOWN	Rate	5°C/second max

8. Reflow Profile



Changelog for the datasheet			
Revision	Date	Author:	Notes:
V0	2024-08-08	Kevin LV	Initial Datasheet Release
V1	2025-05-29	Kevin LV	Update text formatting, titles, fonts, etc