



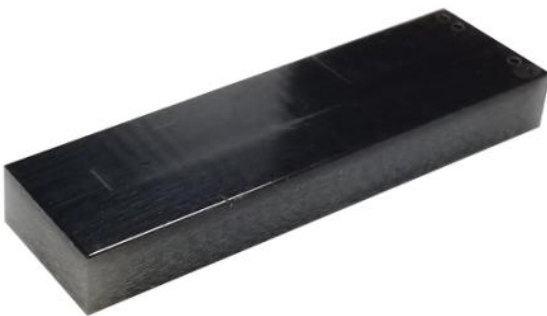
SUNNYWAY

SWD012

PN: SW20018IB66

Features:

- Frequency bands from 824 – 960 MHz 1710 – 2170 MHz .
- SMD Compliant.
- Impedance 50 Ohm.
- Size 26 x 7.65 x 3 mm.



Applications:

- 2G/3G Cellular antenna.
- GPRS.
- Nb-IoT, LTE Cat M1.

Sunnyway Technology

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1. Electrical Specifications

Standards	2G&3G	
Frequency range (MHz)	824~960MHz	1710~2170MHz
Peak Gain (dBi)	-1.3~0.5	1.8~5.0
Average Gain (dB)	-5.2~-3.1	-3.0~-1.6
VSWR	< 3.3	< 2.3
Return Loss	< -5.5	< -8.0
Efficiency (%)	30~49	50~70
Polarization mode	Linear	Linear
Radiation pattern	Omni-Directional	Omni-Directional
Output impedance (Ω)	50	50
Max. Input Power(W)	5	5

Note:

All parameters are measured with Sunnyway's EVK which size is 110*50mm

2. Mechanical and Environmental Specification

Mounting Type	SMD
Antenna size(mm)	26.0 (L) x 7.65 (W) x 3.0 (H)
Material	PCB
Operating Temperature ($^{\circ}\text{C}$)	- 40 $^{\circ}\text{C}$ ~ + 85 $^{\circ}\text{C}$
Storage Temperature($^{\circ}\text{C}$)	- 40 $^{\circ}\text{C}$ ~ + 85 $^{\circ}\text{C}$

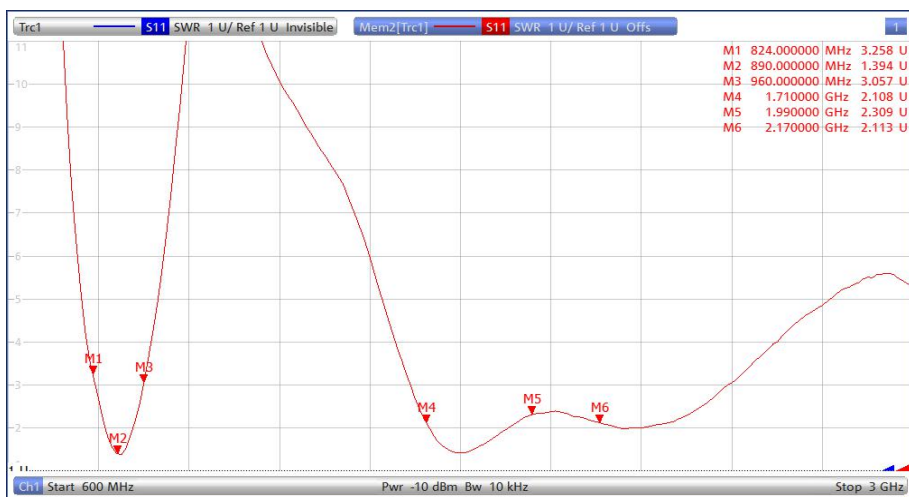


3. Antenna parameters

3.1 General Data

FRE (MHz)	824	890	960	1710	1990	2170
VSWR	3.25	1.39	3.05	2.10	2.30	2.11
Return Loss	-5.53	-15.67	-5.89	-8.98	-8.05	-8.93
Eff (%)	30.5	46.2	38.2	54.0	51.5	55.5
Average Gain(dB)	-5.2	-3.4	-4.2	-2.7	-2.9	-2.6

3.2 VSWR

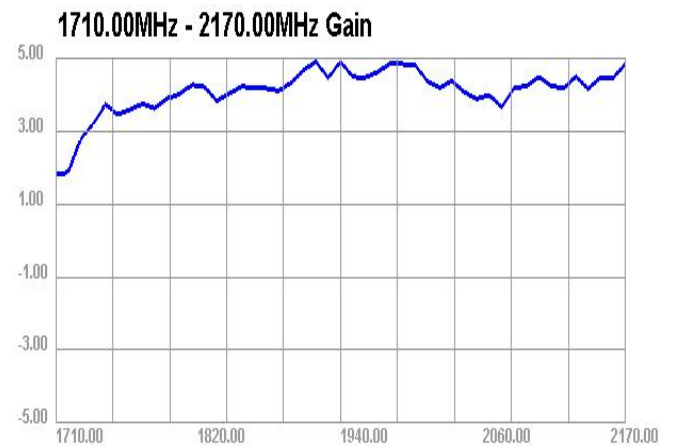
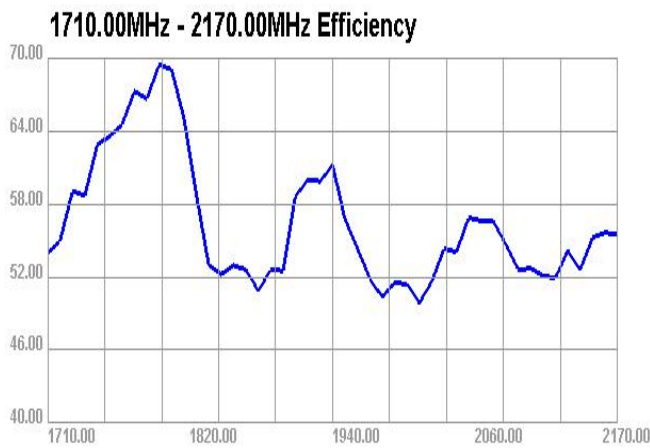
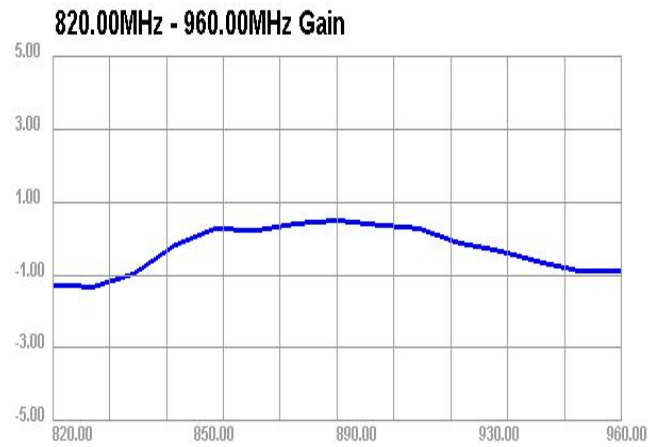
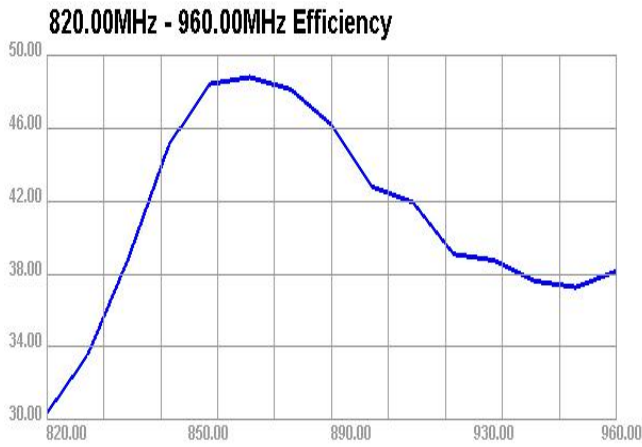


3.3 Return Loss


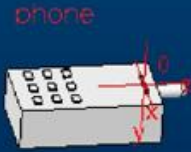
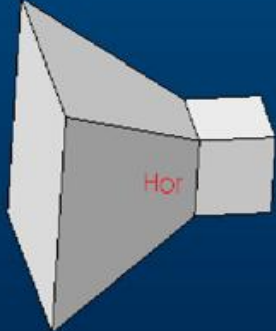




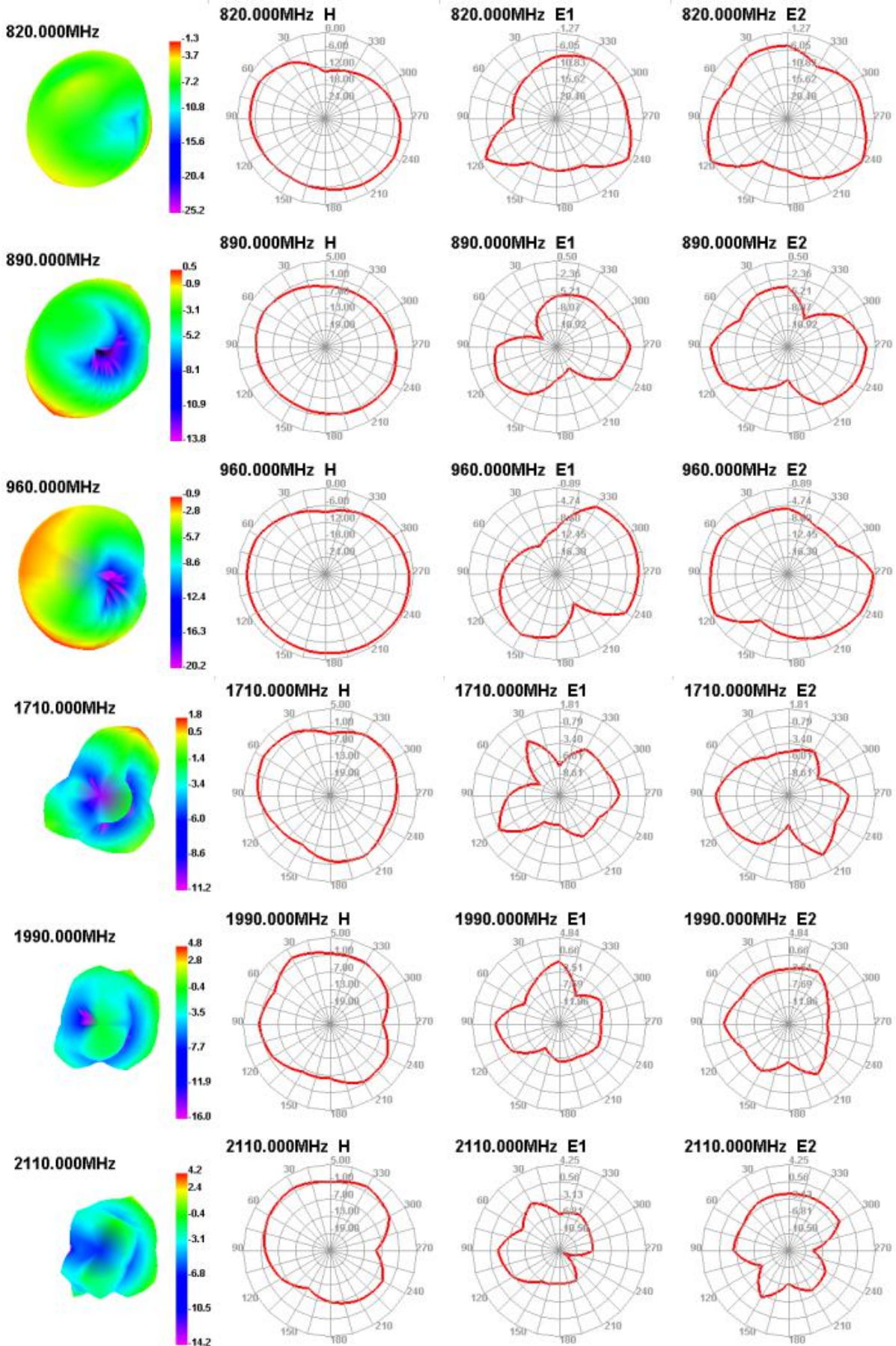
3.4 Efficiency and Gain



3.5 Directional pattern

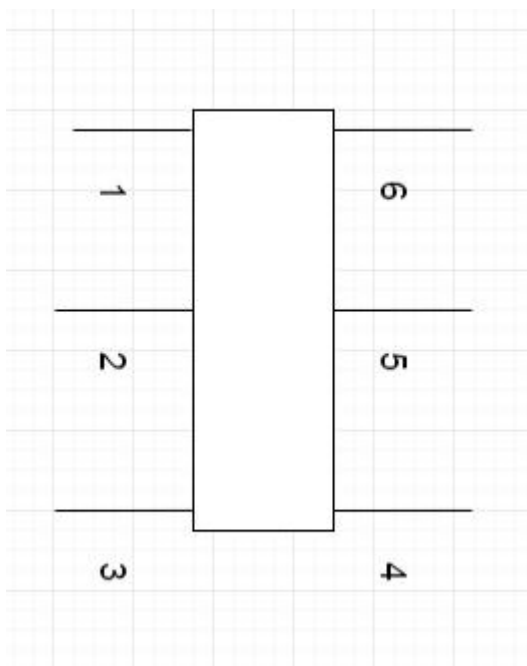
H plane: the tangent of XY
 E1 plane: the tangent of XZ
 E2 plane: the tangent of YZ





4. Schematic symbol and Pin definition

The pin assignment for the SWD012 antenna are as follows. The antenna has 6 pins and only two work. All other pins are designed for mechanical strength.



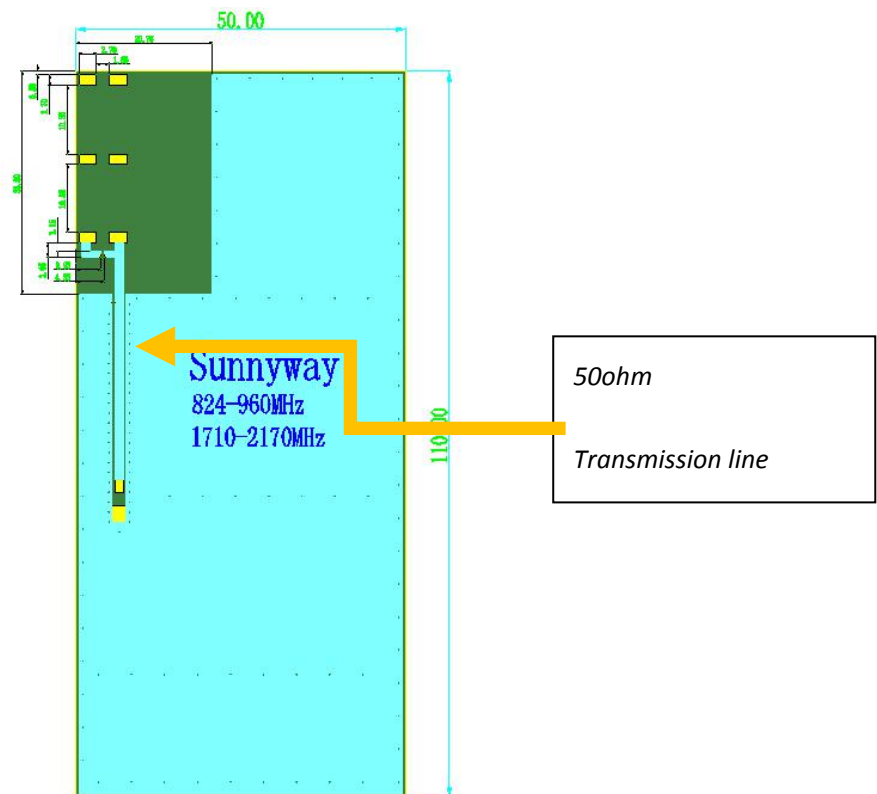
Pin No.	Description
3,4	Feed
1,2,5,6	Not used (Mechanical only)



5. Transmission Line

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

- 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
- All dimensions are in mm

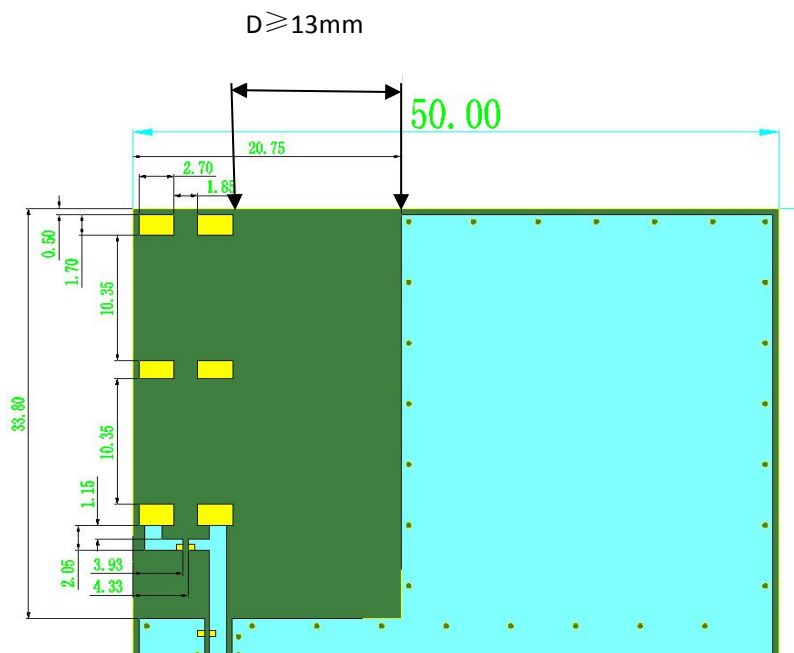




6. Host PCB Requirement

The printed circuit board of the host must ensure that the antenna clearance area meets the antenna specifications. It is suggested that putting the antenna in the corner of the PCB.

An example of a PCB layout shown as below:

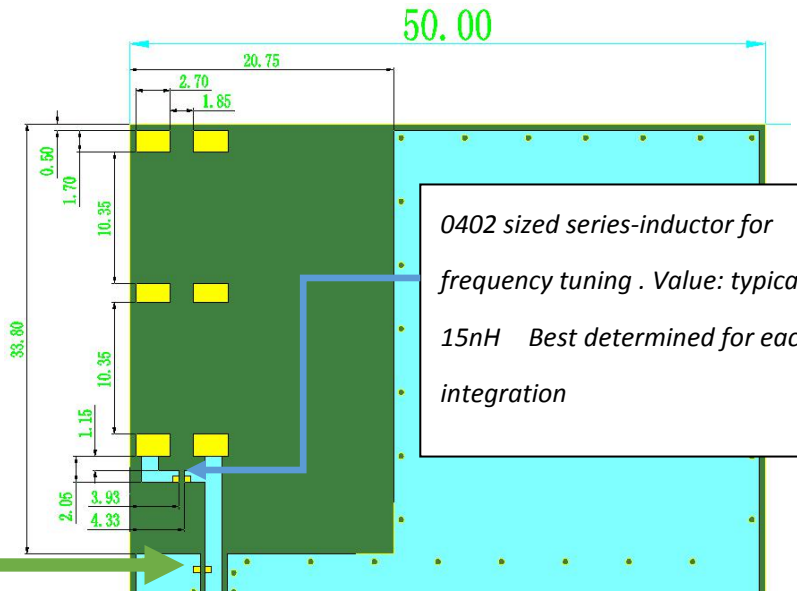


Gap D is required from the edge of the antenna to the ground plane. This should be maintained along the edge of the antenna placement, **minimum value is 13mm**.



7. Matching circuit

OPTIONAL
0402 sized shunt inductor/capacitor for impedance matching . Value best determined during integration.



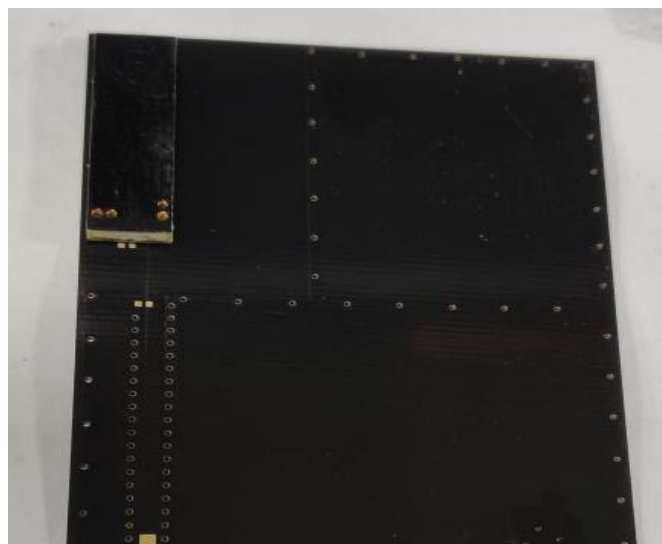
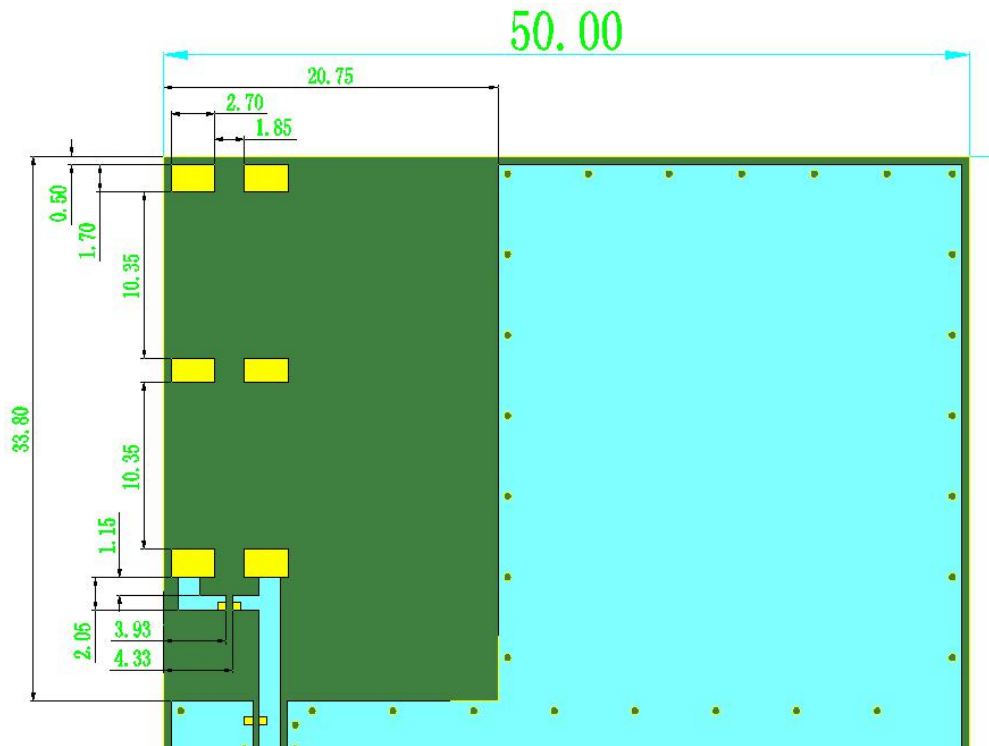
0402 15nH





8. Antenna Drawings

All dimensions are in mm





9. 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

10. Reflow Profile

