

SWD037

PN: SW25062IB16

Key Features:

- Frequency bands from 698~960MHz, 1710~2700MHz, 3300~4200MHz
- Support some 5G frequency bands
- SMD Compliant
- Impedance 50 Ohm



Typical Applications:

- Application of 5G/4G/3G/2G device
- LTE , NB-Iot, Cat M1, GNSS
- Portable Devices
- Remote monitoring
- Network Devices
- Wearable devices
- Smart Metering
- Payment Terminals
- Others

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1. Specifications

Electrical			
Standards	5G/4G/3G/2G/NB-IoT/CAT M1		
Frequency range (MHz)	698 ~ 960	1710 ~ 2170	3300 ~ 4200
Peak Gain (dBi)	-2.0 ~ 2.0	1.0 ~ 4.0	-0.3 ~ 1.4
Average Gain (dB)	-5.9 ~ -1.7	-3.7 ~ -1.8	-4.5 ~ -2.6
VSWR	< 6.0	< 3.5	< 3.5
Return Loss	< -3.0	< -5.0	< -5.0
Efficiency (%)	26.0 ~ 68.0	43.0 ~ 66.0	35.0 ~ 55.0
Polarization mode	Linear		
Radiation pattern	Omni-Directional		
Output impedance (Ω)	50		
Max. Input Power(W)	5		

Note:

All parameters are measured with Sunnyway's EVK which size is 150*36mm

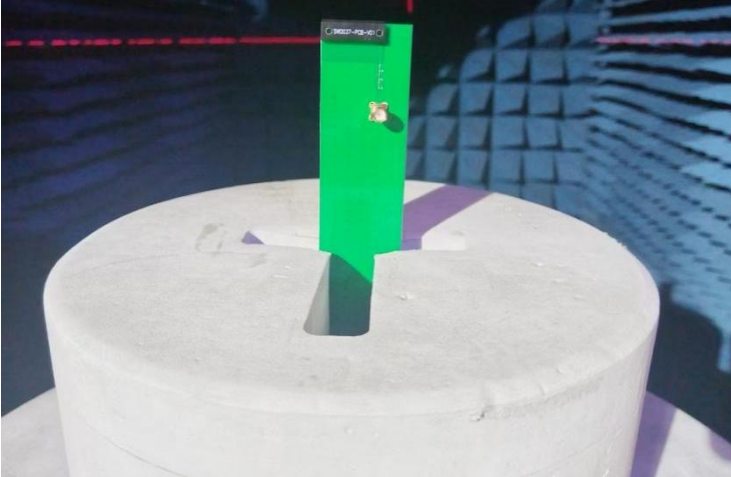
Mechanical	
Mounting Type	SMD
Antenna size(mm)	25.0 (L) x7.0 (W) x 3.0 (H)
Material	PCB
Weight (1 pcs)	1.09 g
Environmental	
Operating Temperature (°C)	- 40 °C ~ + 85 °C
Storage Temperature(°C)	- 40 °C ~ + 85 °C

5G/4G/3G/2G Standards Frequency Support Bands				
Band	Uplink (MHz)	Downlink (MHz)	Average Efficiency (%)	Use Indicator
1	UL: 1920 - 1980	DL: 2110 - 2170	52%	✓
2	UL: 1850 - 1910	DL: 1930 - 1990	61%	✓
3	UL: 1710 - 1785	DL: 1805 - 1880	63%	✓
4	UL: 1710 - 1755	DL: 2110 - 2155	55%	✓
5	UL: 824 - 849	DL: 869 - 894	64%	✓
7	UL: 2500 - 2570	DL: 2620 - 2690	56%	✓
8	UL: 880 - 915	DL: 925 - 960	58%	✓
10	UL: 1710 - 1770	DL: 2110 - 2170	55%	✓
11	UL: 1427.9 - 1447.9	DL: 1475.9 - 1495.9	/	✗
12	UL: 699 - 716	DL: 729 - 746	30%	✓
13	UL: 777 - 787	DL: 746 - 756	39%	✓
14	UL: 788 - 798	DL: 758 - 768	41%	✓
17	UL: 704 - 716	DL: 734 - 746	30%	✓
18	UL: 815 - 830	DL: 860 - 875	60%	✓
19	UL: 830 - 845	DL: 875 - 890	64%	✓
20	UL: 832 - 862	DL: 791 - 821	55%	✓
21	UL: 1447.9 - 1462.9	DL: 1495.9 - 1510.9	/	✗
22	UL: 3410 - 3490	DL: 3510 - 3590	49%	✓
23	UL: 2000 - 2020	DL: 2180 - 2200	50%	✓
24	UL: 1626.5 - 1660.5	DL: 1525 - 1559	/	✗
25	UL: 1850 - 1915	DL: 1930 - 1995	60%	✓
26	UL: 814 - 849	DL: 859 - 894	61%	✓
27	UL: 807 - 824	DL: 852 - 869	60%	✓
28	UL: 703 - 748	DL: 758 - 803	35%	✓
29	UL: N/A	DL: 717 - 728	21%	✓
30	UL: 2305 - 2315	DL: 2350 - 2360	29%	✓
32	UL: N/A	DL: 1452 - 1496	/	✗
33	1900 - 1920		60%	✓
34	2010 - 2025		48%	✓
35	1850 - 1910		64%	✓
38	2570 - 2620		56%	✓
39	1880 - 1920		61%	✓
40	2300 - 2400		46%	✓
41	2496 - 2690		56%	✓
42	3400 - 3600		49%	✓
43	3600 - 3800		48%	✓
48	3550 - 3700		48%	✓
66	UL: 1710-1780	DL: 2110-2200	54%	✓
71	617 - 698		/	✗
74/75/76	1427 - 1518		/	✗
77	3300 - 4200		46%	✓
78	3300 - 3800		50%	✓
79	4400 - 5000		/	✗

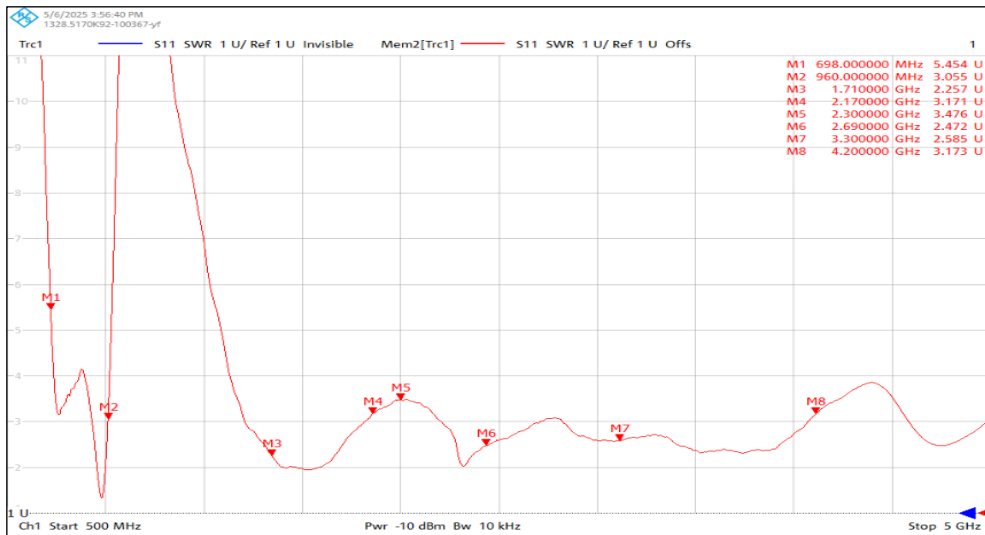
Note: the average efficiency is above 20%, it is judged as “✓”, otherwise it is determined as “✗” .

2. Antenna Characteristics

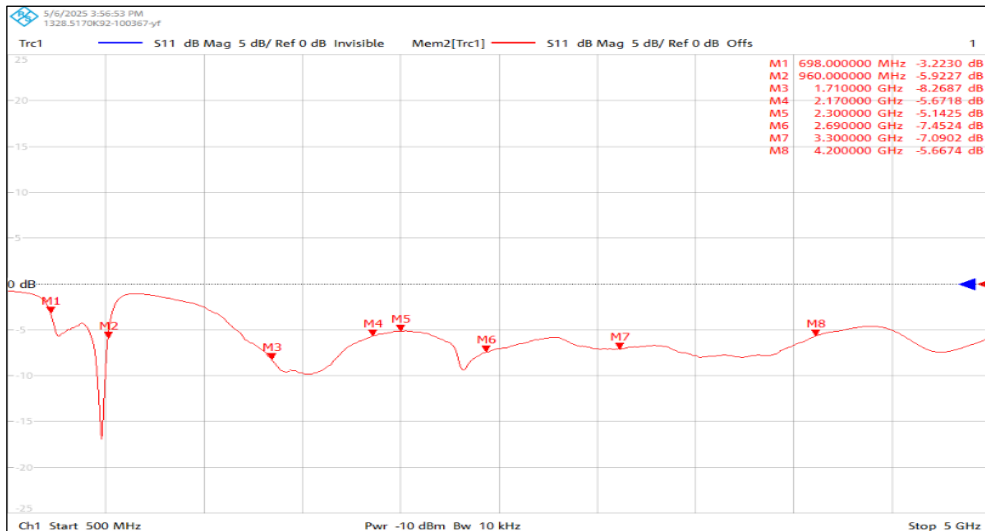
2.1 Test Setup



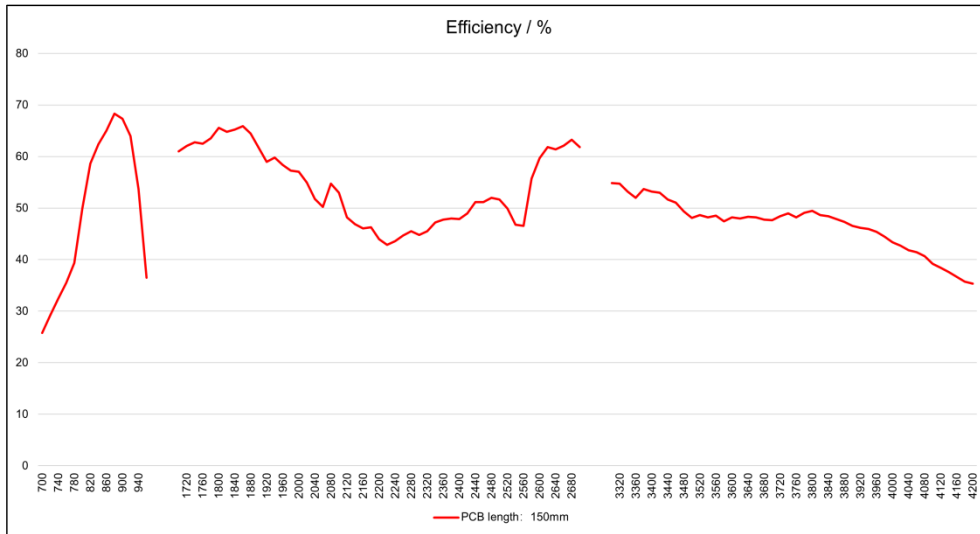
2.2 VSWR



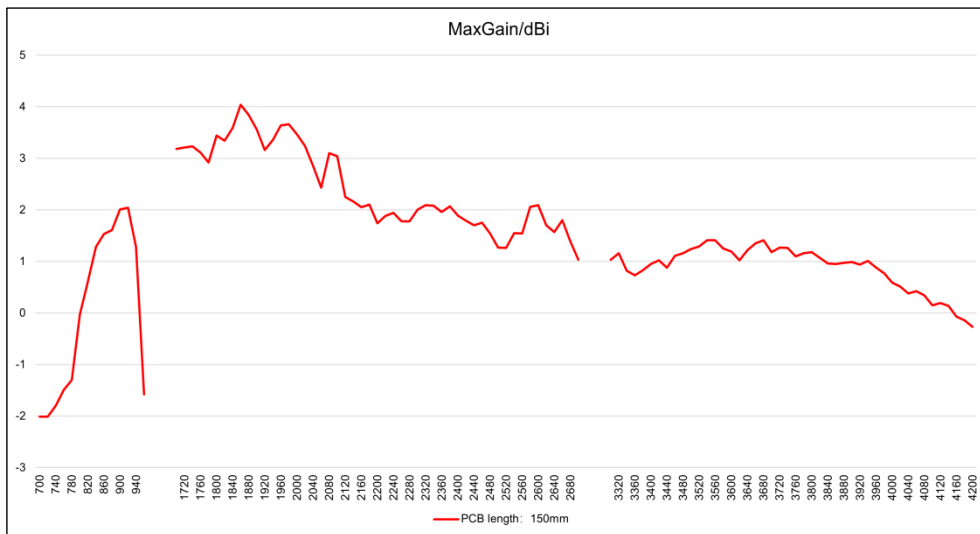
2.3 Return Loss



2.4 Efficiency



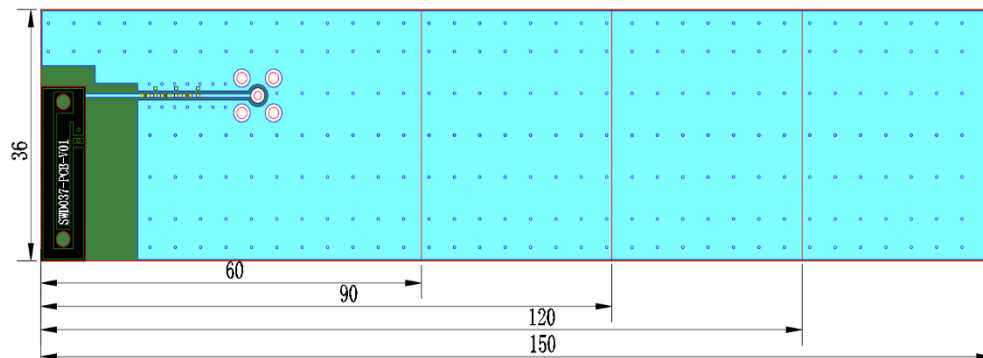
2.5 Gain



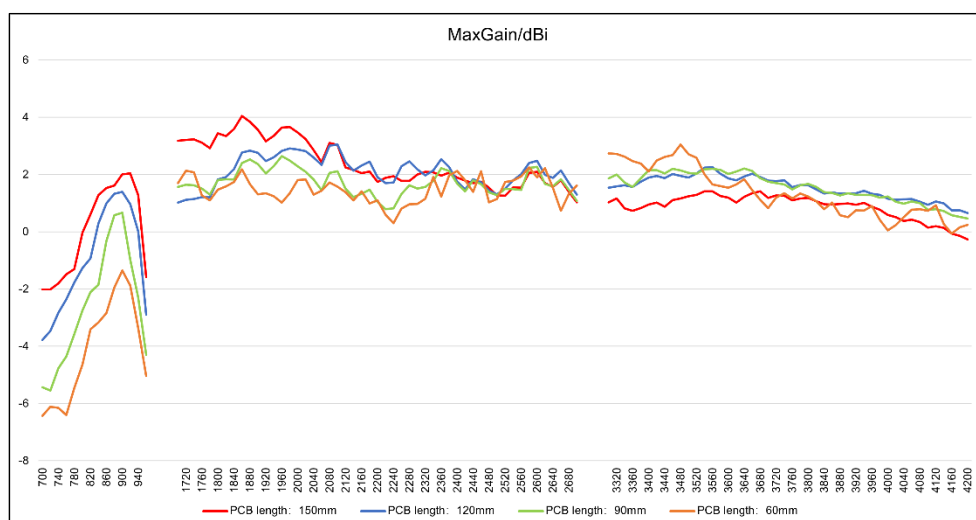
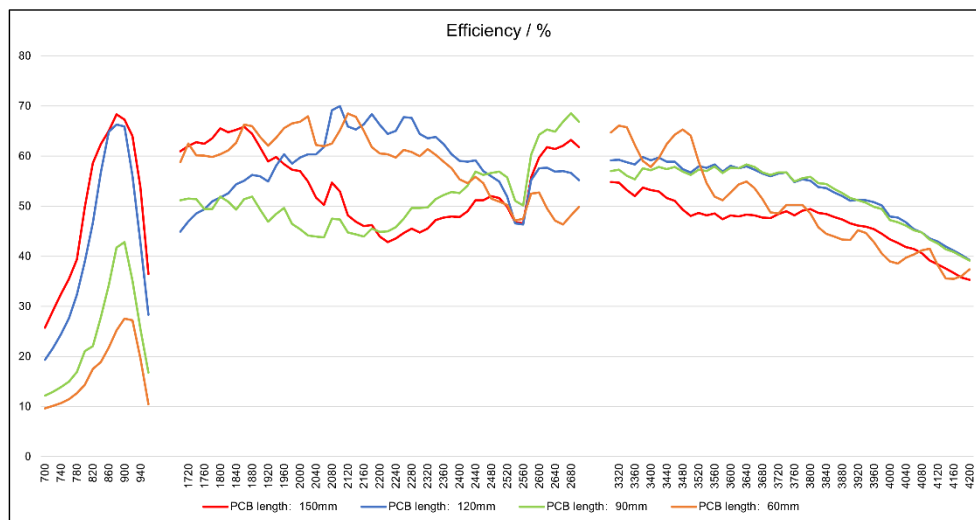
2.6 Host PCB size

The performance of the low frequency section depends on the length of the ground plane. Reducing GND length will directly impact on the performance of low frequency band.

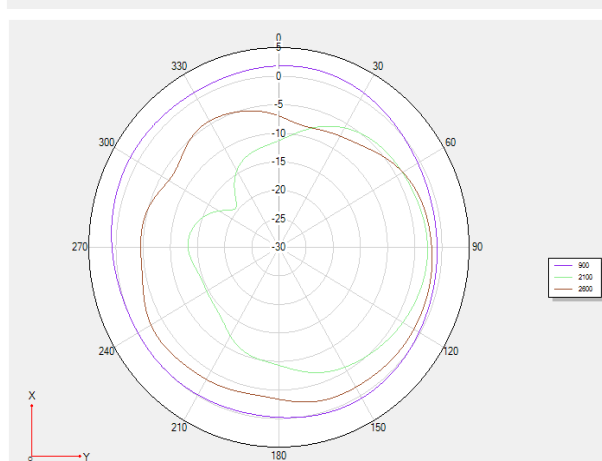
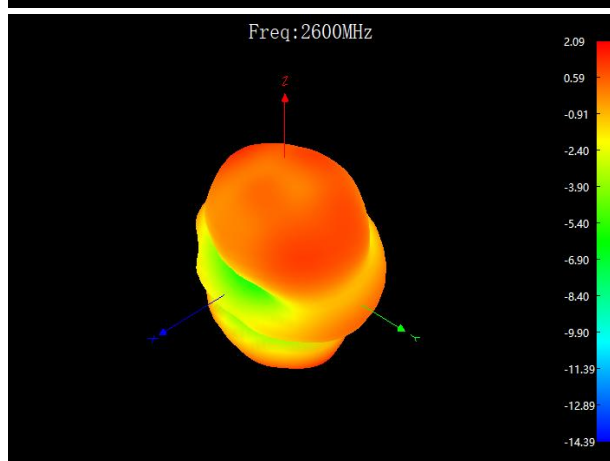
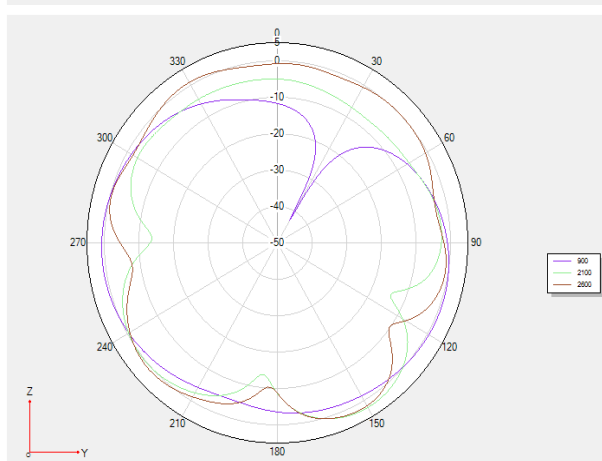
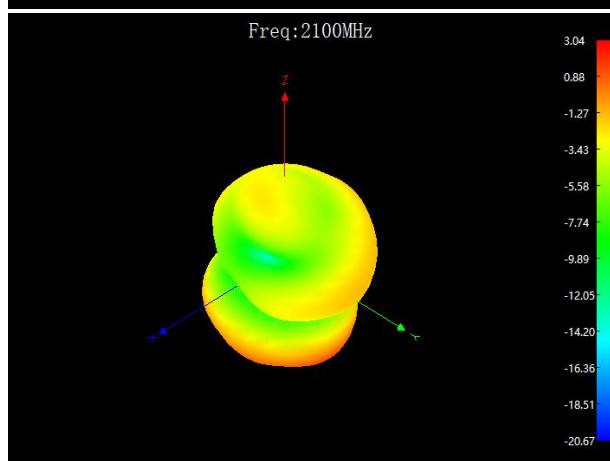
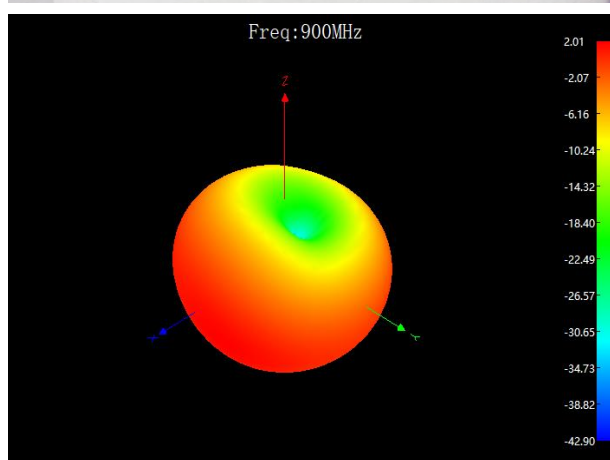
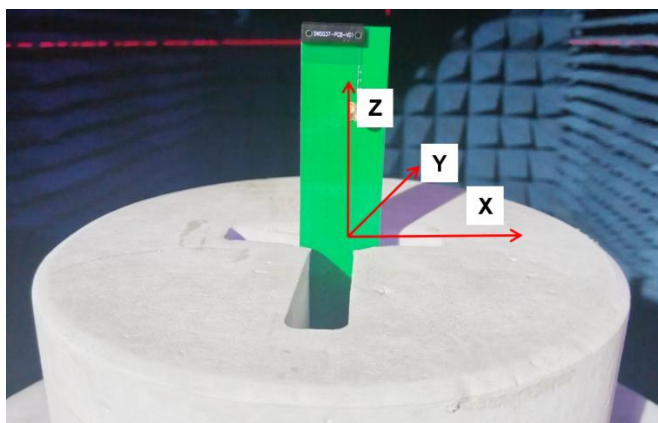
Take antenna efficiency measurement results on different GND sizes as an example

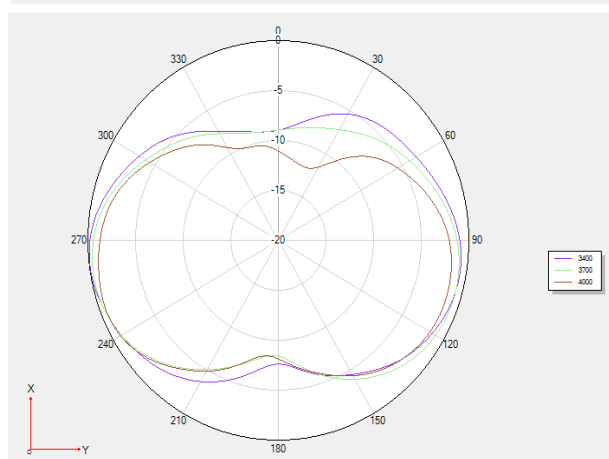
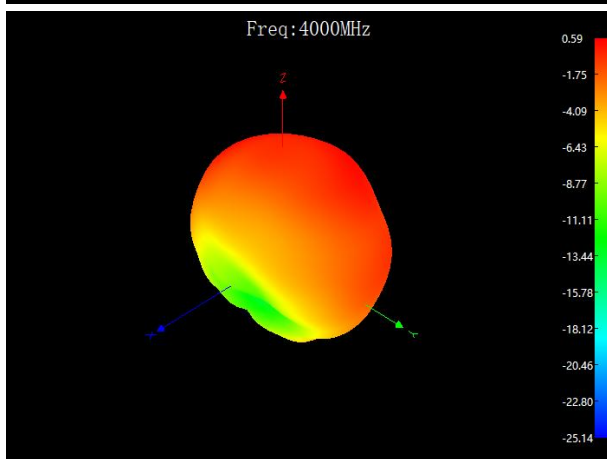
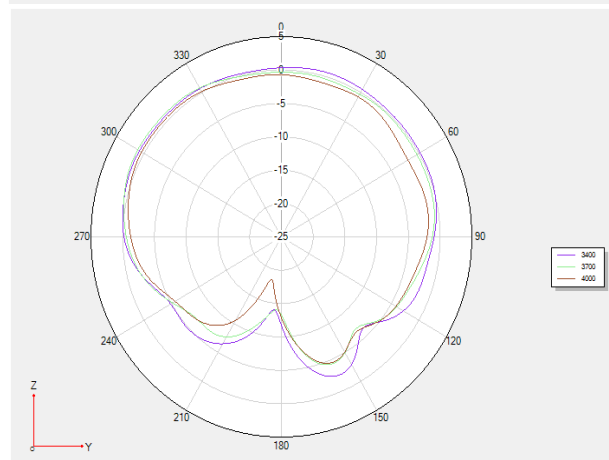
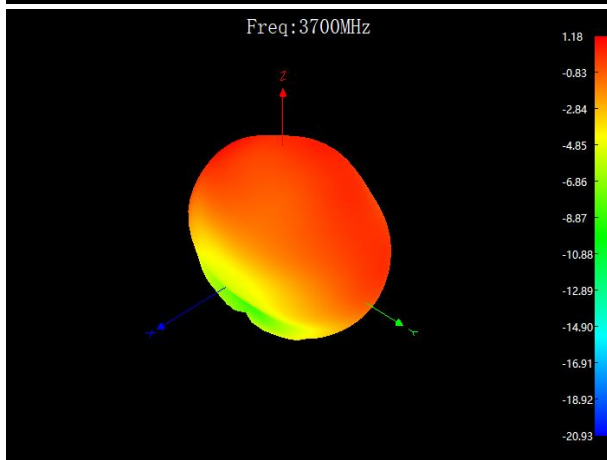
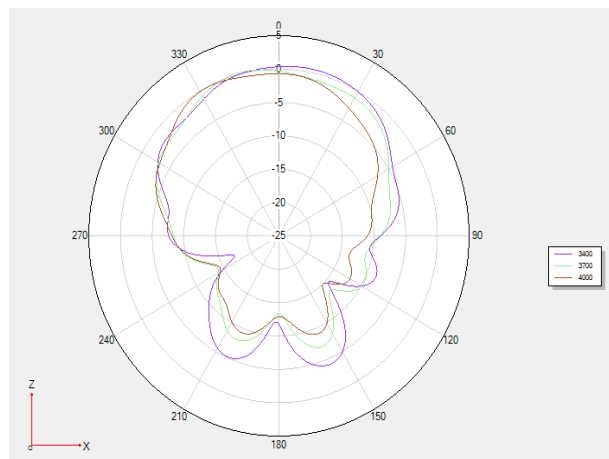
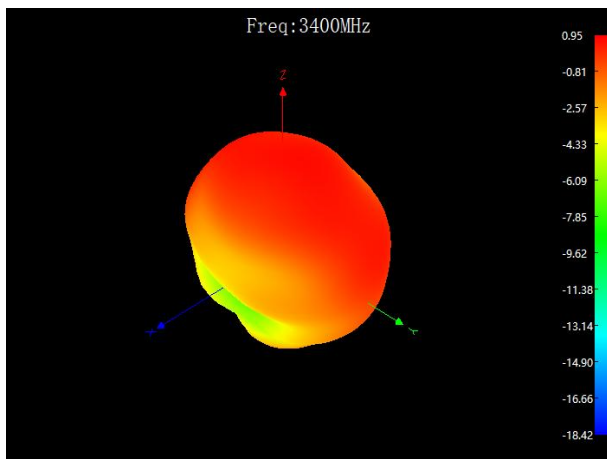


Efficiency and Gain vs. PCB length



2.7 Directional pattern



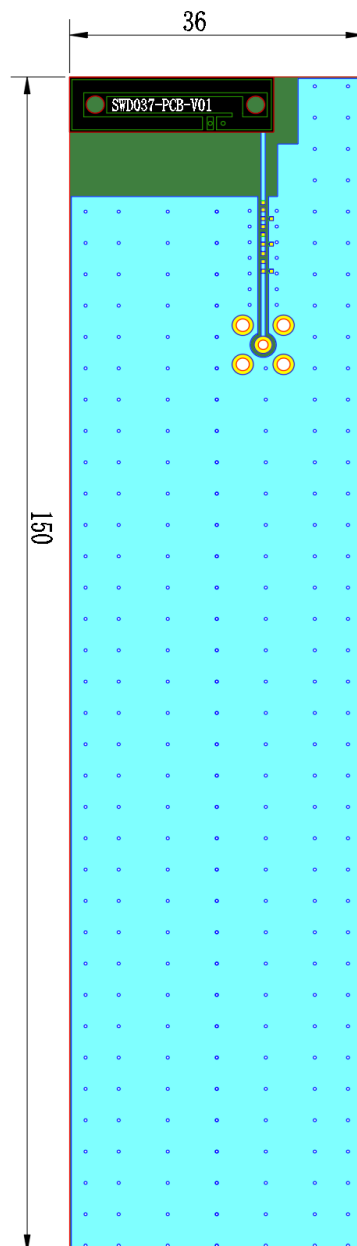


3. Integration Guide

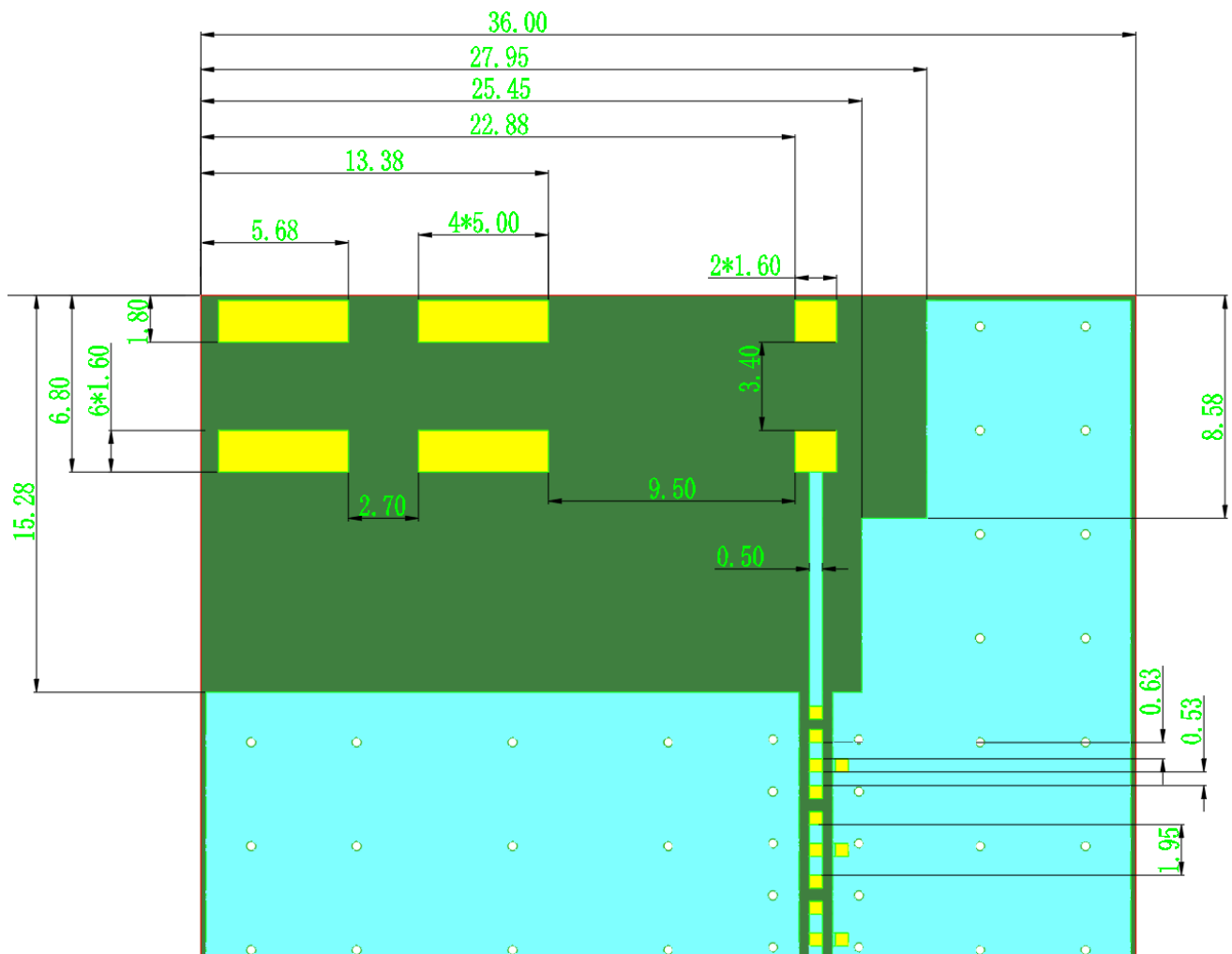
3.1 Transmission Line

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

- Any other part of the RF system, such as transceiver, power amplifiers, etc., shall also be designed with an impedance of 50 Ω

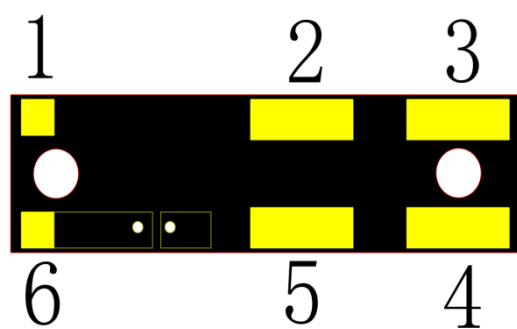


3.2 PCB Layout



3.3 Schematic symbol and Pin definition

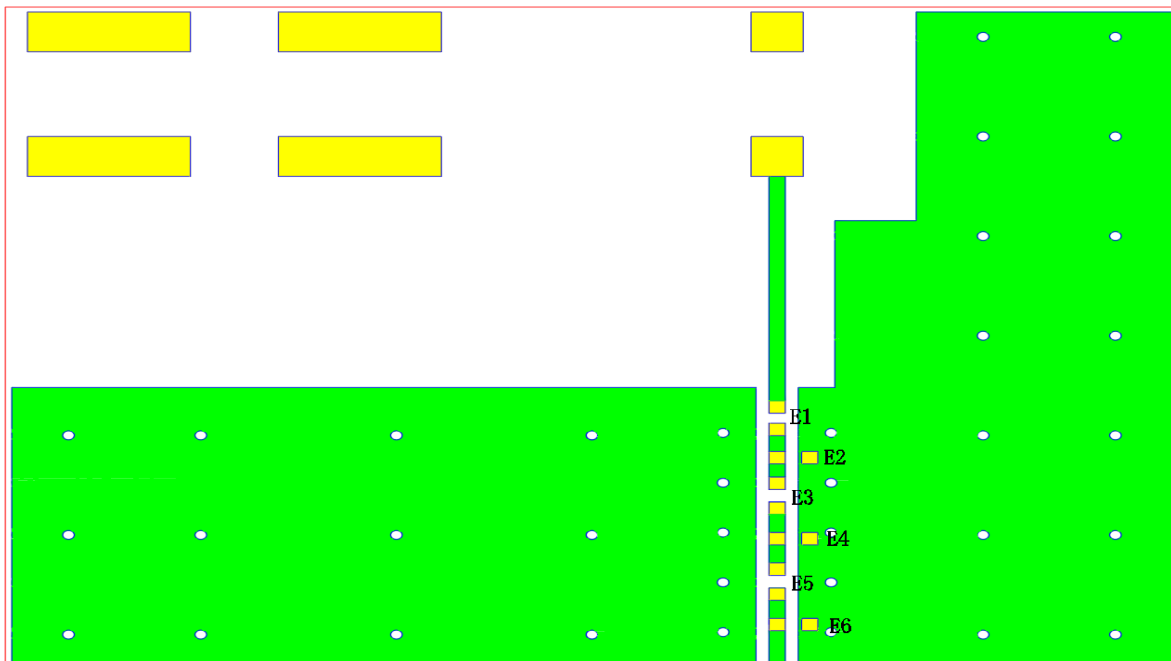
The antenna has 6 pins, with only one working pin, 1 functional connection pins, 5 mechanical fixed pins



Pin No.	Description
6	Feed
1、2、3、4、5	Mechanical

3.4 Matching Circuit

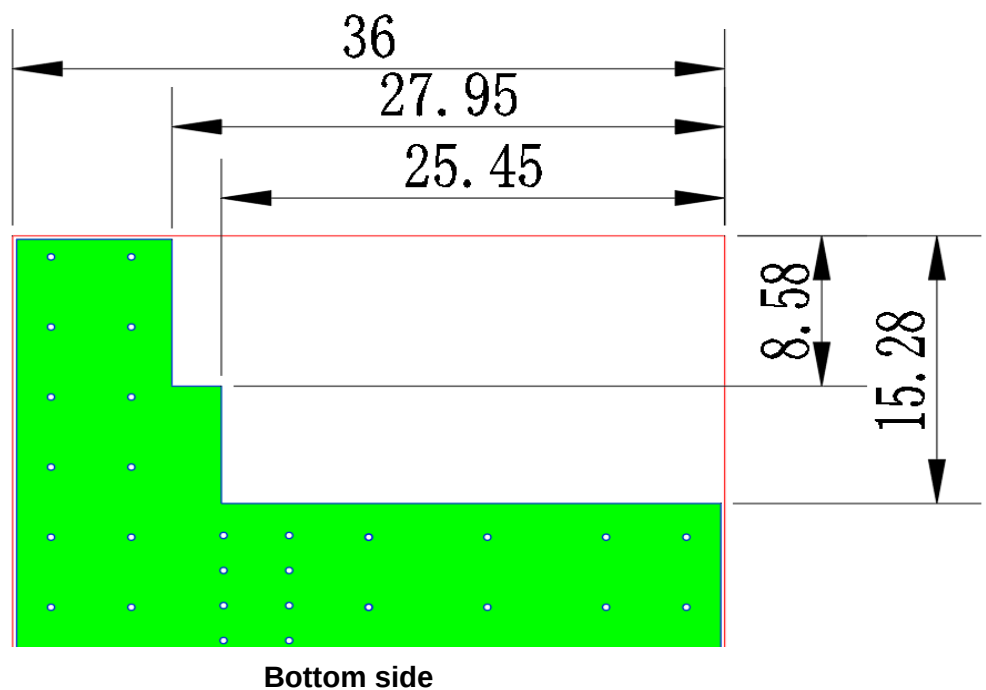
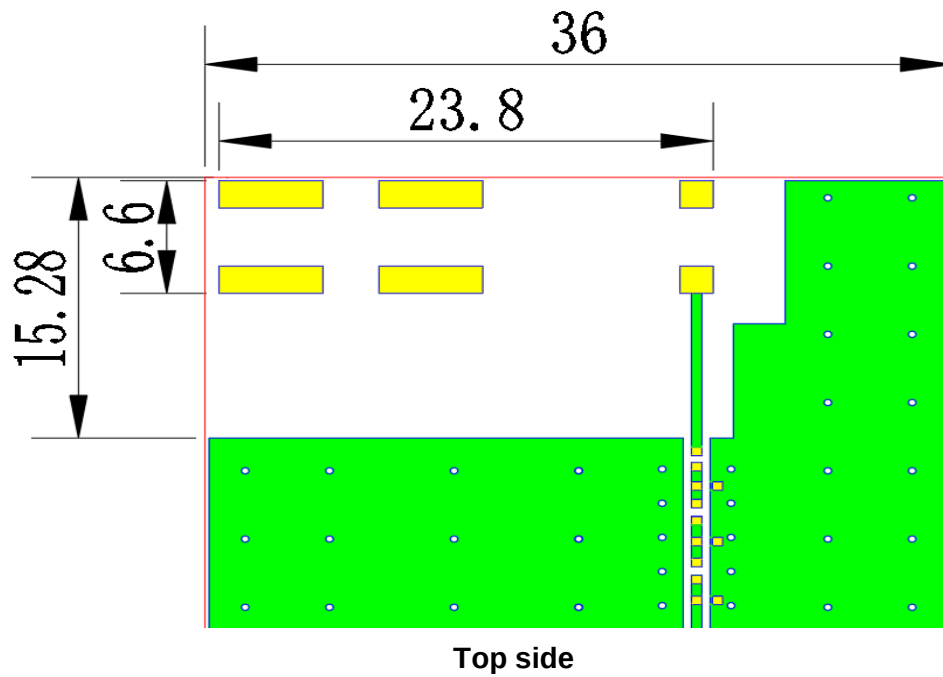
The antenna requires a matching circuit that must be optimized for each product. Not all components may be required but should be included as a precaution. The matching network must be placed close to the antenna feed to ensure it is more effective in tuning the antenna.



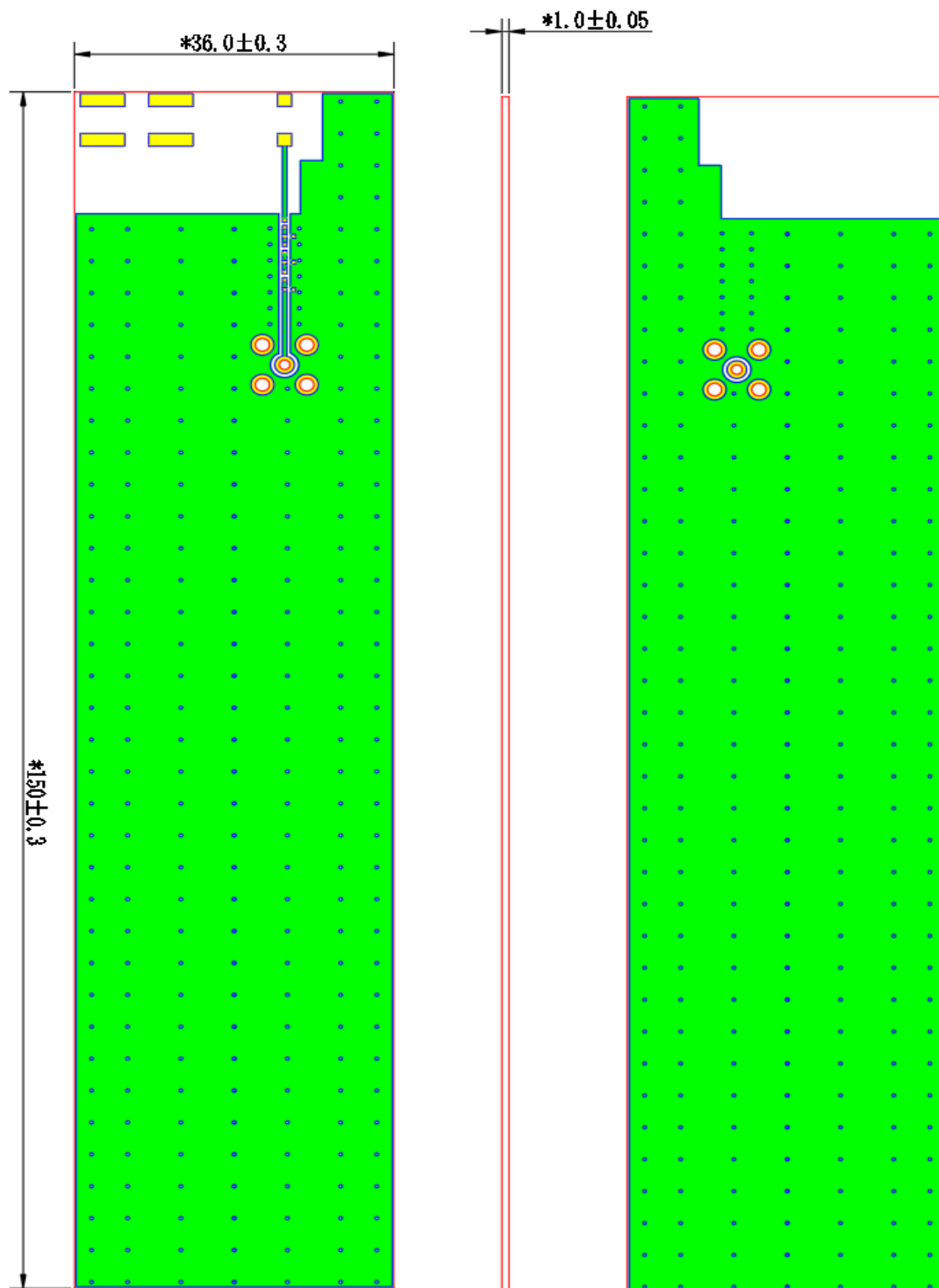
Pin No.	Value
E1	NC
E2	0 ohm
E3	NC
E4	0 ohm
E5	NC
E6	0 ohm

3.5 PCB Clearance

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.

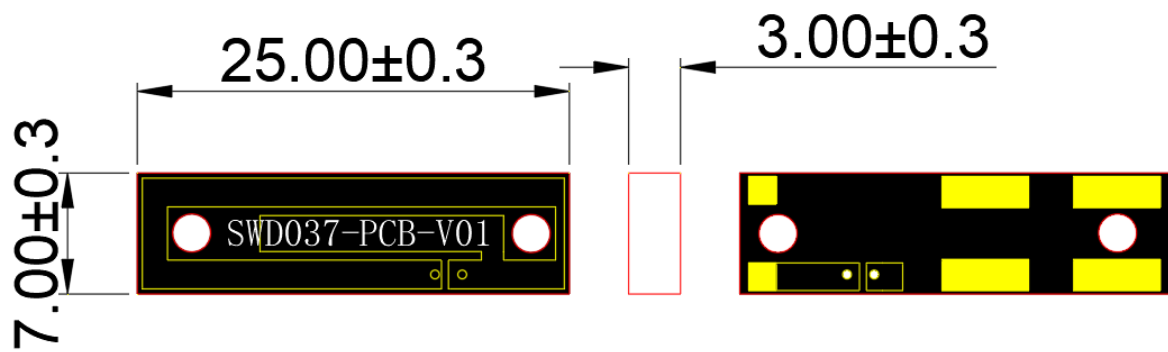


3.6 Evaluation Kit



4. Antenna Drawings

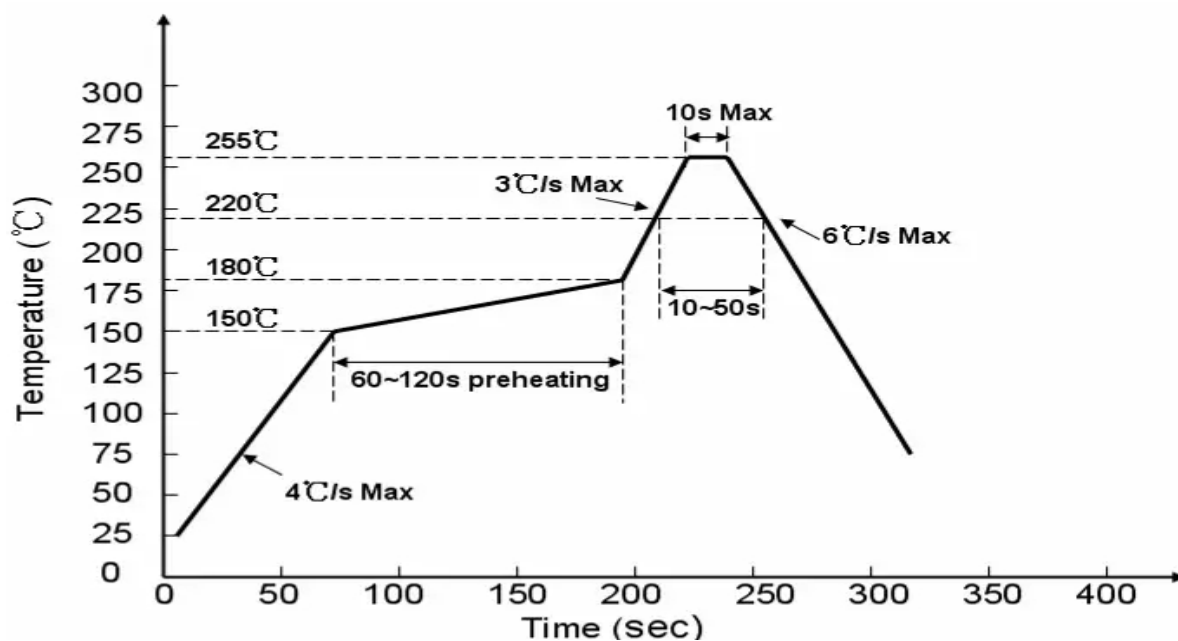
Unit: mm



5. 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)	150°C
	Temperature Max(Tsmax)	180°C
	Time(tsmin to tsmax)	120seconds max
REFLOW	Temperature(TL)	210°C
	Total Time above TL(tl)	50seconnds max
PEAK	Temperature(Tp)	260°C
	Time(tp)	10seconnds max
RAMP-DOWN	Rate	5°C/second max

6. Reflow Profile



Changelog for the datasheet	
SWD037	
Revision: V0 (First version)	
Date:	2025-5-7
Notes:	Initial Datasheet Release
Author:	Kevin