EP PROJECT

3.3V/5V SMPS

Group-27

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(An Institute of National Importance under an Act of Parliament)

ABOUT

- Nowadays, the IoT (Internet of Things) uses various WIFI-based processors like NodeMCU, ESP32, and ESP12E, etc. which operate on 5V or 3.3V.

- These modules are highly compact and hence to power these boards, it makes sense to use smaller SMPS circuits that can go on the same board, instead of using a separate SMPS circuit.

5V/3.3V SMPS Board Specifications

The SMPS will have the following specifications.

1. 85VAC to 230VAC input.
2. 5V or 3.3V selectable 2A output.
3. Open frame construction
4. Short circuit and Overvoltage protection
5. Small size with low-cost features.

Materials Required for SMPS Circuit

- Fuse 1A 250VAC Slow Blow
- Diode Bridge DB107
- 10uF / 400V
- P6KE Diode
- UF4007
- 2Meg – 2 Pcs – 0805 package
- 2.2nF 250VAC
- TNY284DG
- 10uF / 16V – 0805 package
- PC817

- 1k – 0805 package
- 22R – 2pcs - 0805 package
- 100nF – 0805 package
- TL431
- SR360
- 470pF 100V – 0805 package
- 1000uF 16V
- 3.3uH – Drum core
- 2.2nF 250VAC

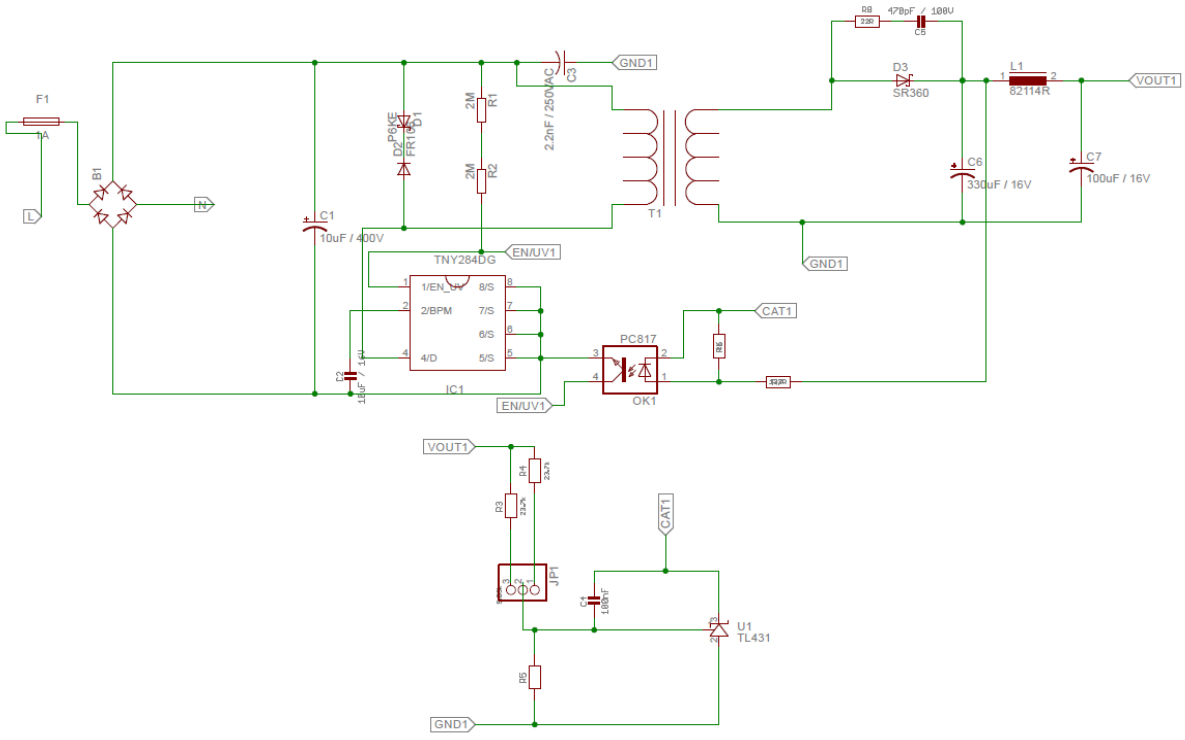
This SMPS is designed using power integration IC **TNY284DG**. This **SMPS Driver IC** is best suitable. The below image is showing the wattage specification of TNY284DG.

Output Power Table

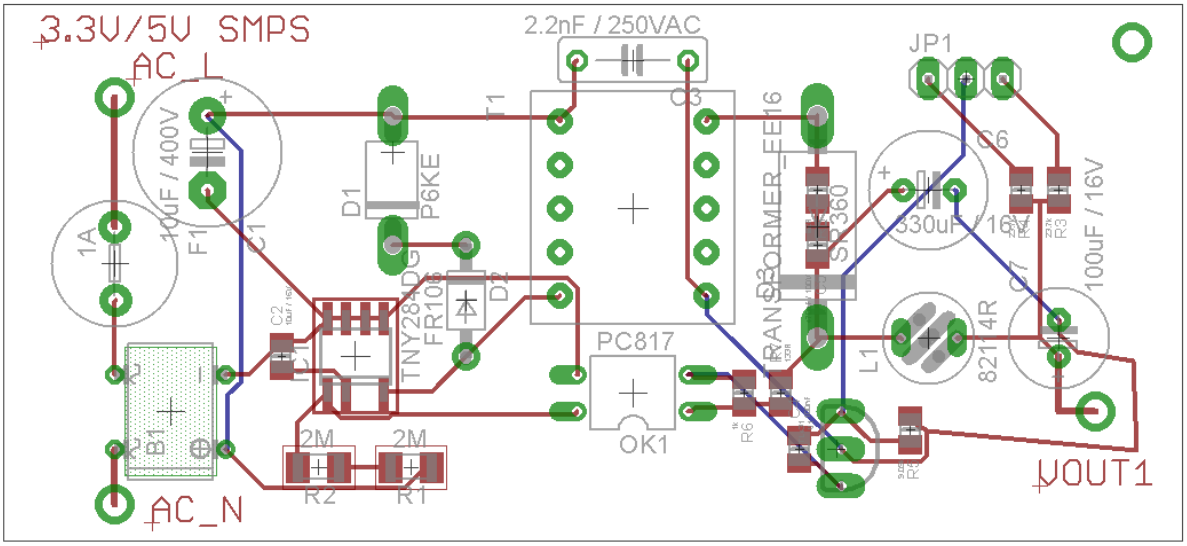
Product[3]	230 VAC ± 15%		85-265 VAC	
	Adapter[1]	Peak or Open Frame[2]	Adapter[1]	Peak or Open Frame[2]
TNY284P/D/K	6 W	11 W	5 W	8.5 W
TNY285P/D	8.5 W	15 W	6 W	11.5 W
TNY285K	11 W	15 W	7.5 W	11.5 W
TNY286P/D	10 W	19 W	7 W	15 W
TNY286K	13.5 W	19 W	9.5 W	15 W
TNY287P	13 W	23.5 W	8 W	18 W
TNY287D	11.5 W	23.5 W	7 W	18 W
TNY287K	18 W	23.5 W	11 W	18 W
TNY288P	16 W	28 W	10 W	21.5 W
TNY288D	14.5 W	26 W	9 W	19.5 W
TNY288K	23 W	28 W	14.5 W	21.5 W
TNY289P	18 W	32 W	12 W	25 W
TNY289K	25 W	32 W	17 W	25 W
TNY290P	20 W	36.5 W	14 W	28.5 W
TNY290K	28 W	36.5 W	20 W	28.5 W

SOFTWARE USED

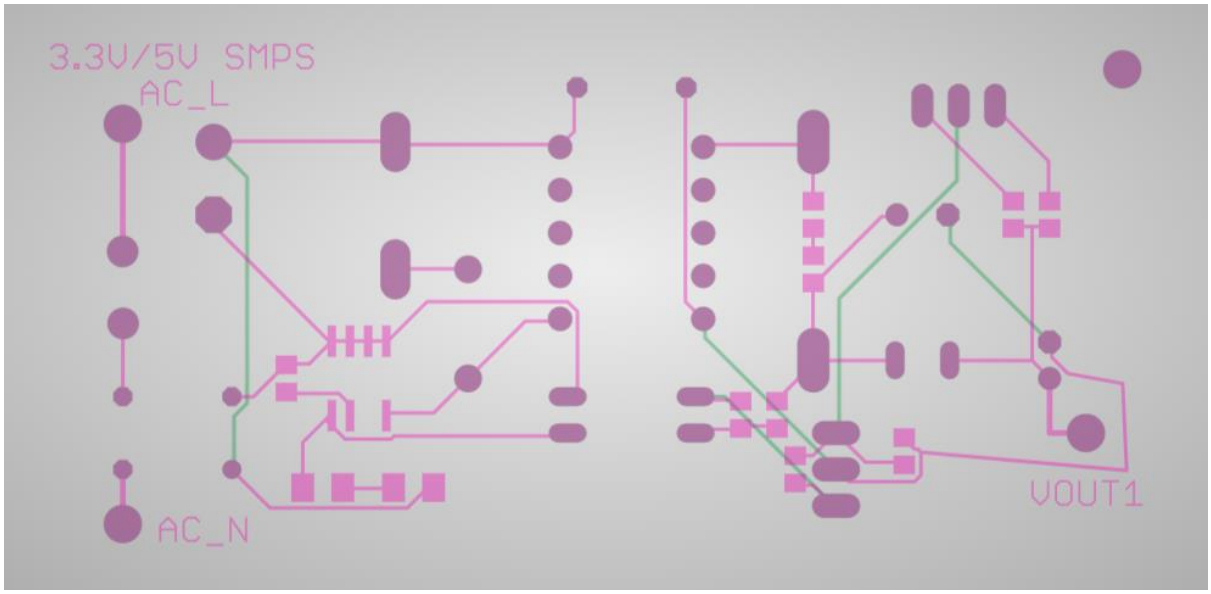
SCHEMATIC CIRCUIT



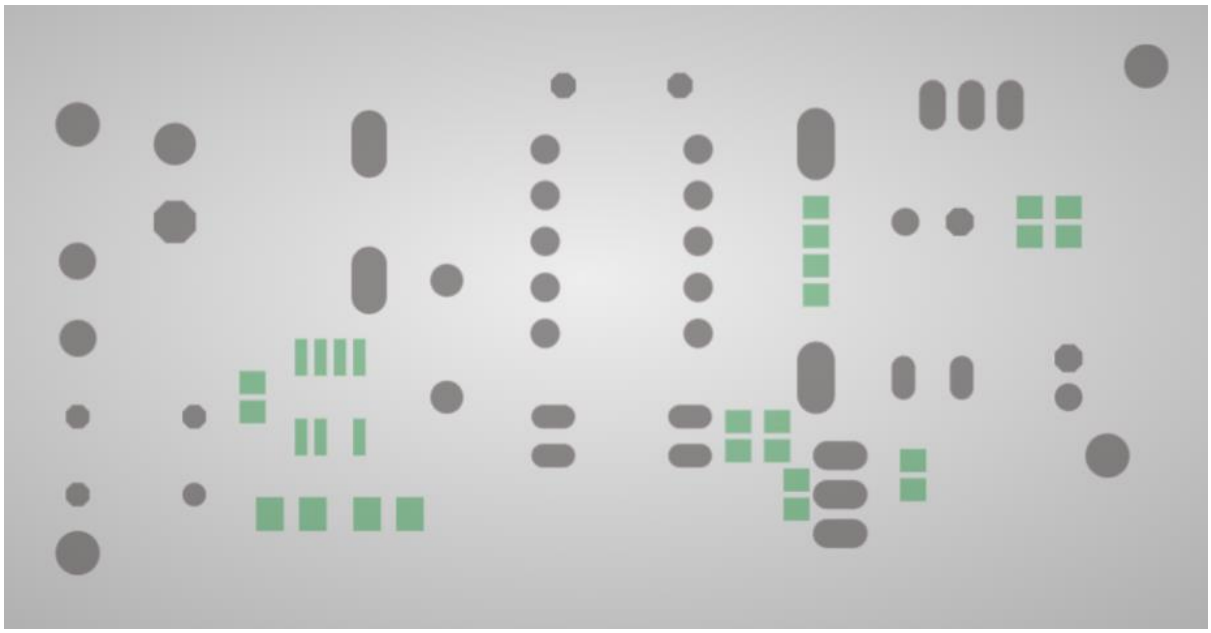
PCB LAYOUT



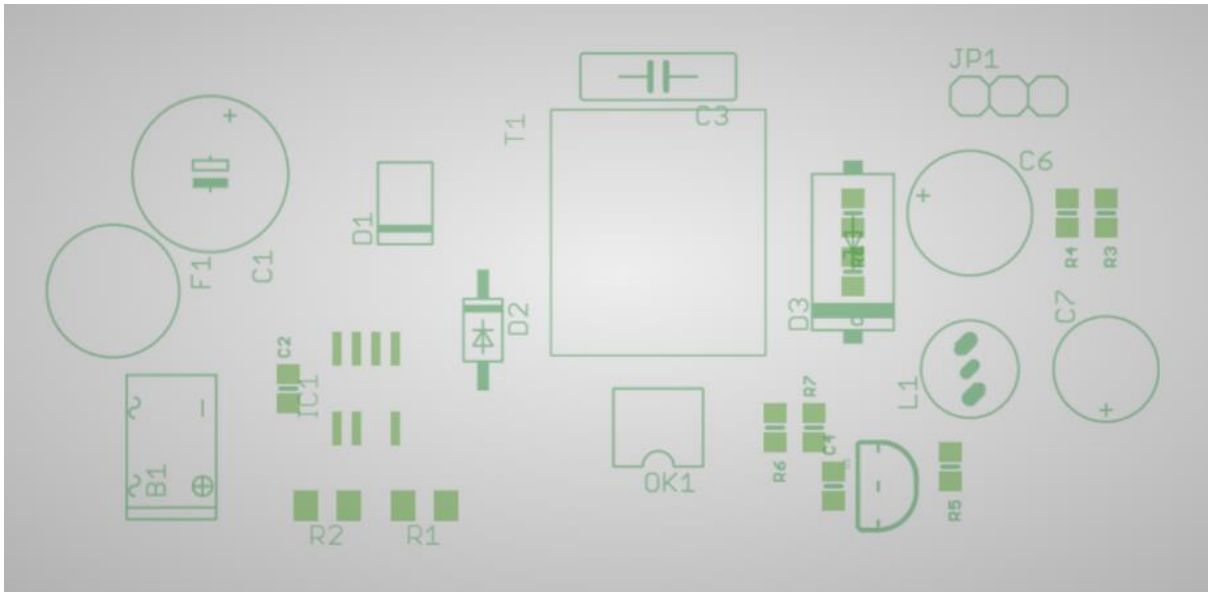
GERBER FILES



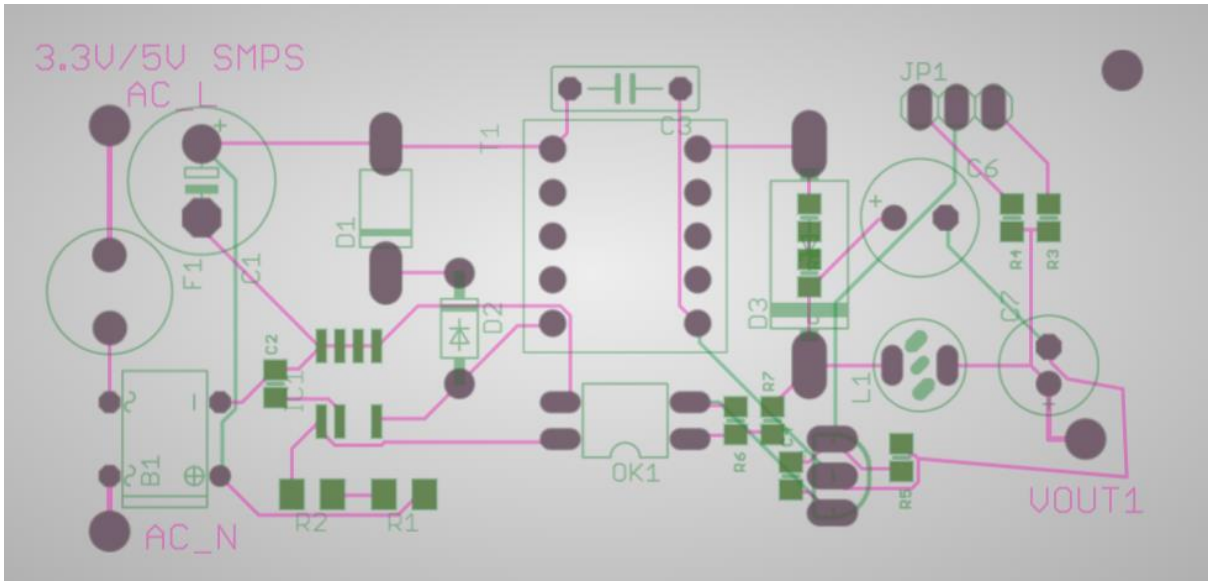
Top and Bottom Copper View



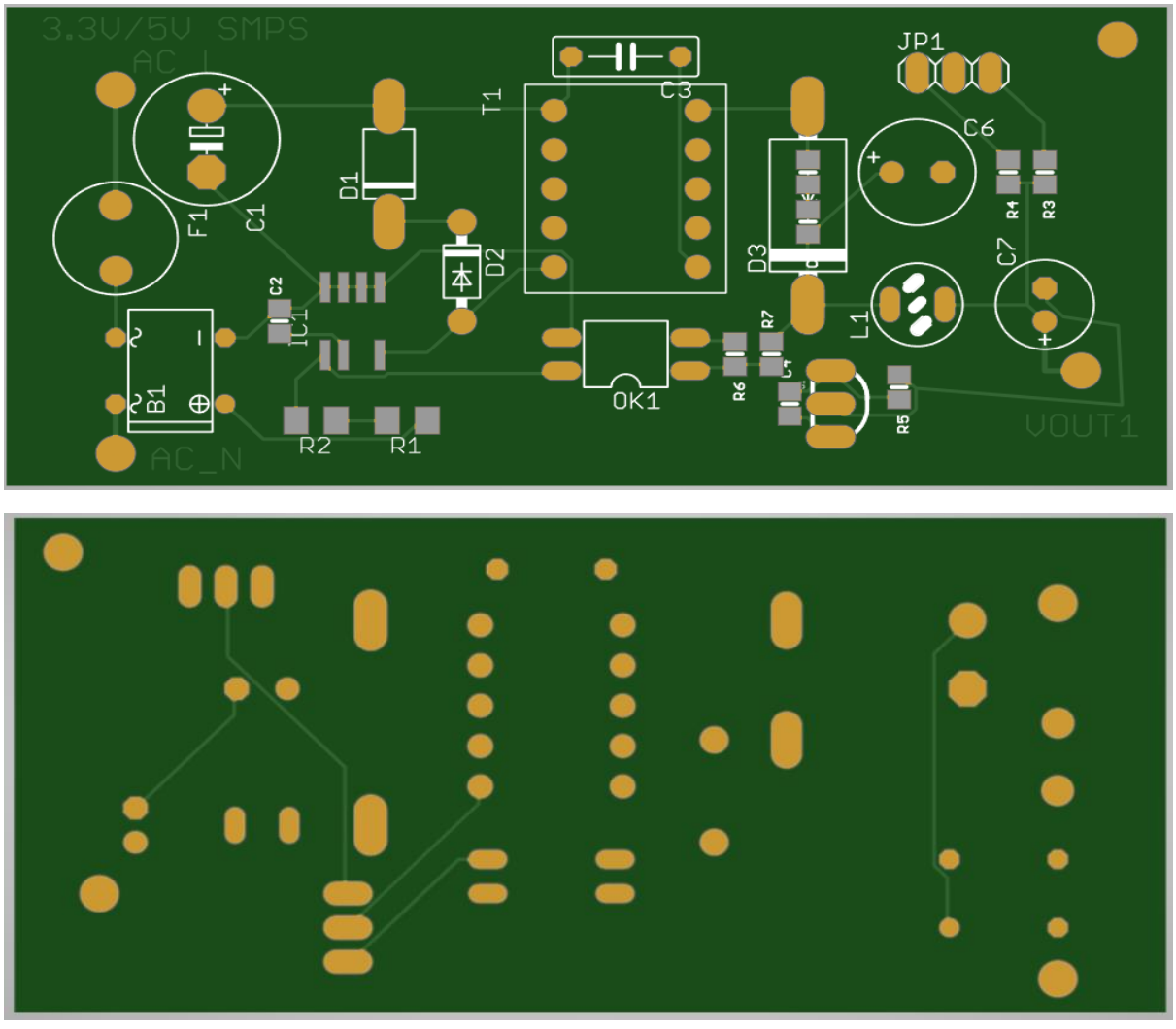
Top and Bottom Solder mask



Top and Bottom Silkscreen and Solder paste

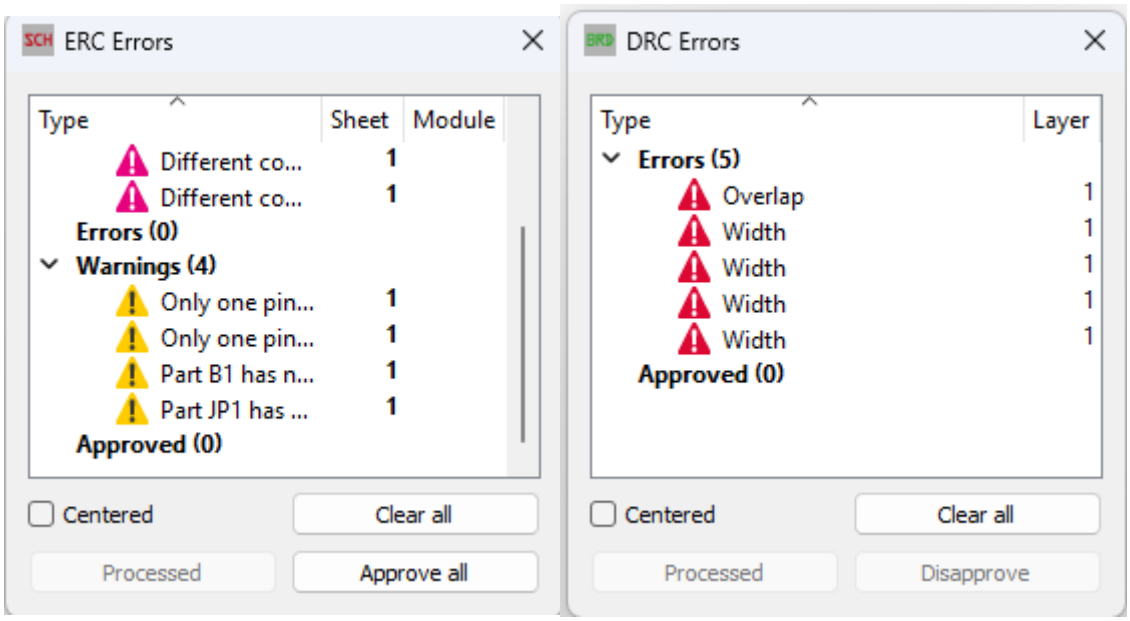


Layer View

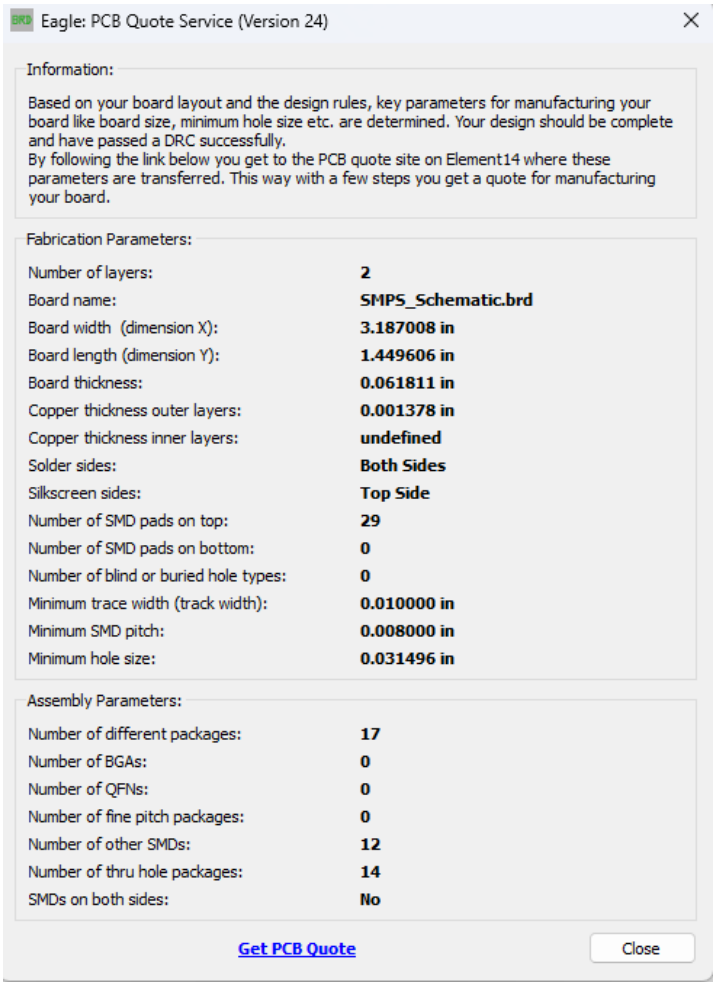


Top and Bottom View

CHALLENGES FACES



PCB OVERVIEW



THANK YOU