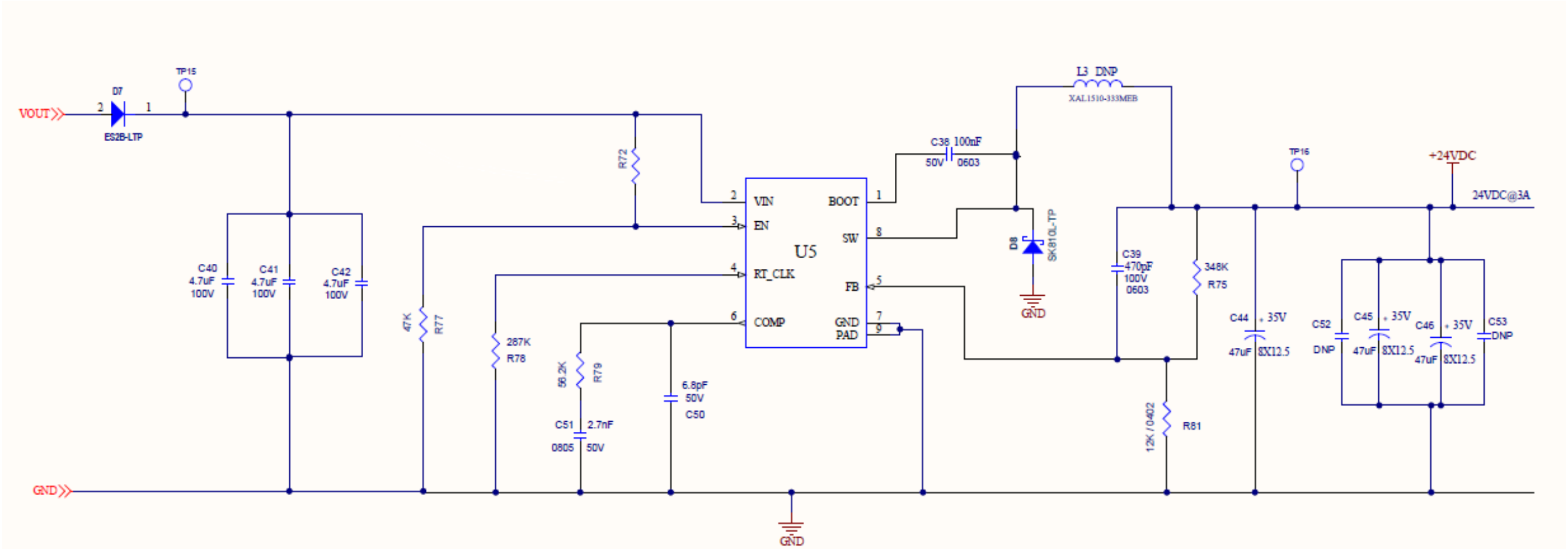
SCHMATIC DIAGRAM With TPS54560B



Test 1 : with XAL1510-333MEB - Fixed Inductors 33uH , 20% 12A 20mOhms AECQ2

Test 2 : with 74435586800 - Fixed Inductors WE-HCI 68uH 7.5A DCR=27.3mOhms AECQ2

TEST – 1 (Tested 2 boards with XAL1510-333MEB Inductor)

Test Date :	16/9/2022	Thermocouple On IC		LOAD Type	C+CW
TPS54560_POE_Ver3					
Start Time :	12:00	Input Voltage :	48.65	Input Current:	1.565
PWM Value :		Output Voltage :	23.86	Load Current :	3.06
TIME	12:05	12:10	12:30	1:00	1:30
IC Temperature	48	70.4	88.9	92.1	93.2
Enclosure Temperature	34.6	40.2	49.2	50.6	51
Load Current	3.06	3.08	3.16	3.17	3.18
TIME	2:30	3:40	4:30	5:15	6:00
IC Temperature	93.8	93.6	94.2	94.4	94.3
Enclosure Temperature	52.2	52.6	52.4	53.2	52.8
Load Current	3.18	3.18	3.19	3.19	3.18
TIME	6:30	7:00	9:30		
IC Temperature	96.4	96.8	97.2		
Enclosure Temperature	51.6	51.8	51.2		
Load Current	3.19	3.19	3.19		

Results with XAL1510-333MEB Inductor

Load Type : 72W LED

Result-1 :

Too much heat is generating over the board and the IC Temperature goes beyond 94.2 Degrees

Load Type : 72W LED Connected with MOSFET and 75% Dimming @ 14KHz PWM frequency

Result-2 :

1. Temperature further shoots up to 102.4 degrees
2. Humming sound is coming if we decrease MosFet Switching frequency below 12 KHz

Test Conditions:

1. Ambient =27 , No Wind or Air Circulation in Room
2. Readings are taken from Thermocouple (Placed over the TPS54560 IC)
3. All reading are with Box Lid is closed
4. Used MosFET to drive the LED LOAD in Test condition-2

TEST – 2 (Tested 2 boards with WURTH 74435586800 Inductor)

TIME	5:16	5:40	5:50	10:10
IC Temperature	69.3	87.9	89.2	94.2
Box Temperature	37.8	49.4	40	47.8
Load Current	3.16	3.19	3.05	3.06

Results with 74435586800 Inductor

Load Type : 72W LED

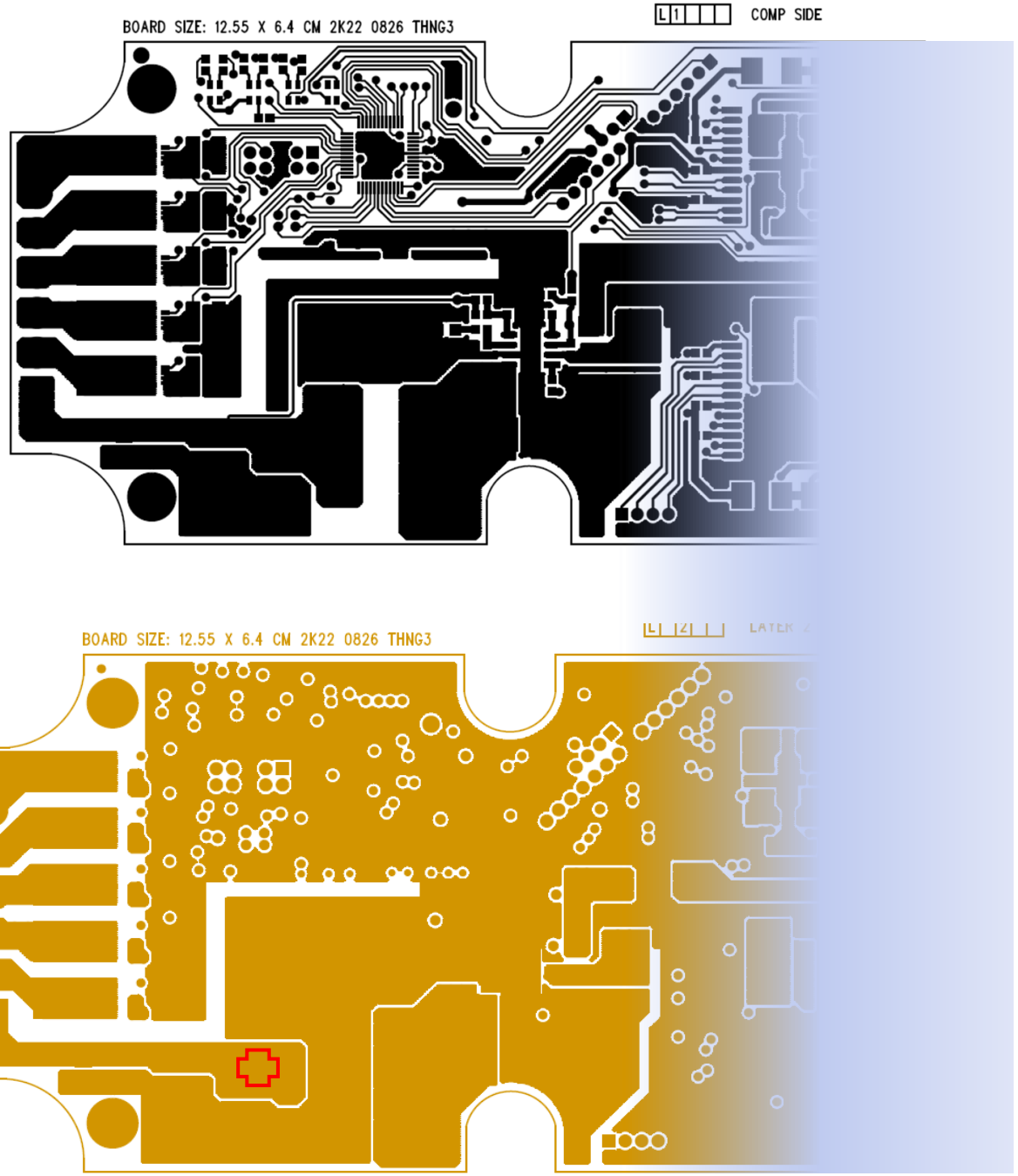
Result-1 :

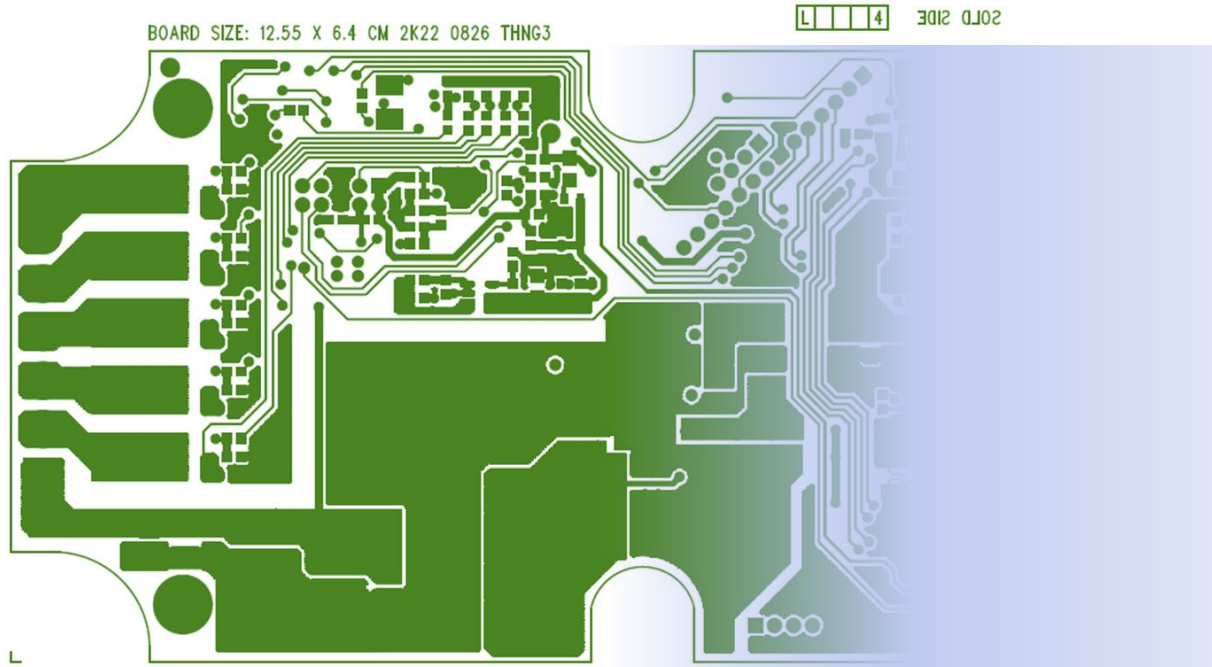
Too much heat is generating over the board and the IC Temperature goes beyond 94.2 Degrees

Load Type : 72W LED Connected with MOSFET and 75% Dimming @ 14KHz PWM frequency

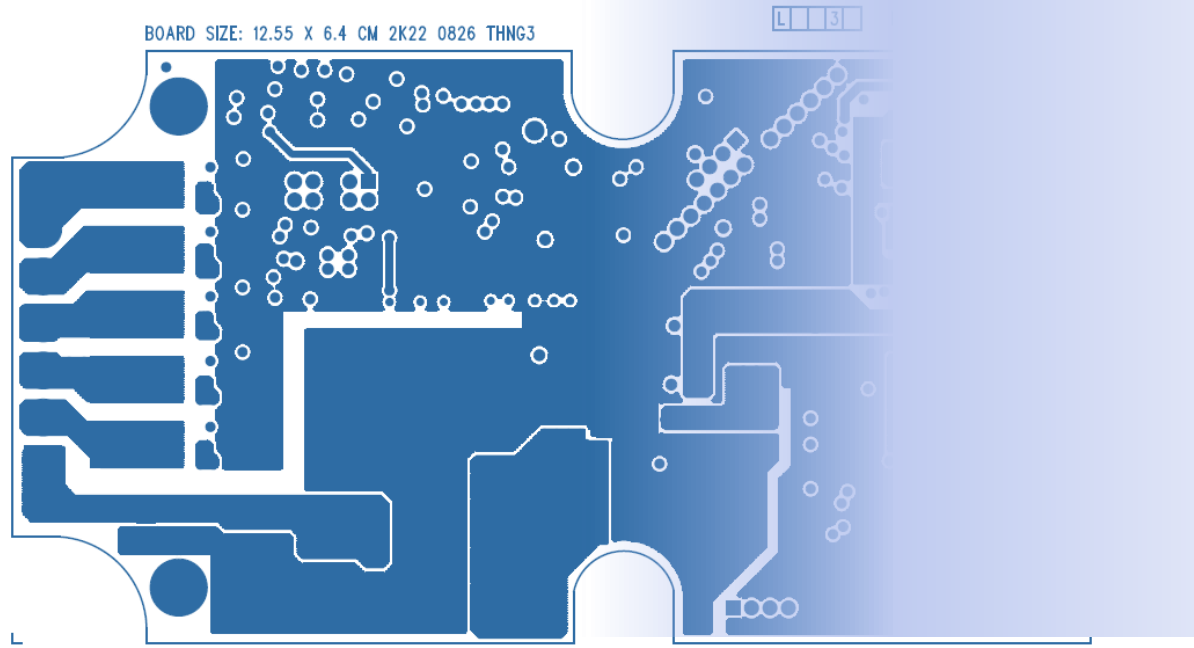
Result-2 :

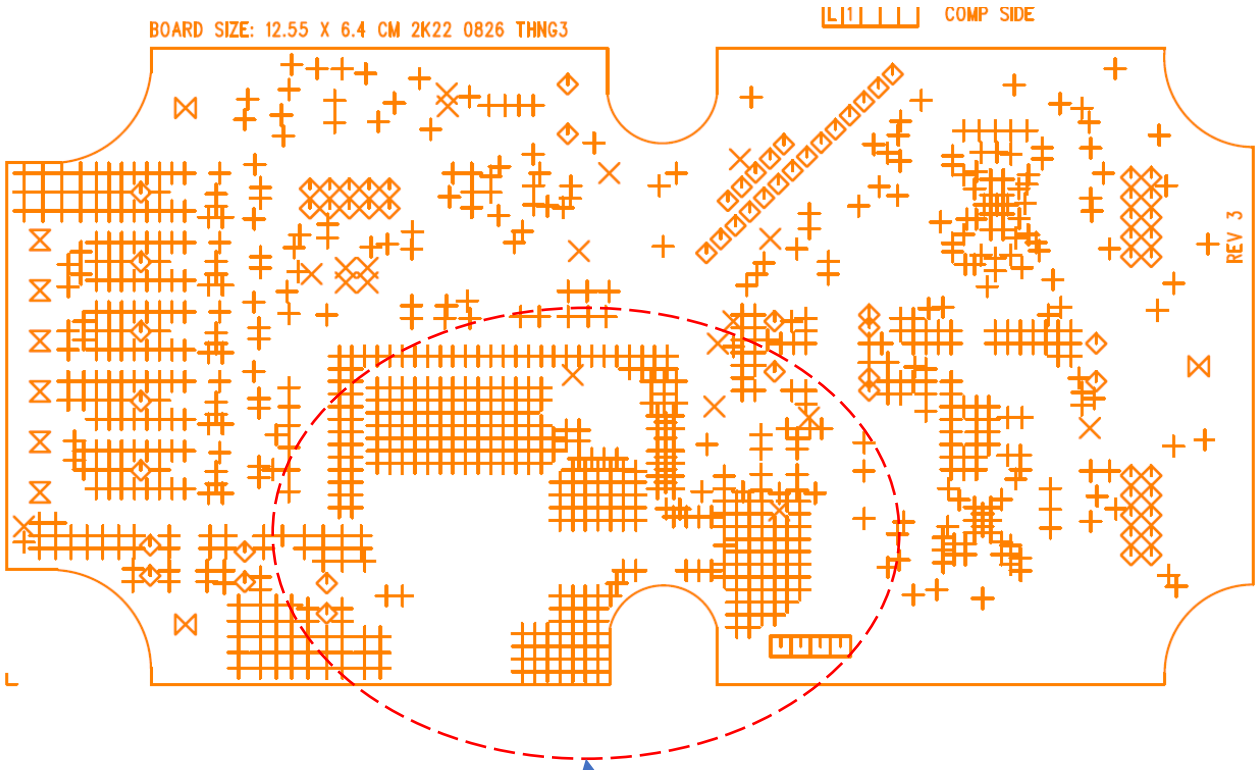
1. Temperature further shoots up to 106.2 degrees
2. Humming sound is coming if we decrease MosFet Switching frequency below 12 KHz


BOARD SIZE: 12.55 X 6.4 CM 2K22 0826 THNG3
L1
COMP SIDE


BOARD SIZE: 12.55 X 6.4 CM 2K22 0826 THNG3
L4
SOLD SIDE

BOARD SIZE: 12.55 X 6.4 CM 2K22 0826 THNG3

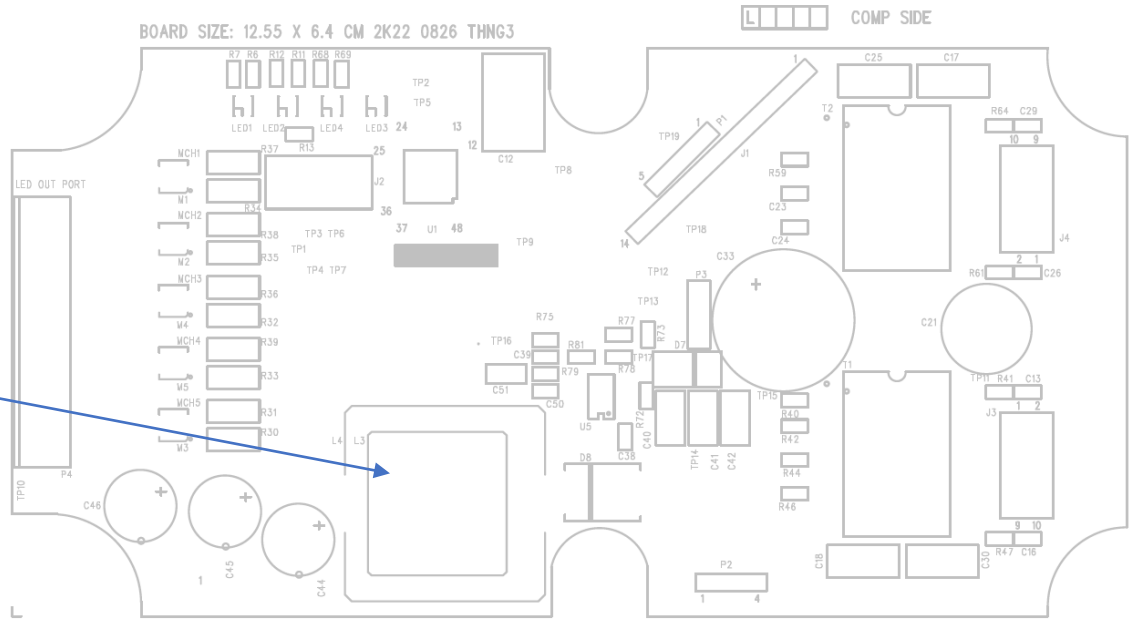

BOARD SIZE: 12.55 X 6.4 CM 2K22 0826 THNG3
L3



Inductor Section

Test Conditions:

1. Ambient =27 , No Wind or Air Circulation in Room
2. Readings are taken from Thermocouple (Placed over the TPS54560 IC)
3. All reading are with Box Lid is closed
4. Used MosFET to drive the LED LOAD in Test condition-2



TI TPS54560 REFRENCE KIT PICTURE