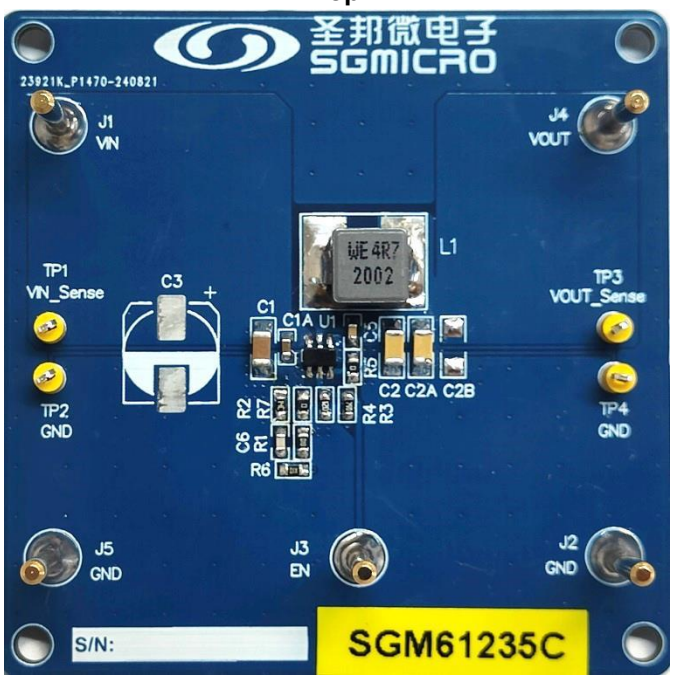
SGM61235C Demo Board Test Report

8V to 28V Input (12V TYP), 5V/3A Output

Demo Board Pictures:

Top



Bottom

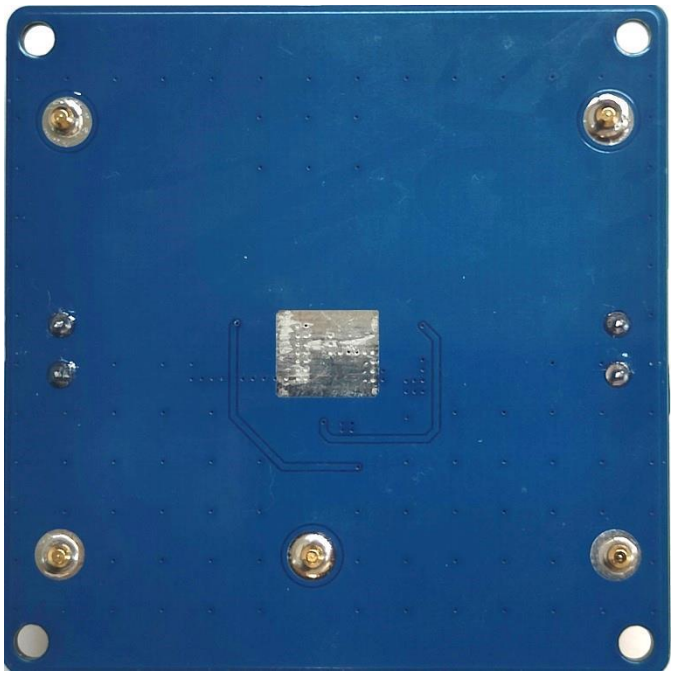
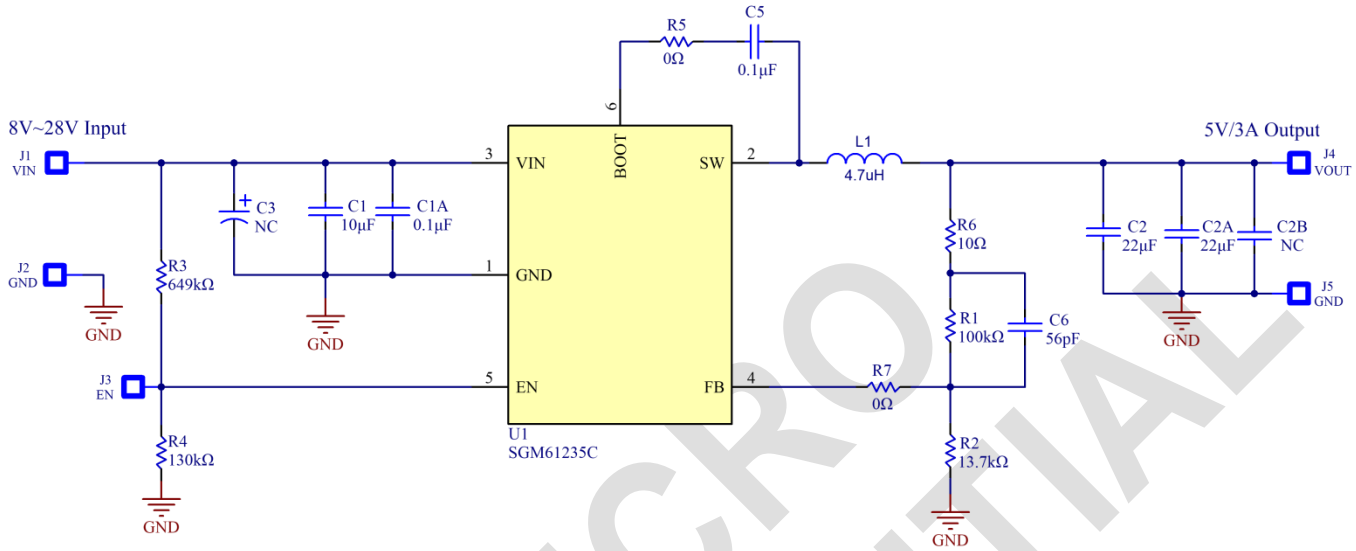


Table of Contents

1. Schematic, BOM List and PCB Layout

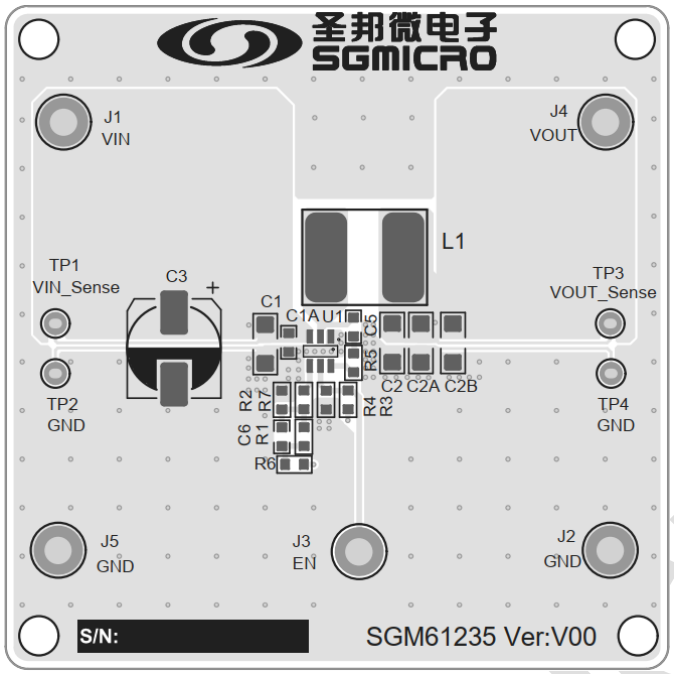
1.1 Schematic



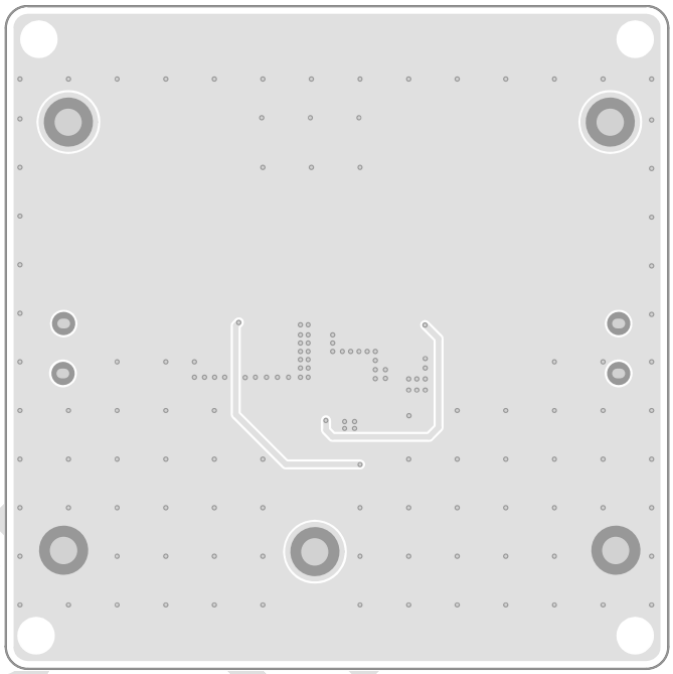
1.2 BOM List

Item	Quantity	Designator	Description	Manufactory
1	1	C1	Ceramic capacitor, 10μF, 50V, ±10%, X5R, 1206	Murata
2	1	C1A	Ceramic capacitor, 0.1μF, 50V, ±10%, X7R, 0603	Murata
3	2	C2, C2A	Ceramic capacitor, 22μF, 16V, ±10%, X5R, 1206	Murata
4	0	C3, C2B	NC	
5	1	C5	Ceramic capacitor, 0.1μF, 10V, ±10%, X7R, 0603	Murata
6	1	C6	Ceramic capacitor, 56pF, 50V, ±10%, C0G, 0603	Murata
7	1	R1	Chip resistor, 100kΩ, ±1%, 0603	YAGEO
8	1	R2	Chip resistor, 13.7kΩ, ±1%, 0603	YAGEO
9	1	R3	Chip resistor, 649kΩ, ±1%, 0603	YAGEO
10	1	R4	Chip resistor, 130kΩ, ±1%, 0603	YAGEO
11	2	R5, R7	Chip resistor, 0Ω, ±1%, 0603	YAGEO
12	1	R6	Chip resistor, 10Ω, ±1%, 0603	YAGEO
13	1	L1	Inductor, 4.7μH, DCR=28mΩ, I_R=5A, I_S=7.5A, 74437349047	Wurth
14	1	U1	SGM61235C, TSOT-23-6	SGMICRO
Conclusion: Total 15 components				

1.3 PCB Layout



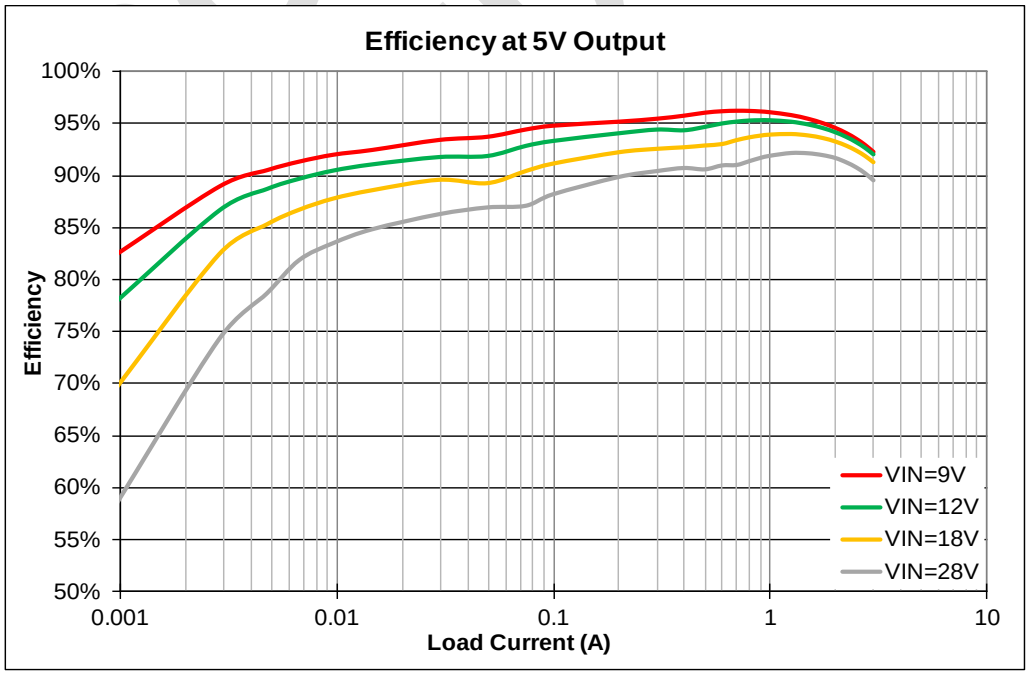
PCB Top Layer



PCB Bottom Layer

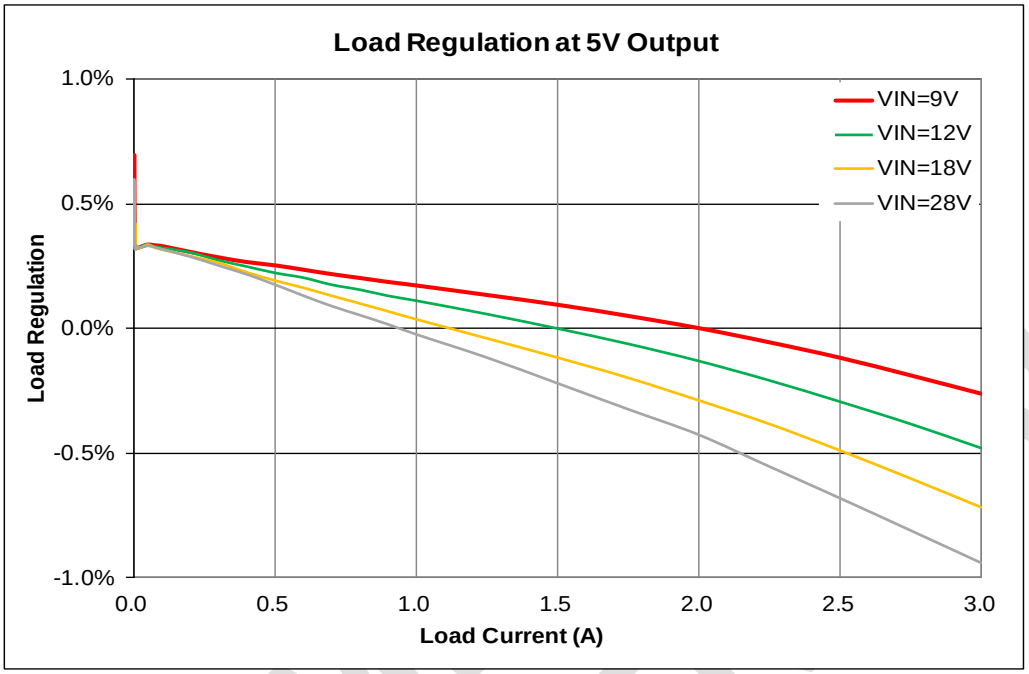
2. Efficiency

Test conditions: V_{IN}=9V/12V/18V/28V, V_{OUT}=5V, I_{OUT}=0.001A to 3A.



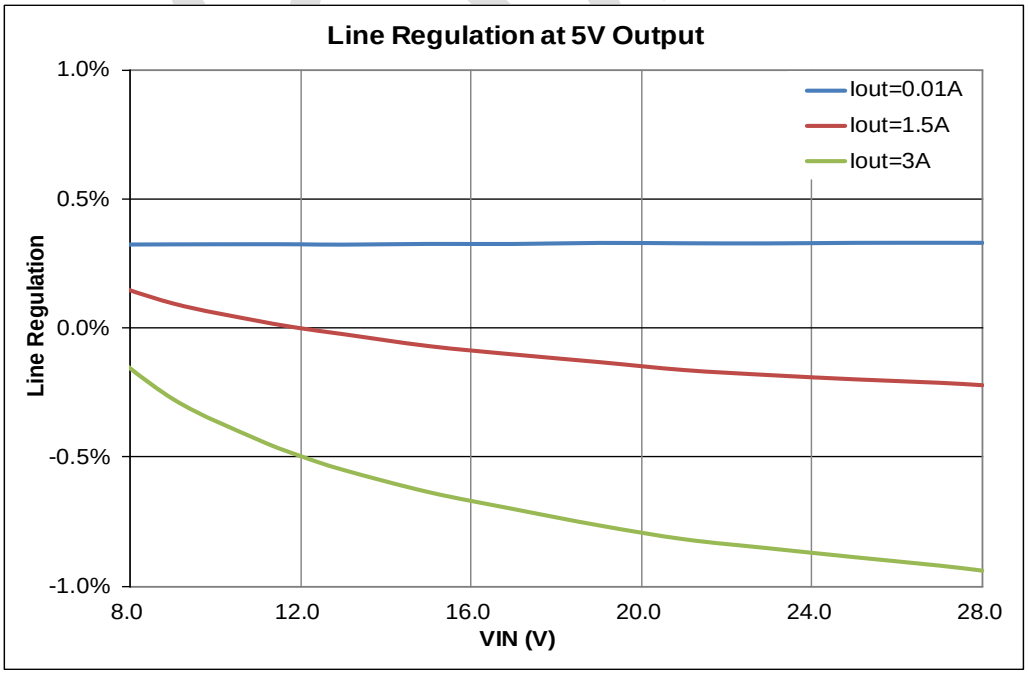
3. Load Regulation

Test conditions: V_{IN}=9V/12V/18V/28V, V_{OUT}=5V, I_{OUT}=0A to 3A.



4. Line Regulation

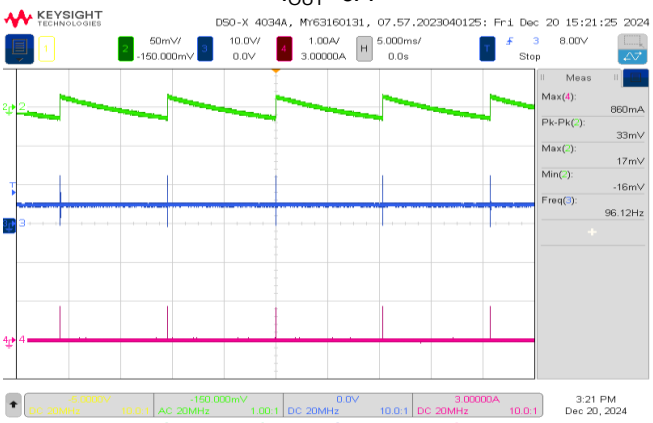
Test conditions: V_{IN}=8V to 28V, V_{OUT}=5V, I_{OUT}=0.01A/1.5A/3A.



5. Output Voltage Ripple

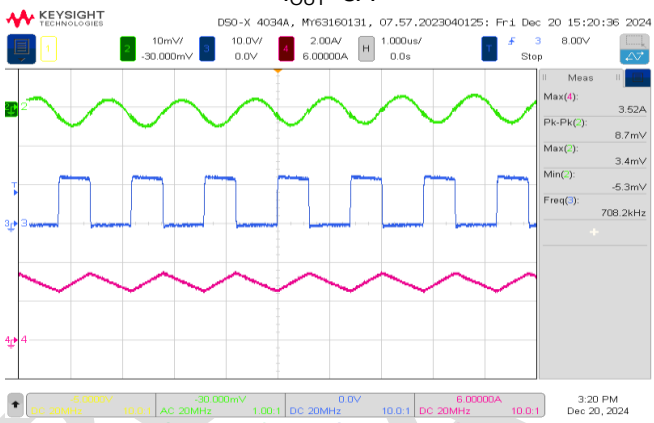
Test conditions: V_{IN}=12V, V_{OUT}=5V.

I_{OUT}=0A



Ch2-V_{OUT}/AC, Ch3-V_{SW}, Ch4-I_L

I_{OUT}=3A

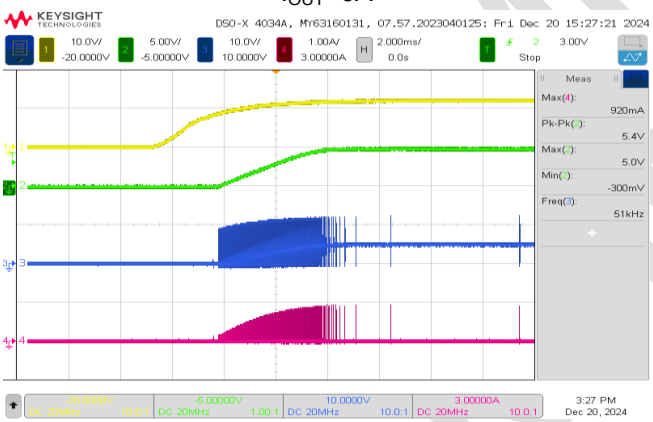


Ch2-V_{OUT}/AC, Ch3-V_{SW}, Ch4-I_L

6. VIN Power On/Off

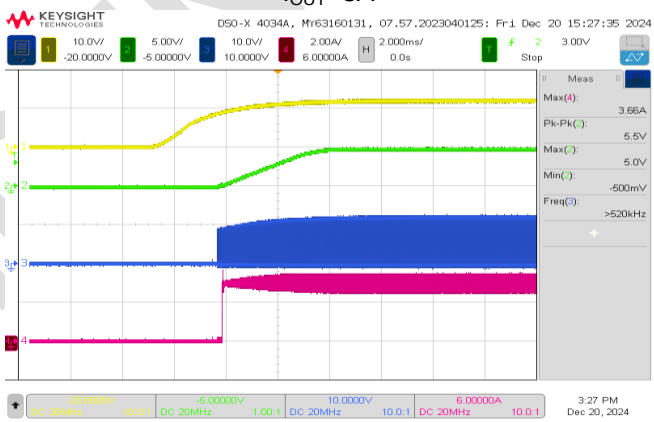
Test conditions: V_{IN}=12V, V_{OUT}=5V. V_{IN} Power On.

I_{OUT}=0A



Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

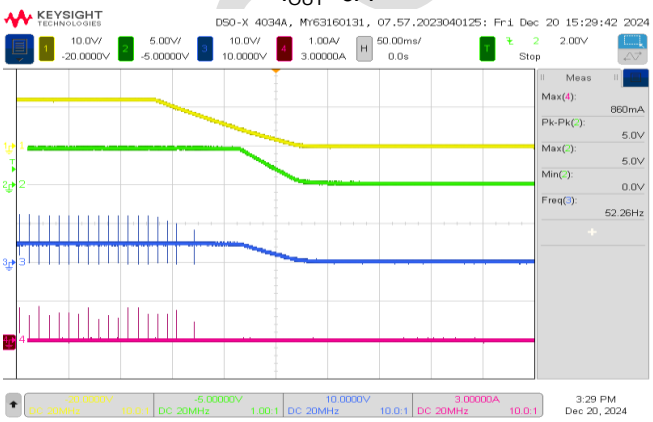
I_{OUT}=3A



Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

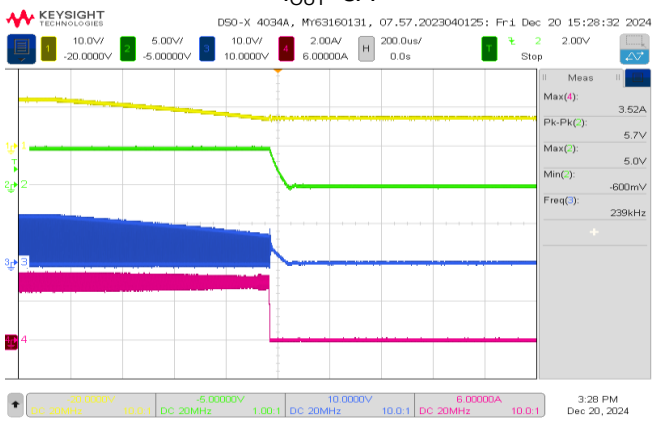
Test conditions: V_{IN}=12V, V_{OUT}=5V. V_{IN} Power Off.

I_{OUT}=0A



Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

I_{OUT}=3A

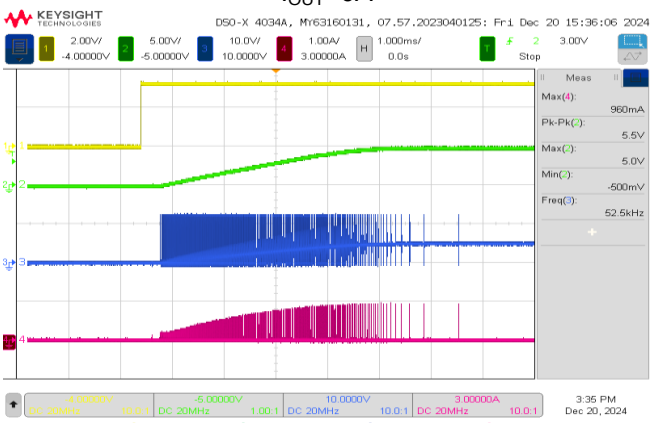


Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

7. EN On/Off

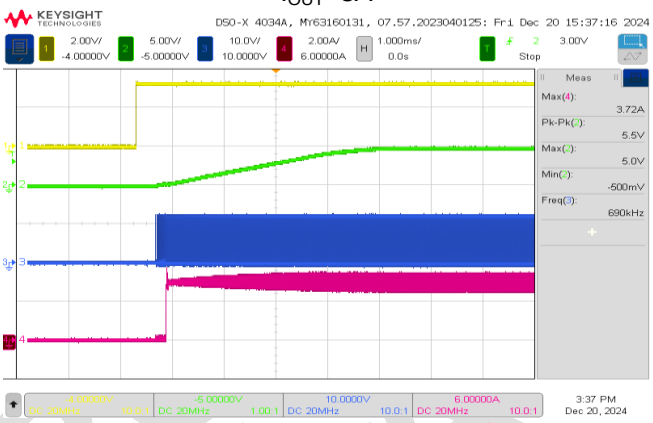
Test conditions: V_{IN}=12V, V_{OUT}=5V. EN Power On.

I_{OUT}=0A



Ch1-EN, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

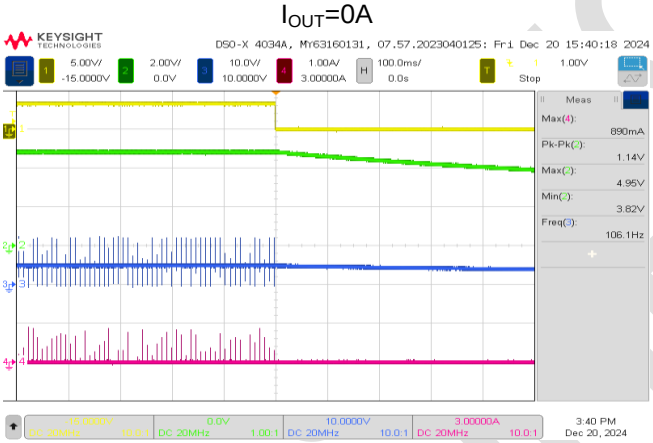
I_{OUT}=3A



Ch1-EN, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

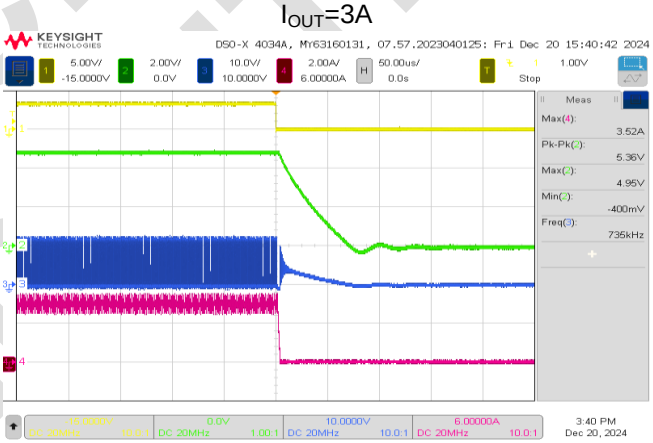
Test conditions: V_{IN}=12V, V_{OUT}=5V. EN Power Off.

I_{OUT}=0A



Ch1-EN, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

I_{OUT}=3A

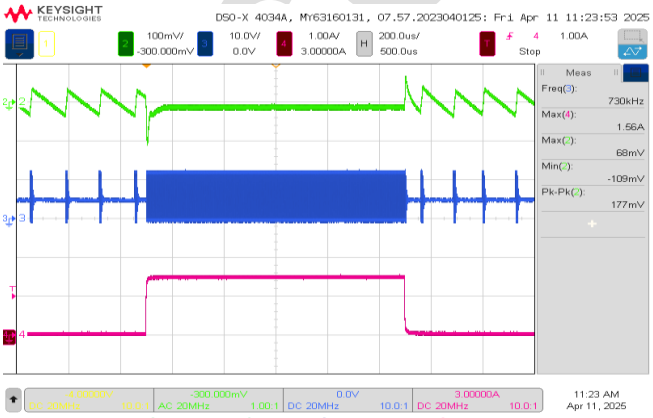


Ch1-EN, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

8. Load Transient

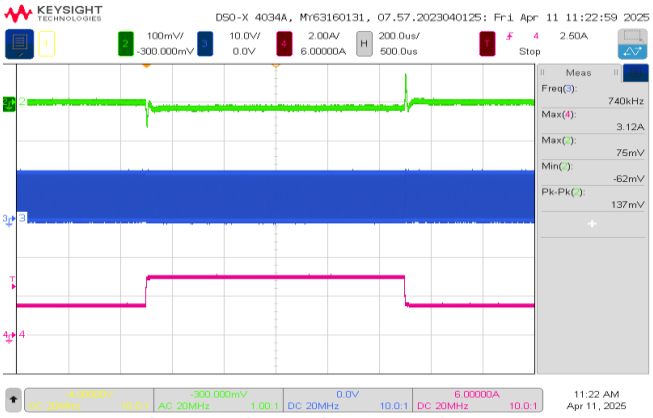
Test conditions: V_{IN}=12V, V_{OUT}=5V.

I_{OUT}=0A to 1.5A to 0A



Ch2-V_{OUT}/AC, Ch3-V_{SW}, Ch4-I_{OUT}

I_{OUT}=1.5A to 3A to 1.5A

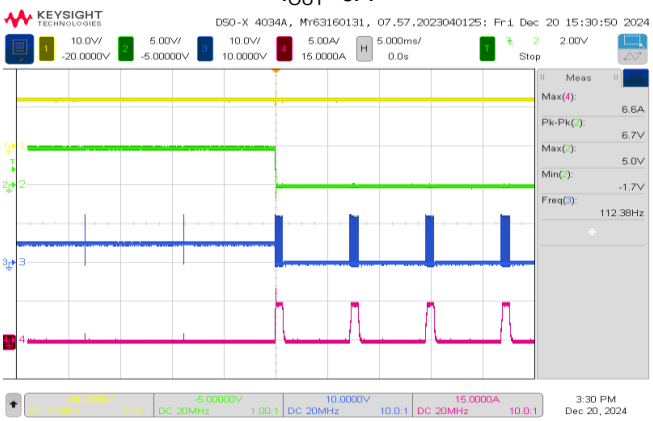


Ch2-V_{OUT}/AC, Ch3-V_{SW}, Ch4-I_{OUT}

9. SCP Entry and Recovery

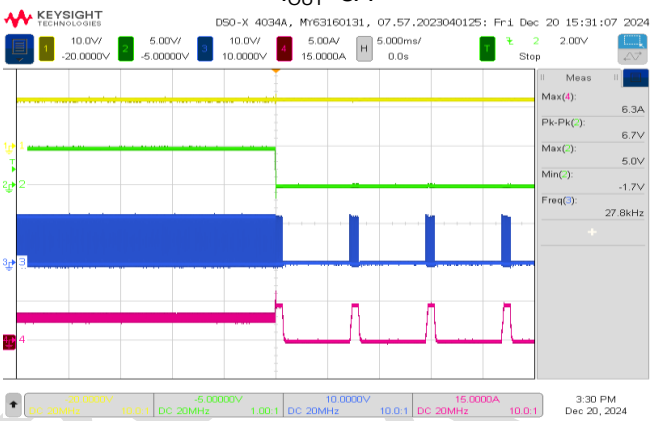
Test conditions: V_{IN}=12V, V_{OUT}=5V. SCP Entry.

I_{OUT}=0A



Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

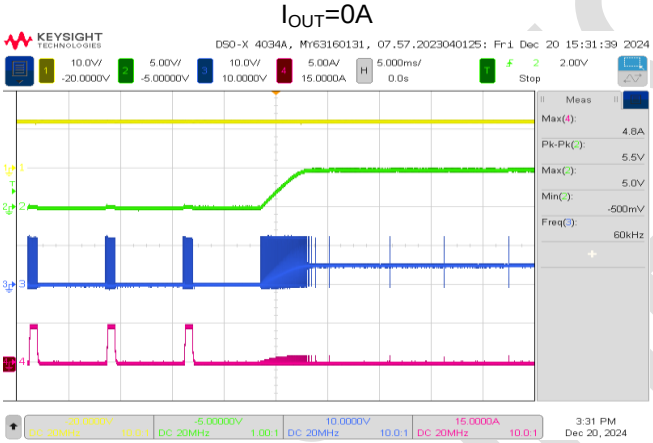
I_{OUT}=3A



Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

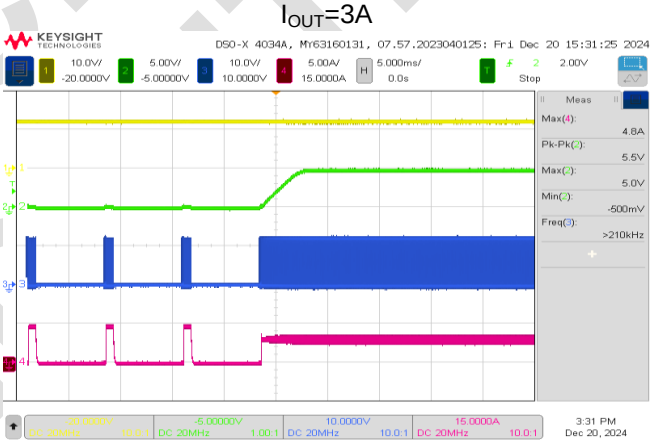
Test conditions: V_{IN}=12V, V_{OUT}=5V. SCP Recovery.

I_{OUT}=0A



Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

I_{OUT}=3A

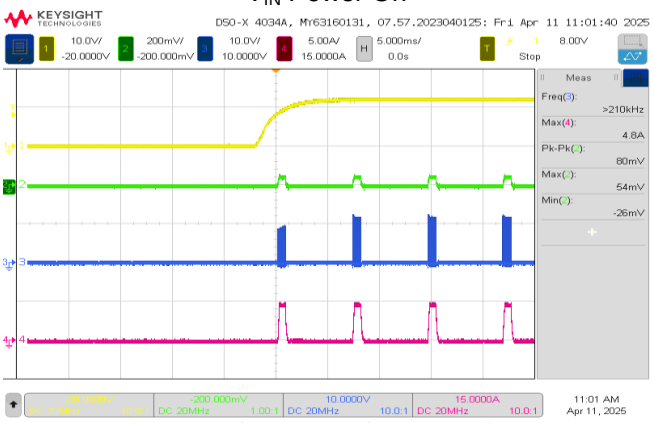


Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

10. VIN/EN On/Off during SCP

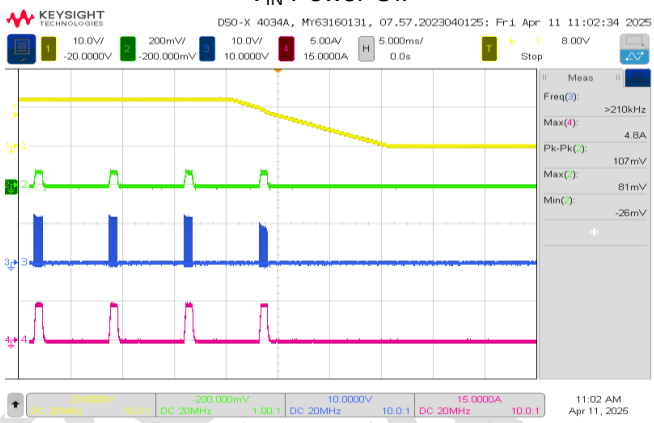
Test conditions: V_{IN}=12V.

V_{IN} Power On



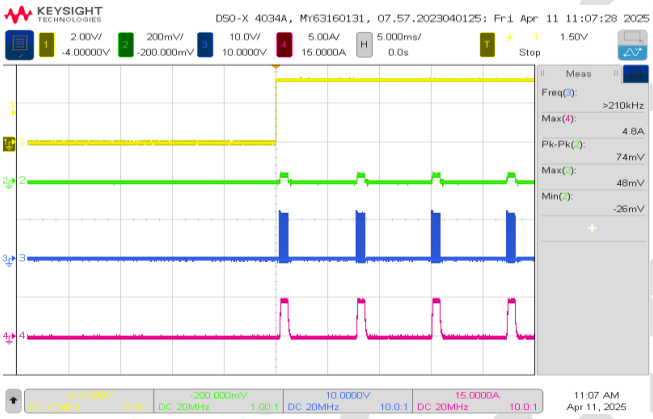
Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

V_{IN} Power Off



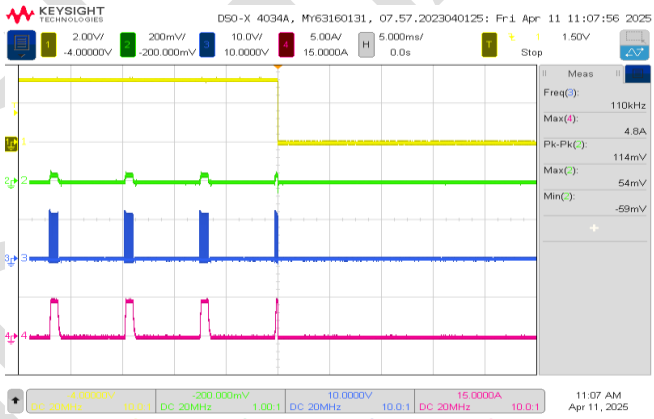
Ch1-V_{IN}, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

EN On



Ch1-EN, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

EN Off



Ch1-EN, Ch2-V_{OUT}, Ch3-V_{SW}, Ch4-I_L

11. Thermal Test

Test conditions: V_{IN}=12V, V_{OUT}=5V, I_{OUT}=0A to 3A.