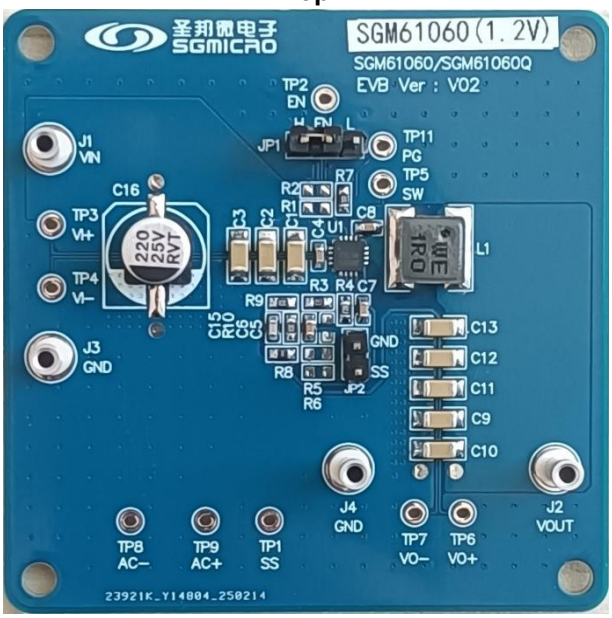
SGM61060Q Demo Board Test Report

2.9V to 6V Input (5V TYP), 1.2V/6A Output

Demo Board Pictures:

Top



Bottom

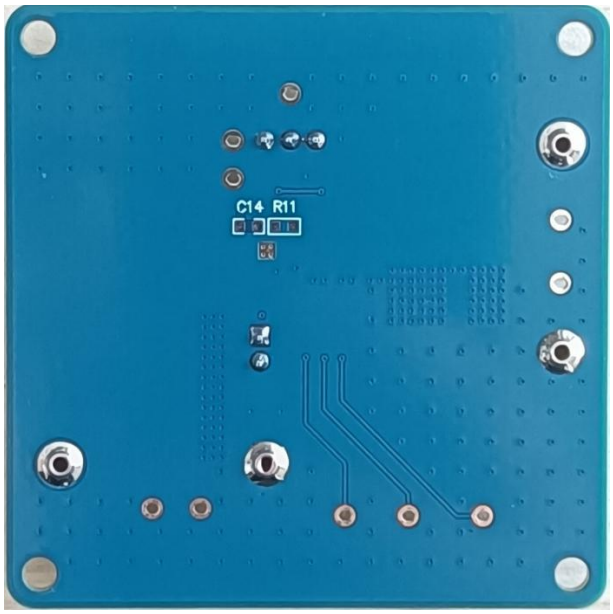


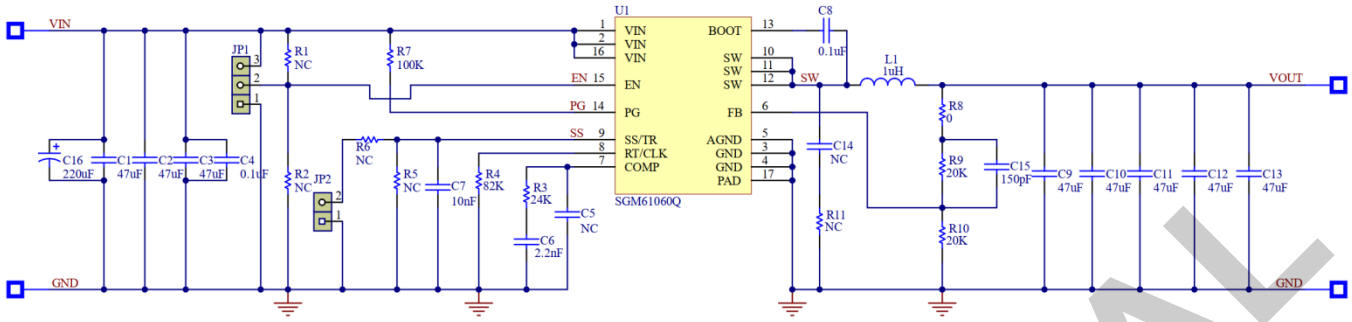
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1. Schematic, BOM List and PCB Layout

1.1 Schematic

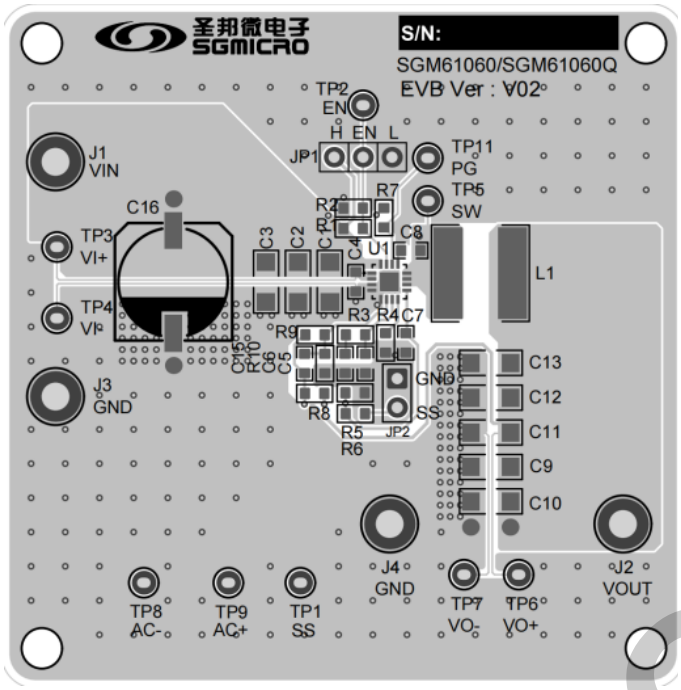


1.2 BOM List

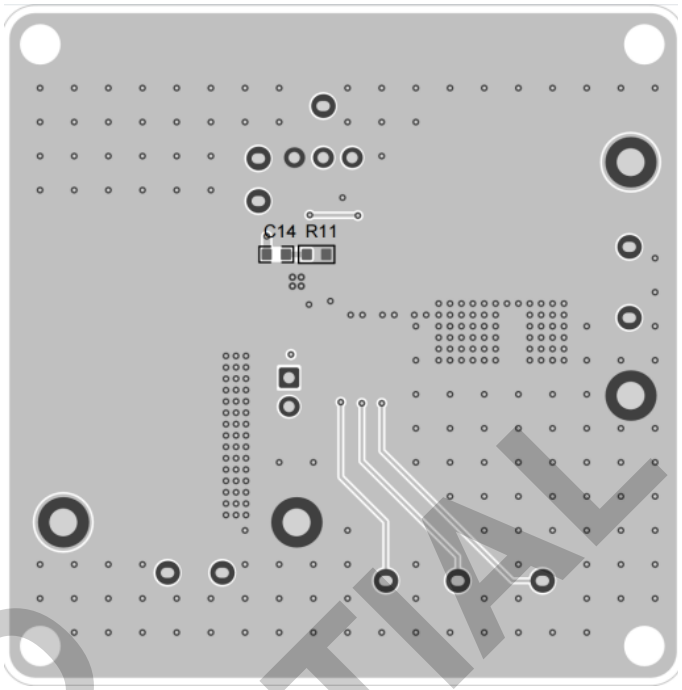
Item	Quantity	Designator	Description	Manufactory
1	8	C1,C2,C3,C9, C10,C11,C12,C13	Ceramic capacitor, 47μF 10V, X5R, ±10%, 1206, GRM31CR61A476KE15	muRata
2	2	C4,C8	Ceramic capacitor, 0.1μF 25V, X7R, ±10%, 0603	muRata
3	0	C5,C14	NC	/
4	1	C6	Ceramic capacitor, 2.2nF 25V, X7R, ±10%, 0603	muRata
5	1	C7	Ceramic capacitor, 10nF 25V, X7R, ±10%, 0603	muRata
6	1	C15	Ceramic capacitor, 150pF 50V, C0G, ±5%, 0603	muRata
7	1	C16	Solid Electrolytic capacitor, 220μF, 16V	Standard
8	1	L1	Inductor, 1μH±20%, I_{TEMP}=7.4A, I_{SAT}=9.6A, DCR=11.6mΩ, 74439344010	Würth
9	0	R1,R2,R5,R6,R11	NC	/
10	1	R3	Film Resistor, 1%, 24KΩ, 0603	Standard
11	1	R4	Film Resistor, 1%, 82KΩ, 0603	Standard
12	1	R7	Film Resistor, 1%, 100KΩ, 0603	Standard
13	1	R8	Film Resistor, 1%, 0Ω, 0603	Standard
14	2	R9,R10	Film Resistor, 1%, 20KΩ, 0603	Standard
15	1	U1	SGM61060Q, 2.95V to 6V Input, 6A Synchronous Step-Down Converter, TQFN-3×3-16CL	SGMICRO
			Conclusion: Total 22 components	

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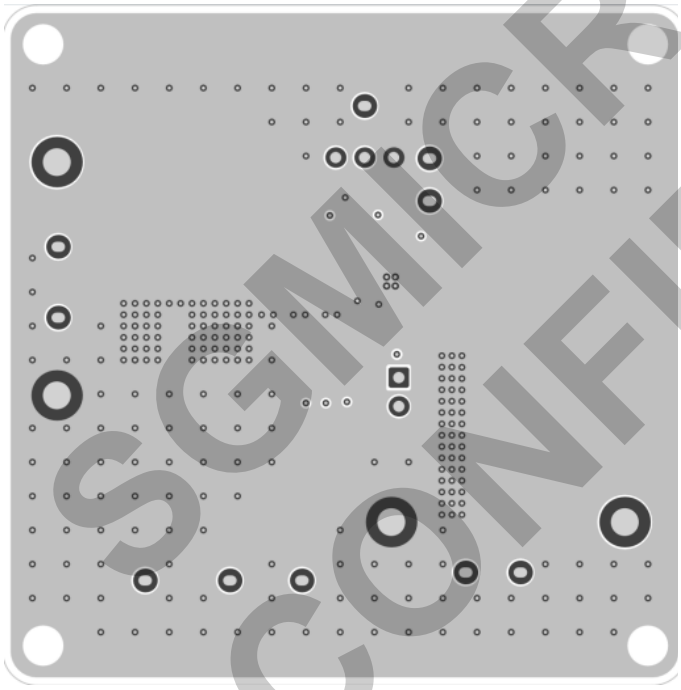
1.3 PCB Layout



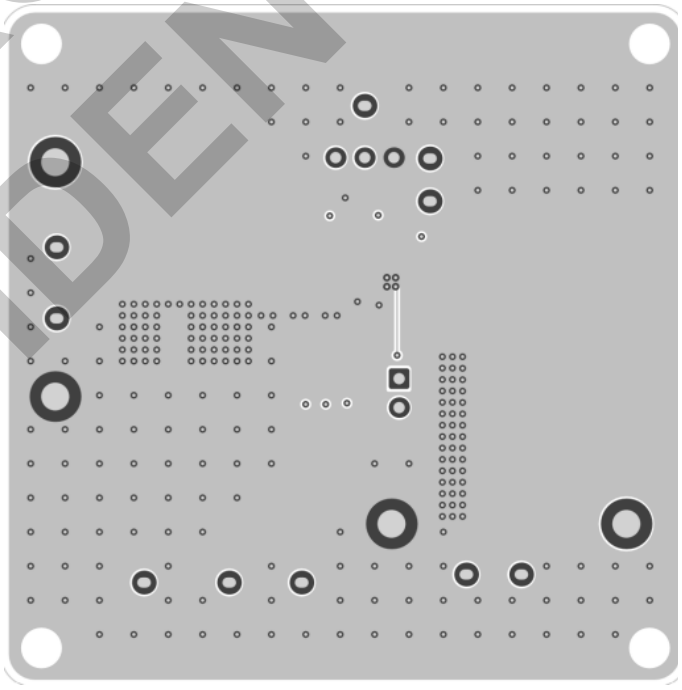
PCB Top Layer



PCB Bottom Layer



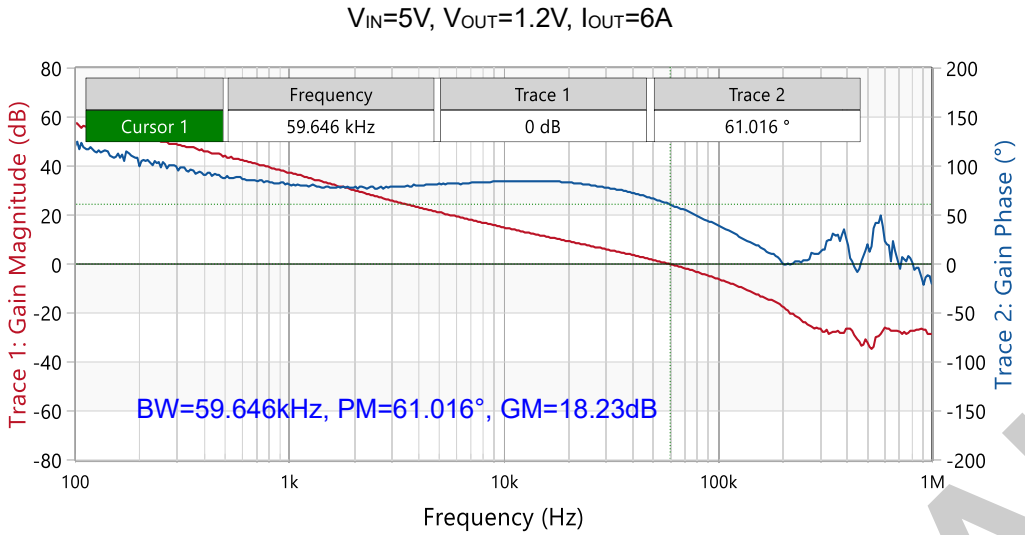
PCB Middle Layer 1



PCB Middle Layer 2

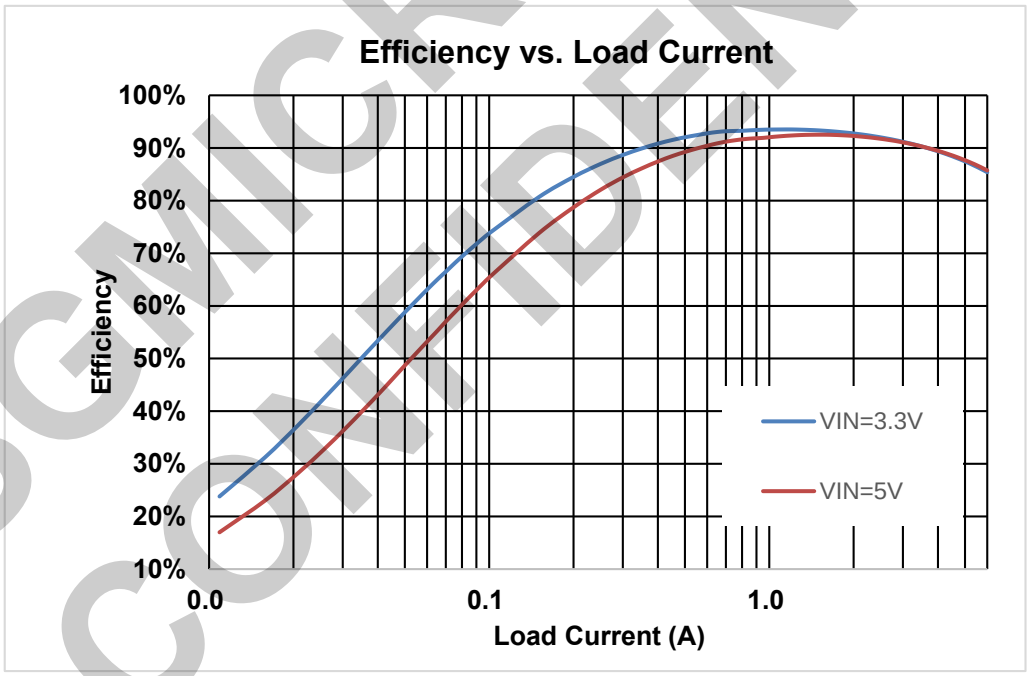
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2. Bode Plot



3. Efficiency

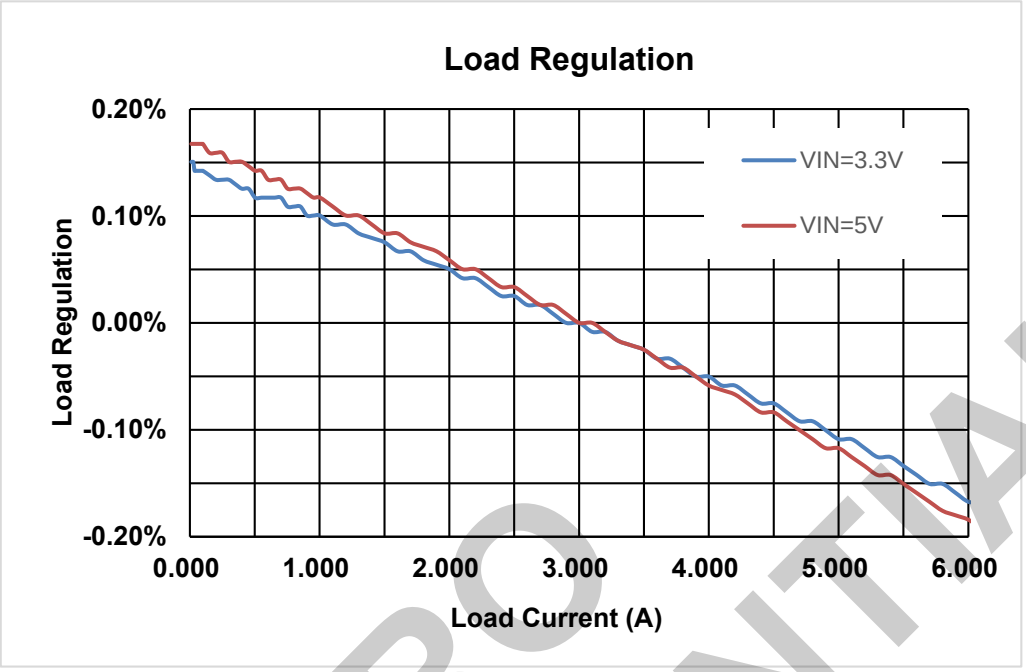
Test conditions: SGM61060Q, V_{IN}=3.3V/5V, I_{OUT}=0.001A~6A, V_{OUT}=1.2V, Efficiency at 25℃ ambient temperature, f=500kHz, L=1μH(DCR=8.3mΩ).



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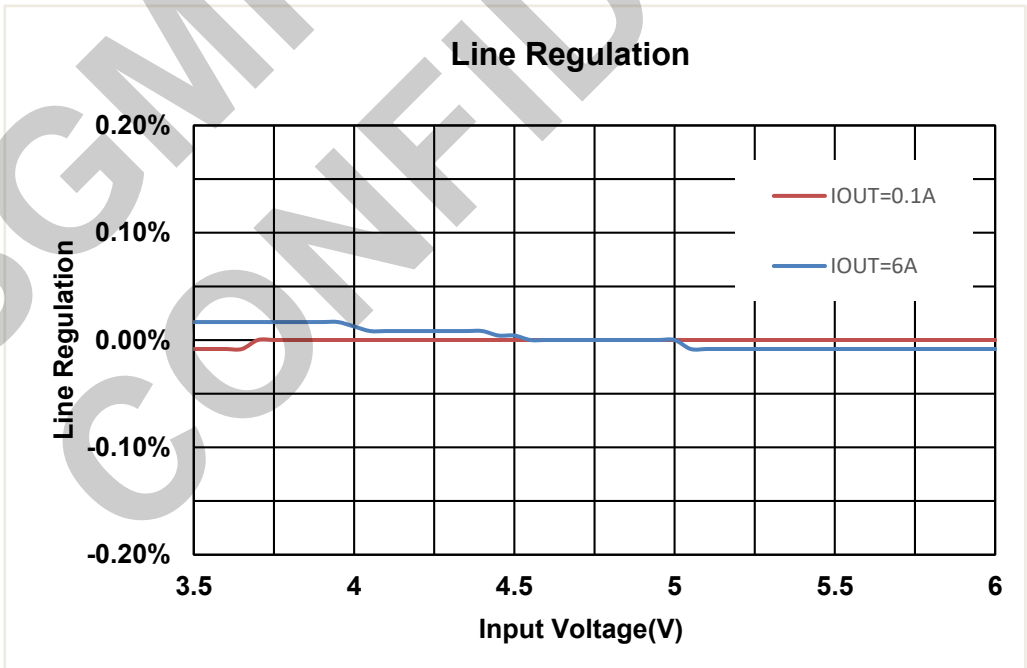
4. Load Regulation

Test conditions: SGM61060Q, V_{IN}=3.3V/5V, I_{OUT}=0A~6A, V_{OUT}=1.2V.



5. Line Regulation

Test conditions: SGM61060Q, V_{IN}=3.5V~6V, I_{OUT}=0.1A/6A, V_{OUT}=1.2V.

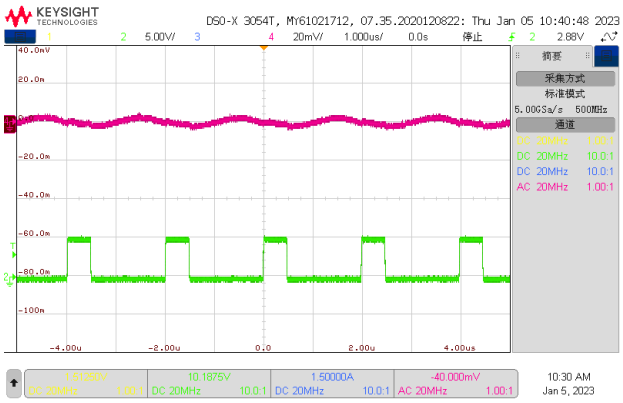


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6. Output Voltage Ripple

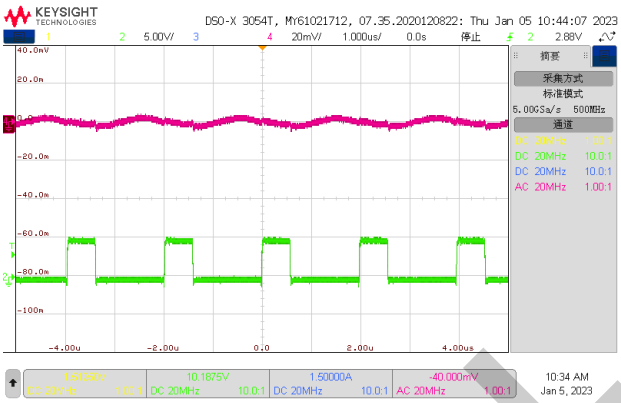
Test conditions: V_{IN}=5V, V_{OUT}=1.2V.

I_{OUT}=0.1A



Ch2-V_{SW} Ch4-V_{OUT}/AC

I_{OUT}=6A

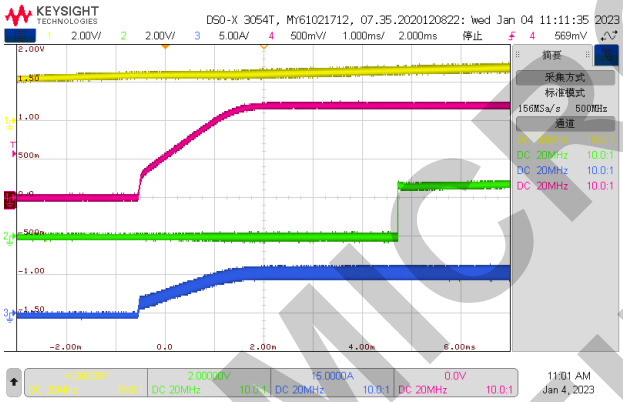


Ch2-V_{SW} Ch4-V_{OUT}/AC

7. VIN Power On/Off

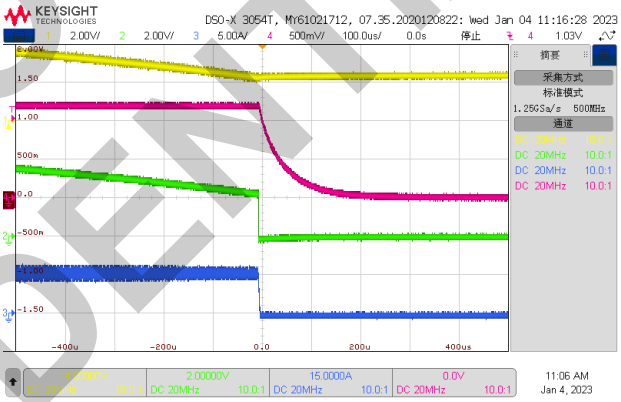
Test conditions: V_{IN}=5V, V_{OUT}=1.2V, I_{OUT}=6A.

V_{IN} Power On



CH1-V_{IN} CH2-V_{PG} CH3-I_L CH4-V_{OUT}

V_{IN} Power Off

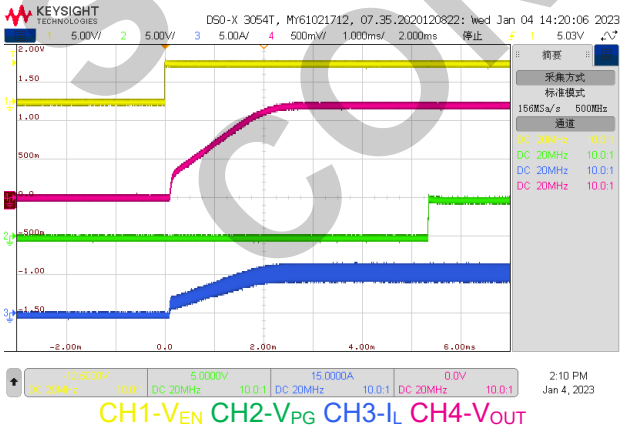


CH1-V_{IN} CH2-V_{PG} CH3-I_L CH4-V_{OUT}

8. EN On/Off

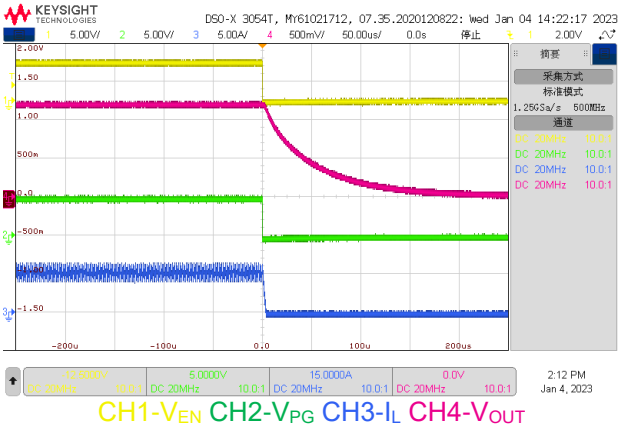
Test conditions: V_{IN}=5V, V_{OUT}=1.2V, I_{OUT}=6A.

EN On



CH1-V_{EN} CH2-V_{PG} CH3-I_L CH4-V_{OUT}

EN Off



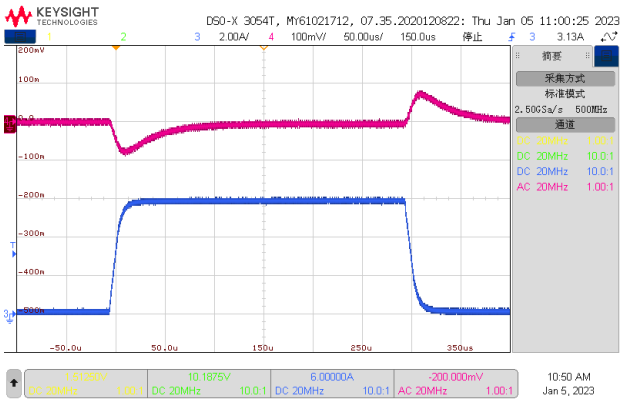
CH1-V_{EN} CH2-V_{PG} CH3-I_L CH4-V_{OUT}

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9. Load Transient

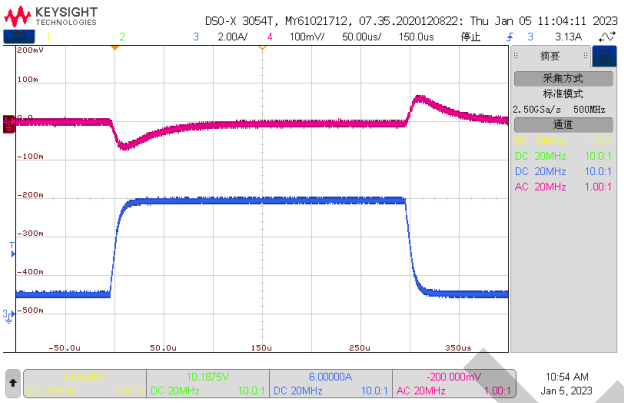
Test conditions: V_{IN}=5V, V_{OUT}=1.2V.

I_{OUT}=0.1A to 6A to 0.1A



CH3-I_{OUT} CH4-V_{OUT}/AC

I_{OUT}=1A to 6A to 1A

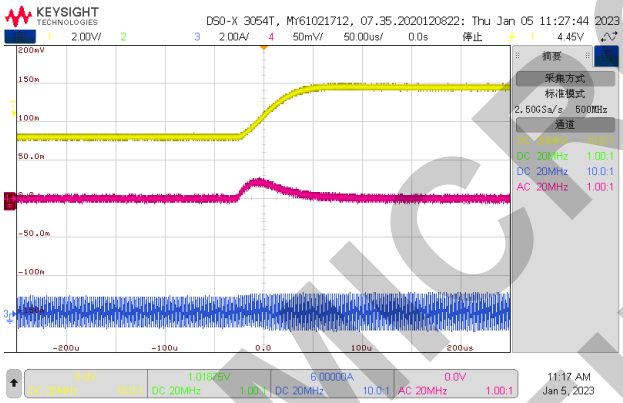


CH3-I_{OUT} CH4-V_{OUT}/AC

10. Line Transient

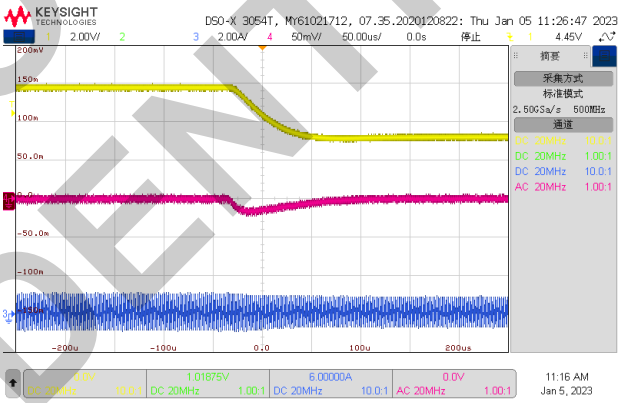
Test conditions: V_{IN}=2.9V to 6V to 2.9V, V_{OUT}=1.2V, I_{OUT}=0.1A.

V_{IN}=2.9V to 6V



CH1-V_{IN} CH3-I_L CH4-V_{OUT}/AC

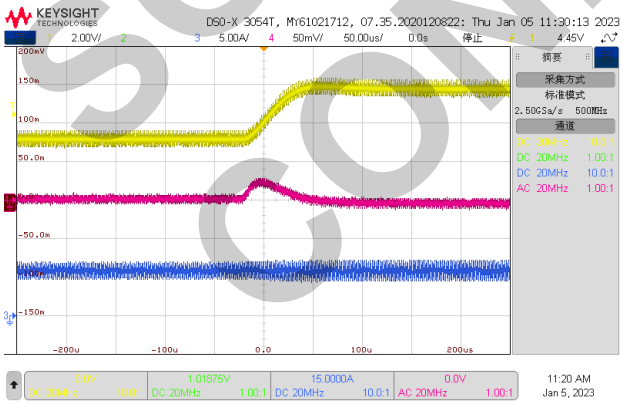
V_{IN}=6V to 2.9V



CH1-V_{IN} CH3-I_L CH4-V_{OUT}/AC

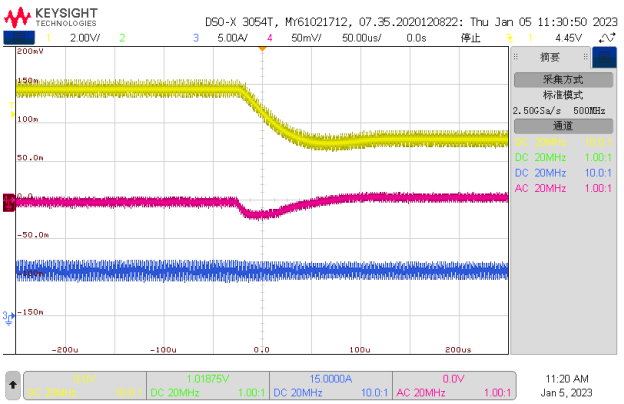
Test conditions: V_{IN}=2.9V to 6V to 2.9V, V_{OUT}=1.2V, I_{OUT}=6A.

V_{IN}=2.9V to 6V



CH1-V_{IN} CH3-I_L CH4-V_{OUT}/AC

V_{IN}=6V to 2.9V



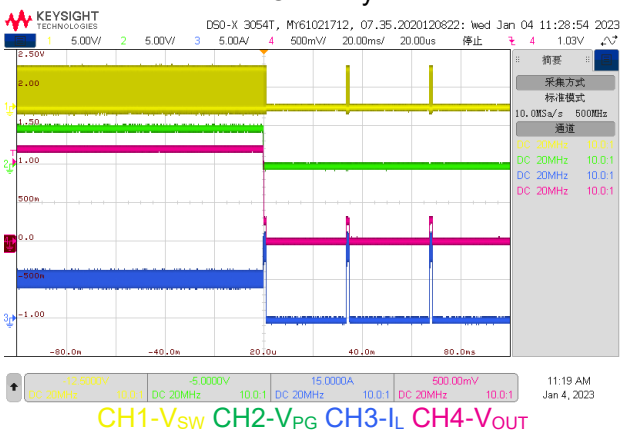
CH1-V_{IN} CH3-I_L CH4-V_{OUT}/AC

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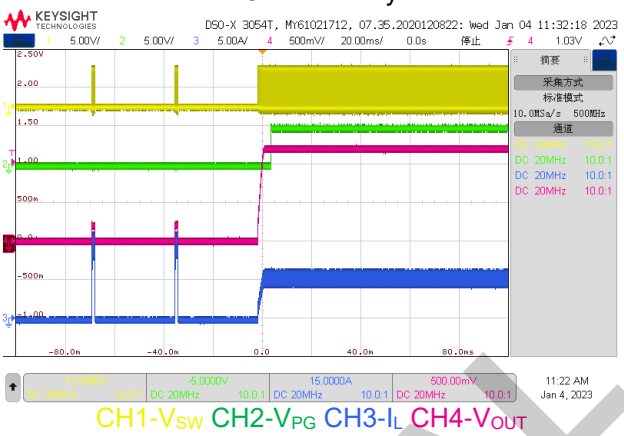
11. SCP Entry and Recovery

Test conditions: V_{IN}=5V, V_{OUT}=1.2V, I_{OUT}=6A, Output Shorted.

SCP Entry



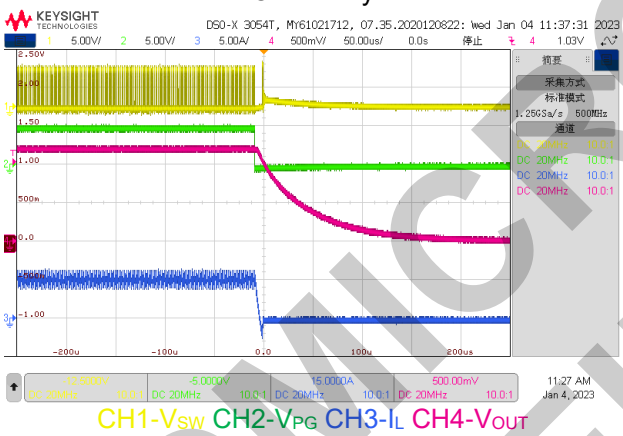
SCP Recovery



12. OTP Entry

Test conditions: V_{IN}=5V, V_{OUT}=1.2V, I_{OUT}=6A, Over temperature.

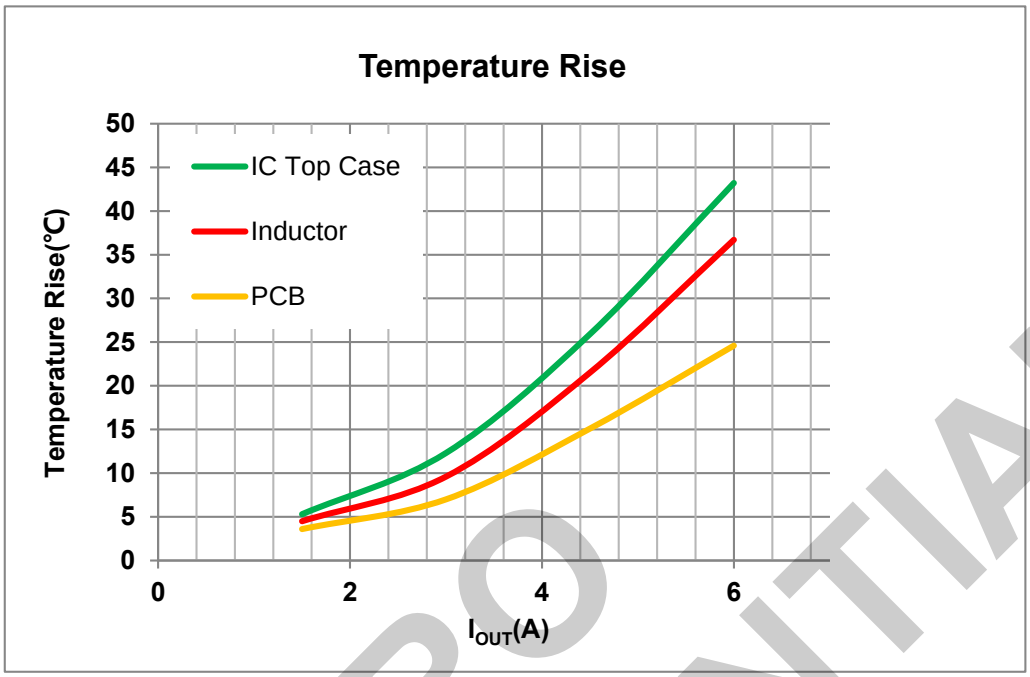
OTP Entry



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13. Thermal Test

Test conditions: V_{IN}=5V, V_{OUT}=1.2V, Room temperature test, Natural air convection heat dissipation.



I_{OUT}(A)	1.5	3	4.5	6
IC Top Case(℃)	34.4	41.6	55.5	73.0
Inductor(℃)	33.6	38.9	51.1	66.5
PCB(℃)	32.7	36.3	44.7	54.4
Ambient(℃)	29.1	29.3	29.6	29.8

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