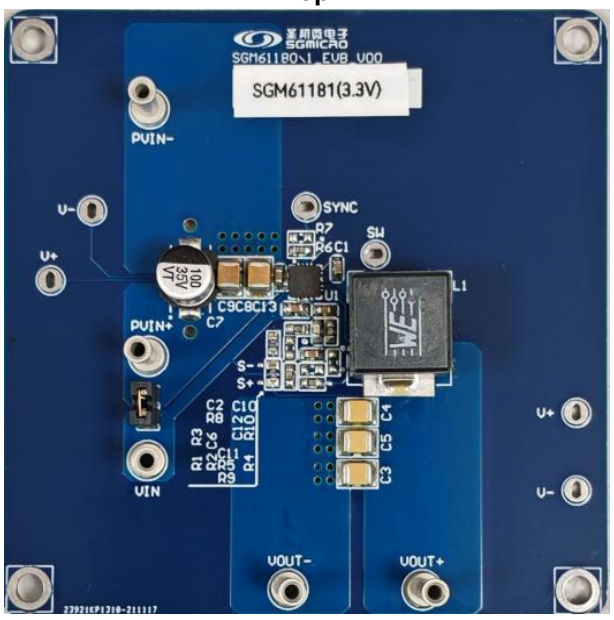
SGM61181 Demo Board Test Report

4.5V to 18V Input (12V TYP), 3.3V/8A Output

Demo Board Pictures:

Top



Bottom

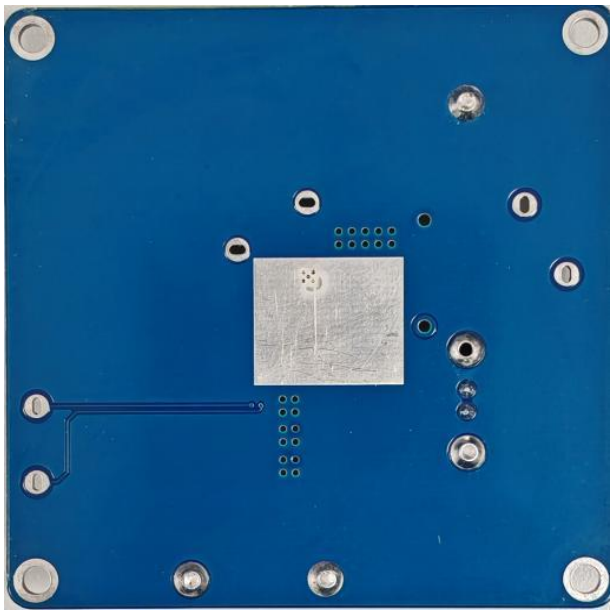


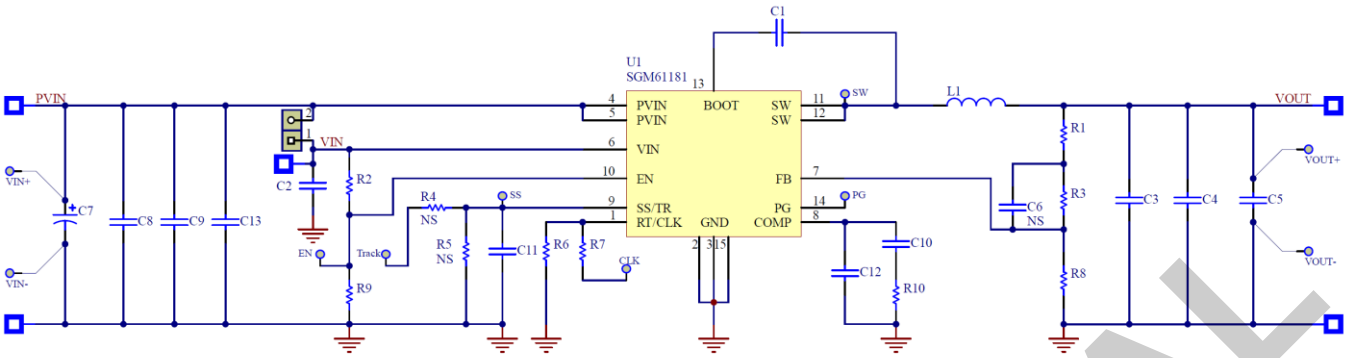
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1. Schematic, BOM List and PCB Layout

1.1 Schematic

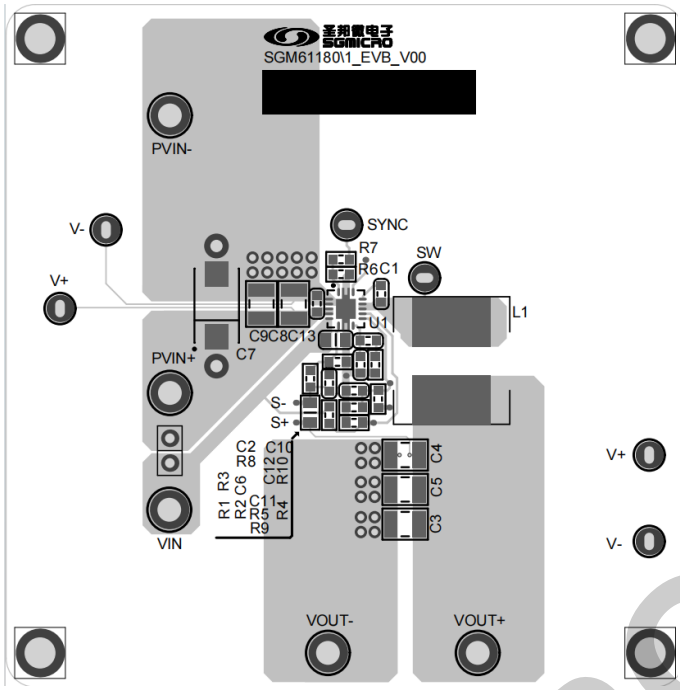


1.2 BOM List

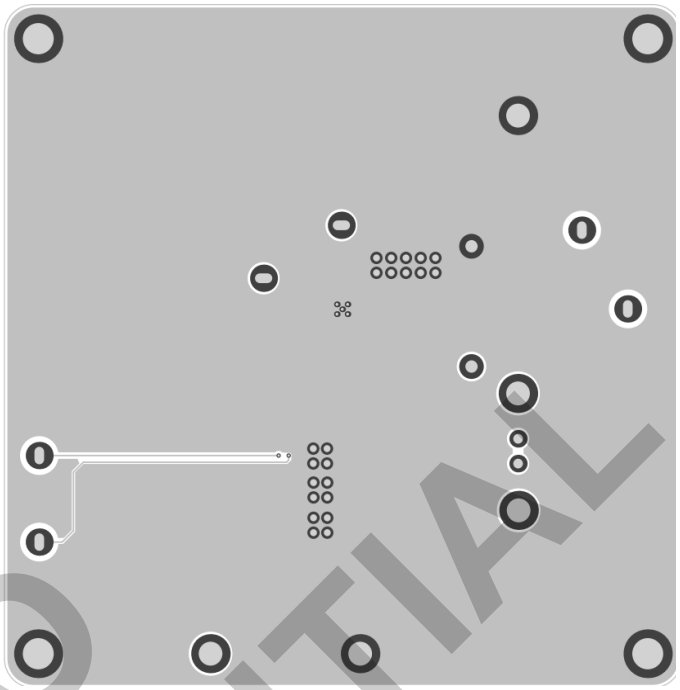
Item	Quantity	Designator	Description	Manufactory
1	2	C1,C13	Ceramic capacitor, 0.1μF, 25V, X7R, ±10%, 0603	muRata
2	1	C2	Ceramic capacitor, 4.7μF, 25V, X5R, ±10%, 0805, GRM219R61E475KA73	muRata
3	3	C3,C4,C5	Ceramic capacitor, 47μF, 10V, X7R, ±10%, 1210, GRM32ER71A476KE15	muRata
4	0	C6	NC	/
5	1	C7	Solid Electrolytic capacitor, 100μF, 35V	Standard
6	1	C8	Ceramic capacitor, 10μF, 25V, X7R, ±10%, 1210, GCM32ER71E106KA57	muRata
7	1	C9	Ceramic capacitor, 4.7μF, 50V, X7R, ±10%, 1210, GCJ32ER71H475KA12	muRata
8	2	C10,C11	Ceramic capacitor, 10nF, 50V, C0G, ±5%, 0603	muRata
9	1	C12	Ceramic capacitor, 22pF, 50V, C0G, ±5%, 0603	muRata
10	1	L1	Ind.,3.3μH±20%, $I_{RMS(40K)}$=18.2A, $I_{SAT(30\%)}$=24.7A, DCR_{TYP}=5.2mΩ, 7443320330	Würth
11	2	R1,R7	Film Resistor, 1%, 0Ω, 0603	Standard
12	1	R2	Film Resistor, 1%, 56KΩ, 0603	Standard
13	1	R3	Film Resistor, 1%, 10KΩ, 0603	Standard
14	0	R4,R5	NC	/
15	1	R6	Film Resistor, 1%, 100KΩ, 0603	Standard
16	1	R8	Film Resistor, 1%, 3.24KΩ, 0603	Standard
17	1	R9	Film Resistor, 1%, 10.5KΩ, 0603	Standard
18	1	R10	Film Resistor, 1%, 3KΩ, 0603	Standard
19	1	U1	SGM61181, 8A, 18V, Synchronous Buck Converter	SGMICRO
			Conclusion: Total 22 components	

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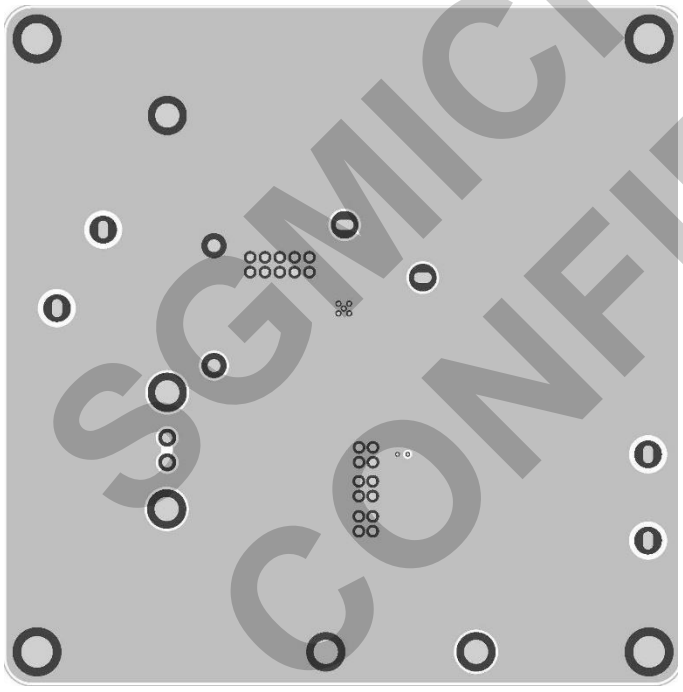
1.3 PCB Layout



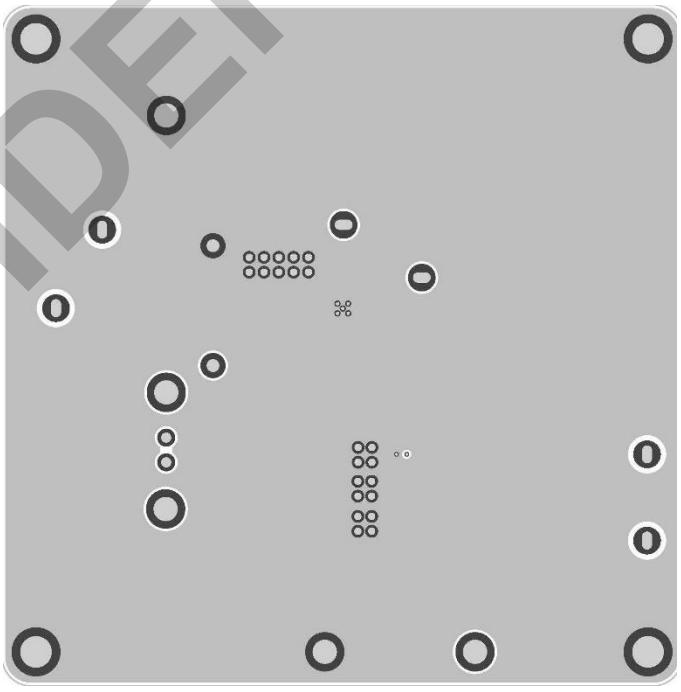
PCB Top Layer



PCB Bottom Layer



PCB Middle Layer 1

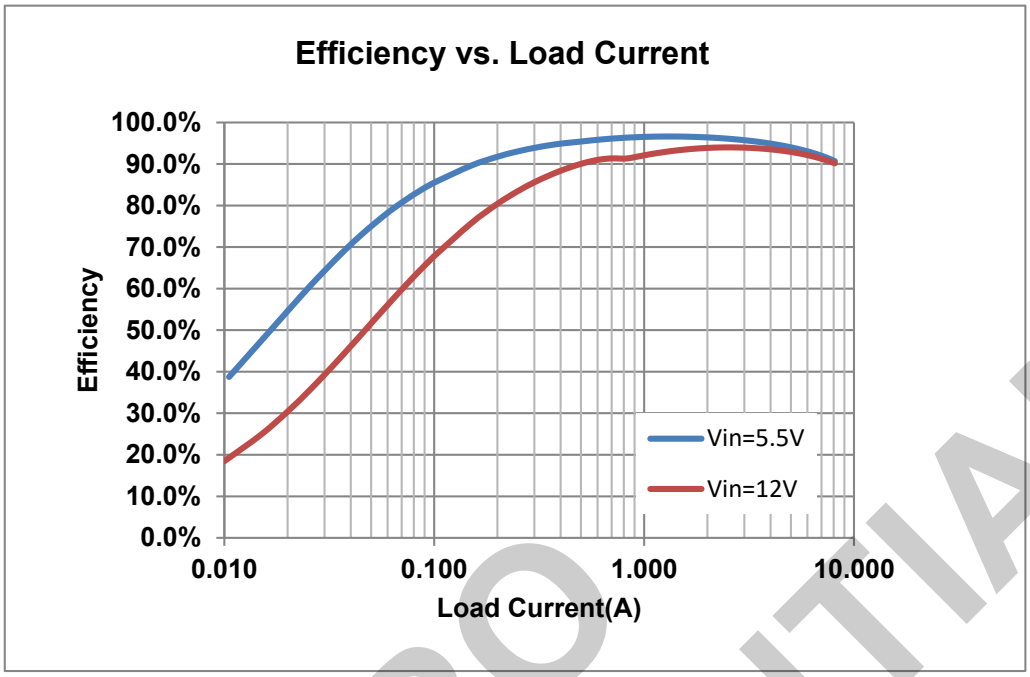


PCB Middle Layer 2

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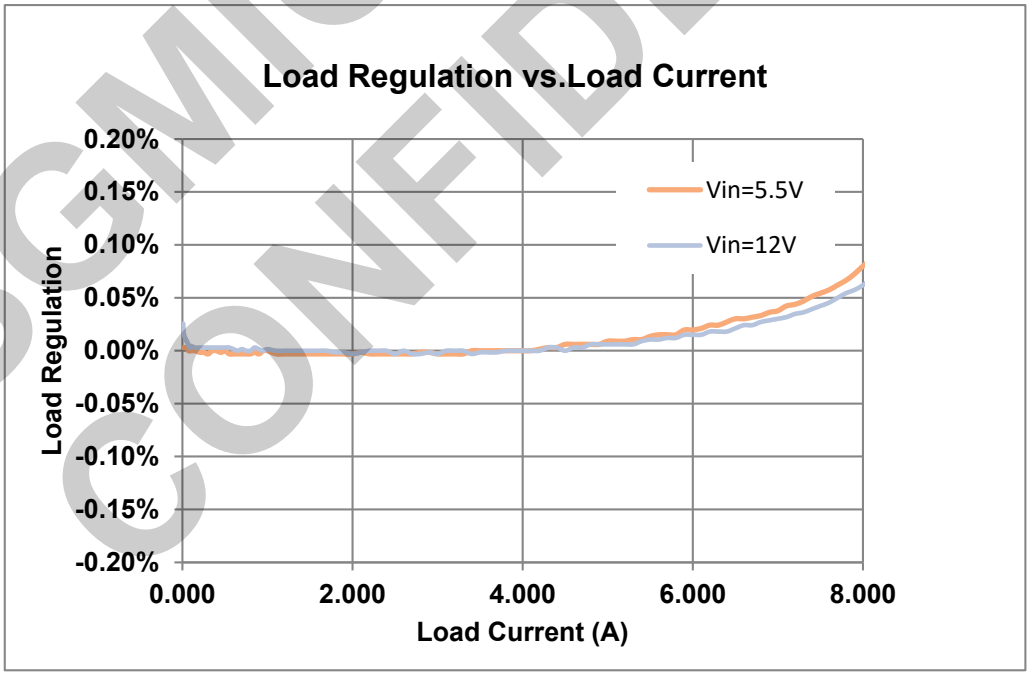
2. Efficiency

Test conditions: V_{IN}=5.5V/12V, V_{OUT}=3.3V, I_{OUT}=0.01A~8A.



3. Load Regulation

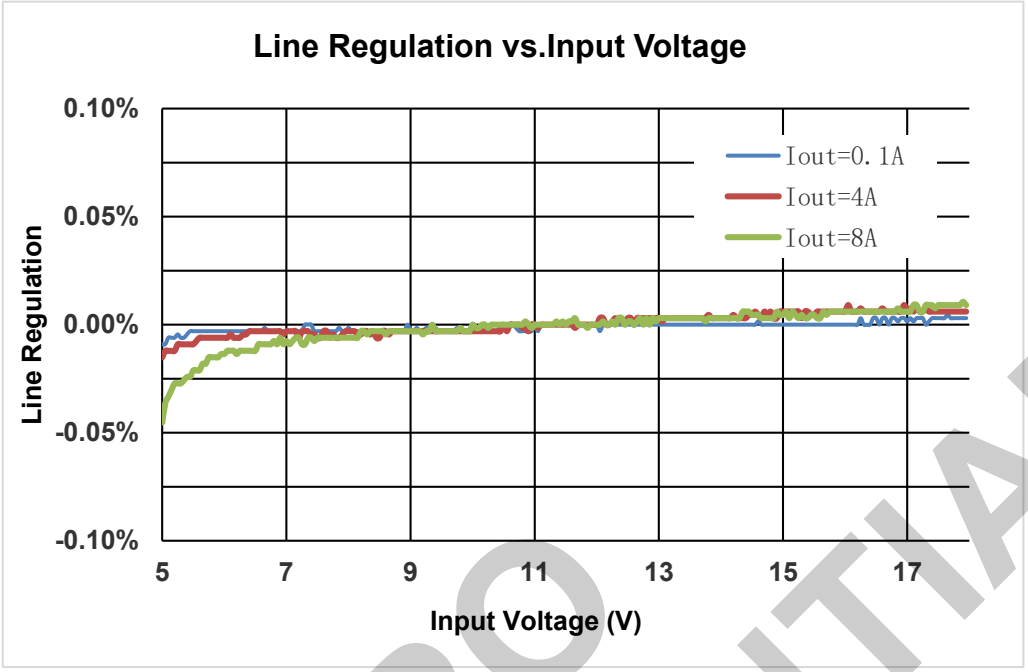
Test conditions: V_{IN}=5.5V/12V, V_{OUT}=3.3V, I_{OUT}=0A~8A.



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4. Line Regulation

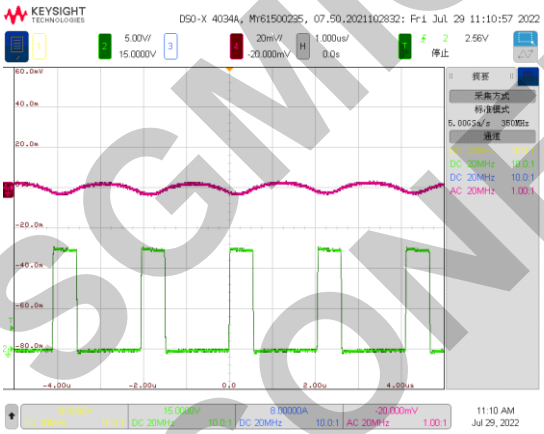
Test conditions: V_{IN}=5V~18V, V_{OUT}=3.3V, I_{OUT}=0.1A/4A/8A.



5. Output Voltage Ripple

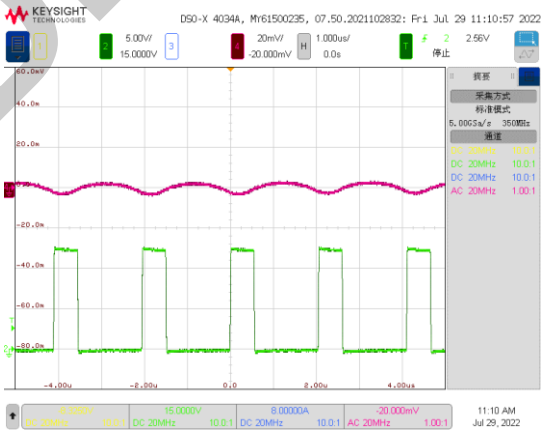
Test conditions: V_{IN}=12V, V_{OUT}=3.3V.

I_{OUT}=0.01A



CH2-V_{SW} CH4-V_{OUT}/AC

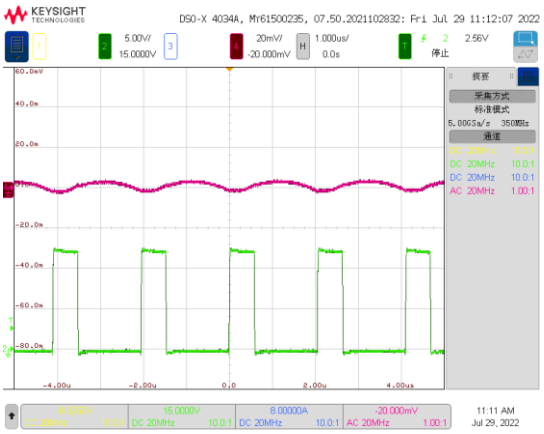
I_{OUT} =0.5A



CH2-V_{SW} CH4-V_{OUT}/AC

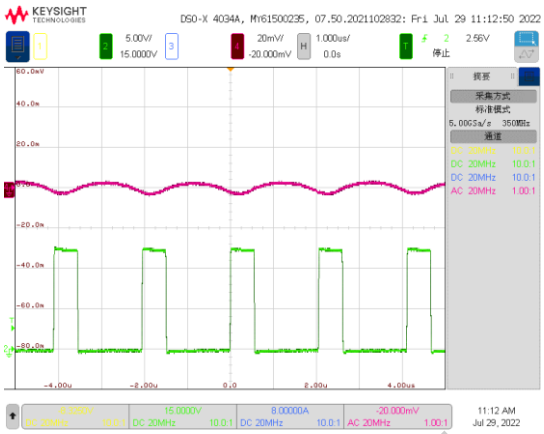
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I_{OUT}=4A



CH2-V_{SW} CH4-V_{OUT}/AC

I_{OUT} =8A

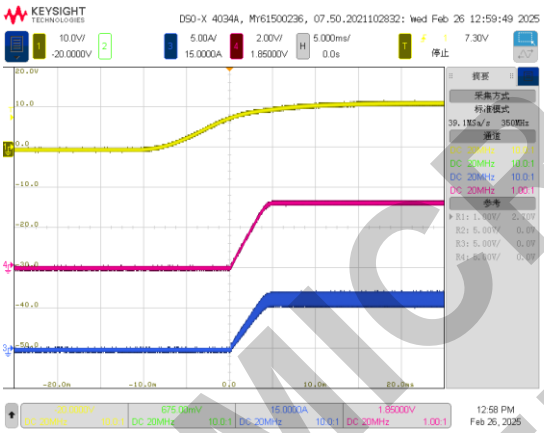


CH2-V_{SW} CH4-V_{OUT}/AC

6. VIN Power On/Off

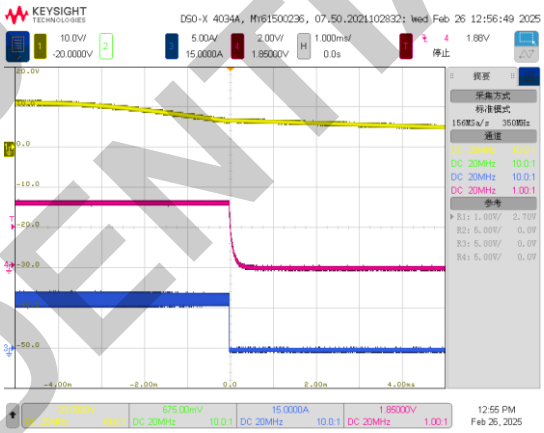
Test conditions: V_{IN}=12V, V_{OUT}=3.3V, I_{OUT}=8A, V_{IN} Power On/Off.

V_{IN} Power On



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

V_{IN} Power Off

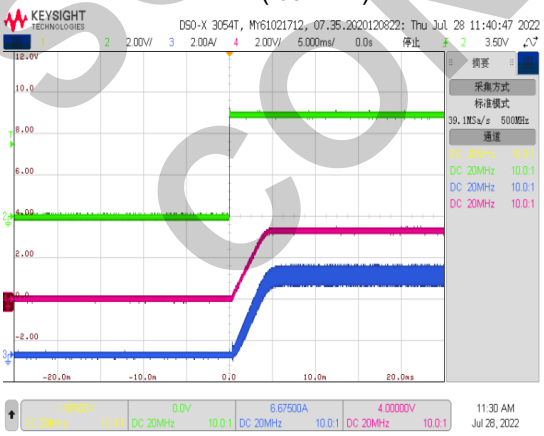


CH1-V_{IN} CH3-I_L CH4-V_{OUT}

7. EN On/Off

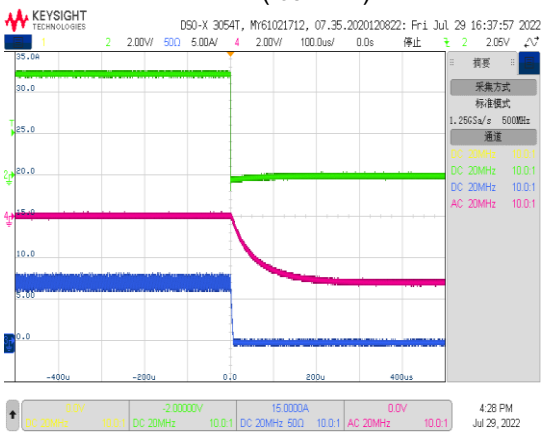
Test conditions: V_{IN}=12V, V_{OUT}=3.3V, EN On/Off.

EN On (I_{OUT}=4A)



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

EN Off (I_{OUT}=8A)



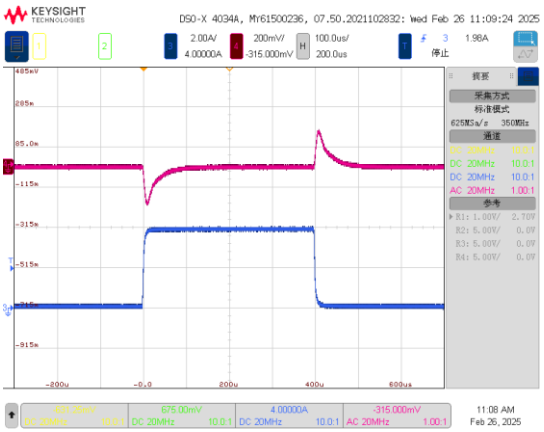
CH2-V_{EN} CH3-I_L CH4-V_{OUT}

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8. Load Transient

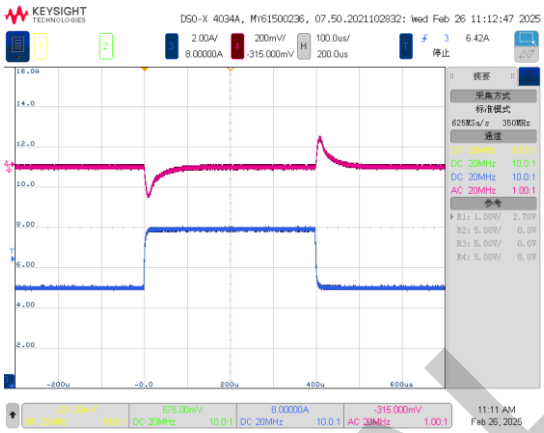
Test conditions: V_{IN}=12V, V_{OUT}=3.3V, Slew rate=0.5A/μs

I_{OUT}=0.05A to 4A to 0.05A



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

I_{OUT}=5A to 8A to 5A

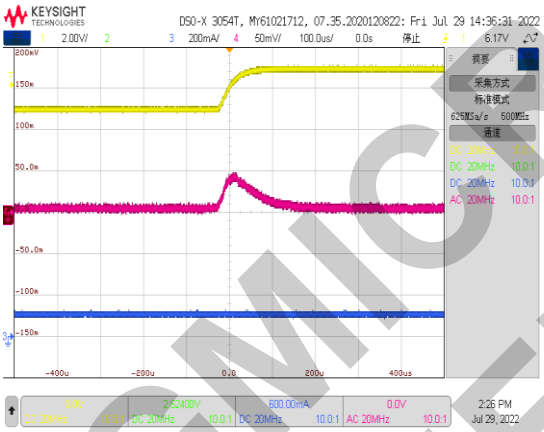


CH3-I_{OUT} CH4-V_{OUT}/AC

9. Line Transient

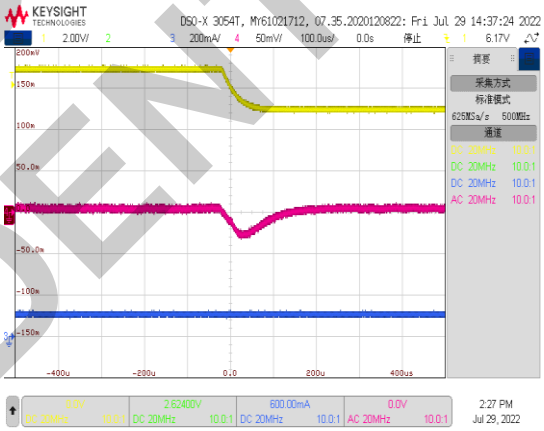
Test conditions: V_{OUT}=3.3V, I_{OUT}=0.1A, EN Floating.

V_{IN}=5V to 7V



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

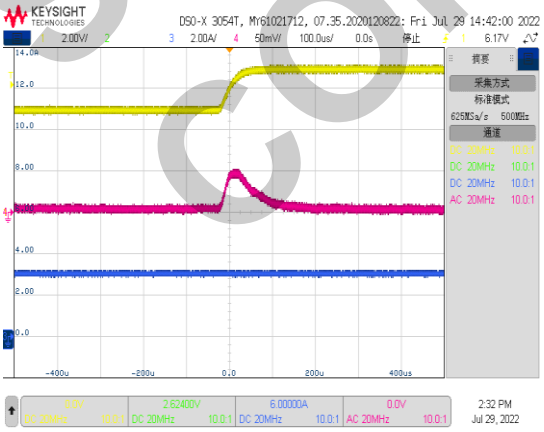
V_{IN}=7V to 5V



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

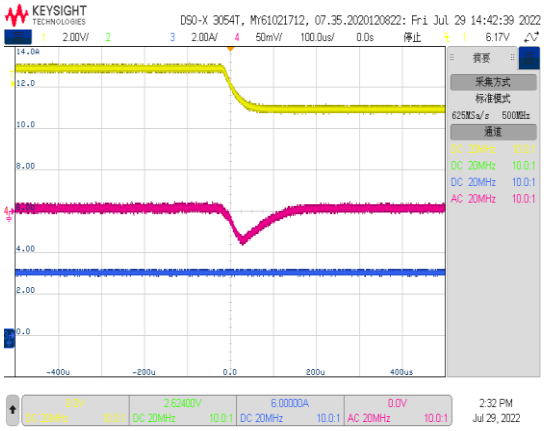
Test conditions: V_{OUT}=3.3V, I_{OUT}=3A, EN Floating.

V_{IN}=5V to 7V



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

V_{IN}=7V to 5V



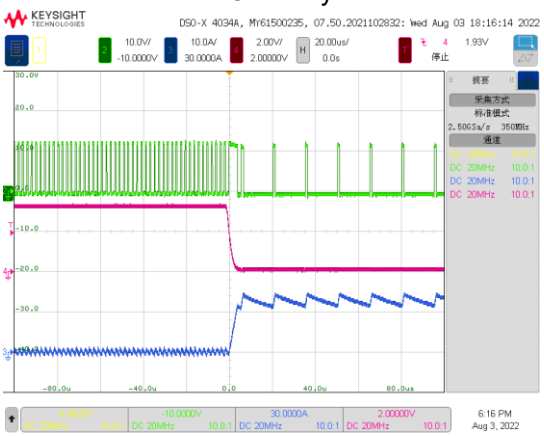
CH1-V_{IN} CH3-I_{OUT} CH4-V_{OUT}/AC

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10. SCP Entry and Recovery

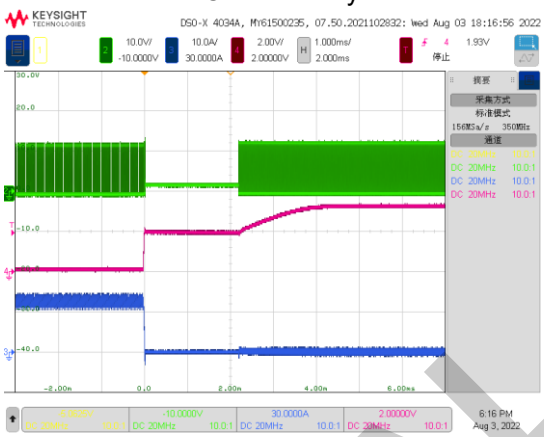
Test conditions: V_{IN}=12V, V_{OUT}=3.3V, Output Shorted.

SCP Entry



CH2-V_{SW} CH3-I_L CH4-V_{OUT}

SCP Recovery

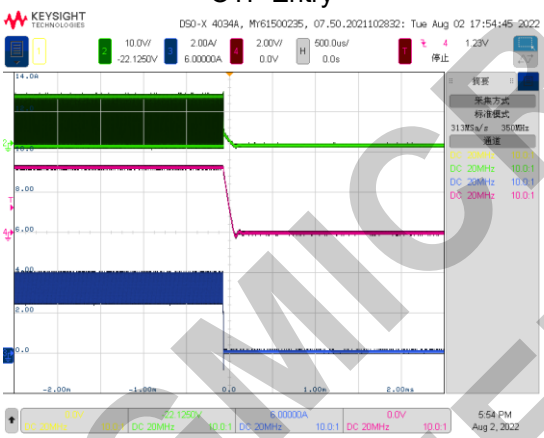


CH2-V_{SW} CH3-I_L CH4-V_{OUT}

11. OTP Entry

Test conditions: V_{IN}=12V, V_{OUT}=3.3V, I_{OUT}=3.3A, Over temperature.

OTP Entry

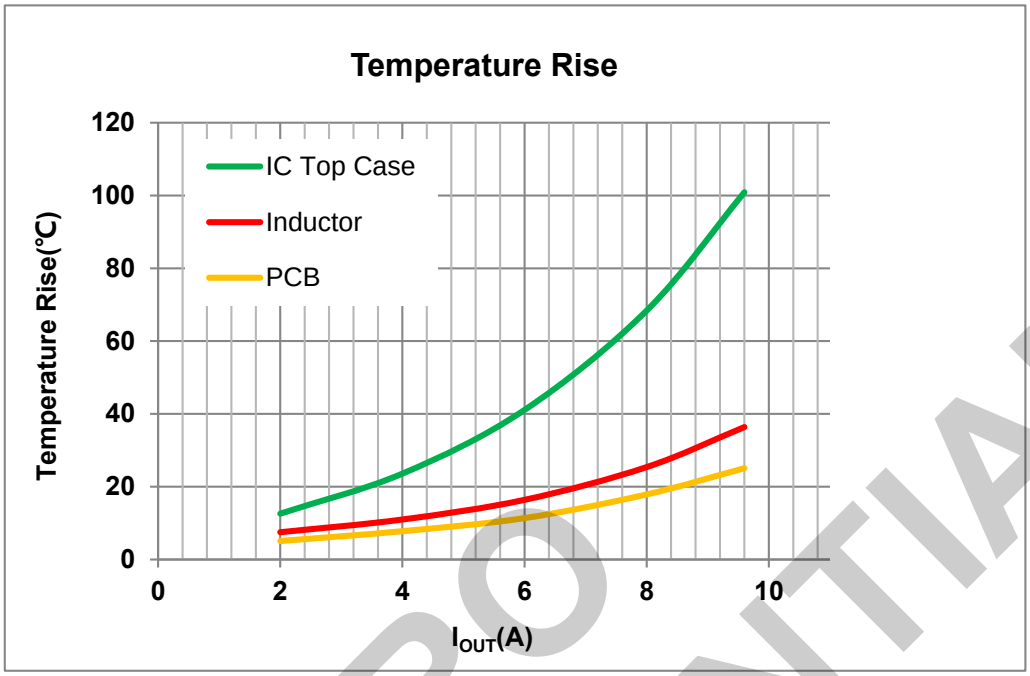


CH2-V_{SW} CH3-I_L CH4-V_{OUT}

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12. Thermal Test

Test conditions: V_{IN}=12V, V_{OUT}=3.3V, Room temperature test, Natural air convection heat dissipation.



I_{OUT}(A)	2	4	6	8	9.6
IC Top Case(℃)	41.3	51.2	69.1	96.9	128.9
Inductor(℃)	36.2	38.6	44.4	53.9	64.4
PCB(℃)	33.8	35.4	39.4	46.4	53.1
Ambient(℃)	28.7	27.6	28	28.5	28

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