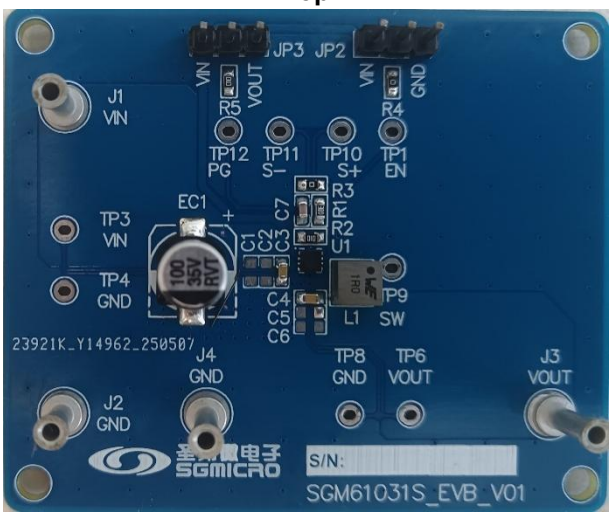
SGM61031S Demo Board Test Report

2.5V to 5.5V Input (5V TYP), 1.8V/3A Output

Demo Board Pictures:

Top



Bottom

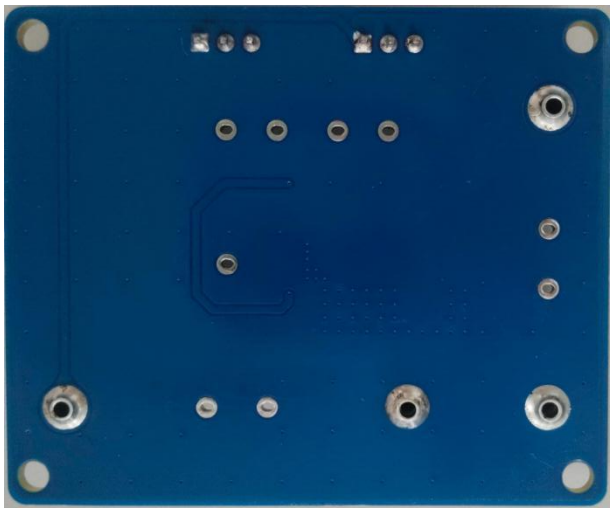


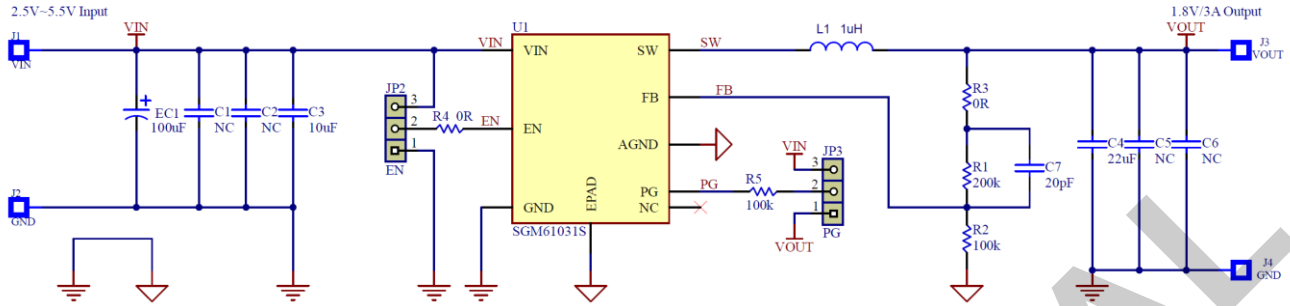
Table of Contents

Table of Contents 2
1. Schematic, BOM List and PCB Layout 3
1.1 Schematic 3
1.2 BOM List 3
1.3 PCB Layout 4
2. Bode Plot 4
3. Efficiency 5
4. Load Regulation 5
5. Line Regulation 6
6. Switching Frequency 6
7. Output Voltage Ripple 7
8. VIN Power On/Off 7
9. EN On/Off 8
10. Load Transient 8
11. Line Transient 8
12. SCP Entry and Recovery 9
13. VIN/EN On/Off during SCP 9
14. Thermal Test 10

SGMICRO CONFIDENTIAL

1. Schematic, BOM List and PCB Layout

1.1 Schematic

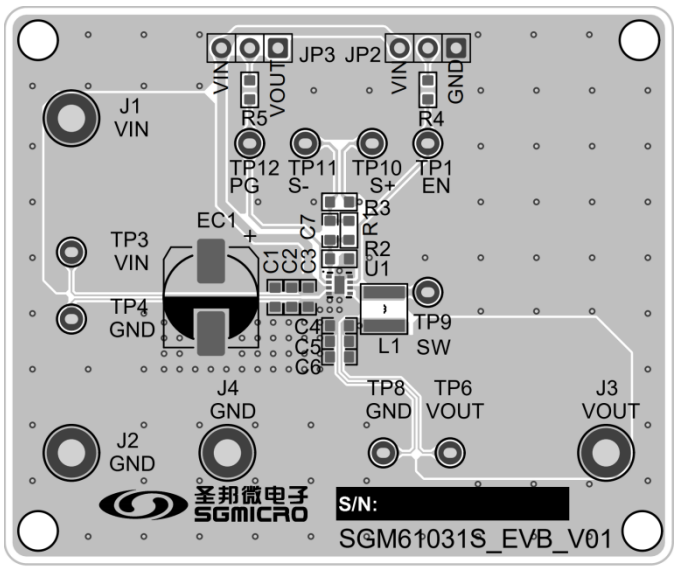


1.2 BOM List

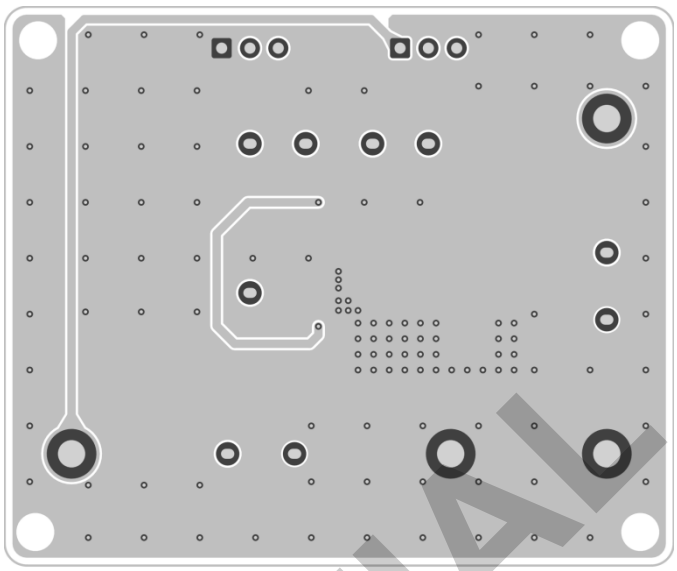
Item	Quantity	Designator	Description	Manufactory
1	0	C1,C2,C5,C6	NC	/
2	1	C3	10μF, Ceramic Capacitor, 10V, X7R,0603, P/N: GRM188Z71A106KA73	muRata
3	1	C4	22μF, Ceramic Capacitor, 10V, X5R,0603, P/N: GRM188R61A226ME15	muRata
4	1	C7	20pF, Ceramic Capacitor, 50V, C0G,Size 0603	Standard
5	1	EC1	100μF, Electrolytic Capacitor, 35V, SMD, D6.3xL7.7mm	Standard
6	1	L1	1μH Wire Wound, DCR_{TYP} = 12mΩ, I_{SAT}(30%) = 11.5A, I_{RMS}(40℃) = 10.1A,SRF = 55MHz,4mm × 4mm × 2mm, P/N: 74438356010	Würth
7	1	R1	200kΩ, Chip Resistor, 1/16W, 1%, Size 0603	Standard
8	2	R2,R5	100kΩ, Chip Resistor, 1/16W, 1%, Size 0603	Standard
9	2	R3,R4	0Ω, Chip Resistor, 1/16W, 1%, Size 0603	Standard
10	1	U1	SGM61031S, 3A, 5.5V, Synchronous Buck Converter, TDFN-2×2-8AL	SGMICRO
			Conclusion: Total 11 components	

SGMICRO CONFIDENTIAL

1.3 PCB Layout



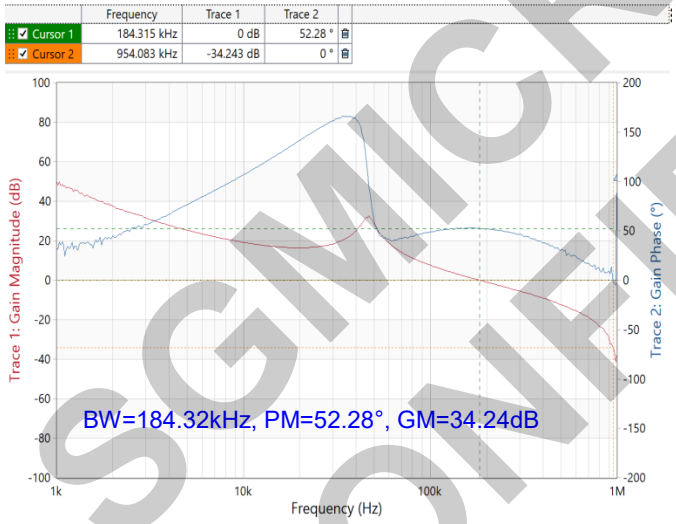
PCB Top Layer



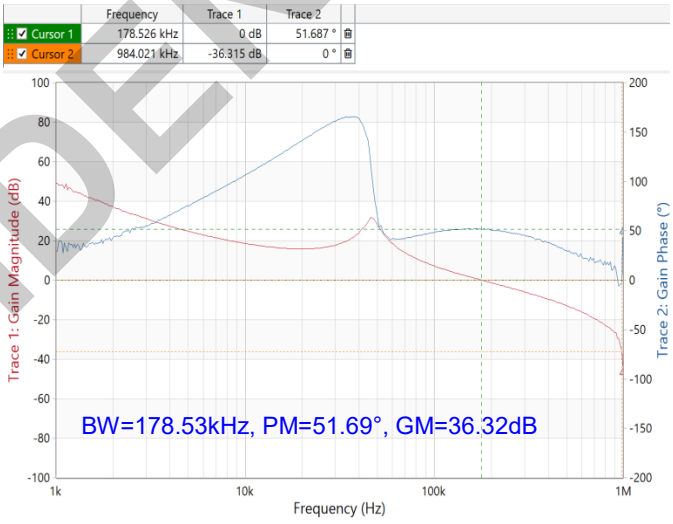
PCB Bottom Layer

2. Bode Plot

V_{IN}=5V, V_{OUT}=1.8V, I_{OUT}=1.5A



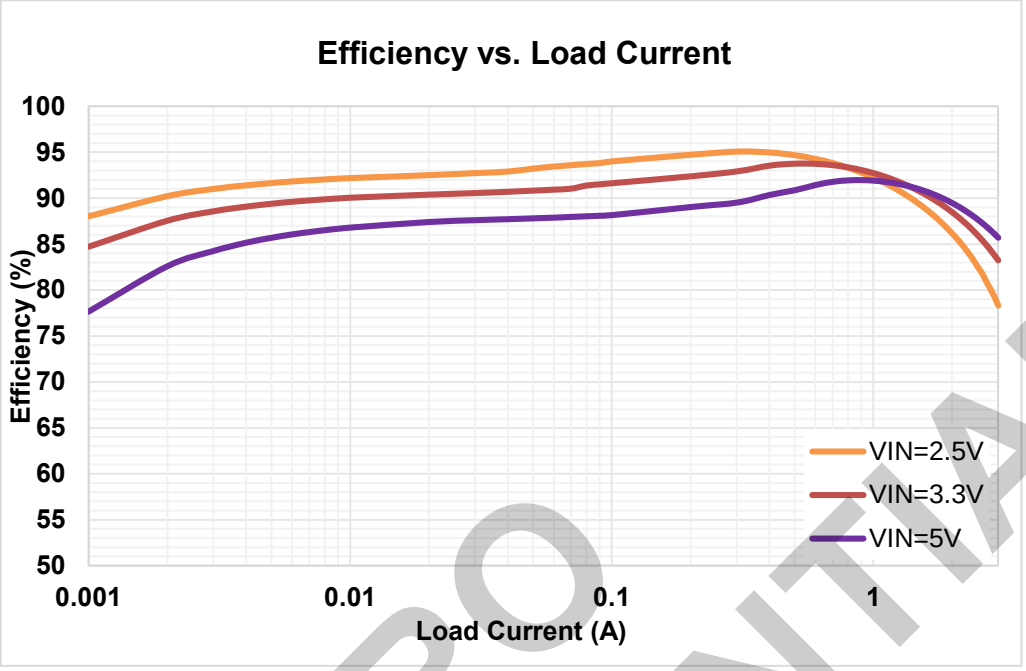
V_{IN}=5V, V_{OUT}=1.8V, I_{OUT}=3A



SGMICRO CONFIDENTIAL

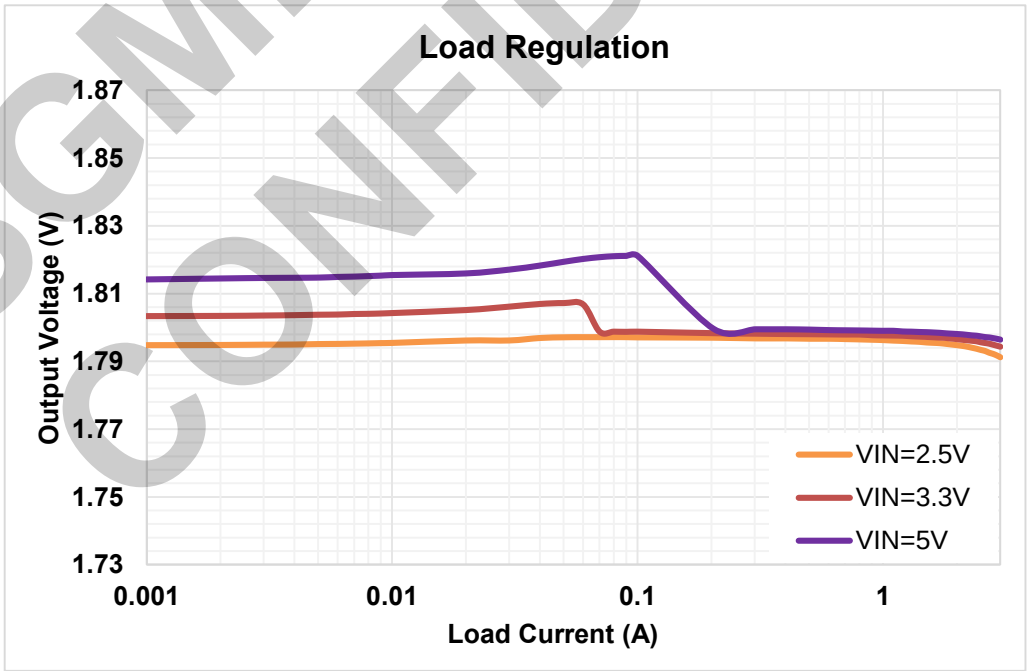
3. Efficiency

Test conditions: V_{IN}=2.5V/3.3V/5V, V_{OUT}=1.8V, I_{OUT}=0.001A~3A.



4. Load Regulation

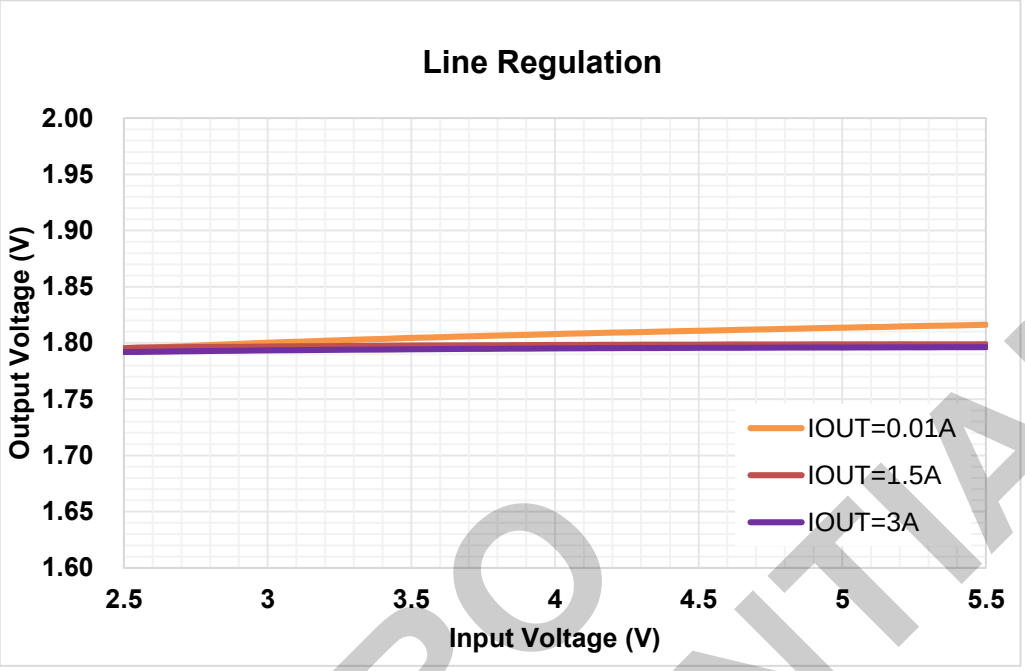
Test conditions: V_{IN}=2.5V/3.3V/5V, V_{OUT}=1.8V, I_{OUT}=0.001A~3A.



SGMICRO CONFIDENTIAL

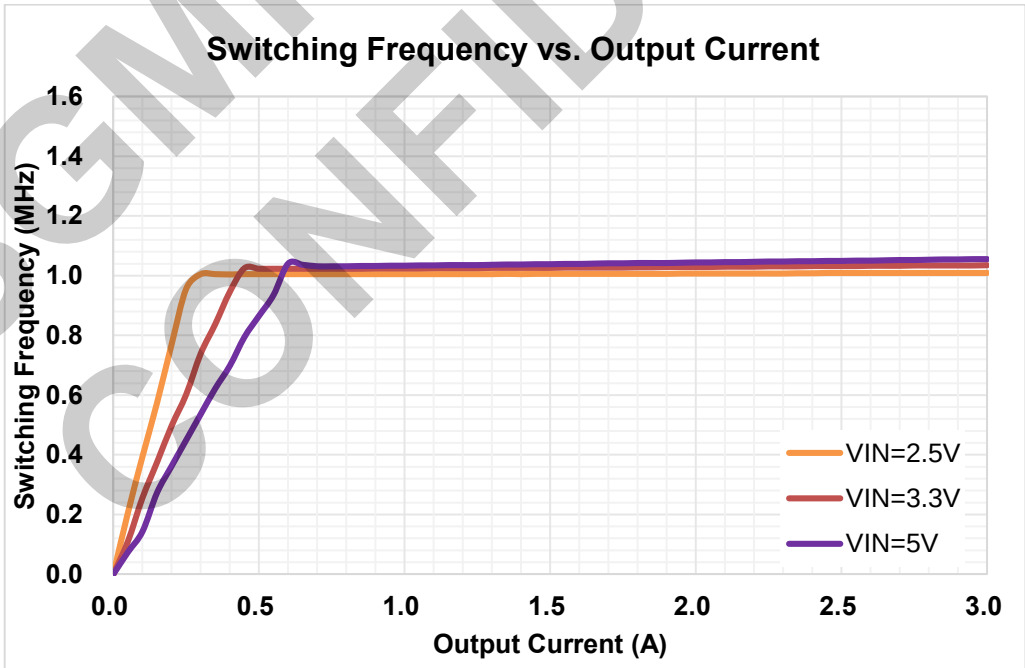
5. Line Regulation

Test conditions: V_{IN}=2.5V~5.5V, V_{OUT}=1.8V, I_{OUT}=0.01A/1.5A/3A.



6. Switching Frequency

Test conditions: V_{IN}=2.5V/3.3V/5V, V_{OUT}=1.8V, I_{OUT}=0A~3A.

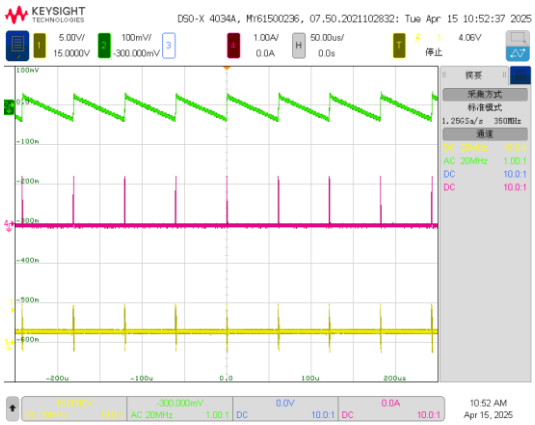


SGMICRO CONFIDENTIAL

7. Output Voltage Ripple

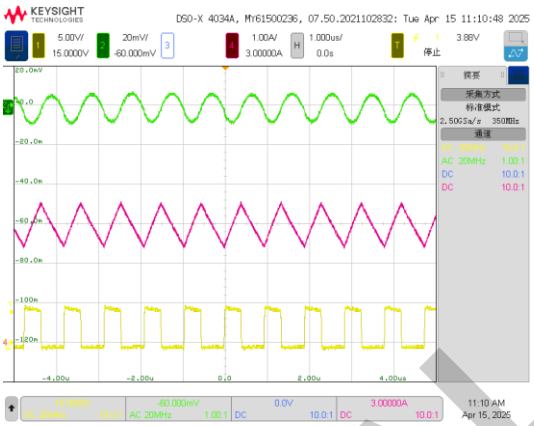
Test conditions: V_{IN}=5V, V_{OUT}=1.8V.

I_{OUT}=0.01A



CH1-V_{SW} CH2-V_{OUT}/AC CH4-I_L

I_{OUT}=3A

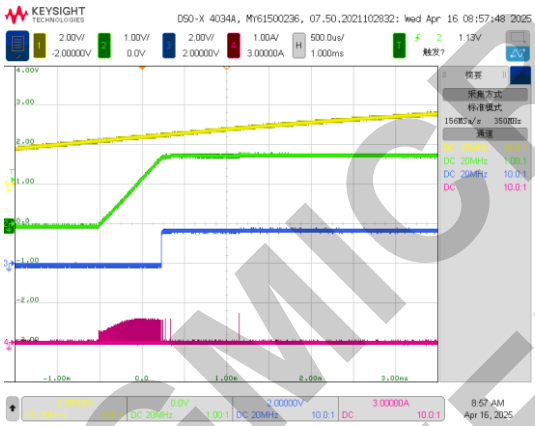


CH1-V_{SW} CH2-V_{OUT}/AC CH4-I_L

8. VIN Power On/Off

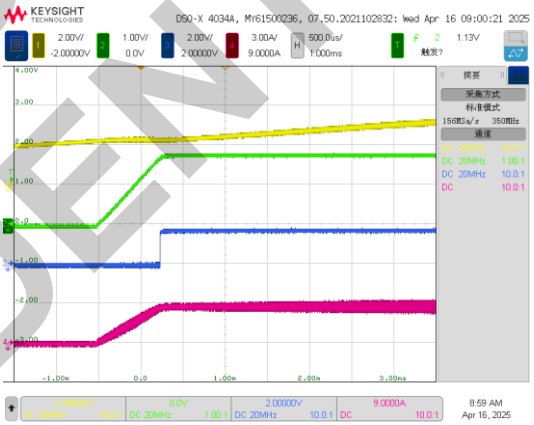
Test conditions: V_{IN}=5V, V_{OUT}=1.8V, V_{IN} Power On, PG is pulled up to V_{OUT}.

I_{OUT}=0A



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

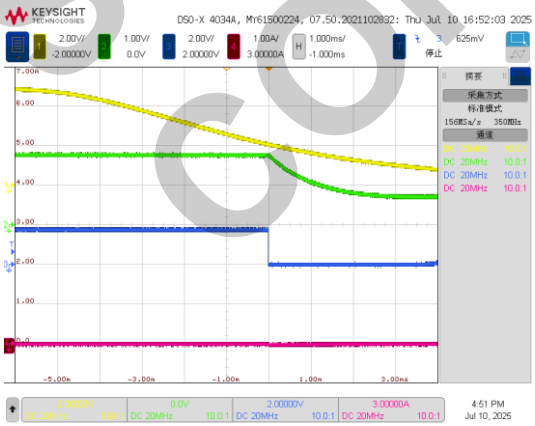
I_{OUT}=3A



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

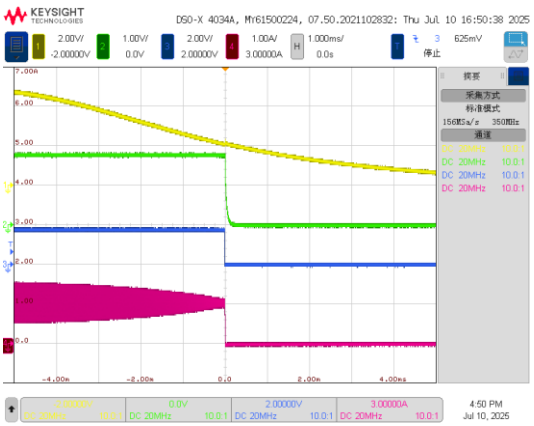
Test conditions: V_{IN}=5V, V_{OUT}=1.8V, V_{IN} Power Off, PG is pulled up to V_{OUT}.

I_{OUT}=0A



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

I_{OUT}=1A



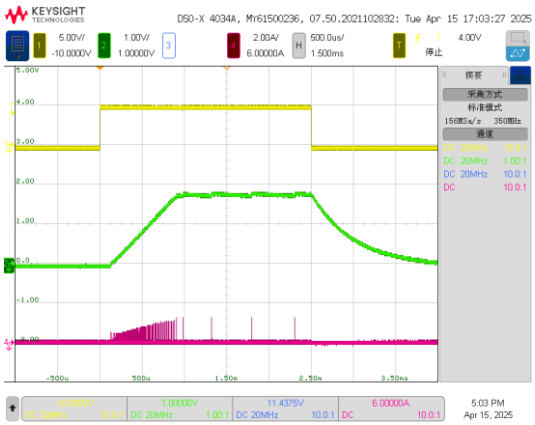
CH1-V_{IN} CH2-V_{OUT} CH3-V_{PG} CH4-I_L

SGMICRO CONFIDENTIAL

9. EN On/Off

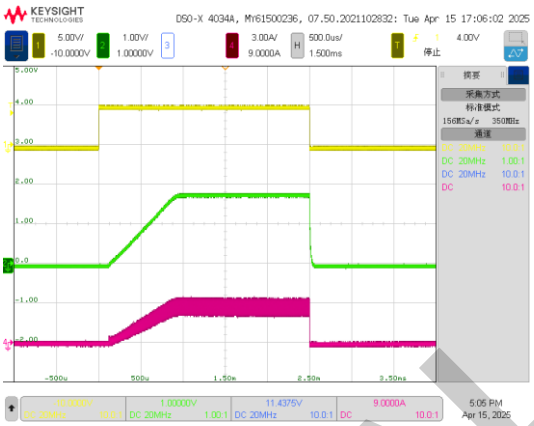
Test conditions: V_{IN}=5V, V_{OUT}=1.8V.

I_{OUT}=0A



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

I_{OUT}=3A

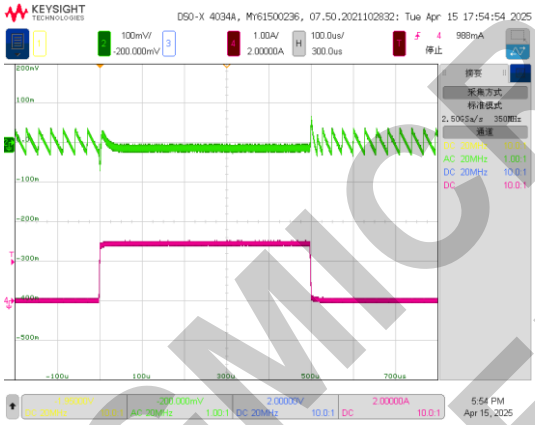


CH1-V_{EN} CH2-V_{OUT} CH4-I_L

10. Load Transient

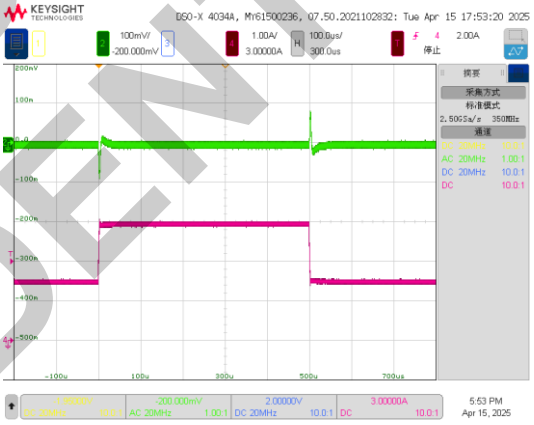
Test conditions: V_{IN}=5V, V_{OUT}=1.8V, E-load slew rate is 0.5A/μs.

I_{OUT}=0.01A to 1.5A to 0.01A



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

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

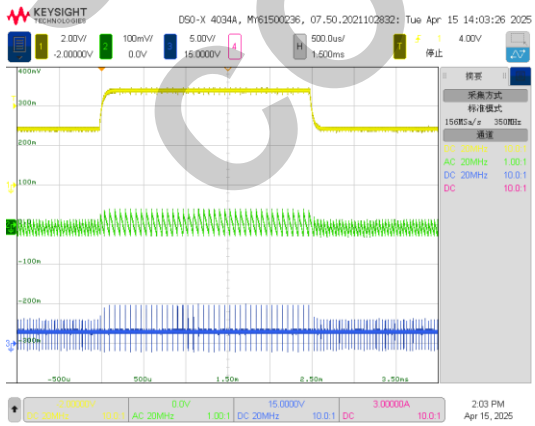


CH2-V_{OUT}/AC CH4-I_{OUT}

11. Line Transient

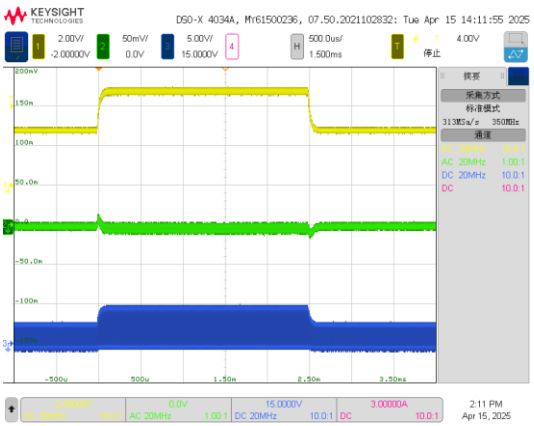
Test conditions: V_{IN}=3V to 5V to 3V, V_{OUT}=1.8V.

I_{OUT}=0.01A



CH1-V_{IN} CH2-V_{OUT}/AC CH3-V_{SW}

I_{OUT}=3A



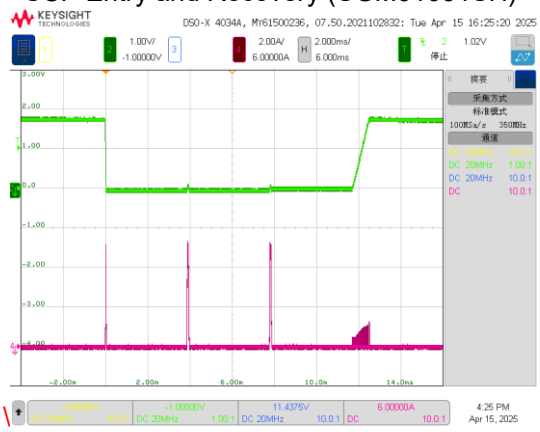
CH1-V_{IN} CH2-V_{OUT}/AC CH3-V_{SW}

SGMICRO CONFIDENTIAL

12. SCP Entry and Recovery

Test conditions: V_{IN}=5V, V_{OUT}=1.8V, I_{OUT}=0A.

SCP Entry and Recovery (SGM61031SH)



CH2-V_{OUT} CH4-I_L

SCP Entry (SGM61031SL)

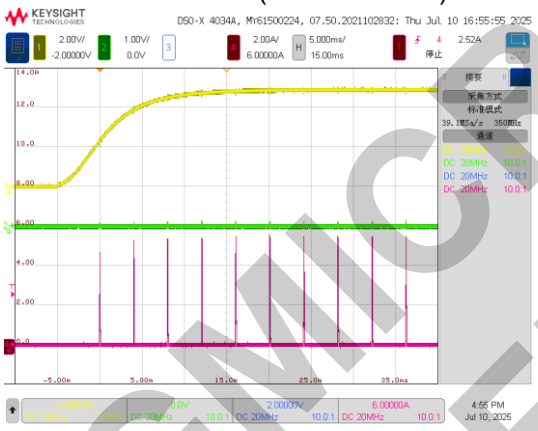


CH2-V_{OUT} CH4-I_L

13. VIN/EN On/Off during SCP

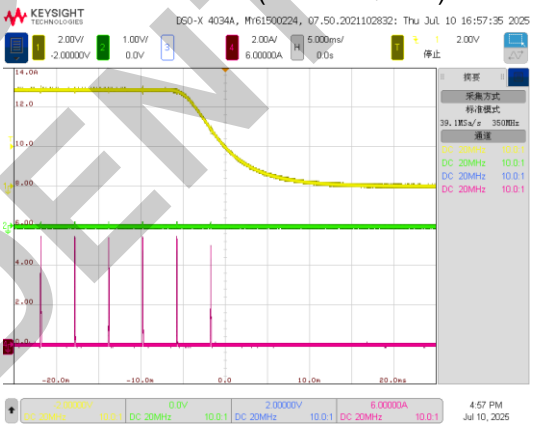
Test conditions: V_{IN}=5V, V_{OUT}=1.8V, short V_{OUT} to GND, V_{IN} Power On/Off.

V_{IN} Power On (SGM61031SH)



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

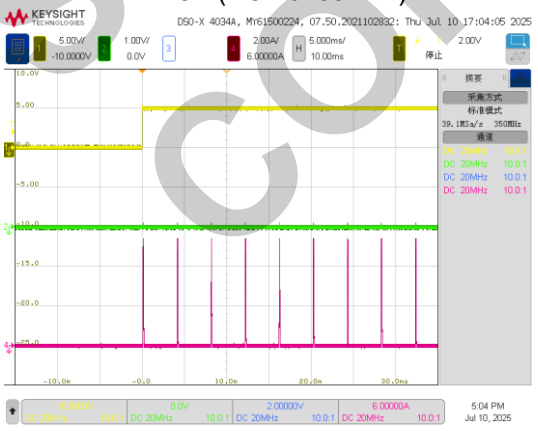
V_{IN} Power Off (SGM61031SH)



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

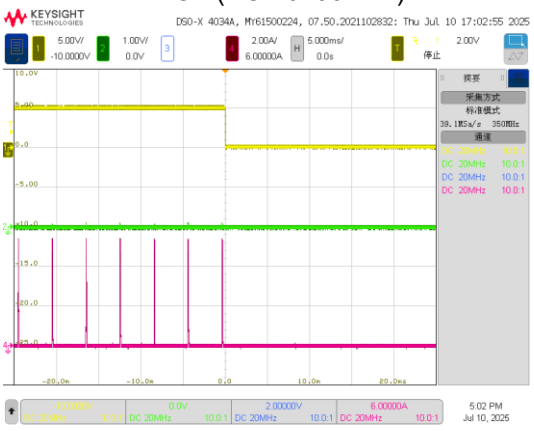
Test conditions: V_{IN}=5V, V_{OUT}=1.8V, short V_{OUT} to GND, EN On/Off.

EN On (SGM61031SH)



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

EN Off (SGM61031SH)

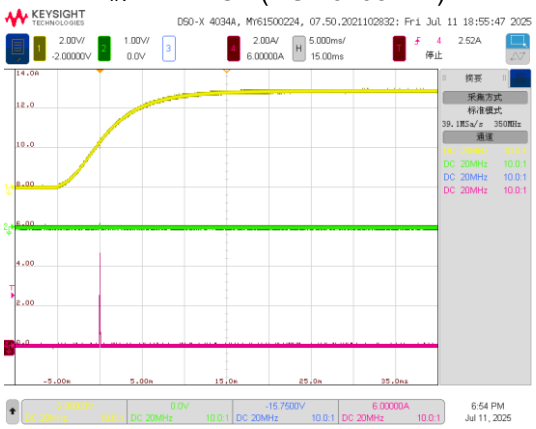


CH1-V_{EN} CH2-V_{OUT} CH4-I_L

SGMICRO CONFIDENTIAL

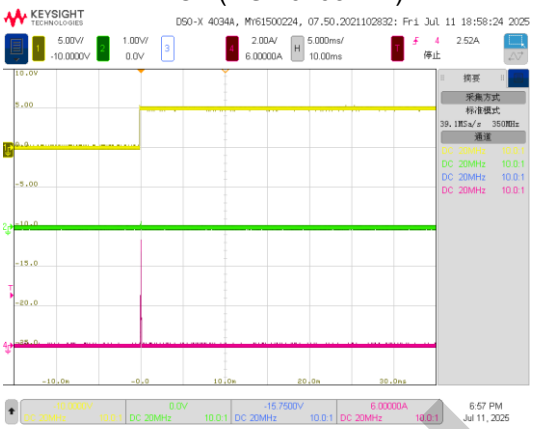
Test conditions: V_{IN}=5V, V_{OUT}=1.8V, short V_{OUT} to GND, V_{IN} Power On/EN On.

V_{IN} Power On (SGM61031SL)



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

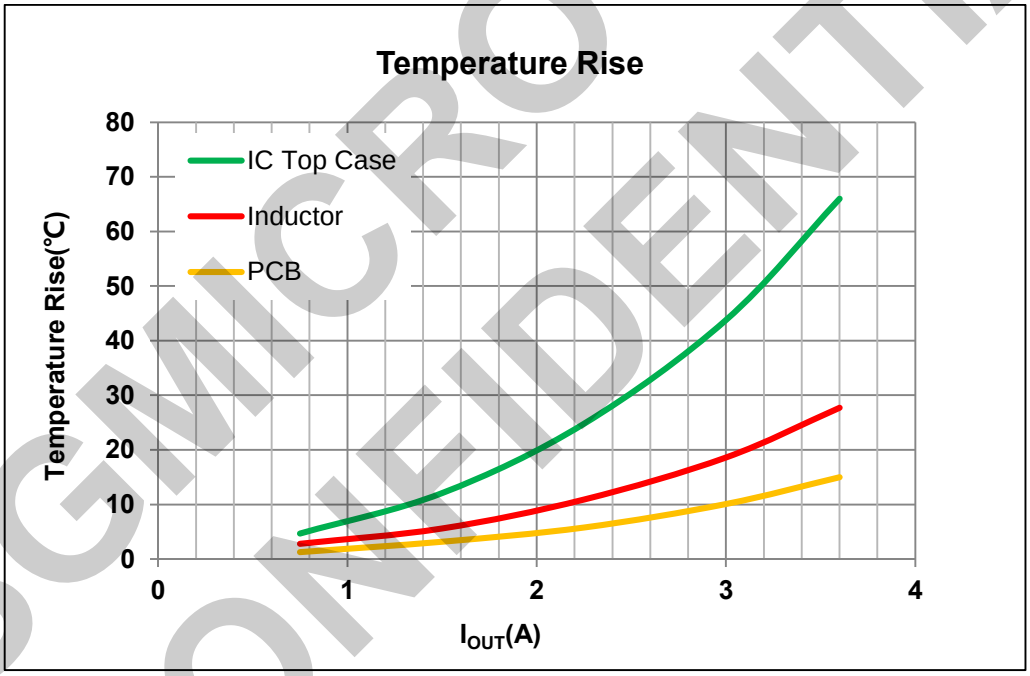
EN On (SGM61031SL)



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

14. Thermal Test

Test conditions: V_{IN}=5V, V_{OUT}=1.8V, Room temperature test, Natural air convection heat dissipation.



I_{OUT}(A)	0.75	1.5	2.25	3	3.6
IC Top Case(℃)	33.6	40.8	53.6	72.6	94.9
Inductor(℃)	31.7	34.3	39.7	47.4	56.6
PCB(℃)	30.2	31.9	34.6	38.9	43.9
Ambient(℃)	28.9	28.7	28.8	28.8	28.9

SGMICRO CONFIDENTIAL