

SGM61184 Demo Board Test Report

4.5V to 18V Input (12V TYP), 1.8V/8A Output

Demo Board Pictures:

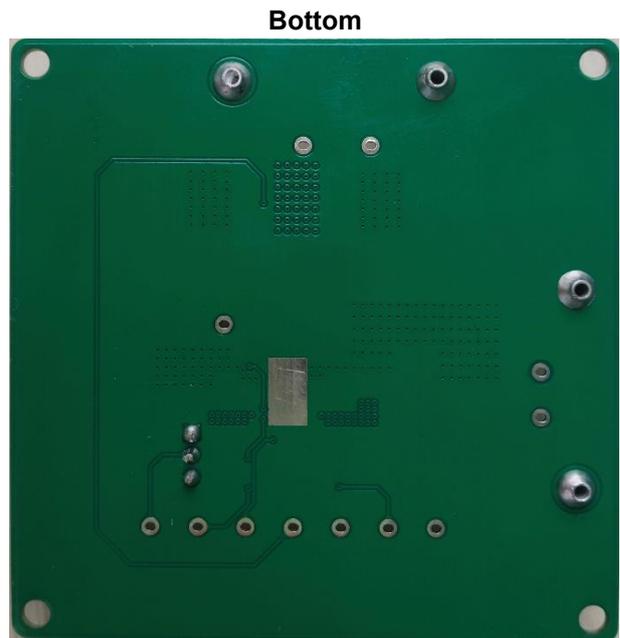
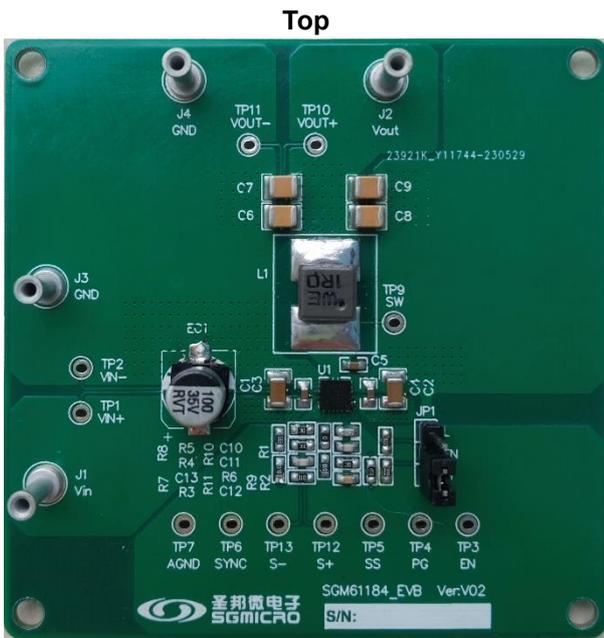


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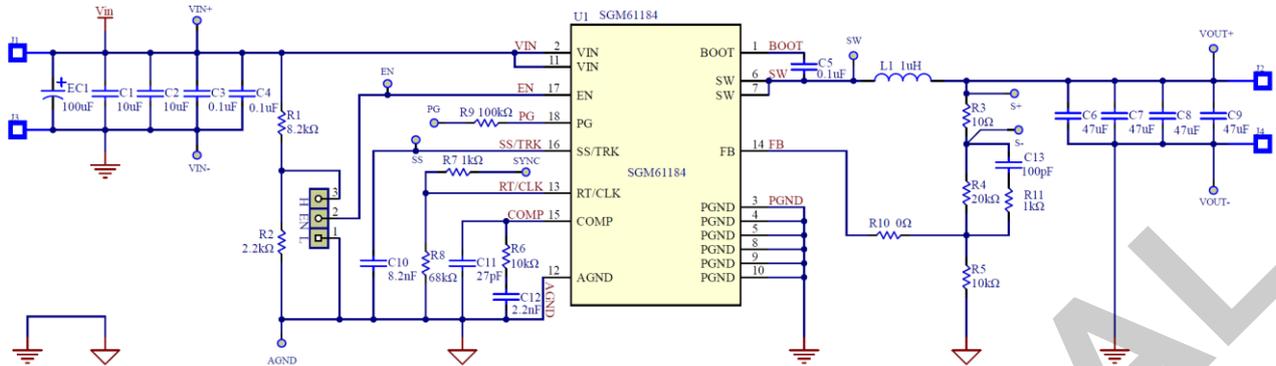
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1. Schematic, BOM List and PCB Layout

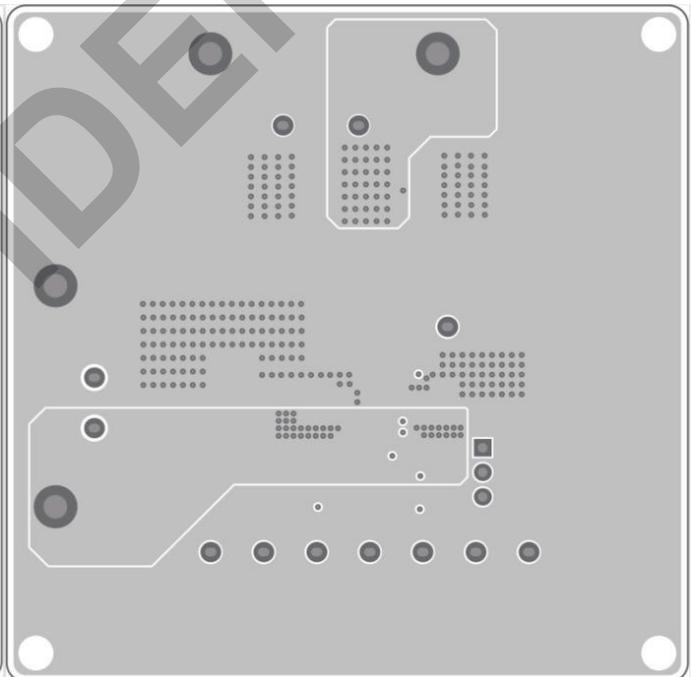
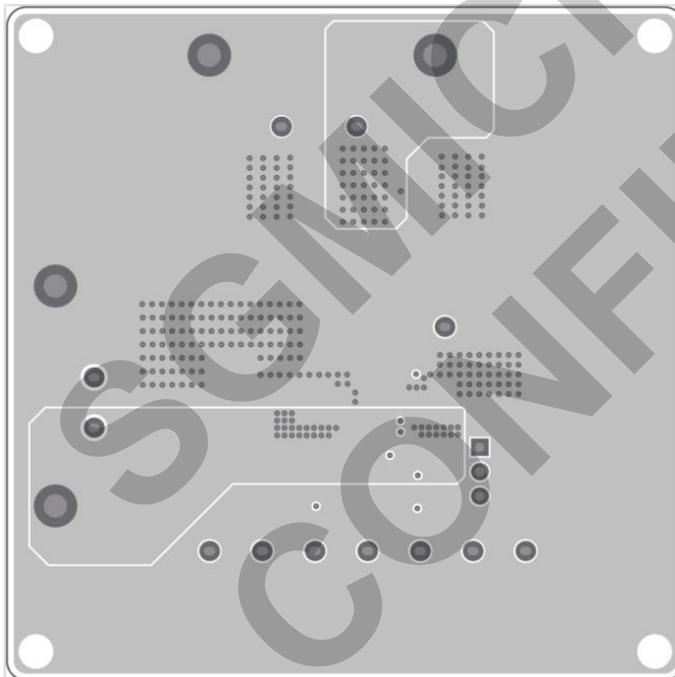
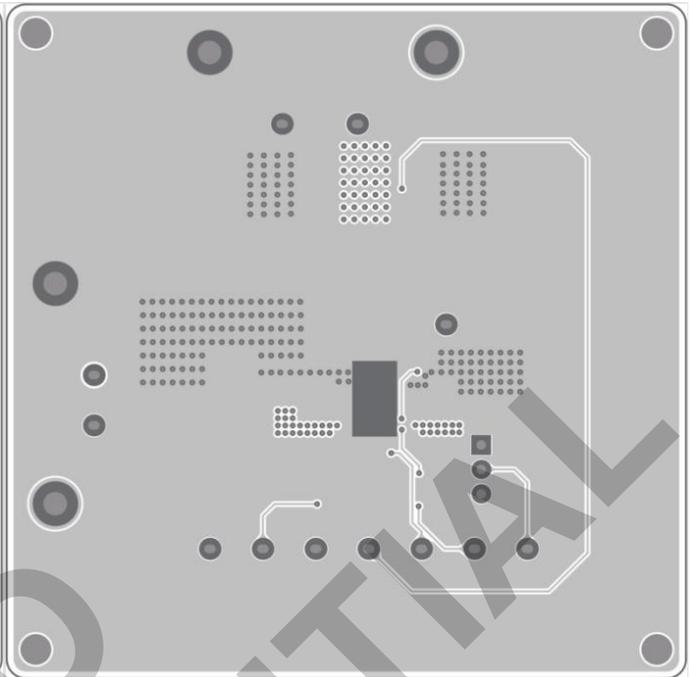
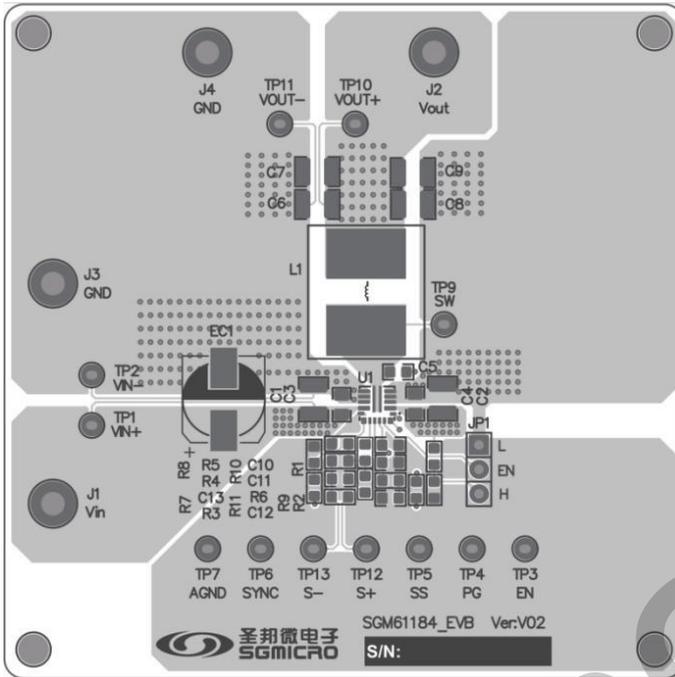
1.1 Schematic



1.2 BOM List

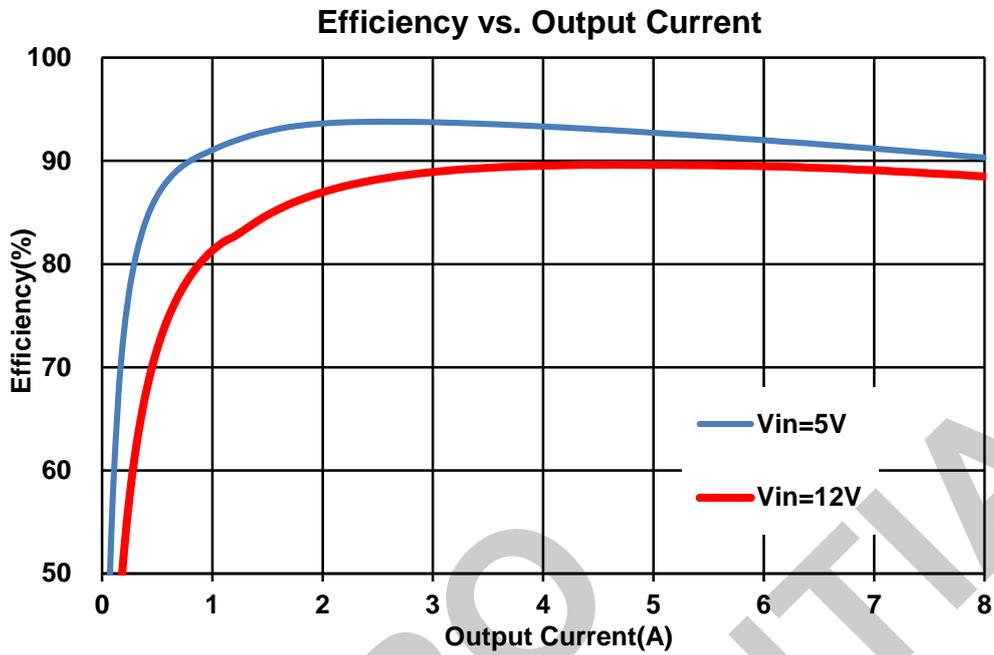
Item	Quantity	Designator	Description	Manufactory
1	2	C1,C2	Cap., Ceramic, 10µF, 25V, ±10%, X7R, 1206	muRata
2	3	C3,C4,C5	Cap., Ceramic, 0.1µF, 25V, ±20%, X7R, 0603	muRata
3	4	C6,C7,C8,C9	Cap., Ceramic, 47µF, 16V, ±10%, X6S, 1210, GRM32EC81C476KE15L	muRata
4	1	C10	Cap., Ceramic, 8.2nF, 25V, ±10%, X7R, 0603	Standard
5	1	C11	Cap., Ceramic, 27pF, 50V, ±5%, C0G, 0603	Standard
6	1	C12	Cap., Ceramic, 2.2nF, 50V, ±10%, X7R, 0603	Standard
7	1	C13	Cap., Ceramic, 100pF, 50V, ±2%, C0G, 0603	Standard
8	1	EC1	Cap., AEC, 100µF, 35V, ±20%, VT1V101M-CRE77	VT
9	1	L1	Ind., Wire Wound, 1µH, ±20%, ITEMP=12A, ISAT=30.6A, DCR=1.85mΩ, 7443320100	Würth
10	1	R1	RES., 8.2KΩ, ±1%, 0.1W, 0603	Standard
11	1	R2	RES., 2.2KΩ, ±1%, 0.1W, 0603	Standard
12	1	R3	RES., 10Ω, ±1%, 0.1W, 0603	Standard
13	1	R4	RES., 20KΩ, ±1%, 0.1W, 0603	Standard
14	2	R5, R6	RES., 10KΩ, ±1%, 0.1W, 0603	Standard
15	1	R7	RES., 1KΩ, ±1%, 0.1W, 0603	Standard
16	1	R8	RES., 68KΩ, ±1%, 0.1W, 0603	Standard
17	1	R9	RES., 100KΩ, ±1%, 0.1W, 0603	Standard
18	1	R10	RES., 0Ω, ±1%, 0.1W, 0603	Standard
19	1	R11	RES., 1KΩ, ±1%, 0.1W, 0603	Standard
20	1	U1	SGM61184, 8A, 18V, Synchronous Buck Converter, TQFN-3.5x3.5-18AL	SGMICRO
Conclusion: Total 27 components				

1.3 PCB Layout



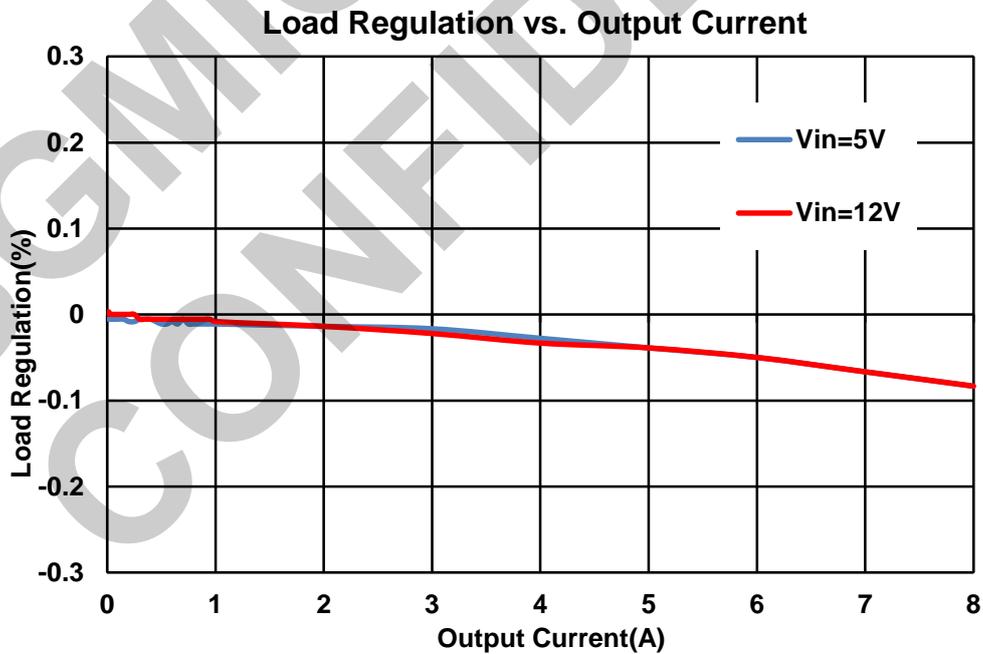
2. Efficiency

Test conditions: $V_{IN}=5V/12V$, $V_{OUT}=1.8V$, $I_{OUT}=0A\sim 8A$.



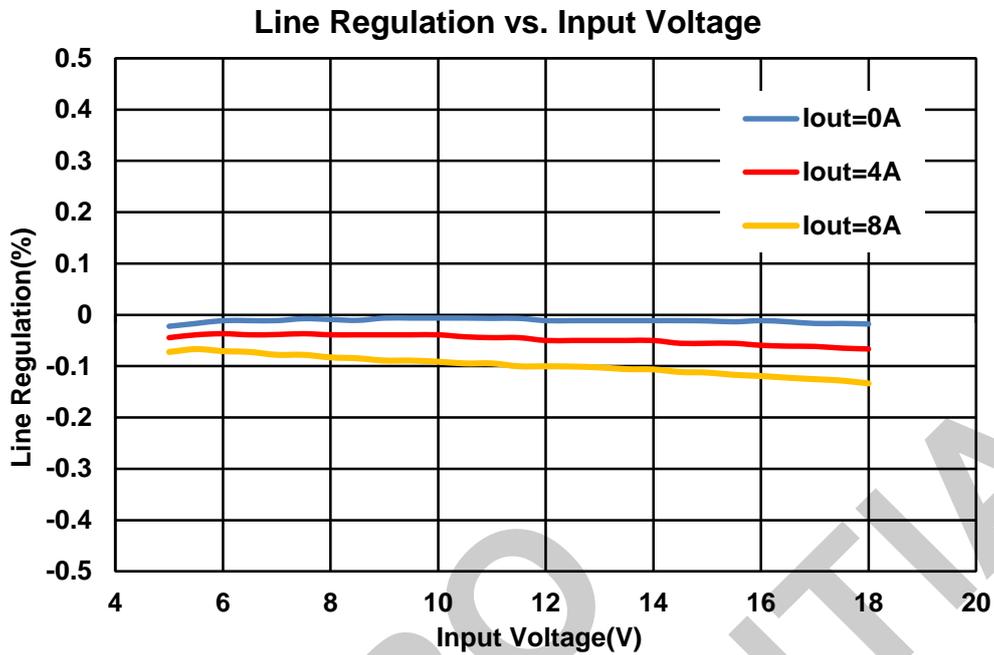
3. Load Regulation

Test conditions: $V_{IN}=5V/12V$, $V_{OUT}=1.8V$, $I_{OUT}=0A\sim 8A$.



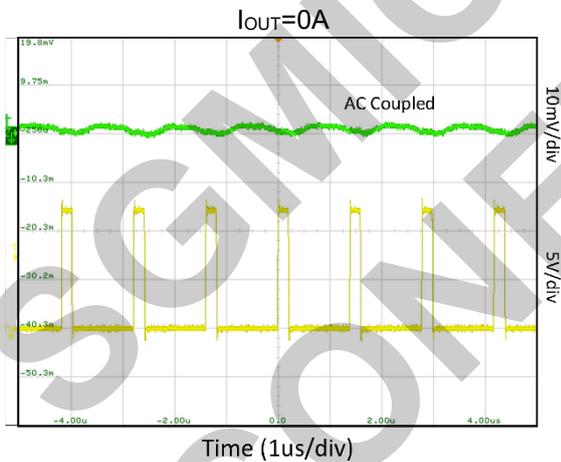
4. Line Regulation

Test conditions: $V_{IN}=5V\sim 18V$, $V_{OUT}=1.8V$, $I_{OUT}=0A/4A/8A$.

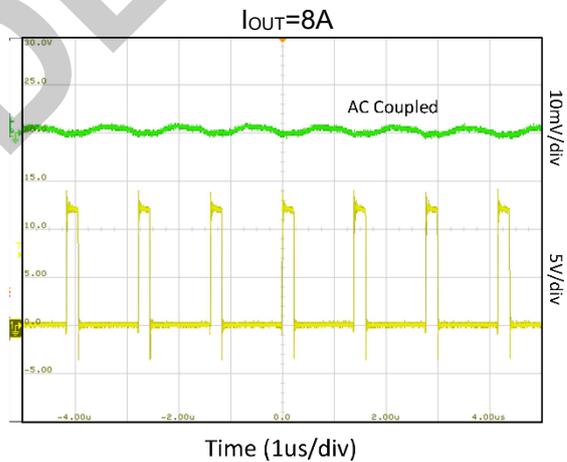


5. Output Voltage Ripple

Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$.



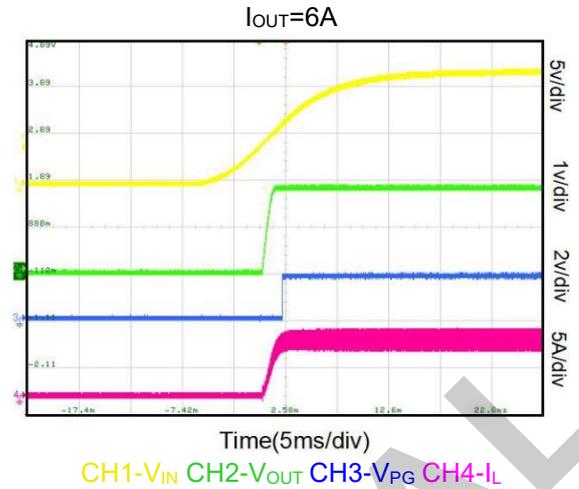
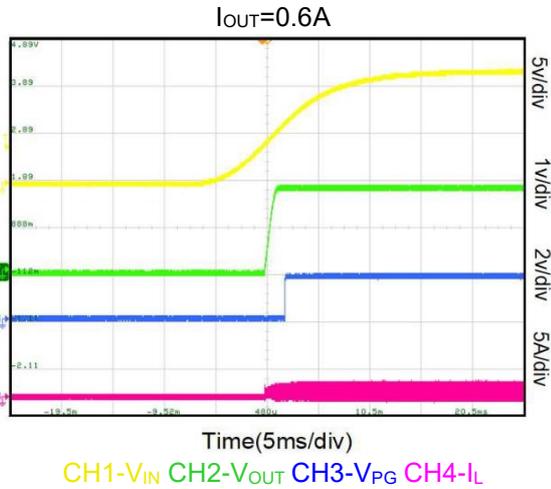
CH1-Vsw CH2-Vout/AC



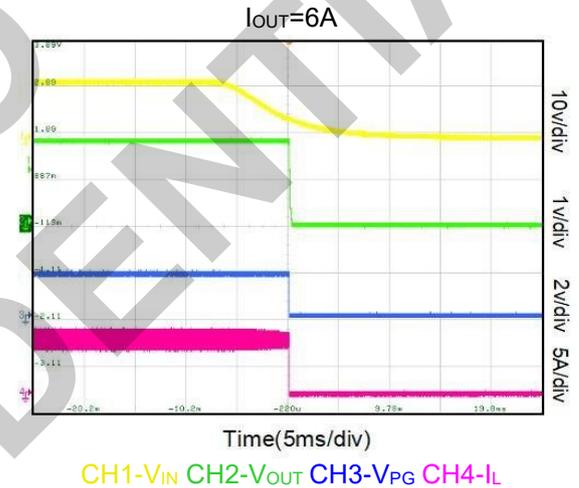
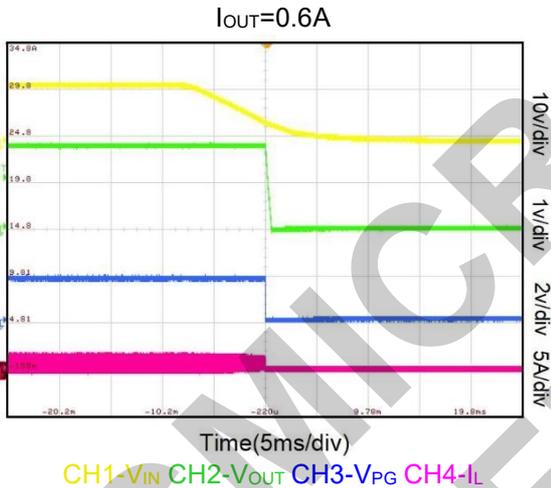
CH1-Vsw CH2-Vout/AC

6. VIN Power On/Off

Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$, V_{IN} power on.

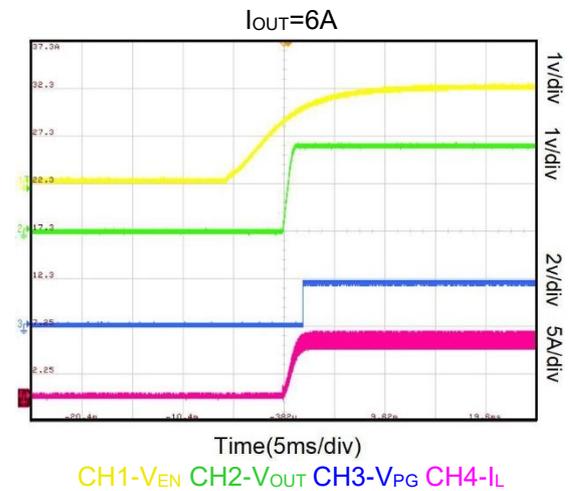
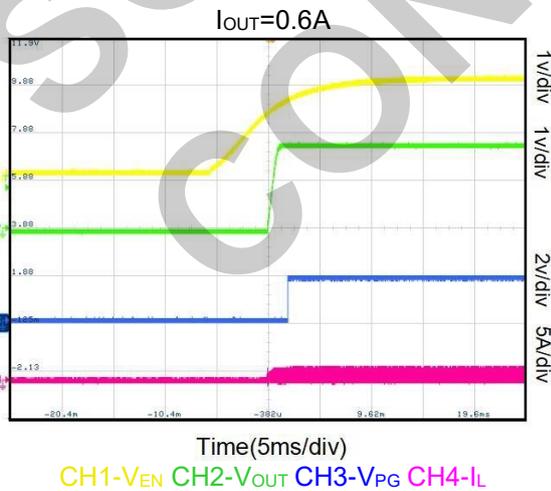


Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$, V_{IN} power off.

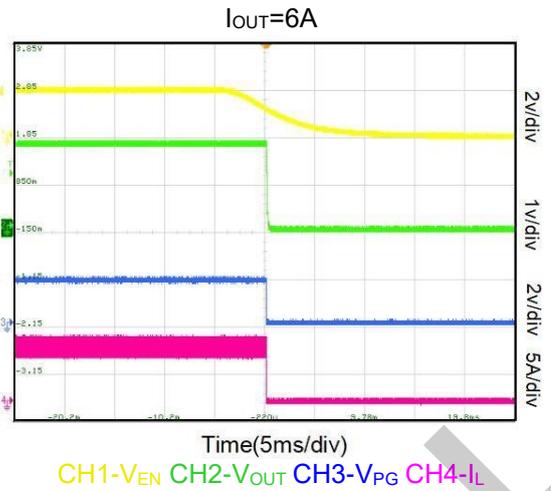
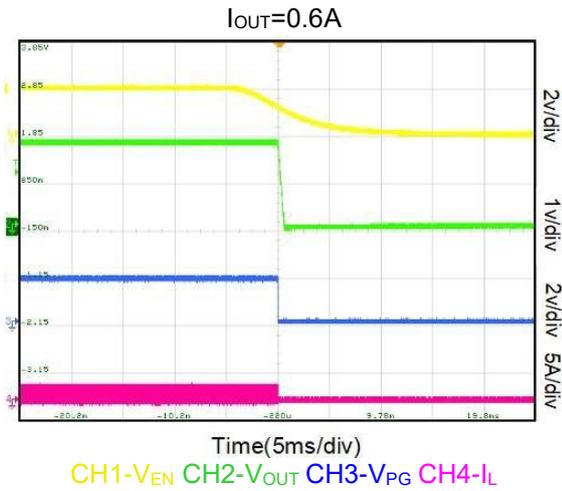


7. EN On/Off

Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$, EN on.

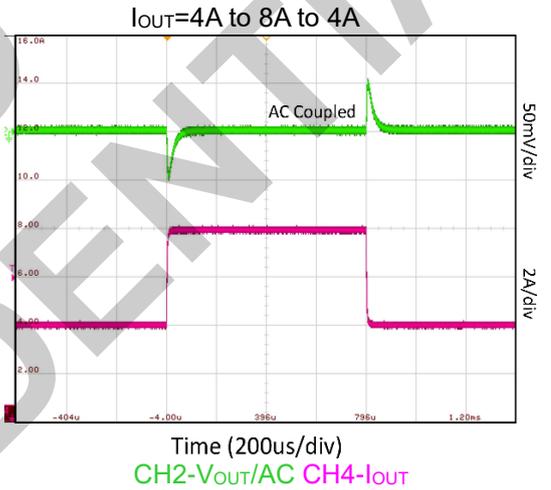
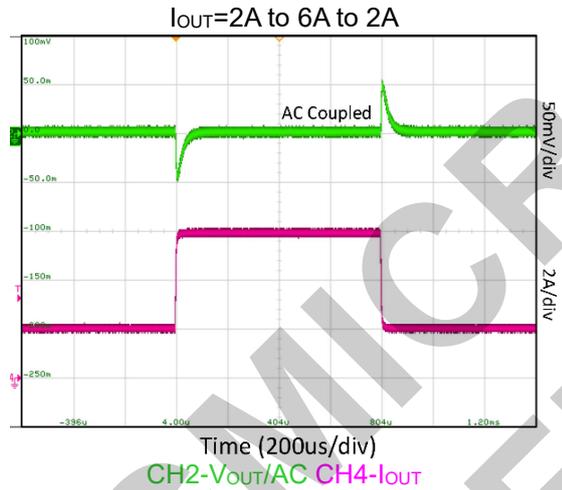


Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$, EN off.



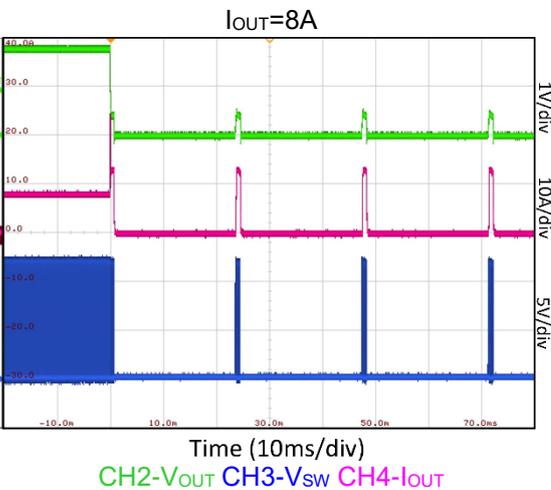
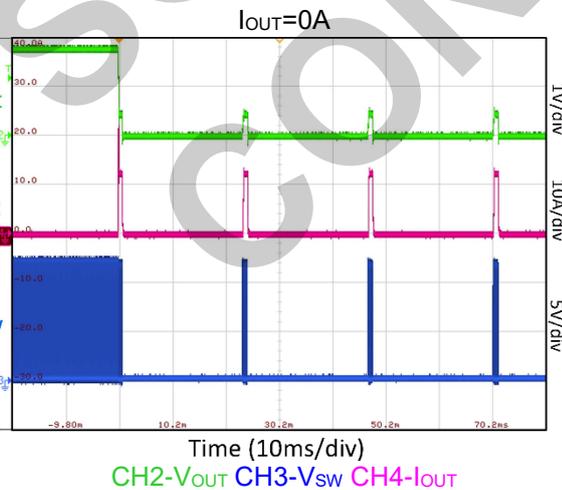
8. Load Transient

Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$, E-load slew rate is $1A/\mu s$.

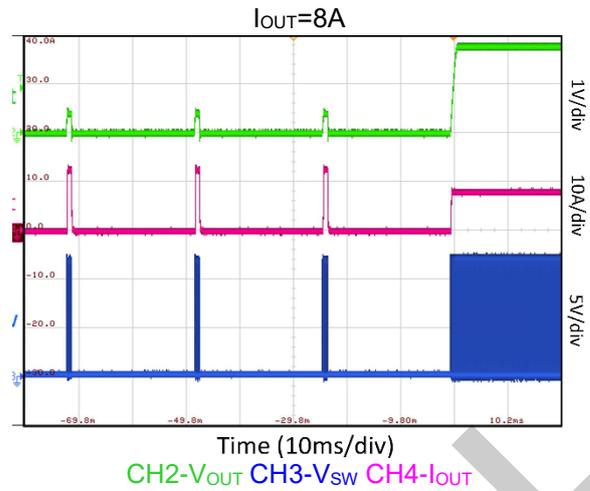
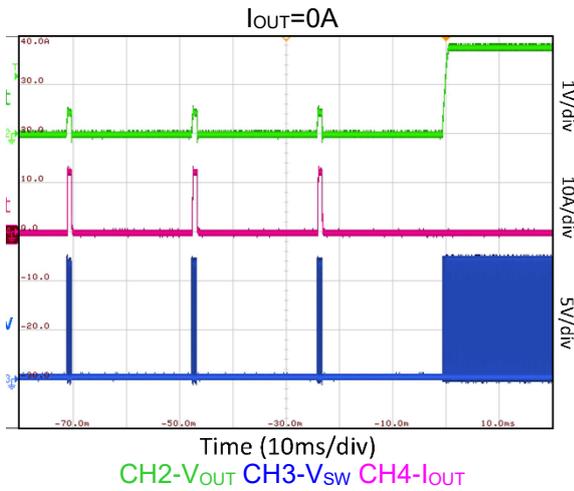


9. SCP Entry and Recovery

Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$, short V_{OUT} to GND, SCP entry.

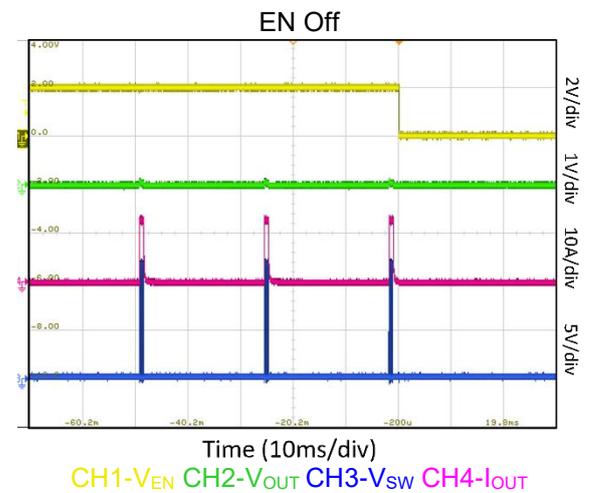
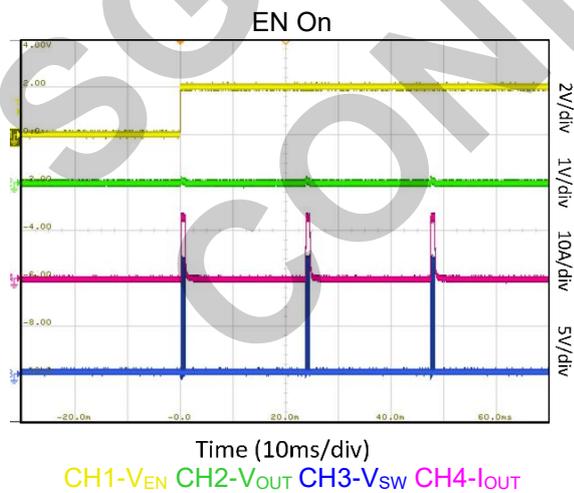
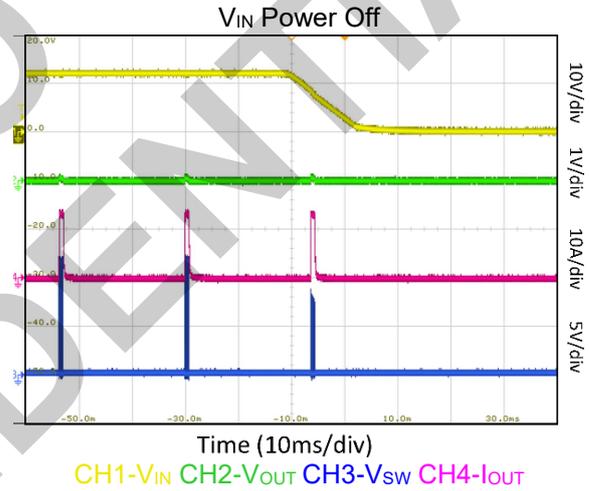
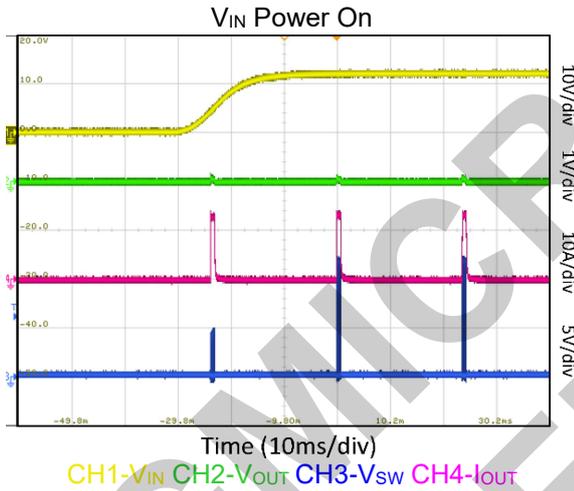


Test conditions: $V_{IN}=12V$, $V_{O}=1.8V$, short V_{OUT} to GND, SCP recovery.



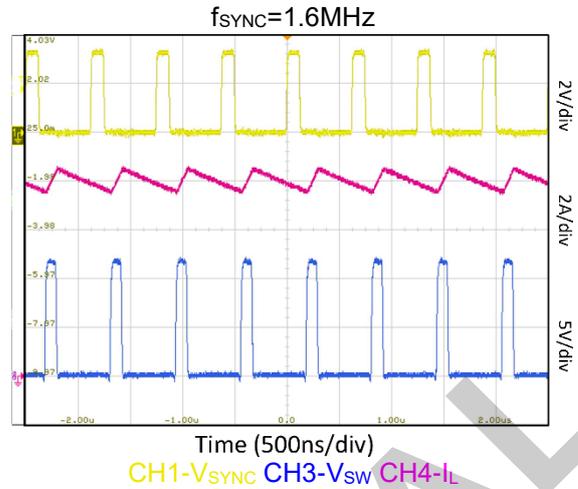
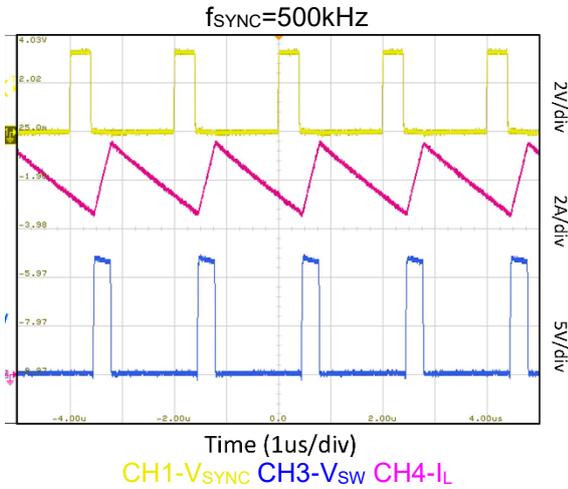
10. V_{IN}/EN On/Off during SCP

Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$, short V_{O} to GND.



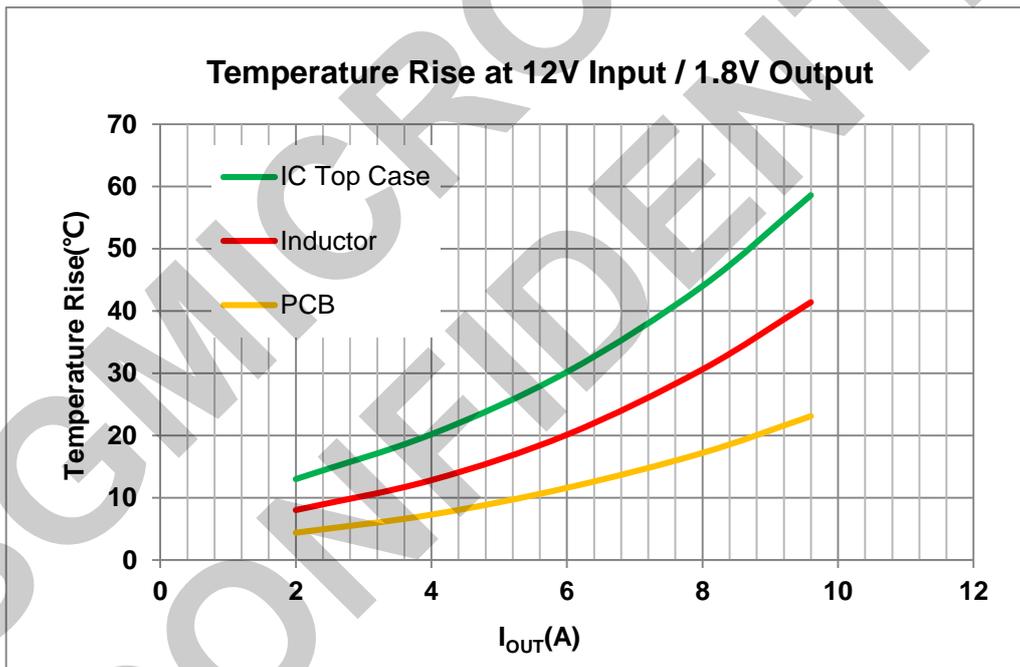
11. Synchronize to External Clock

Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$, $I_{OUT}=8A$, External SYNC signal amplitude is 3.3V.



12. Thermal Test

Test conditions: $V_{IN}=12V$, $V_{OUT}=1.8V$, Room temperature test, Natural air convection heat dissipation.



$I_{OUT}(A)$	2	4	6	8	9.6
IC Top Case(°C)	41.8	48.9	58.9	72.9	87.4
Inductor(°C)	36.8	41.5	48.8	59.5	70.2
PCB(°C)	33.2	36.0	40.3	46.1	51.9
Ambient(°C)	28.8	28.7	28.7	28.9	28.8