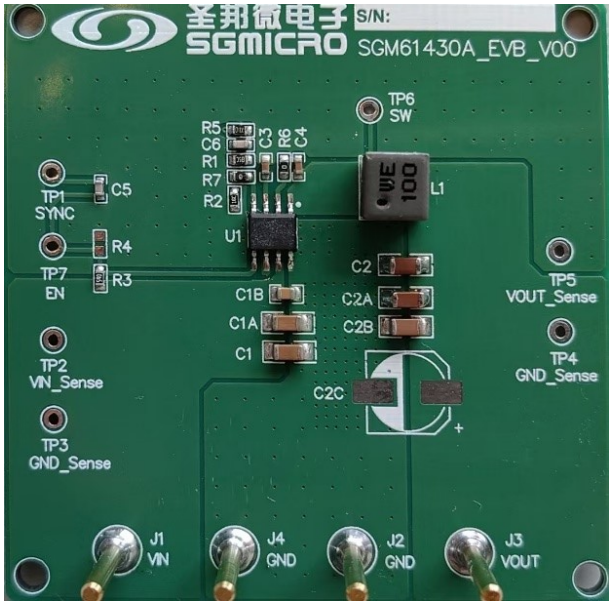
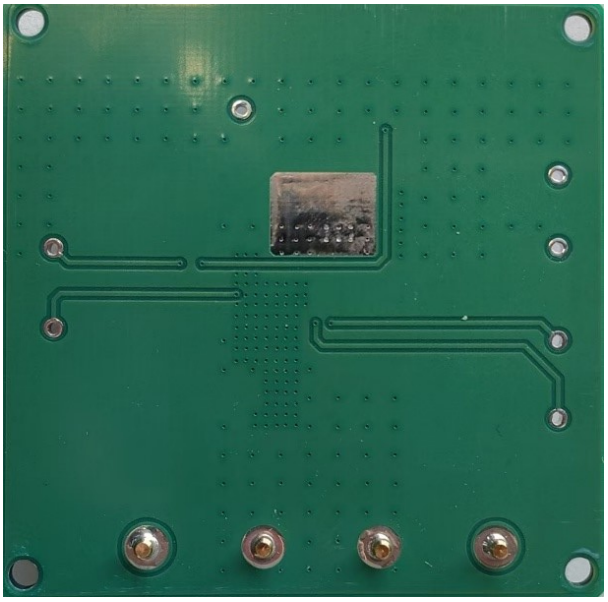
SGM61430A Demo Board Test Report

6V to 36V Input, 5V/3A Output

Demo Board Picture:



Top Layer



Bottom Layer

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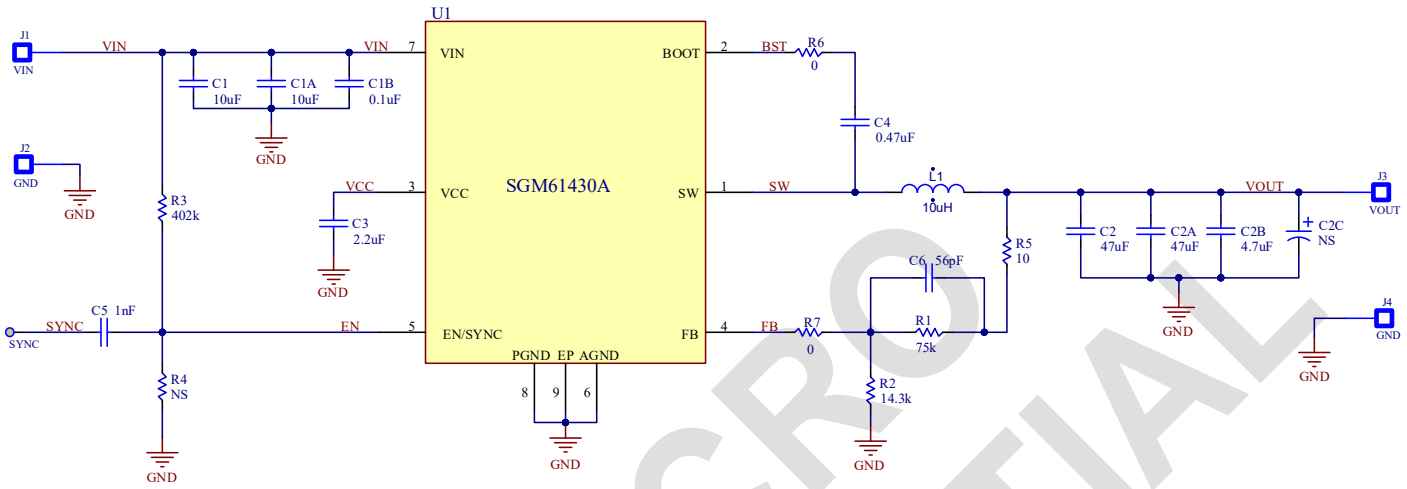
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1. Schematic, BOM List and PCB layout

1.1 Schematic

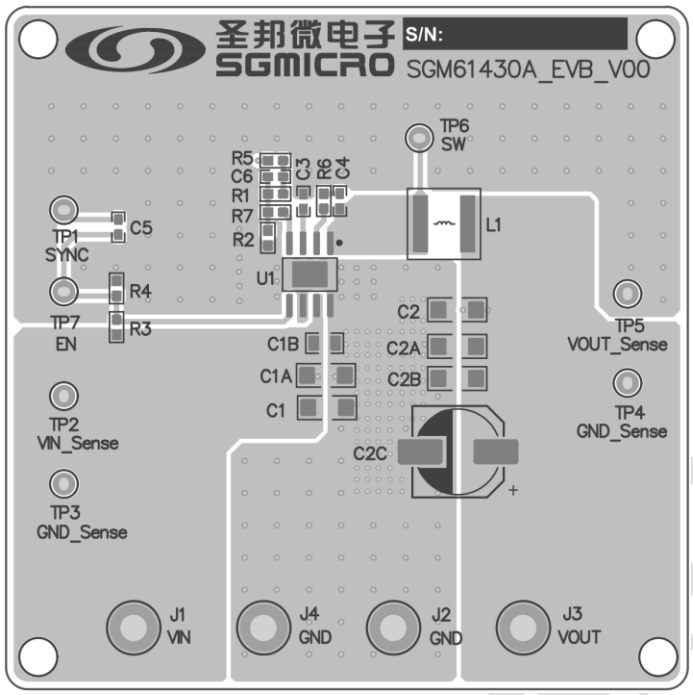


1.2 BOM List

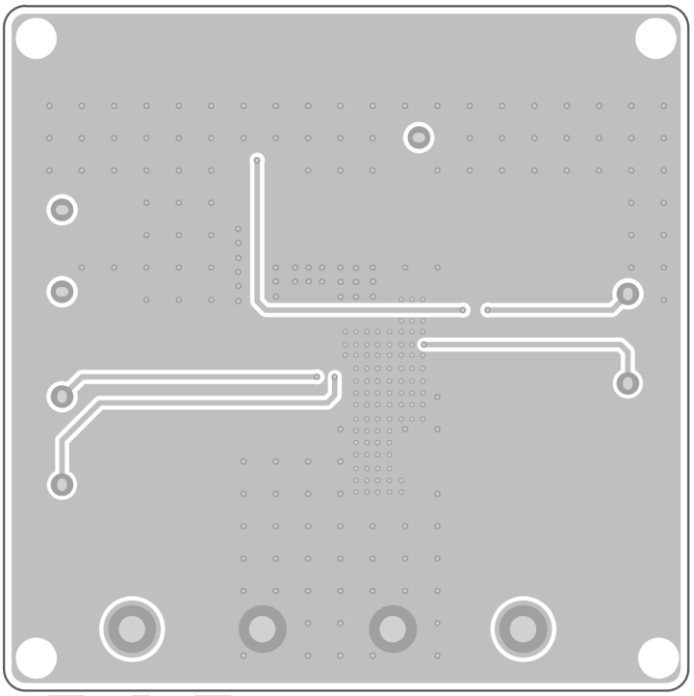
Item	Quantity	Designator	Description	Manufactory
1	2	C1, C1A	10μF, Ceramic capacitor, 50V, X7R, 10%,1206	
2	1	C1B	0.1μF, Ceramic capacitor, 50V, X7R, 10%,0603	
3	2	C2, C2A	47μF, Ceramic capacitor, 25V, X5R, 20%,1206	
4	1	C2B	4.7μF, Ceramic capacitor, 25V, X7R, 10%,1206	
5	0	C2C	NC	
6	1	C3	2.2μF, Ceramic capacitor, 16V, X5R, 10%,0603	
7	1	C4	0.47μF, Ceramic capacitor, 16V, X7R, 10%,0603	
8	1	C5	1nF, Ceramic capacitor, 50V, X7R, 5%,0603	
9	1	C6	56pF, Ceramic capacitor, 50V, C0G, 5%,0603	
10	1	L1	10μH, Inductor, DCR=26.5mOhm, IR=5A, 6060	Wurth: 74439346100
11	1	R1	75kΩ, Film Res,1%,0603	
12	1	R2	14.3kΩ, Film Res,1%,0603	
13	1	R3	402kΩ, Film Res,1%,0603	
14	0	R4	NC	
15	1	R5	10Ω, Film Res,1%,0603	
16	2	R6, R7	0Ω, Film Res,1%,0603	
17	1	U1	Synchronous Step-Down Converter, SOIC-8	SGMICRO: SGM61430A
Conclusion: Total 18 components				

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1.3 PCB Layout



Top Layer



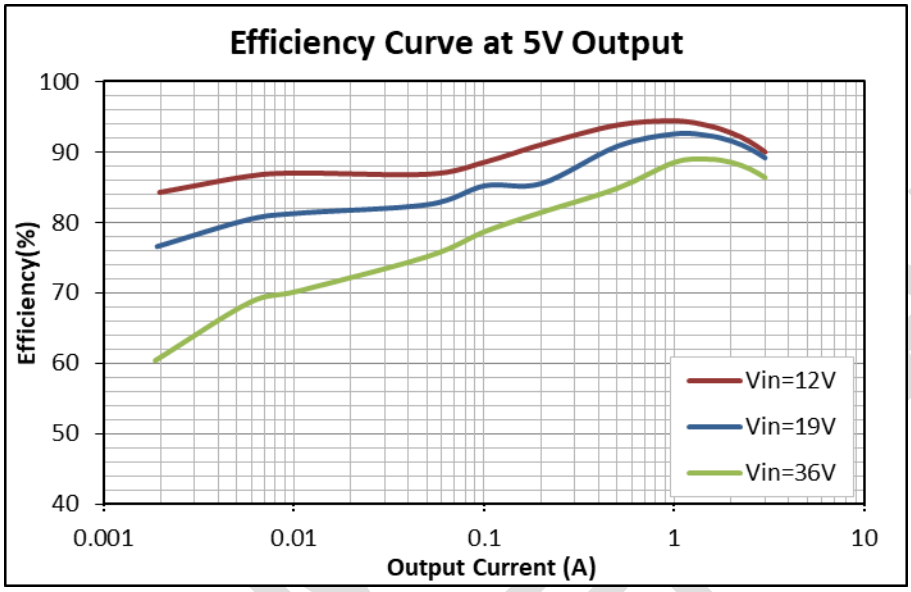
Bottom Layer

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2. Test Item

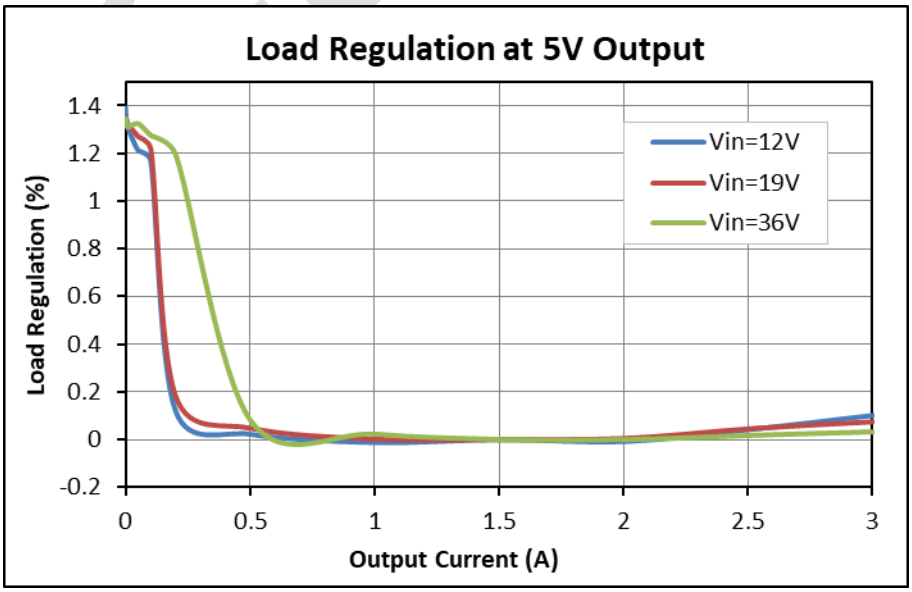
2.1 Efficiency

Test condition: V_{IN}=12-36V, I_O=0.002A-3A, measure the efficiency.



2.2 Load Regulation

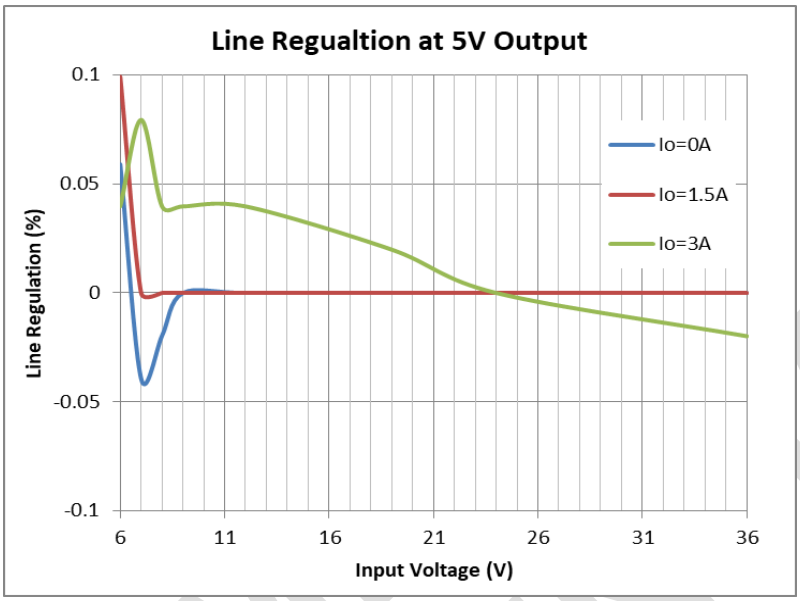
Test condition: V_{IN}=12/19/36V, I_O=0A-3A, measure the load regulation.



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2.3 Line Regulation

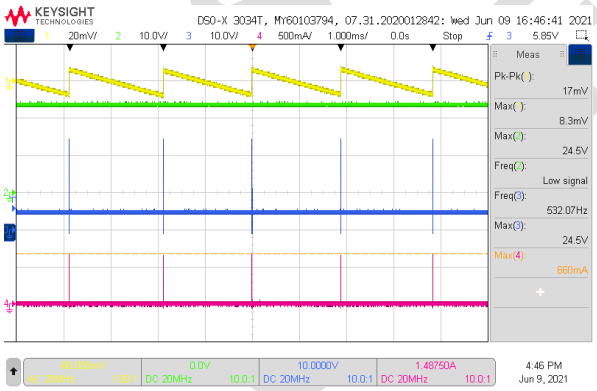
Test condition: V_{IN}=6V-36V, I_O=0A/1.5A/3A, measure the line regulation.



2.4 Output Voltage Ripple

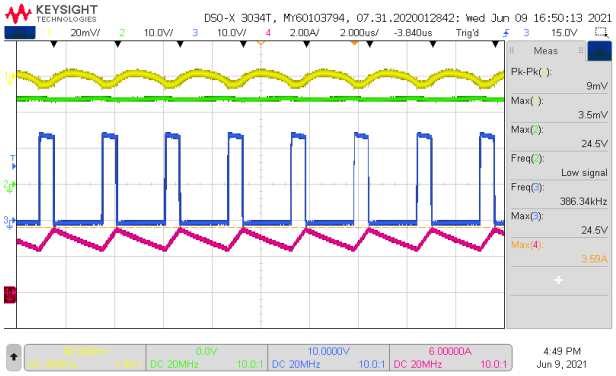
Test condition: V_{IN}=24V, V_{OUT}=5V, test the output ripple.

I_O=0A



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

I_O=3A



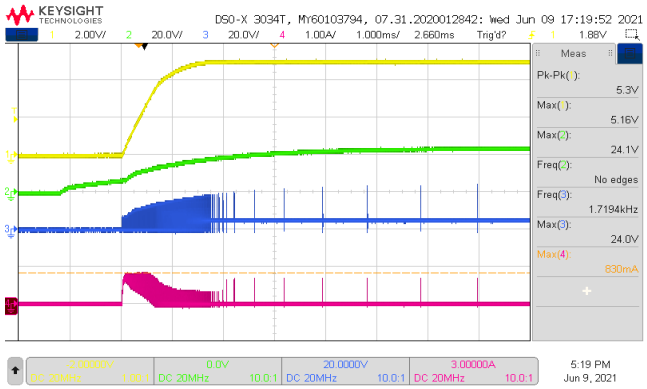
Ch1-V_{OUT}/AC, Ch2-V_{IN}, Ch3-V_{SW}, Ch4-I_L

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2.5 V_{IN} On/Off

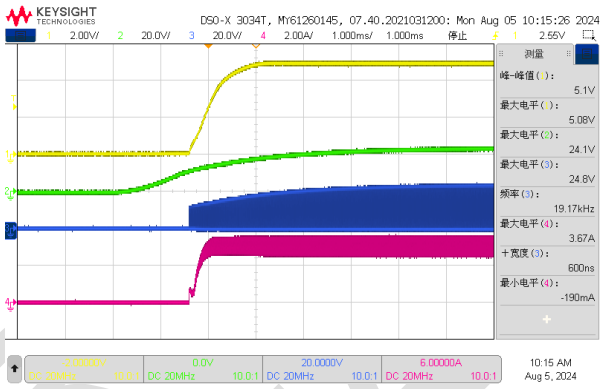
Test condition: V_{IN}=24V, V_{OUT}=5V, V_{IN} power on.

I_O=0A



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

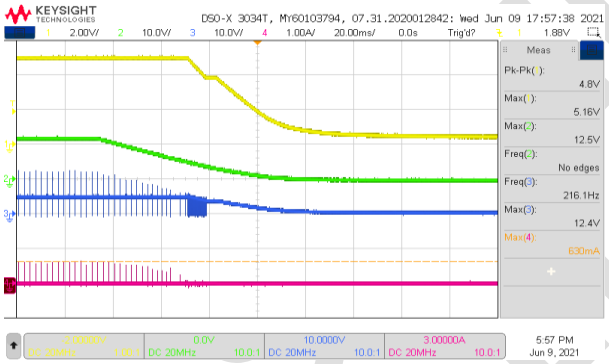
I_O=3A



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

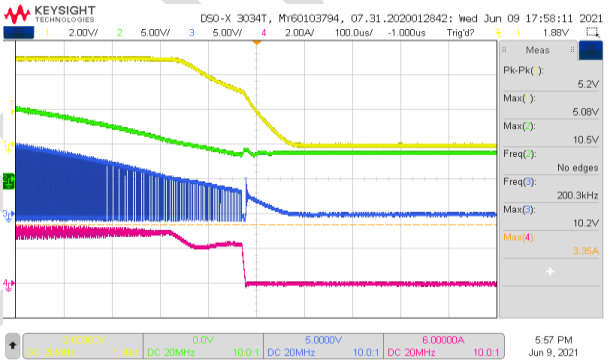
Test condition: V_{IN}=24V, V_{OUT}=5V, V_{IN} power off.

I_O=0A



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

I_O=3A

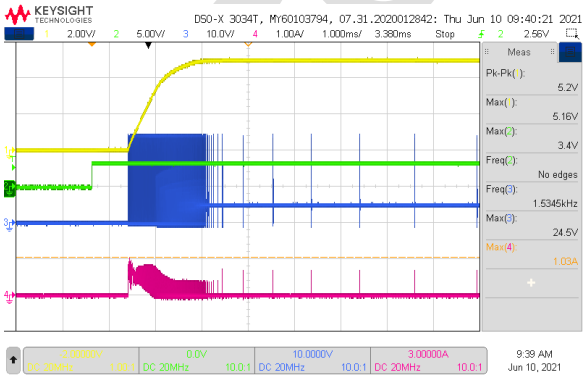


Ch1-V_{OUT}, Ch2-V_{IN}, Ch3-V_{SW}, Ch4-I_L

2.6 EN On/Off

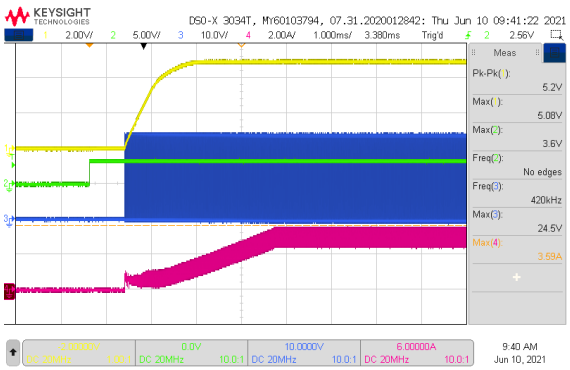
Test condition: V_{IN}=24V, V_{OUT}=5V, EN on.

I_O=0A



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

I_O=3A

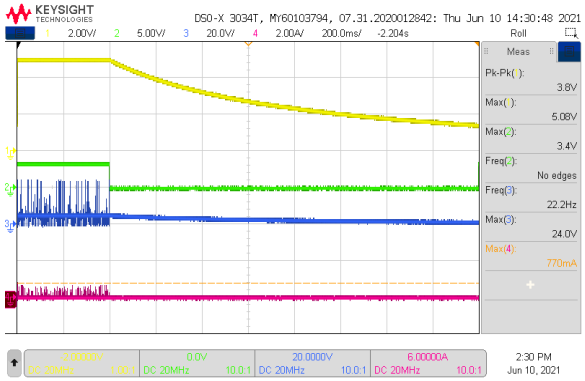


Ch1-V_{OUT}, Ch2-V_{EN}, Ch3-V_{SW}, Ch4-I_L

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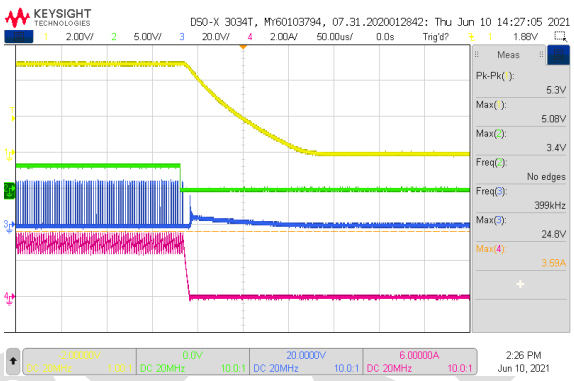
Test condition: V_{IN}=24V, V_{OUT}=5V, EN off

I_O=0A



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

I_O=3A

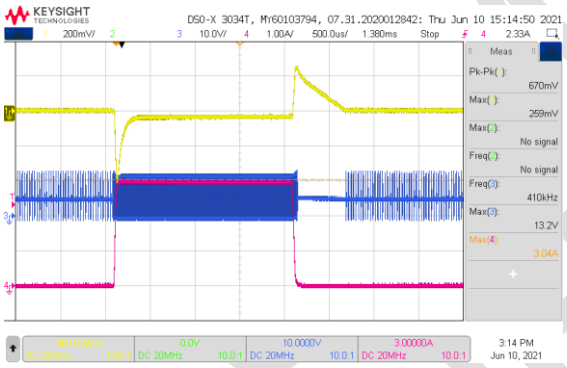


Ch1-V_{OUT}, Ch2-V_{EN}, Ch3-V_{SW}, Ch4-I_L

2.7 Load Transient

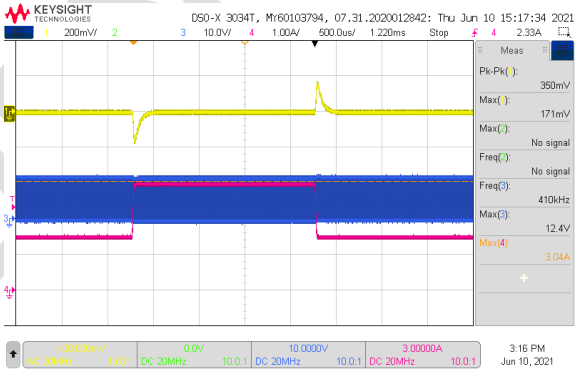
Test condition: V_{IN}=12V, V_{OUT}=5V, CCDH E-load slew rate is set 2.5A/us.

I_O=3A-0.3A-3A



Ch1-V_{OUT}/AC, Ch3-V_{SW}, Ch4-I_{OUT}

I_O=3A-1.5A-3A

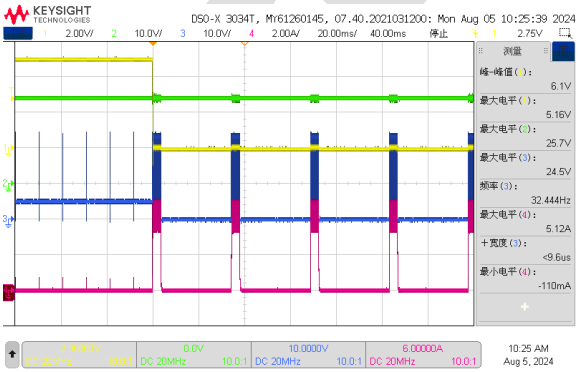


Ch1-V_{OUT}/AC, Ch3-V_{SW}, Ch4-I_{OUT}

2.8 SCP Entry, Recovery

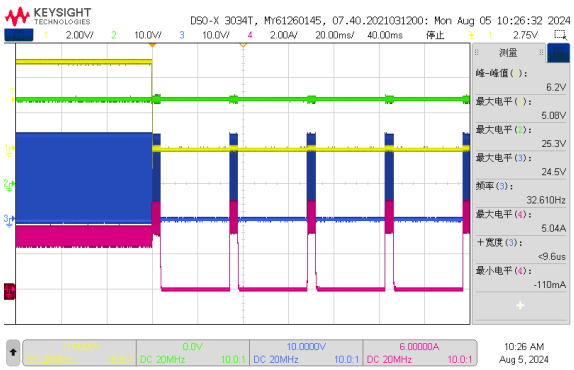
Test condition: V_{IN}=24V, V_{OUT}=5V, short V_O to GND, SCP entry.

I_O=0A



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

I_O=3A

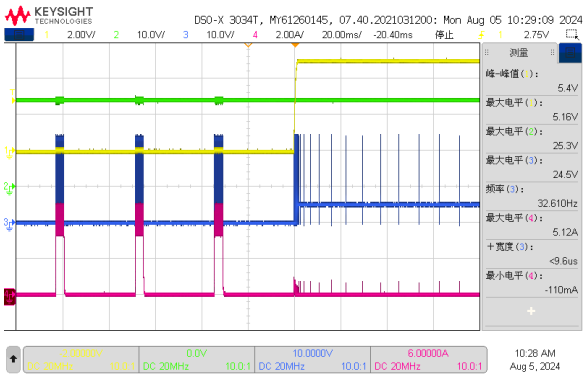


Ch1-V_{OUT}, Ch2-V_{IN}, Ch3-V_{SW}, Ch4-I_L

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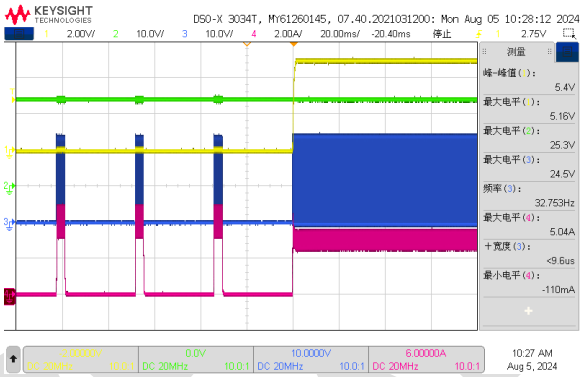
Test condition: V_{IN}=24V, V_O=5V, short V_O to GND, SCP recovery

I_O=0A



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

I_O=3A

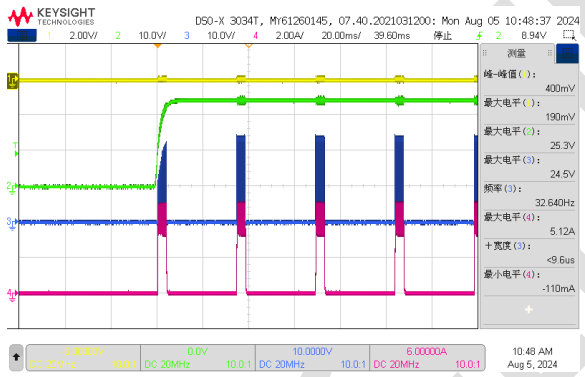


Ch1-V_{OUT}, Ch2-V_{IN}, Ch3-V_{SW}, Ch4-I_L

2.9 SCP power/EN on/off

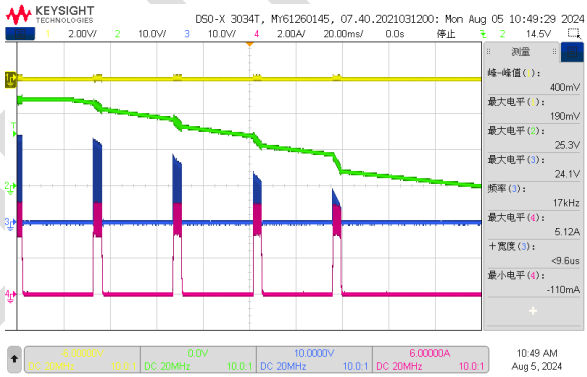
Test condition: V_{IN}=24V, V_{OUT}=5V, short V_O to GND

Power on



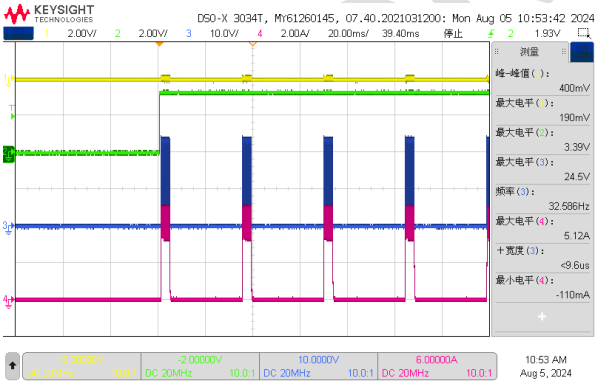
Ch1-V_{OUT}, Ch2-V_{IN}, Ch3-V_{SW}, Ch4-I_L

Power off



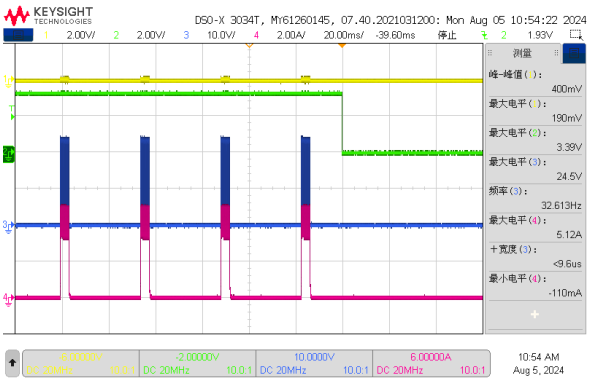
Ch1-V_{OUT}, Ch2-V_{IN}, Ch3-V_{SW}, Ch4-I_L

EN on



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

EN off



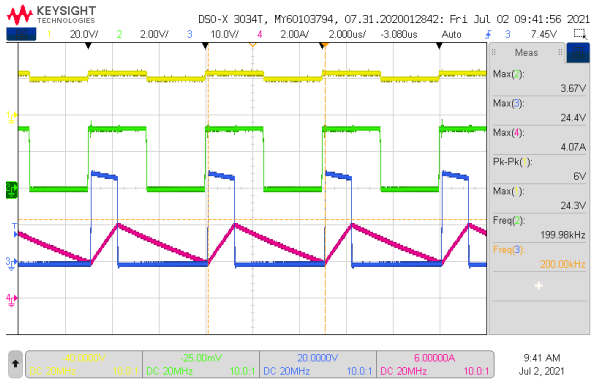
Ch1-V_{OUT}, Ch2-EN, Ch3-V_{SW}, Ch4-I_L

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2.10 Synchronize to External Clock

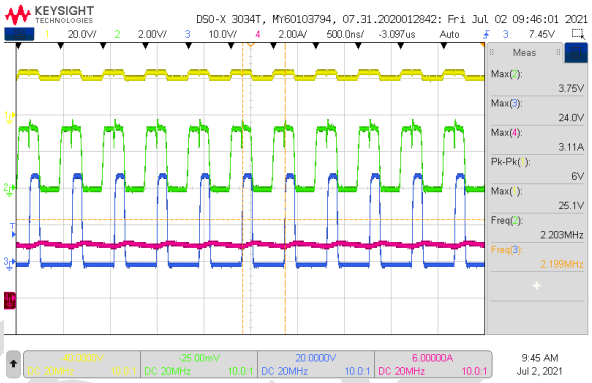
Test condition: V_{IN}=24V, V_{OUT}=5V/3A. External SYNC signal amplitude is 3.3V.

f_{SYNC}=200kHz



Ch1-V_{EN}, Ch2-$V_{EN/SYNC}$, Ch3-V_{SW}, Ch4-I_L

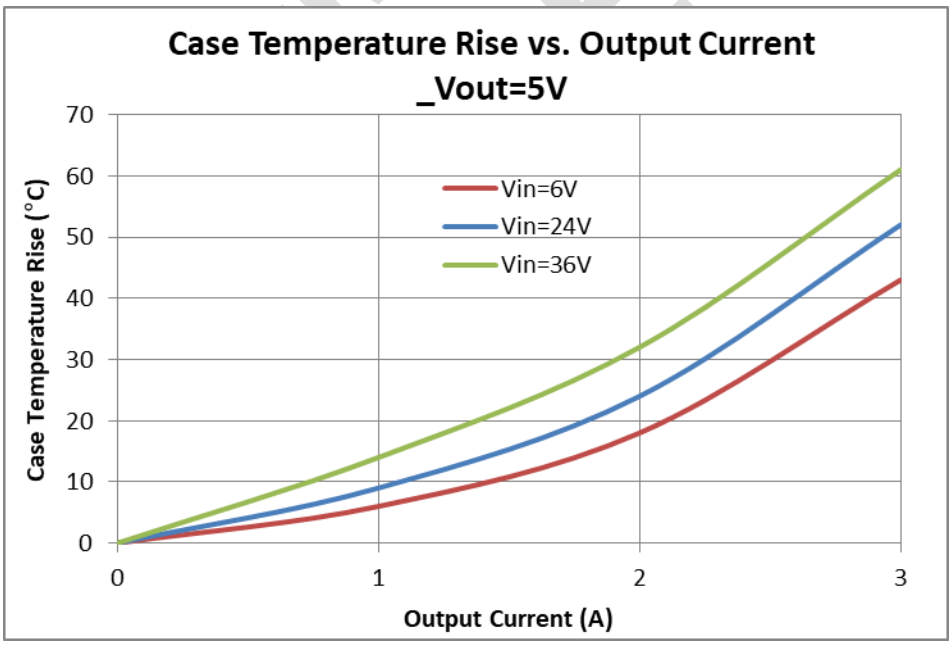
f_{SYNC}=2.2MHz



Ch1-V_{EN}, Ch2-$V_{EN/SYNC}$, Ch3-V_{SW}, Ch4-I_L

2.11 Thermal Test

Test condition: V_{IN}=6/24/36V, V_{OUT}=5V, measure the case temperature (Tc) rise with Io=0A to Io=3A.



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