

SGM66057A Demo Board Test Report

2.7V to 4.85V Input, 5V/3.45A Output

Demo Board Picture:

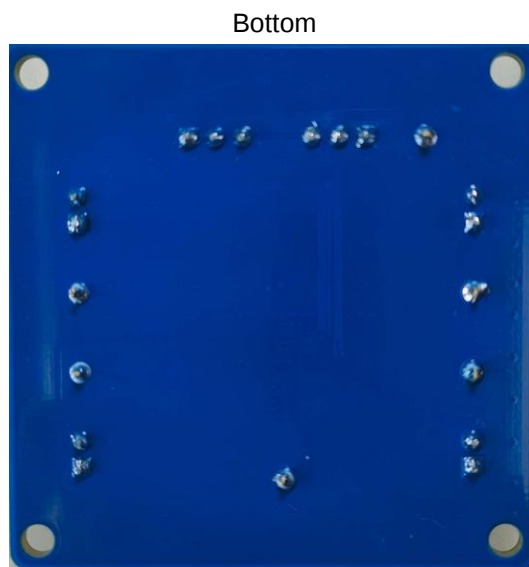
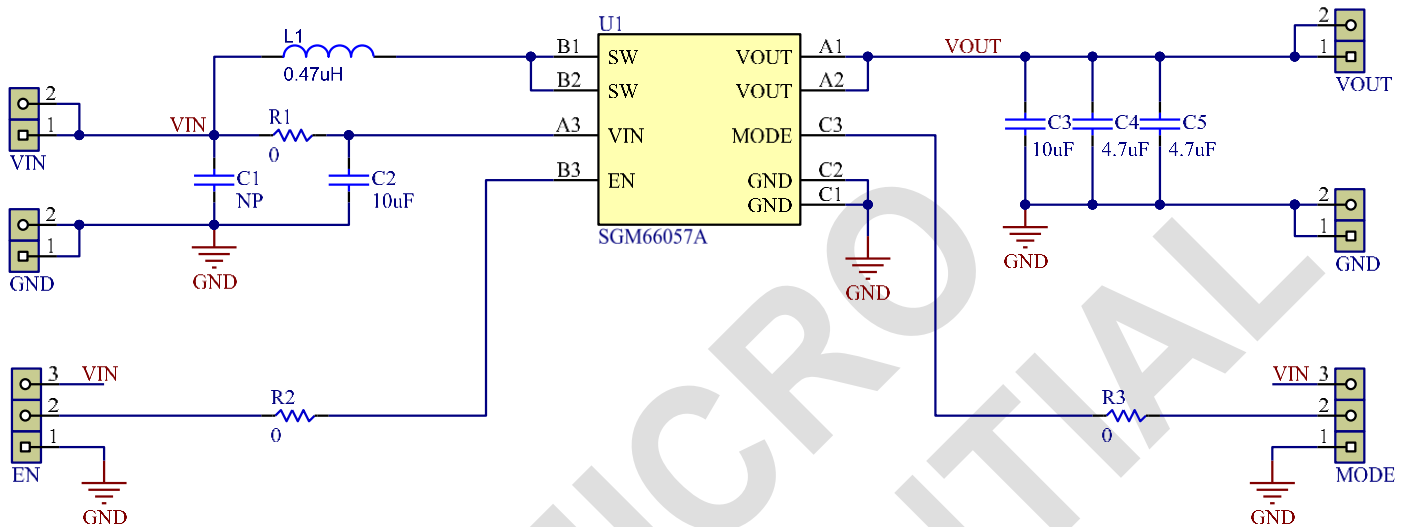


Table of Contents

Table of Contents	2
1. Schematic, BOM List and PCB layout	3
2. Efficiency.....	5
3. Load Regulation.....	6
4. Line Regulation	7
5. Output Voltage Ripple.....	8
6. V_{IN} On/Off	9
7. EN On/Off.....	11
8. Load Transient	13
9. SCP Entry, Recovery.....	14
10. SCP power/EN on/off	16
11. Thermal Test.....	17

1. Schematic, BOM List and PCB layout

Schematic:

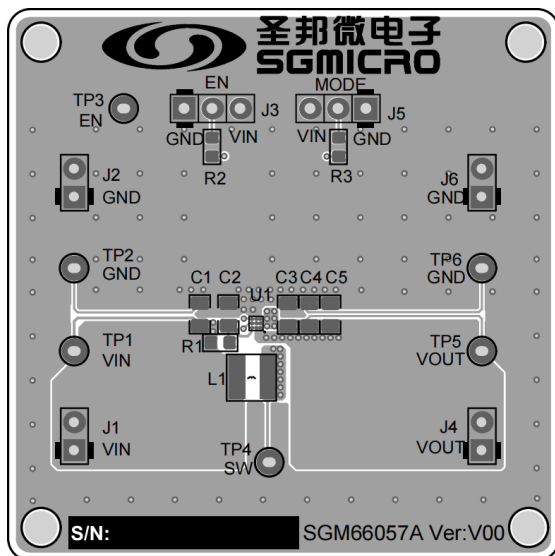


BOM List:

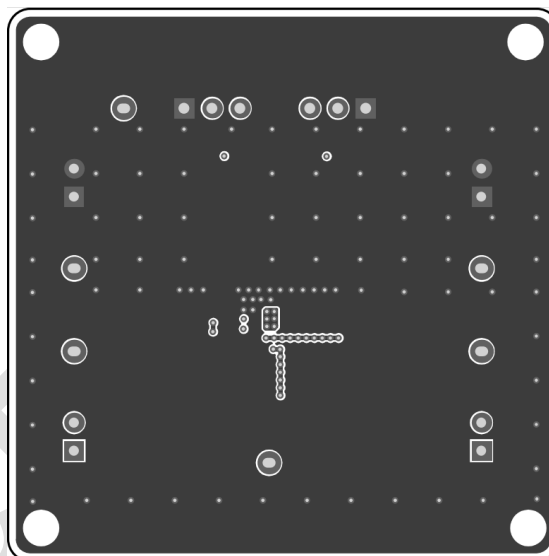
Item	Quantity	Designator	Description	Manufactory
1	0	C1	NP	
2	2	C2, C3	Ceramic capacitor, 10 μ F, 25V, X5R, 20%, 0603	Murata GRM188R61E106MA73D
3	2	C4, C5	Ceramic capacitor, 4.7 μ F, 25V, X5R, 10%, 0603	Murata GRM188R61E475KE11D
4	1	L1	Inductor, 0.47 μ H, DCR(max)=14m Ω , Isat=14.5A, 4.45mm*4.06mm*2mm	Würth 744373240047
5	3	R1, R2, R3	Film Resistor, 1%, 0, 0603	
6	1	U1	Synchronous Boost Converter, WLCSP-1.26x1.21-9B	SG-Micro SGM66057A
Conclusion: Total 9 components				

PCB Layout:

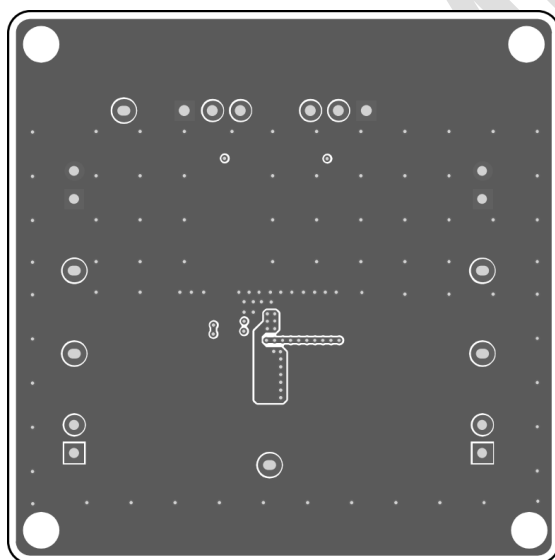
Top Layer



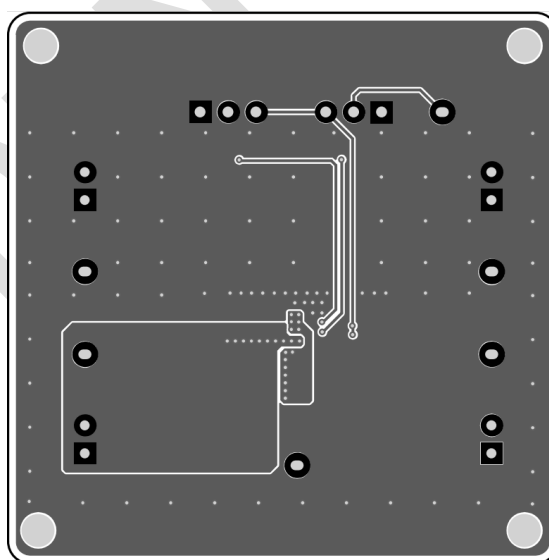
Internal Layer1



Internal Layer2

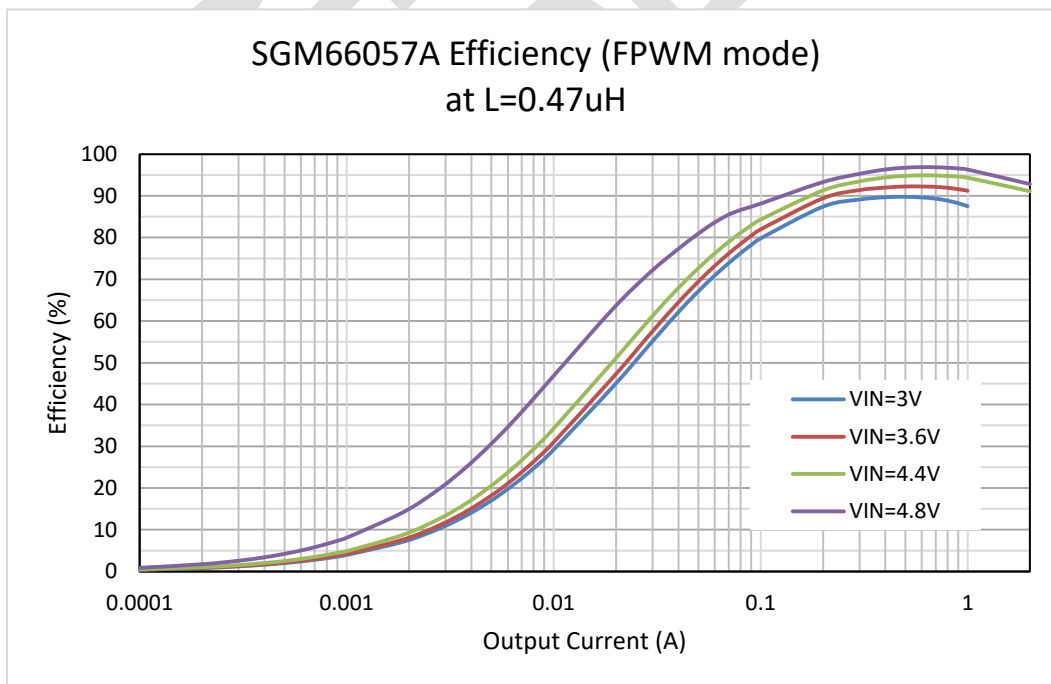
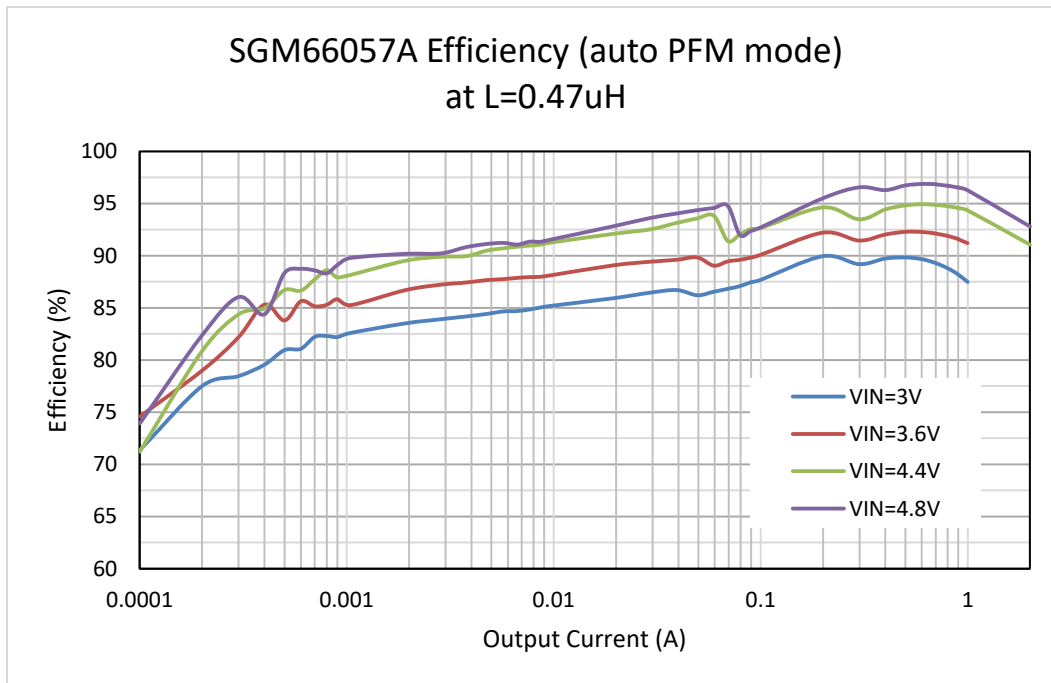


Bottom Layer



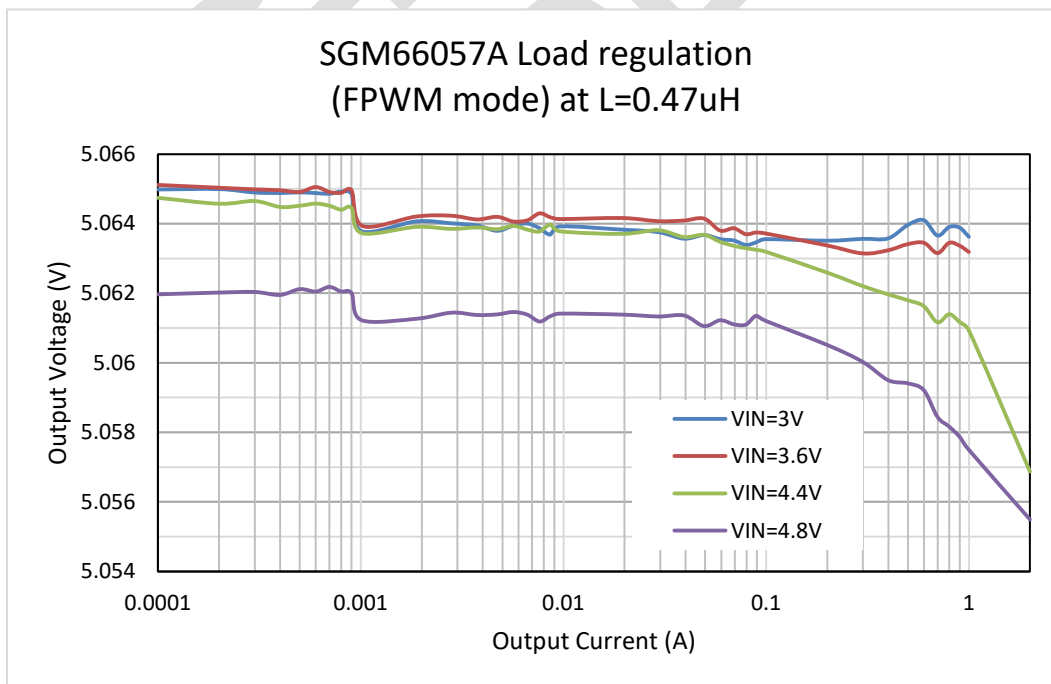
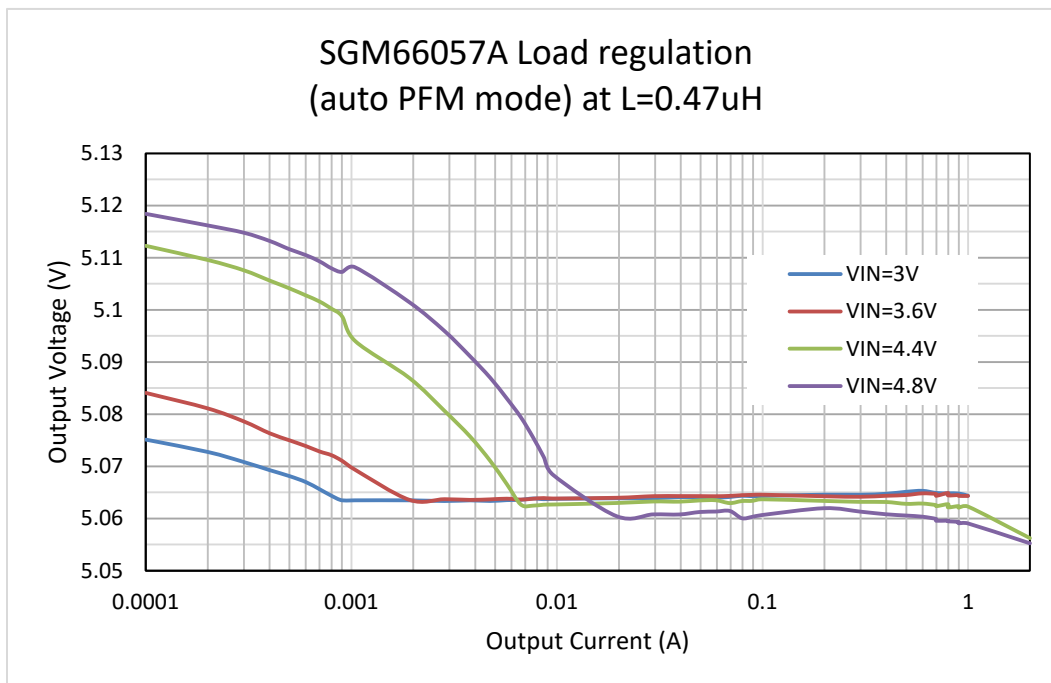
2. Efficiency

Test condition: $V_{IN}=3/3.6/4.4/4.8V$, $I_O=0.1mA-2A$, measure the efficiency.



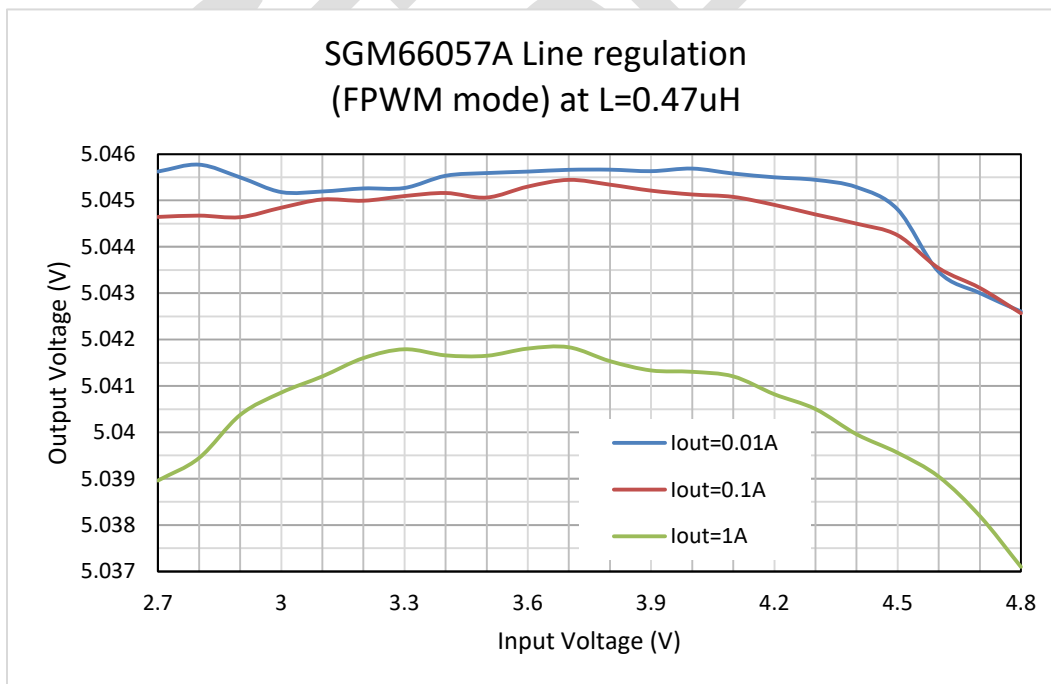
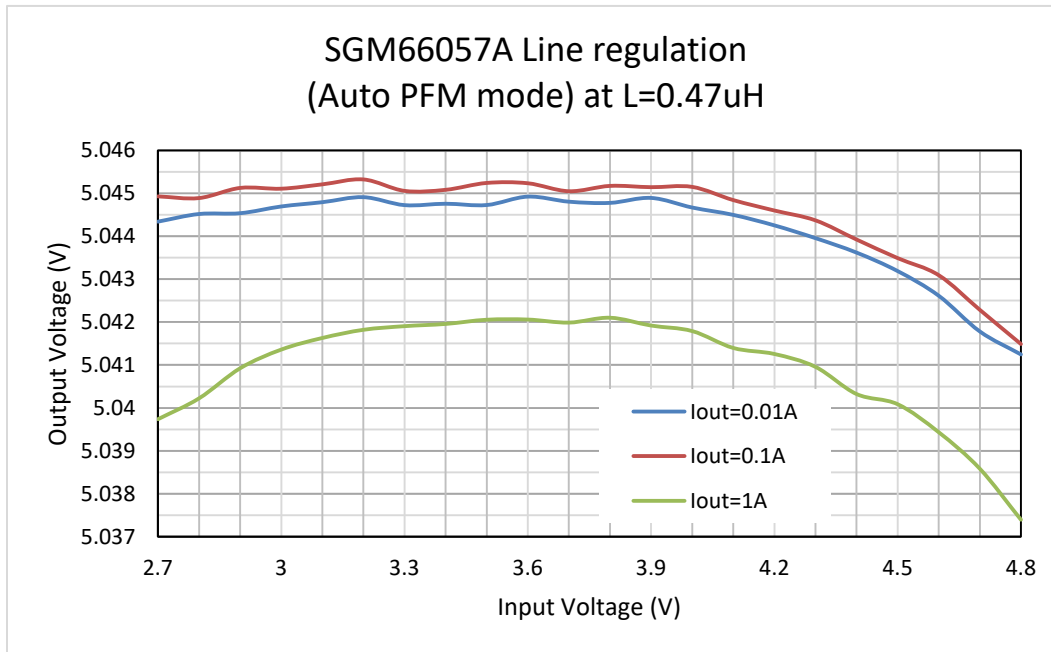
3. Load Regulation

Test condition: $V_{IN}=3/3.6/4.4/4.8V$, $I_O=0.1mA-2A$, measure the load regulation.

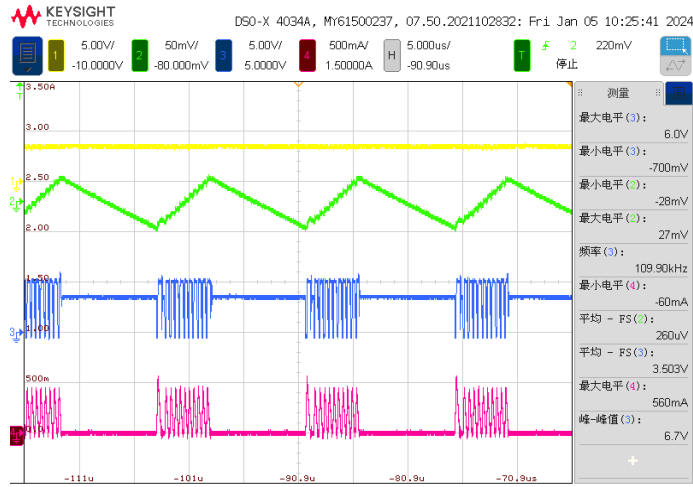
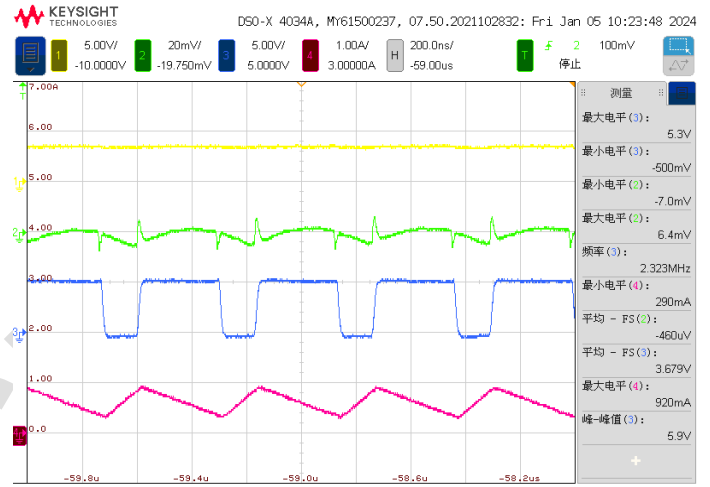
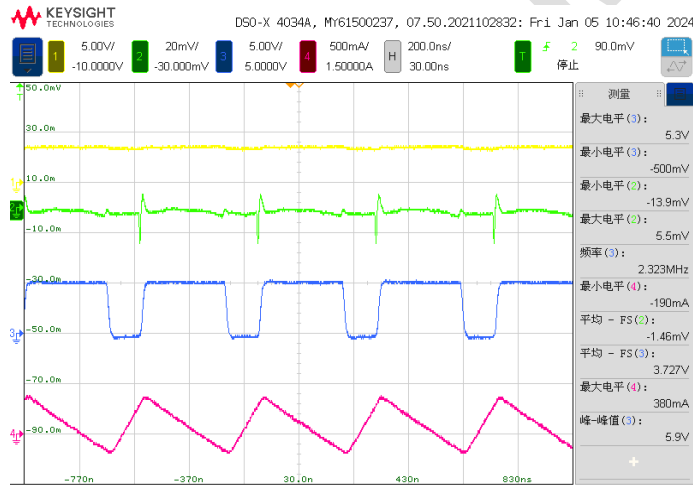


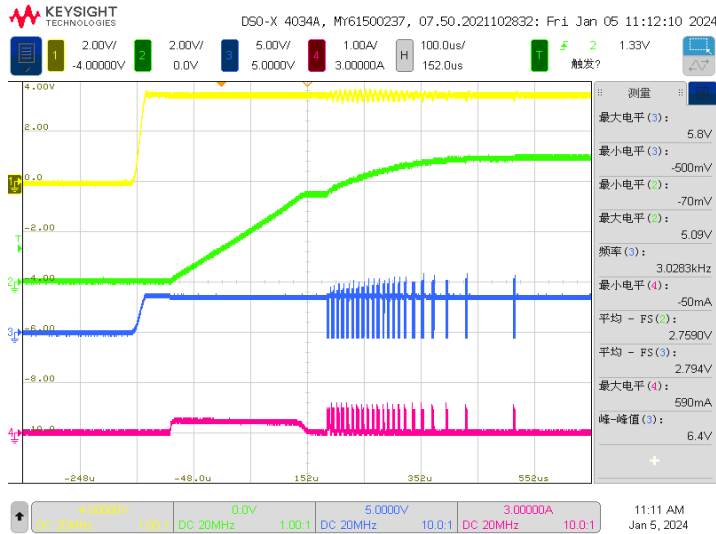
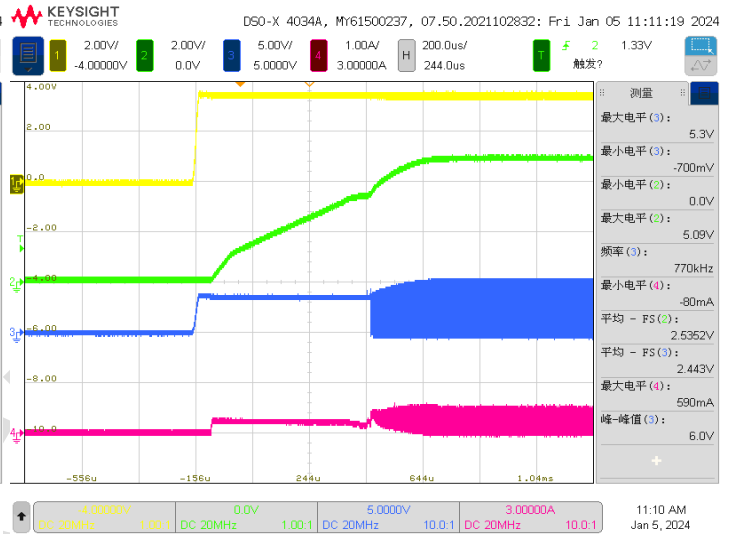
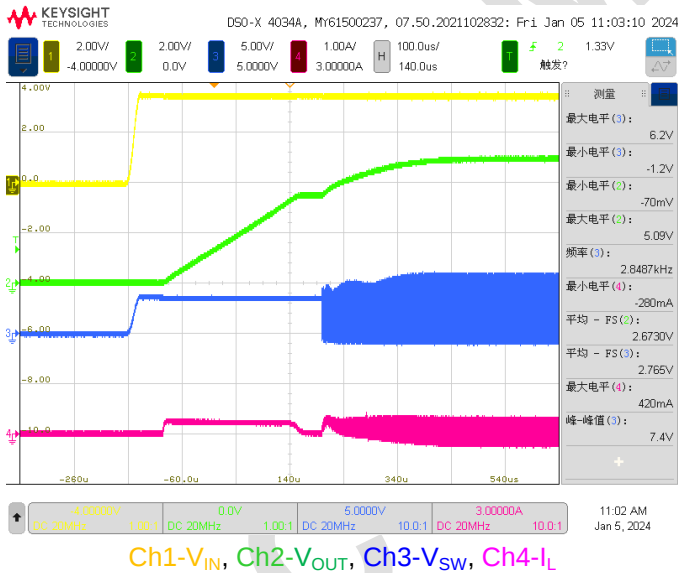
4. Line Regulation

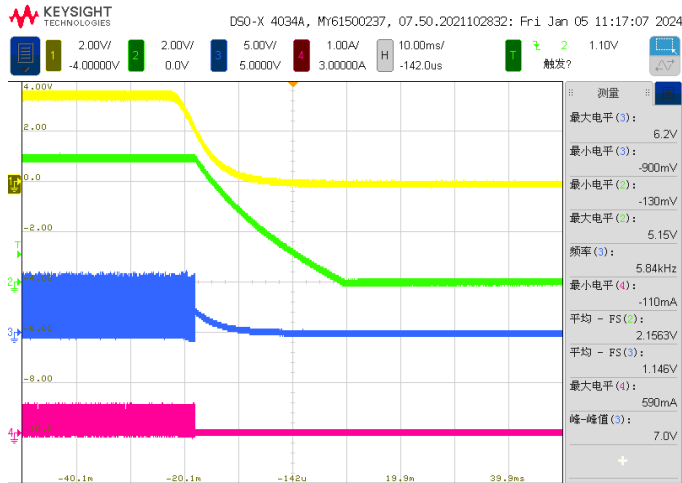
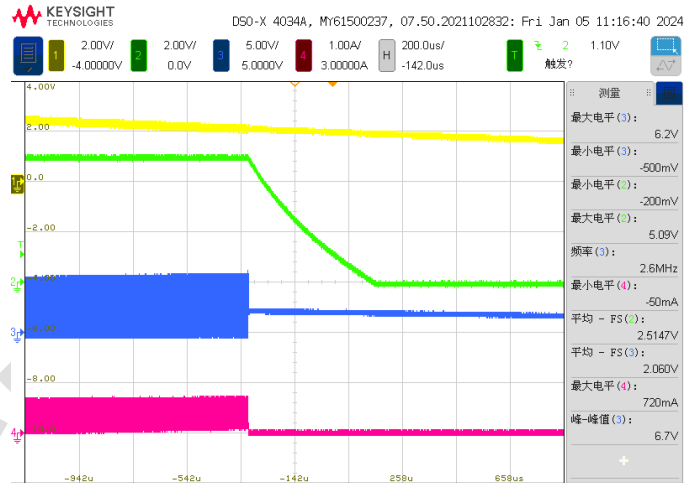
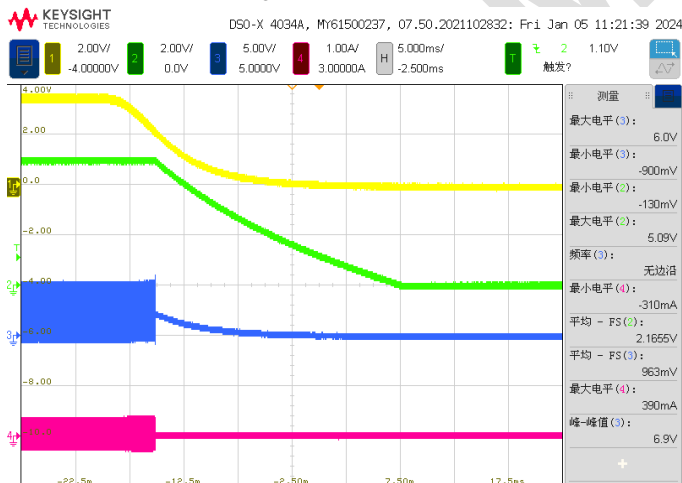
Test condition: $V_{IN}=2.7V-4.8V$, $I_O=0.01A/0.1A/1A$, measure the line regulation.



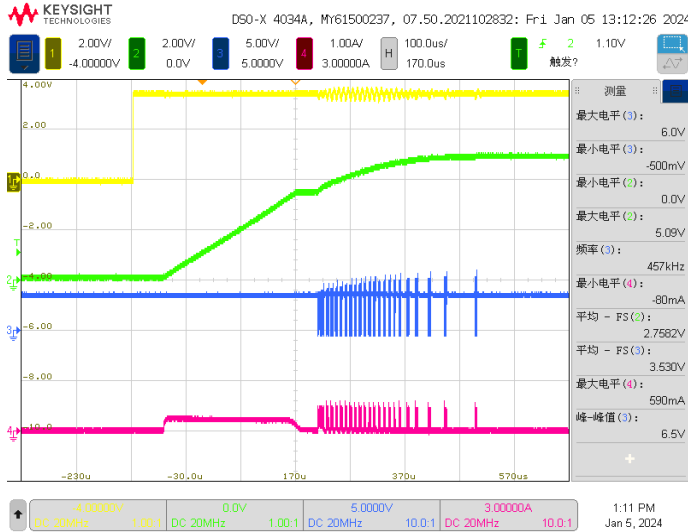
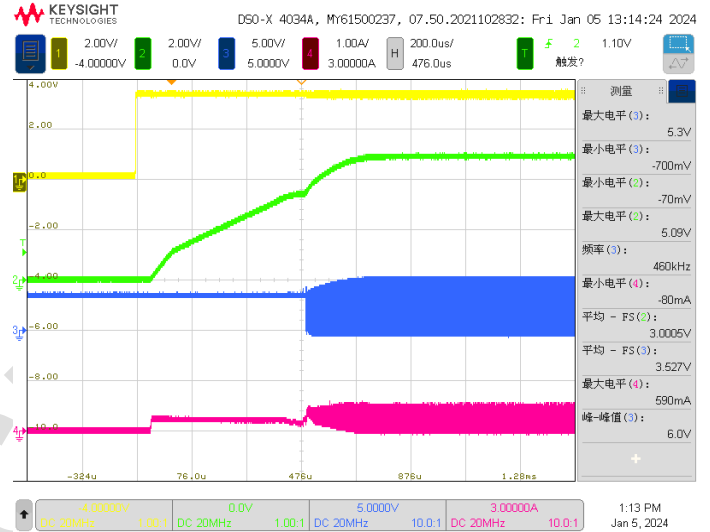
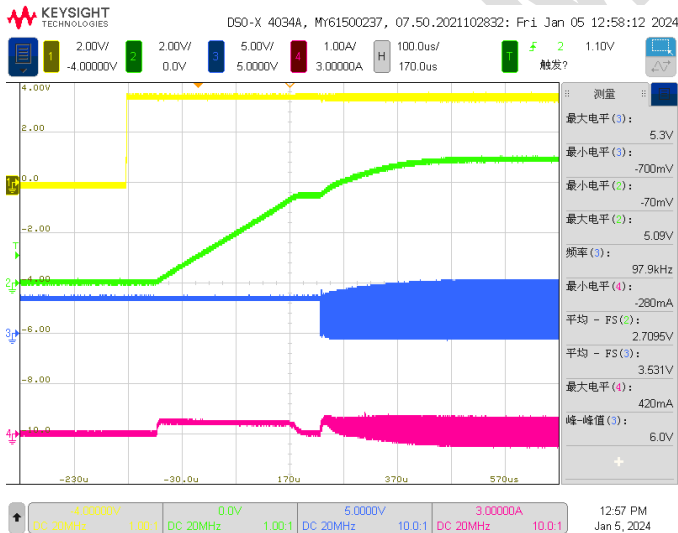
5. Output Voltage Ripple

Test condition: $V_{IN}=3.6V$, $V_{OUT}=5V$ $I_O=40mA$, PFM $I_O=400mA$, PFM $I_O=40mA$, FPWM

6. V_{IN} On/OffTest condition: $V_{IN}=3.6V$, $V_{OUT}=5V$, V_{IN} power on. $I_O=0A$, PFM $I_O=150mA$, FPM $I_O=0A$, FPWM

Test condition: $V_{IN}=3.6V$, $V_{OUT}=5V$, V_{IN} power off. $I_O=1mA$, PFM $I_O=150mA$  $I_O=1mA$, FPWM

7. EN On/Off

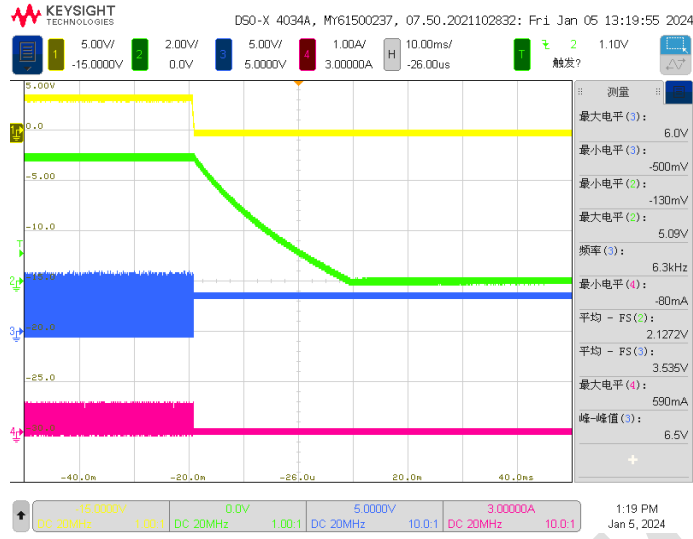
Test condition: $V_{IN}=3.6V$, $V_{OUT}=5V$, EN on. $I_O=0A$, PFM $I_O=150mA$  $I_O=0A$, FPWM

SGM66057A

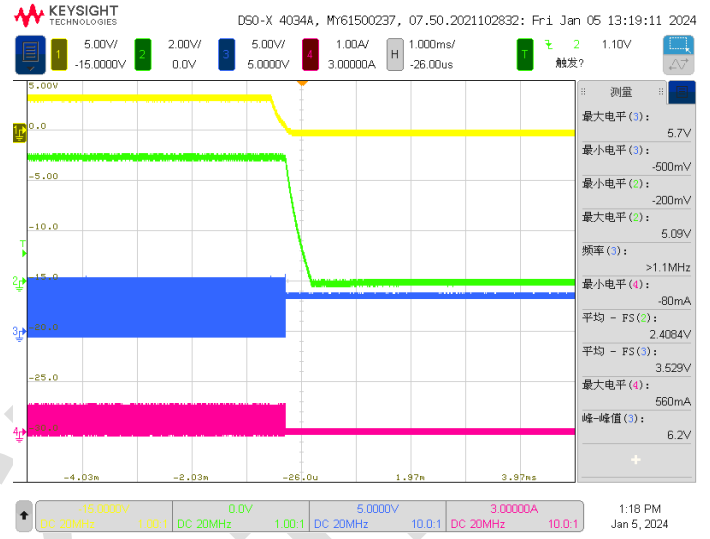
Demo Board Test Report

Test condition: $V_{IN}=3.6V$, $V_{OUT}=5V$, EN off

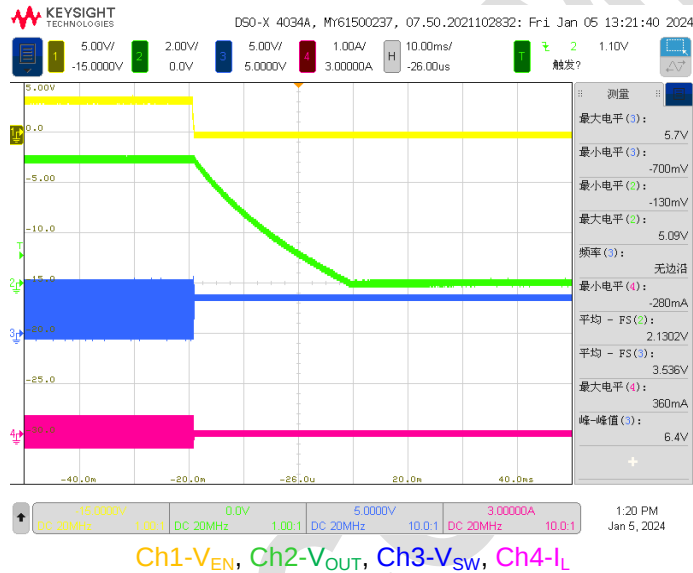
$I_O=1mA$, PFM



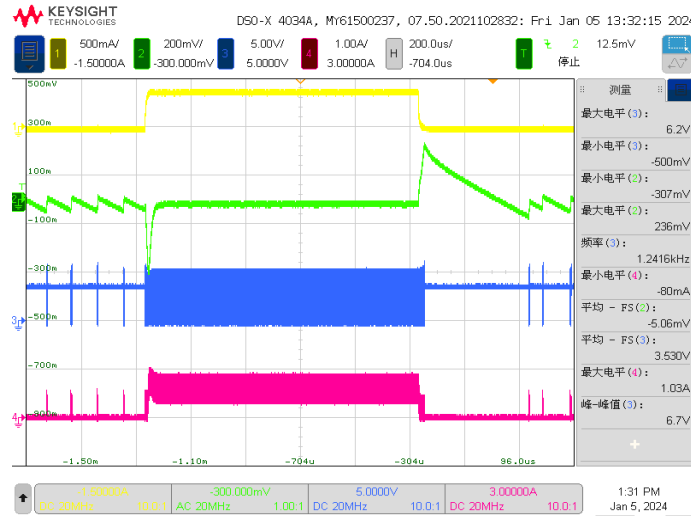
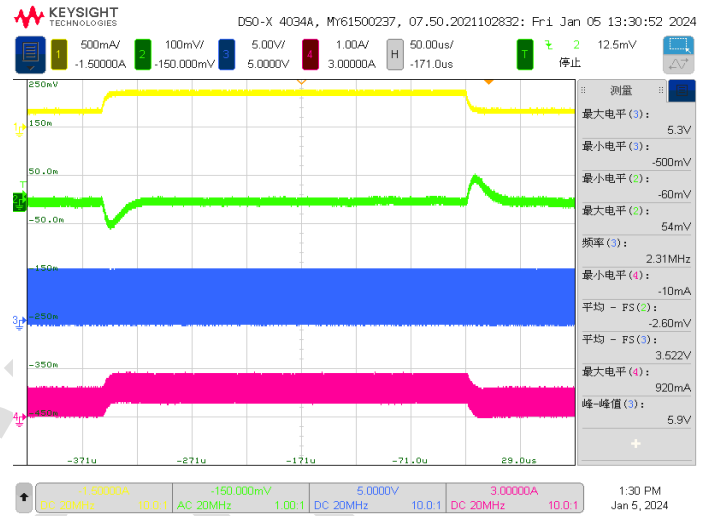
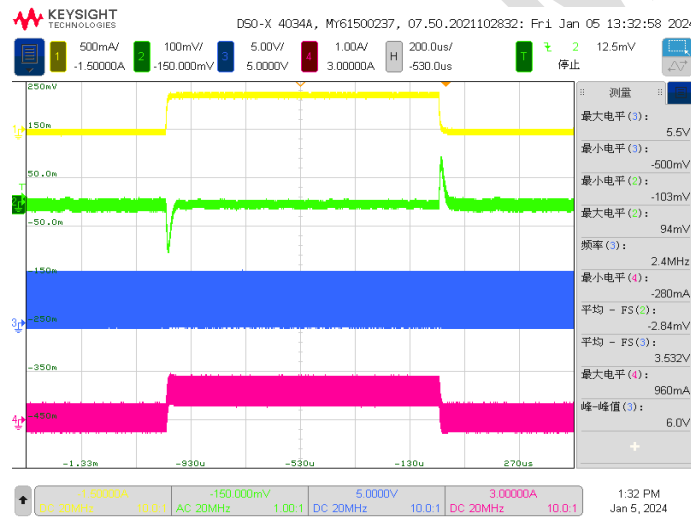
$I_O=150mA$, PFM



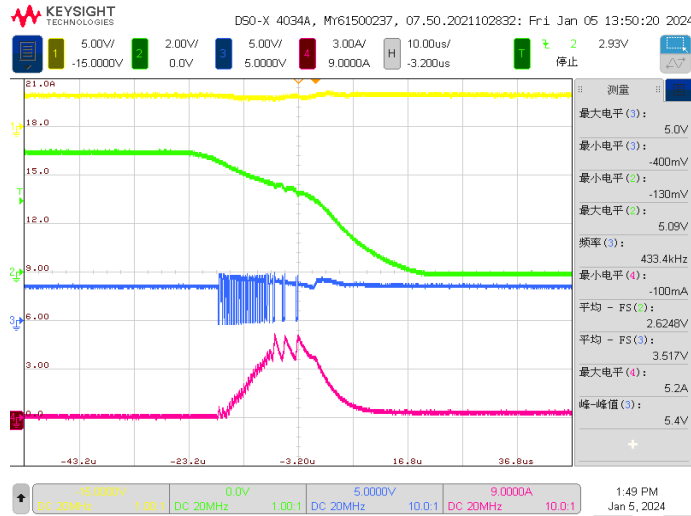
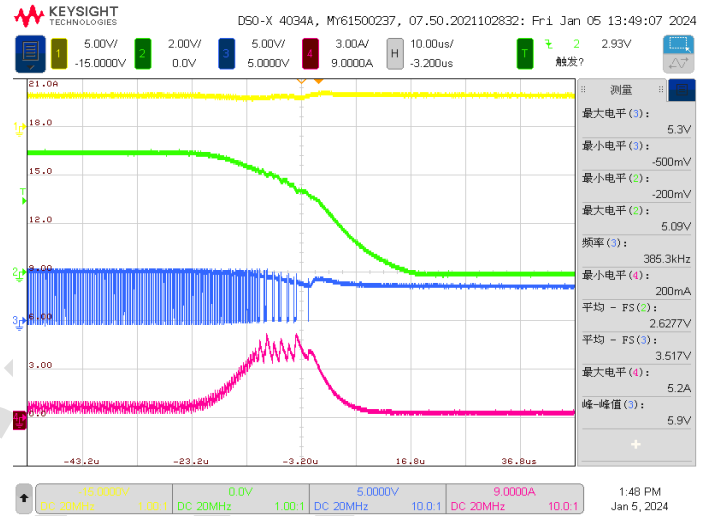
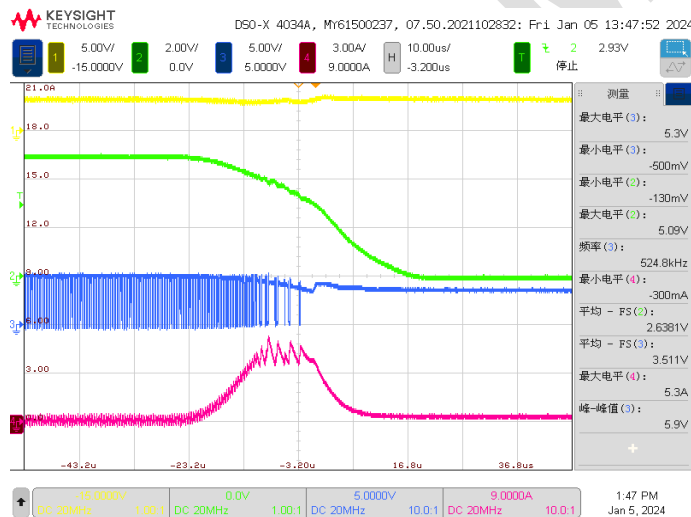
$I_O=1mA$, FPWM

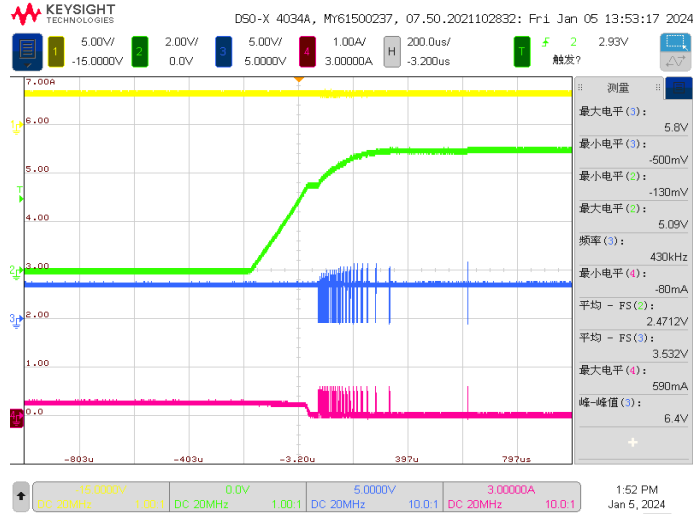
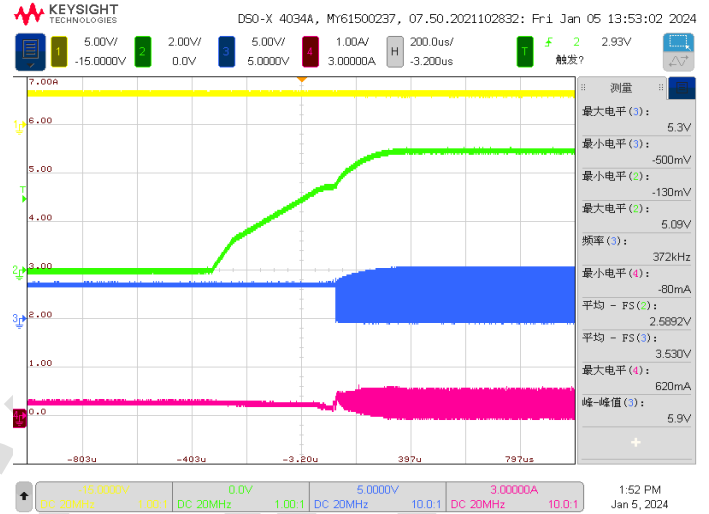
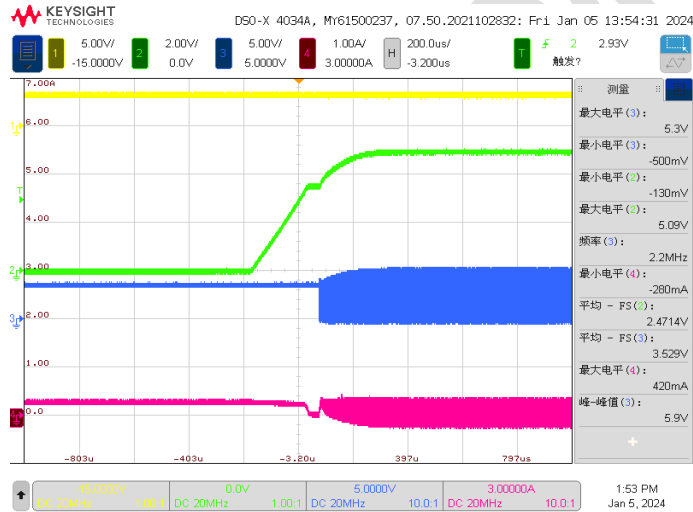


8. Load Transient

Test condition: $V_{IN}=3.6V$, $V_{OUT}=5V$, KIKUSUI E-load slew rate is 1A/us. $I_O=0-400mA-0$, PFMCh1-I_{LOAD}, Ch2-V_{OUT}/AC, Ch3-V_{SW}, Ch4-I_L $I_O=200mA-400mA-200mA$, PFMCh1-I_{LOAD}, Ch2-V_{OUT}/AC, Ch3-V_{SW}, Ch4-I_L $I_O=0-400mA-0$, FPWMCh1-I_{LOAD}, Ch2-V_{OUT}/AC, Ch3-V_{SW}, Ch4-I_L

9. SCP Entry, Recovery

Test condition: $V_{IN}=3.6V$, $V_{OUT}=5V$, short V_O to GND, SCP entry $I_O=0A$, PFMCh1- V_{IN} , Ch2- V_{OUT} , Ch3- V_{SW} , Ch4- I_L $I_O=400mA$, PFMCh1- V_{IN} , Ch2- V_{OUT} , Ch3- V_{SW} , Ch4- I_L $I_O=0A$, FPWMCh1- V_{IN} , Ch2- V_{OUT} , Ch3- V_{SW} , Ch4- I_L

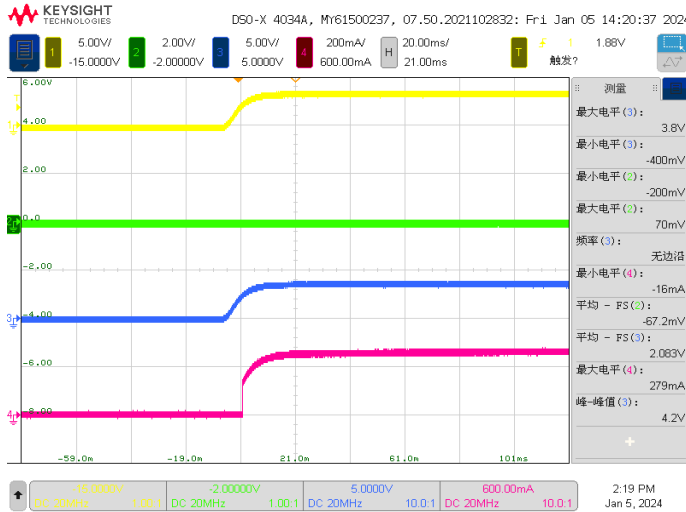
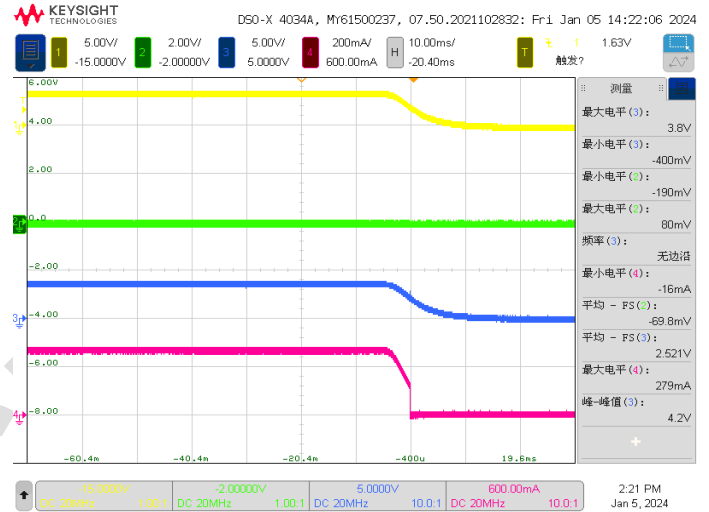
Test condition: $V_{IN}=3.6V$, $V_O=5V$, SCP recovery $I_O=0A$, PFM $I_O=150mA$, PFM $I_O=0A$, FPWM

10. SCP power/EN on/off

Test condition: $V_{IN}=3.6V$, $V_{OUT}=5V$, short V_O to GND

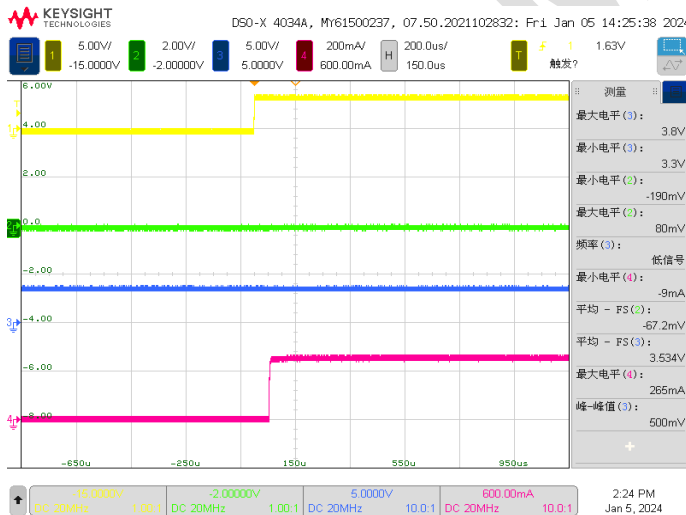
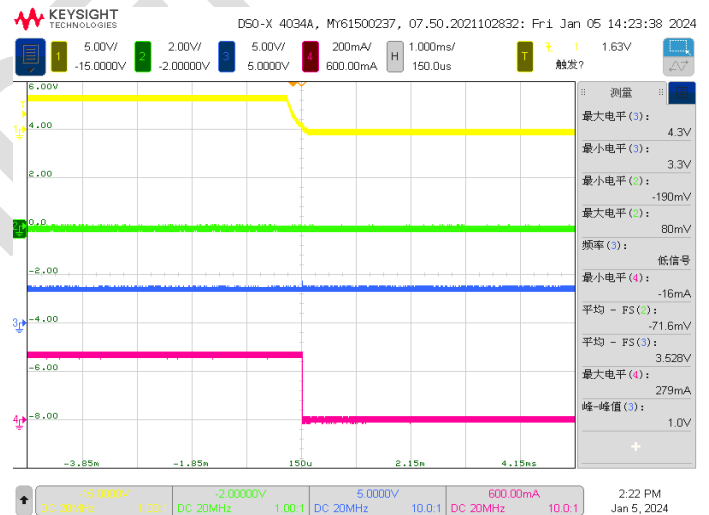
Power on

Power off

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

EN on

EN off

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

11. Thermal Test

Test condition: $V_{IN}=2.7/3.6/4.8V$, $V_{OUT}=5V$, PFM mode, measure the case temperature (T_c) rise with different load current.

