



Texas Instruments

PMP4320A Test Report

China Power Reference Design

REVA

03/03/2014

1 General

1.1 PURPOSE

Provide the detailed data for evaluating and verifying the PMP4320A.

The PMP4320A is a single output DC-DC converter with standard half-brick outline and full digital controlling configuration (UCD3138). It could deliver 50A output current with 12V output voltage. The converter could provide high efficiency and good performance, which makes it an ideal choice for bus converter. For testing applications, a heat sink and sufficient airflow cooling is required.

1.2 REFERENCE DOCUMENTATION

Schematics: PMP4320A_SCH_Final.pdf

PCB Layout: PMP4320A_PCB_Final.pdf

1.3 TEST EQUIPMENTS

Multi-meter: Fluke 187

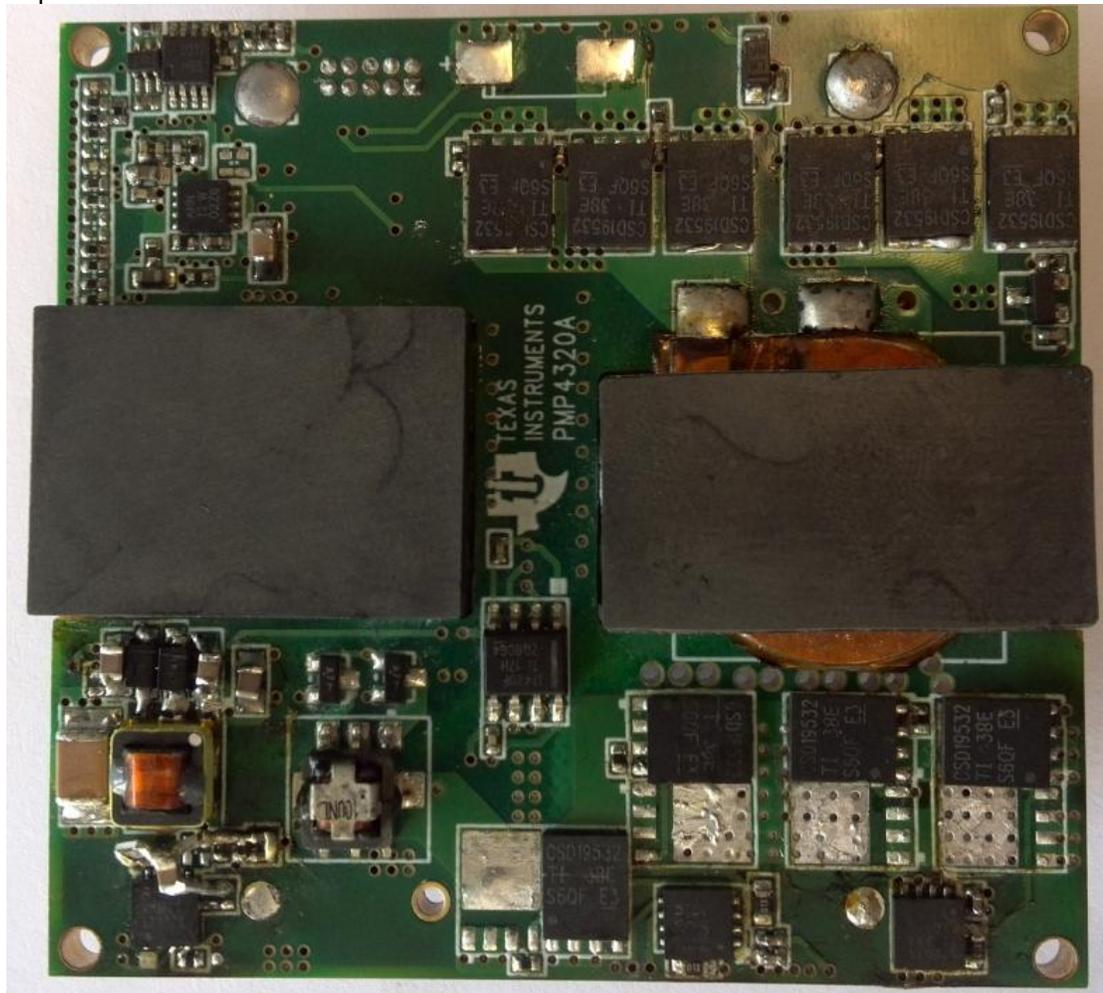
DC Source: LAMBDA

E-Load: Chroma 6314A

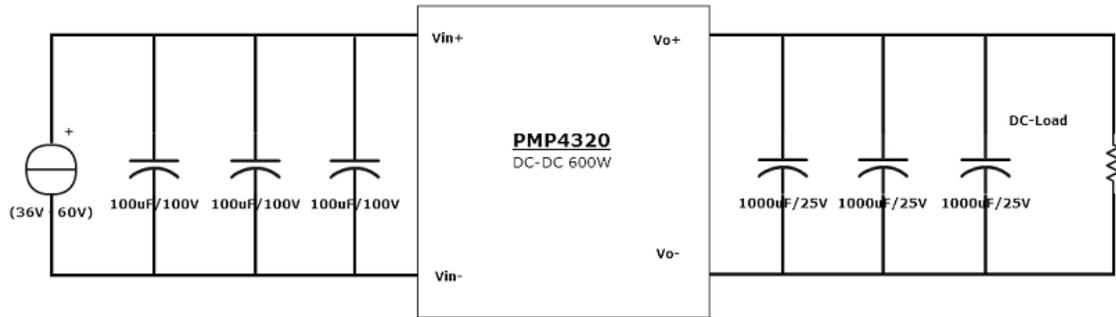
Ambient Temperature at 25DegC

1.3 TEST Setup Photos

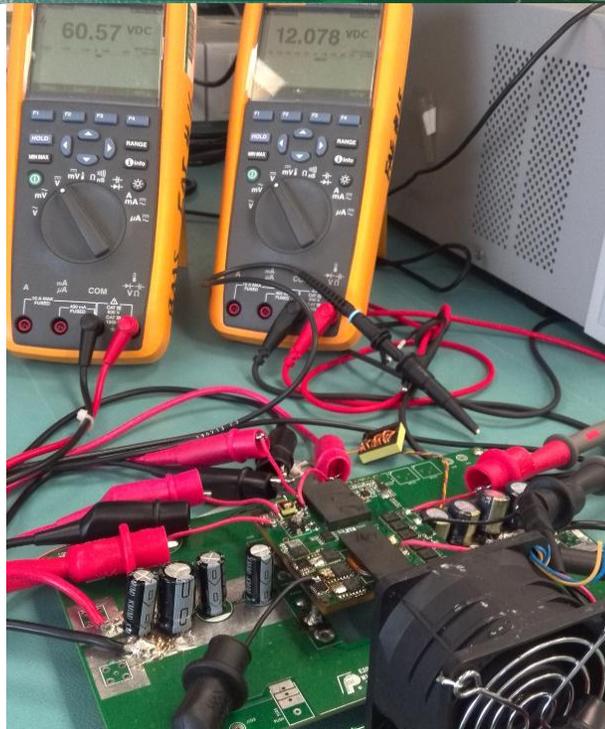
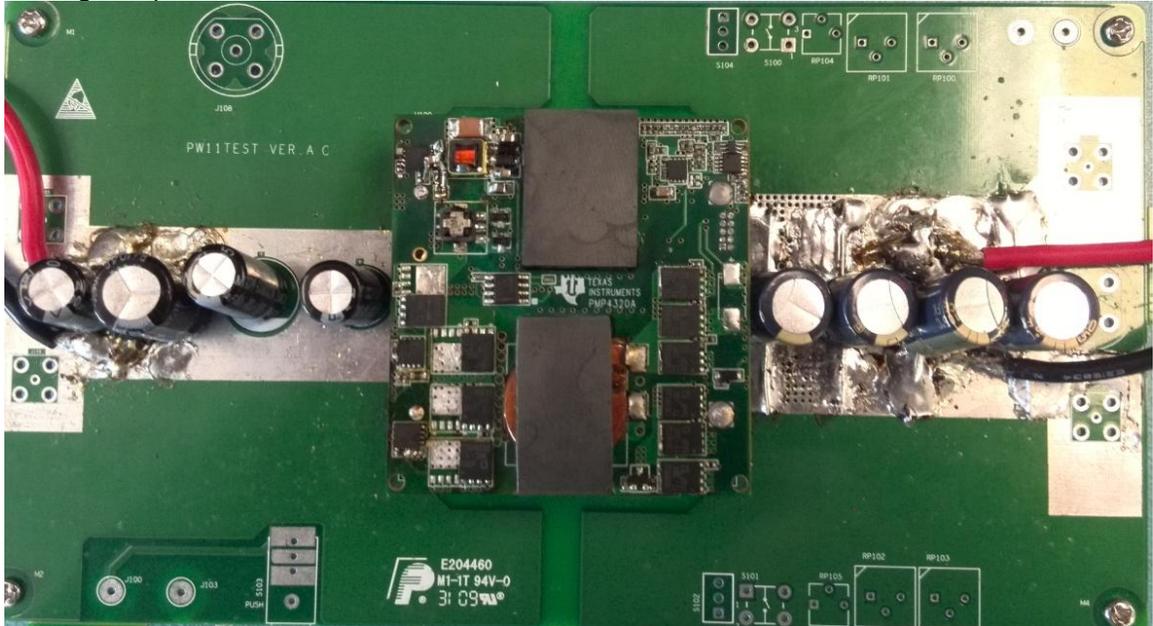
Top side of the PMP4320A



Input Ripple & Output Ripple & Noise Test Configuration



Testing Setup Photos



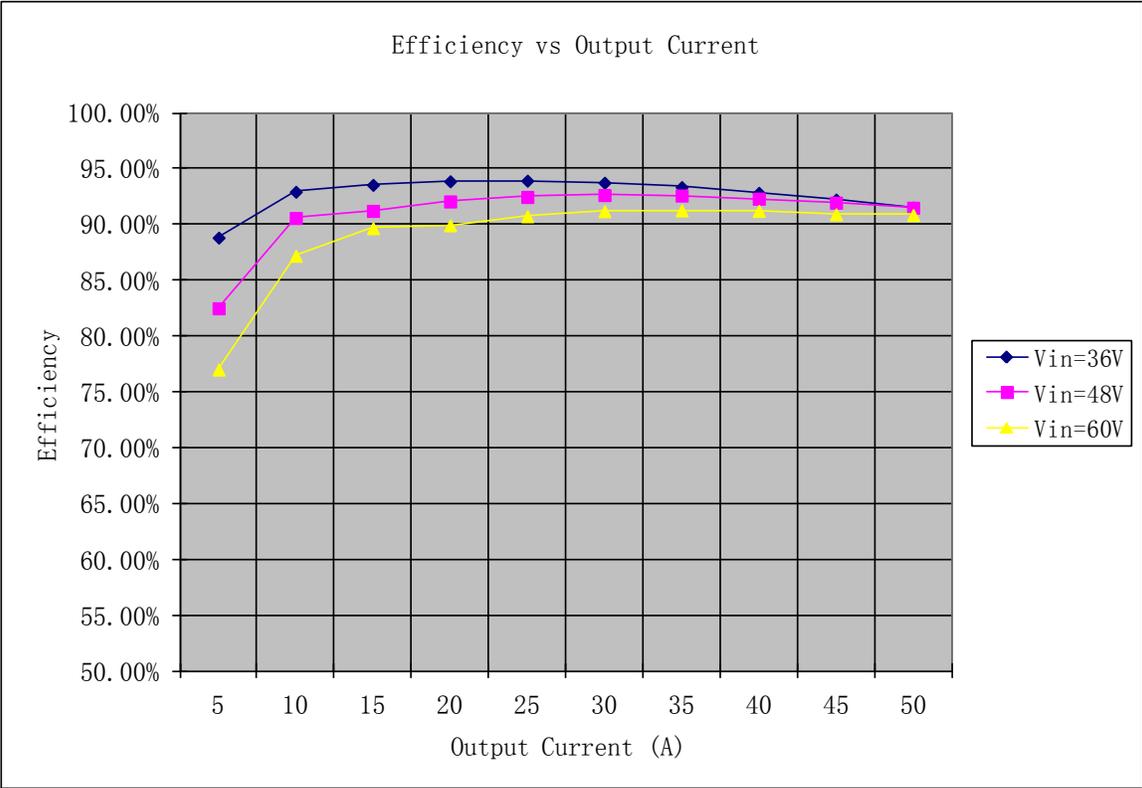
2 INPUT & OUTPUT CHARACTERISTICS

2.1 Efficiency & Regulation

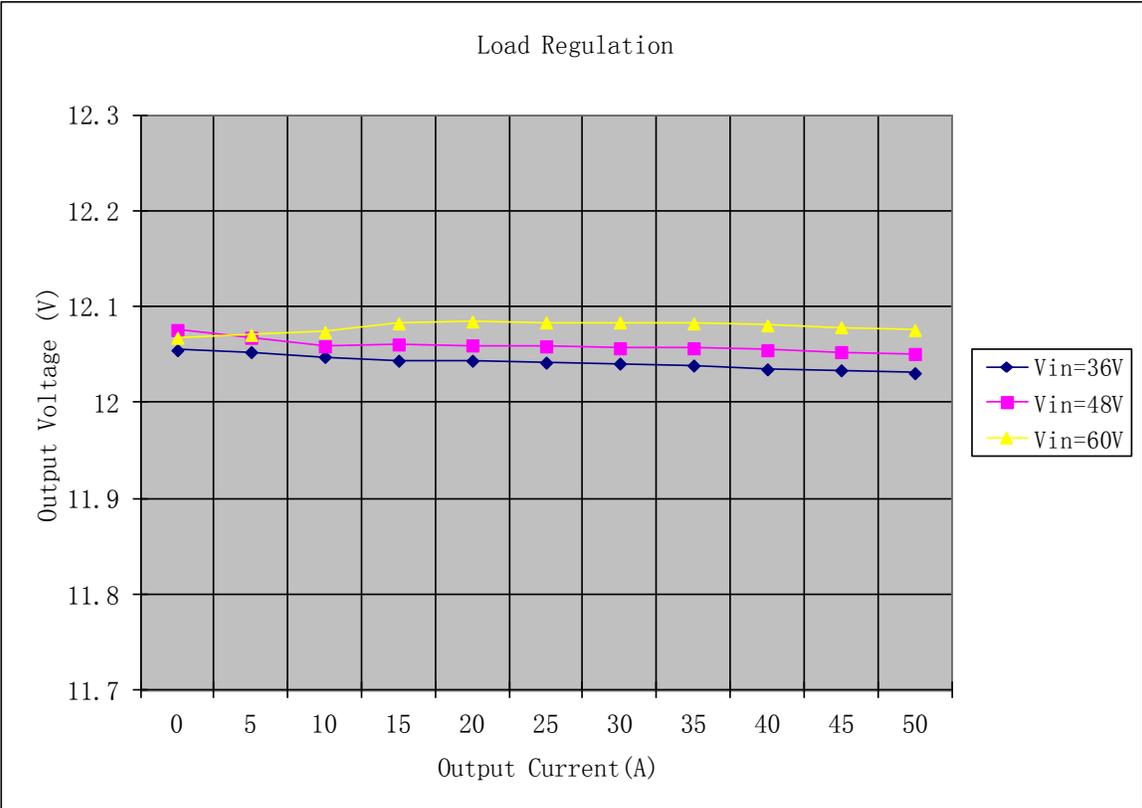
36V Input					
Vin (V)	Iin (A)	Vout (V)	Iout (A)	Eff. (%)	Pass/Fail
36.525	0.21	12.055	0	0.00%	
36.473	1.86	12.053	5	88.83%	
36.412	3.56	12.048	10	92.94%	
36.363	5.31	12.044	15	93.56%	
36.342	7.06	12.044	20	93.88%	
36.294	8.83	12.042	25	93.94%	
36.245	10.63	12.041	30	93.76%	
36.192	12.47	12.039	35	93.36%	
36.08	14.37	12.035	40	92.85%	
36.037	16.29	12.034	45	92.25%	
35.994	18.26	12.031	50	91.53%	

48V Input					
Vin (V)	Iin (A)	Vout (V)	Iout (A)	Eff. (%)	Pass/Fail
48.469	0.26	12.076	0	0.00%	
48.435	1.51	12.068	5	82.50%	
48.401	2.75	12.059	10	90.60%	
48.366	4.1	12.061	15	91.23%	
48.33	5.42	12.06	20	92.08%	
48.294	6.75	12.059	25	92.48%	
48.257	8.09	12.057	30	92.65%	
48.22	9.45	12.057	35	92.61%	
48.182	10.84	12.055	40	92.32%	
48.143	12.25	12.053	45	91.97%	
48.096	13.69	12.051	50	91.51%	

60V Input					
Vin (V)	Iin (A)	Vout (V)	Iout (A)	Eff. (%)	Pass/Fail
60.78	0.3	12.068	0	0.00%	
60.75	1.29	12.071	5	77.02%	
60.72	2.28	12.074	10	87.21%	
60.69	3.33	12.083	15	89.68%	
60.66	4.43	12.085	20	89.94%	
60.63	5.49	12.084	25	90.76%	
60.59	6.56	12.084	30	91.21%	
60.56	7.65	12.083	35	91.28%	
60.53	8.75	12.081	40	91.24%	
60.56	9.87	12.079	45	90.94%	
60.46	10.99	12.076	50	90.87%	

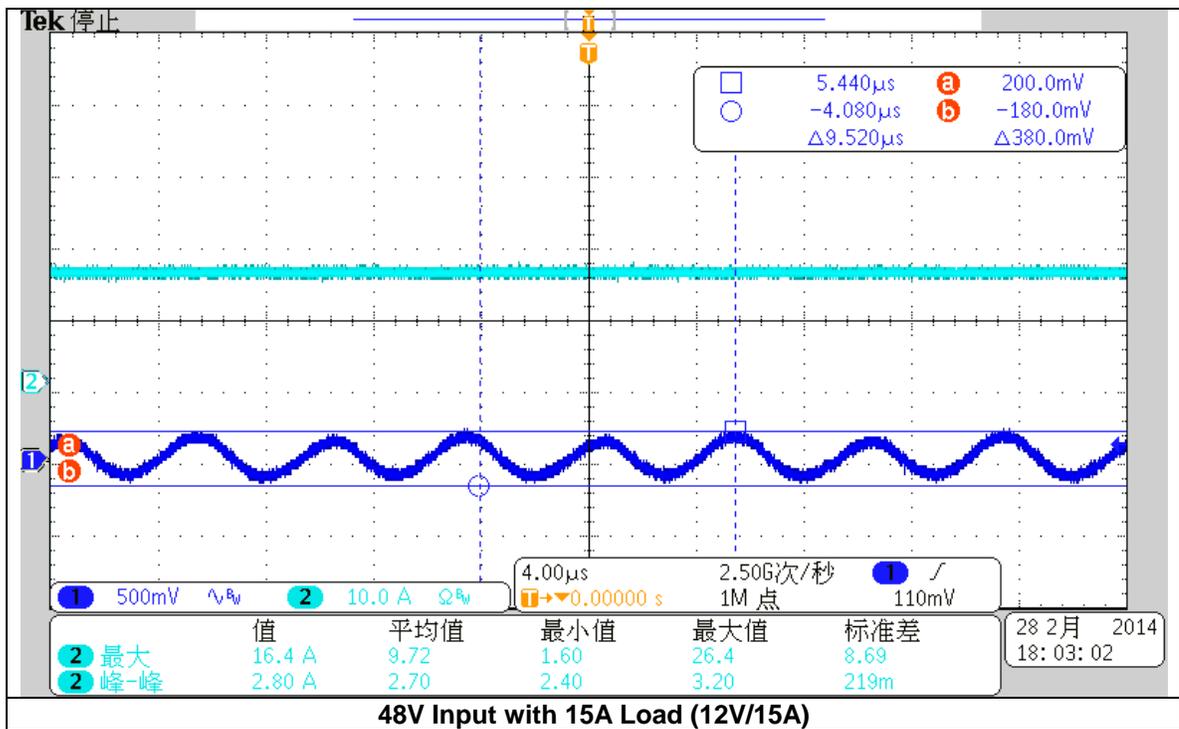
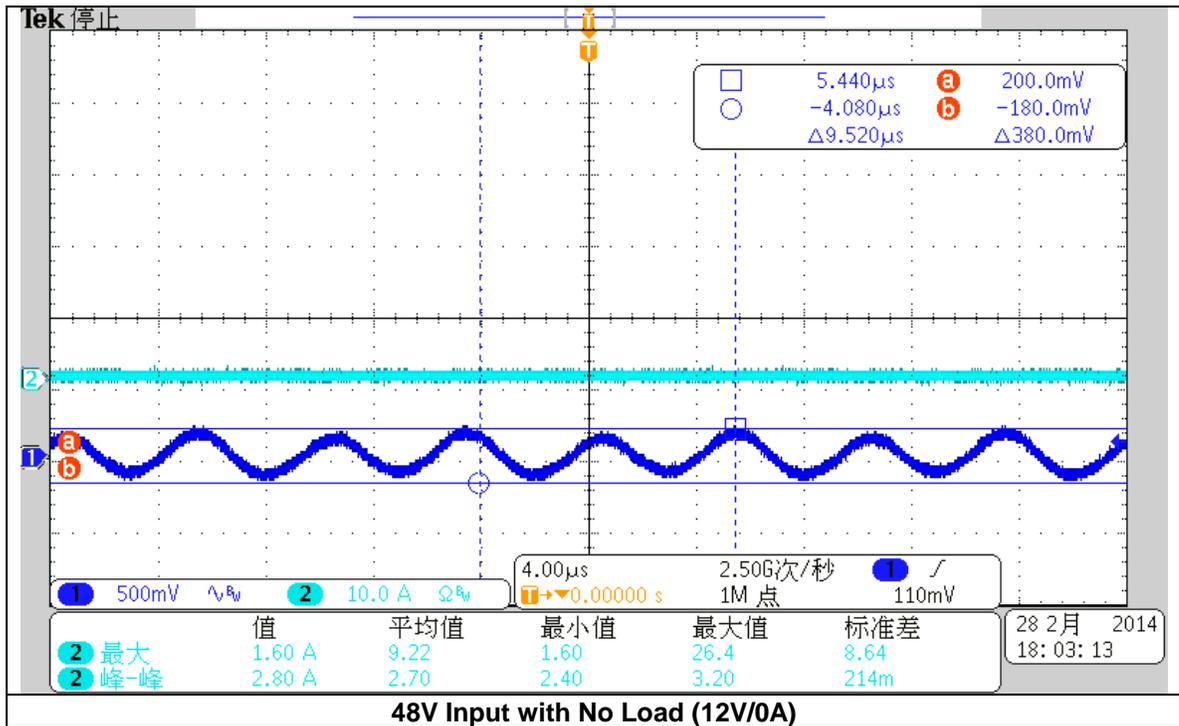


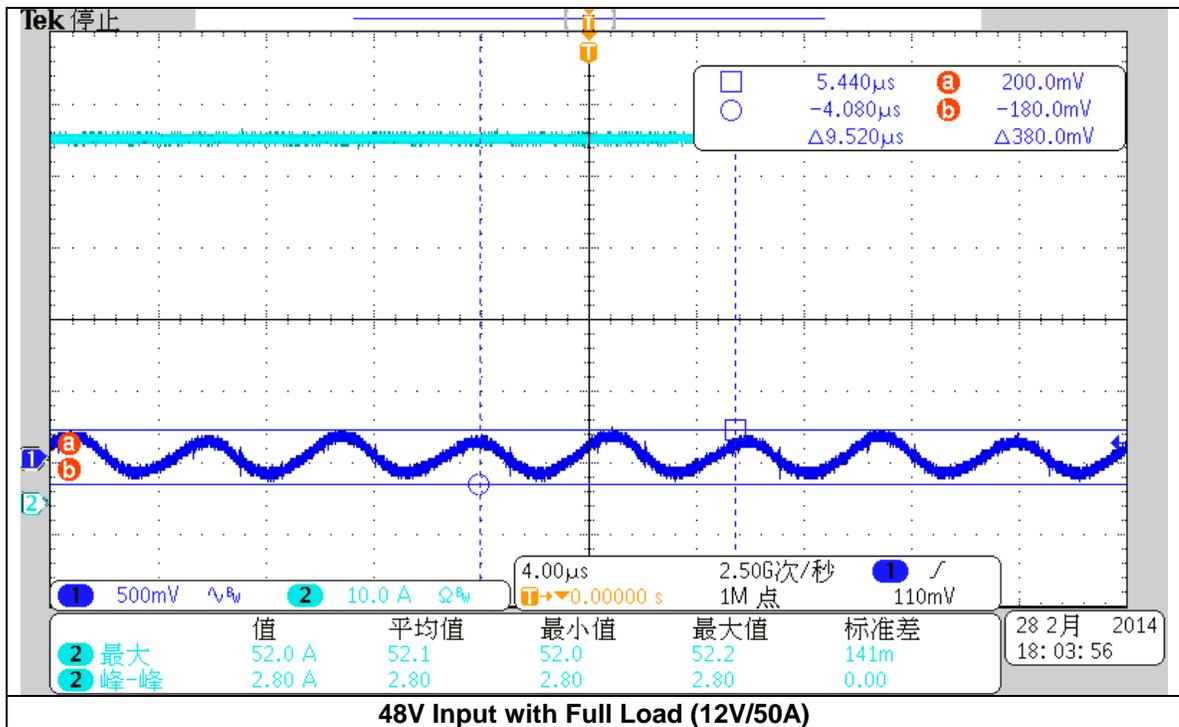
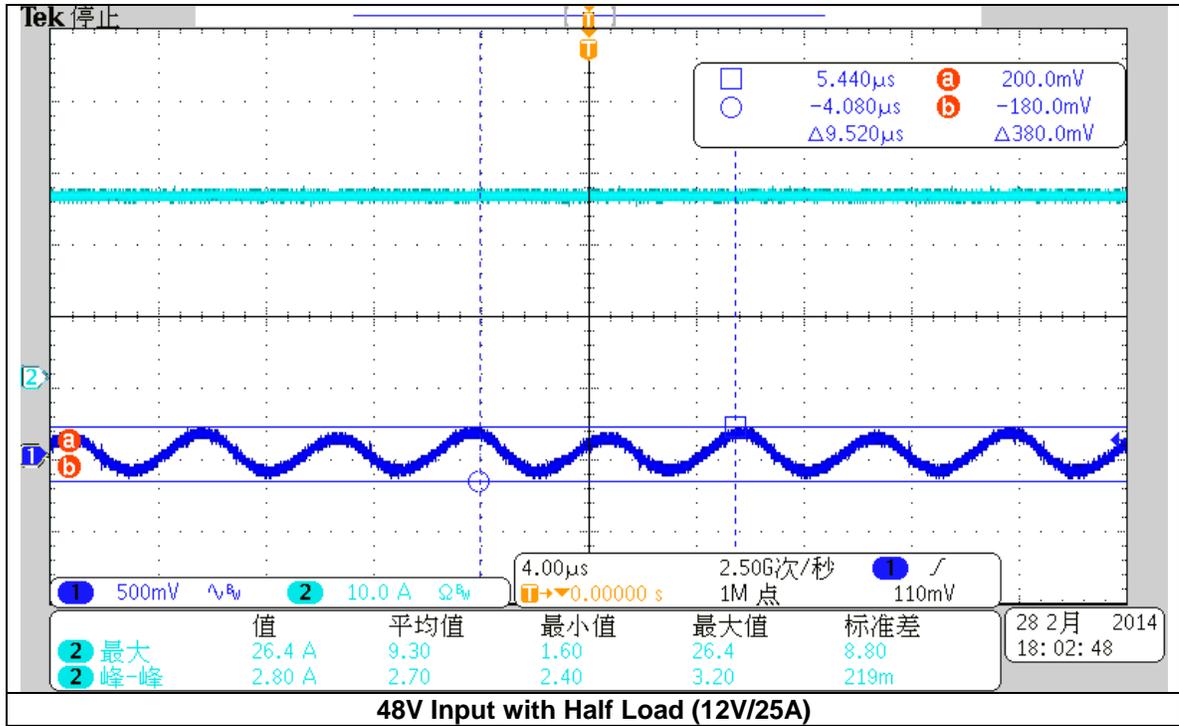
Efficiency vs Output Current



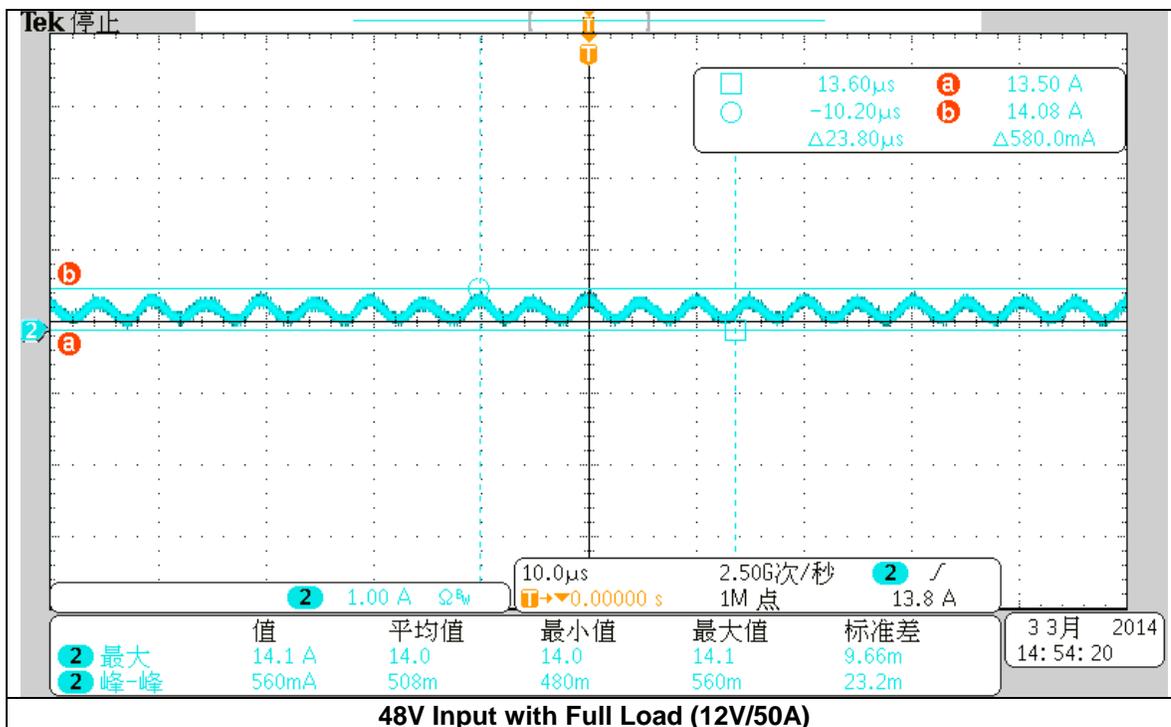
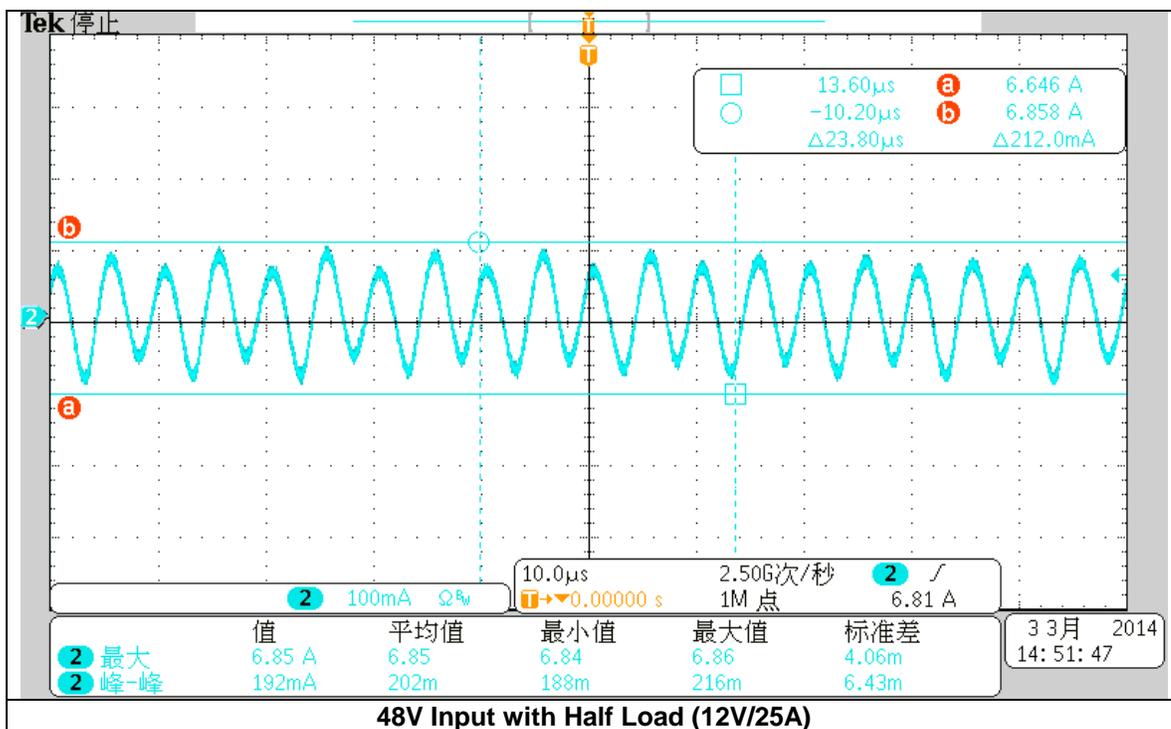
Load Regulation

2.2 Ripple & Noise



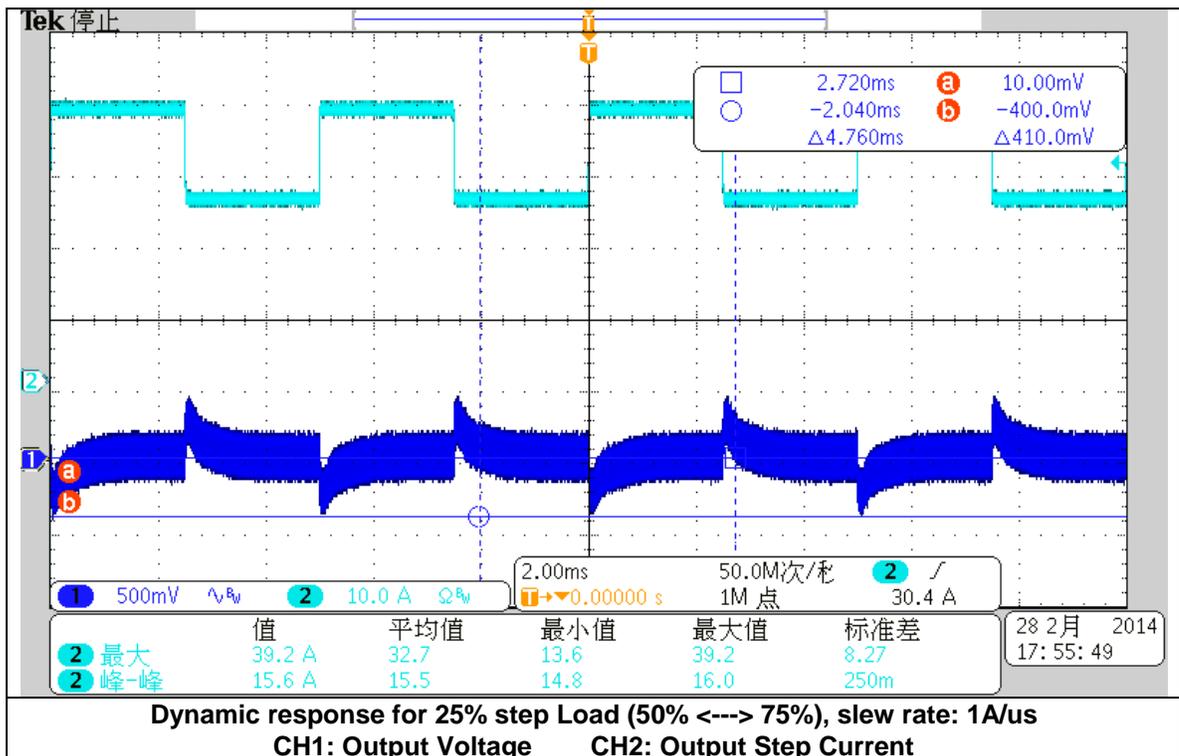
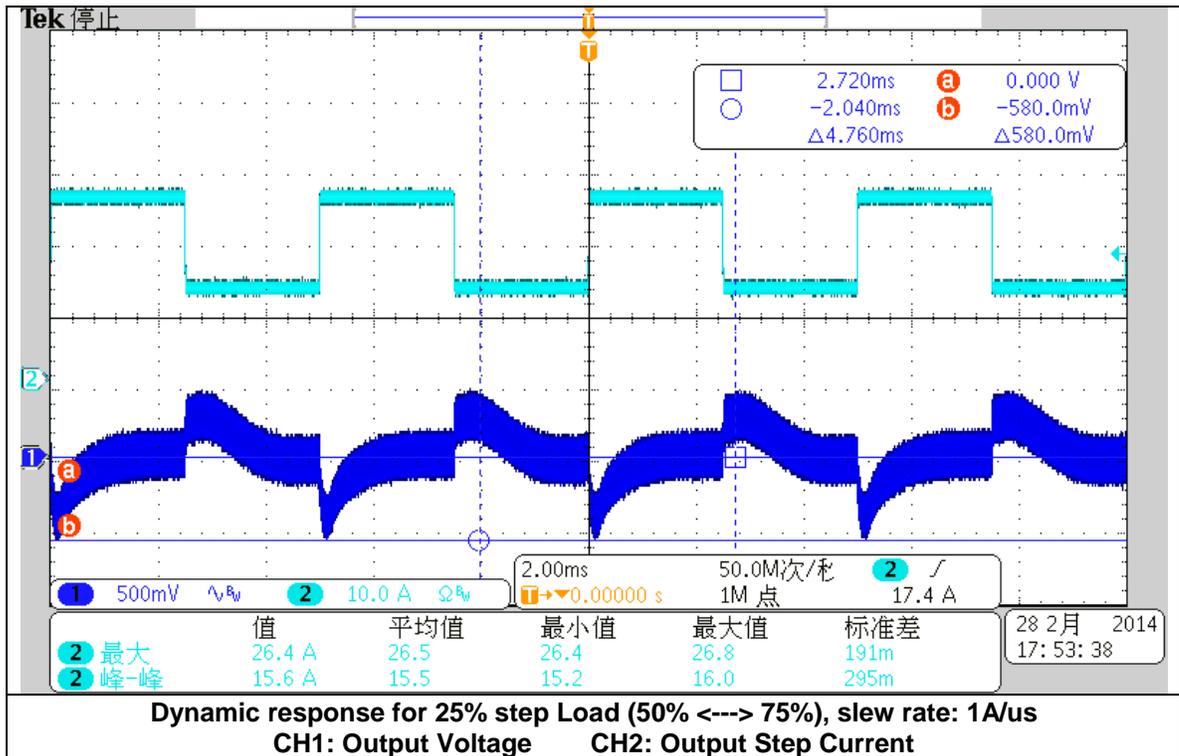


2.3 Input Reflected Current

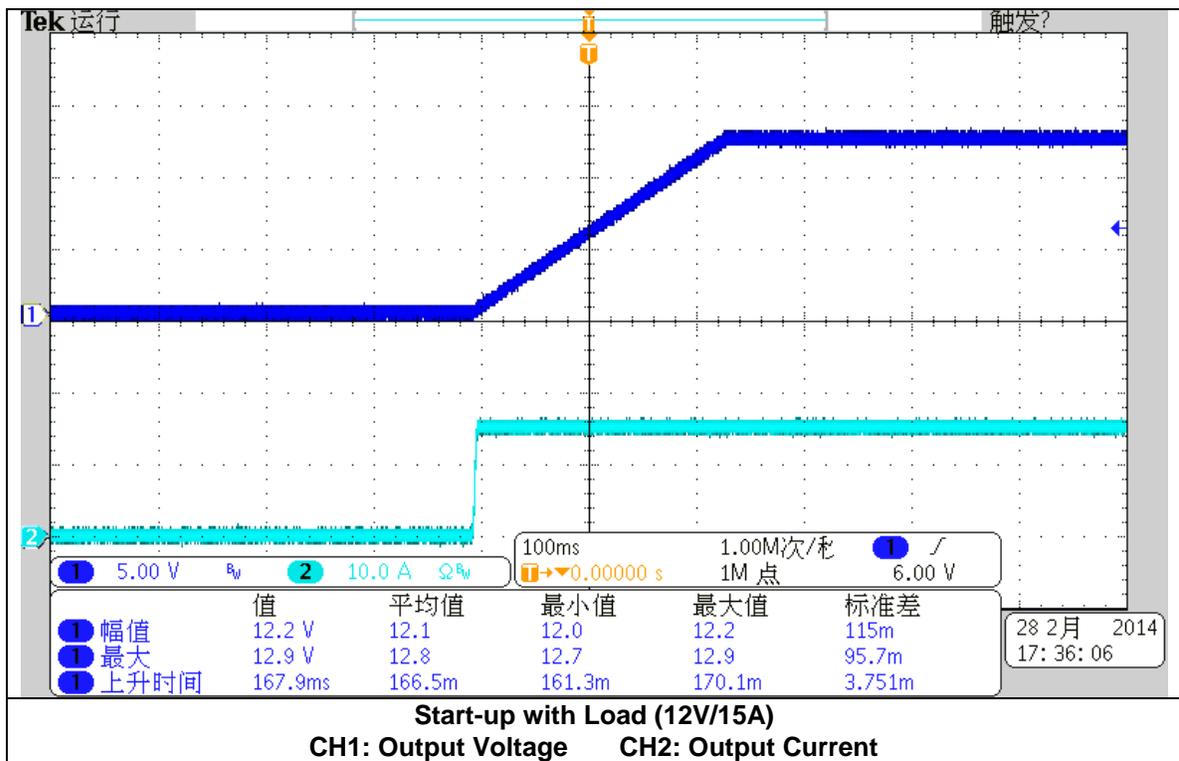
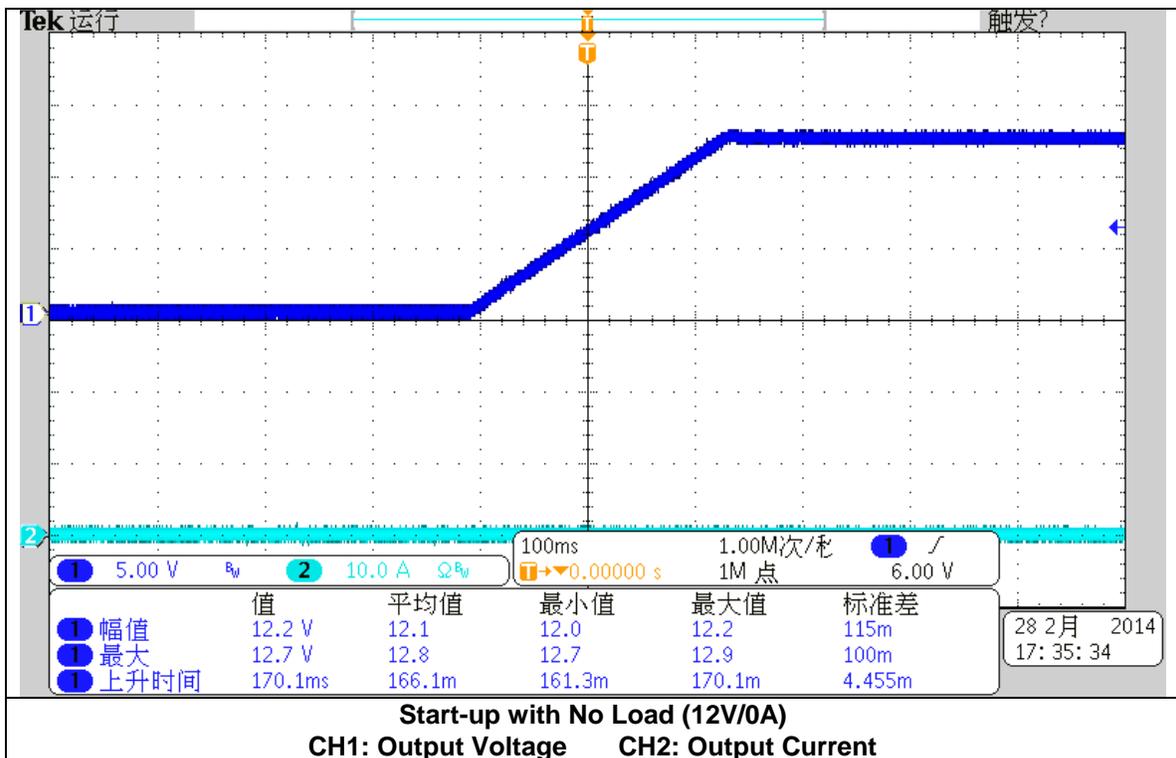


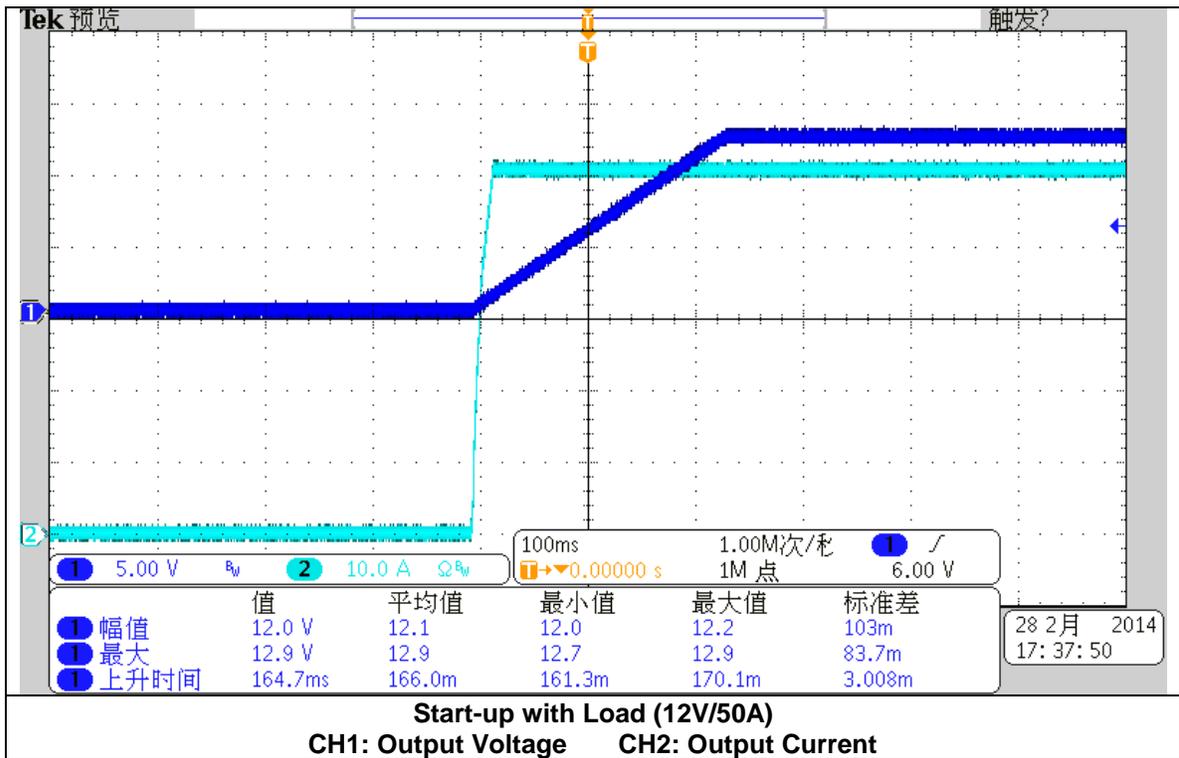
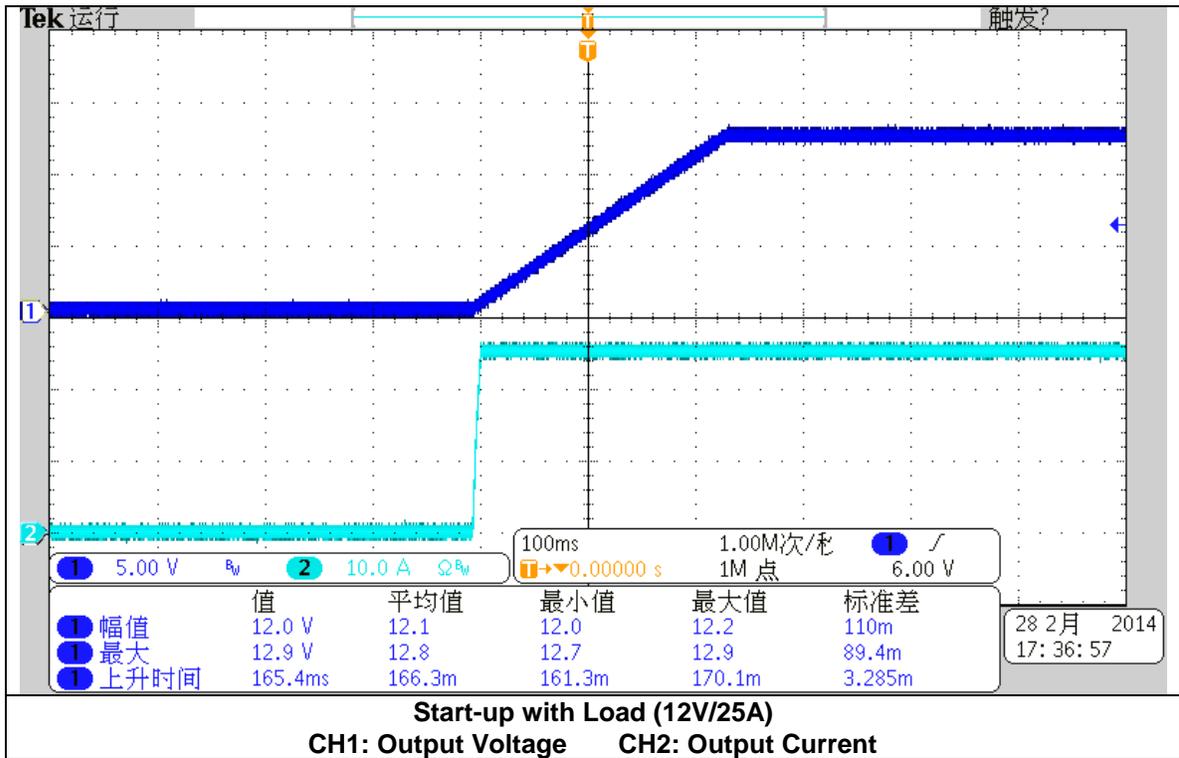
Test point is between the DC Power Supply and the input capacitors.

2.4 Dynamic Load



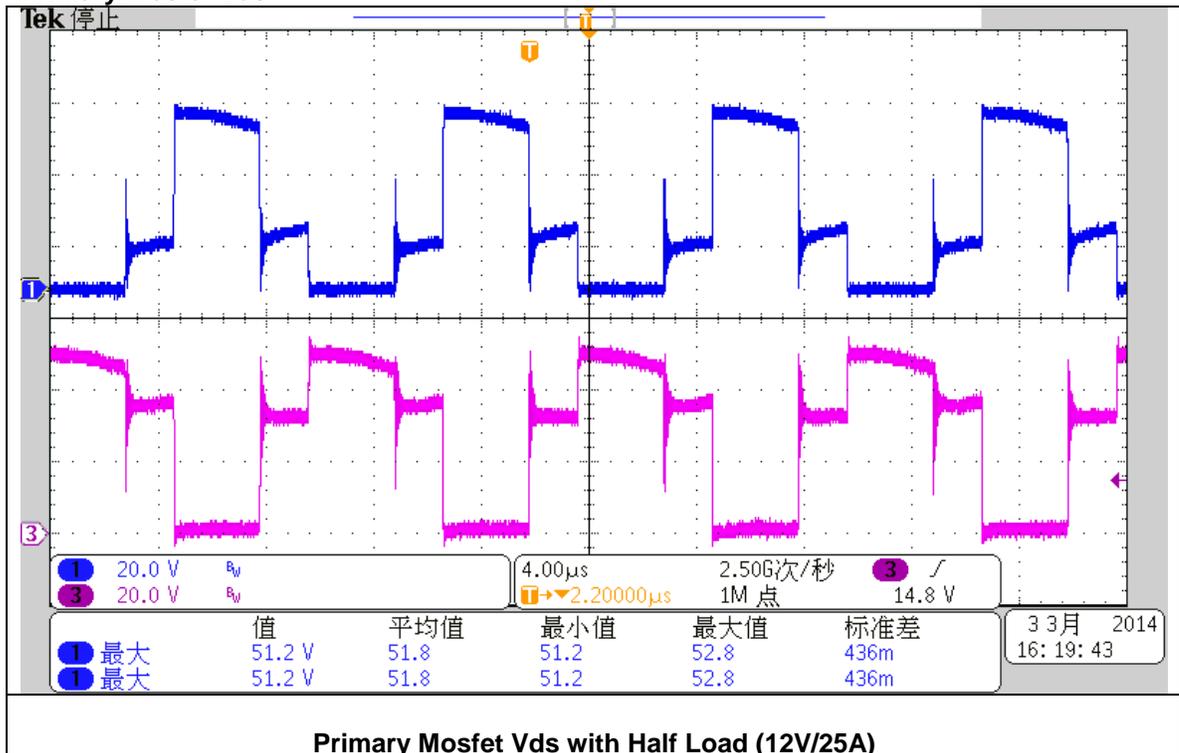
2.5 Start-up Curve



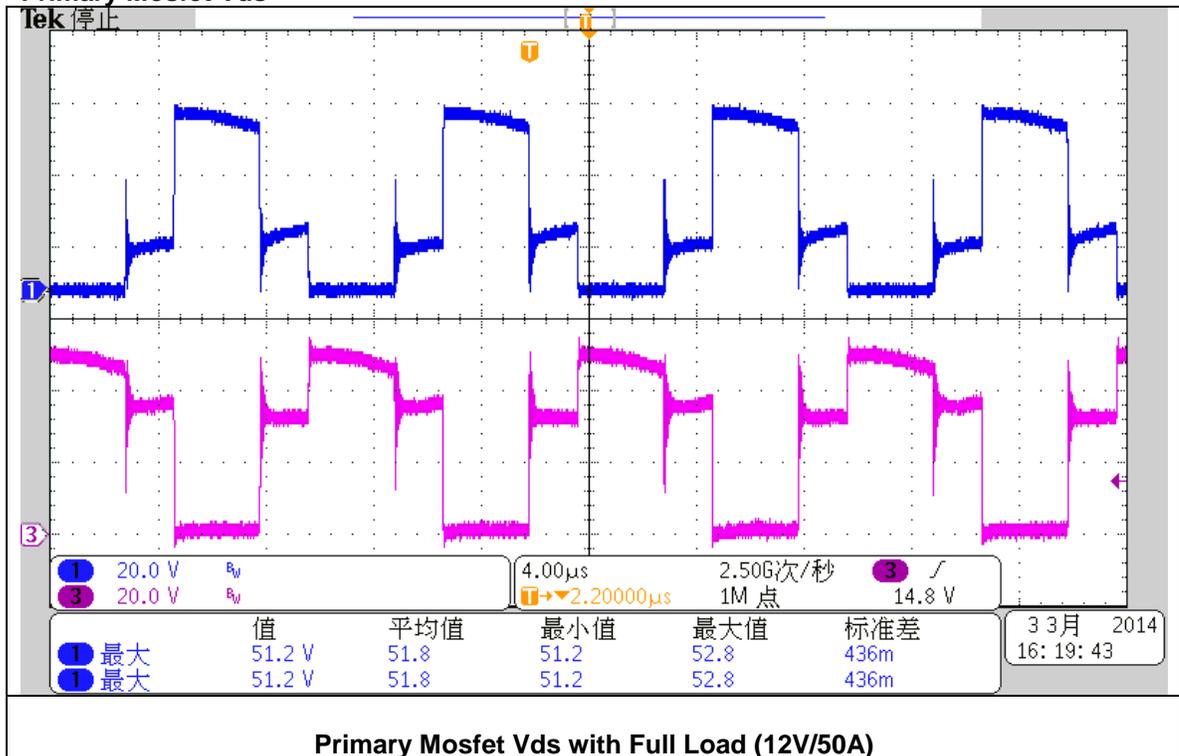


2.6 Key Components Stress (48V Input)

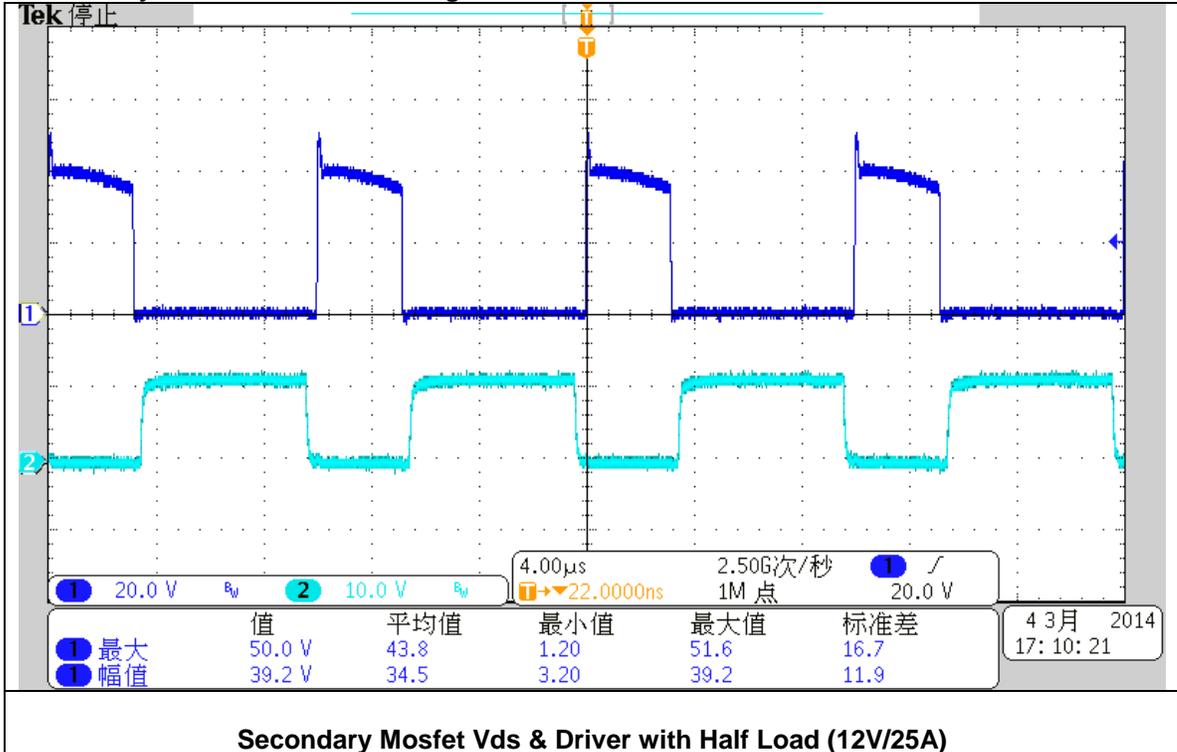
Primary Mosfet Vds



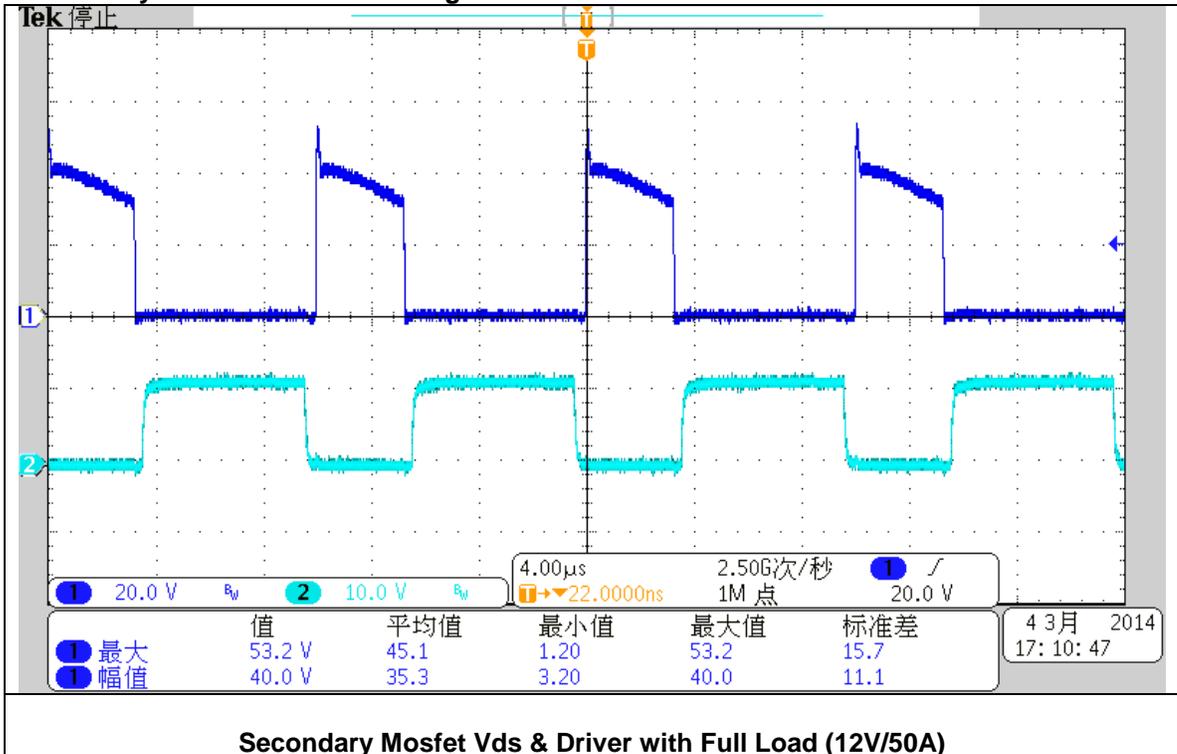
Primary Mosfet Vds



Secondary Mosfet Vds & Driver Signal

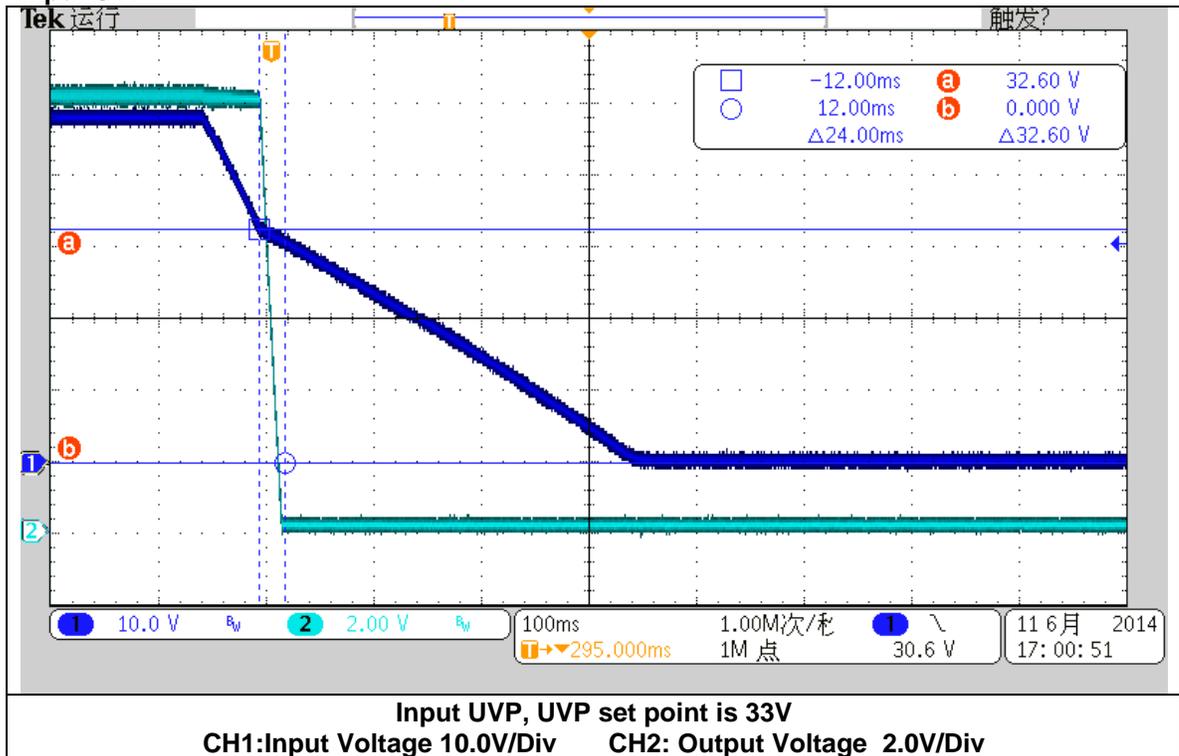


Secondary Mosfet Vds & Driver Signal

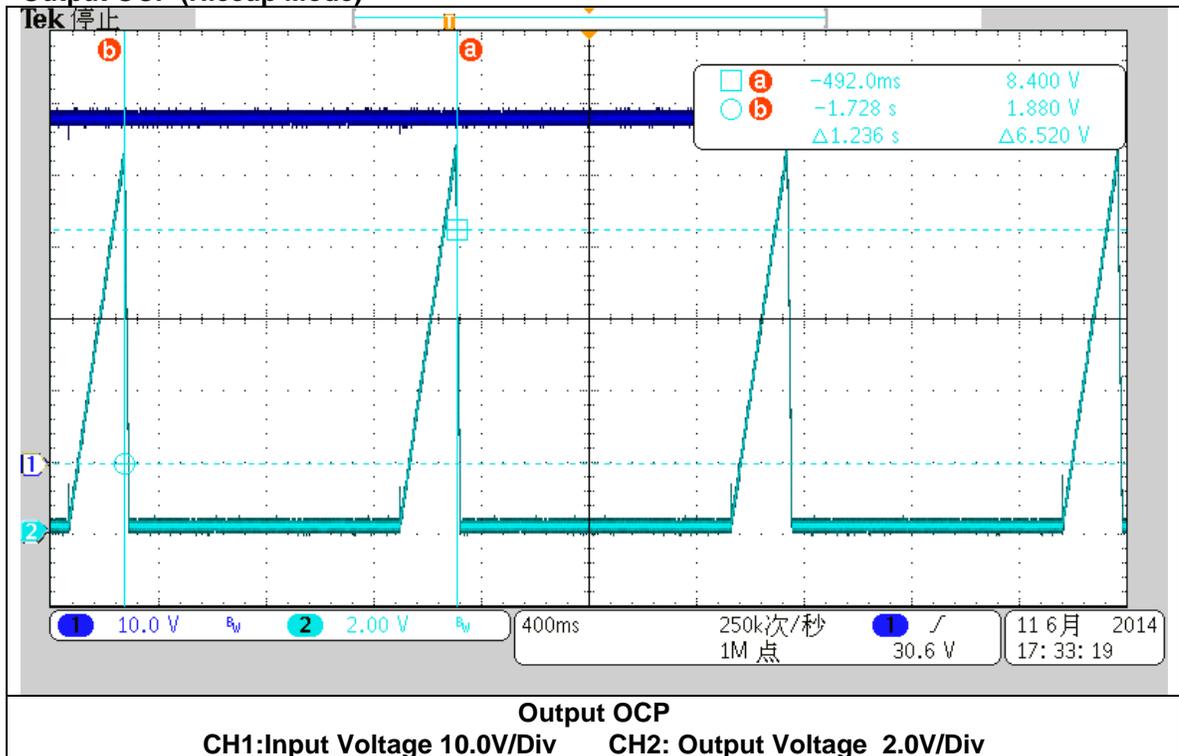


2.7 Protection (48V Input)

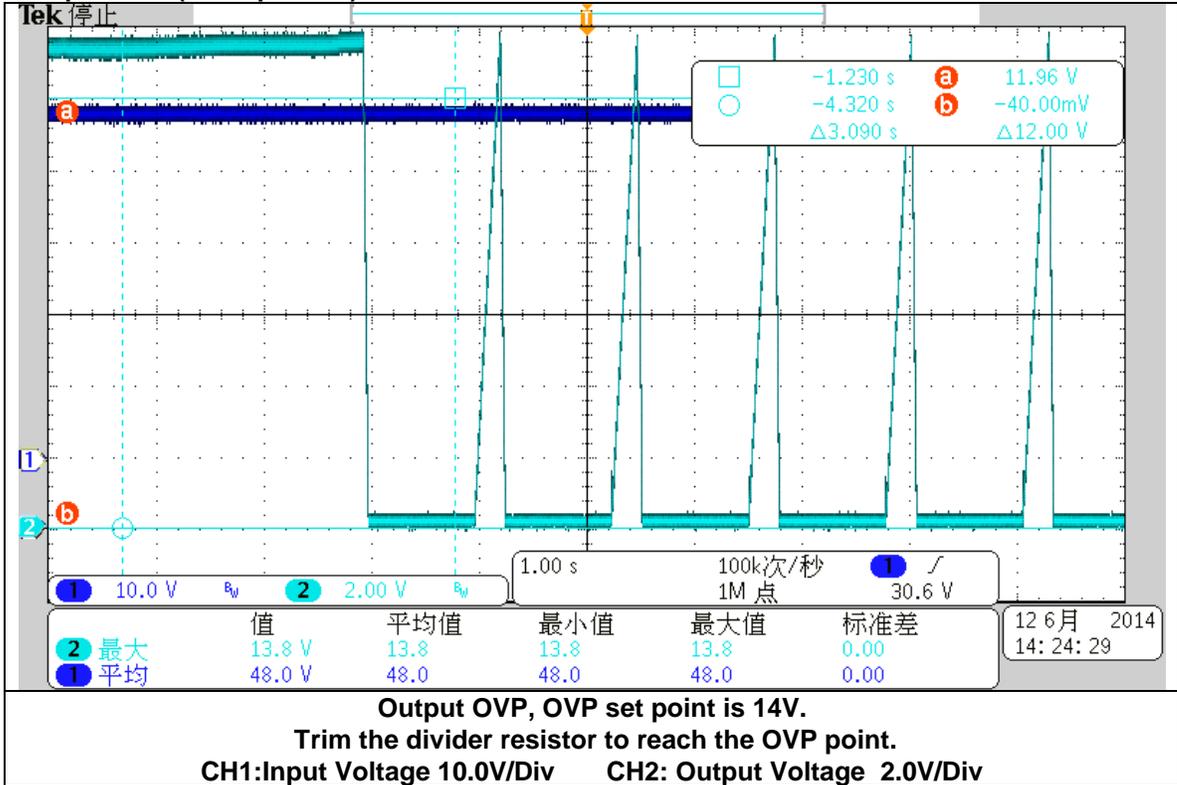
Input UVP



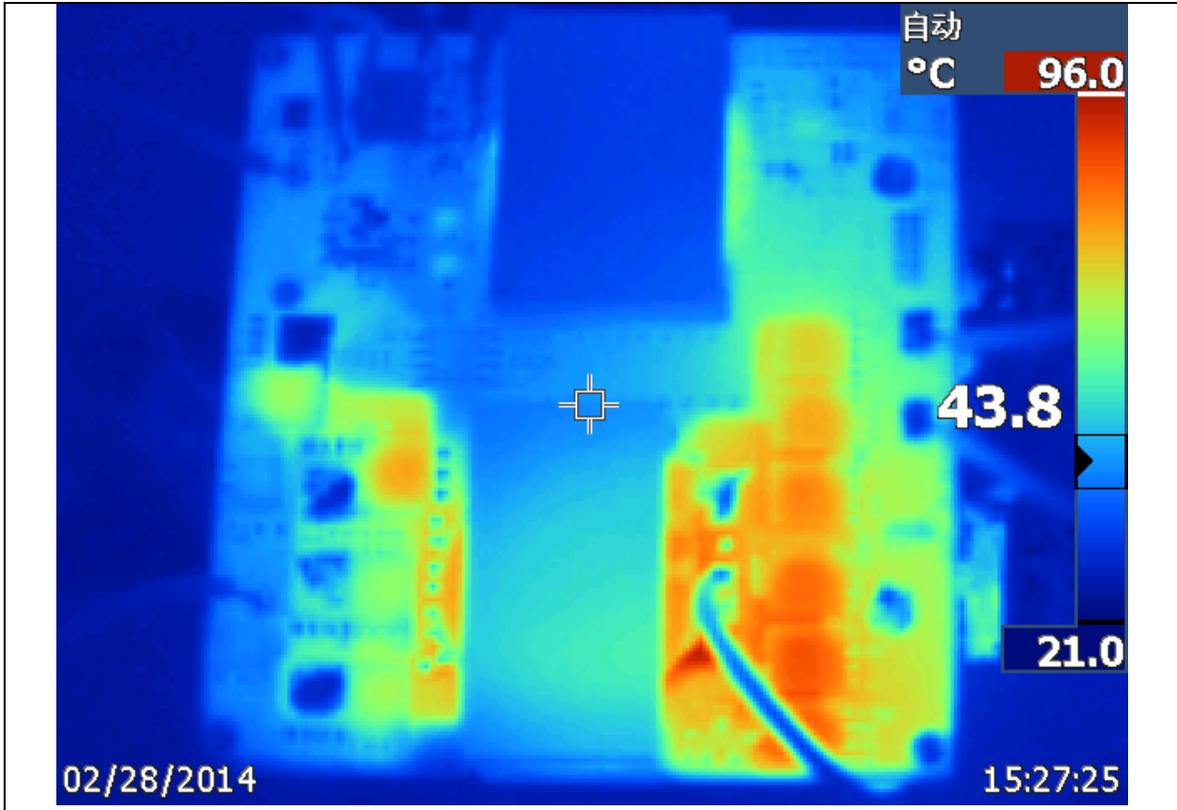
Output OCP (Hiccup Mode)



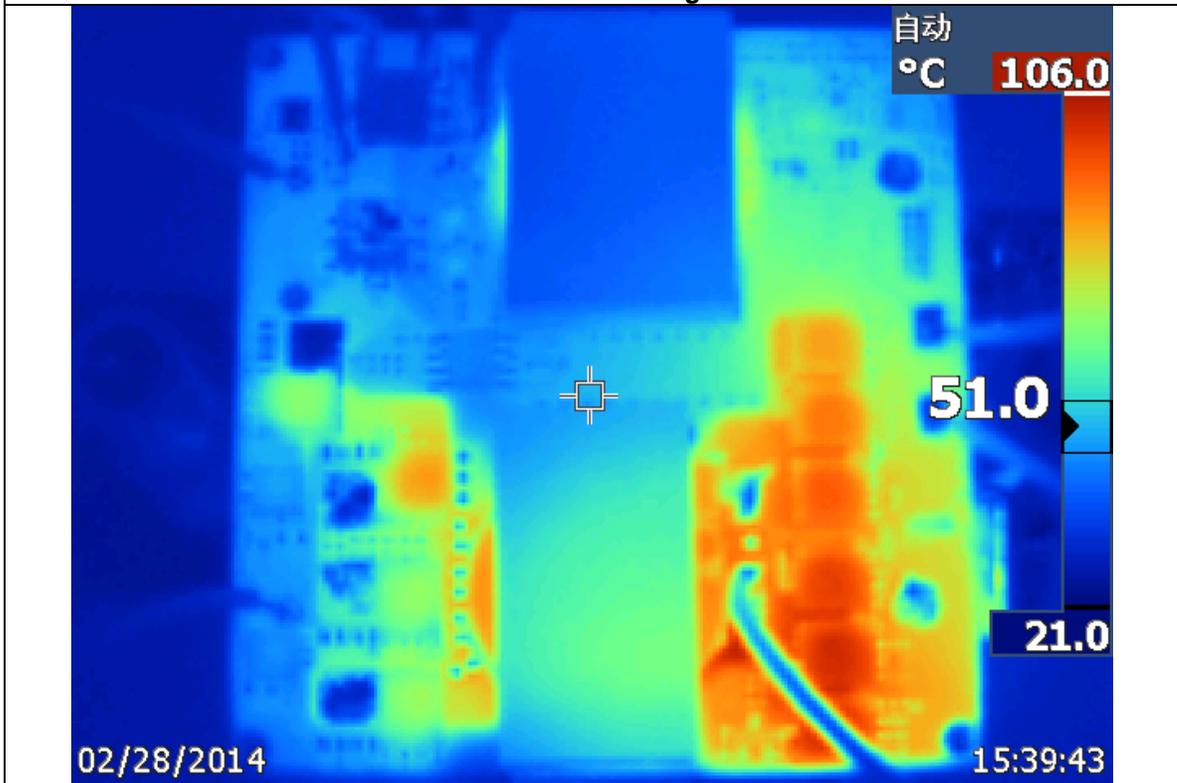
Output OVP (Hiccup Mode)



2.8 Thermal IR Scan



TOP Side IR Scan at Full Load (12V/50A), 48V Input
With Fan Cooling



TOP Side IR Scan at Full Load (12V/50A), 60V Input
With Fan Cooling With Fan Cooling

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