



Texas Instruments

PMP4438 Test Procedure

China Power Reference Design

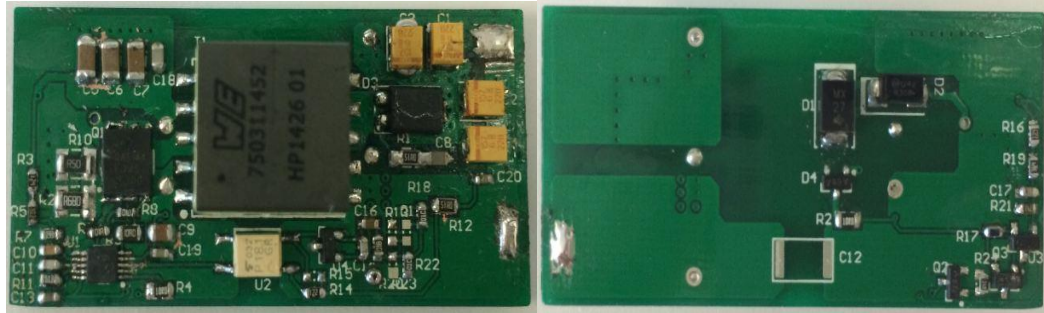
REV A

24/08/2014

1 GENERAL

1.1 PURPOSE

To provide detailed data for evaluating and verifying the PMP4438, this power module uses LM5020 for 5V/2A power supply with size 51mmx26mmx12.5mm. The below photo shows this demo board.



1.2 REFERENCE DOCUMENTATION

Schematic PMP4438_SCH.PDF

Assembly PMP4438_PCB.PDF

BOM

Promotion tools

1.3 TEST EQUIPMENTS

Power-meter: YOKOGAWA WT210

Multi-meter(current): Fluke 8845A

Multi-meter(voltage): Fluke 187

DC Source: Chroma 62102

Electronic load: Chroma 63110A module

Testing demo board

2 INPUT CHARACTERISTICS

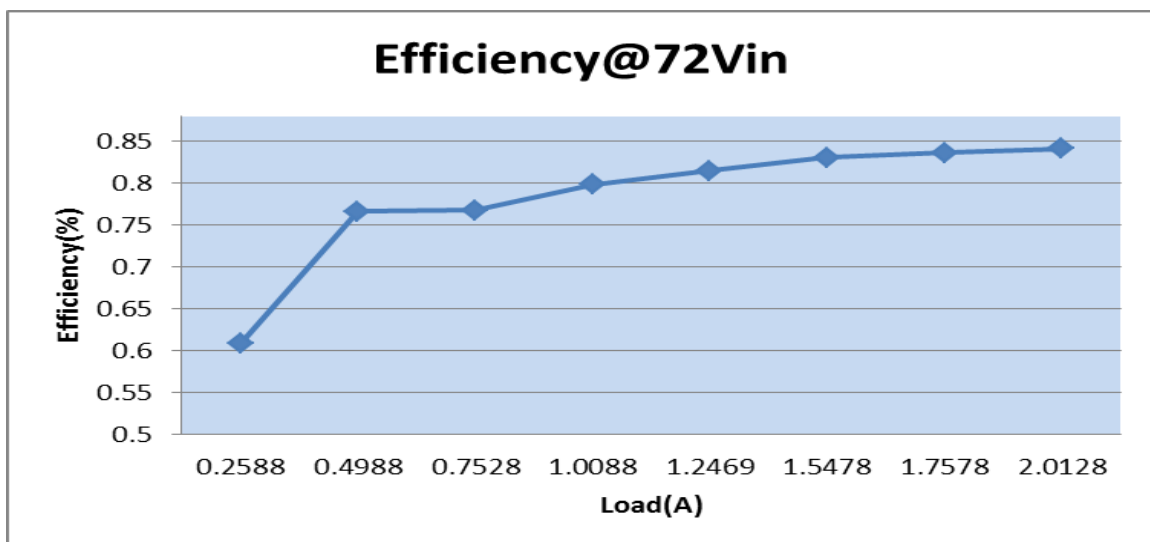
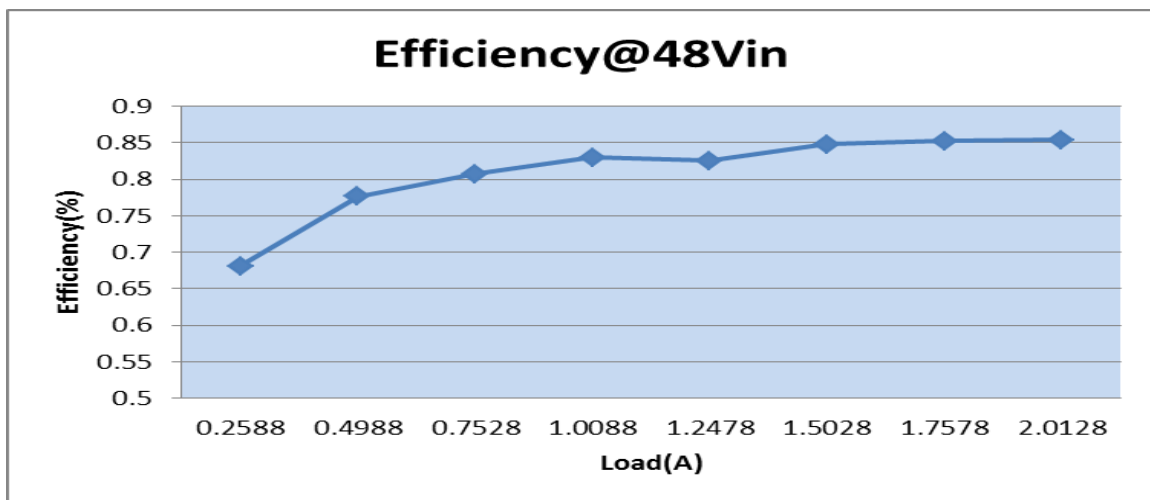
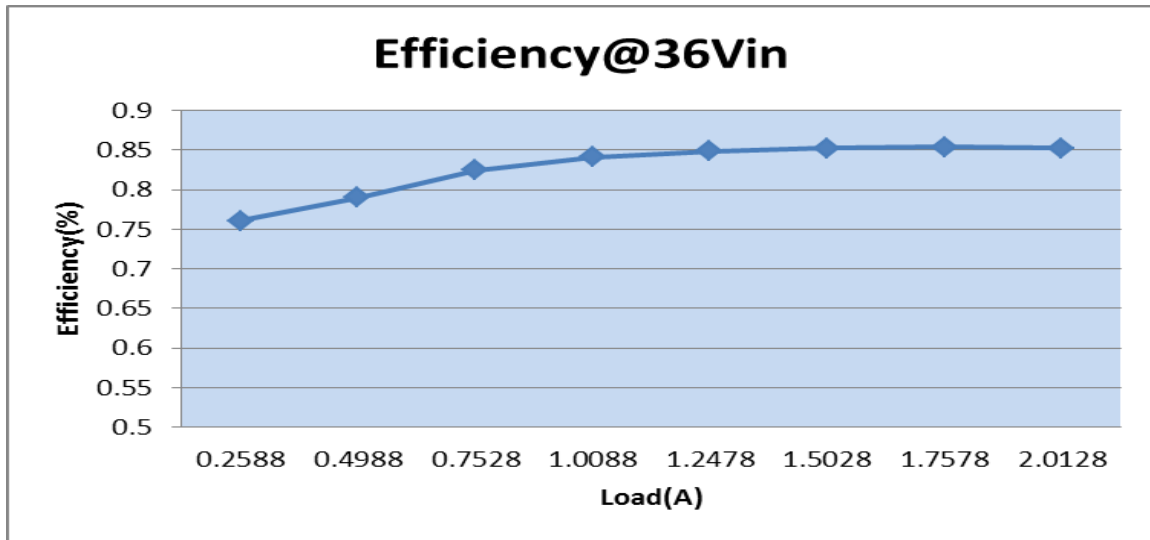
2.1 EFFICIENCY DATA

Vin(V)	Iin(A)	Vo(V)	Io(A)	Efficiency(%)
36.08	0.0476	5.0488	0.2588	76.08
36.093	0.0883	5.0471	0.4988	78.99
36.083	0.1277	5.0465	0.7528	82.45
36.073	0.1677	5.0451	1.0088	84.13
36.063	0.2056	5.0439	1.2478	84.88
36.054	0.2465	5.0429	1.5028	85.27
36.093	0.2874	5.0412	1.7578	85.43
36.083	0.3296	5.0375	2.0128	85.26

Vin(V)	Iin(A)	Vo(V)	Io(A)	Efficiency(%)
48.069	0.0399	5.0497	0.2588	68.14
48.063	0.0675	5.0488	0.4988	77.62
48.056	0.0979	5.0480	0.7528	80.77
48.048	0.1277	5.0469	1.0088	82.98
48.042	0.1588	5.0460	1.2478	82.53
48.034	0.1861	5.0457	1.5028	84.83
48.027	0.2166	5.0438	1.7578	85.23
48.019	0.2475	5.0418	2.0128	85.39

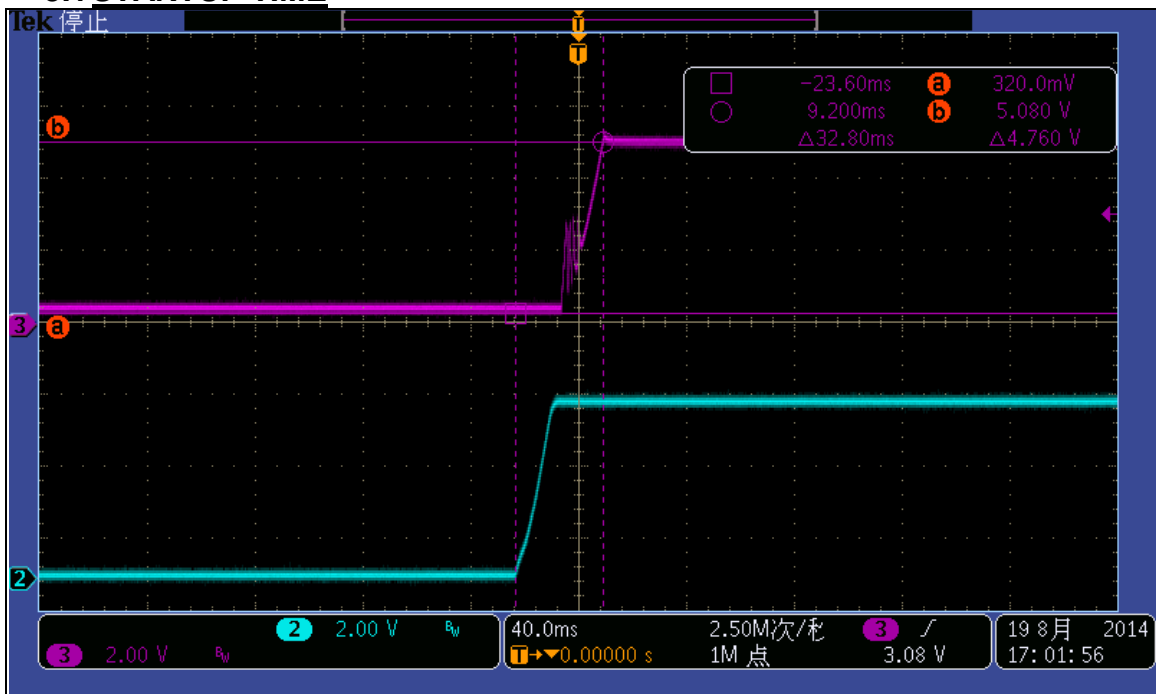
Vin(V)	Iin(A)	Vo(V)	Io(A)	Efficiency(%)
72.06	0.0298	5.0507	0.2588	60.87
72.06	0.0456	5.0501	0.4988	76.66
72.06	0.0687	5.0499	0.7528	76.79
72.05	0.0885	5.0489	1.0088	79.88
72.04	0.1072	5.0484	1.2469	81.51
72.09	0.1305	5.0469	1.5478	83.03
72.09	0.1471	5.0452	1.7578	83.63
72.08	0.1674	5.0441	2.0128	84.14

2.2 LOAD AND INPUT VOLTAGE VS LOAD CURRENT

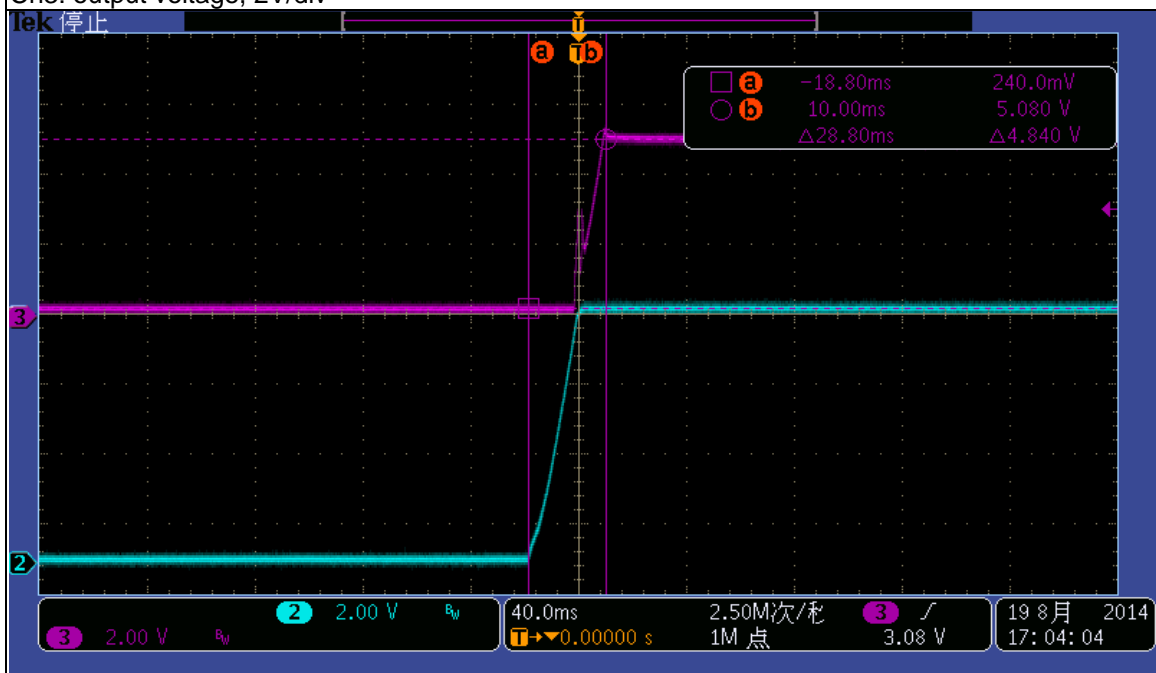


3 OUTPUT CHARACTERISTICS

3.1 STARTUP TIME

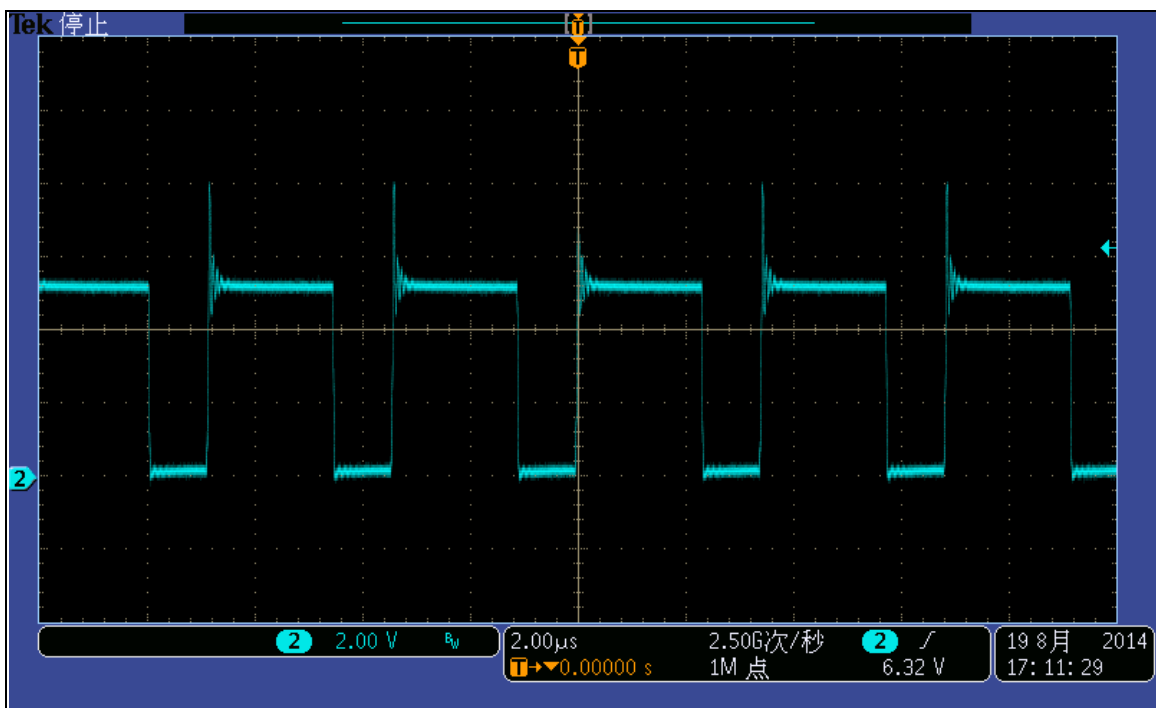


Vin:36Vdc Io: 2A
Ch2: input voltage, 20V/div
Ch3: output voltage, 2V/div

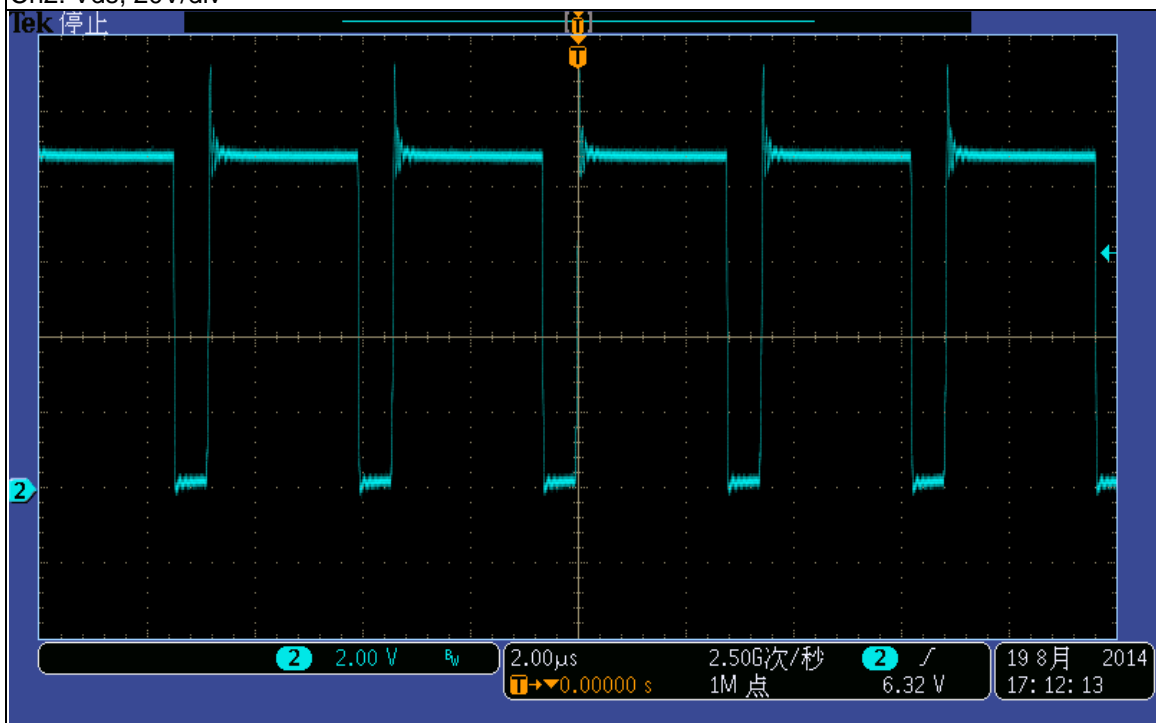


Vin:72Vdc Io: 2A
Ch2: input voltage, 20V/div
Ch3: output voltage, 2V/div

3.2 MOSFET VOLTAGE STRESS

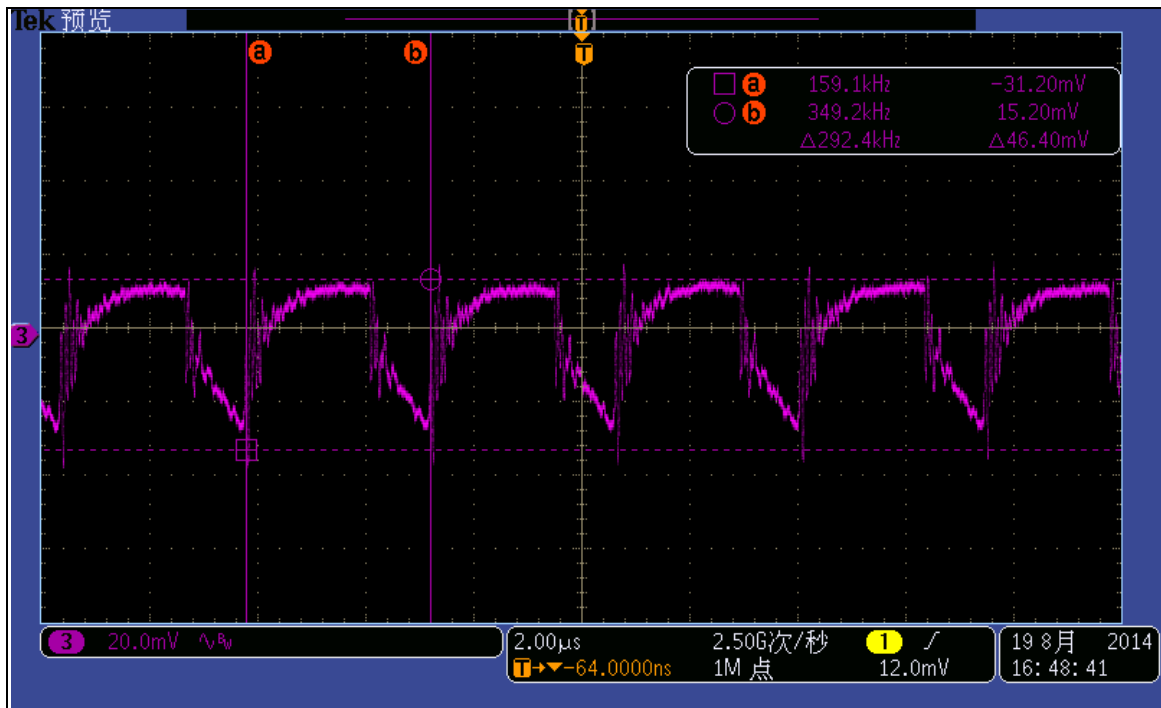


Vin:36Vdc Io: 2A
Ch2: Vds, 20V/div

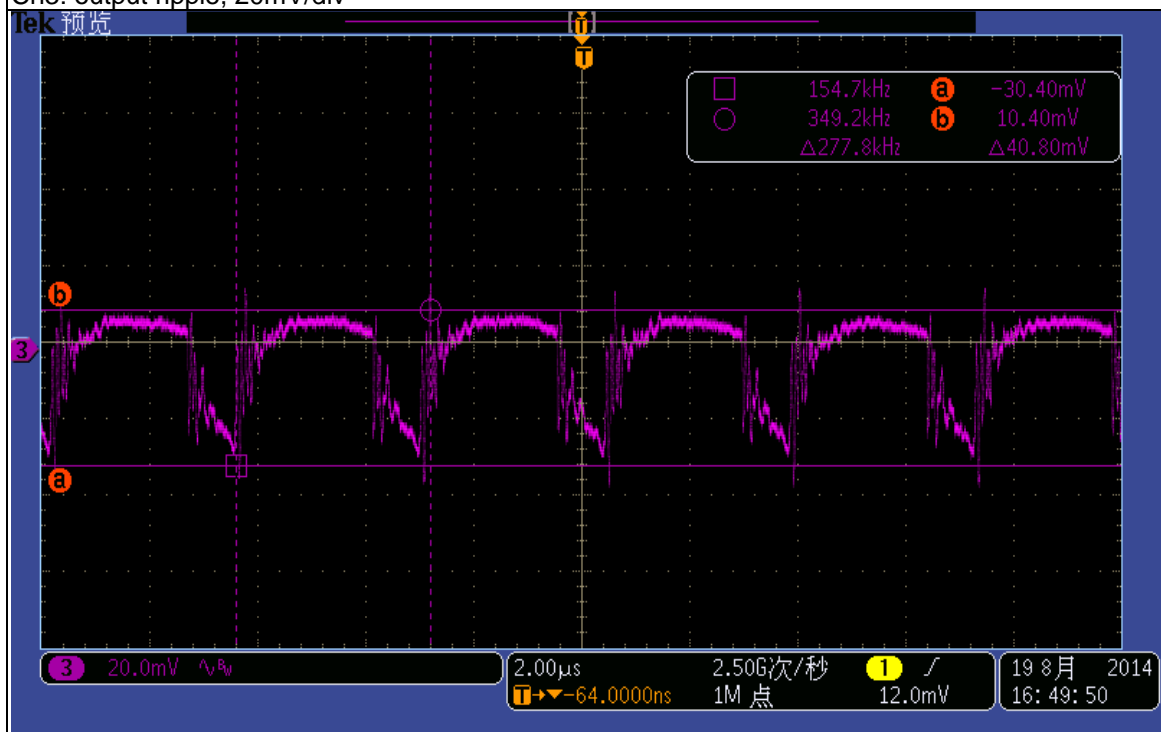


Vin:72Vdc Io: 2A
Ch2: Vds, 20V/div

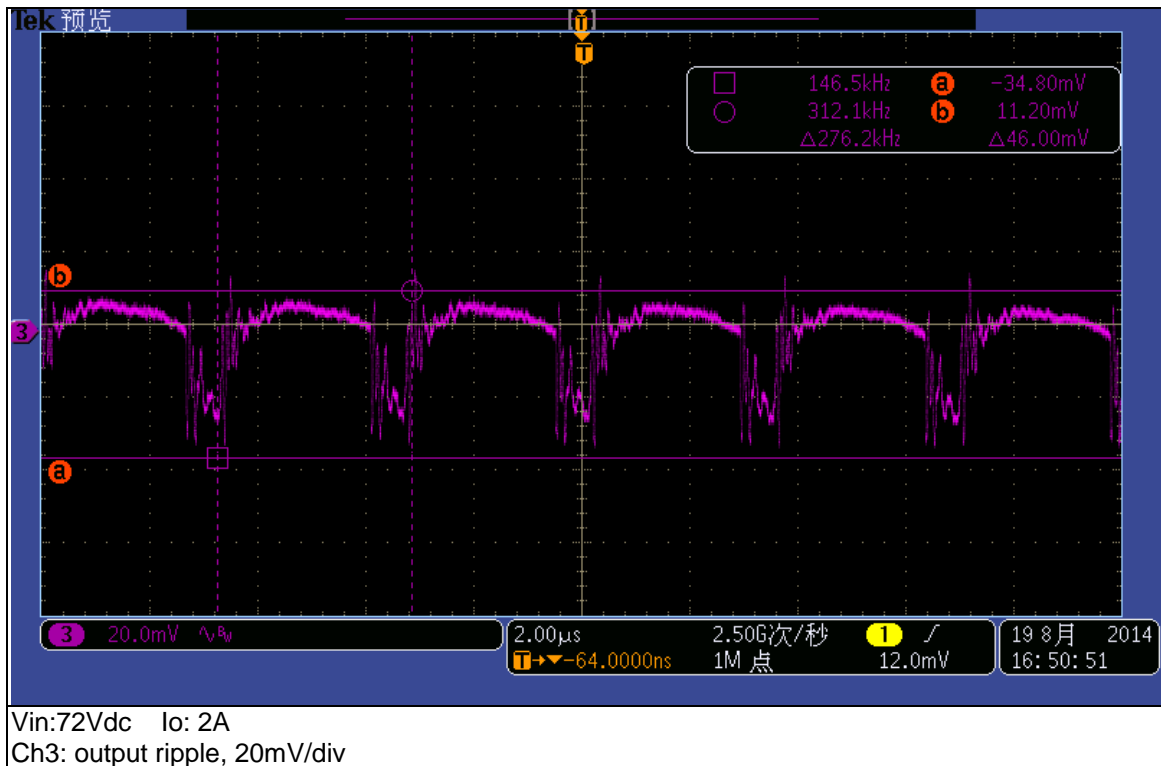
3.3 RIPPLE VOLTAGE



Vin: 36Vdc Io: 2A
Ch3: output ripple, 20mV/div



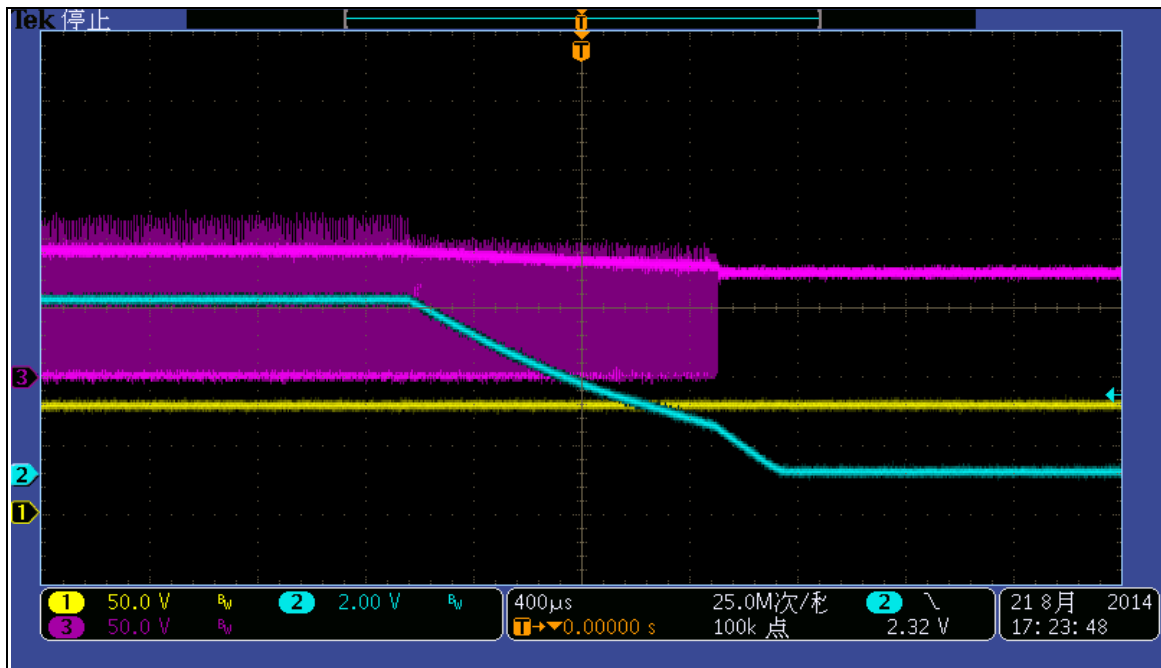
Vin: 48Vdc Io: 2A
Ch3: output ripple, 20mV/div



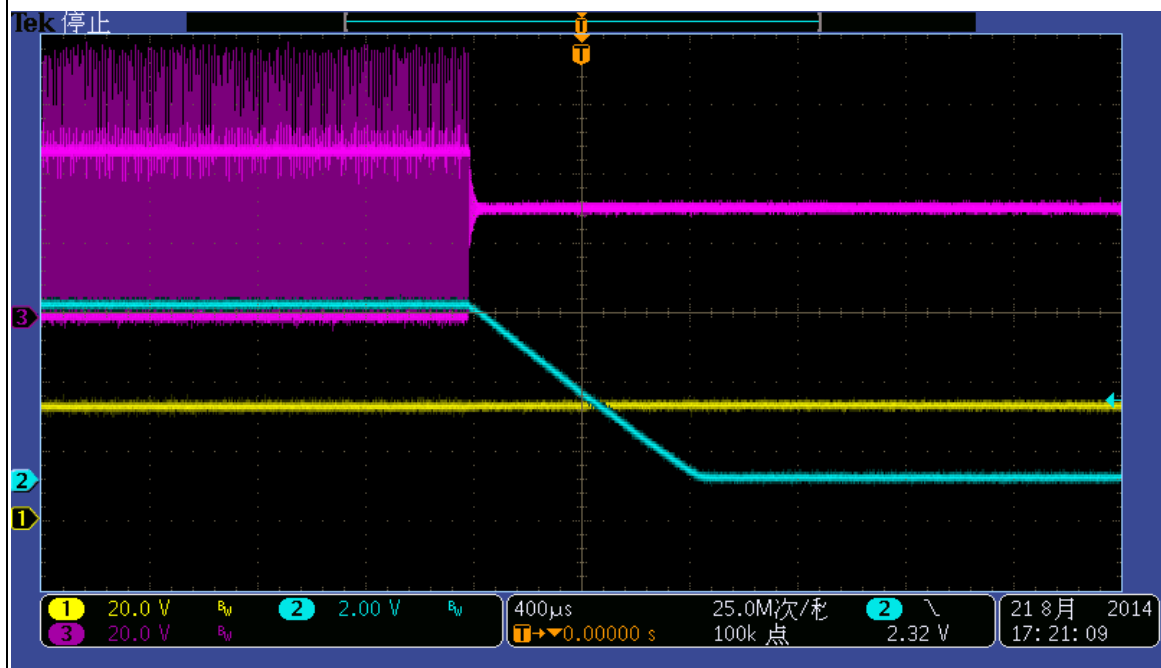
3.4 DYNAMIC RESPONSE



3.5 INPUT VOLTAGE PROTECTION

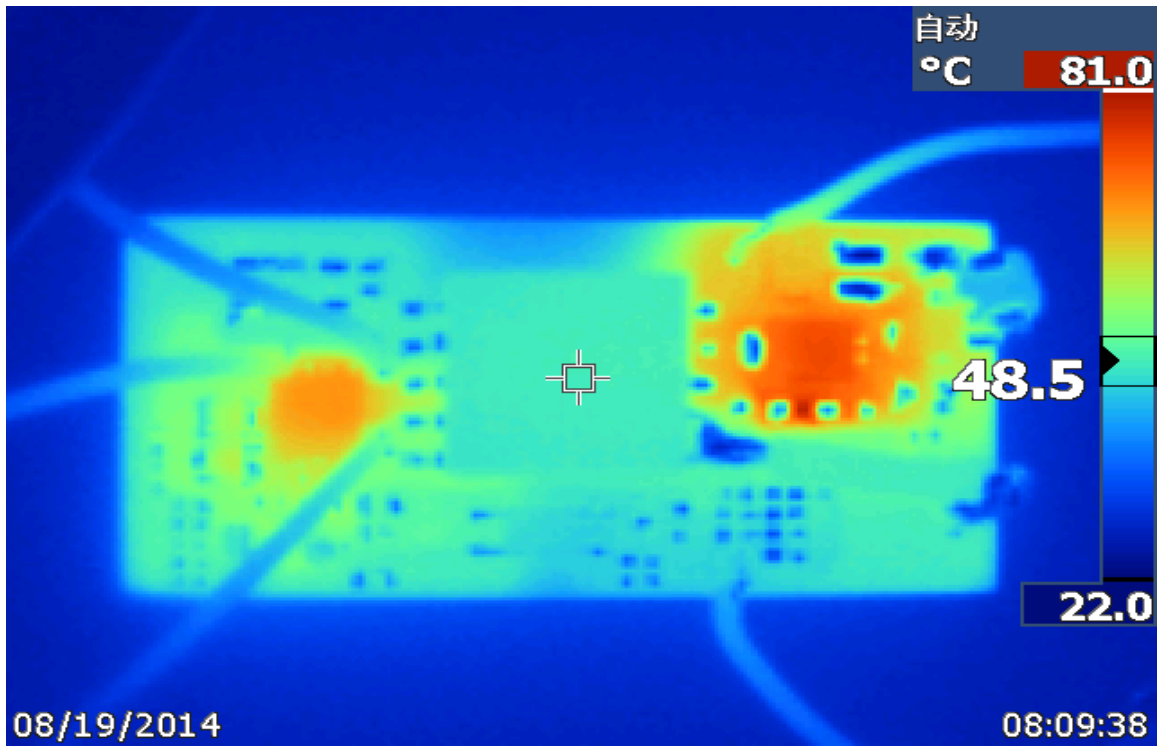


Vin: Vdc OVP: 74V
CH1: input voltage, 50V/div
CH2: output voltage, 2V/div
CH3: Vds voltage of MOSFET, 50V/div

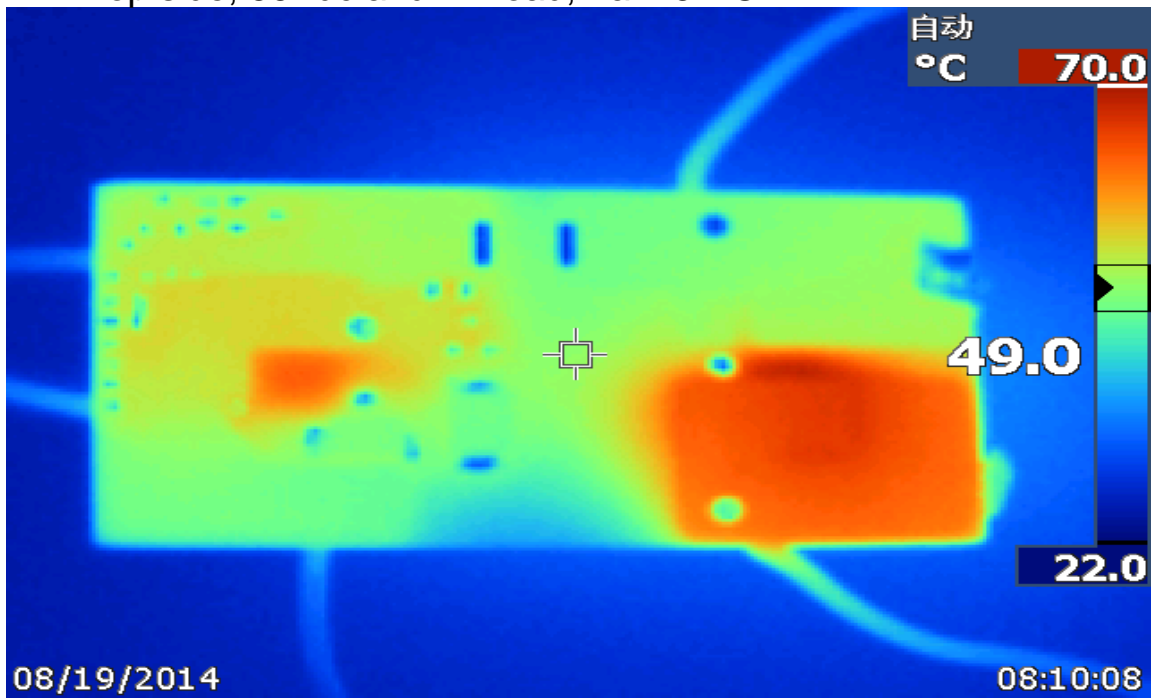


Vin: Vdc UVP: 34V
CH1: input voltage, 50V/div
CH2: output voltage, 2V/div
CH3: Vds voltage of MOSFET, 50V/div

4 THERMAL IMAGE



Top side, 36Vdc and 2A load, $T_a=25^{\circ}\text{C}$



Bottom side, 36Vac and 2A load, $T_a=25^{\circ}\text{C}$

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