PMP11612 Test Results

1. INPUT CHARACTERISTICS

The test is under the condition with 150mOhm cable

1.1 STANDBY POWER

Pass/Fail criteria: The standby power should be less than 60mW if turn on delay time<2S@90Vac 47Hz; should be less than 50mW if turn on delay time<3S@90Vac 47Hz

Vin (Vac)	Input Power(mW)	Pass/ Fail
90	31.5	Pass
115	32.4	Pass
132	33.1	Pass
180	42.8	Pass
230	44.5	Pass
264	48.8	Pass

1.2 EFFICIENCY DATA

Pass/Fail criteria: Average efficiency should be more than 80% with 150mOhm cable at 115Vac and 230Vac with 25%, 50%, 75%, 100% load, it is based on 79% for CoC V5 Tier 2 2016 standard and added 1% for the margin; the efficiency at 10% load should be more than 70%.

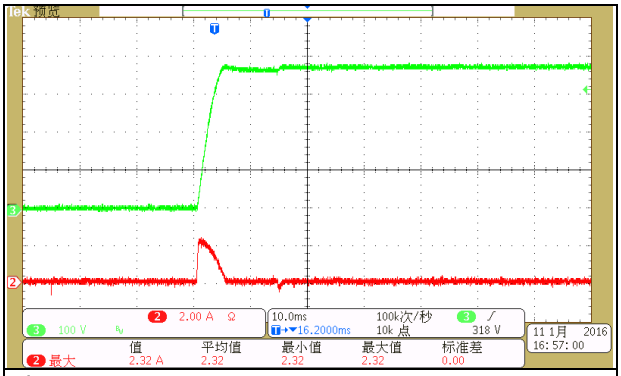
Vin=115Vac

Vout (V)	Iout (A)	Pin (W)	Pout (W)	η(%)		average	Pass/Fail
5.0919	1.9967	12.8	10.17	79.43	100%	80.41	Pass
5.0835	1.4975	9.506	7.61	80.08	75%		
5.0777	0.9977	6.275	5.07	80.73	50%		
5.07	0.498	3.102	2.52	81.39	25%		
5.051	0.2	1.275	1.01	79.23	10%	79.23	Pass

Vin=230Vac

Vout (V)	Iout (A)	Pin (W)	Pout (W)	η(%)		average	Pass/Fail
5.088	1.9964	12.708	10.16	79.93	100%	80.50	Pass
5.0828	1.4972	9.45	7.61	80.53	75%		
5.0773	0.9975	6.25	5.06	81.03	50%		
5.0647	0.4981	3.133	2.52	80.52	25%		
5.053	0.2	1.352	1.01	74.75	10%	74.75	Pass

1.3 INPUT INRUSH CURRENT



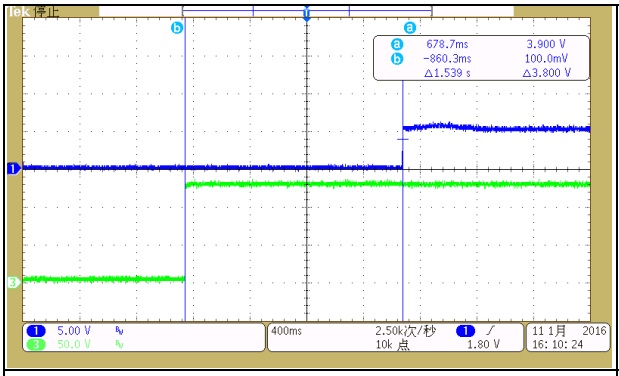
Vin:264Vac Io: 2A
Ch2: Input inrush current 2A/div
Ch3: Input bulk CAP voltage 100V/div

2. OUTPUT CHARACTERISTICS

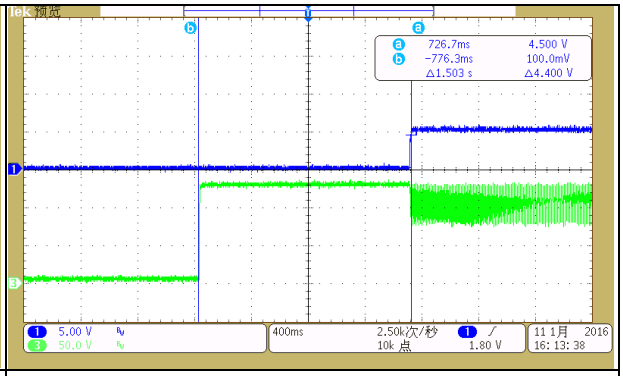
2.1 Turn on delay time

Pass/Fail criteria: The turn on delay time should be less than 2S at 90Vac 47Hz, if the standby power is less than 60mW; the turn on delay time should be less than 3S at 90Vac 47Hz, if the standby power is less than 50mW

Input voltage	Output current	Turn on delay time	Pass/Fail
90Vac 47Hz	0A	**1.539S**	**Pass**
90Vac 47Hz	2A	**1.503S**	**Pass**



Vin: 90Vac Io: 0A
Ch1: Output voltage, 5V/div
Ch3: The voltage after bridge diode, 50V/div



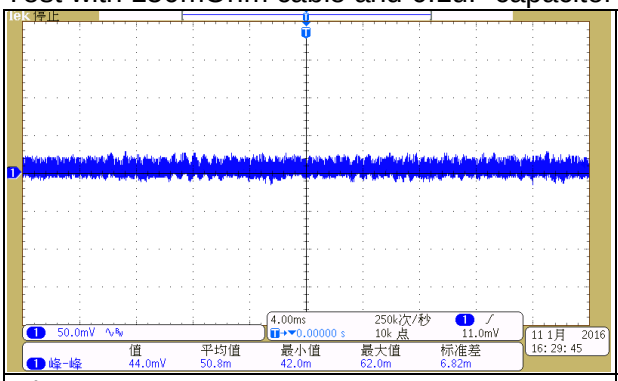
Vin: 90Vac Io: 2A
Ch1: Output voltage, 5V/div
Ch3: The voltage after bridge diode, 50V/div

2.2 RIPPLE VOLTAGE

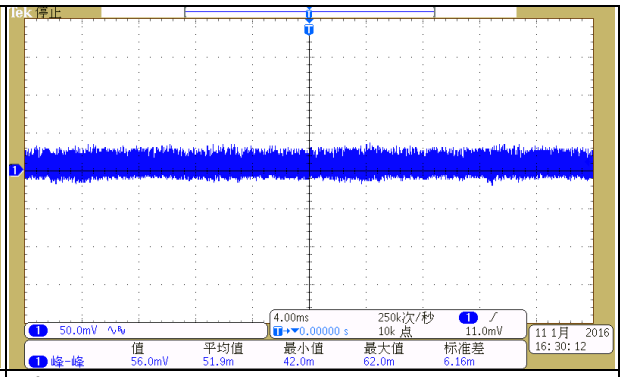
Pass/Fail criteria: The ripple voltage should be less than 100mV at full input range and full load range.

Input voltage	Output current	Ripple voltage	Pass/Fail
115Vac	0.5A	**44mV**	**Pass**
115Vac	1A	**56mV**	**Pass**
115Vac	1.5A	**56mV**	**Pass**
115Vac	2A	**62mV**	**Pass**
230Vac	0.5A	**44mV**	**Pass**
230Vac	1A	**56mV**	**Pass**
230Vac	1.5A	**58mV**	**Pass**
230Vac	2A	**62mV**	**Pass**

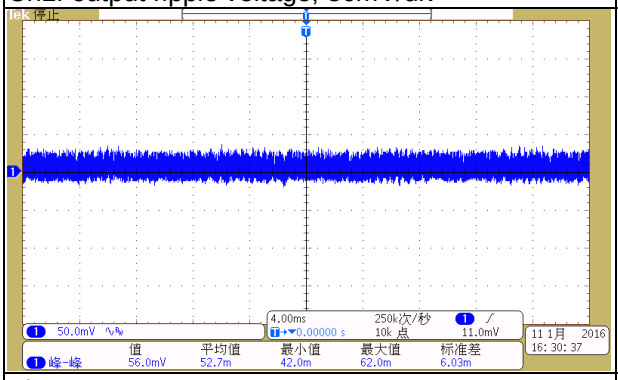
Test with 150mOhm cable and 0.1uF capacitor



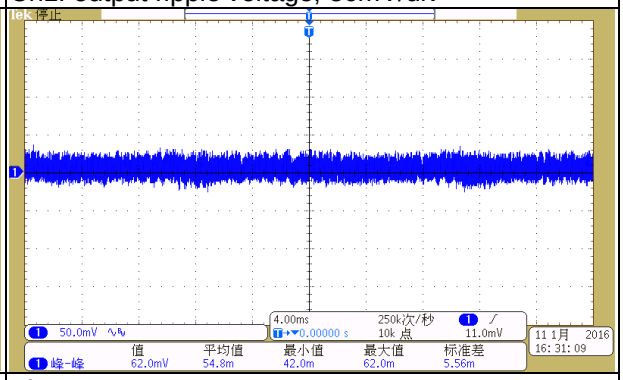
Vin:115Vac Io: 0.5A
Ch1: output ripple voltage, 50mV/div



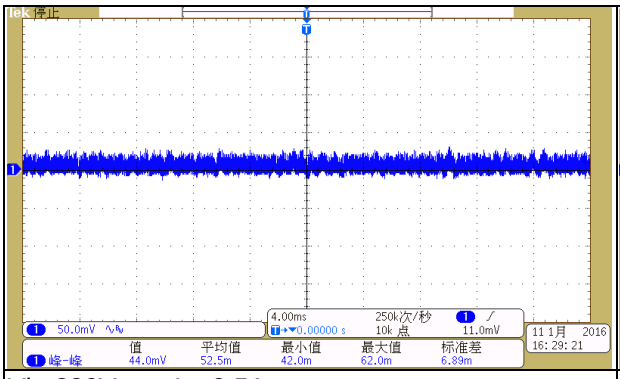
Vin:115Vac Io: 1A
Ch1: output ripple voltage, 50mV/div



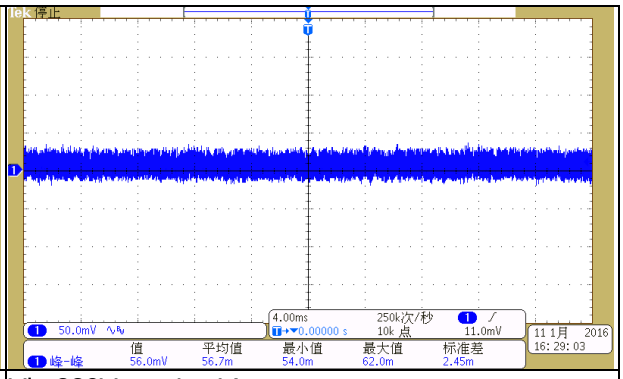
Vin:115Vac Io: 1.5A
Ch1: output ripple voltage, 50mV/div



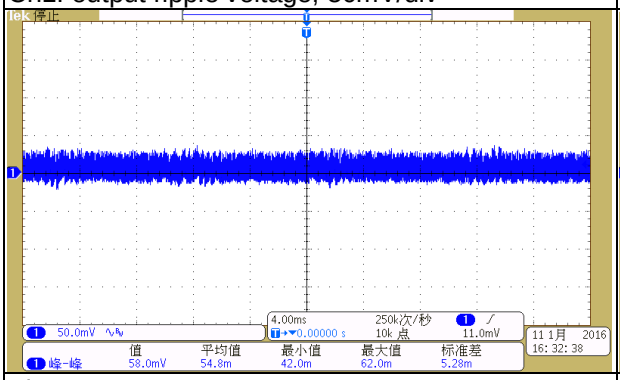
Vin:115Vac Io: 2A
Ch1: output ripple voltage, 50mV/div



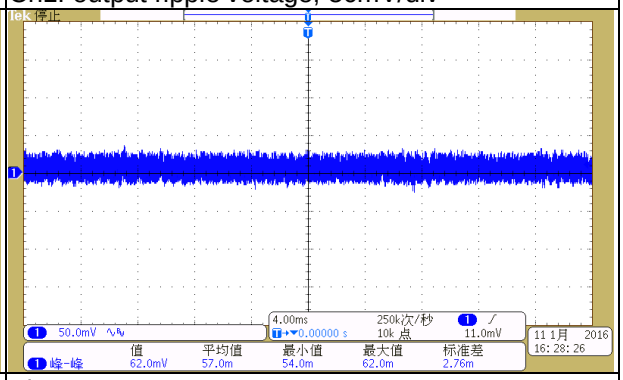
Vin:230Vac Io: 0.5A
Ch1: output ripple voltage, 50mV/div



Vin:230Vac Io: 1A
Ch1: output ripple voltage, 50mV/div



Vin:230Vac Io: 1.5A
Ch1: output ripple voltage, 50mV/div

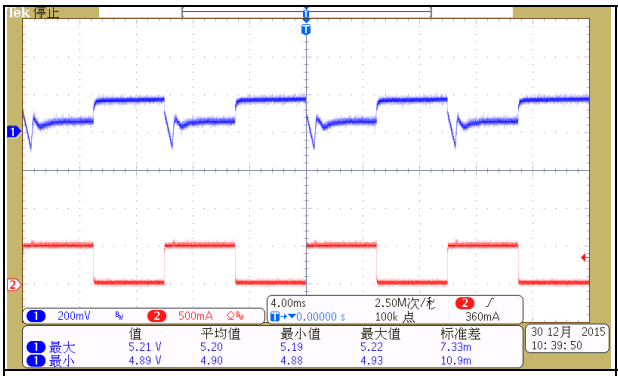


Vin:230Vac Io: 2A
Ch1: output ripple voltage, 50mV/div

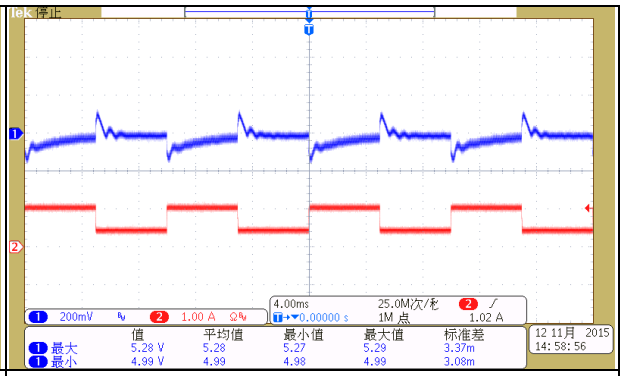
2.3 DYNAMIC RESPONSE

Pass/Fail criteria: Vo change should Less than 5%Vo with 20% - 50% load; less than 10%Vo with 10% - 90% load; 0 to 500mA single step change load response and Vo should stay in 4.1V to 6.0V range.

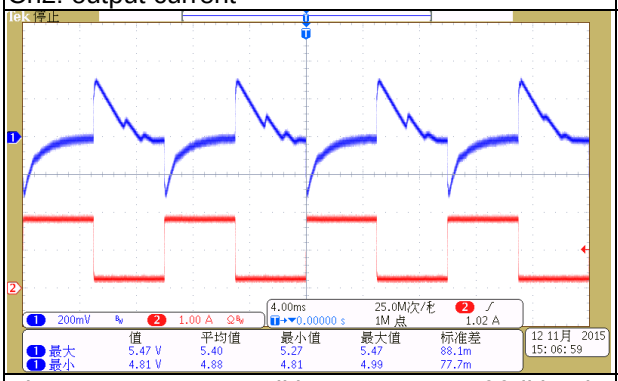
Input voltage	Output current	Min voltage	Max voltage	Pass/ Fail
115Vac	0~500mA	**4.89V**	**5.21V**	**Pass**
115Vac	20%-50% of full load	**4.99V**	**5.28V**	**Pass**
115Vac	10%-90% of full load	**4.81V**	**5.47V**	**Pass**
230Vac	0~500mA	**4.92V**	**5.2V**	**Pass**
230Vac	20%-50% of full load	**4.98V**	**5.28V**	**Pass**
230Vac	10%-90% of full load	**4.83V**	**5.46V**	**Pass**



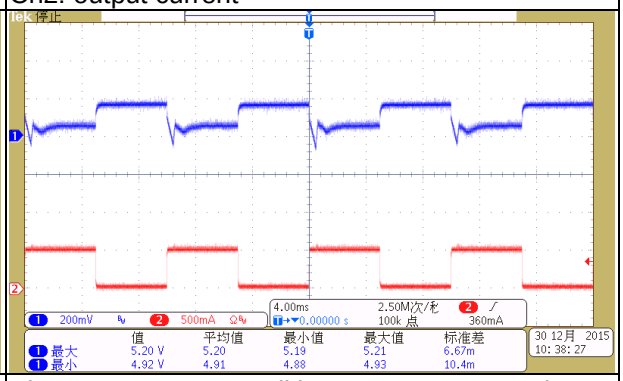
Vin:115Vac test condition: 0-500mA, 0.25A/us, 10ms cycle, 150mOhm cable
Ch1: output voltage
Ch2: output current



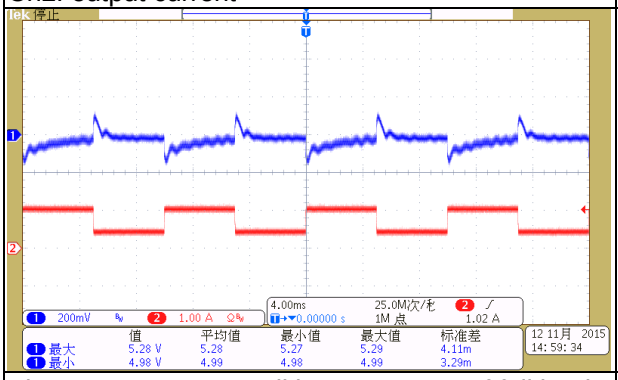
Vin:115Vac test condition: 20%-50% of full load, 0.25A/us, 10ms cycle, 150mOhm cable
Ch1: output voltage
Ch2: output current



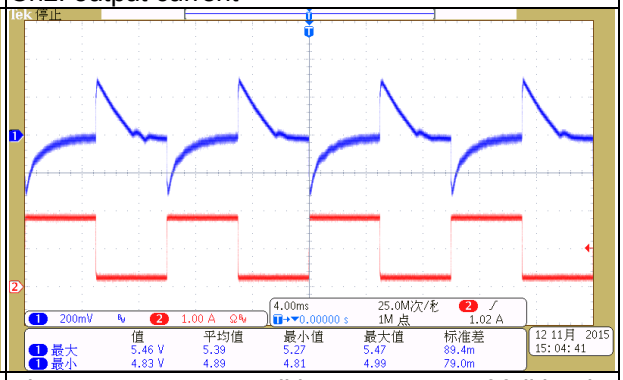
Vin:115Vac test condition: 10%-90% of full load, 0.25A/us, 10ms cycle, 150mOhm cable
Ch1: output voltage
Ch2: output current



Vin:230Vac test condition: 0-500mA, 0.25A/us, 10ms cycle, 150mOhm cable
Ch1: output voltage
Ch2: output current

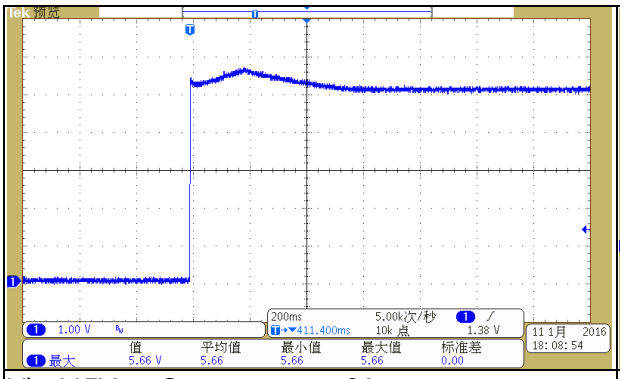


Vin:230Vac test condition: 20%-50% of full load, 0.25A/us, 10ms cycle, 150mOhm cable
Ch1: output voltage
Ch2: output current

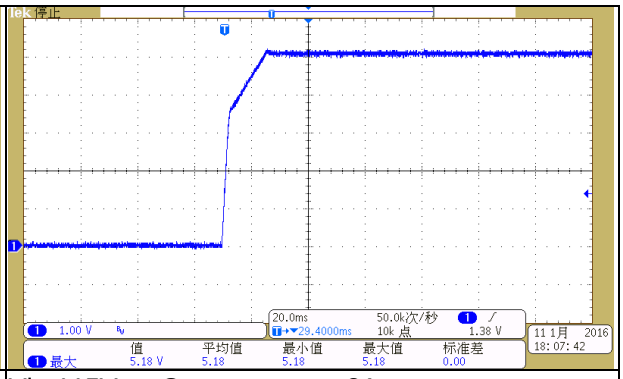


Vin:230Vac test condition: 10%-90% of full load, 0.25A/us, 10ms cycle, 150mOhm cable
Ch1: output voltage
Ch2: output current

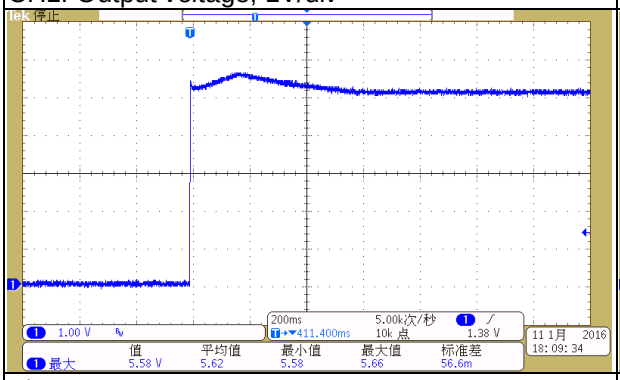
2.4 Overshoot at Turn-on



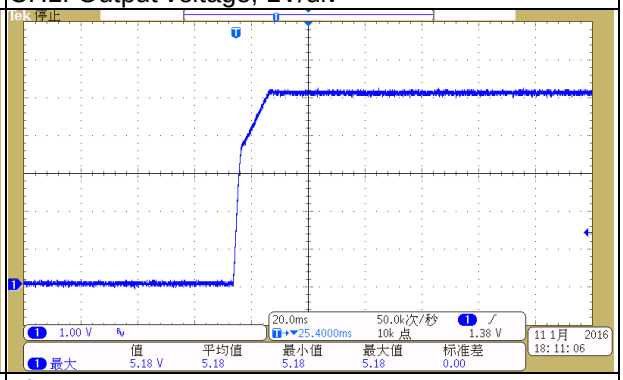
Vin:115Vac Output current: 0A
CH1: Output voltage, 1V/div



Vin:115Vac Output current: 2A
CH1: Output voltage, 1V/div



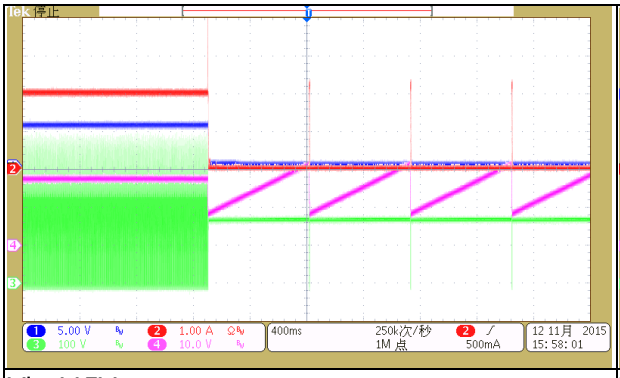
Vin: 230Vac Output current: 0A
CH1: Output voltage, 1V/div



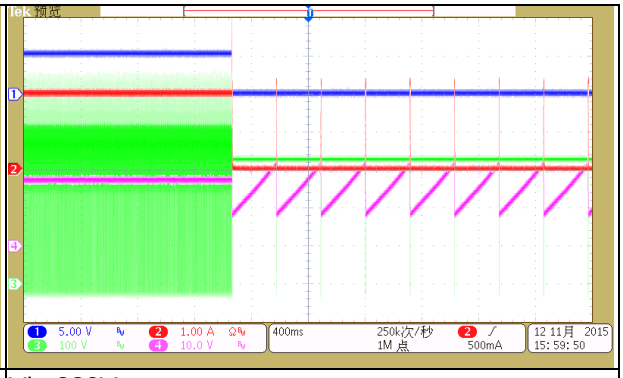
Vin: 230Vac Output current: 2A
CH1: Output voltage, 1V/div

2.5 OUTPUT SHORT PROTECTION

Input voltage	Output short protection
115&230Vac	**Hiccup up mode**

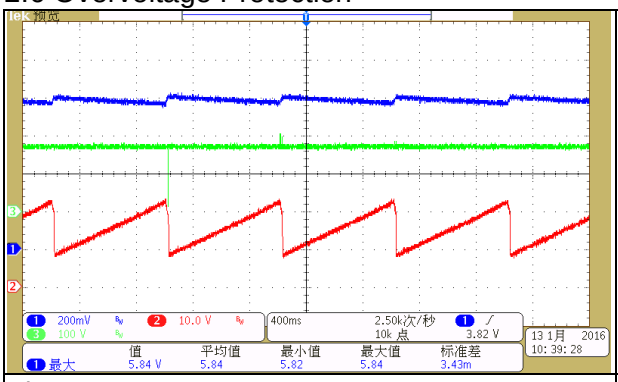
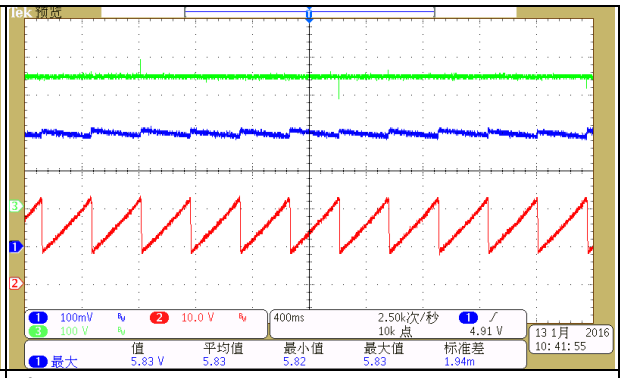


Vin:115Vac
CH1: Output voltage, 5V/div
CH2: output current, 1A/div
CH3: Vds of MOSFET, 100V/div
CH4: Vdd, 10V/div

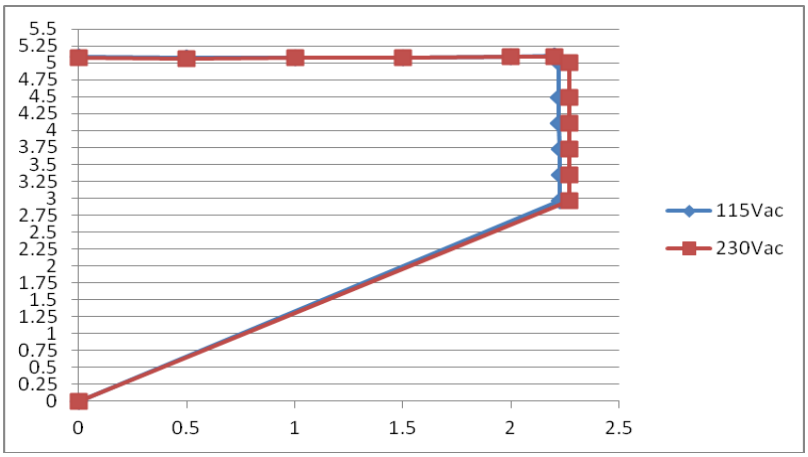


Vin:230Vac
CH1: Output voltage, 5V/div
CH2: output current, 1A/div
CH3: Vds of MOSFET, 100V/div
CH4: Vdd, 10V/div

2.6 Overvoltage Protection

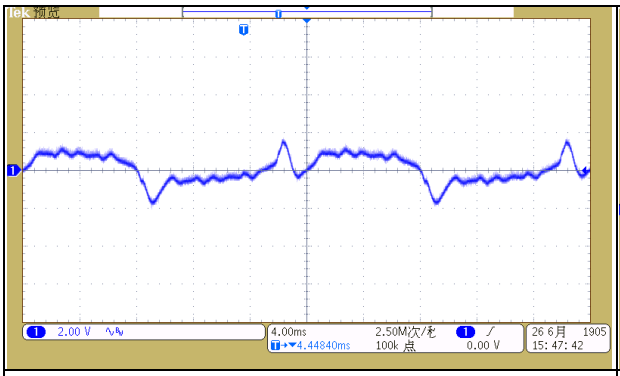
	
Vin:115Vac CH1: Output voltage CH2: Vdd 10V/div CH3: Vds of MOSFET, 100V/div	Vin: 230Vac CH1: Output voltage CH2: Vdd 10V/div CH3: Vds of MOSFET, 100V/div

2.7 IV CURVE

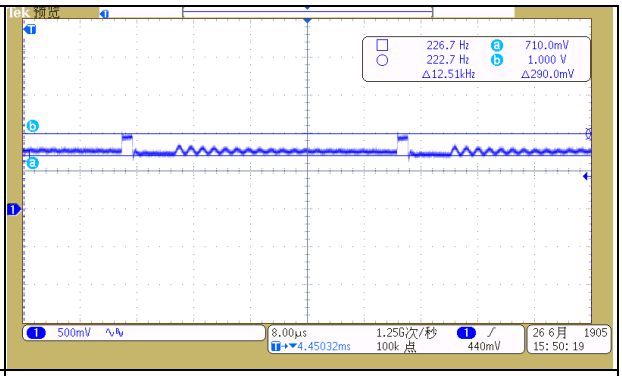


3. CM Noise

Test condition: 230Vac and 1m USB cable with 10Ohm resistor, a metal box with size 10cmx6cmx1cm is connected to secondary GND



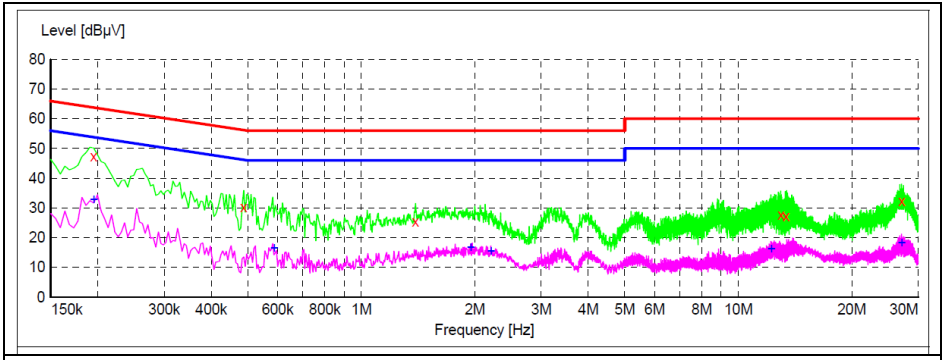
Vin:230Vac
CH1: CM Noise



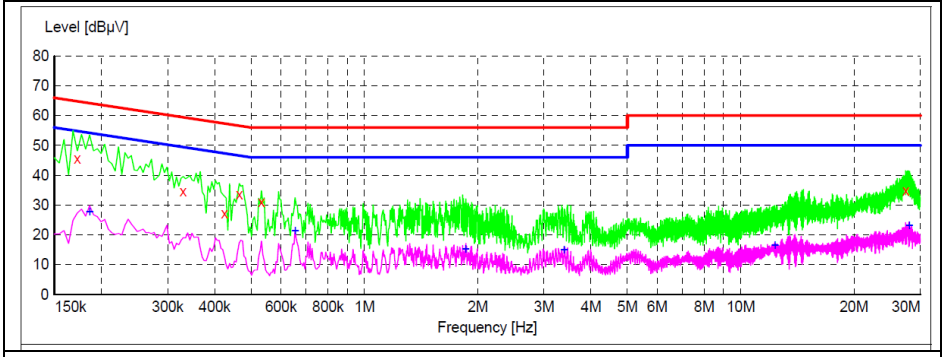
Vin:230Vac
CH1: CM Noise

4. EMI Test

4.1 Conduction EMI

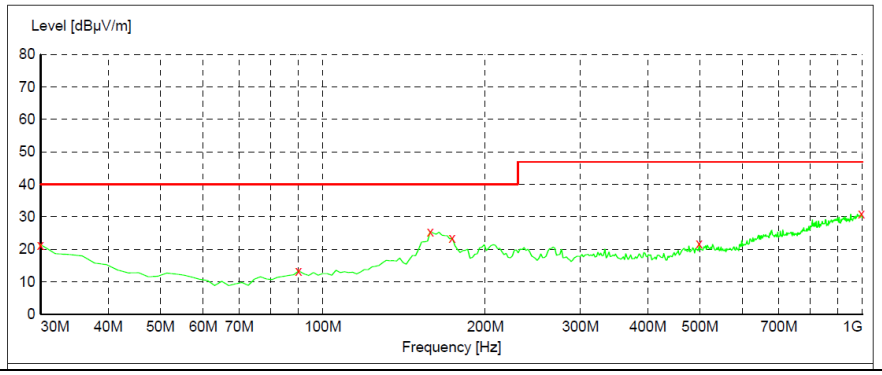


Vin: 115Vac Io: 2A

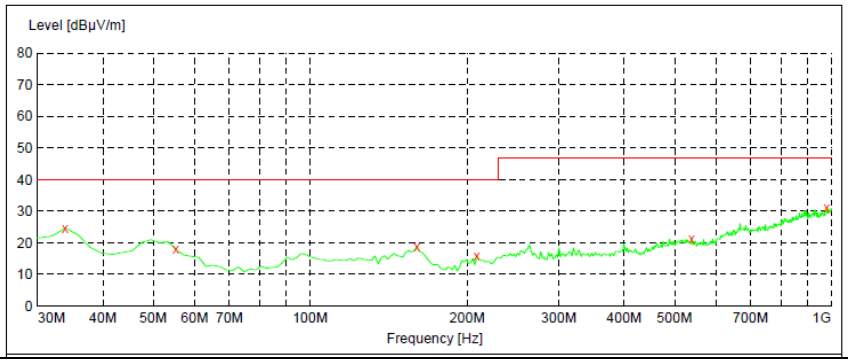


Vin: 230Vac Io: 2A

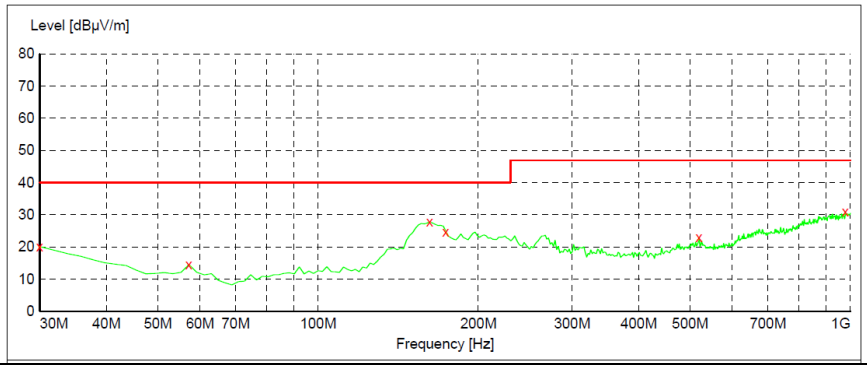
4.2 Radiation EMI



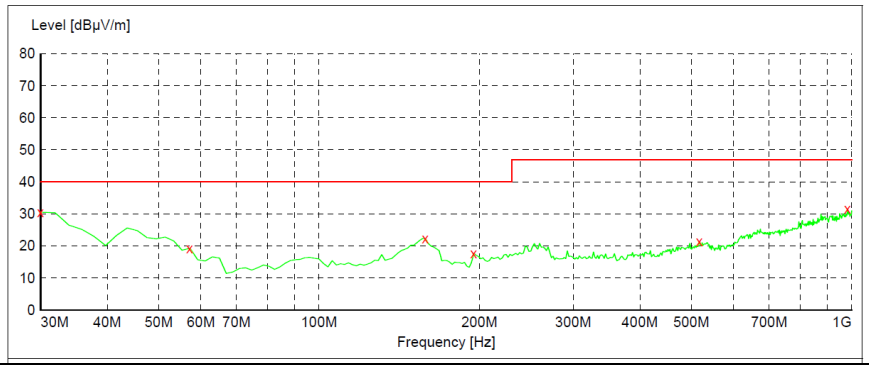
Vin: 115Vac Io: 2A, Horizontal



Vin: 115Vac Io: 2A, Vertical

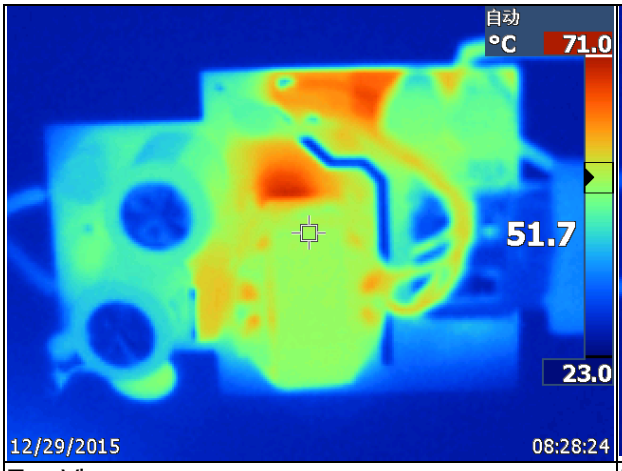
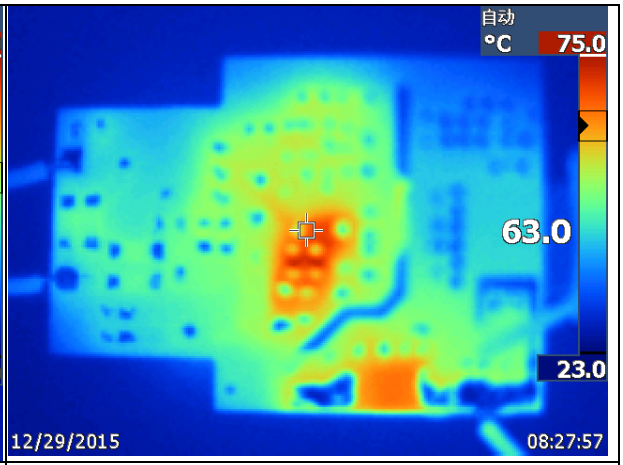


Vin: 230Vac Io: 2A, Horizontal



Vin: 230Vac Io: 2A, Vertical

5. Thermal Test

	
Top View Vin: 230Vac Io: 2A	Bottom View Vin: 230Vac Io: 2A

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265