



Texas Instruments

PMP4330 Test Procedure

China Power Reference Design

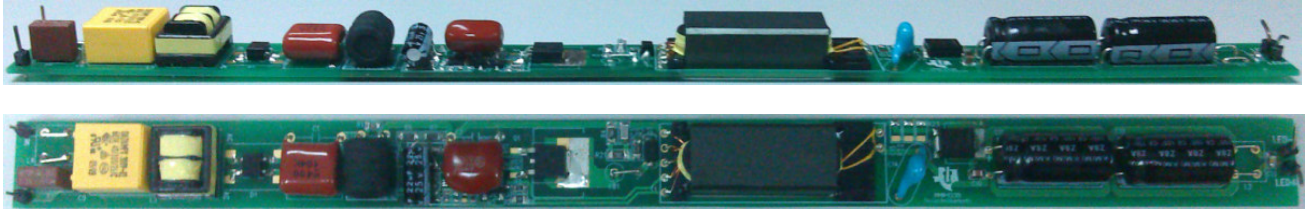
REV A

3/30/2012

1 GENERAL

1.1 PURPOSE

To provide detailed data for evaluating and verifying the PMP4330, which uses TI new Primary Side Controller TPS92310 for GU10 light standard form factor with 256mmx17.6mmx11mm. The below photo shows this demo board.



1.2 REFERENCE DOCUMENTATION

Schematic PMP4330_SCH.PDF
Assembly PMP4330_PCB.PDF
BOM

1.3 TEST EQUIPMENTS

Power-meter: YOKOGAWA WT210
Multi-meter(current): Fluke 3345A
Multi-meter(voltage): Fluke 187
AC Source: Chroma 61530
LED load: Chroma 63110A module

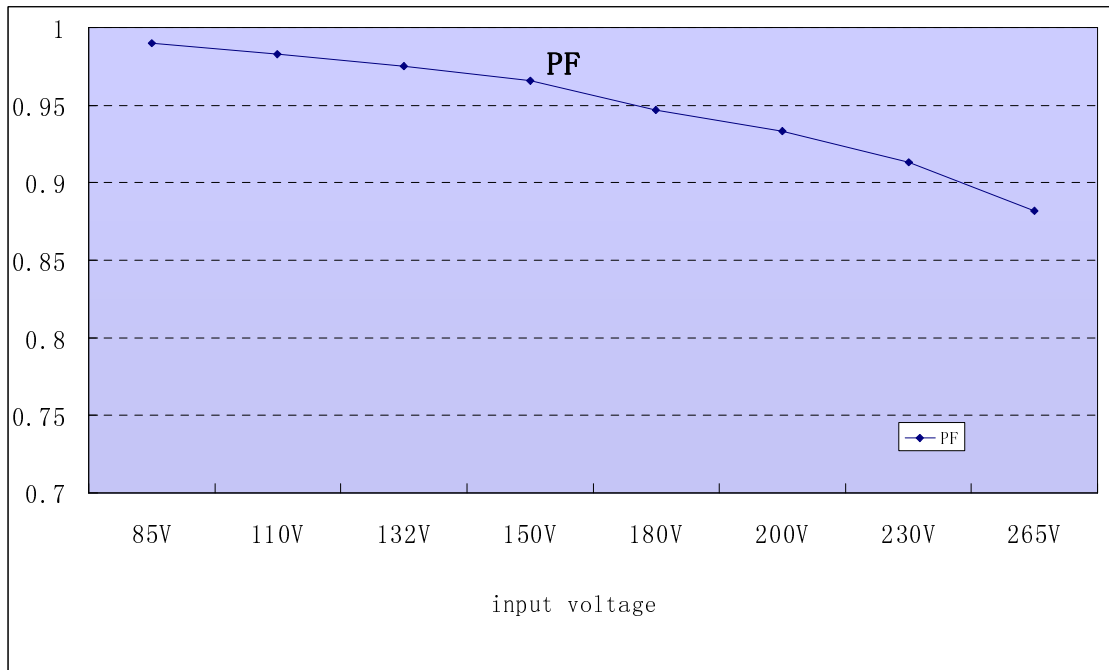
2 INPUT CHARACTERISTICS

Otherwise Specified, the test is under the condition With LED electric Load (Chroma 63310A, 40V, 0.42A).

2.1 POWER FACTOR

Pass/Fail criteria: THD meets to IEC61000-3-2 with 230Vac input at 100% load.

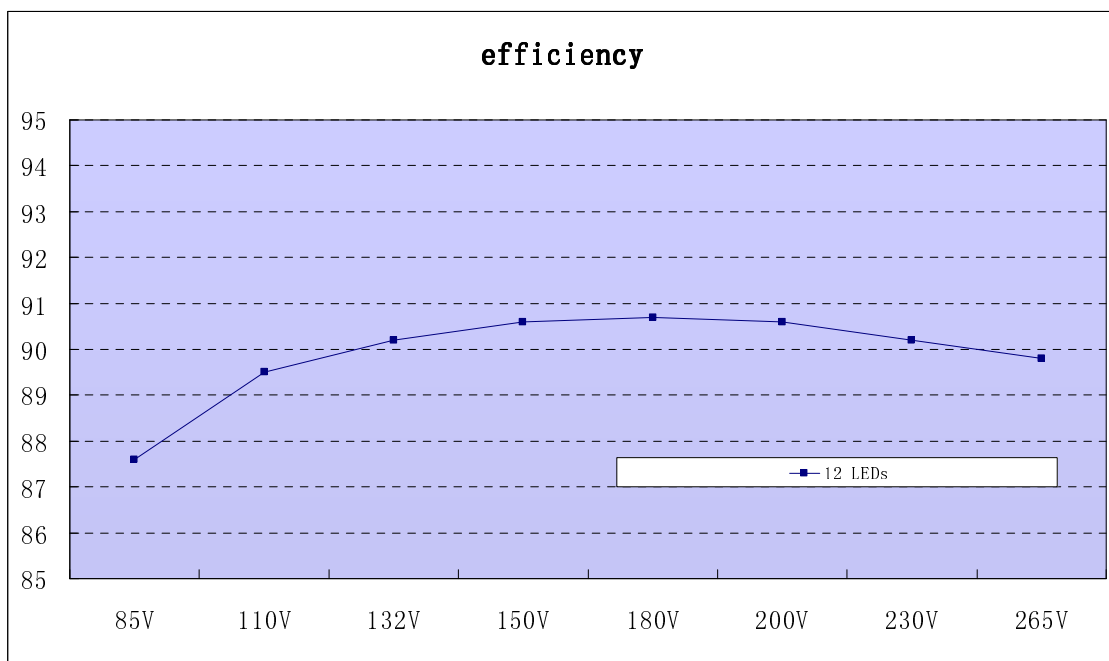
Vin(Vac)	Freq(Hz)	PF	Io(Arms)	THD(%)	Pass/Fail
85	60	0.990	0.426	11.6	
110	60	0.983	0.429	14.4	
132	60	0.975	0.430	16.9	
150	60	0.968	0.428	19.1	
180	50	0.947	0.428	23.9	
200	50	0.933	0.429	25.9	
230	50	0.913	0.431	28.8	
265	50	0.887	0.435	31.5	



2.2 EFFICIENCY

Pass/Fail criteria: 82% minimum with 230v input at 100% load.

Vin(Vac)	Freq(Hz)	Pin(W)	Vo(Vrms)	Io(Arms)	Eff(%)	Pass/Fail
85	60	19.57	40.23	0.426	87.6	
110	60	19.30	40.27	0.429	89.5	
132	60	19.20	40.28	0.430	90.2	
150	60	19.01	40.25	0.428	90.6	
180	50	18.98	40.25	0.428	90.7	
200	50	19.05	40.26	0.429	90.6	
230	50	19.23	40.28	0.431	90.2	
265	50	19.53	40.31	0.435	89.8	



2.3 INPUT CURRENT

Pass/Fail criteria: XX Amps RMS maximum at low line, full load.

Vin(Vac)	Freq(Hz)	Iin(Arms)	Pass/Fail
110	60	0.178	
230	5	0.091	

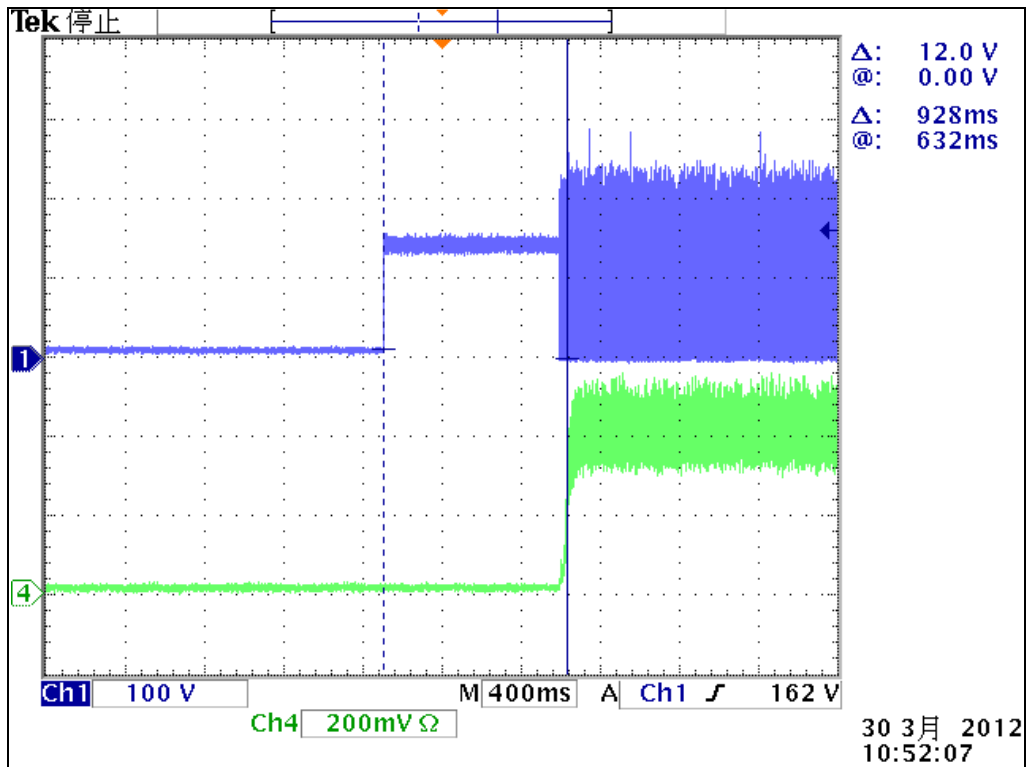
3 OUTPUT CHARACTERISTICS

3.1 OUTPUT VOLTAGE RANGE (38Vdc-42Vdc)

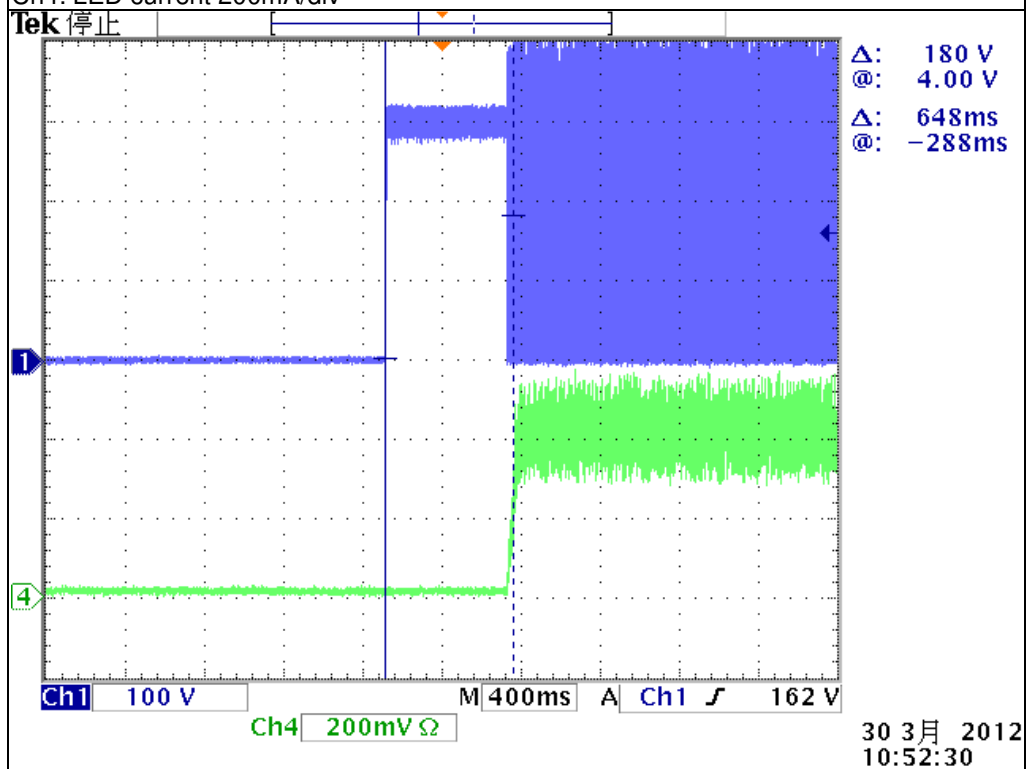
ITEM	Vout (V)	Iout(A)	Pass/Fail
Vin=110Vac	38	0.426	
	42	0.422	
Vin=230Vac	38	0.428	
	42	0.424	

3.2 TURN ON DELAY AND RIPPLE CURRENT

CONDITIONS		Delay time (S)	Ripple current (mA)	Pass/Fail
Vin (Vac)	Load			
110	Full load	0.928	220mA, <+/-30%	
230	Full load	0.648	204mA, <+/-30%	



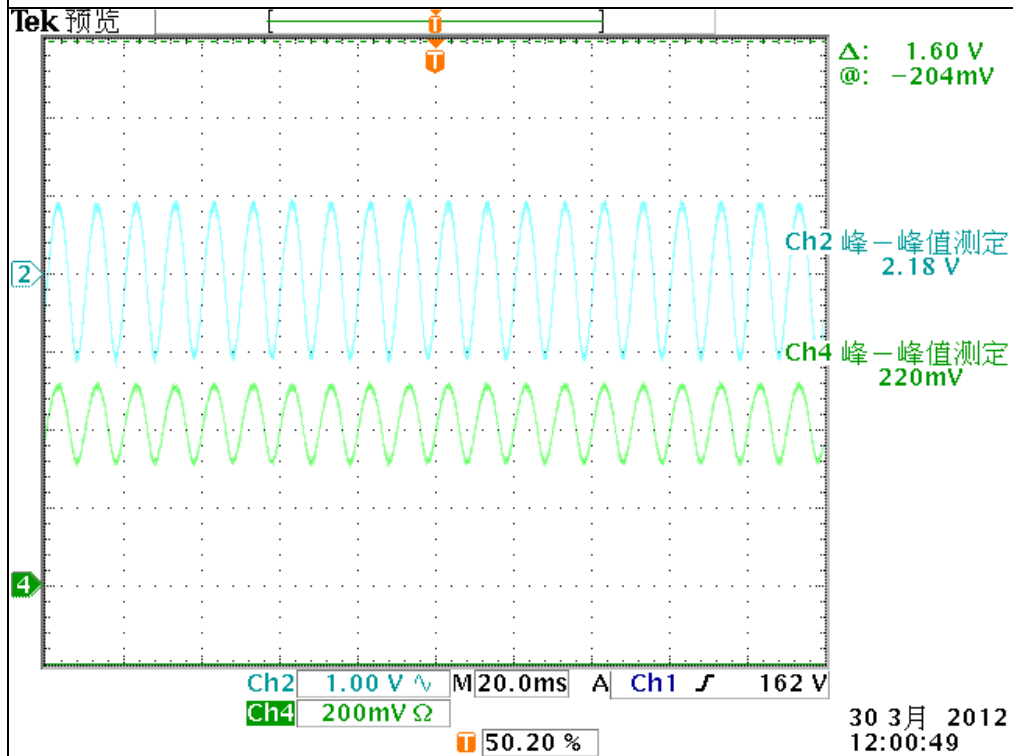
Vin:110Vac Io: full load (LED Lamp Load)
 Ch1: Vds voltage of MOSFET, 100V/div
 Ch4: LED current 200mA/div



Vin:230Vac Io: full load (LED electric Load)

Ch1: Vds voltage of MOSFET, 100V/div

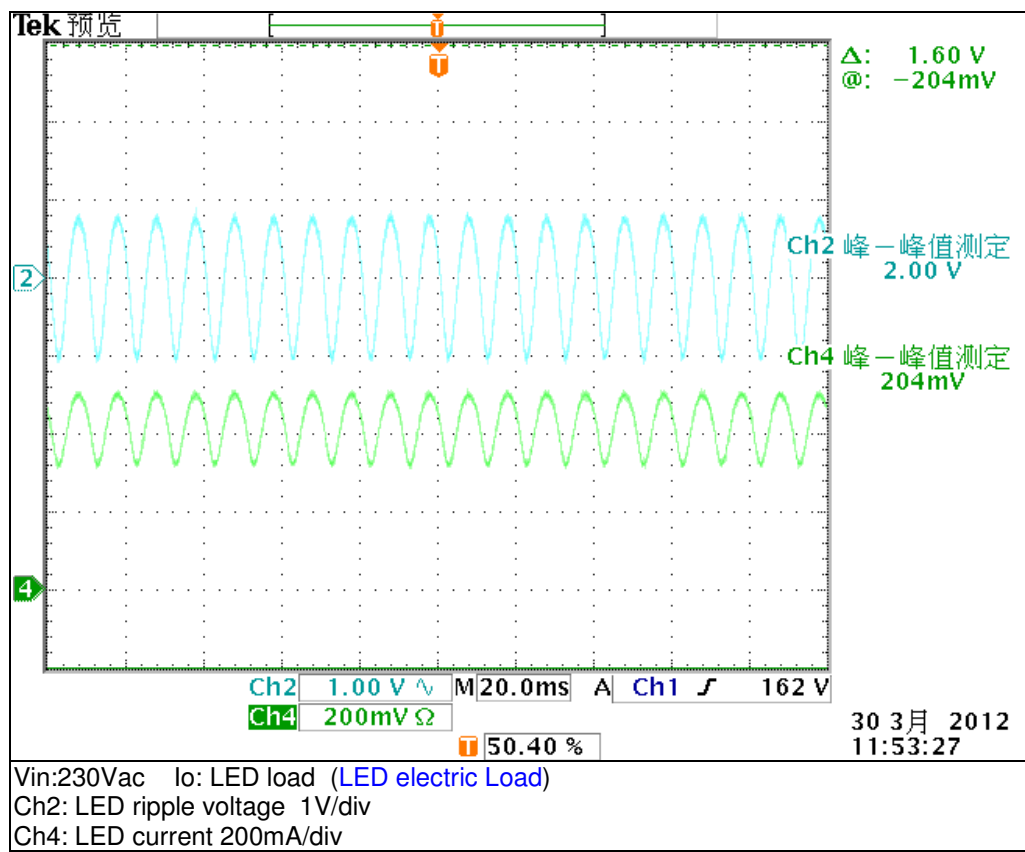
Ch4: LED current, 200mA/div



Vin:110Vac Io: LED load (LED electric Load)

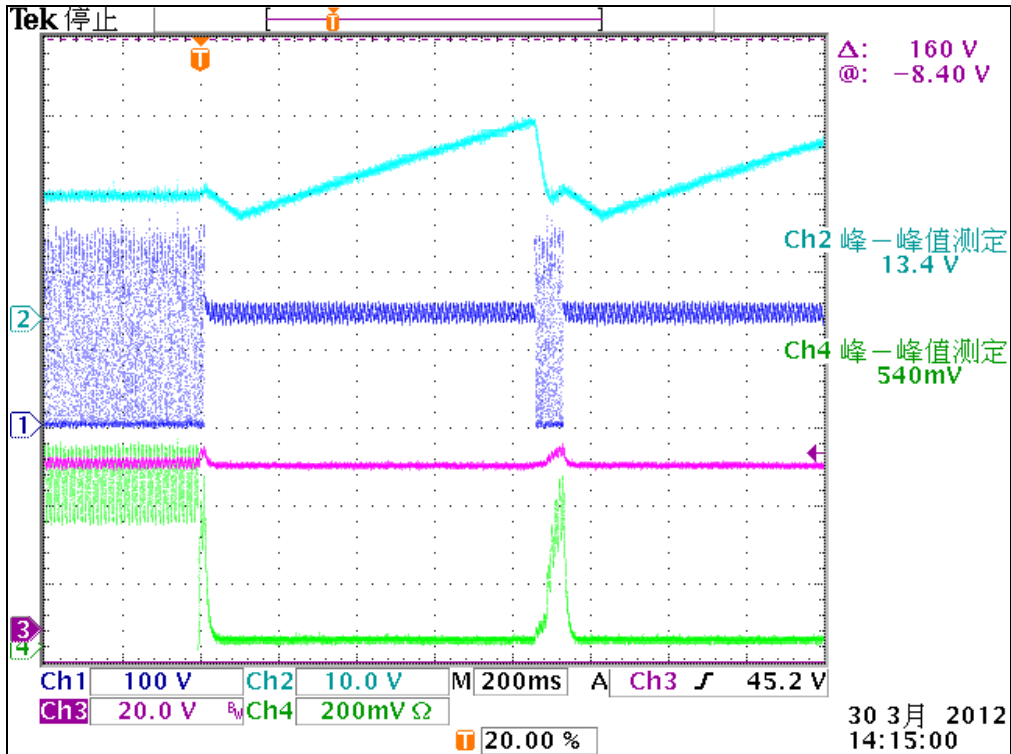
Ch2: LED ripple voltage 1V/div

Ch4: LED current 200mA/div



3.3 OUTPUT VOLTAGE PROTECTION

CONDITIONS	Protection voltage (V)	Pass/Fail
Vin (Vac)		
110&230	46	



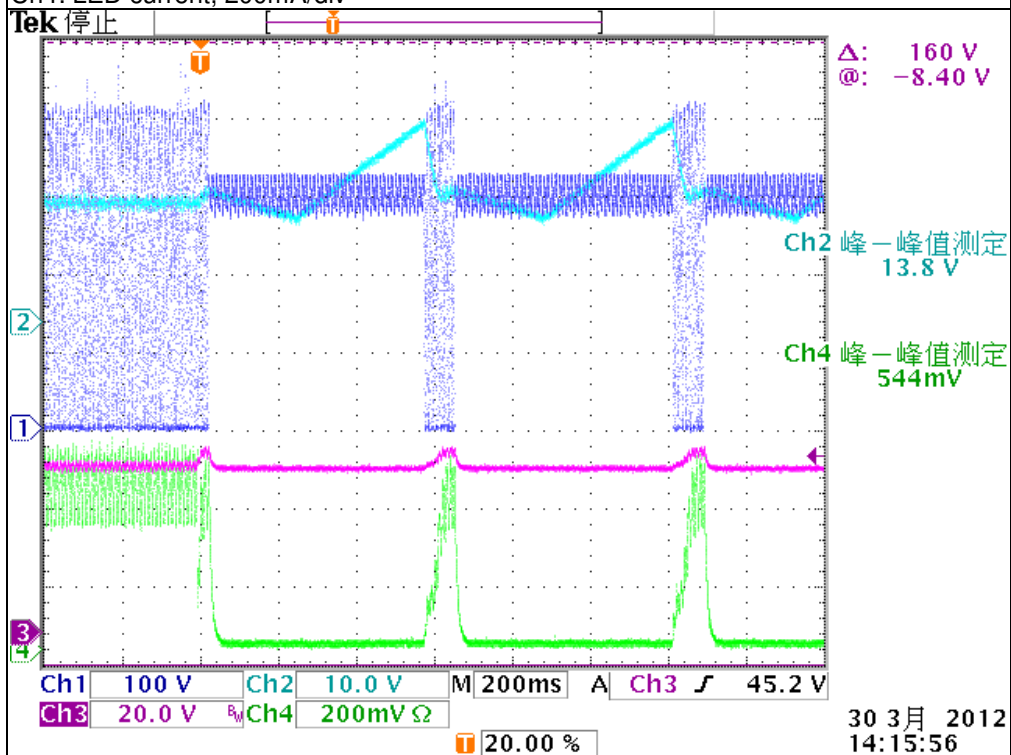
Vin:110Vac OVP and open LED protection (Chroma 63110A LED load)

Ch1: Mosfet Vds, 100V/div

Ch2: Vcc, 10V/div

Ch3: LED voltage, 20V/div

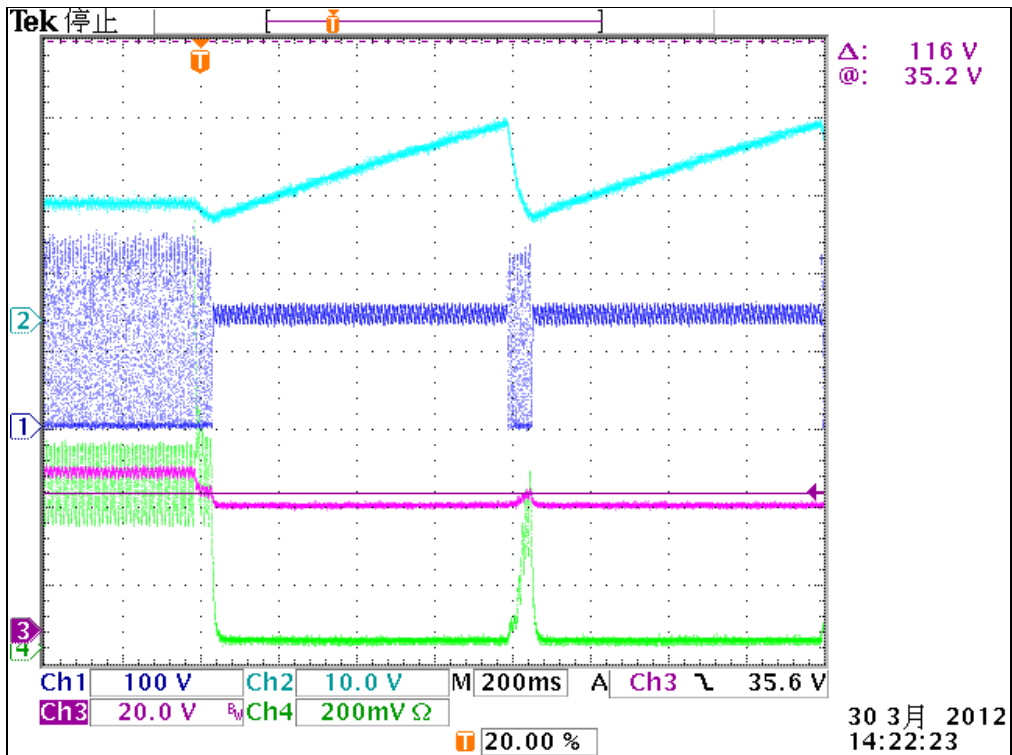
Ch4: LED current, 200mA/div



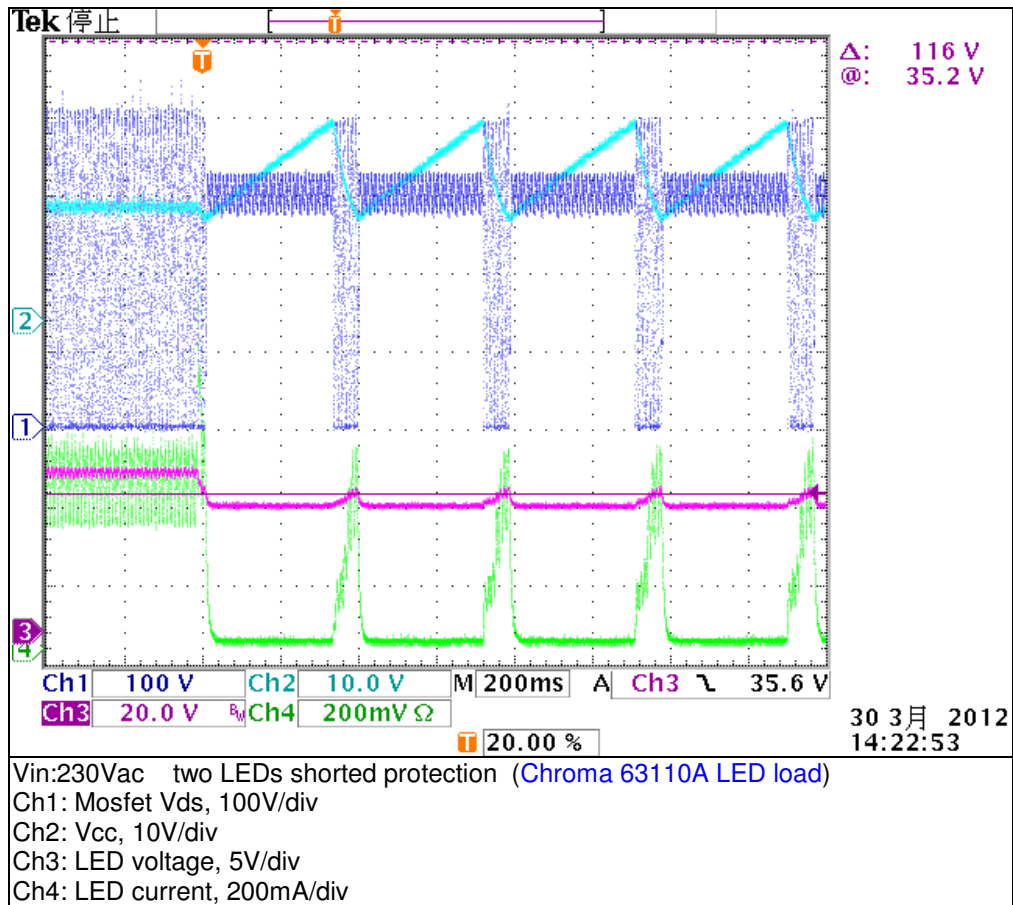
Vin:230Vac OVP and open LED protection (Chroma 63110A LED load)
 Ch1: Mosfet Vds, 100V/div
 Ch2: Vcc, 10V/div
 Ch3: LED voltage, 20V/div
 Ch4: LED current, 200mA/div

3.4b SHORT ONE LED PROTECTION

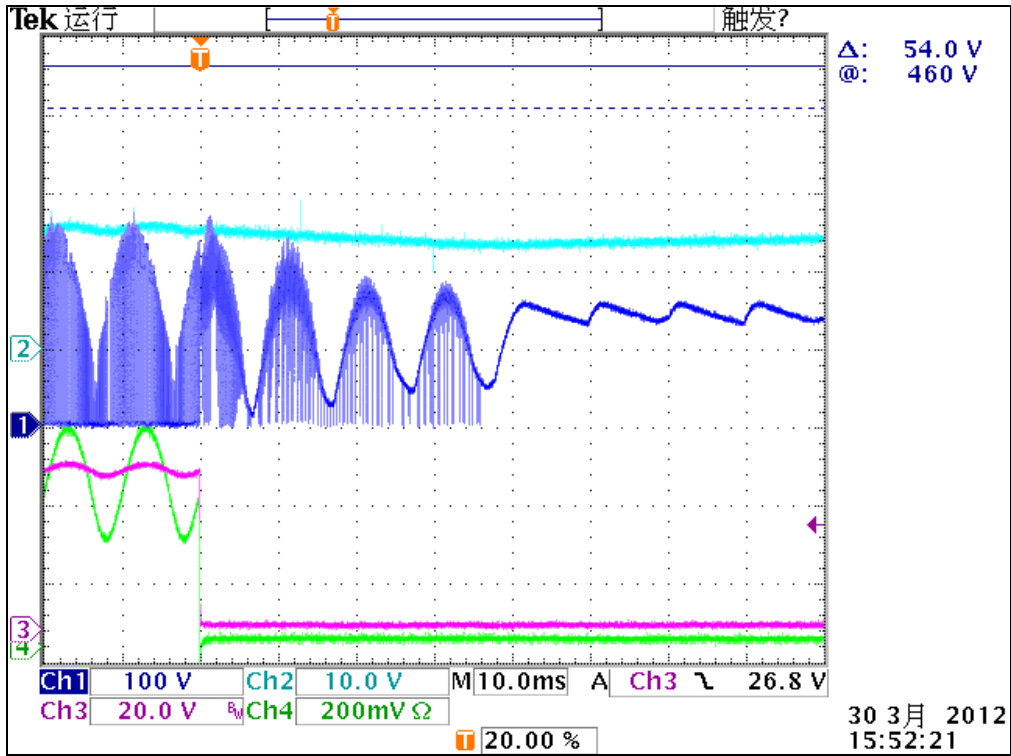
CONDITIONS	Protection voltage (V)	Pass/Fail
Vin (Vac)		
110&230	35	ok



Vin:110Vac one LEDs shorted protection (Chroma 63110A LED load)
 Ch1: Mosfet Vds, 100V/div
 Ch2: Vcc, 10V/div
 Ch3: LED voltage, 20V/div
 Ch4: LED current, 200mA/div



3.5 OUTPUT SHORT PROTECTION



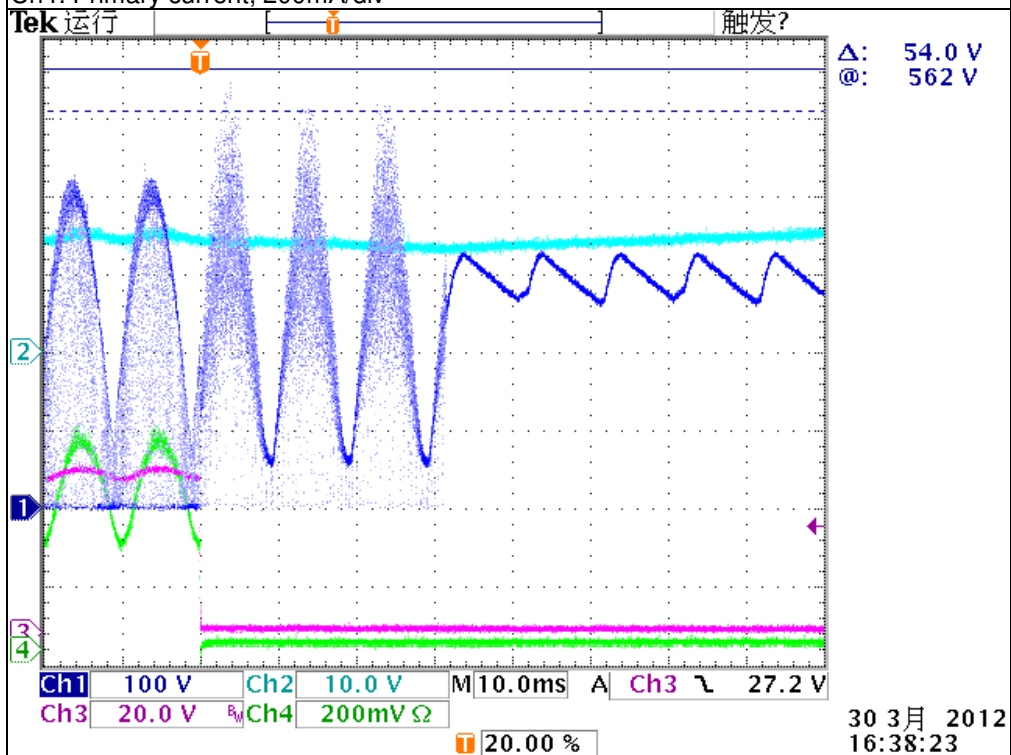
Vin:110Vac two LEDs shorted protection (Chroma 63110A LED load)

Ch1: Mosfet Vds, 100V/div

Ch2: Vcc, 10V/div

Ch3: LED voltage, 20V/div

Ch4: Primary current, 200mA/div

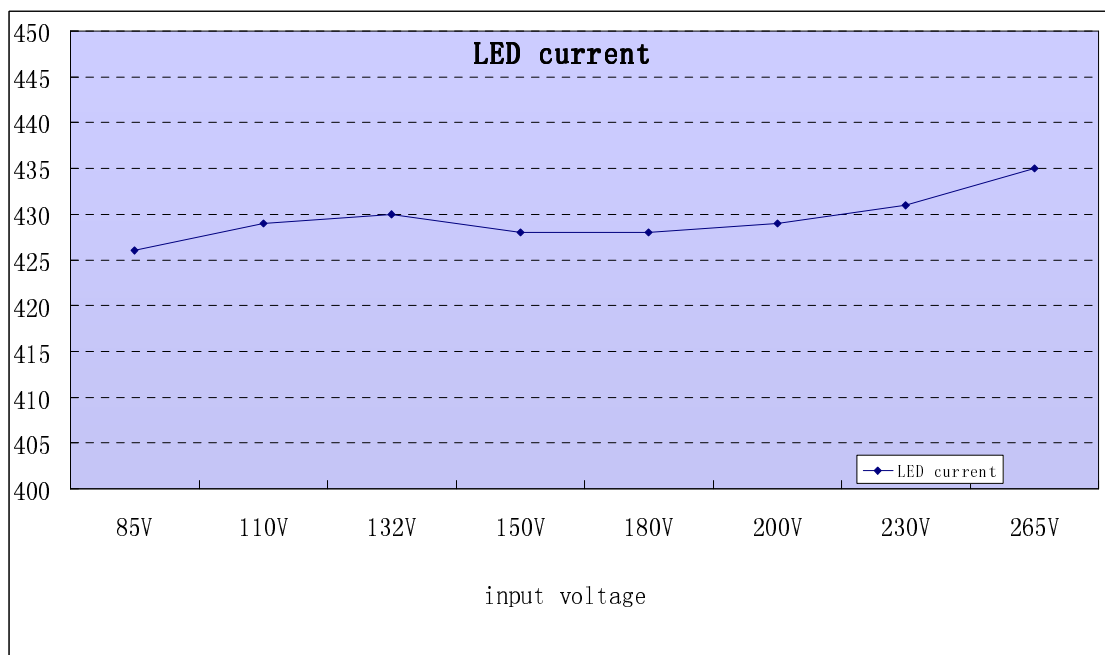


Vin:230Vac two LEDs shorted protection ([Chroma 63110A LED load](#))
 Ch1: Mosfet Vds, 100V/div
 Ch2: Vcc, 10V/div
 Ch3: LED voltage, 20V/div
 Ch4: Primary current, 200mA/div

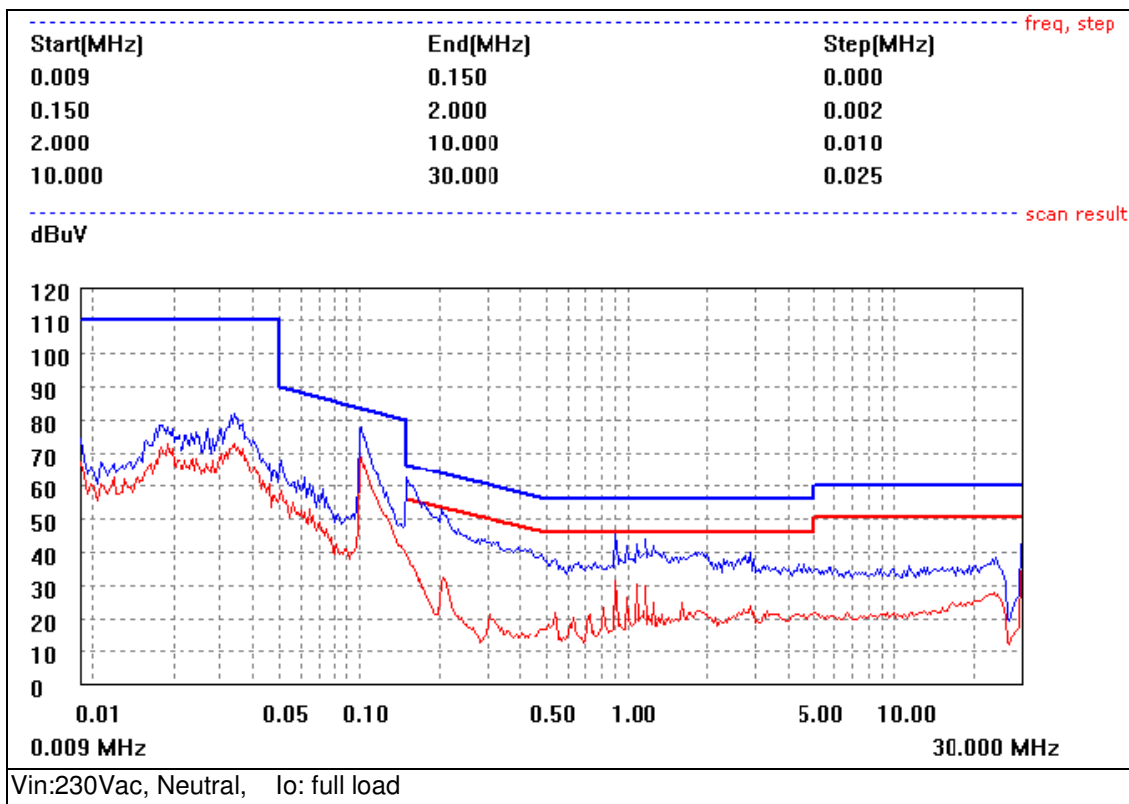
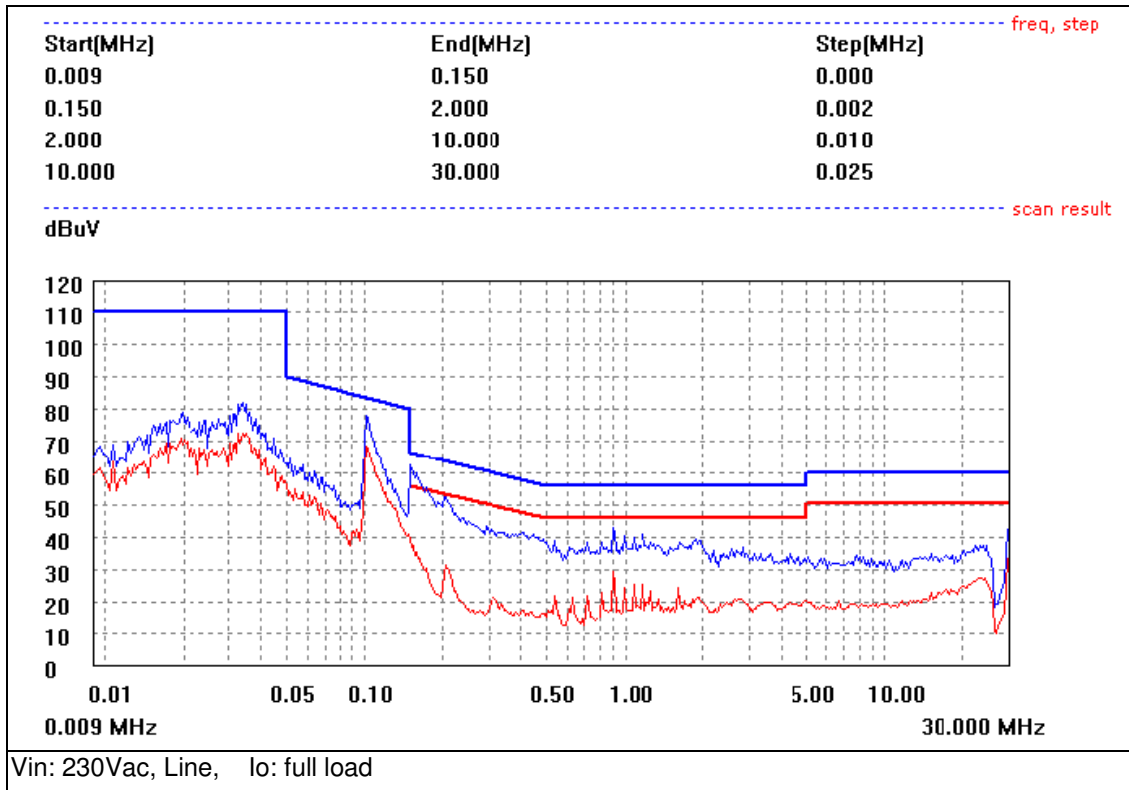
3.6 LINE REGULATION CURVE(4 LEDs)

3.7

Vin(Vac)	Freq(Hz)	Io(Arms)	Pass/Fail
85	60	0.426	
110	60	0.429	
132	60	0.430	
150	60	0.428	
180	50	0.428	
200	50	0.429	
230	50	0.431	
264	50	0.435	



4 EMI Test



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