



Texas Instruments

PMP4350 REVA Test Procedure

China Power Reference Design

REVA

3/1/2013



## 1 General

### 1.1 PURPOSE

To provide detailed data for evaluating and verifying the PMP4350.

### 1.2 REFERENCE DOCUMENTATION

Schematic PMP4350\_REVA\_SCH.PDF

Assembly PMP4350\_REVA\_PCB.PDF

BOM

### 1.3 TEST EQUIPMENTS

Multi-meter: Fluke 287

Power Analyser: PM100

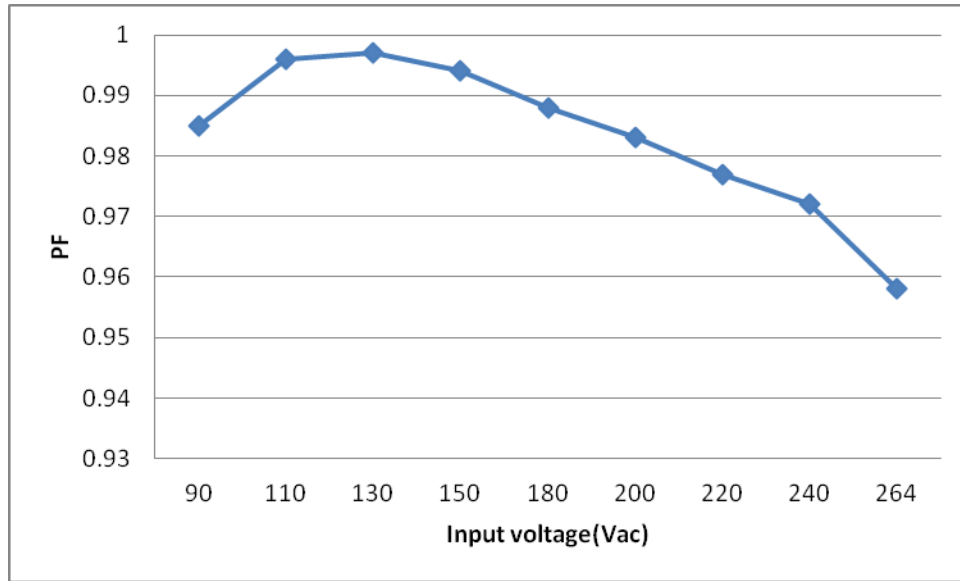
AC Source: Chroma 61503

Ambient Temperature at 25DegC

## 2: INPUT CHARACTERISTICS

### 2.1 Power Factor

Vin(Vac)	Freq(Hz)	PF	Io(Arms)
90	60	<b>0.985</b>	Full Load
110	60	<b>0.996</b>	Full Load
230	50	<b>0.975</b>	Full Load
264	50	<b>0.958</b>	Full Load

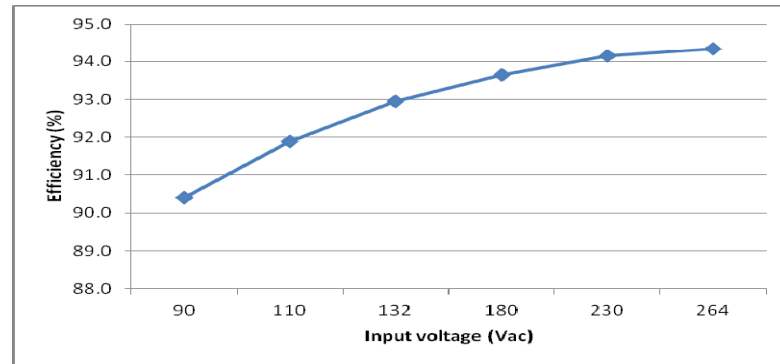


The test was executed under the condition of full load.

## 2.2: Efficiency

Vin(Vac)	Freq(Hz)	Pin	Po	Eff(%)
90	60	154.2	139.4	90.4
110	60	151.7	139.4	91.9
132	60	150.2	139.6	92.9

180	50	149.3	139.8	93.6
230	50	148.7	140	94.1
264	50	148.4	140	94.3



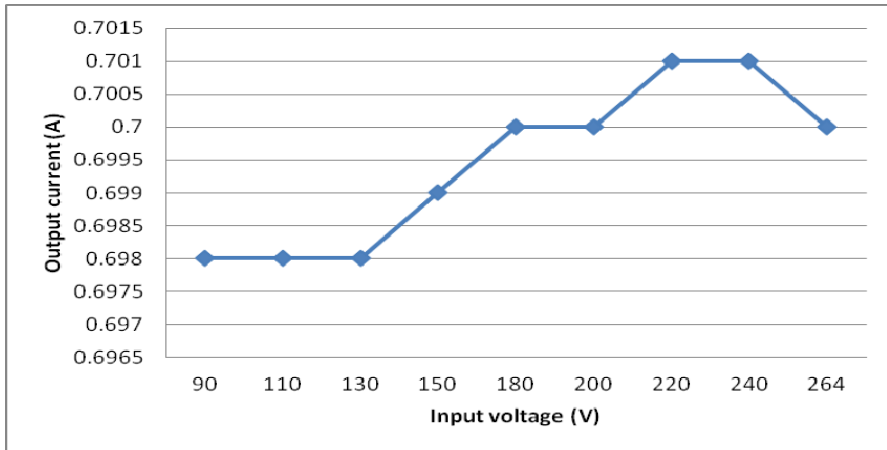
The test was executed under the condition of full load.

### 2.3: Maximum input current

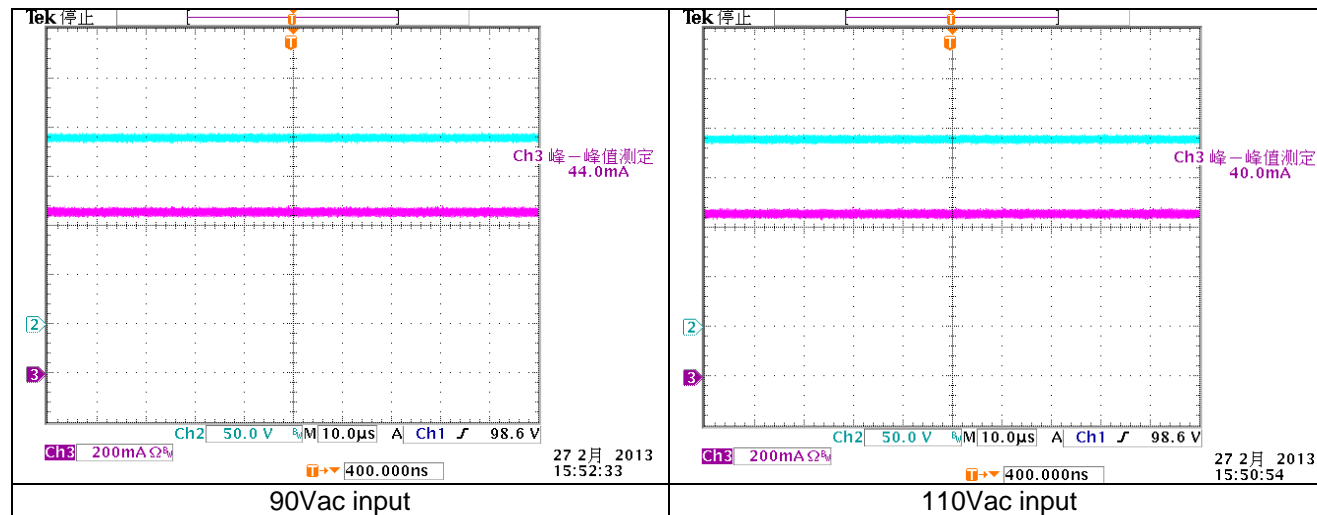
Vin(Vac)	Freq(Hz)	Iin(Arms)
90	60	1.701

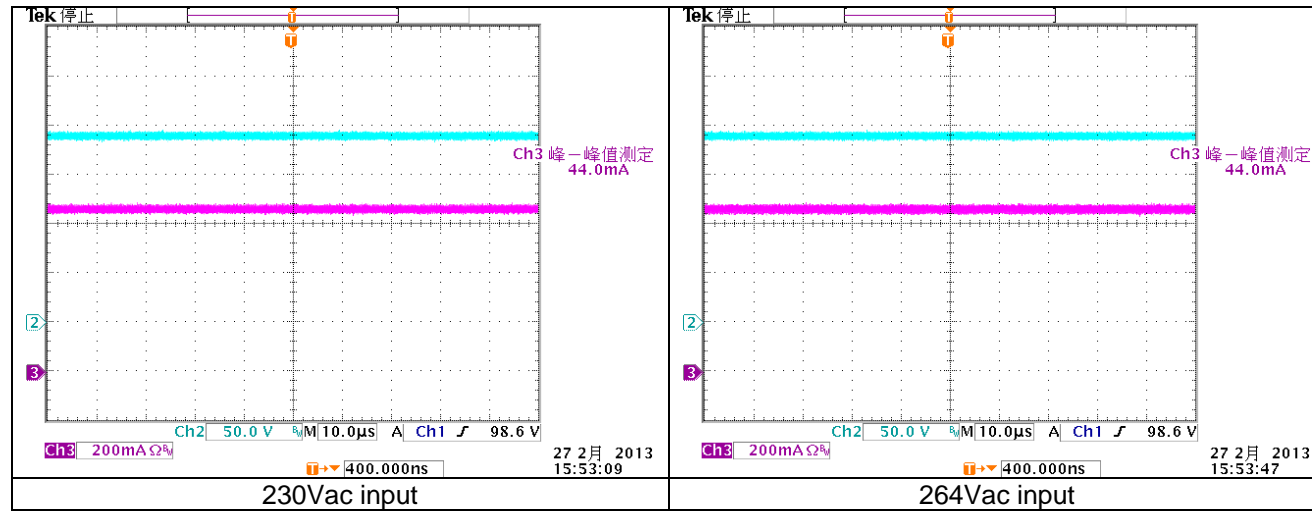
### 2.4: Output Current

Vin (Vac)	90	110	130	150	180	200	220	240	264
I <sub>o</sub> (A)	0.698	0.698	0.698	0.699	0.700	0.700	0.701	0.701	0.700



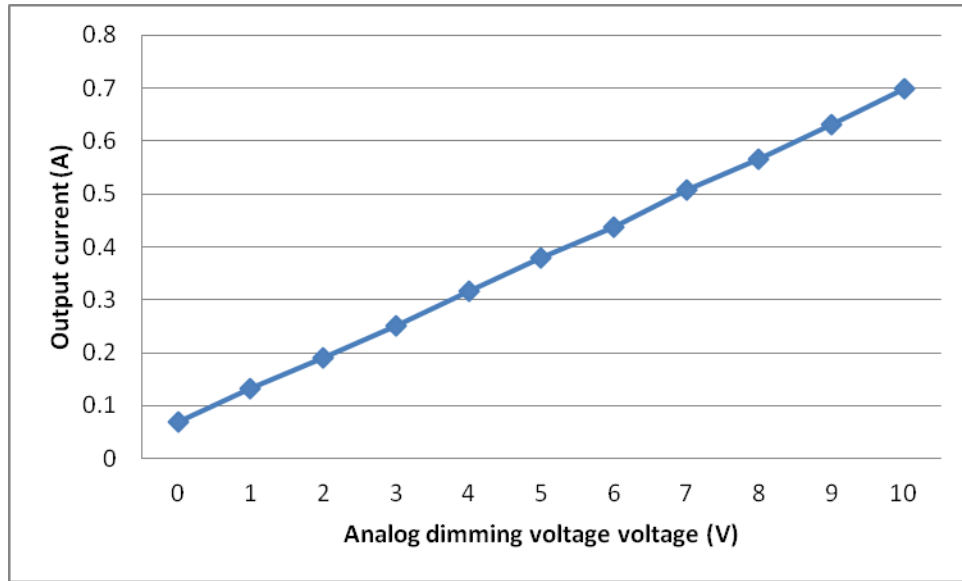
Output current ripple waveforms  
 CH2: LED Output Voltage 50V/Div  
 CH3: LED Output Current 200mA/Div





## 2.5: Output Analog Dimming Control

Dimming Voltage	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V
$I_o$ (A)	0.070	0.133	0.190	0.250	0.317	0.379	0.438	0.508	0.566	0.632	0.698



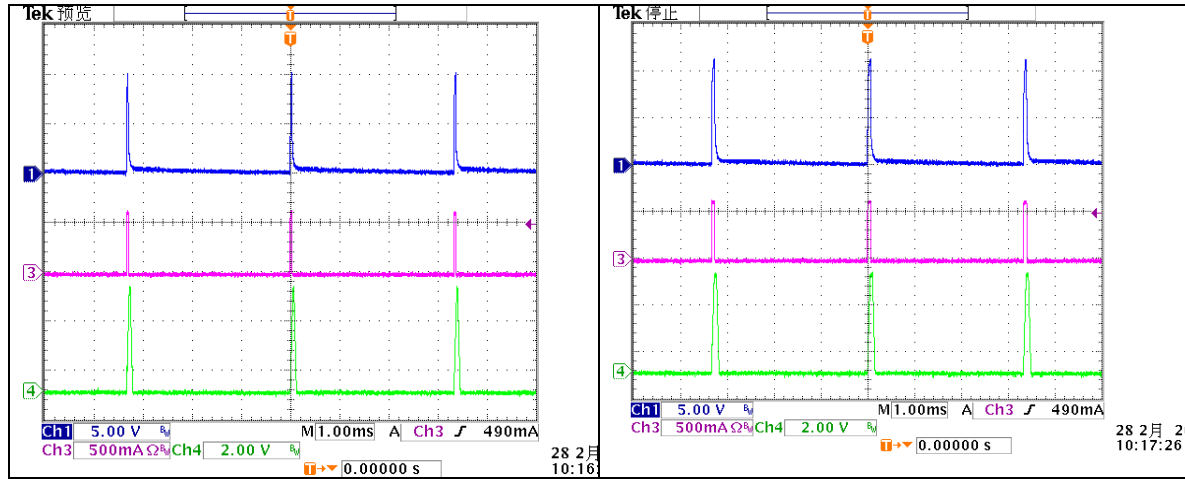
## 2.6: Output Dimming Control

230Vin		
Dimming	Io(mA)	%
1%	7.2	1.0
2%	14	2.0
5%	33	4.7
10%	65	9.3
20%	132	18.9
30%	200	28.7
40%	270	38.7
50%	337	48.4



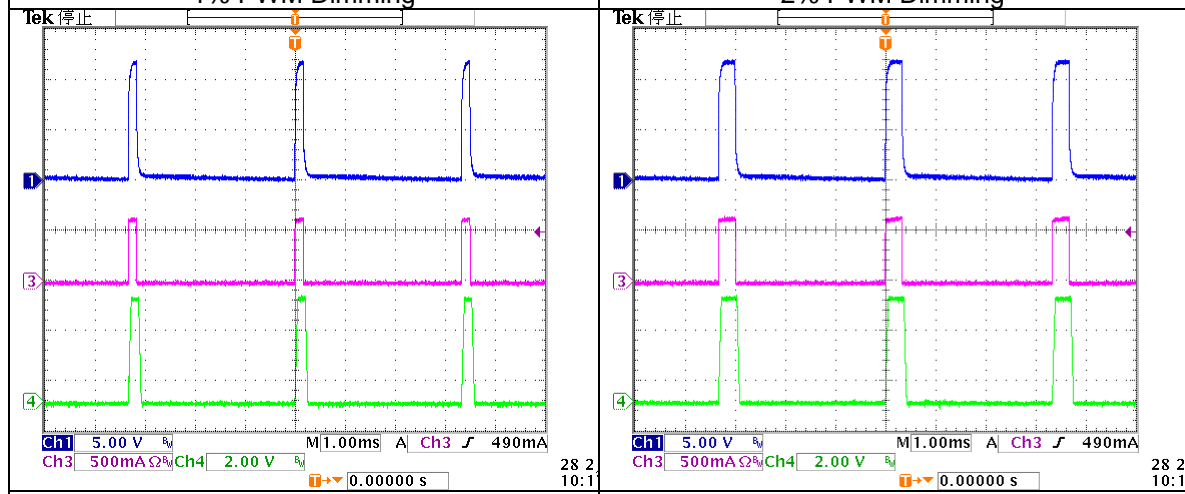
60%	407	58.4
70%	476	68.3
80%	547	78.5
90%	621	89.1
100%	697	100.0

1. Waveform from LED Output Current is controlled by 300Hz PWM dimming.  
It was tested under the condition of 230Vac input.  
CH1: LEDSW MOSFET Vgs 5V/Div      CH3: LED Output Current 500mA/Div  
CH4: DSR 2V/Div



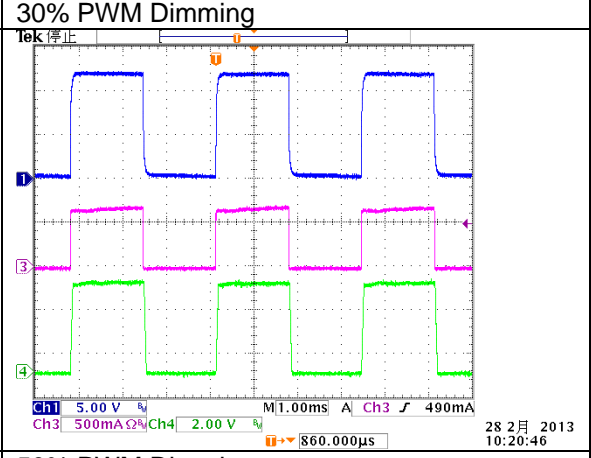
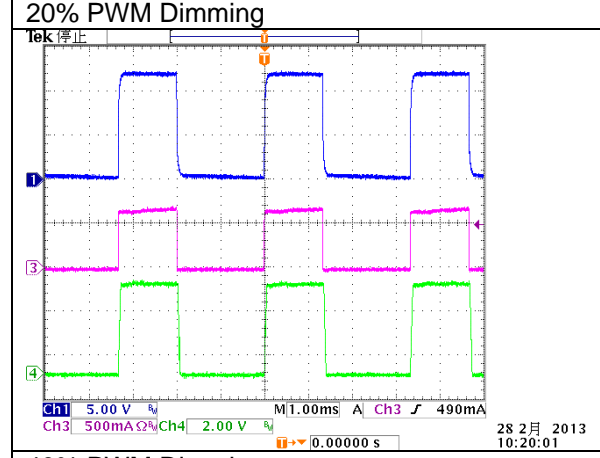
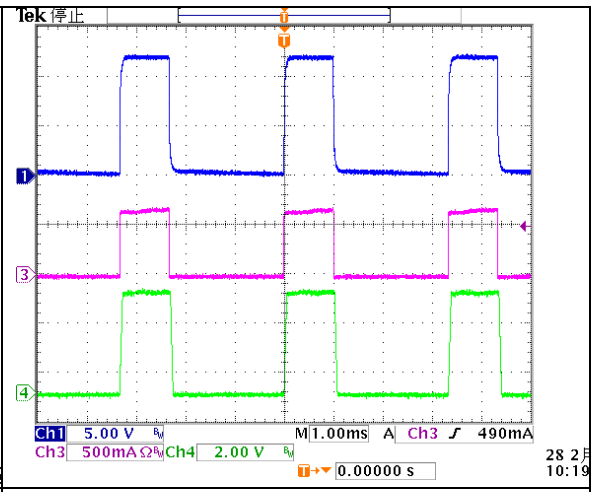
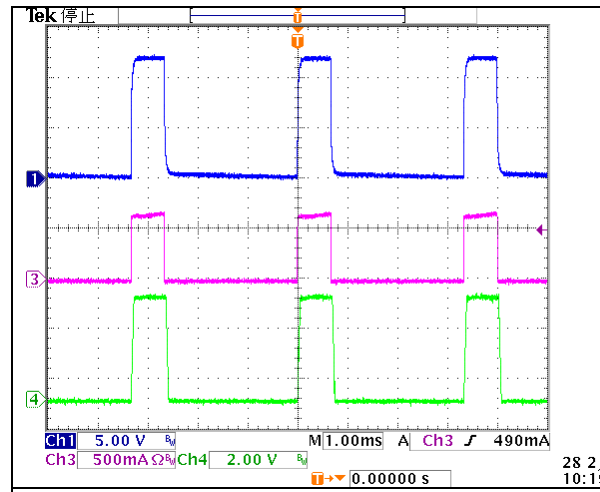
1% PWM Dimming

2% PWM Dimming



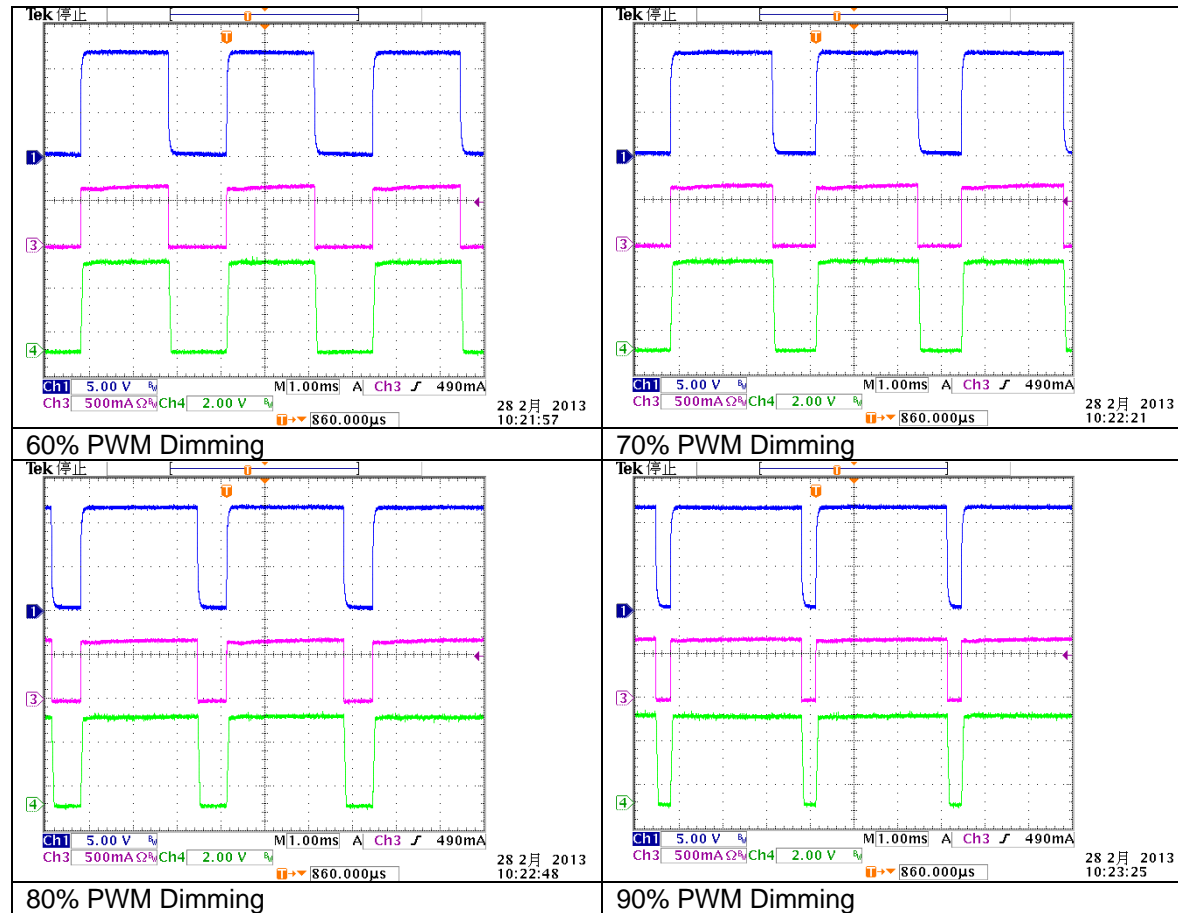
5% PWM Dimming

10% PWM Dimming

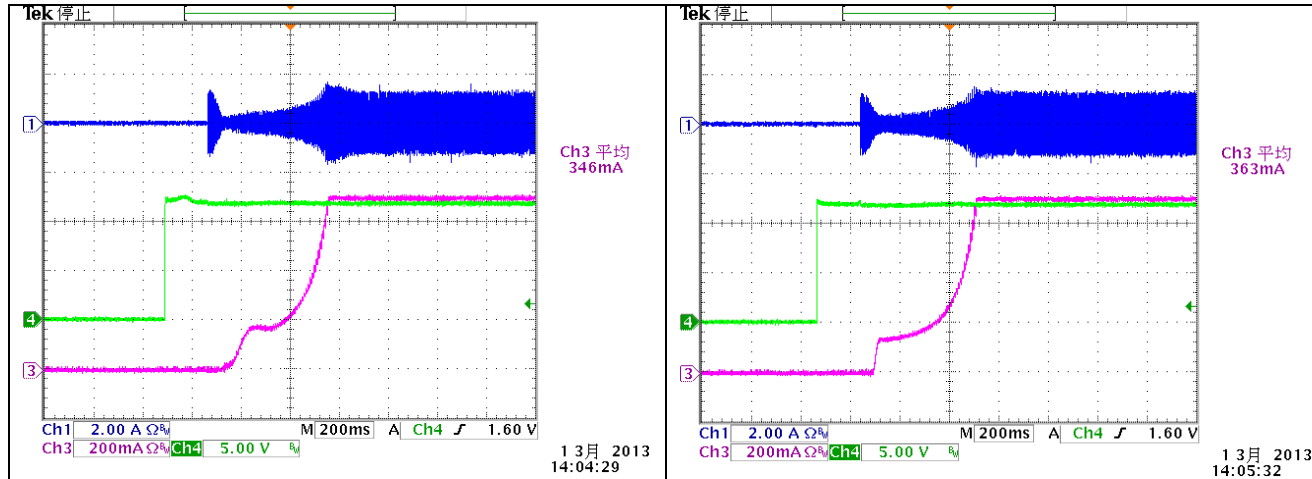


40% PWM Dimming

50% PWM Dimming

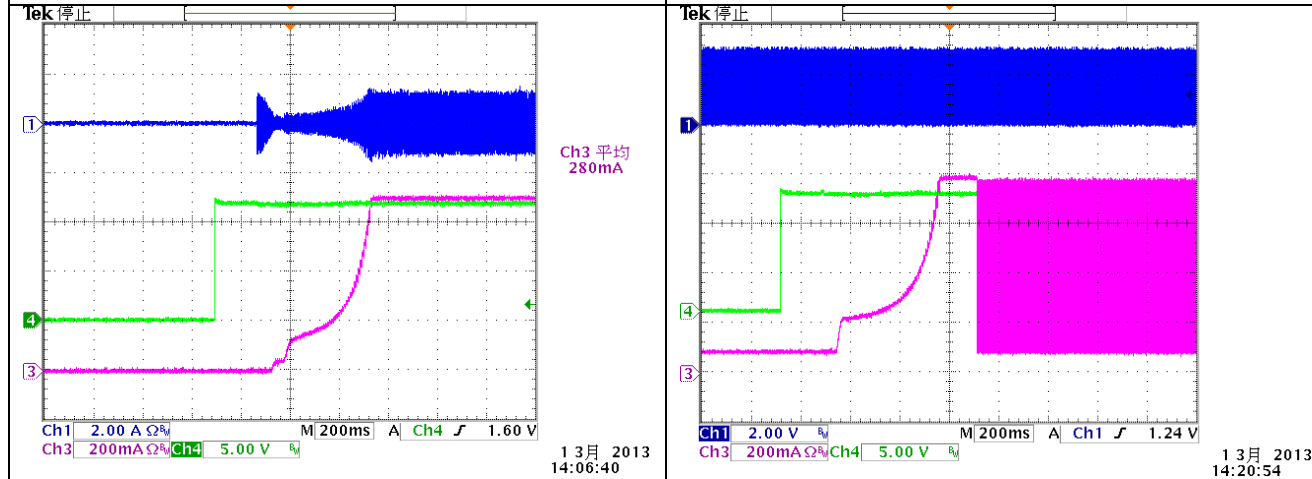


2.7: Start-up waveform



110Vac input  
 CH1: Primary Current 2A/Div  
 CH3: LED Output Current 200mA/Div  
 CH4: LEDSW MOSFET Vgs 5V/Div

230Vac input  
 CH1: Primary Current 2A/Div  
 CH3: LED Output Current 200mA/Div  
 CH4: LEDSW MOSFET Vgs 5V/Div



264Vac input

Start up with 50% dimming 230Vac input

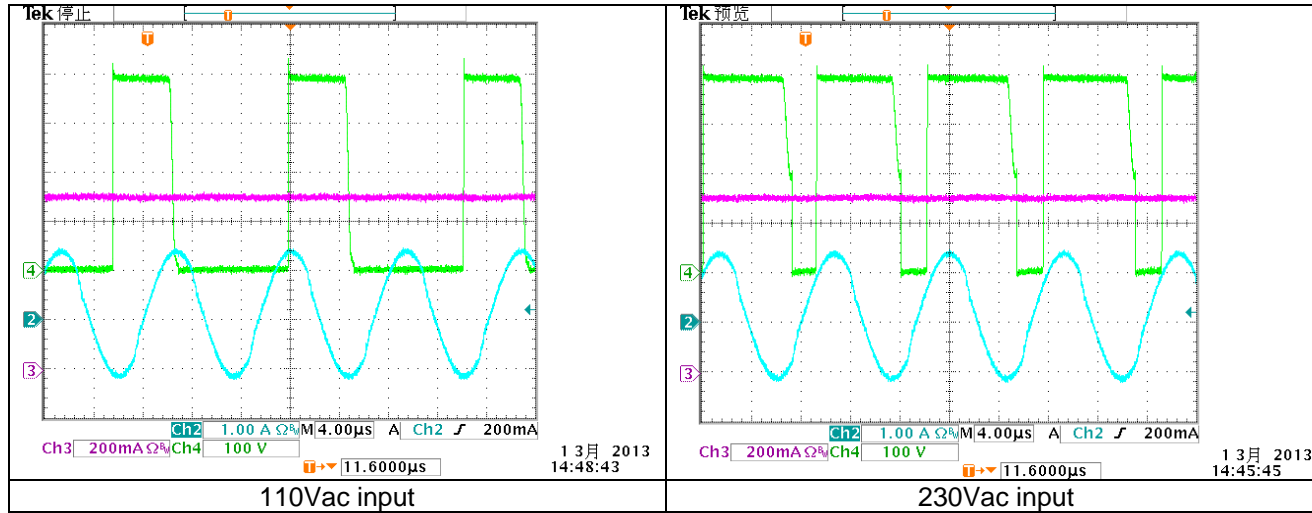
CH1: Primary Current 2A/Div  
CH3: LED Output Current 200mA/Div  
CH4: LEDSW MOSFET Vgs 5V/Div

CH1: Input Dimming signal 2V/Div  
CH3: LED Output Current 200mA/Div  
CH4: LEDSW MOSFET Vgs 5V/Div

## 2.8: Operating waveform

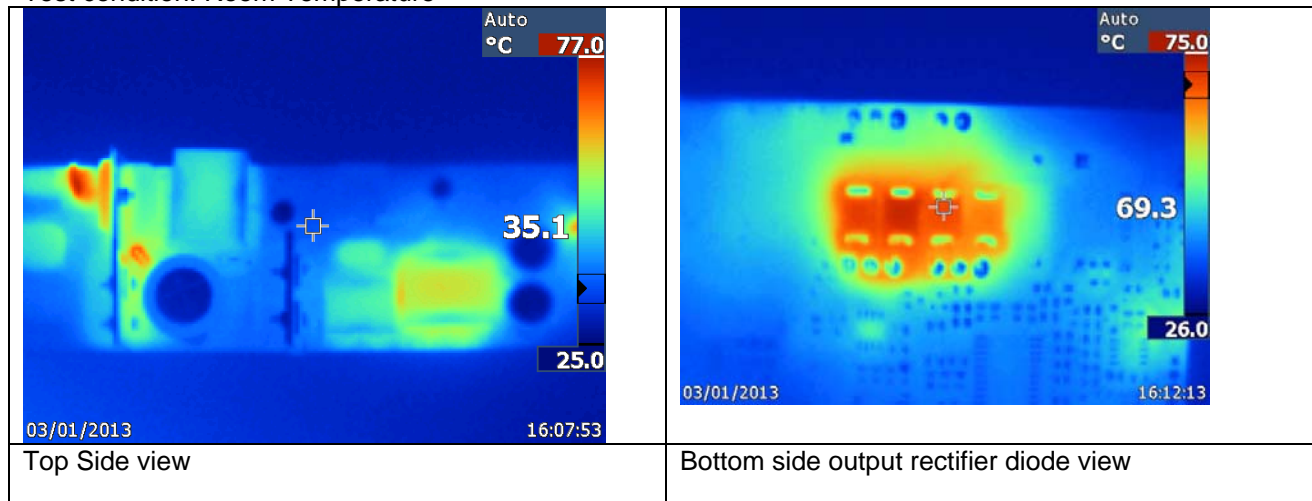
CH2: Primary Current 1A/Div  
CH4: Primary MOSFET Vds 100V/Div

CH3: LED Output Current 200mA/Div



## 2.9: Thermal Test

Test condition: Room Temperature

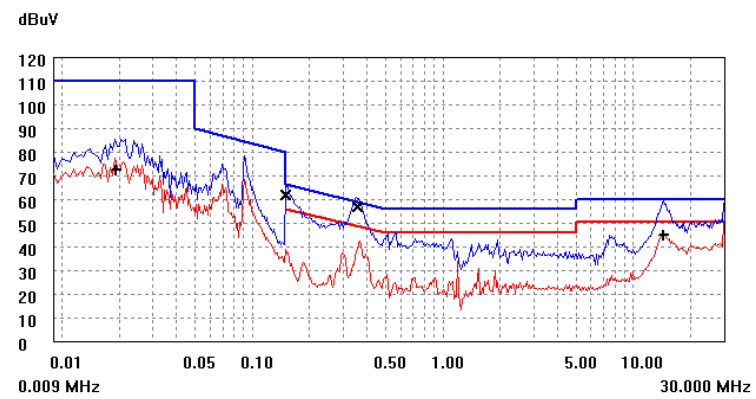


## 2.10: EMI test

Vin=230V

L6 changed to 20mH common mode choke (Wurth PN: 744824220)

L1 changed to 300uH difference mode choke (Wurth PN: 7447060)





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