Texas Instruments

PMP4443 Test Procedure

China Power Reference Design

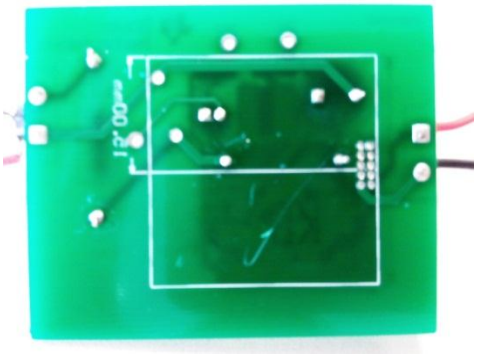
REV A

08/29/2014

1 GENERAL

1.1 PURPOSE

To provide detailed data for evaluating and verifying the PMP4443, which uses TI new Primary Side Controller UCC28910 for 20V0.1A power supply with 30mmx30mmx15mm. The below photo shows this demo board.



1.2 REFERENCE DOCUMENTATION

Schematic PMP4443_SCH.PDF
Assembly PMP4443_PCB.PDF
BOM.sxls

1.3 TEST EQUIPMENTS

Power-meter: YOKOGAWA WT210
Multi-meter(current): Fluke 8845A
Multi-meter(voltage): Fluke 187
AC Source: Chroma 61530
LED load: Chroma 63110A module
Testing demoboard: PMP4443

1.4 TEST DIAGRAM

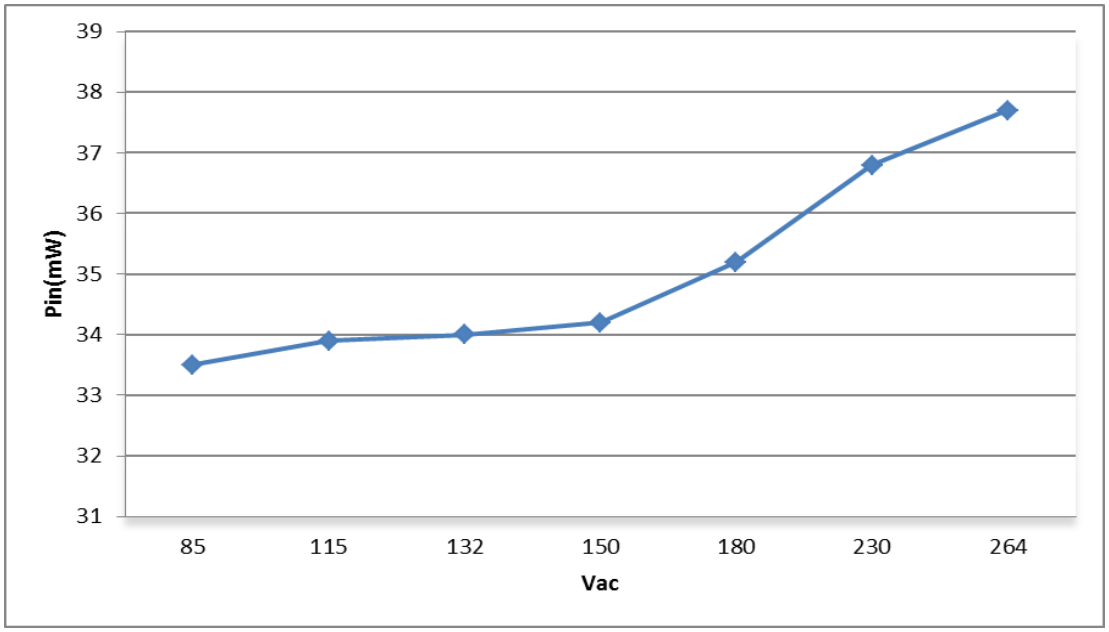
Input
85Vac~264Vac

PMP4443
20V 0.1A

Output
20V 100mA

2 INPUT CHARACTERISTICS

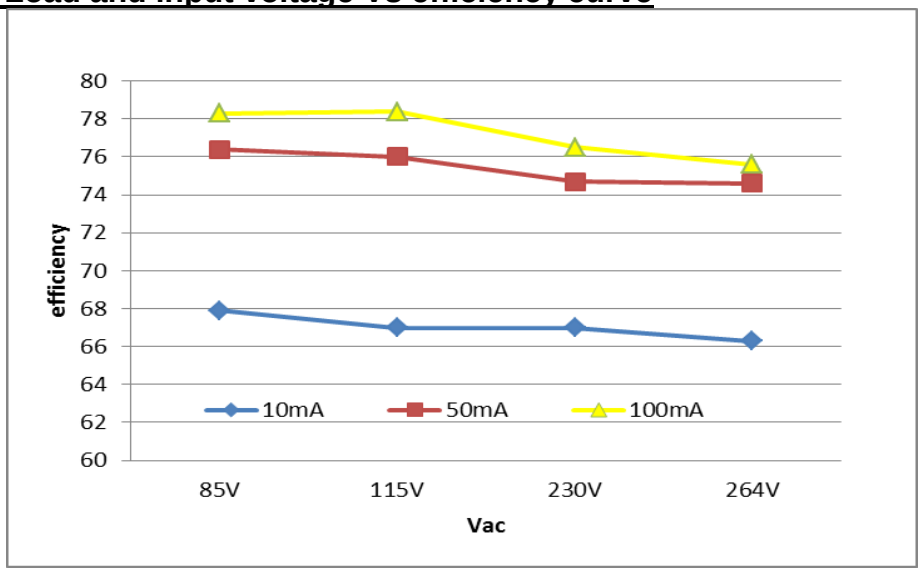
2.1 STANDBY POWER

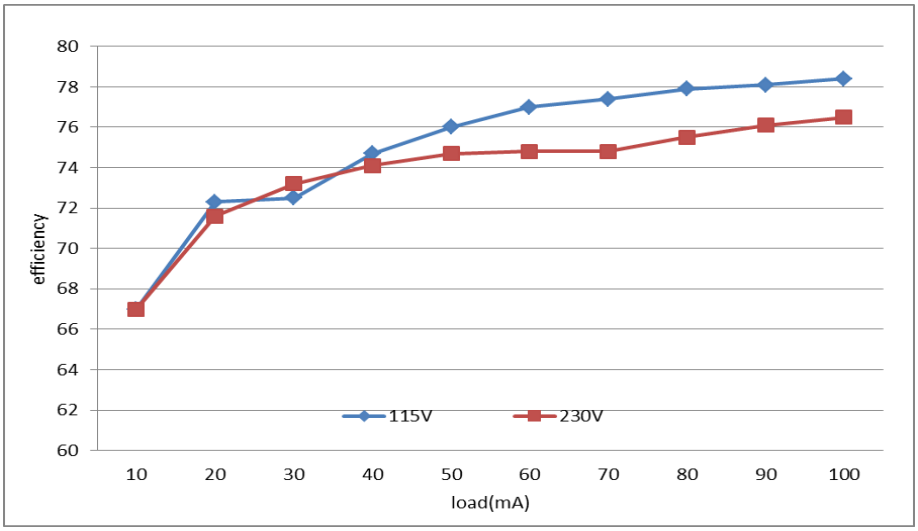


2.2 EFFICIENCY DATA

85V				115V			
负载电流（mA）	输出电压（V）	输入功率（W）	效率%	负载电流（mA）	输出电压（V）	输入功率（W）	效率%
10	19.96	0.294	67.9	10	19.97	0.298	67
20	19.95	0.573	69.6	20	19.93	0.551	72.3
30	19.94	0.815	73.4	30	19.96	0.826	72.5
40	19.94	1.06	75.2	40	19.96	1.069	74.7
50	19.95	1.306	76.4	50	19.97	1.313	76
60	19.96	1.554	77.1	60	19.97	1.557	77
70	19.97	1.802	77.6	70	19.97	1.805	77.4
80	19.97	2.051	77.9	80	19.97	2.052	77.9
90	19.98	2.301	78.1	90	19.98	2.302	78.1
100	19.99	2.552	78.3	100	20	2.552	78.4
230V				264V			
负载电流（mA）	输出电压（V）	输入功率（W）	效率%	负载电流（mA）	输出电压（V）	输入功率（W）	效率%
10	19.98	0.298	67	10	19.95	0.301	66.3
20	19.97	0.558	71.6	20	19.94	0.559	71.3
30	19.95	0.818	73.2	30	19.97	0.817	73.3
40	19.93	1.076	74.1	40	19.97	1.08	74
50	19.91	1.332	74.7	50	19.96	1.338	74.6
60	19.97	1.602	74.8	60	19.96	1.6	74.9
70	19.98	1.871	74.8	70	19.97	1.867	74.9
80	19.98	2.117	75.5	80	19.96	2.14	74.6
90	19.98	2.364	76.1	90	19.96	2.392	75.1
100	19.98	2.612	76.5	100	19.95	2.64	75.6

2.2.1 Load and input voltage Vs efficiency curve

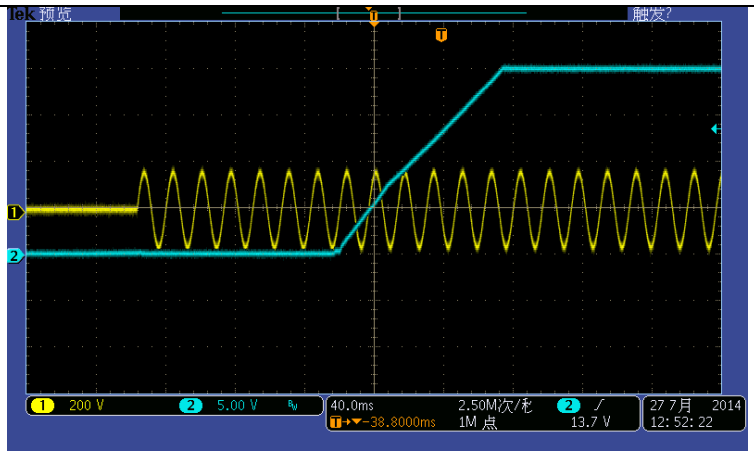




3 OUTPUT CHARACTERISTICS

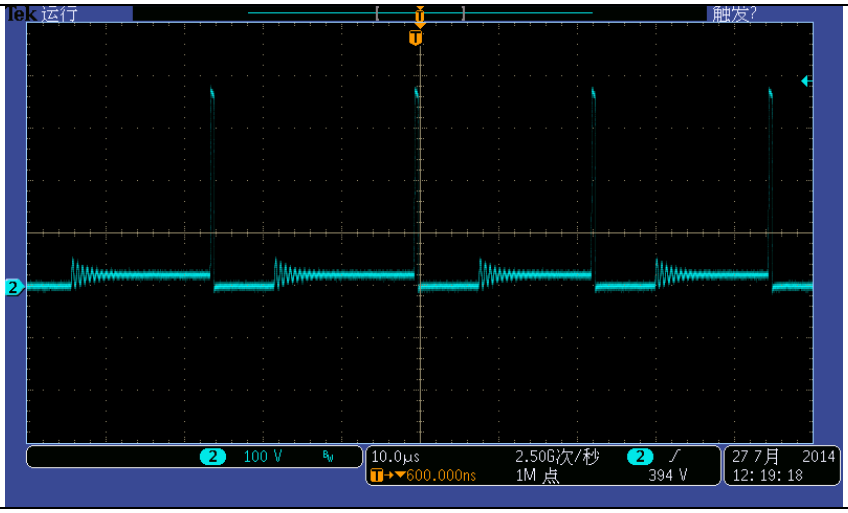
3.1 STARTUP AND OUTPUT VOLTAGE

Input voltage	Output current	Startup time	Pass/Fail
115Vac	75mA	**92mS**	
230Vac	75mA	**64ms**	



Vin:115Vac Io: 75mA
Ch1: Input voltage, 200V/div
Ch2: output voltage, 5V/div

3.2 freewheel diode voltage waveform

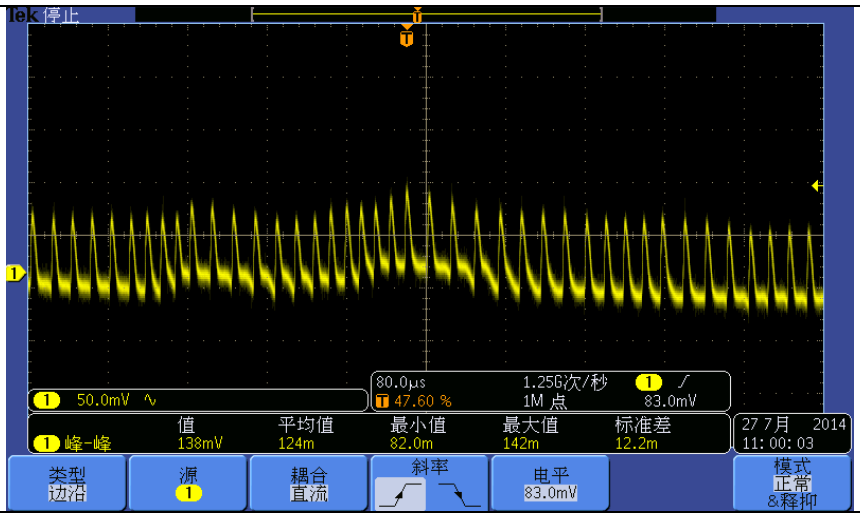


Vin:264Vac Io: 100mA

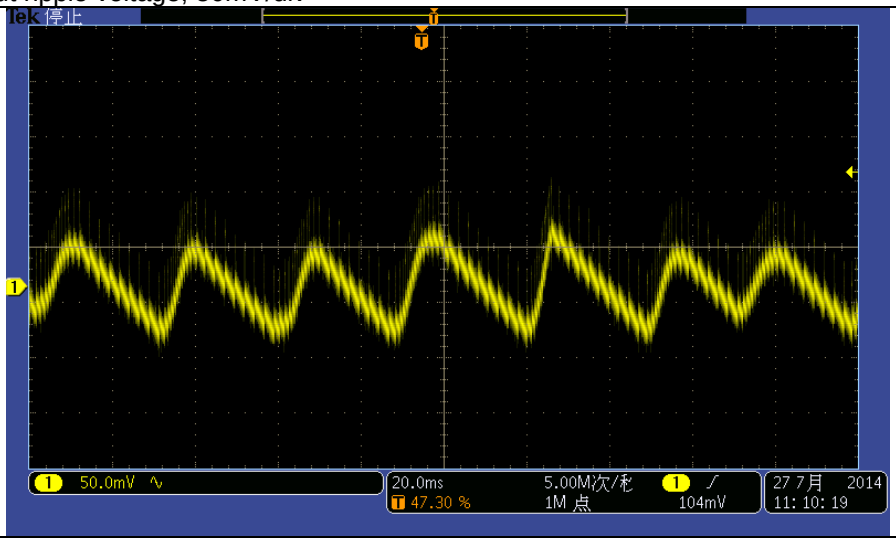
1.1 Ch2: freewheel diode voltage waveform, 100V/div

1.2 RIPPLE VOLTAGE

Input voltage	Output current	Ripple voltage	Pass/Fail
115Vac	100mA	**138mV**	
230Vac	0	**90mV**	



Vin:115Vac Io: 100mA
Ch2: output ripple voltage, 50mV/div



Vin:230Vac Io: 0mA
Ch2: output ripple voltage, 50mV/div

4 EMI Test_CE

EMI TEST REPORT

parameter

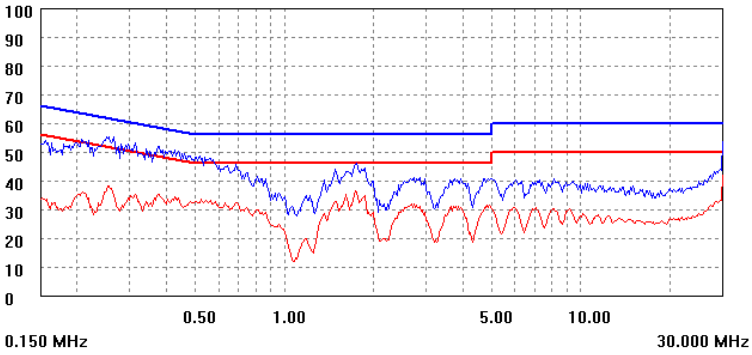
Organization:		Operator:		EUT:	
Place:		Time:	2014/8/26/20:13	Test equipment:	KH3939
Detector:	PK+AV	Test-time(ms):	30	SN:	1139203
Limit:	EN55022B	Transductor(PK/AV):	10 / 10		
Remark:					

freq, step

Start(MHz)	End(MHz)	Step(MHz)
0.150	2.000	0.002
2.000	10.000	0.010
10.000	30.000	0.025

scan result

dBuV



Vin: 115Vac, Line, Io: 100mA
Test condition:200R load resistor

EMI TEST REPORT

parameter

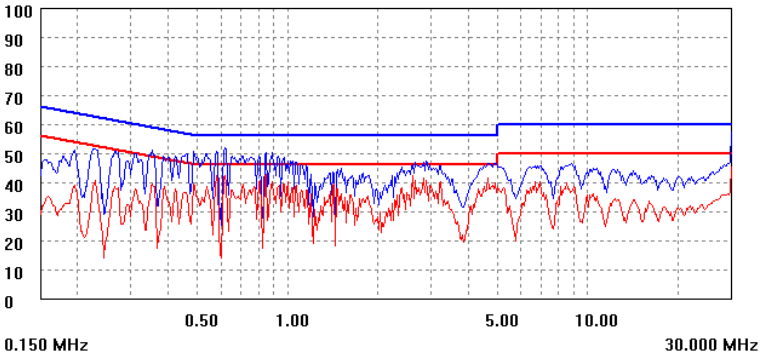
Organization:		Operator:		EUT:	
Place:		Time:	2014/8/26/20:19	Test equipment:	KH3939
Detector:	PK+AV	Test-time(ms):	30	SN:	1139203
Limit:	EN55022B	Transductor(PK/AV):	10 / 10		
Remark:					

freq, step

Start(MHz)	End(MHz)	Step(MHz)
0.150	2.000	0.002
2.000	10.000	0.010
10.000	30.000	0.025

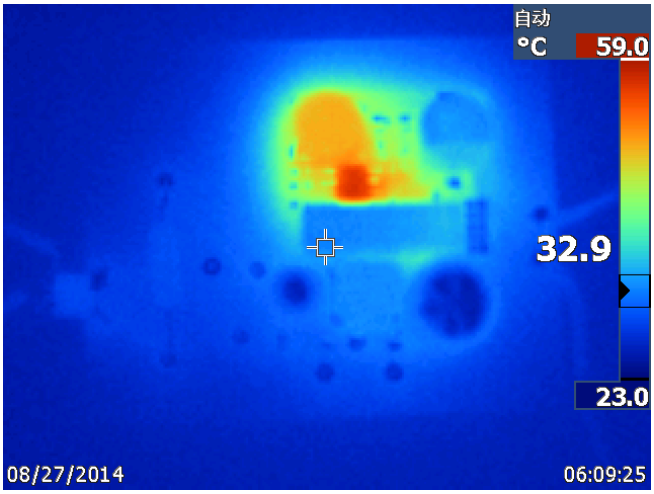
scan result

dBuV

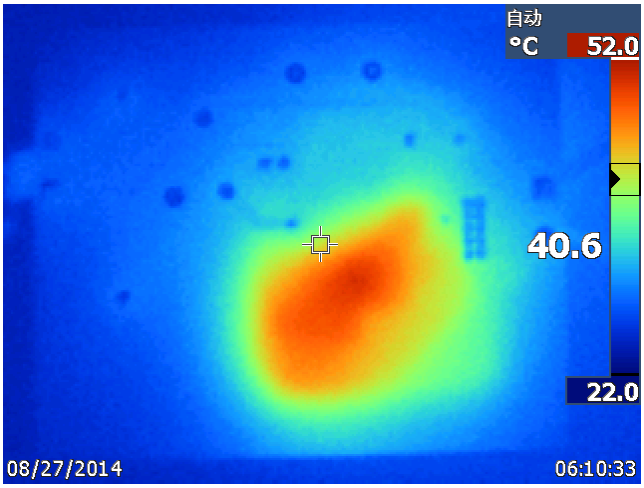


Vin: 230Vac, Line, Io: 100mA
Test condition: 200R load resistor

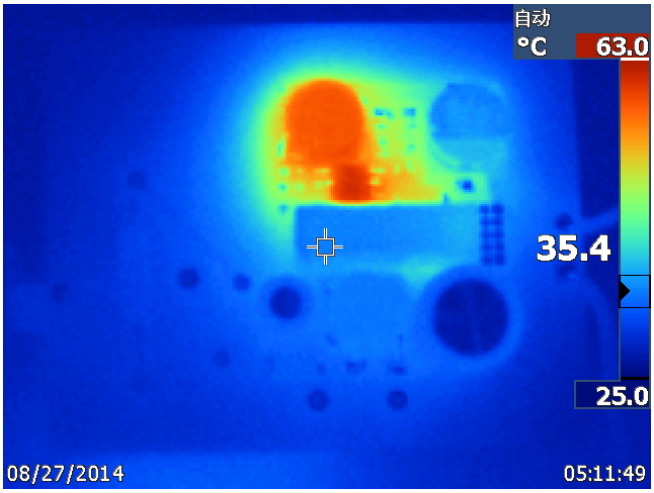
5 Thermal Test At 25˚C Ta



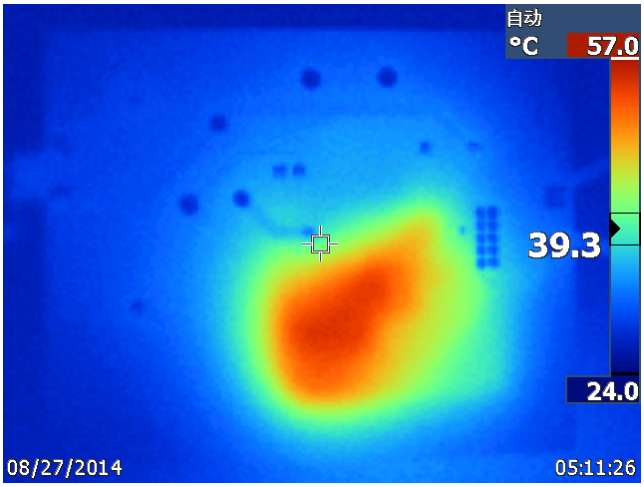
85Vac 100mA Top Side



85Vac 100mA Bottom Side



265Vac 100mA Top Side



265Vac 100mA Bottom Side

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale (https:www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

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