Texas Instruments

PMP4305 Test Procedure

China Power Reference Design

REV A

01/07/11

1 General

1.1 PURPOSE

To provide detailed data for evaluating and verifying the PMP4305

1.2 REFERENCE DOCUMENTATION

Schematic PMP4305_SCH.PDF
Assembly PMP4305_PCB.PDF
BOM

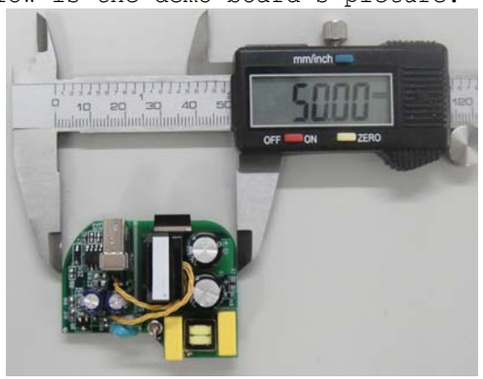
1.3 TEST EQUIPMENTS

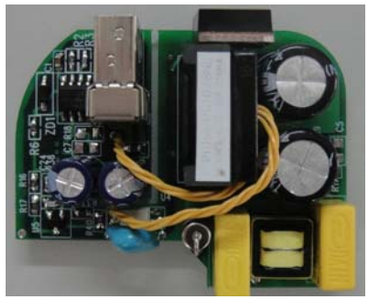
Multi-meter:	Fluke 187
AC Source:	Chroma 61503
E-load:	Chroma 63103
Oscilloscope:	DPO4104
Power Meter:	WT210

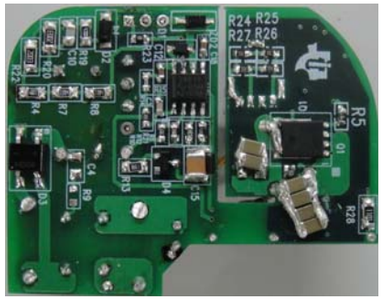
Note: the below result in test under 30uf input E-cap, SPP04N80C3 mosfet and 30V syn-mosfet CSD17310.

2 Demo board size

The demo board size is 50mm(L)x 39mm(W) 20mm(H). The below is the demo board's picture.







3 Electric Performance

3.1 Voltage Tolerances

Spec Requirement: Min:5.45V Nominal:5.6V max:5.8V

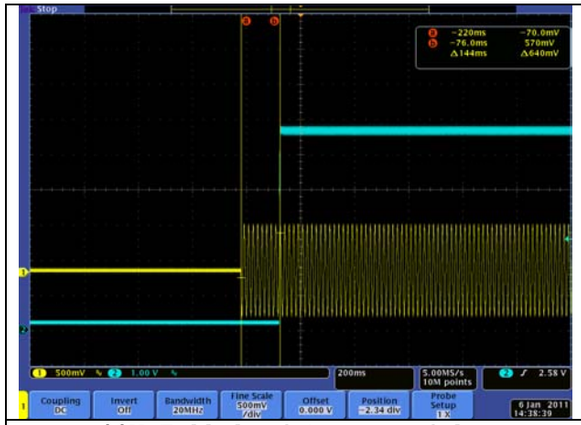
Test Result:

Vin(Vac)	0A	3A
115	5.603V	5.600V
230	5.605V	5.601V

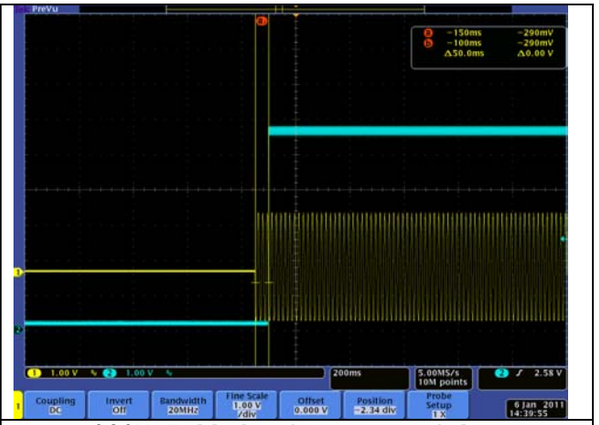
3.2 Timing

3.2.3 Turn on delay

Spec Requirement: Turn on Delay: 4S maximum at 100Vac
5S maximum 90Vac to 100Vac



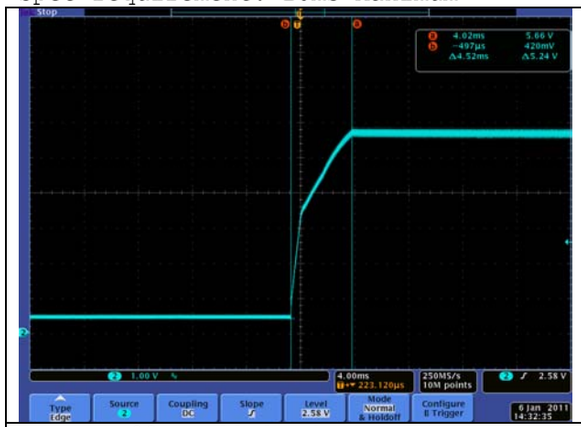
90V Full load turn on delay



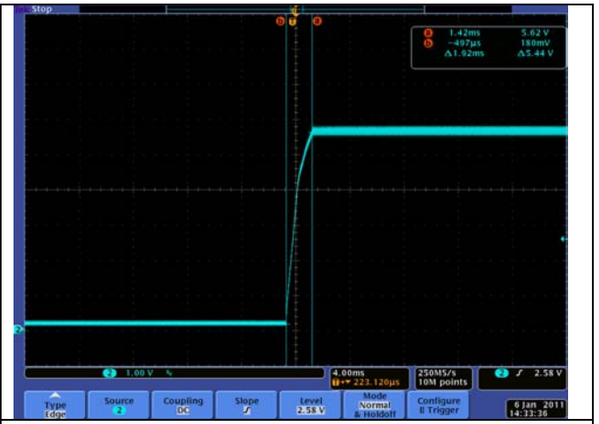
230V Full load turn on delay

3.2.3 **Output Rise time**

Spec requirement: 20ms Maximum



90V Full load Rise time



230V Full load Rise time

3.2.3 Dynamic Load Response

Spec Requirement: Voltage Limits:	**Min.**	**Max.**	**Slew Rate**
	5.3V	5.8V	0.5A/µS

Load Change:

0A to 1A and back
1A to 2A and back
2A to 3A and back
80mA to 1.5A and back
80mA to 3.0A back

115Vin Dynamic Performance

	
115Vin 0A to 1A	115Vin 1A to 2A

	
115Vin 2A to 3A	115Vin 80mA to 1.5A
	
115Vin 80mA to 3A	

230Vin Dynamic Performance

230Vin 0A to 1A

230Vin 1A to 2A

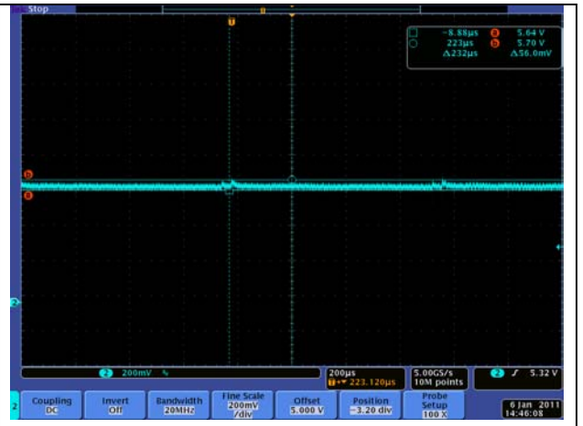
230Vin 2A to 3A

230Vin 80mA to 1.5A

	
230Vin 80mA to 3A	

3.3 Output Ripple

Spec Requirement: 200mVpp

	
115Vin no load Ripple	230Vin no load Ripple
	
115Vin half load Ripple	230Vin half load Ripple

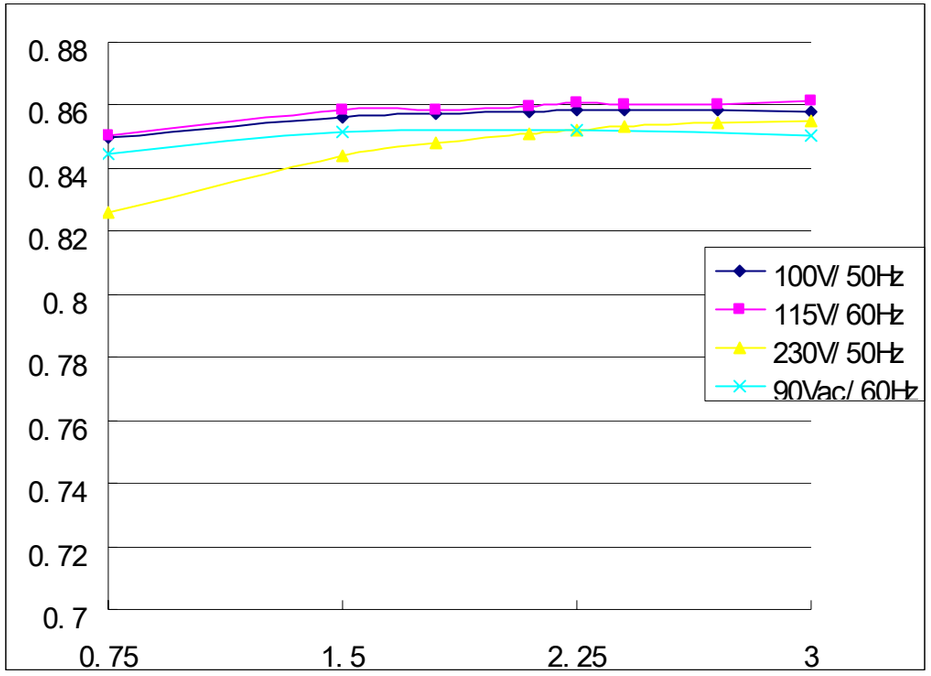
	
115Vin Full load Ripple	230Vin Full load Ripple

3.4 Efficiency

For inputs of 100Vac/50Hz with a 3A loading condition, efficiency: >84% at the USB connector end.
For inputs of 100Vac/50Hz, 115Vac/60Hz and 230Vac/50Hz, average efficiency at 25%, 50%, 75%, and full load shall be ≥ 80%.

Vin	Io	Vo	Pin	Eff
100Vac/50Hz	0.75	5.605	4.948	0.849586
	1.5	5.604	9.816	0.856357
	2.25	5.604	14.685	0.858631
	3	5.603	19.595	0.857821
115Vac/60Hz	0.75	5.605	4.944	0.850273
	1.5	5.604	9.793	0.858368
	2.25	5.603	14.633	0.861529
	3	5.602	19.51	0.861404
230Vac/50Hz	0.75	5.605	5.09	0.825884
	1.5	5.605	9.96	0.844127

	2.25	5.604	14.8	0.851959
	3	5.601	19.65	0.855115



3.5 No load Power

Spec Requirement: For inputs of 100Vac/50Hz, 115Vac/60Hz and 230Vac/50Hz, no-load power shall be ≤ 0.15W

Test Result:

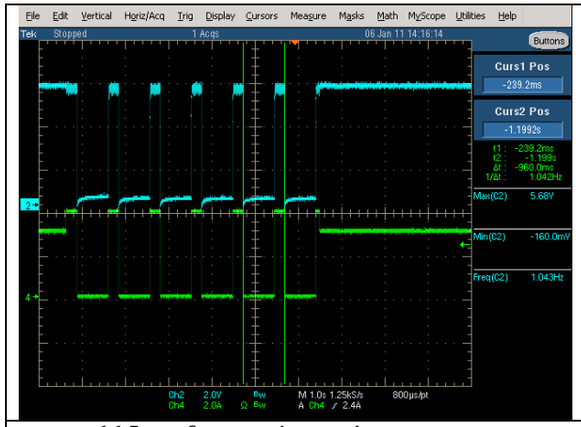
Vin	Pin(Zero load)
100V/50Hz	0.105W
115V/60Hz	0.107W

230V/50Hz	0.148W

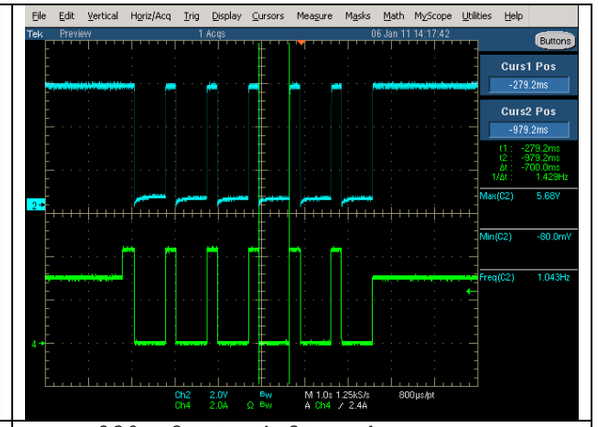
3.6 Over Load Protection

Spec Requirement: Continuous overload currents on the output rail will cause the protection to trip before the load current reaches or exceeds 4.0A.
The PSU shall resume normal operation once the overload is removed.

230V input voltage condition; the unit can't OCP at 4A, but can at 4.3A.



115V 3A to 4A and recovery



230V 3A to 4.3A and recovery

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