Texas Instruments

PMP4351 Test Procedure

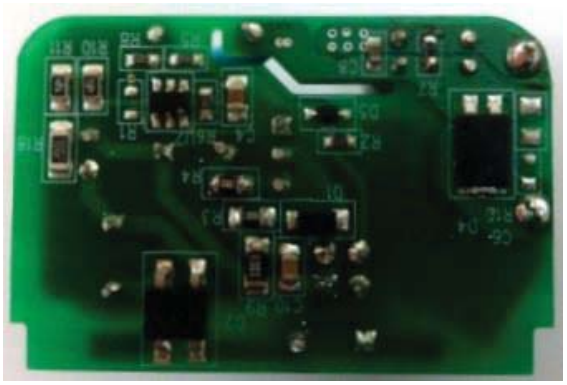
China Power Reference Design

9/13/2012

1 GENERAL

1.1 PURPOSE

To provide detailed data for evaluating and verifying the PMP4351, which uses TI new Primary Side Controller UCC28700. The below photo shows this demo board.



1.2 REFERENCE DOCUMENTATION

Schematic PMP4351_SCH.PDF
Assembly PMP4351_PCB.PDF
BOM PMP4351_RevB_ Bom.pdf

1.3 TEST EQUIPMENTS

Power-meter: YOKOGAWA WT210
Multi-meter(current): Fluke 187
Multi-meter(voltage): Fluke 187
AC Source: Chroma 61503
E-Load: Chroma 63103A module

2 INPUT CHARACTERISTICS

Otherwise Specified, the test is under the condition With LED electric Load (Chroma 63103A).

2.1 EFFICIENCY

Eff over Vin (full load)

Vin(Vac)	Freq(Hz)	Pin(W)	Vo(V)	Io(A)	Eff(%)	Pass/Fail
90	60	12.904	5.1039	1.9931	78.83	
110	60	12.696	5.1073	1.9931	80.18	
180	50	12.545	5.1064	1.9931	81.13	
220	50	12.582	5.1034	1.9931	80.84	
240	50	12.632	5.1002	1.9931	80.47	
265	50	12.728	5.1007	1.9931	79.87	

Eff over Io (Vin: 220V/50Hz)

Io(A)	Vo(V)	Pin(W)	Eff(%)	Pass/Fail
1.9931	5.1019	12.592	80.75	
1.7963	5.0947	11.356	80.59	
1.4972	5.0868	9.472	80.40	
1.1972	5.0732	7.581	80.12	
1.0031	5.0643	6.351	79.99	
0.8081	5.0596	5.129	79.72	
0.5072	5.0602	3.279	78.27	
0.2091	5.0845	1.478	71.94	
0.1031	5.0827	0.792	66.17	

2.2 STANDBY POWER LOSS

Vin(Vac)	Freq(Hz)	Pin(mW)	Pass/Fail
110	60	**24**	
220	50	**35**	

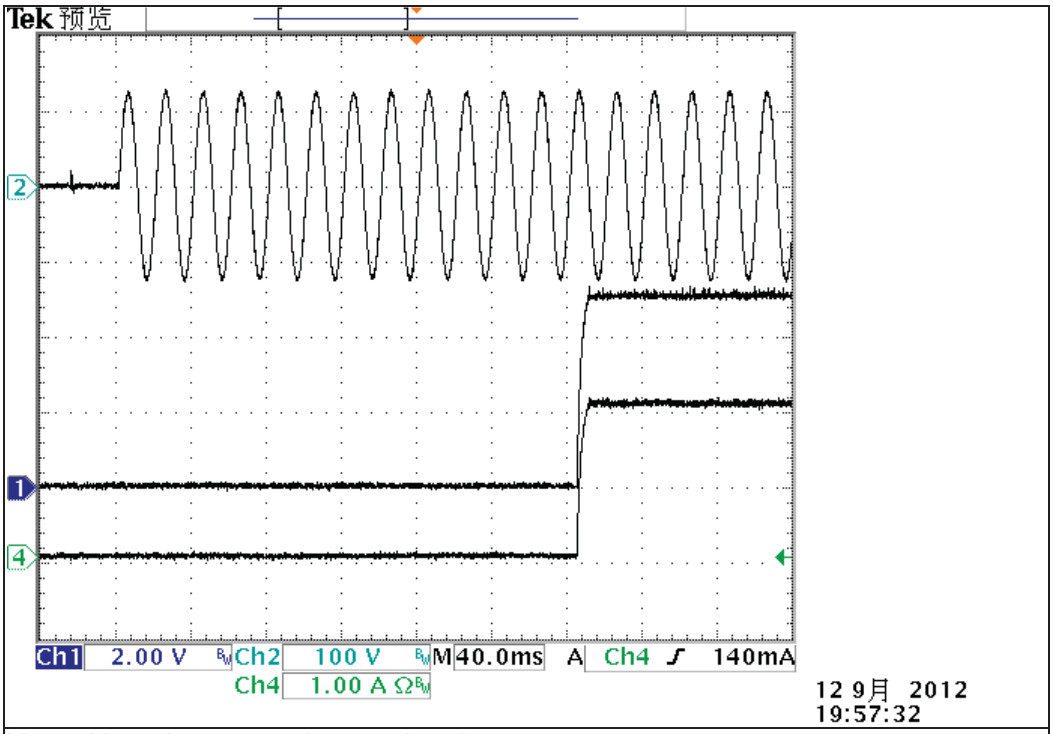
3 OUTPUT CHARACTERISTICS

3.1 OUTPUT VOLTAGE RIPPLE (full load)

ITEM	Vout (V)	Vout-ripple (mV)	Pass/Fail
Vin=110Vac	5	120	
Vin=220Vac	5	120	

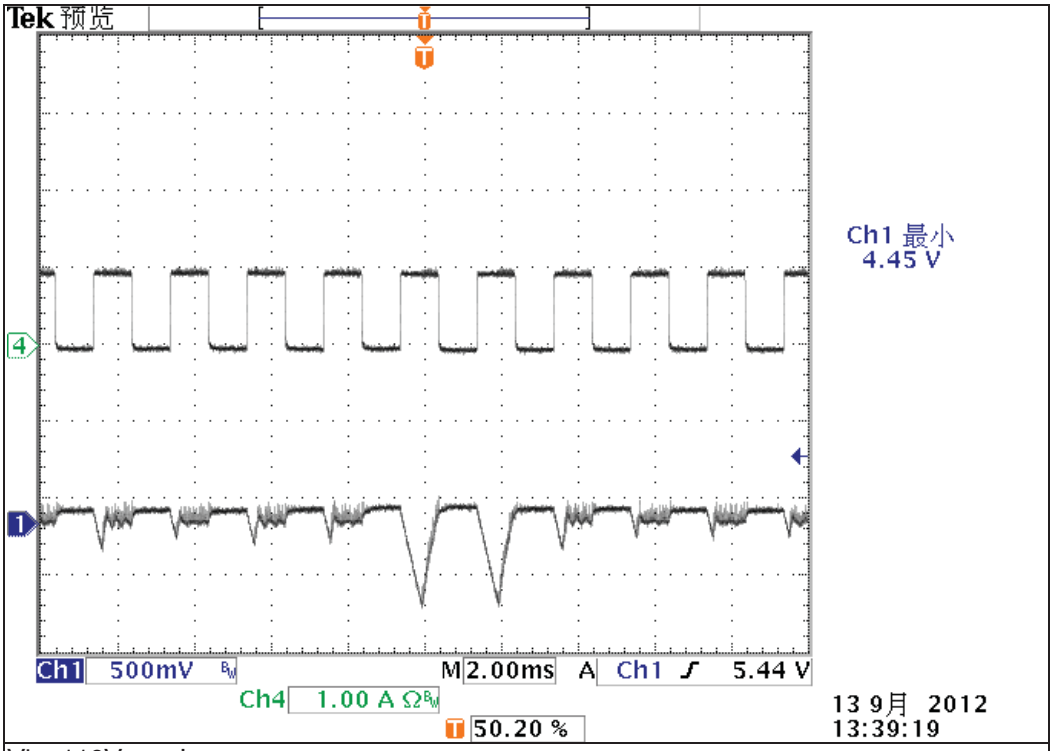
3.2 TURN ON DELAY AND RIPPLE CURRENT

CONDITIONS		Delay time (S)	Pass/Fail
Vin (Vac)	Load		
90	Full load	0.26	

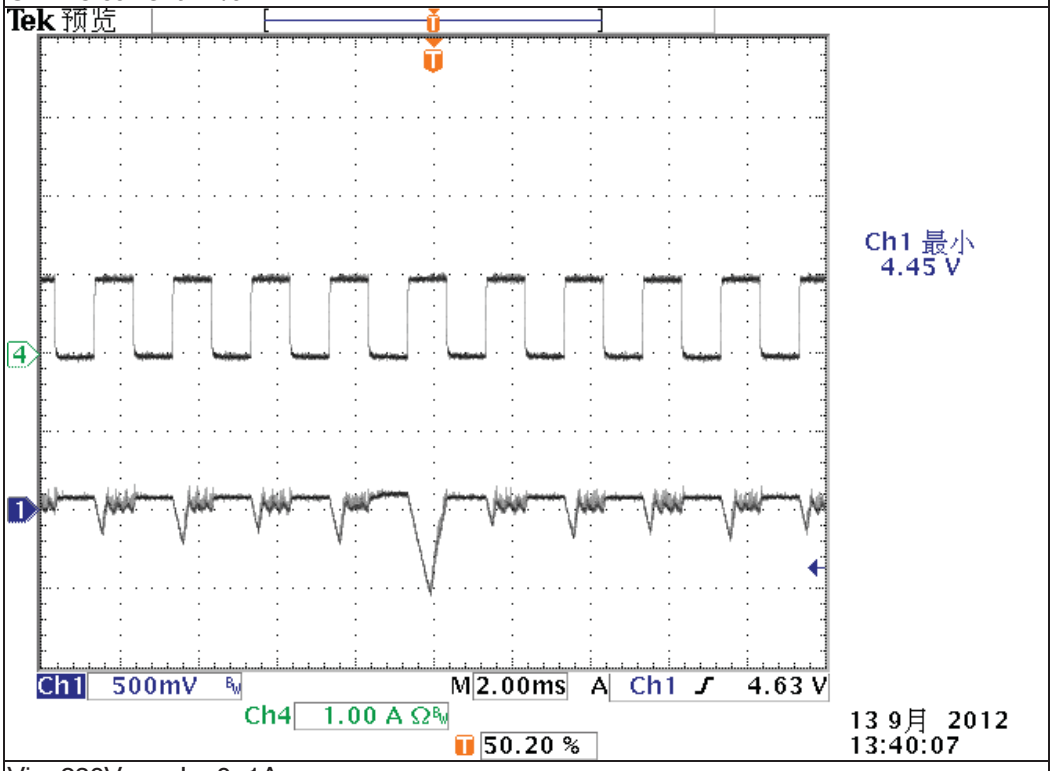


Vin: 90Vac Io: full load (resistor Load)
Ch1: Vo voltage, 2V/div
Ch2: Vin voltage, 100V/div
Ch4: Io current 1A/div

3.3 Load Transient



Vin: 110Vac Io: 0~1A
Ch1: Vo voltage, 500mV/div (5V offset)
Ch4: Io current 1A/div



Vin: 230Vac Io: 0~1A
Ch1: Vo voltage, 500mV/div (5V offset)
Ch4: Io current 1A/div

3.4 OUTPUT CURRENT PROTECTION

CONDITIONS Vin (Vac)	Protection current（A）	Pass/Fail
110&220	2.1	

3.5 OUTPUT SHORT PROTECTION

Okay

3.6 LINE REGULATION (FULL LOAD)

Vin(Vac)	Freq(Hz)	Vo(V)	Pass/Fail
90	60	5.0936	
110	60	5.0945	
180	50	5.0954	
220	50	5.0941	
240	50	5.0928	
265	50	5.0921	

3.7 OUTPUT REGULATION

Vo over Io (Vin: 220V/50Hz)

Io(A)	Vo(V)	Pass/Fail
1.9931	5.0897	
1.7963	5.0866	
1.4972	5.0811	
1.1972	5.0701	
1.0031	5.0636	
0.8081	5.0603	
0.5072	5.0618	
0.2091	5.0852	
0.1031	5.0849	
0.0431	5.0873	

Vo over Io (Vin: 110V/60Hz)

Io(A)	Vo(V)	Pass/Fail
1.9931	5.0939	
1.7963	5.0921	
1.4972	5.0814	
1.1972	5.0664	
1.0031	5.0632	

0.8081	5.0636	
0.5072	5.0665	
0.2091	5.0914	
0.1031	5.0855	
0.0431	5.0911	

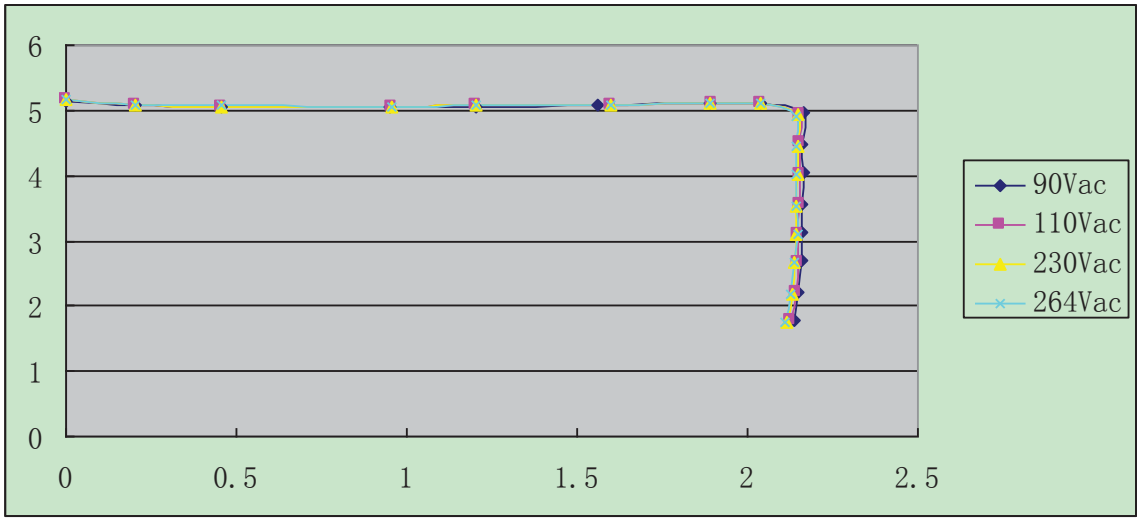
Io over Vo (Vin: 220V/50Hz)

Vo(V)	Io(A)	Pass/Fail
2V	2.0803	
3V	2.0929	
4V	2.0916	
5V	2.0888	

Io over Vo (Vin: 110V/60Hz)

Vo(V)	Io(A)	Pass/Fail
2V	2.1103	
3V	2.1225	
4V	2.1253	
5V	2.1216	

3.8 Vin&Io Curve



4 EMI Test

EMI TEST REPORT

parameter

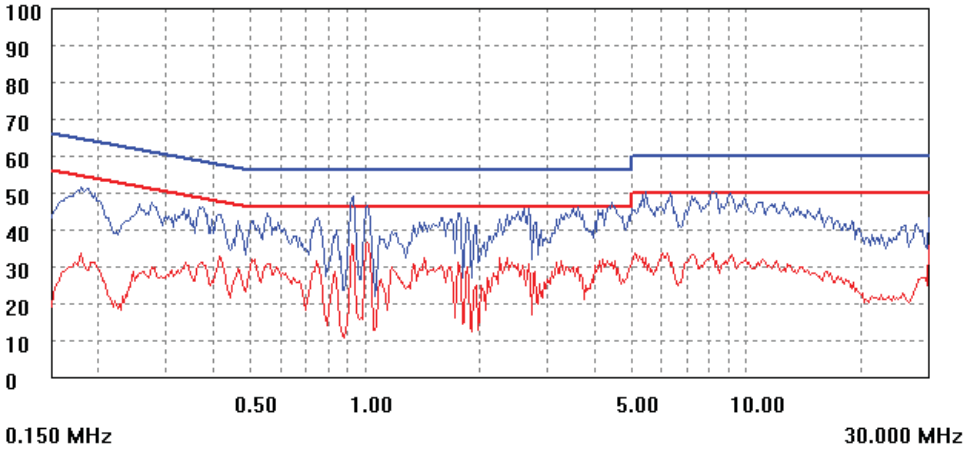
Organization:	Operator:	EUT:
Place:	Time: 2012/10/8/16:21	Test equipment:KH3939
Detector: PK+AV	Test-time(ms): 30	SN: 1139203
Limit: EN55015	Transductor(PK/AV): PK1 / AV1	
Remark: customer Ecap&Mos		

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: 220Vac, Line, full load

EMI TEST REPORT

parameter

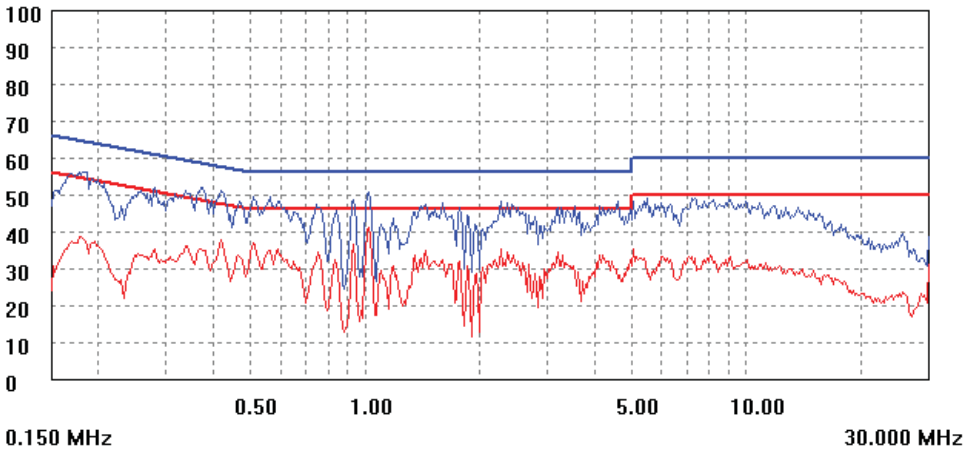
Organization:	Operator:	EUT:
Place:	Time: 2012/10/8/16:23	Test equipment:KH3939
Detector: PK+AV	Test-time(ms): 30	SN: 1139203
Limit: EN55015	Transductor(PK/AV): PK1 / AV1	
Remark: customer Ecap&Mos		

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:220Vac, Neutral, full load

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