**Texas Instruments**

**PMP4301 Test Procedure**

**REV A**

**10/27/2010**

# 1    General

## 1.1  PURPOSE
To provide detailed data for evaluating and verifying the PMP4301.

## 1.2  REFERENCE DOCUMENTATION
Schematic PMP4301_SCH.PDF
Assembly PMP4301_PCB.PDF
BOM

## 1.3 TEST EQUIPMENTS
Multi-meter: YOKOGAWA WT210
Power Analyser: PM100
AC Source: Chroma 61530

# 2: INPUT CHARACTERISTICS
## Otherwise Specified, the test is under the condition With LED lamp Load (12 LEDs in series).

### 2.1  Power Factor
**Pass/Fail criteria:** 0.90 minimum with 230Vac input at 100% load.

| Vin(Vac) | Freq(Hz) | PF | Io(Arms) | THD(%) | Pass/Fail |
|----------|----------|-------|----------|--------|-----------|
| 90 | 60 | **0.989** | **0.449** | 14.3 | |
| 110 | 60 | **0.989** | **0.449** | 12.4 | |
| 132 | 60 | **0.988** | **0.450** | 10.8 | |
| 180 | 50 | **0.978** | **0.450** | 8.9 | |
| 230 | 50 | **0.956** | **0.451** | 10.3 | **PASS** |
| 264 | 50 | **0.928** | **0.451** | 11.2 | |

### 2.2  Efficiency
**Pass/Fail criteria:** 85% minimum with 230V AC input at 100% load.

| Vin(Vac) | Freq(Hz) | Pin(W) | Vo(Vrms) | Io(Arms) | Eff(%) | Pass/Fail |
|----------|----------|--------|----------|----------|--------|-----------|
| 90 | 60 | **20.23** | **38.84** | **0.442** | **84.8** | |
| 110 | 60 | **19.90** | **38.81** | **0.443** | **86.3** | |
| 132 | 60 | **19.78** | **38.81** | **0.443** | **86.9** | |
| 180 | 50 | **19.60** | **38.80** | **0.444** | **87.8** | |
| 230 | 50 | **19.68** | **38.80** | **0.445** | **87.7** | **PASS** |
| 264 | 50 | **19.78** | **38.80** | **0.445** | **87.3** | |

## efficiency
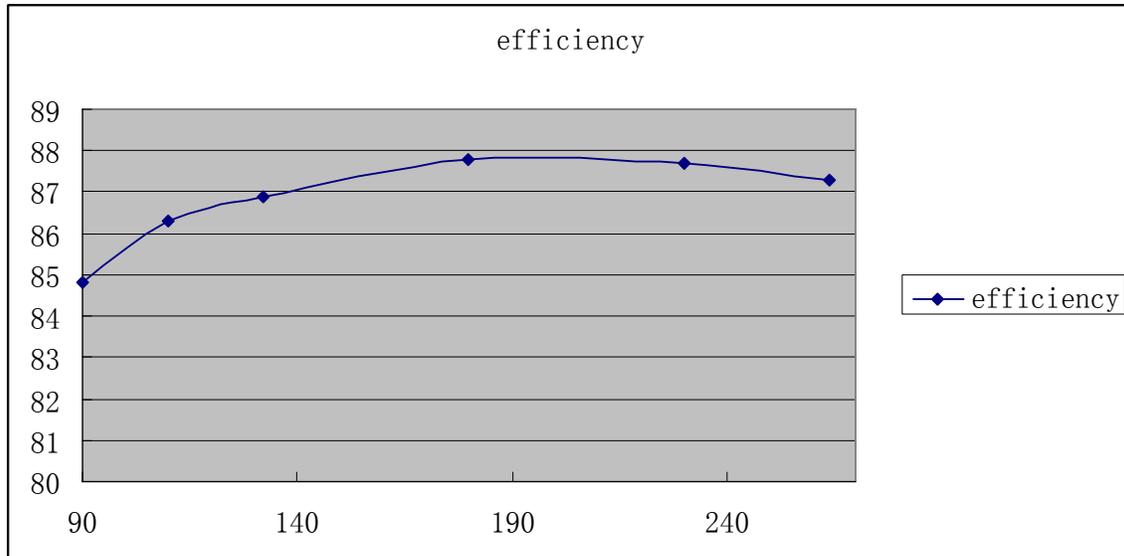


2.3 Maximum input current

**Pass/Fail criteria:** XX Amps RMS maximum at low line, full load.
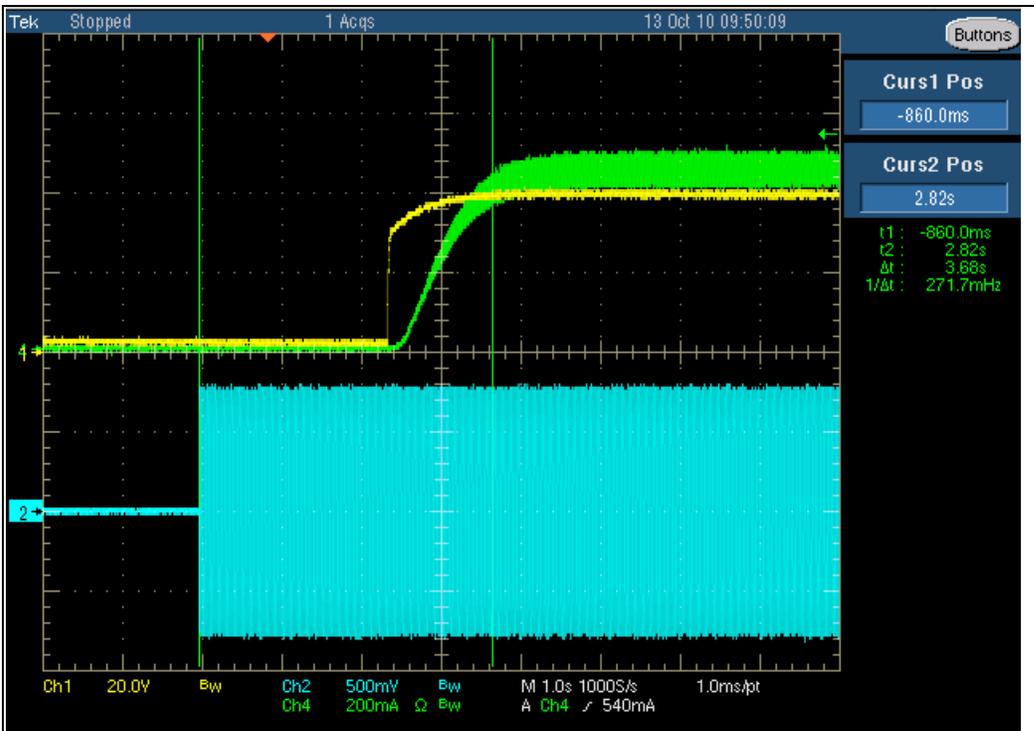
| Vin(Vac) | Freq(Hz) | Iin(Arms) | Pass/Fail |
|---|---|---|---|
| 90 | 60 | **0.227** | **PASS** |

# 3: OUTPUT CHARACTERISTICS

3.1 Output Voltage Range （32V~42Vdc）

| ITEM | Vout (V) | Iout(A) | Pass/Fail |
|---|---|---|---|
| Vin=110Vac | 29.2 | 0.449 | **PASS** |
|  | 42.3 | 0.443 |  |
| Vin=230Vac | 29.1 | 0.448 |  |
|  | 42.3 | 0.445 |  |

3.2 Turn on Delay and Ripple current:

| CONDITIONS | | Delay time (S) | Ripple current （mA） | Pass/Fail |
|---|---|---|---|---|
| Vin (Vac) | Load |  |  |  |
| 110 | Full load | 3.68 | 106 |  |
| 230 | Full load | 2.15 | 106 |  |

| Tek | Stopped | 1 Acqs | 13 Oct 10 09:50:09 |
| --- | --- | --- | --- |

Curs1 Pos
-860.0ms

Curs2 Pos
2.82s

t1 : -860.0ms
t2 : 2.82s
Δt : 3.68s
1/Δt : 271.7mHz

Ch1 20.0V    Bw    Ch2 500mV    Bw    M 1.0s 1000S/s    1.0ms/pt
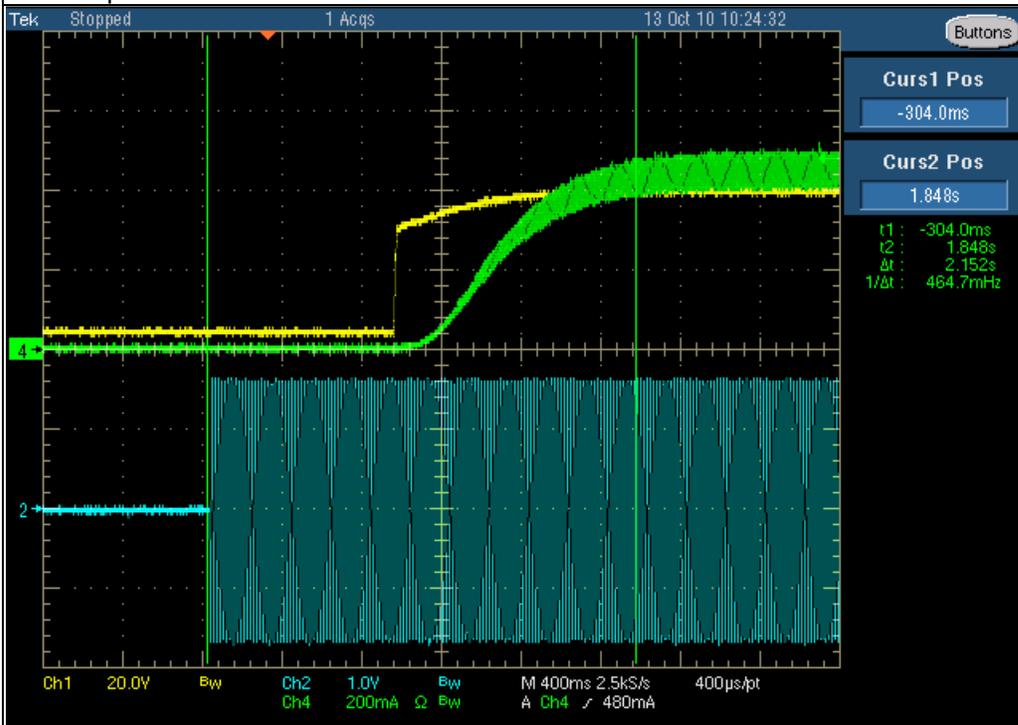                   Ch4 200mA  Ω  Bw   A Ch4 ∫ 540mA

Vin:110Vac    Io: full load  (LED Lamp Load)
Ch1: output voltage 20V/div
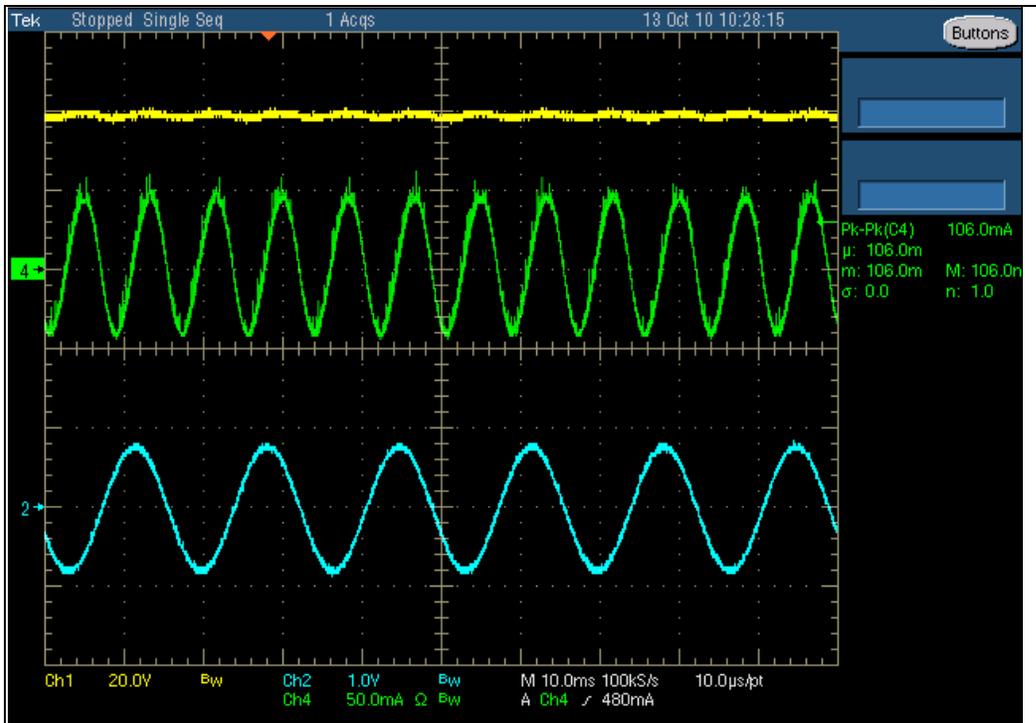Ch2: input voltage 100V/div
Ch4: output current 200mA/div



| Tek | Stopped | 1 Acqs | 13 Oct 10 10:24:32 |
| --- | --- | --- | --- |

Curs1 Pos
-304.0ms

Curs2 Pos
1.848s

t1 : -304.0ms
t2 : 1.848s
Δt : 2.152s
1/Δt : 464.7mHz

Ch1 20.0V    Bw    Ch2 1.0V     Bw    M 400ms 2.5kS/s    400µs/pt
                   Ch4 200mA  Ω  Bw   A Ch4 ∫ 480mA

Vin:230Vac    Io: full load  (LED Lamp Load)
Ch1: output voltage 20V/div
Ch2: input voltage 200V/div
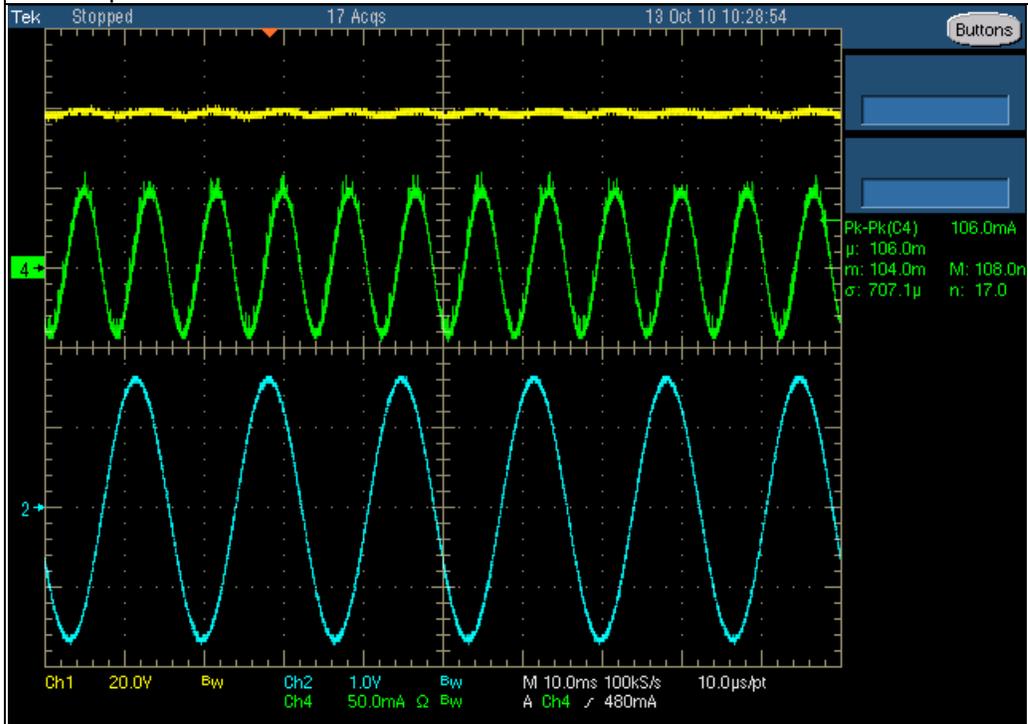Ch4: output current 200mA/div

Vin:110Vac    Io: full load  (LED Lamp Load)
Ch1: output voltage 20V/div
Ch2: input voltage 200V/div
Ch4: output current 50mA/div



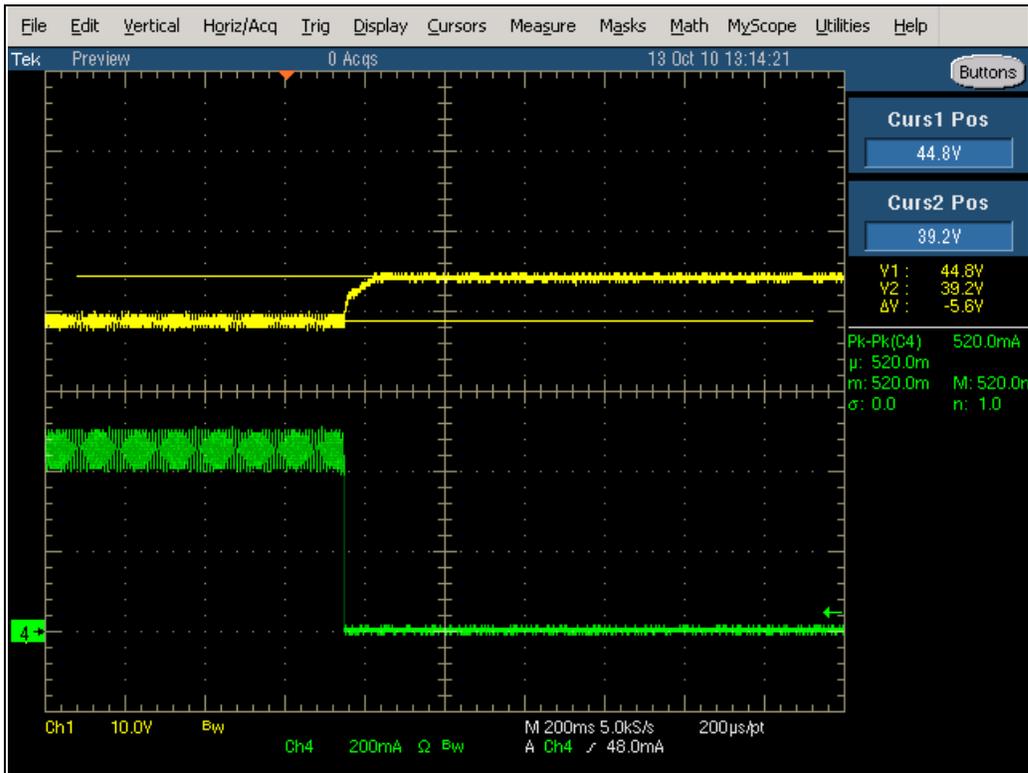Vin:230Vac    Io: full load  (LED Lamp Load)
Ch1: output voltage 20V/div
Ch2: input voltage 200V/div
Ch4: output current 50mA/div

### 3.3 Output over voltage protection

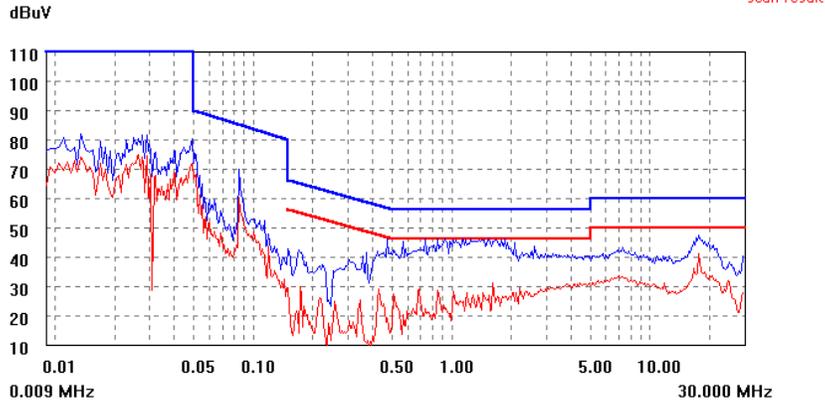| CONDITIONS | Protection voltage（V） | Pass/Fail |
|---|---|---|
| Vin (Vac) | | |
| 230 | 44.8 | |



Vin:230Vac    Io: full load to no load
Ch1: output voltage 10V/div
Ch4: output current 200mA/div

## 4: EMI Test

# EMI TEST REPORT

| Start(MHz) | End(MHz) | Step(MHz) |
|---|---|---|
| 0.009 | 0.150 | 0.001 |
| 0.150 | 2.000 | 0.002 |
| 2.000 | 10.000 | 0.010 |
| 10.000 | 30.000 | 0.030 |

-------------------------------------------------------------------- scan result

dBuV



0.009 MHz         30.000 MHz

Vin: 110Vac     Io: full load

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# EMI TEST REPORT

| Start(MHz) | End(MHz) | Step(MHz) |
|---|---|---|
| 0.009 | 0.150 | 0.001 |
| 0.150 | 2.000 | 0.002 |
| 2.000 | 10.000 | 0.010 |
| 10.000 | 30.000 | 0.030 |

-------------------------------------------------------------------- scan result

dBuV



0.009 MHz         30.000 MHz
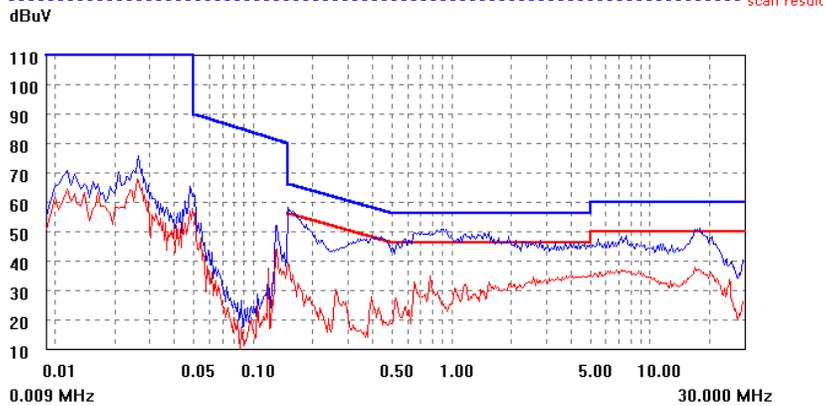
Vin:230Vac     Io: full load

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