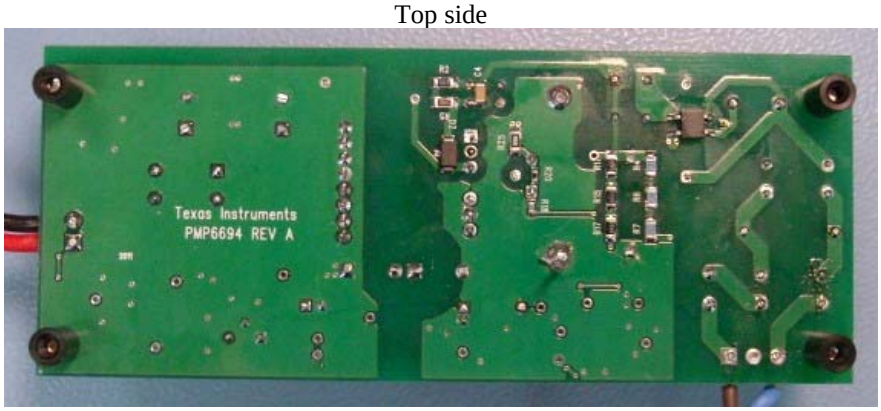
# PMP6694 Rev.B Test Results

The PMP6694 is 18W LED ballast with a constant current control 500mA – 1500mA @ 12V on the output.
Input voltage: 90Vac – 265Vac

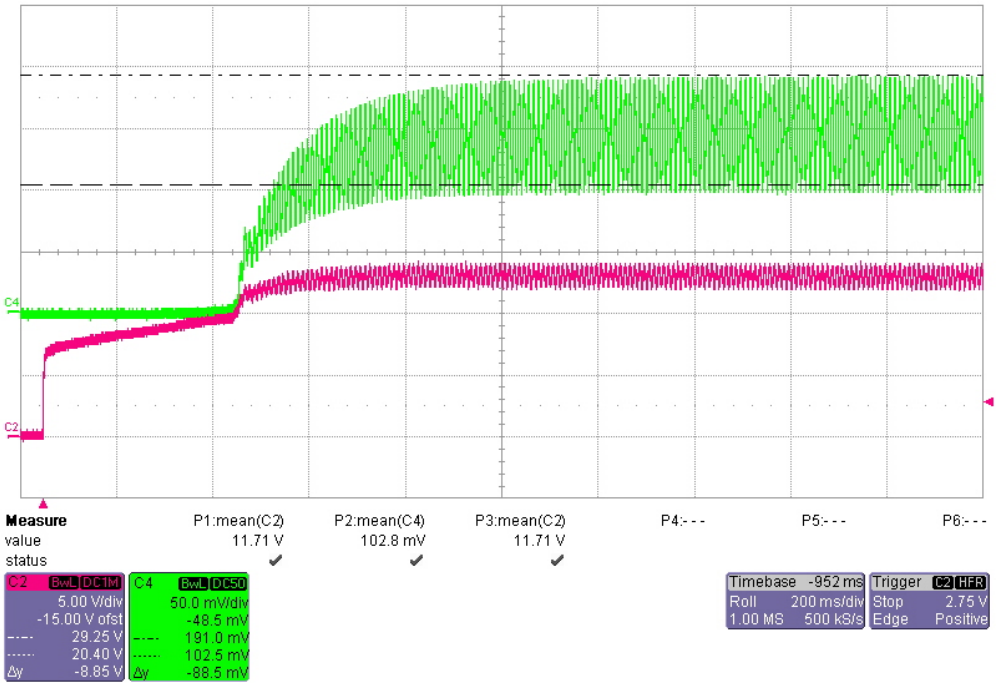
Top side




Bottom side

# 1 Startup

The output voltage and current at startup are shown in the image below. Input voltage is 230Vac.
The output was fully loaded (12V, 1500mA).
Channel 2 shows the output voltage (5V/div, 200ms/div).
Channel 4 shows the output current (500mA/div).



## 2 Efficiency

The efficiency data are shown in the tables and graph below.
The load: two string LEDs.


Uin = 230V

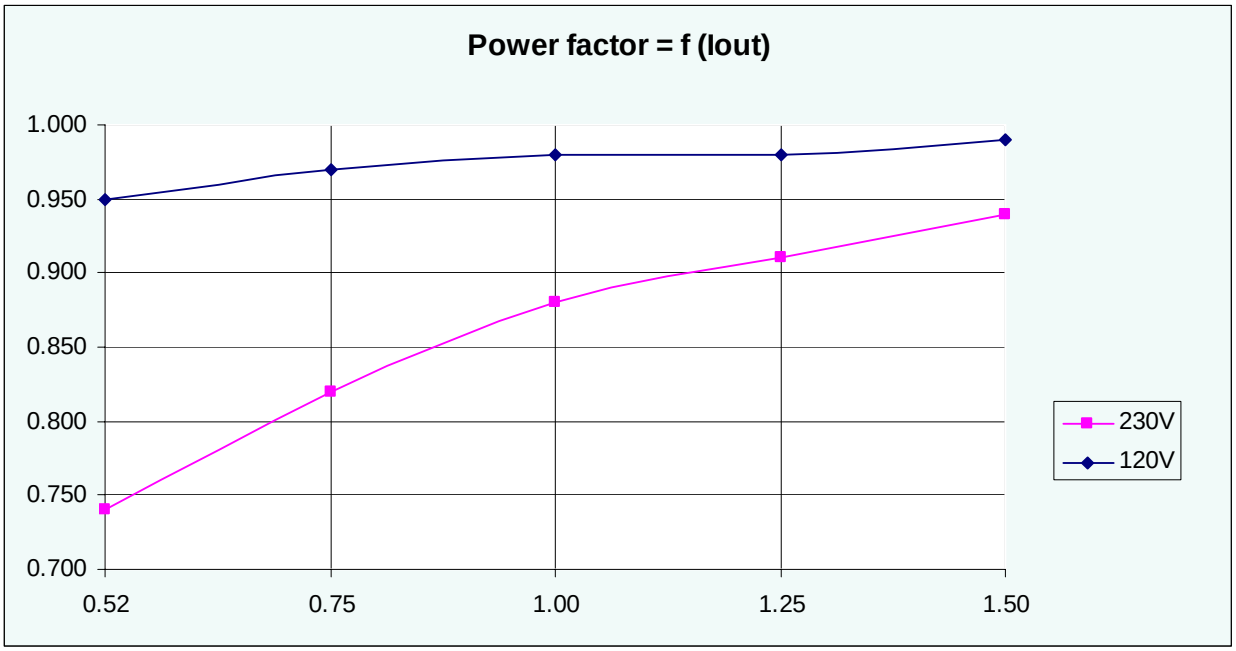
| Uout (V) | 11.12 | 11.52 | 11.82 | 12.09 | 12.38 |
|---|---|---|---|---|---|
| Iout (mA) | 0.522 | 0.75 | 1.00 | 1.25 | 1.50 |
| Pout (W) | 5.805 | 8.64 | 11.82 | 15.11 | 18.57 |
| Power factor | 0.740 | 0.82 | 0.88 | 0.91 | 0.94 |
| Pin (W) | 7.920 | 11.27 | 14.92 | 18.74 | 22.79 |
| Plosses (W) | 2.115 | 2.63 | 3.10 | 3.63 | 4.22 |
| eta (%) | 73.29 | 76.66 | 79.22 | 80.64 | 81.48 |

Uin = 120V

| Uout (V) | 11.14 | 11.58 | 11.91 | 12.14 | 12.27 |
|---|---|---|---|---|---|
| Iout (mA) | 0.522 | 0.75 | 1.00 | 1.25 | 1.50 |
| Pout (W) | 5.815 | 8.69 | 11.91 | 15.18 | 18.41 |
| Power factor | 0.950 | 0.97 | 0.98 | 0.98 | 0.99 |
| Pin (W) | 7.490 | 10.81 | 14.64 | 18.56 | 22.44 |
| Plosses (W) | 1.675 | 2.12 | 2.73 | 3.39 | 4.04 |
| eta (%) | 77.64 | 80.37 | 81.35 | 81.76 | 82.02 |

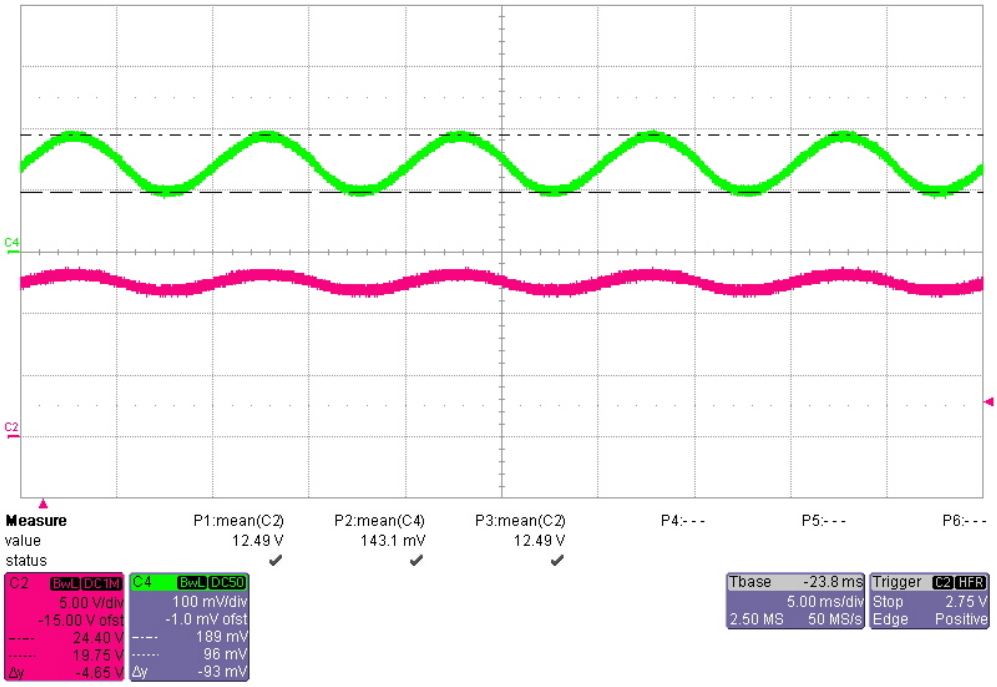
## 3 Power Factor

The Power Factor graph for the two input AC voltages is shown below:




## 4 Output Ripple Voltage and current

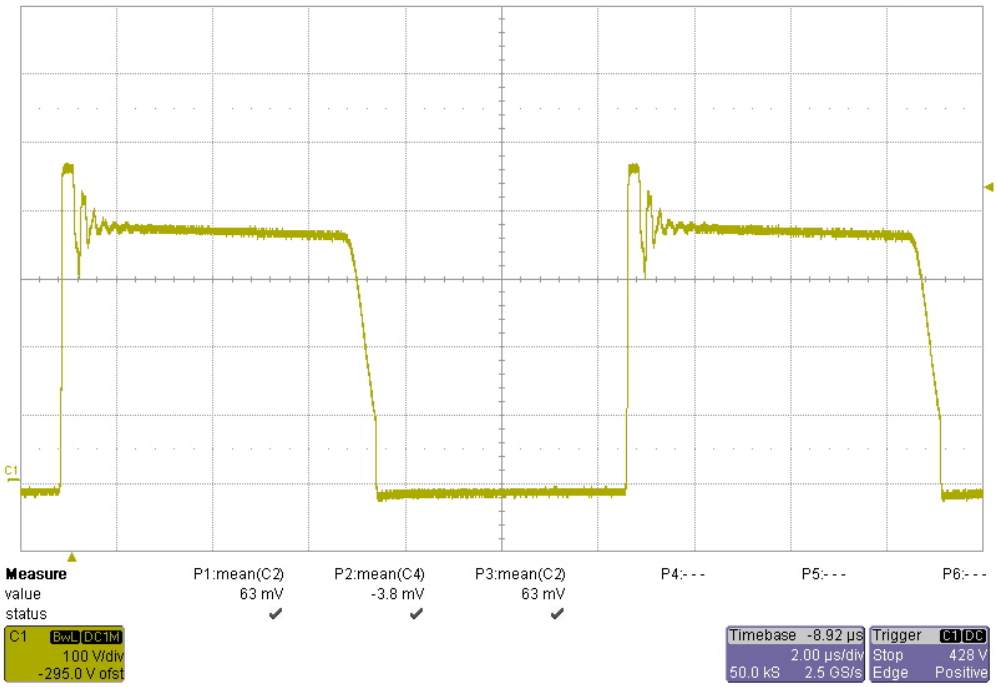
The output ripple voltage is shown in the plot below. The input was set to 230Vac and the load was set to 1500mA, 12V. Channel 2 shows the output DC voltage (5V/div, 5ms/div).



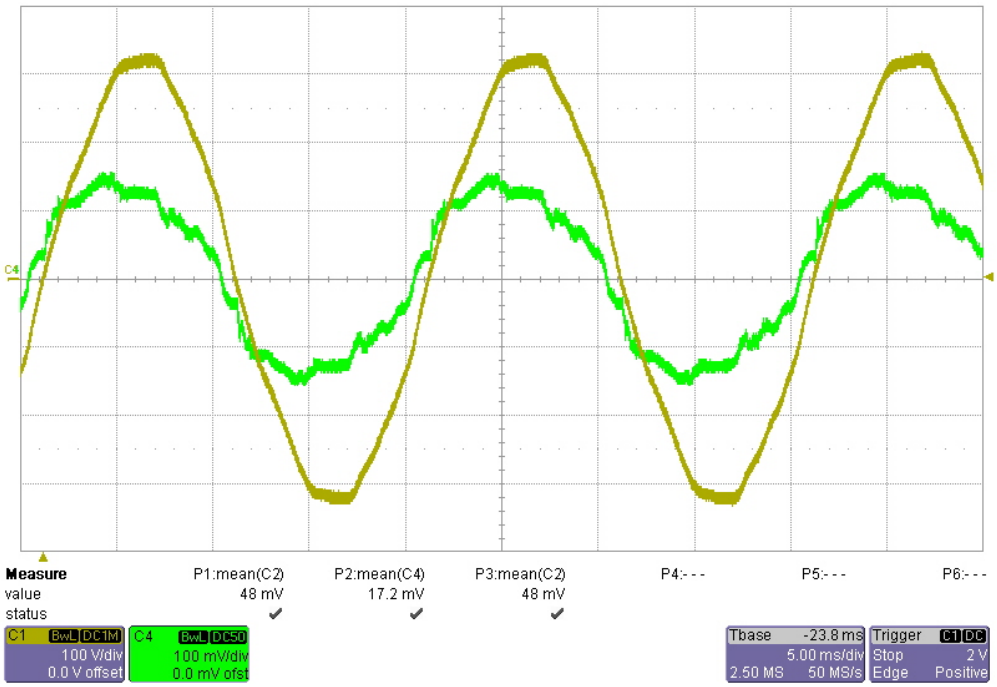

Channel 4 shows the output current (1A/div, 5ms/div).

## 5 Switching Node Waveform

The image below shows the peak voltage on the drain of the switching node (Q2), with a 230Vac input, and a 1500mA, 12V load. Channel 1 shows the drain voltage (100V/div, 2us/div).

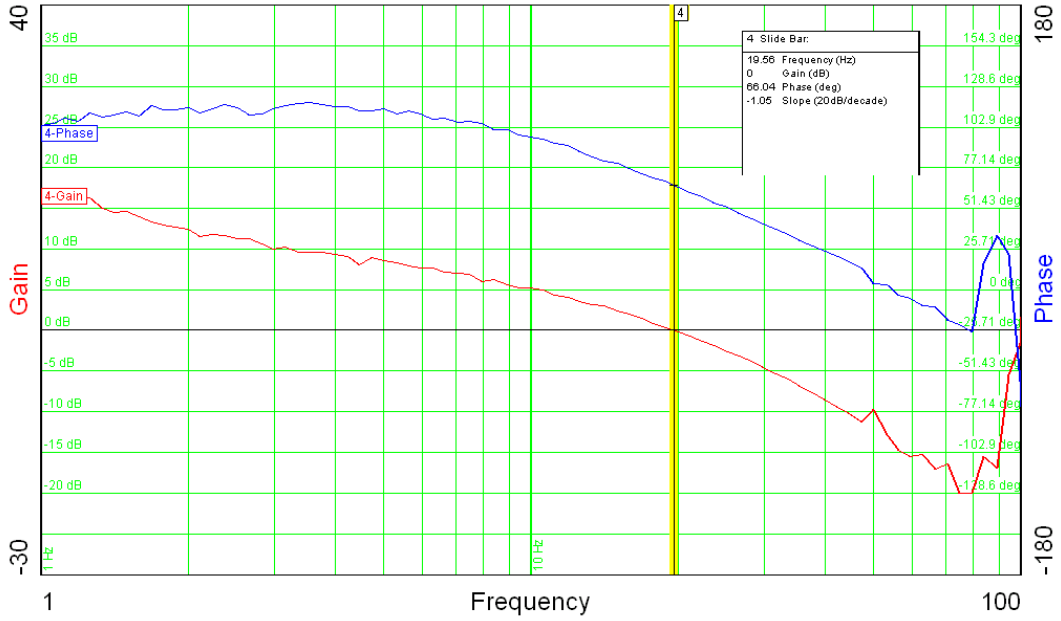


## 6 Input Voltage and Current Waveforms (same conditions)



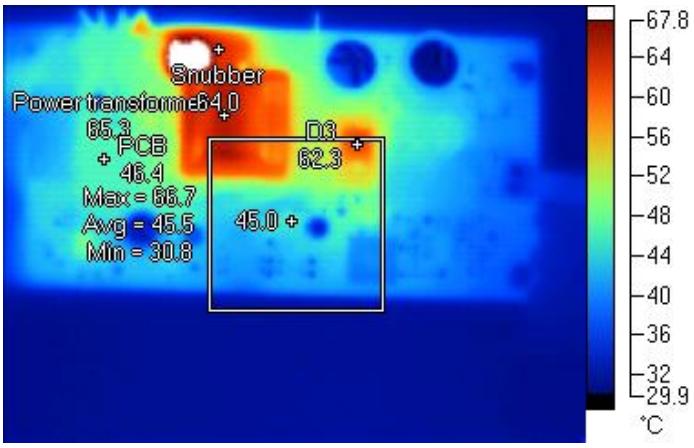

## 7 Loop Response

The image below shows the loop response of the converter measured with a 230Vac input at full load (1500mA, 12V). Phase margin is 66 deg. and crossover frequency is 20 Hz.



## 8 Thermal Image

The image below shows the thermal image in still air taken at full load and 230Vac, while the ambient temperature was 25C.




**Top.is2**
2/6/2006 4:39:22 AM

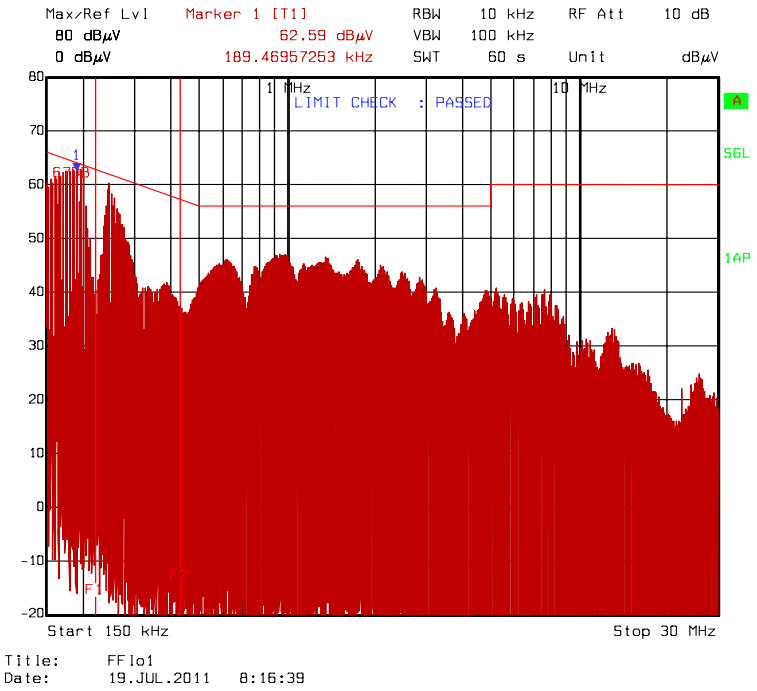
| Name | Avg | Min | Max | Emissivity | St. Dev. |
|---|---|---|---|---|---|
| Center Box | 45.5°C | 30.8°C | 66.7°C | 0.95 | 8.37 |

| Name | Temperature | Emissivity |
|---|---|---|
| Center Point | 45.0°C | 0.95 |
| Power transformer | 65.3°C | 0.95 |
| Snubber | 64.0°C | 0.95 |
| D3 | 62.3°C | 0.95 |
| PCB | 46.4°C | 0.95 |

## 9 EMI Measurements

The image below shows the conducted emission EMI measurements. The test setup was **not accordingly to the standards for lightning ballast**.

Input voltage: 230V.
Output current: 1500mA.


Max/Ref Lvl
80 dBµV
0 dBµV
Marker 1 [T1]
62.59 dBµV
189.46957253 kHz
RBW 10 kHz
VBW 100 kHz
SWT 60 s
RF Att 10 dB
Unit dBµV
1 MHz
10 MHz
LIMIT CHECK : PASSED
SGL
1AP
Start 150 kHz
Stop 30 MHz
Title: FFlo1
Date: 19.JUL.2011 8:16:39

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