# PMP4394 24Vin 1W Bias Supply with

# ±5V/100mA

# Output

logo

**Texas Instruments**

**PMP4394 Test Procedure**

**China Power Reference Design**

**REV A**

**GENERAL**

* 1. **PURPOSE**

To provide detailed data for evaluating and verifying the PMP4394.

* 1. **REFERENCE DOCUMENTATION**

Schematic: PMP4394\_SCH\_RevA

Assembly: PMP4394\_PCB\_RevA

BOM

* 1. **TEST EQUIPMENTS**

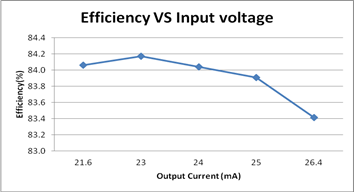
Multi-meter(voltage): Fluke 287

DC Source: TDK-Lambda GEN100-33

Load: Chroma 63110A module

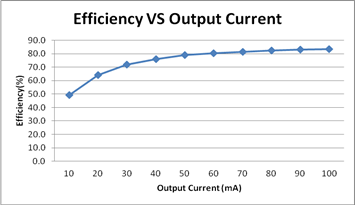
1. **INPUT CHARACTERISTICS**
   1. **Full load Efficiency**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Vin (V)** | **Iin(A)** | **Vo1(V)** | **Vo2(V)** | **Io1(mA)** | **Io2(mA)** | **Effi.(%)** |
| 21.6 | 53.00 | 4.83 | -4.78 | 100 | 100 | 84.1 |
| 23.0 | 50.00 | 4.87 | -4.81 | 100 | 100 | 84.2 |
| 24.0 | 48.25 | 4.89 | -4.83 | 100 | 100 | 84.0 |
| 25.0 | 46.60 | 4.91 | -4.85 | 100 | 100 | 83.9 |
| 26.4 | 44.40 | 4.92 | -4.85 | 100 | 100 | 83.4 |



* 1. **Efficiency versus output current**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Io1/Io2(mA)** | **Vin (V)** | **Iin(mA)** | **Vo1(V)** | **Vo2(V)** | **Effi.(%)** |
| 10 | 24.07 | 8.56 | 5.12 | -5.05 | 49.4 |
| 20 | 24.06 | 12.95 | 5.05 | -4.97 | 64.3 |
| 30 | 24.05 | 17.30 | 5.03 | -4.96 | 72.0 |
| 40 | 24.04 | 21.69 | 5.00 | -4.92 | 76.1 |
| 50 | 24.03 | 25.95 | 4.97 | -4.90 | 79.1 |
| 60 | 24.02 | 30.51 | 4.96 | -4.88 | 80.6 |
| 70 | 24.01 | 35.04 | 4.93 | -4.86 | 81.5 |
| 80 | 24.00 | 39.52 | 4.92 | -4.86 | 82.5 |
| 90 | 23.99 | 44.00 | 4.91 | -4.84 | 83.1 |
| 100 | 23.98 | 48.60 | 4.89 | -4.83 | 83.4 |



1. **OUTPUT CHARACTERISTICS**
   1. **Line and load Regulation**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Vin (V)** | **Io1=Io2=10mA** | | **Io1=Io2=30mA** | | **Io1=Io2=50mA** | | **Io1=Io2=70mA** | | **Io1=Io2=100mA** | | **%** |
| **Vo1 (V)** | **Vo2 (V)** | **Vo1 (V)** | **Vo2 (V)** | **Vo1 (V)** | **Vo2 (V)** | **Vo1 (V)** | **Vo2 (V)** | **Vo1 (V)** | **Vo2 (V)** |
| 21.6 | 5.06 | -5.00 | 4.96 | -4.90 | 4.92 | -4.84 | 4.87 | -4.81 | 4.81 | -4.76 | 4.8 |
| 24.0 | 5.10 | -5.03 | 5.01 | -4.94 | 4.96 | -4.89 | 4.92 | -4.85 | 4.86 | -4.81 | 3.8 |
| 26.4 | 5.15 | -5.07 | 5.05 | -4.98 | 5.00 | -4.93 | 4.96 | -4.90 | 4.92 | -4.85 | 3.0 |

* 1. **Ripple and noise**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Vin (V)** | **Io1=Io2=10mA** | | **Io1=Io2=100mA** | |
| **Vo1 (mV)** | **Vo2 (mV)** | **Vo1 (mV)** | **Vo2 (mV)** |
| 21.6 | 4.8 | 6.0 | 15.2 | 16.0 |
| 24 | 4.8 | 5.6 | 13.6 | 14.8 |
| 26.4 | 4.8 | 6.0 | 13.6 | 14.8 |

|  |  |
| --- | --- |
| tek00006 | tek00007 |
| Vin=21.6V Io=10mA  Ch1: Vo1 Ripple | Vin=21.6V Io=100mA  Ch1: Vo1 Ripple |
| tek00005 | tek00004 |
| Vin=24V Io=10mA  Ch1: Vo1 Ripple | Vin=24V Io=100mA  Ch1: Vo1 Ripple |
| tek00009 | tek00008 |
| Vin=26.4V Io=10mA  Ch1: Vo1 Ripple | Vin=26.4V Io=100mA  Ch1: Vo1 Ripple |
| tek00015 | tek00016 |
| Vin=21.6V Io=10mA  Ch1: Vo2 Ripple | Vin=21.6V Io=100mA  Ch1: Vo2 Ripple |
| tek00014 | tek00013 |
| Vin=24V Io=10mA  Ch1: Vo2 Ripple | Vin=24V Io=100mA  Ch1: Vo2 Ripple |
| tek00018 | tek00017 |
| Vin=26.4V Io=10mA  Ch1: Vo2 Ripple | Vin=26.4V Io=100mA  Ch1: Vo2 Ripple |

* 1. **Start up and shut down**

|  |  |
| --- | --- |
| tek00012 | tek00011 |
| Vin=24V Io=100mA  Ch1: Vo1 Start up | Vin=24V Io=100mA  Ch1: Vo1 shut down |
| tek00021 | tek00020 |
| Vin=24V Io=100mA  Ch1: Vo2 Start up | Vin=24V Io=100mA  Ch1: Vo2 shut down |

* 1. **Output short protection**

|  |
| --- |
| tek00047.png |
| Vin=24V Io=100mA  Vo1 from full load to short  Ch1: Vo1  Ch2: U12 FB |