**Texas Instruments**

**PWR167D Test Procedure**

**May 22, 2013**

# GENERAL

## PURPOSE

The purpose of this document is to provide detailed instructions for testing the PWR167 modules (LMZ34002EVM-001).

## SCOPE

This document covers complete instructions for testing PWR167 (LMZ34002EVM-001). Upon completion of this procedure, all units will be categorized as either conforming or non-conforming material and dispositioned accordingly.

## REFERENCE DOCUMENTATION

1. Schematic PWR167
2. PWR167 Assembly DWGs

## MATERIALS

### *Test Log:* A test log is not required for this procedure.

## DEFINITIONS

N/A

# SAFETY

## EYE PROTECTION

Safety Glasses are to be worn while performing all testing.

## GENERAL RISKS

This test must be performed by qualified personnel trained in electronics theory and understand the risks and hazards of the assembly to be tested.

## ELECTROSTATIC DISCHARGE

ESD precautions must be followed while handling electronic assemblies.

## THERMAL/SHOCK HAZARDS

Precautions should be observed to avoid touching areas of the assembly that may get hot or present a shock hazard during testing.

# QUALITY

## DATA PRESERVATION

Recorded test data is not required for this procedure.

# APPAREL

## ELECTROSTATIC SMOCK

## ELECTROSTATIC GLOVES OR FINGER COTS

## SAFETY GLASSES

## GROUND ESD WRIST STRAP

# EQUIPMENT

## POWER SUPPLIES

A power supply capable of supplying 40.0 volts @ 3 amps is required to supply VIN.

## LOAD

An electronic load should be used to set the output current. The output load will change depending on the output voltage selected. See the table below.

|  |  |
| --- | --- |
| **VOUT Selection (V)** | **LOAD (A)** |
| -3.3 | 2 |
| -5 | 2 |
| -12 | 1 |
| -15 | 1 |

## METERS

One DC voltmeter is required.

## OSCILLOSCOPES

An oscilloscope and one voltage probe is required.

# EQUIPMENT SETUP

## GENERAL INFORMATION

## INPUT SUPPLY

Set the input voltage power supply to 24.0 V, +/- 0.1V and the current limit to 3 A. Turn off the power supply. Connect the input power supply to TB1; VIN and GND positions are noted on the PWR167 circuit board.

## LOAD

Apply a load to the PWR167 at TB2 according to the table below.

|  |  |
| --- | --- |
| **VOUT Selection (V)** | **LOAD (A)** |
| -3.3 | 2 |
| -5 | 2 |
| -12 | 1 |
| -15 | 1 |

## DC VOLT METERS

For the output voltage, connect the positive lead of the voltmeter to test point VOUT, and the negative terminal test point GND.

## OSCILLOSCOPE

The oscilloscope is used to measure the switching frequency at steady state condition. The oscilloscope channel used should be set to DC coupling, 1V/div vertical scale, 500 ns/div time scale, and bandwidth limited to 20 MHz.

Connect the scope probe to the via labeled PH and GND to measure the frequency settings. Via PH is located at the lower center of U1.

## EVM SETTINGS

Install the VOUT Select jumper at -5V.

# PROCEDURE

## APPLY POWER AND MEASURE SWITCHING FREQUENCY

Turn on the 24Volt power supply, VIN. Observe the PH signal on the scope. The PH signal is a repeating, non-symmetric square waveform. Measure the waveform frequency. The pre-set switching frequency is typically 800kHz. The acceptable frequency is 720kHz to 880kHz.

## APPLY POWER AND MEASURE VARIOUS VOLTAGE OUTPUTS

Measure the output voltage with the digital voltmeter at TB2. Move the VOUT Select Jumper to the next selection and repeat. The acceptable voltage range is listed in Table2. The maximum VIN for each VOUT is listed in Table 2.

|  |  |  |
| --- | --- | --- |
| **VOUT Selection (V)** | **VOUT (V)** | **Maximum VIN (V)** |
| -3.3 | -3.2 – -3.4 | 40 |
| -5 | -4.9 – -5.1 | 40 |
| -12 | -11.8 – -12.2 | 38 |
| -15 | -14.75 – -15.25 | 35 |

**Table 2:** Min and Max Output Voltage

The sum of VIN + |VOUT| must not exceed 50V.

## STEP SEVEN: MATERIAL DISPOSITION

All units (passed and failed) shall be dispositioned according to section . Continue testing by going back to step one (section 7.1) until all units have been tested.

# EQUIPMENT SHUTDOWN

Turn off the power supply and remove all test equipment connections.

# MATERIAL DISPOSITION & TRANSFER

## CONFORMING MATERIAL

Units that have passed this test procedure shall be packaged into anti-static ESD approved bags, labeled as indicated in Table 3 and shipped per the P.O.

Table 3: EVM Labels

|  |  |
| --- | --- |
| **Label 1** | **Label 2** |
| PWR167 | LMZ34002RKG |

## NON-CONFORMING MATERIAL

If yield loss is 2% or less, scrap non-conforming units and adjust P.O. to reflect total amount shipped. If yield loss approaches or exceeds 5%, contact EVM coordinator for assistance.