PMP10736
Test Report

Table of Contents

I. Overview

The PMP10736 reference design is a 2.5W isolated Fly-Buck power module. It provides an isolated 5V, 500mA output with 5V to 15V input voltage range. The reference board is designed in a compact SIP-7 package, and the board size is 18 x 13 mm (0.7 x 0.5 inch). The isolation voltage rating is 2500VAC for 1sec. The module design uses the Fly-Buck converter featuring the LM5160 synchronous buck regulator. The Fly-Buck has the advantages of primary side regulation (with no need of opto-coupler feedback). The total output variation over line and load condition is within 9%, and the peak efficiency is about 83%.

II. Power Specification

Input Voltage: 5V – 15V

Output: Isolated 5V @ 500mA

Total output power: 2.5W

Switching frequency: 200 kHz

III. Reference Board

The reference board is designed as a power module in standard SIP 7-pin package (100mil pin pitch). The footprint of the board is shown in Figure 2. The reference board uses 1oz copper 2- layer PCB, and its dimensions are as follows:

Board size: 18 x 13 mm (0.7 x 0.5 inch).
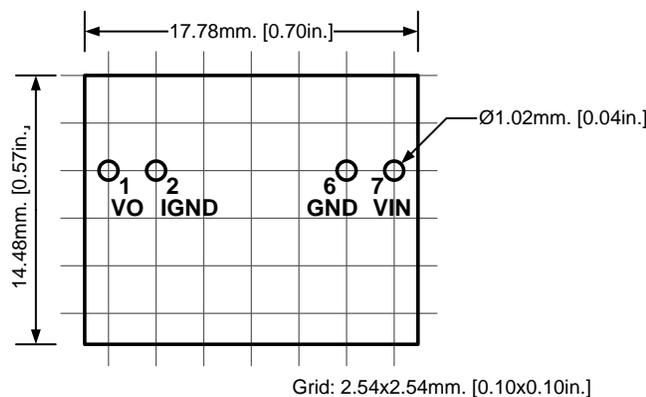
Component height: top side 2.5mm, bottom side 10.5mm
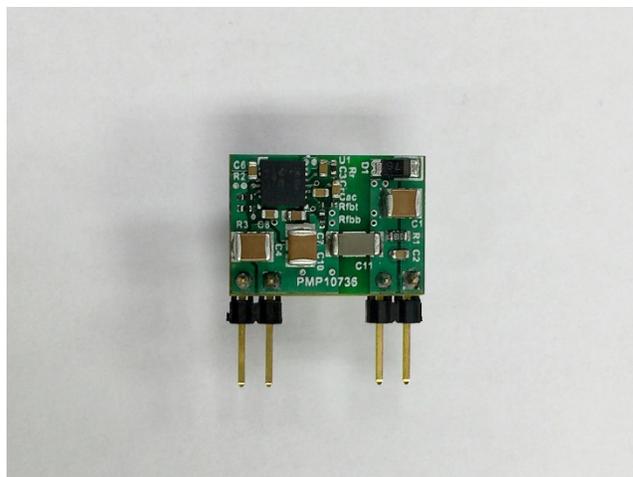

Figure 1 Reference board footprint
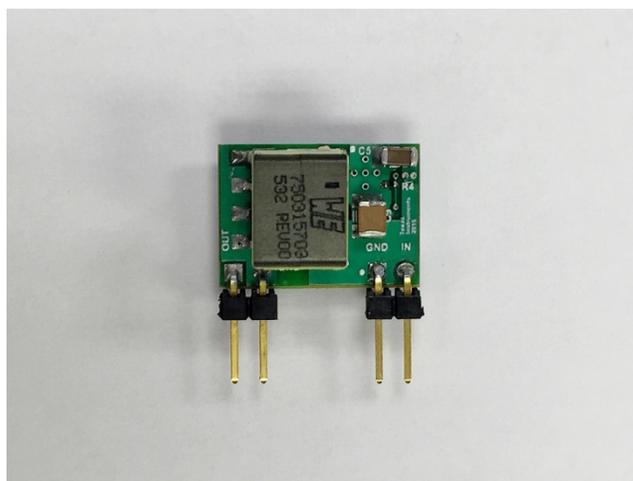
Figure 2 Reference board top view

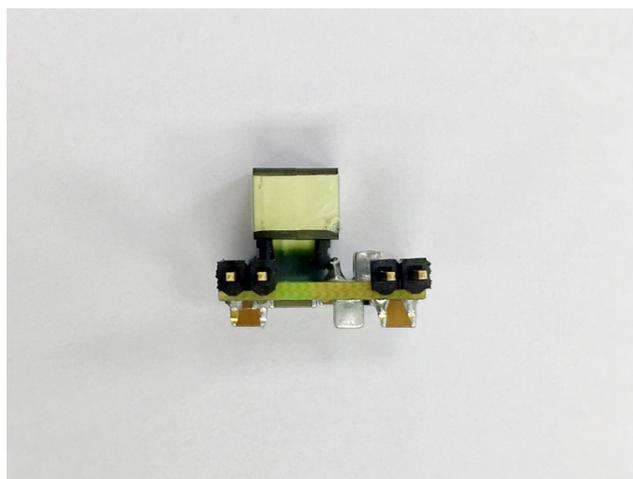**Figure 3 Reference board bottom view**

Figure 4 Reference board side view

IV.   Efficiency

The reference board has a peak efficiency of 83% at 15V input and full load condition.
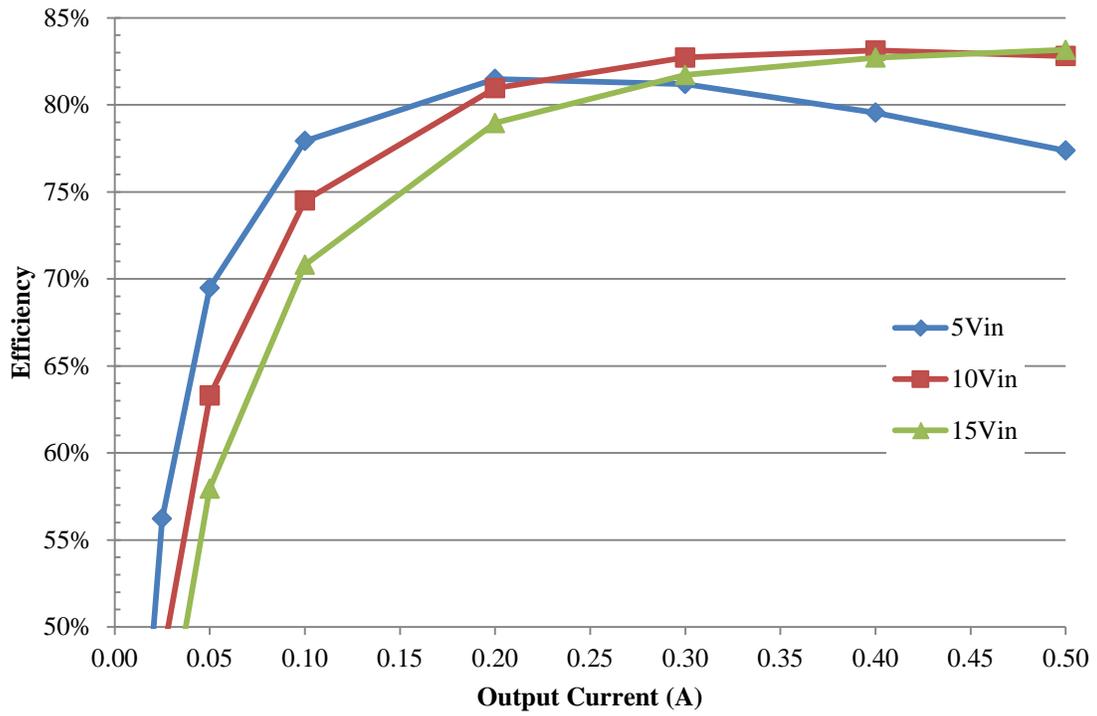

Figure 5 Power efficiency

V. Regulation

The output regulation of the reference design was examined at full input and load range. The test results show that the total output variation is within +2% to -7%.
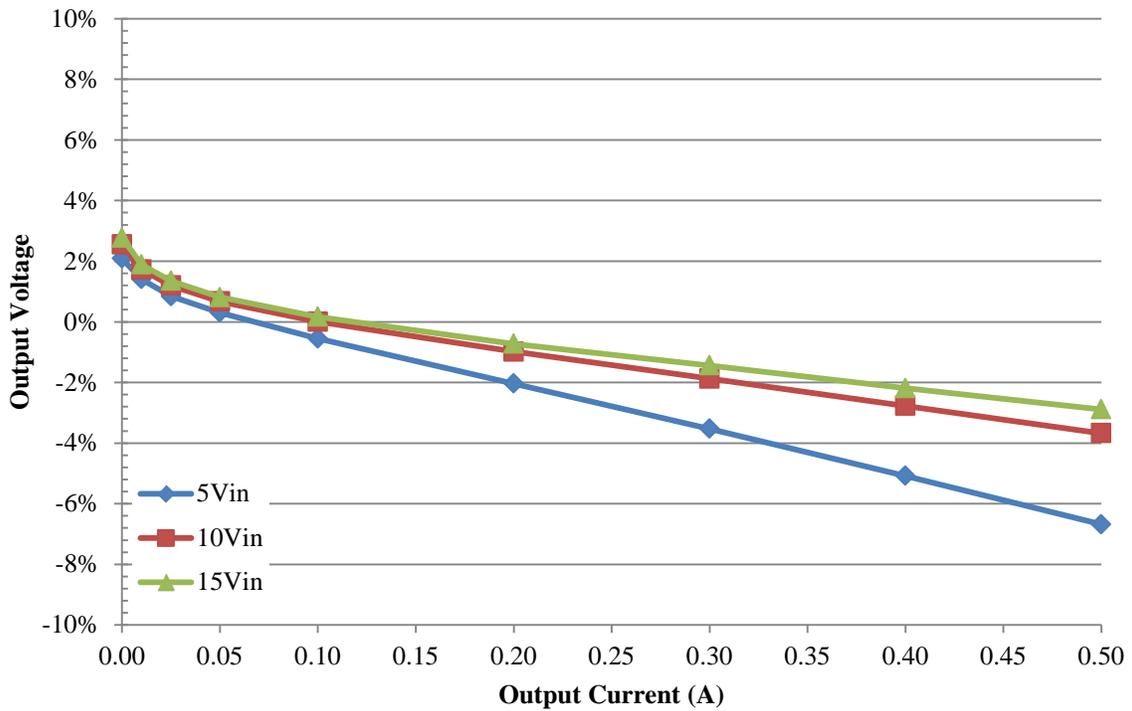

Figure 6 Output regulation
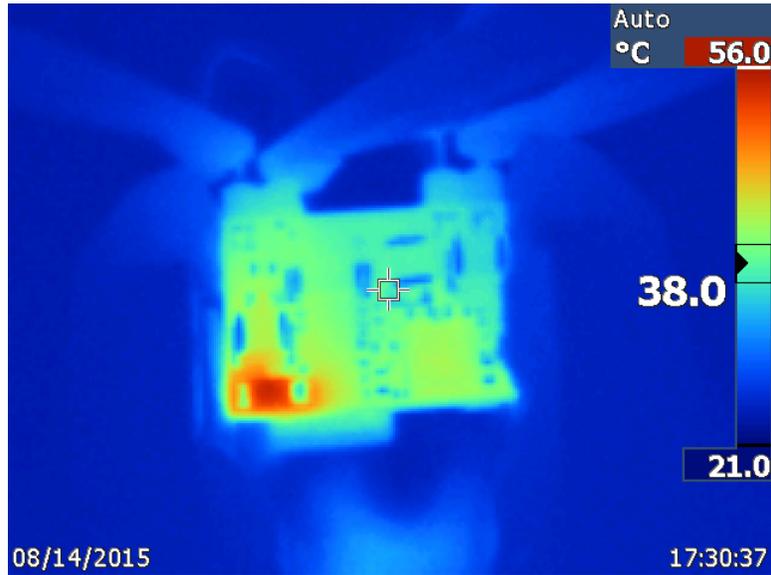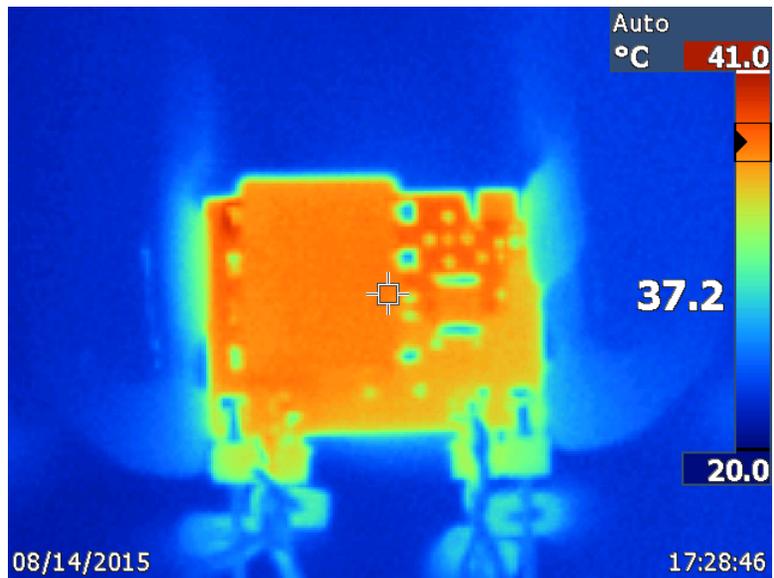
VII.   Power Up

The reference board was tested under no load and full load at 10V input. Ch1 (yellow) is the input voltage, Ch2 (green) is the output voltage.

Figure 9 Power up into no load at 10V input

Figure 10 Power up into full load at 10V input

VIII.   Switching Waveforms

The primary side switch node voltage was measured at no load and full load condition at 10V input. Ch1 (yellow) is the switch node voltage.
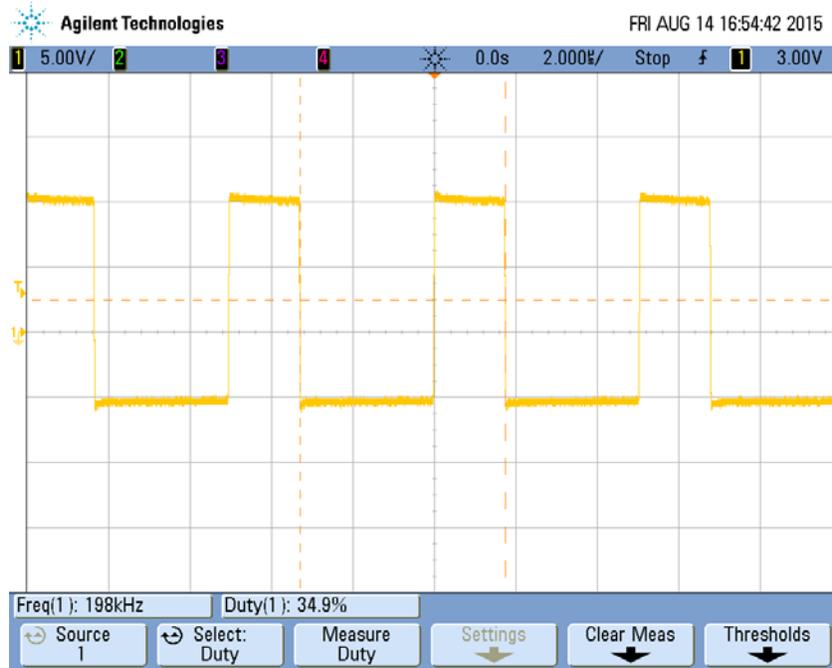

Figure 11 Switch node voltage at 10V input, no load

Figure 12 Switch node voltage at 10V input, full load

The output rectifier diode voltage was examined at 15V input and full load condition, which gave the highest voltage spike on the diode. Ch1 (yellow) shows the voltage across the diode.

Figure 13 Output diode anode (+) to cathode (-) voltage at 15V input, full load

IX.   Load Transients

The load transient response was tested by applying 0.25A to 0.5A load steps at 10V input. Ch1 (yellow) is the output voltage in AC mode, and Ch4 (green) is the output load current.
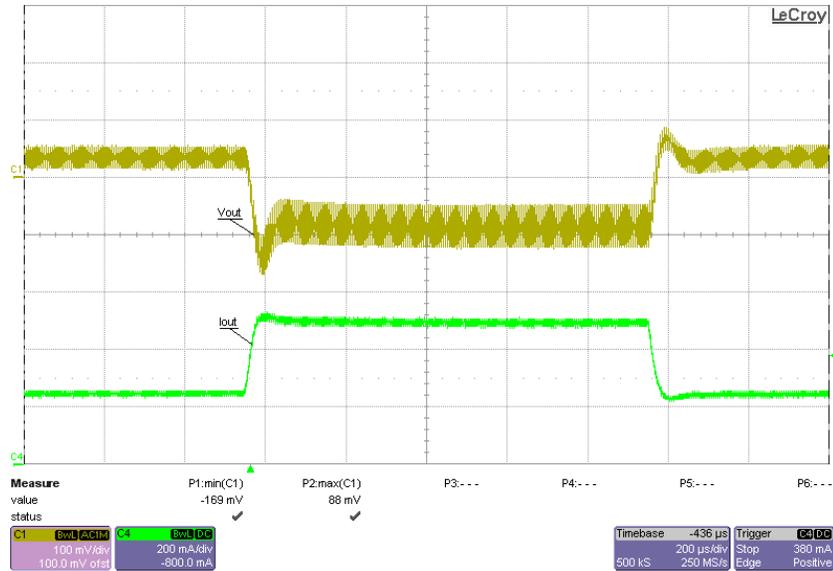
Figure 14 Output load transient at 10V input

X.   Output Voltage Ripples

The output ripples were measured at 10V input, full load. Ch1 (yellow) is the output voltage ripple in AC mode.
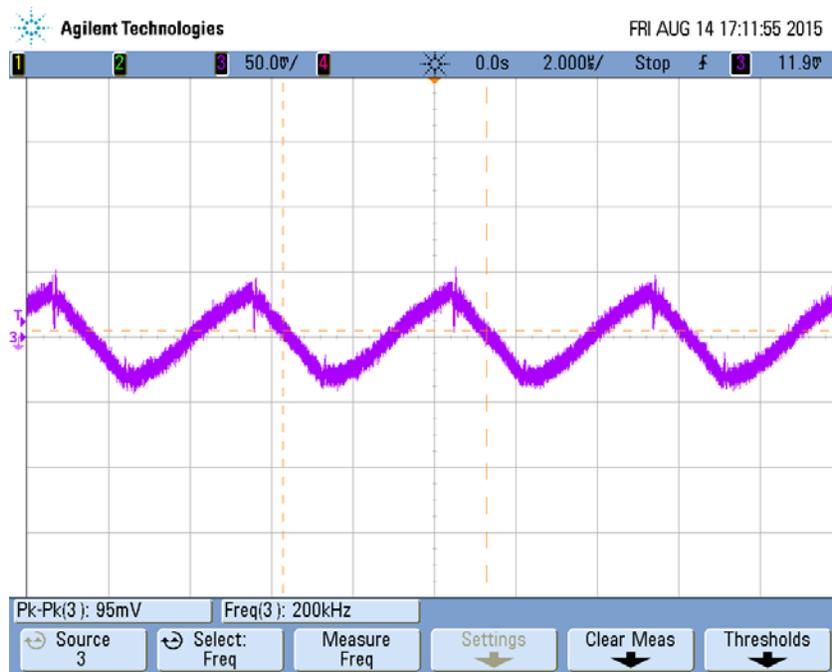
Figure 15 +15V output ripple at 10V input, full load

IMPORTANT NOTICE AND DISCLAIMER