

**Test Data
For PMP7993
08/30/2013**



Power Specification

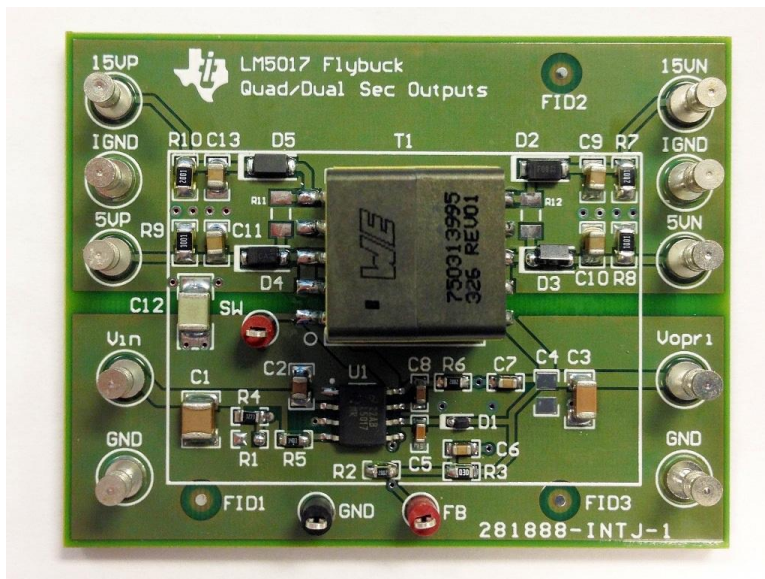
Vin range: 17V – 32V

Nominal Vin = 24V

Quad Isolated Outputs: $\pm 15V @ 50mA$, $\pm 5V @ 100mA$

Fsw = 260kHz

Board Photo

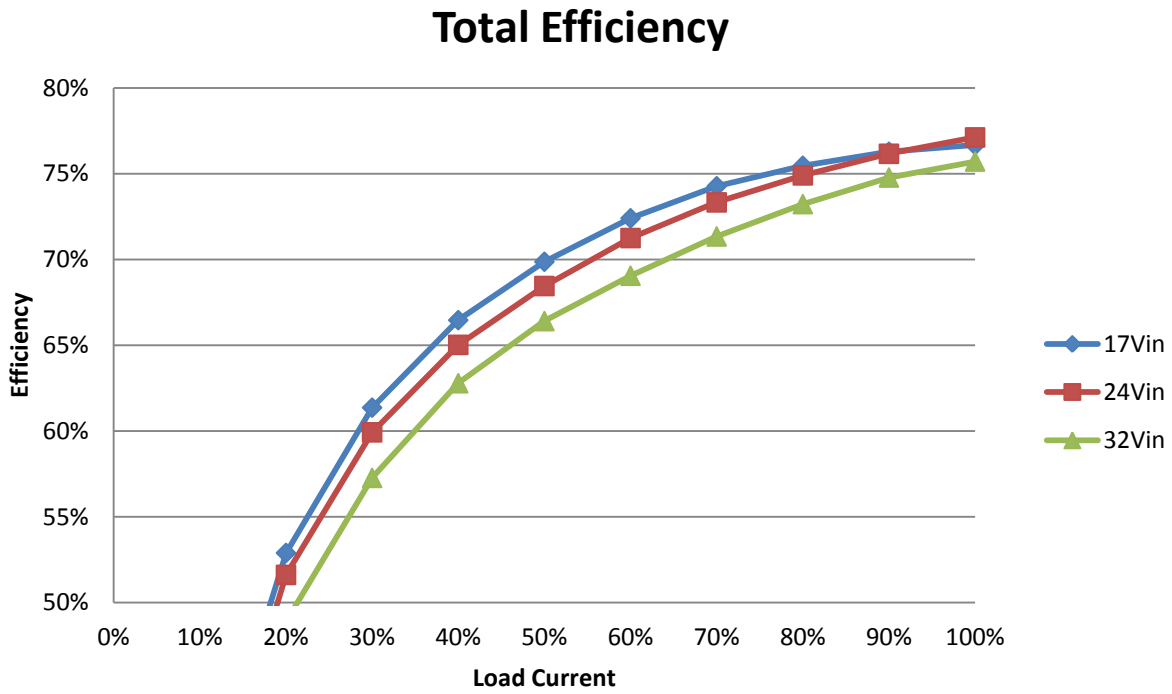


Size: 56x43mm

15VP - +15V output, 15VN - -15V output, 5VP - +5V output, 5VN - -5V output

Efficiency

The efficiency is calculated for all outputs; the load current is incremented at 10% interval.



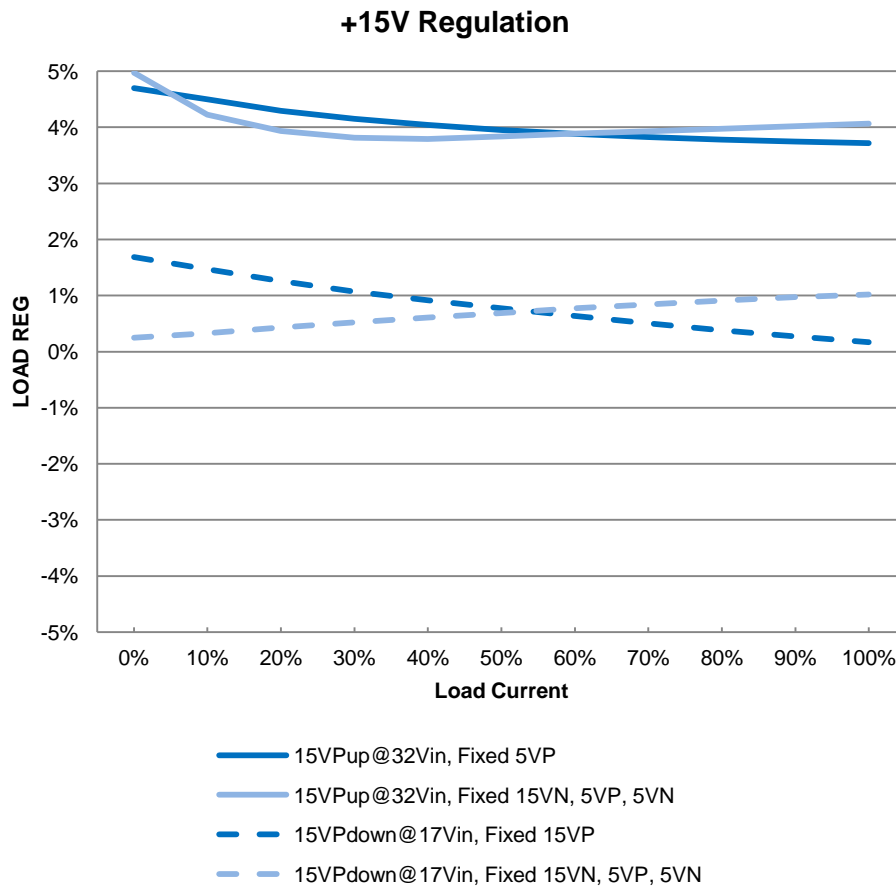
Cross Regulation

The cross regulation was tested by sweeping different load combination on four outputs. The test methodology is as follows:

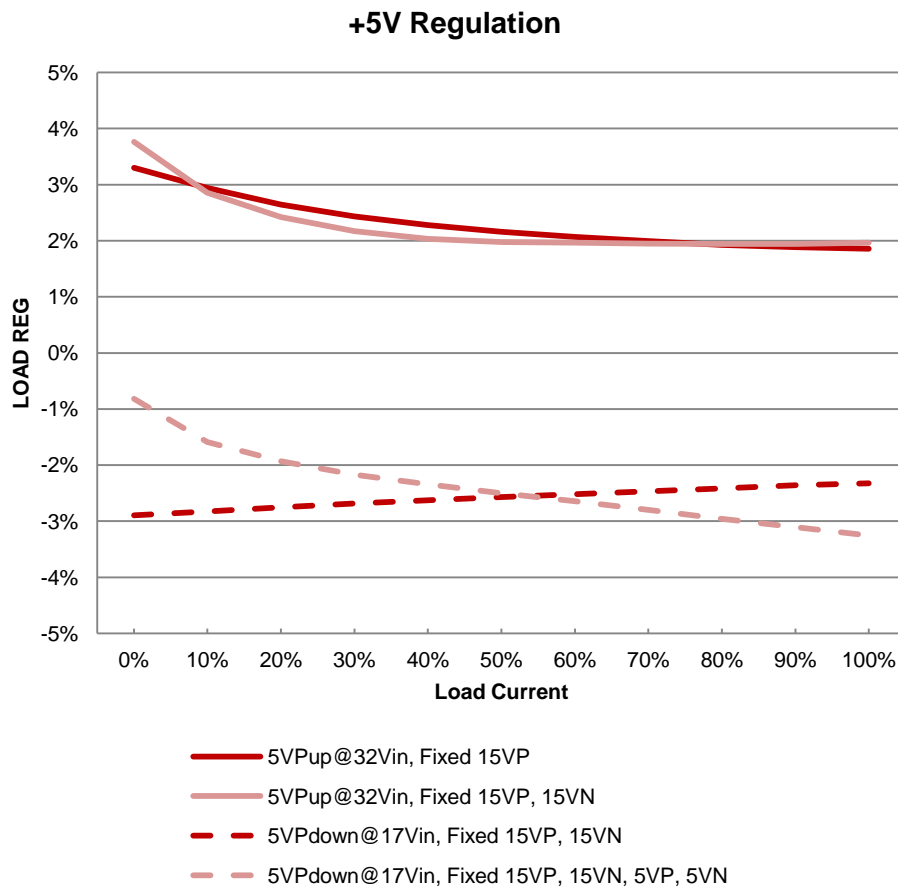
- Step 1. Fix the load on one output
- Step 2. Sweep other outputs' load from 0% to 100% at 10% increment
- Step 3. Record the up & down max variation for all outputs
- Step 4. Increase the fixed output load 10% and repeat from Step 1 until reaching 100% load
- Step 5. Test different fixed output and Vin combinations and start from Step 1

Out of all the test combinations, the worst cases are summarized and plotted in the graphs below:
 (Note: The line legend indicates the test condition. For example: "15VPup@32Vin, Fixed 5VP" means the curve shows the recorded upper limit of the +15V output variation in percentage under Vin=32V and fixed +5V output load condition)

1. +15V output regulation:(The ±15V regulation curves are symmetric about the 0% regulation axis)



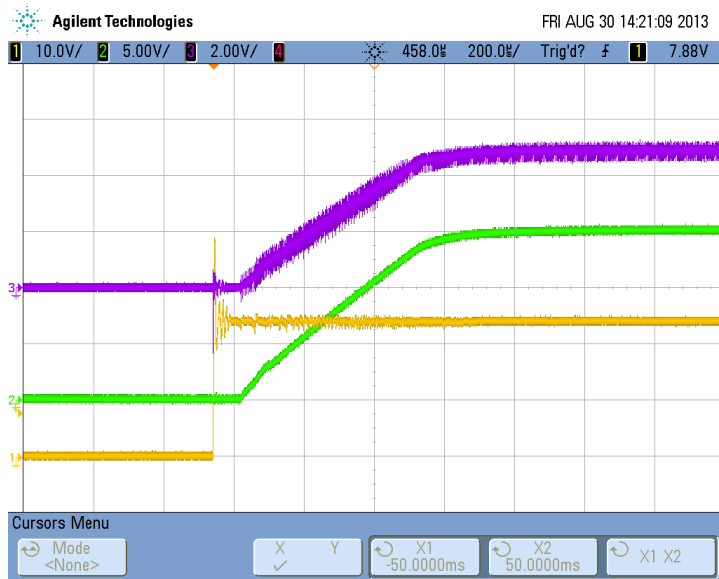
2. +5V output regulation: (The $\pm 5V$ regulation curves are symmetric about the 0% regulation axis)



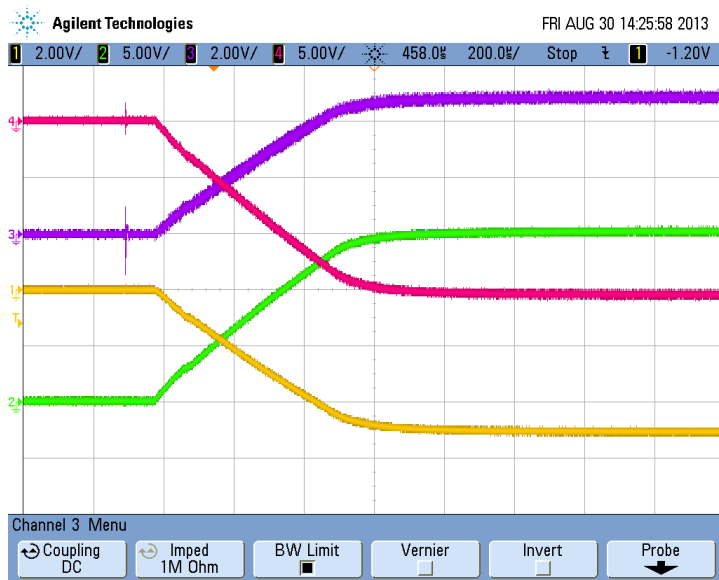
Start Up

Test condition: The input voltage was set at 24V, and all four outputs were set at full load.

Ch1 - Vin, Ch2 - 15VP (+15V), Ch3 - 5VP (+5V)



Ch1 - 5VN (-5V), Ch2 - 15VP (+15V), Ch3 - 5VP (+5V), Ch4 - 15VN (-15V)

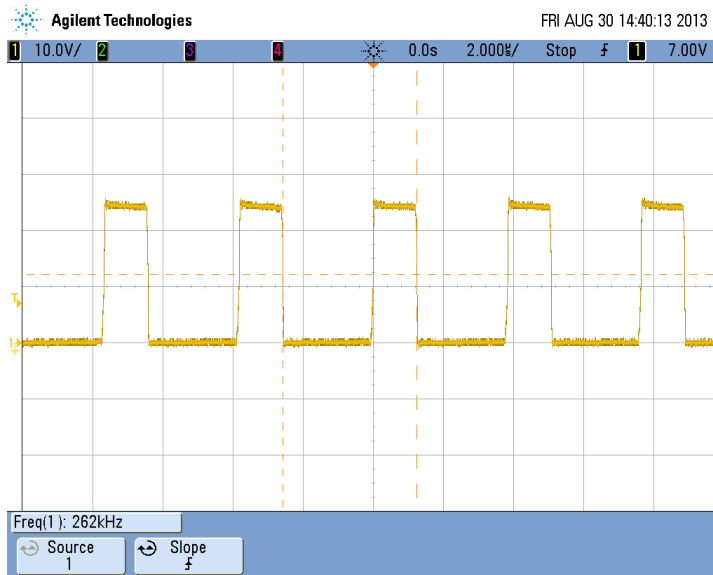


Switching Waveforms

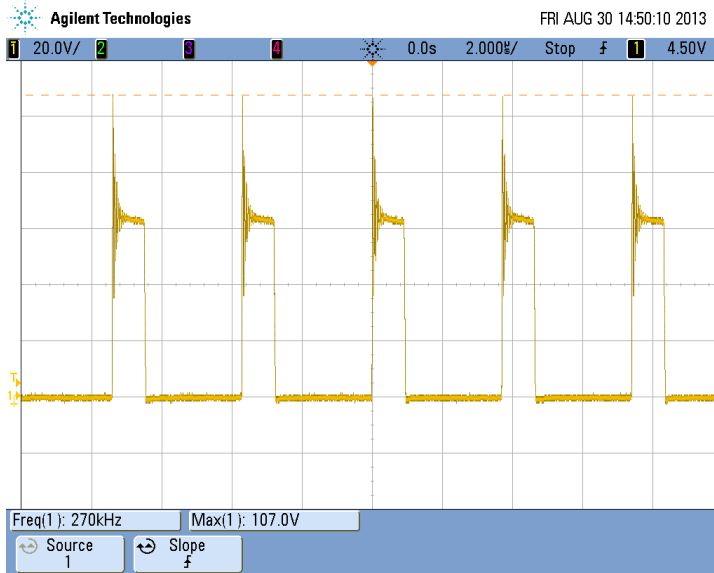
1. Test condition: The input voltage was set at 24V, and all four outputs were set at full load.
Ch1 – Vsw (switch node voltage)



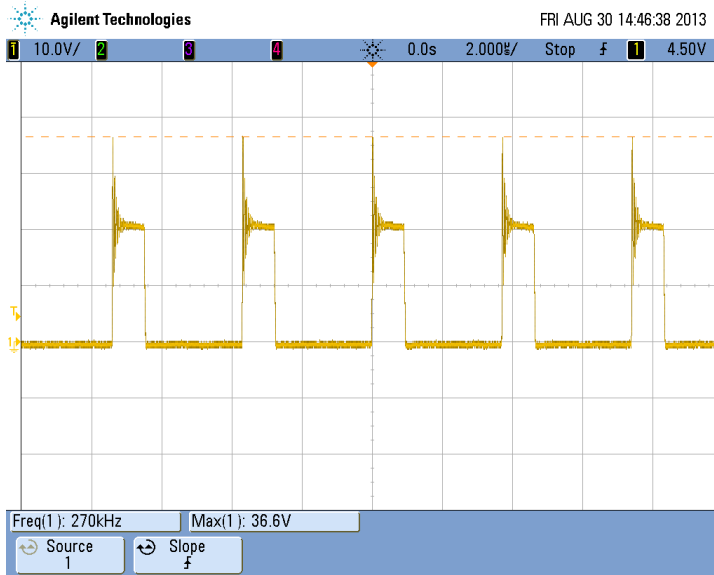
2. Test condition: The input voltage was set at 24V, and all four outputs were set at no load.
Ch1 – Vsw (switch node voltage)



- 3. Test condition: The input voltage was set at 32V, and all four outputs were set at full load.
Ch1 – Vd5 (+15V output diode voltage stress from cathode (-) to anode (+), 200V rating diode)



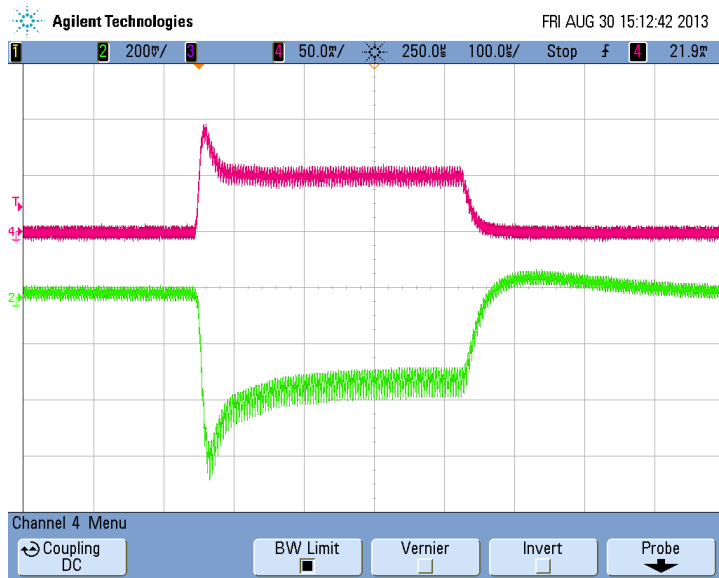
- 4. Test condition: The input voltage was set at 32V, and all four outputs were set at full load.
Ch1 – Vd4 (+5V output diode voltage stress from cathode (-) to anode (+), 60V rating diode)



Load Transients

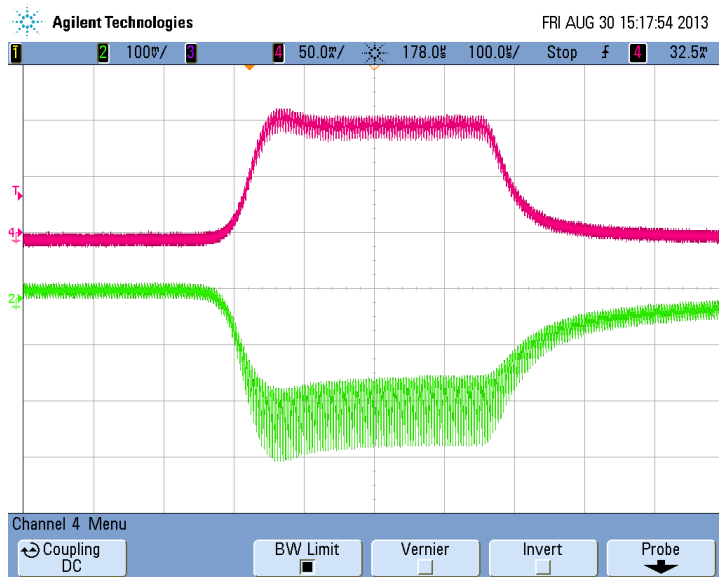
+15V Output Load Step

Test condition: $V_{in} = 24V$, 15VP (+15V) load from 0A to 50mA, no load on other outputs.
Ch2- 15VP (+15V) (AC mode), Ch4- +15V output current



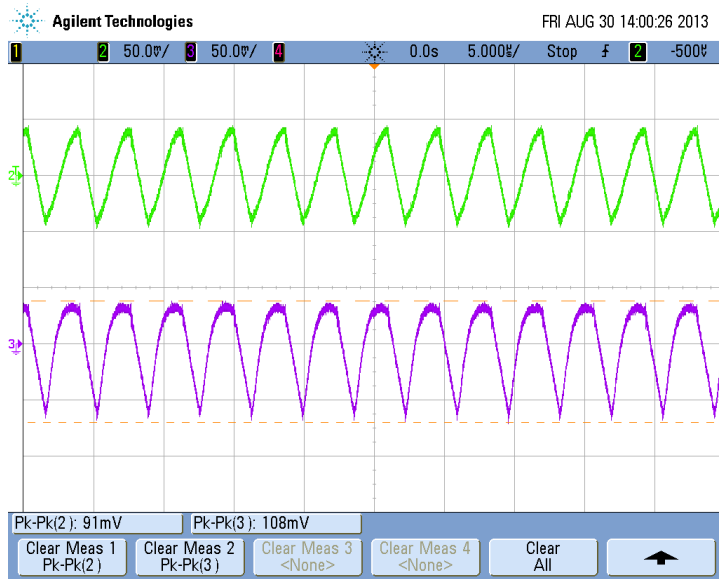
+5V Output Load Step

Test condition: $V_{in} = 24V$, 5VP (+5V) load from 0A to 100mA, no load on other outputs.
Ch2- 5VP (+5V) (AC mode), Ch4- +5V output current



Output Voltage Ripples

Test condition: The input voltage was set at 24V, and all four outputs were set at full load.
Ch2 - 15VP (+15V) (AC coupled), Ch3 - 5VP (+5V) (+5V) (AC coupled)



IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale (<https://www.ti.com/legal/termsofsale.html>) or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2021, Texas Instruments Incorporated