Test Data
For PMP10535
10/08/2014

Power Specification

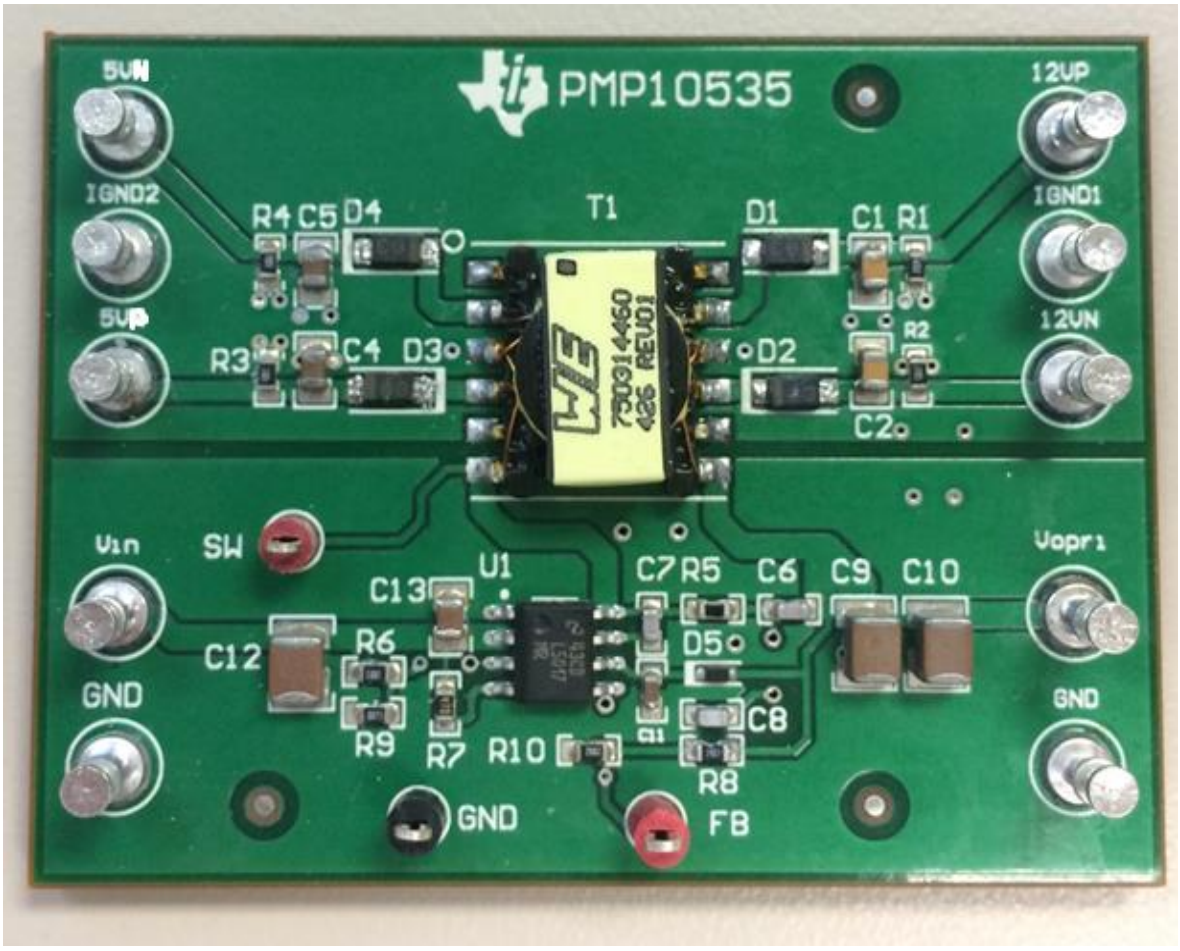
Vin range: 20V – 32V

Nominal Vin = 24V

Quad Isolated Outputs: ±5V@75mA, ±12V@75mA

Fsw = 350kHz

Board Photo

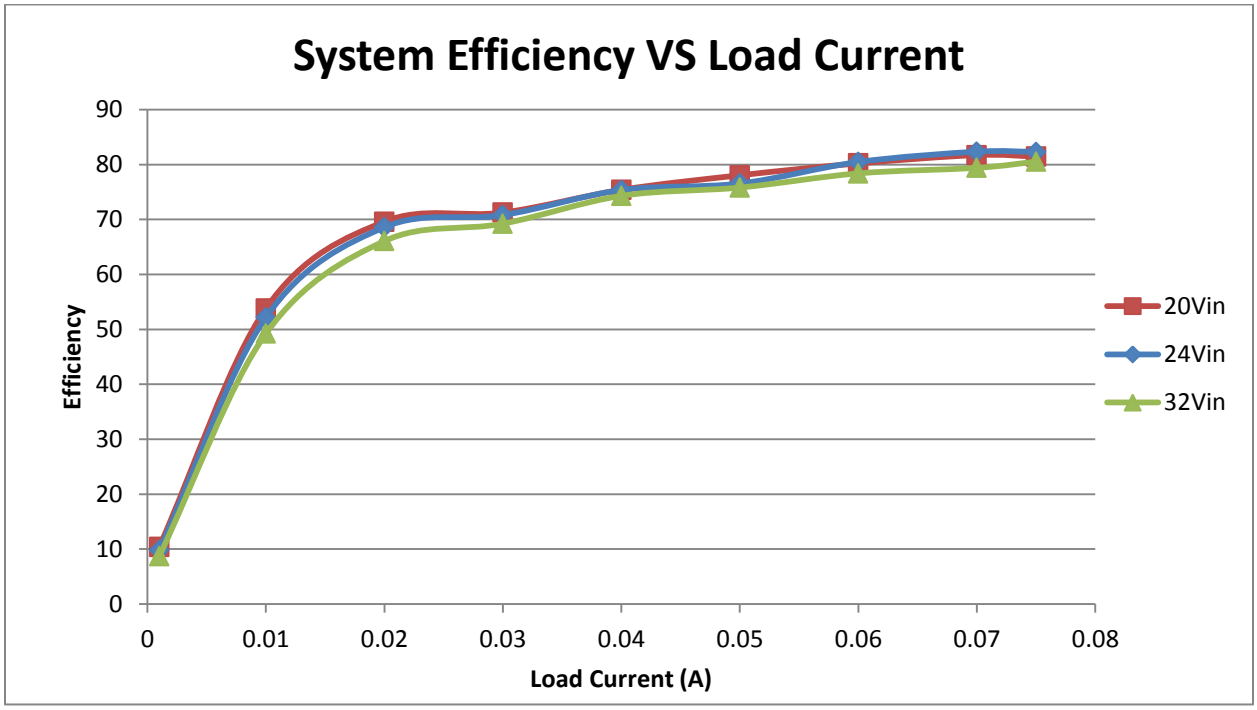


Size: 56x43mm

5VP: +5V output, 5VN: -5V output, 12VP: +12V output, 12VN: -12V output

Efficiency

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

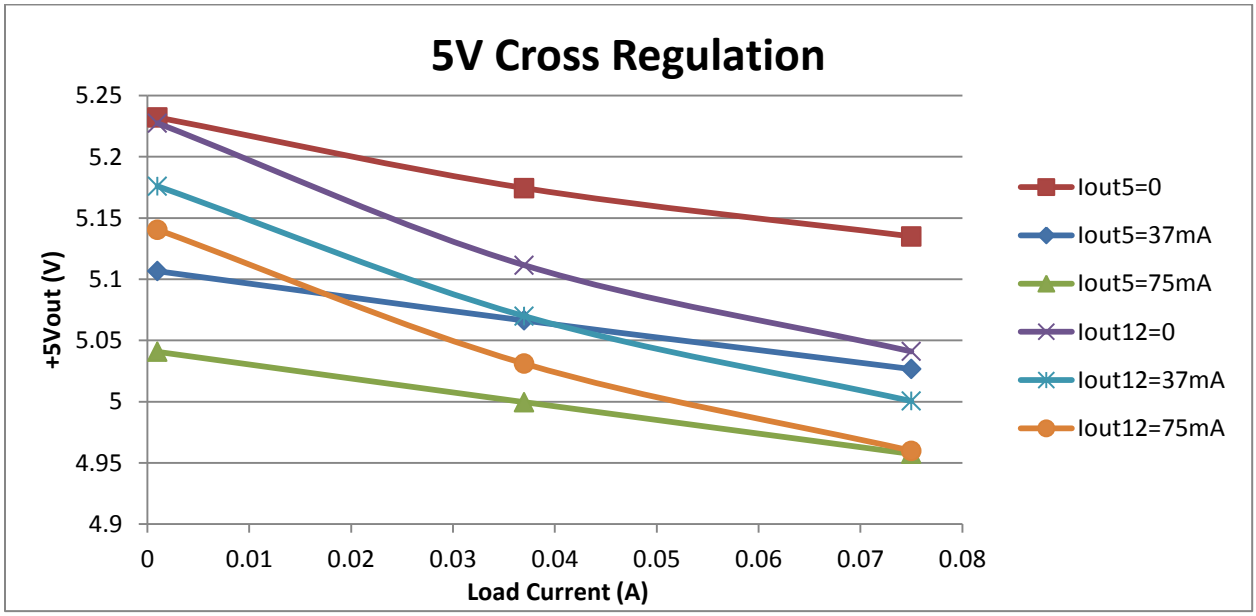


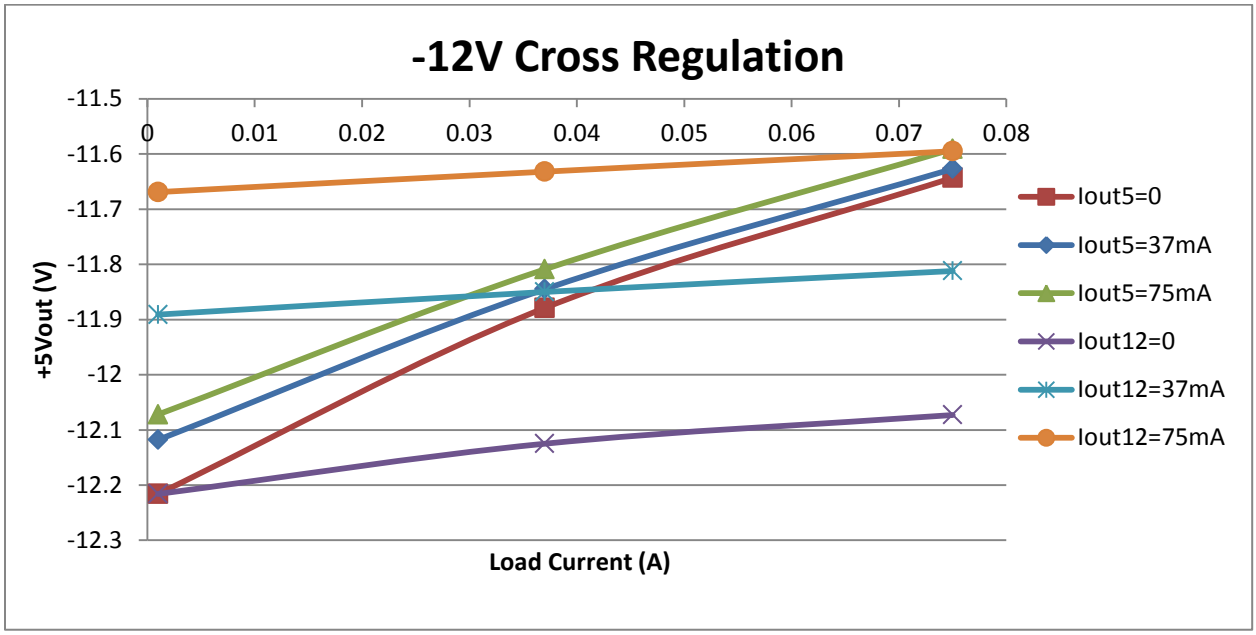
For more data at different Vin, see the Appendix.

Cross Regulation

The cross regulation was tested by sweeping different load condition on four outputs.

Vin=24V

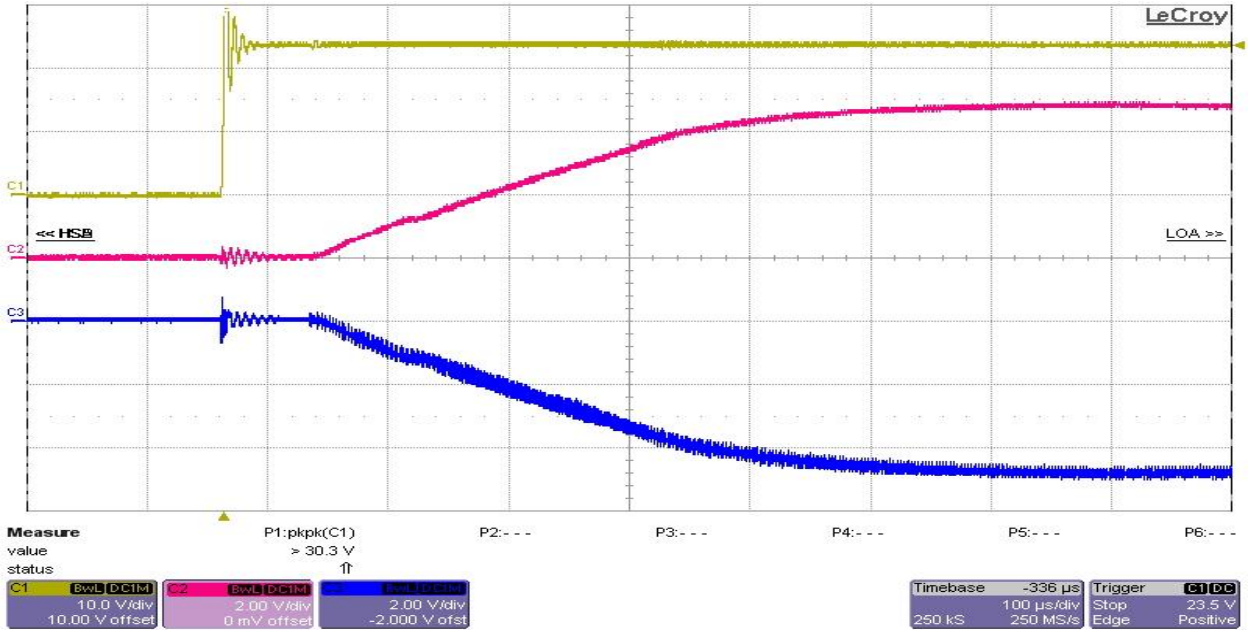




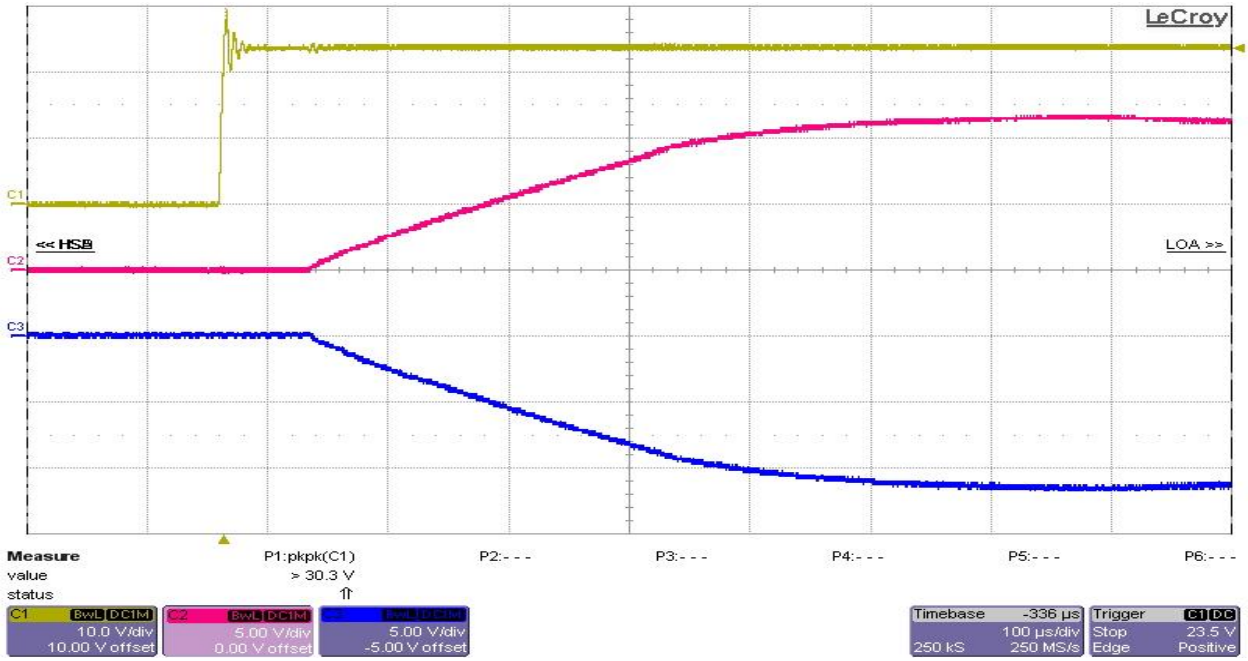
For more data of different rails, see the Appendix.

Start Up

Test condition: The input voltage was set at 24V, and both outputs were set at full load of 75mA.
Ch1 - Vin, Ch2 – 5VP (+5V), Ch3 – 5VN (-5V)



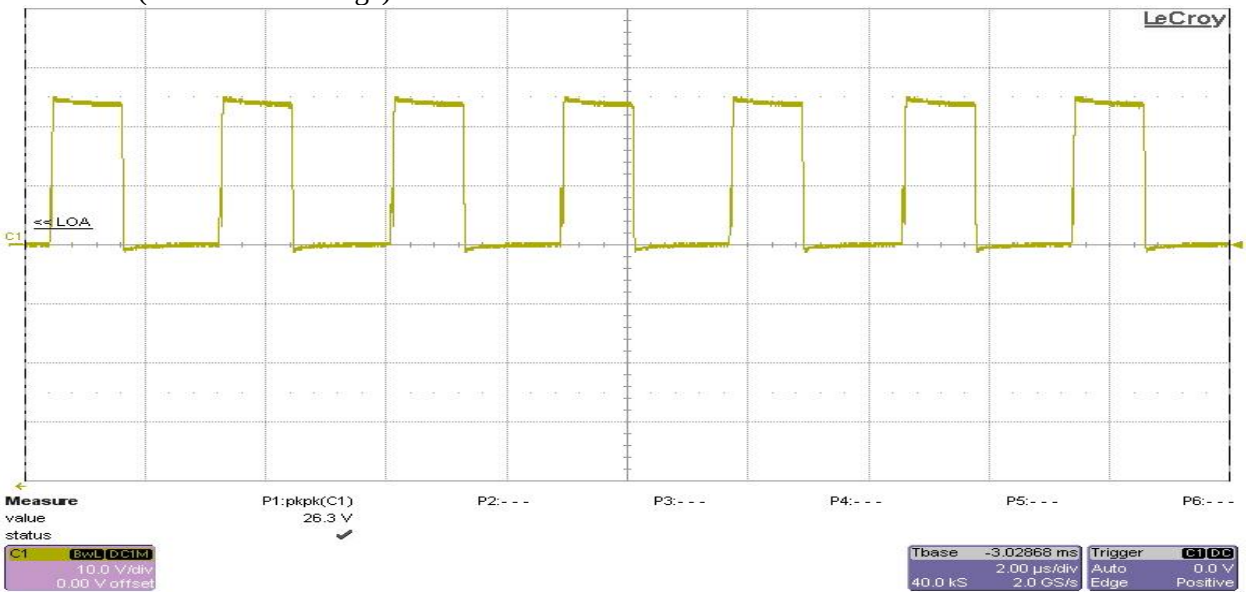
Test condition: The input voltage was set at 24V, and both outputs were set at full load of 75mA.
Ch1 - Vin, Ch2 – 12VP (+12V), Ch3 – 12VN (-12V)



Switching Waveforms

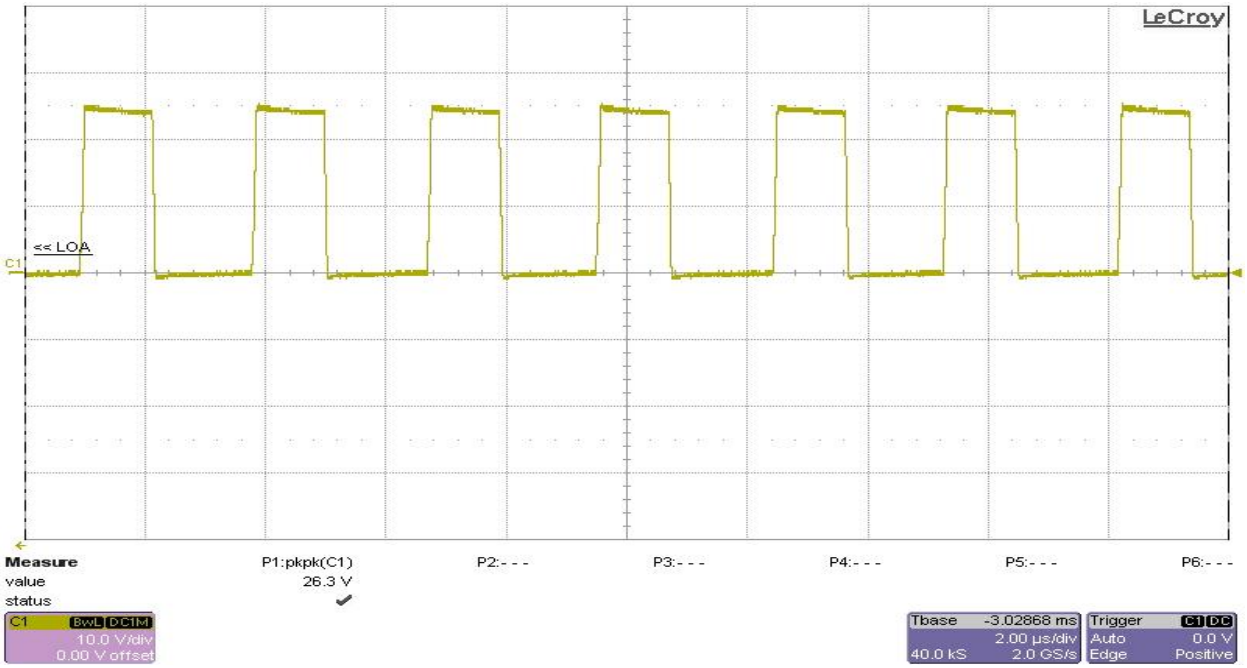
Test condition: The input voltage was set at 24V, and four outputs were set at full load.

Ch1 – Vsw (switch node voltage)



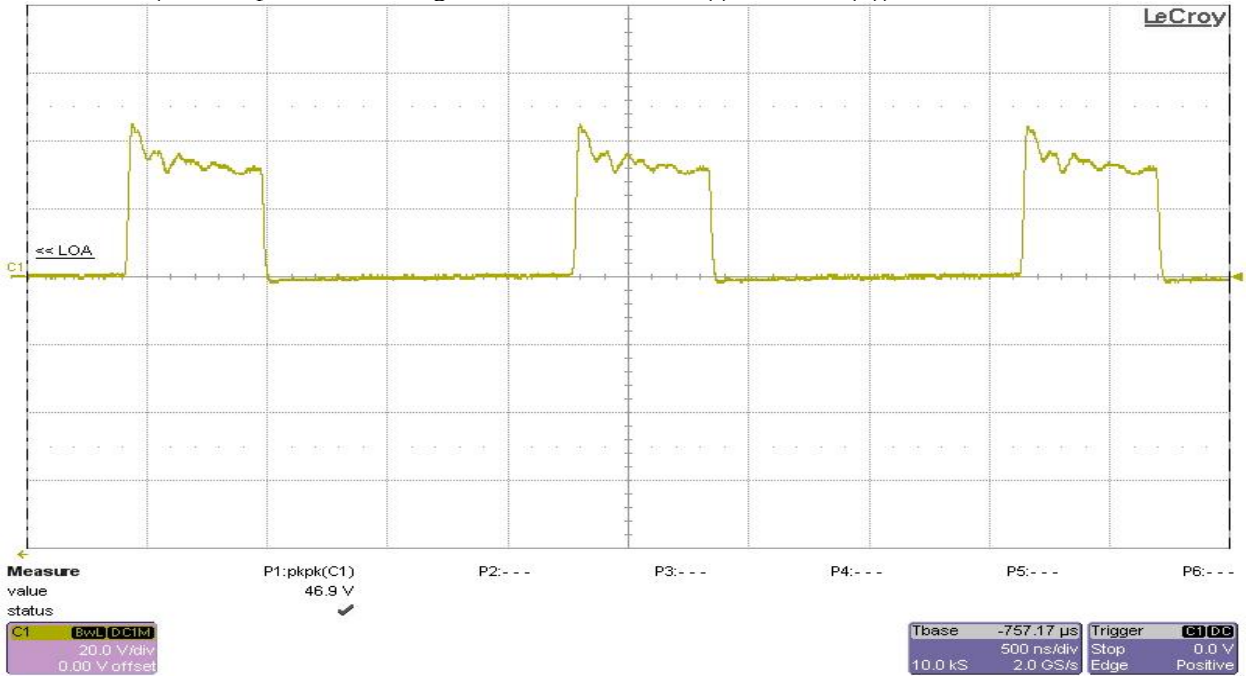
Test condition: The input voltage was set at 24V, and four outputs were set at no load.

Ch1 – Vsw (switch node voltage)



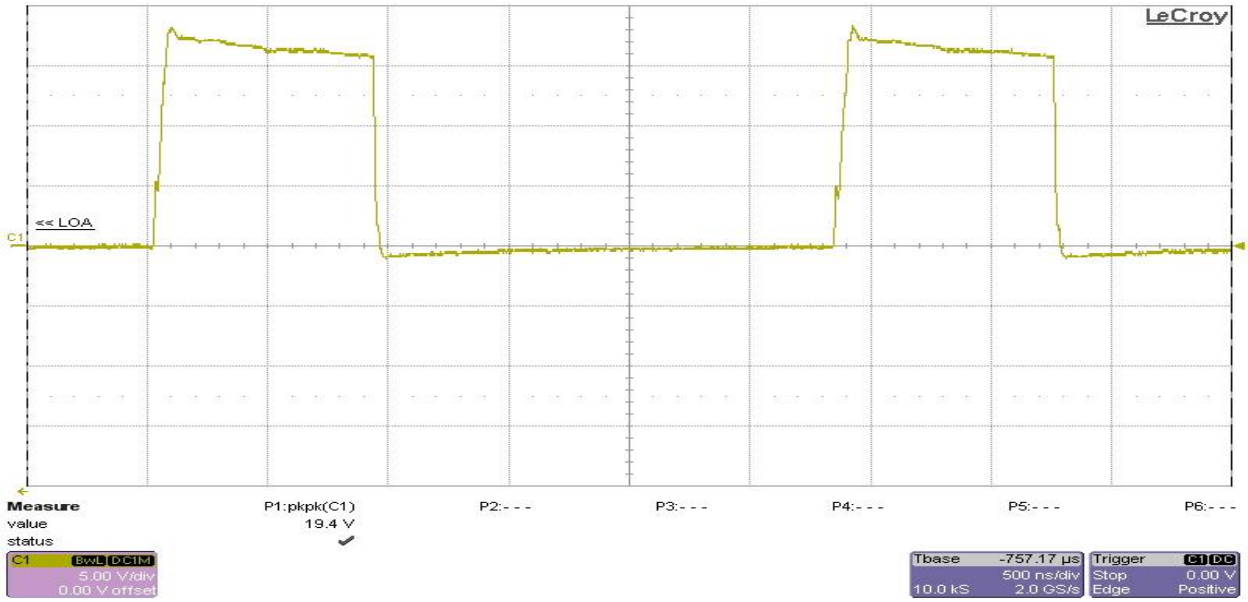
Test condition: The input voltage was set at 32V, and four outputs were set at full load of 75mA.

Ch1 – Vd12 (12V output diode voltage stress from cathode (-) to anode (+))



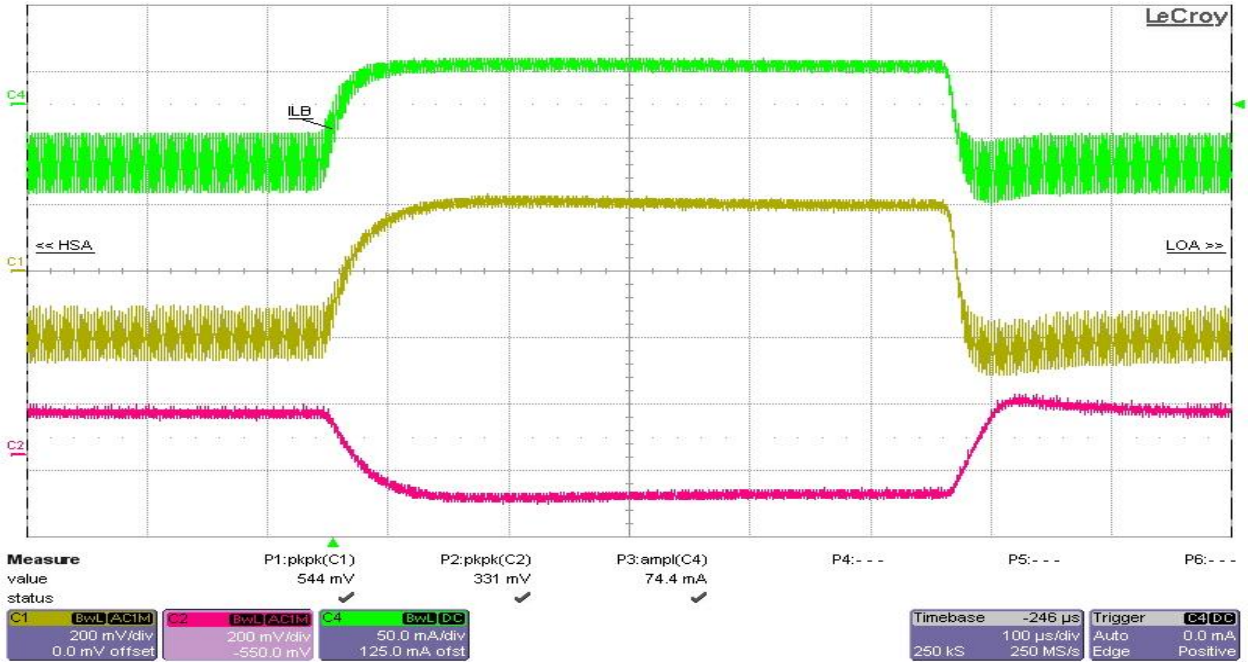
Test condition: The input voltage was set at 32V, and four outputs were set at full load of 75mA.

Ch1 – Vd5 (5V output diode voltage stress from cathode (-) to anode (+))

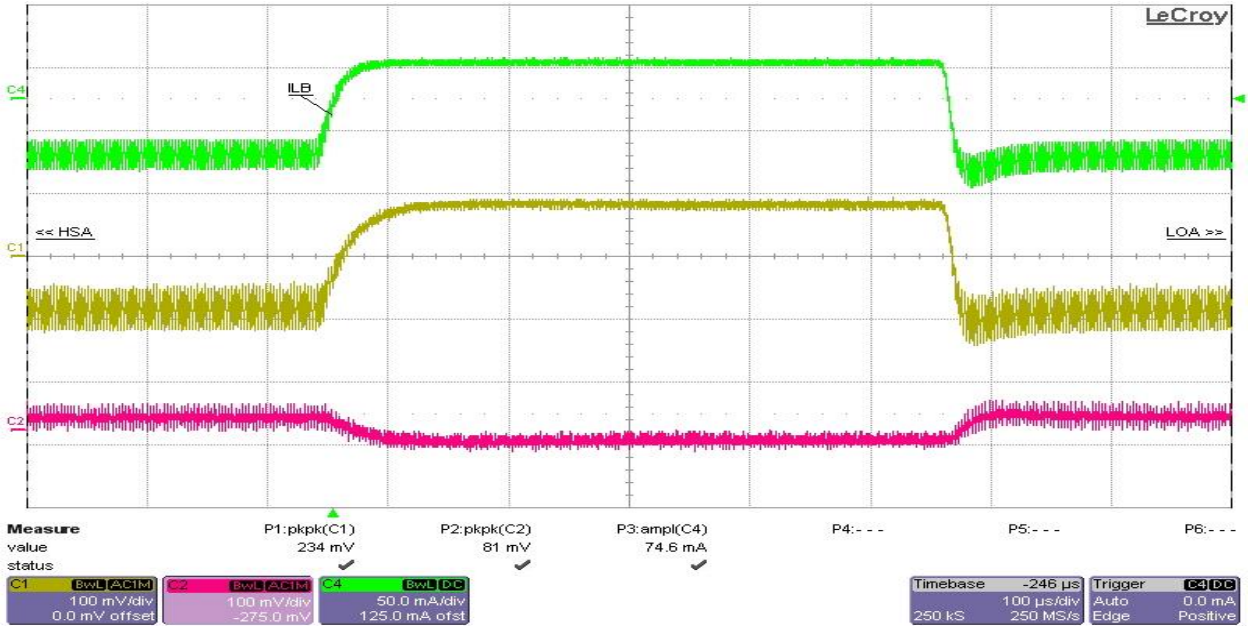


Load Transients

Test condition: Vin = 24V, 12VP (+12V) load from 0A to 75mA, no load at the other outputs.
Ch1- 12VP (+12V) (AC mode), Ch2- 12VN (-12V) (AC mode), Ch4- Io (+12V output current)

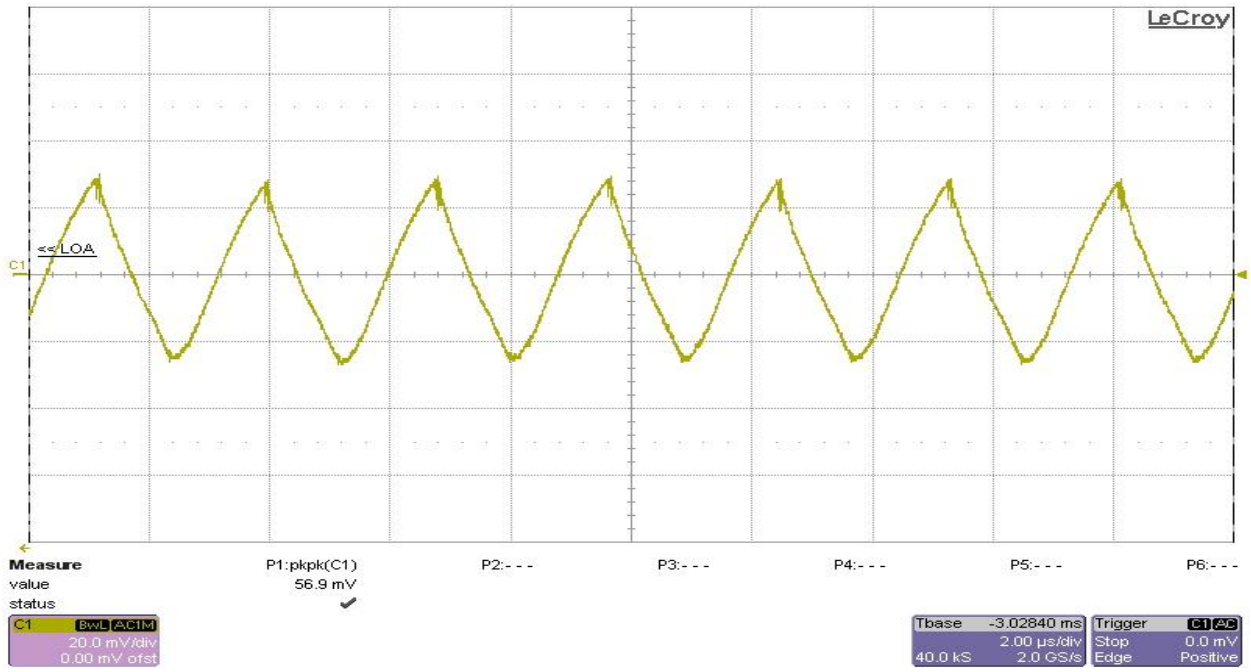


Test condition: Vin = 24V, 5VP (+5V) load from 0A to 75mA, no load at the other outputs.
Ch1- 5VP (+5V) (AC mode), Ch2- 5VN (-5V) (AC mode), Ch4- Io (+5V output current)

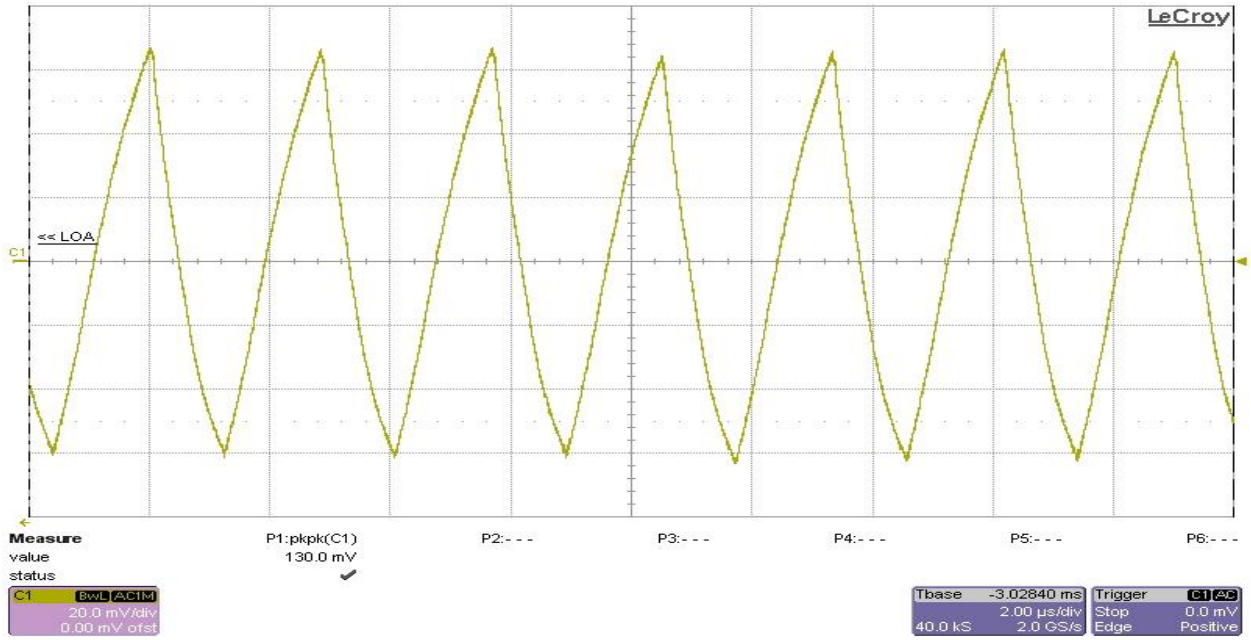


Output Voltage Ripples

Test condition: The input voltage was set at 24V, and four outputs were set at full load of 75mA.
Ch1 – 5VP (+5V) (AC coupled)



Test condition: The input voltage was set at 24V, and four outputs were set at full load of 75mA.
Ch1 – 12VP (+12V) (AC coupled)



Appendix – Test Data

Vin=24V

Iin	12Vout	12VoutN	Iout12	5Vout	5VoutN	Iout5	Eff
0.01482	12.188	-12.182	0.001	5.229	-5.2266	0.001	9.791273
0.027522	12.067	-12.06	0.01	5.174	-5.1715	0.01	52.18931
0.041575	11.981	-11.975	0.02	5.135	-5.132	0.02	68.59691
0.059925	11.885	-11.878	0.03	5.092	-5.0893	0.03	70.8058
0.074615	11.815	-11.808	0.04	5.061	-5.0583	0.04	75.36979
0.09121	11.7367	-11.7308	0.05	5.026	5.0239	0.05	76.5573
0.1037	11.6905	-11.6848	0.06	5.0048	-5.0025	0.06	80.47878
0.11759	11.6277	-11.6218	0.07	4.977	-4.9746	0.07	82.351
0.12563	11.5905	-11.585	0.075	4.9583	-4.958	0.075	82.31463

Vin=20V

Iin	12Vout	12VoutN	Iout12	5Vout	5VoutN	Iout5	Eff
0.0166	12.104	-12.097	0.001	5.199	-5.1963	0.001	10.42057
0.0318	11.975	-11.968	0.01	5.139	-5.136	0.01	53.80189
0.04869	11.863	-11.856	0.02	5.089	-5.0865	0.02	69.61286
0.07055	11.729	-11.723	0.03	5.033	-5.03	0.03	71.25797
0.0881	11.624	-11.619	0.04	4.989	-4.986	0.04	75.40976
0.10567	11.546	-11.54	0.05	4.955	-4.9514	0.05	78.05527
0.12238	11.452	-11.446	0.06	4.915	-4.9114	0.06	80.21997
0.13895	11.354	-11.348	0.07	4.874	-4.8704	0.07	81.72897
0.14857	11.296	-11.29	0.075	4.85	-4.846	0.075	81.48179

Vin=32V

Iin	12Vout	12VoutN	Iout12	5Vout	5VoutN	Iout5	Eff
0.012605	12.35	-12.341	0.001	5.275	-5.2736	0.001	8.736513
0.02208	12.181	-12.174	0.01	5.216	-5.2137	0.01	49.23106
0.03269	12.105	-12.097	0.02	5.179	-5.1775	0.02	66.07238
0.0465	12.031	-12.024	0.03	5.147	-5.1436	0.03	69.24516
0.05753	11.981	-11.975	0.04	5.125	-5.122	0.04	74.31557
0.07017	11.928	-11.922	0.05	5.101	-5.0987	0.05	75.81966
0.08113	11.885	-11.879	0.06	5.082	-5.079	0.06	78.40426
0.0931	11.84	-11.833	0.07	5.063	-5.0593	0.07	79.40625
0.0982	11.823	-11.816	0.075	5.053	-5.0496	0.075	80.53144

Iout5 =0

5Vout	5VoutN	12Vout	12VoutN	Iout12
5.2322	-5.234	12.223	-12.216	0.001
5.1745	-5.175	11.884	-11.879	0.037
5.135	-5.135	11.646	-11.643	0.075

Iout5 = 0.037

5Vout	5VoutN	12Vout	12VoutN	Iout12
5.1066	-5.1042	12.129	-12.118	0.001
5.0663	-5.0643	11.85	-11.845	0.037
5.0266	-5.0247	11.631	-11.627	0.075

Iout5 = 0.075

5Vout	5VoutN	12Vout	12VoutN	Iout12
5.0407	-5.037	12.084	-12.072	0.001
4.9996	-4.996	11.815	-11.809	0.037
4.9573	-4.9543	11.595	-11.591	0.075

Iout12=0

5Vout	5VoutN	12Vout	12VoutN	Iout5
5.2275	-5.2263	12.223	-12.216	0.001
5.1115	-5.1089	12.135	-12.125	0.037
5.041	-5.0376	12.086	-12.073	0.075

Iout12 = 0.037

5Vout	5VoutN	12Vout	12VoutN	Iout5
5.176	-5.175	11.897	-11.891	0.001
5.0699	-5.0678	11.855	-11.85	0.037
5.0005	-4.997	11.818	-11.812	0.075

Iout12 = 0.075

5Vout	5VoutN	12Vout	12VoutN	Iout5
5.1405	-5.1395	11.673	-11.669	0.001
5.0311	-5.0292	11.637	-11.632	0.037
4.9599	-4.9567	11.599	-11.595	0.075

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 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