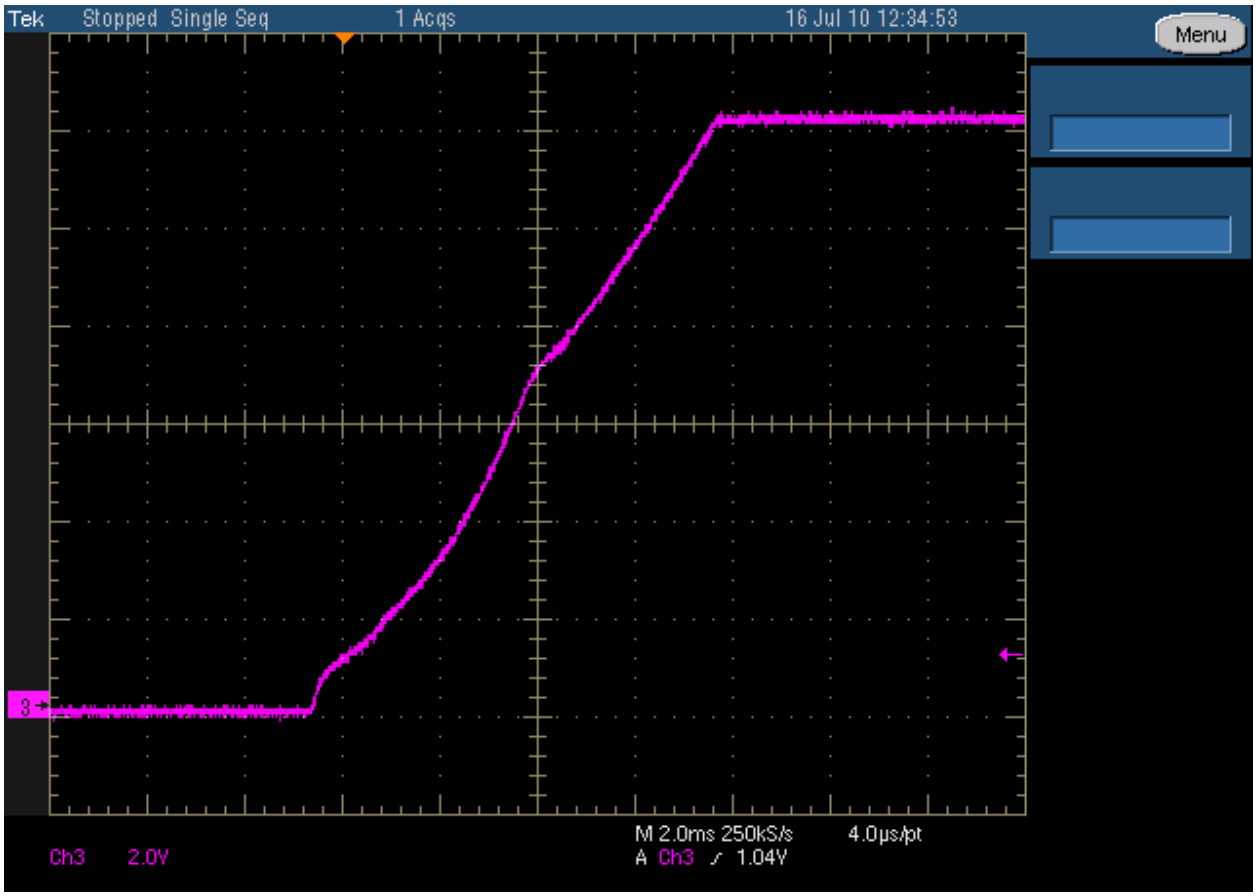
1. Startup

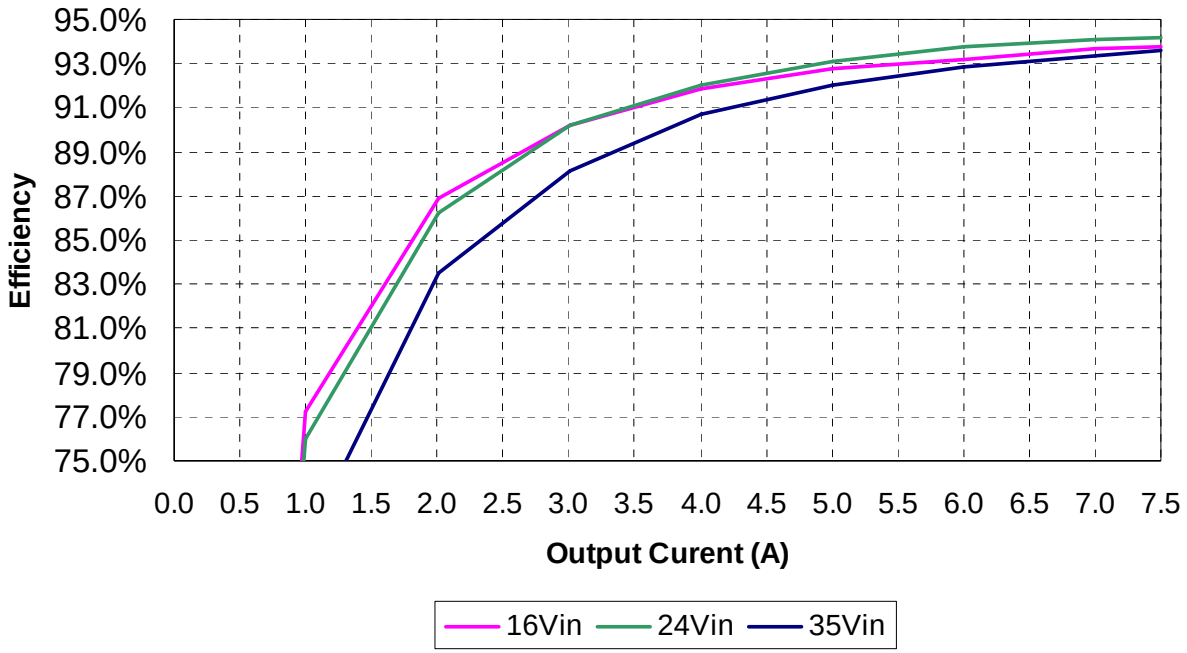
The output voltage at startup is shown in the image below. Input voltage was set to 17V and the load was set to 7.5A.

Channel 3: Output Voltage (2 V/div, 2msec/div).



2. Efficiency

The efficiency data is shown in the tables and graph below.
The measurements were taken at 16Vin, 24Vin and 35Vin.



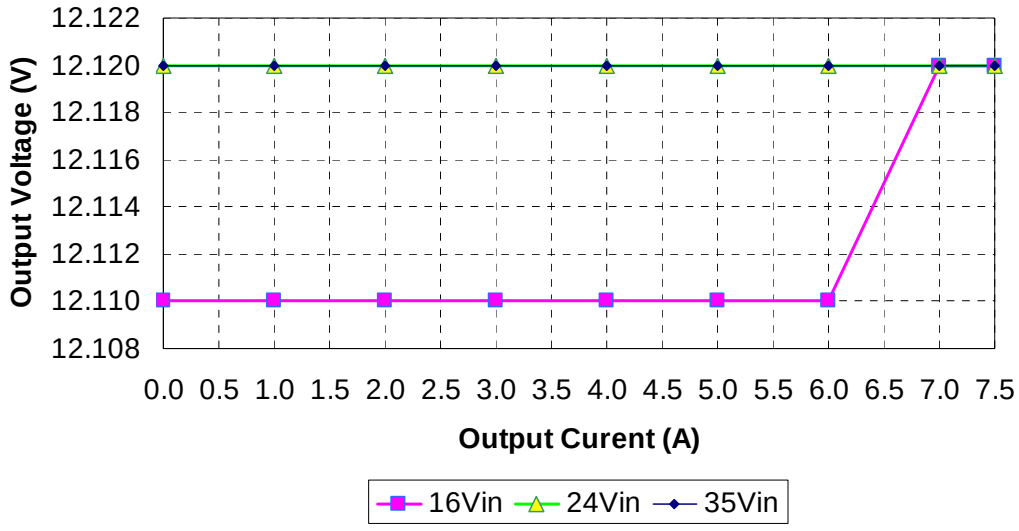
Iout (A)	Vout (V)	Pout (W)	Iin (A)	Vin (V)	Pin (W)	Ploss (W)	Eff. (%)
0.000	12.11	0.00	0.2843	16.02	4.55	4.55	0.0%
1.0036	12.11	12.15	0.9804	16.05	15.74	3.58	77.2%
2.005	12.11	24.28	1.742	16.04	27.94	3.66	86.9%
3.006	12.11	36.40	2.518	16.03	40.36	3.96	90.2%
4.005	12.11	48.50	3.297	16.01	52.78	4.28	91.9%
5.002	12.11	60.57	4.080	16.01	65.32	4.75	92.7%
6.003	12.11	72.70	4.871	16.01	77.98	5.29	93.2%
7.000	12.12	84.84	5.656	16.01	90.55	5.71	93.7%
7.501	12.12	90.91	6.057	16.01	96.97	6.06	93.8%

Iout (A)	Vout (V)	Pout (W)	Iin (A)	Vin (V)	Pin (W)	Ploss (W)	Eff. (%)
0.000	12.12	0.00	0.1830	24.02	4.40	4.40	0.0%
1.0036	12.12	12.16	0.6670	24.01	16.01	3.85	76.0%
2.005	12.12	24.30	1.173	24.01	28.17	3.87	86.3%
3.006	12.12	36.43	1.683	24.00	40.39	3.96	90.2%
4.004	12.12	48.53	2.196	24.01	52.73	4.20	92.0%
5.002	12.12	60.62	2.714	24.00	65.14	4.51	93.1%
6.003	12.12	72.76	3.234	24.00	77.62	4.86	93.7%
7.000	12.12	84.84	3.757	24.00	90.17	5.33	94.1%
7.500	12.12	90.90	4.019	24.02	96.54	5.64	94.2%

Iout (A)	Vout (V)	Pout (W)	Iin (A)	Vin (V)	Pin (W)	Ploss (W)	Eff. (%)
0.000	12.12	0.00	0.1555	35.01	5.44	5.44	0.0%
1.0040	12.12	12.17	0.4877	35.01	17.07	4.91	71.3%
2.005	12.12	24.30	0.832	35.00	29.10	4.80	83.5%
3.006	12.12	36.43	1.180	35.01	41.33	4.89	88.2%
4.004	12.12	48.53	1.529	35.00	53.52	4.99	90.7%
5.002	12.12	60.62	1.882	35.01	65.89	5.26	92.0%
6.002	12.12	72.74	2.237	35.02	78.34	5.60	92.9%
6.998	12.12	84.82	2.595	35.01	90.85	6.04	93.4%
7.500	12.12	90.90	2.776	35.00	97.16	6.26	93.6%

3. Output Voltage Regulation

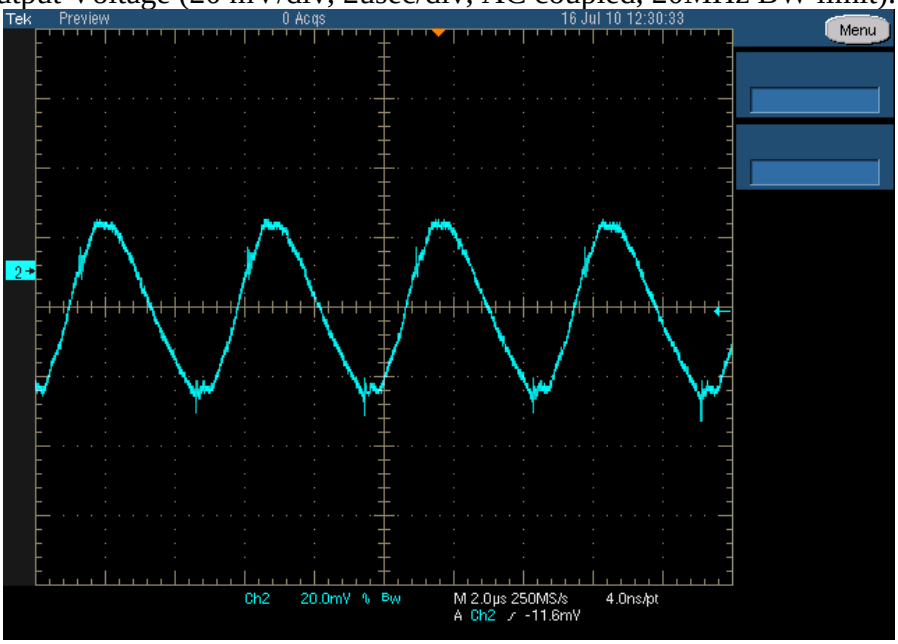
The output voltage regulation of the 12V output versus load, has been taken at the same conditions as above.



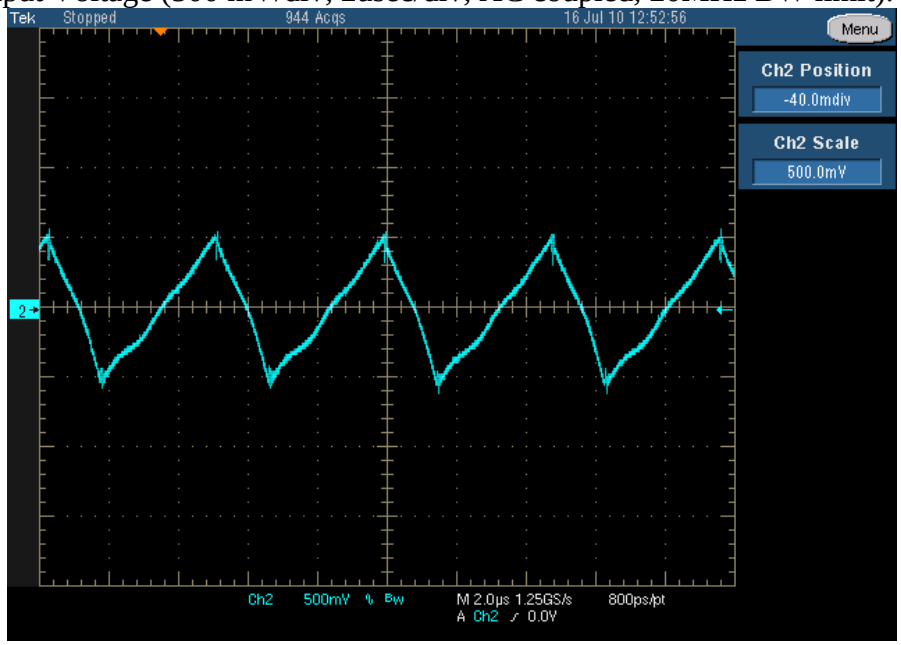
4. Input and Output Ripple Voltage

The ripple voltage waveforms measured at the terminal blocks are shown in the plots below. The input was set to 32V (worst case).

Channel 2: Output Voltage (20 mV/div, 2usec/div, AC coupled, 20MHz BW limit).



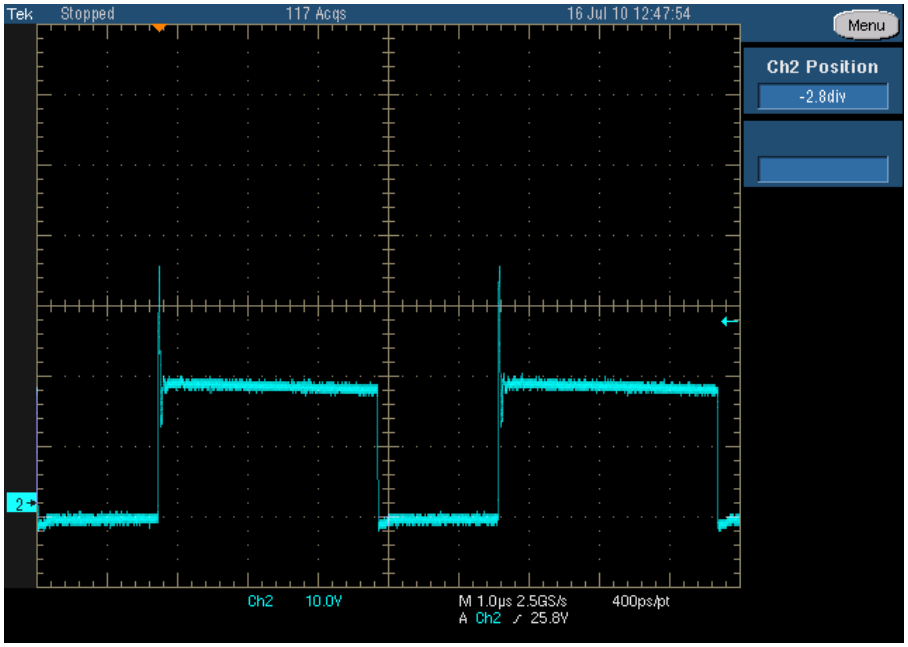
Channel 2: Input Voltage (500 mV/div, 2usec/div, AC coupled, 20MHz BW limit).



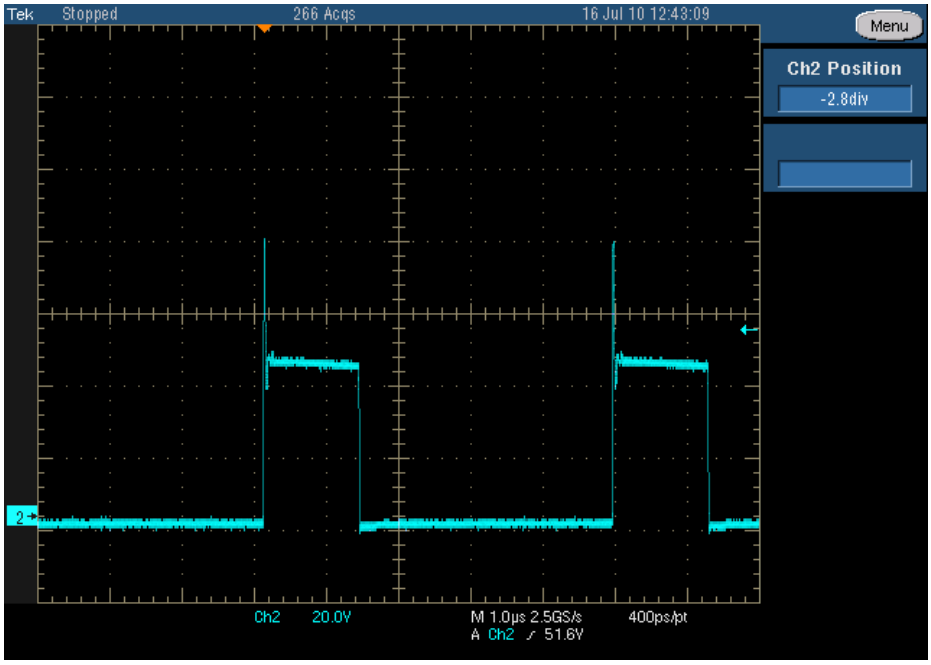
5. Switching Waveforms

The images below show the drain-to-source waveforms of the power MOSFETs at full load.

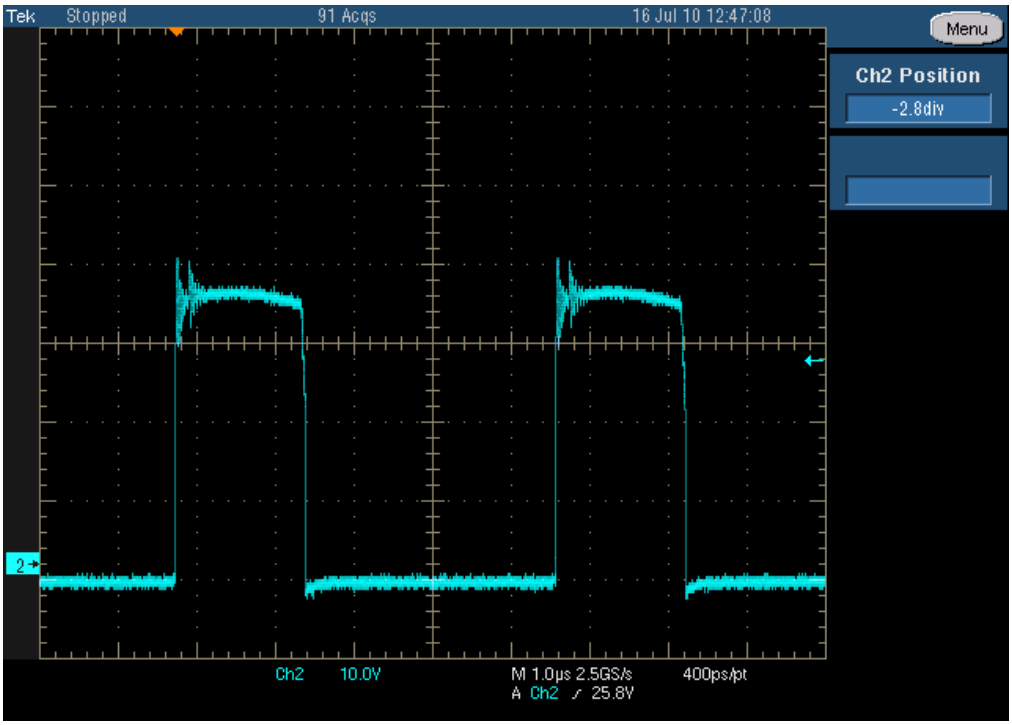
Channel 2: "**Q11** Vds", (10V/div, 1usec/div), no bandwidth reduction, **@ 16Vin**



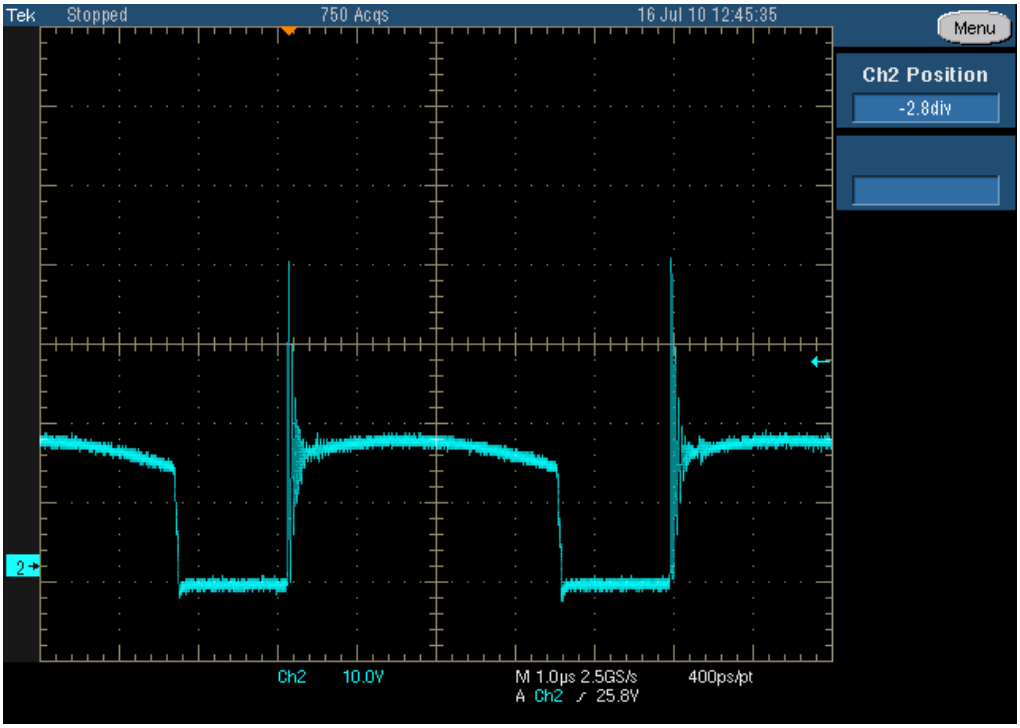
Channel 2: "**Q11** Vds", (20V/div, 1usec/div), no bandwidth reduction, **@ 36Vin**



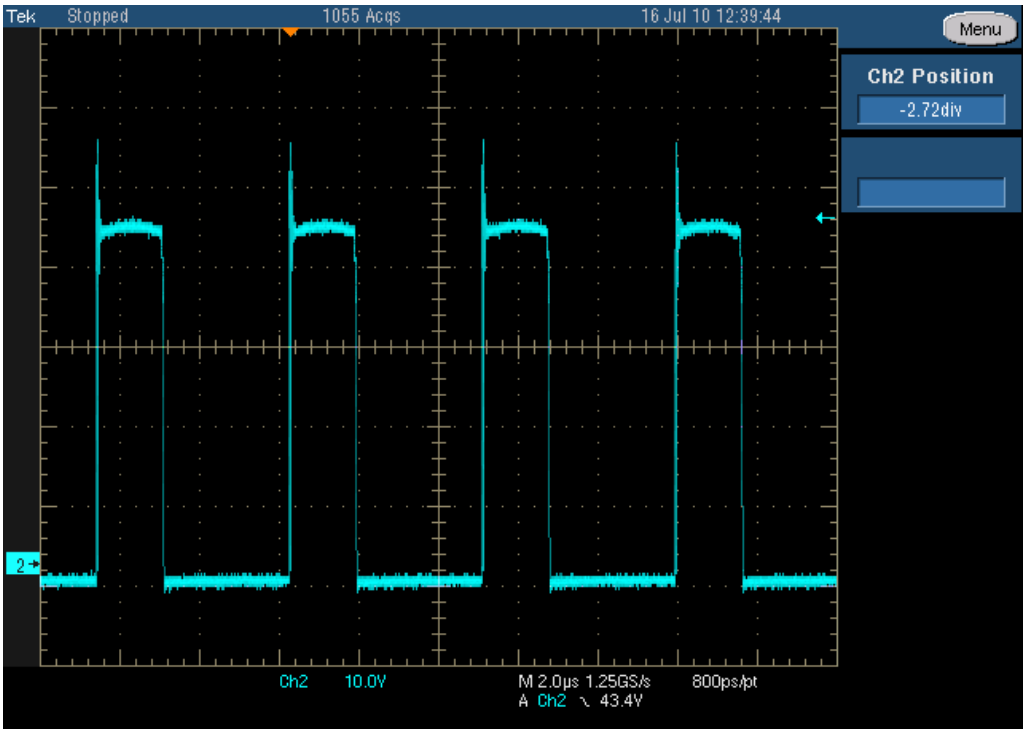
Channel 2: "**Q9** Vds", (10V/div, 1usec/div), no bandwidth reduction, **@ 16Vin**



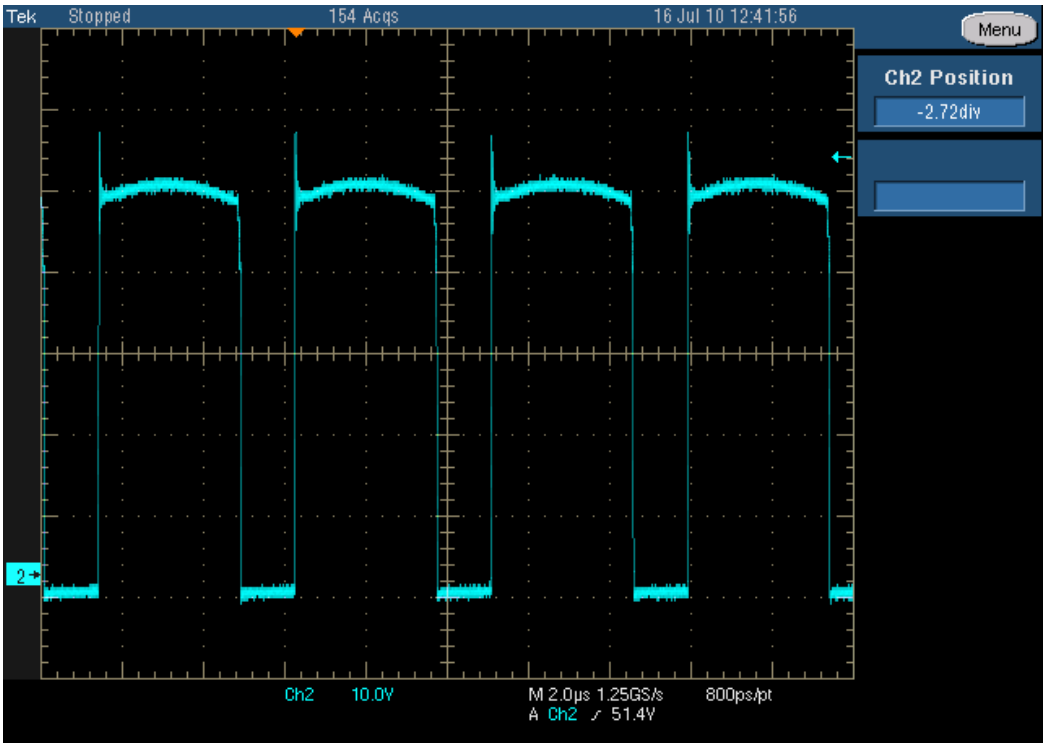
Channel 2: "**Q9** Vds", (10V/div, 1usec/div), no bandwidth reduction, **@ 36Vin**



Channel 2: "**Q6** Vds", (10V/div, 2usec/div), no bandwidth reduction, **@ 16Vin**



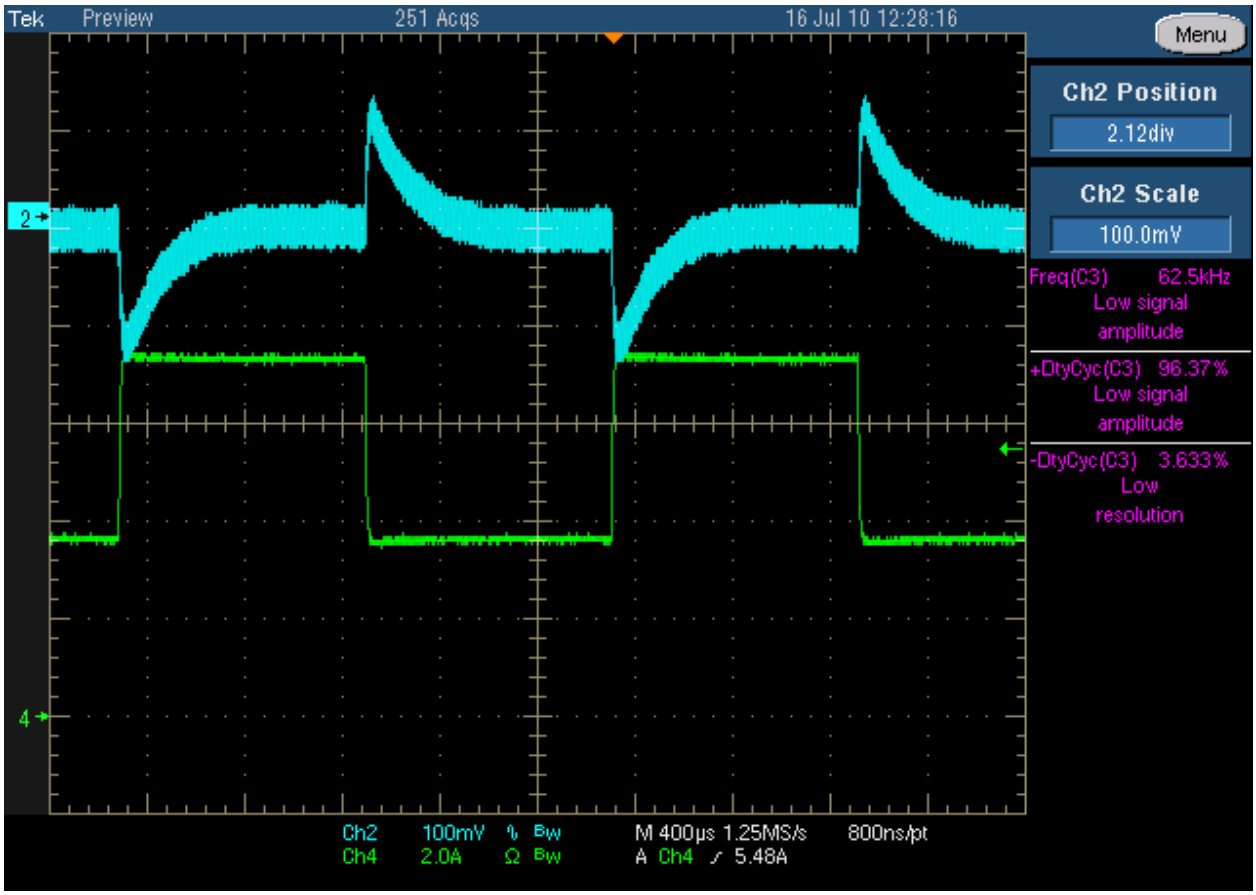
Channel 2: "**Q6** Vds", (10V/div, 2usec/div), no bandwidth reduction, **@ 36Vin**



6. Transient Response

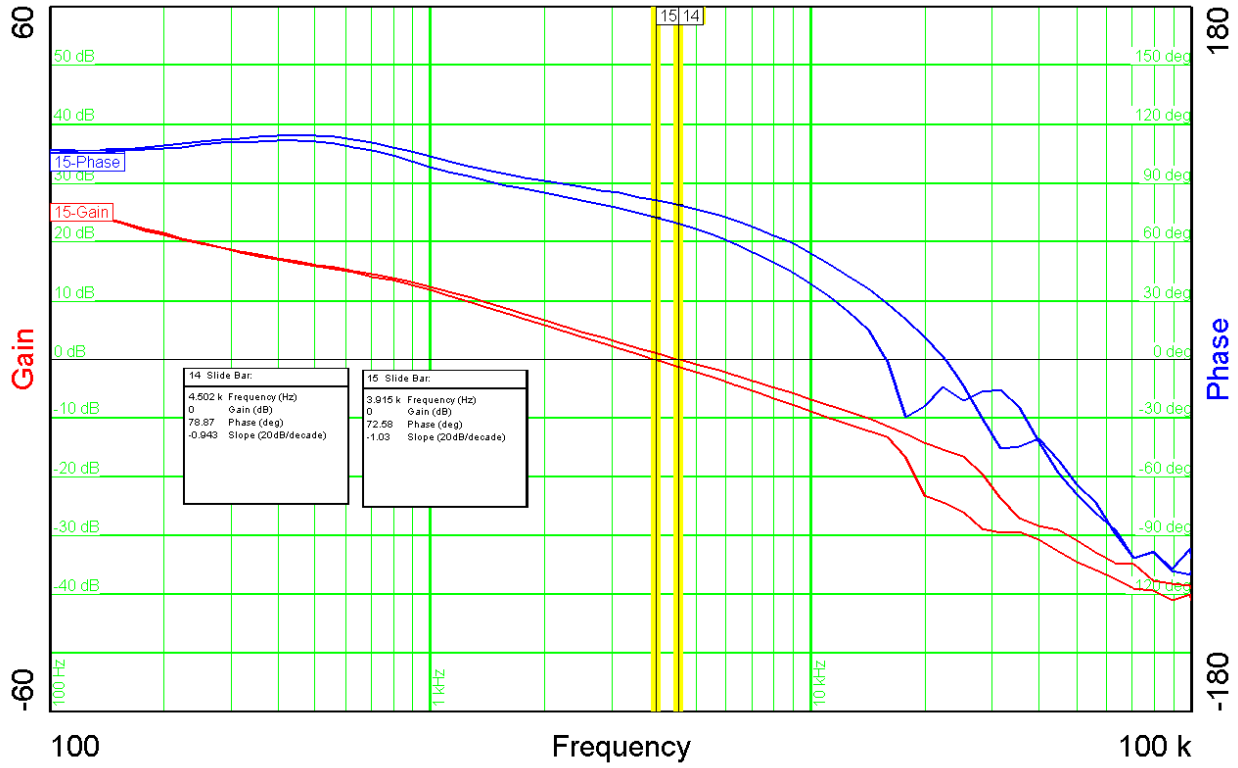
The image below shows the transient response behavior. The input voltage was set to the nominal voltage: 24V, and the load on the 12Vout switched from 50% to 100% of the nominal value.

Channel 2: Output Voltage (100mV/div, AC coupled, 400usec/div, 20MHz bandwidth)
Channel 4: Switched current on the 12V output (2A/div, DC coupled)



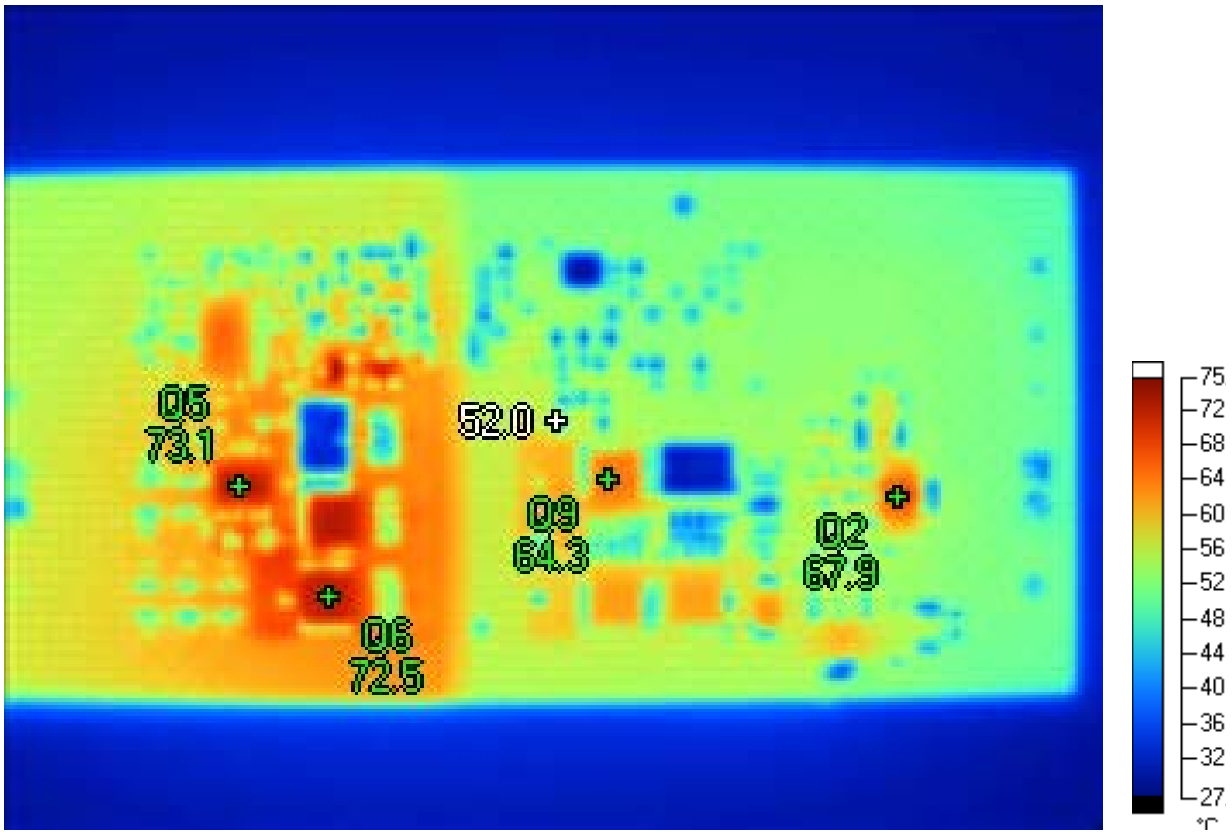
7. Loop Analysis

The graph below shows the loop measurement at 17Vin and 32Vin @ full load.
The worst case crossover frequency was 3.915 KHz and the phase margin 72.58 deg.



8. Thermal Analysis

The images and tables below describe the thermal behavior of the board, supplied with 16Vin and fully loaded. The thermal shots were taken 20 minutes after power on.



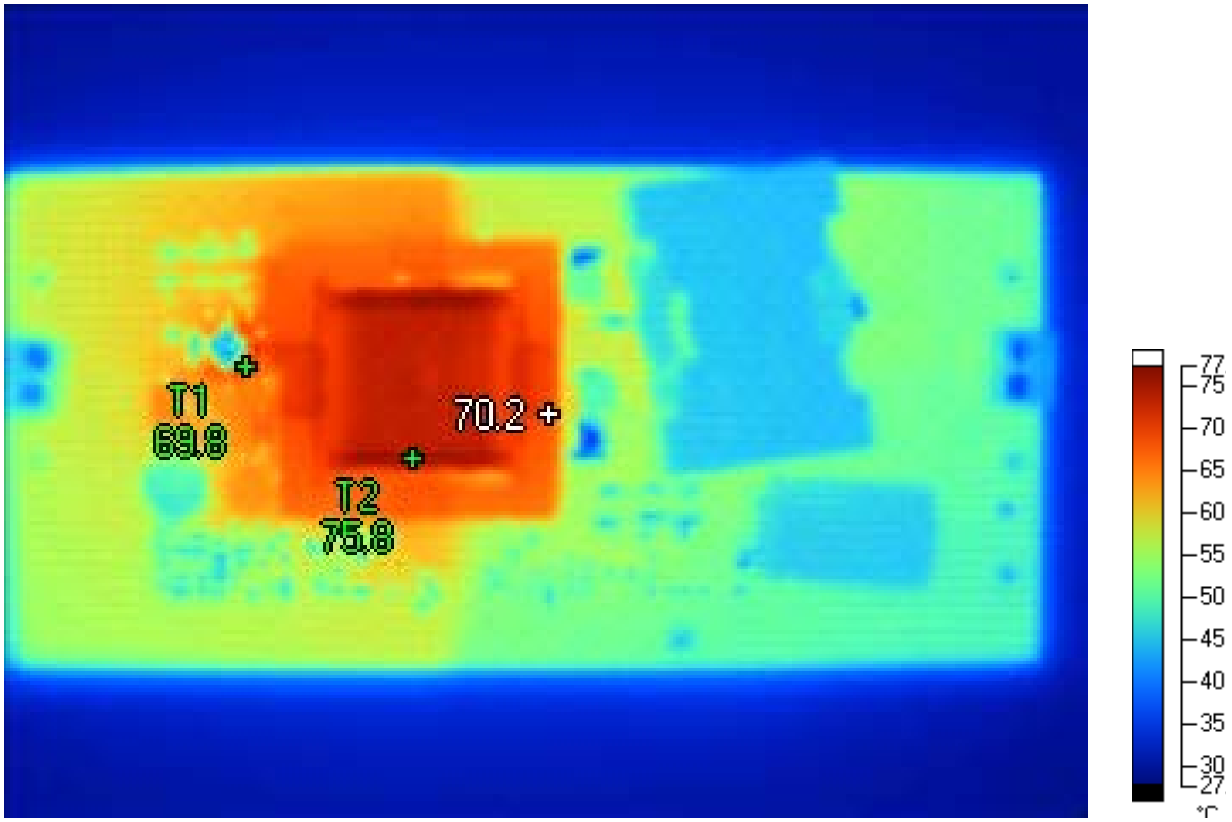
7/16/2010 3:31:04 PM

Image Info

Background	24.0 °C
Average Temperature	46.0 °C
Camera Model	Ti40FT
Image Range	28.4 °C to 75.3 °C
Image Time	7/16/2010 3:31:04 PM
Manufacturer	Fluke
Camera Serial Number	Ti40FT-070263

Markers

Label	Temperature	Emissivity	Background
Center Point	52.0 °C	0.95	24.0 °C
Q5	73.1 °C	0.95	24.0 °C
Q6	72.5 °C	0.95	24.0 °C
Q9	64.3 °C	0.95	24.0 °C
Q2	67.9 °C	0.95	24.0 °C



7/16/2010 3:31:29 PM

Image Info

Background	240 °C
Average Temperature	45.7 °C
Calibration Range	-20.0 °C to 350.0 °C
Camera Model	Ti40FT
Image Range	28.4 °C to 76.6 °C
Image Time	7/16/2010 3:31:29 PM
Manufacturer	Fluke
Camera Serial Number	Ti40FT-070263

Markers

Label	Temperature	Emissivity	Background
Center Point	70.2 °C	0.95	24.0 °C
T1	69.8 °C	0.95	24.0 °C
T2	75.8 °C	0.95	24.0 °C

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