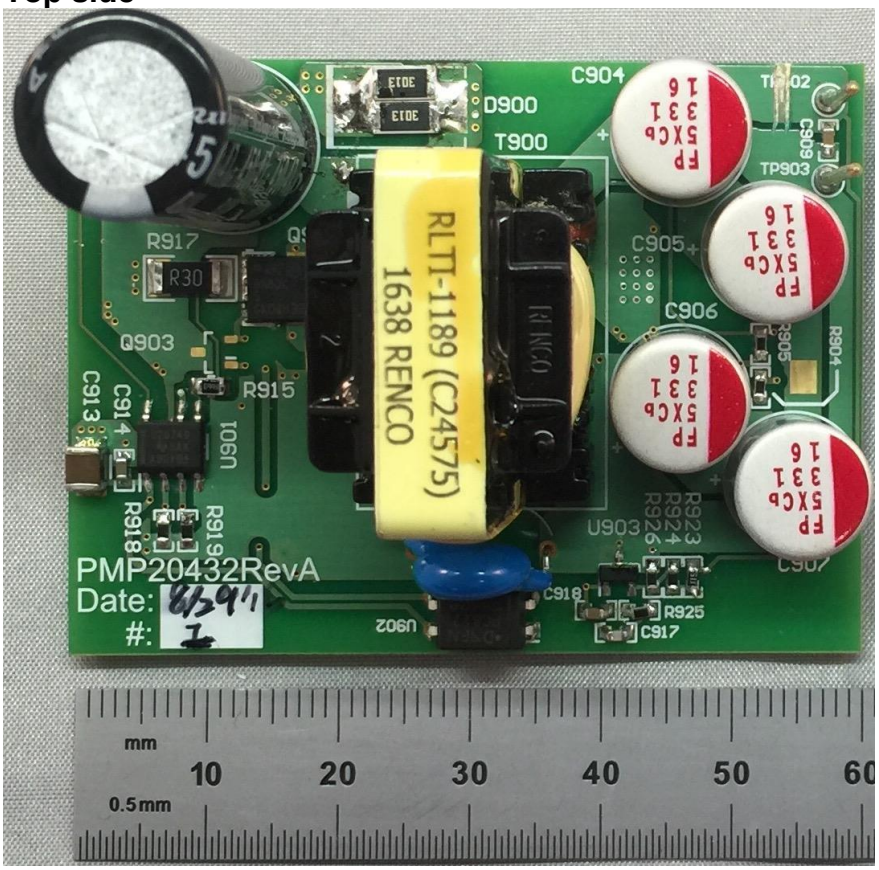
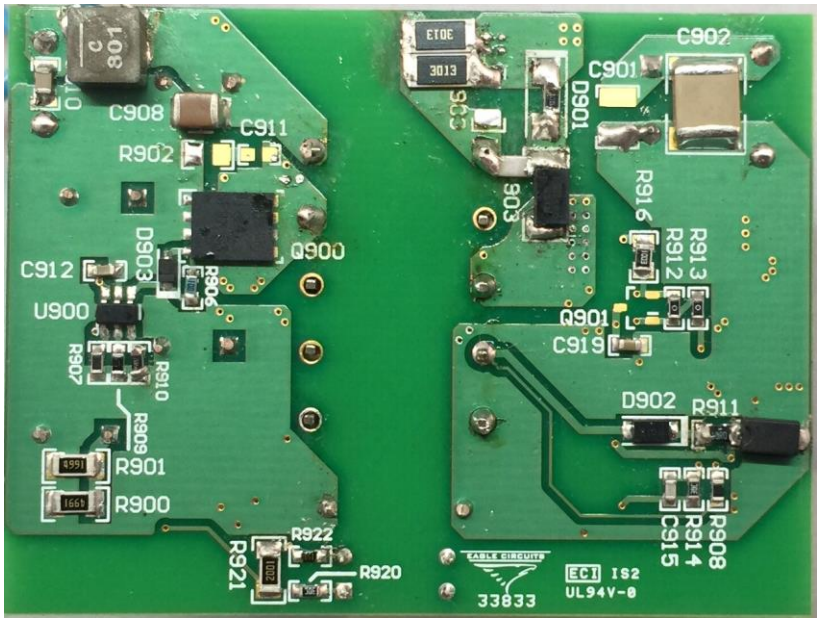
1 Photo

The photographs below show the PMP20432 Rev A assembly. This circuit was built on a PMP20432 Rev A PCB.

Top side

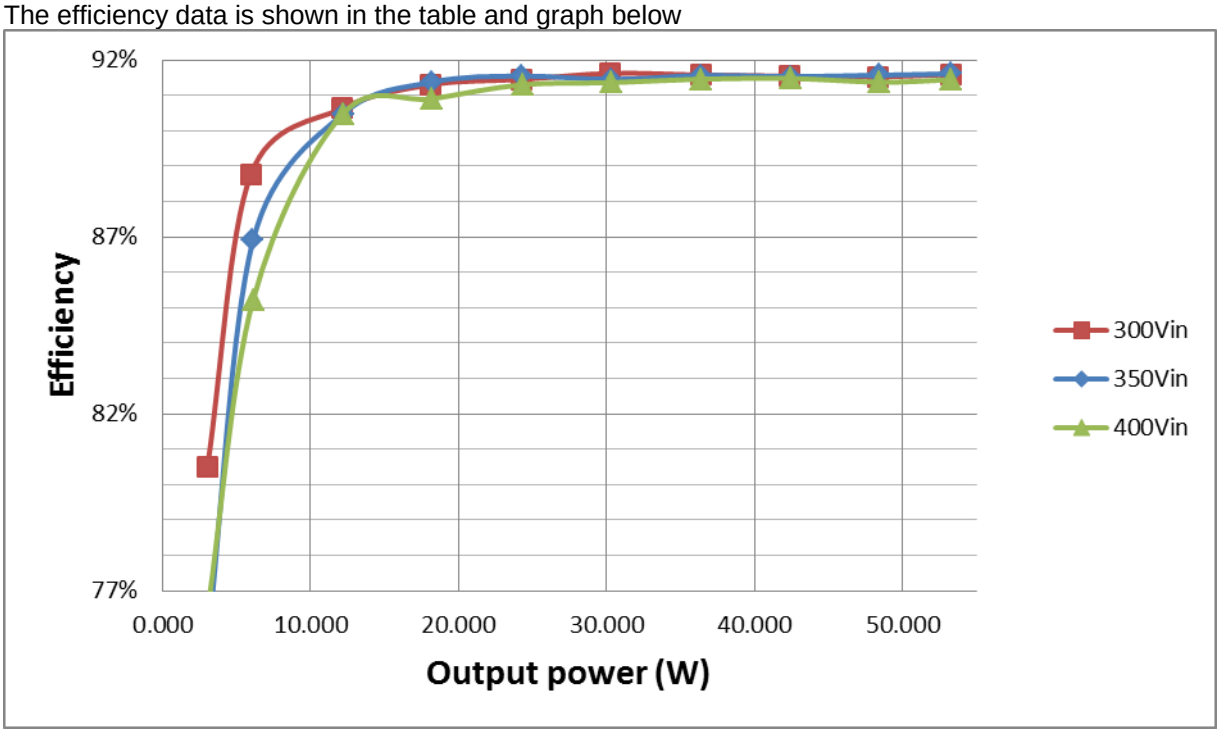


Bottom side



2 Converter efficiency

The efficiency data is shown in the table and graph below



V_{IN} = 300V_{DC}:

Vin(DC)	Iin(A)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Ploss(W)	Eff. (%)
300.0	0.19	58.10	12.090	4.402	53.220	4.88	91.59%
300.0	0.18	52.82	12.090	3.999	48.348	4.47	91.53%
300.0	0.15	46.26	12.090	3.503	42.351	3.91	91.54%
300.0	0.13	39.70	12.100	3.005	36.361	3.34	91.58%
300.0	0.11	33.03	12.100	2.501	30.262	2.77	91.62%
300.0	0.09	26.53	12.100	2.005	24.261	2.27	91.45%
300.0	0.07	19.85	12.100	1.498	18.126	1.73	91.30%
300.0	0.04	13.35	12.100	1.000	12.100	1.25	90.63%
300.0	0.02	6.73	12.100	0.494	5.977	0.76	88.77%
300.0	0.01	3.77	12.100	0.251	3.037	0.74	80.49%
300.0	0.00	0.23	12.100	0.000	0.000	0.23	0.00%

V_{IN} = 350V_{DC}:

Vin(DC)	Iin(A)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Ploss(W)	Eff. (%)
350.0	0.17	58.17	12.090	4.408	53.293	4.88	91.61%
350.0	0.15	52.82	12.090	4.001	48.372	4.45	91.57%
350.0	0.13	46.32	12.090	3.507	42.400	3.92	91.53%
350.1	0.11	39.76	12.100	3.009	36.409	3.35	91.56%
350.0	0.09	33.12	12.100	2.503	30.286	2.83	91.46%
350.1	0.08	26.49	12.100	2.004	24.248	2.24	91.55%
350.1	0.06	19.92	12.100	1.504	18.198	1.72	91.38%
350.1	0.04	13.48	12.100	1.008	12.197	1.28	90.48%
350.1	0.02	7.05	12.100	0.506	6.123	0.92	86.91%
350.1	0.01	4.00	12.100	0.249	3.013	0.98	75.38%
350.1	0.00	0.27	12.100	0.000	0.000	0.27	0.00%

V_{IN} = 400V_{DC}:

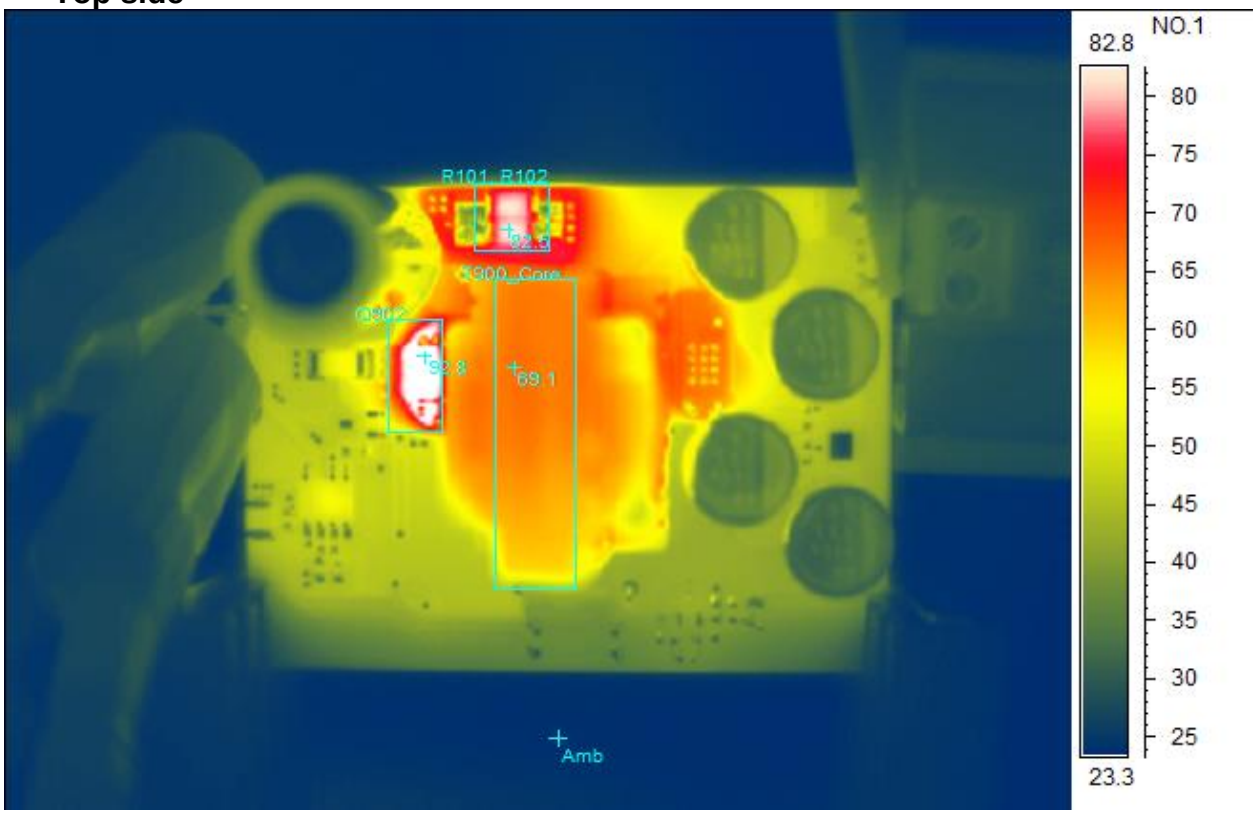
Vin(DC)	Iin(A)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Ploss(W)	Eff. (%)
400.0	0.15	58.28	12.090	4.408	53.293	4.99	91.44%
400.0	0.13	53.02	12.090	4.007	48.445	4.57	91.38%
400.0	0.12	46.36	12.100	3.505	42.411	3.95	91.48%
400.0	0.10	39.78	12.100	3.007	36.385	3.40	91.46%
400.0	0.08	33.20	12.100	2.507	30.335	2.87	91.36%
400.0	0.07	26.62	12.100	2.009	24.309	2.32	91.30%
400.0	0.05	20.05	12.100	1.506	18.223	1.82	90.91%
400.0	0.03	13.47	12.100	1.007	12.185	1.28	90.48%
400.0	0.02	7.20	12.100	0.507	6.135	1.06	85.23%
400.0	0.01	3.95	12.100	0.249	3.013	0.93	76.33%
400.0	0.00	0.31	12.100	0.000	0.000	0.31	0.00%

3 Thermal Images

The thermal images below show a top view and bottom view of the board. The ambient temperature was 20ºC with no forced air flow. The output was at 12V/4.4A load.

V_{in} : 400V_{DC}

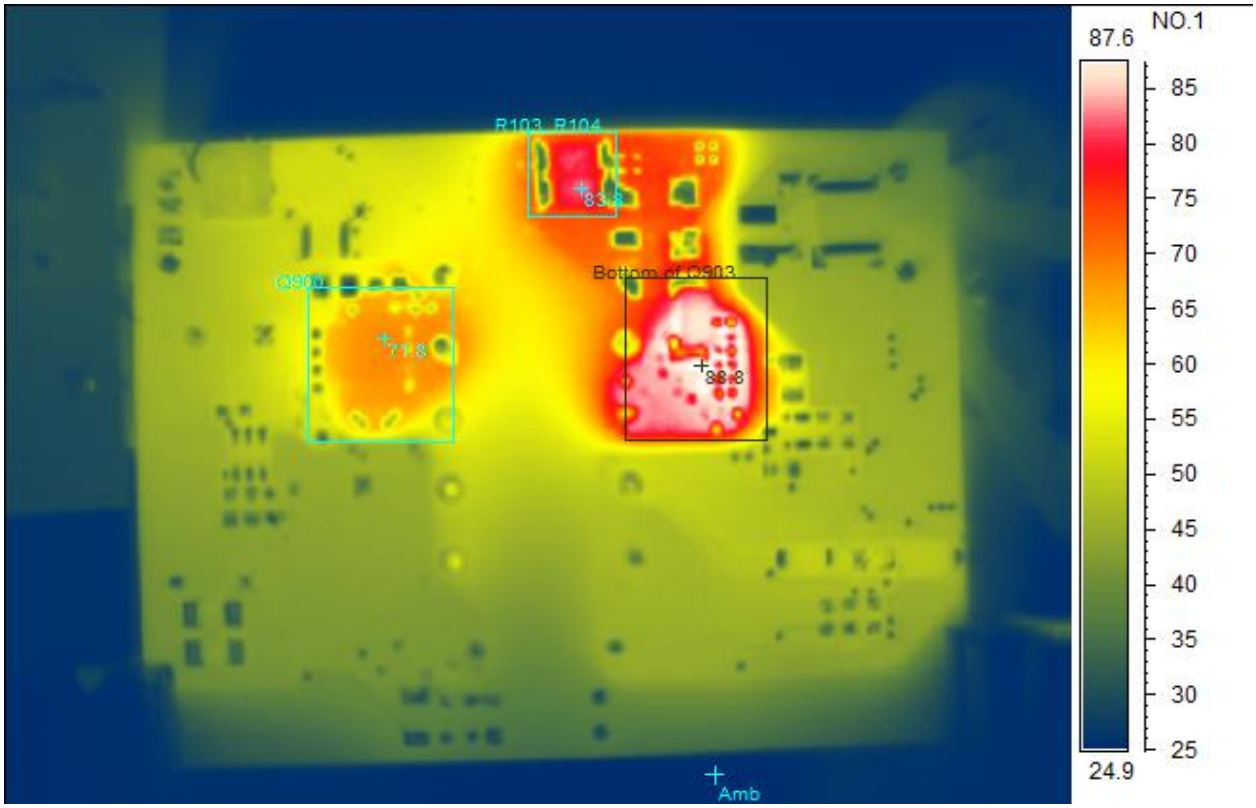
- **Top side**



Spot analysis	Value
Amb Temperature	24.3°C
Area analysis	**Value**
Q902Max	92.8°C
R101, R102Max	82.5°C
T900_CoreMax	69.1°C

V_{in} : 400V_{DC}

- **Bottom side**

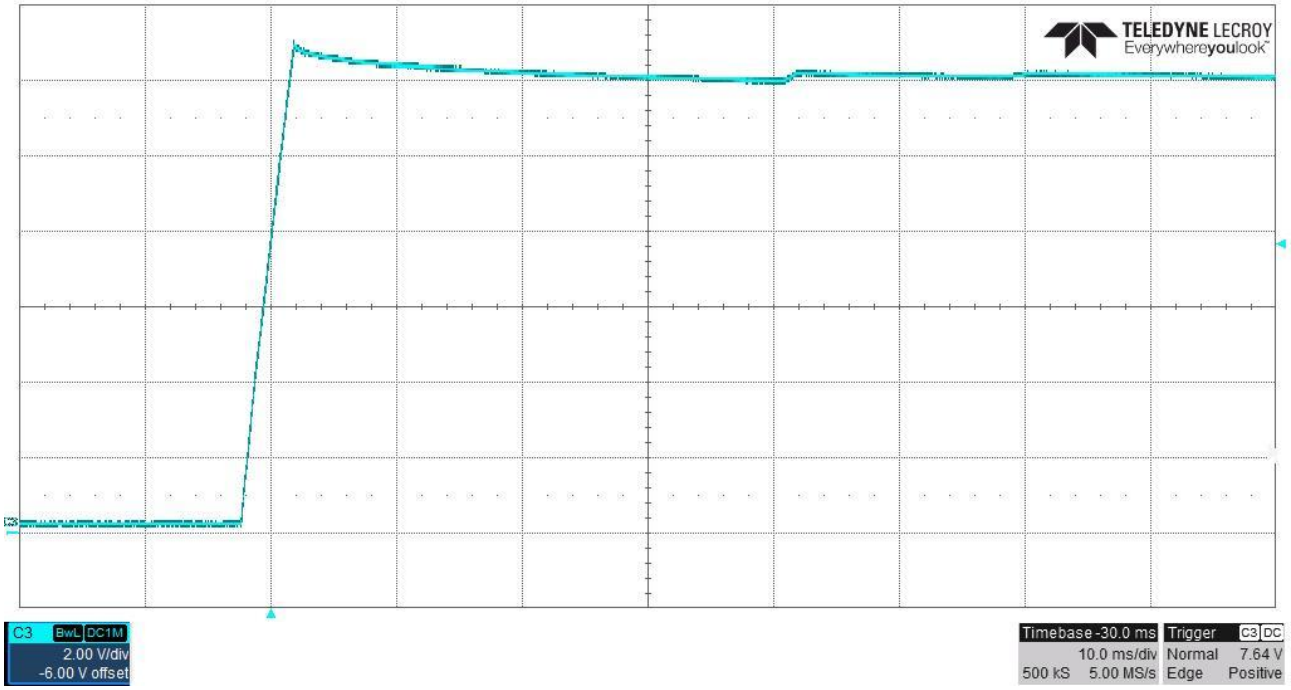


Spot analysis	Value
Amb Temperature	25.0°C
Area analysis	**Value**
R103, R104Max	83.8°C
Q900Max	71.8°C
Bottom of Q903Max	88.8°C

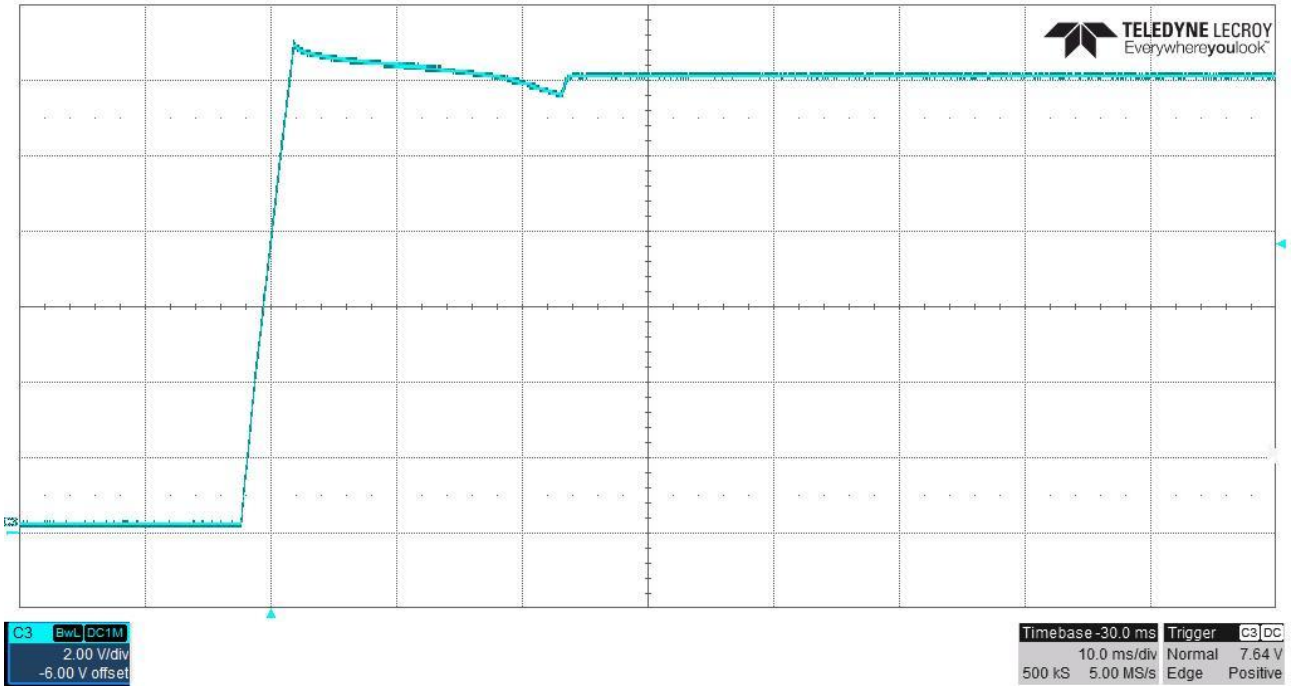
4 Startup

The output voltage at startup is shown in the images below.

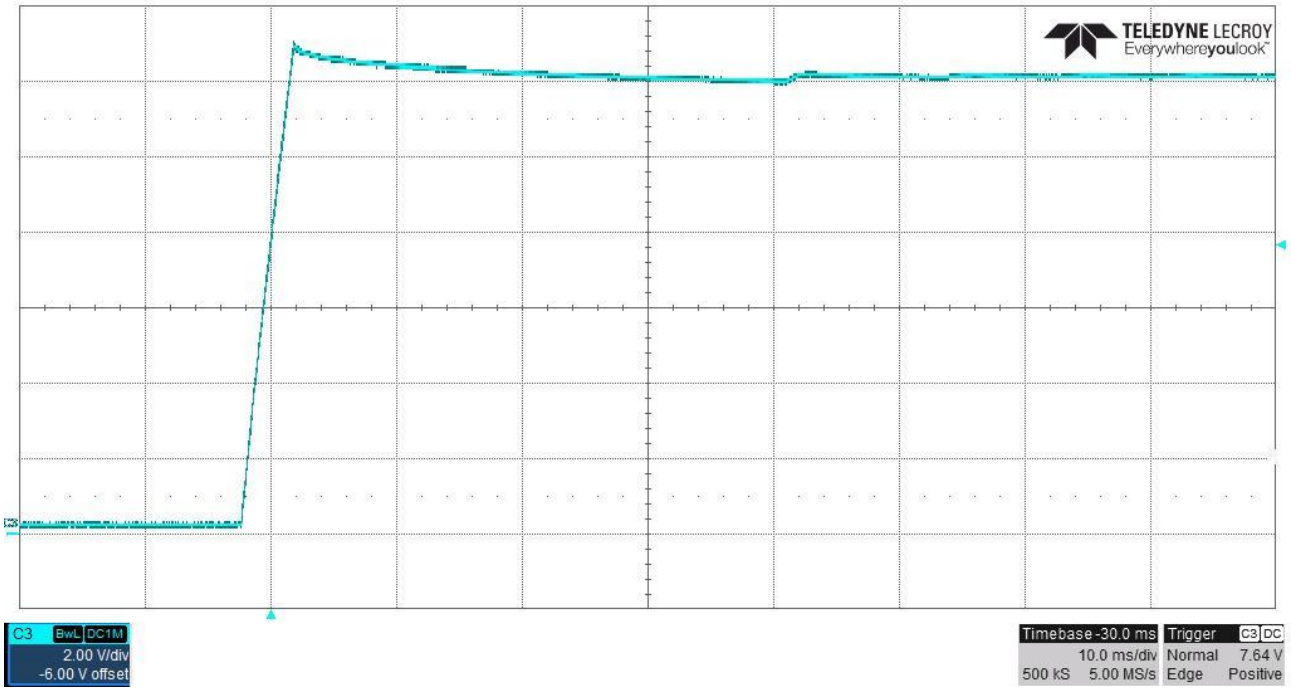
4.1.1 Start Up @ 100V_{DC}: 12V/0A



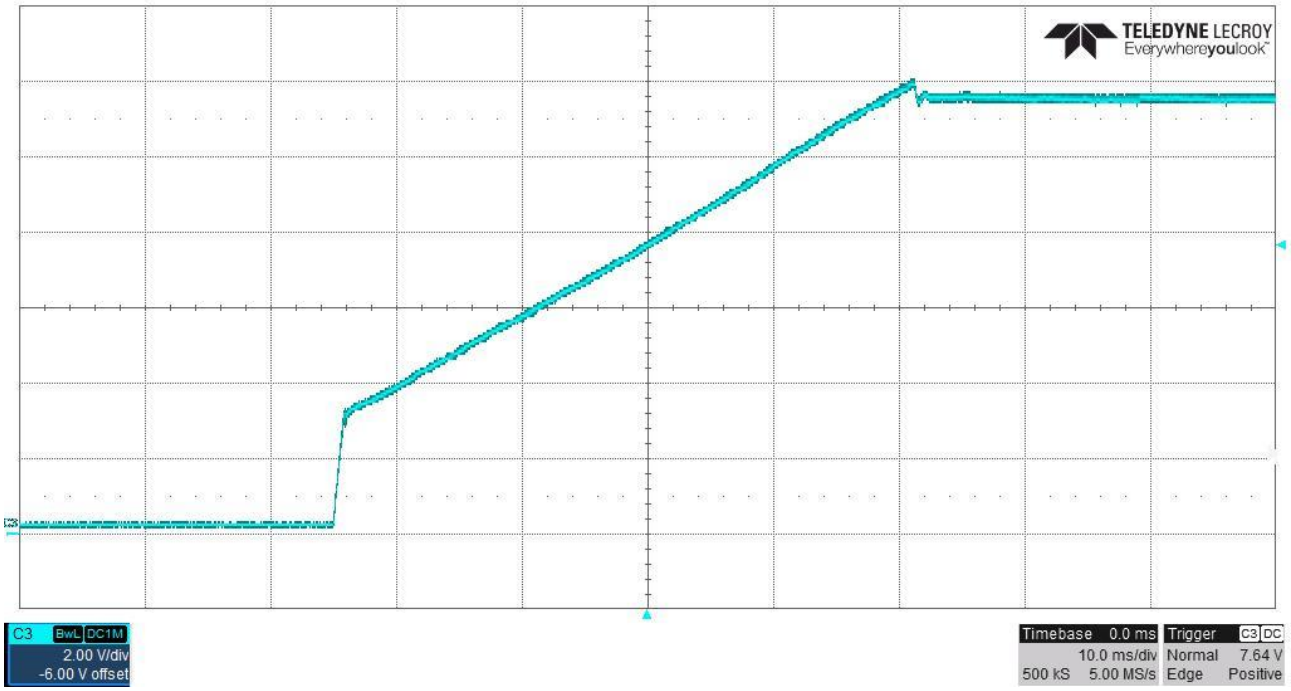
4.1.2 Start Up @ 100V_{DC}: 12V/0.16A



4.1.3 Start Up @ 400V_{DC}: 12V/0A



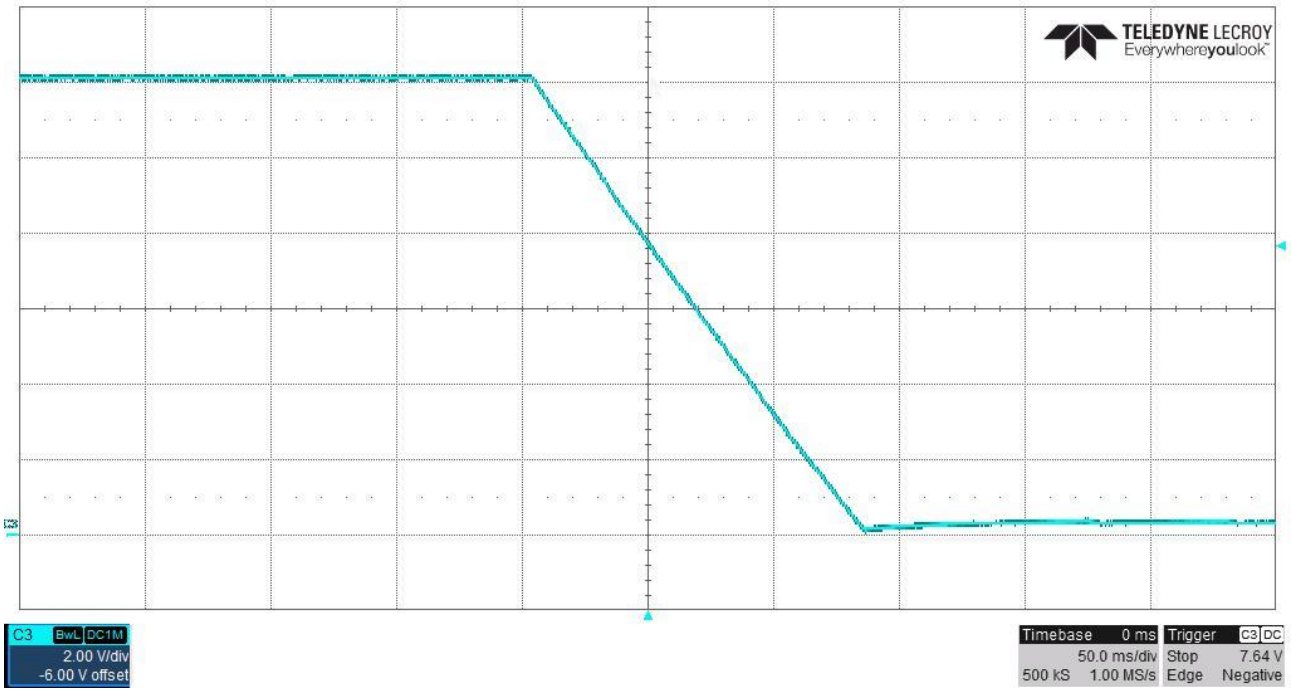
4.1.4 Start Up @ 400V_{DC}: 12V/4.4A



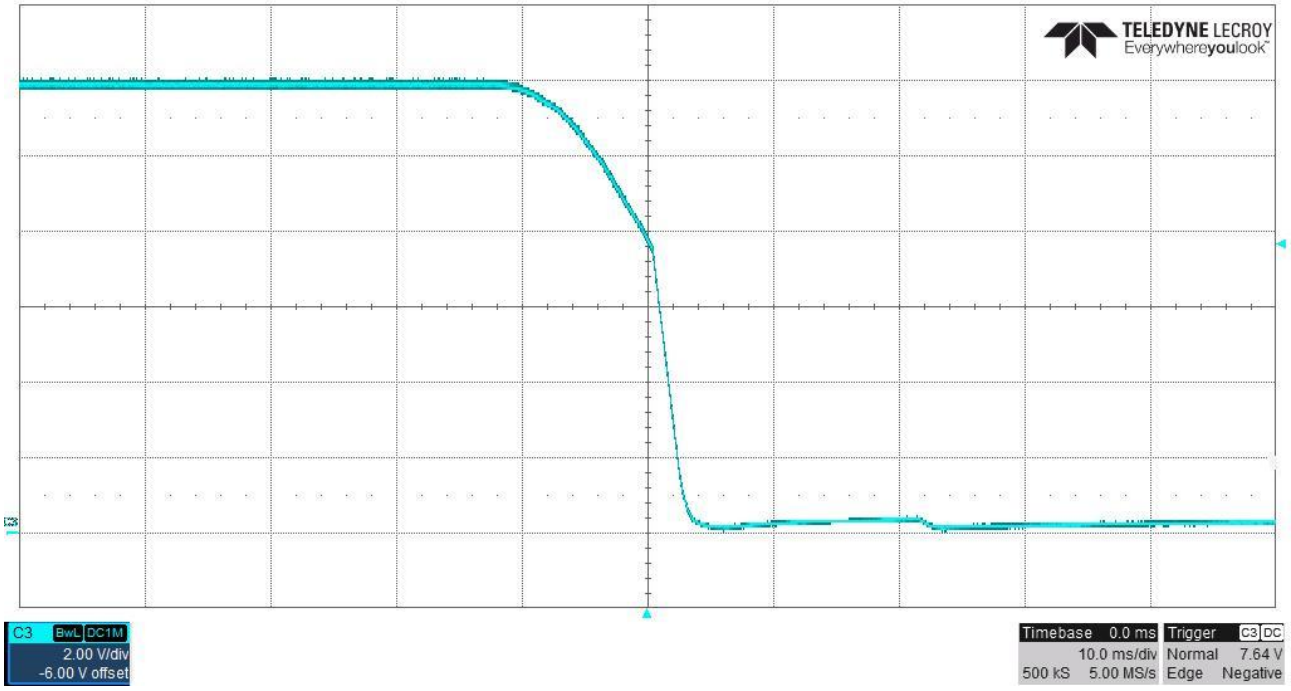
5 Turnoff

The output voltage at turnoff is shown in the images below.

5.1.1 Turnoff @ 100V_{DC}: 12V/0.16A



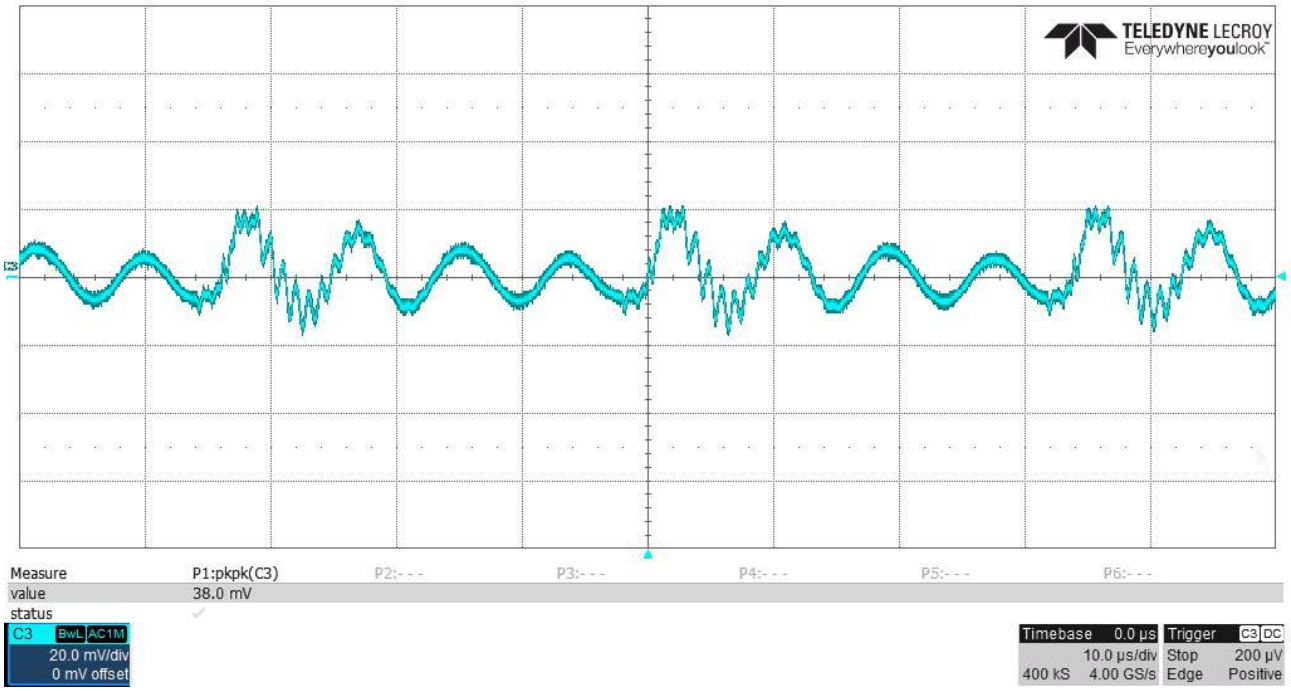
5.1.2 Turnoff @ 400V_{DC}: 12V/4.4A



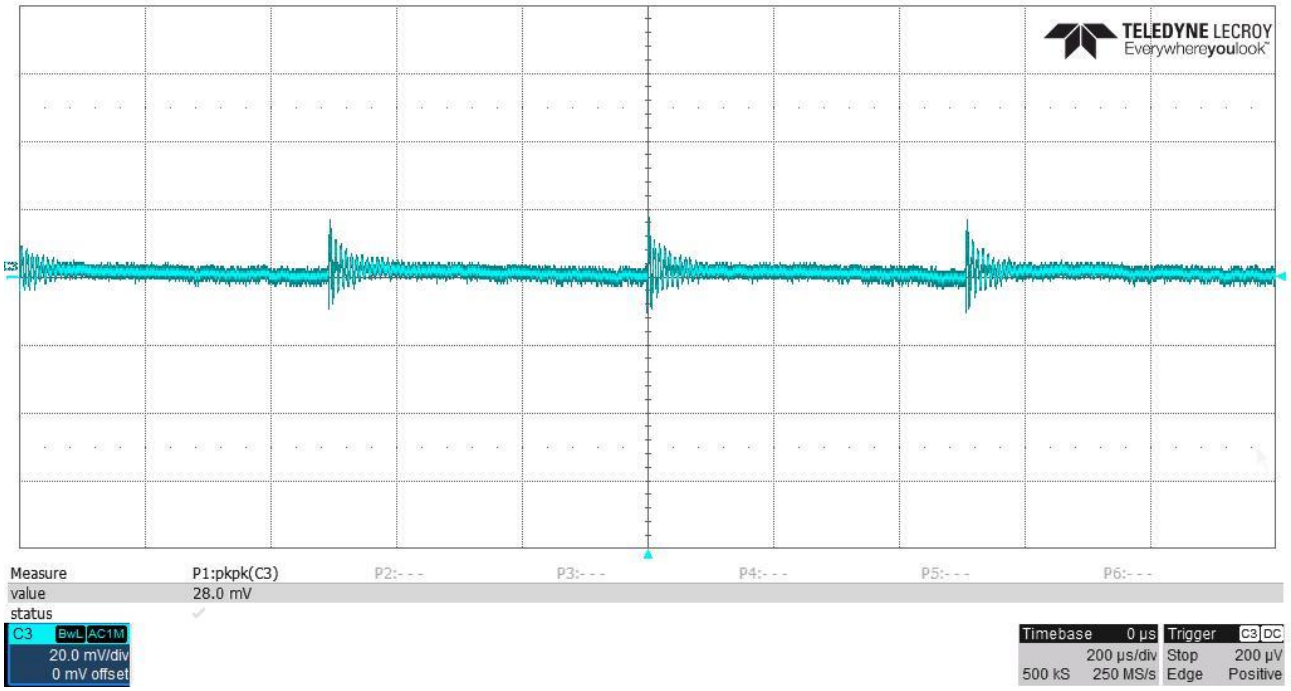
6 Output Ripple Voltage

The output voltage ripple was measured with additional 2.2uF/50V ceramic capacitor on the probe BNC connector.

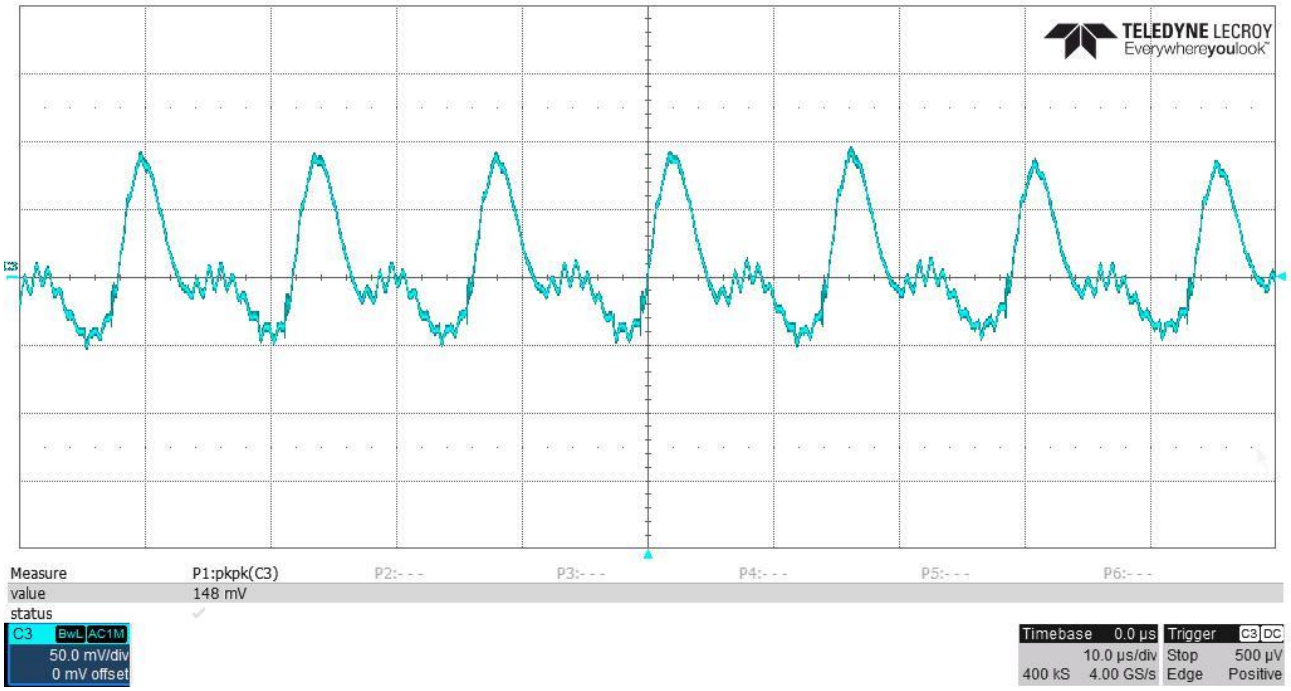
6.1.1 Output Ripple @ 100V_{DC}: 12V/0.16A.



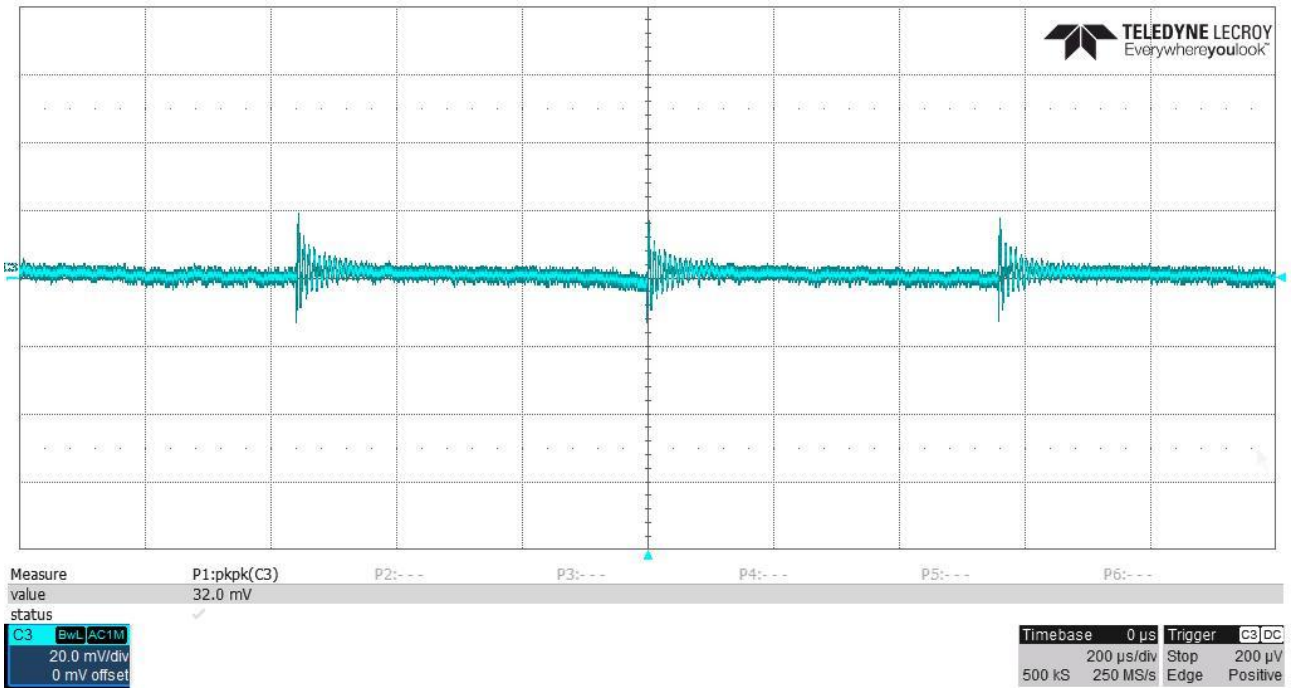
6.1.2 Output Ripple @ 300V_{DC}: 12V/0A.



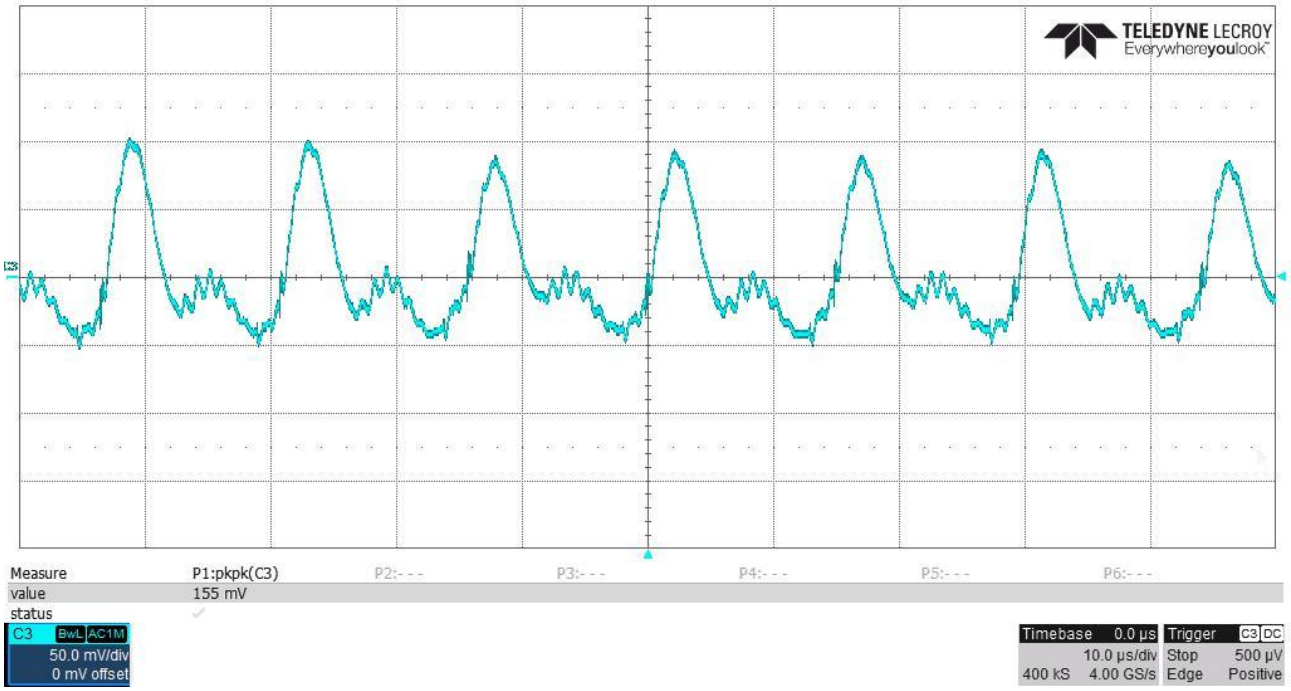
6.1.3 Output Ripple @ 300V_{DC}: 12V/4.2A.



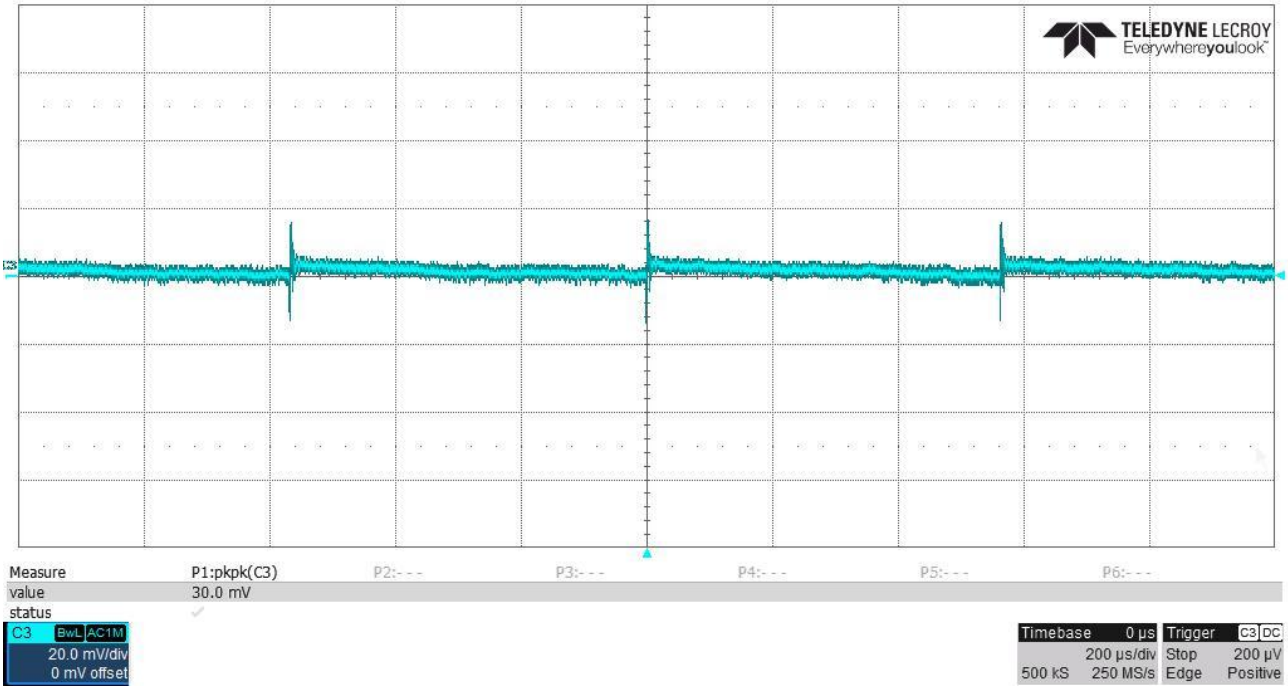
6.1.4 Output Ripple @ 350V_{DC}: 12V/0A.



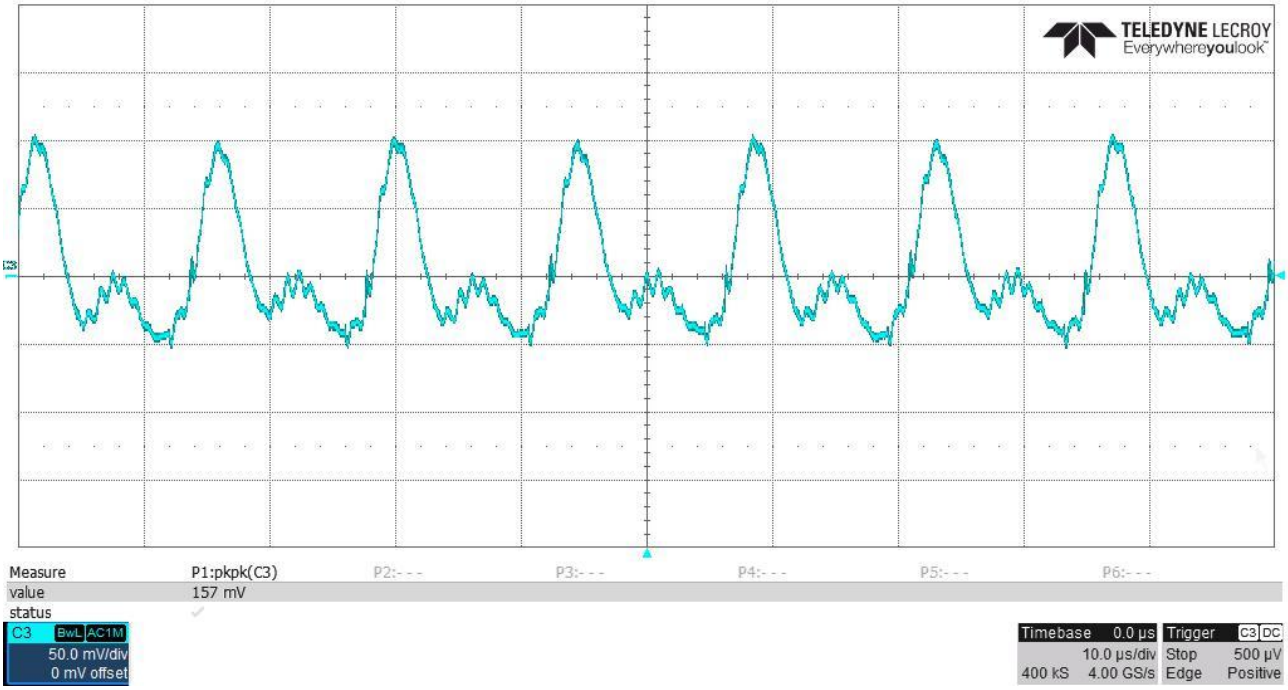
6.1.5 Output Ripple @ 350V_{DC}: 12V/4.4A.



6.1.6 Output Ripple @ 400V_{DC}: 12V/0A.

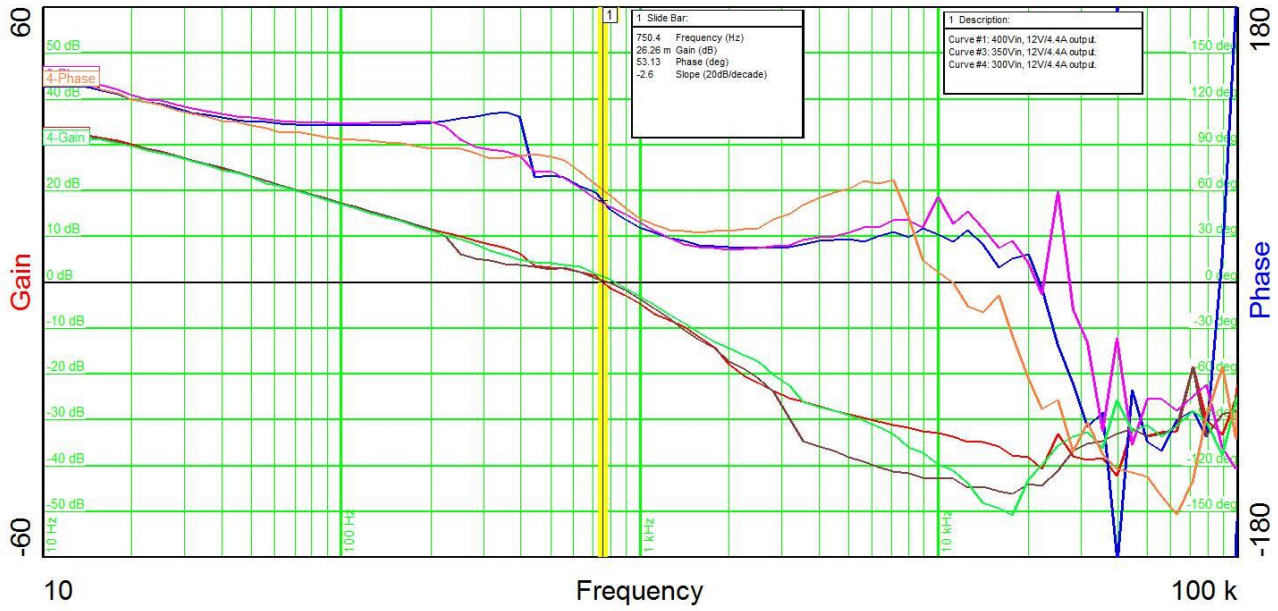


6.1.7 Output Ripple @ 400V_{DC}: 12V/4.4A.



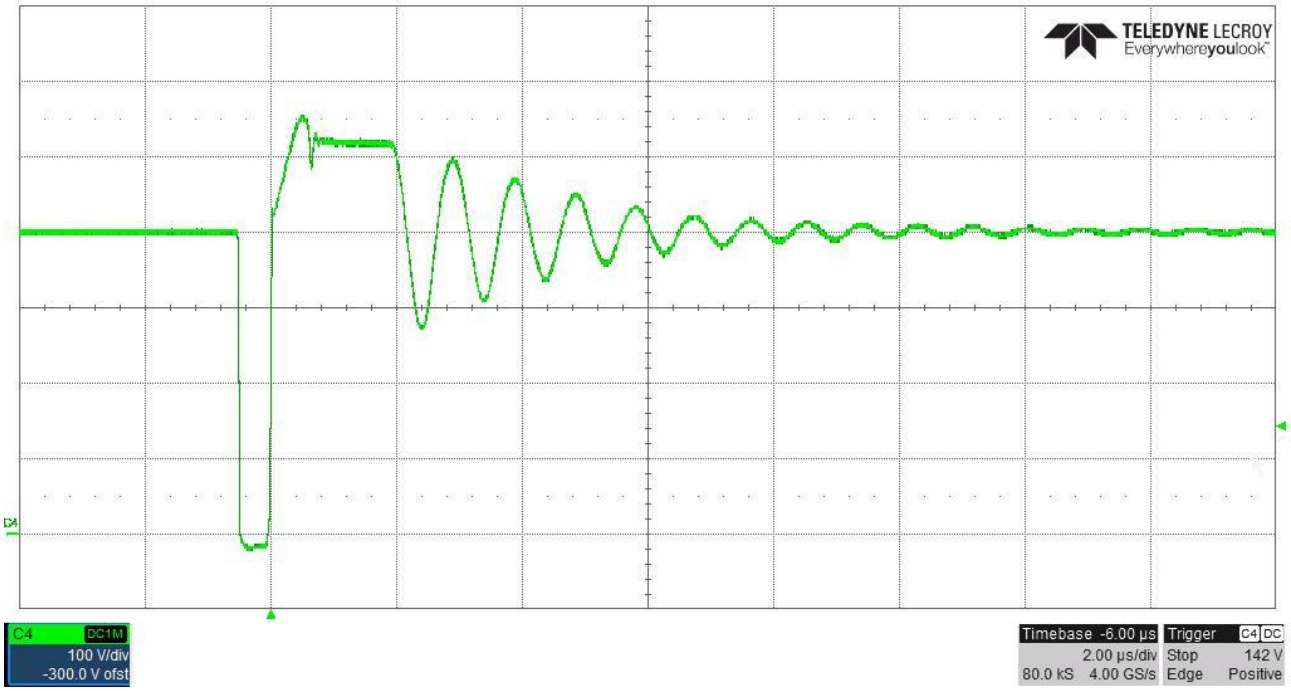
7 Frequency Response

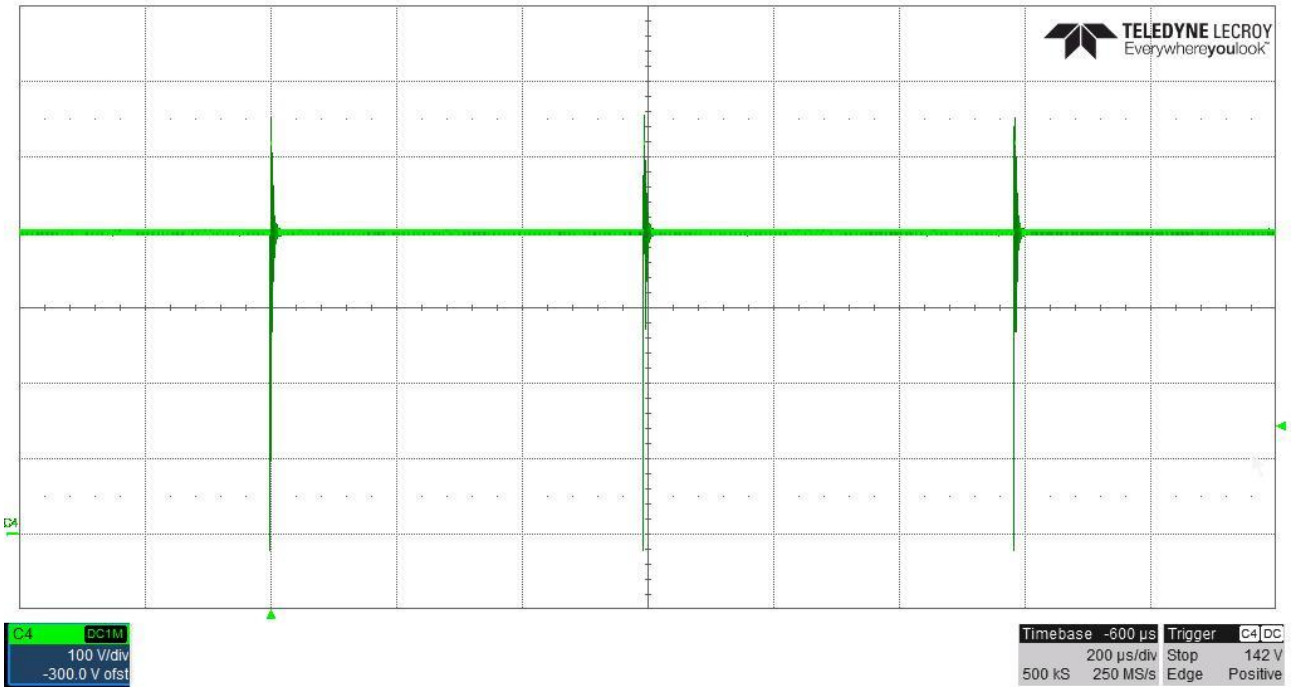
Frequency response is tested with 4.4A full load. Signal and measurement are process across R922.
Curve #1: 400Vin
Curve #3: 350Vin
Curve #4: 300Vin



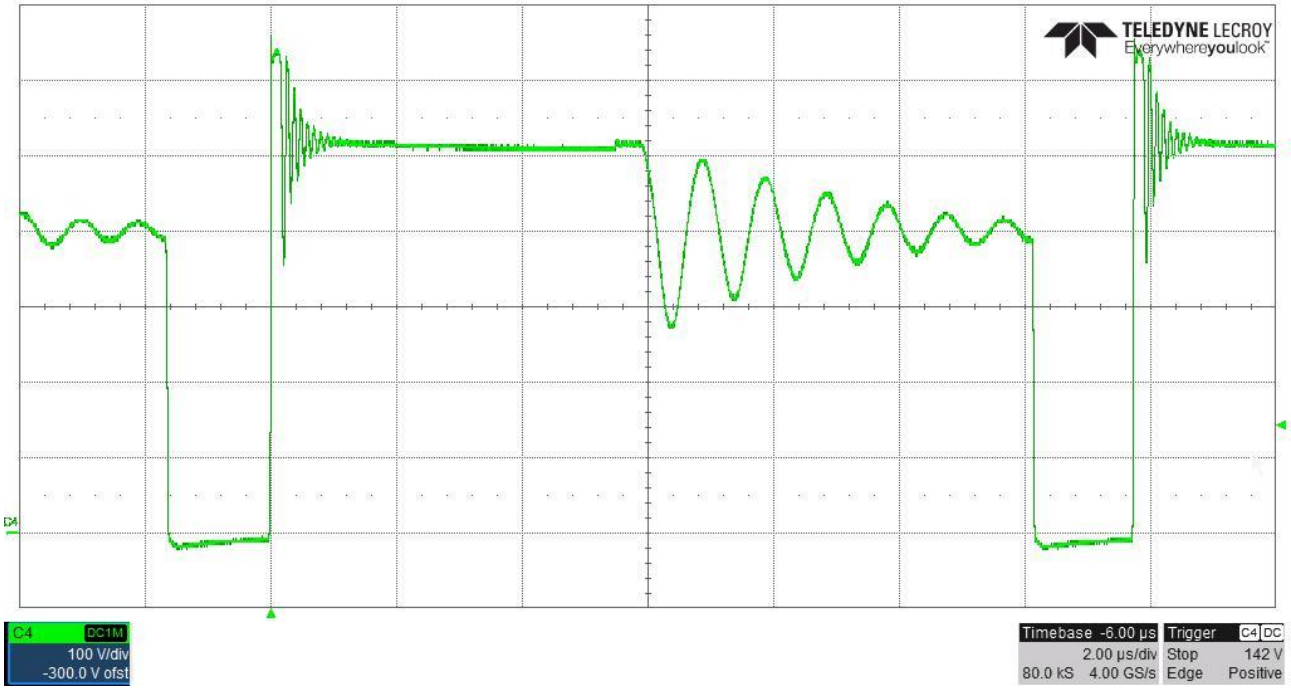
8 Switching Waveforms

8.1.1 Switching Waveform @ 400V_{DC}: 12V/0A





8.1.2 Switching Waveform @ 400V_{DC}: 12V/4.4A



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