

The photographs below show the PMP20315 Rev A assembly. This circuit was built on a PMP20315 Rev A PCB.

A photograph of a green printed circuit board (PCB) populated with various electronic components. The board is rectangular and oriented horizontally. It features numerous silver-colored solder joints, many of which are arranged in vertical columns. Some components, possibly integrated circuits or connectors, are visible as small, dark, rectangular or square shapes. The solder joints vary in size and are distributed across the surface, with some appearing as small dots and others as larger, more complex shapes. The green substrate of the PCB is visible between the soldered components.

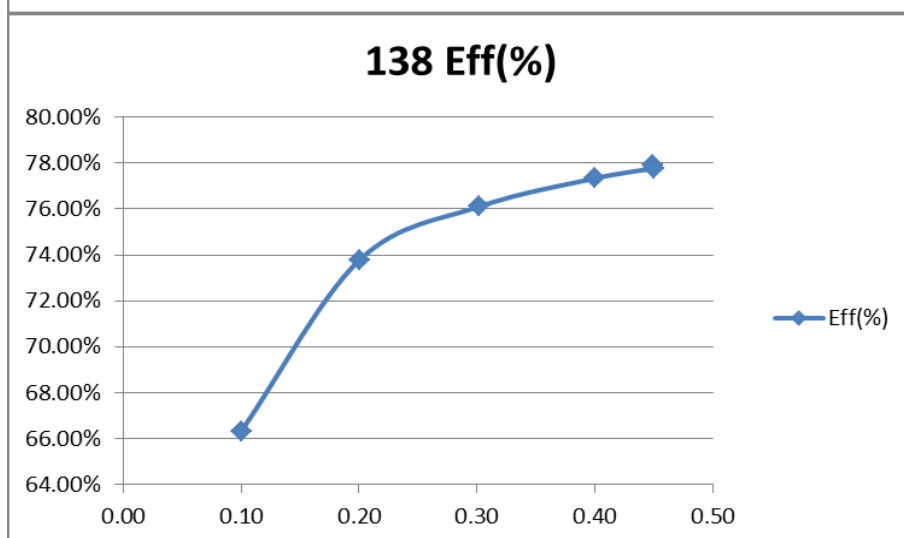
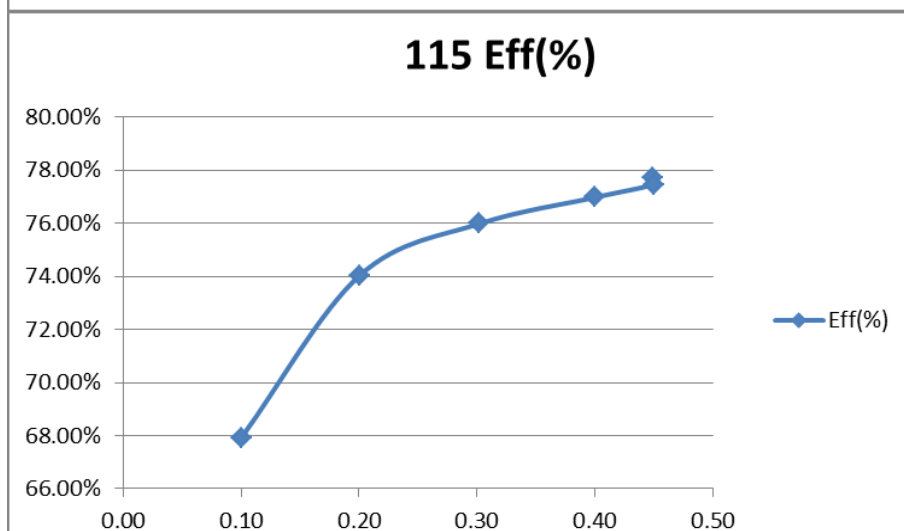
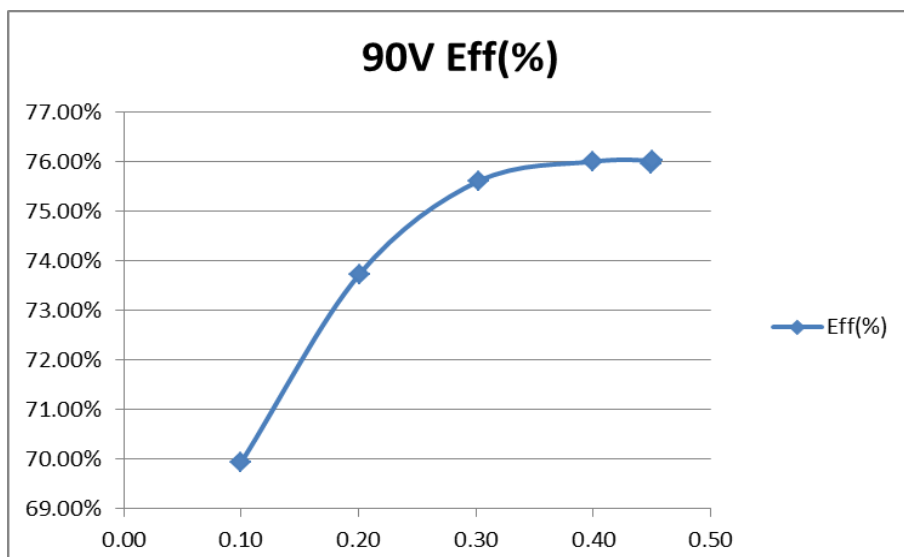
2 Cross regulation

Vin(V)	Pin(W)	Vout1(V)	Iout1(A)	Vout2(V)	Iout2(A)
90	7.48	12.18	0.45	4.24	0.05
90	7.21	12.18	0.45	4.38	0.00
90	0.40	13.31	0.00	3.46	0.05
90	0.20	12.23	0.00	4.14	0.00
Vin(V)	Pin(W)	Vout1(V)	Iout1(A)	Vout2(V)	Iout2(A)
115	7.33	12.22	0.45	4.25	0.05
115	7.09	12.21	0.45	4.39	0.00
115	0.44	13.48	0.00	3.53	0.05
115	0.23	12.23	0.00	4.13	0.00
Vin(V)	Pin(W)	Vout1(V)	Iout1(A)	Vout2(V)	Iout2(A)
138	7.32	12.22	0.45	4.25	0.05
138	7.07	12.22	0.45	4.39	0.00
138	0.51	14.14	0.00	3.77	0.05
138	0.25	12.22	0.00	4.11	0.00

3 Converter efficiency

The efficiency data is shown in the table and graph below.

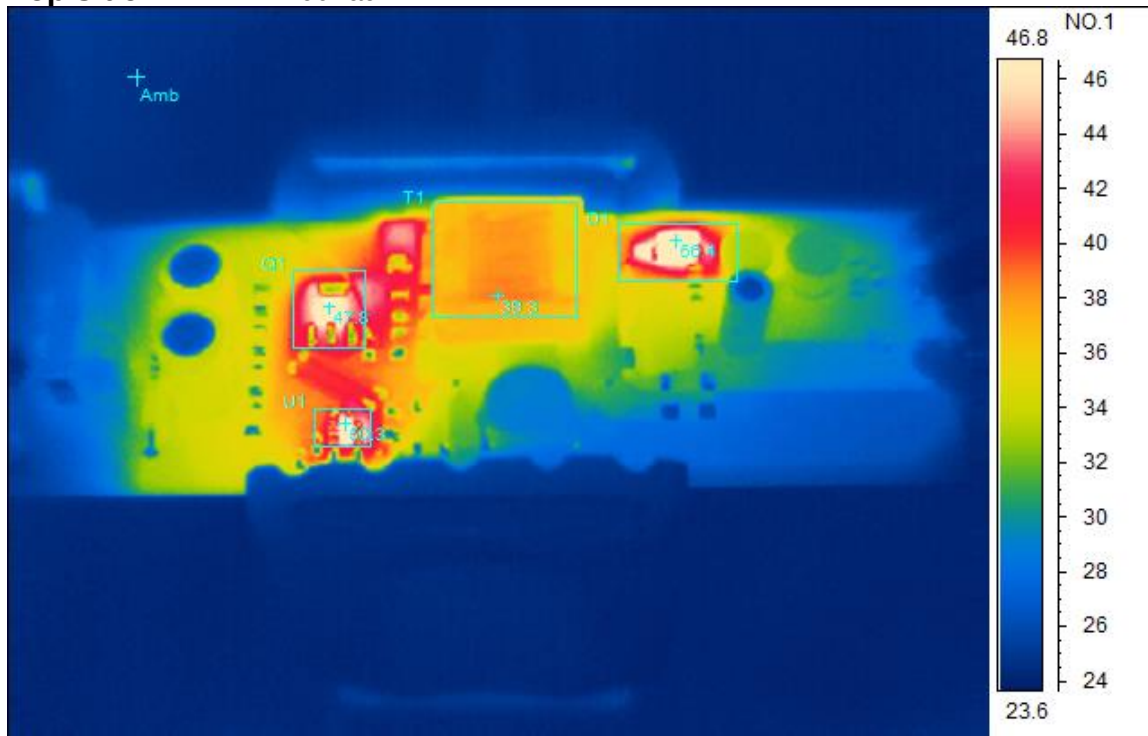
Vin(V)	Pin(W)	Vout1(V)	Iout1(A)	Vout2(V)	Iout2(A)	Pout(W)	Eff(%)
90	7.48	12.18	0.45	4.24	0.05	5.68	75.96%
90	7.21	12.18	0.45	4.38	0.00	5.48	76.02%
90	6.41	12.18	0.40	4.37	0.00	4.87	76.01%
90	4.86	12.16	0.30	4.35	0.00	3.67	75.61%
90	3.31	12.17	0.20	4.34	0.00	2.44	73.73%
90	1.74	12.14	0.10	4.30	0.00	1.21	69.94%
90	0.40	13.31	0.00	3.46	0.05	0.17	43.25%
90	0.20	12.23	0.00	4.14	0.00	0.00	0.00%
Vin(V)	Pin(W)	Vout1(V)	Iout1(A)	Vout2(V)	Iout2(A)	Pout(W)	Eff(%)
115	7.33	12.22	0.45	4.25	0.05	5.70	77.72%
115	7.09	12.21	0.45	4.39	0.00	5.49	77.46%
115	6.34	12.20	0.40	4.38	0.00	4.88	76.97%
115	4.84	12.18	0.30	4.35	0.00	3.68	75.99%
115	3.30	12.18	0.20	4.34	0.00	2.44	74.04%
115	1.79	12.15	0.10	4.30	0.00	1.22	67.92%
115	0.44	13.48	0.00	3.53	0.05	0.18	40.26%
115	0.23	12.23	0.00	4.13	0.00	0.00	0.00%
Vin(V)	Pin(W)	Vout1(V)	Iout1(A)	Vout2(V)	Iout2(A)	Pout(W)	Eff(%)
138	7.32	12.22	0.45	4.25	0.05	5.70	77.91%
138	7.07	12.22	0.45	4.39	0.00	5.50	77.78%
138	6.31	12.20	0.40	4.38	0.00	4.88	77.34%
138	4.84	12.19	0.30	4.36	0.00	3.68	76.11%
138	3.31	12.18	0.20	4.34	0.00	2.44	73.79%
138	1.83	12.15	0.10	4.30	0.00	1.22	66.32%
138	0.51	14.14	0.00	3.77	0.05	0.19	36.97%
138	0.25	12.22	0.00	4.11	0.00	0.00	0.00%



4 Thermal Images

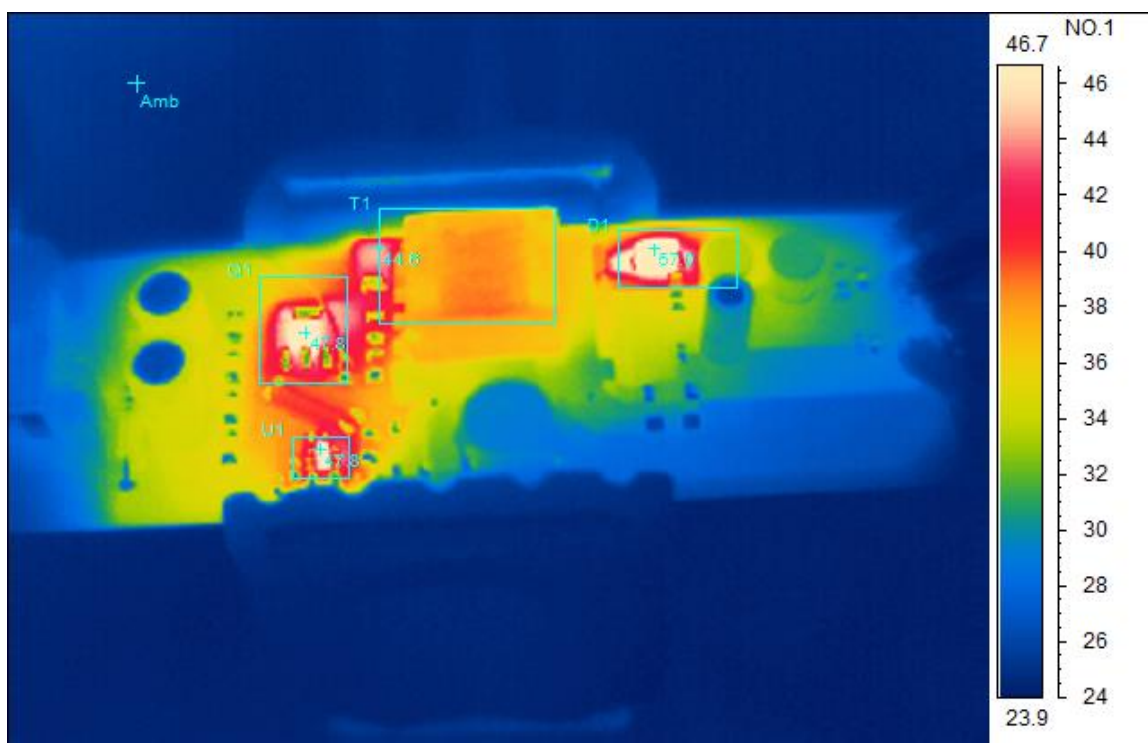
The thermal images below show a top view and bottom view of the board. The ambient temperature was 20°C with no forced air flow. The outputs were at 12V/0.45A ; 5V/0.05A loads.

- Top side Vin : 90Vac



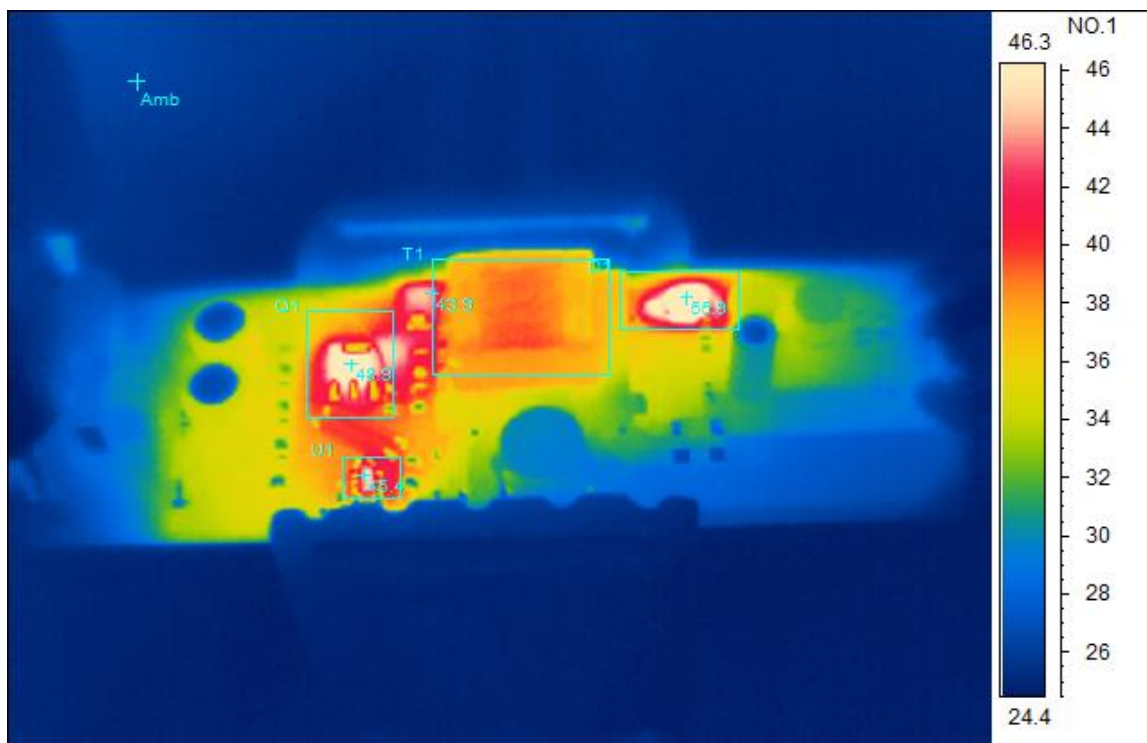
Spot analysis	Value
Amb Temperature	24.9°C
Area analysis	Value
D1Max	56.4°C
Q1Max	47.8°C
U1Max	50.3°C
T1Max	39.3°C

- **Top side** Vin : 115Vac



Spot analysis	Value
Amb Temperature	25.2°C
Area analysis	Value
D1Max	57.0°C
Q1Max	47.8°C
U1Max	47.8°C
T1Max	44.6°C

- **Top side** Vin : 138Vac



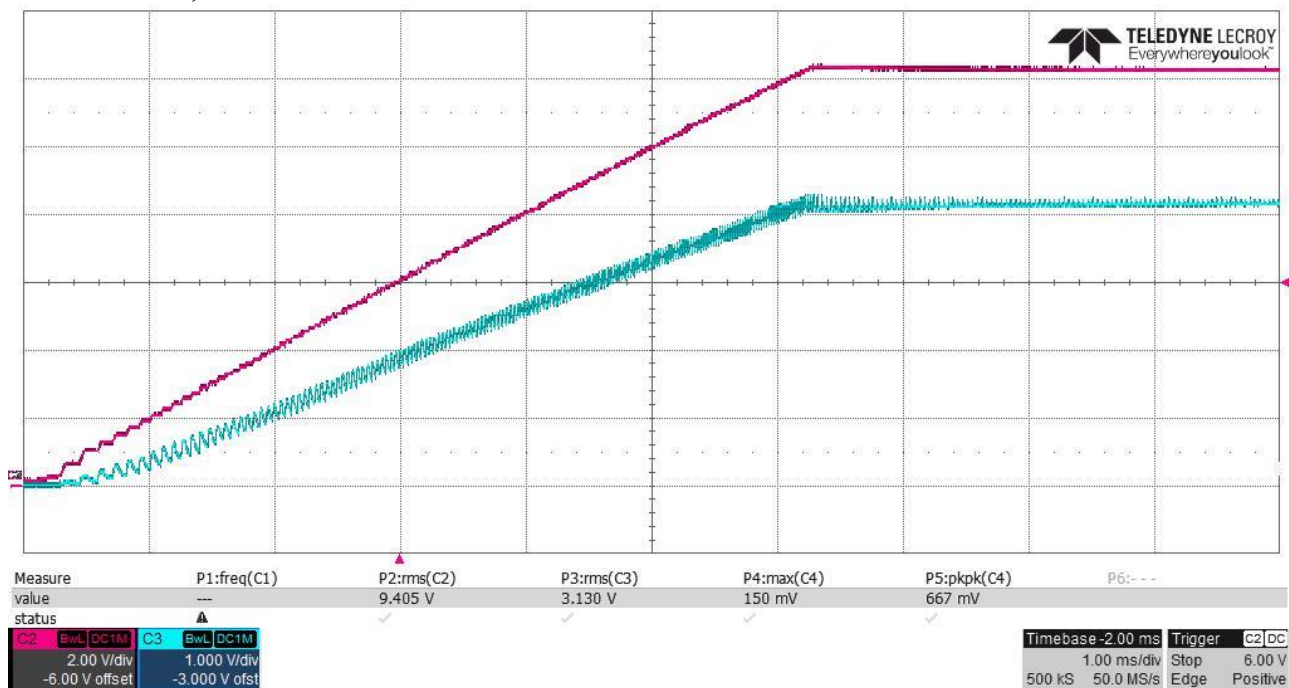
Spot analysis	Value
Amb Temperature	26.6°C
Area analysis	Value
D1Max	55.9°C
Q1Max	48.9°C
U1Max	45.4°C
T1Max	43.9°C

5 Startup

The output voltages at startup are shown in the images below.

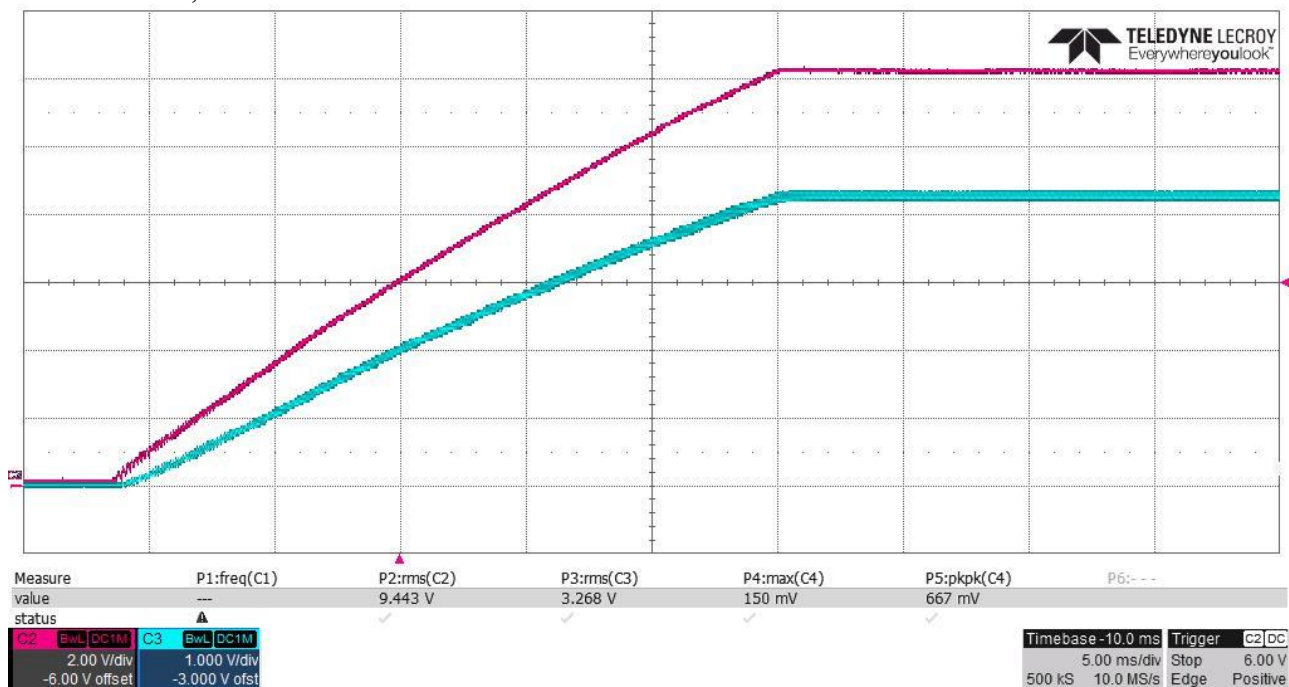
5.1.1 Start Up @ 90V_{AC}: 12V/0A ; 5V/0A,

Channel 2 : 12V ; Channel 3 : 5V



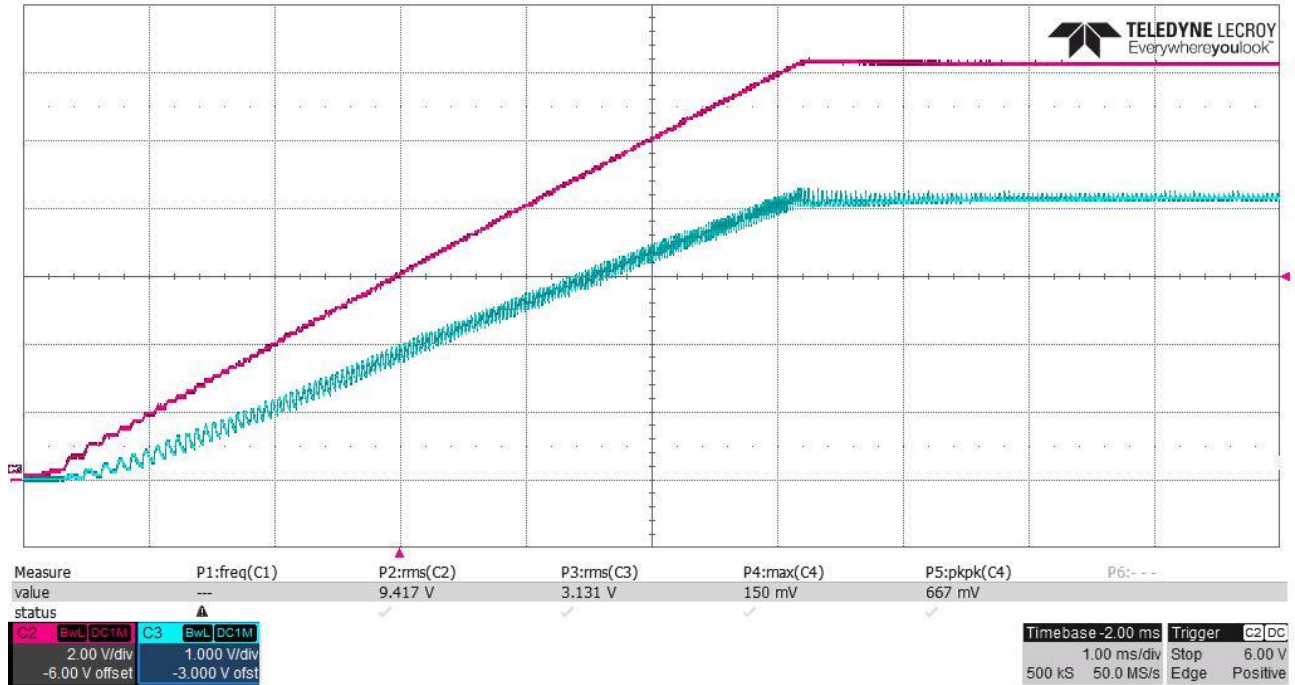
5.1.2 Start Up @ 90V_{AC}: 12V/0.45A ; 5V/0.05A,

Channel 2 : 12V ; Channel 3 : 5V



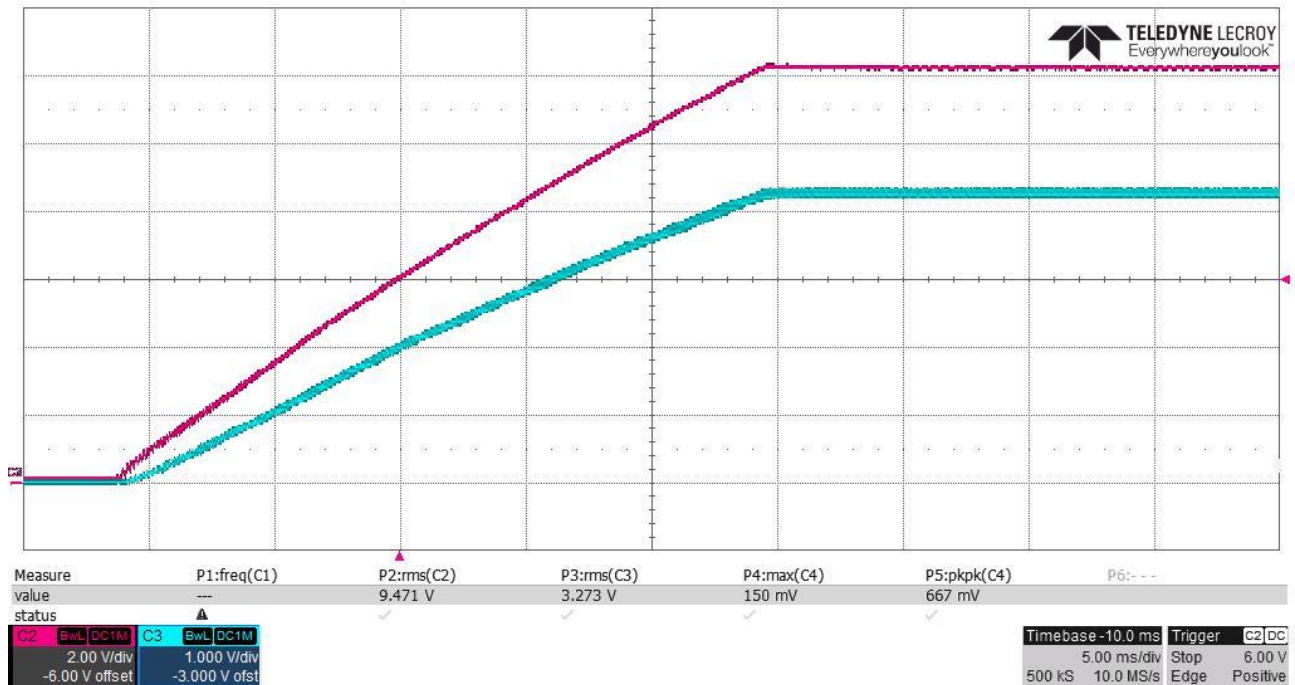
5.1.3 Start Up @ 115V_{AC}: 12V/0A ; 5V/0A,

Channel 2 : 12V ; Channel 3 : 5V



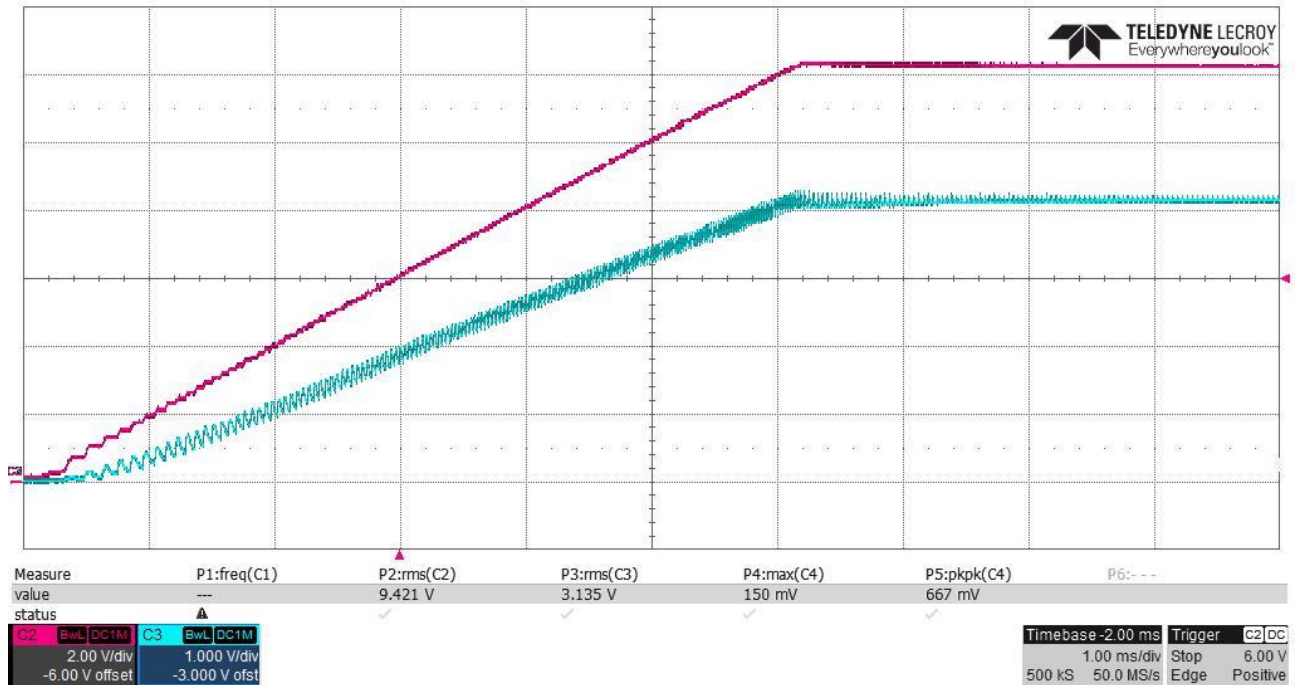
5.1.4 Start Up @ 115V_{AC}: 12V/0.45A ; 5V/0.05A,

Channel 2 : 12V ; Channel 3 : 5V



5.1.5 Start Up @ 138V_{AC}: 12V/0A ; 5V/0A,

Channel 2 : 12V ; Channel 3 : 5V

**5.1.6 Start Up @ 138V_{AC}: 12V/0.45A ; 5V/0.05A,**

Channel 2 : 12V ; Channel 3 : 5V

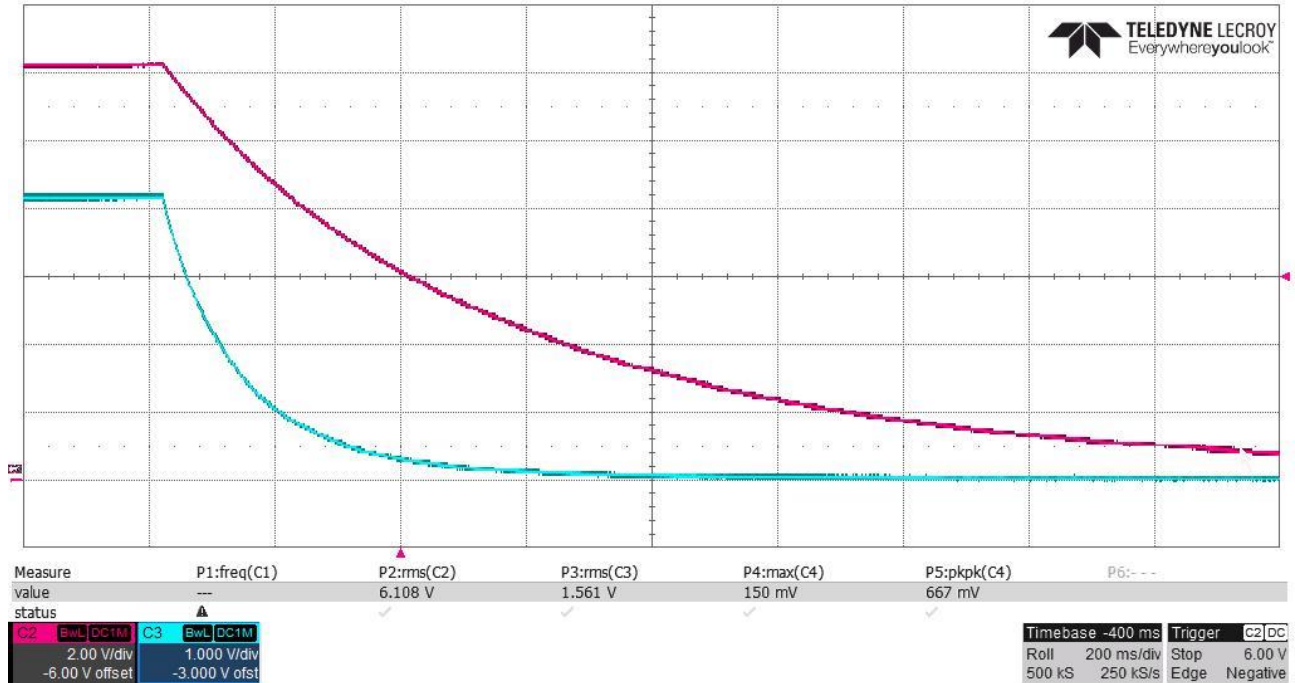


6 Turnoff

The output voltages at turnoff are shown in the images below.

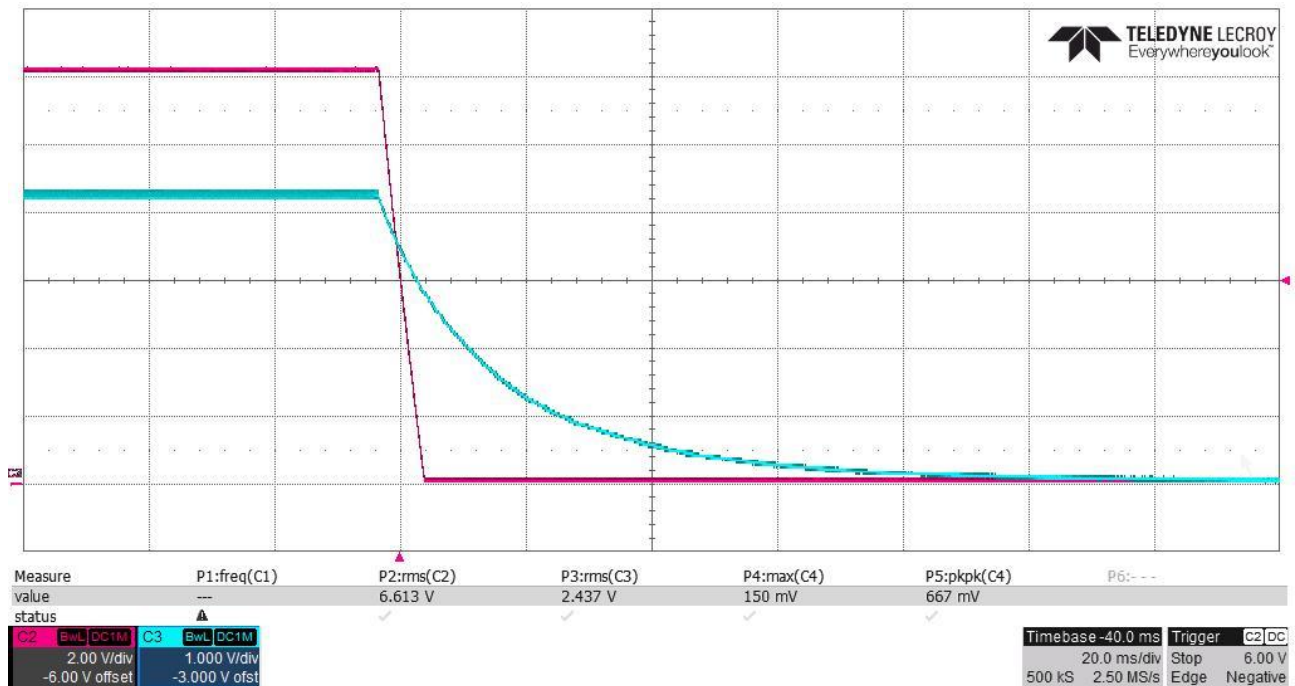
6.1.1 Turnoff @ 90V_{AC}: 12V/0A ; 5V/0A

Channel 2 : 12V ; Channel 3 : 5V



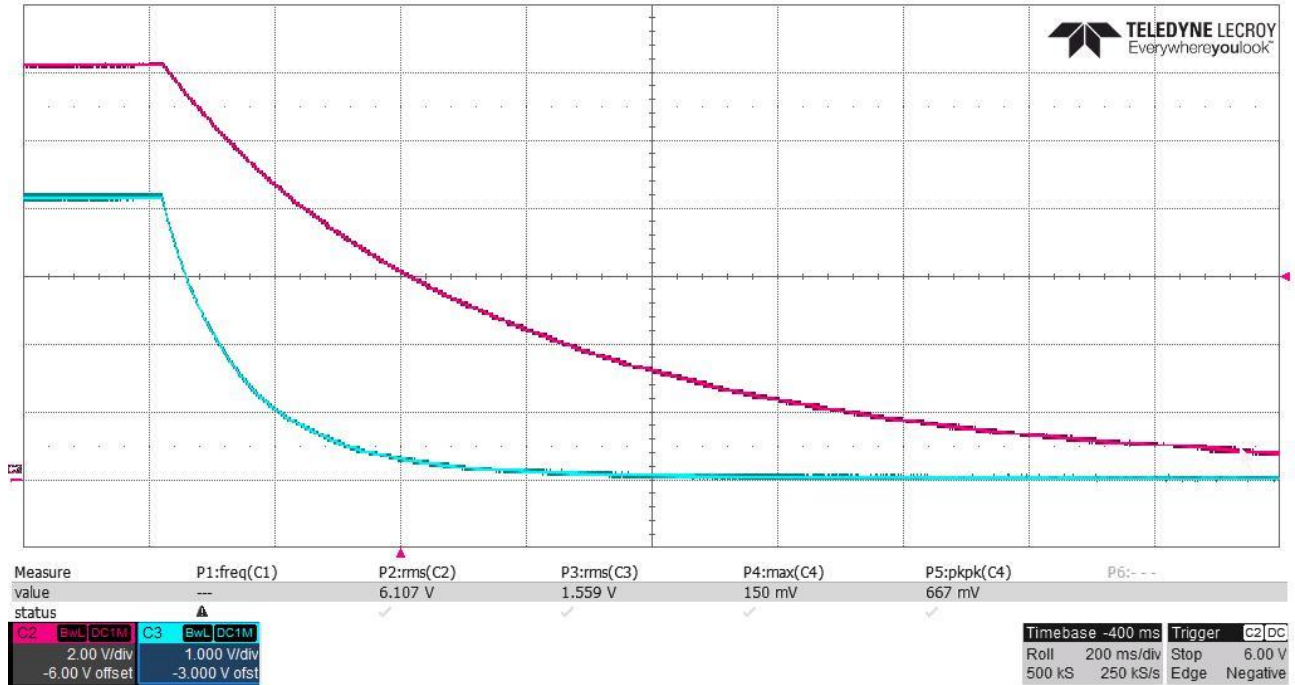
6.1.2 Turnoff @ 90V_{AC}: 12V/0.45A ; 5V/0.05A

Channel 2 : 12V ; Channel 3 : 5V

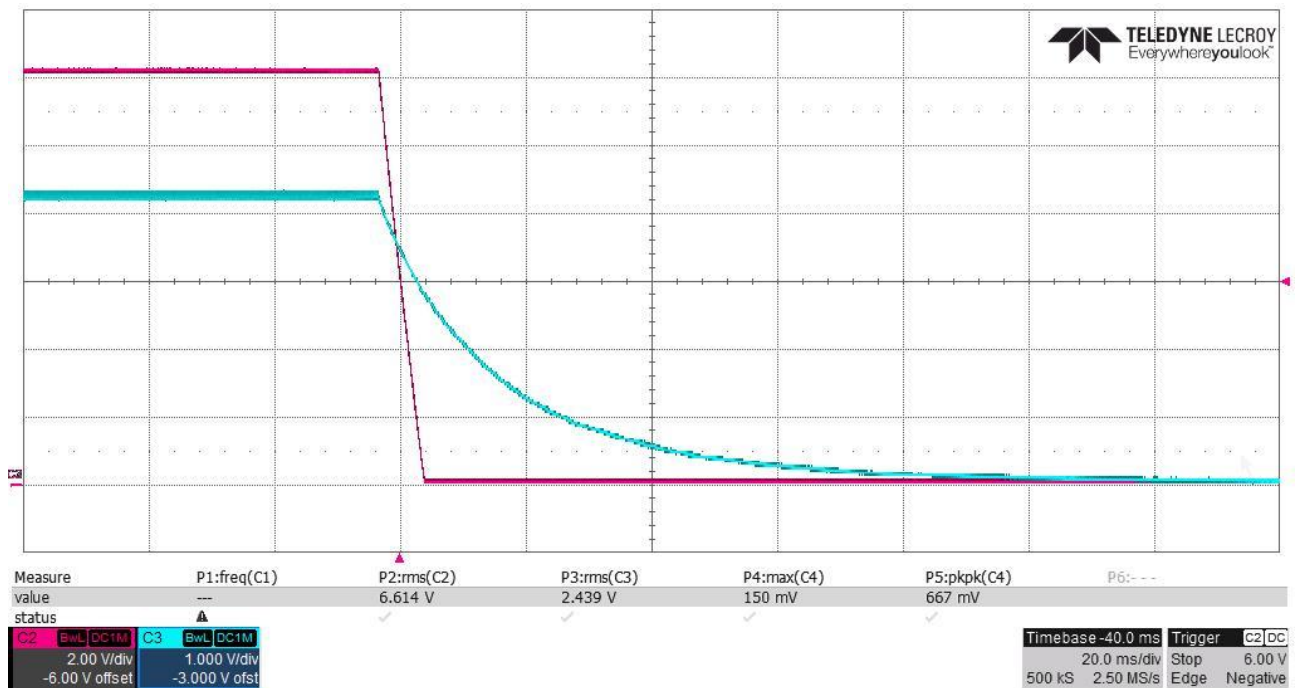


6.1.3 Turnoff @ 115V_{AC}: 12V/0A ; 5V/0A

Channel 2 : 12V ; Channel 3 : 5V

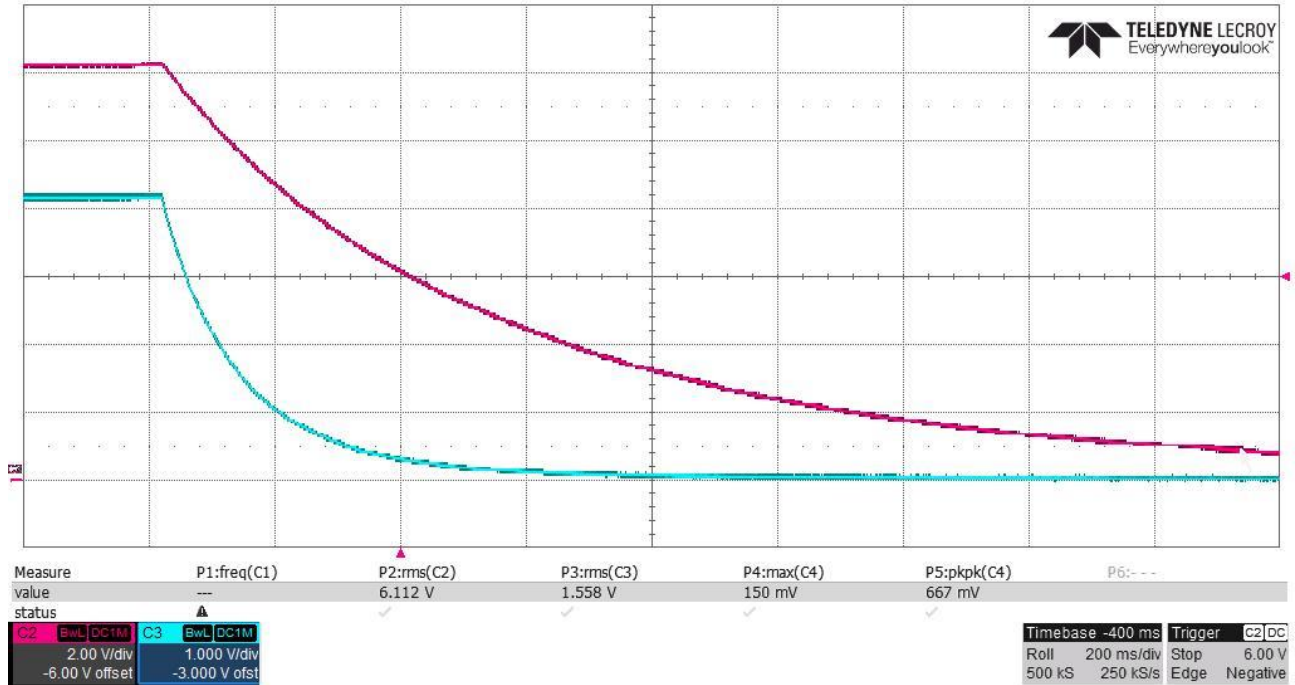
**6.1.4 Turnoff @ 115V_{AC}: 12V/0.45A ; 5V/0.05A**

Channel 2 : 12V ; Channel 3 : 5V

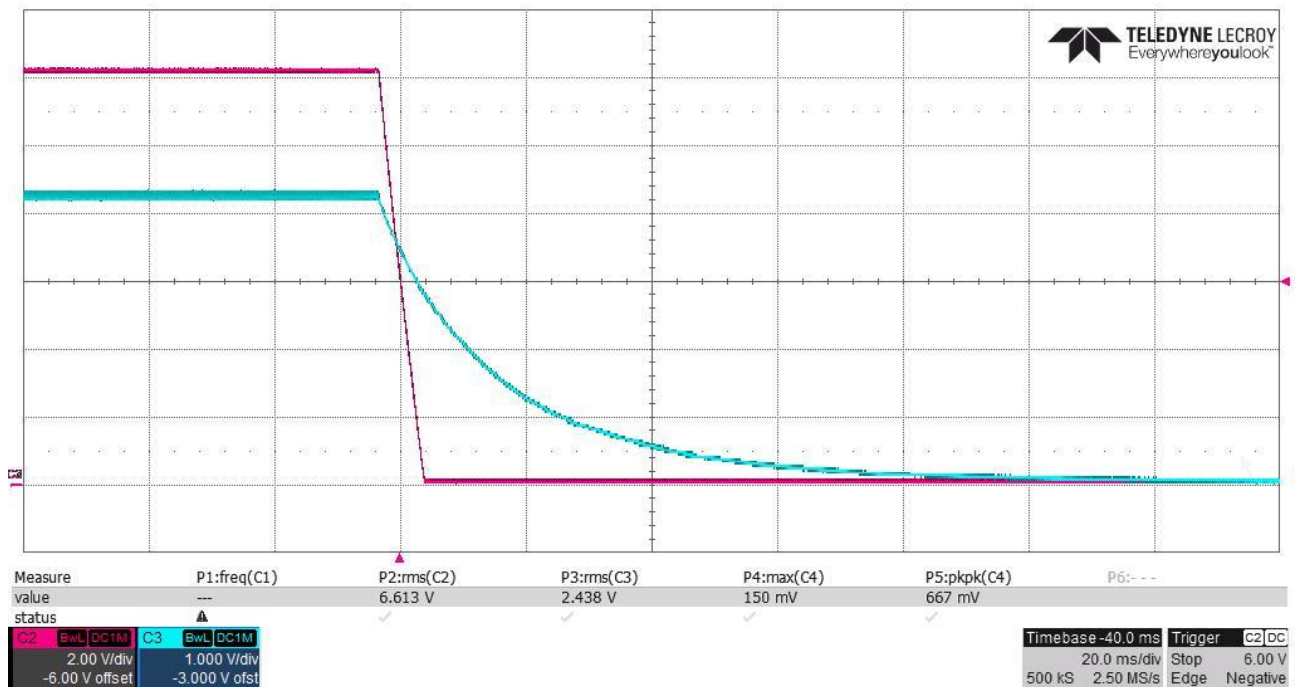


6.1.5 Turnoff @ 138V_{AC}: 12V/0A ; 5V/0A

Channel 2 : 12V ; Channel 3 : 5V

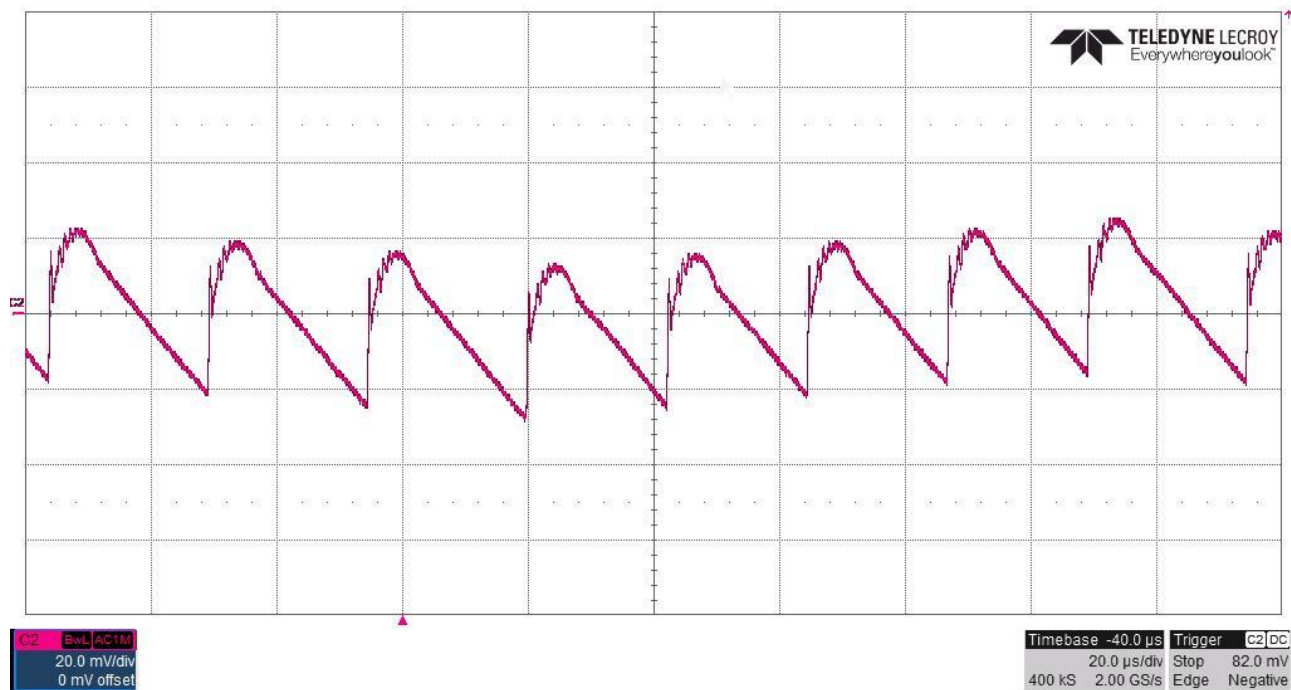
**6.1.6 Turnoff @ 138V_{AC}: 12V/0.45A ; 5V/0.05A,**

Channel 2 : 12V ; Channel 3 : 5V

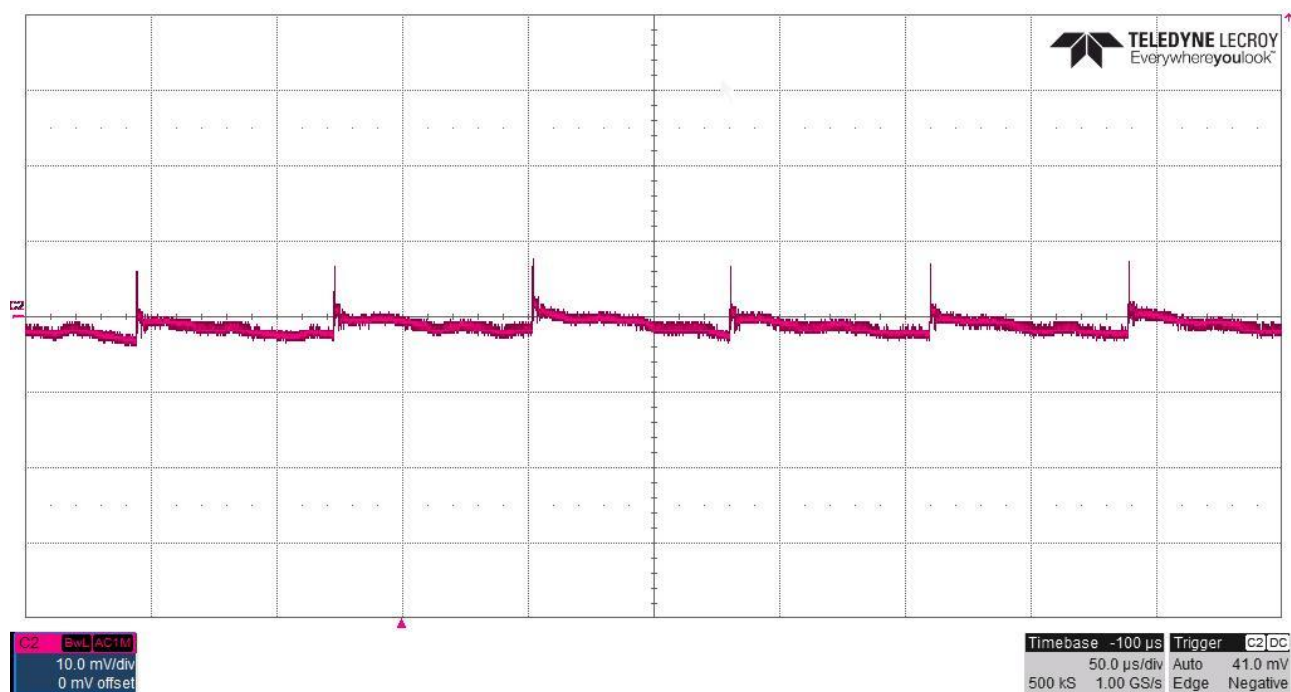


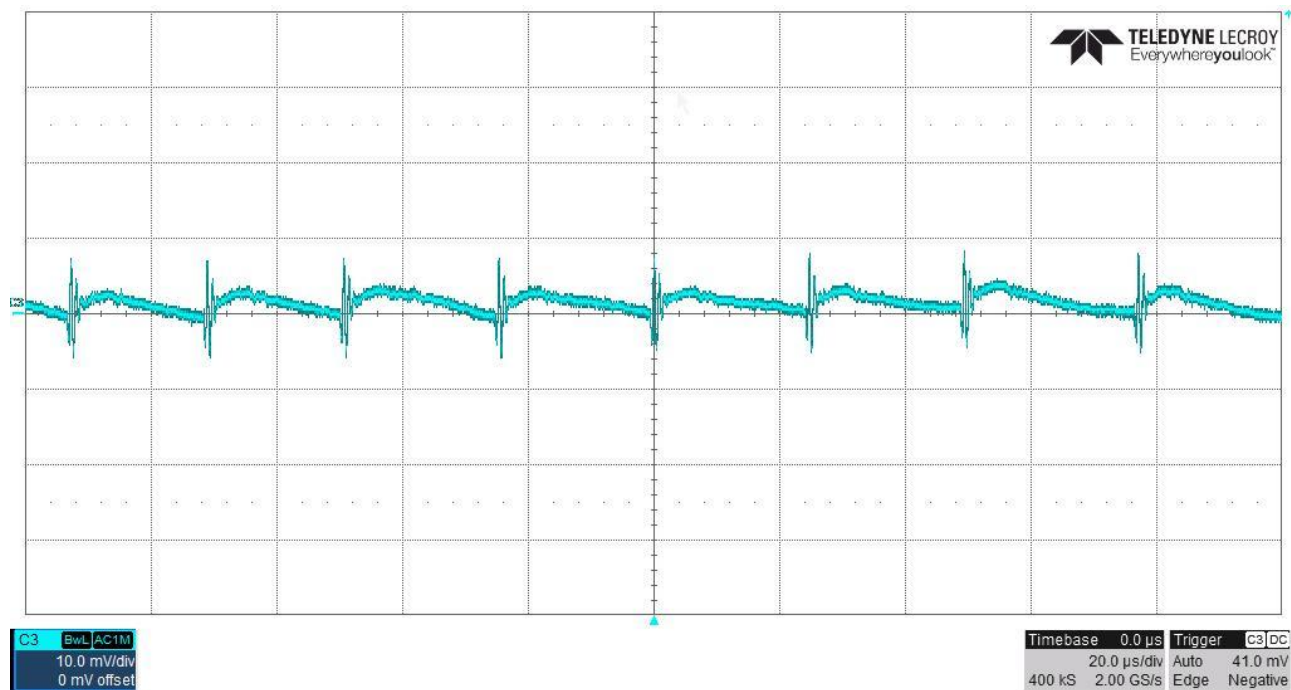
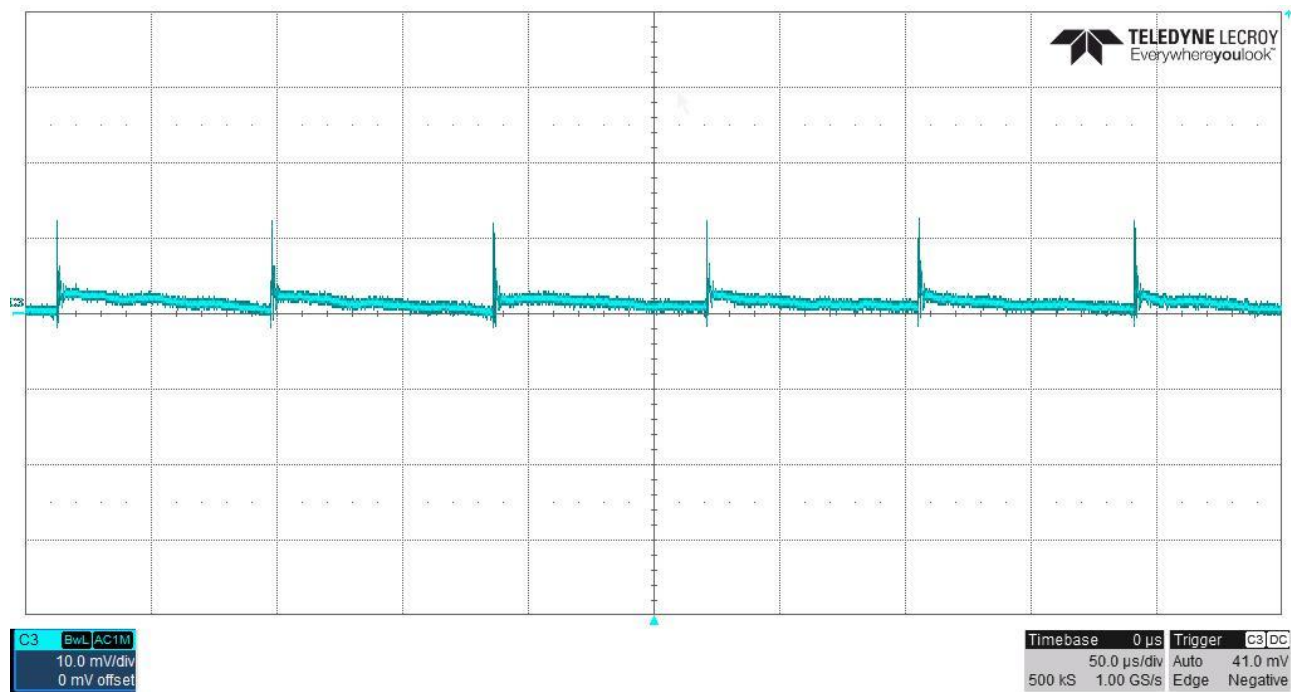
7 Output Ripple Voltage

7.1.1 Output Ripple 12V @ 115V_{AC}: 12V/0.45A; 5V/0.05A



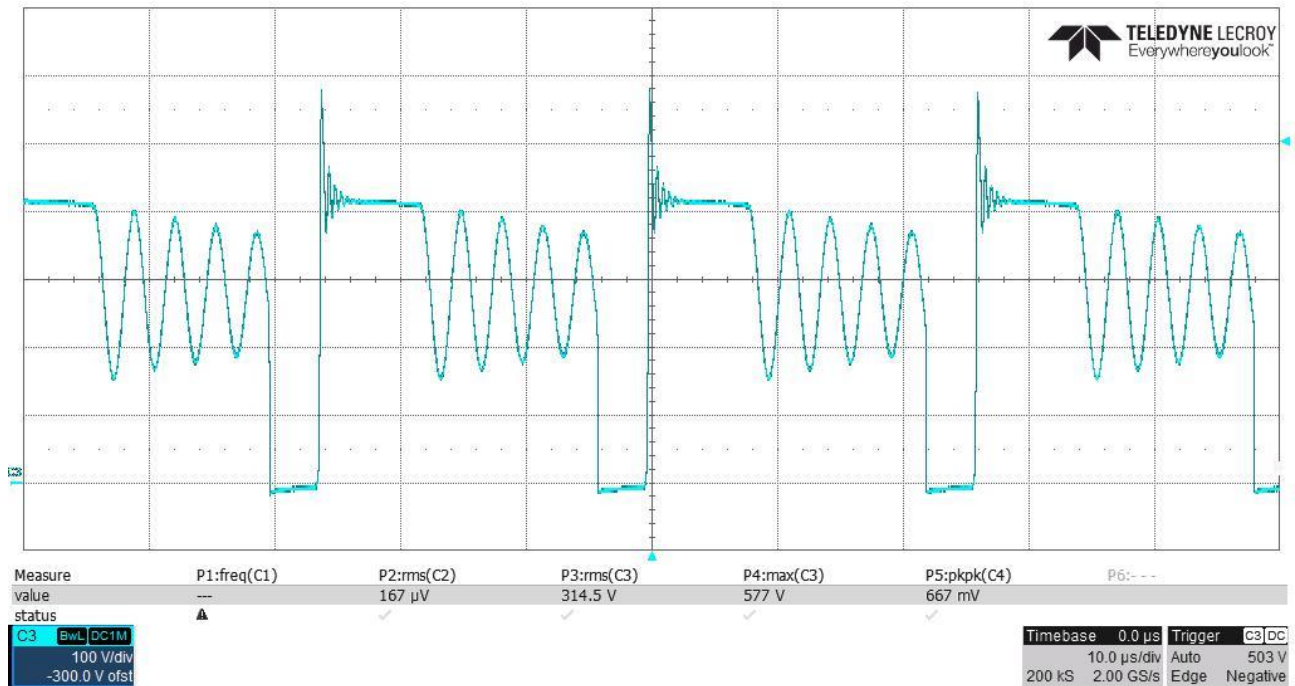
7.1.2 Output Ripple 12V @ 115V_{AC}: 12V/0A; 5V/0A



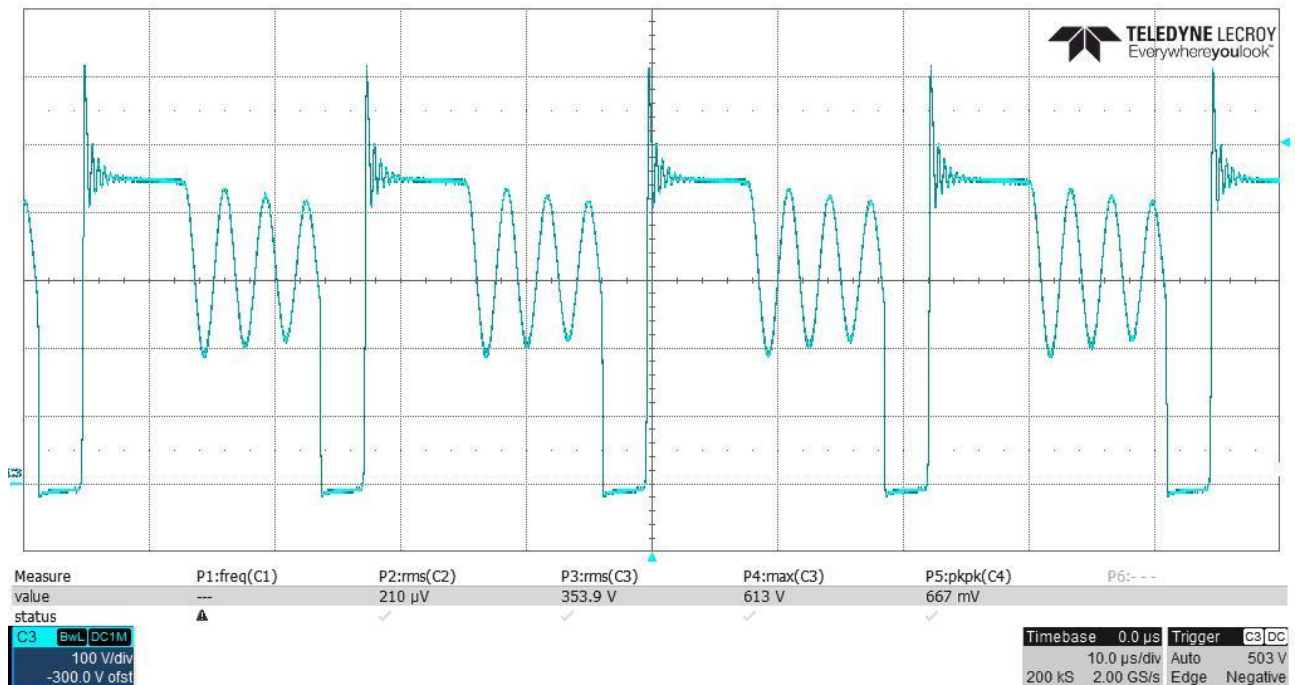
7.1.3 Output Ripple 5V @ 115V_{AC}: 12V/0.45A; 5V/0.05A**7.1.4 Output Ripple 5V @ 115V_{AC}: 12V/0A; 5V/0A**

8 Switching Waveforms

8.1.1 Switching Waveform @ 115V_{AC}: 12V/0.45A; 5V/0.05A



8.1.2 Switching Waveform @ 138V_{AC}: 12V/0.45A; 5V/0.05A



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