AMD-Xilinx SU35P

Test Report

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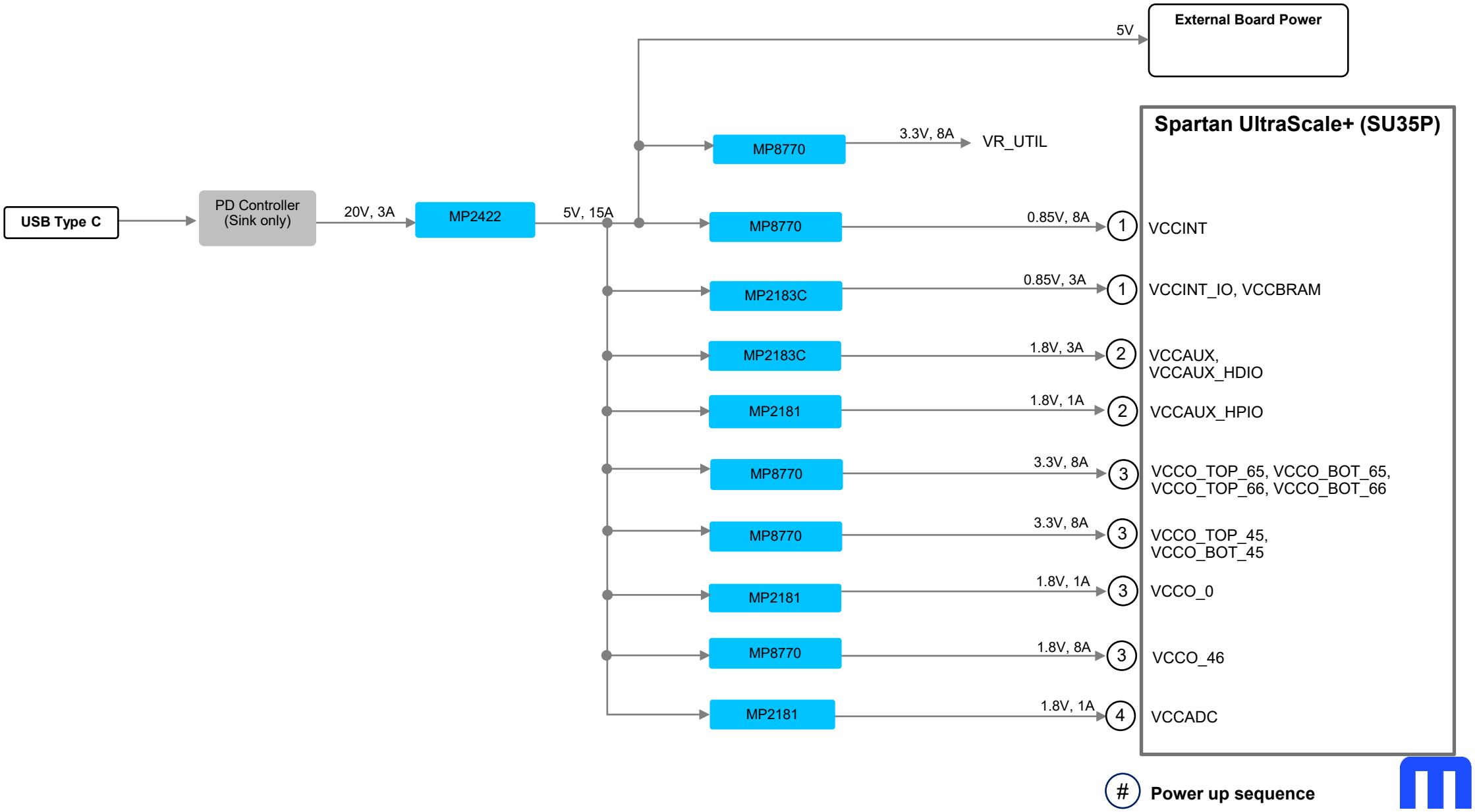
SU35P Reference Design



SU35P DC Voltage Accuracy

Rail Name	MPS Part #	Voltage Design Requirements		Max Current	Output Voltage (No Load)	Output Voltage (Half Load)	Output Voltage (Full Load)
		Vin	Vout				
VR_EXT_5V0	MP2422	20V	5V	13A	5.026V	5.025V	5.024V
VR_VCCADC_1V8	MP2181	5V	1.8V	0.5A	1.805V	1.809V	1.806V
VR_VCCO_0_1V8	MP2181	5V	1.8V	0.5A	1.816V	1.818V	1.816V
VR_VCCAUX_HPIO_1V8	MP2181	5V	1.8V	0.5A	1.801V	1.804V	1.802V
VR_VCCINT_INA_0V85	MP8770C	5V	0.85V	5A	0.843V	0.841V	0.839V
VR_VCCAUX_HDIO_1V8	MP2183C	5V	1.8V	1A	1.807V	1.806V	1.804V
VR_VCCINT_IO_BRAM_0V85	MP2183C	5V	0.85V	1A	0.849V	0.848V	0.847V
VR_UTIL_3V3	MP8770C	5V	3.3V	5A	3.310A	3.311A	3.315A
VR_VCCO_46_1V8	MP8770C	5V	1.8V	4A	1.795V	1.793V	1.792V
VR_VCCO_65_66_3V3	MP8770C	5V	3.3V	5A	3.302V	3.303V	3.306V
VR_VCCO_45_ADJ	MP8770C	5V	3.3V	5A	3.304V	3.303V	3.305V

SU35P Test Specifications

Rail Name	MPS Part #	Voltage Design Requirements		Max Current	Max AC Ripple + DC Tolerance %	Step load	Slew Rate
		Vin	Vout				
VR_EXT_5V0	MP2422	20V	5V	13A	+/-5%	3.25A→9.75A→3.25A	10A/us
VR_VCCADC_1V8	MP2181	5V	1.8V	0.5A	+/-3%	0.125A→0.375A→0.125A	10A/us
VR_VCCO_0_1V8	MP2181	5V	1.8V	0.5A	+/-3%	0.125A→0.375A→0.125A	10A/us
VR_VCCAUX_HPIO_1V8	MP2181	5V	1.8V	0.5A	+/-3%	0.125A→0.375A→0.125A	10A/us
VR_VCCINT_INA_0V85	MP8770C	5V	0.85V	5A	+/-3%	1.25A→3.75A→1.25A	10A/us
VR_VCCAUX_HDIO_1V8	MP2183C	5V	1.8V	1A	+/-3%	0.25A→0.75A→0.25A	10A/us
VR_VCCINT_IO_BRAM_0V85	MP2183C	5V	0.85V	1A	+/-3%	0.25A→0.75A→0.25A	10A/us
VR_UTIL_3V3	MP8770C	5V	3.3V	5A	+/-3%	1.25A→3.75A→1.25A	10A/us
VR_VCCO_46_1V8	MP8770C	5V	1.8V	4A	+/-3%	1.0A→3.0A→1.0A	10A/us
VR_VCCO_65_66_3V3	MP8770C	5V	3.3V	5A	+/-3%	1.25A→3.75A→1.25A	10A/us
VR_VCCO_45_ADJ	MP8770C	5V	3.3V	5A	+/-3%	1.25A→3.75A→1.25A	10A/us

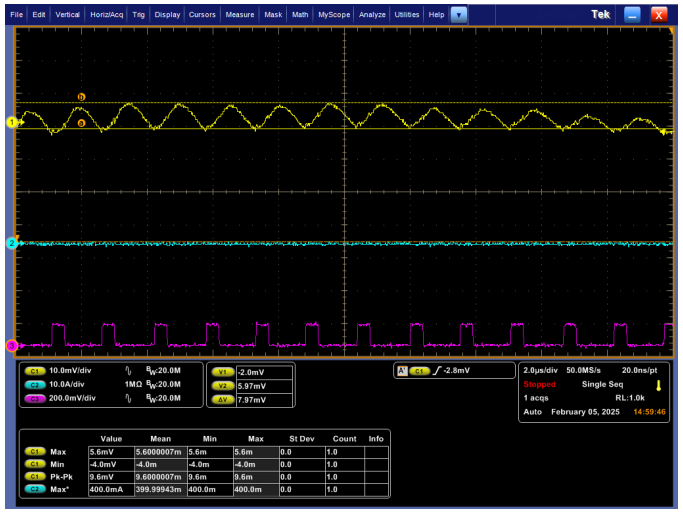
MP2422 Steady State Ripple – 5V, 13A

VOUT

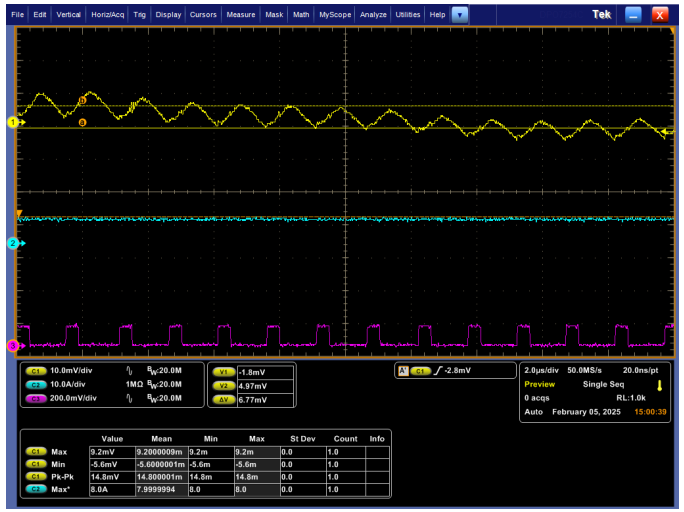
IOUT

SW

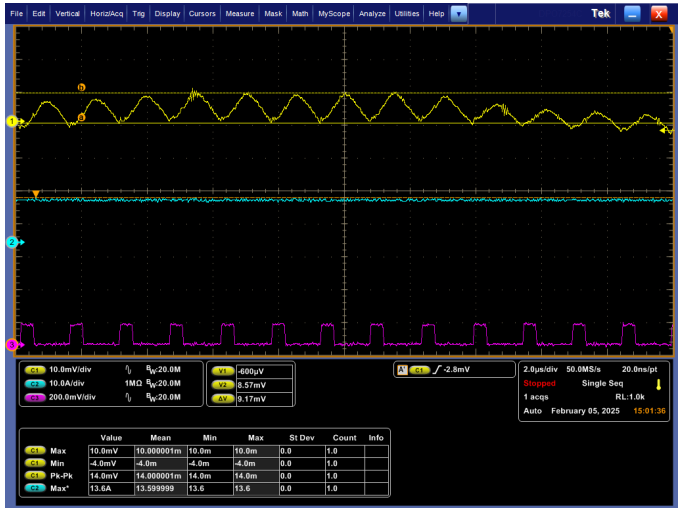
No load



Half Load (7.5A)



Max Load (13A)



- 7.97mV peak-peak ripple at No load
- 6.77mV peak-peak ripple at Half load
- 9.17mV peak-peak ripple at Max load

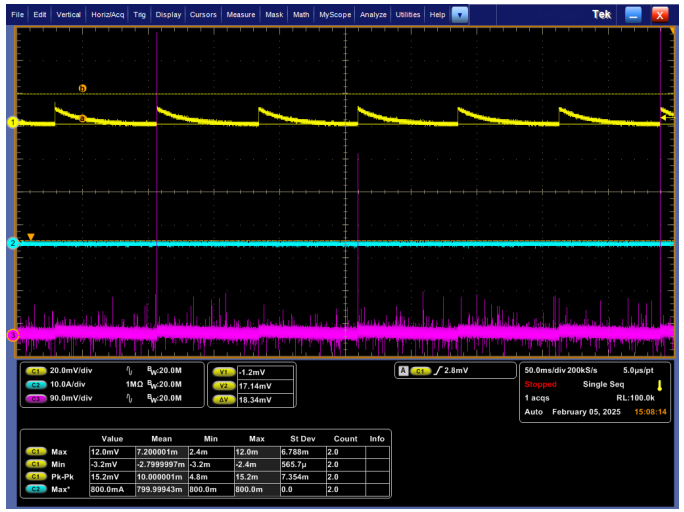
MP2181 Steady State Ripple – 1.8V, 0.5A

VOUT

IOUT

SW

No load



Half Load (0.25A)

Max Load (0.5A)

- 9.34mV peak-peak ripple at No load
- 2.931mV peak-peak ripple at Half load
- 2.691mV peak-peak ripple at Max load

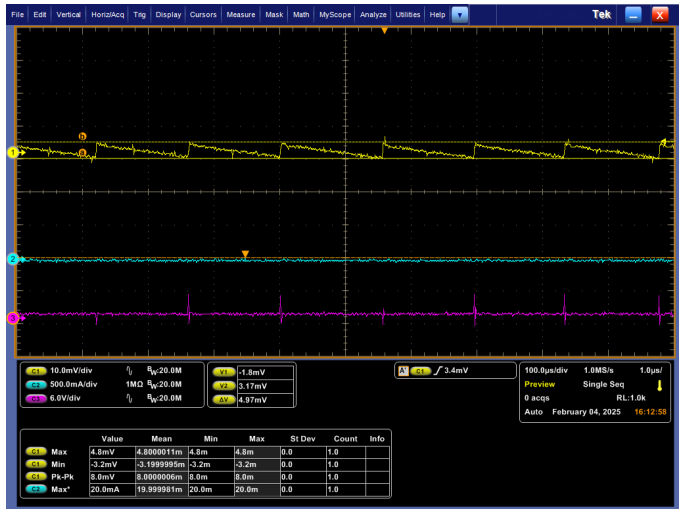
MP2181 Steady State Ripple – 1.8V, 0.5A

VOUT

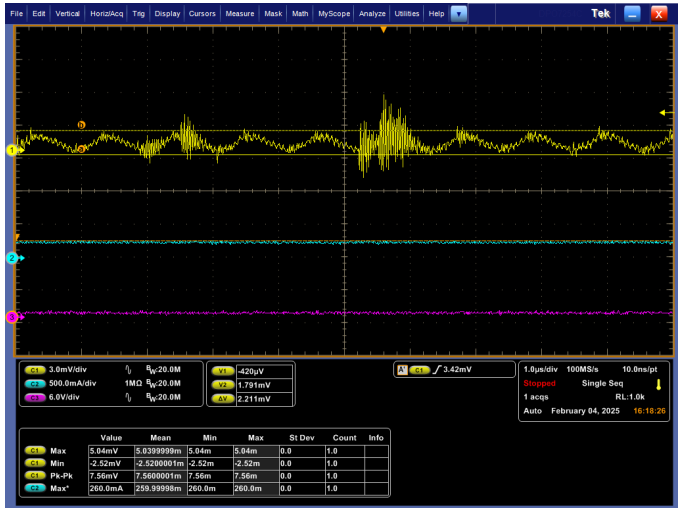
IOUT

SW

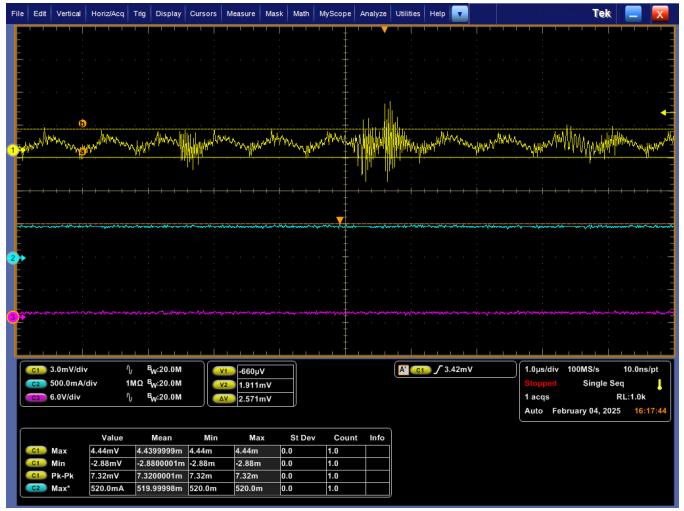
No load



Half Load (0.25A)



Max Load (0.5A)



- 4.97mV peak-peak ripple at No load
- 2.211mV peak-peak ripple at Half load
- 2.571mV peak-peak ripple at Max load

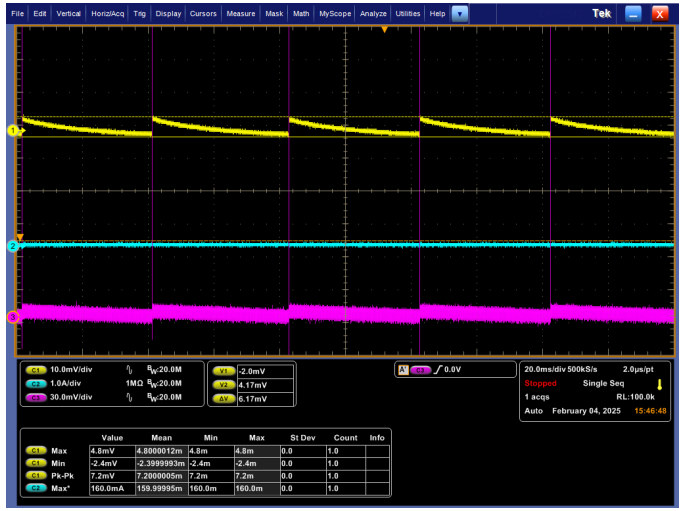
MP2181 Steady State Ripple – 1.8V, 0.5A

VOUT

IOUT

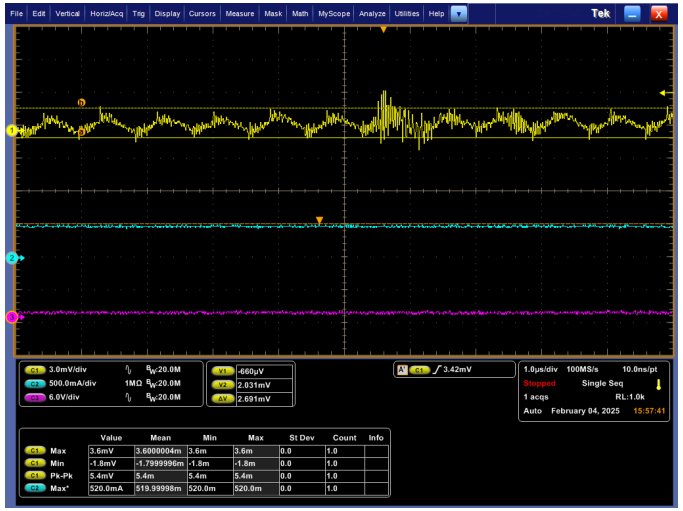
SW

No load



Half Load (0.25A)

Max Load (0.5A)



- 6.17mV peak-peak ripple at No load
- 2.511mV peak-peak ripple at Half load
- 2.691mV peak-peak ripple at Max load

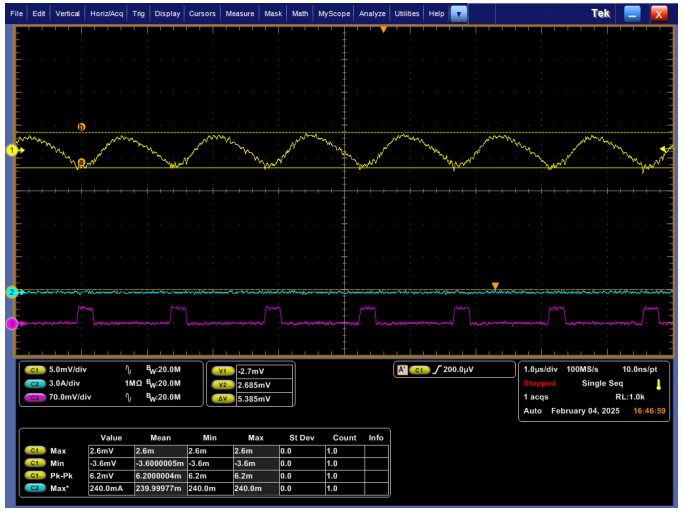
MP8770C Steady State Ripple – 0.85V, 5A

VOUT

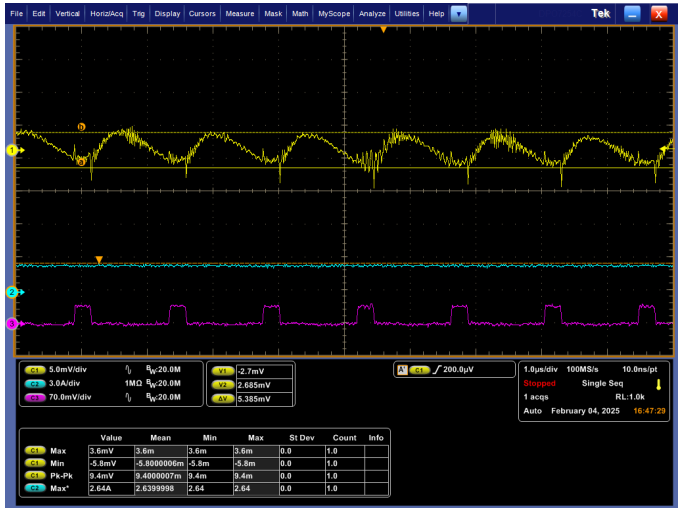
IOUT

SW

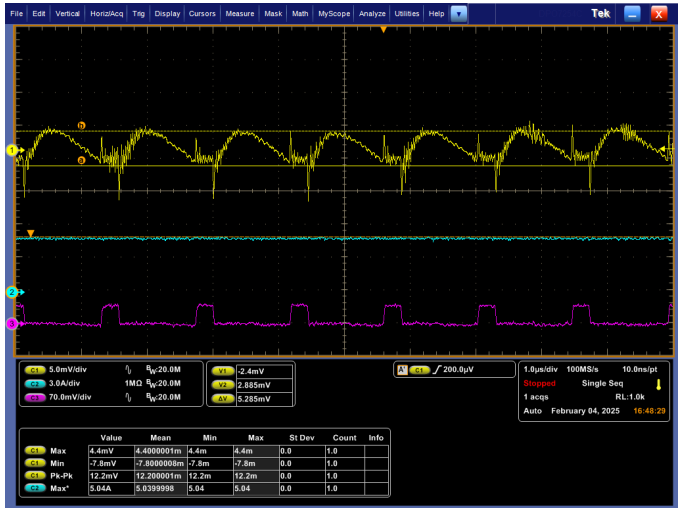
No load



Half Load (2.5A)



Max Load (5A)



- 5.385mV peak-peak ripple at No load
- 5.385mV peak-peak ripple at Half load
- 5.285mV peak-peak ripple at Max load

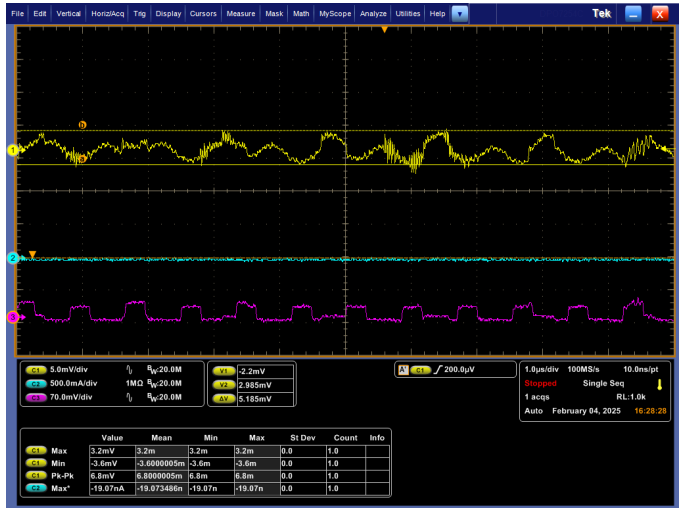
MP2183C Steady State Ripple – 1.8V, 1A

VOUT

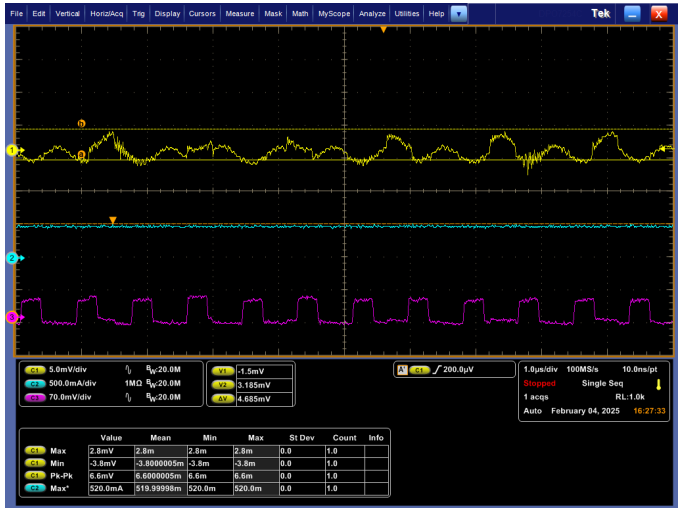
IOUT

SW

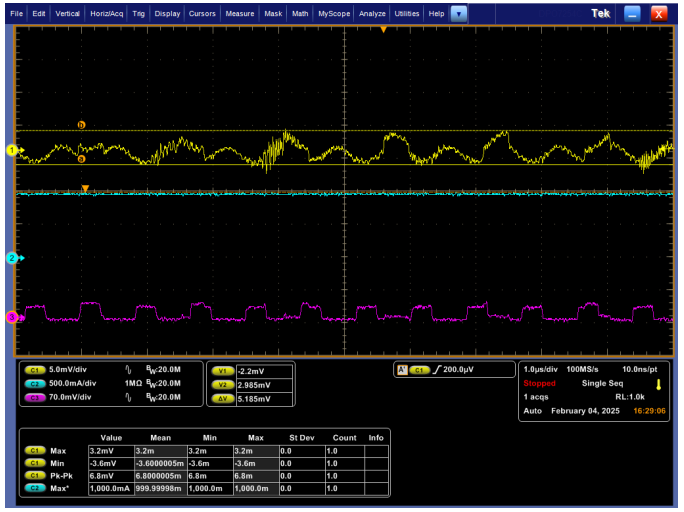
No load



Half Load (0.5A)



Max Load (1A)



- 5.185mV peak-peak ripple at No load
- 4.685mV peak-peak ripple at Half load
- 5.185mV peak-peak ripple at Max load

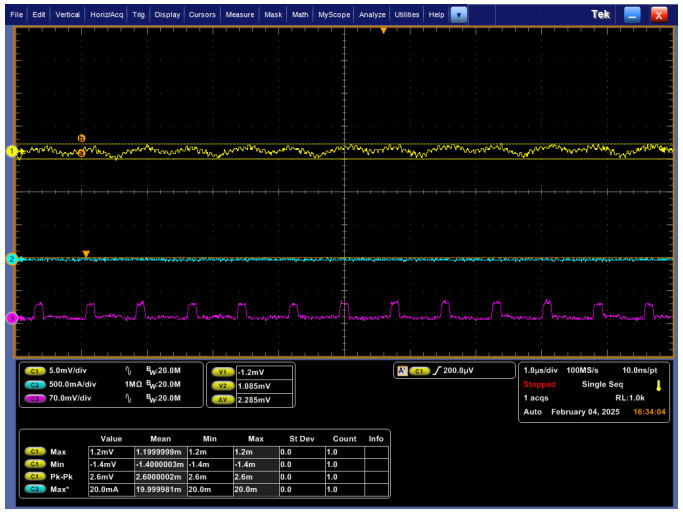
MP2183C Steady State Ripple – 0.85V, 1A

VOUT

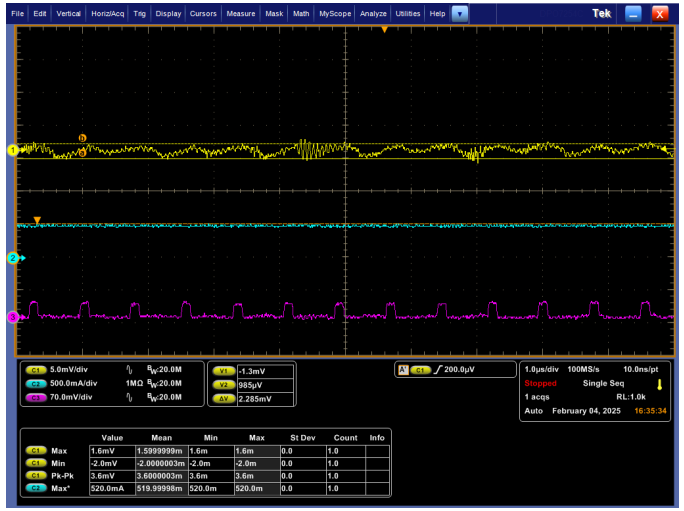
IOUT

SW

No load



Half Load (0.5A)



Max Load (1A)

- 2.285mV peak-peak ripple at No load
- 2.285mV peak-peak ripple at Half load
- 2.285mV peak-peak ripple at Max load

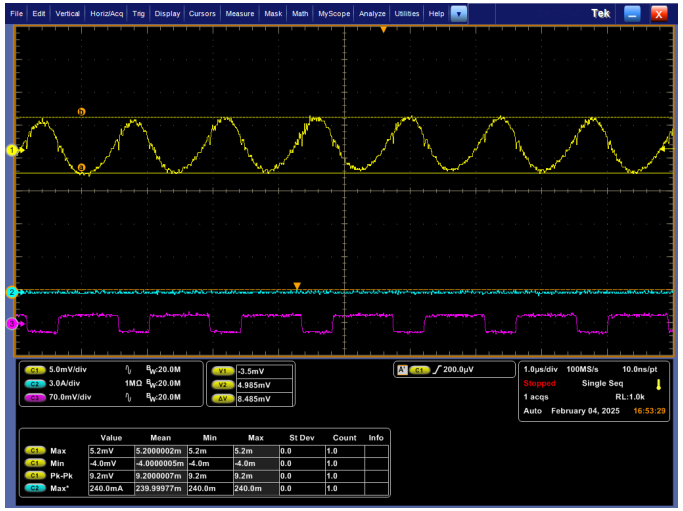
MP8770C Steady State Ripple – 3.3V, 5A

VOUT

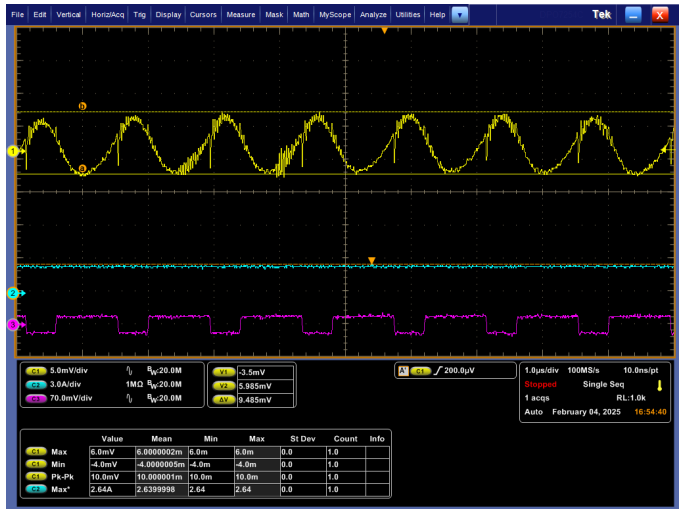
IOUT

SW

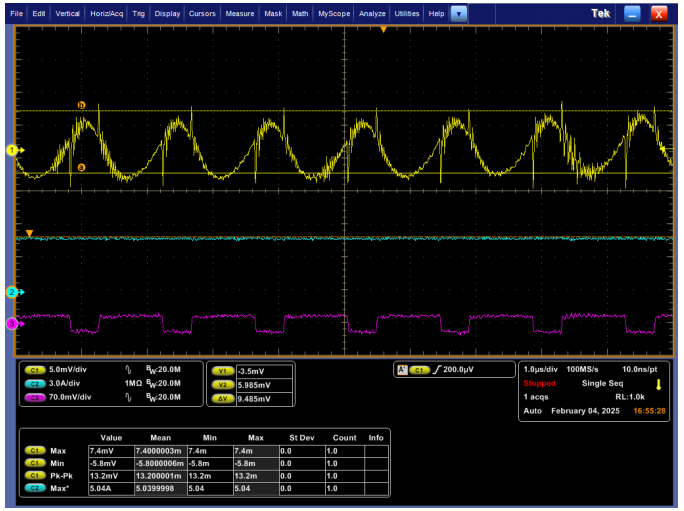
No load



Half Load (2.5A)



Max Load (5A)



- 8.485mV peak-peak ripple at No load
- 9.485mV peak-peak ripple at Half load
- 9.485mV peak-peak ripple at Max load

MP8770C Steady State Ripple – 1.8V, 4A

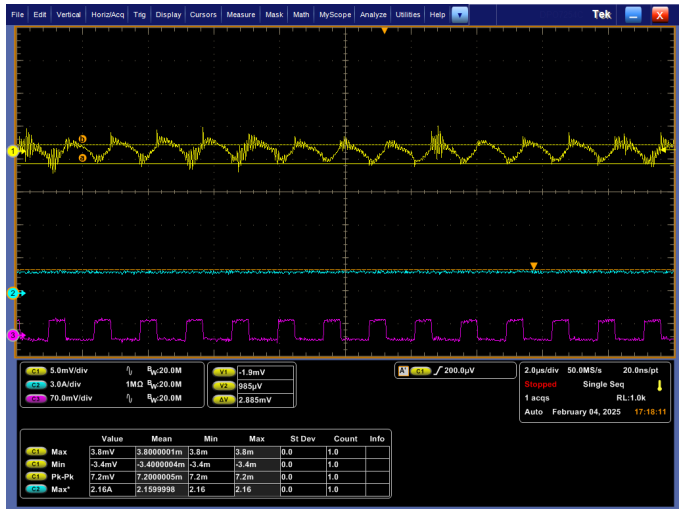
VOUT

IOUT

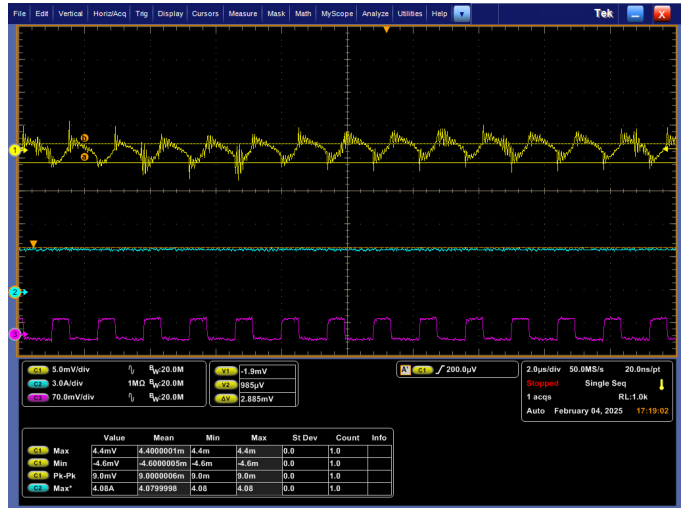
SW

No load

Half Load (2A)



Max Load (4A)



- 2.685mV peak-peak ripple at No load
- 2.885mV peak-peak ripple at Half load
- 3.885mV peak-peak ripple at Max load

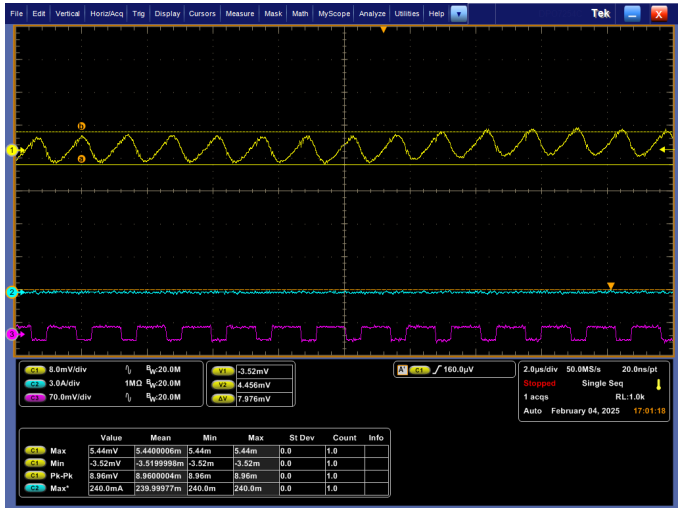
MP8770C Steady State Ripple – 3.3V, 5A

VOUT

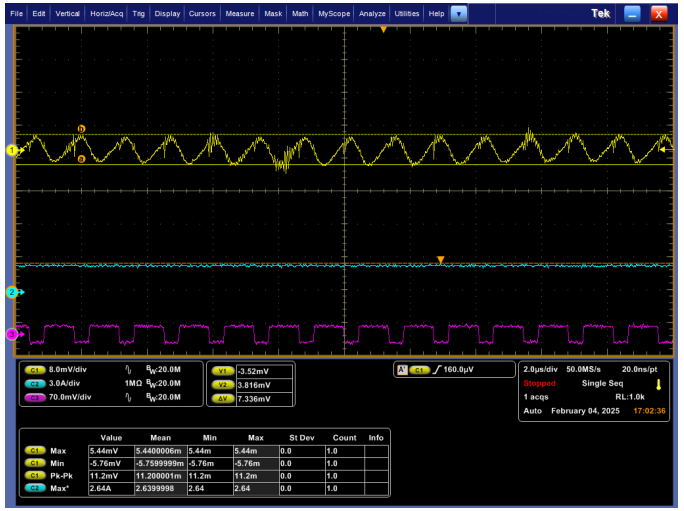
IOUT

SW

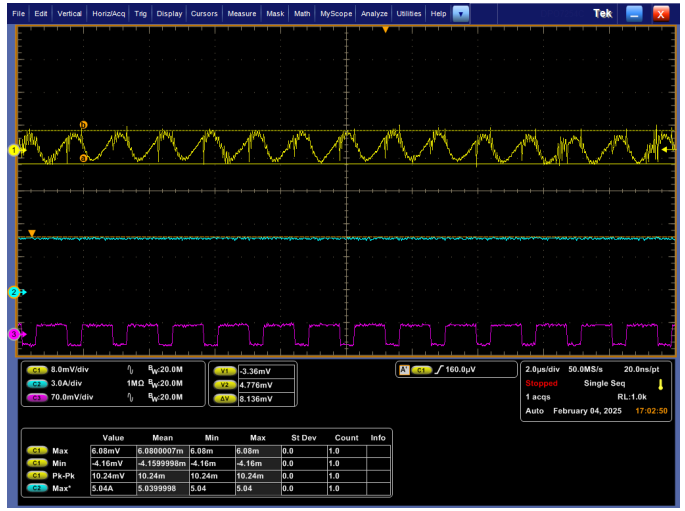
No load



Half Load (2.5A)



Max Load (5A)



- 7.976mV peak-peak ripple at No load
- 7.336mV peak-peak ripple at Half load
- 8.136mV peak-peak ripple at Max load

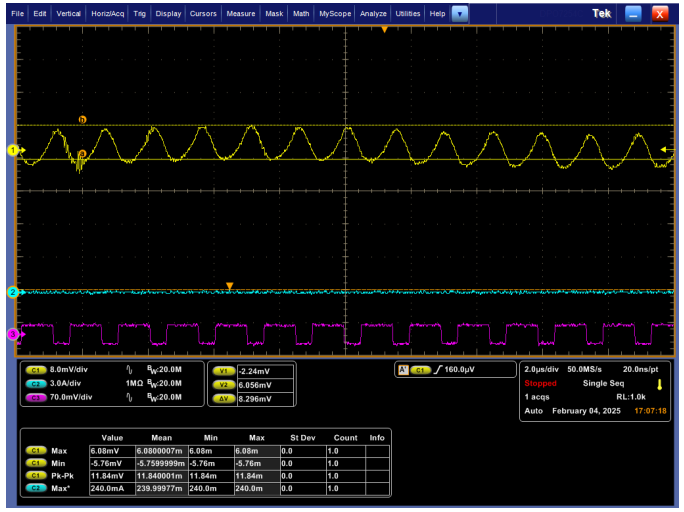
MP8770C Steady State Ripple – 3.3V, 5A

VOUT

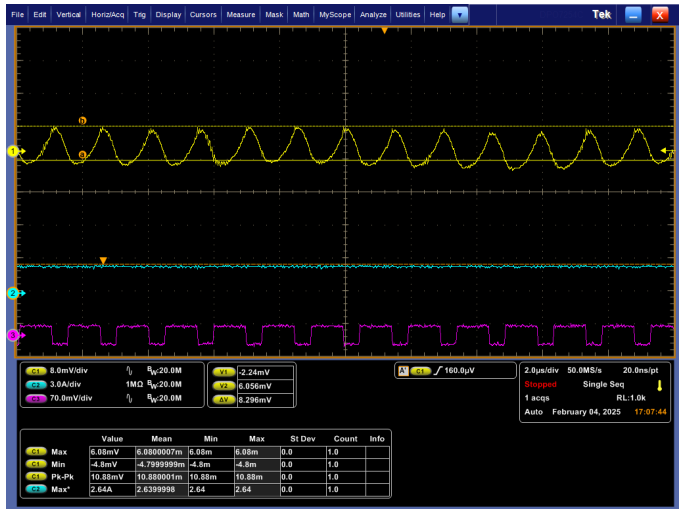
IOUT

SW

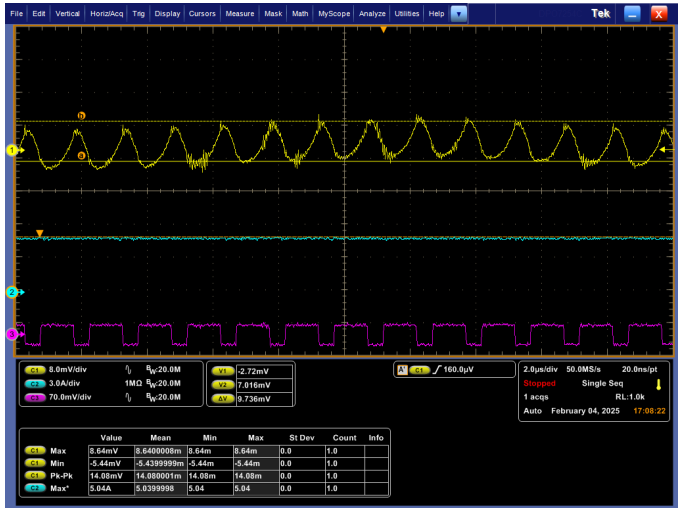
No load



Half Load (2.5A)



Max Load (5A)



- 8.296mV peak-peak ripple at No load
- 8.296mV peak-peak ripple at Half load
- 9.736mV peak-peak ripple at Max load

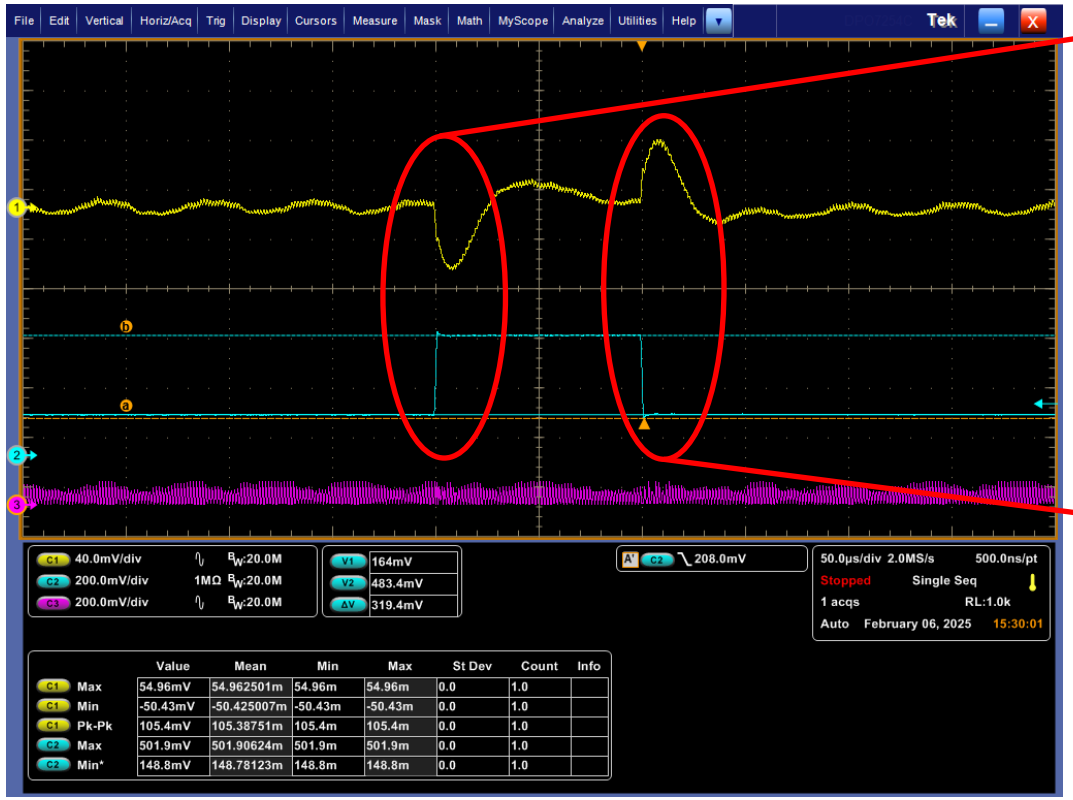
MP2422 Transient Test – 5V, 13A

Step Load 3.25A → 9.75A → 3.25A, 10A/us

VOUT

IOUT

SW

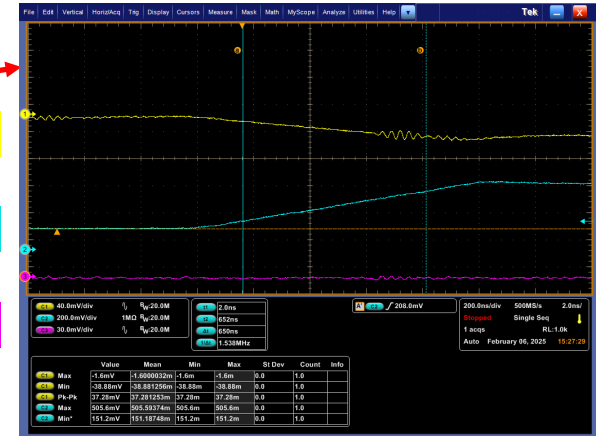


Rising Edge

VOUT

IOUT

SW

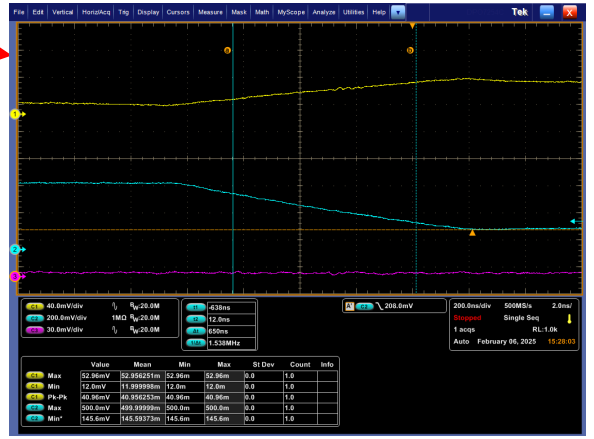


Falling Edge

VOUT

IOUT

SW



Vout ripple -1.09% (-50.43mV) to +1.10% (54.96mV) with load transient

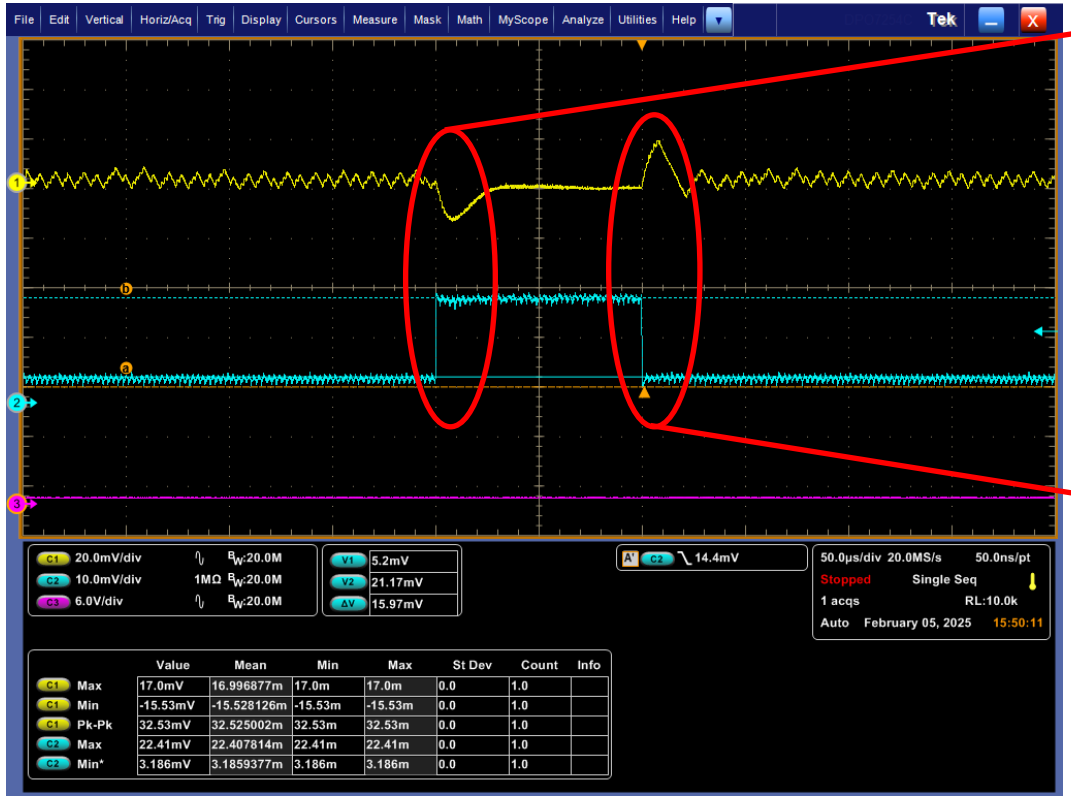
MP2181 Transient Test – 1.8V, 0.5A

Step Load 0.125A → 0.375A → 0.125A, 10A/us

VOUT

IOUT

SW

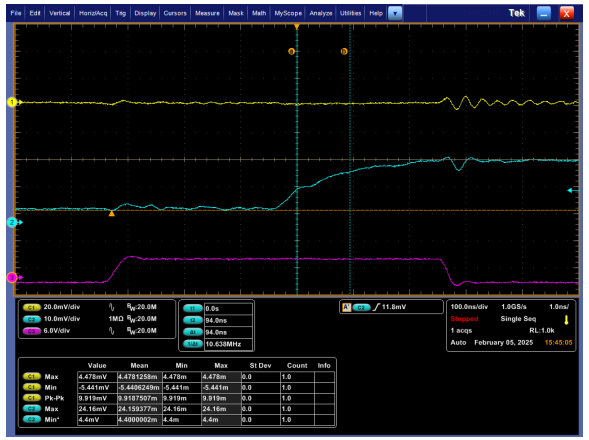


Rising Edge

VOUT

IOUT

SW

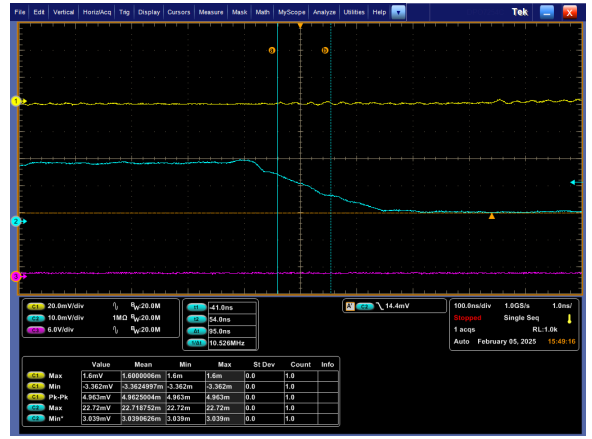


Falling Edge

VOUT

IOUT

SW



Vout ripple -0.86% (-15.53mV) to +0.94% (17.0mV) with load transient

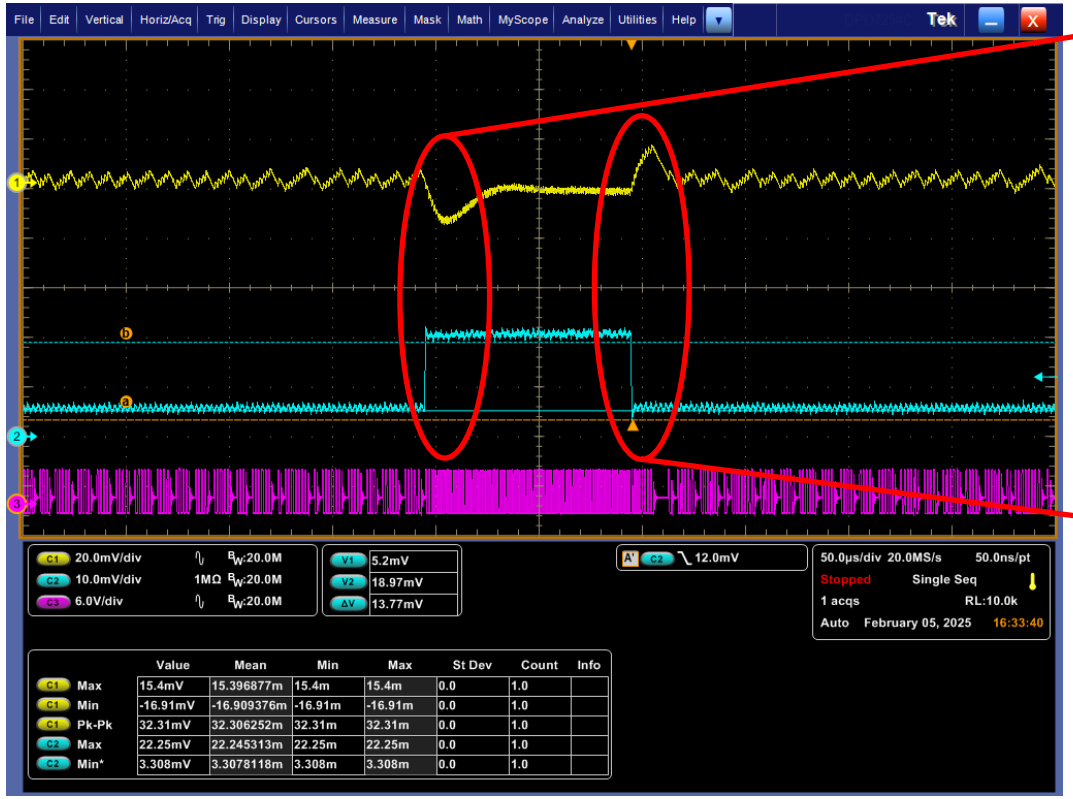
MP2181 Transient Test – 1.8V, 0.5A

Step Load 0.125A → 0.375A → 0.125A, 10A/us

VOUT

IOUT

SW

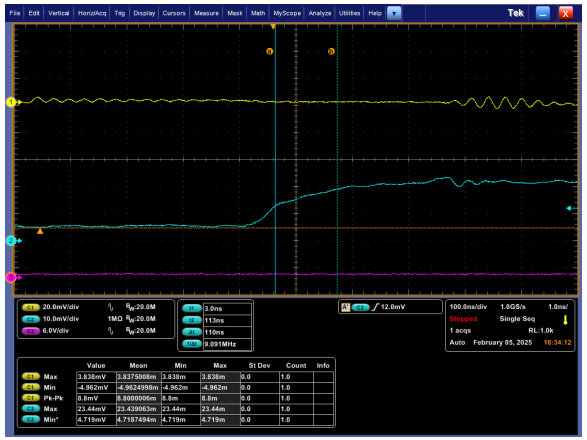


Rising Edge

VOUT

IOUT

SW

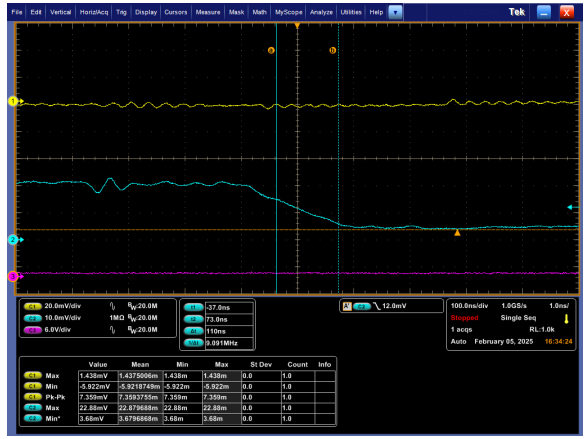


Falling Edge

VOUT

IOUT

SW



Vout ripple -0.94% (-16.91mV) to +0.86% (15.4mV) with load transient

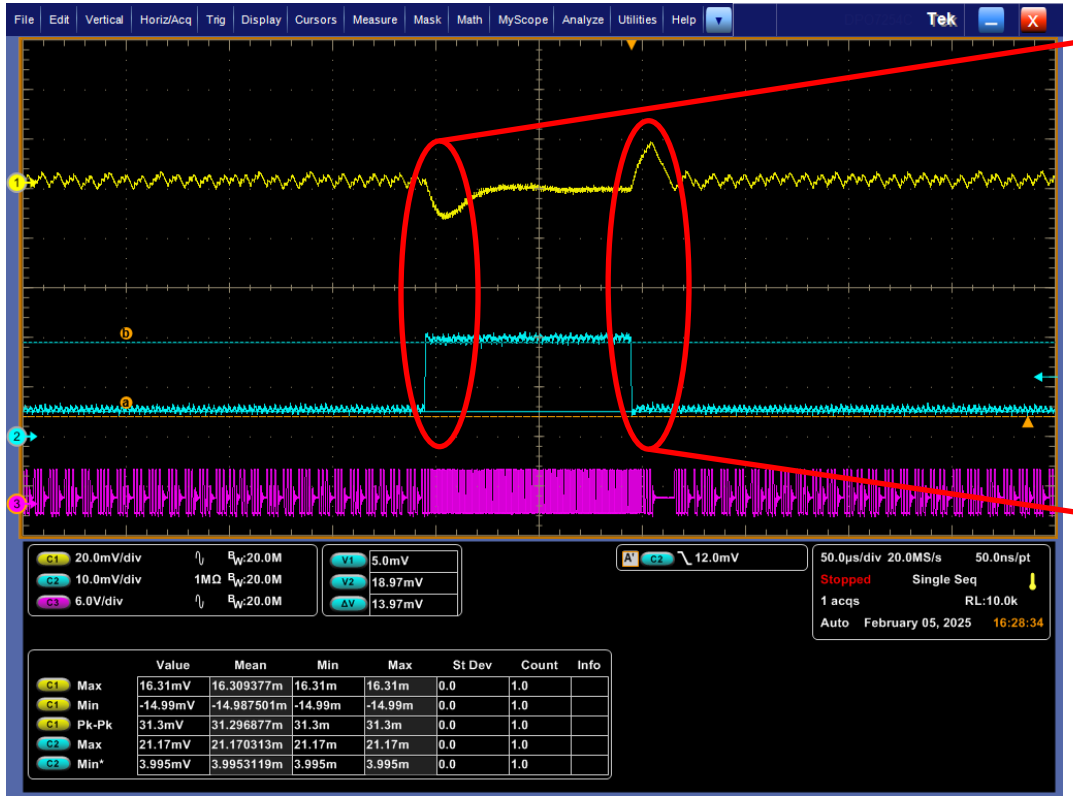
MP2181 Transient Test – 1.8V, 0.5A

Step Load 0.125A → 0.375A → 0.125A, 10A/us

VOUT

IOUT

SW



Rising Edge

VOUT

IOUT

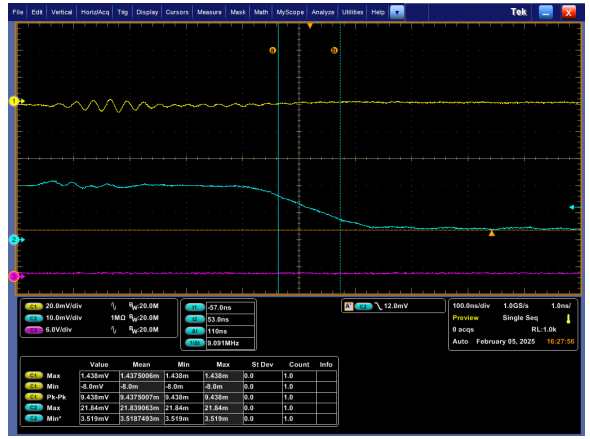
SW

Falling Edge

VOUT

IOUT

SW



Vout ripple -0.83% (-14.99mV) to +0.91% (16.31mV) with load transient

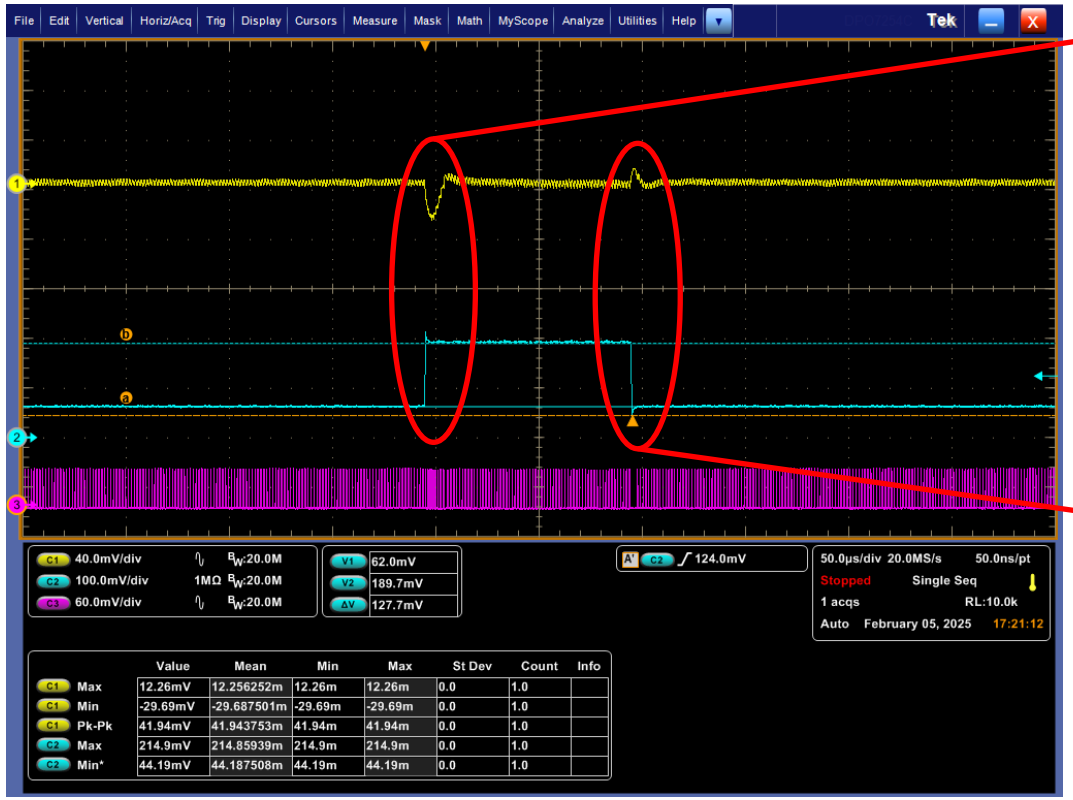
MP8770C Transient Test – 0.85V, 5A

Step Load 1.25A → 3.75A → 1.25A, 10A/us

VOUT

IOUT

SW

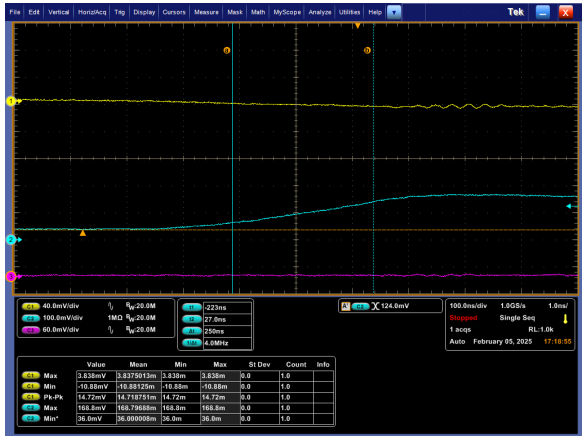


Rising Edge

VOUT

IOUT

SW

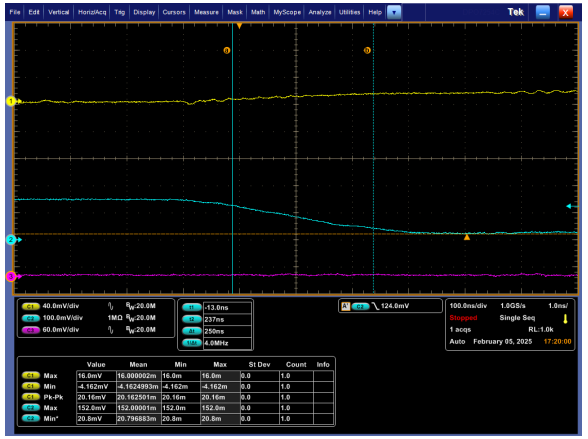


Falling Edge

VOUT

IOUT

SW



Vout ripple -3.14% (-26.69mV) to +1.44% (12.26mV) with load transient

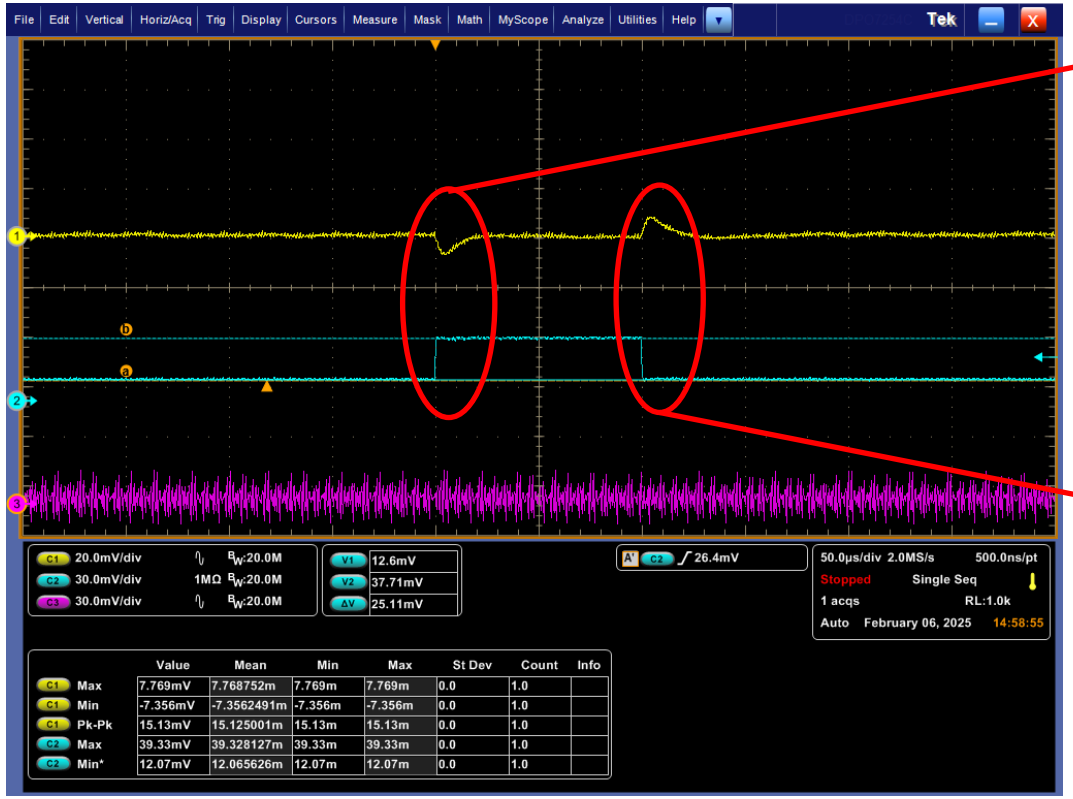
MP2183C Transient Test – 1.8V, 1A

Step Load 0.25A → 0.75A → 0.25A, 10A/us

VOUT

IOUT

SW

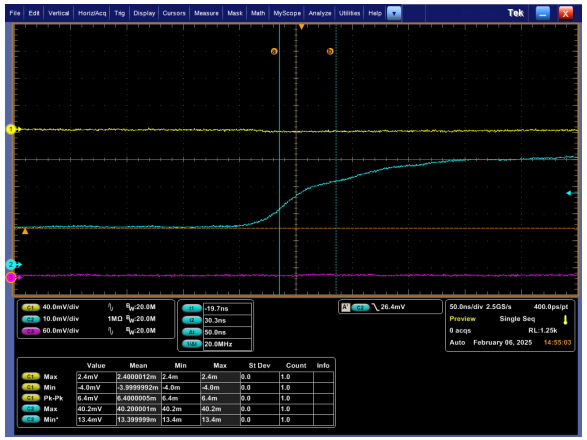


Rising Edge

VOUT

IOUT

SW

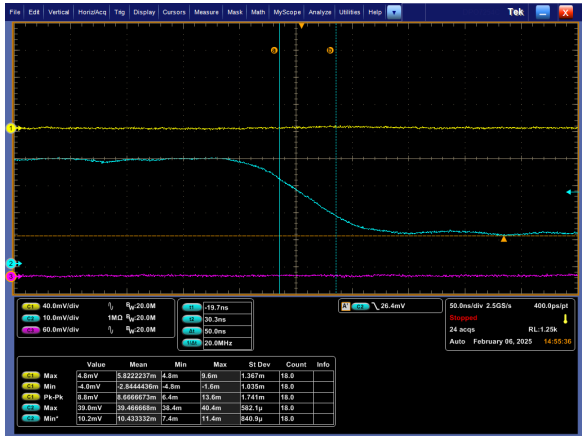


Falling Edge

VOUT

IOUT

SW



Vout ripple -0.41% (-7.356mV) to +0.43% (7.769mV) with load transient

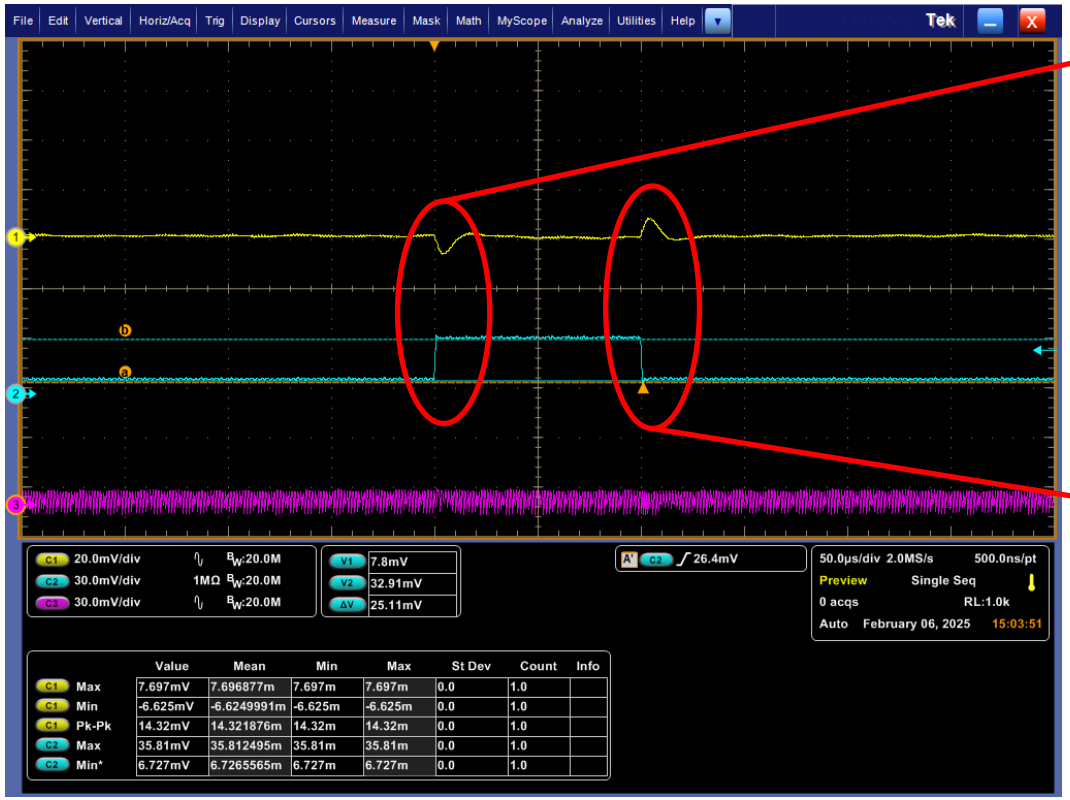
MP2183C Transient Test – 0.85V, 1A

Step Load 0.25A → 0.75A → 0.25A, 10A/us

VOUT

IOUT

SW

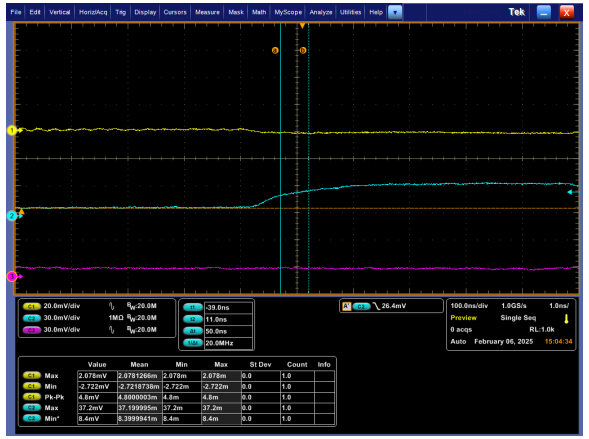


Rising Edge

VOUT

IOUT

SW

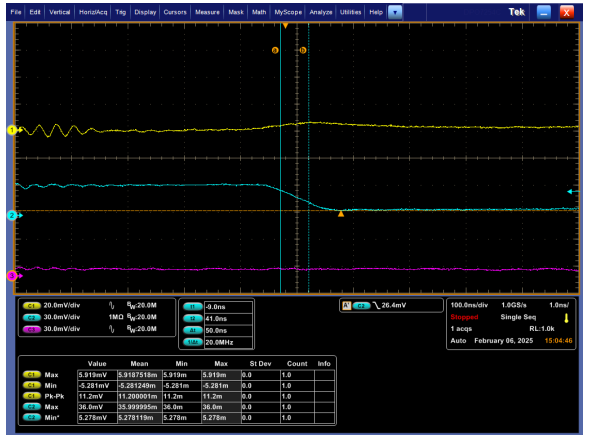


Falling Edge

VOUT

IOUT

SW



Vout ripple -0.78% (-6.625mV) to +0.91% (7.697mV) with load transient

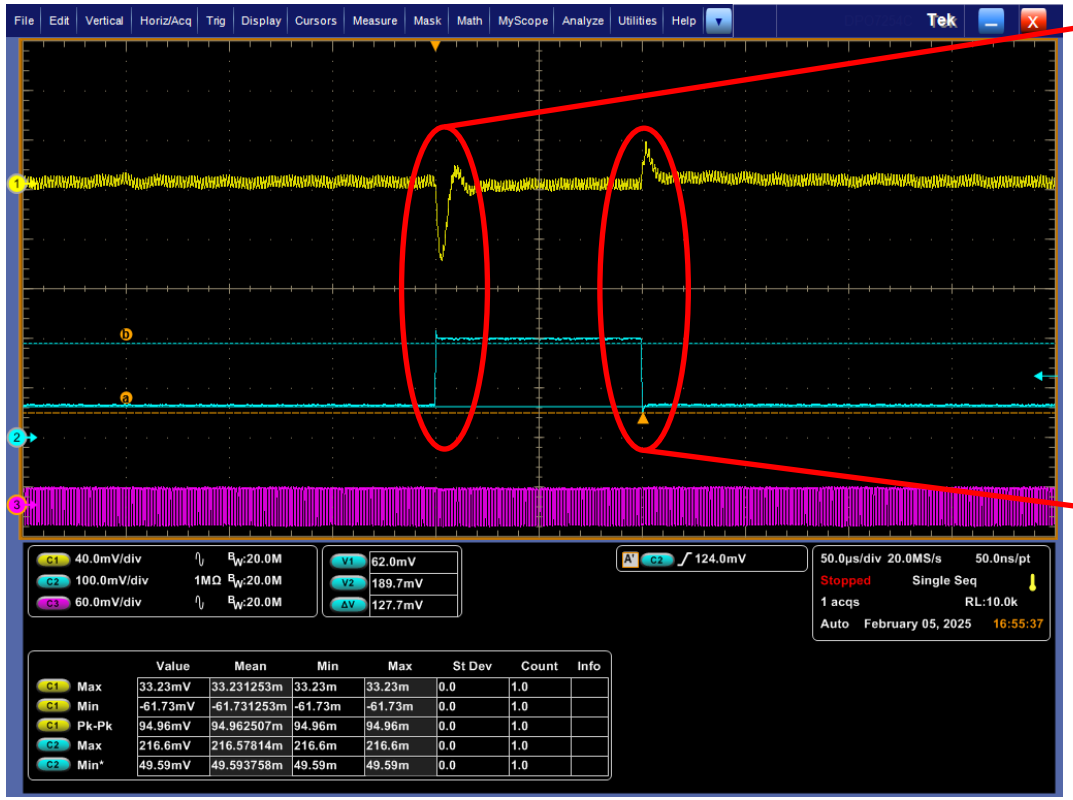
MP8770C Transient Test – 3.3V, 5A

Step Load 1.25A → 3.75A → 1.25A, 10A/us

VOUT

IOUT

SW

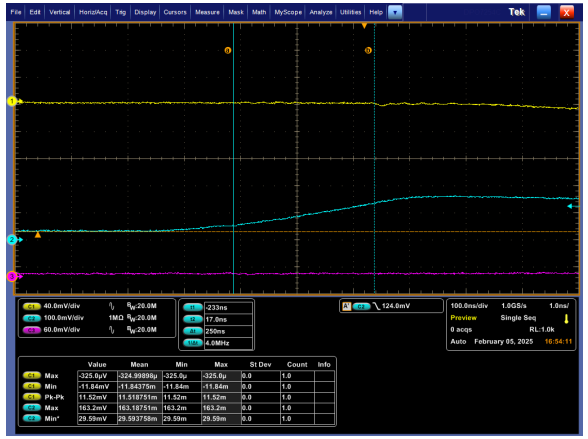


Rising Edge

VOUT

IOUT

SW

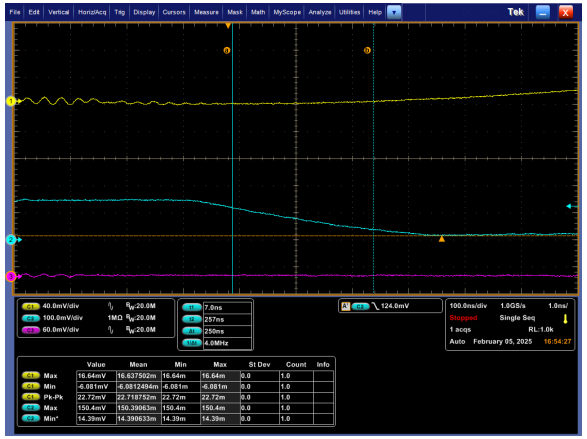


Falling Edge

VOUT

IOUT

SW



Vout ripple -1.87% (-61.73mV) to +1.01% (33.23mV) with load transient

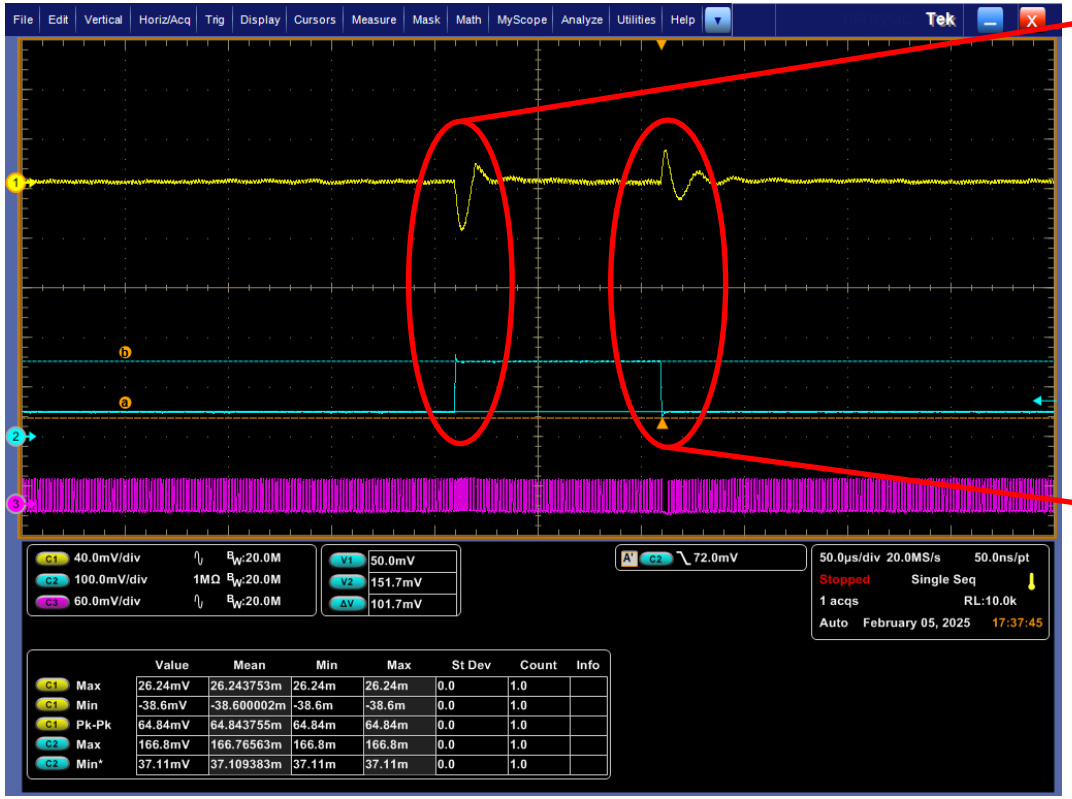
MP8770C Transient Test – 1.8V, 4A

Step Load 1A → 3A → 1A, 10A/us

VOUT

IOUT

SW

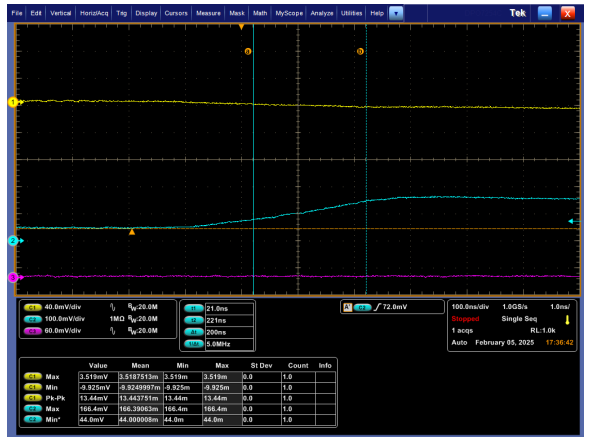


Rising Edge

VOUT

IOUT

SW

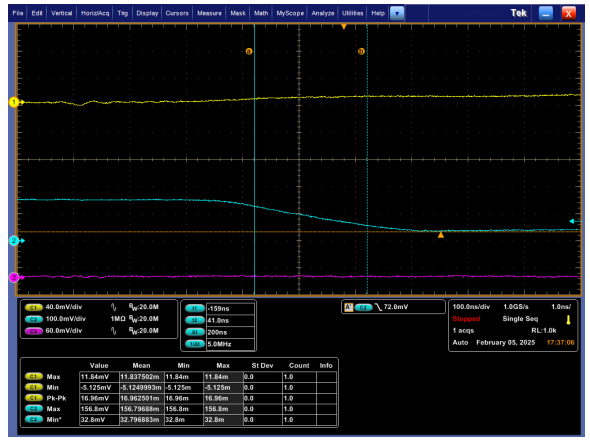


Falling Edge

VOUT

IOUT

SW



Vout ripple -2.14% (-38.6mV) to +1.46% (26.24mV) with load transient

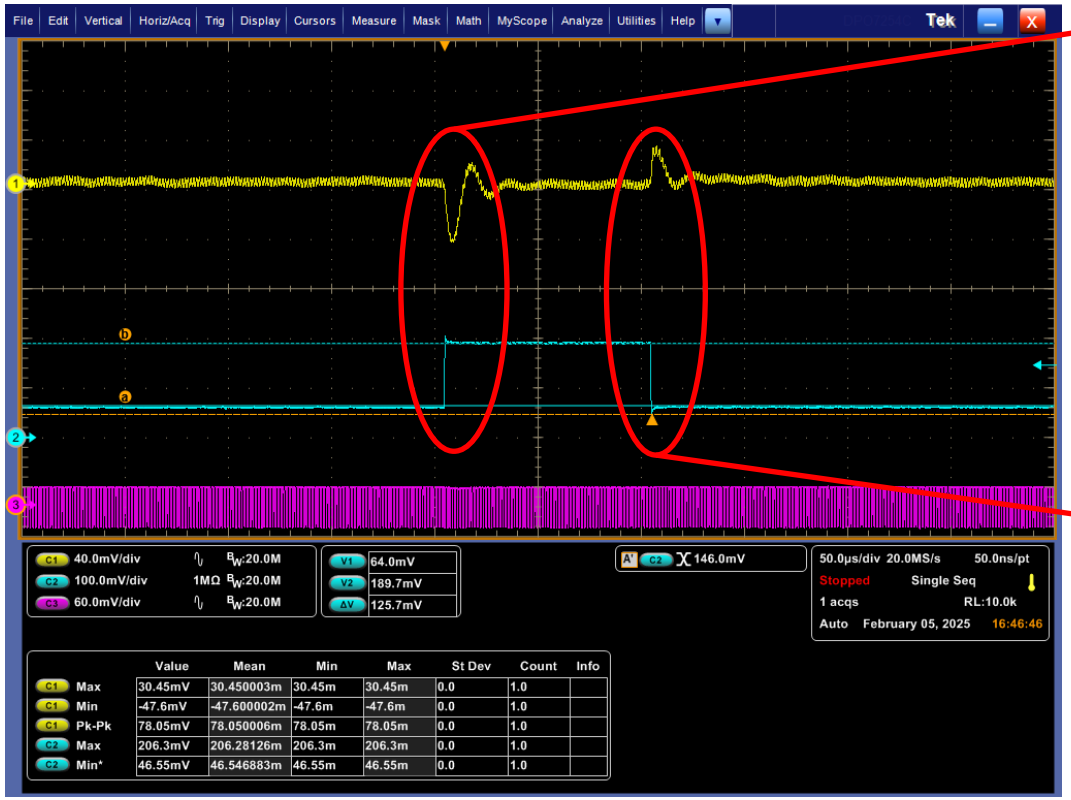
MP8770C Transient Test – 3.3V, 5A

Step Load 1.25A → 3.75A → 1.25A, 10A/us

VOUT

IOUT

SW

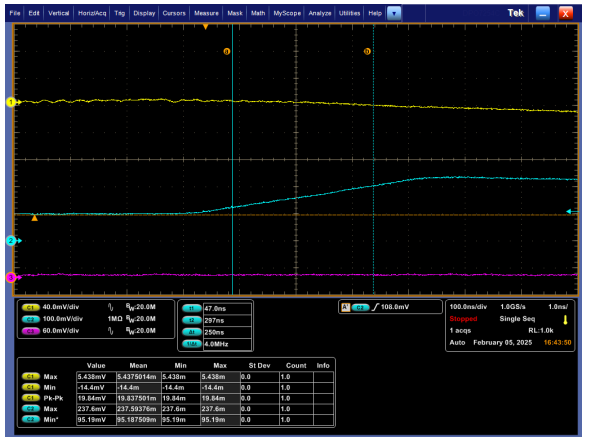


Rising Edge

VOUT

IOUT

SW

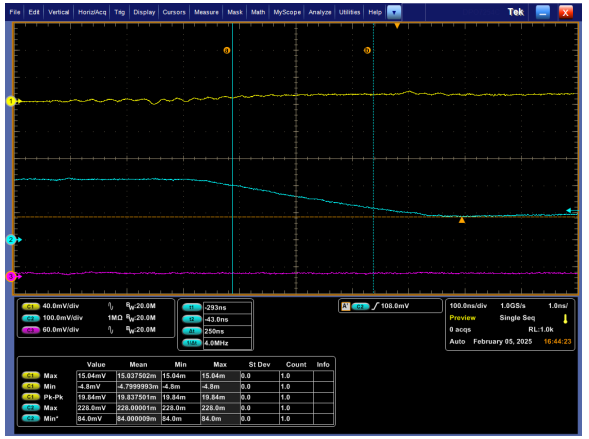


Falling Edge

VOUT

IOUT

SW



Vout ripple -1.44% (-47.6mV) to +0.92% (30.45mV) with load transient

MP8770C Transient Test – 3.3V, 5A

Step Load 1.25A → 3.75A → 1.25A, 10A/us

VOUT

IOUT

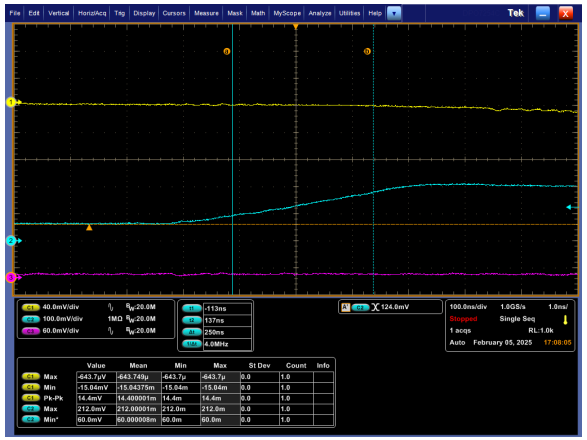
SW

Rising Edge

VOUT

IOUT

SW

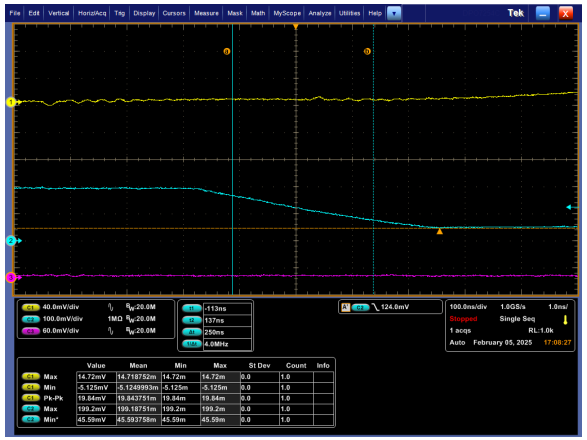


Falling Edge

VOUT

IOUT

SW



Vout ripple -1.87% (-61.56mV) to +1.01% (33.2mV) with load transient

Test Equipment

Measurement procedures

- All steady state measurements (No Load/Typical/Max) were taken directly at output capacitors using a digital multimeter
- All current waveforms were captured with a current probe coming directly off the output capacitor into the E-load
- Steady state ripple and transient response waveforms were measured directly across the output capacitors using a shielded cable

Equipment

- Tektronix DPO 4034 Digital Phosphor Oscilloscope
- Tektronix AFG3022C Function Generator
- Chroma 63103A DC Electronic Load
- Intel Series 1 25A Mini Slammer ver. B2
- I.T.E. Power Supply: TE240A2451F01
- Fluke 179 True RMS Multimeter