

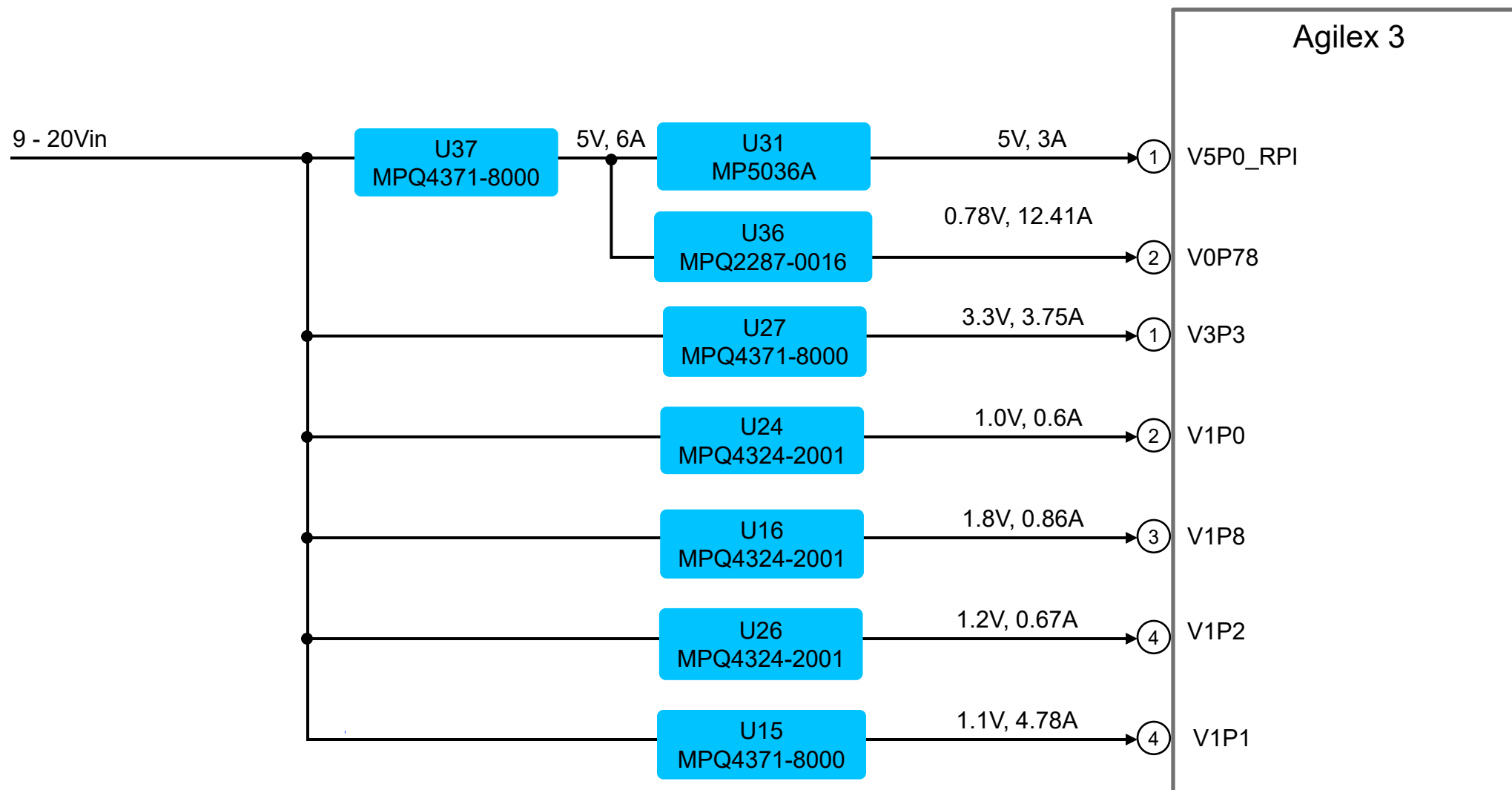
Intel Altera Agilex 3

Test Report

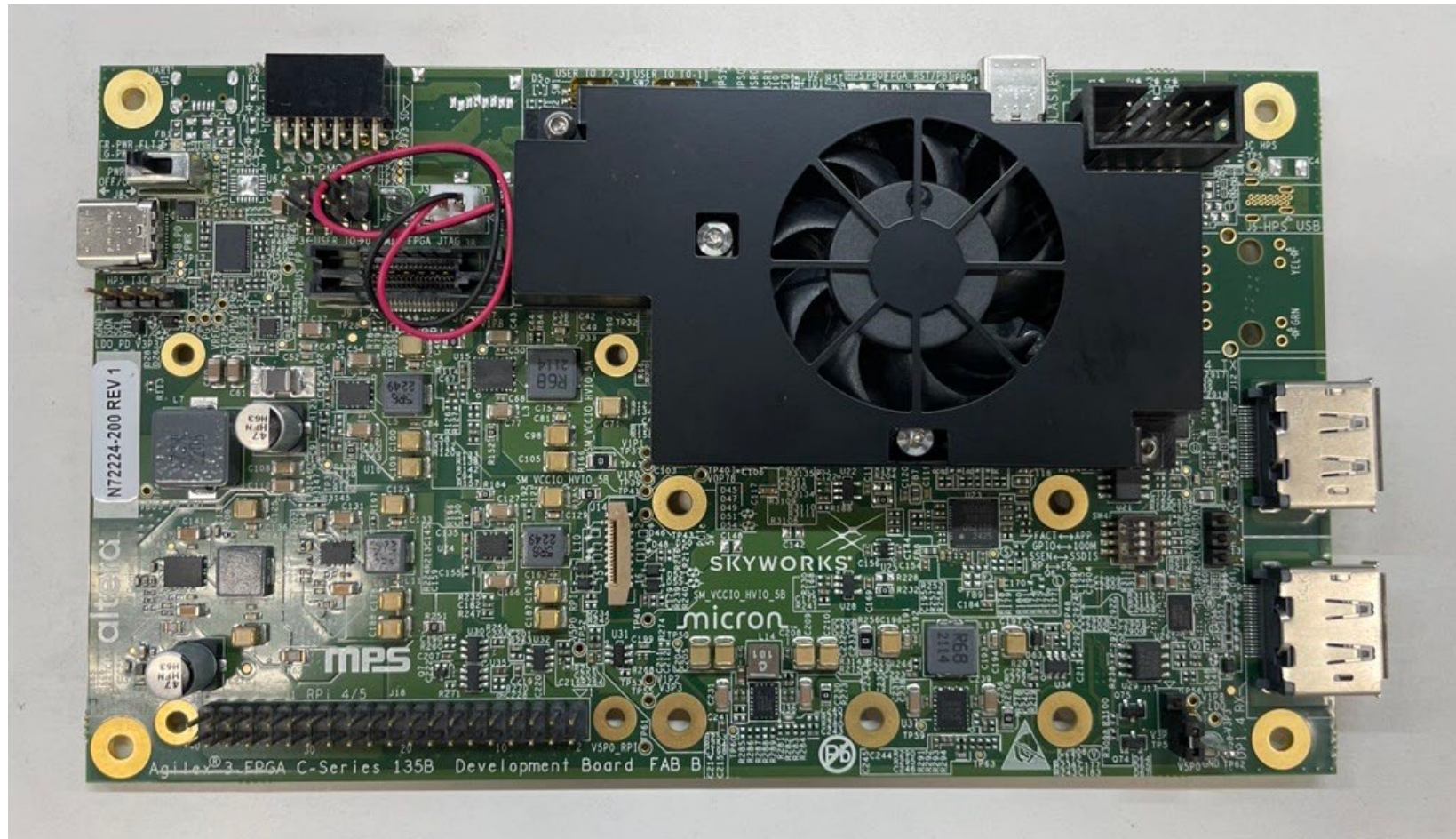
2/28/2025

By: Cindy Yu

Agilex 3 Block Diagram



Agilex 3 Board Front



Agilex 3 Board Back



Agilex 3 Test Specifications

Rail Name	Ref Des	MPS Part #	Design		Max Current	Max AC Ripple + DC Tolerance %	Step load	Slew Rate
			Vin	Vout				
V5P0	U37	MPQ4371-8000	20V	5V	6A	+/-3%	1.5A → 4.5A → 1.5A	10A/μs
V0P78	U36	MPQ2287-0016	5V	0.78V	12.41A	+/-3%	10.91A → 12.41A → 10.91A	50A/μs
V3P3	U27	MPQ4371-8000	20V	3.3V	3.75A	+/-3%	0.94A → 2.81A → 0.94A	10A/μs
V1P0	U24	MPQ4324-2001	20V	1.0V	0.6A	+/-2.5%	0.38A → 0.48A → 0.38A	0.3A/μs
V1P8	U16	MPQ4324-2001	20V	1.8V	0.86A	+/-2.5%	0.15A → 0.220A → 0.15A	7.14A/μs
V1P2	U26	MPQ4324-2001	20V	1.2V	0.67A	+/-3%	0.10A → 0.30A → 0.10A	5A/μs
V1P1	U15	MPQ4371-8000	20V	1.1V	4.78A	+/-3%	1.8A → 2.445A → 1.80A	10.8A/μs

Agilex 3 DC Voltage Accuracy

Rail Name	Ref Des	MPS Part #	Design		Max Current	Output Voltage (No Load)	Output Voltage (Half Load)	Output Voltage (Full Load)
			Vin	Vout				
V5P0	U37	MPQ4371-8000	20V	5V	6A	4.974V	4.796V	4.979V
V0P78	U36	MPQ2287-0016	5V	0.78V	12.41A	0.783V	0.783V	0.782V
V3P3	U27	MPQ4371-8000	20V	3.3V	3.75A	3.299V	3.299V	3.299V
V1P0	U24	MPQ4324-2001	20V	1.0V	0.6A	1.038V	1.039V	1.039V
V1P8	U16	MPQ4324-2001	20V	1.8V	0.86A	1.821V	1.822V	1.823V
V1P2	U26	MPQ4324-2001	20V	1.2V	0.67A	1.224V	1.224V	1.225V
V1P1	U15	MPQ4371-8000	20V	1.1V	4.78A	1.102V	1.101V	1.103V

U37 MPQ4371-8000 Steady State Ripple – 5V, 6A

No load

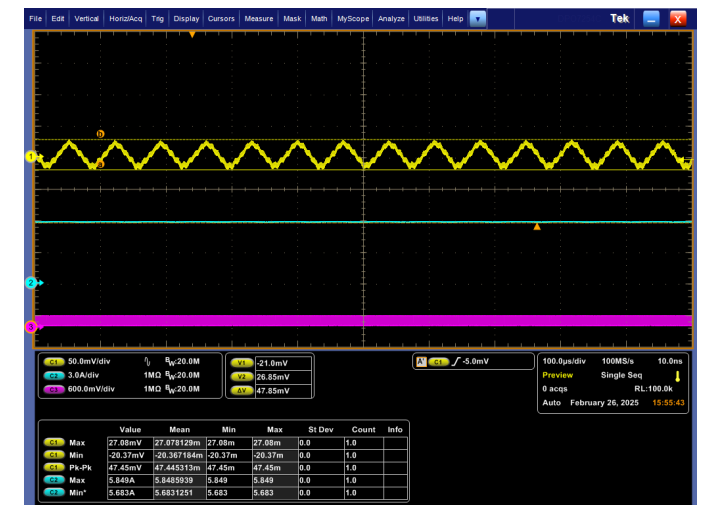
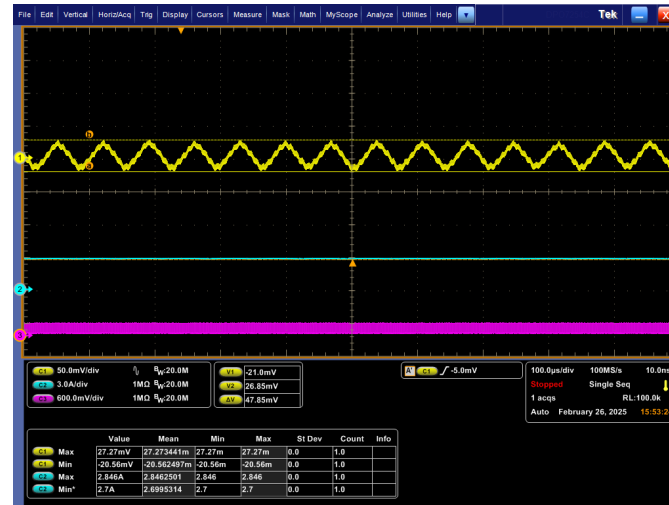
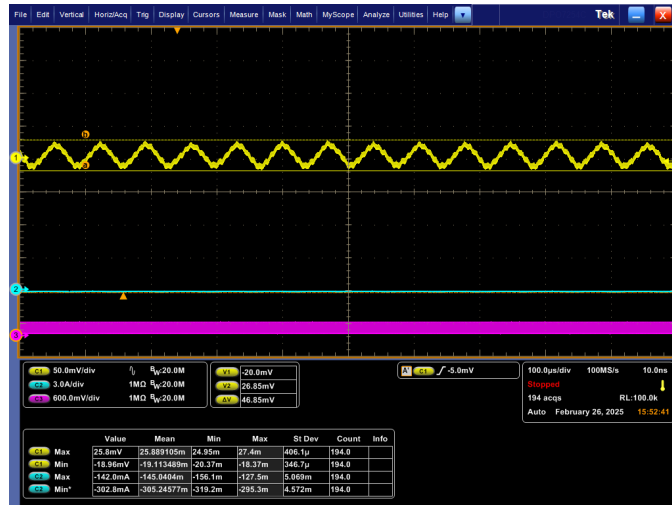
Half Load (3A)

Max Load (6A)

VOUT

IOUT

SW



- 46.85mV peak-peak ripple at No load
- 47.85mV peak-peak ripple at Half load
- 47.85mV peak-peak ripple at Max load

U36 MPQ2287-0016 Steady State Ripple – 0.78V, 12.41A

No load

Half Load (6.21A)

Max Load (12.41A)

VOUT

IOUT

SW



- 3.385mV peak-peak ripple at No load
- 4.485mV peak-peak ripple at Half load
- 4.785mV peak-peak ripple at Max load

U27 MPQ4371-8000 Steady State Ripple – 3.3V, 3.75A

No load

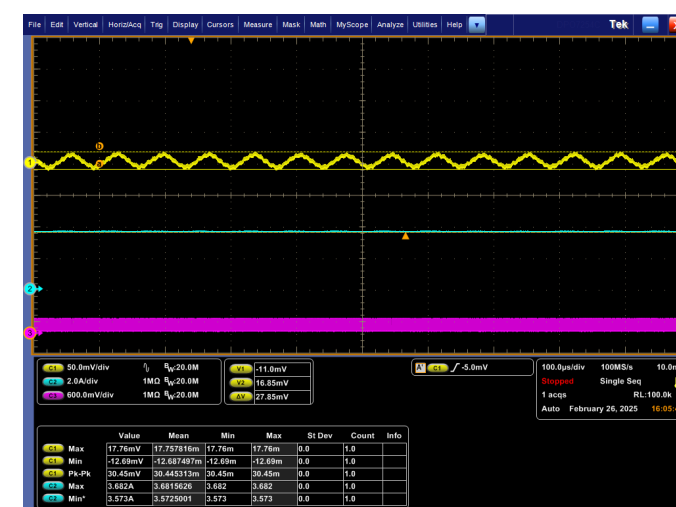
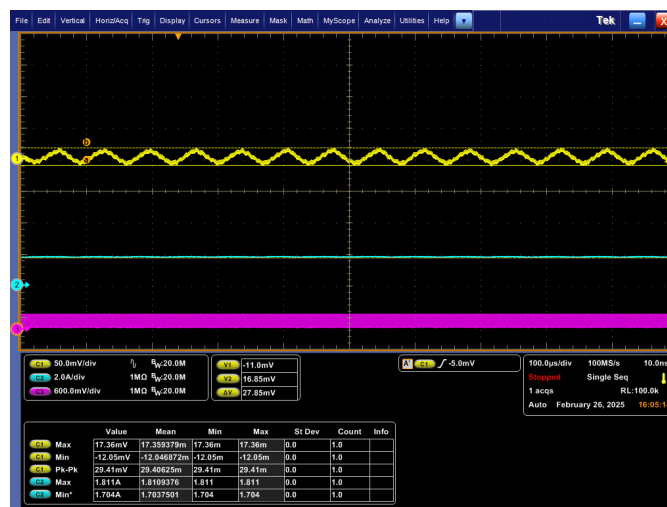
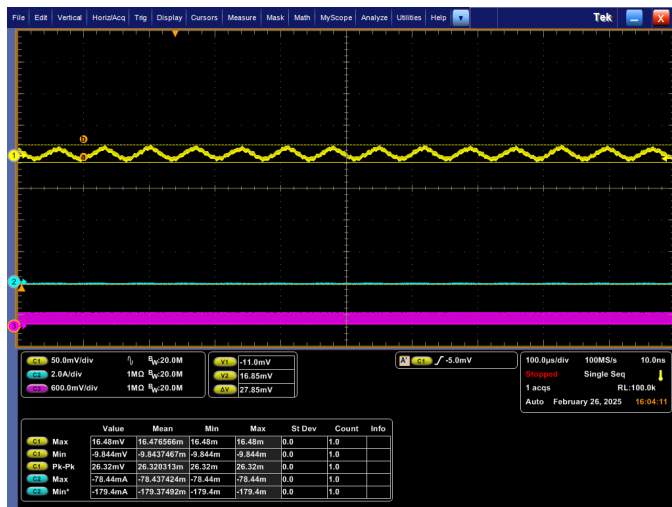
Half Load (1.88A)

Max Load (3.75A)

VOUT

IOUT

SW



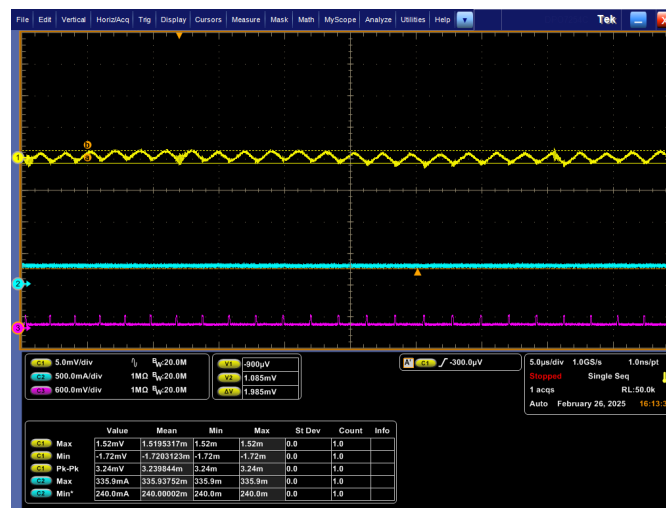
- 27.85mV peak-peak ripple at No load
- 27.85mV peak-peak ripple at Half load
- 27.85mV peak-peak ripple at Max load

U24 MPQ4324-2001 Steady State Ripple – 1.0V, 0.60A

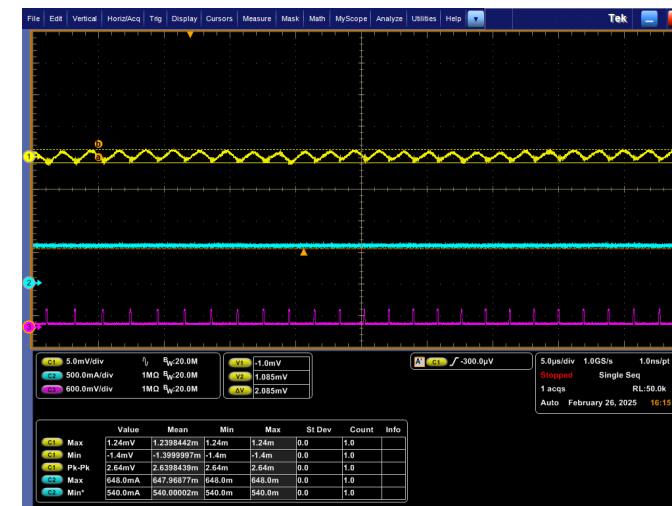
No load



Half Load (0.30A)



Max Load (0.60A)



- 1.985mV peak-peak ripple at No load
- 1.985mV peak-peak ripple at Half load
- 2.085mV peak-peak ripple at Max load

U16 MPQ4324-2001 Steady State Ripple – 1.8V, 0.86A

No load



Half Load (0.43A)



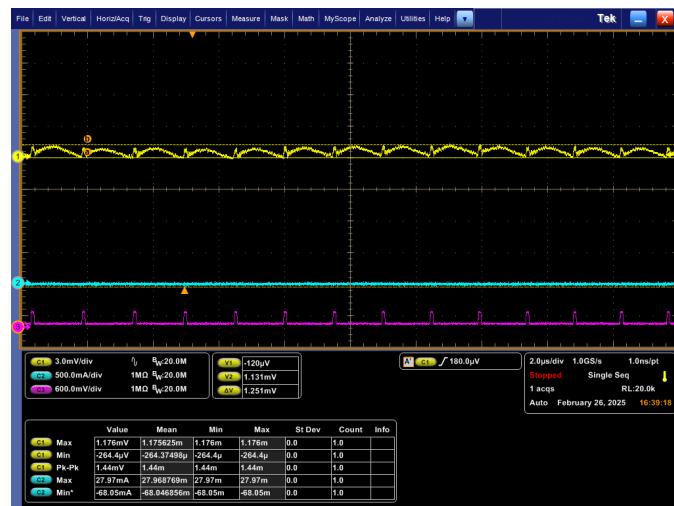
Max Load (0.86A)



- 1.251mV peak-peak ripple at No load
- 1.251mV peak-peak ripple at Half load
- 1.371mV peak-peak ripple at Max load

U26 MPQ4324-2001 Steady State Ripple – 1.2V, 0.67A

No load



Half Load (0.34A)



Max Load (0.67A)



- 1.251mV peak-peak ripple at No load
- 1.491mV peak-peak ripple at Half load
- 1.491mV peak-peak ripple at Max load

U15 MPQ4374-8000 Steady State Ripple – 1.1V, 4.78A

No load

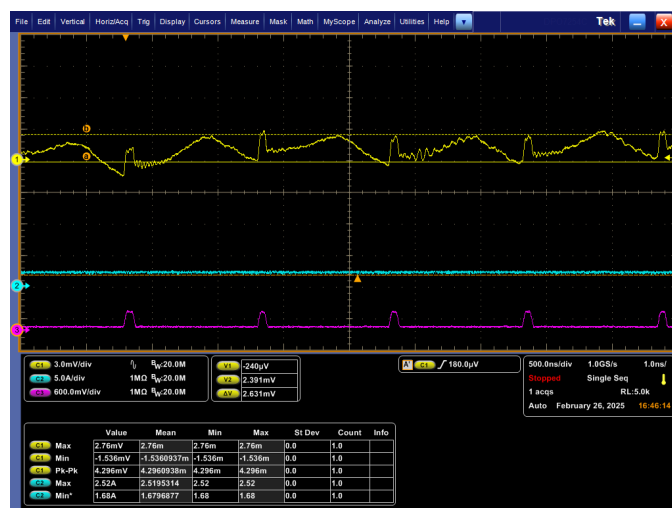
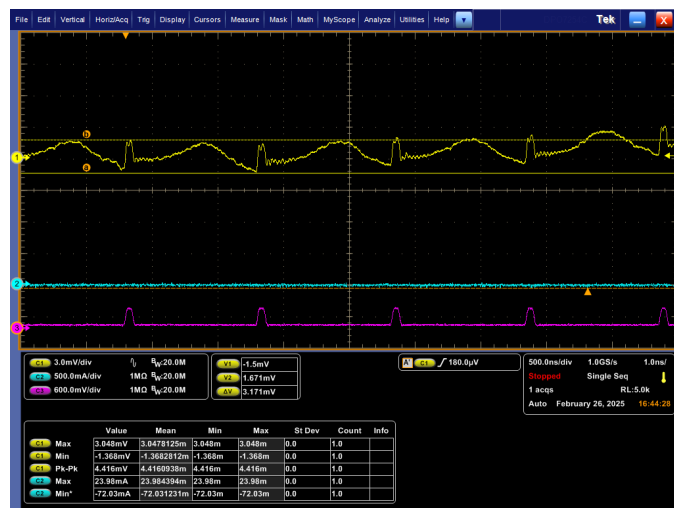
Half Load (2.39A)

Max Load (4.78A)

VOUT

IOUT

SW



- 3.171mV peak-peak ripple at No load
- 2.631mV peak-peak ripple at Half load
- 2.511mV peak-peak ripple at Max load

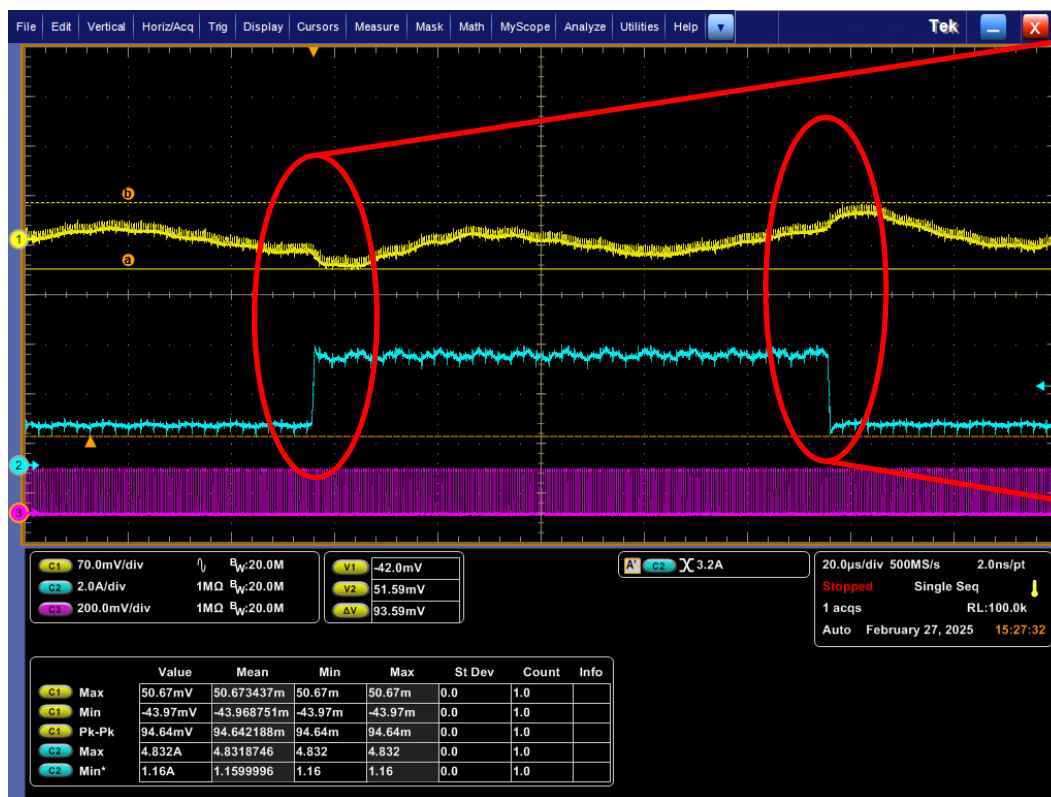
U37 MPQ4371-8000 Transient Test – 5V, 6A

Step Load 1.5A → 4.5A → 1.5A, 10A/us

VOUT

IOUT

SW



VOUT

IOUT

SW

Rising Edge

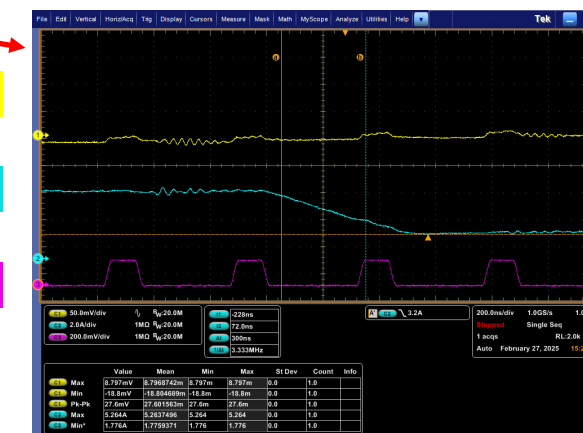


Falling Edge

VOUT

IOUT

SW



Vout ripple -0.84% (-42.0mV) to +1.03% (51.59mV) with load transient

U36 MPQ2287-0016 Transient Test – 0.78V, 12.41A

Step Load 10.91A → 12.41A → 10.91A, 50A/us

VOUT

IOUT

SW

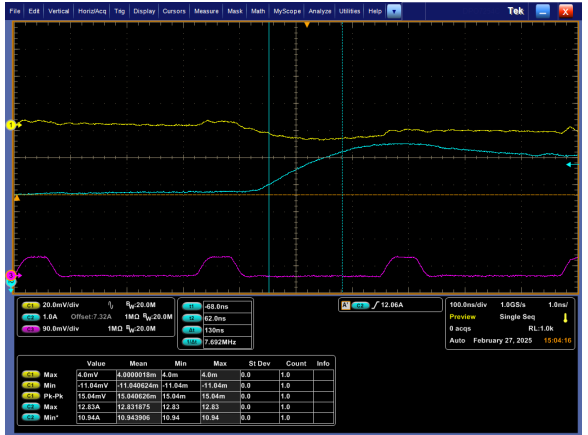


Rising Edge

VOUT

IOUT

SW

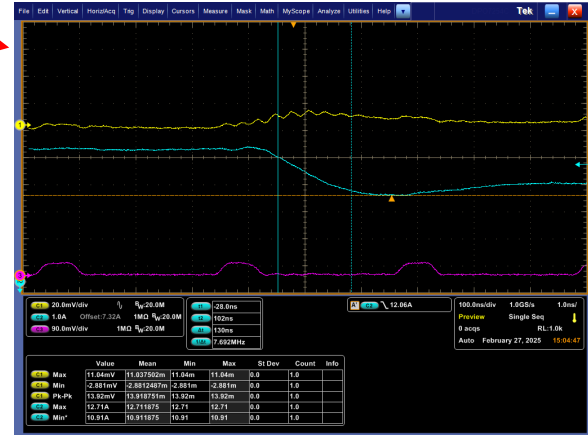


Falling Edge

VOUT

IOUT

SW



Vout ripple -1.38% (-10.8mV) to +1.22% (9.54mV) with load transient

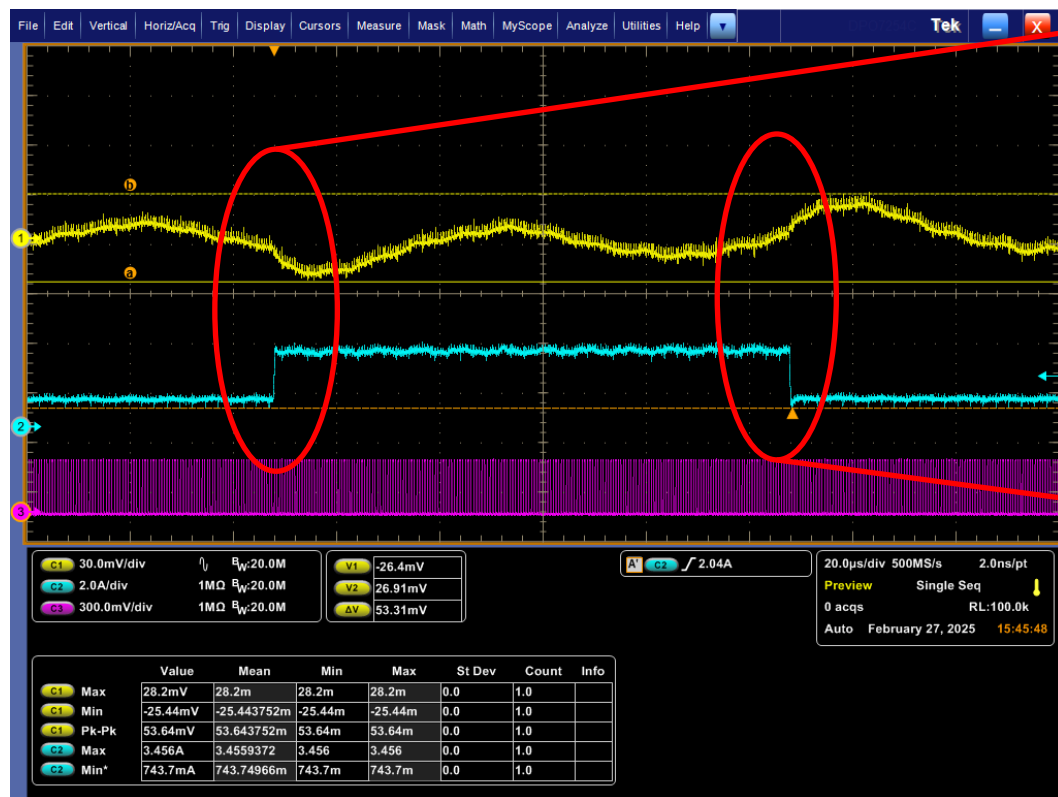
U27 MPQ4371-8000 Transient Test – 3.3V, 3.75A

Step Load $0.94\text{A} \rightarrow 2.81\text{A} \rightarrow 0.94\text{A}$, $10\text{A}/\mu\text{s}$

VOUT

IOUT

SW



Vout ripple -0.80% (-26.4mV) to $+0.82\%$ (26.91mV) with load transient

Rising Edge

VOUT

IOUT

SW

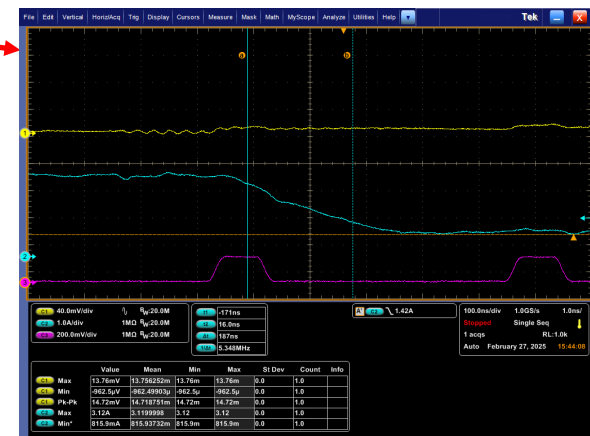


Falling Edge

VOUT

IOUT

SW



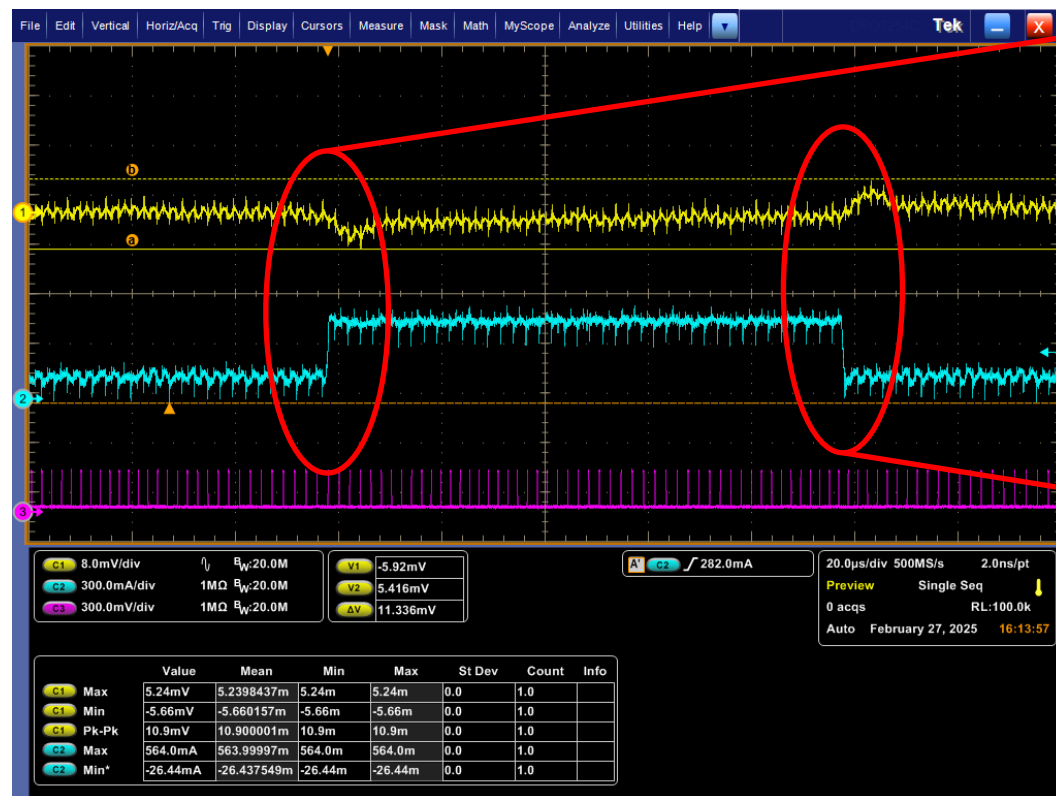
U24 MPQ4324-2001 Transient Test – 1.0V, 0.6A

Step Load $0.38\text{A} \rightarrow 0.48\text{A} \rightarrow 0.38\text{A}$, $0.3\text{A}/\mu\text{s}$

VOUT

IOUT

SW



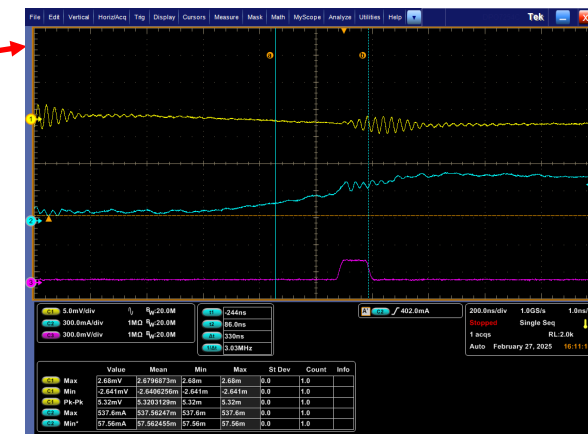
Vout ripple -0.59% (-5.92mV) to $+0.54\%$ (5.416mV) with load transient

Rising Edge

VOUT

IOUT

SW



Falling Edge

VOUT

IOUT

SW



U16 MPQ4324-2001 Transient Test – 1.8V, 0.86A

Step Load 0.15A → 0.22A → 0.15A, 7.14A/us

VOUT

IOUT

SW



Vout ripple -0.11% (-2.0mV) to +0.17% (3.19mV) with load transient

Rising Edge

VOUT

IOUT

SW



Falling Edge

VOUT

IOUT

SW



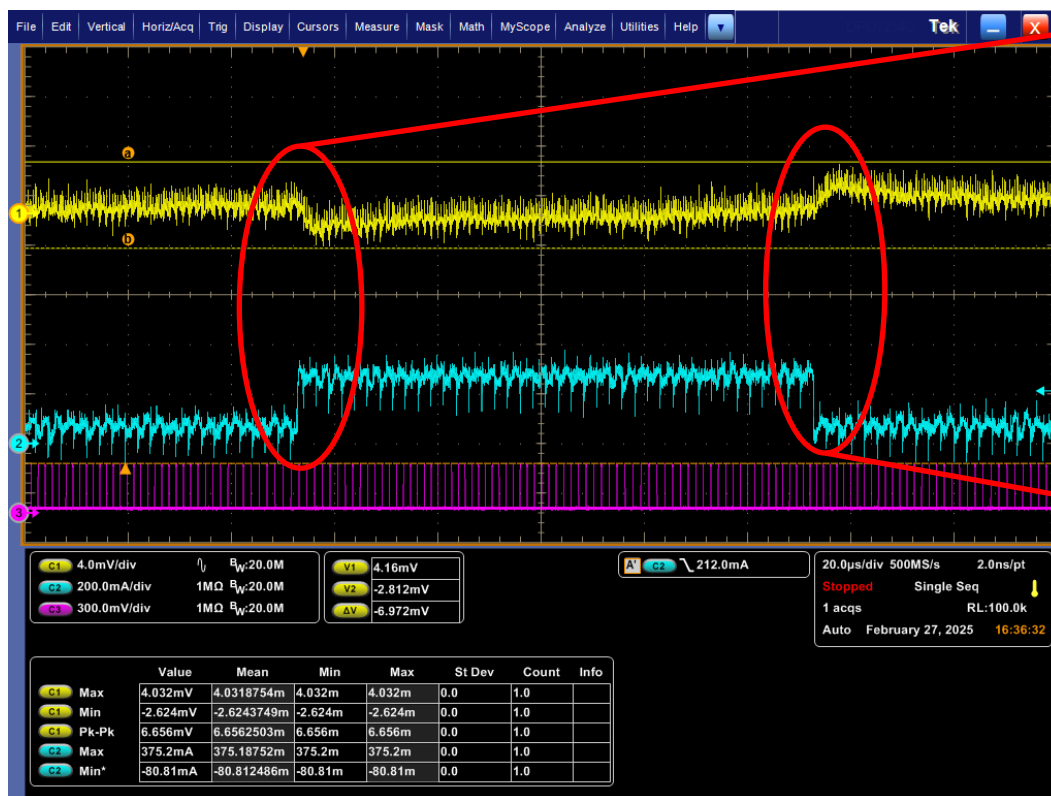
U26 MPQ4324-2001 Transient Test – 1.2V, 0.67A

Step Load 0.10A → 0.30A → 0.10A, 5A/us

VOUT

IOUT

SW



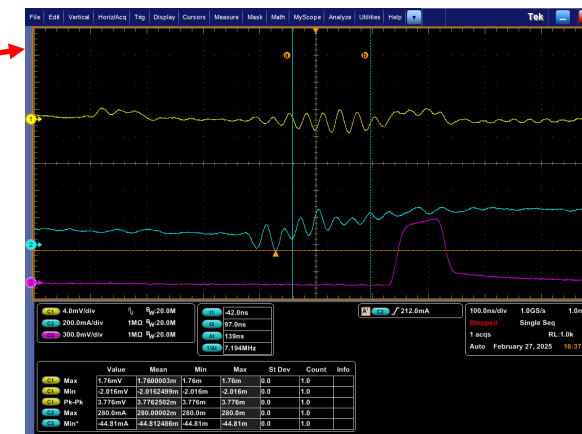
Vout ripple -0.23% (-2.81mV) to +0.35% (4.16mV) with load transient

Rising Edge

VOUT

IOUT

SW

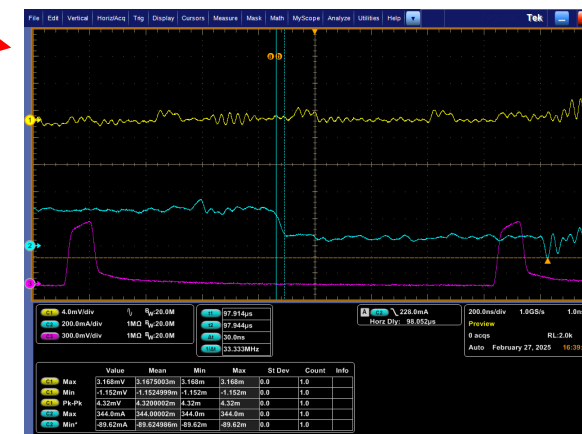


Falling Edge

VOUT

IOUT

SW



U15 MPQ4371-8000 Transient Test – 1.1V, 4.78A

Step Load 1.8A → 2.45A → 1.8A, 10.8A/us

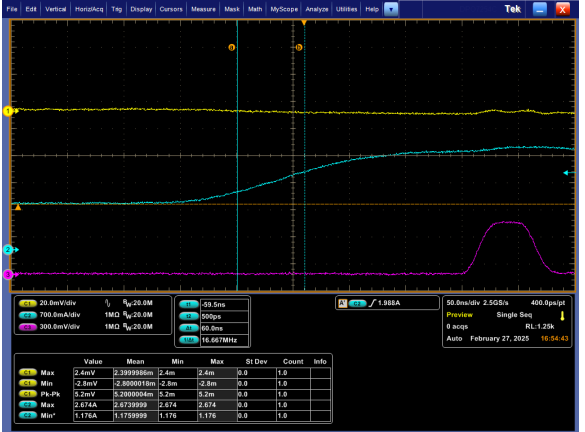
VOUT

IOUT

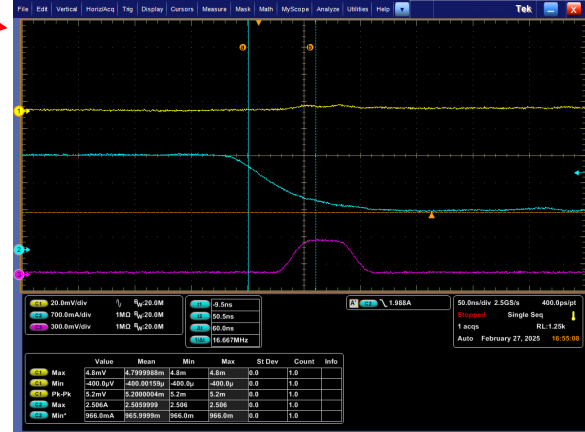
SW



Rising Edge



Falling Edge



Vout ripple -0.91% (-10.0mV) to +1.27% (13.94mV) 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