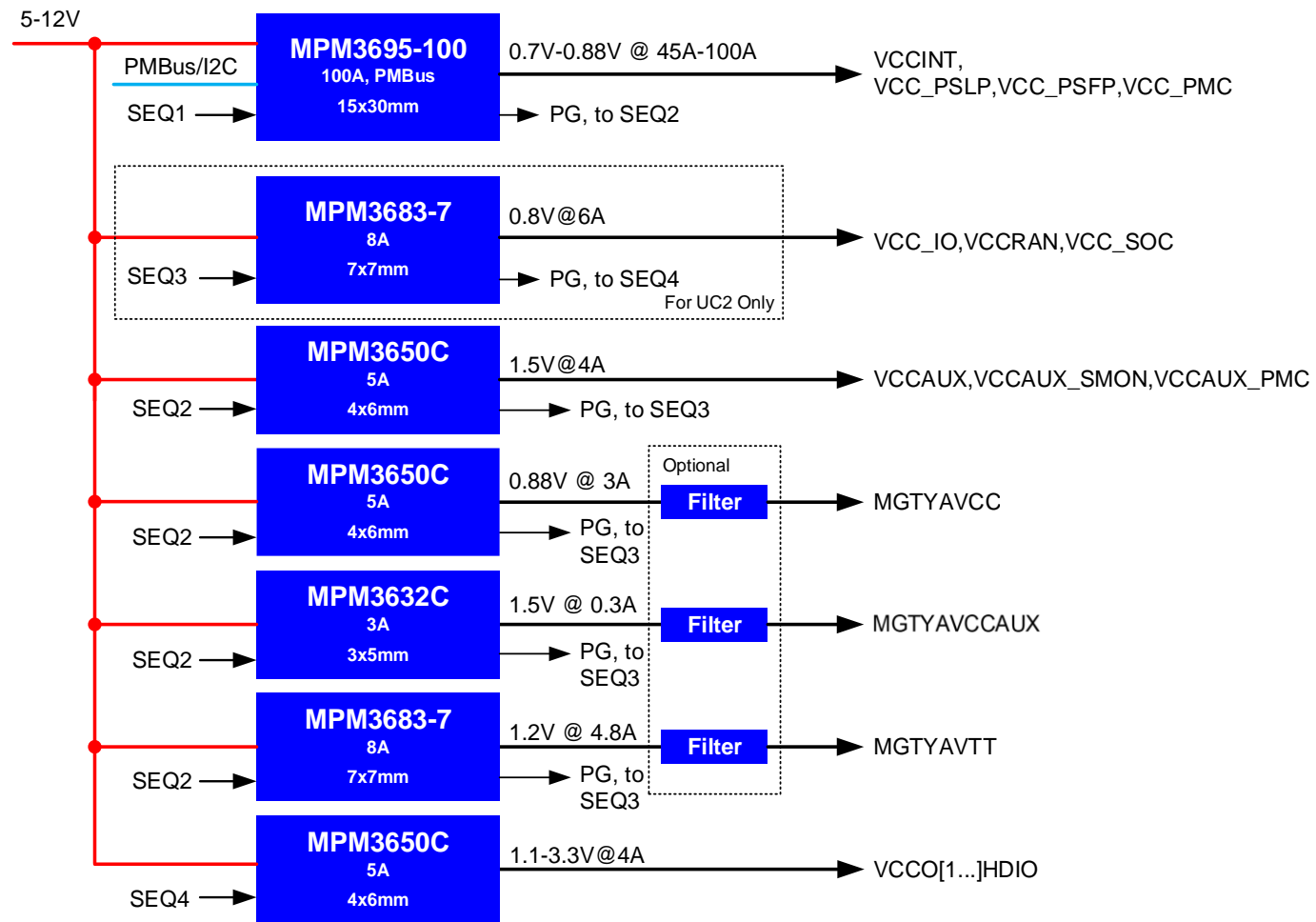


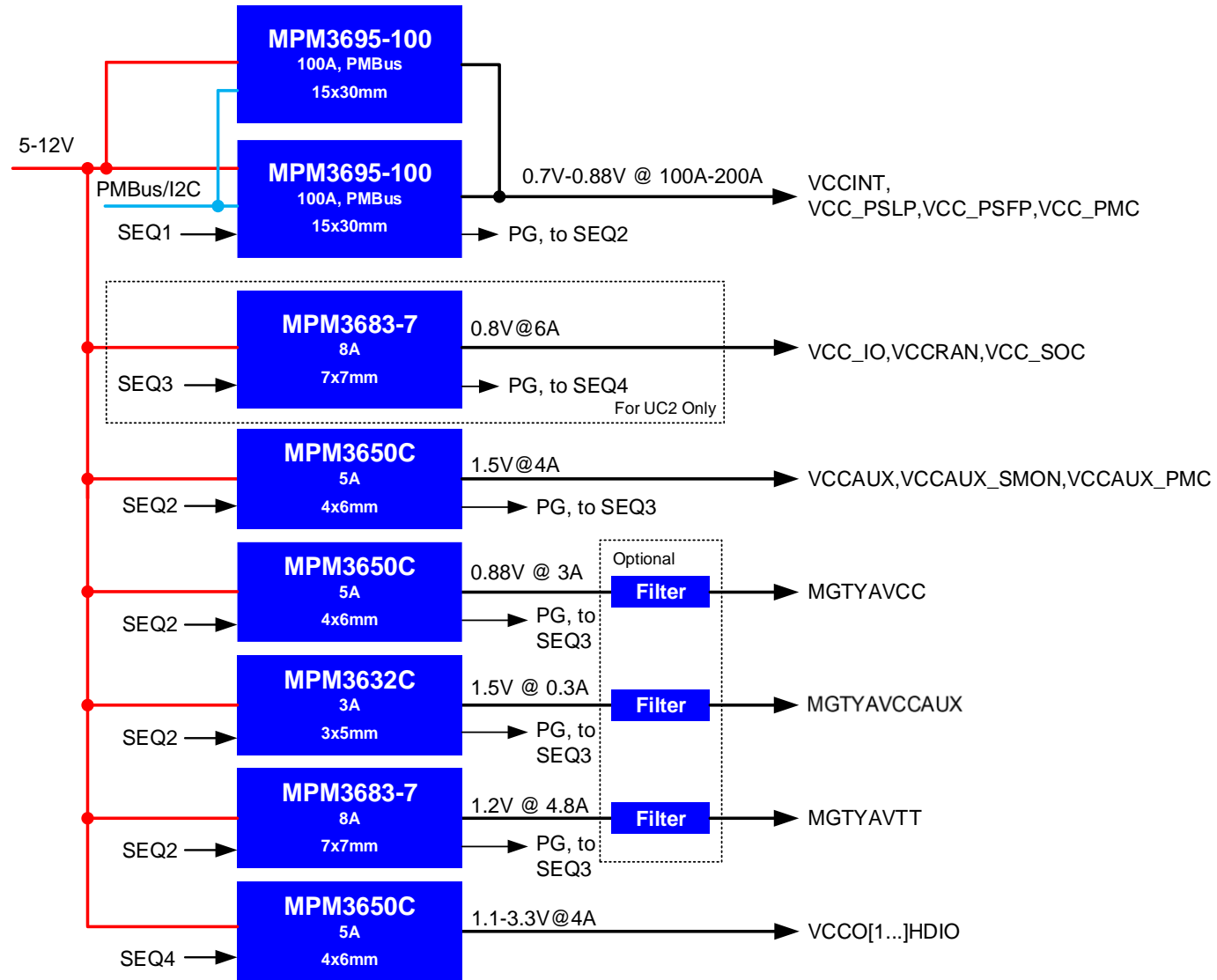
# Xilinx VERSAL EVB Test Report EVXLVA\_02A/B

Sept 2020

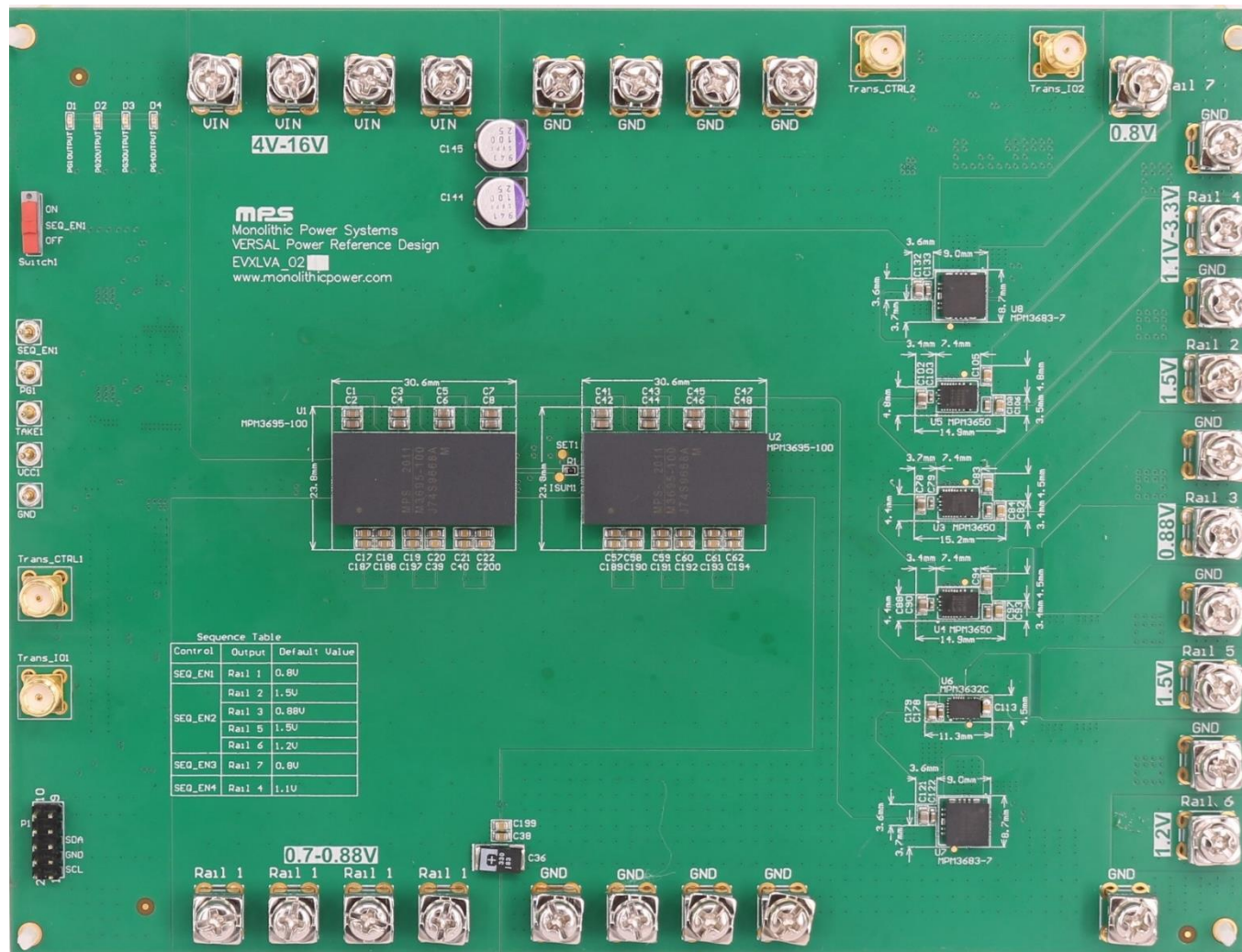
# EVXLVA\_02A Power Tree



# EVXLVA\_02B Power Tree



# EVXLVA\_02A/B Board



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# EVB Specification-- EVXLVA-02A

Rail	Power Rail	Vin (V)	Nominal Vout (V)	DC Accuracy* (%)	AC Ripple Noise*	Iout (A)	Step Load	MPS part#	Power sequence
Rail1	VCCINT, VCC_PSLP, VCC_PSFP, VCC_PMC	12	0.8	+/-1%	+/-25mV Static load, +/-3% total	100A	60% @200A/μS	MPM3695-100	1
Rail2	VCCAUX, VCCAUX_SMON, VCCAUX_PMC	12	1.5	+/-1%	+/-3% total	4A	90% @10A/μS	MPM3650C	2
Rail3	MGTYAVCC	12	0.88	+/-1%	10mVpp Static load, +/-3% Total	3A	25% @10A/μS	MPM3650C	2
Rail4	VCCO[1...]HDIO	12	1.1	+/-1%	+/-4% Total	4A	25% @10A/μS	MPM3650C	4
Rail5	MGTYAVCCAUX	12	1.5	+/-1%	10mVpp Static load, +/-3% Total	0.3A	25% @10A/μS	MPM3632C	2
Rail6	MGTYAVTT	12	1.2	+/-1%	10mVpp Static load, +/-3% Total	4.8A	25% @10A/μS	MPM3683-7	2
Rail7	VCC_IO, VCCRAM, VCC_SOC	12	0.8	+/-1%	+/-3% total	6A	40% @10A/μS	MPM3683-7	3

\* +/-% from nominal voltage

# EVB Specification-- EVXLVA-02B

Rail	Power Rail	Vin (V)	Nominal Vout (V)	DC Accuracy* (%)	AC Ripple Noise*	Iout (A)	Step Load	MPS part#	Power sequence
Rail1	VCCINT, VCC_PSLP, VCC_PSFP, VCC_PMC	12	0.8	+/-1%	+/-25mV Static load, +/-3% total	200A	60% @200A/μS	MPM3695-100	1
Rail2	VCCAUX, VCCAUX_SMON, VCCAUX_PMC	12	1.5	+/-1%	+/-3% total	4A	90% @10A/μS	MPM3650C	2
Rail3	MGTYAVCC	12	0.88	+/-1%	10mVpp Static load, +/-3% Total	3A	25% @10A/μS	MPM3650C	2
Rail4	VCCO[1...]HDIO	12	1.1	+/-1%	+/-3% Total	4A	25% @10A/μS	MPM3650C	4
Rail5	MGTYAVCCAUX	12	1.5	+/-1%	10mVpp Static load, +/-3% Total	0.3A	25% @10A/μS	MPM3632C	2
Rail6	MGTYAVTT	12	1.2	+/-1%	10mVpp Static load, +/-3% Total	4.8A	25% @10A/μS	MPM3683-7	2
Rail7	VCC_IO, VCCRAM, VCC_SOC	12	0.8	+/-1%	+/-3% total	6A	40% @10A/μS	MPM3683-7	3

\* +/-% from nominal voltage

# DC Voltage Accuracy-- EVXLVA-02A

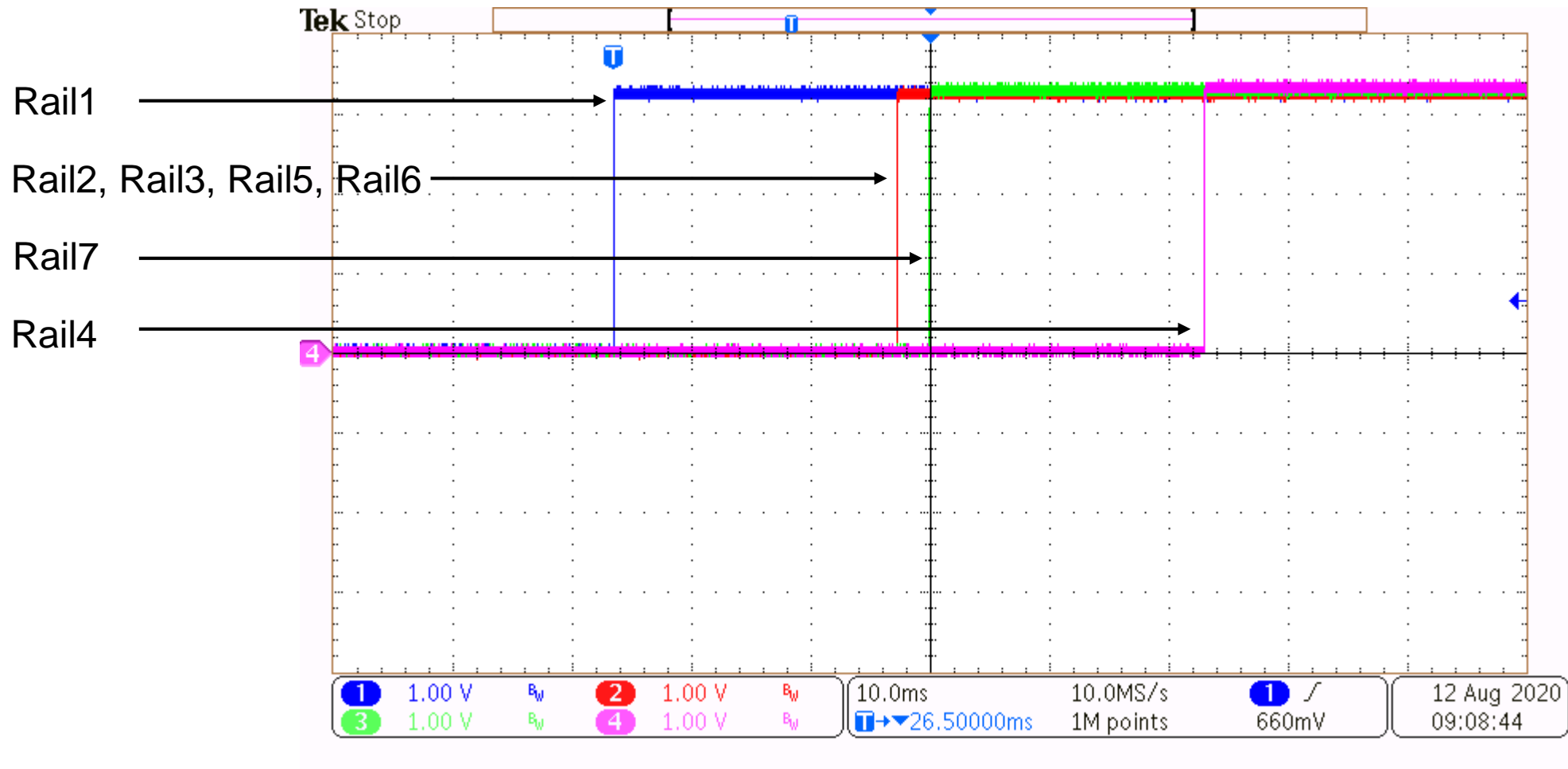
Rail	Power Rail	Target Voltage (V)	Actual Voltage (V)	DC Error(%)	MPS part#
Rail1	VCCINT, VCC_PSLP, VCC_PSFP, VCC_PMC	0.8	0.7989	-0.14	MPM3695-100
Rail2	VCCAUX, VCCAUX_SMON, VCCAUX_PMC	1.5	1.4992	-0.05	MPM3650C
Rail3	MGTYAVCCAUX	0.88	0.8776	-0.27	MPM3650C
Rail4	VCCO[1...]HDIO	1.1	1.0963	-0.34	MPM3650C
Rail5	MGTYAVCC	1.5	1.5088	0.59	MPM3632C
Rail6	MGTYAVTT	1.2	1.2005	0.04	MPM3683-7
Rail7	VCC_IO, VCCRAM, VCC_SOC	0.8	0.8028	0.35	MPM3683-7



# DC Voltage Accuracy-- EVXLVA-02B

Rail	Power Rail	Target Voltage (V)	Actual Voltage (V)	DC Error(%)	MPS part#
Rail1	VCCINT, VCC_PSLP, VCC_PSFP, VCC_PMC	0.8	0.7986	-0.175	MPM3695-100
Rail2	VCCAUX, VCCAUX_SMON, VCCAUX_PMC	1.5	1.4992	-0.05	MPM3650C
Rail3	MGTYAVCCAUX	0.88	0.8776	-0.27	MPM3650C
Rail4	VCCO[1...]HDIO	1.1	1.0963	-0.34	MPM3650C
Rail5	MGTYAVCC	1.5	1.5088	0.59	MPM3632C
Rail6	MGTYAVTT	1.2	1.2005	0.04	MPM3683-7
Rail7	VCC_IO, VCCRAM, VCC_SOC	0.8	0.8028	0.35	MPM3683-7

# Power ON Sequence

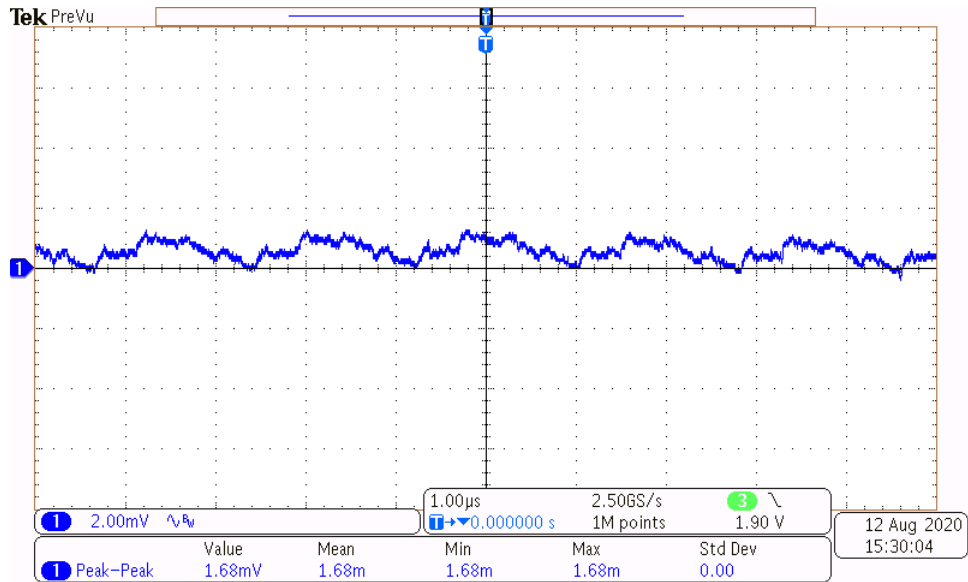


# Rail 1 – Steady State Ripple of EVXLVA\_02A

Test condition:  $V_{in}=12V$ ,  $V_o=0.8V$ ,  $F=600kHz$ ,  $C_{out}=47\mu F \cdot 28 \text{ MLCC} + 330\mu F \cdot 4 \text{ POSCAP}$

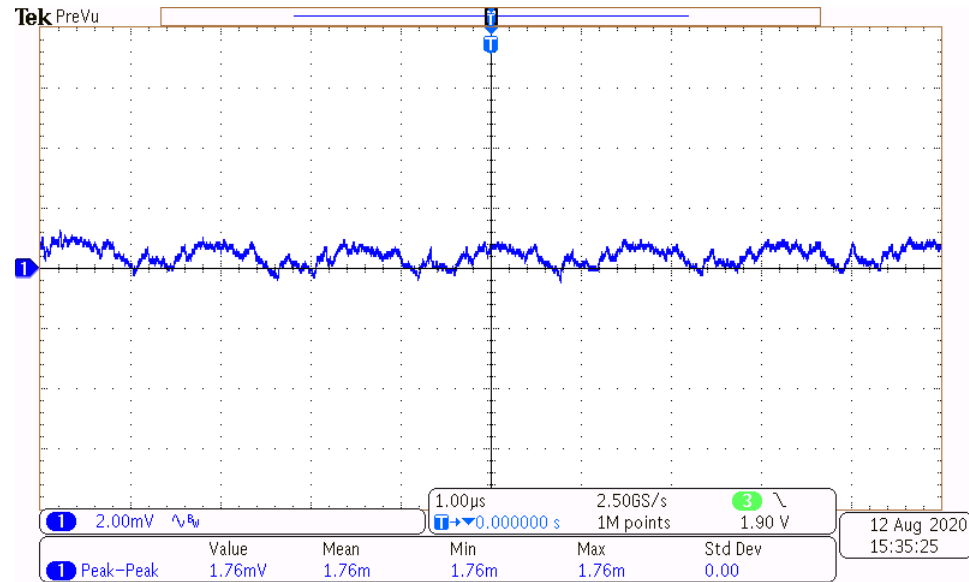
Load (A)	Ripple p-p(mV)
No Load (0A)	1.68
Max Load (100A)	1.76

IOUT=0A



VOUT/AC

IOUT=100A



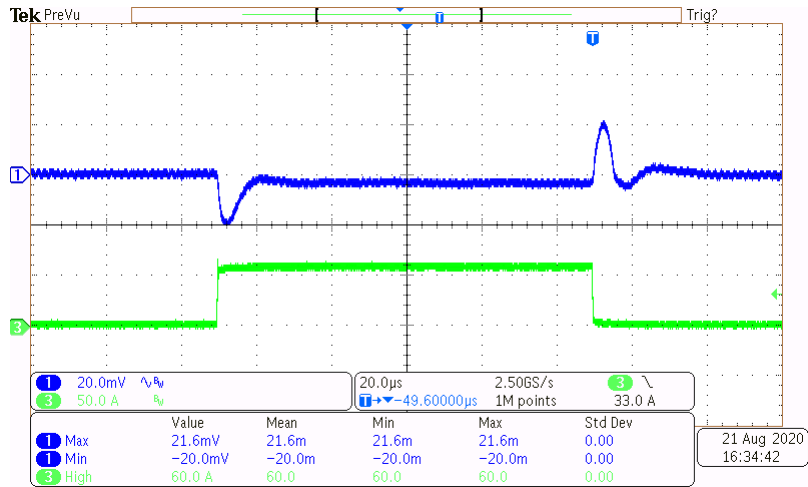
VOUT/AC

# Rail 1 – Transient Performance of EVXLVA\_02A

$V_{in}=12V$ ,  $V_o=0.8V$ ,  $F=600kHz$ ,  $C_{out}=47\mu F \cdot 42 \text{ MLCC} + 330\mu F \cdot 7 \text{ POSCAP}$ , 60% step load, 200A/ $\mu S$  Slew rate

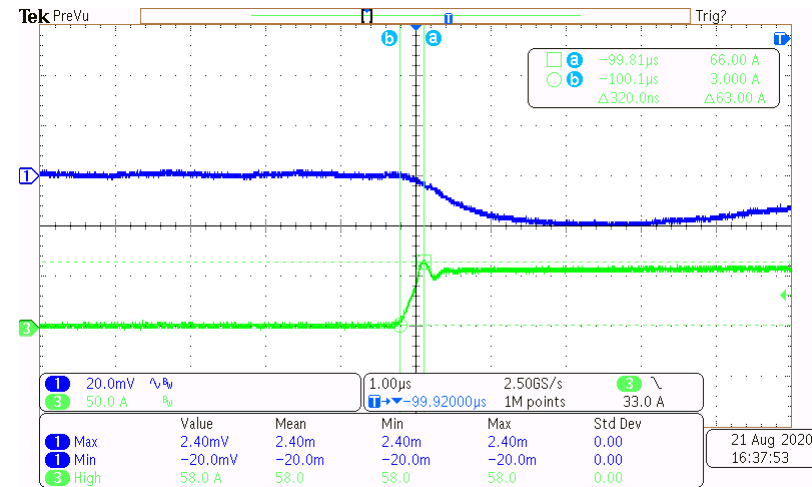
Parameter	Value(mV)	AC Accuracy(%)
Undershoot	-20	-2.5
Overshoot	21.6	2.7

IOUT=0-60A

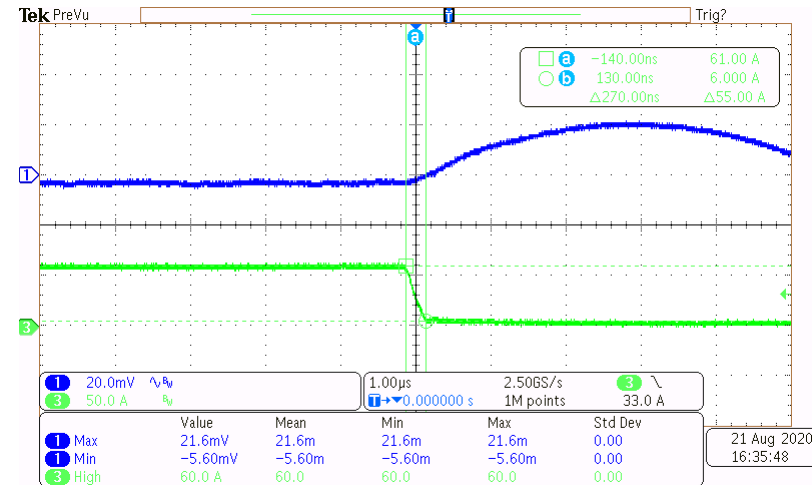


VOUT/AC ILOAD

## Rising Edge



## Falling Edge

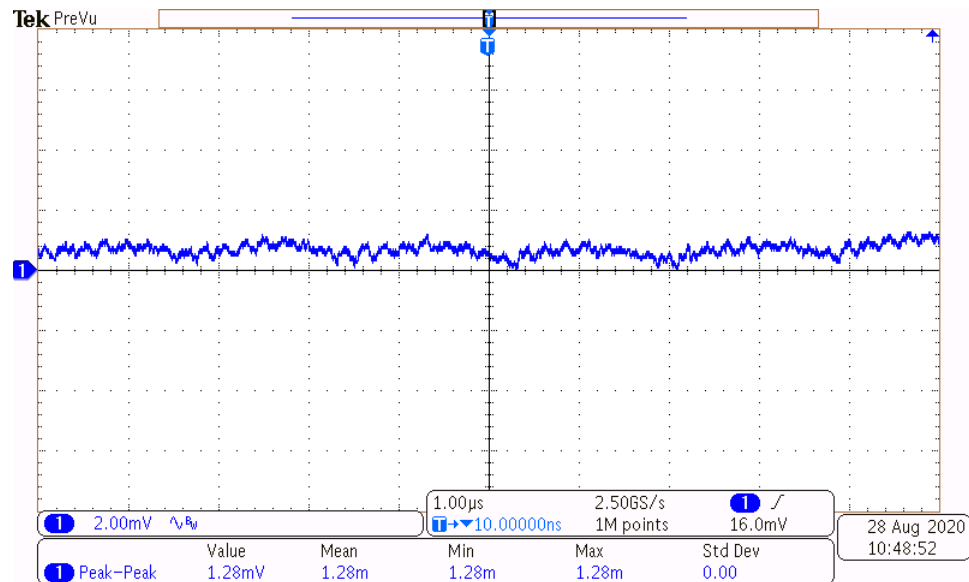


# Rail 1 – Steady State Ripple of EVXLVA\_02B

Test condition:  $V_{in}=12V$ ,  $V_o=0.8V$ ,  $F=600kHz$ ,  $C_{out}=47\mu F * 52 \text{ MLCC} + 330\mu F * 8 \text{ POSCAP}$

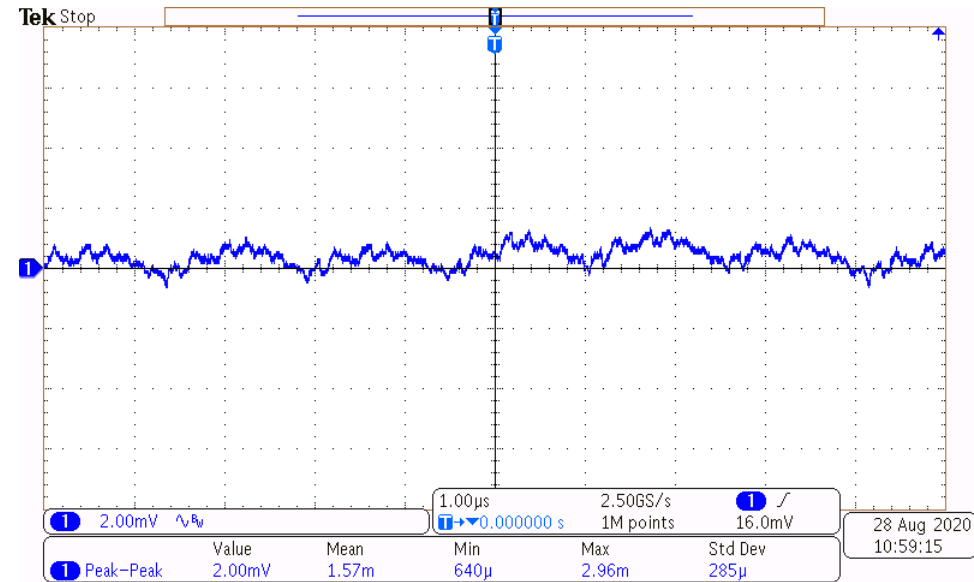
Load (A)	Ripple p-p(mV)
No Load (0A)	1.28
Max Load (100A)	2

IO<sub>UT</sub>=0A



VOUT/AC

IO<sub>UT</sub>=200A



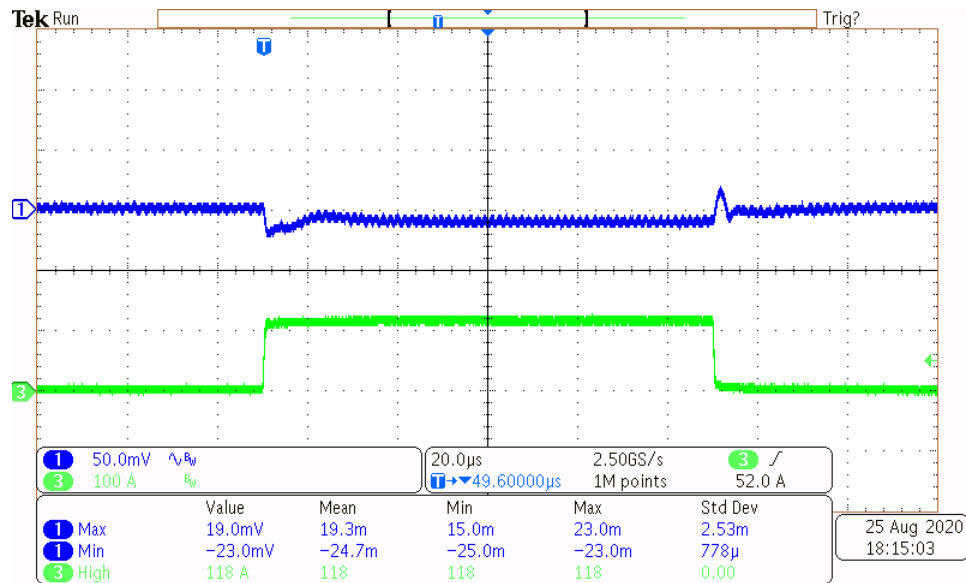
VOUT/AC

# Rail 1 – Transient performance of EVXLVA\_02B

$V_{in}=12V$ ,  $V_o=0.8V$ ,  $F=600kHz$ ,  $C_{out}=47\mu F \cdot 91 \text{ MLCC} + 330\mu F \cdot 12 \text{ POSCAP}$ , 60% Step load, 200A/ $\mu$ S Slew rate

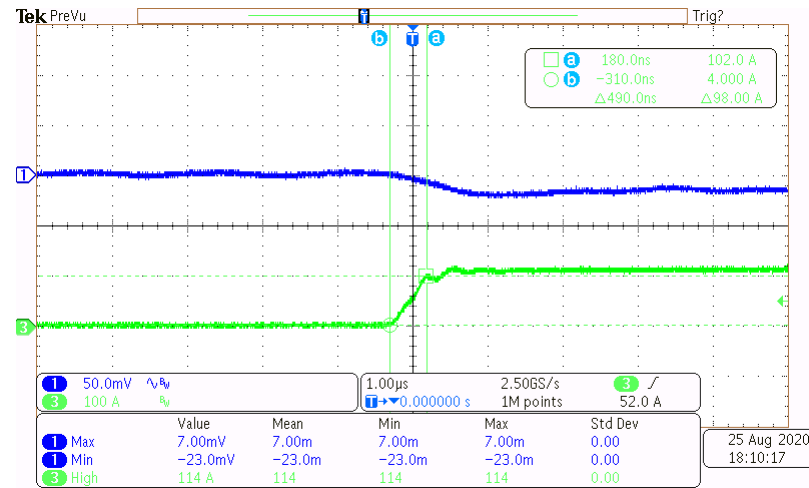
Parameter	Value(mV)	AC Accuracy(%)
Undershoot	-23	-2.6
Overshoot	21	2.2

IOUT=0-120A

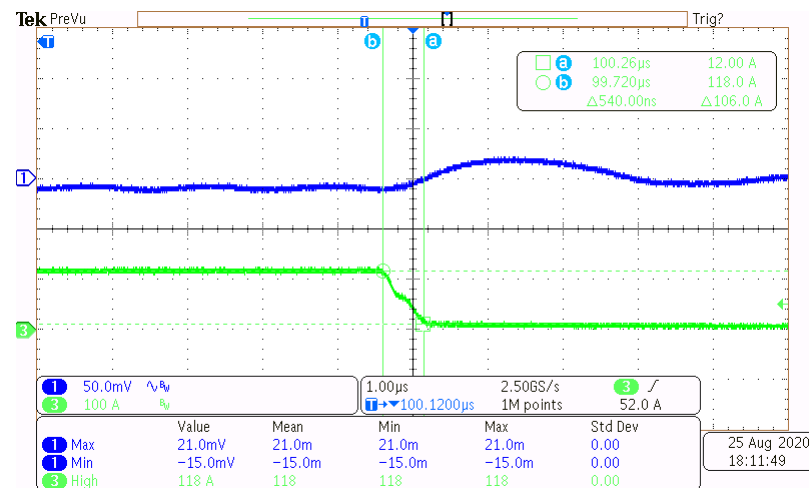


VOUT/AC ILOAD

## Rising Edge



## Falling Edge

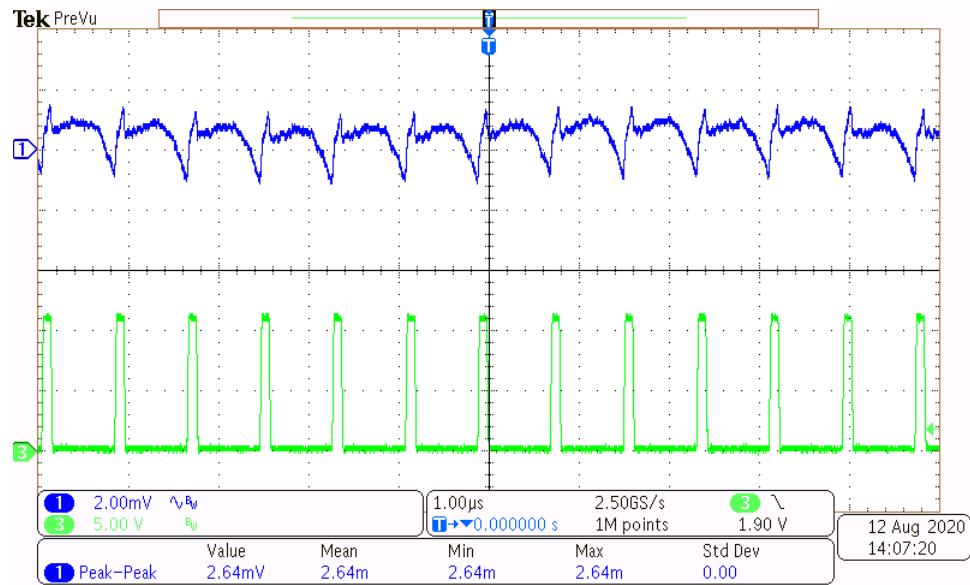


# Rail 2: MPM3650C – Steady State Ripple

Test condition:  $V_{in}=12V$ ,  $V_o=1.5V$ ,  $F=1200kHz$ ,  $C_{out}=0.1\mu F+47\mu F*4$  MLCC

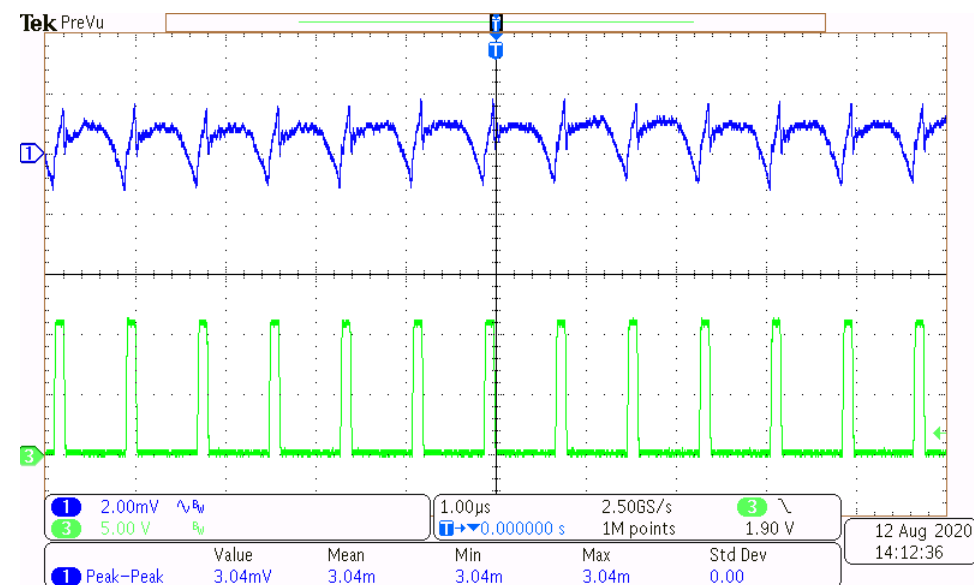
Load (A)	Ripple p-p(mV)
No Load (0A)	2.64
Full Load (4A)	3.04

IOUT=0A



VOUT/AC VSW

IOUT=4A



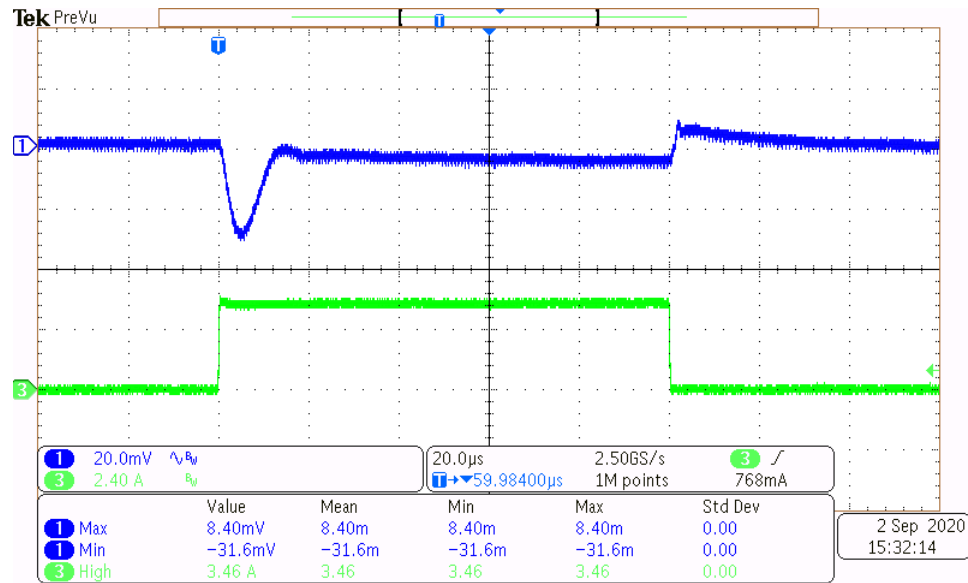
VOUT/AC VSW

# Rail 2: MPM3650C – Transient Performance

Test condition:  $V_{in}=12V$ ,  $V_o=1.5V$ ,  $F=1200kHz$ ,  $C_{out}=0.1\mu F+47\mu F*7$  MLCC, 90% Step load, 10A/ $\mu S$  Slew rate

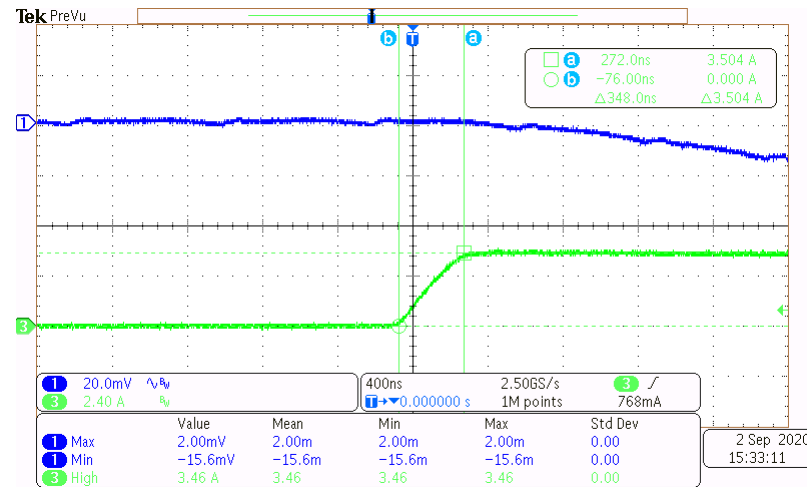
Parameter	Value(mV)	AC Accuracy(%)
Undershoot	-31	-2.06
Overshoot	8.4	0.56

IOUT=0-3.6A

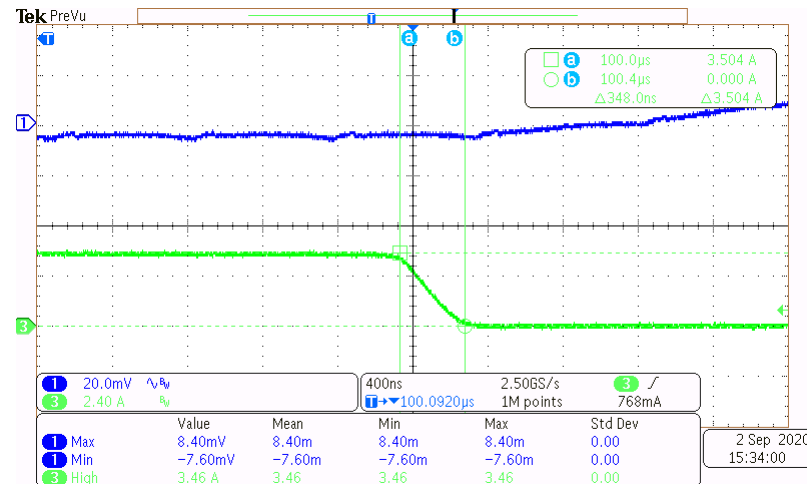


VOUT/AC ILOAD

## Rising Edge



## Falling Edge



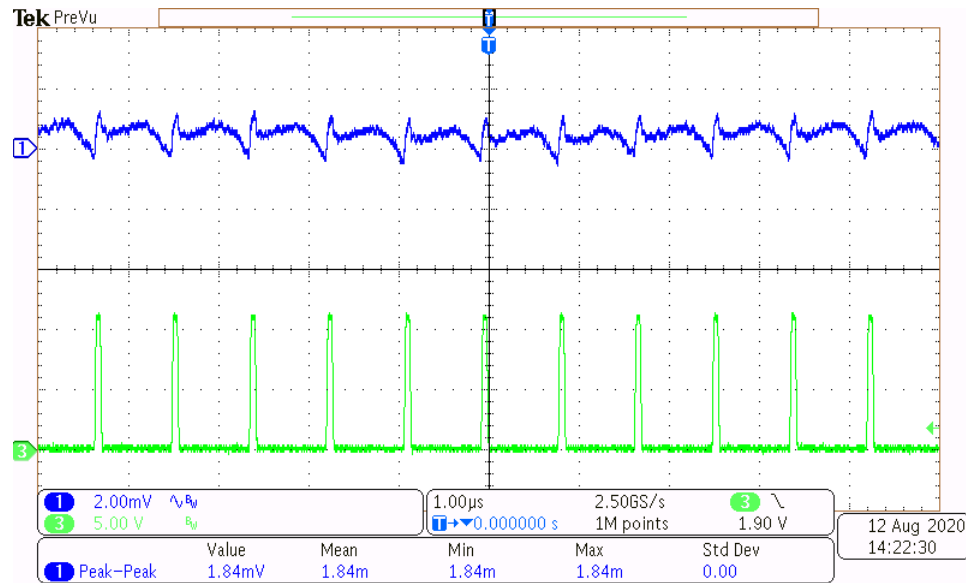


# Rail 3: MPM3650C – Steady State Ripple

Test condition:  $V_{in}=12V$ ,  $V_o=0.88V$ ,  $F=1200kHz$ ,  $C_{out}=0.1\mu F+47\mu F*4$  MLCC

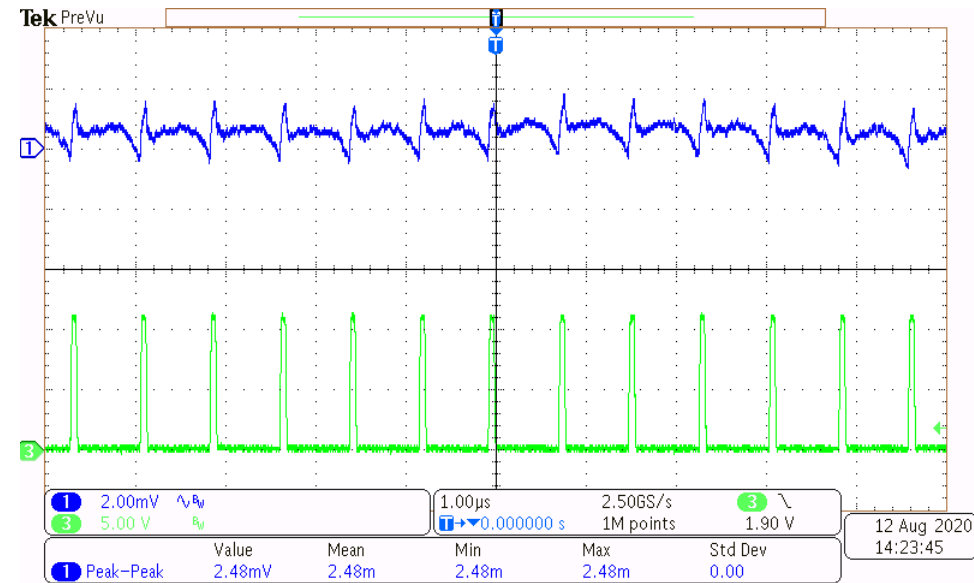
Load (A)	Ripple p-p(mV)
No Load (0A)	1.84
Full Load (3A)	2.48

IOUT=0A



VOUT/AC VSW

IOUT=3A



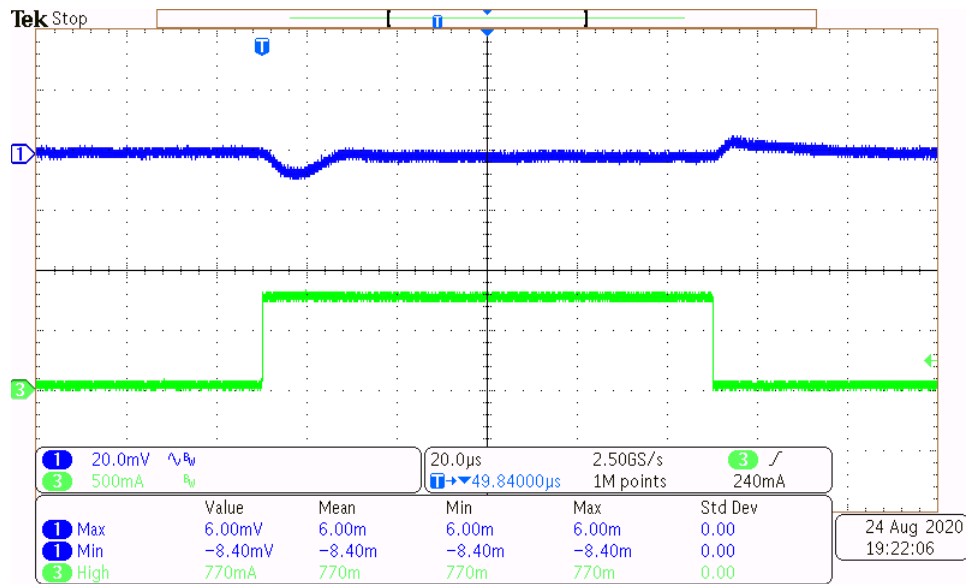
VOUT/AC VSW

# Rail 3: MPM3650C– Transient Performance

Test condition:  $V_{in}=12V$ ,  $V_o=0.88V$ ,  $F=1200kHz$ ,  $C_{out}=0.1\mu F+47\mu F*4$  MLCC, 25% Step load,  $10A/\mu S$  Slew rate

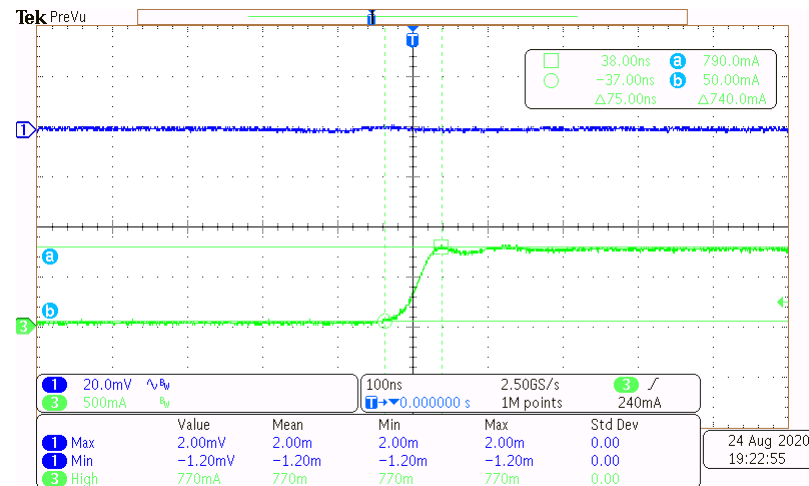
Parameter	Value(mV)	AC Accuracy(%)
Undershoot	-8.4	-0.95
Overshoot	6	0.68

IOUT = 0A-0.75A

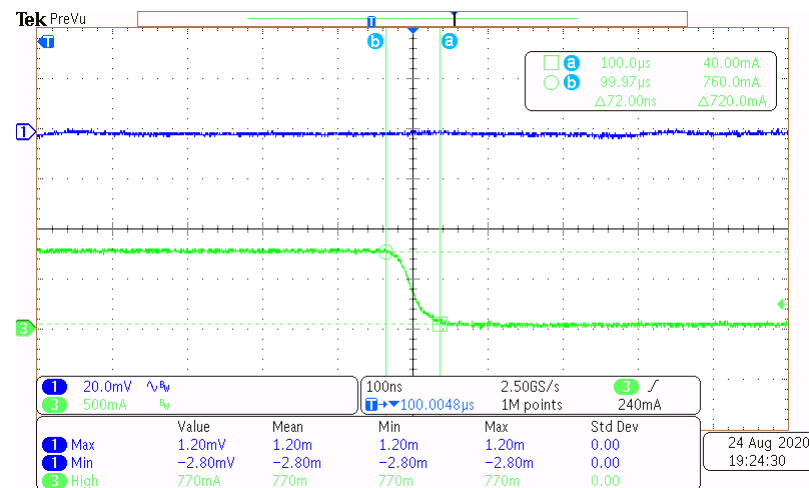


VOUT/AC VSW

## Rising Edge



## Falling Edge

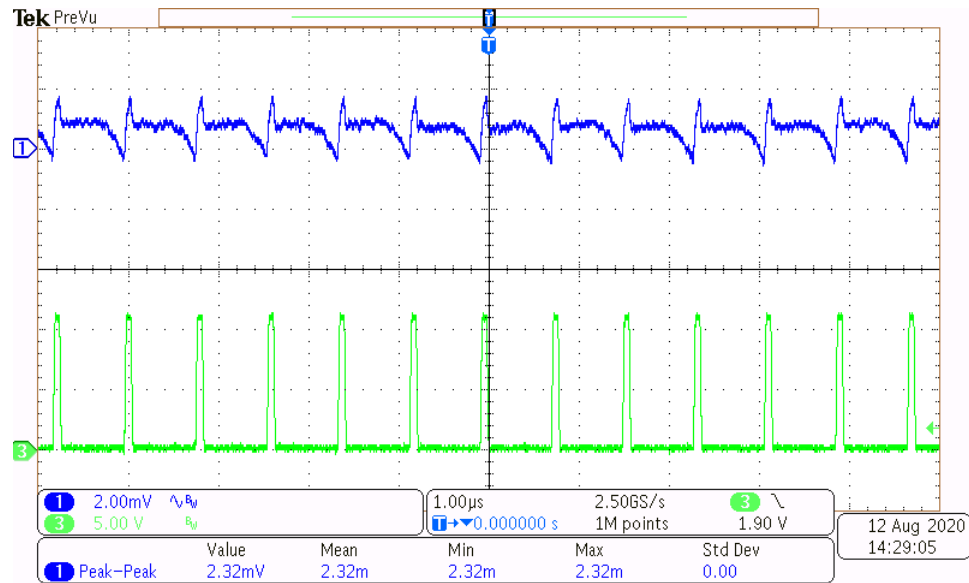


# Rail 4: MPM3650C – Steady State Ripple

Test condition:  $V_{in}=12V$ ,  $V_o=1.1V$ ,  $F=1200kHz$ ,  $C_{out}=0.1\mu F+47\mu F*4$  MLCC

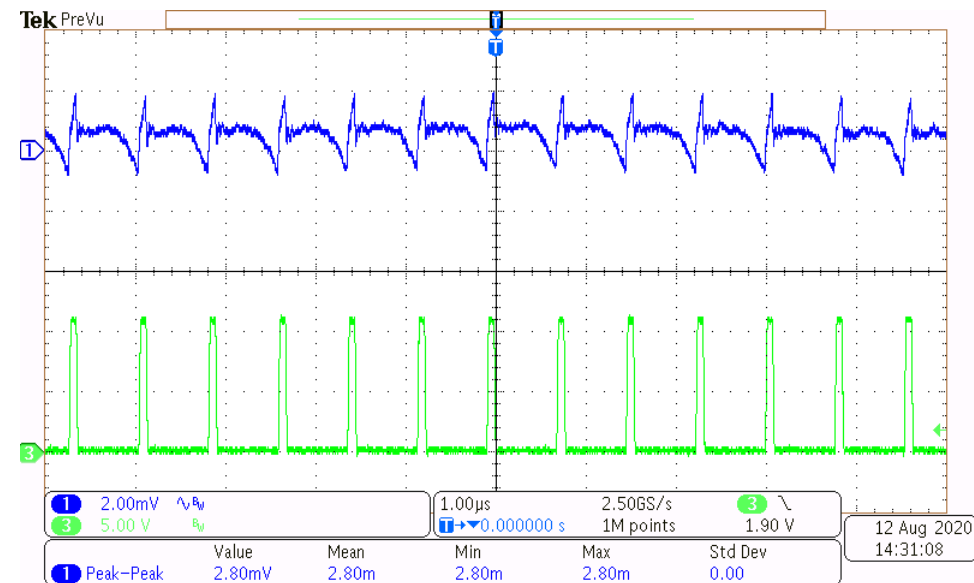
Load (A)	Ripple p-p(mV)
No Load (0A)	2.32
Full Load (4A)	2.8

IOUT=0A



VOUT/AC VSW

IOUT=4A

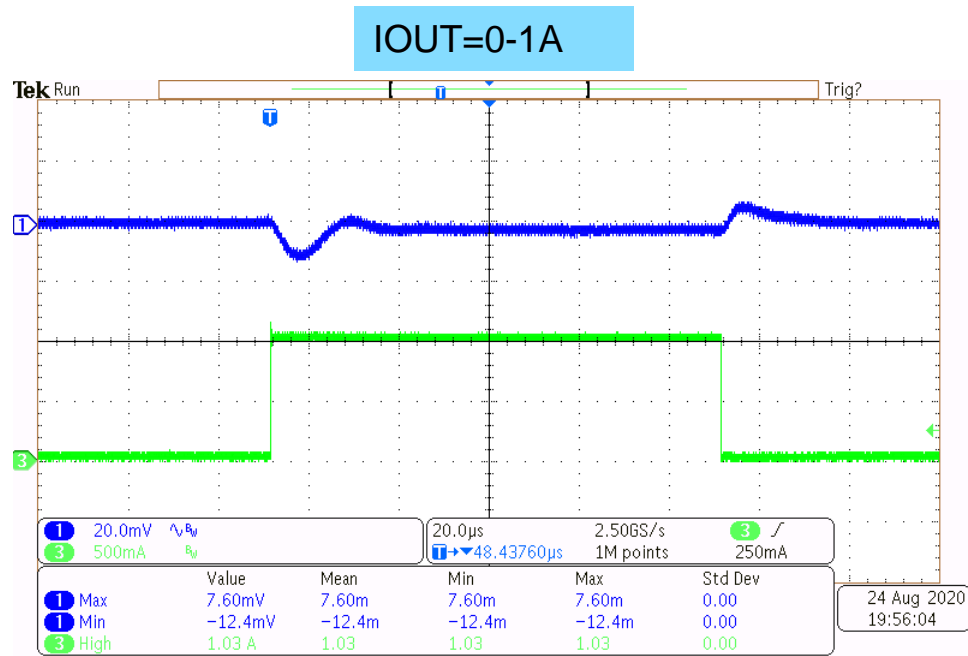


VOUT/AC VSW

# Rail 4: MPM3650C – Transient performance

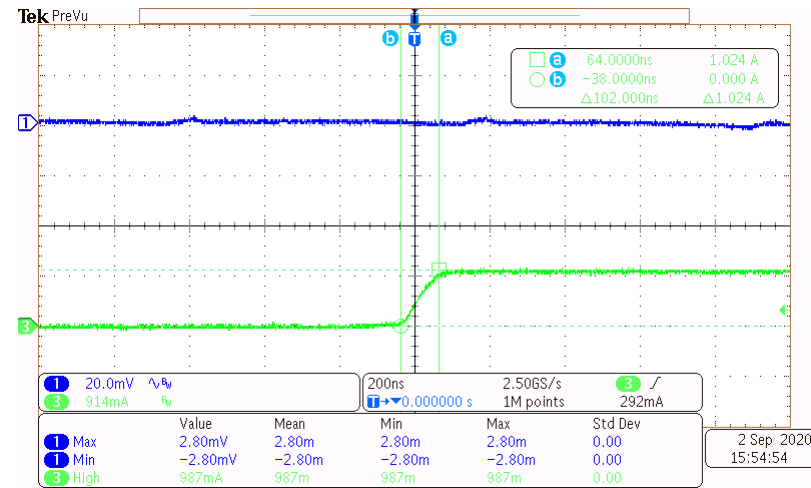
Test condition:  $V_{in}=12V$ ,  $V_o=1.1V$ ,  $F=1200kHz$ ,  $C_{out}=0.1\mu F+47\mu F*7$  MLCC, 25% Step load,  $10A/\mu S$  Slew rate

Parameter	Value(mV)	AC Accuracy(%)
Undershoot	-12.4	-1.4
Overshoot	7.6	0.86

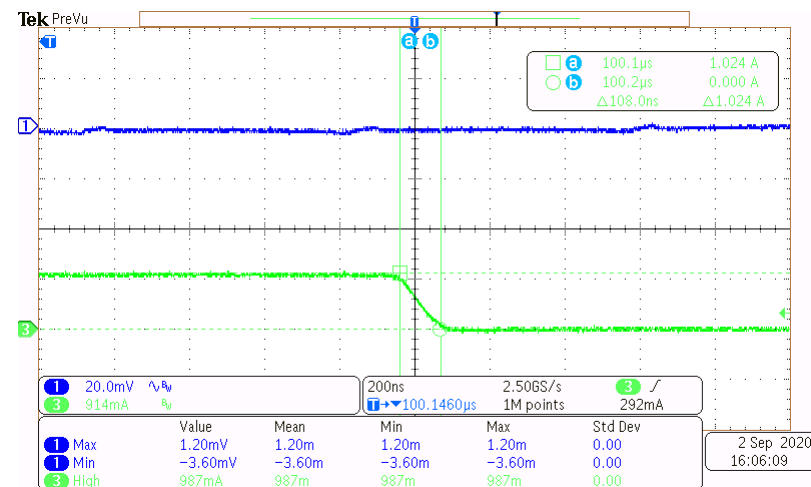


**VOUT/AC** **ILOAD**

## Rising Edge



## Falling Edge

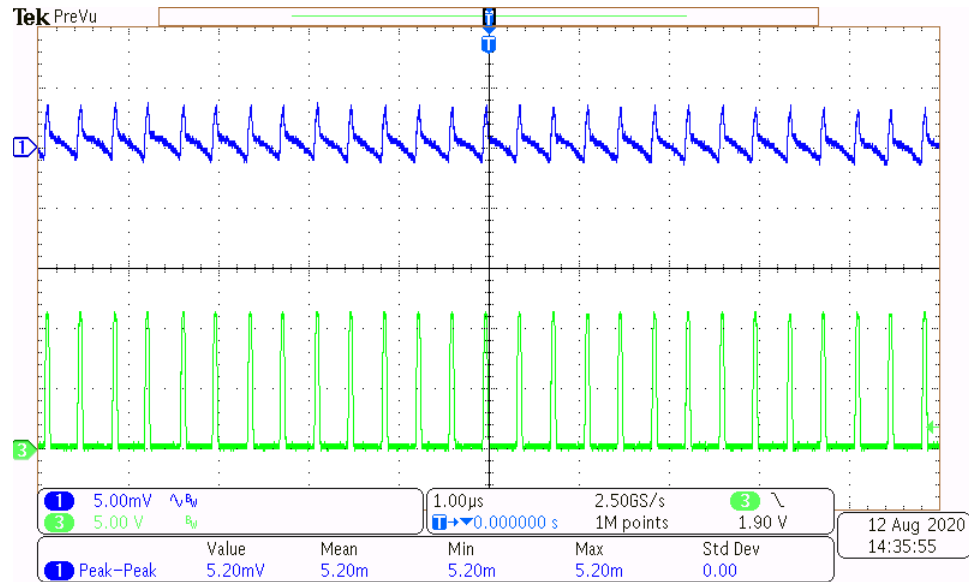


# Rail 5: MPM3632C – Steady State Ripple

Test condition:  $V_{in}=12V$ ,  $V_o=1.5V$ ,  $F=3000kHz$ ,  $C_{out}=47\mu F \times 2$  MLCC

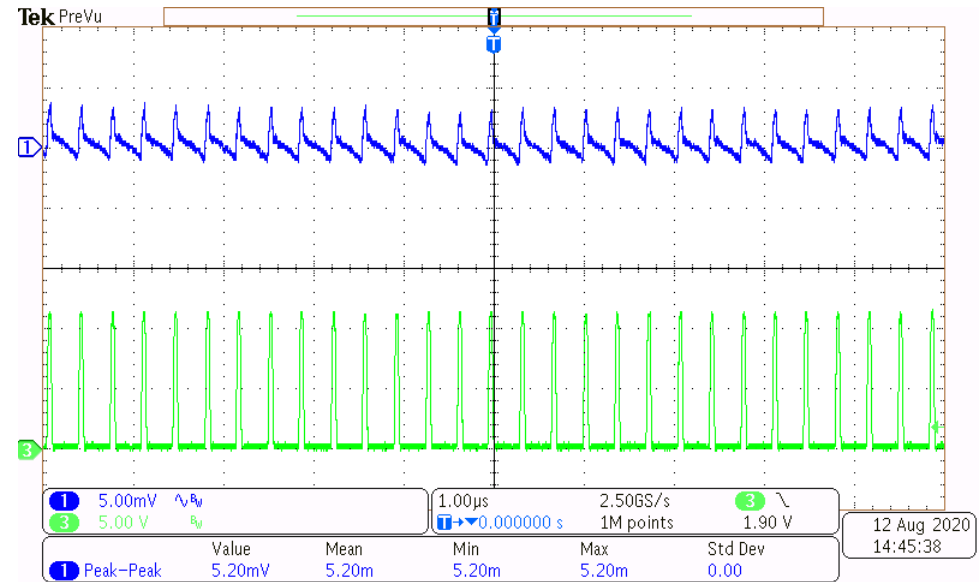
Load (A)	Ripple p-p(mV)
No Load (0A)	5.20
Full Load (0.3A)	5.20

IO<sub>UT</sub>=0A



VOUT/AC VSW

IO<sub>UT</sub>=0.3A



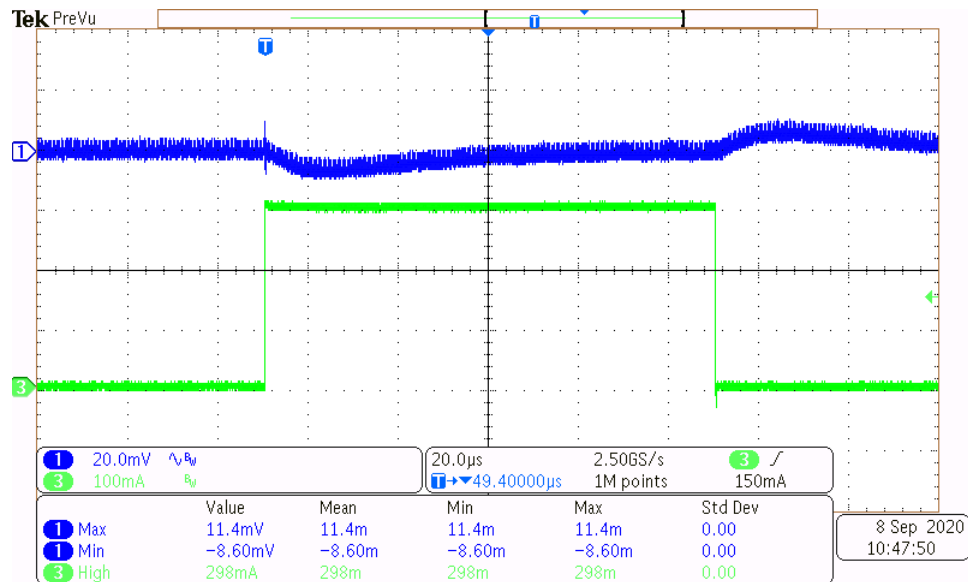
VOUT/AC VSW

# Rail 5: MPM3632C – Transient Performance

Test condition:  $V_{in}=12V$ ,  $V_o=1.5V$ ,  $F=3000kHz$ ,  $C_{out}=47\mu F \cdot 2$  MLCC,  $I_{out}=0-0.3A$ , 100% @10A/us

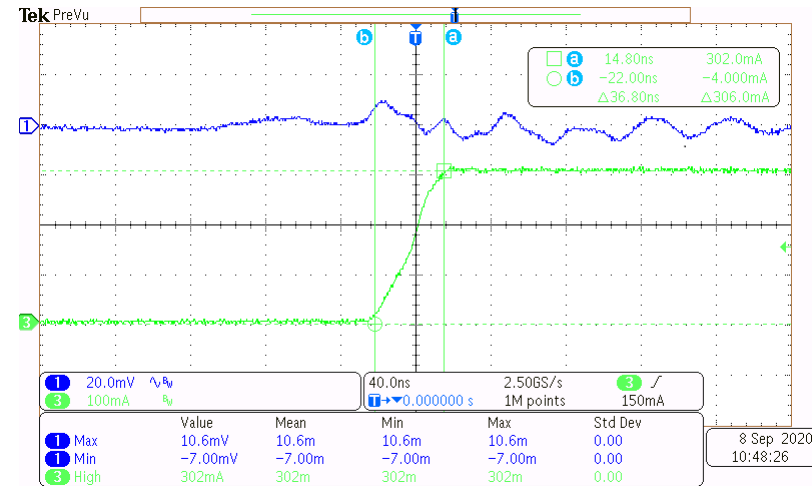
Parameter	Value(mV)	AC Accuracy(%)
Undershoot	-8.6	-0.57
Overshoot	11.4	0.76

IO<sub>UT</sub>=0-0.3A

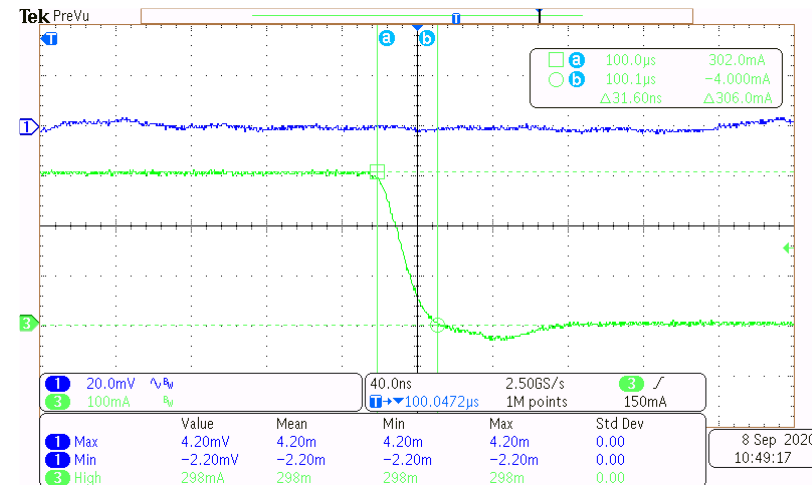


VOUT/AC IO

## Rising Edge



## Falling Edge

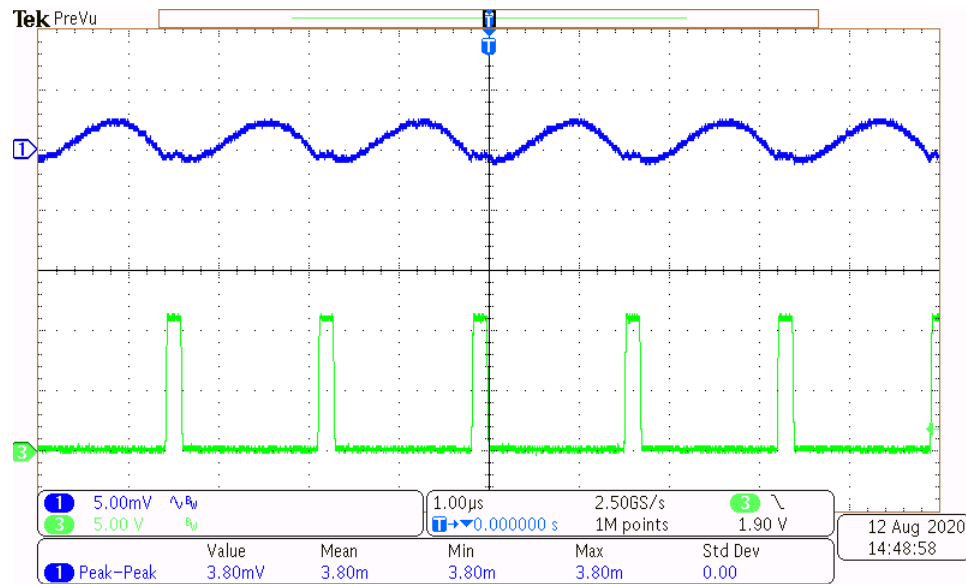


# Rail 6: MPM3683-7 – Steady State Ripple

Test condition:  $V_{in}=12V$ ,  $V_o=1.2V$ ,  $F=600kHz$ ,  $C_{out}=47\mu F \times 4$  MLCC

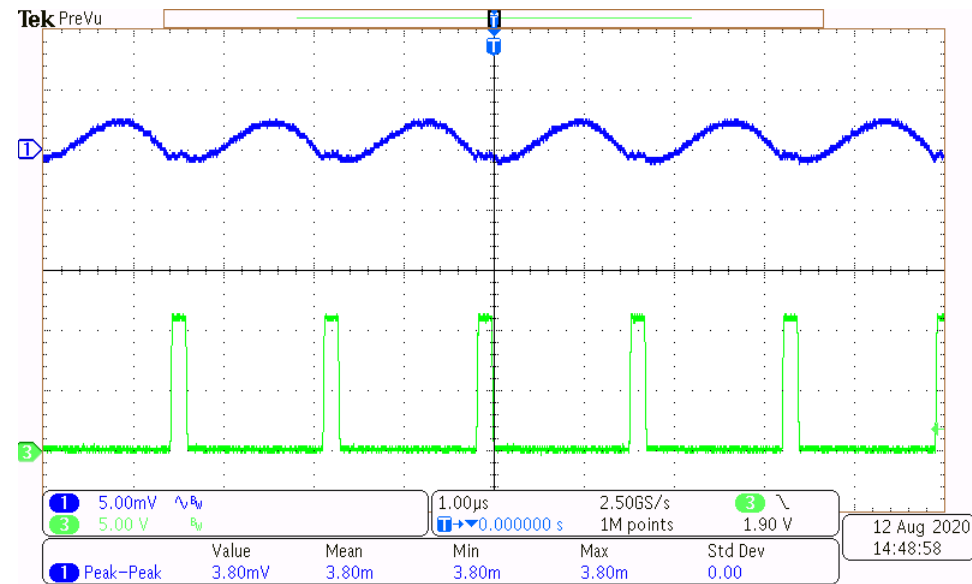
Load (A)	Ripple p-p(mV)
No Load (0A)	3.80
Full Load (4.8A)	3.80

IOUT=0A



VOUT/AC VSW

IOUT=4.8A



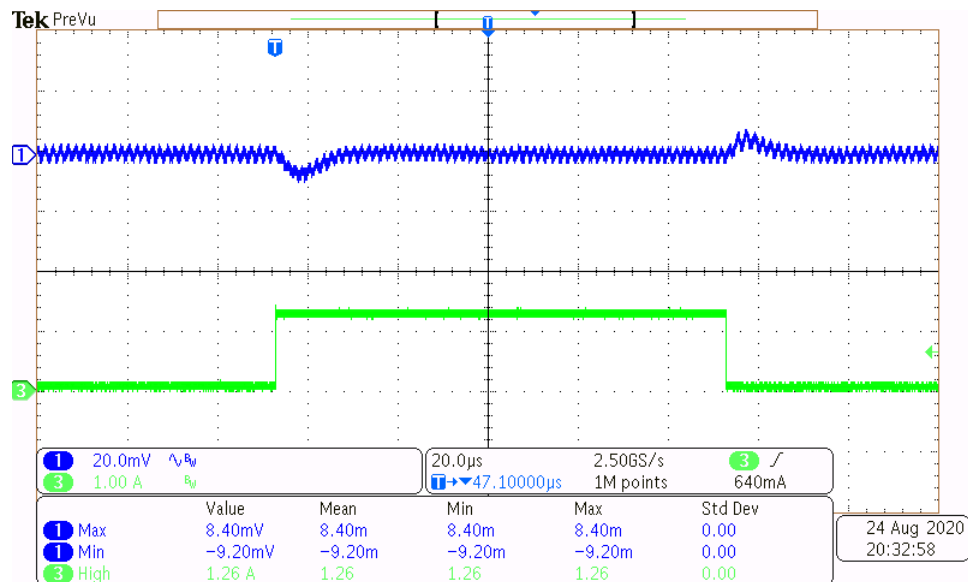
VOUT/AC VSW

# Rail 6: MPM3683-7 – Transient Performance

Test condition:  $V_{in}=12V$ ,  $V_o=1.2V$ ,  $F=600kHz$ ,  $C_{out}=47\mu F \cdot 4$  MLCC, 25% Step load,  $10A/\mu S$  Slew rate

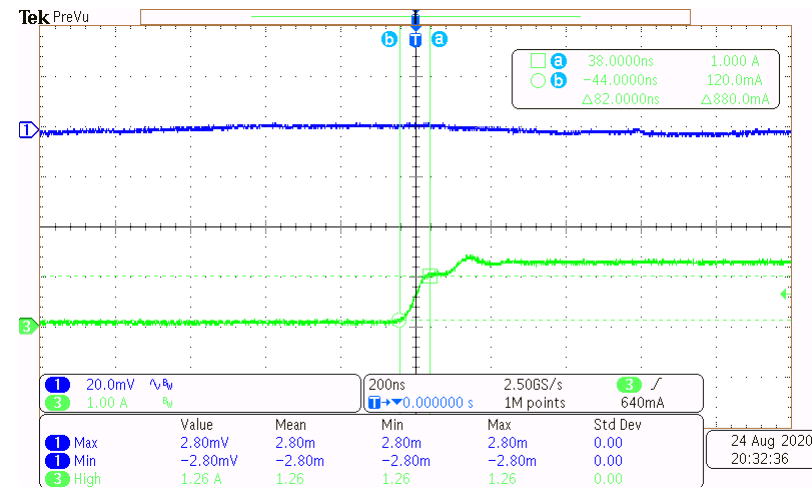
Parameter	Value(mV)	AC Accuracy(%)
Undershoot	-8.4	-0.95
Overshoot	9.2	1.04

$I_{OUT}=0-1.2A$

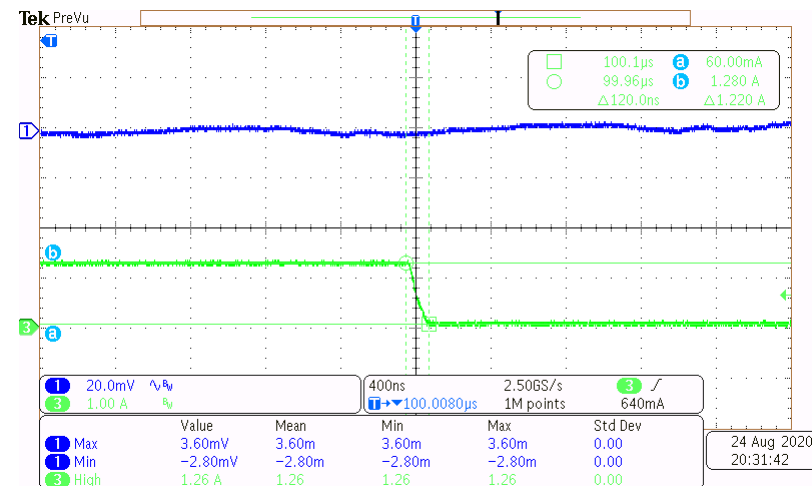


VOUT/AC IO

## Rising Edge



## Falling Edge



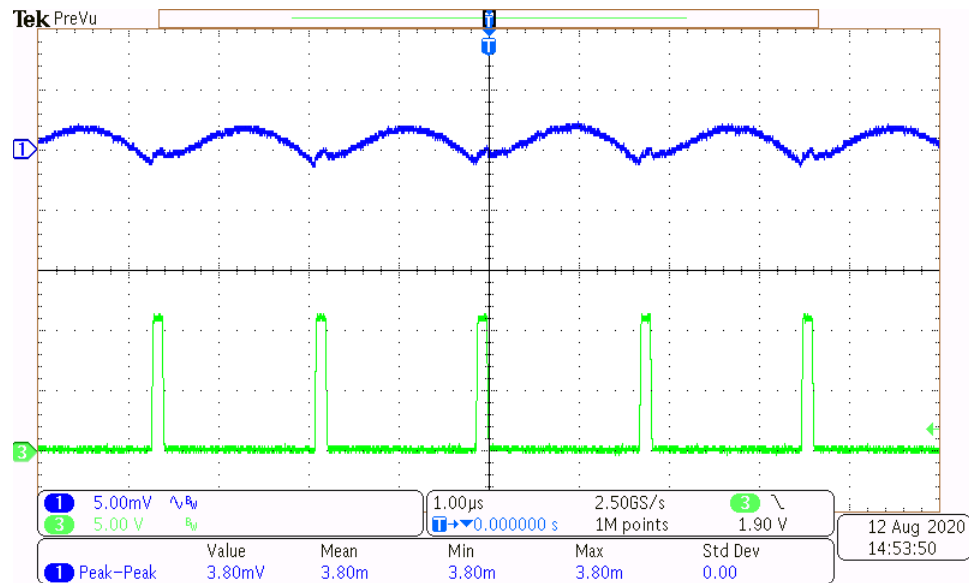


# Rail 7: MPM3683-7 – Steady State Ripple

Test condition:  $V_{in}=12V$ ,  $V_o=0.8V$ ,  $F=600kHz$ ,  $C_{out}=47\mu F \cdot 4$  MLCC

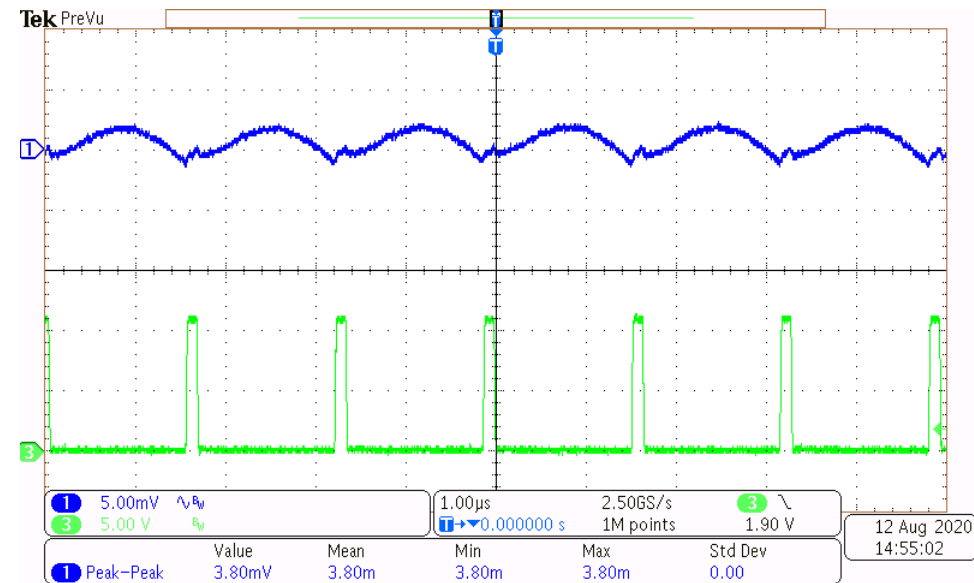
Load (A)	Ripple p-p(mV)
No Load (0A)	3.80
Full Load (6A)	3.80

IOUT=0A



VOUT/AC VSW

IOUT=6A



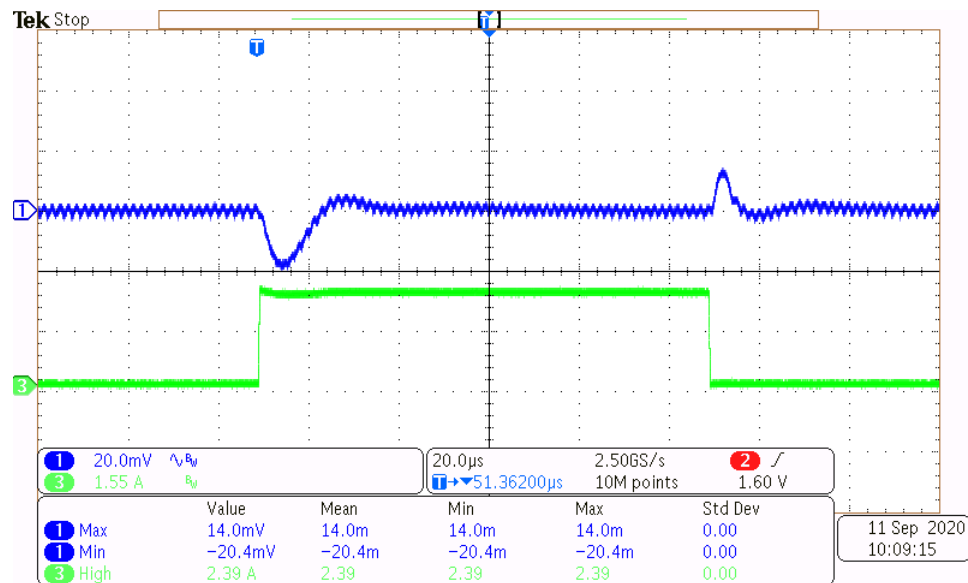
VOUT/AC VSW

# Rail 7: MPM3683-7 – Transient Performance

Test condition:  $V_{in}=12V$ ,  $V_o=0.8V$ ,  $F=600kHz$ ,  $C_{out}=47\mu F \cdot 7$  MLCC, Slew rate= $10A/\mu s$ , 40% of full load

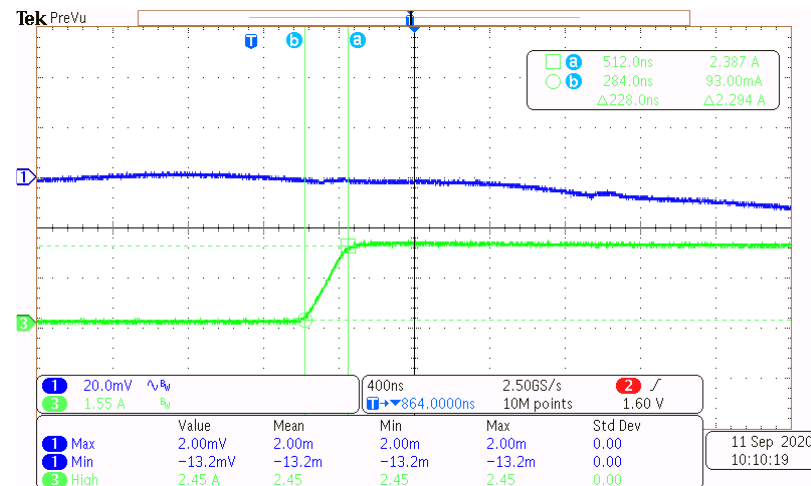
Parameter	Value(mV)	AC Accuracy(%)
Undershoot	-20.4	-2.3
Overshoot	14	1.75

IOUT=0-2.4A

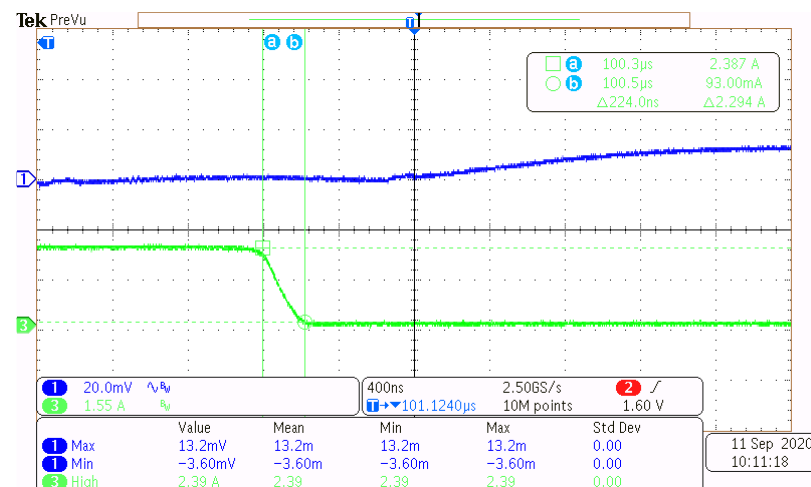


VOUT/AC ILOAD

## Rising Edge



## Falling Edge



**Thank you**