TDK·Lambda

TPF45000-385

Evaluation Data

April 23, 2021

INDEX

TERMINOLOGY USED

- Vout = Output Voltage
- Iout = Output Current
- Vin = Input Voltage
- Iin = Input Current
- Ilim = Current Limit
- Ta = Ambient Temperature
- OCP – Over-current protection

Load/Line Regulation

Vout = 385Vdc, 100% load = 109A, Ta = 25°C
Vout measured at output connector.

Iout\Vin	360VAC	400VAC	480VAC	528VAC	Line Regulation	
0% Load	386.11	385.69	384.92	384.54	1.57	0.41%
25% Load	385.62	385.42	384.78	384.33	1.29	0.33%
50% Load	385.45	385.28	384.63	384.19	1.26	0.33%
75% Load	385.3	385.12	384.5	384.07	1.23	0.32%
100% Load	385.13	384.97	384.37	383.94	1.19	0.31%
Load Regulation	0.98	0.71	0.56	0.6		
	0.25%	0.19%	0.14%	0.16%		

Temperature Drift

Vout =385Vdc, 100% load = 109A

Vin (VAC)	Iout (%)	Vout @ -10°C	Vout @ 25°C	Vout @ 50°C	Vout Delta	Overall Temperature Coefficient (ppm)
400	0%	384.31	385.30	382.47	1.84	80
400	100%	384.07	384.87	381.34	2.74	118
400	107%	384.08	384.89	381.38	2.70	117
480	0%	383.44	383.39	381.66	1.78	77
480	100%	383.15	382.66	380.96	2.20	95
480	107%	383.16	382.73	381.13	2.02	88

Efficiency vs Output Current

Vout = 385Vdc, 100% Load = 109A, Ta = 25°C

Iout(%) / Vin	360 VAC	400 VAC	480 VAC	528 VAC
100% Load	99	99	99	98
107% Load	99	99	99	99

Power Factor vs Output Current

Vout = 385Vdc, 100% Load = 109A, Ta = 25°C

Iout(%) / Vin	360 VAC	400 VAC	480 VAC	528 VAC
100% Load	.94	.94	.94	0.93
107% Load	.94	.94	.95	.94

Inrush Characteristics

Inrush Current <150A peak per phase @ 400-480VAC input (excluding initial spike charging EMI capacitors lasting < 2ms)

Vout =385Vdc, Ta=25°C, Iout = 116A

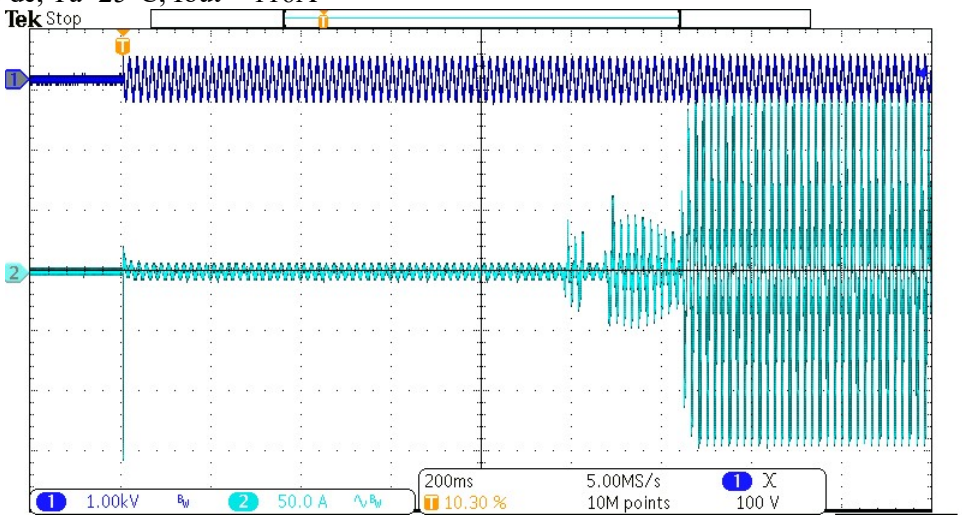


Figure 1: Inrush @ 400VAC (Imax = 156A)

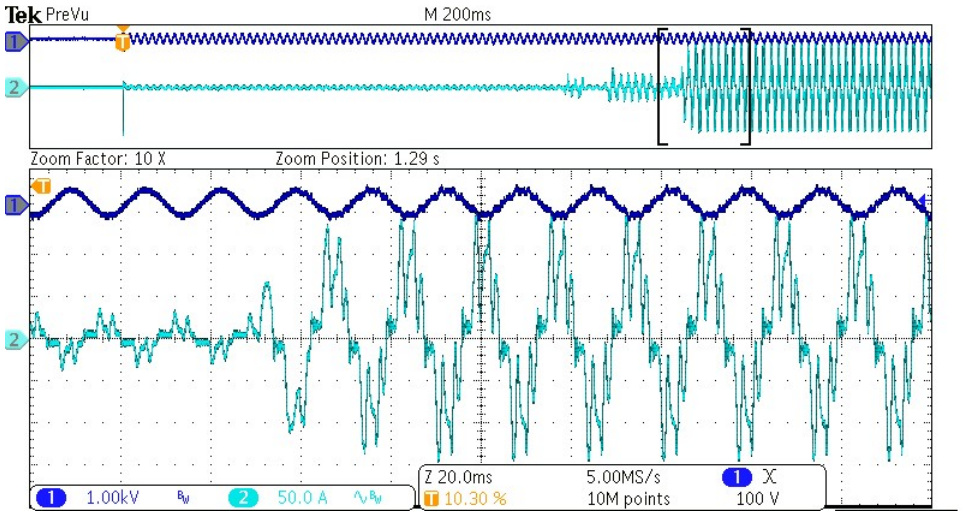


Figure 2: Inrush @ 400VAC - At Load turn on (Imax = 148A)

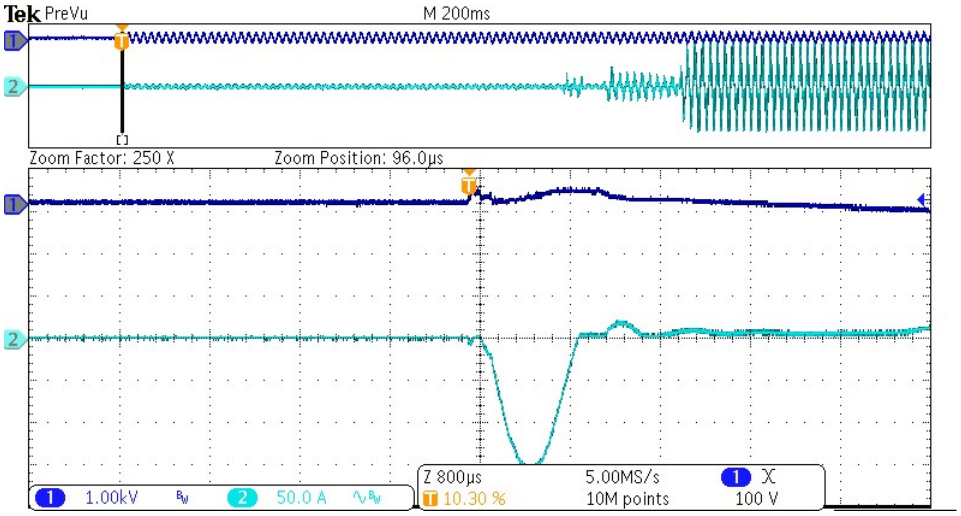


Figure 3: Inrush @ 400VAC - Initial spike charging of EMI capacitors (Imax = 156A)

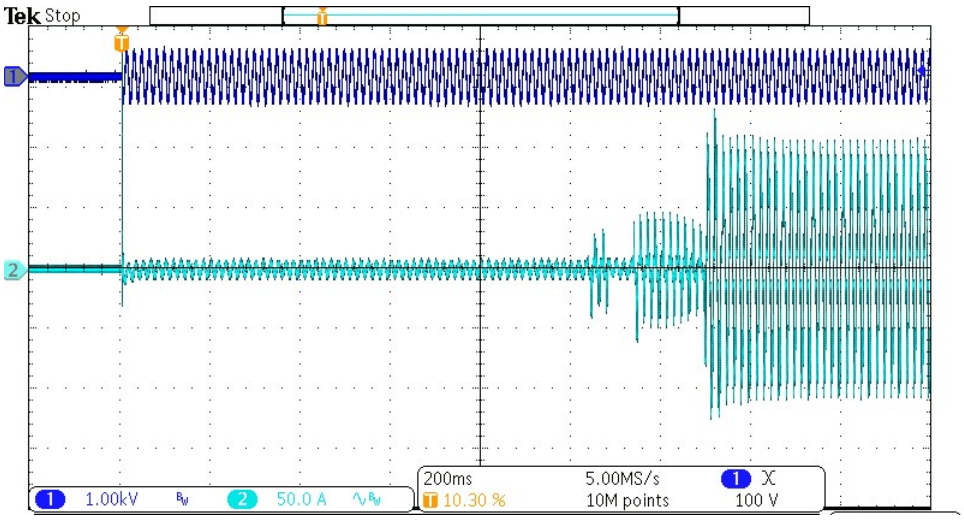


Figure 4: Inrush @ 480VAC (Imax = >258A)

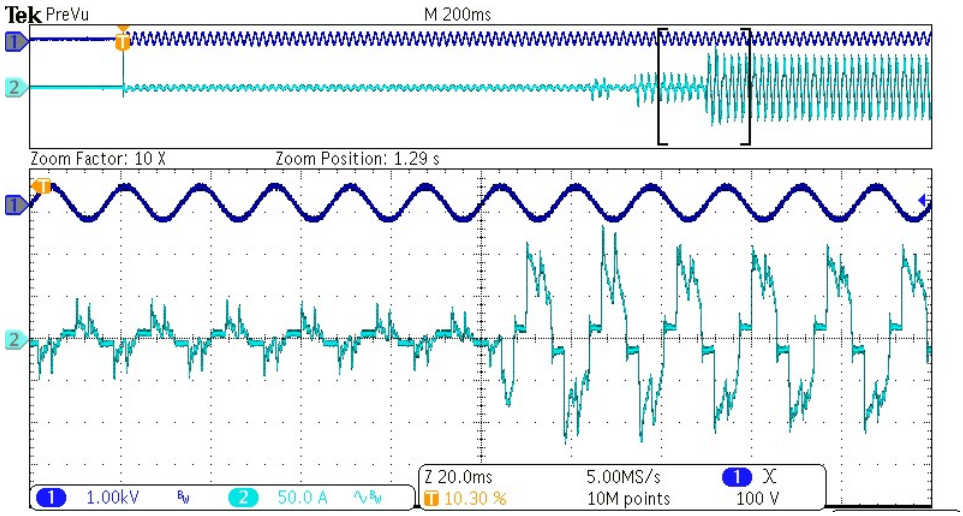


Figure 5: Inrush @ 480VAC - At Load turn on (Imax = 134A)

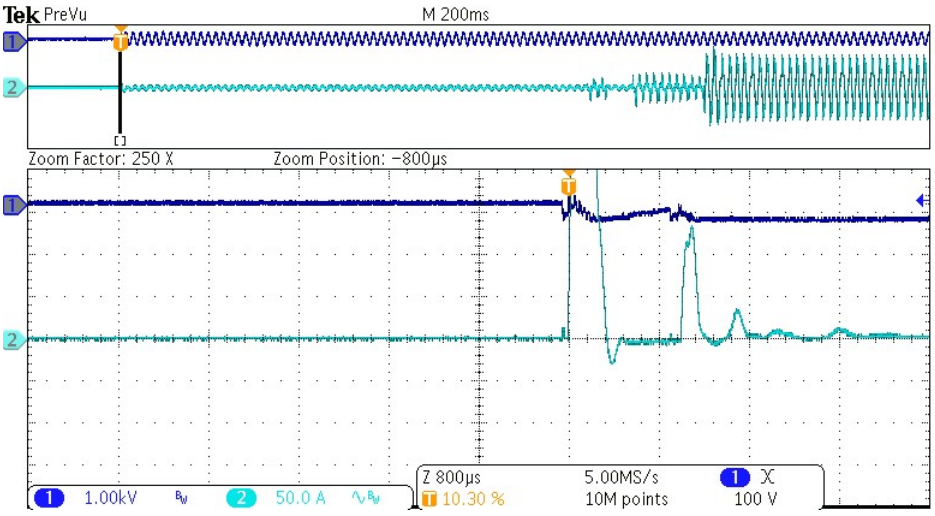


Figure 6: Inrush @ 480VAC - Initial spike charging of EMI capacitors (Imax = >258A)

Turn On Characteristics

Vout = 385Vdc, Ta = 25°C, ***AC ON Control*** – Output turn on time from application of input voltage

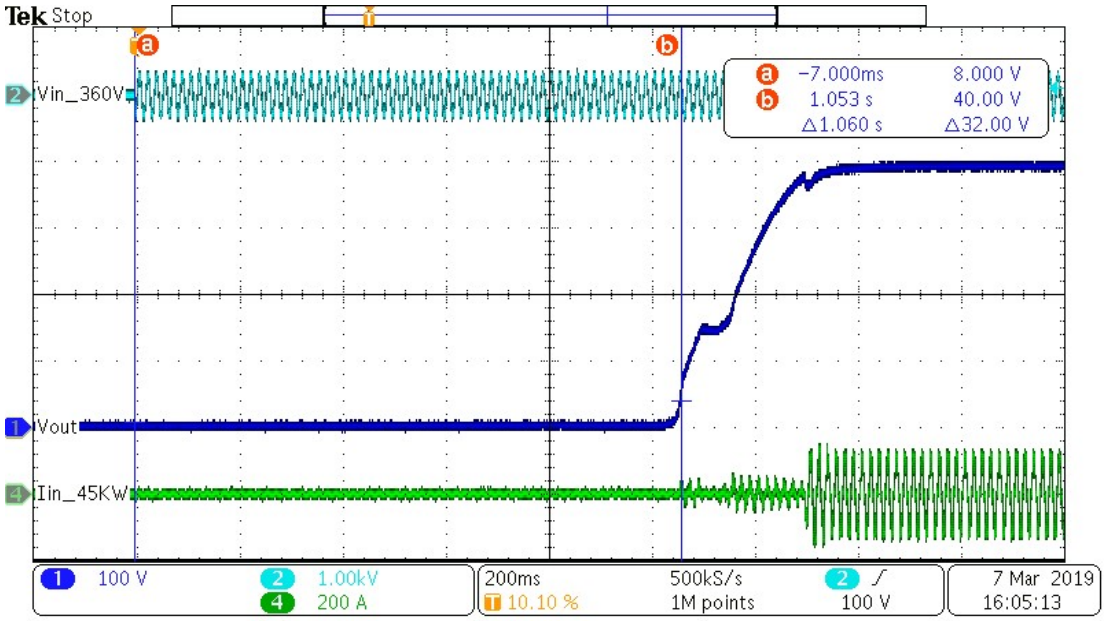


Figure 7: Turn ON Time from Vin = 360VAC.
(CH1: Vout, 100V/div; CH2: Vin, 1kV/div, CH4: Iin, 200A/div)

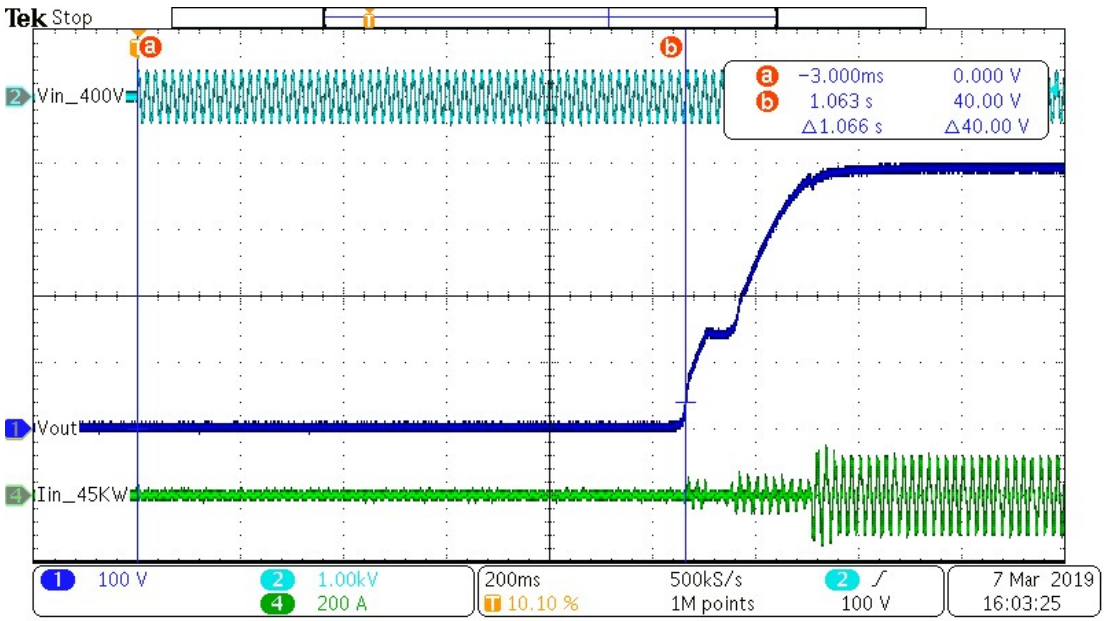


Figure 8: Turn ON Time from Vin = 400VAC.
(CH1: Vout, 100V/div; CH2: Vin, 1kV/div, CH4: Iin, 200A/div)

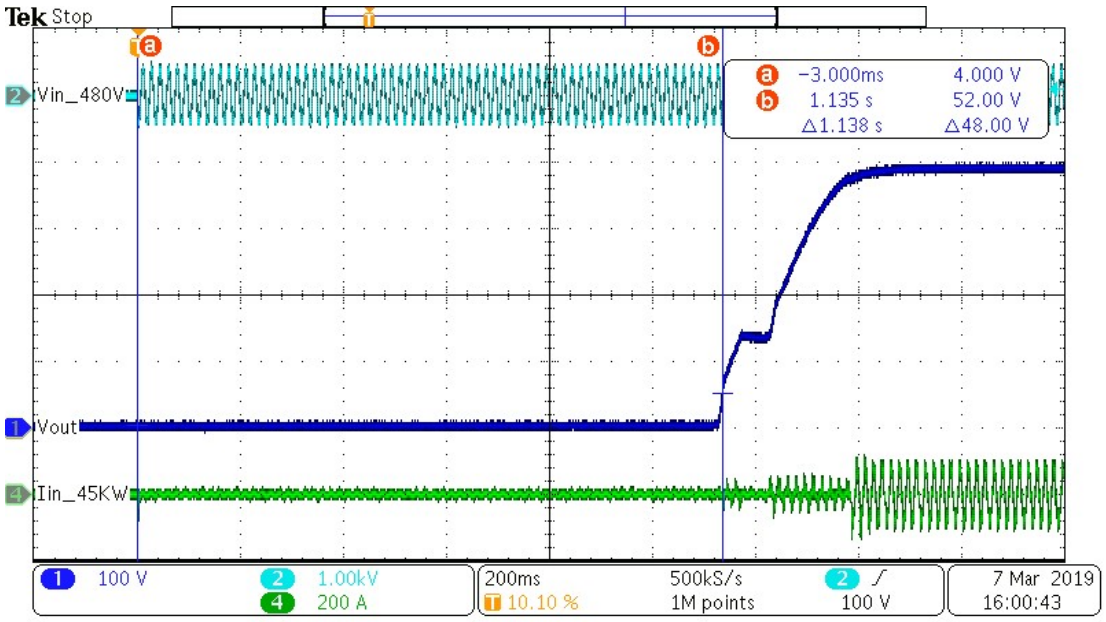


Figure 9: Turn ON Time from Vin = 480VAC.
(CH1: Vout, 100V/div; CH2: Vin, 1kV/div, CH4: Iin, 200A/div)

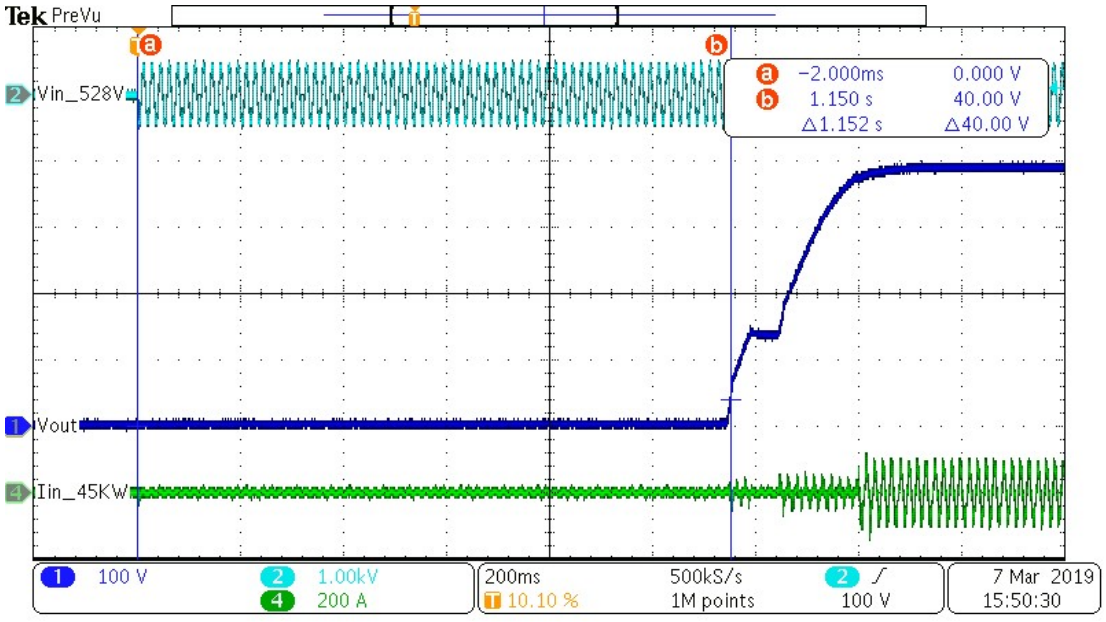


Figure 10: Turn ON Time from Vin = 528VAC.
(CH1: Vout, 100V/div; CH2: Vin, 1kV/div, CH4: Iin, 200A/div)

Remote On/Off Control – Signal connected between terminals 1 (PSON1) and 2 (PSON2) of the Signal connector. 0~0.6V or open, OFF, >6V, ON

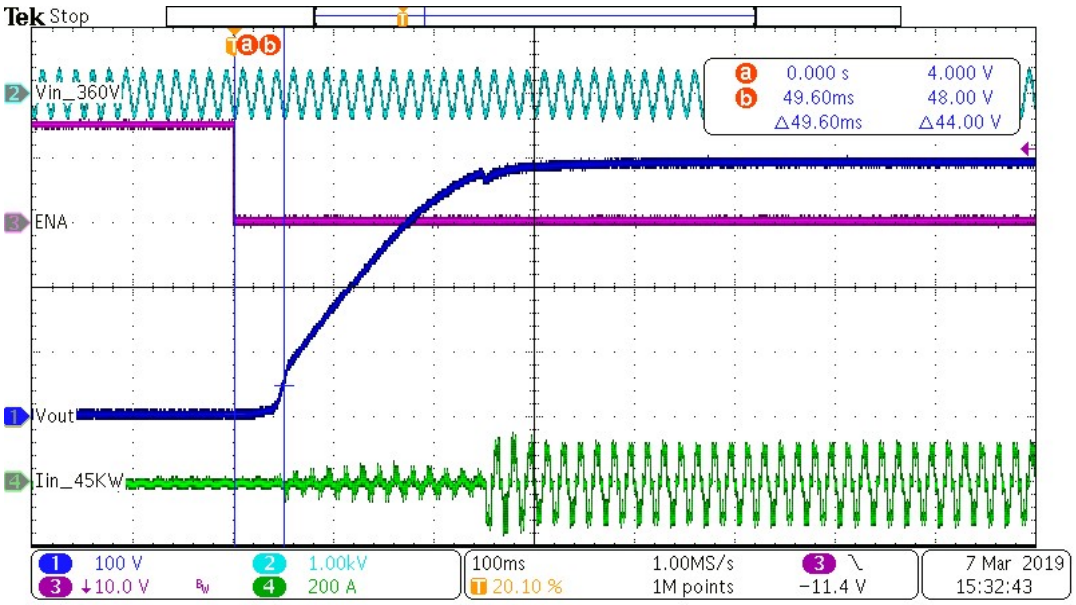


Figure 11: Turn on Time from Remote On-Off - 360VAC

(CH1:Vout, 100V/div; CH2:Vin, 1kV/div; CH3: PSON, 10V/div; CH4: Iin, 200A/div, Timebase = 100ms/div)

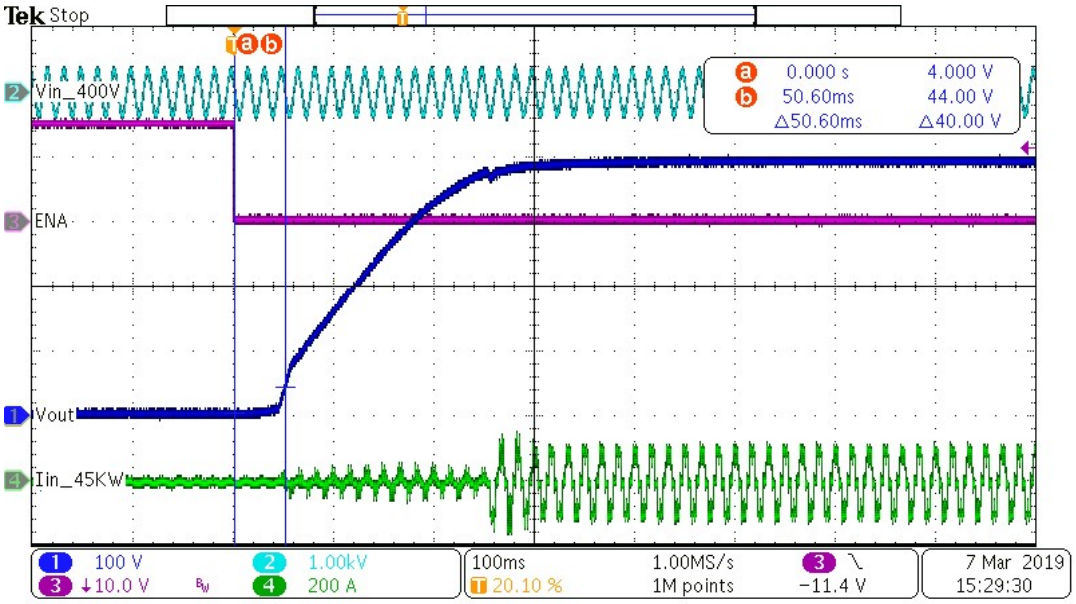


Figure 12: Rise Time from Remote On-Off - 400VAC

(CH1:Vout, 100V/div; CH2:Vin, 1kV/div; CH3: PSON, 10V/div; CH4: Iin, 200A/div, Timebase = 100ms/div)

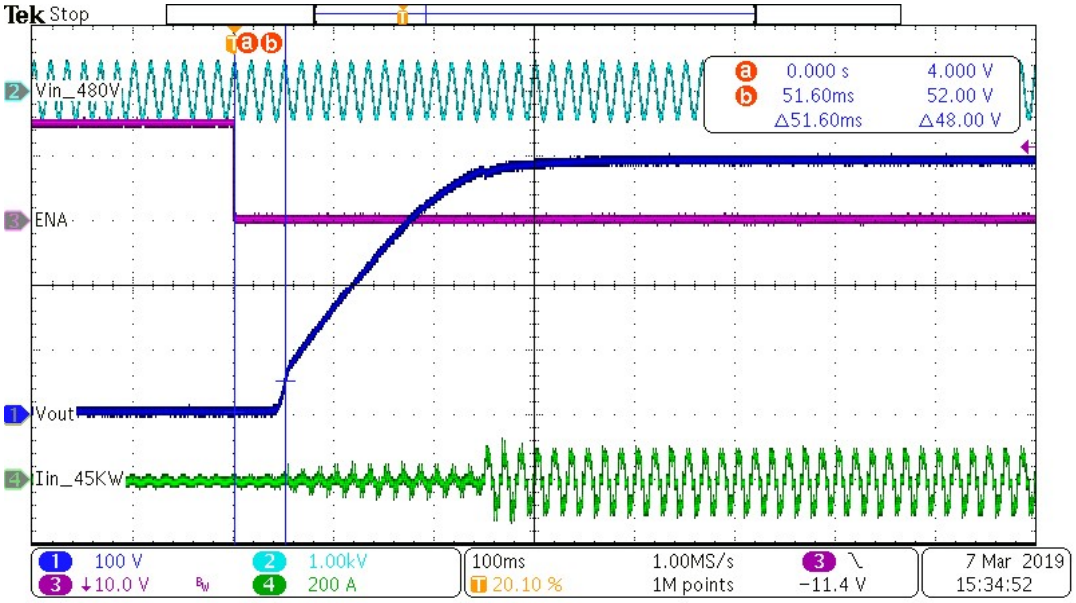


Figure 13: Rise Time from Remote On-Off - 480VAC

(CH1:Vout, 100V/div; CH2:Vin, 1kV/div; CH3: PSON, 10V/div; CH4: Iin, 200A/div, Timebase = 100ms/div)

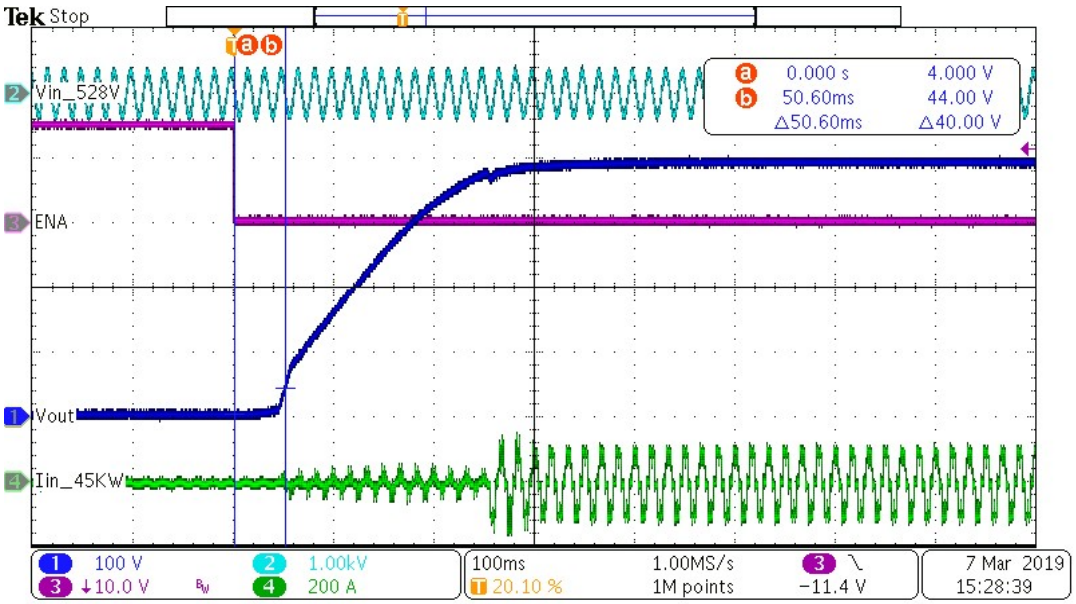


Figure 14: Rise Time from Remote On-Off - 528VAC

(CH1:Vout, 100V/div; CH2:Vin, 1kV/div; CH3: PSON, 10V/div; CH4: Iin, 200A/div, Timebase = 100ms/div)

Hold-Up Time Characteristics

Vout =385Vdc, Ta=25°C, Iout = 116A

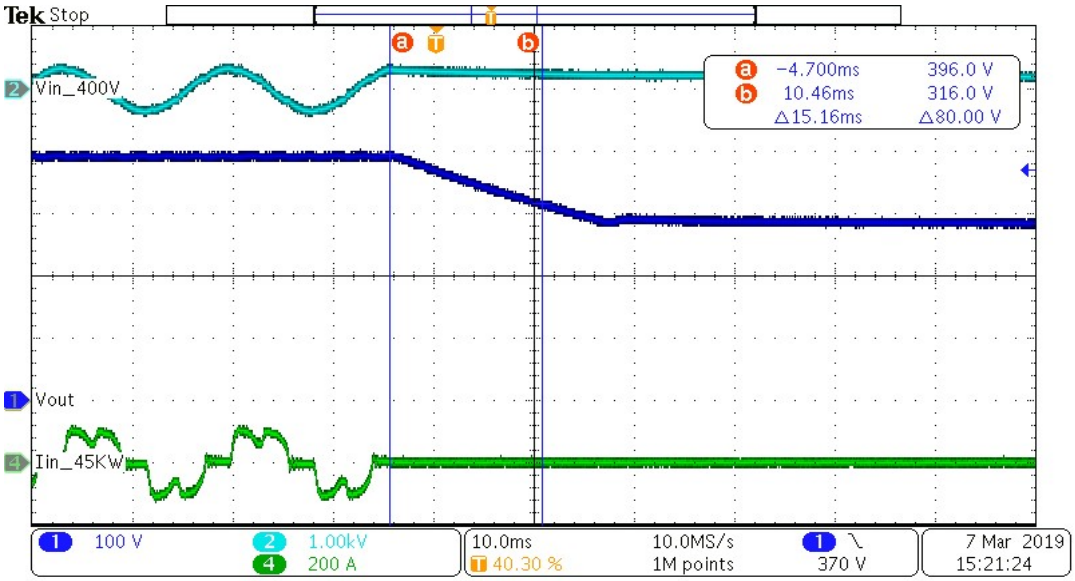


Figure 15: HOLD-UP TIME 400VAC

(CH1: Vout, 100V/div, CH2:Vin, 1kV/div, CH4:Iin, 200A/div, Timebase = 10ms/div)

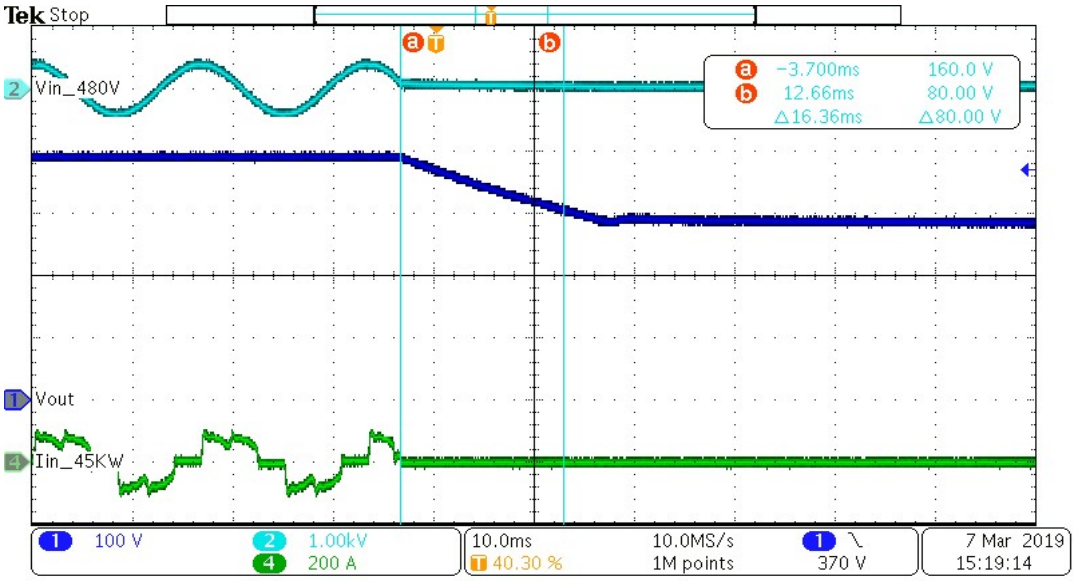


Figure 16: HOLD-UP TIME 480VAC

(CH1: Vout, 100V/div, CH2:Vin, 1kV/div, CH4:Iin, 200A/div, Timebase = 10ms/div)

Ripple Characteristics

Ripple and Noise: 20MHz bandwidth. 100:1 probe.
Vout =385Vdc, Ta=25°C, Iout = 116A

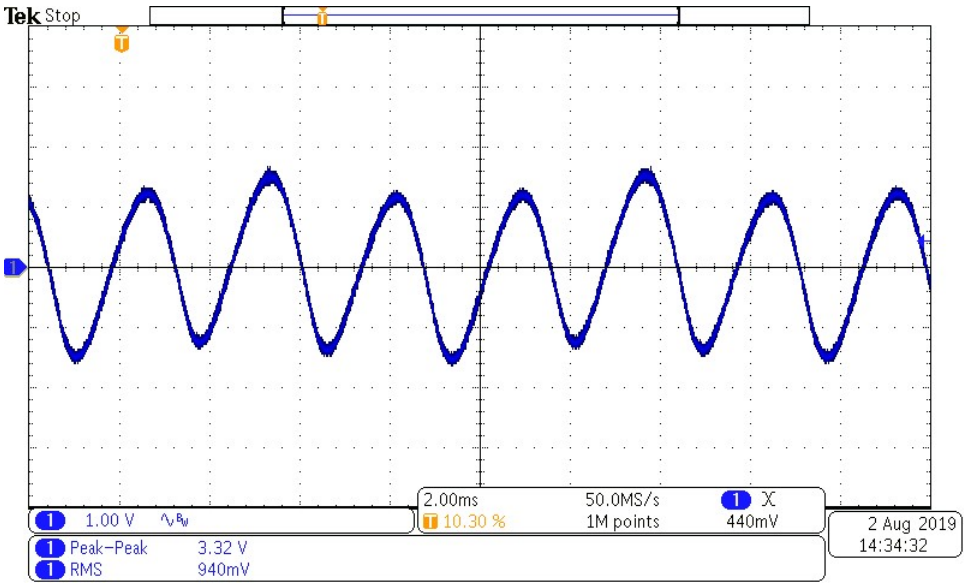


Figure 17: Ripple @ 360VAC.
(CH1: Vout, 1V/div, Timebase = 2ms/div)

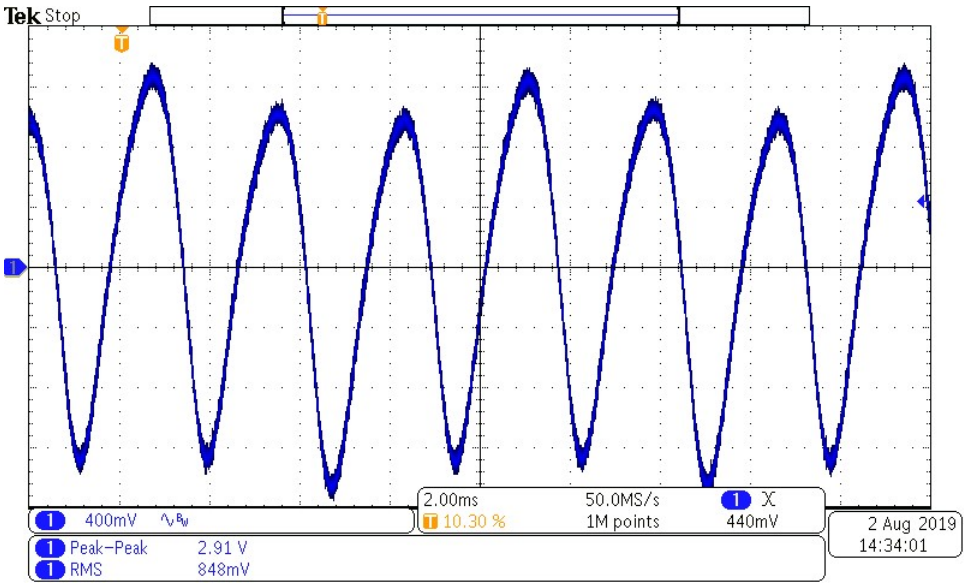


Figure 18: Ripple at 100% Load @ 400VAC.
(CH1: Vout, 400mV/div, Timebase = 2ms/div)

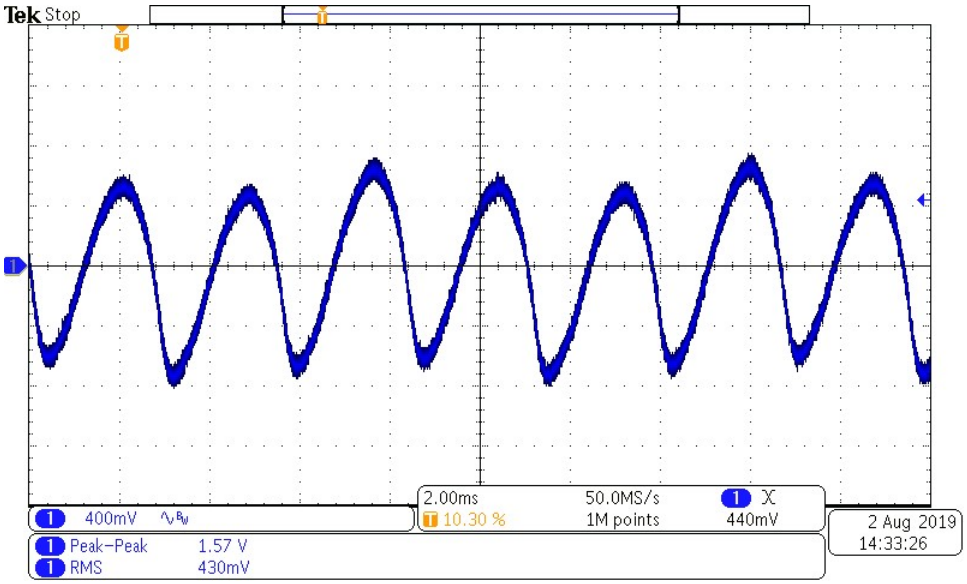


Figure 19: Ripple at 100% Load @ 480VAC.
(CH1: Vout, 400mV/div, Timebase = 2ms/div)

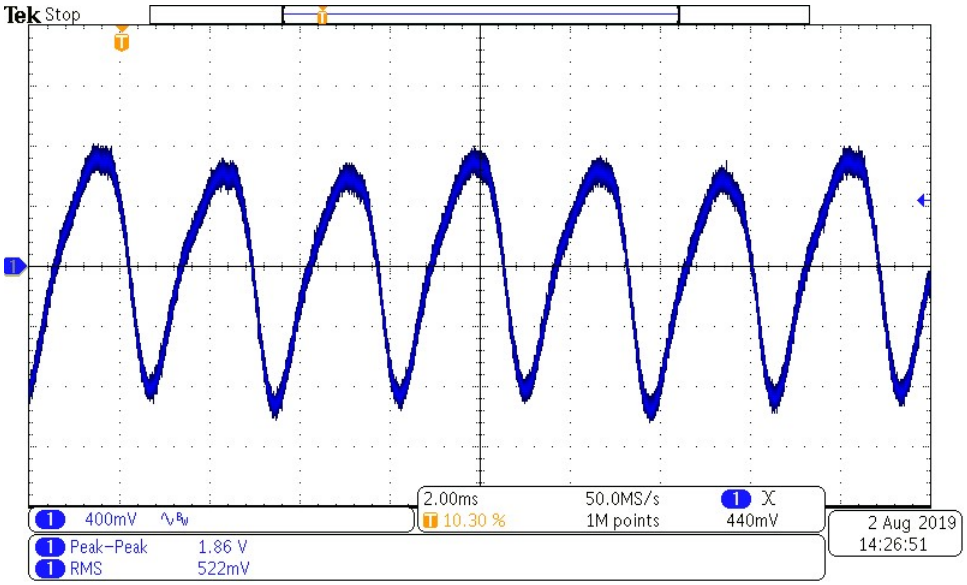


Figure 20: Ripple at 100% Load @ 480VAC.
(CH1: Vout, 400mV/div, Timebase = 2ms/div)

OCP Characteristics

Vout =385Vdc, Ta=25°C

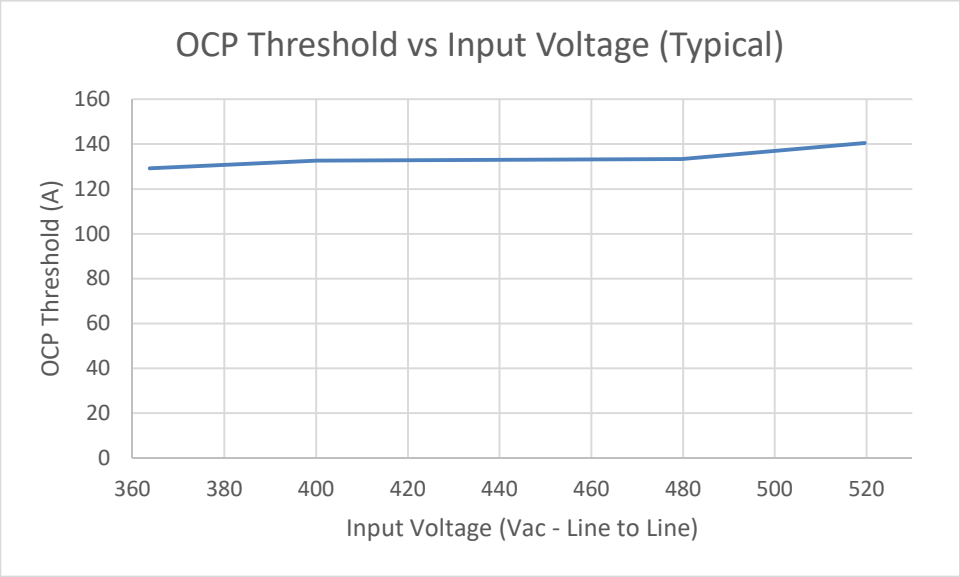


Figure 30: OCP Threshold vs Input Voltage

Conducted Emissions

EN55032 Class A /FCC Part 15 Class A

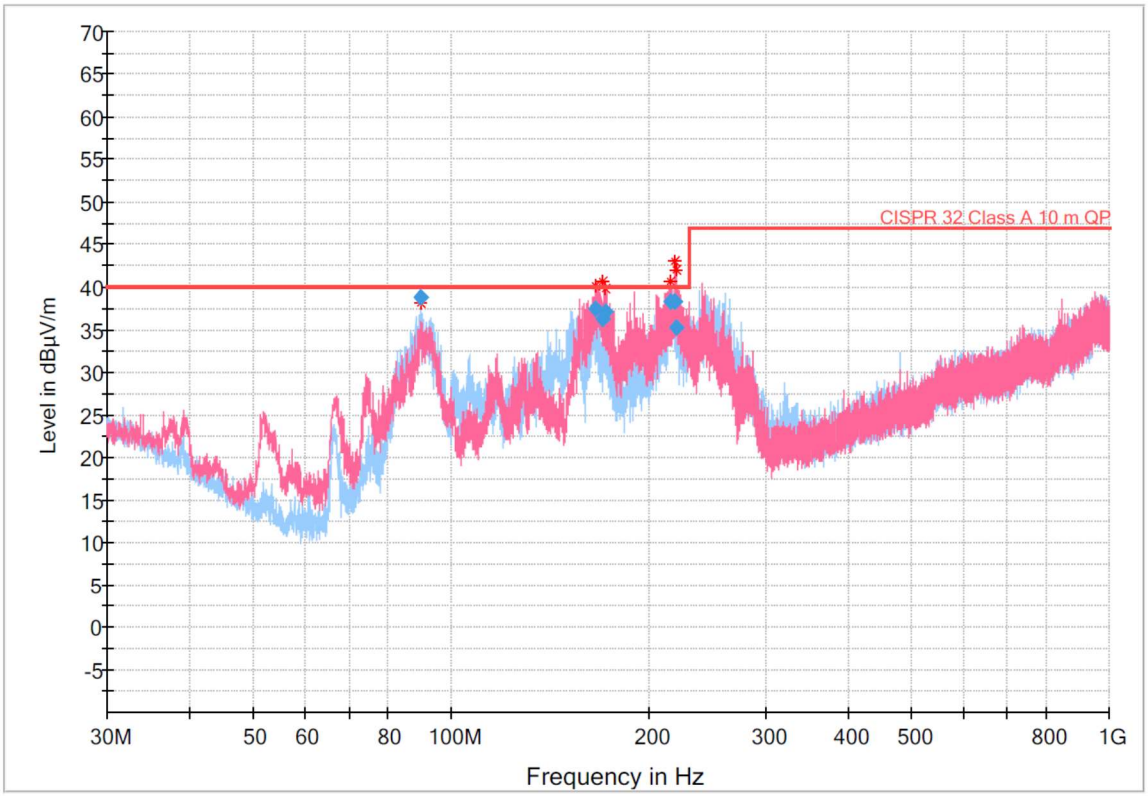
Vout =385Vdc, Ta=25°C, Iout = 109A

Figure 31: Conducted Emissions. Vin = 400VAC

Radiated Emissions

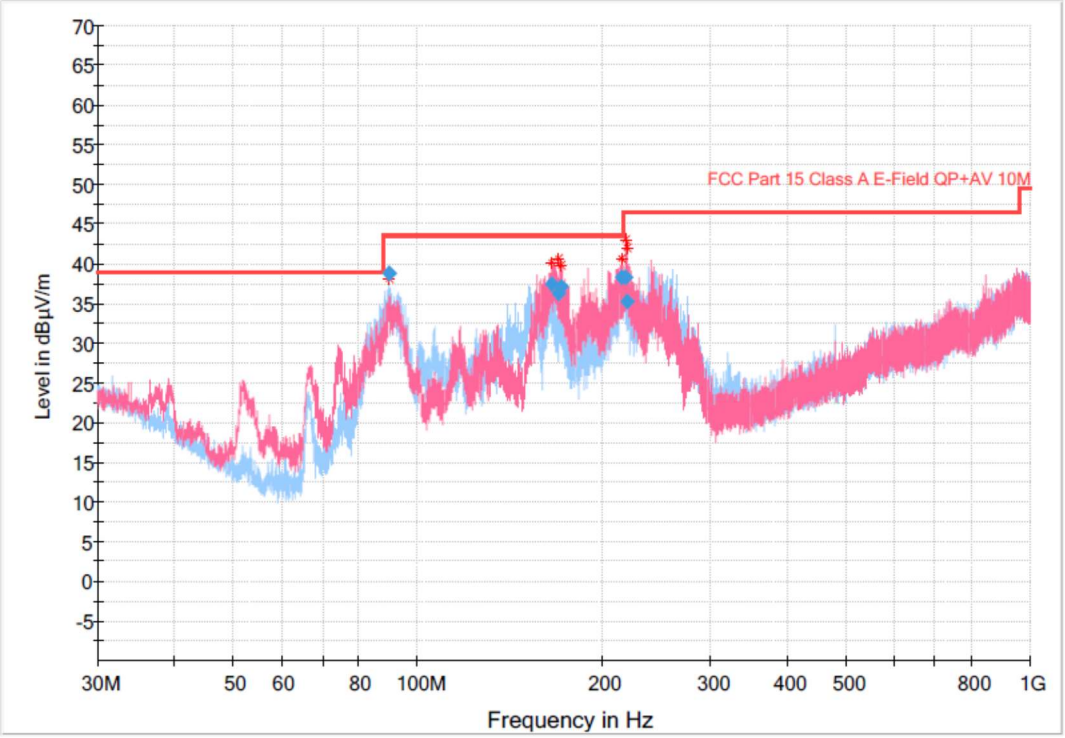
EN55032 Class A /FCC Part 15 Class A

Vout =385Vdc, Ta=25°C, Iout = 109A



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Figure 34: EN55032 Class A Radiated Emissions



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Figure 35: FCC Part 15 Class A Radiated Emissions