PFH500A-28-xxx-R

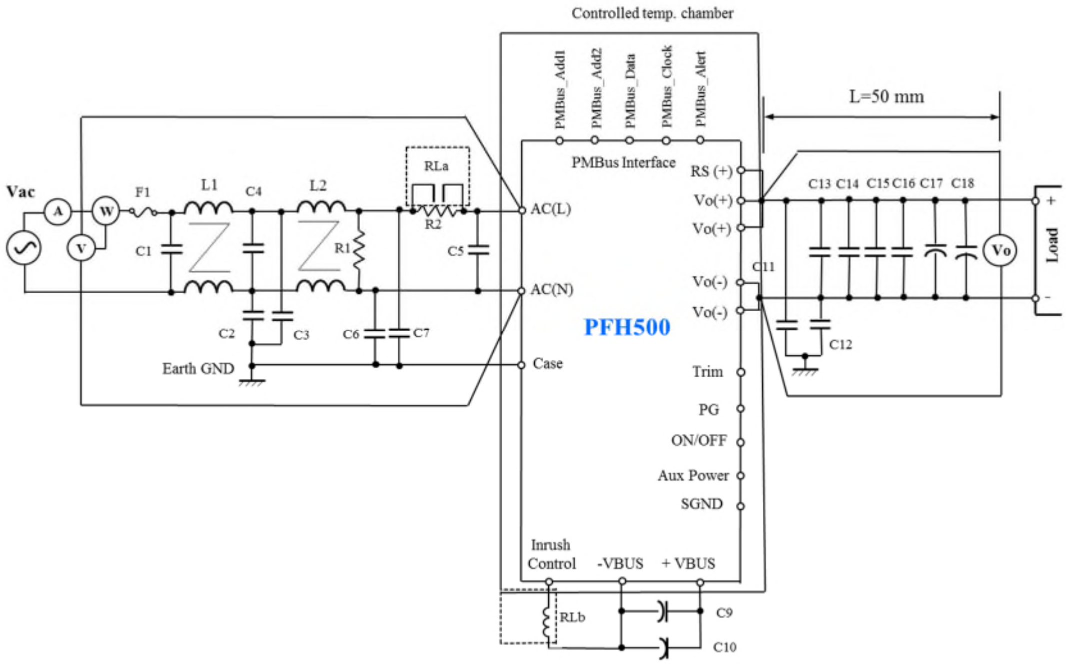
Evaluation Report

Contents

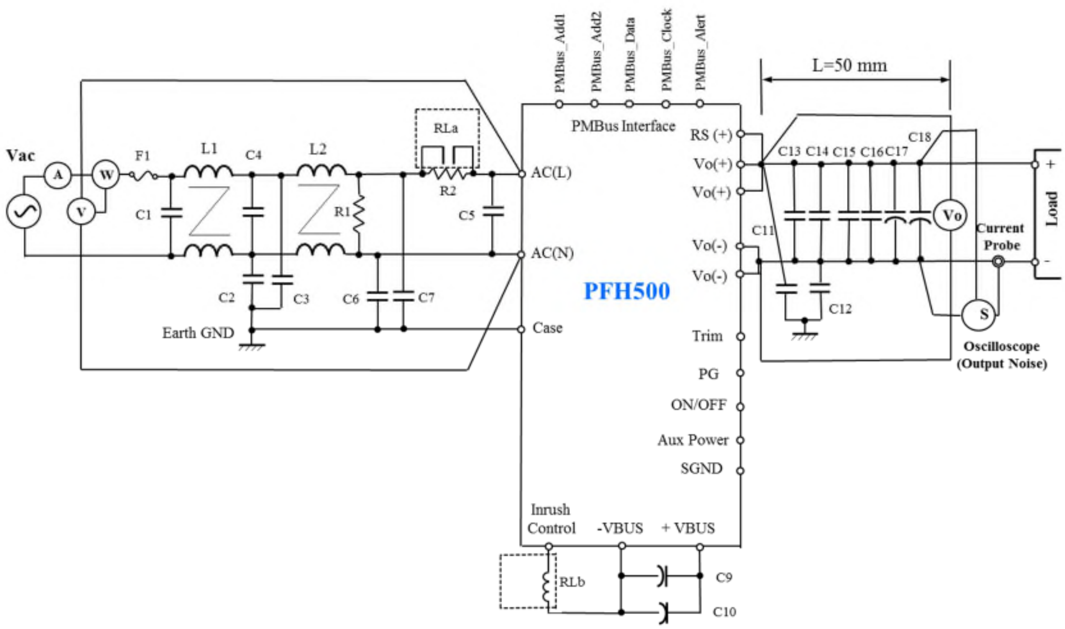
1. EVALUATION METHOD

1.1 Test / Measurement Circuits

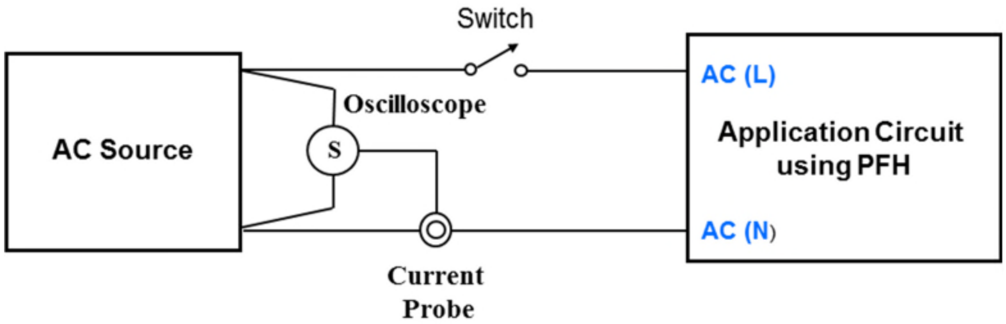
1.1.1 Steady State Test Measurement Circuit



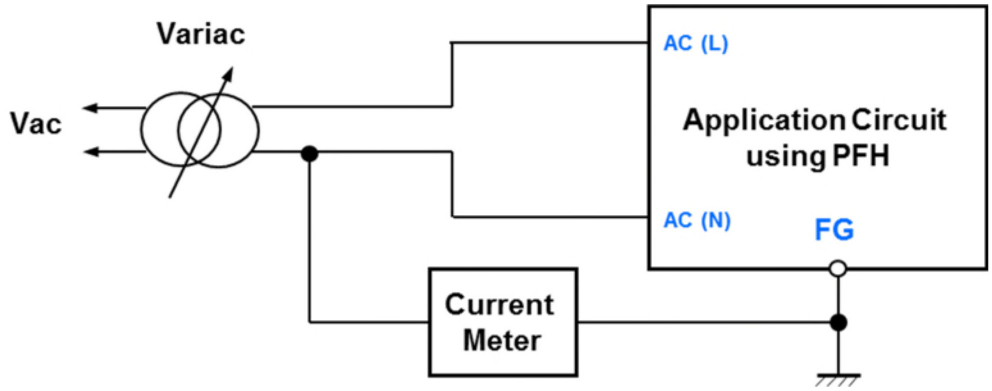
1.1.2 Dynamic, Protection and Output Ripple and Noise Measurement Circuit



1.1.3 Inrush Current Measurement Circuit

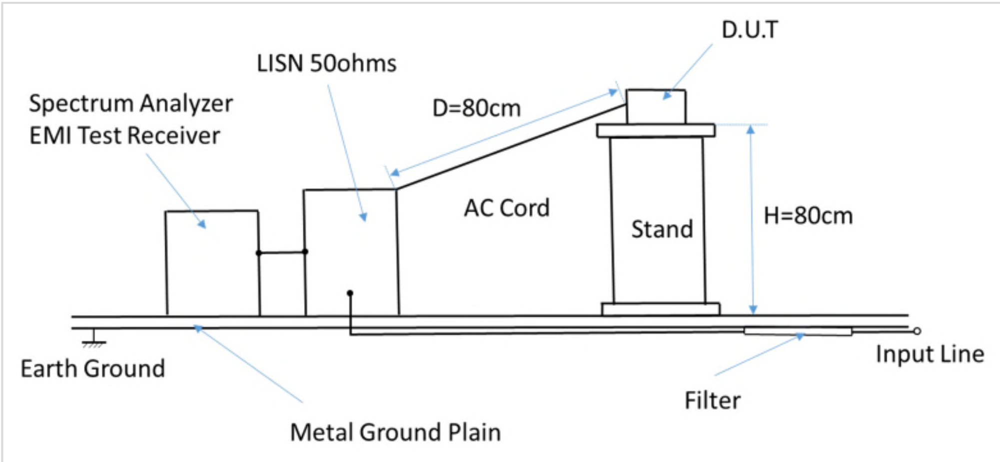


1.1.4 Leakage Current Measurement Circuit

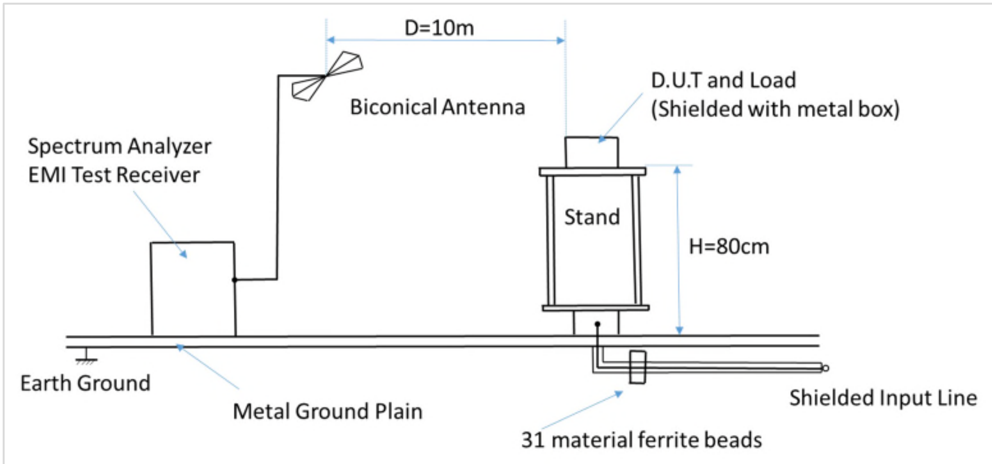


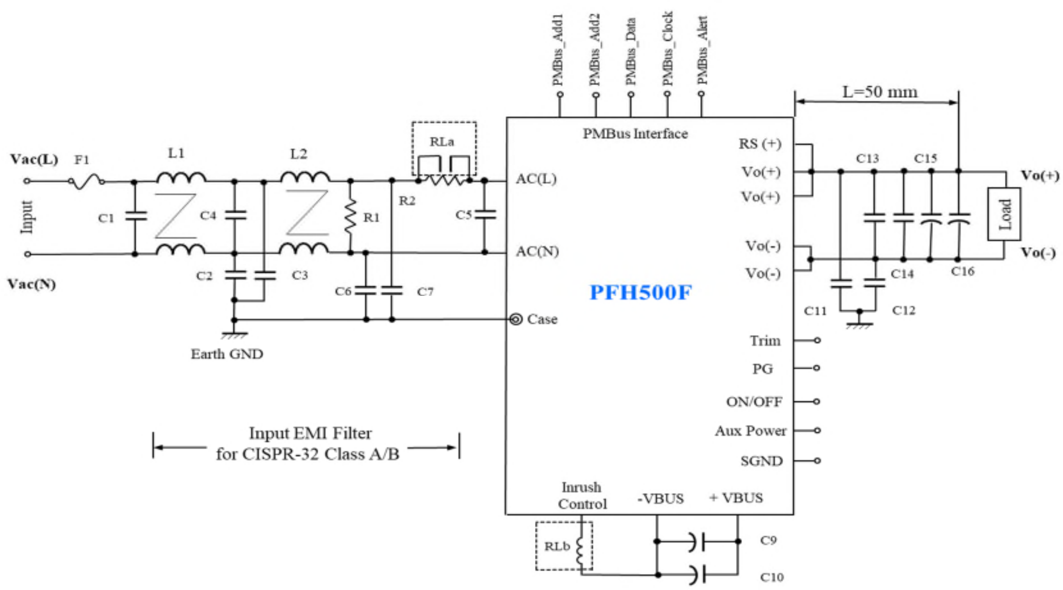
1.1.5 Electro-Magnetic Interference Test Set-Up

1.1.5.1 Conducted EMI



1.1.5.2 Radiated EMI





Circuit Code	Description	Circuit Code	Description
C1, C4	1µF Film Capacitor	C5	2.2µF Film Capacitor
C2, C3	3300pF Ceramic Capacitor	C6, C7	470pF Ceramic Capacitor
L1, L2	6.3mH	R2	22 Ohms
R1	470kOhms	C13	0.1µF Ceramic Capacitor
C15, C16 (1)	470µF Electrolytic Capacitor	C14	40uF Ceramic Capacitor
C11, C12	470pF Ceramic Capacitor	C9, C10	470µF Electrolytic Capacitor
RLa,RLb	1 Form A relay with 10A, 277VAC, power rating: 12VDC, 16.7mA, 200mW, High Sensitivity	F1	10A, 250V, Fast Blow

(1): Higher Capacitance Value (~2X total cap value recommended) for Ta ≤ -20 °C operation.

List of Equipment

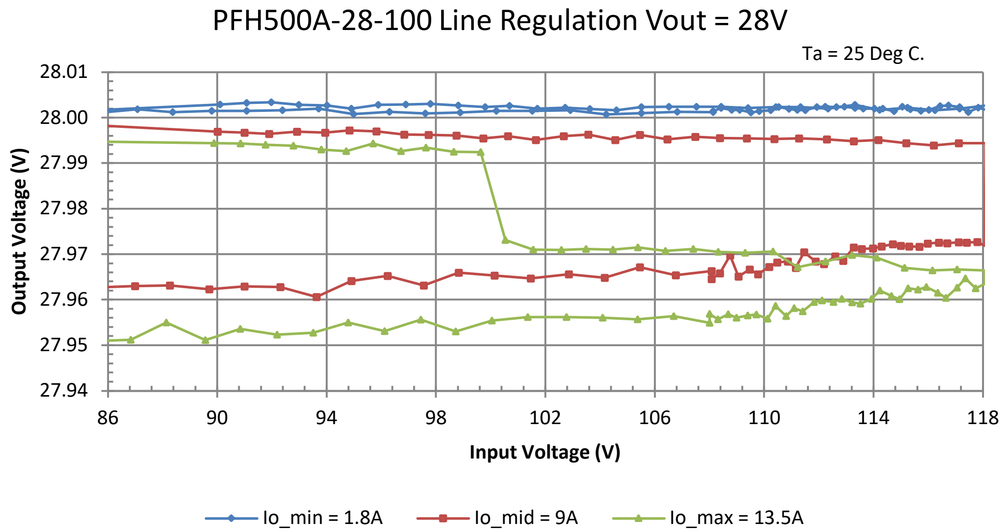
	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	OSCILLOSCOPE	LECROY	WaveSurfer 454
2	OSCILLOSCOPE	LECROY	WaveRunner 6050
3	DIGITAL MULTIMETER	KEITHLEY	2110
4	DIGITAL MULTIMETER	KEITHLEY	2110
5	DIFFERENTIAL AMPLIFIER	LECROY	DA1855A
6	DIFFERENTIAL AMPLIFIER	LECROY	DA1855A
7	SHUNT RESISTER	EMPRO SHUNT	HA20-100
8	TEMP CHAMBER	TENNEY JUNIOR ENVIRONMENTAL	TJR
9	DIFFERENTIAL PROBE	LECROY	A101
10	DIFFERENTIAL PROBE	LECROY	DXG100A
11	DIGITAL POWER METER	YOKOGAWA	WT310
12	SURGE TESTER	THERMO SCIENTIFIC	EMCPRO PLUS
13	DC ELECTRONIC LOAD	CHROMA	63201
14	FREQUENCY ANALYZER	AP INSTRUMENT	300
15	AC POWER SOURCE	CHROMA	6530
16	INJECTION ISOLATOR	RIDLEY ENGINEERING	0.1Hz TO 30MHz
17	WAVEFORM GENERATOR	AGILENT	33120A
18	DC ELECTRONIC LOAD	CHROMA	6334
19	AC CONTROL	SORENSEN	DCS150-20
20	THERMOSTREAM	TEMPTRONIC CORPORATION	ATS-810-M-4
21	CURRENT PROBE	LECROY	AP015
22	CURRENT PROBE	LECROY	CP150

CHARACTERISTIC

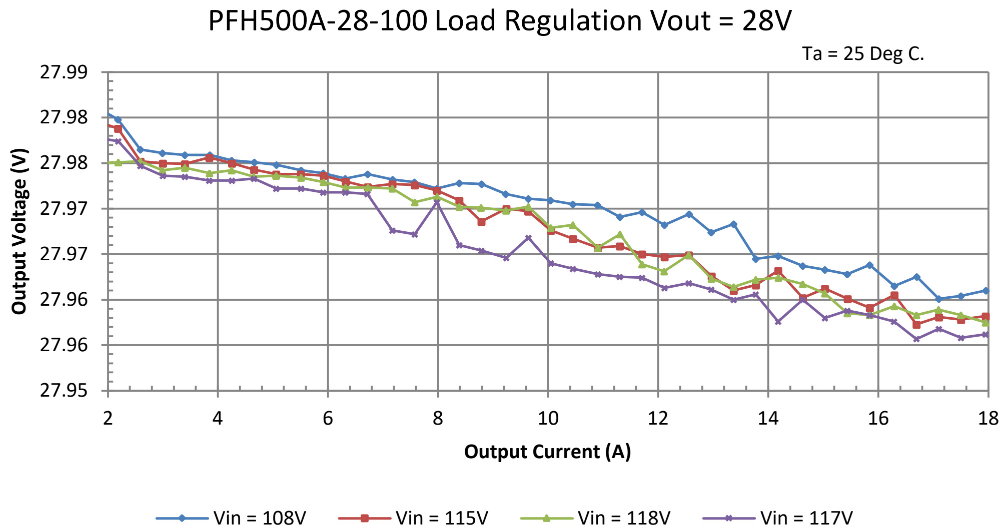
2.1 Steady State Data (Refer to Section 1.1.1 For Test Setup)

2.1.1 Regulation – Line, Load

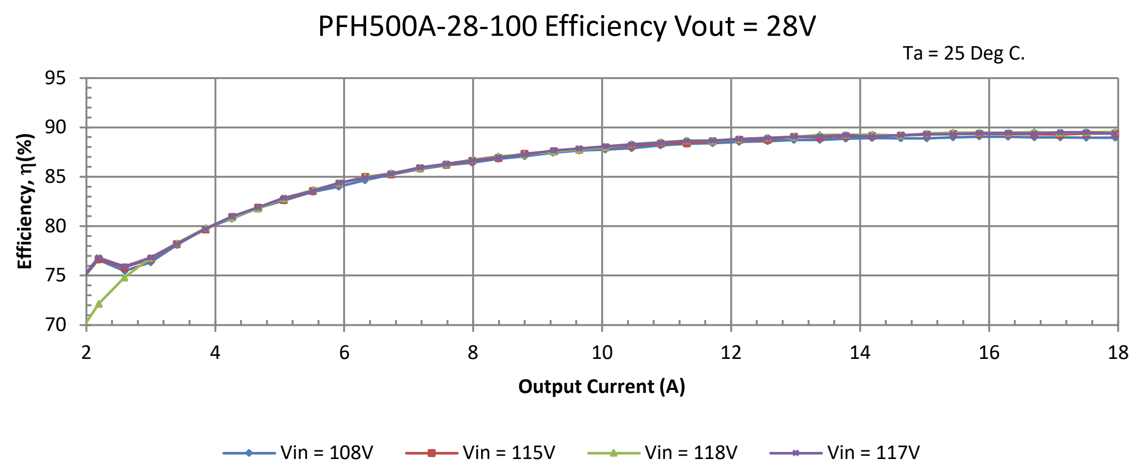
a. Line Regulation (400Hz)

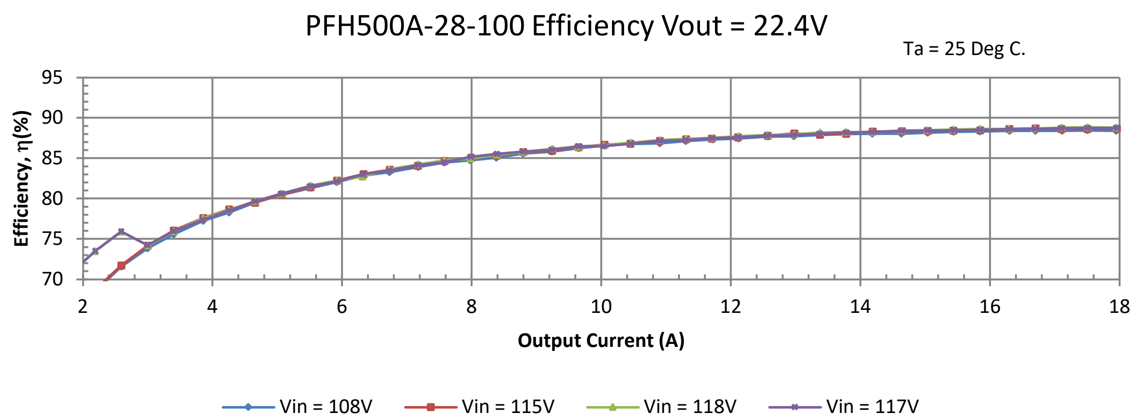


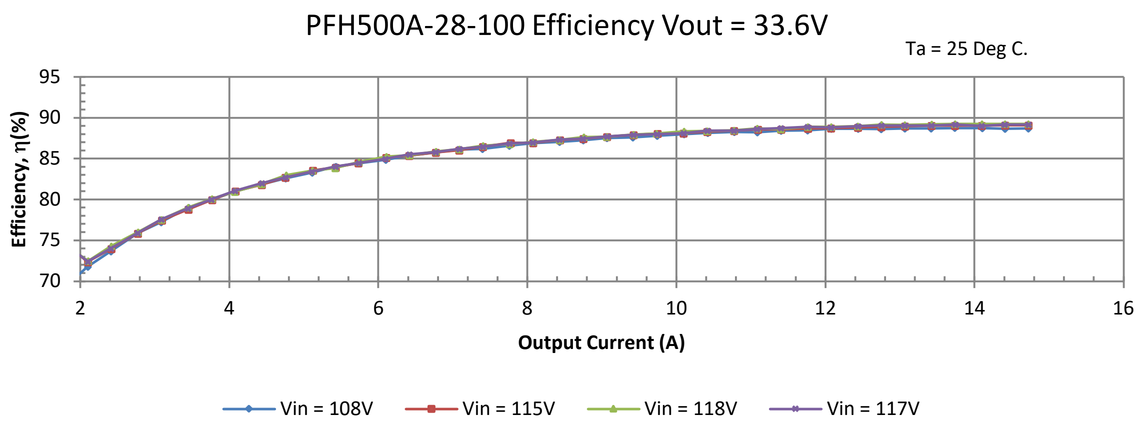
b. Load Regulation (400Hz)



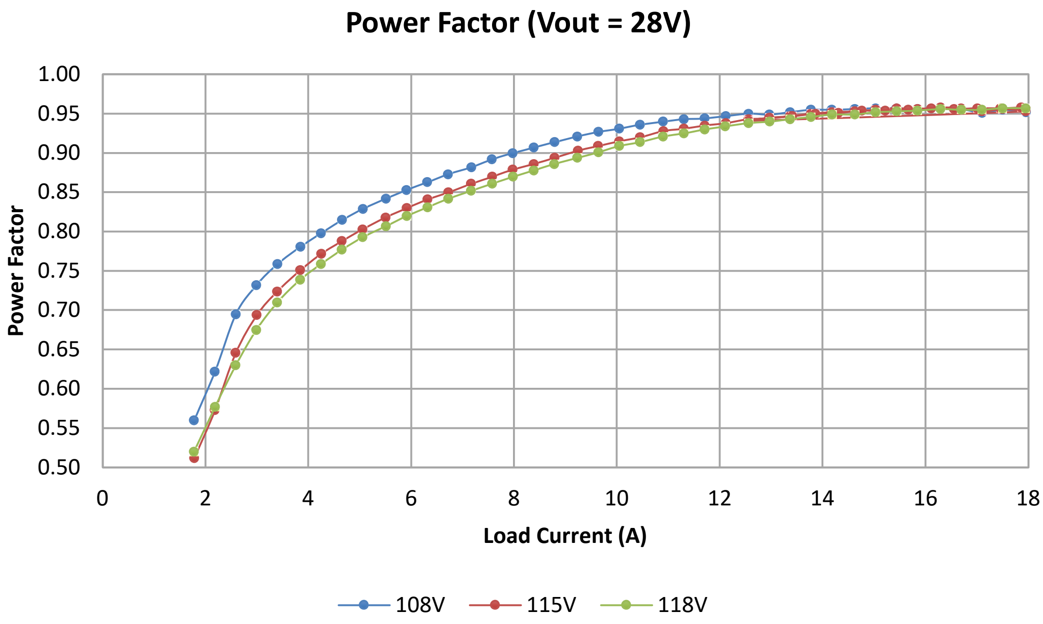
2.1.2 Efficiency vs. Output Current (400Hz)



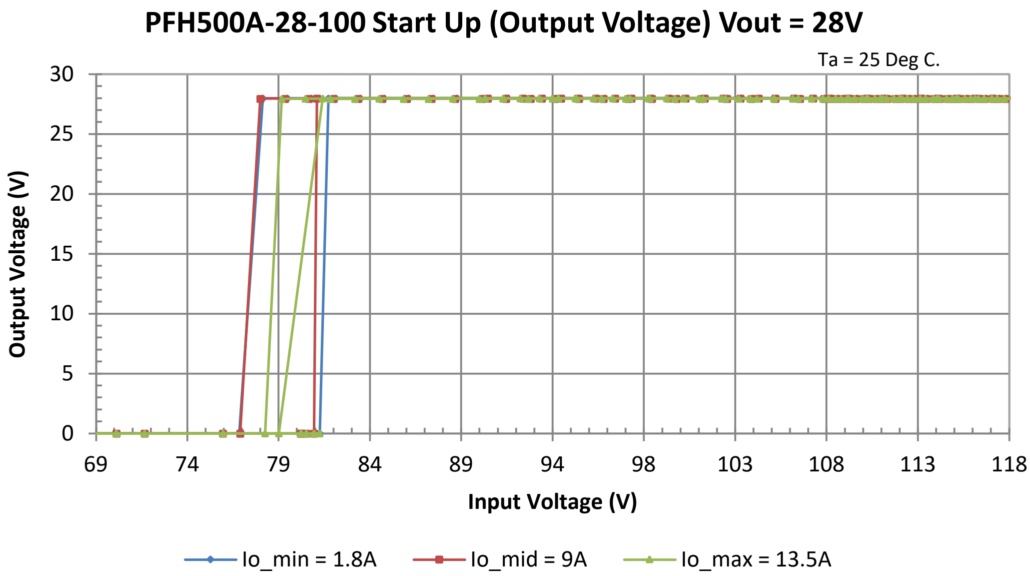




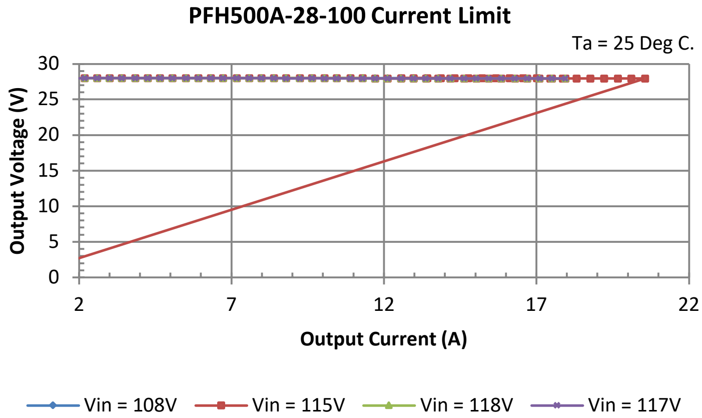
2.1.3 Power Factor (PF) vs. Output Current (400Hz)

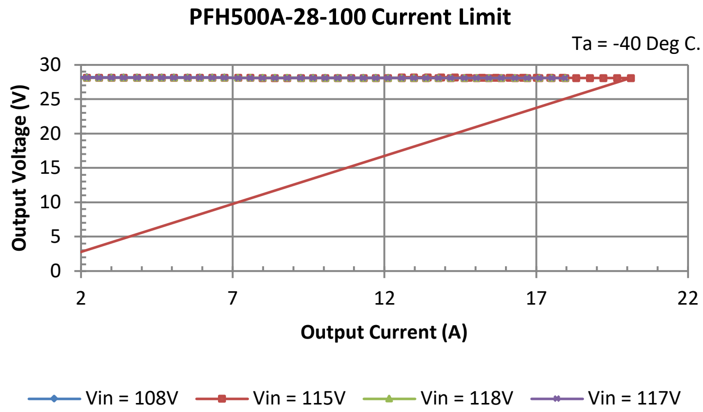


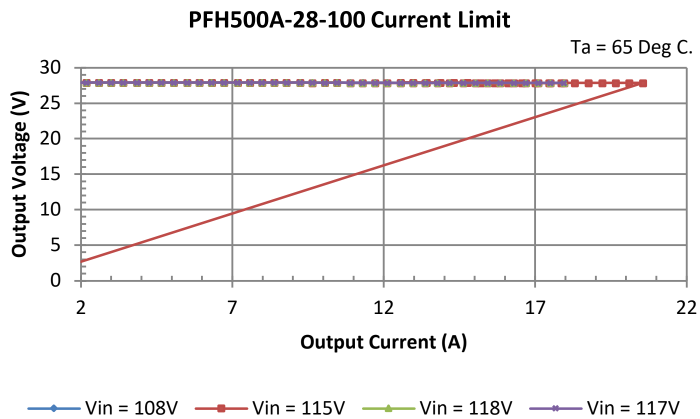
2.1.4 Output behavior with input line sweep (400Hz)



2.2 Over Current Protection (OCP) Characteristics (Refer to section 1.1.2 for Test Setup) (400Hz)

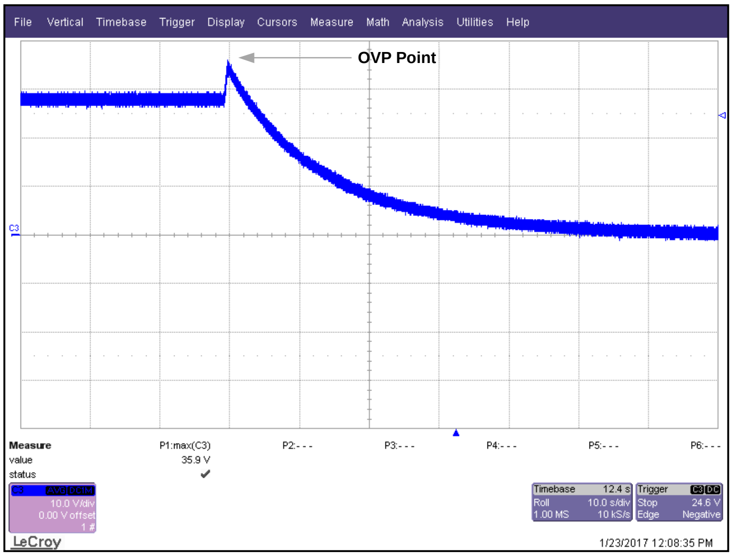






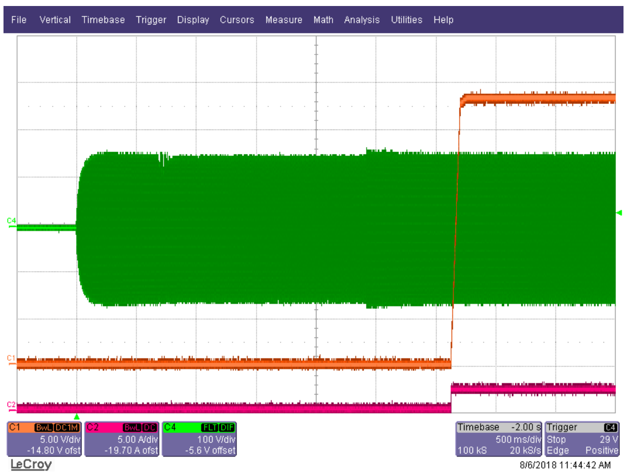
2.3 Over Voltage Protection (OVP) Characteristics (Refer to Section 1.1.2 for Test Setup)

Conditions:	I_O = 0%
	T_a = 25 °C
	V_{IN} = 115 VAC

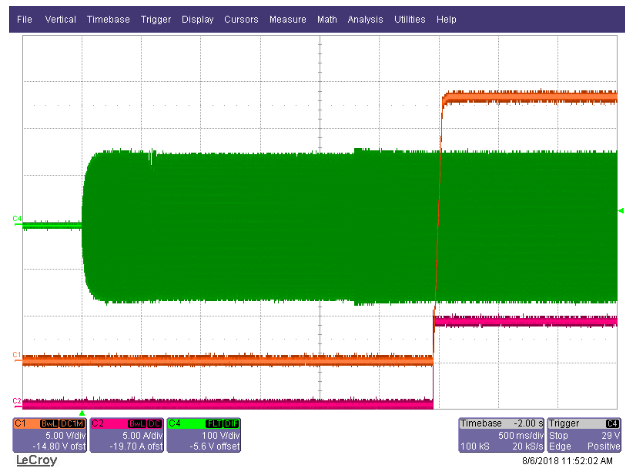


2.4 Output Rise and Fall Characteristic with AC Turn On

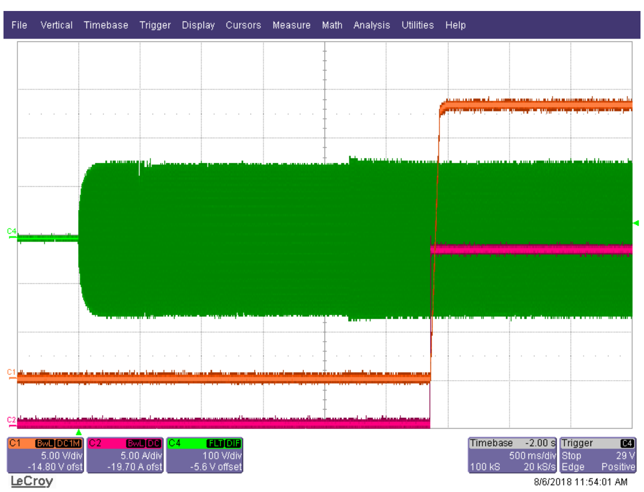
115Vac 400Hz 2A load
Ch1 = Vout, Ch2 = Iout, Ch4 = Vin



115Vac 400Hz 9A load
Ch1 = Vout, Ch2 = Iout, Ch4 = Vin

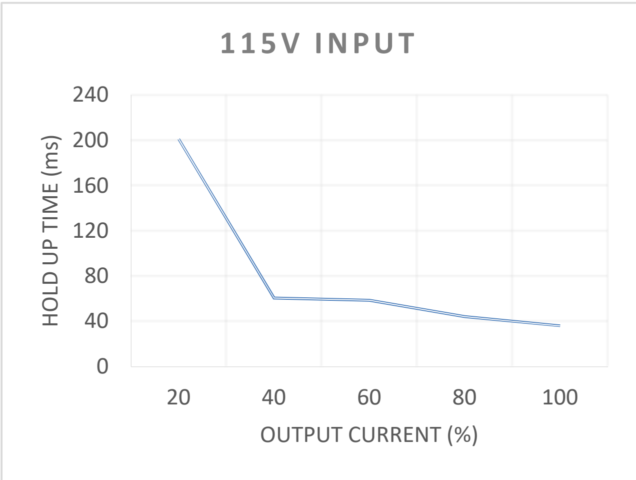


115Vac 400Hz 18A load
Ch1 = Vout, Ch2 = Iout, Ch4 = Vin

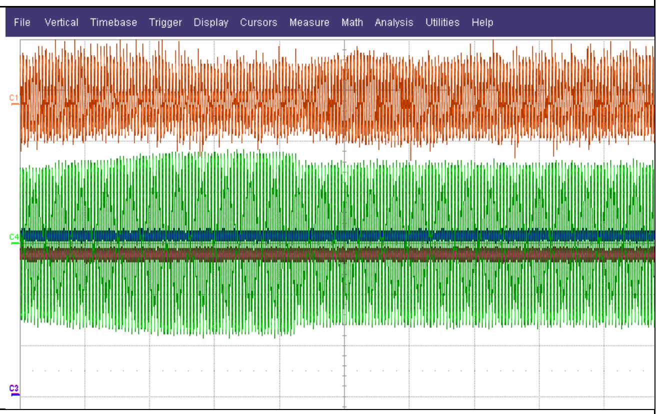
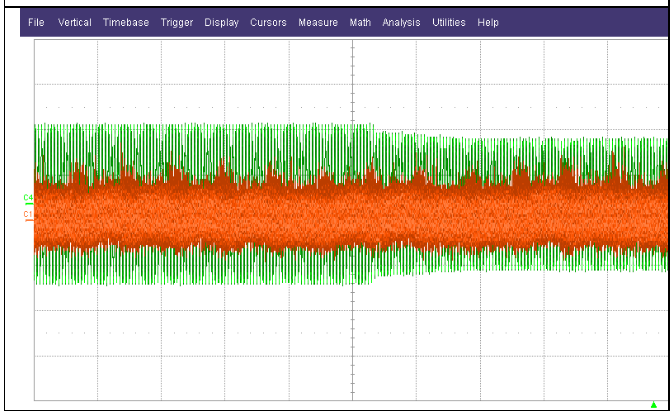
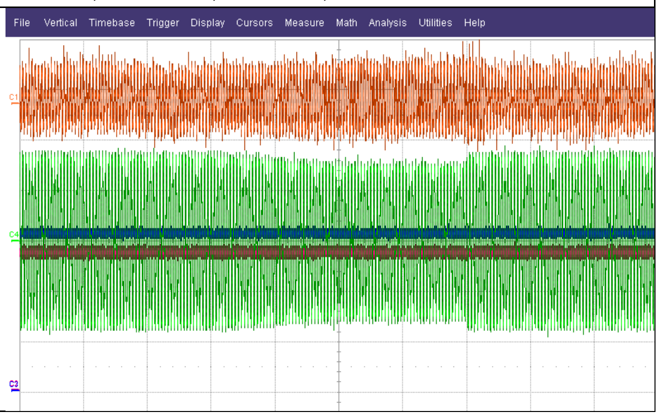


2.5 Hold Up Time Characteristic

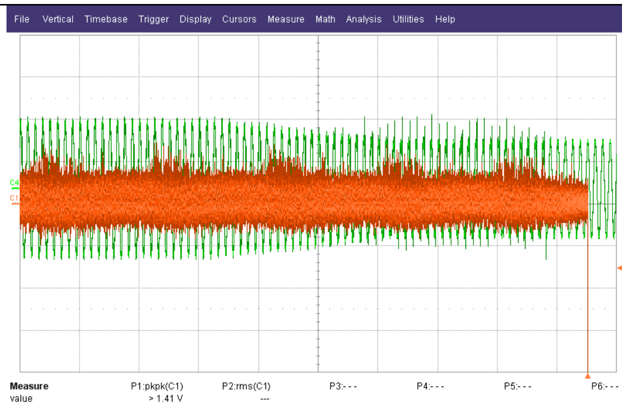
V_{IN} = 115 VAC; V_O = 28 VDC



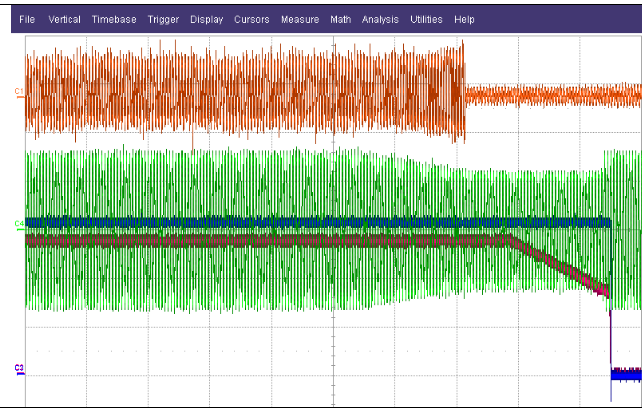
2.6 Dynamic Line Response (400Hz)

Line step for 108Vac to 118Vac in 0.08Sec @ 18A load Ch1 = Vout (AC Coupled), Ch4 = Vin	Line step for 108Vac to 118Vac in 0.1Sec @ 18A load Ch1 = Iin, Ch2 = Vout, Ch3 = Iout,Ch4 = Vin
	
Line step for 118Vac to 108Vac in 0.08Sec @ 18A load Ch1 = Vout (AC Coupled), Ch4 = Vin	Line step for 118Vac to 108Vac in 0.1Sec @ 18A load Ch1 = Iin, Ch2 = Vout, Ch3 = Iout,Ch4 = Vin
	

Line step for 108Vac to 80Vac in 0.08Sec @ 18A load
Ch1 = Vout (AC Coupled), Ch4 = Vin

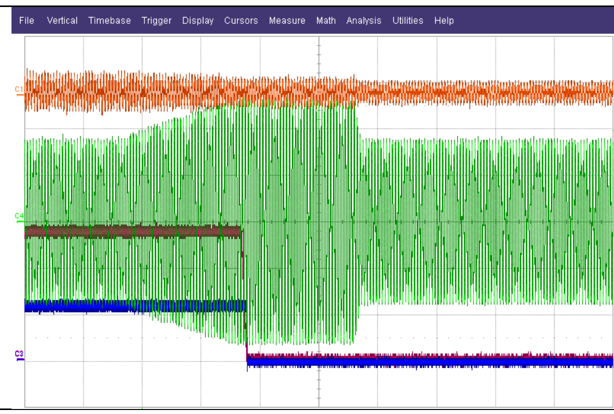


Line step for 108Vac to 80Vac in 0.1Sec @ 18A load
Ch1 = Iin, Ch2 = Vout, Ch3 = Iout,Ch4 = Vin



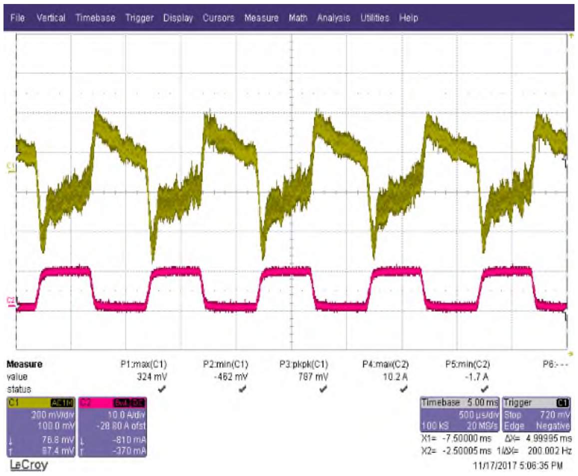
Line step for 118Vac to 180Vac in 0.08Sec @ 18A load
Ch1 = Vout (AC Coupled), Ch4 = Vin

Line step for 118Vac to 180Vac in 0.1Sec @ 18A load
Ch1 = Iin, Ch2 = Vout, Ch3 = Iout,Ch4 = Vin

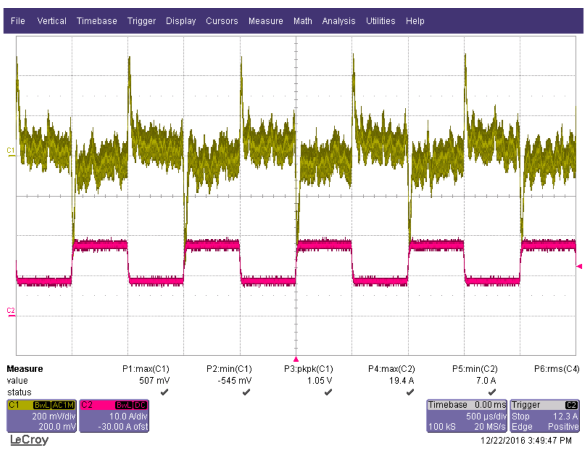


2.7 Dynamic Load Response

V_{IN} = 115 VAC; Load Step: 0% (0A) ↔ 50% (9A), 1kHz
CH1: V_O (AC Couple); CH2: $I_{O;}$ Slew rate: 0.1A/us

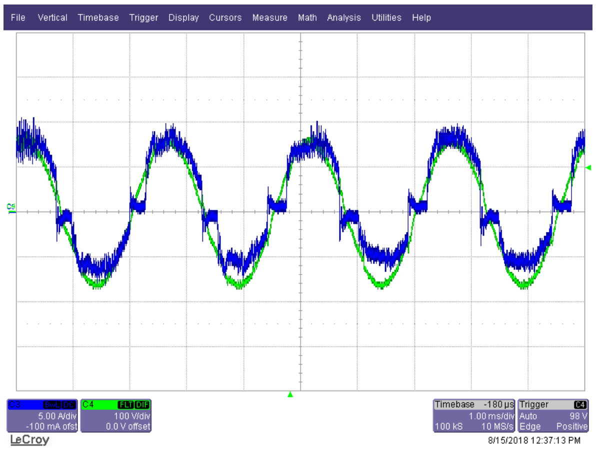


V_{IN} = 115 VAC; Load Step: 50% (9A) ↔ 100% (18A), 1kHz
CH1: V_O (AC Couple); CH2: $I_{O;}$ Slew rate: 0.1A/us



2.8 Input Current Waveform

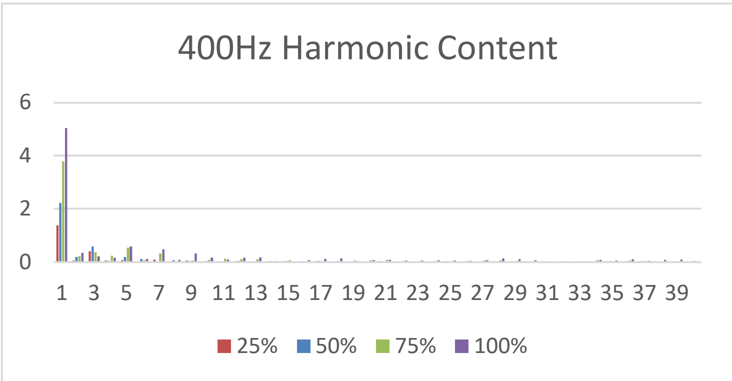
Condition:	I_O = 100%
	T_a = 25 °C

V_{IN} = 115 VAC 400Hz; I_O = 18A CH3: I_{IN}; CH4: V_{IN}	**Current (THD = 22%) (PF = 0.93)**
	

2.9 Input Current Harmonics

Condition:	I_O = 100%
	T_a = 25°C

V_{IN} = 115 VAC

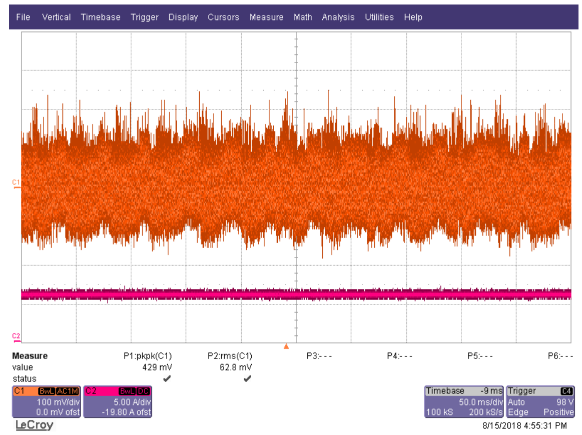


2.10 Output Ripple and Noise

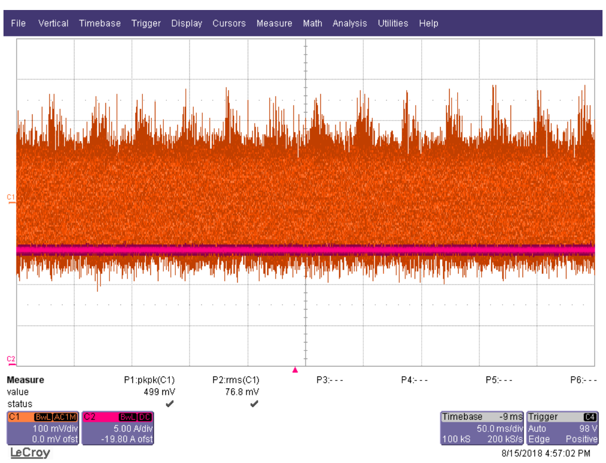
T_a = 25 °C

V_{IN} = 115 VAC 400Hz; I_O = 2A; V_O = 28 VDC
Ch1 = Vout (ac coupled) Ch2 = Iout

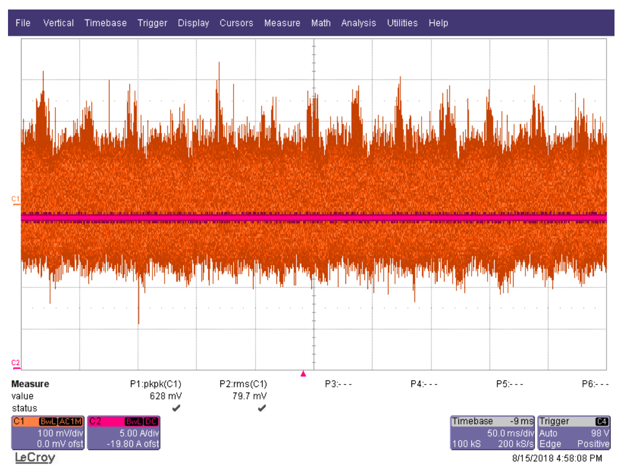
V_{IN} = 115 VAC 400Hz; I_O = 6A; V_O = 28 VDC
Ch1 = Vout (ac coupled) Ch2 = Iout



V_{IN} = 115 VAC 400Hz; I_O = 14A; V_O = 28 VDC
Ch1 = Vout (ac coupled) Ch2 = Iout



V_{IN} = 115 VAC 400Hz; I_O = 18A; V_O = 28 VDC
Ch1 = Vout (ac coupled) Ch2 = Iout



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