Supplemental test data
(参考資料)

Date of issue: Jun. 22, 2011

Test Data

Model Number: OZP-120-24

Model Name: DC POWER SUPPLY

INPUT: 85V – 264V AC, 50 / 60 Hz

OUTPUT: 24 V 5.0A ($9.0\ A_{peak}$)

Minimum load : 0W
Rated load :120W
Peak output power: 216W

Approved by : Makoto Urasue (QA manager)

Designed by : Naoki Yamamoto (R&D engineer)

Tested by : Kohei Sawada (Evaluation test engineer)

Nipron Co., Ltd.

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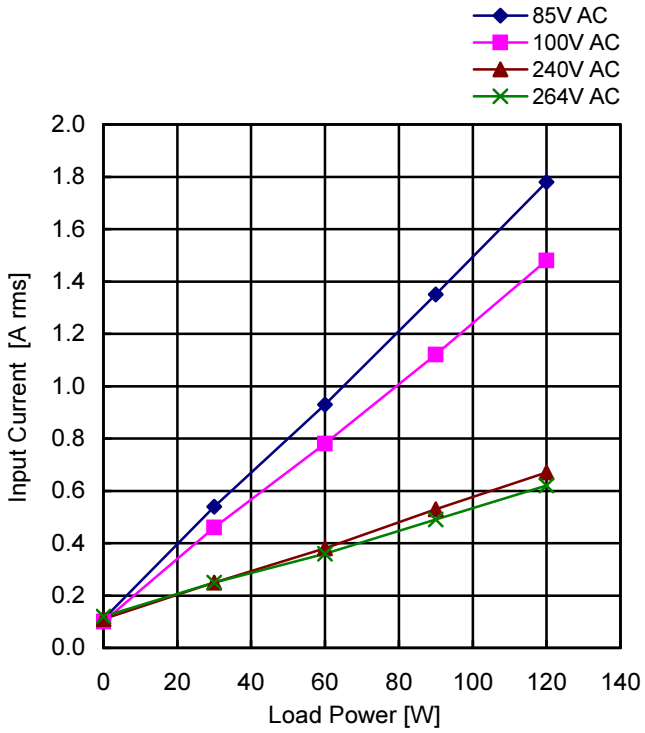
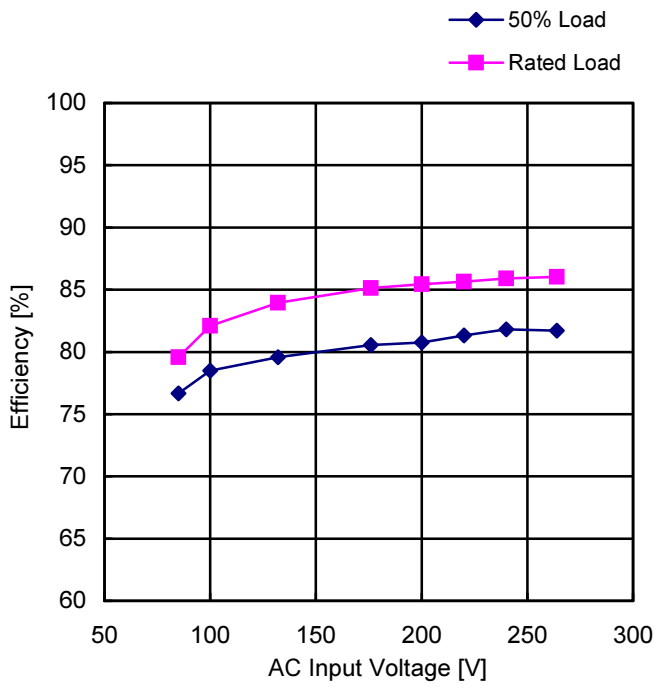
Model	OZP-120-24	Temperature: 25℃
Item	Input Current（by Load Power）	



Load Power [W]	Input Current [A rms]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	0.11	0.10	0.11	0.12
30.0	0.54	0.46	0.25	0.25
60.0	0.93	0.78	0.38	0.36
90.0	1.35	1.12	0.53	0.49
120.0	1.78	1.48	0.67	0.62

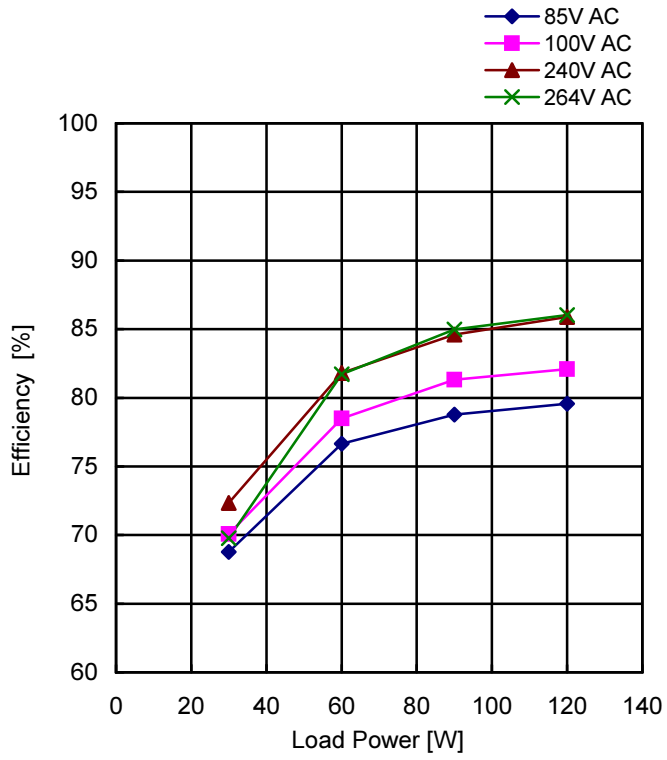
Model	OZP-120-24	Temperature: 25℃
Item	Efficiency	

■Efficiency(by Input Voltage)



AC Input Voltage [V]	Efficiency [%]	
	50% Load	Rated Load
85	76.66	79.57
100	78.50	82.08
132	79.58	83.95
176	80.55	85.14
200	80.77	85.44
220	81.32	85.65
240	81.80	85.90
264	81.71	86.03

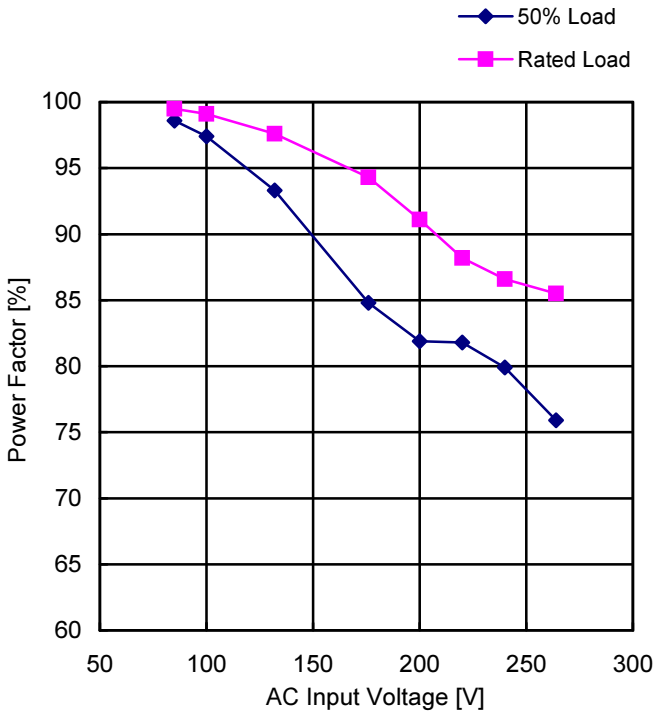
■Efficiency(by Load Power)



Load Power [W]	Efficiency [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
30.0	68.77	70.08	72.34	69.77
60.0	76.66	78.50	81.80	81.71
90.0	78.77	81.31	84.60	84.98
120.0	79.57	82.08	85.90	86.03

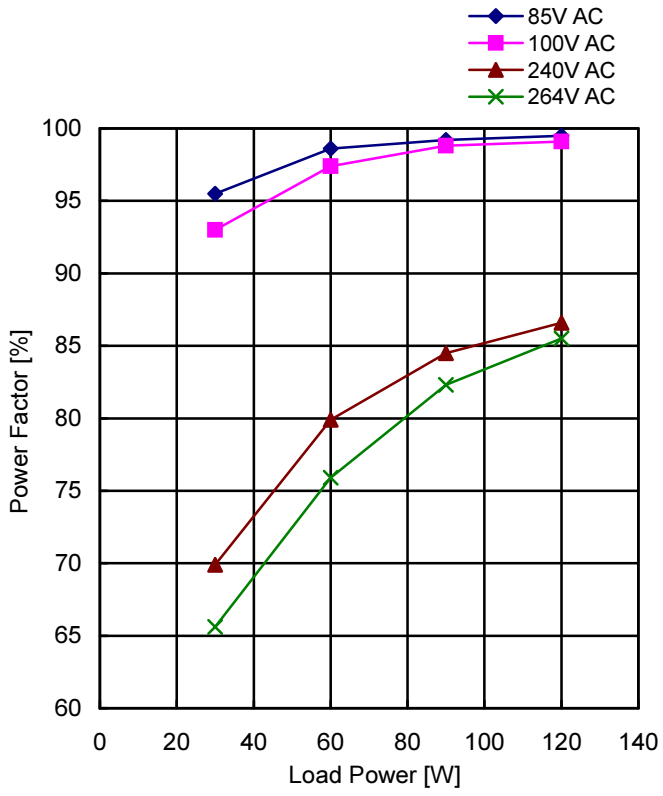
Model	OZP-120-24	Temperature: 25℃
Item	Power Factor	

■Power Factor(by Input Voltage)



AC Input Voltage [V]	Power Factor [%]	
	50% Load	Rated Load
85	98.6	99.5
100	97.4	99.1
132	93.3	97.6
176	84.8	94.3
200	81.9	91.1
220	81.8	88.2
240	79.9	86.6
264	75.9	85.5

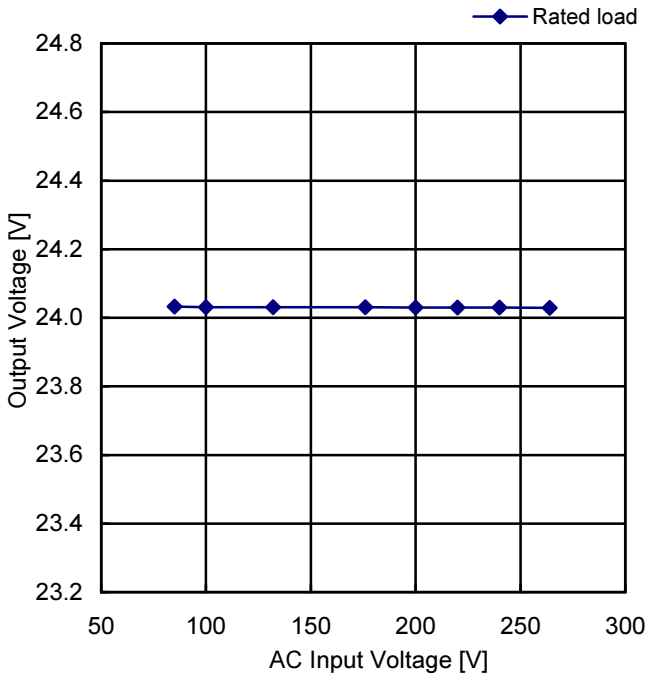
■Power Factor (by Load Power)



Load Power [W]	Power Factor [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
30.0	95.5	93.0	69.9	65.6
60.0	98.6	97.4	79.9	75.9
90.0	99.2	98.8	84.5	82.3
120.0	99.5	99.1	86.6	85.5

Model	OZP-120-24	Temperature: 25℃
Item	Line Regulation	

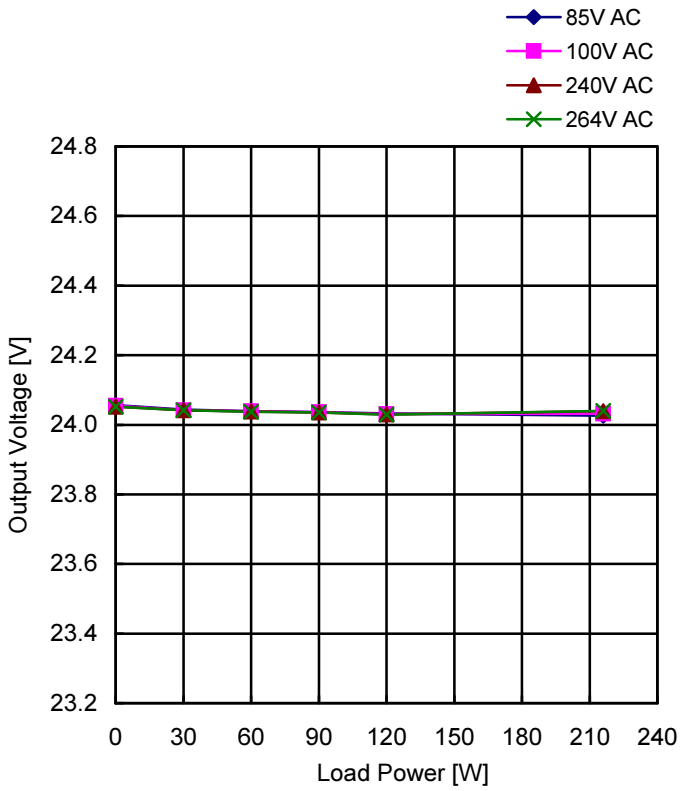
24V/5A



AC Input Voltage [V]	Output Voltage [V]
85	24.033
100	24.031
132	24.031
176	24.031
200	24.030
220	24.030
240	24.030
264	24.029

Model	OZP-120-24	Temperature: 25℃
Item	Load Regulation	

24V



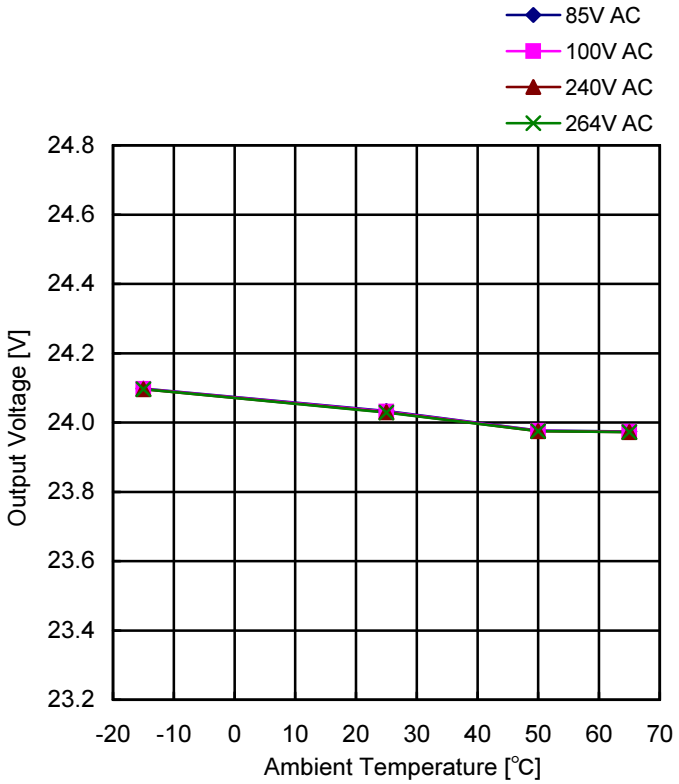
Load Power [W]	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	24.057	24.055	24.052	24.052
30.0	24.044	24.042	24.042	24.042
60.0	24.039	24.039	24.038	24.037
90.0	24.036	24.036	24.035	24.035
120.0	24.033	24.031	24.030	24.029
216.0	24.026	24.032	24.039	24.040

Load Condition

Load Power [W]	Load Current [A]
	24V
0.0	0.00
30.0	1.25
60.0	2.50
90.0	3.75
120.0	5.00
216.0	9.00

Model	OZP-120-24
Item	Ambient Temperature Drift

24V



Ambient Temp. (℃)	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
-15	24.098	24.097	24.096	24.096
25	24.033	24.031	24.030	24.029
50	23.977	23.976	23.975	23.975
65	23.974	23.973	23.972	23.972

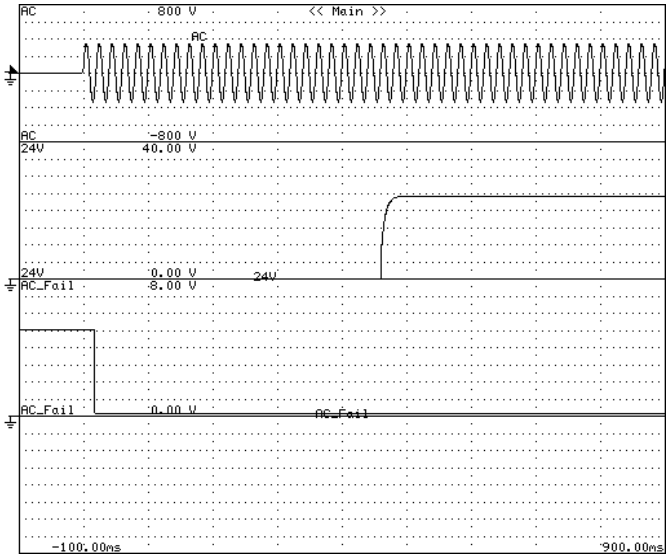
Load Condition

Ambient Temp. (℃)	Load Current [A]
	24V
-15	5.00
25	5.00
50	5.00
65	2.92

Model	OZP-120-24	Temperature: 25℃
Item	Output Rise Characteristics (at AC Power ON)	

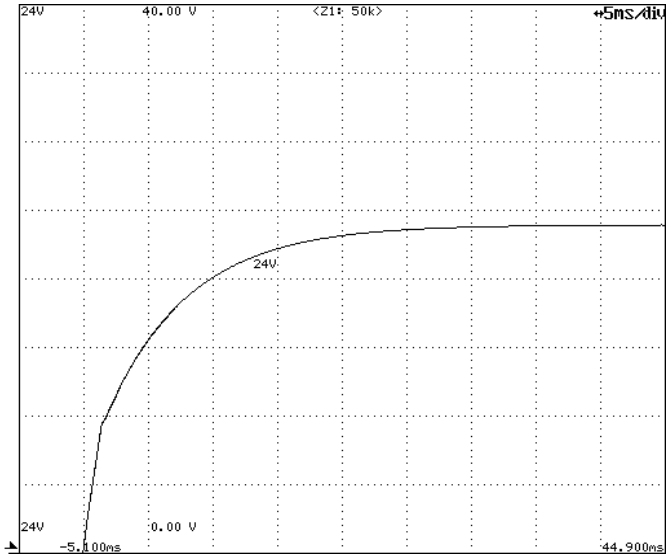
Input: 100V AC
Load: Rated Load

Timebase Range: 100ms/div



All Output Start-up Sequence

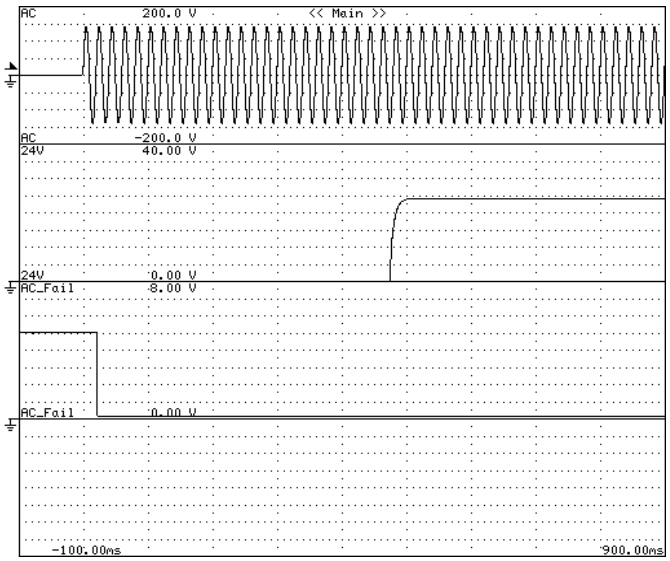
Vertical Sensitivity: 5V/div
Timebase Range: 5ms/div



24V DC Output Rise Characteristics

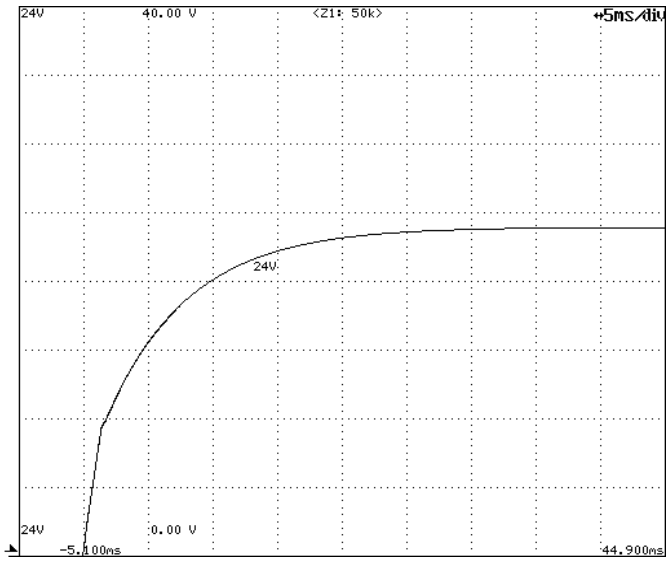
Input: 240V AC
Load: Rated Load

Timebase Range: 100ms/div



All Output Start-up Sequence

Vertical Sensitivity: 5V/div
Timebase Range: 5ms/div

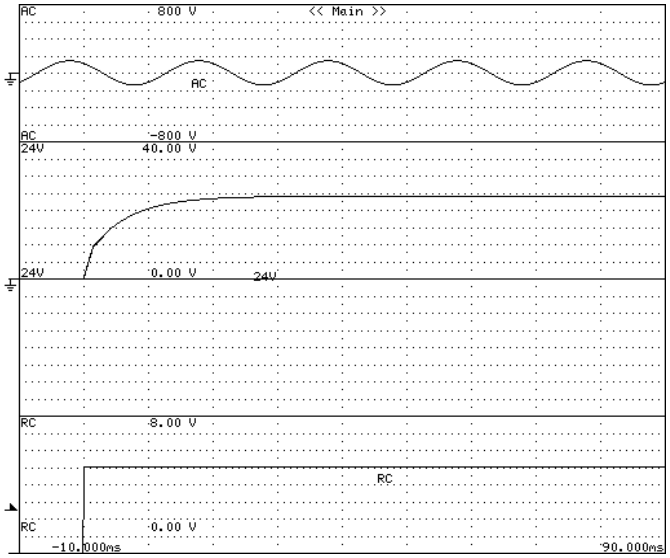


24V DC Output Rise Characteristics

Model	OZP-120-24	Temperature: 25℃
Item	Output Rise Characteristics (at Remote ON)	

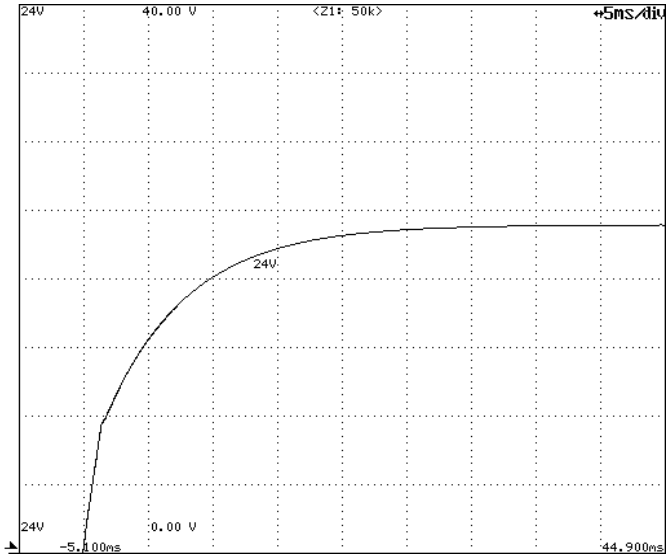
Input: 100V AC
Load: Rated Load

Timebase Range: 10ms/div



All Output Start-up Sequence

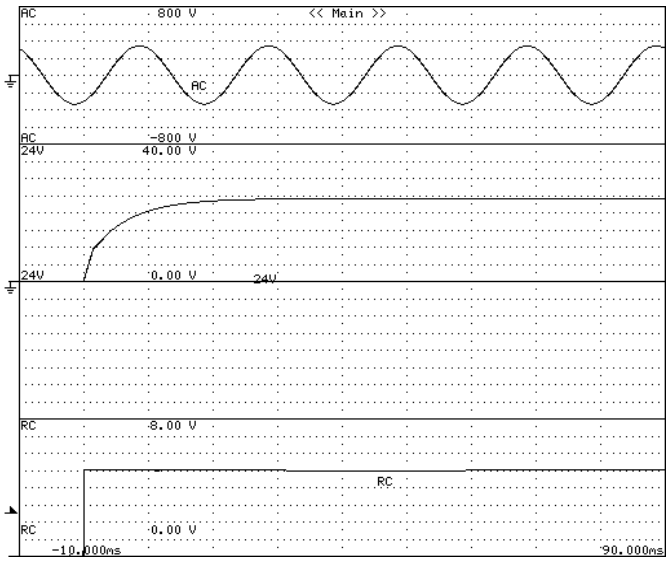
Vertical Sensitivity: 5V/div
Timebase Range: 5ms/div



24V DC Output Rise Characteristics

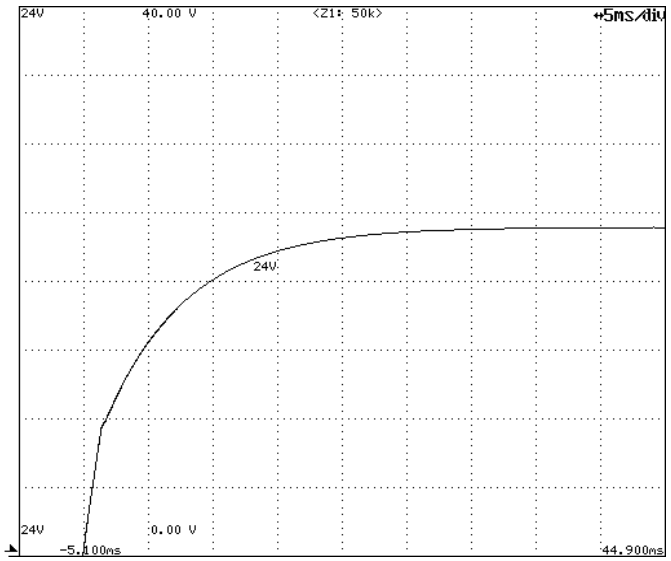
Input: 240V AC
Load: Rated Load

Timebase Range: 10ms/div



All Output Start-up Sequence

Vertical Sensitivity: 5V/div
Timebase Range: 5ms/div

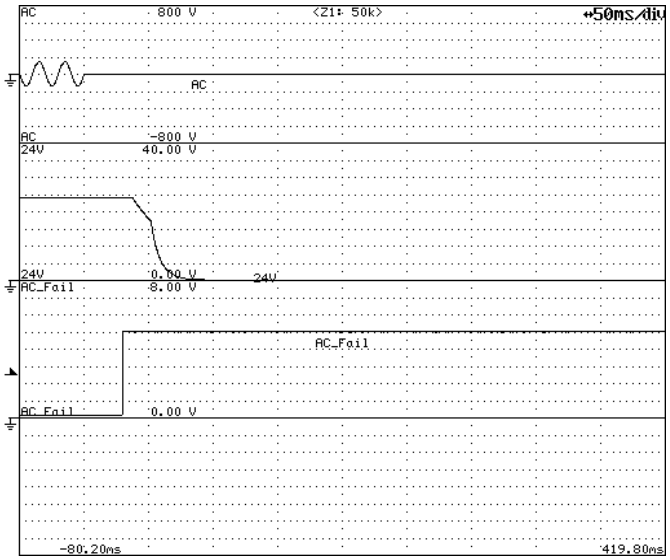


24V DC Output Rise Characteristics

Model	OZP-120-24	Temperature: 25℃
Item	Output Fall Characteristics (at AC Power OFF)	

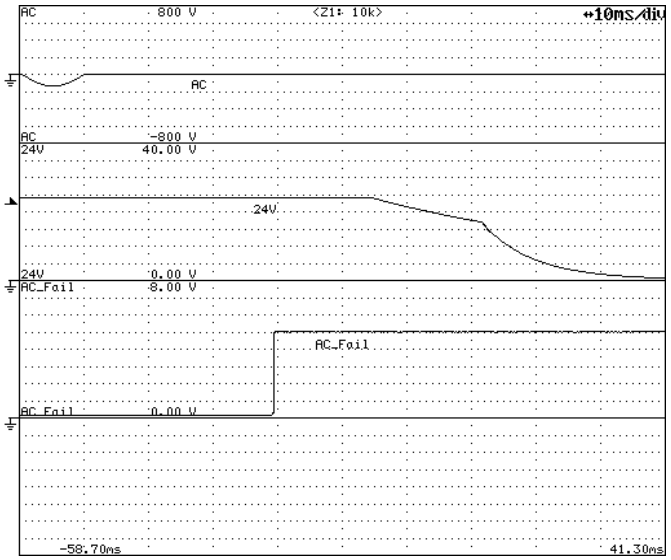
Input: 100V AC
Load: Rated Load

Timebase Range: 50ms/div



Output Fall Characteristics

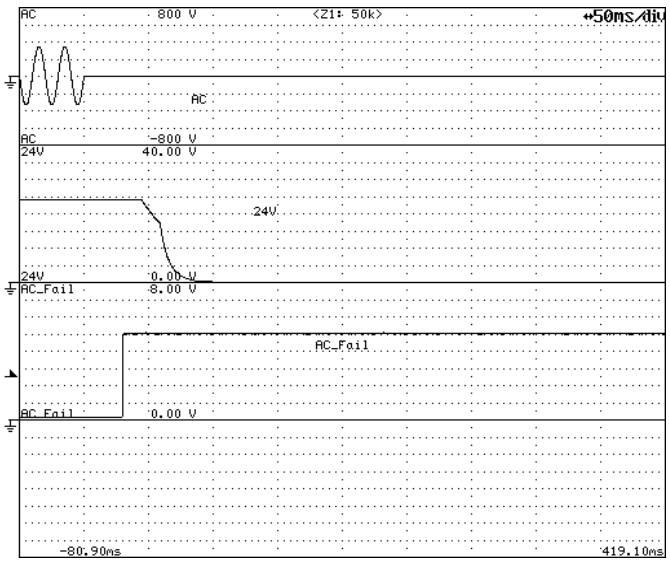
Timebase Range: 10ms/div



Output Fall Characteristics (magnification)

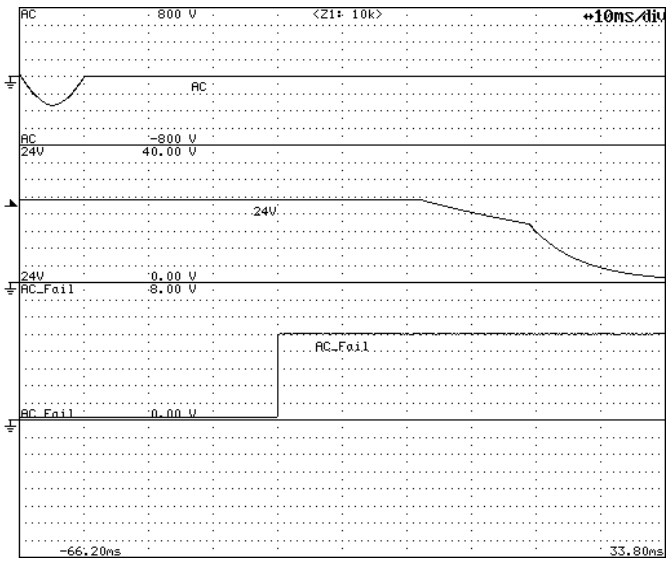
Input: 240V AC
Load: Rated Load

Timebase Range: 50ms/div



Output Fall Characteristics

Timebase Range: 10ms/div

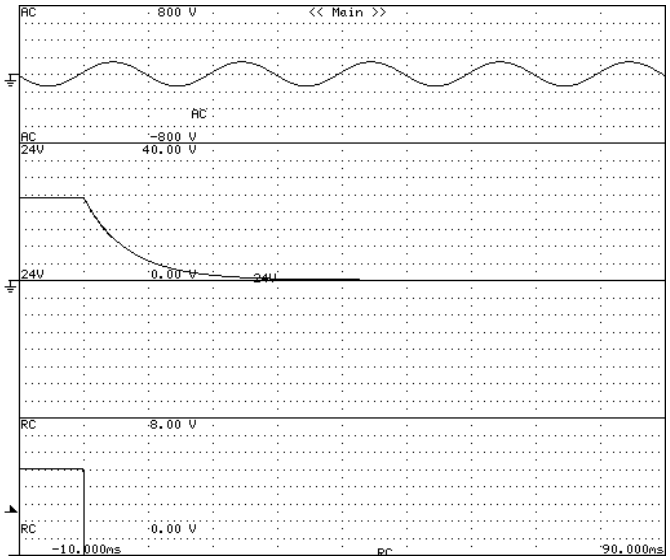


Output Fall Characteristics (magnification)

Model	OZP-120-24	Temperature: 25℃
Item	Output Fall Characteristics (at Remote OFF)	

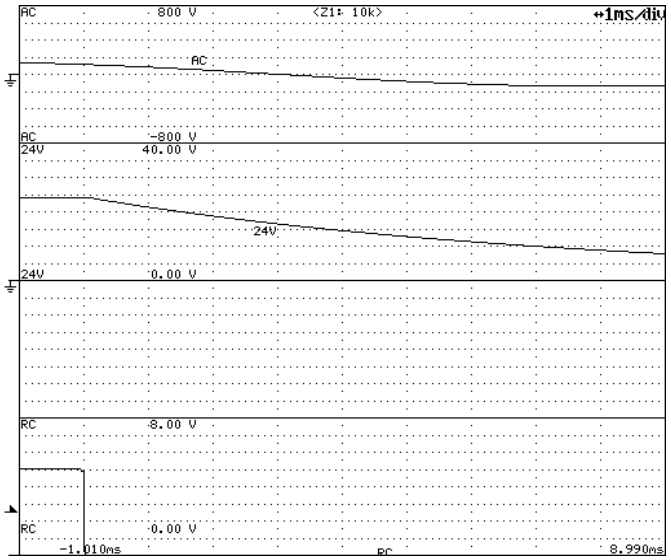
Input: 100V AC
Load: Rated Load

Timebase Range: 10ms/div



Output Fall Characteristics

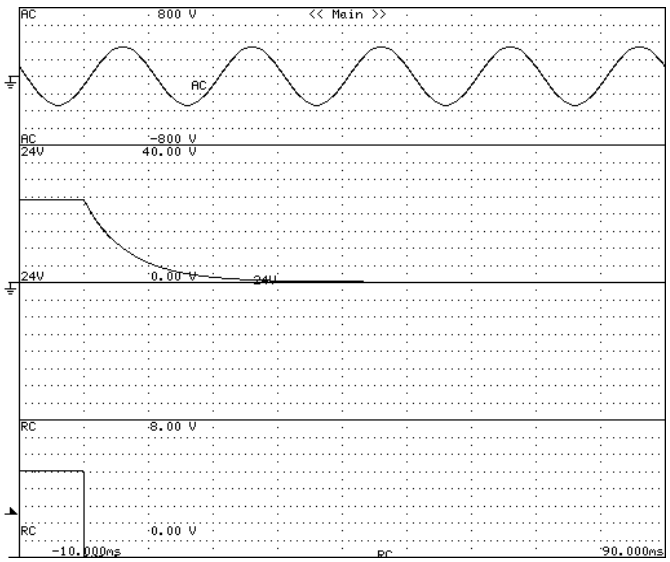
Timebase Range: 1ms/div



Output Fall Characteristics (magnification)

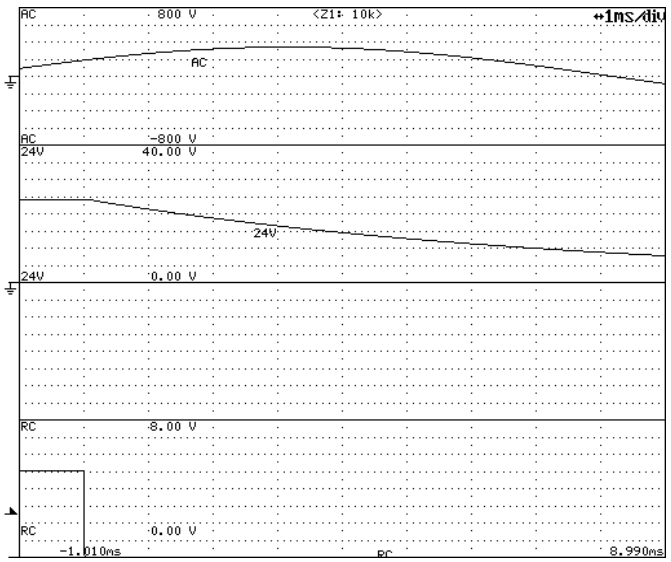
Input: 240V AC
Load: Rated Load

Timebase Range: 10ms/div



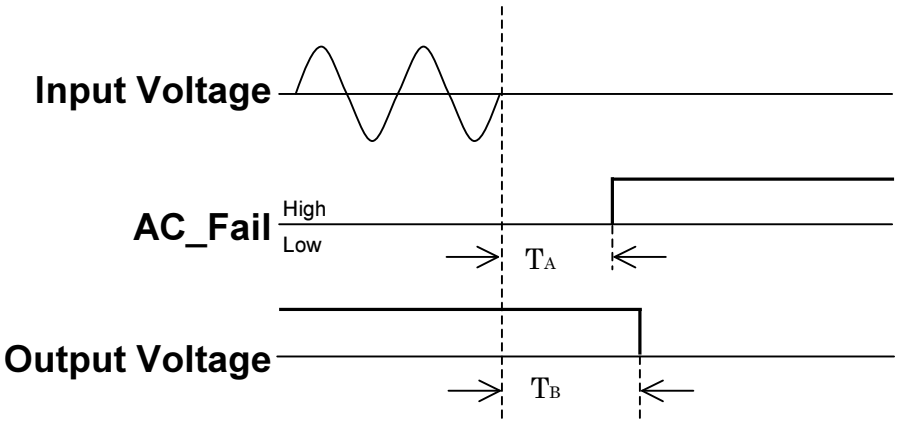
Output Fall Characteristics

Timebase Range: 1ms/div

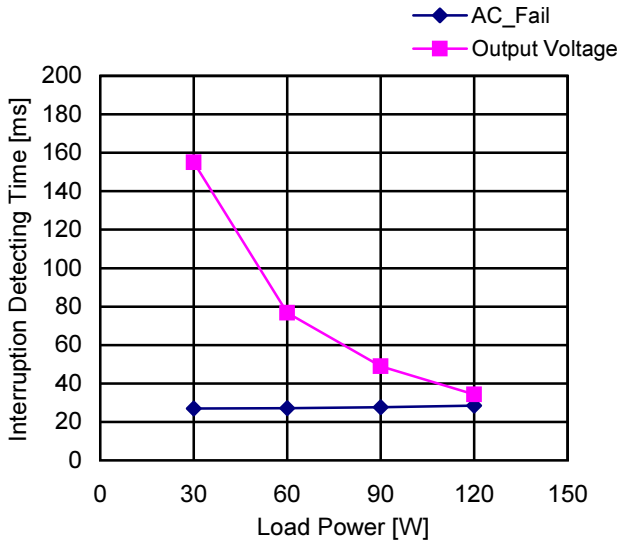


Output Fall Characteristics (magnification)

Model	OZP-120-24	Temperature: 25℃
Item	Instantaneous Interruption Compensation (by Load Power)	

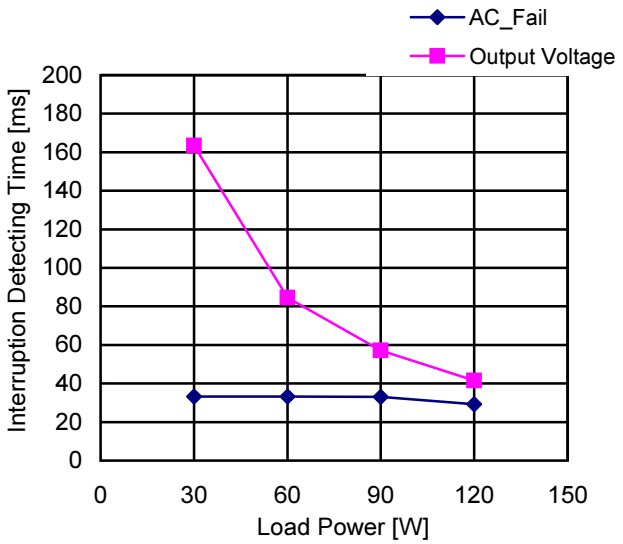


Input Voltage:100V AC



Load Power [W]	Interruption Detecting Time [ms]	
	AC_Fail	Ouput Voltage
	TA	TB
30.0	26.9	155.1
60.0	27.1	76.8
90.0	27.7	48.9
120.0	28.5	34.3

Input Voltage:240V AC



Load Power [W]	Interruption Detecting Time [ms]	
	AC_Fail	Ouput Voltage
	TA	TB
30.0	33.2	163.4
60.0	33.2	84.6
90.0	33.1	57.1
120.0	29.3	41.6

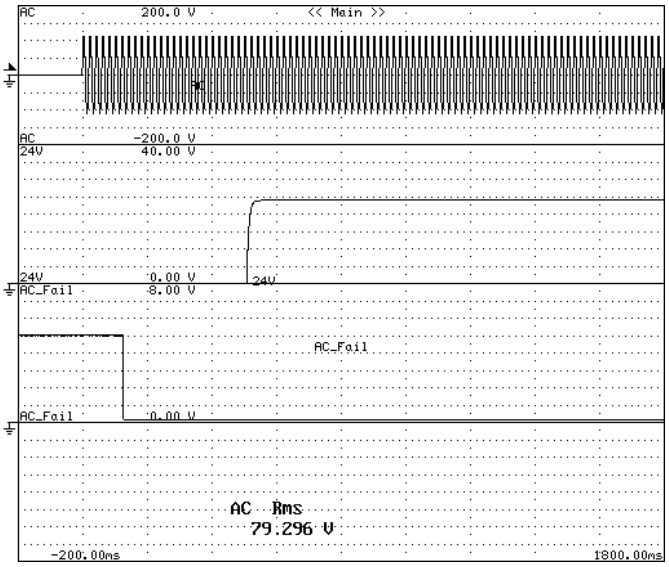
Model	OZP-120-24	Temperature: 25℃
Item	Start-Up Voltage	

Timebase Range: 200ms/div
Load: Rated Load

AC Input

+24V

AC_FAIL



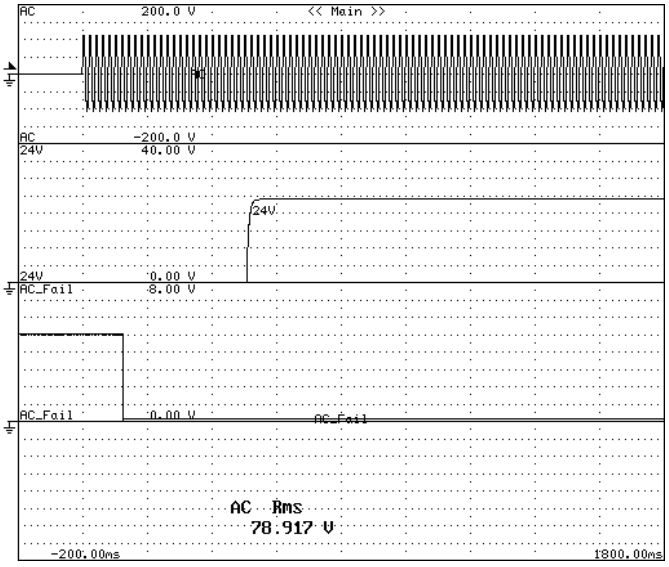
Start-up Voltage: 79.3V AC

Timebase Range: 200ms/div
Load: Minimum Load

AC Input

+24V

AC_FAIL



Start-up Voltage: 78.9V AC

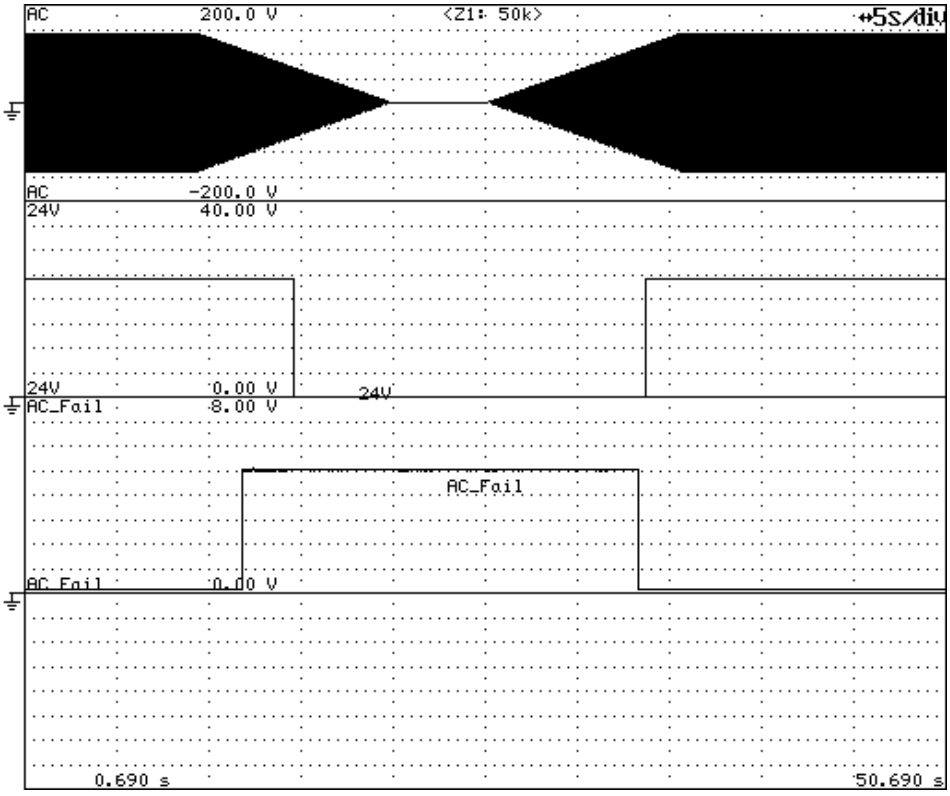
Model	OZP-120-24	Temperature: 25℃
Item	Input Voltage Sweep Up/Down	

Timebase Range: 5s/div
Load: Rated Load

AC Input

+24V

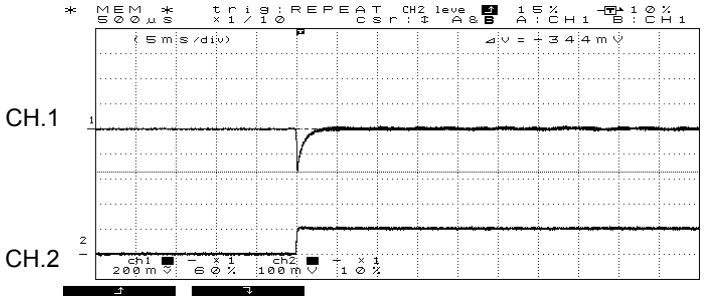
AC_FAIL



Sweep Rate: 10Vave/sec

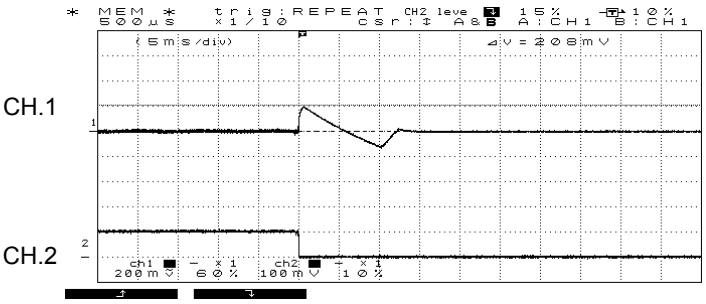
Model	OZP-120-24	Temperature: 25℃
Item	Dynamic Load Response	

+24V DC Output Transient Response Waveforms

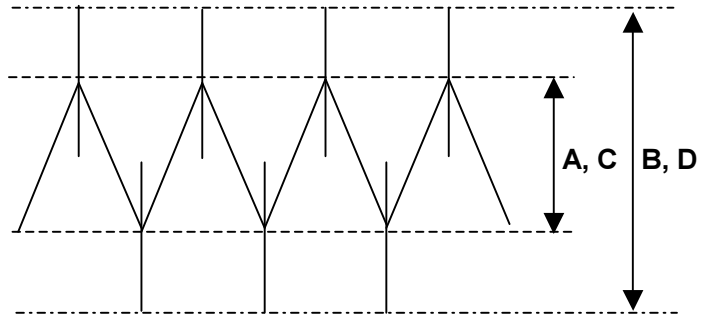


Waveform 1	
CH1	Measuring Point: DC Output Voltage
	Vertical Sensitivity: 200mV/div
CH2	Measuring Point: DC Output Current
	Vertical Sensitivity: 5A/div
Timebase Range	5ms/div
Condition	Input: 100V AC

Note:
Rated Load(5A) ⇌ Minimum load(0A)



Model	OZP-120-24	Load: Rated Load
Item	Ambient Temperature Drift	



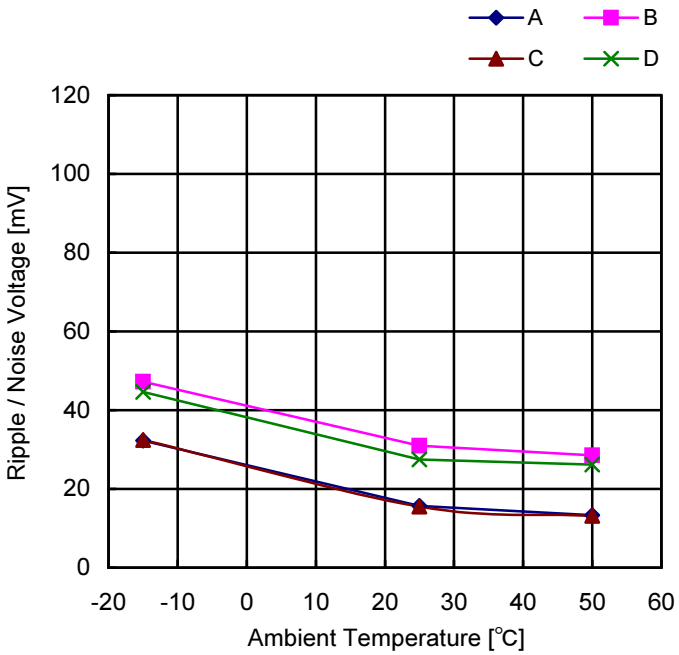
at 100V AC

A: Ripple Voltage (mV_{P-P})
B: Noise Voltage (mV_{P-P})

at 240V AC

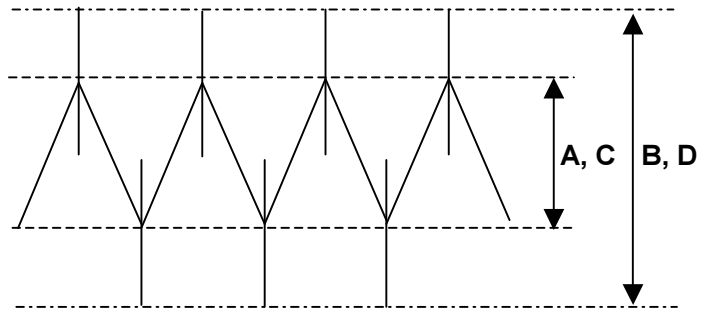
C: Ripple Voltage (mV_{P-P})
D: Noise Voltage (mV_{P-P})

24V



Ambient Temp. [℃]	Ripple / Noise Voltage [mV]			
	A	B	C	D
-15	32.3	47.2	32.4	44.6
25	15.7	31.0	15.5	27.5
50	13.3	28.5	13.2	26.2

Model	OZP-120-24	Temperature : 25℃
Item	Ambient Temperature Drift	



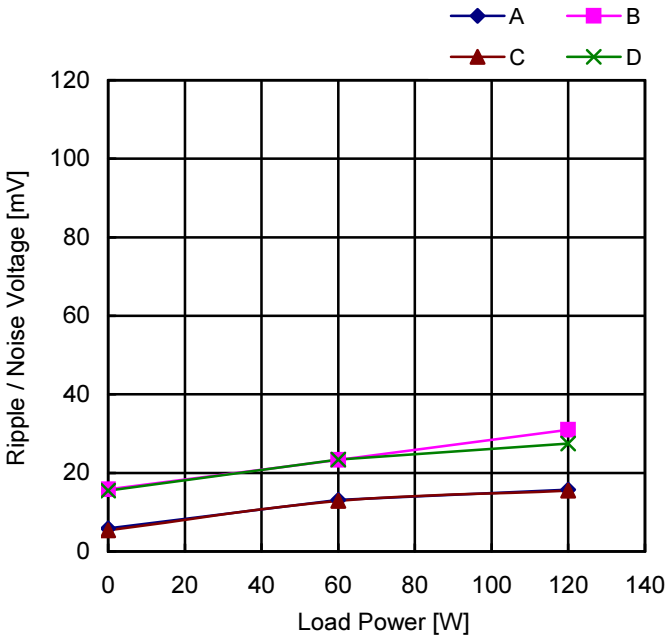
at 100V AC

A: Ripple Voltage (mV_{P-P})
B: Noise Voltage (mV_{P-P})

at 240V AC

C: Ripple Voltage (mV_{P-P})
D: Noise Voltage (mV_{P-P})

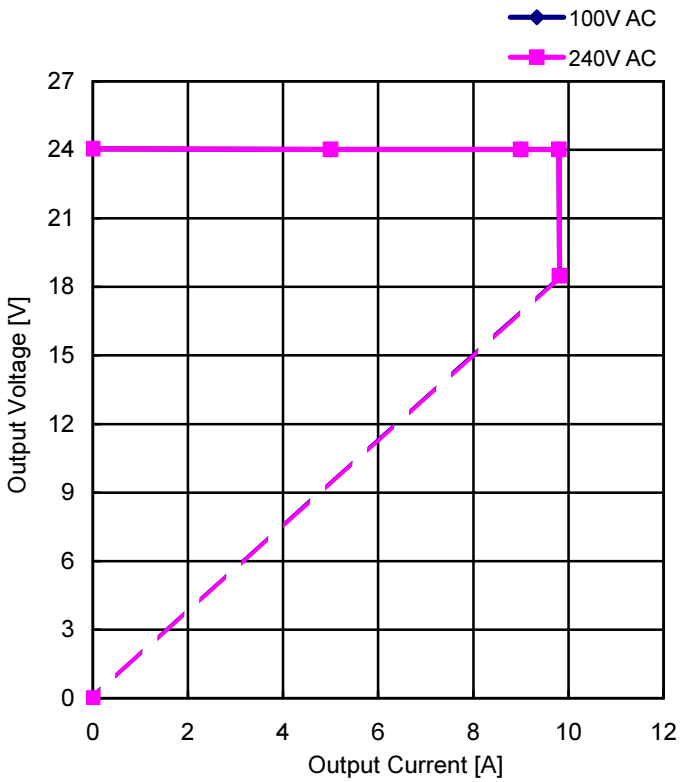
24V



Load Power [W]	Ripple / Noise Voltage [mV]			
	A	B	C	D
0	5.9	15.8	5.4	15.5
60	13.1	23.3	12.9	23.4
120	15.7	31.0	15.5	27.5

Model	OZP-120-24	Temperature: 25℃
Item	Over-Current Protection	

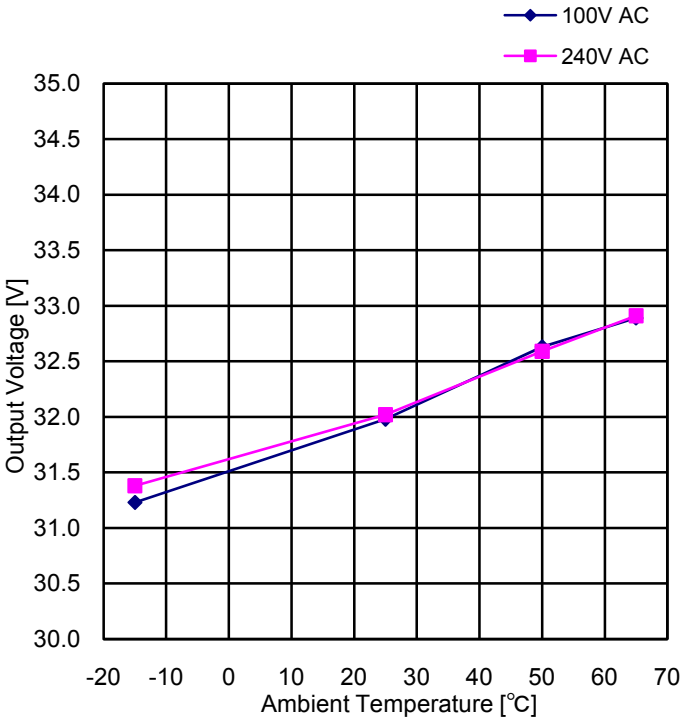
V-I Characteristics of 24V O.C.P



Input Voltage: 100V AC		Input Voltage: 240V AC	
Output Current [A]	Output Voltage [V]	Output Current [A]	Output Voltage [V]
0.00	24.04	0.00	24.04
5.00	24.02	5.00	24.02
9.00	24.02	9.00	24.02
9.80	24.01	9.80	24.01

Model	OZP-120-24	Load: Minimum Load
Item	Over-Voltage Protection	

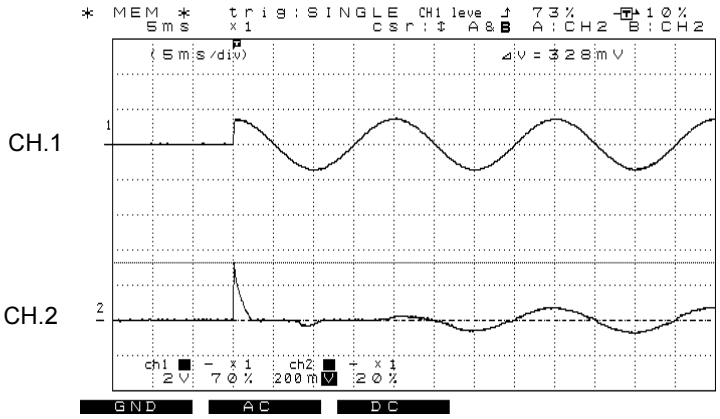
24V



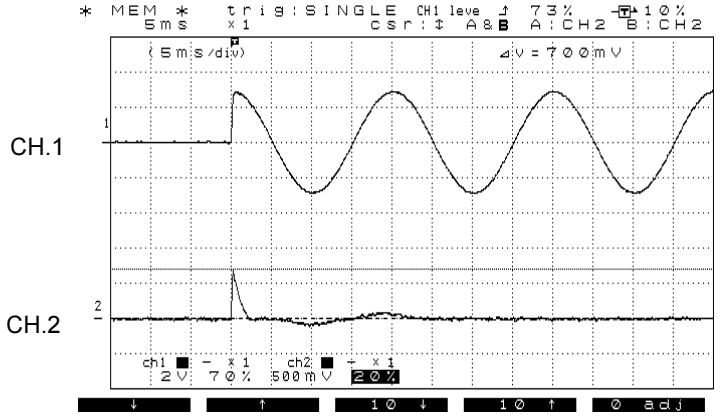
Ambient Temp. [℃]	Output Voltage [V]	
	100V AC	240V AC
-15	31.23	31.38
25	31.98	32.02
50	32.63	32.59
65	32.89	32.91

Model	OZP-120-24	Temperature: 25℃
Item	Inrush Current	Load: Rated Load

Inrush Current Waveforms

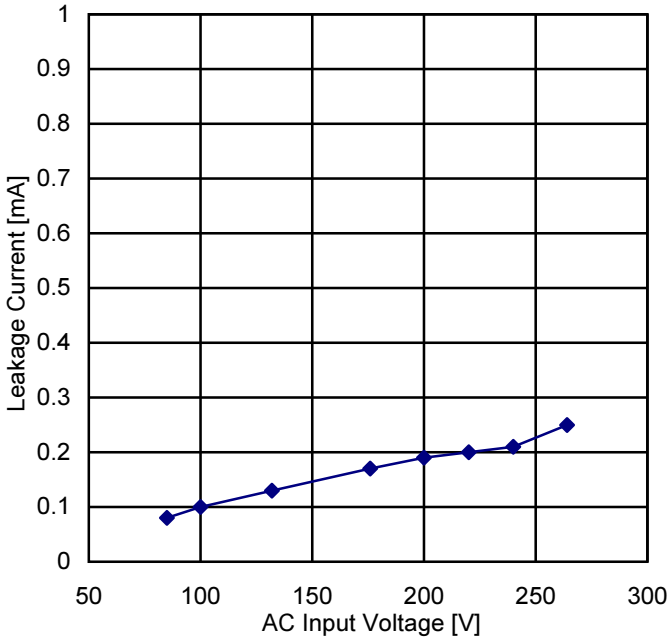


Waveform 1	
CH1	Measuring Point: AC Input Voltage
	Range: 200V/div
CH2	Measuring Point: AC Input Current
	Range: 10A/div
Timebase Range	5ms/div
Conditions	Input: 100V AC Load: Rated Load
Note: Inrush Current: 16.4A	



Waveform 2	
CH1	Measuring Point: AC Input Voltage
	Range: 200V/div
CH2	Measuring Point: AC Input Current
	Range: 25A/div
Timebase Range	5ms/div
Conditions	Input: 200V AC Load: Rated Load
Note: Inrush Current: 35.0A	

Model	OZP-120-24	Load: Rated Load
Item	Leakage Current	



AC Input Voltage [V]	Leakage Current [mA]
85	0.08
100	0.10
132	0.13
176	0.17
200	0.19
220	0.20
240	0.21
264	0.25