Nipron

Supplemental test data
(参考資料)

Date of issue: May. 25, 2011

Test Data

Model Number: OZP-170-24

Model Name: DC POWER SUPPLY

INPUT: 85V – 264V AC, 50 / 60 Hz

OUTPUT: 24 V 7.0A (12.5 A_{peak})

Minimum load : 0W
Rated load :168W
Peak output power: 300W

Approved by : Makoto Urasue (QA manager)

Designed by : Naoki Yamamoto (R&D engineer)

Tested by : hirayuki Watanabe (Evaluation test engineer)

Nipron Co., Ltd.

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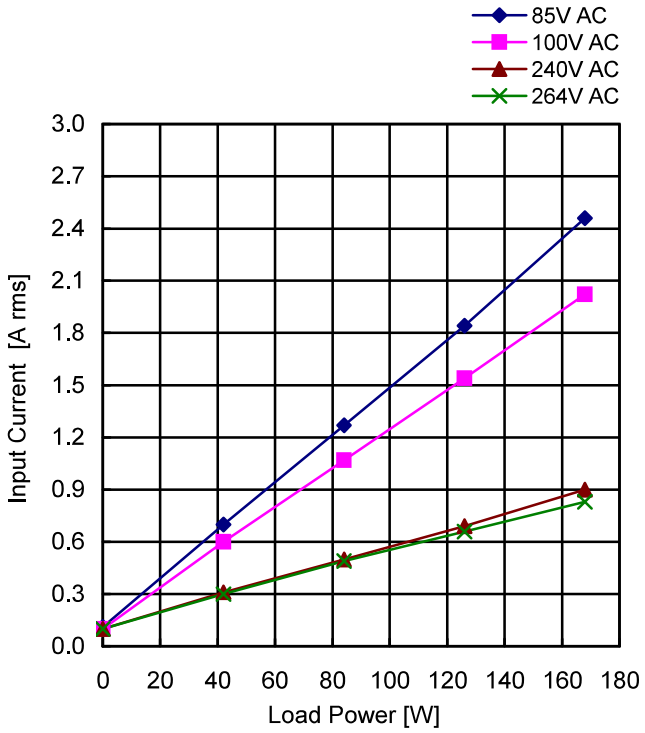
Supplemental test data
(参考資料)

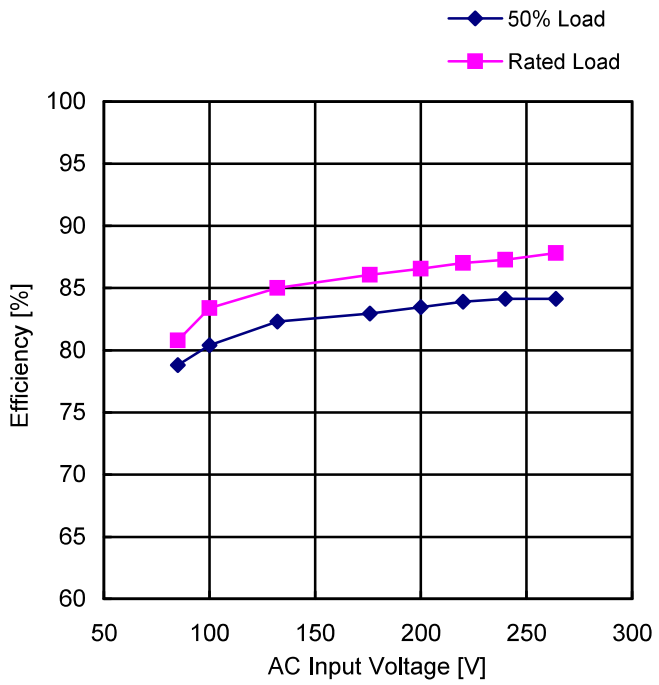
Model	OZP-170-24	Temperature: 25℃
Item	Input Current（by Load Power）	



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	0.10	0.10
42.0	0.70	0.60	0.31	0.30
84.0	1.27	1.07	0.50	0.49
126.0	1.84	1.54	0.69	0.66
168.0	2.46	2.02	0.90	0.83

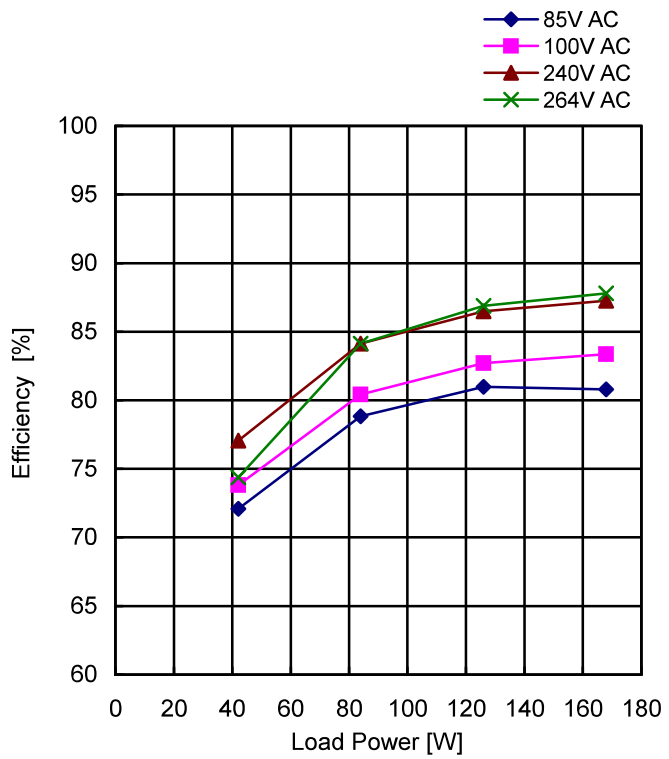
Model	OZP-170-24	Temperature: 25℃
Item	Efficiency	

■Efficiency(by Input Voltage)



AC Input Voltage [V]	Efficiency [%]	
	50% Load	Rated Load
85	78.81	80.78
100	80.40	83.37
132	82.31	84.99
176	82.94	86.07
200	83.45	86.54
220	83.91	87.00
240	84.13	87.27
264	84.13	87.81

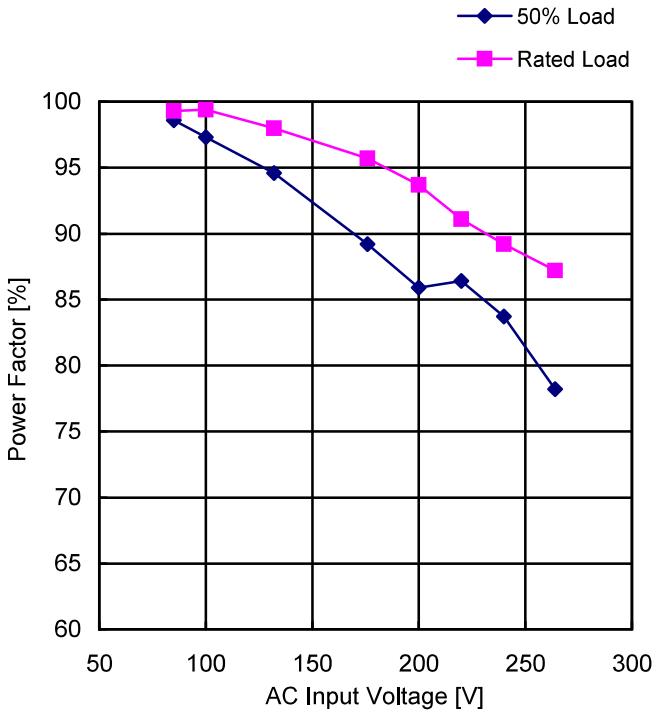
■Efficiency(by Load Power)



Load Power [W]	Efficiency [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
42.0	72.09	73.82	77.04	74.38
84.0	78.81	80.40	84.13	84.13
126.0	80.96	82.72	86.49	86.89
168.0	80.78	83.37	87.27	87.81

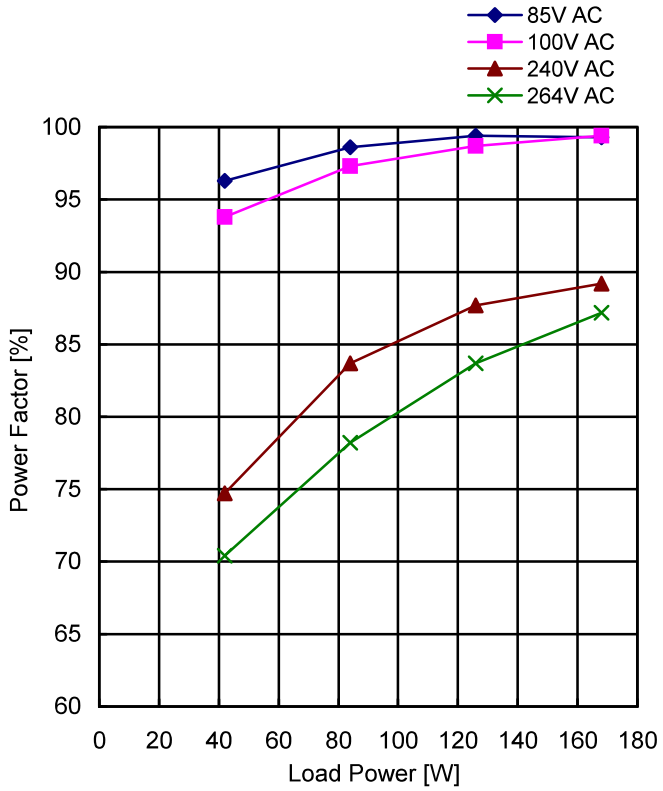
Model	OZP-170-24	Temperature: 25℃
Item	Power Factor	

■Power Factor(by Input Voltage)



AC Input Voltage [V]	Power Factor [%]	
	50% Load	Rated Load
85	98.6	99.3
100	97.3	99.4
132	94.6	98.0
176	89.2	95.7
200	85.9	93.7
220	86.4	91.1
240	83.7	89.2
264	78.2	87.2

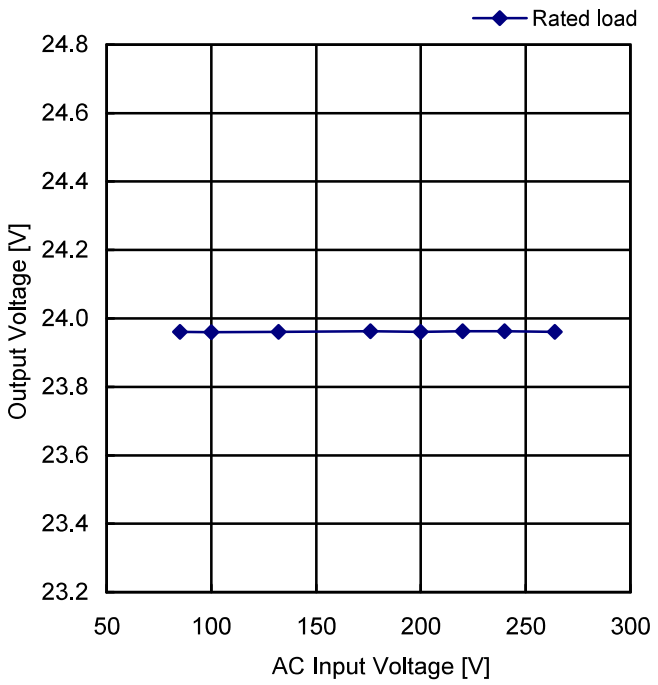
■Power Factor (by Load Power)



Load Power [W]	Power Factor [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
42.0	96.3	93.8	74.7	70.4
84.0	98.6	97.3	83.7	78.2
126.0	99.4	98.7	87.7	83.7
168.0	99.3	99.4	89.2	87.2

Model	OZP-170-24	Temperature: 25℃
Item	Line Regulation	

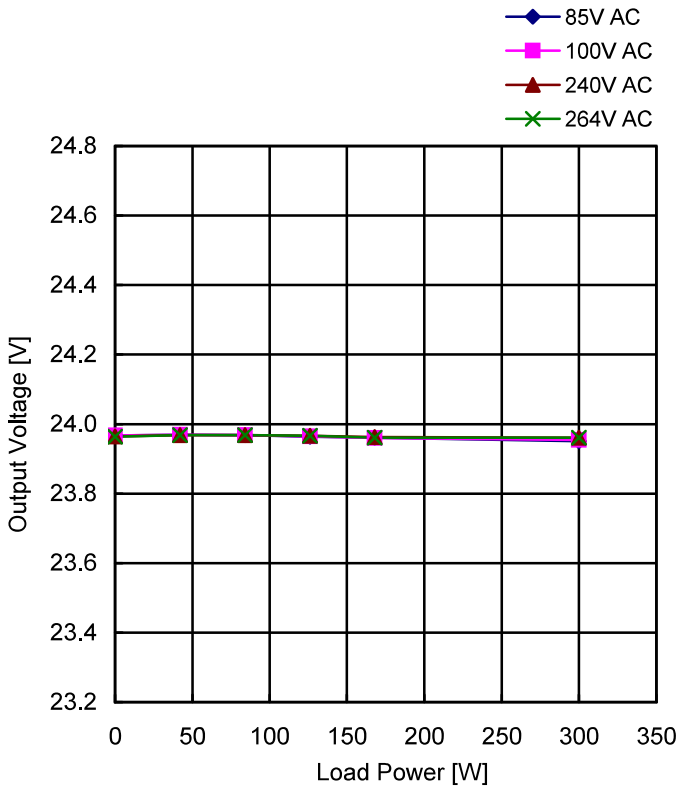
24V/7A



AC Input Voltage [V]	Output Voltage [V]
85	23.961
100	23.960
132	23.961
176	23.963
200	23.961
220	23.963
240	23.963
264	23.961

Model	OZP-170-24	Temperature: 25℃
Item	Load Regulation	

24V



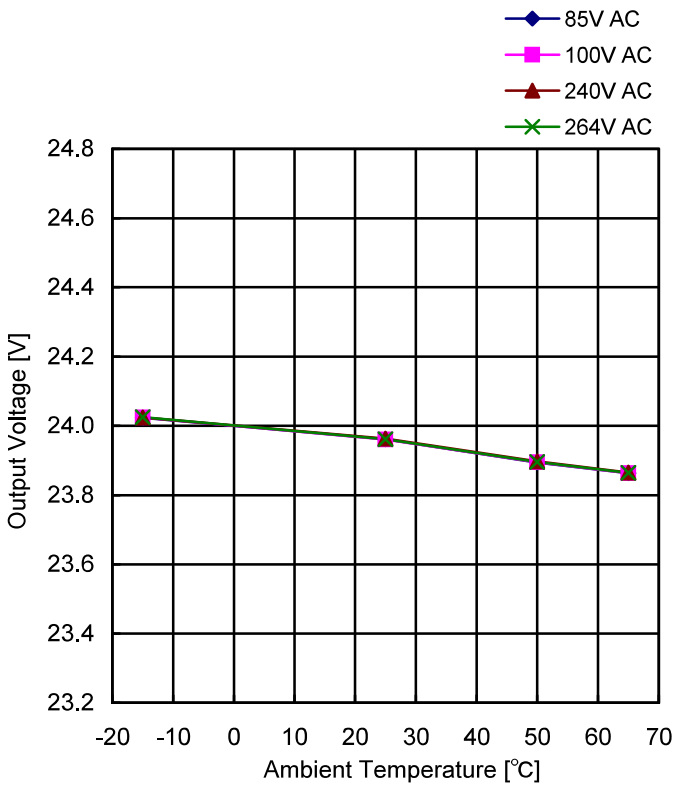
Load Power [W]	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	23.967	23.967	23.965	23.964
42.0	23.969	23.969	23.968	23.968
84.0	23.968	23.968	23.968	23.968
126.0	23.964	23.965	23.966	23.966
168.0	23.961	23.960	23.963	23.961
300.0	23.951	23.954	23.961	23.961

Load Condition

Load Power [W]	Load Current [A]
	24V
0.0	0.00
42.0	1.75
84.0	3.50
126.0	5.25
168.0	7.00
300.0	12.50

Model	OZP-170-24
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	24.023	24.024	24.024	24.025
25	23.961	23.960	23.963	23.961
50	23.894	23.895	23.897	23.896
65	23.863	23.863	23.865	23.864

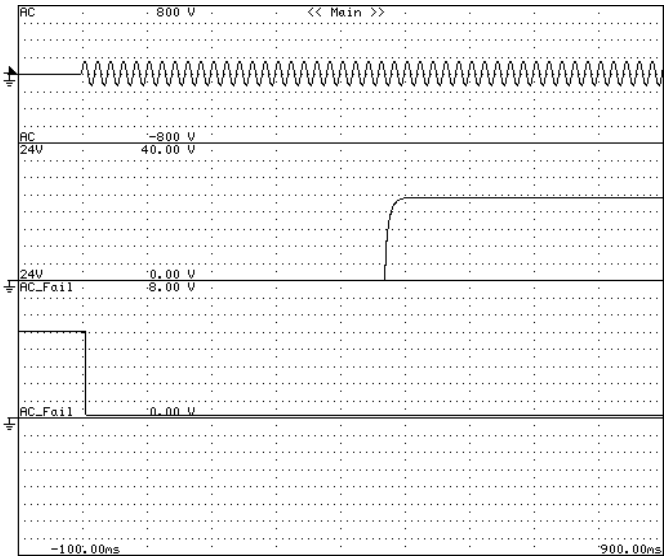
Load Condition

Ambient Temp. (℃)	Load Current [A]
	24V
-15	7.00
25	7.00
50	7.00
65	4.58

Model	OZP-170-24	Temperature: 25℃
Item	Output Rise Characteristics (at AC Power ON)	

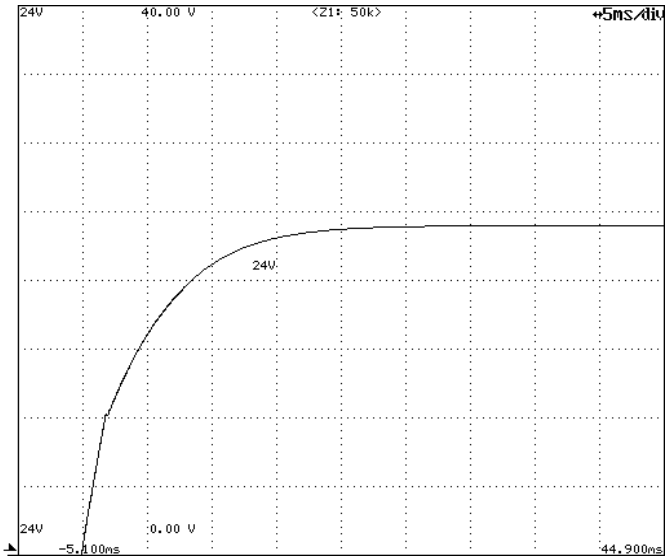
Input: 100V AC
Load: Rated Load

Timebase Range: 100ms/div



All Output Start-up Sequence

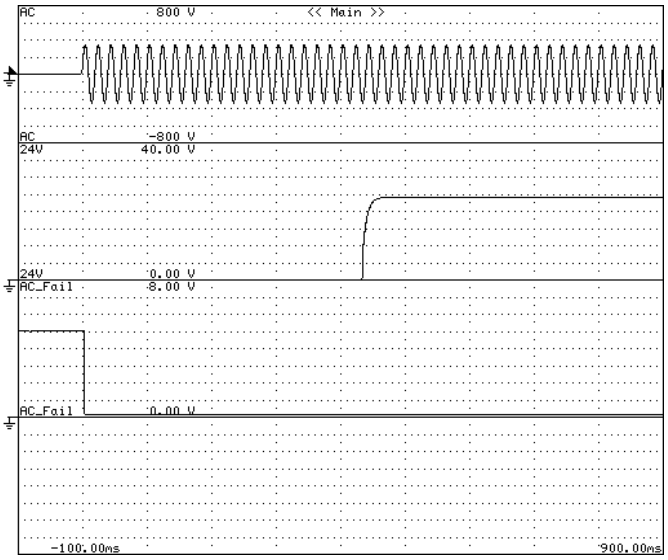
Vertical Sensitivity: 5V/div
Timebase Range: 5ms/div



24V DC Output Rise Characteristics

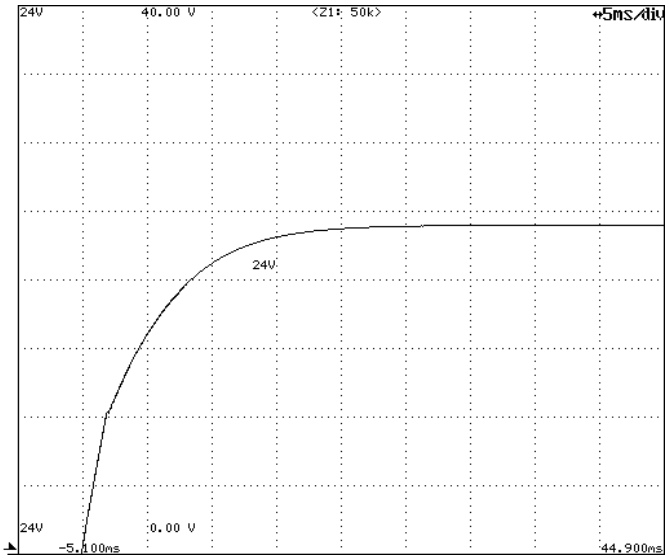
Input: 240V AC
Load: Rated Load

Timebase Range: 100ms/div



All Output Start-up Sequence

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

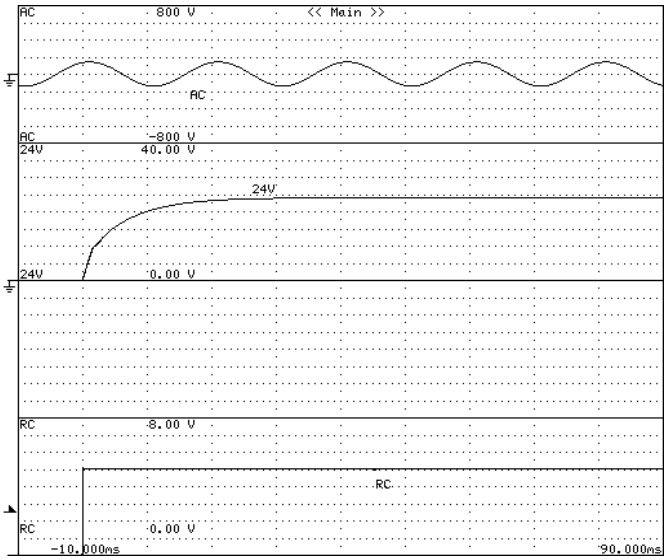


24V DC Output Rise Characteristics

Model	OZP-170-24	Temperature: 25℃
Item	Output Rise Characteristics (at Remote ON)	

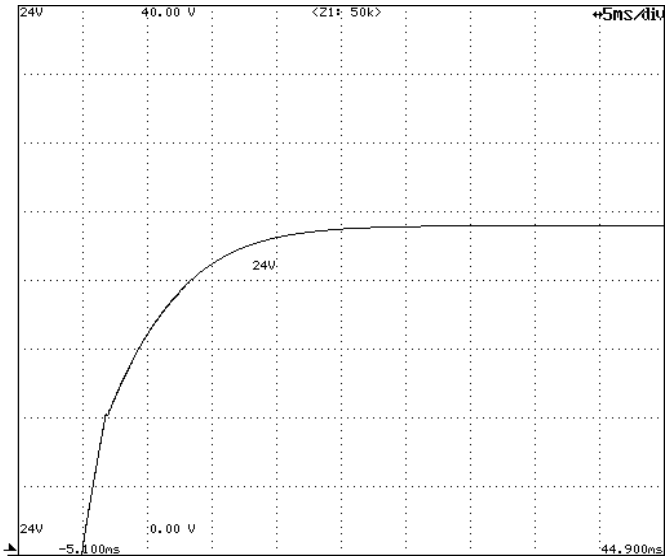
Input: 100V AC
Load: Rated Load

Timebase Range: 10ms/div



All Output Start-up Sequence

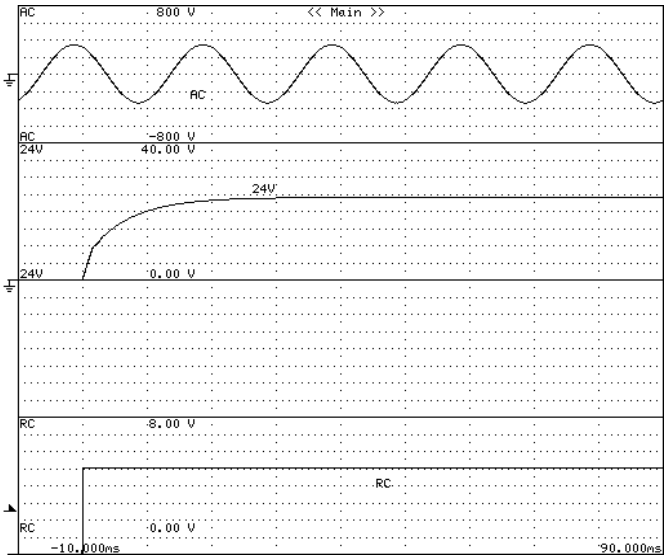
Vertical Sensitivity: 5V/div
Timebase Range: 5ms/div



24V DC Output Rise Characteristics

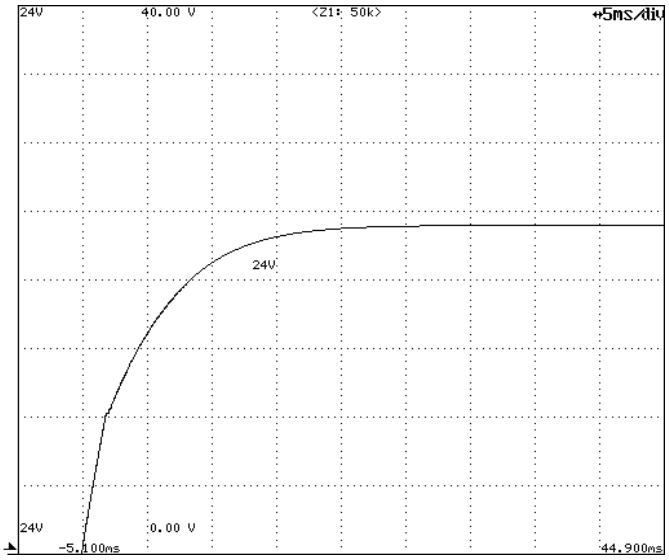
Input: 240V AC
Load: Rated Load

Timebase Range: 10ms/div



All Output Start-up Sequence

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

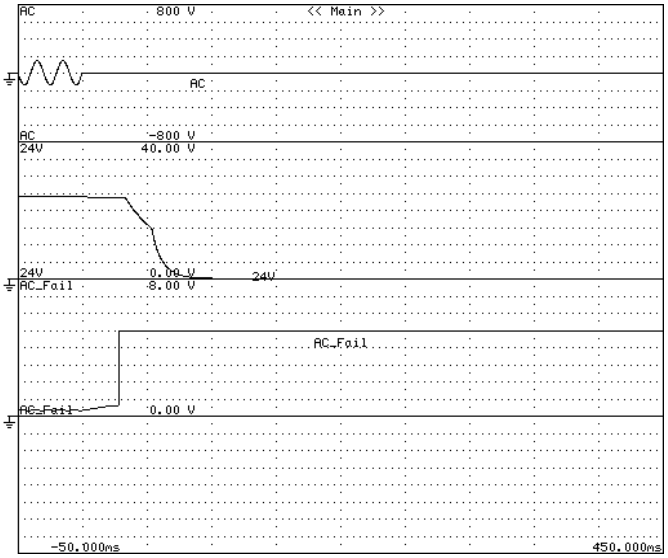


24V DC Output Rise Characteristics

Model	OZP-170-24	Temperature: 25℃
Item	Output Fall Characteristics (at AC Power OFF)	

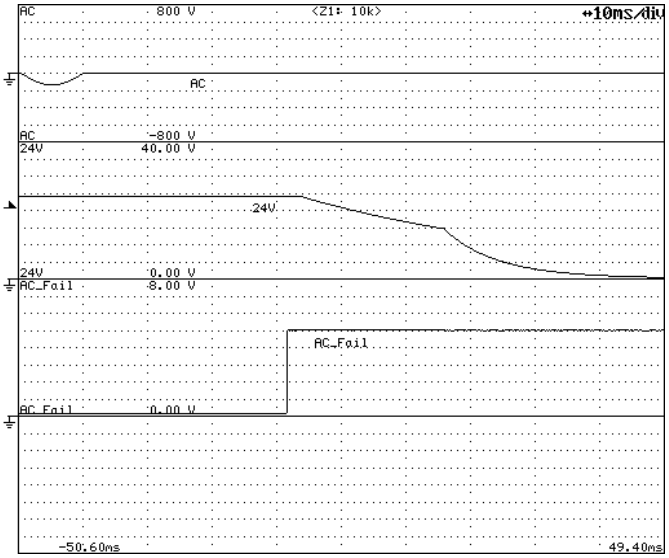
Input: 100V AC
Load: Rated Load

Timebase Range: 50ms/div



Output Fall Characteristics

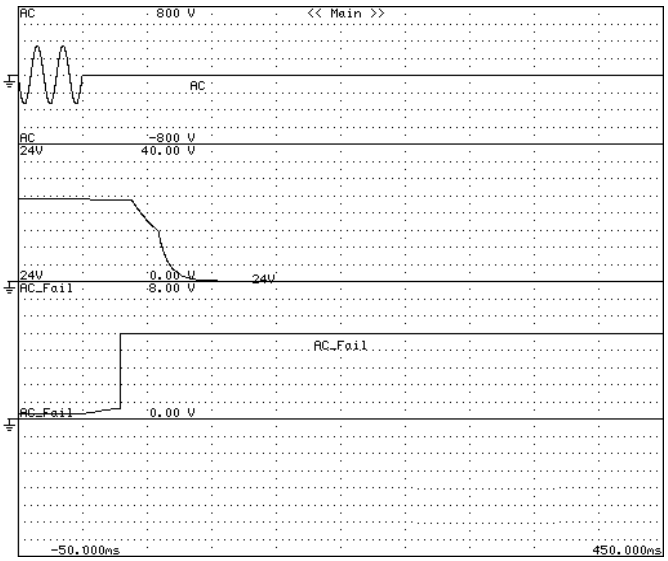
Timebase Range: 10ms/div



Output Fall Characteristics (magnification)

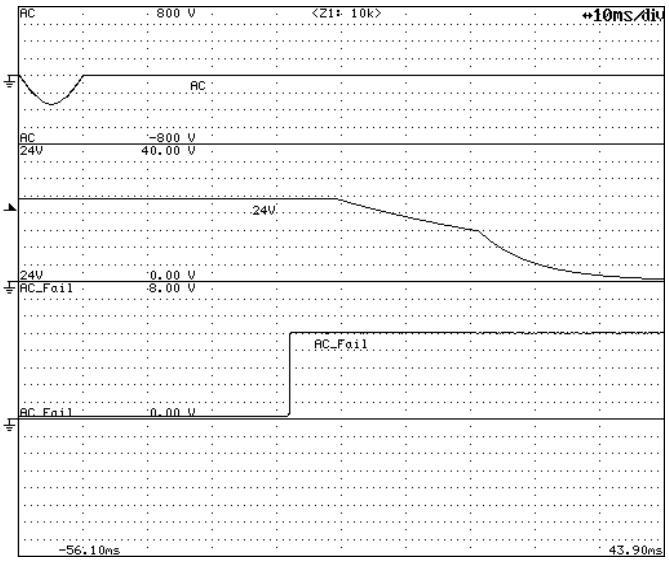
Input: 240V AC
Load: Rated Load

Timebase Range: 50ms/div



Output Fall Characteristics

Timebase Range: 10ms/div

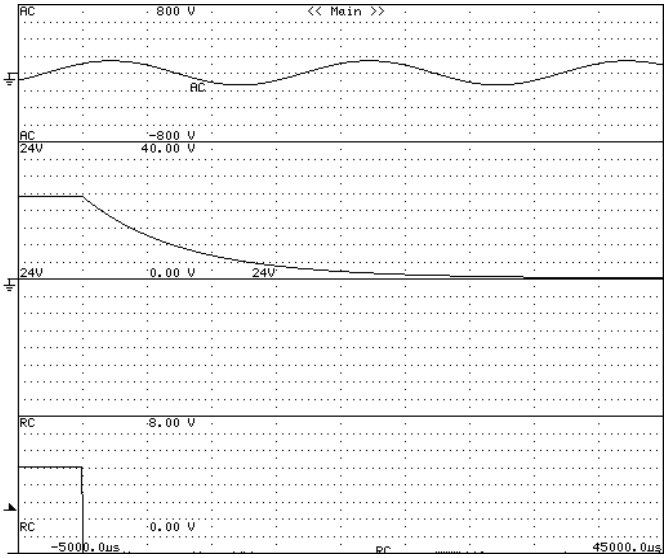


Output Fall Characteristics (magnification)

Model	OZP-170-24	Temperature: 25℃
Item	Output Fall Characteristics (at Remote OFF)	

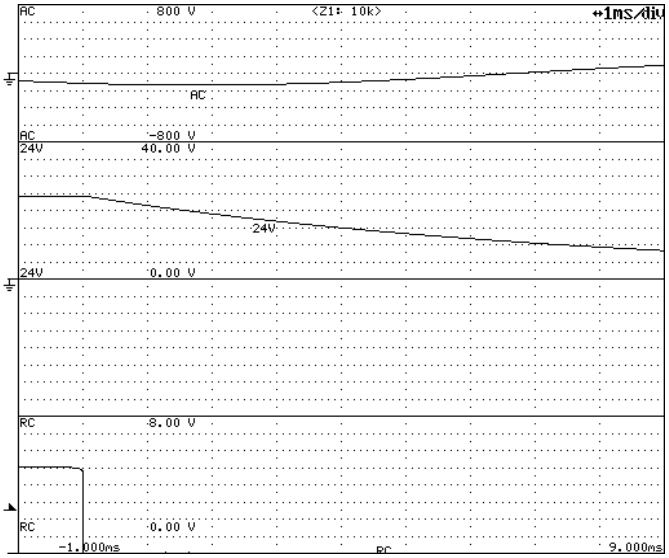
Input: 100V AC
Load: Rated Load

Timebase Range: 5ms/div



Output Fall Characteristics

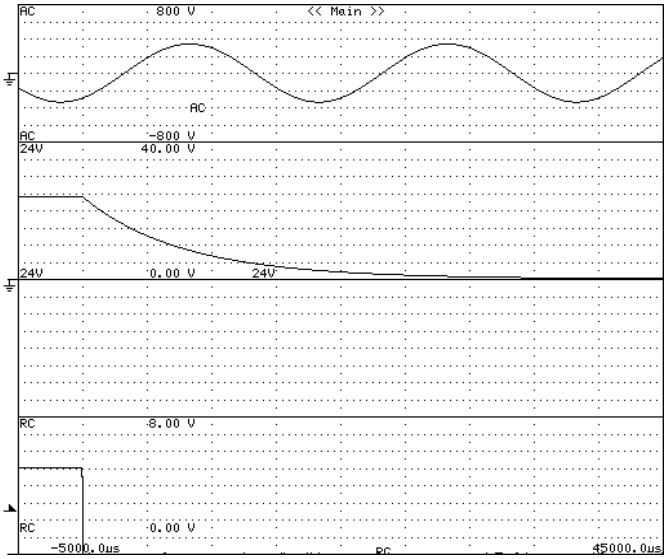
Timebase Range: 1ms/div



Output Fall Characteristics (magnification)

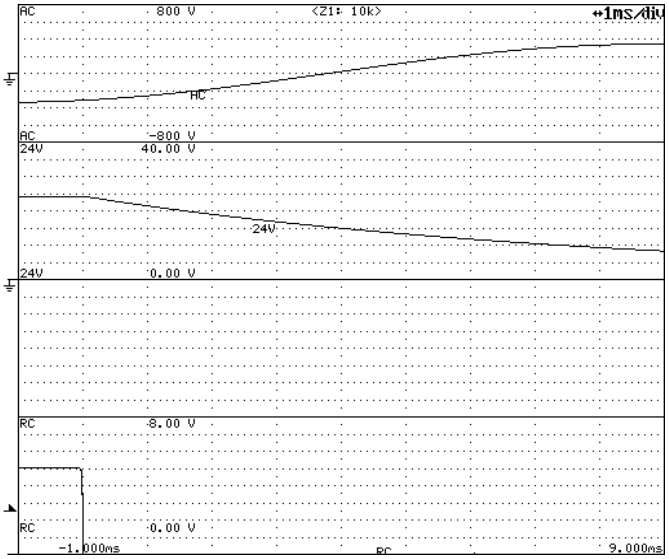
Input: 240V AC
Load: Rated Load

Timebase Range: 5ms/div



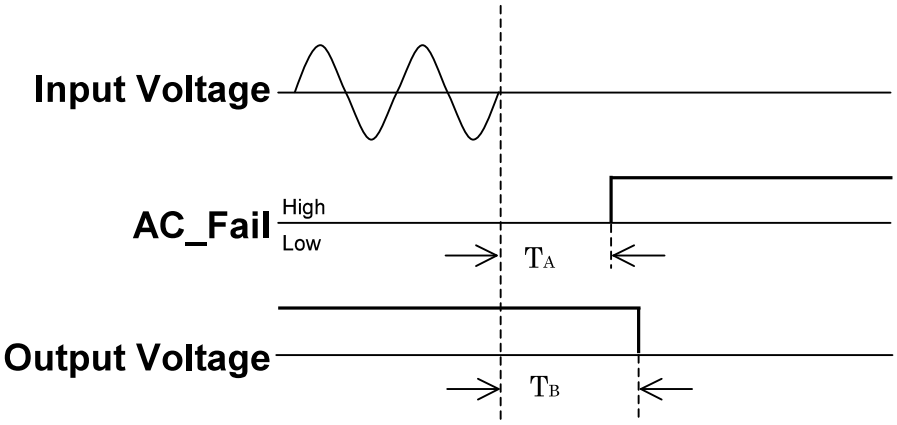
Output Fall Characteristics

Timebase Range: 1ms/div

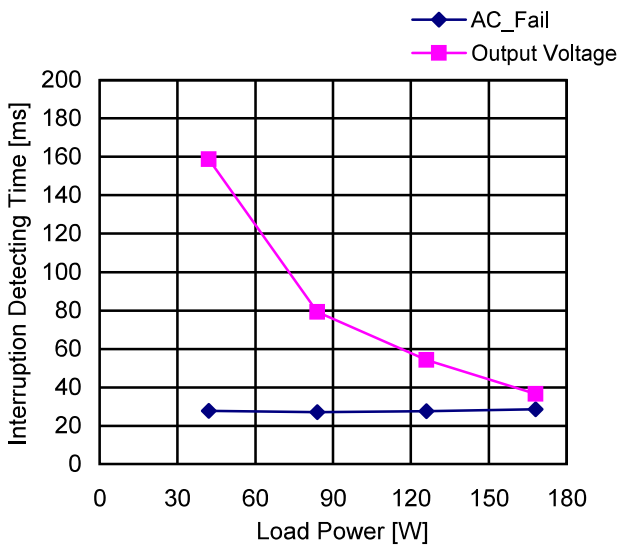


Output Fall Characteristics (magnification)

Model	OZP-170-24	Temperature: 25℃
Item	Instantaneous Interruption Compensation (by Load Power)	

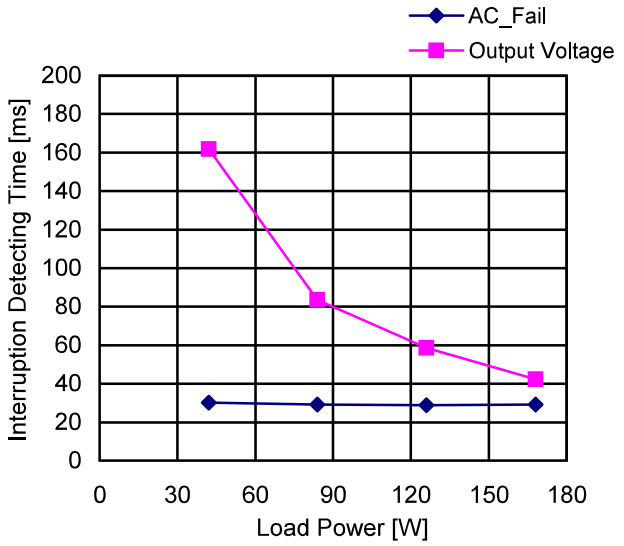


Input Voltage:100V AC



Load Power [W]	Interruption Detecting Time [ms]	
	AC_Fail	Ouput Voltage
	TA	TB
42.0	27.8	158.7
84.0	27.2	79.2
126.0	27.7	54.3
168.0	28.7	36.6

Input Voltage:240V AC



Load Power [W]	Interruption Detecting Time [ms]	
	AC_Fail	Ouput Voltage
	TA	TB
42.0	30.3	161.8
84.0	29.2	83.5
126.0	28.9	58.7
168.0	29.3	42.3

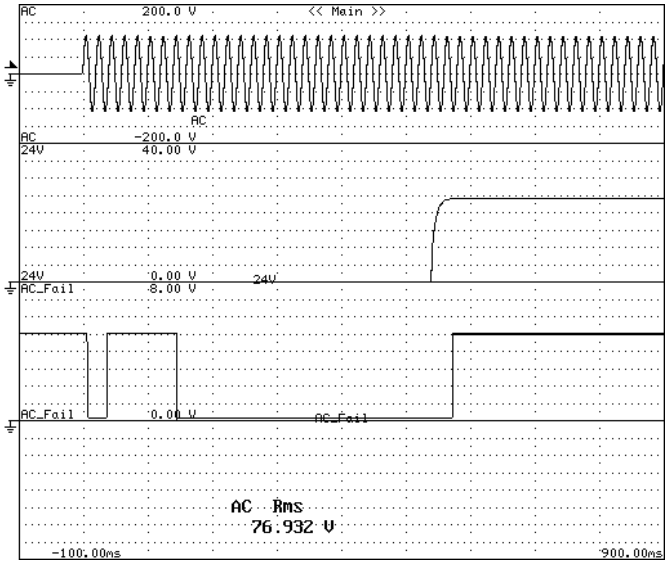
Model	OZP-170-24	Temperature: 25℃
Item	Start-Up Voltage	

Timebase Range: 100ms/div
Load: Rated Load

AC Input

+24V

AC_FAIL



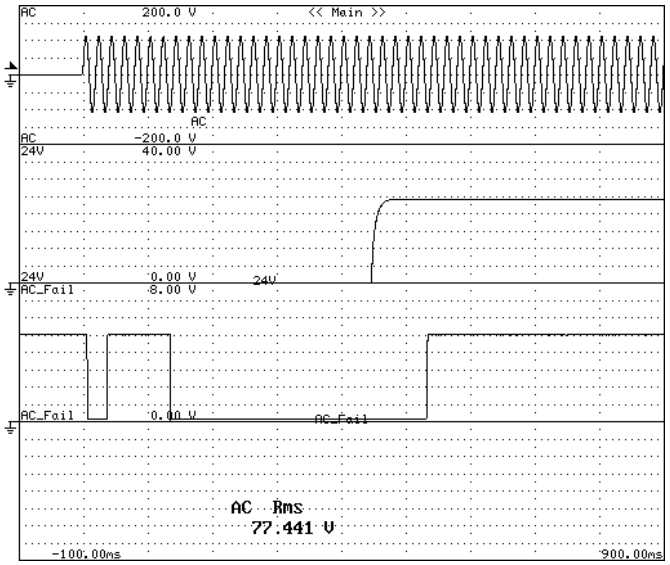
Start-up Voltage: 76.9V AC

Timebase Range: 100ms/div
Load: Minimum Load

AC Input

+24V

AC_FAIL



Start-up Voltage: 77.4V AC

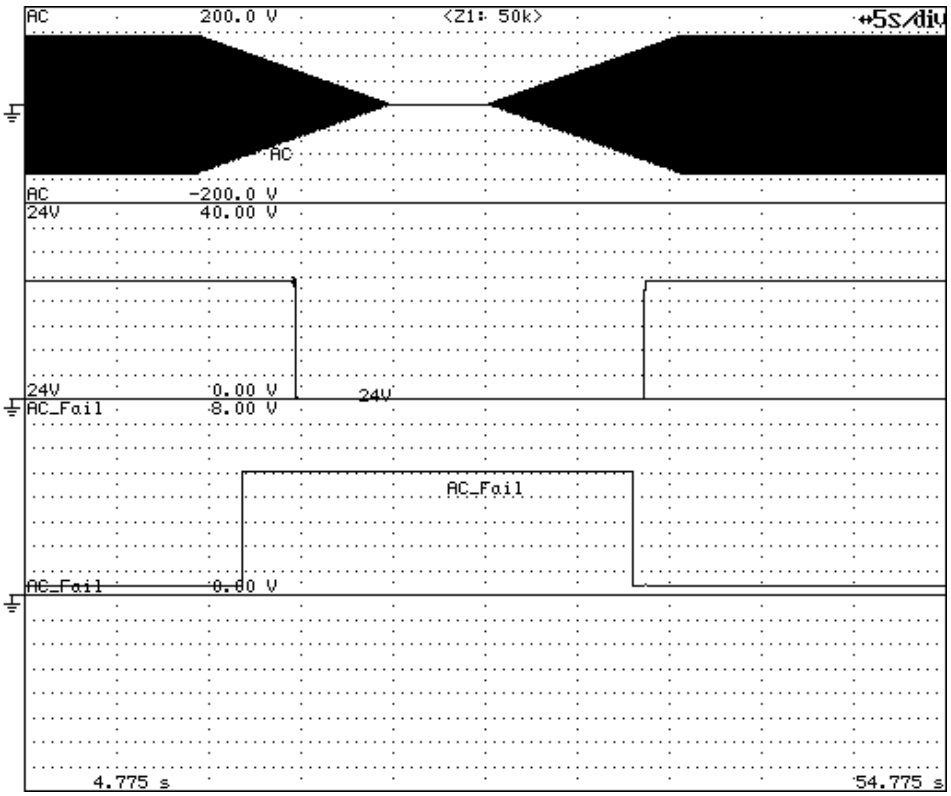
Model	OZP-170-24	Temperature: 25℃
Item	Input Voltage Sweep Up/Down	

Timebase Range: 5s/div
Load: Rated Load

AC Input

+24V

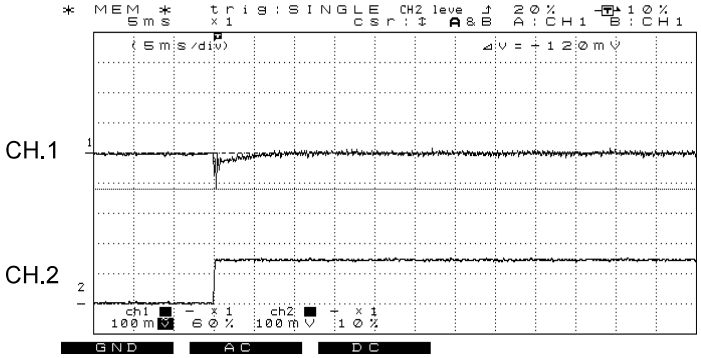
AC_FAIL

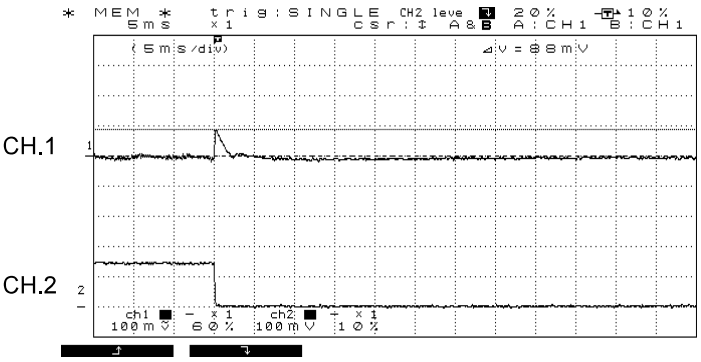


<u>Sweep Rate: 10Vave/sec</u>

Model	OZP-170-24	Temperature: 25℃
Item	Dynamic Load Response	

+24V DC Output Transient Response Waveforms

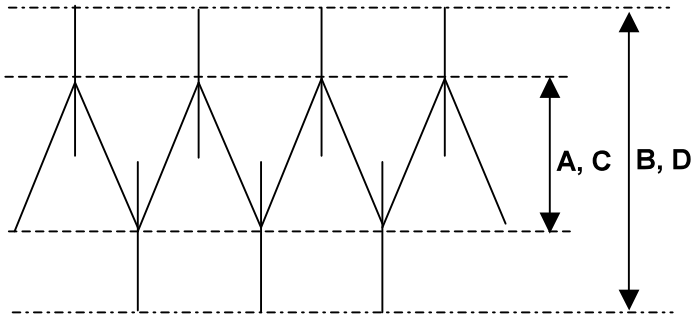




Waveform 1	
CH1	Measuring Point: DC Output Voltage
	Vertical Sensitivity: 100mV/div
CH2	Measuring Point: DC Output Current
	Vertical Sensitivity: 5A/div
Timebase Range	5ms/div
Condition	Input: 100V AC

Note:
Rated Load(7A) ⇌ Minimum load(0A)

Model	OZP-170-24	Load: Rated Load
Item	Ripple / Noise Voltage	



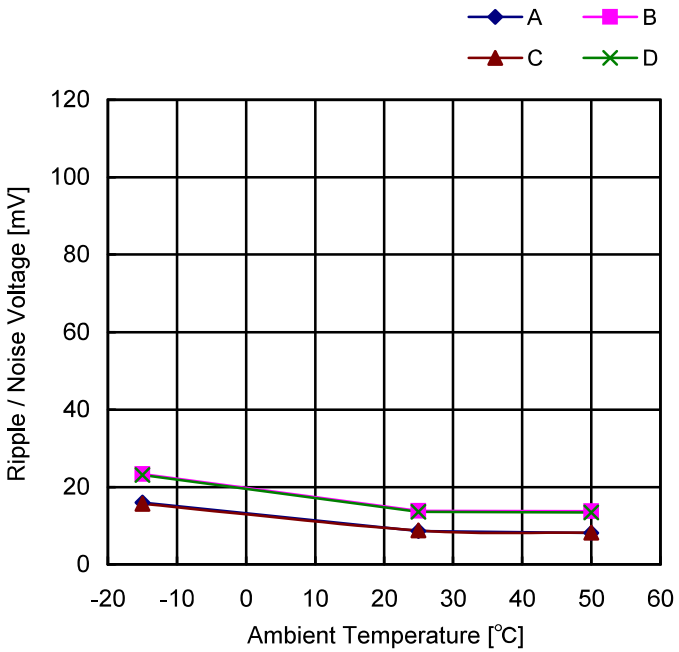
at 100V AC

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

at 240V AC

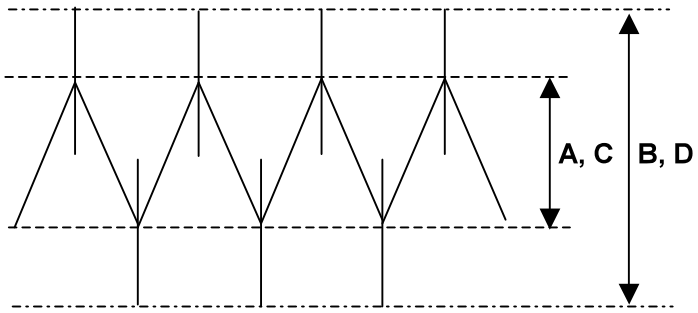
C: Ripple Voltage (mV_{P-P})
D: Noise Voltage (mV_{P-P})

24V



Ambient Temp. [℃]	Ripple / Noise Voltage [mV]			
	A	B	C	D
-15	16.0	23.4	15.7	23.1
25	8.7	13.9	8.8	13.6
50	8.2	13.8	8.3	13.5

Model	OZP-170-24	Temperature : 25℃
Item	Ripple / Noise Voltage	



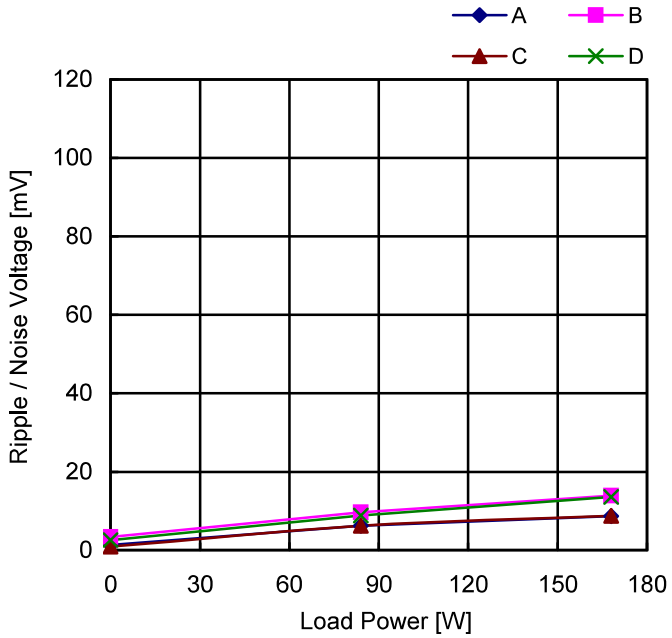
at 100V AC

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})

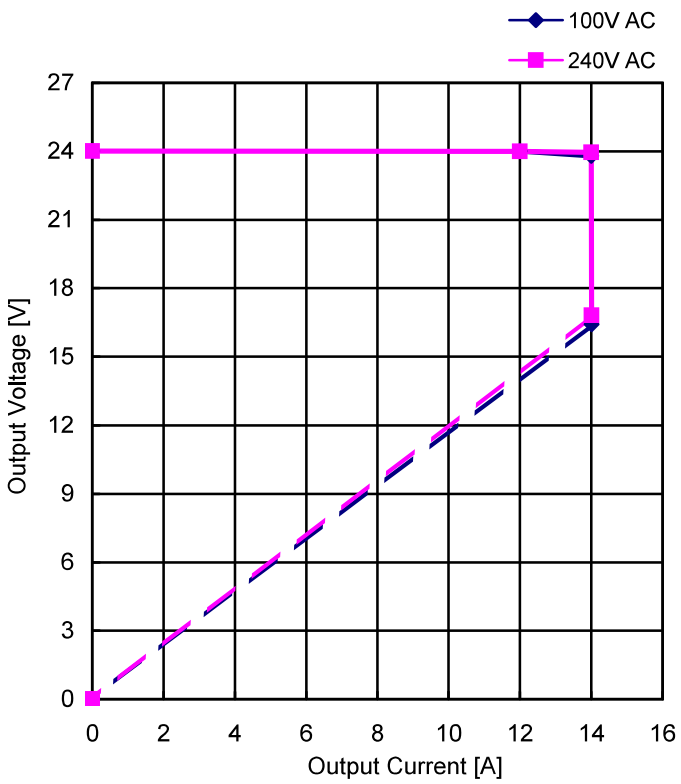
24V



Load Power [W]	Ripple / Noise Voltage [mV]			
	A	B	C	D
0	1.3	3.4	0.9	2.6
84	6.3	9.7	6.3	8.9
168	8.7	13.9	8.8	13.6

Model	OZP-170-24	Temperature: 25℃
Item	Over-Current Protection	

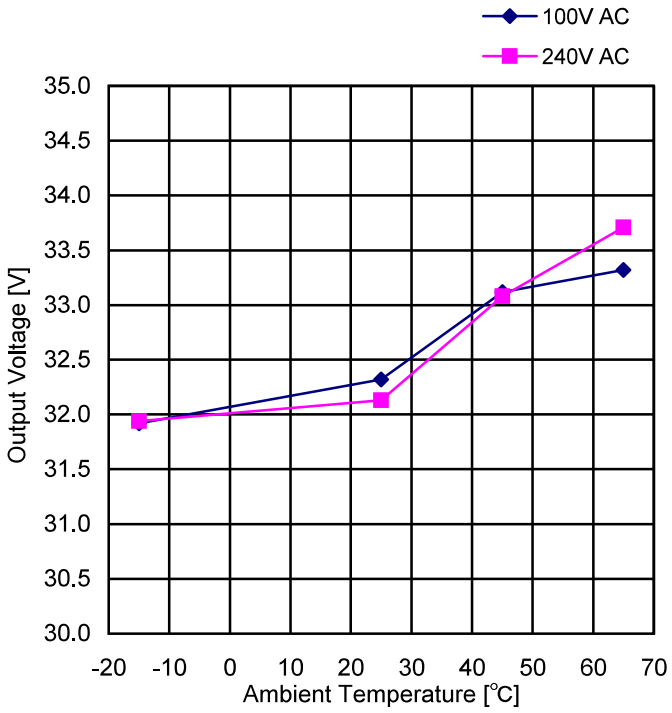
V-I Characteristics of 24V O.C.P



Input Voltage: 100V AC		Input Voltage: 240V AC	
Output Current [A]	Output Voltage [V]	Output Current [A]	Output Voltage [V]
0.00	24.01	0.00	24.01
12.00	24.01	12.00	24.00
14.00	23.80	14.00	23.96
14.01	16.42	14.01	16.81

Model	OZP-170-24	Load: Minimum Load
Item	Over-Voltage Protection	Temperature: 25℃

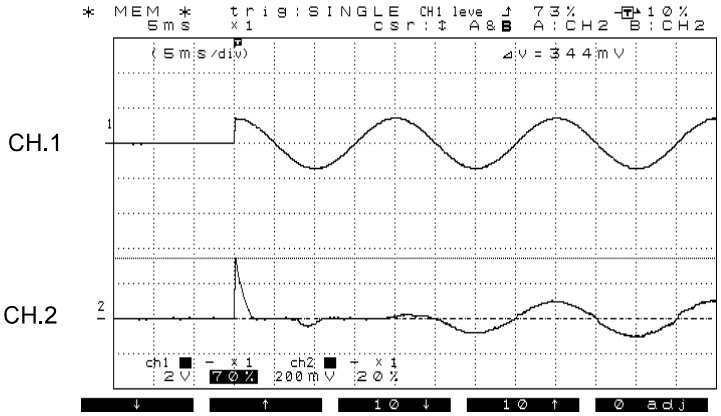
24V



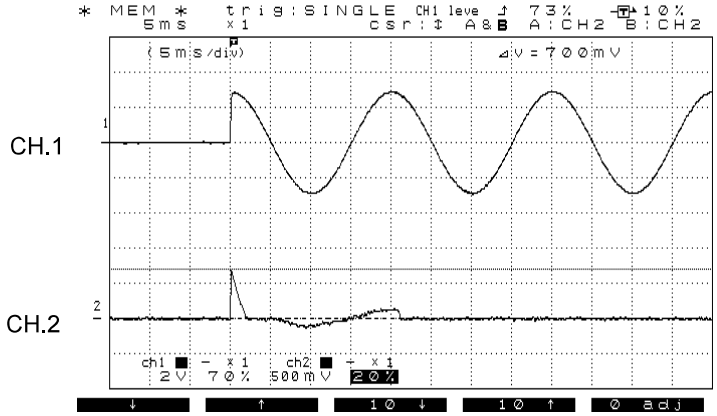
Ambient Temp. [℃]	Output Voltage	
	Input Voltage 100V AC	Input Voltage 240V AC
-15	31.92	31.94
25	32.32	32.13
45	33.12	33.08
65	33.32	33.71

Model	OZP-170-24	Temperature: 25℃
Item	Inrush Current	Load: Rated Load

Inrush Current Waveforms

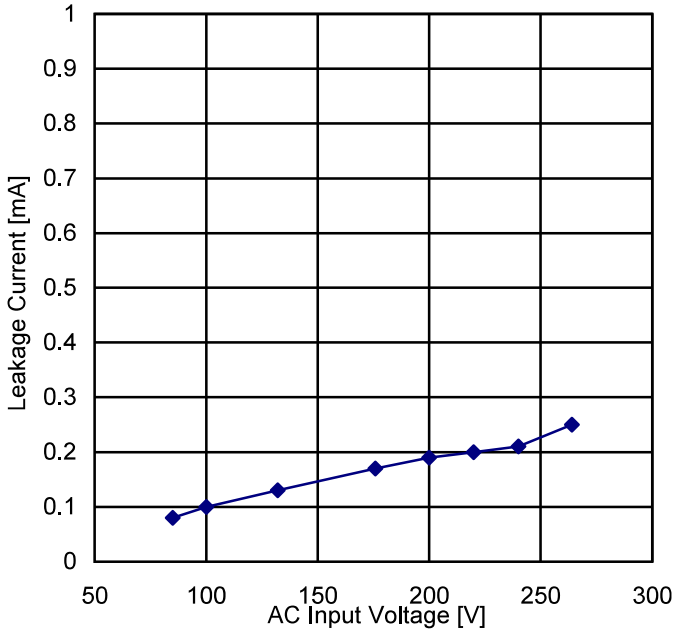


Waveform 1	
CH1	Measuring Point: AC Input Voltage
	Range: 200V/div
CH2	Measuring Point: AC Input Current
	Range: 10A/div
Timebase Range	5ms/div
Conditions	Input: 100V AC Load: Rated Load
Note: Inrush Current: 17.2A	



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-170-24	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