Nipron

Supplemental test data
(参考資料)

Date of issue: Jul. 25, 2011

Test Data

Model Number: OZ-060-24

Model Name: DC POWER SUPPLY

INPUT: 85V – 264V AC, 50 / 60 Hz

OUTPUT: 24 V 2.5A

Minimum load : 0W
Rated load :60W

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Tested by : Kohei Sawada (Evaluation test engineer)

Nipron Co.,Ltd.

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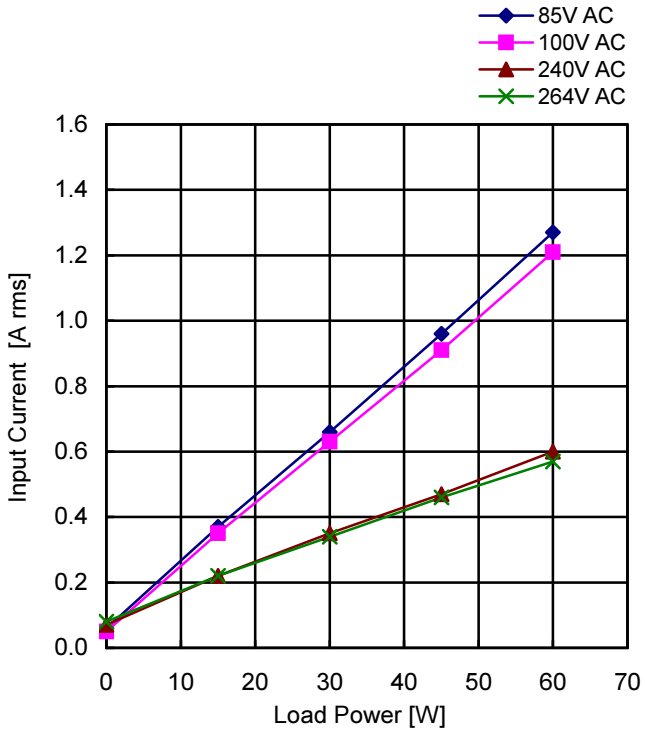
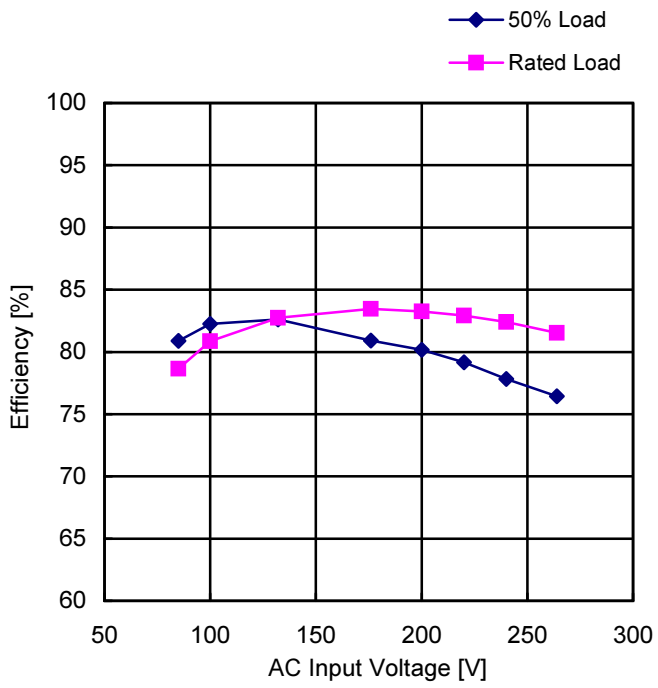
Model	OZ-60-24	Temperature: 25℃
Item	Input Current（by Load Power）	



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	0.06	0.05	0.07	0.08
15.0	0.37	0.35	0.22	0.22
30.0	0.66	0.63	0.35	0.34
45.0	0.96	0.91	0.47	0.46
60.0	1.27	1.21	0.60	0.57

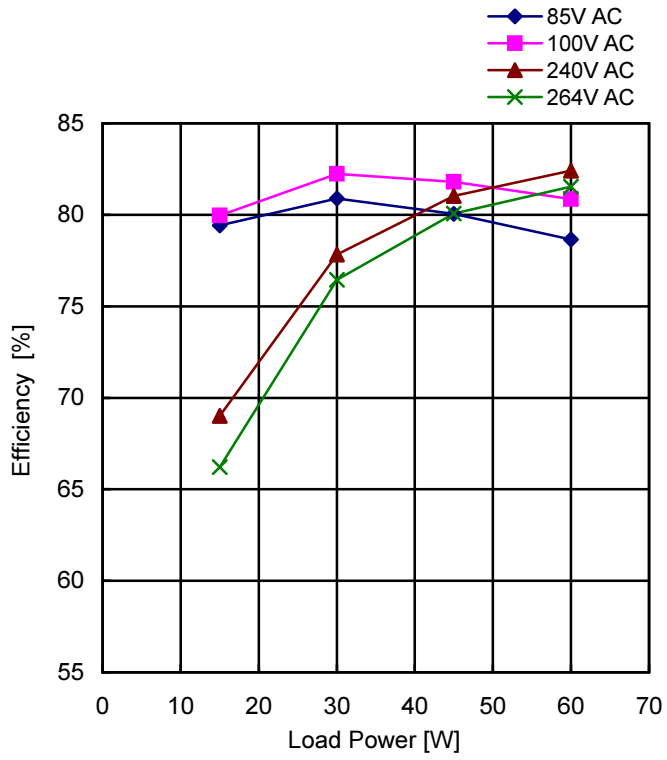
Model	OZ-60-24	Temperature: 25℃
Item	Efficiency	

■Efficiency(by Input Voltage)



AC Input Voltage [V]	Efficiency [%]	
	50% Load	Rated Load
85	80.89	78.66
100	82.24	80.86
132	82.60	82.75
176	80.91	83.47
200	80.17	83.25
220	79.16	82.91
240	77.84	82.40
264	76.44	81.53

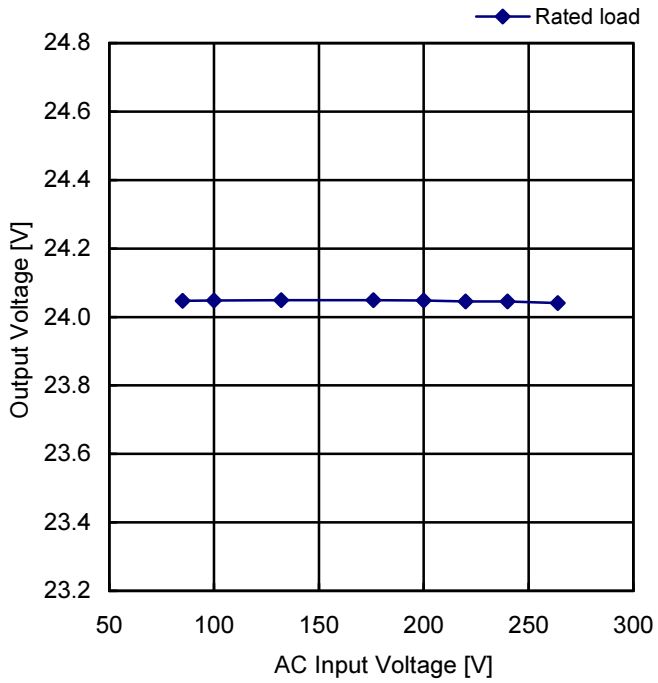
■Efficiency(by Load Power)



Load Power [W]	Efficiency [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
15.0	79.42	79.97	69.01	66.21
30.0	80.89	82.24	77.84	76.44
45.0	80.06	81.80	81.02	80.08
60.0	78.66	80.86	82.40	81.53

Model	OZ-60-24	Temperature: 25℃
Item	Line Regulation	

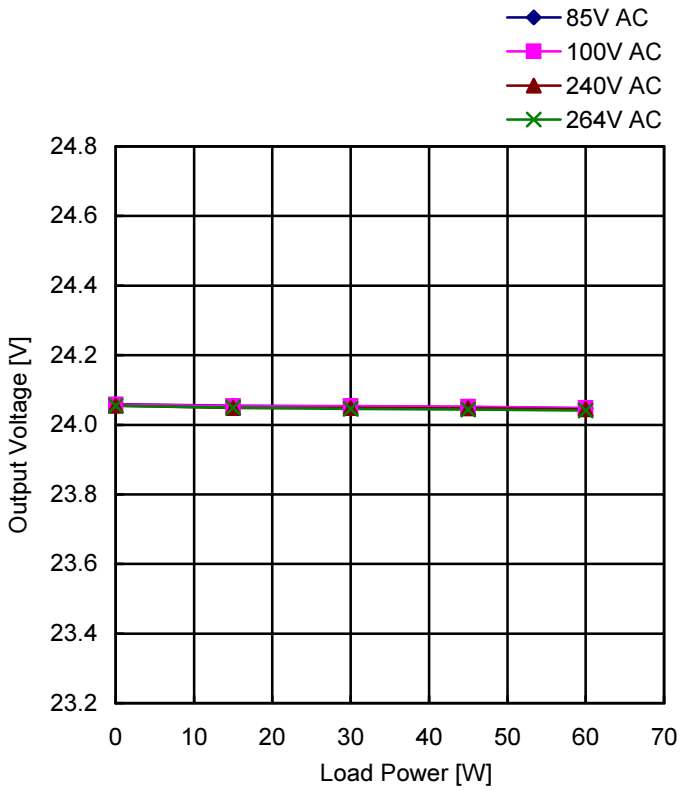
24V/2.5A



AC Input Voltage [V]	Output Voltage [V]
85	24.047
100	24.048
132	24.049
176	24.049
200	24.048
220	24.045
240	24.045
264	24.041

Model	OZ-60-24	Temperature: 25℃
Item	Load Regulation	

24V



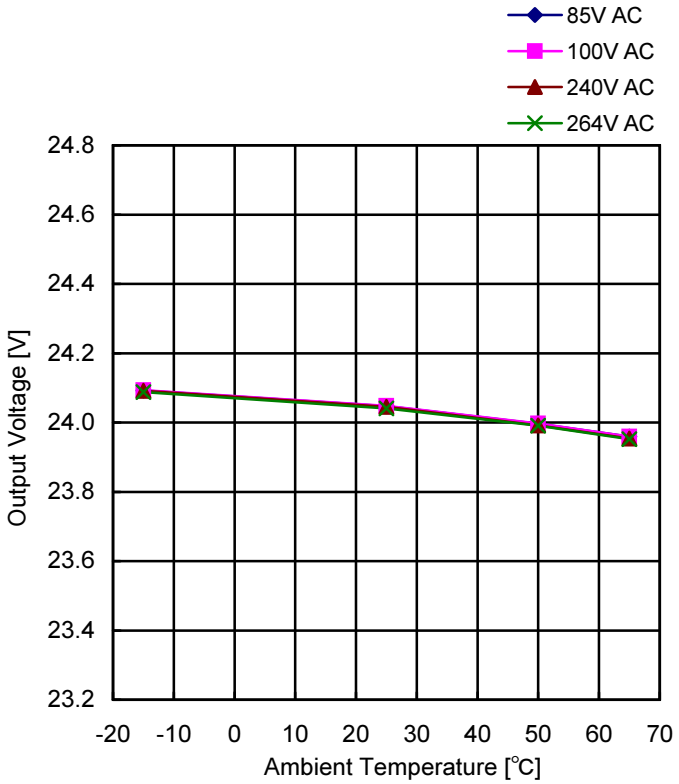
Load Power [W]	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	24.059	24.058	24.055	24.055
15.0	24.055	24.054	24.048	24.049
30.0	24.053	24.054	24.048	24.046
45.0	24.051	24.052	24.047	24.044
60.0	24.047	24.048	24.045	24.041
-	-	-	-	-

Load Condition

Load Power [W]	Load Current [A]
	24V
0.0	0.00
15.0	0.625
30.0	1.25
45.0	1.875
60.0	2.50
-	-

Model	OZ-60-24
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	24.092	24.093	24.091	24.088
25	24.047	24.048	24.045	24.041
50	23.996	23.997	23.992	23.991
65	23.959	23.959	23.954	23.952

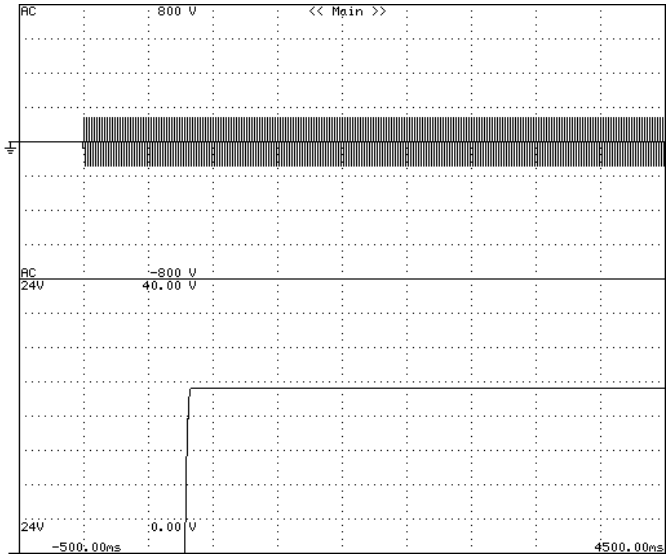
Load Condition

Ambient Temp. (℃)	Load Current [A]
	24V
-15	2.50
25	2.50
50	2.50
65	1.75

Model	OZ-060-24	Temperature: 25℃
Item	Output Rise Characteristics (at AC Power ON)	

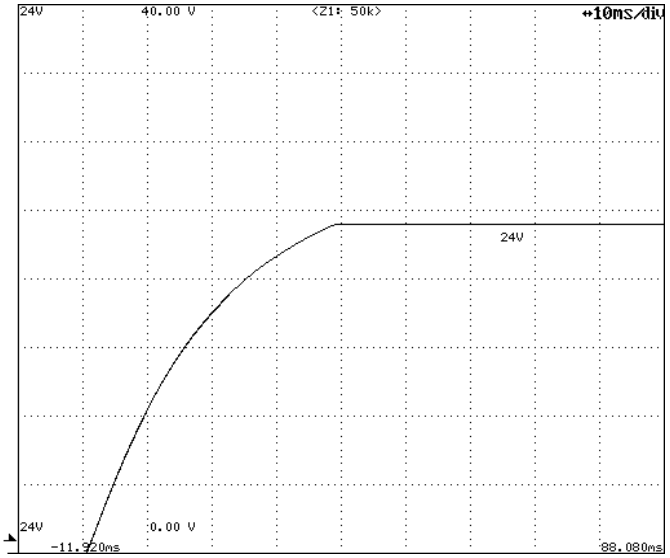
Input: 100V AC
Load: Rated Load

Timebase Range: 500ms/div



All Output Start-up Sequence

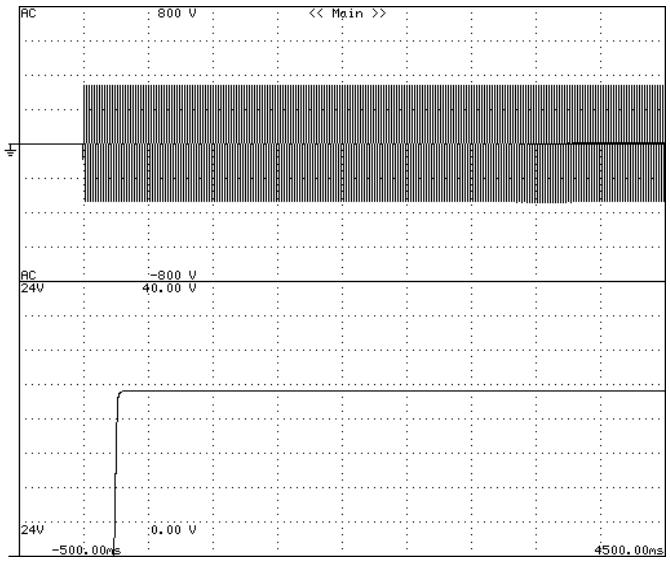
Vertical Sensitivity: 5V/div
Timebase Range: 10ms/div



24V DC Output Rise Characteristics

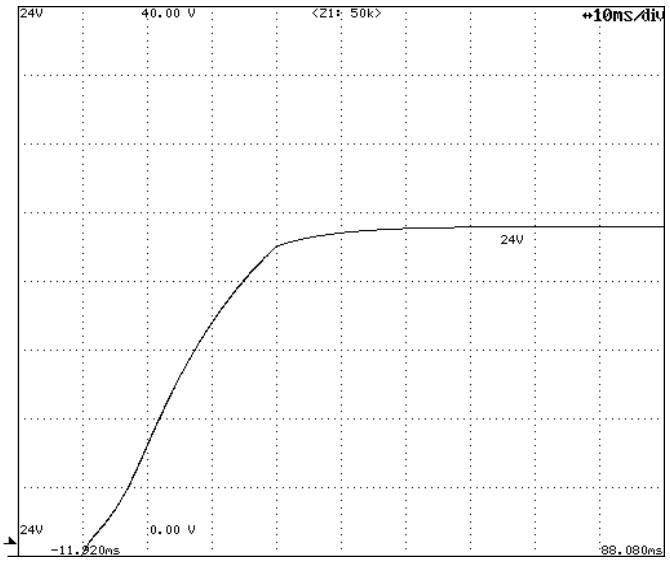
Input: 240V AC
Load: Rated Load

Timebase Range: 500ms/div



All Output Start-up Sequence

Vertical Sensitivity: 5V/div
Timebase Range: 10ms/div

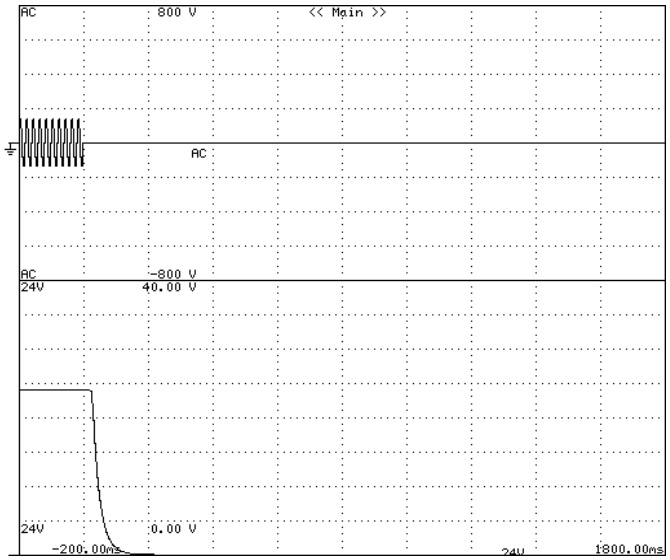


24V DC Output Rise Characteristics

Model	OZ-060-24	Temperature: 25℃
Item	Output Fall Characteristics (at AC Power OFF)	

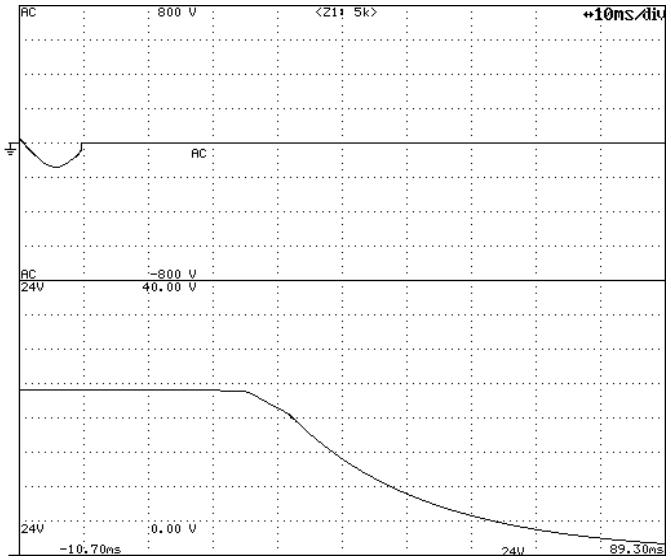
Input: 100V AC
Load: Rated Load

Timebase Range: 200ms/div



Output Fall Characteristics

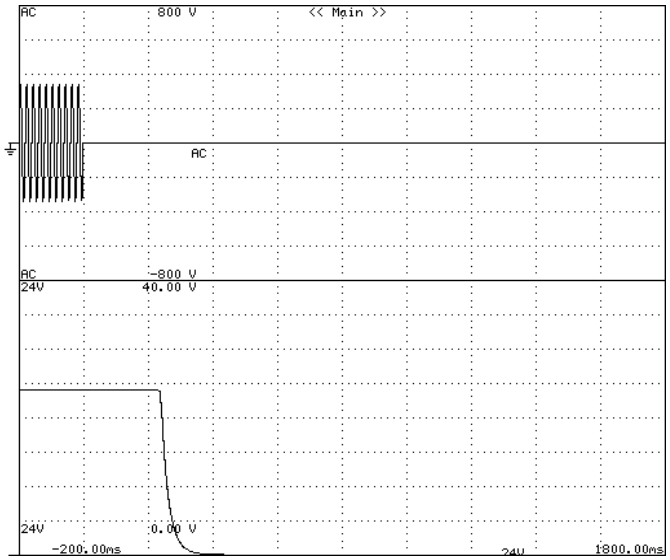
Timebase Range: 10ms/div



Output Fall Characteristics (magnification)

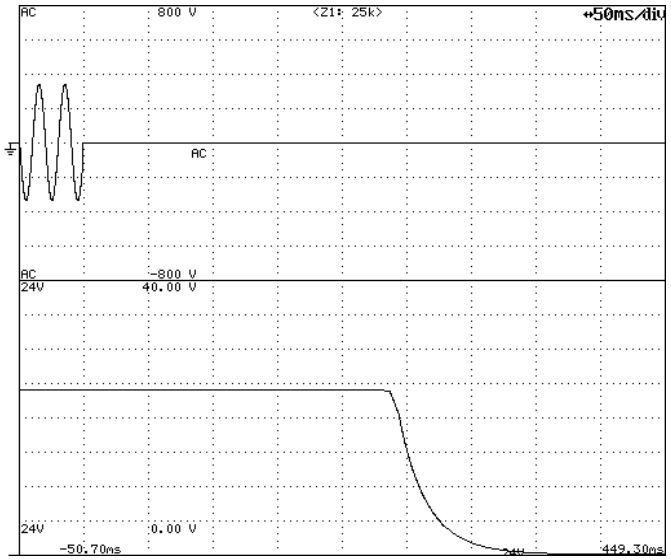
Input: 240V AC
Load: Rated Load

Timebase Range: 200ms/div



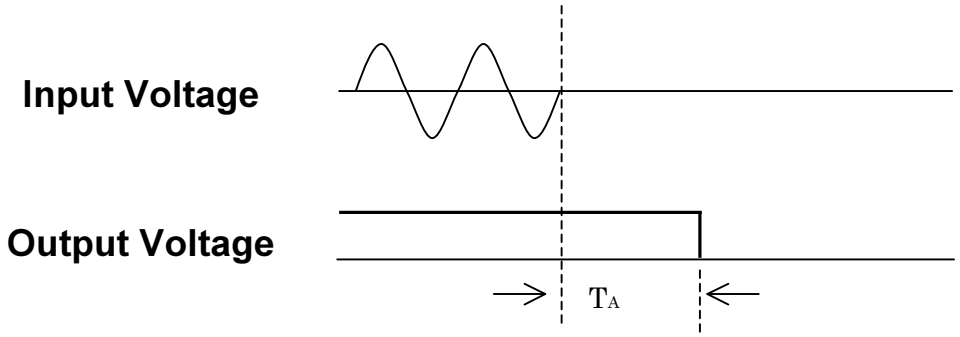
Output Fall Characteristics

Timebase Range: 50ms/div

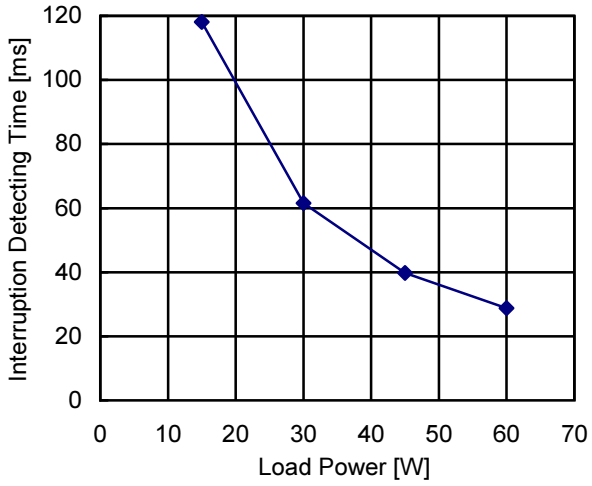


Output Fall Characteristics (magnification)

Model	OZ-060-24	Temperature: 25℃
Item	Instantaneous Interruption Compensation (by Load Power)	

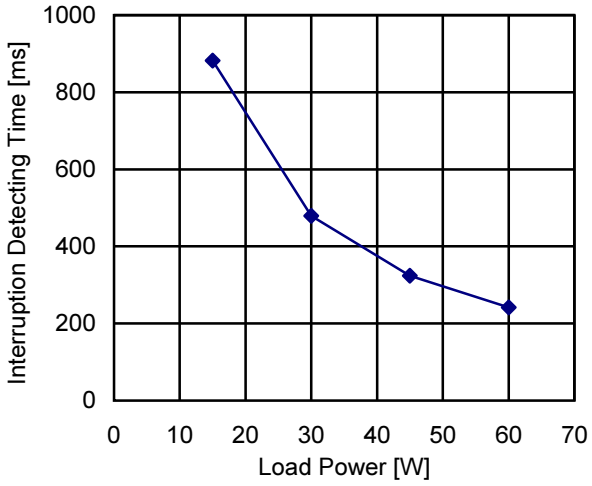


Input Voltage:100V AC



Load Power [W]	Interruption Detecting Time [ms]
	Ouput Voltage
	TA
15.0	118.1
30.0	61.5
45.0	39.8
60.0	28.8

Input Voltage:240V AC



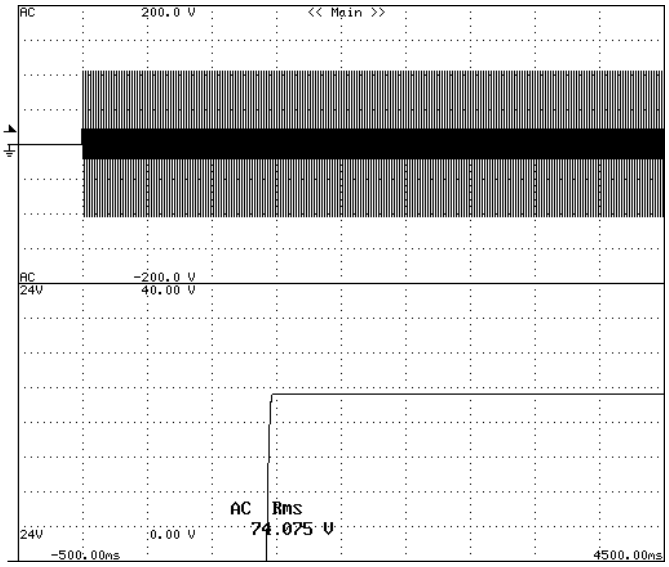
Load Power [W]	Interruption Detecting Time [ms]
	Ouput Voltage
	TA
15.0	881.7
30.0	479.2
45.0	323.7
60.0	242.1

Model	OZ-060-24	Temperature: 25℃
Item	Start-Up Voltage	

Timebase Range: 500ms/div
Load: Rated Load

AC Input

+24V

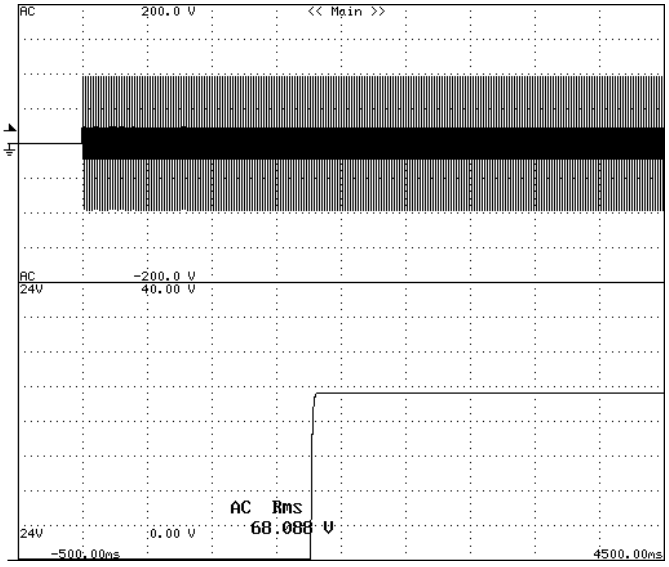


Start-up Voltage: 74.075V AC

Timebase Range: 500ms/div
Load: Minimum Load

AC Input

+24V



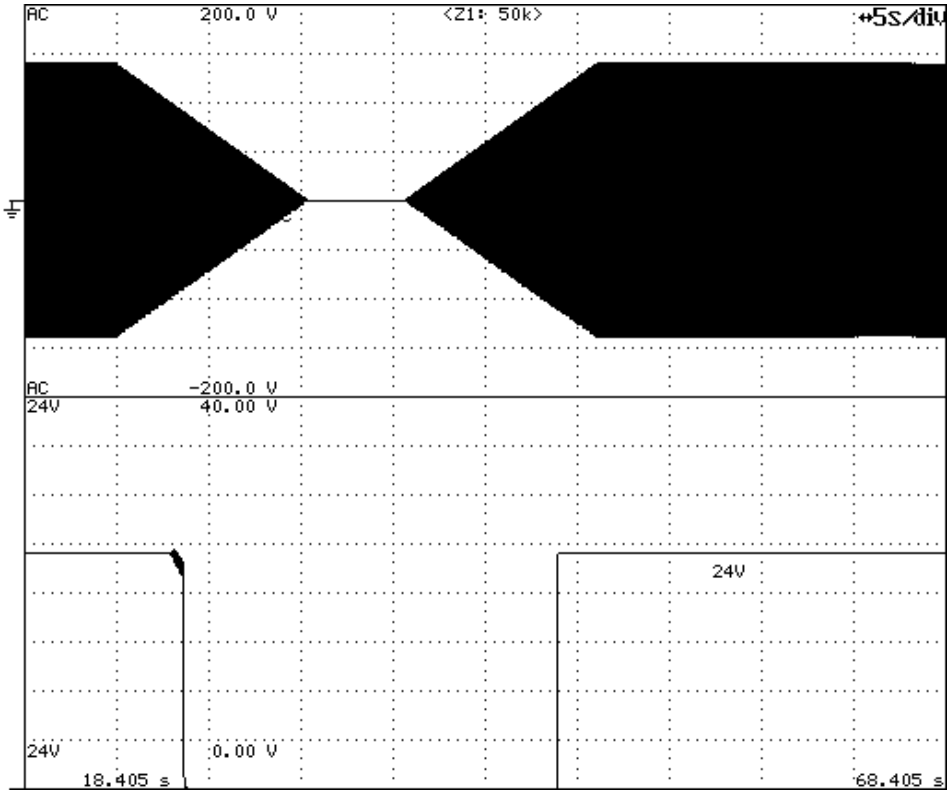
Start-up Voltage: 68.088V AC

Model	OZ-060-24	Temperature: 25℃
Item	Input Voltage Sweep Up/Down	

Timebase Range: 5s/div
Load: Rated Load

AC Input

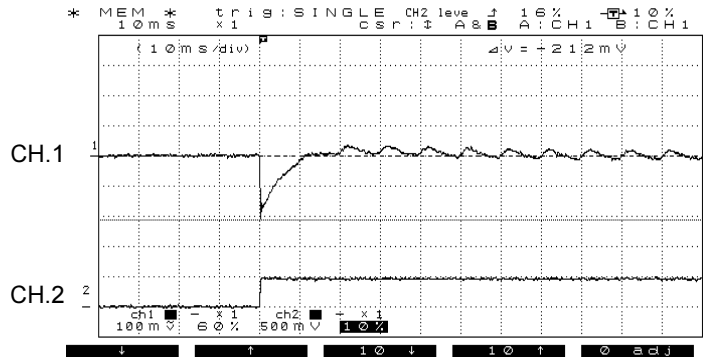
+24V

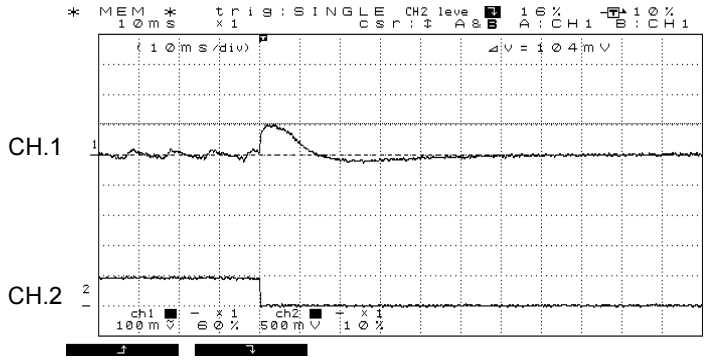


Sweep Rate: 10Vave/sec

Model	OZ-060-24	Temperature: 25℃
Item	Dynamic Load Response	

+24V DC Output Transient Response Waveforms

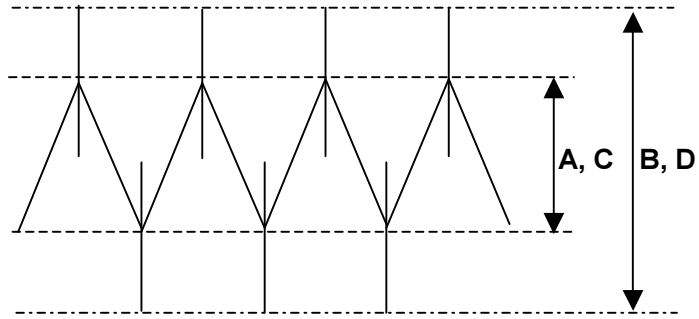




Waveform 1	
CH1	Measuring Point: DC Output Voltage
	Vertical Sensitivity: 100mV/div
CH2	Measuring Point: DC Output Current
	Vertical Sensitivity: 2.5A/div
Timebase Range	10ms/div
Condition	Input: 100V AC

Note:
Rated Load(2.5A) ⇌ Minimum load(0A)

Model	OZ-60-24	Load: Rated Load
Item	Ambient Temperature Drift	



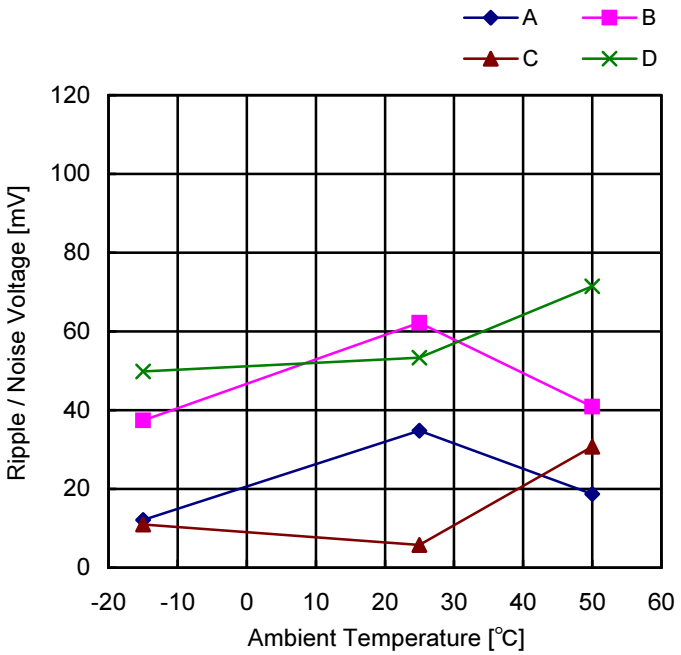
at 100V AC

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

at 240V AC

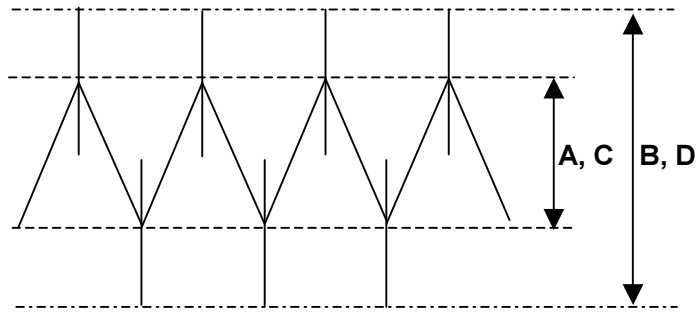
C: Ripple Voltage (mV_{P-P})
D: Noise Voltage (mV_{P-P})

24V



Ambient Temp. [℃]	Ripple / Noise Voltage [mV]			
	A	B	C	D
-15	12.1	37.4	11.0	49.8
25	34.8	62.2	5.8	53.3
50	18.7	40.9	30.7	71.5

Model	OZ-60-24	Temperature : 25℃
Item	Ambient Temperature Drift	



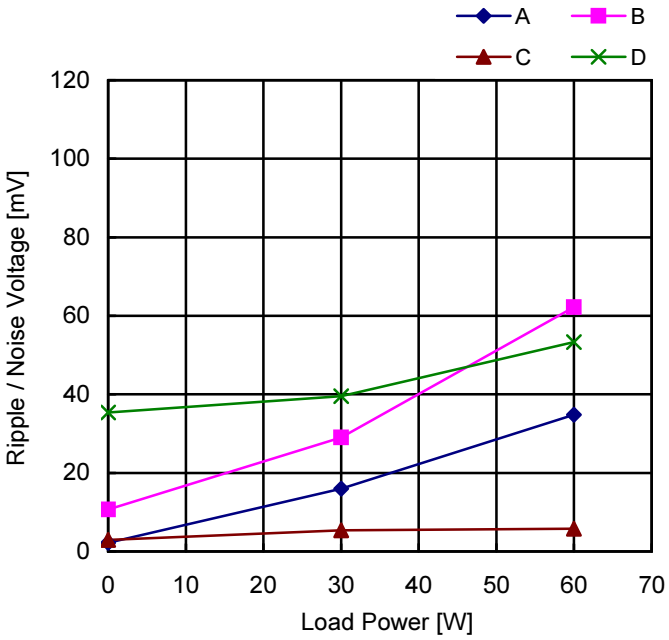
at 100V AC

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})

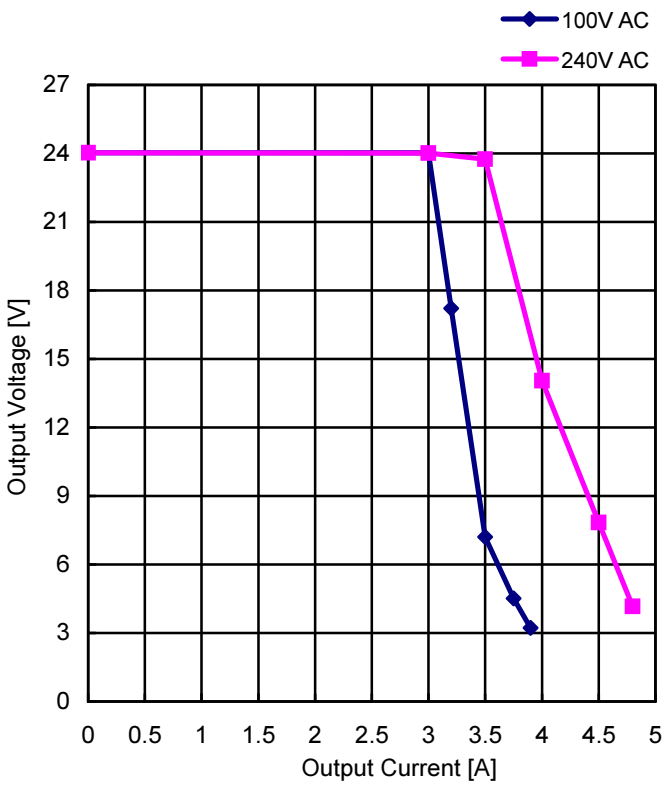
24V



Load Power [W]	Ripple / Noise Voltage [mV]			
	A	B	C	D
0	2.2	10.7	2.9	35.4
30	16.0	29.0	5.4	39.5
60	34.8	62.2	5.8	53.3

Model	OZ-60-24	Temperature: 25℃
Item	Over-Current Protection	

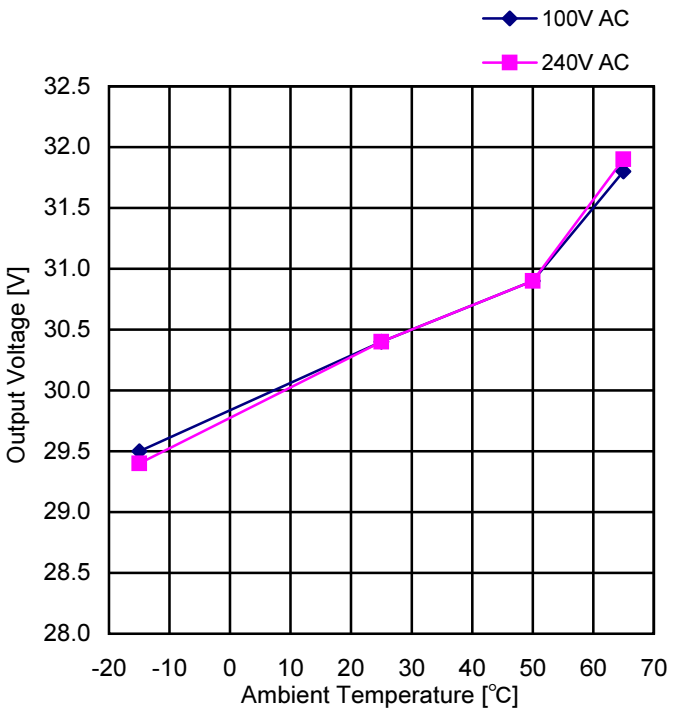
V-I Characteristics of 24V O.C.P



Input Voltage: 100V AC		Input Voltage: 240V AC	
Output Current [A]	Output Voltage [V]	Output Current [A]	Output Voltage [V]
0.00	24.03	0.00	24.03
3.00	24.03	3.00	24.02
3.20	17.21	3.50	23.75
3.50	7.21	4.00	14.05
3.75	4.52	4.50	7.84
3.90	3.23	4.80	4.16

Model	OZ-060-24	Load: Minimum Load
Item	Over-Voltage Protection	

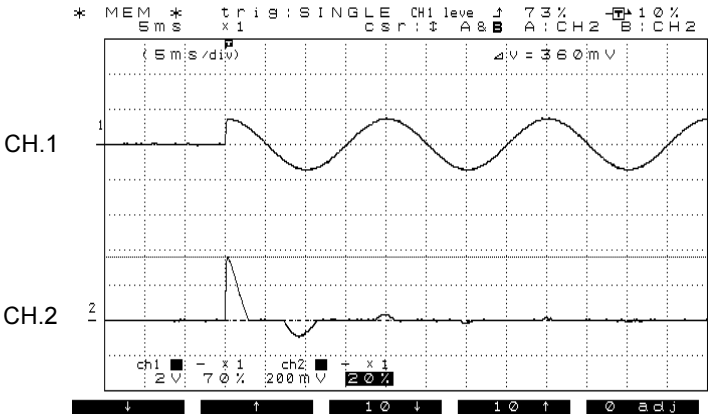
+24V



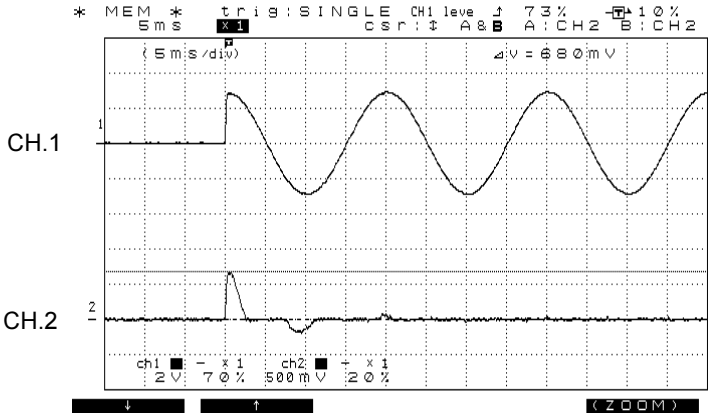
Ambient Temp. [℃]	Output Voltage	
	100V AC	240V AC
-15	29.50	29.40
25	30.40	30.40
50	30.90	30.90
65	31.80	31.90

Model	OZ-060-24	Temperature: 25℃
Item	Inrush Current	Load: Rated Load

Inrush Current Waveforms

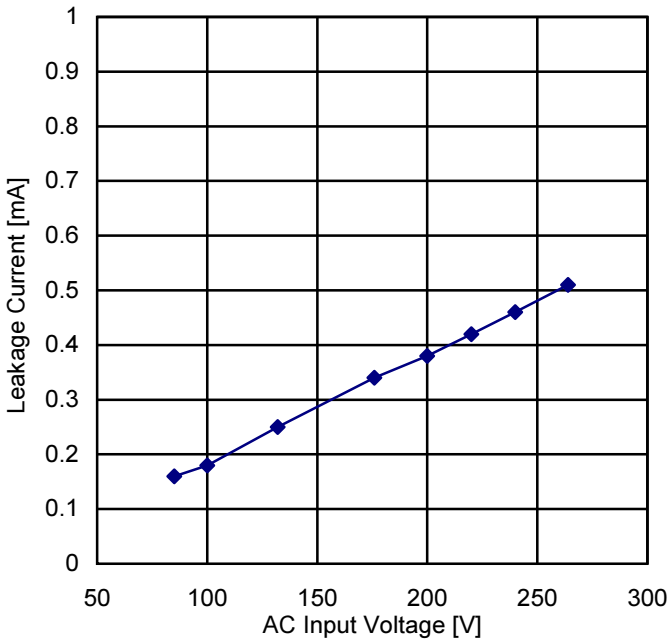


Waveform 1	
CH1	Measuring Point: AC Input Voltage
	Range: 200V/div
CH2	Measuring Point: AC Input Current
	Range: 10A/div
Timebase Range	5ms/div
Conditions	Input: 100V AC Load: Rated Load
Note: Inrush Current: 18.0A	



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: 34.0A	

Model	OZ-060-24	Load: Rated Load
Item	Leakage Current	



AC Input Voltage [V]	Leakage Current [mA]
85	0.16
100	0.18
132	0.25
176	0.34
200	0.38
220	0.42
240	0.46
264	0.51