



Supplemental test data
(参考資料)

Date of issue: Jun. 28, 2011

Test Data

Model Number: OZ-015-3R3

Model Name: DC POWER SUPPLY

INPUT: 85V – 264V AC, 50 / 60 Hz

OUTPUT: 3.3 V 3.0A

Minimum load : 0W

Rated load :9.9W

Approved by : Makoto Urasue (QA manager)

Designed by : A. Takeda (R&D engineer)

Tested by : Kohji Sawada (Evaluation test engineer)

Nipron Co., Ltd.

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Model	OZ-15-3R3	Temperature: 25°C																																					
Item	Input Current (by Load Power)																																						
		<table border="1"> <thead> <tr> <th rowspan="2">Load Power [W]</th> <th colspan="4">Input Current [A rms]</th> </tr> <tr> <th>Input Voltage 85V AC</th> <th>Input Voltage 100V AC</th> <th>Input Voltage 240V AC</th> <th>Input Voltage 264V AC</th> </tr> </thead> <tbody> <tr> <td>0.0</td> <td>0.03</td> <td>0.03</td> <td>0.03</td> <td>0.03</td> </tr> <tr> <td>2.475</td> <td>0.09</td> <td>0.08</td> <td>0.06</td> <td>0.06</td> </tr> <tr> <td>4.95</td> <td>0.15</td> <td>0.13</td> <td>0.08</td> <td>0.08</td> </tr> <tr> <td>7.425</td> <td>0.20</td> <td>0.18</td> <td>0.11</td> <td>0.10</td> </tr> <tr> <td>9.9</td> <td>0.26</td> <td>0.23</td> <td>0.13</td> <td>0.12</td> </tr> </tbody> </table>				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	0.03	0.03	0.03	0.03	2.475	0.09	0.08	0.06	0.06	4.95	0.15	0.13	0.08	0.08	7.425	0.20	0.18	0.11	0.10	9.9	0.26	0.23	0.13	0.12
Load Power [W]	Input Current [A rms]																																						
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9.9	0.26	0.23	0.13	0.12																																			

Model	OZ-15-3R3	Temperature: 25°C	
Item	Efficiency		

■ Efficiency(by Input Voltage)

AC Input Voltage [V]	50% Load Efficiency [%]	Rated Load Efficiency [%]
85	74.91	74.10
100	74.24	75.92
132	74.81	77.90
176	74.60	77.15
200	70.36	77.76
220	69.86	76.52
240	67.70	77.68
264	65.67	76.31

AC Input Voltage [V]	Efficiency [%]	
	50% Load	Rated Load
85	74.91	74.10
100	74.24	75.92
132	74.81	77.90
176	74.60	77.15
200	70.36	77.76
220	69.86	76.52
240	67.70	77.68
264	65.67	76.31

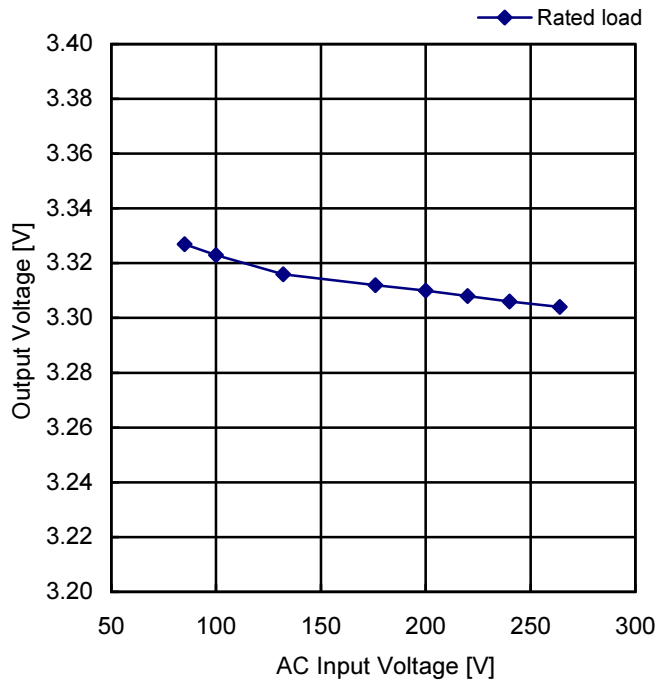
■ Efficiency(by Load Power)

Load Power [W]	Efficiency [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
2.475	65.93	65.55	52.99	48.75
4.95	74.91	74.24	67.70	65.67
7.425	75.04	76.78	74.42	73.95
9.9	74.10	75.92	77.68	76.31

Load Power [W]	Efficiency [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
2.475	65.93	65.55	52.99	48.75
4.95	74.91	74.24	67.70	65.67
7.425	75.04	76.78	74.42	73.95
9.9	74.10	75.92	77.68	76.31

Model	OZ-15-3R3	Temperature: 25°C
Item	Line Regulation	

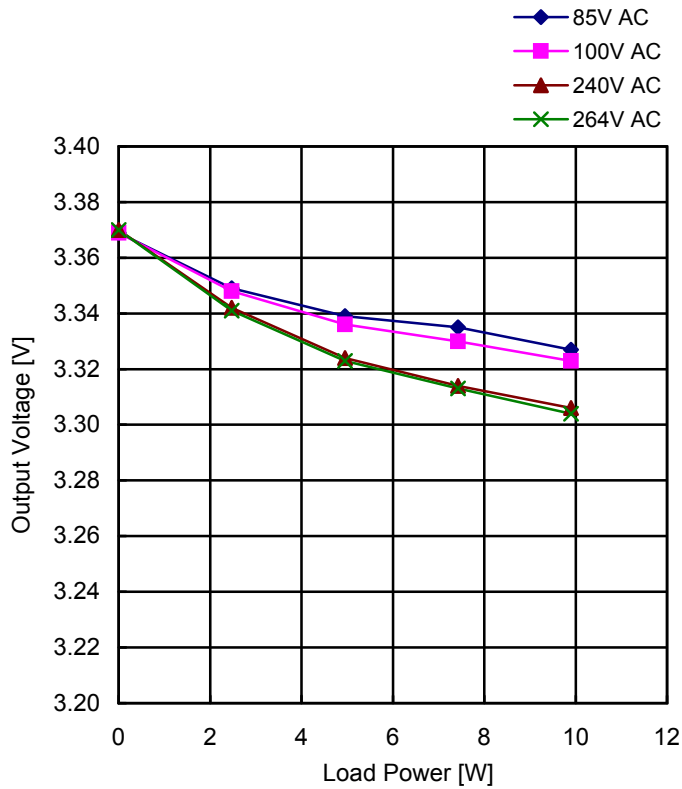
3.3V/3A



AC Input Voltage [V]	Output Voltage [V]
85	3.327
100	3.323
132	3.316
176	3.312
200	3.310
220	3.308
240	3.306
264	3.304

Model	OZ-15-3R3	Temperature: 25°C
Item	Load Regulation	

3.3V

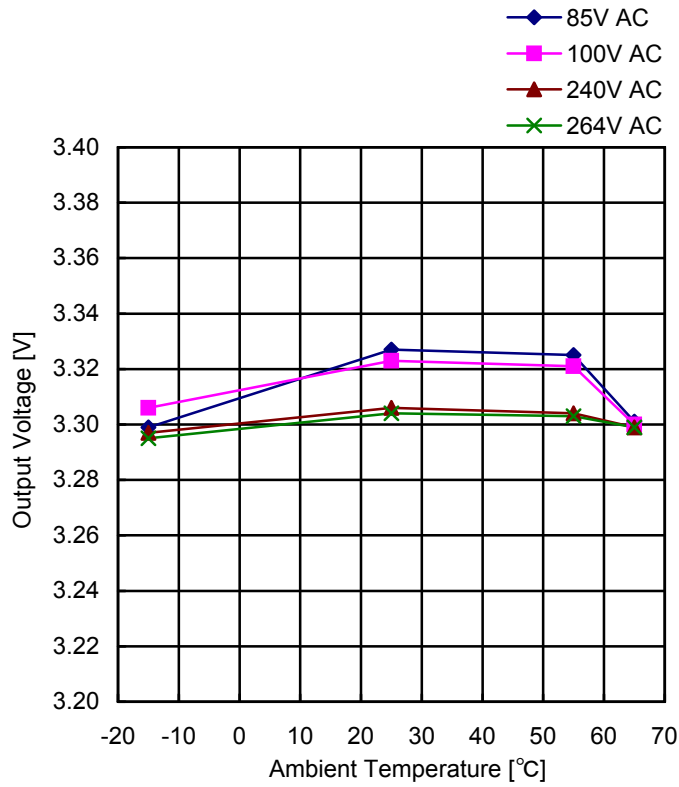


Load Power [W]	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	3.369	3.369	3.370	3.370
2.475	3.349	3.348	3.342	3.341
4.95	3.339	3.336	3.324	3.323
7.425	3.335	3.330	3.314	3.313
9.9	3.327	3.323	3.306	3.304
-	-	-	-	-

Load Power [W]	Load Condition	
	Load Current [A]	
0.0	0.00	
2.475	0.75	
4.95	1.50	
7.425	2.25	
9.9	3.00	
-	-	

Model	OZ-15-3R3
Item	Ambient Temperature Drift

3.3V



Ambient Temp. (°C)	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
-15	3.299	3.306	3.297	3.295
25	3.327	3.323	3.306	3.304
55	3.325	3.321	3.304	3.303
65	3.301	3.300	3.299	3.299

Load Condition

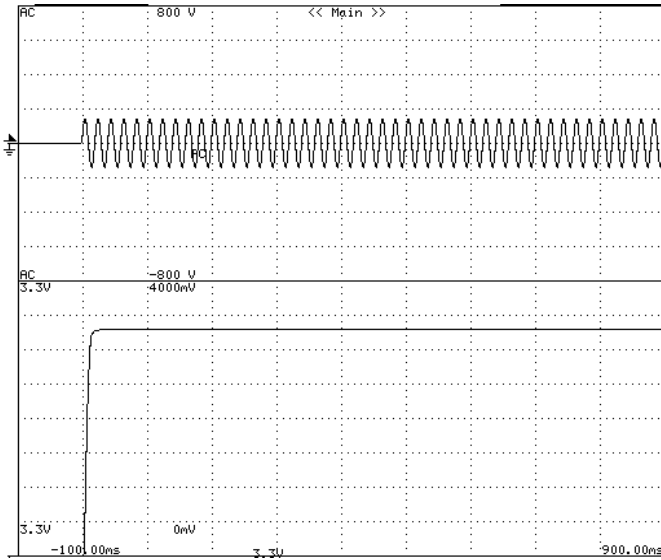
Ambient Temp. (°C)	Load Current [A]
	3.3V
-15	3.00
25	3.00
55	3.00
65	2.10

Model	OZ-015-3R3	Temperature: 25°C
Item	Output Rise Characteristics (at AC Power ON)	

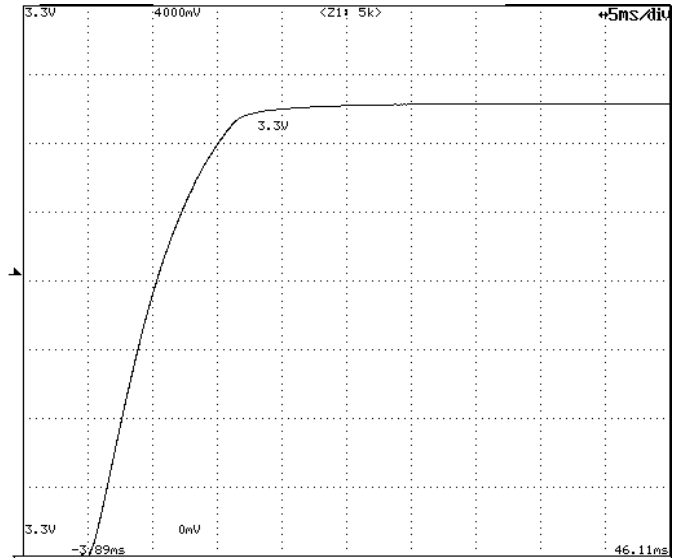
Input: 100V AC
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 0.5V/div
Timebase Range: 5ms/div



All Output Start-up Sequence

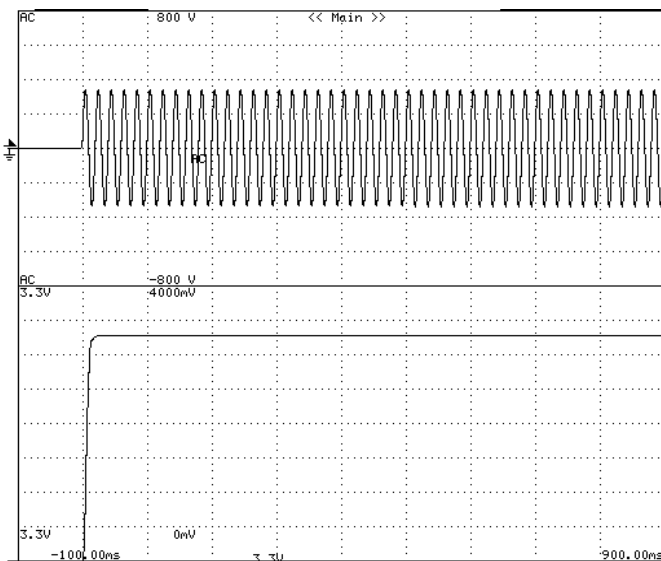


3.3V DC Output Rise Characteristics

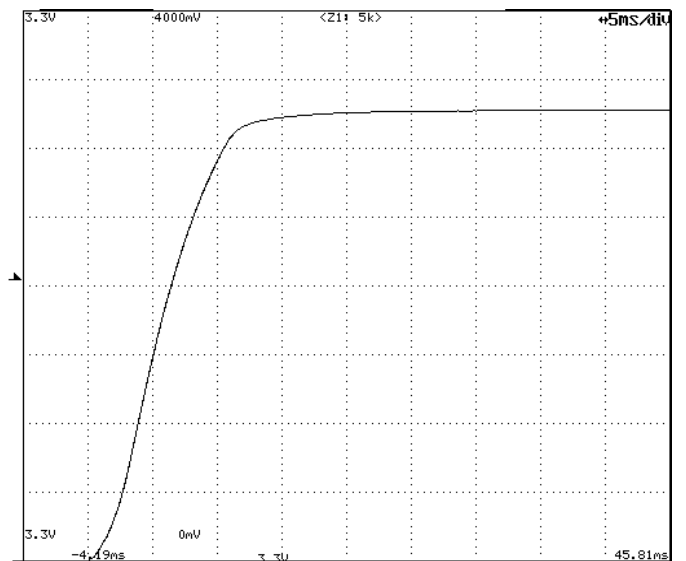
Input: 240V AC
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 0.5V/div
Timebase Range: 5ms/div



All Output Start-up Sequence

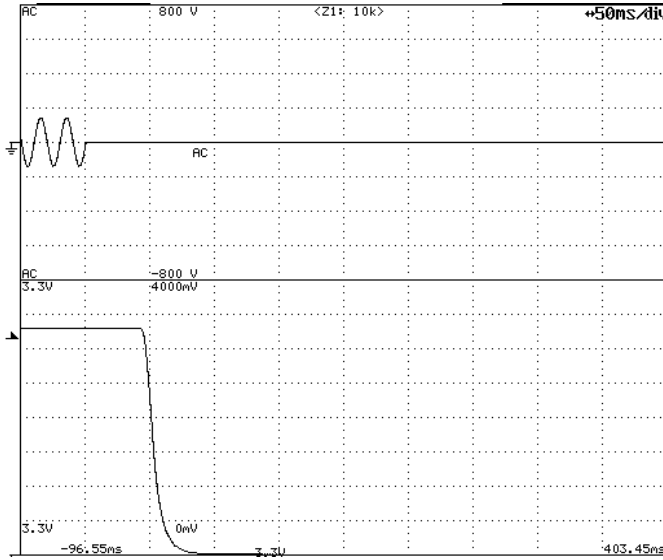


3.3V DC Output Rise Characteristics

Model	OZ-015-3R3	Temperature: 25°C
Item	Output Fall Characteristics (at AC Power OFF)	

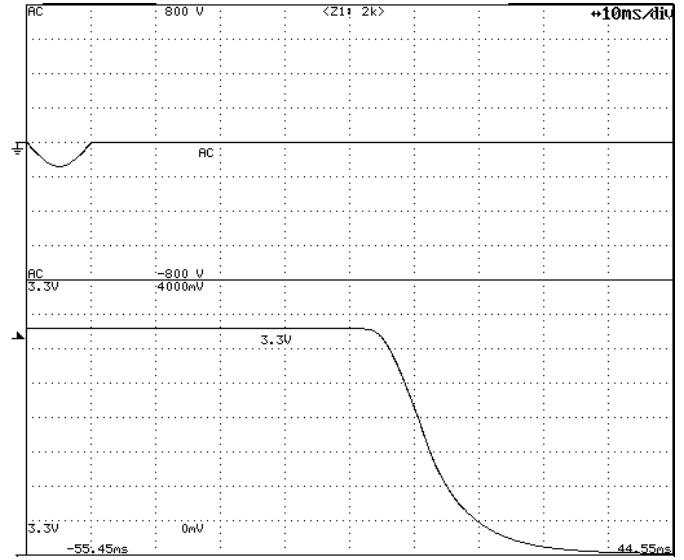
Input: 100V AC
Load: Rated Load

Timebase Range: 50ms/div



Output Fall Characteristics

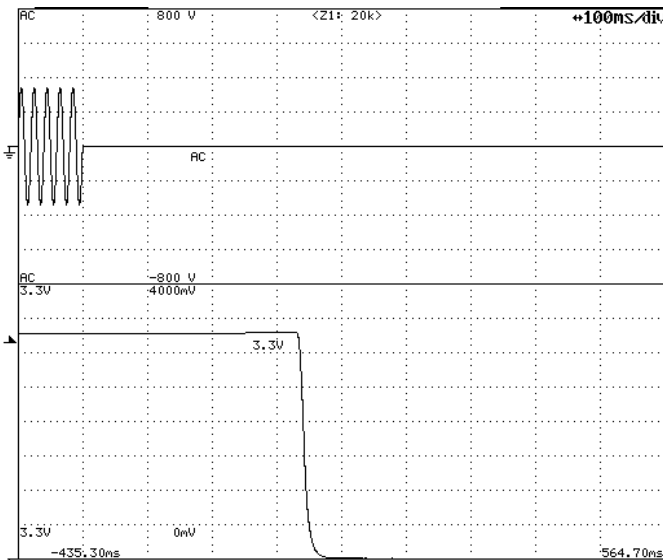
Timebase Range: 10ms/div



Output Fall Characteristics (magnification)

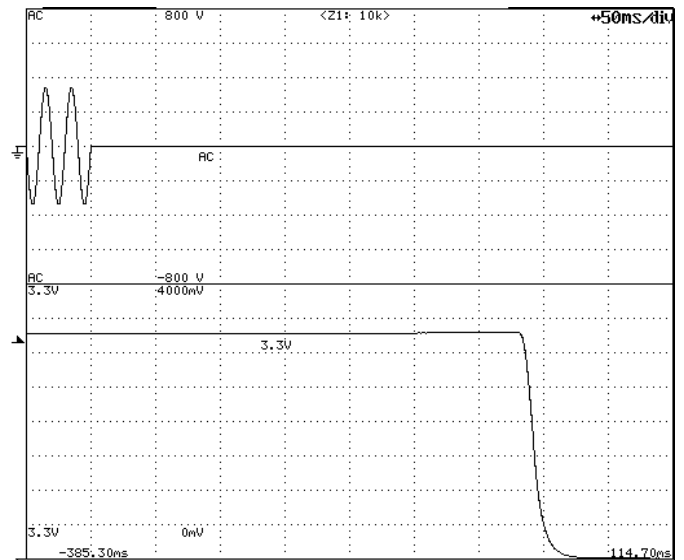
Input: 240V AC
Load: Rated Load

Timebase Range: 100ms/div



Output Fall Characteristics

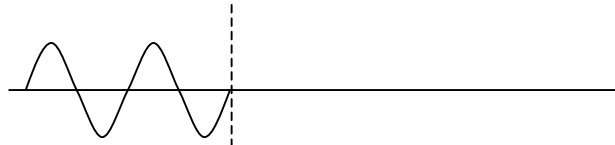
Timebase Range: 50ms/div



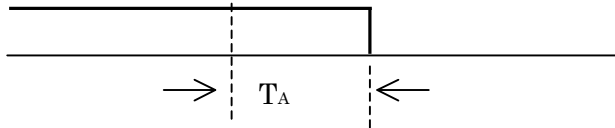
Output Fall Characteristics (magnification)

Model	OZ-015-3R3	Temperature: 25°C
Item	Instantaneous Interruption Compensation (by Load Power)	

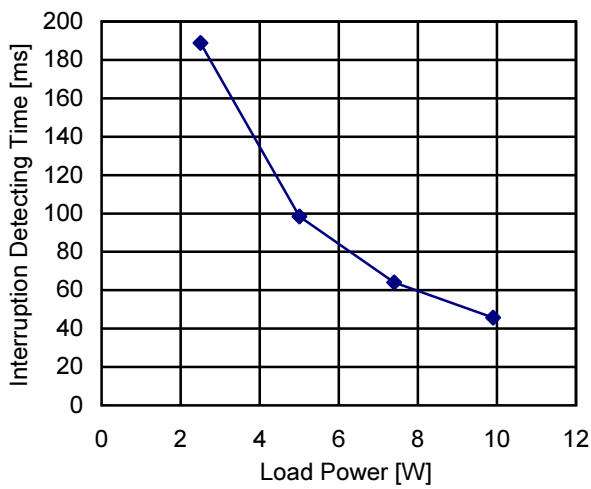
Input Voltage



Output Voltage

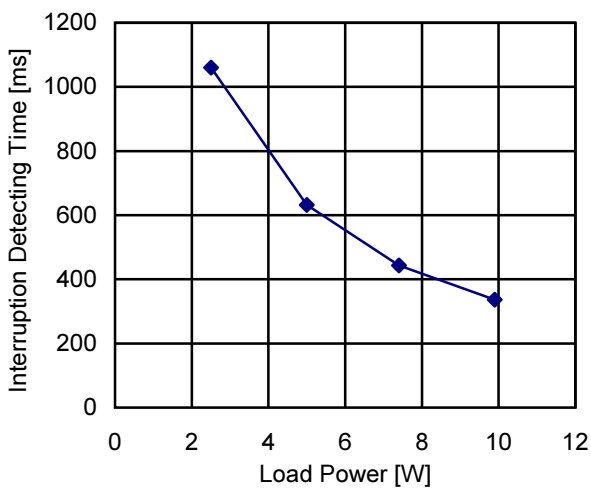


Input Voltage: 100V AC



Load Power [W]	Interruption Detecting Time [ms]
	Output Voltage
	T_A
2.5	188.8
5.0	98.5
7.4	64.1
9.9	45.8

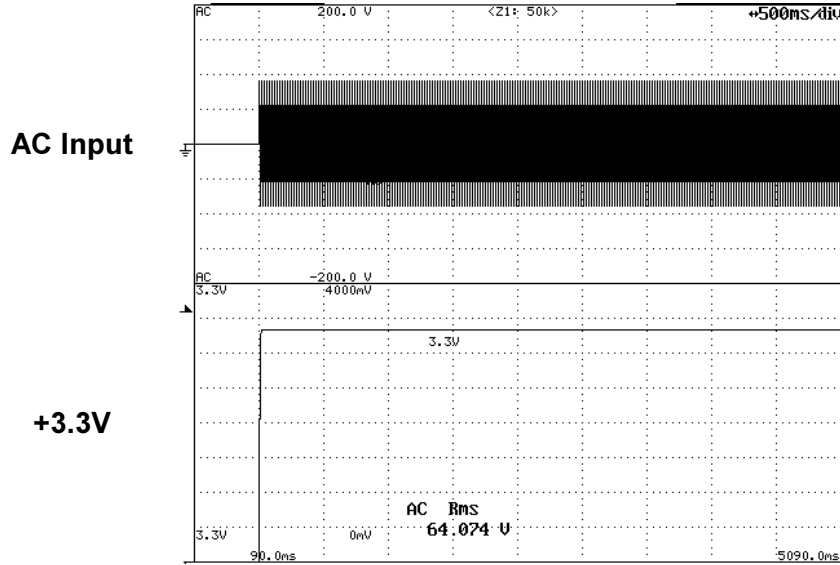
Input Voltage: 240V AC



Load Power [W]	Interruption Detecting Time [ms]
	Output Voltage
	T_A
2.5	1060.1
5.0	632.4
7.4	442.9
9.9	336.0

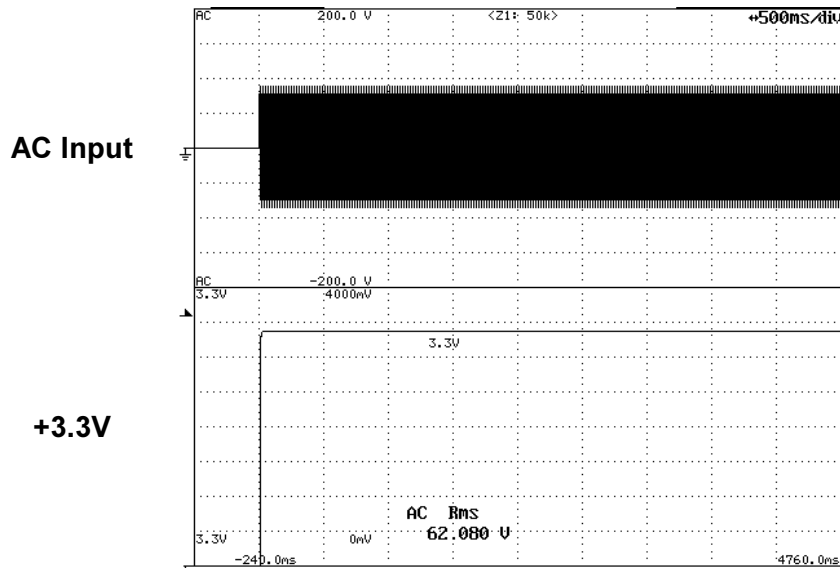
Model	OZ-015-3R3	Temperature: 25°C
Item	Start-Up Voltage	

**Timebase Range: 500ms/div
Load: Rated Load**



Start-up Voltage: 64.074V AC

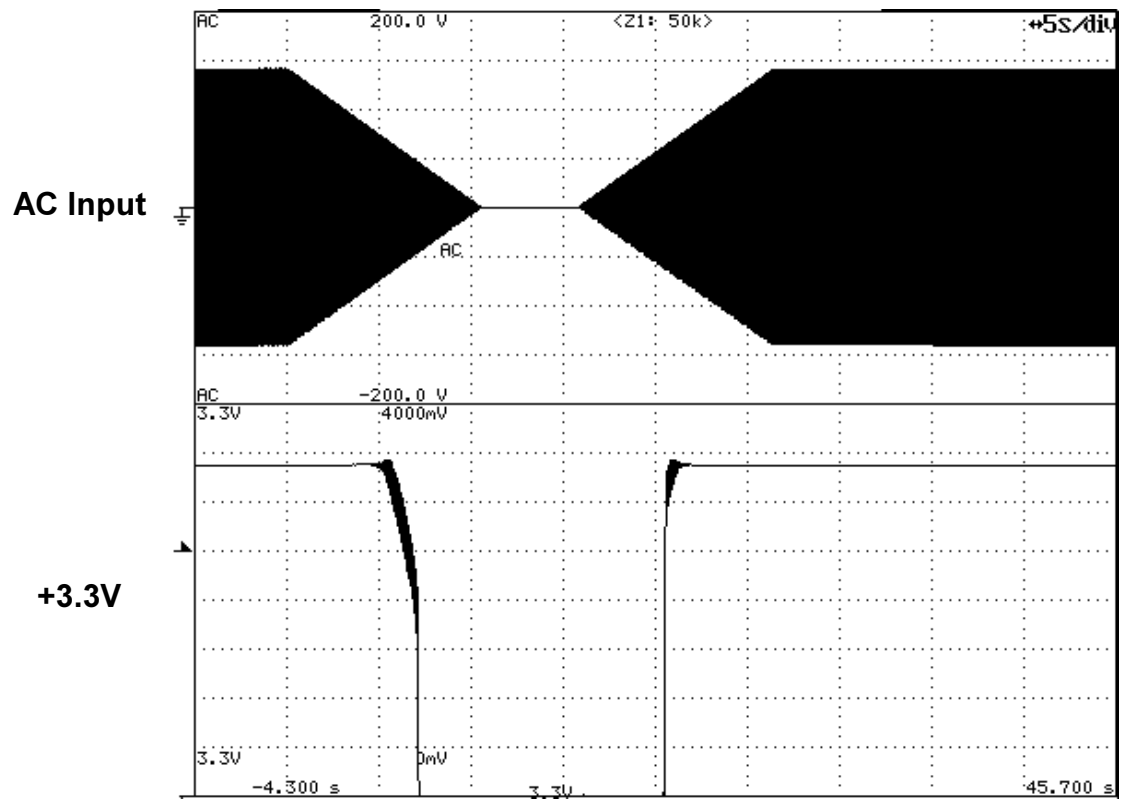
**Timebase Range: 500ms/div
Load: Minimum Load**



Start-up Voltage: 62.080V AC

Model	OZ-015-3R3	Temperature: 25°C
Item	Input Voltage Sweep Up/Down	

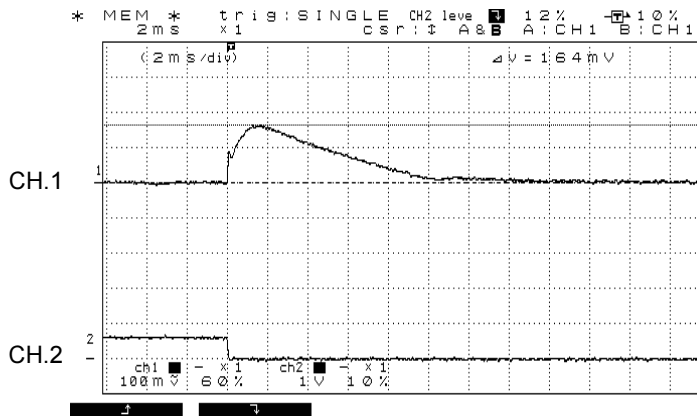
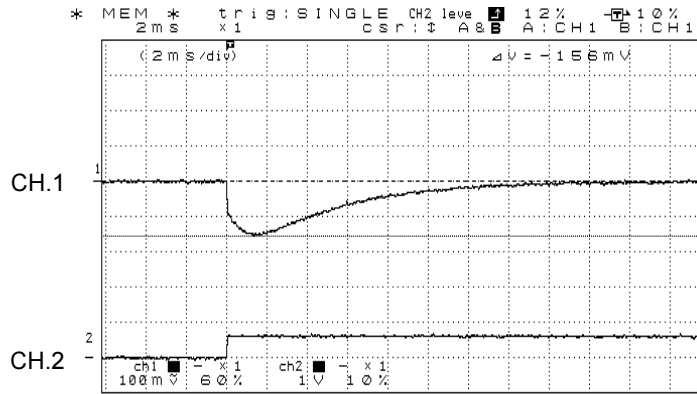
Timebase Range: 5s/div
Load: Rated Load



Sweep Rate: 10Vave/sec

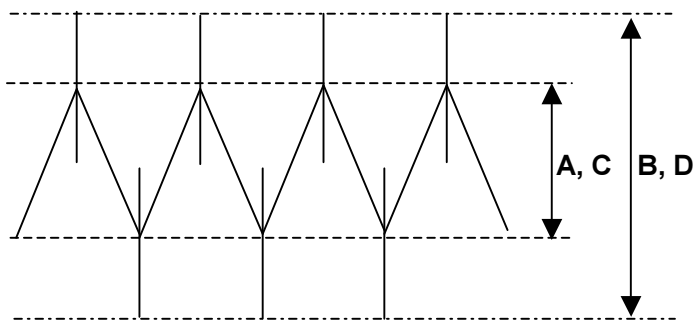
Model	OZ-015-3R3	Temperature: 25°C
Item	Dynamic Load Response	

+3.3V 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	2ms/div
Condition	Input: 100V AC
Note: Rated Load(3A) ⇒ Minimum load(0A)	

Model	OZ-15-3R3	Load: Rated Load
Item	Ambient Temperature Drift	



at 100V AC

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

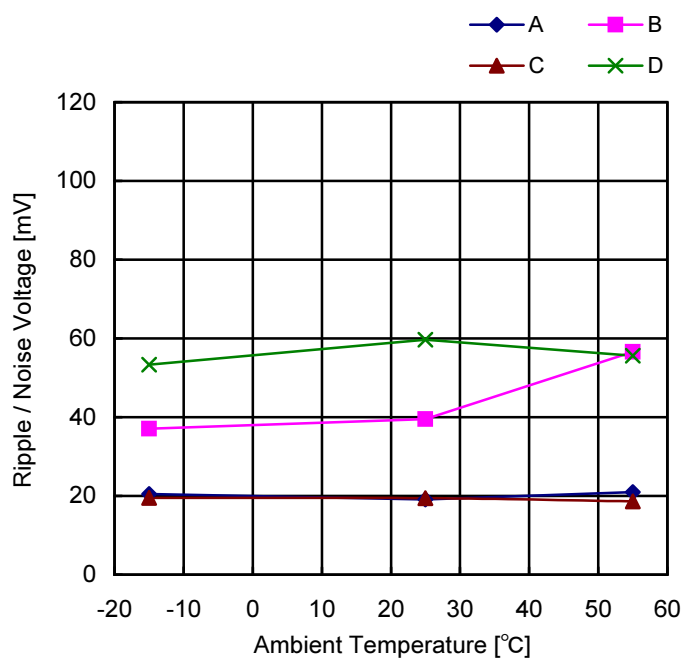
B: Noise Voltage (mV_{P-P})

at 240V AC

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

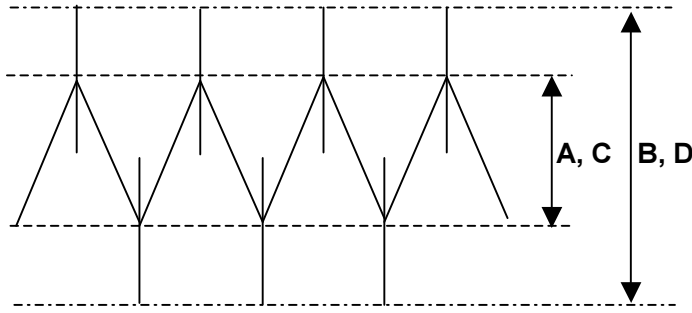
D: Noise Voltage (mV_{P-P})

3.3V



Ambient Temp. [°C]	Ripple / Noise Voltage [mV]			
	A	B	C	D
-15	20.5	37.1	19.5	53.3
25	19.1	39.5	19.4	59.7
55	21.0	56.6	18.6	55.6

Model	OZ-15-3R3	Temperature: 25°C
Item	Ambient Temperature Drift	



at 100V AC

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

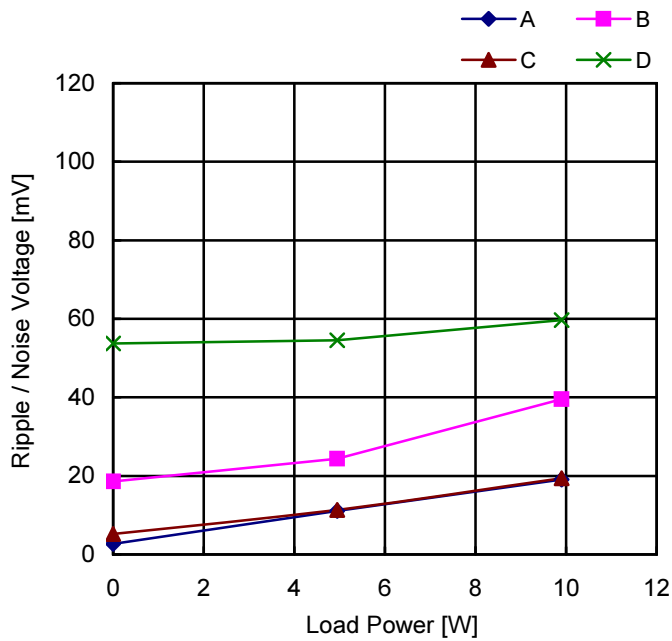
B: Noise Voltage (mV_{P-P})

at 240V AC

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

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

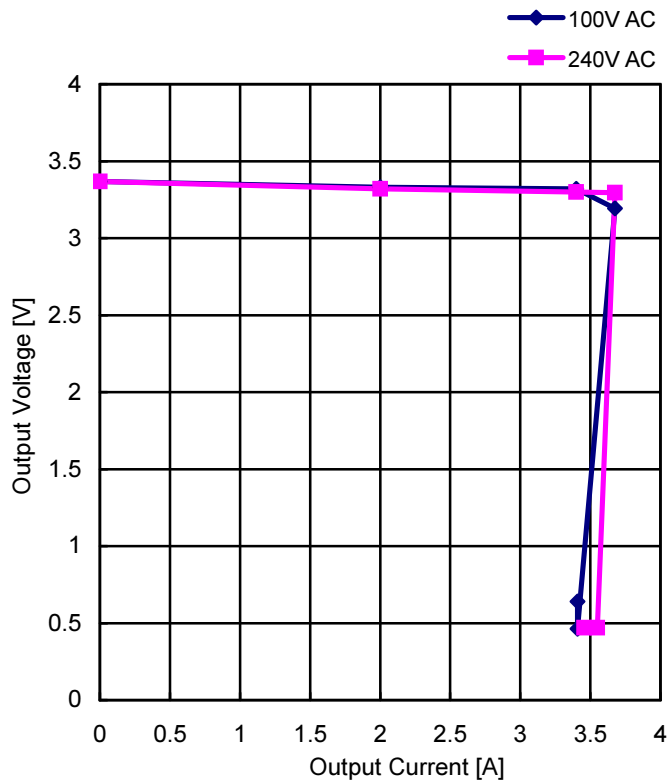
3.3V



Load Power [W]	Ripple / Noise Voltage [mV]			
	A	B	C	D
0	2.7	18.6	5.2	53.7
4.95	11.1	24.4	11.3	54.5
9.9	19.1	39.5	19.4	59.7

Model	OZ-15-3R3	Temperature: 25°C
Item	Over-Current Protection	

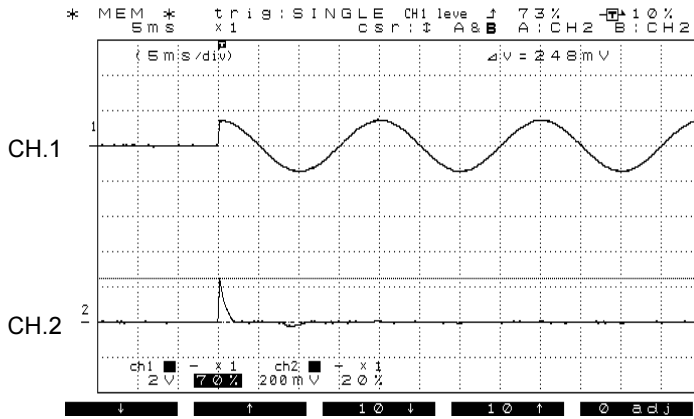
V-I Characteristics of 3.3V O.C.P



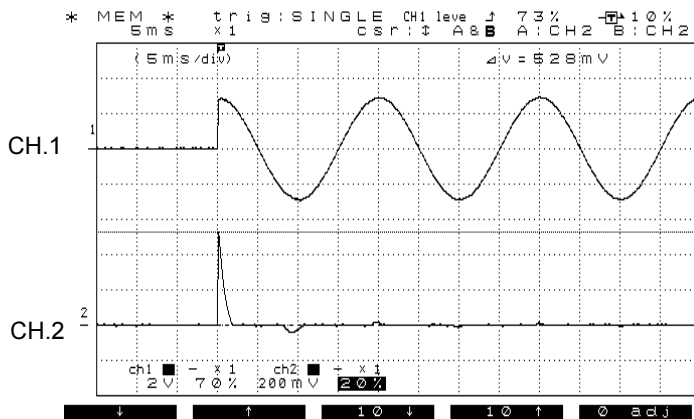
Input Voltage: 100V AC		Input Voltage: 240V AC	
Output Current [A]	Output Voltage [V]	Output Current [A]	Output Voltage [V]
0.00	3.37	0.00	3.37
2.00	3.33	2.00	3.32
3.40	3.32	3.40	3.30
3.68	3.19	3.68	3.30
3.41	0.46	3.55	0.47
3.41	0.64	3.46	0.47

Model	OZ-015-3R3	Temperature: 25°C
Item	Inrush Current	Load: Rated Load

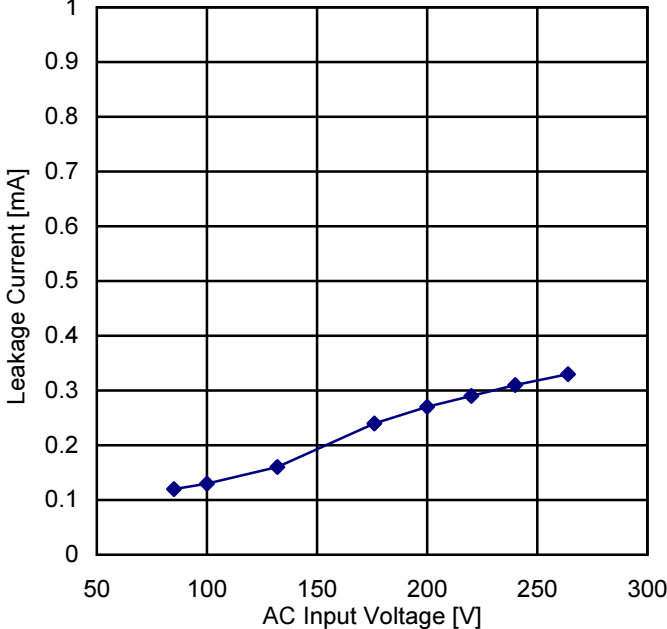
Inrush Current Waveforms



DATA 1	
CH1	Measuring Point: AC Input Voltage
	Range: 200V/div
CH2	Measuring Point: AC Input Current
	Range: 10A/div
Temporal Axis	5ms/div
Conditions	Input: 100V AC Load: Rated Load
Note: Inrush Current: 12.4A	



DATA 2	
CH1	Measuring Point: AC Input Voltage
	Range: 200V/div
CH2	Measuring Point: AC Input Current
	Range: 10A/div
Temporal Axis	5ms/div
Conditions	Input: 200V AC Load: Rated Load
Note: Inrush Current: 26.4A	

Model	OZ-015-3R3	Load: Rated Load																		
Item	Leakage Current																			
		<table border="1"> <thead> <tr> <th>AC Input Voltage [V]</th> <th>Leakage Current [mA]</th> </tr> </thead> <tbody> <tr> <td>85</td> <td>0.12</td> </tr> <tr> <td>100</td> <td>0.13</td> </tr> <tr> <td>132</td> <td>0.16</td> </tr> <tr> <td>176</td> <td>0.24</td> </tr> <tr> <td>200</td> <td>0.27</td> </tr> <tr> <td>220</td> <td>0.29</td> </tr> <tr> <td>240</td> <td>0.31</td> </tr> <tr> <td>264</td> <td>0.33</td> </tr> </tbody> </table>	AC Input Voltage [V]	Leakage Current [mA]	85	0.12	100	0.13	132	0.16	176	0.24	200	0.27	220	0.29	240	0.31	264	0.33
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