



Supplemental test data
(参考資料)

Date of issue: Jul. 25, 2011

Test Data

Model Number: OZ-030-12

Model Name: DC POWER SUPPLY

INPUT: 85V - 264V AC, 50 / 60 Hz

OUTPUT: 12 V 2.5A

Minimum load : 0W
Rated load : 30W

Approved by : Makoto Urasue (QA manager)
Designed by : A. Takeda (R.&D engineer)
Tested by : Kohji Sawada (Evaluation test engineer)

Nipron Co., Ltd.

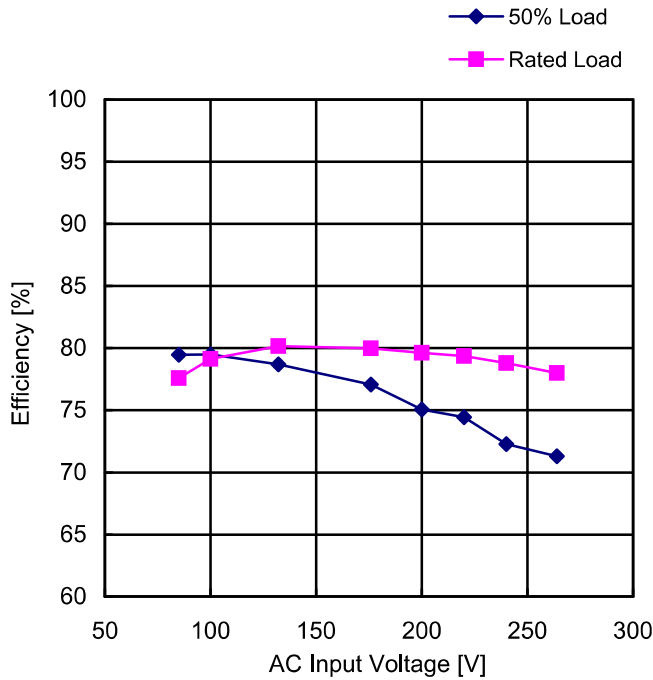
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| Model | OZ-30-12 | Temperature: 25°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------------------|--|-----------------------|-----------------------|----------------|-----------------------|--|--|--|----------------------|-----------------------|-----------------------|-----------------------|-----|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Item | Input Current (by Load Power) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Legend: ● 85V AC ■ 100V AC ▲ 240V AC × 264V AC</p> | | <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>0.05</td> <td>0.05</td> <td>0.06</td> <td>0.06</td> </tr> <tr> <td>7.5</td> <td>0.21</td> <td>0.19</td> <td>0.13</td> <td>0.13</td> </tr> <tr> <td>15.0</td> <td>0.37</td> <td>0.33</td> <td>0.20</td> <td>0.20</td> </tr> <tr> <td>22.5</td> <td>0.52</td> <td>0.46</td> <td>0.27</td> <td>0.26</td> </tr> <tr> <td>30.0</td> <td>0.68</td> <td>0.60</td> <td>0.33</td> <td>0.32</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 | 0.05 | 0.05 | 0.06 | 0.06 | 7.5 | 0.21 | 0.19 | 0.13 | 0.13 | 15.0 | 0.37 | 0.33 | 0.20 | 0.20 | 22.5 | 0.52 | 0.46 | 0.27 | 0.26 | 30.0 | 0.68 | 0.60 | 0.33 | 0.32 |
| 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 | 0.05 | 0.05 | 0.06 | 0.06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.5 | 0.21 | 0.19 | 0.13 | 0.13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15.0 | 0.37 | 0.33 | 0.20 | 0.20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22.5 | 0.52 | 0.46 | 0.27 | 0.26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30.0 | 0.68 | 0.60 | 0.33 | 0.32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

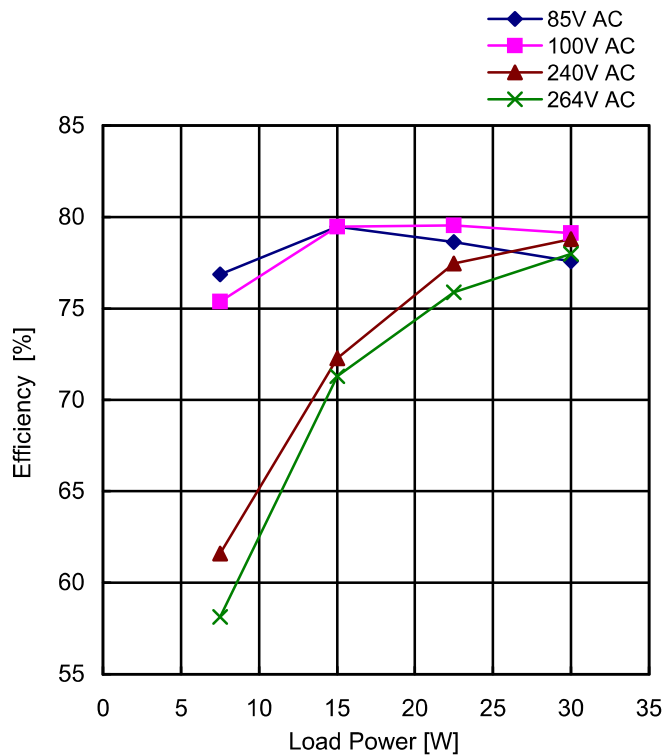
| | | |
|-------|------------|-------------------|
| Model | OZ-30-12 | Temperature: 25°C |
| Item | Efficiency | |

■ Efficiency (by Input Voltage)



| AC Input Voltage [V] | Efficiency [%] | |
|----------------------|----------------|------------|
| | 50% Load | Rated Load |
| 85 | 79.47 | 77.58 |
| 100 | 79.47 | 79.11 |
| 132 | 78.68 | 80.16 |
| 176 | 77.07 | 79.99 |
| 200 | 75.07 | 79.63 |
| 220 | 74.43 | 79.35 |
| 240 | 72.28 | 78.79 |
| 264 | 71.29 | 77.99 |

■ Efficiency (by Load Power)



| Load Power [W] | Efficiency [%] | | | |
|----------------|----------------------|-----------------------|-----------------------|-----------------------|
| | Input Voltage 85V AC | Input Voltage 100V AC | Input Voltage 240V AC | Input Voltage 264V AC |
| 7.5 | 76.86 | 75.39 | 61.59 | 58.14 |
| 15.0 | 79.47 | 79.47 | 72.28 | 71.29 |
| 22.5 | 78.62 | 79.54 | 77.46 | 75.89 |
| 30.0 | 77.58 | 79.11 | 78.79 | 77.99 |

| | | |
|-------|-----------------|-------------------|
| Model | OZ-30-12 | Temperature: 25°C |
| Item | Line Regulation | |

12V/2.5A

Legend: Rated load

| AC Input Voltage [V] | Output Voltage [V] |
|----------------------|--------------------|
| 85 | 12.006 |
| 100 | 12.005 |
| 132 | 12.006 |
| 176 | 12.006 |
| 200 | 12.006 |
| 220 | 12.006 |
| 240 | 12.006 |
| 264 | 12.006 |

| AC Input Voltage [V] | Output Voltage [V] |
|----------------------|--------------------|
| 85 | 12.006 |
| 100 | 12.005 |
| 132 | 12.006 |
| 176 | 12.006 |
| 200 | 12.006 |
| 220 | 12.006 |
| 240 | 12.006 |
| 264 | 12.006 |

| | | |
|-------|-----------------|-------------------|
| Model | OZ-30-12 | Temperature: 25°C |
| Item | Load Regulation | |

12V

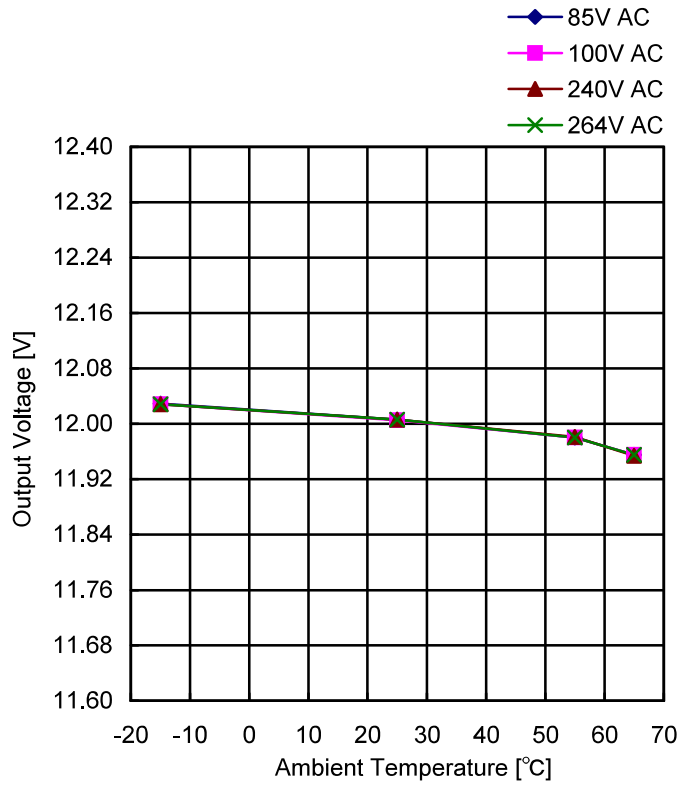
| Load Power [W] | 85V AC [V] | 100V AC [V] | 240V AC [V] | 264V AC [V] |
|----------------|------------|-------------|-------------|-------------|
| 0.0 | 12.014 | 12.014 | 12.013 | 12.013 |
| 7.5 | 12.011 | 12.011 | 12.011 | 12.011 |
| 15.0 | 12.009 | 12.010 | 12.009 | 12.009 |
| 22.5 | 12.007 | 12.007 | 12.007 | 12.008 |
| 30.0 | 12.006 | 12.005 | 12.006 | 12.006 |

| Load Power [W] | Output Voltage [V] | | | |
|----------------|----------------------|-----------------------|-----------------------|-----------------------|
| | Input Voltage 85V AC | Input Voltage 100V AC | Input Voltage 240V AC | Input Voltage 264V AC |
| 0.0 | 12.014 | 12.014 | 12.013 | 12.013 |
| 7.5 | 12.011 | 12.011 | 12.011 | 12.011 |
| 15.0 | 12.009 | 12.010 | 12.009 | 12.009 |
| 22.5 | 12.007 | 12.007 | 12.007 | 12.008 |
| 30.0 | 12.006 | 12.005 | 12.006 | 12.006 |
| - | - | - | - | - |

| Load Power [W] | Load Condition | |
|----------------|------------------|--|
| | Load Current [A] | |
| | 12V | |
| 0.0 | 0.00 | |
| 7.5 | 0.625 | |
| 15.0 | 1.25 | |
| 22.5 | 1.875 | |
| 30.0 | 2.50 | |
| - | - | |

| | |
|-------|---------------------------|
| Model | OZ-30-12 |
| Item | Ambient Temperature Drift |

12V



| Ambient Temp. (°C) | Output Voltage [V] | | | |
|--------------------|----------------------|-----------------------|-----------------------|-----------------------|
| | Input Voltage 85V AC | Input Voltage 100V AC | Input Voltage 240V AC | Input Voltage 264V AC |
| -15 | 12.029 | 12.028 | 12.028 | 12.028 |
| 25 | 12.006 | 12.005 | 12.006 | 12.006 |
| 55 | 11.980 | 11.980 | 11.981 | 11.980 |
| 65 | 11.955 | 11.955 | 11.954 | 11.955 |

Load Condition

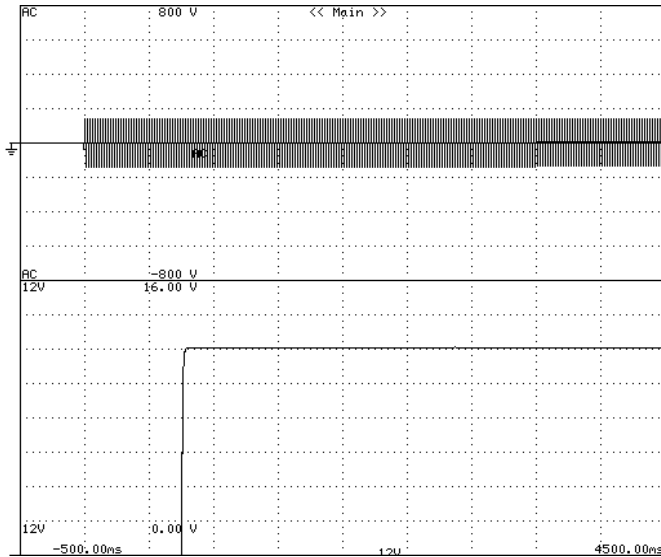
| Ambient Temp. (°C) | Load Current [A] |
|--------------------|------------------|
| | 12V |
| -15 | 2.50 |
| 25 | 2.50 |
| 55 | 2.50 |
| 65 | 1.75 |

| | | |
|-------|--|-------------------|
| Model | OZ-030-12 | Temperature: 25°C |
| Item | Output Rise Characteristics (at AC Power ON) | |

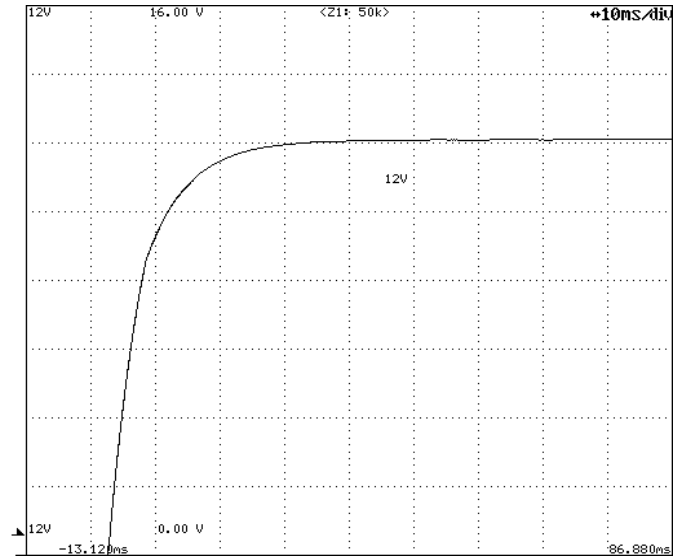
Input: 100V AC
Load: Rated Load

Timebase Range: 500ms/div

**Vertical Sensitivity: 2V/div
Timebase Range: 10ms/div**



All Output Start-up Sequence

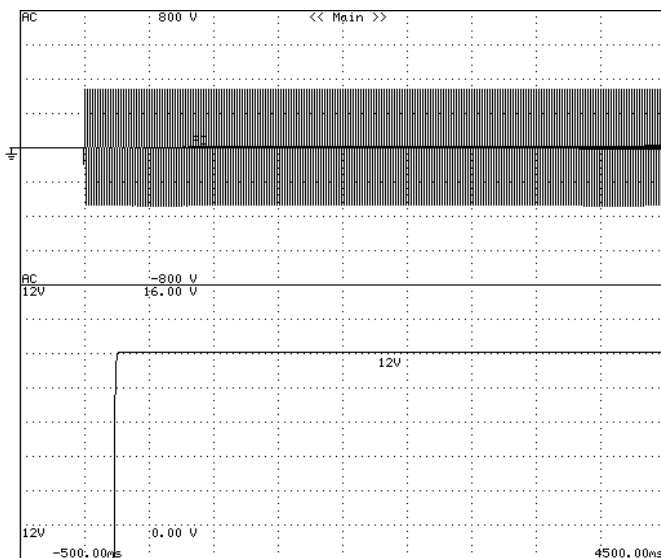


12V DC Output Rise Characteristics

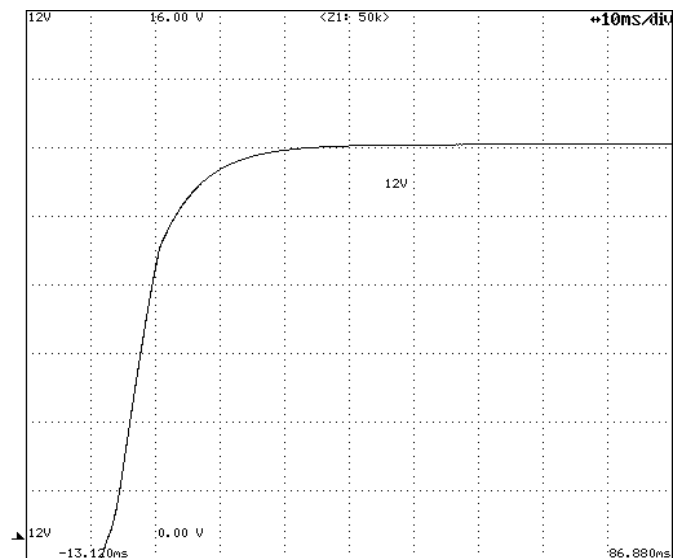
Input: 240V AC
Load: Rated Load

Timebase Range: 500ms/div

**Vertical Sensitivity: 2V/div
Timebase Range: 10ms/div**



All Output Start-up Sequence

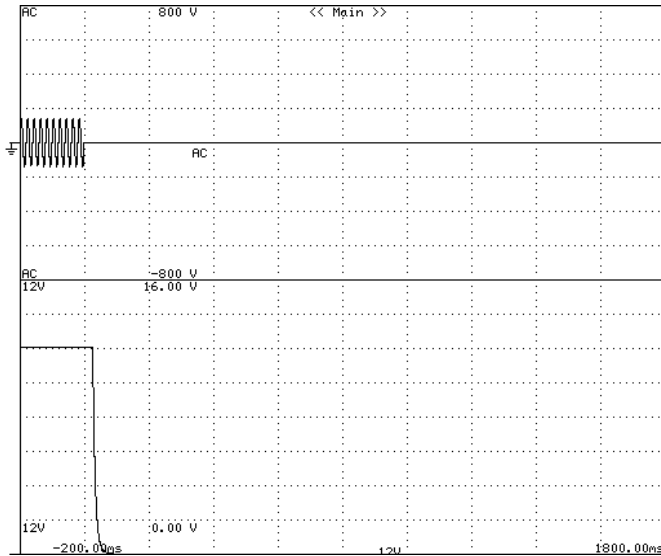


12V DC Output Rise Characteristics

| | | |
|-------|---|-------------------|
| Model | OZ-030-12 | Temperature: 25°C |
| Item | Output Fall Characteristics (at AC Power OFF) | |

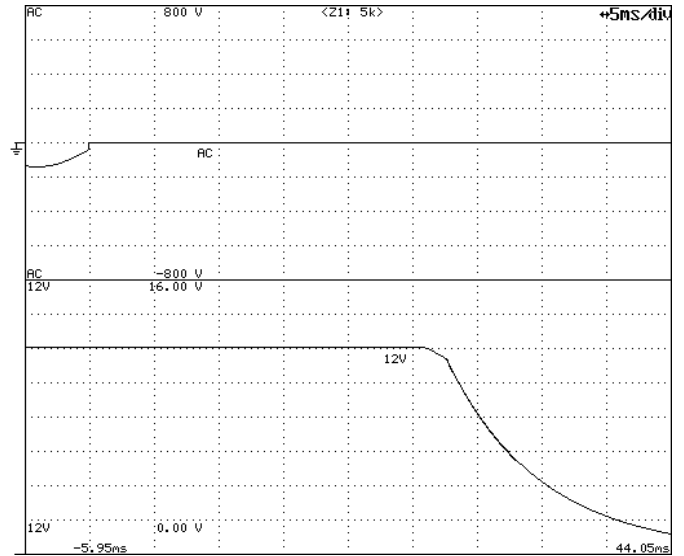
Input: 100V AC
Load: Rated Load

Timebase Range: 200ms/div



Output Fall Characteristics

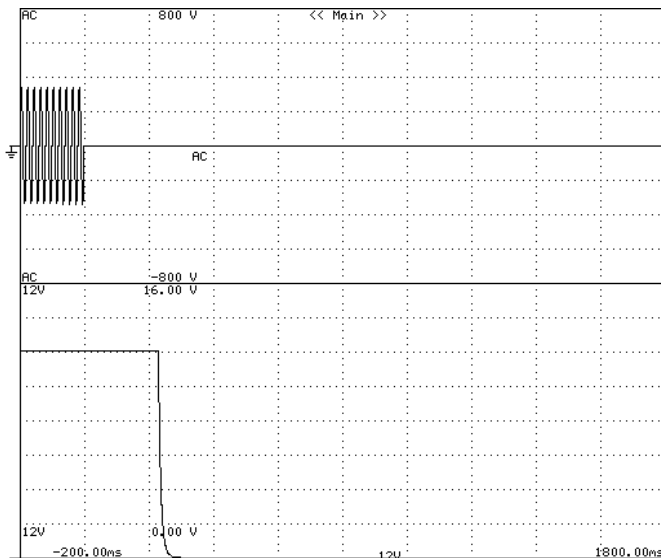
Timebase Range: 5ms/div



Output Fall Characteristics (magnification)

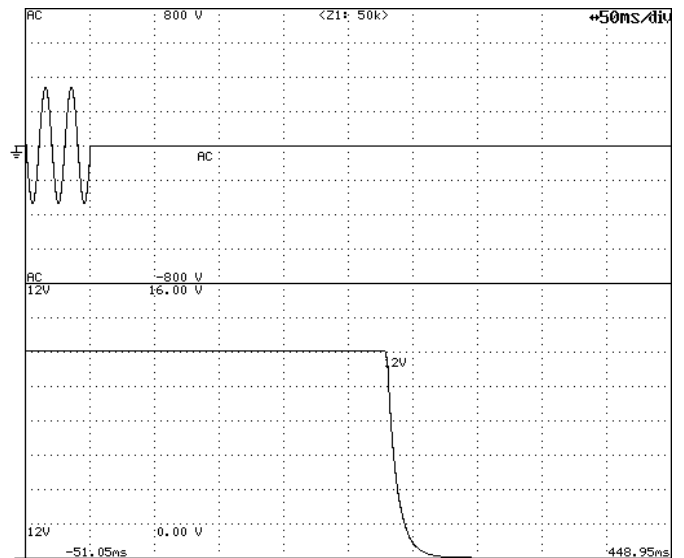
Input: 240V AC
Load: Rated Load

Timebase Range: 200ms/div



Output Fall Characteristics

Timebase Range: 50ms/div



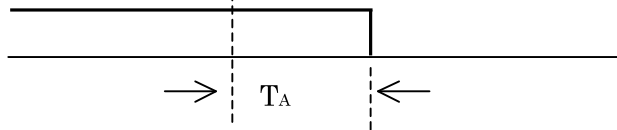
Output Fall Characteristics (magnification)

| | | |
|-------|---|-------------------|
| Model | OZ-030-12 | Temperature: 25°C |
| Item | Instantaneous Interruption Compensation (by Load Power) | |

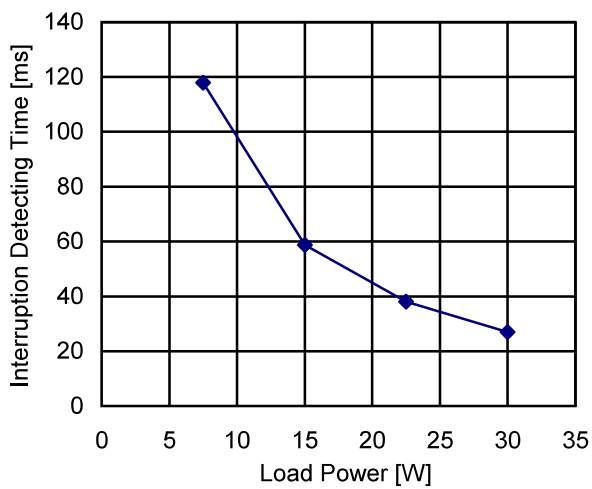
Input Voltage



Output Voltage

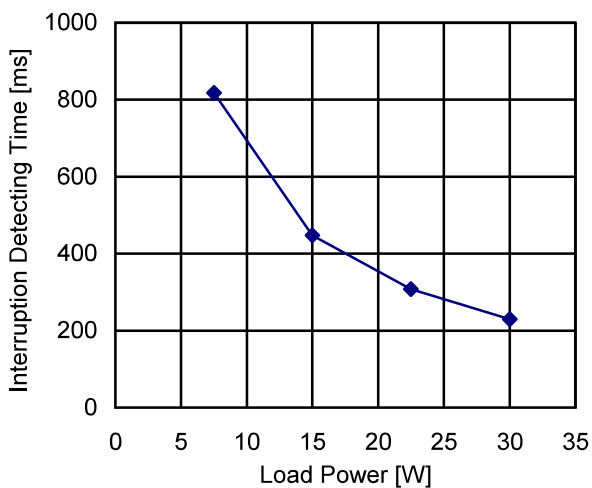


Input Voltage:100V AC



| Load Power [W] | Interruption Detecting Time [ms] |
|----------------|----------------------------------|
| | Ouput Voltage |
| | T _A |
| 7.5 | 117.9 |
| 15.0 | 58.8 |
| 22.5 | 38.1 |
| 30.0 | 27.0 |

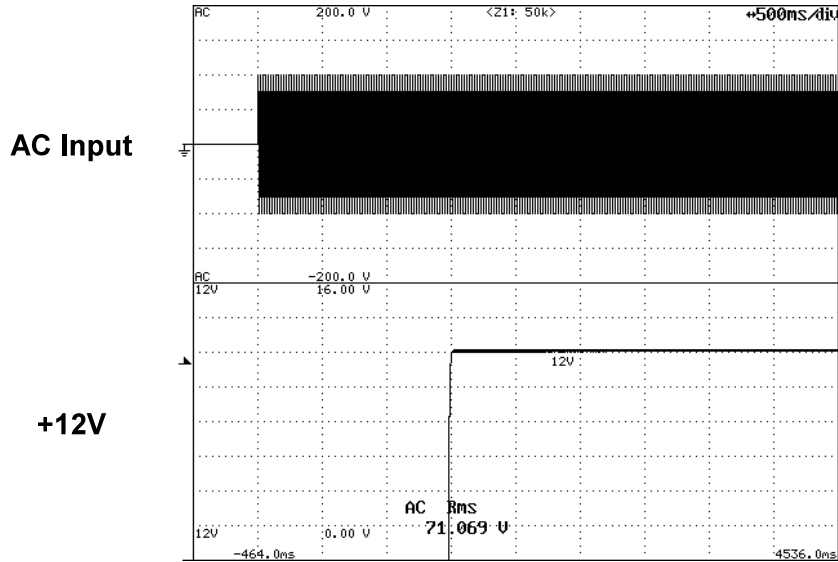
Input Voltage:240V AC



| Load Power [W] | Interruption Detecting Time [ms] |
|----------------|----------------------------------|
| | Ouput Voltage |
| | T _A |
| 7.5 | 817.3 |
| 15.0 | 447.5 |
| 22.5 | 308.1 |
| 30.0 | 229.7 |

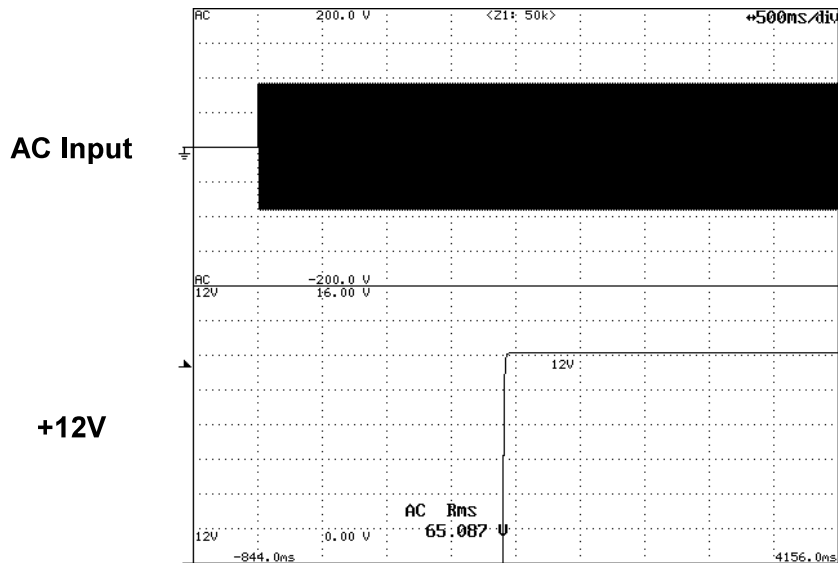
| | | |
|-------|------------------|-------------------|
| Model | OZ-030-12 | Temperature: 25°C |
| Item | Start-Up Voltage | |

Timebase Range: 500ms/div
Load: Rated Load



Start-up Voltage: 71.1V AC

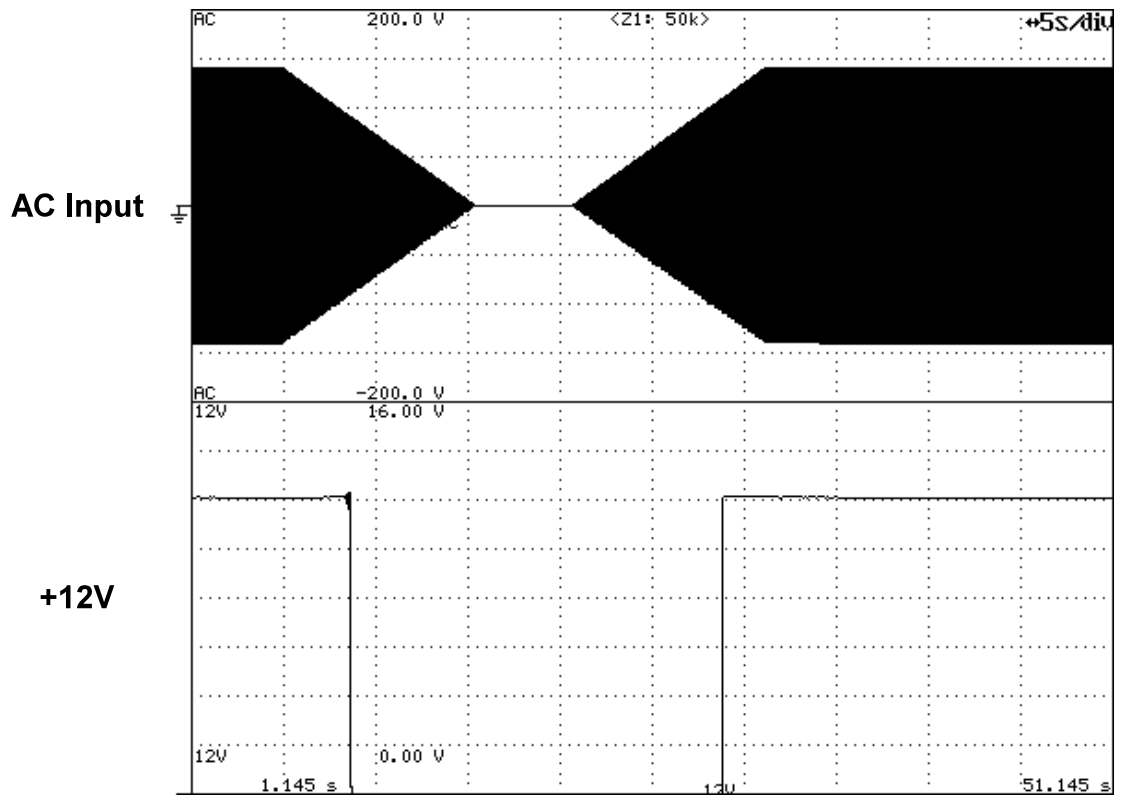
Timebase Range: 500ms/div
Load: Minimum Load



Start-up Voltage: 65.1V AC

| | | |
|-------|-----------------------------|-------------------|
| Model | OZ-030-12 | Temperature: 25°C |
| Item | Input Voltage Sweep Up/Down | |

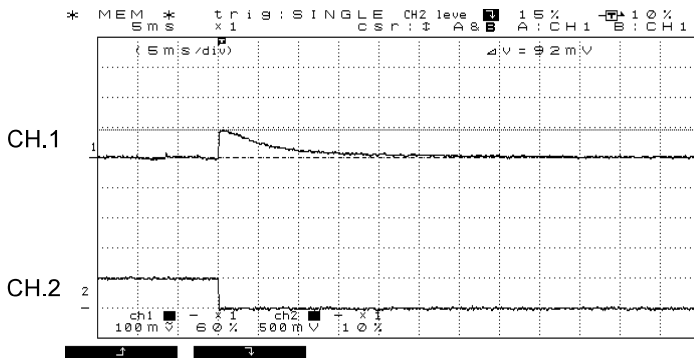
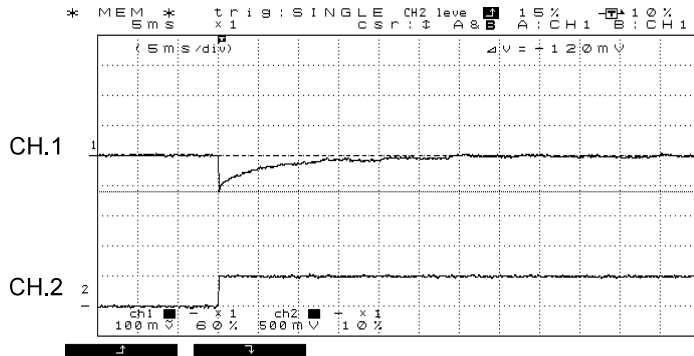
Timebase Range: 5s/div
Load: Rated Load



Sweep Rate: 10Vave/sec

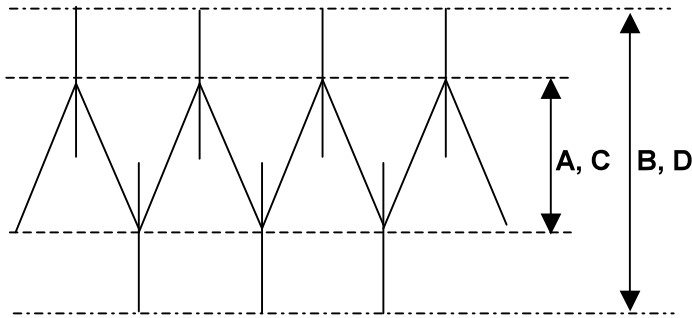
| | | |
|-------|-----------------------|-------------------|
| Model | OZ-030-12 | Temperature: 25°C |
| Item | Dynamic Load Response | |

+12V 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 | 5ms/div |
| Condition | Input: 100V AC |
| Note: Rated Load(2.5A) ⇒ Minimum load(0A) | |

| | | |
|-------|---------------------------|------------------|
| Model | OZ-30-12 | Load: Rated Load |
| Item | Ambient Temperature Drift | |



at 100V AC

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

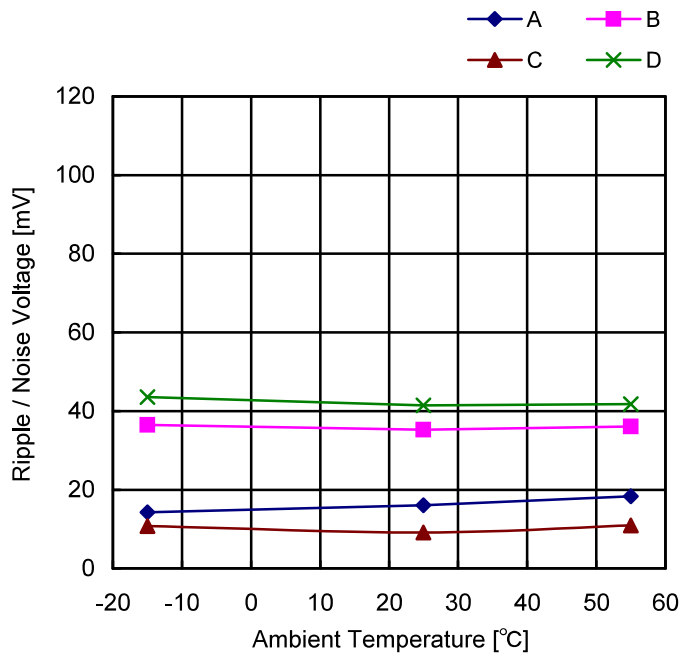
B: Noise Voltage (mV_{P-P})

at 240V AC

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

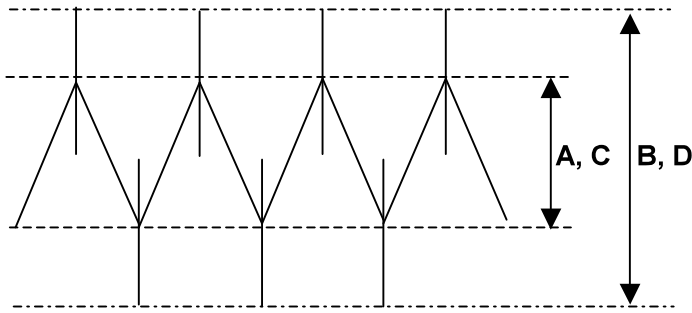
D: Noise Voltage (mV_{P-P})

12V



| Ambient Temp. [°C] | Ripple / Noise Voltage [mV] | | | |
|--------------------|-----------------------------|------|------|------|
| | A | B | C | D |
| -15 | 14.3 | 36.5 | 10.8 | 43.6 |
| 25 | 16.1 | 35.3 | 9.2 | 41.5 |
| 55 | 18.4 | 36.1 | 11.0 | 41.8 |

| | | |
|-------|---------------------------|-------------------|
| Model | OZ-30-12 | Temperature: 25°C |
| Item | Ambient Temperature Drift | |



at 100V AC

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

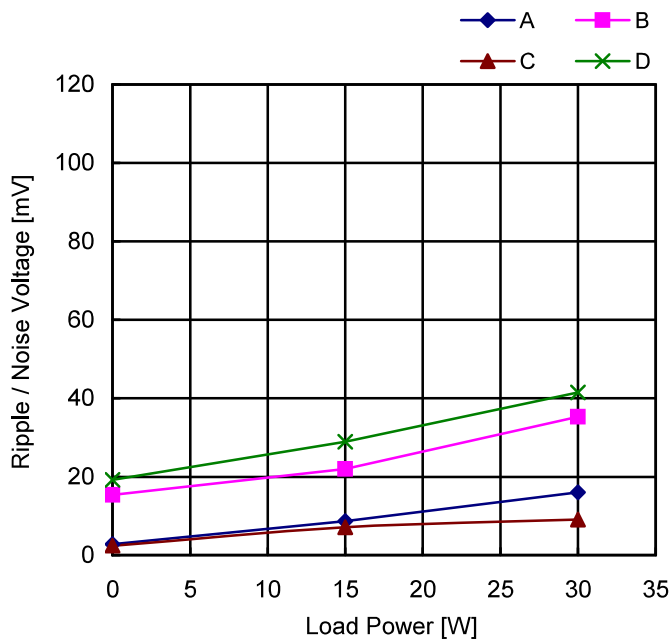
B: Noise Voltage (mV_{P-P})

at 240V AC

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

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

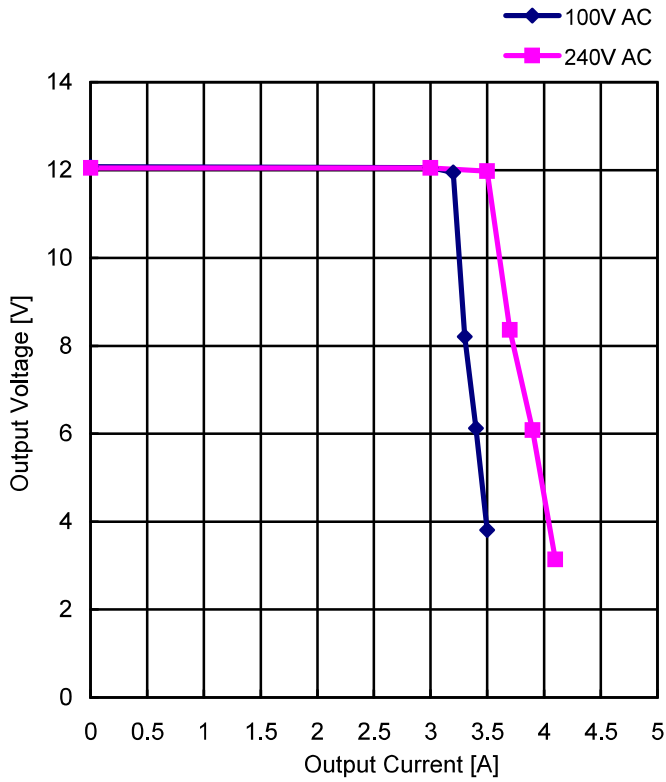
12V



| Load Power [W] | Ripple / Noise Voltage [mV] | | | |
|----------------|-----------------------------|------|-----|------|
| | A | B | C | D |
| 0 | 2.8 | 15.4 | 2.4 | 19.2 |
| 15.0 | 8.7 | 22.0 | 7.2 | 28.9 |
| 30.0 | 16.1 | 35.3 | 9.2 | 41.5 |

| | | |
|-------|-------------------------|-------------------|
| Model | OZ-30-12 | Temperature: 25°C |
| Item | Over-Current Protection | |

V-I Characteristics of 12V O.C.P

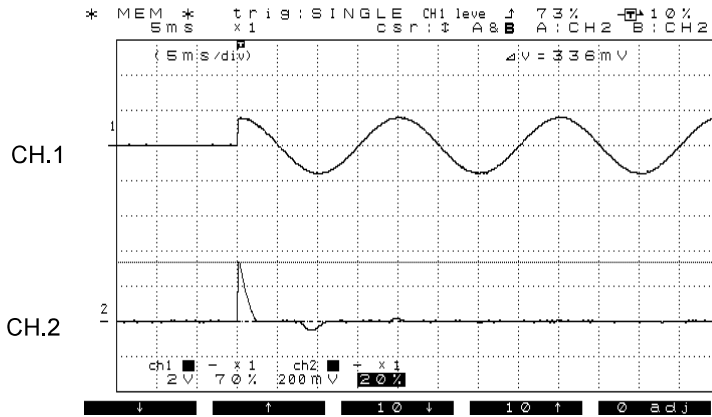


| Input Voltage: 100V AC | | Input Voltage: 240V AC | |
|------------------------|--------------------|------------------------|--------------------|
| Output Current [A] | Output Voltage [V] | Output Current [A] | Output Voltage [V] |
| 0.00 | 12.08 | 0.00 | 12.05 |
| 3.00 | 12.06 | 3.00 | 12.05 |
| 3.20 | 11.95 | 3.50 | 11.98 |
| 3.30 | 8.21 | 3.70 | 8.36 |
| 3.40 | 6.13 | 3.90 | 6.08 |
| 3.50 | 3.81 | 4.10 | 3.14 |

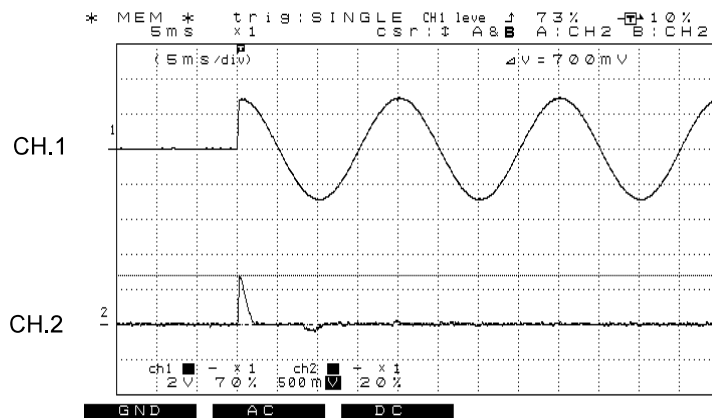
| Model | OZ-030-12 | Load: Minimum Load | | | | | | | | | | | | | | | | | | |
|--------------------|-------------------------|--|--|--------------------|----------------|--|---------|---------|-----|-------|-------|----|-------|-------|----|-------|-------|----|-------|-------|
| Item | Over-Voltage Protection | | | | | | | | | | | | | | | | | | | |
| <p>+12V</p> | | <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temp. [°C]</th> <th colspan="2">Output Voltage</th> </tr> <tr> <th>100V AC</th> <th>240V AC</th> </tr> </thead> <tbody> <tr> <td>-15</td> <td>14.45</td> <td>14.50</td> </tr> <tr> <td>25</td> <td>14.89</td> <td>14.85</td> </tr> <tr> <td>55</td> <td>15.11</td> <td>15.10</td> </tr> <tr> <td>65</td> <td>15.26</td> <td>15.27</td> </tr> </tbody> </table> | | Ambient Temp. [°C] | Output Voltage | | 100V AC | 240V AC | -15 | 14.45 | 14.50 | 25 | 14.89 | 14.85 | 55 | 15.11 | 15.10 | 65 | 15.26 | 15.27 |
| Ambient Temp. [°C] | Output Voltage | | | | | | | | | | | | | | | | | | | |
| | 100V AC | 240V AC | | | | | | | | | | | | | | | | | | |
| -15 | 14.45 | 14.50 | | | | | | | | | | | | | | | | | | |
| 25 | 14.89 | 14.85 | | | | | | | | | | | | | | | | | | |
| 55 | 15.11 | 15.10 | | | | | | | | | | | | | | | | | | |
| 65 | 15.26 | 15.27 | | | | | | | | | | | | | | | | | | |

| | | |
|-------|----------------|-------------------|
| Model | OZ-030-12 | 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: 16.8A | |



| DATA 2 | |
|--------------------------------|--------------------------------------|
| CH1 | Measuring Point: AC Input Voltage |
| | Range: 200V/div |
| CH2 | Measuring Point: AC Input Current |
| | Range: 25A/div |
| Temporal Axis | 5ms/div |
| Conditions | Input: 200V AC Load: Rated Load |
| Note: Inrush Current: 35.0A | |

| | | |
|-------|-----------------|------------------|
| Model | OZ-030-12 | Load: Rated Load |
| Item | Leakage Current | |

| AC Input Voltage [V] | Leakage Current [mA] |
|----------------------|----------------------|
| 85 | 0.12 |
| 100 | 0.15 |
| 132 | 0.19 |
| 176 | 0.25 |
| 200 | 0.29 |
| 220 | 0.32 |
| 240 | 0.35 |
| 264 | 0.38 |

| AC Input Voltage [V] | Leakage Current [mA] |
|----------------------|----------------------|
| 85 | 0.12 |
| 100 | 0.15 |
| 132 | 0.19 |
| 176 | 0.25 |
| 200 | 0.29 |
| 220 | 0.32 |
| 240 | 0.35 |
| 264 | 0.38 |