**Z600 Series**

**EVALUATION DATA**

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<thead>
<tr>
<th>APPD</th>
<th>CHK</th>
<th>DWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/7/17</td>
<td>20/7/17</td>
<td>10/03/17</td>
</tr>
</tbody>
</table>

TDK-Lambda
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<td>(11) Leakage current characteristics</td>
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</tr>
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<td>(3) Output current and ripple current v.s input voltage</td>
<td></td>
</tr>
<tr>
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<td>T-15~17</td>
</tr>
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<td>T-18~20</td>
</tr>
<tr>
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</tr>
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<tr>
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<td>T-59~60</td>
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<tr>
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<td>T-61~64</td>
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<tr>
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<td>T-65~66</td>
</tr>
<tr>
<td>2.13 Leakage current characteristic</td>
<td>T-67</td>
</tr>
<tr>
<td>2.14 Output voltage ripple &amp; noise waveform</td>
<td>T-68~69</td>
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</table>

TERMINOLOGY USED

Definition

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td>Vin</td>
<td>Input voltage</td>
</tr>
<tr>
<td>Vout</td>
<td>Output voltage</td>
</tr>
<tr>
<td>Iin</td>
<td>Input current</td>
</tr>
<tr>
<td>Iout</td>
<td>Output current</td>
</tr>
<tr>
<td>Ta</td>
<td>Ambient temperature</td>
</tr>
<tr>
<td>f</td>
<td>Frequency</td>
</tr>
<tr>
<td>C.V</td>
<td>Constant voltage mode</td>
</tr>
<tr>
<td>C.C</td>
<td>Constant current mode</td>
</tr>
</tbody>
</table>
1. EVALUATION METHOD

1.1 Circuit used for determination

(1) Steady state data

(2) Warm up voltage drift characteristic same as Steady state data

(3) Warm up current drift characteristic same as Steady state data

(4) Over voltage protection (OVP) characteristics

(5) Output voltage rise/fall characteristics same as Steady state data

(6) Output current rise/fall characteristics
1.1 Circuit used for determination

(7) Dynamic line voltage and current response characteristics

(8) Dynamic load voltage and current response characteristics

Constant Voltage mode

Output current waveform
\( \text{Iout 0\%} \leftrightarrow 100\% \)

Output current waveform
\( \text{Iout 50\%} \leftrightarrow 100\% \)
1.1 Circuit used for determination

(9) Response to brown-out characteristic

(10) Inrush current characteristics same as Response to brown-out

(11) Leakage current characteristics

(12) Output Voltage ripple & noise waveform 10V up to 100V models

(a) Normal mode (JEITA Standard RC-9131A)
1.1 Circuit used for determination

(12) Output Voltage ripple & noise waveform 10V up to 100V models

(b) Normal + Common mode

(13) Output Current rms ripple 10V to 100V models

Notes:
(*) Output Current rms ripple = Output Voltage rms ripple divided by the Load resistance.
# 1.2 List of equipment used

<table>
<thead>
<tr>
<th>No.</th>
<th>EQUIPMENT USED</th>
<th>MANUFACTURER</th>
<th>MODEL No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Digital oscilloscope</td>
<td>YOKOGAWA</td>
<td>DL7100</td>
</tr>
<tr>
<td>2</td>
<td>Digital oscilloscope</td>
<td>YOKOGAWA</td>
<td>DL1740EL</td>
</tr>
<tr>
<td>3</td>
<td>Digital multimeter</td>
<td>AGILENT</td>
<td>34401A</td>
</tr>
<tr>
<td>4</td>
<td>Digital power meter</td>
<td>YOKOGAWA</td>
<td>WT230</td>
</tr>
<tr>
<td>5</td>
<td>AC Source</td>
<td>CHROMA</td>
<td>6590</td>
</tr>
<tr>
<td>6</td>
<td>AC Source</td>
<td>CHROMA</td>
<td>6530</td>
</tr>
<tr>
<td>7</td>
<td>Electronic load</td>
<td>H&amp;H</td>
<td>ZS6060 SC150</td>
</tr>
<tr>
<td>8</td>
<td>Electronic load</td>
<td>H&amp;H</td>
<td>ZS7006</td>
</tr>
<tr>
<td>9</td>
<td>Electronic load</td>
<td>H&amp;H</td>
<td>ZS7060</td>
</tr>
<tr>
<td>10</td>
<td>Electronic load</td>
<td>CHROMA</td>
<td>63203</td>
</tr>
<tr>
<td>11</td>
<td>Electronic load</td>
<td>CHROMA</td>
<td>63204</td>
</tr>
<tr>
<td>12</td>
<td>Electronic load</td>
<td>CHROMA</td>
<td>63206</td>
</tr>
<tr>
<td>13</td>
<td>Controlled temp. chamber</td>
<td>THERMOTRON</td>
<td>SM-16-3800</td>
</tr>
<tr>
<td>14</td>
<td>Controlled temp. chamber</td>
<td>THERMOTRON</td>
<td>SE-600-5-5</td>
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<tr>
<td>15</td>
<td>Controlled temp. chamber</td>
<td>THERMOTRON</td>
<td>SE-600-6-6</td>
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<td>16</td>
<td>Leakage Current Tester</td>
<td>KIKUSUI</td>
<td>TOS3200</td>
</tr>
<tr>
<td>17</td>
<td>Voltage probe</td>
<td>YOKOGAWA</td>
<td>700988</td>
</tr>
<tr>
<td>18</td>
<td>Current probe</td>
<td>YOKOGAWA</td>
<td>701933</td>
</tr>
<tr>
<td>19</td>
<td>Current probe</td>
<td>LEM Danfysik</td>
<td>IT 80-S Ultrastab</td>
</tr>
<tr>
<td>20</td>
<td>Inrush Current Meter</td>
<td>TAKAMISAWA</td>
<td>PSA-210</td>
</tr>
<tr>
<td>21</td>
<td>Data Acquisition/Switch Unit</td>
<td>AGILENT</td>
<td>34970A</td>
</tr>
</tbody>
</table>
2. CHARACTERISTIC

2.1 Steady state data

(1) Regulation - Line & Load, Temperature drift

<table>
<thead>
<tr>
<th>Io</th>
<th>Vin (AC)</th>
<th></th>
<th></th>
<th></th>
<th>Line Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>9.9999</td>
<td>9.9999</td>
<td>9.9999</td>
<td>9.9999</td>
<td>0.0</td>
</tr>
<tr>
<td>25%</td>
<td>9.9996</td>
<td>9.9996</td>
<td>9.9996</td>
<td>9.9996</td>
<td>0.0</td>
</tr>
<tr>
<td>50%</td>
<td>9.9992</td>
<td>9.9992</td>
<td>9.9992</td>
<td>9.9992</td>
<td>0.0</td>
</tr>
<tr>
<td>75%</td>
<td>9.9989</td>
<td>9.9989</td>
<td>9.9989</td>
<td>9.9989</td>
<td>0.0</td>
</tr>
<tr>
<td>100%</td>
<td>9.9986</td>
<td>9.9986</td>
<td>9.9986</td>
<td>9.9986</td>
<td>0.0</td>
</tr>
<tr>
<td>Load</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td>ΔV(mV) (%)</td>
</tr>
<tr>
<td>Regulation</td>
<td>0.013</td>
<td>0.013</td>
<td>0.013</td>
<td>0.013</td>
<td>(%)</td>
</tr>
</tbody>
</table>

Conditions: Ta = 25°C

1. Regulation - Line & Load, C.V mode (Readings in [V])

2. Temperature drift, C.V mode

<table>
<thead>
<tr>
<th>Ta</th>
<th>0°C</th>
<th>25°C</th>
<th>50°C</th>
<th>Temp. Coefficient (0°C~50°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vout</td>
<td>9.999</td>
<td>9.999</td>
<td>9.998</td>
<td>1 mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 ppm/°C</td>
</tr>
</tbody>
</table>

Conditions: Vin:100Vac
lout:100%
2.1 Steady state data

(1) Regulation - Line & Load, Temperature drift

Conditions: Ta = 25°C

1. Regulation - Line & Load, C.V mode (Readings in [V])

<table>
<thead>
<tr>
<th>Io</th>
<th>85</th>
<th>100</th>
<th>200</th>
<th>265</th>
<th>Line Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>36.0007</td>
<td>36.0008</td>
<td>36.0007</td>
<td>36.0008</td>
<td>0.2</td>
</tr>
<tr>
<td>25%</td>
<td>36.0004</td>
<td>36.0003</td>
<td>36.0003</td>
<td>36.0004</td>
<td>0.1</td>
</tr>
<tr>
<td>50%</td>
<td>36.0001</td>
<td>36.0000</td>
<td>36.0001</td>
<td>36.0001</td>
<td>0.1</td>
</tr>
<tr>
<td>75%</td>
<td>35.9999</td>
<td>36.0000</td>
<td>35.9999</td>
<td>35.9998</td>
<td>0.2</td>
</tr>
<tr>
<td>100%</td>
<td>35.9998</td>
<td>35.9997</td>
<td>35.9998</td>
<td>35.9998</td>
<td>0.1</td>
</tr>
<tr>
<td>Load Regulation</td>
<td>0.002</td>
<td>0.003</td>
<td>0.002</td>
<td>0.002</td>
<td>ΔV(mV) (%)</td>
</tr>
</tbody>
</table>

2. Temperature drift, C.V mode

Conditions: Vin: 100 Vac
lout: 100%

<table>
<thead>
<tr>
<th>Ta</th>
<th>0°C</th>
<th>25°C</th>
<th>50°C</th>
<th>Temp. Coefficient (0°C-50°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vout</td>
<td>36.001</td>
<td>35.992</td>
<td>35.988</td>
<td>15 mV</td>
</tr>
</tbody>
</table>
2.1 Steady state data

(1) Regulation - Line & Load, Temperature drift

Conditions: $T_a = 25^\circ C$

1. Regulation - Line & Load, C.V mode (Readings in [V])

<table>
<thead>
<tr>
<th>Vin (AC)</th>
<th>85</th>
<th>100</th>
<th>200</th>
<th>265</th>
<th>Line Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_o$ 0%</td>
<td>99.9993</td>
<td>99.9993</td>
<td>99.9991</td>
<td>99.9991</td>
<td>0.2</td>
</tr>
<tr>
<td>25%</td>
<td>99.9989</td>
<td>99.9989</td>
<td>99.9988</td>
<td>99.9987</td>
<td>0.2</td>
</tr>
<tr>
<td>50%</td>
<td>99.9986</td>
<td>99.9985</td>
<td>99.9985</td>
<td>99.9984</td>
<td>0.1</td>
</tr>
<tr>
<td>75%</td>
<td>99.9984</td>
<td>99.9983</td>
<td>99.9984</td>
<td>99.9984</td>
<td>0.1</td>
</tr>
<tr>
<td>100%</td>
<td>99.9983</td>
<td>99.9983</td>
<td>99.9982</td>
<td>99.9982</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Load Regulation

<table>
<thead>
<tr>
<th>$\Delta V(mV)$</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

2. Temperature drift, C.V mode

Conditions: $V_{in}:100$Vac
Load: 100%

<table>
<thead>
<tr>
<th>$T_a$</th>
<th>0°C</th>
<th>25°C</th>
<th>50°C</th>
<th>Temp. Coefficient (0°C–50°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{out}$</td>
<td>100.012</td>
<td>99.983</td>
<td>99.984</td>
<td>48 mV</td>
</tr>
</tbody>
</table>

TDK-Lambda
2.1 Steady state data

(1) Regulation - Line & Load, Temperature drift

<table>
<thead>
<tr>
<th>Vo</th>
<th>85</th>
<th>100</th>
<th>200</th>
<th>265</th>
<th>Line Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>59.9396</td>
<td>59.9396</td>
<td>59.9396</td>
<td>59.9396</td>
<td>0.0</td>
</tr>
<tr>
<td>25%</td>
<td>59.9369</td>
<td>59.9369</td>
<td>59.9369</td>
<td>59.9369</td>
<td>0.0</td>
</tr>
<tr>
<td>50%</td>
<td>59.9383</td>
<td>59.9383</td>
<td>59.9383</td>
<td>59.9383</td>
<td>0.0</td>
</tr>
<tr>
<td>75%</td>
<td>59.9378</td>
<td>59.9378</td>
<td>59.9378</td>
<td>59.9378</td>
<td>0.0</td>
</tr>
<tr>
<td>100%</td>
<td>59.9375</td>
<td>59.9375</td>
<td>59.9375</td>
<td>59.9375</td>
<td>0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Load</th>
<th>2.1</th>
<th>2.1</th>
<th>2.1</th>
<th>2.1</th>
<th>ΔI(mA) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation</td>
<td>0.004</td>
<td>0.004</td>
<td>0.004</td>
<td>0.004</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Notes:
(*) Not including load regulation thermal drift effect.

2. Temperature drift, C.C mode

<table>
<thead>
<tr>
<th>Ta</th>
<th>0°C</th>
<th>25°C</th>
<th>50°C</th>
<th>Temp. Coefficient (0°C-50°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iout</td>
<td>59.9365</td>
<td>59.9415</td>
<td>59.9066</td>
<td>79.8 mA</td>
</tr>
</tbody>
</table>

Conditions: Ta = 25°C

Conditions: Vin:100 Vac
Iout:100%
2.1 Steady state data

(1) Regulation - Line & Load, Temperature drift

Conditions: Ta = 25°C

1. Regulation - Line & Load, C.C mode (*) (Readings in [A])

<table>
<thead>
<tr>
<th>Vo</th>
<th>85</th>
<th>100</th>
<th>200</th>
<th>265</th>
<th>Line Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>17.9967</td>
<td>17.9965</td>
<td>17.9965</td>
<td>17.9965</td>
<td>0.2</td>
</tr>
<tr>
<td>25%</td>
<td>17.9966</td>
<td>17.9964</td>
<td>17.9961</td>
<td>17.9961</td>
<td>0.5</td>
</tr>
<tr>
<td>50%</td>
<td>17.9957</td>
<td>17.9955</td>
<td>17.9954</td>
<td>17.9953</td>
<td>0.4</td>
</tr>
<tr>
<td>75%</td>
<td>17.9951</td>
<td>17.9951</td>
<td>17.9951</td>
<td>17.9952</td>
<td>0.1</td>
</tr>
<tr>
<td>100%</td>
<td>17.9950</td>
<td>17.9951</td>
<td>17.9951</td>
<td>17.9951</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Load Regulation: 0.009 0.008 0.008 0.008 (%)

Notes:
(*) Not including load regulation thermal drift effect.

2. Temperature drift, C.C mode

Conditions: Vin:100Vac
lout:100%

<table>
<thead>
<tr>
<th>Ta</th>
<th>0°C</th>
<th>25°C</th>
<th>50°C</th>
<th>Temp. Coefficient (0°C~50°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lout</td>
<td>18.0012</td>
<td>17.9826</td>
<td>17.9687</td>
<td>32.5 mA</td>
</tr>
</tbody>
</table>
2.1 Steady state data

(1) Regulation - Line & Load, Temperature drift

Conditions: \( T_a = 25^\circ C \)

1. Regulation - Line & Load, C.C mode (*) (Readings in [A])

<table>
<thead>
<tr>
<th>Vo</th>
<th>85</th>
<th>100</th>
<th>200</th>
<th>265</th>
<th>Line Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>6.0005</td>
<td>6.0005</td>
<td>6.0005</td>
<td>6.0005</td>
<td>0.0</td>
</tr>
<tr>
<td>25%</td>
<td>6.0002</td>
<td>6.0002</td>
<td>6.0002</td>
<td>6.0002</td>
<td>0.0</td>
</tr>
<tr>
<td>50%</td>
<td>5.9999</td>
<td>5.9999</td>
<td>5.9999</td>
<td>5.9999</td>
<td>0.0</td>
</tr>
<tr>
<td>75%</td>
<td>5.9997</td>
<td>5.9997</td>
<td>5.9997</td>
<td>5.9997</td>
<td>0.0</td>
</tr>
<tr>
<td>100%</td>
<td>5.9994</td>
<td>5.9994</td>
<td>5.9993</td>
<td>5.9993</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Load Regulation: 0.018 0.018 0.020 0.020

Notes:
(*) Not including load regulation thermal drift effect.

2. Temperature drift, C.C mode

Conditions: \( V_{in}:100\text{Vac} \)
\( I_{out}:100\%

<table>
<thead>
<tr>
<th>( T_a )</th>
<th>0°C</th>
<th>25°C</th>
<th>50°C</th>
<th>Temp. Coefficient (0°C~50°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( I_{out} )</td>
<td>6.0013</td>
<td>5.9981</td>
<td>5.9991</td>
<td>3.2 mA</td>
</tr>
</tbody>
</table>
2.1 Steady state data

(2) Output voltage and ripple voltage v.s input voltage

C.V mode

Conditions: Iout:100%

Ta: 0°C 25°C 50°C

(3) Output current and ripple current v.s input voltage

C.C mode

Conditions: Vout:100%

Ta: 0°C 25°C 50°C
2.1 Steady state data

(2) Output voltage and ripple voltage v.s input voltage

C.V mode

Conditions: Iout:100%

\[ Ta: \]
- 0°C
- 25°C
- 50°C

\[ Output\ voltage\ (V) \]
- 36
- 30
- 24
- 18
- 12
- 6
- 0

\[ Output\ noise\ (Pk-Pk) \]
- 12
- 8
- 4
- 0

\[ Output\ ripple\ (RMS) \]
- 2
- 1
- 0

\[ Input\ voltage\ (VAC) \]
- 85
- 100
- 200
- 285
- 0

(3) Output current and ripple current v.s input voltage

C.C mode

Conditions: Vout:100%

\[ Ta: \]
- 0°C
- 25°C
- 50°C

\[ Output\ Current\ (A) \]
- 18
- 16
- 14
- 12
- 10
- 8
- 6
- 4
- 2
- 0

\[ Output\ ripple\ (RMS) \]
- 2.7
- 2.5
- 2.3
- 2.1
- 1.9
- 1.7
- 1.5
- 1.3
- 1.1
- 0.9

\[ Input\ voltage\ (VAC) \]
- 85
- 100
- 200
- 285
- 0

TDK-Lambda T-13
2.1 Steady state data

(2) Output voltage and ripple voltage v.s input voltage

C.V mode

Conditions: Iout:100%

Ta: 0°C
25°C
50°C

(3) Output current and ripple current v.s input voltage

C.C mode

Conditions: Vout:100%

Ta: 0°C
25°C
50°C
2.1 Steady state data

(4) Efficiency and Input current vs. Output current

Conditions:
- Vin: 85 VAC
- 100 VAC
- 200 VAC
- 265 VAC
- Vout: 100%
- Ts: 25°C

Efficiency

Input current (A)

Output current (%)

0 10 20 30 40 50 60 70 80 90 100

0 2 4 6 8 10 12 14 16 18 20

0 10 25 50 75 100
2.1 Steady state data

(4) Efficiency and Input current vs. Output current

Conditions:
- Vin: 85 VAC
- 100 VAC
- 200 VAC
- 265 VAC
- Vout: 100%
- Ta: 25°C
2.1 Steady state data

(4) Efficiency and Input current vs. Output current

Conditions:
Vin: 85 VAC
100VAC
200 VAC
265 VAC
Vout:100%
Ta: 25°C
2.2 Warm up drift & stability

C.V mode

Conditions:
- Vin: 100Vac
- Vout: 100%
- Iout: 100%
- Ta = 25°C

C.C mode
2.2 Warm up drift & stability

C.V mode

Conditions:
- Vin: 100Vac
- Vout: 100%
- Iout: 100%
- Ta = 25°C

C.C mode
2.2 Warm up drift & stability

C.V mode

Conditions: Vin: 100Vac
Vout: 100%
lout: 100%
Ta = 25°C

C.C mode
2.3 Over voltage protection (OVP) characteristic

Conditions: Vin: 100Vac
Iout: 0%
Ta = 25°C

OVP setting: 12V

OVP setting: 40V
2.3 Over voltage protection (OVP) characteristic

Conditions:
- Vin: 100 Vac
- Iout: 0%
- Ta = 25°C

OVP setting: 110V
2.4 ON/OFF Output rise characteristics

C.V mode

Conditions: Vin: 100Vac
Vout: 100%
lout: 0%
lset=105%
Ta = 25°C
2.4 ON/OFF Output rise characteristics

C.V mode

Conditions: Vin: 100Vac
Vout: 100%
lout: 0%
lset: 105%
Ta = 25°C
2.4 ON/OFF Output rise characteristics

C.V mode

Conditions: Vin: 100Vac
Vout: 100%
lout: 100%
lset: 105%
Load: CR
T_a = 25°C
2.4 ON/OFF Output rise characteristics

C.V mode

Conditions: Vin: 100Vac
            Vout: 100%
            Iout: 100%
            Isat: 105%
            Load: CR
            Ta = 25°C
2.4 ON/OFF Output rise characteristics

C.C mode

Conditions: Vin: 100Vac
Vout: 100%
Iout: 100%
Vset: 105%
Load: CR
Ta = 25°C

Z10-60

Z36-18

14µs/DIV 10ms/DIV

5µs/DEV 10ms/DEV
2.4 ON/OFF Output rise characteristics

C.C. mode

Conditions:
Vin: 100Vac
Vout: 100%
lout: 100%
Veot: 105%
Load: CR
Ta = 25°C
2.4 ON/OFF Output rise characteristics

C.C mode

Conditions: Vin:100Vac
lout: 100%
Vset=105%
shorted output
Ta = 25°C
2.4 ON/OFF Output rise characteristics

C.C mode

Conditions: Vin: 100Vac
Iout: 100%
Vset: 105%
shorted output
Ta = 25°C

Z100-6
2.5 ON/OFF Output fall characteristics

C.V mode

Conditions: Vin: 100 Vac
Vout: 100%
Iout: 0%
Iset = 105%
Ta = 25°C

Z10-60

Z36-18

TDK-Lambda T-31
2.5 ON/OFF Output fall characteristics

C.V mode

Conditions: Vin: 100Vac
Vout: 100%
lout: 0%
Iset: 105%
Ta = 25°C
2.5 ON/OFF Output fall characteristics

C.V mode

Conditions:
Vin: 100Vac
Vout: 100%
Iout: 100%
Iset=105%
Load: CR
Ta = 25°C
2.5 ON/OFF Output fall characteristics

C.V mode

Conditions: Vin: 100Vac
Vout: 100%
Iout: 100%
Iset: 105%
Load: CR
Ta = 25°C
2.5 ON/OFF Output fall characteristics

C.C mode

Conditions: 
Vin: 100Vac
Vout: 100%
Iout: 100%
Vset=105%
Load: CR
Ta = 25°C

Z10-60

Z36-18

TDK-Lambda
2.5 ON/OFF Output Fall Characteristics

C.C mode

Conditions: 
Vin: 100Vac
Vout: 100%
Iout: 100%
Vset=105%
Load: CR
Ta = 25°C

Z100-6
2.5 ON/OFF Output fall characteristics

C.C mode

Conditions: Vin: 100Vac
Iout: 100%
Vset: 105%
shorted output
Ta = 25°C
2.5 ON/OFF Output fall characteristics

C.C mode

Conditions: Vin: 100Vac
Iout: 100%
Vset: 105%
shorted output
Ta = 25°C
2.6 Hold up time characteristics

Conditions: Vin: 100 Vac
Vout: 100%
Ta = 25°C
2.6 Hold up time characteristics

Conditions: Vin: 100Vac
Vout: 100%
Ta = 25°C
2.6 Hold up time characteristics

Conditions:
Vin: 100 Vac
Vout: 100%
Ta = 25°C

![Graph showing hold up time characteristics with axes for hold up time (ms) and output current (%)].
2.7 Dynamic line response characteristics

C.V mode

Conditions: Vin: 85→132V
Vout: 100%
lout: 100%
Ta = 25°C

Conditions: Vin: 170→265V
Vout: 100%
lout: 100%
Ta = 25°C
2.7 Dynamic line response characteristics

C.V mode

Conditions: Vin: 85±132V
            Vout: 100%
            Iout: 100%
            Ta = 25°C

Conditions: Vin: 170±265V
            Vout: 100%
            Iout: 100%
            Ta = 25°C
2.7 Dynamic line response characteristics

C.V mode

Conditions: Vin: 85→132V
Vout: 100%
lout: 100%
Ta = 25°C

Conditions: Vin: 170→265V
Vout: 100%
lout: 100%
Ta = 25°C

TDK-Lambda
2.7 Dynamic line response characteristics

C.C mode

Conditions: Vin: 85→132V
Vout: 100%
lout: 100%
Ta = 28°C

Conditions: Vin: 170→265V
Vout: 100%
lout: 100%
Ta = 25°C
2.7 Dynamic line response characteristics

C.C mode

Conditions: Vin: 85→132V
Vout: 100%
lout: 100%
Ta = 25°C

Conditions: Vin: 170→265V
Vout: 100%
lout: 100%
Ta = 25°C
2.7 Dynamic line response characteristics

C.C mode

Conditions: Vin: 85V - 132V
Vout: 100%
lout: 100%
Ta = 25°C

Conditions: Vin: 170V - 265V
Vout: 100%
lout: 100%
Ta = 25°C
2.8 Dynamic load response characteristics

C.V mode

Conditions: Vin: 100Vac
Vout: 100%
Ta = 25°C
Load current: tr=tf=100us
2.8 Dynamic load response characteristics

C.V mode

Conditions: Vin: 100Vac
Vout: 100%
Ta = 25°C

Load current: tr=tf=100us

<table>
<thead>
<tr>
<th>Z36-18</th>
<th>lout:0% → 100%</th>
<th>f: 100Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.5V/Div</td>
<td>2ms/Div</td>
</tr>
<tr>
<td></td>
<td>1.31%</td>
<td>-1.72%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Z36-18</th>
<th>lout:50% → 100%</th>
<th>f: 100Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.2V/Div</td>
<td>2ms/Div</td>
</tr>
<tr>
<td></td>
<td>0.61%</td>
<td>-0.76%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Z36-18</th>
<th>lout:0% → 100%</th>
<th>f: 1000Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.5V/Div</td>
<td>200ms/Div</td>
</tr>
<tr>
<td></td>
<td>1.06%</td>
<td>-1.45%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Z36-18</th>
<th>lout:50% → 100%</th>
<th>f: 1000Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.2V/Div</td>
<td>200ms/Div</td>
</tr>
<tr>
<td></td>
<td>0.56%</td>
<td>-0.71%</td>
</tr>
</tbody>
</table>
2.8 Dynamic load response characteristics

C.V mode

Conditions: Vin: 100Vac
Vout: 100%
Ta = 25°C

Load current: $t_r=t_f=100us$
### 2.8 Dynamic load response characteristics

**C.C mode**

<table>
<thead>
<tr>
<th>Z10-60</th>
<th>( I_o = 60A )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vout:</strong> 9V → 7.5V</td>
<td><strong>f:</strong> 10HZ</td>
</tr>
<tr>
<td>( 7^N_{DIV} )</td>
<td>( 20^{mV}_{DIV} )</td>
</tr>
<tr>
<td>16.12%</td>
<td>-13.31%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Z36-18</th>
<th>( I_o = 18A )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vout:</strong> 32.4V → 27V</td>
<td><strong>f:</strong> 10HZ</td>
</tr>
<tr>
<td>( 2^N_{DIV} )</td>
<td>( 20^{mV}_{DIV} )</td>
</tr>
<tr>
<td>21.47%</td>
<td>-17.20%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>( I_o = 30A )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vout:</strong> 9V → 7.5V</td>
<td><strong>f:</strong> 10HZ</td>
</tr>
<tr>
<td>( 3.5^N_{DIV} )</td>
<td>( 20^{mV}_{DIV} )</td>
</tr>
<tr>
<td>8.02%</td>
<td>-6.69%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>( I_o = 9A )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vout:</strong> 32.4V → 27V</td>
<td><strong>f:</strong> 10HZ</td>
</tr>
<tr>
<td>( 1^N_{DIV} )</td>
<td>( 20^{mV}_{DIV} )</td>
</tr>
<tr>
<td>10.05%</td>
<td>-8.12%</td>
</tr>
</tbody>
</table>

**Conditions:** Vin: 100Vac  
Ta = 25°C
2.8 Dynamic load response characteristics

C.C mode

Conditions: Vin: 100 Vac
Ta = 25°C

Z100-6

<table>
<thead>
<tr>
<th>Vout: 90 V → 75 V</th>
<th>f: 10 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Io = 6 A</td>
<td></td>
</tr>
<tr>
<td>0.5 A/Div</td>
<td>20 ms/Div</td>
</tr>
<tr>
<td>21.93%</td>
<td>-17.93%</td>
</tr>
</tbody>
</table>

Z100-6

<table>
<thead>
<tr>
<th>Vout: 90 V → 75 V</th>
<th>f: 10 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Io = 3 A</td>
<td></td>
</tr>
<tr>
<td>0.2 A/Div</td>
<td>20 ms/Div</td>
</tr>
<tr>
<td>10.17%</td>
<td>-8.46%</td>
</tr>
</tbody>
</table>
2.9 Response to brown-out characteristics

C.V mode

Conditions: Vin: 100VAC
Vout: 100%
lout: 100%
Ta = 25°C

Brown-out time
A: 17mS
B: 26mS

Vin
Vout

Vout: $2V_{DIV}$
100ms/$DIV$
2.9 Response to brown-out characteristics

C.V mode

Conditions: Vin: 100VAC
Vout: 100%
lout: 100%
Ta = 25°C

Brown-out time
A - 17mS
B - 26mS
2.9 Response to brown-out characteristics

C.V mode

Conditions: Vin: 100VAC
Vout: 100%
lout: 100%
Ta = 25°C

Brown-out time
A - 23ms
B - 24ms

Vout: $10^Y_{DIV}$

100 ms/Div
2.9 Response to brown-out characteristics

C.V mode

Conditions: Vin: 100VAC
Vout: 100%
Iout: 100%
Ta = 25°C

Brown-out time
A - 24ms
B - 27ms
2.9 Response to brown-out characteristics

C.C mode

Conditions: Vin: 100VAC
Vout: 100%
lout: 100%
Ta = 25°C

Brown-out time
A - 23ms
B - 24ms

Z36-18
2.9 Response to brown-out characteristics

C.C mode

Conditions: Vin: 100VAC
Vout: 100%
lout: 100%
Ta = 25°C

Brown-out time
A - 25ms
B - 20ms

lout: $2^i_\text{DIV}$
100ms/$i_\text{DIV}$
2.10 Inrush Current Characteristics during line brown outs

Conditions: Vin: 100VAC
Vout: 100%
lout: 0%
lout: 100%
Ta = 25°C
2.10 Inrush Current Characteristics during line brown outs

Conditions: Vin: 200VAC
Vout: 100%
lout: 0%
lout: 100%
Ta = 25°C
2.11 Inrush current waveform

Conditions: Vin: 100V
Vout: 100%
lout: 100%
Ta = 25°C

Switch on phase angle of input AC voltage

Φ=0°

Switch on phase angle of input AC voltage

Φ=90°

* Inrush current more than 30A is charge current into input film capacitor for EMI. These pulse width is less than 200usec.
2.11 Inrush current waveform

Conditions: Vin: 200V
Vout: 100%
lout: 100%
Ta = 25°C

Switch on phase angle of input AC voltage
\[ \Phi = 0^\circ \]

Switch on phase angle of input AC voltage
\[ \Phi = 90^\circ \]

* Inrush current more than 30A is charge current into input film capacitor for EMI. These pulse width is less than 200usec.
2.11 Inrush current waveform

Conditions: Vin: 100V  
Vout: 100%  
lout: 100%  
Ta = 25°C

Switch on phase angle of input AC voltage  
\( \phi = 0^\circ \)

Switch on phase angle of input AC voltage  
\( \phi = 90^\circ \)

* Inrush current more than 30A is charge current into input film capacitor for EMI. These pulse width is less than 200usec.
2.11 Inrush current waveform

Conditions: Vin: 200V
Vout: 100%
Iout: 100%
Ta = 25°C

* Inrush current more than 30A is charge current into input film capacitor for EMI. These pulse width is less than 200usec.
2.12 Input current waveform

Conditions: Vin: 100VAC
            Vout: 100%
            Iout: 100%
            Ta = 25°C

Conditions: Vin: 200VAC
            Vout: 100%
            Iout: 100%
            Ta = 25°C
2.12 Input current waveform

Conditions: Vin: 100VAC
Vout: 100%
lout: 100%
Ta = 25°C

Conditions: Vin: 200VAC
Vout: 100%
lout: 100%
Ta = 25°C
2.13 Leakage current characteristics

Conditions: Vin: 100~265Vac
 Iout: 0%
 Iout: 100%
 Ta = 25°C
 f=50Hz
2.14 Output voltage ripple & noise waveform

C.V mode

Conditions: Vin: 100VAC
Vout: 100%
Iout: 100%
Ta = 25°C

Normal Mode

Z10-60

Z36-18

TDK-Lambda
2.14 Output voltage ripple & noise waveform

C.V mode

Conditions: Vin: 100VAC
Vout: 100%
Iout: 100%
Ta = 25°C