$Z^+800$ Series

IEC 61000

DATA

<table>
<thead>
<tr>
<th>APPD</th>
<th>CHK</th>
<th>DWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>yani</td>
<td>D. MIROV</td>
</tr>
<tr>
<td>10/3/13</td>
<td>10/03/13</td>
<td>Feb-28-2013</td>
</tr>
</tbody>
</table>

TDK-Lambda
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* Test results are typical data. Nevertheless the following results are considered to be actual capability data because all units have nearly the same characteristics.

TDK-Lambda
1. Electrostatic Discharge Immunity Test (IEC61000-4-2)

(1) Equipment used

Electrostatic discharge simulator: ESS-2000 (NOISEKEN)
Discharge resistance: 330Ω    Capacitor: 150pF

(2) Test conditions

Input voltage: 115, 230Vac    Output voltage: 100%
Output current: 100%    Polarity: -,+ 
Number of tests: 10 times    Ta: 25°C
Discharge interval: > 1 Second

(3) Test method and Device test point

Contact discharge: FG, Case screw
Air discharge: Input and Output terminals

(4) Acceptable conditions

1. Output voltage regulation not to exceed ±5% of intial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test result

<table>
<thead>
<tr>
<th>Contact discharge (kV)</th>
<th>Z36-24</th>
<th>Air discharge (kV)</th>
<th>Z36-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>PASS</td>
<td>8</td>
<td>PASS</td>
</tr>
</tbody>
</table>

TDK-Lambda
2. Radiated Radio-Frequency Electromagnetic Field Immunity Test (IEC61000-4-3)

(1) Equipment used

Test laboratory: Hermon Laboratories Ltd.

(2) Test conditions

Input voltage: 115, 230Vac
Output current: 100%
Electromagnetic frequency: 80~1000MHz
Distance: 2.4m
Sweep condition: 1.0% Step Up, 2.8 second Hold
Test Angle: Top/Bottom, Both Sides, Front/Back

Output voltage: 100%
Amplitude modulated: 80%, 1kHz
Ambient temperature: 25°C
Wave Angle: Horizontal and vertical

(3) Test method

![Test setup diagram]

(4) Acceptable conditions

1. Output voltage regulation not to exceed ±5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test result

<table>
<thead>
<tr>
<th>Radiated field strength (V/m)</th>
<th>Z36-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>PASS</td>
</tr>
</tbody>
</table>

TDK-Lambda R-2
3. Electrical Fast Transient / Burst Immunity Test (IEC61000-4-4)

(1) Equipment used

EFT/B Generator: SCHAFFNER NSG2025

(2) Test conditions

- Input voltage: 115, 230Vac
- Output current: 100%
- Polarity: -,+ (Output voltage: 100%)
- Test time: 1 minute
- Ambient temperature: 25°C
- Number of tests: 3 times

(3) Test method and Device test point

Neutral (N), Line (L), Ground (FG) apply pulses from EFT/B Generator to N, L, FG separately, as well as, all at the same time.

(4) Acceptable conditions

1. Output voltage regulation not to exceed ±5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test result

<table>
<thead>
<tr>
<th>Test voltage (kV)</th>
<th>Repetition rate (kHz)</th>
<th>Z36-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
<td>PASS</td>
</tr>
</tbody>
</table>

TDK-Lambda
4. Surge Immunity Test (IEC61000-4-5)

(1) Equipment used

Surge Generator: NSG651 (SCHAFFNER)
Coupling impedance: Common - 12Ω  Normal - 2Ω
Coupling capacitance  Common : 9pF  Normal - 18pF
Coupling network: CDN110 (SCHAFFNER)

(2) Test method and device test points

Input voltage: 115, 230Vac  Output voltage: 100%
Output current: 100%  Number of tests: 5 times
Polarity: -, +  Ambient temperature: 25°C
Phase: 0°, 90°

(3) Acceptable conditions

1. Output voltage regulation not to exceed ±5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(4) Test result

<table>
<thead>
<tr>
<th>Test voltage (kV)</th>
<th>Z36-24</th>
<th>Test voltage (kV)</th>
<th>Z36-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>Normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>PASS</td>
<td>1.0</td>
<td>PASS</td>
</tr>
<tr>
<td>2.0</td>
<td>PASS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (IEC61000-4-6)

(1) Equipment used

RF Signal Generator 10kHz-1050MHz: Fluke, 6061A
RF Amplifier 10kHz-220MHz, 150W: Amplifier Research, 150L
Coupling/Decoupling network: HL CDN 801-M3

(2) Test Condition:

Output voltage: 100%
Input voltage: 115, 230Vac
Output current: 100%

Electromagnetic frequency: 150kHz~80MHz
Type of modulation: AM 80% @ 1kHz
Test Voltage: 3Vrms prior to modulation
Dwell Time: 3s
Frequency Step: 1.0% of current frequency

Ambient temperature: 25°C

(3) Test Method:

![Test setup diagram]

(4) Acceptable conditions

1. Output voltage regulation not to exceed ±5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

<table>
<thead>
<tr>
<th>Test Voltage level (V)</th>
<th>Z36-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>PASS</td>
</tr>
</tbody>
</table>

TDK-Lambda
6. Power Frequency Magnetic Field Immunity Test (IE61000-4-8)

(1) Equipment used

Test laboratory: Hermon Laboratories Ltd.

(2) Test condition:

Input voltage: 115, 230Vac  
Output voltage: 100%

Output current: 100%  
Frequency: 50Hz

Magnetic field strength: 30A/m  
Direction: X, Y, Z

Test time: 10min.  
Ambient temperature: 25°C

(3) Test Method:

(4) Acceptable conditions

1. Output voltage regulation not to exceed ±5% of initial (before test) value during test.

2. Output voltage to be within regulation specification after the test.

3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test result

<table>
<thead>
<tr>
<th>EUT Positions</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>PASS</td>
</tr>
<tr>
<td>Y</td>
<td>PASS</td>
</tr>
<tr>
<td>Z</td>
<td>PASS</td>
</tr>
</tbody>
</table>
7. Voltage Dips, Short Intermittions Immunity Test (IE61000-4-11)

(1) Equipment used

AC Source: 6590 (CHROMA)
Oscilloscope: DL1740EL (Yokogawa)

(2) Test Condition:

Input voltage: 115, 230Vac  Output voltage: 100%
Output current: 100%      Frequency: 50Hz
Repetition: 0.1Hz          Ambient temperature: 25°C
Number of tests: 3 times

(3) Test Method:

(4) Acceptable conditions

1. Output voltage to be within output voltage regulation specification after the test.
2. No discharge of fire or smoke.

(5) Test Result

<table>
<thead>
<tr>
<th>Test level</th>
<th>Dip rate</th>
<th>Continue time ts</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>30%</td>
<td>500ms</td>
<td>PASS</td>
</tr>
<tr>
<td>40%</td>
<td>60%</td>
<td>200ms</td>
<td>PASS</td>
</tr>
<tr>
<td>0%</td>
<td>100%</td>
<td>5000ms</td>
<td>PASS</td>
</tr>
</tbody>
</table>
8. Input Current Harmonics Test (IEC61000-3-2)

(1) Equipment used

AC Power Analyzer: WT110 (Yokogawa)

AC Source: 6590 (CHROMA)

(2) Test conditions:

Input voltage: 115, 230Vac

Output current: 100%

Output voltage: 100%

(3) Test method:

![Test Diagram]

Vin: 115Vac

![Graph 1]

Vin: 230Vac

![Graph 2]

IEC61000-3-2 Limit (Class A)