CUS500M1

IMMUNITY DATA
INDEX

1. Summary of Immunity Test Result ................................................................. 2–3

IEC61000 Series Test Data

2. Electrostatic Discharge Immunity Test (IEC61000-4-2) ............................. 4

3. Radiated Radio-Frequency Electromagnetic Field Immunity Test (IEC61000-4-3) .......... 5

4. Electrical Fast Transient / Burst Immunity Test (IEC61000-4-4) .................... 6

5. Surge Immunity Test (IEC61000-4-5) ............................................................. 7

6. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (IEC61000-4-6) .... 8

7. Power Frequency Magnetic Field Immunity Test (IEC61000-4-8) ..................... 9

8. Voltage Dips, Short Interruptions Immunity Test (IEC61000-4-11) ................. 10

IEC60601 Series Test Data

9. Electrostatic Discharge Immunity Test (IEC60601-1-2 Ed.4) ....................... 11

10. Radiated Radio-Frequency Electromagnetic Field Immunity Test (IEC60601-1-2 Ed.4) .......... 12

11. Electrical Fast Transient / Burst Immunity Test (IEC60601-1-2 Ed.4) ............ 13

12. Surge Immunity Test (IEC60601-1-2 Ed.4) .................................................... 14

13. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (IEC60601-1-2 Ed.4) .... 15

14. Power Frequency Magnetic Field Immunity Test (IEC60601-1-2 Ed.4) ............. 16

15. Voltage Dips, Voltage Interruptions Immunity Test (IEC60601-1-2 Ed.4) .......... 17

Terminology Used

| FG | ●●●●● | Frame GND |
| FG | ●●●●● | Earth (➕) terminal |
| L  | ●●●●● | Live line |
| N  | ●●●●● | Neutral line |
| N  | ●●●●● | Earth |
| +V | ●●●●● | + Output |
| -V | ●●●●● | - Output |

※ Test results are reference data based on our standard measurement condition.
1. Summary of Immunity Test Result

MODEL: CUS500M1

### (1) IEC61000 Series Test Result:

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Test level</th>
<th>Criteria</th>
<th>Result</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic Discharge Immunity Test</td>
<td>IEC61000-4-2</td>
<td>1,2,3,4</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Radiated Radio-Frequency Electromagnetic Field Immunity Test</td>
<td>IEC61000-4-3</td>
<td>1,2,3</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Electrical Fast Transient / Burst Immunity Test</td>
<td>IEC61000-4-4</td>
<td>1,2,3,4</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Surge Immunity Test</td>
<td>IEC61000-4-5</td>
<td>1,2,3,(4)</td>
<td>A</td>
<td>PASS</td>
<td>Level 4: Common mode only</td>
</tr>
<tr>
<td>Conducted Disturbances Induced by Radio-Frequency Field Immunity Test</td>
<td>IEC61000-4-6</td>
<td>1,2,3</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Power Frequency Magnetic Field Immunity Test</td>
<td>IEC61000-4-8</td>
<td>1,2,3,4</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
</tbody>
</table>

**Voltage Dips Immunity Test, Short Interruptions Immunity Test**

<table>
<thead>
<tr>
<th>Test level</th>
<th>Criteria</th>
<th>Result</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dip: 20% 5000ms</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Dip: 30% 500ms</td>
<td>A/B</td>
<td>PASS</td>
<td>A ≤ 440W, B &gt; 440W</td>
</tr>
<tr>
<td>Dip: 60% 200ms</td>
<td>A/B</td>
<td>PASS</td>
<td>A ≤ 180W, B &gt; 180W</td>
</tr>
<tr>
<td>Dip: 100% 20ms</td>
<td>A/B</td>
<td>PASS</td>
<td>A ≤ 280W, B &gt; 280W</td>
</tr>
<tr>
<td>Dip: 100% 10ms</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Dip: 100% 5000ms</td>
<td>B</td>
<td>PASS</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test level</th>
<th>Criteria</th>
<th>Result</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dip: 20% 5000ms</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Dip: 30% 500ms</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Dip: 60% 200ms</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Dip: 100% 20ms</td>
<td>A/B</td>
<td>PASS</td>
<td>A ≤ 280W, B &gt; 280W</td>
</tr>
<tr>
<td>Dip: 100% 10ms</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Dip: 100% 5000ms</td>
<td>B</td>
<td>PASS</td>
<td></td>
</tr>
</tbody>
</table>

Detail of test condition refer to each test page.

Criteria A
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

Criteria B
1. Must not have temporary function degradation that requires input restart.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.
## 1. Summary of Immunity Test Result

**MODEL: CUS500M1**

### (2) IEC60601-1-2 Series Test Result:

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Test level</th>
<th>Criteria</th>
<th>Result</th>
<th>Notes &amp; Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic Discharge Immunity Test</td>
<td>IEC60601-1-2 Ed.4</td>
<td>1,2,3,4</td>
<td>A</td>
<td>PASS</td>
<td>ENCLOSURE PORT</td>
</tr>
<tr>
<td>Radiated Radio-Frequency Electromagnetic Field Immunity Test</td>
<td>IEC60601-1-2 Ed.4</td>
<td>1,2,3</td>
<td>A</td>
<td>PASS</td>
<td>ENCLOSURE PORT</td>
</tr>
<tr>
<td>Electrical Fast Transient / Burst Immunity Test</td>
<td>IEC60601-1-2 Ed.4</td>
<td>1,2,3</td>
<td>A</td>
<td>PASS</td>
<td>Input a.c. power PORT</td>
</tr>
<tr>
<td>Surge Immunity Test</td>
<td>IEC60601-1-2 Ed.4</td>
<td>1,2,3</td>
<td>A</td>
<td>PASS</td>
<td>Input a.c. power PORT</td>
</tr>
<tr>
<td>Conducted Disturbances Induced by Radio-Frequency Field Immunity Test</td>
<td>IEC60601-1-2 Ed.4</td>
<td>1,2</td>
<td>A</td>
<td>PASS</td>
<td>Input a.c. power PORT</td>
</tr>
<tr>
<td>Power Frequency Magnetic Field Immunity Test</td>
<td>IEC60601-1-2 Ed.4</td>
<td>1,2,3,4</td>
<td>A</td>
<td>PASS</td>
<td>ENCLOSURE PORT</td>
</tr>
<tr>
<td>Voltage Dips Immunity Test, Short Interruptions</td>
<td>IEC60601-1-2 Ed4</td>
<td>Dip: 30% 500ms</td>
<td>A/B</td>
<td>PASS</td>
<td>A : ( \leq 440) W, B : ( &gt; 440) W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dip: 100% 10ms</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dip: 100% 20ms</td>
<td>A/B</td>
<td>PASS</td>
<td>A : ( \leq 280) W, B : ( &gt; 280) W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dip: 100% 5000ms</td>
<td>B</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>Voltage Dips Immunity Test, Short Interruptions</td>
<td>IEC60601-1-2 Ed4</td>
<td>Dip: 30% 500ms</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dip: 100% 10ms</td>
<td>A</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dip: 100% 20ms</td>
<td>A/B</td>
<td>PASS</td>
<td>A : ( \leq 280) W, B : ( &gt; 280) W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dip: 100% 5000ms</td>
<td>B</td>
<td>PASS</td>
<td></td>
</tr>
</tbody>
</table>

Detail of test condition refer to each test page.

Criteria A
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

Criteria B
1. Must not have temporary function degradation that requires input restart.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.
2. Electrostatic Discharge Immunity Test (IEC61000-4-2)

MODEL : CUS500M1

(1) Equipment Used
Electro Static Discharge Simulator : ZSS-S3011A (NOISEKEN)
Discharge Resistance : 330Ω Capacity : 150pF

(2) Test Conditions
- Input Voltage : 115, 230VAC
- Output Voltage : Rated
- Output Current : 0%, 100%
- Polarity : +, –
- Test Times : 10 times
- Discharge Interval : >1 second
- Ambient Temperature : 25°C

(3) Test Method and Device Test Point
Contact Discharge : *+, Mounting screw
Air Discharge : *+, Mounting screw, Input and output terminal

(4) Acceptable Conditions
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Contact Discharge (kV)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
<th>Air Discharge(kV)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>PASS</td>
<td>2</td>
<td>PASS</td>
</tr>
<tr>
<td>4</td>
<td>PASS</td>
<td>4</td>
<td>PASS</td>
</tr>
<tr>
<td>6</td>
<td>PASS</td>
<td>8</td>
<td>PASS</td>
</tr>
<tr>
<td>8</td>
<td>PASS</td>
<td>15</td>
<td>PASS</td>
</tr>
</tbody>
</table>
3. Radiated Radio-Frequency Electromagnetic Field Immunity Test (IEC61000-4-3)

MODEL : CUS500M1

(1) Equipment Used
SML 03(RS CORPORATION)
HL 046(RS CORPORATION)
AR500W 1000A(AR CORPORATION)
FM5004(AR CORPORATION)
FP6001(AR CORPORATION)

(2) Test Conditions
- Input Voltage : 115, 230VAC
- Output Voltage : Rated
- Output Current : 0%, 100%
- Amplitude Modulated : 80%, 1kHz
- Wave Angle : Horizontal and Vertical
- Ambient Temperature : 25°C
- Sweep Condition : 1.0% Step Up, 0.5 Seconds Hold
- Distance : 3.0m
- Test Angle : Top/Bottom, Both Sides, Front/Back
- Electromagnetic Frequency : 80〜1000MHz, 1.4〜2.0GHz, 2.0〜2.7GHz

(3) Test Method

(4) Acceptable Conditions
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Radiation Field Strength (V/m)</th>
<th>Electromagnetic Frequency</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.0-2.7GHz</td>
<td>PASS</td>
</tr>
<tr>
<td>3</td>
<td>1.4-2.0GHz</td>
<td>PASS</td>
</tr>
<tr>
<td>10</td>
<td>80-1000MHz</td>
<td>PASS</td>
</tr>
</tbody>
</table>
4. Electrical Fast Transient / Burst Immunity Test (IEC61000-4-4)

MODEL : CUS500M1

(1) Equipment Used
EFT/B Generator : FNS-AX3 (NOISEKEN)

(2) Test Conditions
- Input Voltage : 115, 230VAC
- Output Voltage : Rated
- Output Current : 0%, 100%
- Test Time : 1 minute
- Polarity : +, −
- Ambient Temperature : 25℃
- Number of Tests : 1 time
- Pulse Frequency : 5kHz / 100kHz
- Burst Time : 15msec / 0.75msec
- Number of Pulse : 75pcs
- Burst Cycle : 300msec

(3) Test Method and Device Test Point
Apply to (N, L, ½), (N, L), (N), (L), ( ½)

(4) Acceptable Conditions
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Test Voltage (kV)</th>
<th>Repetition Rate (kHz)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>5 / 100</td>
<td>PASS</td>
</tr>
<tr>
<td>1</td>
<td>5 / 100</td>
<td>PASS</td>
</tr>
<tr>
<td>2</td>
<td>5 / 100</td>
<td>PASS</td>
</tr>
<tr>
<td>4</td>
<td>5 / 100</td>
<td>PASS</td>
</tr>
</tbody>
</table>
5. Surge Immunity Test (IEC61000-4-5)

MODEL : CUS500M1

(1) Equipment Used
Surge Generator : LSS-F03 (NOISEKEN)
Coupling Impedance : Common 12Ω Normal 2Ω
Coupling Capacitance : Common 9μF Normal 18μF

(2) Test Conditions
・ Input Voltage : 115, 230VAC
・ Output Voltage : Rated
・ Output Current : 0, 100%
・ Number of Tests : 5 times
・ Polarity : +,−
・ Mode : Common, Normal
・ Phase : 0, 90 deg
・ Ambient Temperature : 25℃

(3) Test Method and Device Test Points
Apply to Common mode (N-, L-) and Normal mode (N-L)

(4) Acceptable Conditions
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Common Test Voltage (kV)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
<th>Normal Test Voltage (kV)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>PASS</td>
<td>0.5</td>
<td>PASS</td>
</tr>
<tr>
<td>1</td>
<td>PASS</td>
<td>1</td>
<td>PASS</td>
</tr>
<tr>
<td>2</td>
<td>PASS</td>
<td>2</td>
<td>PASS</td>
</tr>
<tr>
<td>4</td>
<td>PASS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (IEC61000-4-6)

MODEL : CUS500M1

(1) Equipment Used
- Compact RF Simulator : NSG 4070-30 (TESEQ)
- Coupling-Decoupling Network : CDN L-801 M2/M3 (Liithi)

(2) Test Conditions
- Input Voltage : 115, 230VAC
- Output Voltage : Rated
- Output Current : 100%
- Electromagnetic Frequency : 150kHz ~ 80MHz
- Ambient Temperature : 25°C
- Sweep Condition : 1.0% Step Up, 0.5 Seconds Hold

(3) Test Method
Apply to (N, L, \( \pm \))

(4) Acceptable Conditions
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Voltage Level (V)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PASS</td>
</tr>
<tr>
<td>3</td>
<td>PASS</td>
</tr>
<tr>
<td>10</td>
<td>PASS</td>
</tr>
</tbody>
</table>

TDK-Lambda
7. Power Frequency Magnetic Field Immunity Test (IEC61000-4-8)

MODEL : CUS500M1

(1) Equipment Used
AC Power Source : NSG 1007(SCHAFFNER)
Helmholtz Coil : R-1000-4-8/9-L-1M (TESEQ)

(2) Test Conditions
• Input Voltage : 115, 230VAC
• Output Voltage : Rated
• Output Current : 100%
• Magnetic Frequency : 50Hz, 60Hz
• Ambient Temperature : 25℃
• Direction : X, Y, Z
• Test Time : More than 10 seconds (each direction)

(3) Test Method and Device Test Point

(4) Acceptable Conditions
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Magnetic Field Strength (A/m)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PASS</td>
</tr>
<tr>
<td>3</td>
<td>PASS</td>
</tr>
<tr>
<td>10</td>
<td>PASS</td>
</tr>
<tr>
<td>30</td>
<td>PASS</td>
</tr>
</tbody>
</table>
8. Voltage Dips, Short Interruptions Immunity Test (IEC61000-4-11)

MODEL : CUS500M1

(1) Equipment Used
Test Generator : PCR2000LE (KIKUSUI)

(2) Test Conditions
- Input Voltage : 100 ~ 120VAC, 200~ 240VAC
- Output Voltage : Rated
- Output Current : 100\%
- Ambient Temperature : 25℃
- Number of Tests : 3 times
- Test interval : More than 10 seconds

(3) Test Method and Device Test Point

(4) Acceptable Conditions
Criteria A
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

Criteria B
1. Must not have temporary function degradation that requires input restart.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Phenomenon</th>
<th>Test Level</th>
<th>Dip rate</th>
<th>Continue Time</th>
<th>Input Voltage Range</th>
<th>Criteria</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage dips</td>
<td>80%</td>
<td>20%</td>
<td>5000ms</td>
<td>100 ~ 120VAC</td>
<td>A</td>
<td>PASS</td>
</tr>
<tr>
<td></td>
<td>70%</td>
<td>30%</td>
<td>500ms</td>
<td>100 ~ 120VAC</td>
<td>A : ≤ 440W, B : &gt; 440W</td>
<td>PASS</td>
</tr>
<tr>
<td></td>
<td>40%</td>
<td>60%</td>
<td>200ms</td>
<td>100 ~ 120VAC</td>
<td>A : ≤ 180W, B : &gt; 180W</td>
<td>PASS</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>100%</td>
<td>20ms</td>
<td>100 ~ 120VAC</td>
<td>A : ≤ 280W, B : &gt; 280W</td>
<td>PASS</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>100%</td>
<td>10ms</td>
<td>100 ~ 120VAC</td>
<td>A</td>
<td>PASS</td>
</tr>
<tr>
<td>Short Interruptions</td>
<td>0%</td>
<td>100%</td>
<td>5000ms</td>
<td>100 ~ 120VAC</td>
<td>B</td>
<td>PASS</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>100%</td>
<td>10ms</td>
<td>200 ~ 240VAC</td>
<td>B</td>
<td>PASS</td>
</tr>
</tbody>
</table>
9. Electrostatic Discharge Immunity Test (IEC60601-1-2 Ed.4)

MODEL: CUS500M1

(1) Equipment Used
Electro Static Discharge Simulator : ZSS-S3011A (NOISEKEN)
Discharge Resistance : 330Ω Capacity : 150pF

(2) Test Conditions
- Input Voltage : 100, 240VAC
- Output Voltage : Rated
- Output Current : 0%, 100%
- Polarity : +, −
- Number of Tests : 10 times
- Discharge Interval : >1 second
- Ambient Temperature : 25°C

(3) Test Method and Device Test Point (IEC61000-4-2, ENCLOSURE PORT)
- Contact Discharge : ±, Mounting screw
- Air Discharge : ±, Mounting screw, Input and output terminal

(4) Acceptable Conditions
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Contact Discharge (kV)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
<th>Air Discharge (kV)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>PASS</td>
<td>2</td>
<td>PASS</td>
</tr>
<tr>
<td>4</td>
<td>PASS</td>
<td>4</td>
<td>PASS</td>
</tr>
<tr>
<td>6</td>
<td>PASS</td>
<td>8</td>
<td>PASS</td>
</tr>
<tr>
<td>8</td>
<td>PASS</td>
<td>15</td>
<td>PASS</td>
</tr>
</tbody>
</table>

TDK-Lambda
10. Radiated Radio-Frequency Electromagnetic Field Immunity Test (IEC60601-1-2 Ed.4)

**MODEL: CUS500M1**

(1) **Equipment Used**
- Signal generator : MG3692B (Anritsu)
- Power amplifier system : AP32 SW210 (PRANA)
- Electric field sensor : HI-6105 (ETS-Lindgren)
- Bilog antenna : AT4510 (AR)

(2) **Test Conditions**
- **Input Voltage** : 100, 240VAC
- **Output Voltage** : Rated
- **Output Current** : 0%, 100%
- **Distance (AM)** : 3.0m
- **Wave Angle** : Horizontal and Vertical
- **Distance (FM, PM)** : 0.3m
- **Test Angle** : Top/Bottom, Both Sides, Front/Back
- **Ambient Temperature** : 25℃
- **Amplitude Modulated (AM)** : 80%, 1kHz, 1.0% step up, 0.5 seconds hold.
- **Pulse Modulated (PM)** : 18Hz, 217Hz, 0.5 seconds hold.
- **Frequency Modulated (FM)** : 5kHz deviation, 1kHz sine, 0.5 seconds hold.

(3) **Test Method (IEC61000-4-3, ENCLOSURE PORT)**

(4) **Acceptable Conditions**
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) **Test Result**

<table>
<thead>
<tr>
<th>Modulation</th>
<th>Radiation Field Strength (V/m) (Level 3)</th>
<th>Electromagnetic Frequency</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
<td>10</td>
<td>80MHz ~ 2.7GHz</td>
<td>PASS</td>
</tr>
<tr>
<td>PM (18Hz)</td>
<td>27</td>
<td>385MHz</td>
<td>PASS</td>
</tr>
<tr>
<td>PM (217Hz)</td>
<td>9</td>
<td>810, 870, 930 MHz</td>
<td>PASS</td>
</tr>
<tr>
<td>FM</td>
<td>28</td>
<td>1720, 1845, 1970, 2450 MHz</td>
<td>PASS</td>
</tr>
</tbody>
</table>
11. Electrical Fast Transient / Burst Immunity Test (IEC60601-1-2 Ed.4)

MODEL: CUS500M1

(1) Equipment Used
EFT/B Generator : FNS-AX3  (NOISEKEN)

(2) Test Conditions
- Input Voltage : 100, 240VAC
- Output Voltage : Rated
- Output Current : 0%, 100%
- Test Time : 1 minute
- Polarity : +, −
- Ambient Temperature : 25°C
- Number of Tests : 1 time
- Pulse Frequency : 100kHz
- Burst Time : 0.75msec
- Number of Pulse : 75pcs
- Burst Cycle : 300msec

(3) Test Method and Device Test Point (IEC61000-4-4, Input a.c. power PORT)
Apply to (N, L, ⊕), (N, L), (N), (L), ( ⊕)

(4) Acceptable Conditions
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Test Voltage (kV) (Level 3)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>PASS</td>
</tr>
<tr>
<td>1</td>
<td>PASS</td>
</tr>
<tr>
<td>2</td>
<td>PASS</td>
</tr>
</tbody>
</table>
12. Surge Immunity Test (IEC60601-1-2 Ed.4)

MODEL: CUS500M1

(1) Equipment Used
- Surge Generator: LSS-F03 (NOISEKEN)
- Coupling Impedance: Common 12Ω, Normal 2Ω
- Coupling Capacitance: Common 9μF, Normal 18μF

(2) Test Conditions
- Input Voltage: 100, 240VAC
- Output Voltage: Rated
- Output Current: 0%, 100%
- Number of Tests: 5 times
- Polarity: +, −
- Mode: Common, Normal
- Phase: 0, 90deg
- Ambient Temperature: 25℃

(3) Test Method and Device Test Point (IEC61000-4-5, Input a.c. power PORT)
Apply to Common mode (N- /perl L- /perl) and Normal mode (N-L)

(4) Acceptable Conditions
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Test Voltage (kV)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
<th>Test Voltage (kV)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>PASS</td>
<td>0.5</td>
<td>PASS</td>
</tr>
<tr>
<td>1</td>
<td>PASS</td>
<td>1</td>
<td>PASS</td>
</tr>
<tr>
<td>2</td>
<td>PASS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (IEC60601-1-2 Ed.4)

**MODEL: CUS500M1**

(1) **Equipment Used**

- Compact RF Simulator: NSG 4070-30 (TESEQ)
- Coupling-Decoupling Network: CDN L-801 M2/M3 (Liithi)

(2) **Test Conditions**

- Input Voltage: 100, 240VAC
- Output Voltage: Rated
- Output Current: 100%
- Electromagnetic Frequency: 150kHz ~ 80MHz
- Ambient Temperature: 25℃
- Sweep Condition: 1.0% step up, 0.5 seconds hold

(3) **Test Method and Device Test Point (IEC61000-4-6, Input a.c. power PORT)**

apply to (N, L, ¼)

(4) **Acceptable Conditions**

1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) **Test Result**

<table>
<thead>
<tr>
<th>Voltage Level (V)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PASS</td>
</tr>
<tr>
<td>3</td>
<td>PASS</td>
</tr>
</tbody>
</table>
14. Power Frequency Magnetic Field Immunity Test (IEC60601-1-2 Ed.4)

MODEL: CUS500M1

(1) Equipment Used
   AC Power Source : NSG 1007(SCHAFFNER)
   Helmholtz Coil : R-1000-4-8/9-L-1M (TESEQ)

(2) Test Conditions
   - Input Voltage : 100, 240VAC
   - Output Voltage : Rated
   - Output Current : 100%
   - Magnetic Frequency : 50Hz, 60Hz
   - Ambient Temperature : 25℃
   - Direction : X, Y, Z
   - Test Time : More than 10 seconds (each direction)

(3) Test Method (IEC61000-4-8, ENCLOSURE PORT)

(4) Acceptable Conditions
   1. The regulation of output voltage must not exceed 5% of initial value during test.
   2. The output voltage must be within the regulation of specification after the test.
   3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Magnetic Field Strength (A/m) (Level 4)</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PASS</td>
</tr>
<tr>
<td>3</td>
<td>PASS</td>
</tr>
<tr>
<td>10</td>
<td>PASS</td>
</tr>
<tr>
<td>30</td>
<td>PASS</td>
</tr>
</tbody>
</table>

TDK-Lambda
15. Voltage Dips, Voltage Interruptions Immunity Test (IEC60601-1-2 Ed.4)

MODEL: CUS500M1

(1) Equipment Used
Test generator : PCR2000LE (KIKUSUI)

(2) Test Conditions
- Input Voltage : 100, 240VAC
- Output Voltage : Rated
- Output Current : 100%
- Ambient Temperature : 25℃
- Number of Tests : 3 times
- Test Interval : More than 10 seconds

(3) Test Method (IEC61000-4-11, Input a.c. power PORT)

(4) Acceptable Conditions
Criteria A
1. The regulation of output voltage must not exceed 5% of initial value during test.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

Criteria B
1. Must not have temporary function degradation that requires input restart.
2. The output voltage must be within the regulation of specification after the test.
3. Smoke and fire are not allowed.

(5) Test Result

<table>
<thead>
<tr>
<th>Phenomenon</th>
<th>Test Level</th>
<th>Continae Time</th>
<th>Phase Angles</th>
<th>Input Voltage Range</th>
<th>Criteria</th>
<th>CUS500M1-12/19/24/28/32/36/48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage dips</td>
<td>70%</td>
<td>500ms</td>
<td>0 deg</td>
<td>100VAC</td>
<td>A</td>
<td>PASS</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>10ms</td>
<td>0,45,90,135,180,225,270,315 deg</td>
<td>100VAC</td>
<td>A</td>
<td>PASS</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>20ms</td>
<td>0 deg</td>
<td>240VAC</td>
<td>A</td>
<td>PASS</td>
</tr>
<tr>
<td>Voltage interruptions</td>
<td>0%</td>
<td>5000ms</td>
<td>0 deg</td>
<td>100VAC</td>
<td>B</td>
<td>PASS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>240VAC</td>
<td>B</td>
<td>PASS</td>
</tr>
</tbody>
</table>