



# Test Report: HLG-240H-C1050

---

250W Single Output LED Power Supply

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

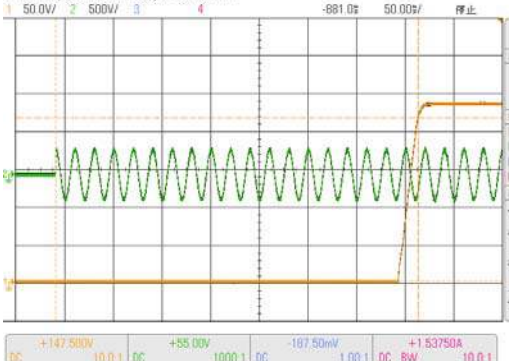
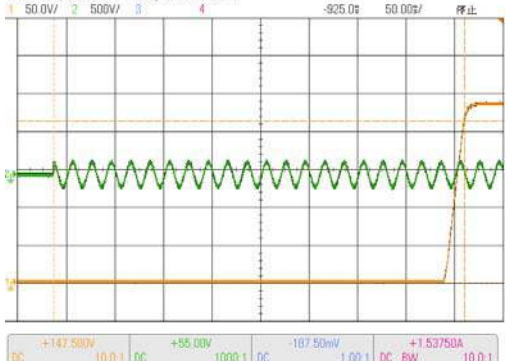
E.M.C. Test

## ■ RELIABILITY TEST

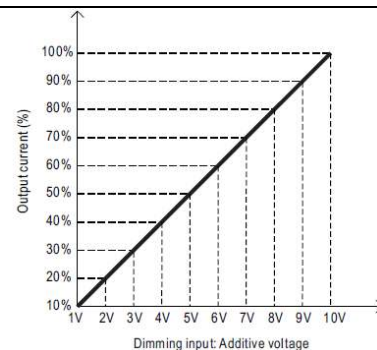
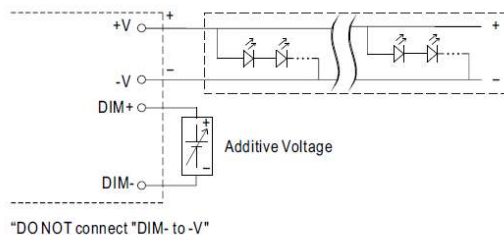
ENVIRONMENT TEST

## DESIGN VERIFY TEST

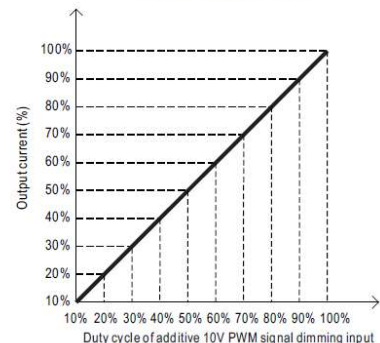
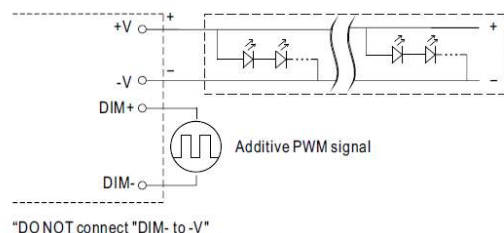
### OUTPUT FUNCTION TEST

| NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TEST ITEM                      | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                              | TEST CONDITION                                                 | RESULT                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CURRENT TOLERANCE              | ±5%                                                                                                                                                                                                                                                                                                                                                                        | I/P: 230 VAC<br>I/P:115VAC<br>O/P:FULL LOAD<br>Ta:25℃          | 1.055A /230VAC@CV MAX-2V<br>1.057A /230VAC@CV MIN<br>1.055A/115VAC@CV MAX-2V<br>1.057A/115VAC@CV MIN<br>+0.667%                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CONSTANT CURRENT REGION        | CH1: 119V~ 238V                                                                                                                                                                                                                                                                                                                                                            | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃                        | 0.3V~237 V /230VAC                                                                                                               |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | OPEN CIRCUIT VOLTAGE (max.)    | 241V                                                                                                                                                                                                                                                                                                                                                                       | I/P: 230 VAC<br>O/P:NO LOAD<br>Ta:25℃                          | 241.5V                                                                                                                           |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CURRENT ADJ. RANGE             | CH1:525mA~ 1050mA                                                                                                                                                                                                                                                                                                                                                          | I/P: 230 VAC<br>I/P:115VAC<br>O/P:CV MIN & CV MAX-2V<br>Ta:25℃ | 0.438A~ 1.281A /230VAC@CV MAX-2V<br>0.441A~ 1.28A /230VAC@CV MIN<br>0.439A~1.281/115VAC@CV MAX-2V<br>0.441A~1.28 A/115VAC@CV MIN |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CURRENT RIPPLE                 | 5.0% max. @rated current                                                                                                                                                                                                                                                                                                                                                   | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃                        | 1.92%                                                                                                                            |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SET UP TIME(Max)               | 230VAC/500 ms<br>115VAC/1000ms                                                                                                                                                                                                                                                                                                                                             | I/P: 230 VAC<br>I/P: 115 VAC<br>O/P:FULL LOAD<br>Ta:25℃        | 230VAC/ 372ms<br>115 VAC/423 ms                                                                                                  |
| <div> <div> <p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : AC Input Voltage CH2 : Output Voltage</p> <p>050-X-3014A, MY52161480 Thu May 07 15:33:37 2015</p>  <p>DC +147.500V 10.0 1 DC +55.00V 1000.1 DC -187.50mV 1.00 1 DC 8W 10.0 1</p> </div> <div> <p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1 : AC Input Voltage CH2 : Output Voltage</p> <p>050-X-3014A, MY52161480 Thu May 07 15:39:12 2015</p>  <p>DC +147.500V 10.0 1 DC +55.00V 1000.1 DC -187.50mV 1.00 1 DC 8W 10.0 1</p> </div> </div> |                                |                                                                                                                                                                                                                                                                                                                                                                            |                                                                |                                                                                                                                  |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | DIMMING OPERATION (for B-Type) | <p>※3 in 1 dimming function</p> <p>※Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-: 1 ~ 10VDC, or 10V PWM signal or resistance.</p> <p>※Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.</p> <p>※Dimming source current from power supply: 100μ A (typ.)</p> |                                                                |                                                                                                                                  |

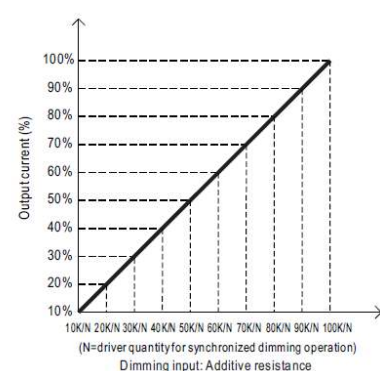
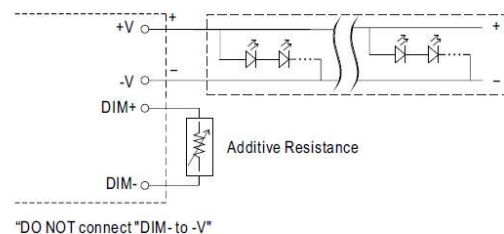
◎ Applying additive 1 ~ 10VDC



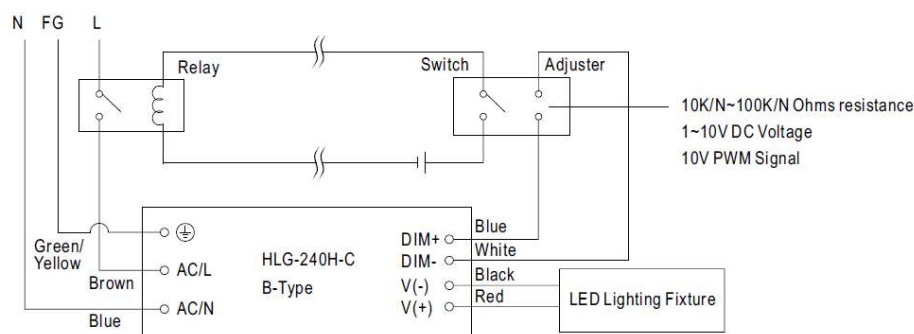
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



◎ Applying additive resistance:



Note: In the case of turning the lighting fixture down to 0% brightness, please refer to the configuration as follow, or please contact MEAN WELL for other options.



Using a switch and relay can turn ON/OFF the lighting fixture.

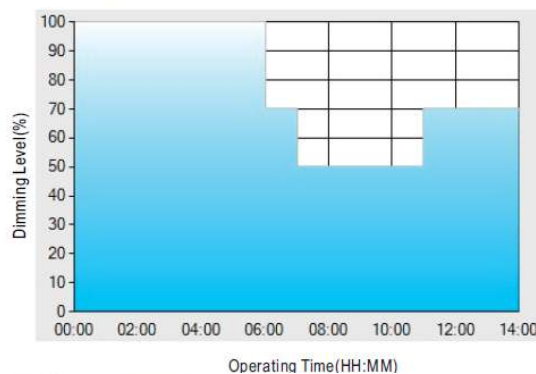
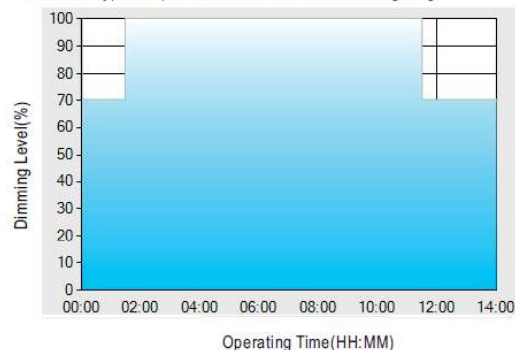
I/P : 230VAC

O/P : DIMMING TEST

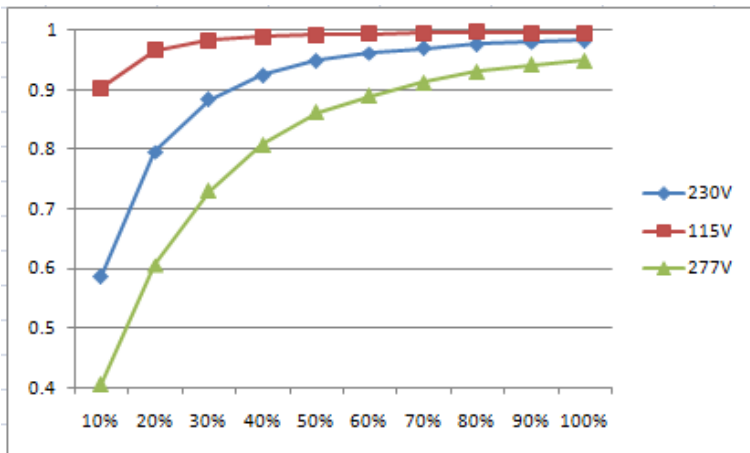
TA : 25°C

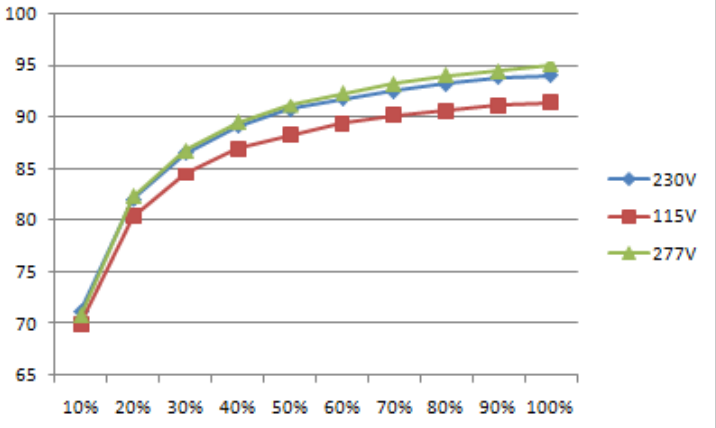
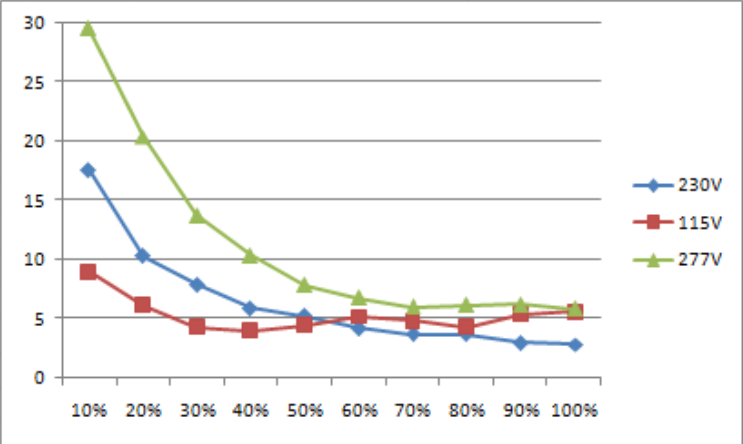
| R           | 10K    | 20K    | 30K    | 40K    | 50K    | 60K    | 70K    | 80K    | 90K    | 100K   | OPEN    |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| O/P CURRENT | 0.110A | 0.213A | 0.319A | 0.422A | 0.523A | 0.625A | 0.728A | 0.826A | 0.927A | 1.021A | 1.056A  |
| %           | 10.50% | 20.26% | 30.40% | 40.19% | 49.84% | 59.48% | 69.29% | 78.67% | 88.29% | 97.20% | 100.54% |
| V           | 1V     | 2V     | 3V     | 4V     | 5V     | 6V     | 7V     | 8V     | 9V     | 10V    | OPEN    |

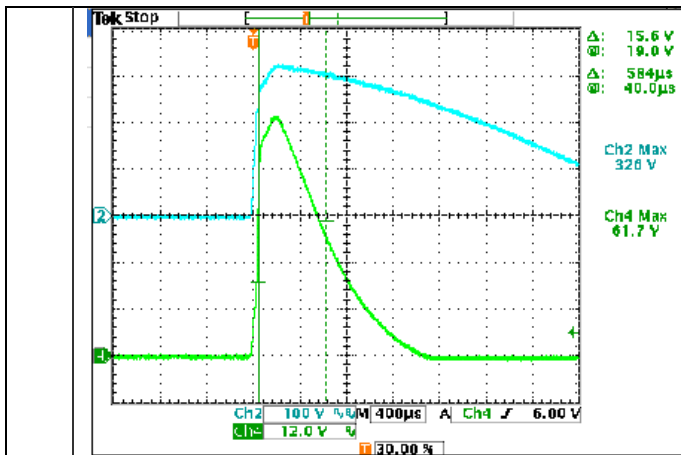
|             |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |        |        |        |        |        |        |         |         |        |        |        |   |        |        |        |        |        |        |        |        |        |         |         |             |     |     |     |     |     |     |     |     |     |      |      |             |        |        |        |        |        |        |        |        |        |        |        |   |       |        |        |        |        |        |        |        |        |        |         |
|-------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
|             |        | <table><tr><td>O/P CURRENT</td><td>0.111A</td><td>0.215A</td><td>0.320A</td><td>0.425A</td><td>0.530A</td><td>0.633A</td><td>0.737A</td><td>0.842A</td><td>0.946A</td><td>1.051A</td><td>1.056A</td></tr><tr><td>%</td><td>10.56%</td><td>20.50%</td><td>30.45%</td><td>40.48%</td><td>50.48%</td><td>60.29%</td><td>70.19%</td><td>80.19%</td><td>90.10%</td><td>100.10%</td><td>100.54%</td></tr><tr><td>PWM (100HZ)</td><td>10%</td><td>20%</td><td>30%</td><td>40%</td><td>50%</td><td>60%</td><td>70%</td><td>80%</td><td>90%</td><td>100%</td><td>OPEN</td></tr><tr><td>O/P CURRENT</td><td>0.101A</td><td>0.208A</td><td>0.317A</td><td>0.422A</td><td>0.526A</td><td>0.629A</td><td>0.731A</td><td>0.833A</td><td>0.938A</td><td>1.041A</td><td>1.056A</td></tr><tr><td>%</td><td>9.62%</td><td>19.85%</td><td>30.18%</td><td>40.18%</td><td>50.12%</td><td>59.86%</td><td>69.57%</td><td>79.35%</td><td>89.29%</td><td>99.10%</td><td>100.54%</td></tr></table> | O/P CURRENT | 0.111A | 0.215A | 0.320A | 0.425A | 0.530A | 0.633A | 0.737A  | 0.842A  | 0.946A | 1.051A | 1.056A | % | 10.56% | 20.50% | 30.45% | 40.48% | 50.48% | 60.29% | 70.19% | 80.19% | 90.10% | 100.10% | 100.54% | PWM (100HZ) | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | OPEN | O/P CURRENT | 0.101A | 0.208A | 0.317A | 0.422A | 0.526A | 0.629A | 0.731A | 0.833A | 0.938A | 1.041A | 1.056A | % | 9.62% | 19.85% | 30.18% | 40.18% | 50.12% | 59.86% | 69.57% | 79.35% | 89.29% | 99.10% | 100.54% |
| O/P CURRENT | 0.111A | 0.215A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.320A      | 0.425A | 0.530A | 0.633A | 0.737A | 0.842A | 0.946A | 1.051A  | 1.056A  |        |        |        |   |        |        |        |        |        |        |        |        |        |         |         |             |     |     |     |     |     |     |     |     |     |      |      |             |        |        |        |        |        |        |        |        |        |        |        |   |       |        |        |        |        |        |        |        |        |        |         |
| %           | 10.56% | 20.50%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 30.45%      | 40.48% | 50.48% | 60.29% | 70.19% | 80.19% | 90.10% | 100.10% | 100.54% |        |        |        |   |        |        |        |        |        |        |        |        |        |         |         |             |     |     |     |     |     |     |     |     |     |      |      |             |        |        |        |        |        |        |        |        |        |        |        |   |       |        |        |        |        |        |        |        |        |        |         |
| PWM (100HZ) | 10%    | 20%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 30%         | 40%    | 50%    | 60%    | 70%    | 80%    | 90%    | 100%    | OPEN    |        |        |        |   |        |        |        |        |        |        |        |        |        |         |         |             |     |     |     |     |     |     |     |     |     |      |      |             |        |        |        |        |        |        |        |        |        |        |        |   |       |        |        |        |        |        |        |        |        |        |         |
| O/P CURRENT | 0.101A | 0.208A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.317A      | 0.422A | 0.526A | 0.629A | 0.731A | 0.833A | 0.938A | 1.041A  | 1.056A  |        |        |        |   |        |        |        |        |        |        |        |        |        |         |         |             |     |     |     |     |     |     |     |     |     |      |      |             |        |        |        |        |        |        |        |        |        |        |        |   |       |        |        |        |        |        |        |        |        |        |         |
| %           | 9.62%  | 19.85%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 30.18%      | 40.18% | 50.12% | 59.86% | 69.57% | 79.35% | 89.29% | 99.10%  | 100.54% |        |        |        |   |        |        |        |        |        |        |        |        |        |         |         |             |     |     |     |     |     |     |     |     |     |      |      |             |        |        |        |        |        |        |        |        |        |        |        |   |       |        |        |        |        |        |        |        |        |        |         |
|             |        | TEST RESULT : OK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |        |        |        |        |        |        |         |         |        |        |        |   |        |        |        |        |        |        |        |        |        |         |         |             |     |     |     |     |     |     |     |     |     |      |      |             |        |        |        |        |        |        |        |        |        |        |        |   |       |        |        |        |        |        |        |        |        |        |         |

|         |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |       |     |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
|---------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-----|----|----|--------|-------|-------|-------|----|---------|------|-----|-----|-----|--|----|----|----|----|----|--------|-------|-------|------|-------|----|---------|-----|-----|------|-----|-----|--|----|----|----|--------|-------|-------|-----|---------|-----|------|-----|
| 8       | DIMMING OPERATION<br>(for Dxx-Type by User definition) | <p>※Smart timer dimming function (for Dxx-Type by User definition)</p> <p>MEAN WELL Smart timer dimming primarily provides the adaptive proportion dimming profile for the output constant current level to perform up to 14 consecutive hours. 3 dimming profiles hereunder are defined accounting for the most frequently seen applications. If other options may be needed,please contact MEAN WELL for details.</p> <p>Ex : Ⓒ D01-Type: the profile recommended for residential lighting</p> <div><p>Operating Time(HH:MM)</p></div> <p>Set up for D01-Type in Smart timer dimming software program:</p> <table><tr><td></td><td>T1</td><td>T2</td><td>T3</td><td>T4</td></tr><tr><td>TIME**</td><td>06:00</td><td>07:00</td><td>11:00</td><td>--</td></tr><tr><td>LEVEL**</td><td>100%</td><td>70%</td><td>50%</td><td>70%</td></tr></table> <p>Ex : Ⓒ D02-Type: the profile recommended for street lighting</p> <div><p>Operating Time(HH:MM)</p></div> <p>Set up for D02-Type in Smart timer dimming software program:</p> <table><tr><td></td><td>T1</td><td>T2</td><td>T3</td><td>T4</td><td>T5</td></tr><tr><td>TIME**</td><td>01:00</td><td>03:00</td><td>8:00</td><td>11:00</td><td>--</td></tr><tr><td>LEVEL**</td><td>50%</td><td>80%</td><td>100%</td><td>60%</td><td>80%</td></tr></table> <p>Ex : Ⓒ D03-Type: the profile recommended for tunnel lighting</p> <div><p>Operating Time(HH:MM)</p></div> <p>Set up for D03-Type in Smart timer dimming software program:</p> <table><tr><td></td><td>T1</td><td>T2</td><td>T3</td></tr><tr><td>TIME**</td><td>01:30</td><td>11:00</td><td>---</td></tr><tr><td>LEVEL**</td><td>70%</td><td>100%</td><td>70%</td></tr></table> |       | T1    | T2  | T3 | T4 | TIME** | 06:00 | 07:00 | 11:00 | -- | LEVEL** | 100% | 70% | 50% | 70% |  | T1 | T2 | T3 | T4 | T5 | TIME** | 01:00 | 03:00 | 8:00 | 11:00 | -- | LEVEL** | 50% | 80% | 100% | 60% | 80% |  | T1 | T2 | T3 | TIME** | 01:30 | 11:00 | --- | LEVEL** | 70% | 100% | 70% |
|         | T1                                                     | T2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | T3    | T4    |     |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
| TIME**  | 06:00                                                  | 07:00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 11:00 | --    |     |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
| LEVEL** | 100%                                                   | 70%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 50%   | 70%   |     |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
|         | T1                                                     | T2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | T3    | T4    | T5  |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
| TIME**  | 01:00                                                  | 03:00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 8:00  | 11:00 | --  |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
| LEVEL** | 50%                                                    | 80%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 100%  | 60%   | 80% |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
|         | T1                                                     | T2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | T3    |       |     |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
| TIME**  | 01:30                                                  | 11:00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ---   |       |     |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
| LEVEL** | 70%                                                    | 100%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 70%   |       |     |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |
|         |                                                        | I/P : 230VAC<br>O/P : DIMMING TEST<br>TA : 25℃<br>TEST RESULT : OK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |       |     |    |    |        |       |       |       |    |         |      |     |     |     |  |    |    |    |    |    |        |       |       |      |       |    |         |     |     |      |     |     |  |    |    |    |        |       |       |     |         |     |      |     |

## INPUT FUNCTION TEST

| NO       | TEST ITEM             | SPECIFICATION                                                              | TEST CONDITION                                                                                                                                                                                                                    | RESULT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
|----------|-----------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|------|
| 1        | INPUT VOLTAGE RANGE   | 90VAC~305 VAC                                                              | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25℃                                                                                                                                                                                            | 67V~305V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
|          |                       |                                                                            | I/P:<br>(1)LOW-LINE-3V=87 V<br>HIGH-LINE+10V=315 V<br>O/P:FULL/MIN LOAD<br>(PLEASE CHECK DERATING CURVE)<br>ON: 30 Sec . OFF: 30 Sec 10MIN<br>( POWER ON/OFF NO DAMAGE )<br>(2)<br>I/P:230Vac<br>ON: 0.5 Sec . OFF: 0.5 Sec 20MIN | (1).TEST:OK<br>(2).TEST :OK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 2        | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE                                                   | I/P: 100 VAC ~305VAC<br>O/P:FULL~MIN LOAD<br>Ta:25℃                                                                                                                                                                               | OK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 3        | INPUT CURRENT (TYP)   | 277VAC/ 1.1 A<br>230 VAC/ 1.3 A<br>115 VAC/ 2.5 A                          | I/P: 277VAC/230 VAC/115 VAC<br>O/P:FULL LOAD<br>Ta:25℃                                                                                                                                                                            | I=1.008 A/277VAC<br>I = 1.18A/ 230VAC<br>I = 2.41A/ 115VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 4        | POWER FACTOR(TYP)     | 0.95/230 VAC FULL LOAD<br>0.98/115 VAC FULL LOAD<br>0.92/277 VAC FULL LOAD | I/P: 230 VAC/115VAC/277VAC<br>O/P:FULL LOAD<br>Ta:25℃                                                                                                                                                                             | PF= 0.975/230V/100%LOAD<br>PF=0.996 /115V/100%LOAD<br>PF= 0.951/277V/100%LOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
|          |                       |                                                                            |                                                                                                                                                                                                                                   | <div>P.F vs LOAD</div>  <table><caption>P.F vs LOAD Data</caption><thead><tr><th>Load (%)</th><th>230V P.F</th><th>115V P.F</th><th>277V P.F</th></tr></thead><tbody><tr><td>10%</td><td>0.58</td><td>0.90</td><td>0.40</td></tr><tr><td>20%</td><td>0.78</td><td>0.95</td><td>0.60</td></tr><tr><td>30%</td><td>0.88</td><td>0.98</td><td>0.73</td></tr><tr><td>40%</td><td>0.92</td><td>0.99</td><td>0.81</td></tr><tr><td>50%</td><td>0.95</td><td>1.00</td><td>0.86</td></tr><tr><td>60%</td><td>0.96</td><td>1.00</td><td>0.89</td></tr><tr><td>70%</td><td>0.97</td><td>1.00</td><td>0.91</td></tr><tr><td>80%</td><td>0.98</td><td>1.00</td><td>0.93</td></tr><tr><td>90%</td><td>0.98</td><td>1.00</td><td>0.94</td></tr><tr><td>100%</td><td>0.98</td><td>1.00</td><td>0.95</td></tr></tbody></table> | Load (%) | 230V P.F | 115V P.F | 277V P.F | 10% | 0.58 | 0.90 | 0.40 | 20% | 0.78 | 0.95 | 0.60 | 30% | 0.88 | 0.98 | 0.73 | 40% | 0.92 | 0.99 | 0.81 | 50% | 0.95 | 1.00 | 0.86 | 60% | 0.96 | 1.00 | 0.89 | 70% | 0.97 | 1.00 | 0.91 | 80% | 0.98 | 1.00 | 0.93 | 90% | 0.98 | 1.00 | 0.94 |
| Load (%) | 230V P.F              | 115V P.F                                                                   | 277V P.F                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 10%      | 0.58                  | 0.90                                                                       | 0.40                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 20%      | 0.78                  | 0.95                                                                       | 0.60                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 30%      | 0.88                  | 0.98                                                                       | 0.73                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 40%      | 0.92                  | 0.99                                                                       | 0.81                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 50%      | 0.95                  | 1.00                                                                       | 0.86                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 60%      | 0.96                  | 1.00                                                                       | 0.89                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 70%      | 0.97                  | 1.00                                                                       | 0.91                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 80%      | 0.98                  | 1.00                                                                       | 0.93                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 90%      | 0.98                  | 1.00                                                                       | 0.94                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 100%     | 0.98                  | 1.00                                                                       | 0.95                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
| 5        | EFFICIENCY (TYP)      | 93.5 %                                                                     | I/P: 230 VAC<br>O/P:FULL LOAD<br>Ta:25℃                                                                                                                                                                                           | 94.3%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |
|          |                       |                                                                            | EFFICIENCY vs LOAD                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |          |          |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |     |      |      |      |

|   |                                                                                             |                                                                                                                                                                                                                        |                                                                                                                            |                                                         |
|---|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
|   |                                                                                             |                                                                                                                                                                                                                        |                                          |                                                         |
| 6 | TOTAL HARMONIC DISTORTION                                                                   | <p>Total harmonic distortion will be lower than 20% when output loading is 50% or higher at 230VAC / 115VAC</p> <p>Total harmonic distortion will be lower than 20% when output loading is 75% or higher at 277VAC</p> | <p>I/P : 230VAC<br/>I/P : 115VAC<br/>O/P : 50% LOAD<br/>Ta : 25°C</p> <p>I/P : 277VAC<br/>O/P : 75% LOAD<br/>Ta : 25°C</p> | <p>THD : 3.5 %<br/>THD : 5.12 %</p> <p>THD : 6.32 %</p> |
|   |                                                                                             |                                                                                                                                                                                                                        | <p><b>THD&amp;LOAD</b></p>             |                                                         |
| 7 | INRUSH CURRENT (TYP)                                                                        | <p>230 V/ 75A<br/>COLD START</p> <p>(twidh= 700us measured at 50% Ipeak) COLD START</p>                                                                                                                                | <p>I/P: 230 VAC<br/>O/P:FULL LOAD<br/>Ta:25°C</p>                                                                          | <p>I= 61.7A/ 230VAC</p> <p>T50= 584 us</p>              |
|   | <p>INPUT=230VAC/50HZ @ FULL LOAD<br/>CH2 : AC Input Voltage CH4 : Input current (1V=1A)</p> |                                                                                                                                                                                                                        |                                                                                                                            |                                                         |



## ROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                          | TEST CONDITION                                                        | RESULT                                                                                                                                   |
|----|-----------------------------|----------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | OVER VOLTAGE PROTECTION     | V1: 250V~ 275 V                        | I/P: 305VAC<br>I/P: 230VAC<br>I/P: 90VAC<br>O/P: MIN LOAD<br>Ta: 25°C | 263.02V/ 305VAC<br>263.02V/ 230VAC<br>262.91V/ 90VAC<br>PROTECTION TYPE :<br>Shut down and latch off o/p voltage, re-power on to recover |
| 2  | OVER TEMPERATURE PROTECTION | SPEC:<br>NO DAMAGE                     | I/P: 305 VAC<br>I/P: 90 VAC<br>O/P: FULL LOAD                         | O.T.P. Active<br>PROTECTION TYPE :<br>Shut down o/p voltage, recovers automatically after temperature goes down                          |
| 3  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 305VAC<br>I/P: 90 VAC<br>O/P: FULL LOAD<br>Ta: 25°C              | NO DAMAGE<br>PROTECTION TYPE :<br>Constant current limiting, recovers automatically after fault condition is removed                     |

## COMPONENT STRESS TEST

| NO | TEST ITEM                                              | SPECIFICATION        | TEST CONDITION                                                                                                                                                                                                                                         | RESULT                                                                                   |
|----|--------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 1  | P.F.C Transistor<br>( D to S) or (C to E) Peak Voltage | Q1 Rated<br>600V/19A | I/P: High-Line +3V = 308V<br>AC ON/OFF<br>VDS:<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) FULL LOAD CONTINUE<br><br>I/P: Low-Line -3V = 107V<br>AC ON/OFF<br>VDS<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) FULL LOAD CONTINUE<br>Ta: 25°C | VDS:<br>(1) 521V<br>(2) 489V<br>(3) 517V<br><br>VDS:<br>(1) 513V<br>(2) 501V<br>(3) 501V |

|   |                                                            |                                                    |                                                                                                                                                                                                                                                  |                                                                                                        |
|---|------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 2 | PWM Transistor<br>(D to S) or (C to E) <b>Peak Voltage</b> | Q3 Rated<br>20A/600V                               | I/P:High-Line +3V =308V<br>AC ON/OFF<br>VDS:<br>O/P: (1)Full Load<br>(2)Output Short<br>(3)FULL LOAD CONTINUE<br><br>I/P:Low-Line -3V = 107V<br>AC ON/OFF<br>VDS<br>O/P: (1)Full Load<br>(2)Output Short<br>(3)FULL LOAD CONTINUE<br><br>Ta:25°C | VDS:<br>(1)477V<br>(2)497V<br>(3)477V<br><br>VDS:<br>(1)476V<br>(2)501V<br>(3)465V                     |
| 3 | Diode <b>Peak Voltage</b>                                  | D102 Rated<br>3A/400V<br><br>D103 Rated<br>3A/400V | I/P:High-Line +3V = 308 V<br>AC ON/OFF<br>VDS:<br>O/P: (1)Full Load<br>(2)Output Short<br>(3)FULL LOAD CONTINUE<br><br>VDS:<br>(1)Full Load<br>(2)Output Short<br>(3)FULL LOAD CONTINUE<br><br>Ta:25°C                                           | D102:<br>VDS:<br>(1)244V<br>(2)30.2V<br>(3)242V<br><br>D103:<br>VDS:<br>(1)246V<br>(2)38.2V<br>(3)243V |
| 4 | Input Capacitor Voltage                                    | C5 Rated:<br>150u/450V<br>SURGE POWER :495V        | I/P:High-Line +3V =308 V<br>O/P: (1)Full Load input on/off<br>(2) Min load input on /Off<br>(3)Full Load /Min load Change<br>Ta:25°C                                                                                                             | (1)466V<br>(2)454V<br>(3)446V                                                                          |
| 5 | Control IC Voltage Test                                    | PWM IC U70 Rated<br>8.85V~16V                      | I/P:High-Line +3V =308 V<br>AC ON/OFF<br>O/P:(1)FULL LOAD<br>(2) Output Short<br>(3)O.L.P<br>(4)O.V.P.<br>(5)NO LOAD (LOW LINE)<br>Ta:25°C                                                                                                       | (1) 15.5V<br>(2) 15.5V<br>(3) 15.3V<br>(4) 15.5V<br>(5) 14.5V                                          |

## SAFETY & EMC TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION                                                                         | TEST CONDITION                                                                     | RESULT                                                           |
|----|----------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1  | WITHSTAND VOLTAGE    | IEC60950-1<br>I/P-O/P: 3.75KVAC/min<br>I/P-FG: 2 KVAC/min<4.5mA<br>O/P-FG:1.5KVAC/min | I/P-O/P: 4.125 KVAC/min<br>I/P-FG: 2.4 KVAC/min<br>O/P-FG: 1.8 KVAC/min<br>Ta:25°C | I/P-O/P: 4.02mA<br>I/P-FG: 3.92mA<br>O/P-FG: 3.15mA<br>NO DAMAGE |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ<br>I/P-FG: 500VDC>100MΩ<br>O/P-FG:500VDC>100MΩ                   | I/P-O/P: 500 VDC<br>I/P-FG: 500 VDC<br>O/P-FG: 500 VDC<br>Ta:25°C                  | I/P-O/P: 30GΩ<br>I/P-FG: 12.4G Ω<br>O/P-FG:30 G Ω<br>NO DAMAGE   |



|   |                      |                                                      |                                         |                              |
|---|----------------------|------------------------------------------------------|-----------------------------------------|------------------------------|
| 3 | GROUNDING CONTINUITY | IEC60950-1<br>FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ | 40A / 2min<br>Ta:25°C                   | 30MΩ                         |
| 4 | LEAKAGE CURRENT      | IEC60950-1<br>< 0.75mA / 277VAC                      | I/P: 277 VAC<br>O/P:Min LOAD<br>Ta:25°C | L-FG: .026mA<br>N-FG: 0.28mA |

## E.M.C TEST

| NO | TEST ITEM                                                                                                                           | SPECIFICATION                                          | TEST CONDITION                                      | RESULT                        |
|----|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------|-------------------------------|
| 1  | HARMONIC                                                                                                                            | EN61000-3-2<br>CLASS A<br>CLASS C                      | I/P: 230VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C        | PASS                          |
| 2  | CONDUCTION                                                                                                                          | EN55015<br>CLASS B                                     | I/P: 230 VAC (50HZ)<br>O/P:FULL/50% LOAD<br>Ta:25°C | PASS<br>Test by certified Lab |
| 3  | RADIATION                                                                                                                           | EN55015<br>CLASS B                                     | I/P: 230 VAC (50HZ)<br>O/P:FULL LOAD<br>Ta:25°C     | PASS<br>Test by certified Lab |
| 4  | E.S.D                                                                                                                               | EN61000-4-2<br>LIGHT INDUSTRY<br>AIR:8KV / Contact:4KV | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C       | CRITERIA A                    |
| 5  | E.F.T                                                                                                                               | EN61000-4-4<br>INDUSTRY<br>INPUT: 2KV                  | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C       | CRITERIA A                    |
| 6  | SURGE                                                                                                                               | IEC61000-4-5<br>INDUSTRY<br>L-N :2KV<br>L,N-PE:4KV     | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C       | CRITERIA A                    |
| 7  | Test by certified Lab & Test Report Prepare.<br>Any contradictions of the test results, please refer to the latest EMC test report. |                                                        |                                                     |                               |

## RELIABILITY TEST

### ENVIRONMENT TEST

| NO | TEST ITEM                                                         | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | TEST CONDITION                                                     | RESULT                |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
|----|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------|----|----------|--------------|--------------|---|-----|--------|--------|---|-----|--------|--------|---|-----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|------|--------|--------|----|----|--------|--------|----|----|--------|--------|----|-----|--------|--------|----|-----|--------|--------|----|------|--------|--------|----|----|--------|---------|----|------|--------|--------|----|------|--------|--------|----|----|--------|--------|----|------|--------|--------|----|------|--------|--------|
| 1  | TEMPERATURE RISE TEST                                             | <div>MODEL : HLG-240H-C700</div> <div>1. ROOM AMBIENT BURN-IN : 3 HRS</div> <div>I/P : 230VAC O/P : FULL LOAD Ta= 29.2 °C</div> <div>2. HIGH AMBIENT BURN-IN : 6 HRS</div> <div>I/P : 230VAC O/P : FULL LOAD Ta= 55.7 °C</div> <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT</th><th>HIGH AMBIENT</th></tr><tr><td>1</td><td>BD1</td><td>65.7°C</td><td>89.0°C</td></tr><tr><td>2</td><td>C14</td><td>62.6°C</td><td>86.3°C</td></tr><tr><td>3</td><td>LF2</td><td>61.6°C</td><td>84.8°C</td></tr><tr><td>4</td><td>Q1</td><td>64.7°C</td><td>88.6°C</td></tr><tr><td>5</td><td>D3</td><td>63.9°C</td><td>87.7°C</td></tr><tr><td>6</td><td>L2</td><td>62.2°C</td><td>85.9°C</td></tr><tr><td>7</td><td>L1</td><td>63.5°C</td><td>88.6°C</td></tr><tr><td>8</td><td>D2</td><td>63.9°C</td><td>87.7°C</td></tr><tr><td>9</td><td>TSW1</td><td>62.2°C</td><td>85.9°C</td></tr><tr><td>10</td><td>Q4</td><td>63.6°C</td><td>87.4°C</td></tr><tr><td>11</td><td>C5</td><td>61.6°C</td><td>84.9°C</td></tr><tr><td>12</td><td>C35</td><td>63.9°C</td><td>86.9°C</td></tr><tr><td>13</td><td>C37</td><td>63.9°C</td><td>86.9°C</td></tr><tr><td>14</td><td>D102</td><td>63.9°C</td><td>87.5°C</td></tr><tr><td>15</td><td>T1</td><td>81.1°C</td><td>101.8°C</td></tr><tr><td>16</td><td>C201</td><td>61.3°C</td><td>85.2°C</td></tr><tr><td>17</td><td>C102</td><td>60.2°C</td><td>83.9°C</td></tr><tr><td>18</td><td>U1</td><td>61.3°C</td><td>84.9°C</td></tr><tr><td>19</td><td>D101</td><td>71.9°C</td><td>96.6°C</td></tr><tr><td>20</td><td>U201</td><td>63.5°C</td><td>88.0°C</td></tr></table> |                                                                    |                       | NO | Position | ROOM AMBIENT | HIGH AMBIENT | 1 | BD1 | 65.7°C | 89.0°C | 2 | C14 | 62.6°C | 86.3°C | 3 | LF2 | 61.6°C | 84.8°C | 4 | Q1 | 64.7°C | 88.6°C | 5 | D3 | 63.9°C | 87.7°C | 6 | L2 | 62.2°C | 85.9°C | 7 | L1 | 63.5°C | 88.6°C | 8 | D2 | 63.9°C | 87.7°C | 9 | TSW1 | 62.2°C | 85.9°C | 10 | Q4 | 63.6°C | 87.4°C | 11 | C5 | 61.6°C | 84.9°C | 12 | C35 | 63.9°C | 86.9°C | 13 | C37 | 63.9°C | 86.9°C | 14 | D102 | 63.9°C | 87.5°C | 15 | T1 | 81.1°C | 101.8°C | 16 | C201 | 61.3°C | 85.2°C | 17 | C102 | 60.2°C | 83.9°C | 18 | U1 | 61.3°C | 84.9°C | 19 | D101 | 71.9°C | 96.6°C | 20 | U201 | 63.5°C | 88.0°C |
| NO | Position                                                          | ROOM AMBIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | HIGH AMBIENT                                                       |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 1  | BD1                                                               | 65.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 89.0°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 2  | C14                                                               | 62.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 86.3°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 3  | LF2                                                               | 61.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 84.8°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 4  | Q1                                                                | 64.7°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 88.6°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 5  | D3                                                                | 63.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 87.7°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 6  | L2                                                                | 62.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 85.9°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 7  | L1                                                                | 63.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 88.6°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 8  | D2                                                                | 63.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 87.7°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 9  | TSW1                                                              | 62.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 85.9°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 10 | Q4                                                                | 63.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 87.4°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 11 | C5                                                                | 61.6°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 84.9°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 12 | C35                                                               | 63.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 86.9°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 13 | C37                                                               | 63.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 86.9°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 14 | D102                                                              | 63.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 87.5°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 15 | T1                                                                | 81.1°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 101.8°C                                                            |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 16 | C201                                                              | 61.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 85.2°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 17 | C102                                                              | 60.2°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 83.9°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 18 | U1                                                                | 61.3°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 84.9°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 19 | D101                                                              | 71.9°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 96.6°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 20 | U201                                                              | 63.5°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 88.0°C                                                             |                       |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 2  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | I/P : 305VAC/110VAC<br>O/P : 100 % LOAD<br>Ta= -40°C               | TEST : OK             |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 3  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 60 °C<br>NO DAMAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | I/P : 305 VAC<br>O/P : FULL LOAD<br>Ta= 60 °C<br>HUMIDITY= 95 %R.H | TEST : OK             |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 4  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.03 %/°C (0~60°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | I/P : 230 VAC<br>O/P : FULL LOAD                                   | ± 0.011 %/°C (0~60°C) |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |
| 5  | STORAGE TEMPERATURE TEST                                          | 1. Thermal shock Temperature : -45°C~ +90°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 5 CYCLE<br>5. Input/Output condition : STATIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                    | OK                    |    |          |              |              |   |     |        |        |   |     |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |        |    |    |        |        |    |    |        |        |    |     |        |        |    |     |        |        |    |      |        |        |    |    |        |         |    |      |        |        |    |      |        |        |    |    |        |        |    |      |        |        |    |      |        |        |

|    |                          |                                                                                                                                                                                                                                                                                 |                                                 |
|----|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 6  | THERMAL SHOCK TEST       | 1. Thermal shock Temperature : -45°C~+65°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST<br>turn on 58sec ; turn off 2sec | OK                                              |
| 7  | VIBRATION TEST           | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(3) Sweep Time : 12min/sweep cycle<br>(4) Acceleration : 5G<br>(5) Test Time : 72min in each axis (X.Y.Z)<br>(6) Ta : 25°C                                                                          | TEST : OK                                       |
| 8  | CAPACITOR LIFE CYCLE     | HLG-240H-C700:SUPPOSE C102 IS THE MOST CRITICAL COMPONENT<br>(1 I/P : 230VAC O/P : FULL LOAD Tc=75°C LIFE TIME<br>(2 I/P : 230VAC O/P : 75% LOAD Tc=75°C LIFE TIME<br>(3 I/P : 230VAC O/P : 50% LOAD Tc=75°C LIFE TIME                                                          | (1) 85205 HRS<br>(2) 86966 HRS<br>(3) 91020 HRS |
| 9  | MTBF                     | Conducted by Parts Stress Analysis Prediction<br>180K hrs min. MIL-HDBK-217F (25°C)                                                                                                                                                                                             |                                                 |
| 10 | Ongoing Reliability Test | I/P : 230VAC O/P : FULL LOAD TA=50°C<br>Demonstration Mean Time Between Failure : 62,000 hours                                                                                                                                                                                  |                                                 |

| TEST RESULT | TESTER     | REVIEW     | APPROVAL      |
|-------------|------------|------------|---------------|
| PASS        | DANIEL GAO | SANFORD SU | VINCENT TSENG |

12.10.30 A50-F031