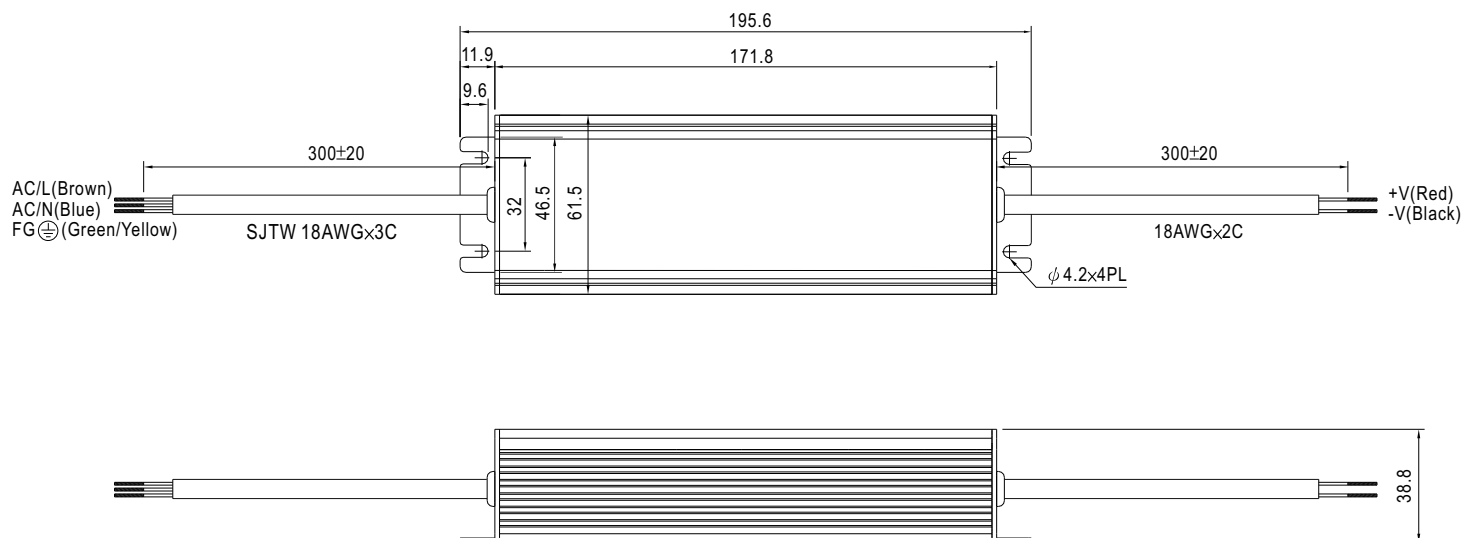


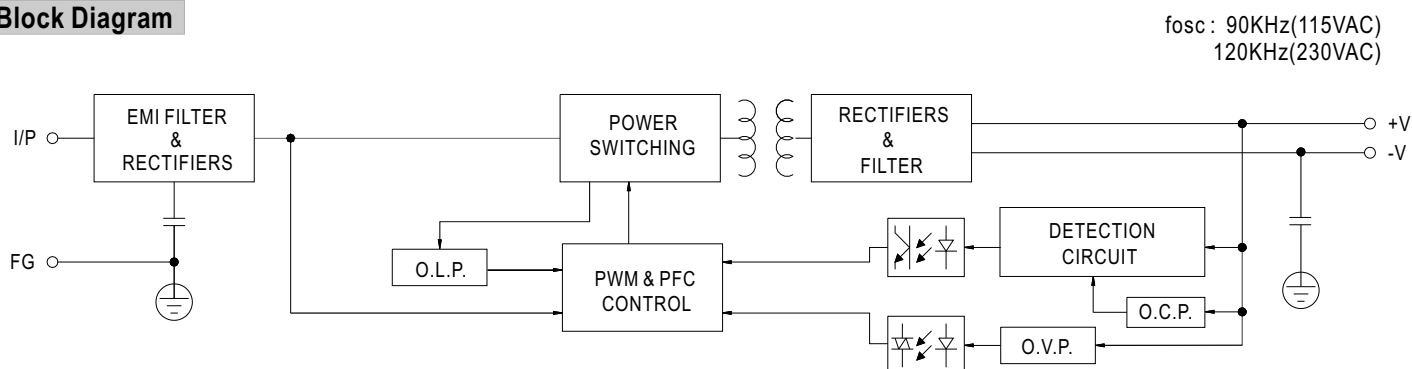


## Mechanical Specification

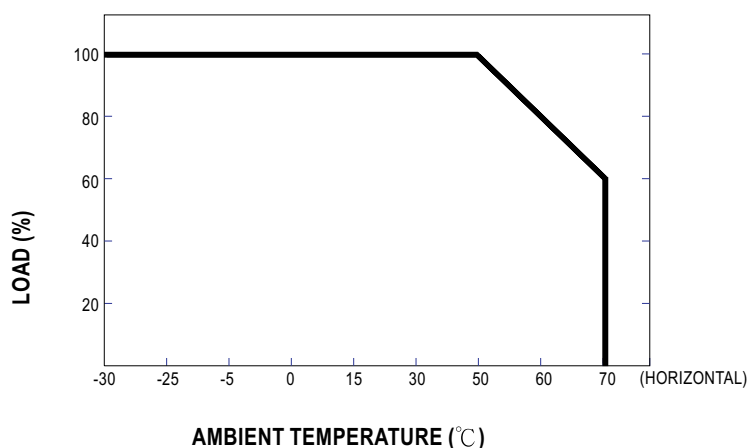
Case No. 957A Unit:mm



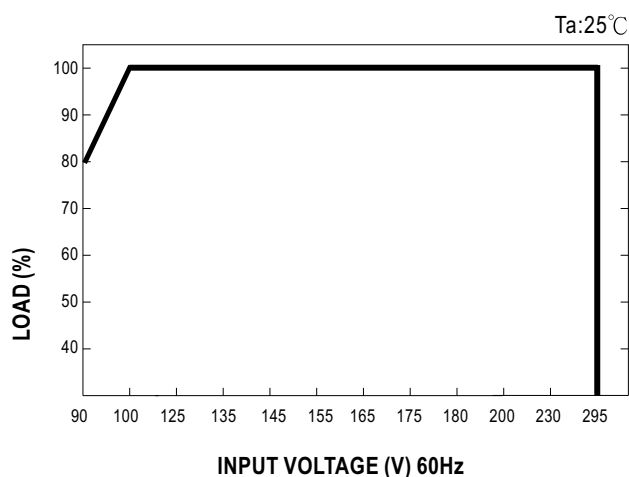
## Block Diagram



## Derating Curve



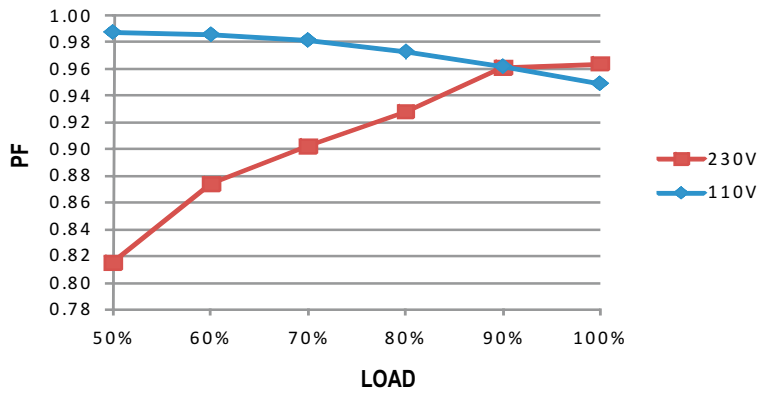
## Static Characteristics



## Power Factor Characteristic

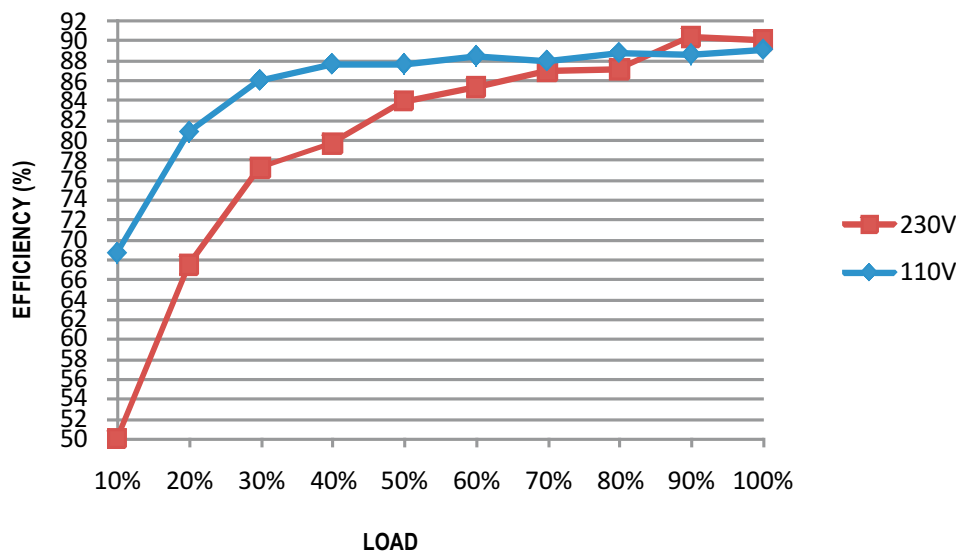
Power factor will be higher than 0.9 when output loading is 75% or higher.

### Constant Current Mode



## EFFICIENCY vs LOAD (48V Model)

CLG-60 series possess superior working efficiency that up to 89% can be reached in field applications.

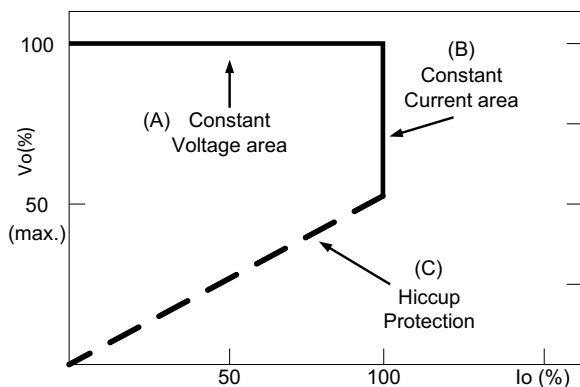


## DRIVING METHODS OF LED MODULE

There are two major kinds of LED drive method "direct drive" and "with LED driver".

A typical LED power supply may either work in "constant voltage mode (CV) or constant current mode (CC)" to drive the LEDs.

Mean Well's LED power supply with CV+ CC characteristic can be operated at both CV mode [with LED driver, at area (A)] and CC mode [direct drive, at area (B)].



Typical LED power supply I-V curve

MODEL : CLG-60-48

## OUTPUT FUNCTION TEST

| NO | TEST ITEM                      | SPECIFICATION                                     | TEST CONDITION                                                          | RESULT                                               | VERDICT |
|----|--------------------------------|---------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------|---------|
| 1  | RIPPLE & NOISE                 | V1 : 4.6 Vp-p (Max)                               | I/P : 230VAC<br>O/P : 100% LOAD<br>Ta : 25°C                            | V1 : 3 Vp-p (Max)                                    | P       |
| 2  | OUTPUT VOLTAGE<br>ADJUST RANGE | CH1 : 43.6 V~ 51.8V                               | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25°C           | 42.37V~ 53.13 V/ 230 VAC<br>42.37V~ 53.13 V/ 115 VAC | P       |
| 3  | OUTPUT CURRENT<br>ADJUST RANGE | CH1 : 1.339 A~0.975 A                             | I/P : 230 VAC<br>I/P : 115 VAC<br>Ta : 25°C                             | 0.94 A~ 1.83 A/ 230 VAC<br>0.87 A~ 1.58 A/ 115 VAC   | P       |
| 4  | OUTPUT VOLTAGE<br>TOLERANCE    | V1 : 10 %~ -10 % (Max)                            | I/P : 100 VAC / 295 VAC<br>O/P : 100% LOAD / MIN LOAD<br>Ta : 25°C      | V1 : 1.5 %~ -1.5 %                                   | P       |
| 5  | LINE REGULATION                | V1 : 3 %~ -3 % (Max)                              | I/P : 100VAC ~ 295 VAC<br>O/P : 100% LOAD<br>Ta : 25°C                  | V1 : 0.9 %~ -0.9 %                                   | P       |
| 6  | LOAD REGULATION                | V1 : 5%~ -5 % (Max)                               | I/P : 230 VAC<br>O/P : 100% LOAD ~MIN LOAD<br>Ta : 25°C                 | V1 : 0.3 %~ -0.3 %                                   | P       |
| 7  | SET UP TIME                    | 230VAC : 3000 ms (Max)<br>115 VAC : 5000 ms (Max) | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : 100% LOAD<br>Ta : 25°C          | 230VAC/ 1117 ms<br>115VAC/ 2234 ms                   | P       |
| 8  | OVER/UNDERSHOOT<br>TEST        | < ±10%                                            | I/P : 230 VAC<br>O/P : 100% LOAD<br>Ta : 25°C                           | TEST : <10 %                                         | P       |
| 9  | DYNAMIC LOAD                   | V1 : 9600 mVp-p                                   | I/P : 230 VAC<br>O/P : 100% LOAD /Min LOAD<br>90%DUTY/1KHZ<br>Ta : 25°C | 2752 mVp-p                                           | P       |

## INPUT FUNCTION TEST

| NO | TEST ITEM             | SPECIFICATION                                                         | TEST CONDITION                                                                                                                                    | RESULT                                                                | VERDICT |
|----|-----------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------|
| 1  | INPUT VOLTAGE RANGE   | 90VAC~295 VAC                                                         | I/P : TESTING<br>O/P : 100% LOAD<br>Ta : 25°C                                                                                                     | 80 V~295V                                                             | P       |
|    |                       |                                                                       | I/P :<br>LOW-LINE-3V= 87V<br>HIGH-LINE+15%=300 V<br>O/P : 100% LOAD /MIN LOAD<br>ON : 30 Sec. OFF : 30 Sec 10MIN<br>( AC POWER ON/OFF NO DAMAGE ) | TEST : OK                                                             |         |
| 2  | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE OSC                                          | I/P : 90 VAC ~ 295 VAC<br>O/P : 100% LOAD ~MIN LOAD<br>Ta : 25°C                                                                                  | TEST : OK                                                             | P       |
| 3  | POWER FACTOR          | 0.90 / 230 VAC(TYP)<br>0.90 / 115 VAC(TYP)<br>≥ 0.9 at 75 ~ 100% load | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : 100% LOAD<br>Ta : 25°C                                                                                    | PF= 0.904 / 230 VAC<br>PF= 0.989 / 115 VAC<br>≥ 0.9 at 75 ~ 100% load | P       |
| 4  | EFFICIENCY            | 87% (TYP)                                                             | I/P : 230 VAC<br>O/P : 100% LOAD<br>Ta : 25°C                                                                                                     | 88.5%                                                                 | P       |
| 5  | INPUT CURRENT         | 230V/ 0.4 A (TYP)<br>115V/ 0.8 A (TYP)                                | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : 100% LOAD<br>Ta : 25°C                                                                                    | I = 0.35 A/ 230 VAC<br>I = 0.62 A/ 115 VAC                            | P       |
| 6  | INRUSH CURRENT        | 230V/ 40 A (TYP)<br><br>COLD START                                    | I/P : 230 VAC<br>O/P : 100% LOAD<br>Ta : 25°C                                                                                                     | I = 28 A/ 230 VAC                                                     | P       |
| 7  | LEAKAGE CURRENT       | < 0.75 mA / 240 VAC                                                   | I/P : 264 VAC<br>O/P : Min LOAD<br>Ta : 25°C                                                                                                      | L-FG : 0.28 mA<br>N-FG : 0.28 mA                                      | P       |

## PROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                                  | TEST CONDITION                                                | RESULT                                                       | VERDICT |
|----|-----------------------------|------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|---------|
| 1  | OVER LOAD PROTECTION        | 110 % (MAX)                                    | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : TESTING<br>Ta : 25°C  | 105 %/ 230 VAC<br>105%/ 115 VAC<br>Constant Current Limiting | P       |
| 2  | OVER VOLTAGE PROTECTION     | CH1 : 54V~ 60V                                 | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25°C | 59 V/ 230 VAC<br>59 V/ 115 VAC<br>Shunt down Re- power ON    | P       |
| 3  | OVER TEMPERATURE PROTECTION | SPEC :<br>TSW1 : 85 ± 10°C O.T.P.<br>NO DAMAGE | I/P : 230 VAC<br>O/P : 100% LOAD                              | O.T.P. Active<br>Shunt down Re-power ON                      | P       |
| 4  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE         | I/P : 264 VAC<br>O/P : 100% LOAD<br>Ta : 25°C                 | NO DAMAGE<br>Hiccup Mode                                     | P       |

## ENVIRONMENT TEST

| NO | TEST ITEM                                                         | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TEST CONDITION                                                    | RESULT                      | VERDICT |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
|----|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------|---------|----------|-----|-----------------------------|-----------------------------|---|-----|---------------------|--------|--------|---|----|--------------------|--------|--------|---|-----|--------|--------|--------|---|----|--------|--------|--------|---|----|--------------|--------|--------|---|----|-------------------|--------|--------|---|-----|-----------------------|--------|--------|---|---------|------------|--------|--------|---|------|--------|--------|--------|----|------|------------------------|--------|--------|----|------|-------|--------|--------|----|----|-------------------|--------|--------|----|-------|--------|--------|--------|----|----|-----------------|--------|--------|----|------|---------|------|--------|---|
| 1  | TEMPERATURE RISE TEST                                             | <div>MODEL : CLG-60-24</div> <div>1. ROOM AMBIENT BURN-IN : 2 HRS</div> <div>I/P : 230VAC O/P : 100% LOAD Ta= 32.1 °C</div> <div>2. HIGH AMBIENT BURN-IN : 3 HRS</div> <div>I/P : 230VAC O/P : 100% LOAD Ta= 50.5 °C</div> <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT<br/>Ta= 32.1 °C</th><th>HIGH AMBIENT<br/>Ta= 50.5 °C</th></tr><tr><td>1</td><td>BD1</td><td>US4KB80 4A/800V SHI</td><td>56.1°C</td><td>70.3°C</td></tr><tr><td>2</td><td>Q1</td><td>K2843 10A/600V TOS</td><td>62.8°C</td><td>76.9°C</td></tr><tr><td>3</td><td>LF2</td><td>TR-689</td><td>58.3°C</td><td>71.8°C</td></tr><tr><td>4</td><td>L1</td><td>TR-623</td><td>55.7°C</td><td>69.7°C</td></tr><tr><td>5</td><td>R5</td><td>100K/2W R/MO</td><td>60.7°C</td><td>74.4°C</td></tr><tr><td>6</td><td>D2</td><td>1N5406 3A/600V LT</td><td>63.4°C</td><td>77.1°C</td></tr><tr><td>7</td><td>C46</td><td>100U/50V NCC 105°C KY</td><td>56.1°C</td><td>69.8°C</td></tr><tr><td>8</td><td>T1 COIL</td><td>TF-1547 LS</td><td>63.6°C</td><td>76.5°C</td></tr><tr><td>9</td><td>D100</td><td>BYV32E</td><td>64.3°C</td><td>77.8°C</td></tr><tr><td>10</td><td>C106</td><td>1000U/35V NCC 105°C KY</td><td>60.1°C</td><td>73.7°C</td></tr><tr><td>11</td><td>TSW1</td><td>ST-85</td><td>54.4°C</td><td>68.5°C</td></tr><tr><td>12</td><td>U1</td><td>TDA4863G INFINEON</td><td>57.0°C</td><td>70.8°C</td></tr><tr><td>13</td><td>LF100</td><td>TR-706</td><td>56.5°C</td><td>70.4°C</td></tr><tr><td>14</td><td>C7</td><td>474/450V NISSEI</td><td>55.5°C</td><td>69.6°C</td></tr><tr><td>15</td><td>CASE</td><td>UP CASE</td><td>50°C</td><td>66.4°C</td></tr></table> |                                                                   |                             | NO      | Position | P/N | ROOM AMBIENT<br>Ta= 32.1 °C | HIGH AMBIENT<br>Ta= 50.5 °C | 1 | BD1 | US4KB80 4A/800V SHI | 56.1°C | 70.3°C | 2 | Q1 | K2843 10A/600V TOS | 62.8°C | 76.9°C | 3 | LF2 | TR-689 | 58.3°C | 71.8°C | 4 | L1 | TR-623 | 55.7°C | 69.7°C | 5 | R5 | 100K/2W R/MO | 60.7°C | 74.4°C | 6 | D2 | 1N5406 3A/600V LT | 63.4°C | 77.1°C | 7 | C46 | 100U/50V NCC 105°C KY | 56.1°C | 69.8°C | 8 | T1 COIL | TF-1547 LS | 63.6°C | 76.5°C | 9 | D100 | BYV32E | 64.3°C | 77.8°C | 10 | C106 | 1000U/35V NCC 105°C KY | 60.1°C | 73.7°C | 11 | TSW1 | ST-85 | 54.4°C | 68.5°C | 12 | U1 | TDA4863G INFINEON | 57.0°C | 70.8°C | 13 | LF100 | TR-706 | 56.5°C | 70.4°C | 14 | C7 | 474/450V NISSEI | 55.5°C | 69.6°C | 15 | CASE | UP CASE | 50°C | 66.4°C | P |
| NO | Position                                                          | P/N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ROOM AMBIENT<br>Ta= 32.1 °C                                       | HIGH AMBIENT<br>Ta= 50.5 °C |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 1  | BD1                                                               | US4KB80 4A/800V SHI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 56.1°C                                                            | 70.3°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 2  | Q1                                                                | K2843 10A/600V TOS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 62.8°C                                                            | 76.9°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 3  | LF2                                                               | TR-689                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 58.3°C                                                            | 71.8°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 4  | L1                                                                | TR-623                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 55.7°C                                                            | 69.7°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 5  | R5                                                                | 100K/2W R/MO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 60.7°C                                                            | 74.4°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 6  | D2                                                                | 1N5406 3A/600V LT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 63.4°C                                                            | 77.1°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 7  | C46                                                               | 100U/50V NCC 105°C KY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 56.1°C                                                            | 69.8°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 8  | T1 COIL                                                           | TF-1547 LS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 63.6°C                                                            | 76.5°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 9  | D100                                                              | BYV32E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 64.3°C                                                            | 77.8°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 10 | C106                                                              | 1000U/35V NCC 105°C KY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 60.1°C                                                            | 73.7°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 11 | TSW1                                                              | ST-85                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 54.4°C                                                            | 68.5°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 12 | U1                                                                | TDA4863G INFINEON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 57.0°C                                                            | 70.8°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 13 | LF100                                                             | TR-706                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 56.5°C                                                            | 70.4°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 14 | C7                                                                | 474/450V NISSEI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 55.5°C                                                            | 69.6°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 15 | CASE                                                              | UP CASE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 50°C                                                              | 66.4°C                      |         |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 2  | OVER LOAD BURN-IN TEST                                            | NO DAMAGE<br>1 HOUR ( MIN )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | I/P : 230 VAC<br>O/P : 107 % LOAD<br>Ta : 25°C                    | TEST : OK                   | P       |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 3  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | I/P : 230 VAC<br>O/P : 100 % LOAD<br>Ta= -30 °C                   | TEST : OK                   | P       |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 4  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 50°C<br>NO DAMAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | I/P : 295 VAC<br>O/P : 100% LOAD<br>Ta= 50°C<br>HUMIDITY= 95 %R.H | TEST : OK                   | P       |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 5  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.03 %(0~50°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | I/P : 230 VAC<br>O/P : 100% LOAD                                  | ± 0.01 %(0~50°C)            | P       |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |
| 6  | VIBRATION TEST                                                    | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(3) Time : 72min<br>(4) Acceleration : 5G<br>(5) Test Time : 1 hour in each axis (X.Y.Z)<br>(6) Ta : 25°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   | TEST : OK                   | P       |          |     |                             |                             |   |     |                     |        |        |   |    |                    |        |        |   |     |        |        |        |   |    |        |        |        |   |    |              |        |        |   |    |                   |        |        |   |     |                       |        |        |   |         |            |        |        |   |      |        |        |        |    |      |                        |        |        |    |      |       |        |        |    |    |                   |        |        |    |       |        |        |        |    |    |                 |        |        |    |      |         |      |        |   |

## SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION                                                            | TEST CONDITION                                                                      | RESULT                                                                   | VERDICT |
|----|----------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P : 3.75 KVAC/min<br>I/P-FG : 1.88KVAC/min<br>O/P-FG : 0.5KVAC/min | I/P-O/P : 4.2KVAC/min<br>I/P-FG : 2.25KVAC/min<br>O/P-FG : 0.6KVAC/min<br>Ta : 25°C | I/P-O/P : 0.348 mA<br>I/P-FG : 4.16 mA<br>O/P-FG : 2.088 mA<br>NO DAMAGE | P       |
| 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>Ta : 25°C                                                      | I/P-O/P : 30 GΩ<br>I/P-FG : 30 GΩ<br>O/P-FG : 30 GΩ<br>NO DAMAGE         | P       |
| 3  | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 mΩ                                   | 40 A / 2min<br>Ta : 25°C                                                            | 17 mΩ                                                                    | P       |
| 4  | APPROVAL             | TUV : Certificate NO : R50102381<br>UL : File NO : E307078               |                                                                                     |                                                                          | P       |

## E.M.C TEST

| NO | TEST ITEM                                   | SPECIFICATION                                               | TEST CONDITION                                                 | RESULT                        | VERDICT |
|----|---------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------|-------------------------------|---------|
| 1  | HARMONIC                                    | EN61000-3-2<br>CLASS C                                      | I/P : 230 VAC/50HZ<br>O/P : 100% LOAD/70%LOAD<br>Ta : 25°C     | PASS                          | P       |
| 2  | CONDUCTION                                  | EN55022<br>CLASS B                                          | I/P : 230 VAC (50HZ)<br>O/P : 100% LOAD /50% LOAD<br>Ta : 25°C | PASS<br>Test by certified Lab | P       |
| 3  | RADIATION                                   | EN55022<br>CLASS B                                          | I/P : 230 VAC (50HZ)<br>O/P : 100% LOAD<br>Ta : 25°C           | PASS<br>Test by certified Lab | P       |
| 4  | E.S.D                                       | EN61000-4-2<br>LIGHT INDUSTRY<br>AIR : 8KV / Contact : 4KV  | I/P : 230 VAC/50HZ<br>O/P : 100% LOAD<br>Ta : 25°C             | CRITERIA A                    | P       |
| 5  | E.F.T                                       | EN61000-4-4<br>LIGHT INDUSTRY<br>INPUT : 1KV                | I/P : 230 VAC/50HZ<br>O/P : 100% LOAD<br>Ta : 25°C             | CRITERIA A                    | P       |
| 6  | SURGE                                       | IEC61000-4-5<br>LIGHT INDUSTRY<br>L-N : 2KV<br>L,N-PE : 4KV | I/P : 230 VAC/50HZ<br>O/P : 100% LOAD<br>Ta : 25°C             | CRITERIA A                    | P       |
| 7  | Test by certified Lab & Test Report Prepare |                                                             |                                                                |                               |         |

## M.T.B.F & LIFE CYCLE CALCULATION

| NO | TEST ITEM                      | SPECIFICATION                                                                                                                                                                           | TEST CONDITION | RESULT | VERDICT |
|----|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------|---------|
| 1  | CAPACITOR<br>LIFE CYCLE        | CLG-60-24 : SUPPOSE C105 IS THE MOST CRITICAL COMPONENT<br>I/P : 230VAC O/P : 100% LOAD Ta= 25 °C LIFE TIME= 449574 HRS<br>I/P : 230VAC O/P : 100% LOAD Ta= 50 °C LIFE TIME= 116307 HRS |                |        | P       |
| 2  | MTBF                           | MIL-HDBK-217F NOTICES2 PARTS COUNT<br>TOTAL FAILURE RATE : 495.7K HRS                                                                                                                   |                |        | P       |
| 3  | ORT (Ongoing Reliability test) | I/P : 230VAC O/P : 95% LOAD TA=50°C Sample=10pcs TEST TIME=624HRS                                                                                                                       |                |        | P       |

## COMPONENT STRESS TEST

| NO | TEST ITEM                                             | SPECIFICATION                     | TEST CONDITION                                                                                                                         | RESULT                                    | VERDICT |
|----|-------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------|
| 1  | Power Transistor<br>(D to S) or (C to E) Peak Voltage | Q1 Rated<br>2SK2843 : 600V 10 A   | I/P : High-Line +3V = 298 V<br>O/P : (1) 100% LOAD Turn on<br>(2) Output Short<br>Ta : 25°C                                            | (1) 530 V<br>(2) 442 V                    | P       |
| 2  | Diode Peak Voltage                                    | D100 Rated<br>FCF10A40 : 400V 10A | I/P : High-Line +3V = 298 V<br>O/P : (1) 100% LOAD Turn on<br>(2) Output Short<br>Ta : 25°C                                            | (1) 290 V<br>(2) 243 V                    | P       |
| 3  | Clamp Diode Peak Voltage                              | D2 Rated<br>IN5406 : 600V 3A      | I/P : High-Line +3V = 298 V<br>O/P : (1) Dynamic Load<br>90%Duty/1KHz<br>Ta : 25°C                                                     | (1) 502 V                                 | P       |
| 4  | Control IC Voltage Test                               | U1 Rated<br>TDA4863G : 22V        | I/P : High-Line +3V = 298 V<br>O/P : (1) 100% LOAD Turn on /Off<br>(2) Min load Turn on /Off<br>(3) 100% /Min load Change<br>Ta : 25°C | (1) 15.29 V<br>(2) 13.65 V<br>(3) 15.29 V | P       |

| DATE      | SAMPLE                     | TEST RESULT | TESTER        | APPROVAL |
|-----------|----------------------------|-------------|---------------|----------|
| 2006/10/5 | RD SAMPLE                  | PASS        | VINCENT TSENG | MAX LIN  |
| 2007/1/9  | PRODUCT SAMPLE<br>W0611B31 | PASS        | VINCENT TSENG | MAX LIN  |

2003/12/12 A50-F023