



# Test Report: PCD-16-1400B

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16W Single Output AC Dimmable 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

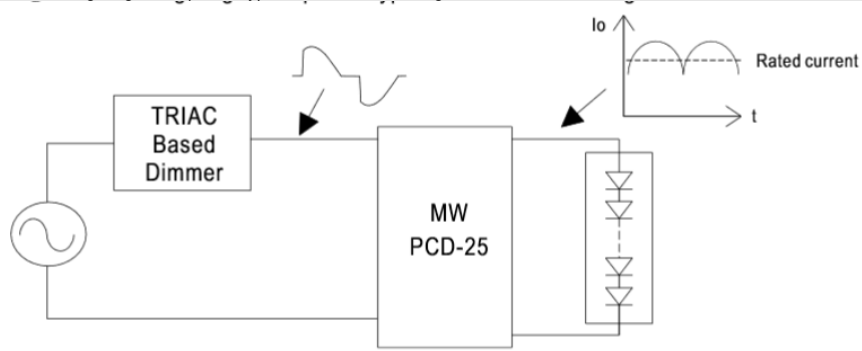
| NO | TEST ITEM               | SPECIFICATION          | TEST CONDITION                                | RESULT                                  | VERDICT |
|----|-------------------------|------------------------|-----------------------------------------------|-----------------------------------------|---------|
| 1  | RIPPLE & NOISE          | V1 : 2 Vp-p (Max )     | I/P : 230VAC<br>O/P : FULL LOAD<br>Ta : 25°C  | V1 : 872 mVp-p (Max )                   | P       |
| 2  | SET UP TIME             | 230VAC : 1000 ms (Max) | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | 230VAC/ 651 ms                          | P       |
| 3  | OPERATING VOLTAGE RANGE | 8V~12V                 | I/P : 230VAC<br>O/P : CV MODE<br>Ta : 25°C    | O/P= 8V : 1.401 A<br>O/P= 11V : 1.401 A | P       |
| 4  | OVER/UNDERSHOOT TEST    | < 16V                  | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | TEST : < 16 V                           | P       |

### INPUT FUNCTION TEST

| NO | TEST ITEM             | SPECIFICATION                                                  | TEST CONDITION                                                                                                                                                                                      | RESULT                                                          | VERDICT |
|----|-----------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------|
| 1  | INPUT VOLTAGE RANGE   | 180VAC~295 VAC                                                 | I/P : TESTING<br>O/P : FULL LOAD<br>Ta : 25°C<br><br>I/P :<br>LOW-LINE-3V= 177 V<br>HIGH-LINE+15%=300 V<br>O/P : FULL/MIN LOAD<br>ON : 30 Sec . OFF : 30 Sec 10MIN<br>( AC POWER ON/OFF NO DAMAGE ) | 159 V~295V<br><br>TEST : OK                                     | P       |
| 2  | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE OSC                                   | I/P : 180 VAC ~ 295 VAC<br>O/P : FULL~MIN LOAD<br>Ta : 25°C                                                                                                                                         | TEST : OK                                                       | P       |
| 3  | POWER FACTOR          | 0.9 / 230 VAC(TYP)<br>0.9 / 180 VAC(TYP)<br>0.9 / 277 VAC(TYP) | I/P : 230 VAC (FULL LOAD)<br>I/P : 180 VAC (FULL LOAD)<br>I/P : 277 VAC (FULL LOAD)<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                 | PF= 0.965 / 230 VAC<br>PF= 0.985 / 180 VAC<br>PF= 0.91 / 277VAC | P       |
| 4  | EFFICIENCY            | 80 % (TYP)                                                     | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                                                                       | 80.22 %                                                         | P       |
| 5  | INPUT CURRENT         | 230V/ 0.2 A (TYP)<br>180V/ 0.4 A (TYP)                         | I/P : 230 VAC<br>I/P : 180 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                                                      | I = 0.08 A/ 230 VAC<br>I = 0.11 A/ 180 VAC                      | P       |
| 6  | INRUSH CURRENT        | 230V/ 10 A (TYP)<br>COLD START                                 | I/P : 230 VAC<br><br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                                                                   | I = 5 A/ 230 VAC                                                | P       |
| 7  | LEAKAGE CURRENT       | < 0.5 mA / 240 VAC                                             | I/P : 240 VAC<br>O/P : Min LOAD<br>Ta : 25°C                                                                                                                                                        | L-CASE : 0.01 mA<br>N-CASE : 0.01 mA                            | P       |

## 8 AC Dimming Operation

The following diagram depicts a typical installation utilizing the PCD-25:



Under direct driving, the power supply will work in "constant current mode (CC)" and output voltage of the power supply will be clamped by sum of forward voltage (V) of the LED strip.

Test condition:

I/P : A type:120VAC B type:220VAC~277VAC

O/P : Testing

Ta : 25°C

Dimmer Compatibility Chart:

| Manufacturer            | Dimmer Model                |                     |
|-------------------------|-----------------------------|---------------------|
| LUTRON                  | SKYLARK SF-12P-277          | (277VAC / 60Hz)     |
| LUTRON                  | DVF-103P-277                | (277VAC / 60Hz)     |
| LUTRON                  | SKYLARK SF-10P              | (120VAC / 60Hz)     |
| LUTRON                  | SKYLARK S-600P              | (120VAC / 60Hz)     |
| LUTRON                  | SKYLARK DVF-103P            | (120VAC / 60Hz)     |
| LEVITON                 | ILLUMATECH TM Cat.No.IP106  | (120VAC / 60Hz)     |
| LEVITON                 | SURESLIDE TM Cat.No.6633-P  | (120VAC / 60Hz)     |
| LEVITON                 | SURESLIDE TM Cat. NO.6615-P | (120VAC / 60Hz)     |
| JUNG                    | Licht-Management 225 TDE    | (230VAC / 50Hz)     |
| JUNG                    | Licht-Management 225 NV DE  | (230VAC / 50Hz)     |
| BERKER                  | Tronic-Drehdimmer 286710    | (230-240VAC / 50Hz) |
| Bodo Ehmann LICHTREGLER | T39.01                      | (230VAC / 50Hz)     |
| CLIPSAL                 | 32E450UDM                   | (220-240VAC / 50Hz) |
| CLIPSAL                 | NO 32E450TM                 | (220-240VAC / 50Hz) |

Test result:

Conduction angle: 30 degrees(min.) / 180 degrees(max.)

P

## PROTECTION FUNCTION TEST

| NO | TEST ITEM                   | SPECIFICATION                                                                                    | TEST CONDITION                                               | RESULT                                                                                                                       | VERDICT |
|----|-----------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------|
| 1  | OVER LOAD PROTECTION        | 95 % ~ 110 %                                                                                     | I/P : 230 VAC<br>I/P : 180 VAC<br>O/P : TESTING<br>Ta : 25°C | 100 %/ 230 VAC<br>100 %/ 180 VAC<br>Constant Current Limiting<br>recovers automatically after fault<br>condition is removed. | P       |
| 2  | OVER TEMPERATURE PROTECTION | SPEC :<br>RTH1 : $95 \pm 10^{\circ}\text{C}$ O.T.P.<br>Detect on heatsink of<br>power transistor | I/P : 230 VAC<br>O/P : FULL LOAD<br>TSW1,10KΩ OTP            | O.T.P. Active<br>Shut down o/p voltage , Re-power<br>ON to recover                                                           | P       |
| 3  | SHORT PROTECTION            | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE                                                           | I/P : 295 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                | NO DAMAGE                                                                                                                    | 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 | Q 1 Rated :<br>STD4NK80ZT4 3A/800V       | I/P : High-Line +3V = 298 V<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C                          | (1) 560 V<br>(2) 476 V<br>(3) 564 V          | P       |
| 2  | Diode Peak Voltage                                        | D100 Rated :<br>B5100C 5A/100V           | I/P : High-Line +3V = 298 V<br>O/P : (1)Full Load Turn on<br>(2)Output Short<br>(3)Full load continue<br>Ta : 25°C                           | (1) 74.8 V<br>(2) 57.2 V<br>(3) 72.8 V       | P       |
| 3  | Clamp Diode Peak Voltage                                  | D 6 Rated :<br>1A/1KV 1N4007GP           | I/P : High-Line +3V = 298 V<br>O/P : (1)Full Load Turn on<br>(2)Output Short<br>(3)Full load continue<br>Ta : 25°C                           | (1) 582 V<br>(2) 500 V<br>(3) 592 V          | P       |
| 4  | Control IC Voltage Test                                   | U 1 Rated :<br>PWM NCP1608B<br>10.2V~20V | I/P : High-Line +3V = 298 V<br>O/P : (1)Full Load Turn on /Off<br>(2) Min load Turn on /Off<br>(3)Full Load /Min load<br>Change<br>Ta : 25°C | (1) 13.767 V<br>(2) 11.912 V<br>(3) 11.912 V | P       |

## SAFETY & E.M.C. TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION                            | TEST CONDITION                        | RESULT                          | VERDICT |
|----|----------------------|------------------------------------------|---------------------------------------|---------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P : 3.75 KVAC/min                  | I/P-O/P : 4 KVAC/min<br>Ta : 25°C     | I/P-O/P : 1.148 mA<br>NO DAMAGE | P       |
| 2  | ISOLATION RESISTANCE | I/P-O/P : 500VDC>100MΩ                   | I/P-O/P : 500 VDC<br>Ta : 25°C /70%RH | I/P-O/P : 30 GΩ<br>NO DAMAGE    | P       |
| 3  | APPROVAL             | TUV : Certificate NO :<br>UL : File NO : |                                       |                                 | N/A     |

### E.M.C TEST

| NO | TEST ITEM                                   | SPECIFICATION                                              | TEST CONDITION                                                                      | RESULT                        | VERDICT |
|----|---------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------|---------|
| 1  | HARMONIC                                    | EN61000-3-2<br>CLASS C                                     | I/P:230 /240//220VAC/50HZ<br>LOAD:LED/ELECTRONIC LOAD<br>O/P:40V/58VLOAD<br>Ta:25°C | PASS                          | P       |
| 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 | P       |
| 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 | P       |
| 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                    | P       |
| 5  | E.F.T                                       | EN61000-4-4<br>LIGHT INDUSTRY<br>INPUT : 1KV               | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C                                  | CRITERIA A                    | P       |
| 6  | SURGE                                       | IEC61000-4-5<br>LIGHT INDUSTRY<br>L-N : 1KV                | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C                                  | CRITERIA A                    | P       |
| 7  | Test by certified Lab & Test Report Prepare |                                                            |                                                                                     |                               |         |

## RELIABILITY TEST

### ENVIRONMENT TEST

| NO | TEST ITEM                                                         | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | TEST CONDITION                                                    | RESULT                   | VERDICT |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
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| 1  | TEMPERATURE RISE TEST                                             | <div>MODEL : PCD-16-1400B</div> <div>1. ROOM AMBIENT BURN-IN : 1 HRS</div> <div>I/P : 230VAC O/P : FULL LOAD Ta=30.3℃</div> <div>2. HIGH AMBIENT BURN-IN : 3.5 HRS</div> <div>I/P : 230VAC O/P : FULL LOAD Ta=50℃</div> <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT<br/>Ta= 30.3 ℃</th><th>HIGH AMBIENT<br/>Ta= 50 ℃</th></tr><tr><td>6</td><td>LF1</td><td>LF804</td><td>61.3℃</td><td>75.4℃</td></tr><tr><td>7</td><td>L1</td><td>TF2170</td><td>62.2℃</td><td>76.1℃</td></tr><tr><td>8</td><td>BD1</td><td>2A/800V GLASS KBP208G</td><td>64.3℃</td><td>78.2℃</td></tr><tr><td>9</td><td>C9</td><td>333/630V 10% P=7.5 MEX</td><td>59.1℃</td><td>73.4℃</td></tr><tr><td>10</td><td>R1</td><td>3W 22KΩ 5% MINI</td><td>87.3℃</td><td>101.4℃</td></tr><tr><td>11</td><td>R5</td><td>3W 330Ω 5% MINI</td><td>64.5℃</td><td>78.4℃</td></tr><tr><td>12</td><td>C1</td><td>104/275VAC 20% P=10 R.46</td><td>69.1℃</td><td>82.6℃</td></tr><tr><td>13</td><td>D30</td><td>HER204 2A/300V</td><td>66.2℃</td><td>80.3℃</td></tr><tr><td>14</td><td>C48</td><td>22u/50V UL10Kh 5*11 YXM</td><td>66.1℃</td><td>80.1℃</td></tr><tr><td>15</td><td>TSW1</td><td>220KΩ 3Φ TTC3A224F4371EY 1%</td><td>62.2℃</td><td>77.0℃</td></tr><tr><td>16</td><td>T1</td><td>TF2146</td><td>73.1℃</td><td>87.0℃</td></tr><tr><td>17</td><td>U1</td><td>NCP1608B</td><td>65.2℃</td><td>79.3℃</td></tr><tr><td>18</td><td>Q1</td><td>STD4NK80ZT4 3A/800V DPAK</td><td>70.4℃</td><td>84.7℃</td></tr><tr><td>19</td><td>C7</td><td>333/450V 10% P=7.5 MEC</td><td>68.1℃</td><td>81.9℃</td></tr><tr><td>20</td><td>D100</td><td>B5100C 5A/100V SMC</td><td>77.0℃</td><td>90.7℃</td></tr><tr><td>21</td><td>C105</td><td>2200u/16V UL10Kh 12.5*20 ZLH</td><td>62.0℃</td><td>76.5℃</td></tr><tr><td>22</td><td>C54</td><td>33u/50V UL10Kh 6.3*11 YXM</td><td>63.0℃</td><td>77.1℃</td></tr><tr><td>23</td><td>LF100</td><td>TR574-R2</td><td>57.4℃</td><td>72.6℃</td></tr></table> |                                                                   |                          | NO      | Position | P/N | ROOM AMBIENT<br>Ta= 30.3 ℃ | HIGH AMBIENT<br>Ta= 50 ℃ | 6 | LF1 | LF804 | 61.3℃ | 75.4℃ | 7 | L1 | TF2170 | 62.2℃ | 76.1℃ | 8 | BD1 | 2A/800V GLASS KBP208G | 64.3℃ | 78.2℃ | 9 | C9 | 333/630V 10% P=7.5 MEX | 59.1℃ | 73.4℃ | 10 | R1 | 3W 22KΩ 5% MINI | 87.3℃ | 101.4℃ | 11 | R5 | 3W 330Ω 5% MINI | 64.5℃ | 78.4℃ | 12 | C1 | 104/275VAC 20% P=10 R.46 | 69.1℃ | 82.6℃ | 13 | D30 | HER204 2A/300V | 66.2℃ | 80.3℃ | 14 | C48 | 22u/50V UL10Kh 5*11 YXM | 66.1℃ | 80.1℃ | 15 | TSW1 | 220KΩ 3Φ TTC3A224F4371EY 1% | 62.2℃ | 77.0℃ | 16 | T1 | TF2146 | 73.1℃ | 87.0℃ | 17 | U1 | NCP1608B | 65.2℃ | 79.3℃ | 18 | Q1 | STD4NK80ZT4 3A/800V DPAK | 70.4℃ | 84.7℃ | 19 | C7 | 333/450V 10% P=7.5 MEC | 68.1℃ | 81.9℃ | 20 | D100 | B5100C 5A/100V SMC | 77.0℃ | 90.7℃ | 21 | C105 | 2200u/16V UL10Kh 12.5*20 ZLH | 62.0℃ | 76.5℃ | 22 | C54 | 33u/50V UL10Kh 6.3*11 YXM | 63.0℃ | 77.1℃ | 23 | LF100 | TR574-R2 | 57.4℃ | 72.6℃ | P |
| NO | Position                                                          | P/N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ROOM AMBIENT<br>Ta= 30.3 ℃                                        | HIGH AMBIENT<br>Ta= 50 ℃ |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 6  | LF1                                                               | LF804                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 61.3℃                                                             | 75.4℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 7  | L1                                                                | TF2170                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 62.2℃                                                             | 76.1℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 8  | BD1                                                               | 2A/800V GLASS KBP208G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 64.3℃                                                             | 78.2℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 9  | C9                                                                | 333/630V 10% P=7.5 MEX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 59.1℃                                                             | 73.4℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 10 | R1                                                                | 3W 22KΩ 5% MINI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 87.3℃                                                             | 101.4℃                   |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 11 | R5                                                                | 3W 330Ω 5% MINI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 64.5℃                                                             | 78.4℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 12 | C1                                                                | 104/275VAC 20% P=10 R.46                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 69.1℃                                                             | 82.6℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 13 | D30                                                               | HER204 2A/300V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 66.2℃                                                             | 80.3℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 14 | C48                                                               | 22u/50V UL10Kh 5*11 YXM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 66.1℃                                                             | 80.1℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 15 | TSW1                                                              | 220KΩ 3Φ TTC3A224F4371EY 1%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 62.2℃                                                             | 77.0℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 16 | T1                                                                | TF2146                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 73.1℃                                                             | 87.0℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 17 | U1                                                                | NCP1608B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 65.2℃                                                             | 79.3℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 18 | Q1                                                                | STD4NK80ZT4 3A/800V DPAK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 70.4℃                                                             | 84.7℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 19 | C7                                                                | 333/450V 10% P=7.5 MEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 68.1℃                                                             | 81.9℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 20 | D100                                                              | B5100C 5A/100V SMC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 77.0℃                                                             | 90.7℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 21 | C105                                                              | 2200u/16V UL10Kh 12.5*20 ZLH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 62.0℃                                                             | 76.5℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 22 | C54                                                               | 33u/50V UL10Kh 6.3*11 YXM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 63.0℃                                                             | 77.1℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 23 | LF100                                                             | TR574-R2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 57.4℃                                                             | 72.6℃                    |         |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 2  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | I/P : 230VAC/100VAC<br>O/P : 100 % LOAD<br>Ta= -30 ℃              | TEST : OK                | P       |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 3  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 50 ℃<br>NO DAMAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | I/P : 295 VAC<br>O/P : FULL LOAD<br>Ta= 50 ℃<br>HUMIDITY= 95 %R.H | TEST : OK                | P       |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 4  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.03 %(0~50℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | I/P : 230 VAC<br>O/P : FULL LOAD                                  | ± 0.005 %(0~50℃)         | P       |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 5  | STORAGE TEMPERATURE TEST                                          | 1. Thermal shock Temperature : -45℃~ +90℃<br>2. Temperature change rate : 25℃ / 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                       | P       |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |
| 6  | THERMAL SHOCK TEST                                                | 1. Thermal shock Temperature : -30℃~ +50℃<br>2. Temperature change rate : 25℃ / 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                       | P       |          |     |                            |                          |   |     |       |       |       |   |    |        |       |       |   |     |                       |       |       |   |    |                        |       |       |    |    |                 |       |        |    |    |                 |       |       |    |    |                          |       |       |    |     |                |       |       |    |     |                         |       |       |    |      |                             |       |       |    |    |        |       |       |    |    |          |       |       |    |    |                          |       |       |    |    |                        |       |       |    |      |                    |       |       |    |      |                              |       |       |    |     |                           |       |       |    |       |          |       |       |   |

|    |                             |                                                                                                                                                                                                       |                                 |   |
|----|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---|
| 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 : 2G<br>(5) Test Time : 72min in each axis (X.Y.Z)<br>(6) Ta : 25℃ | TEST : OK                       | P |
| 8  | CAPACITOR<br>LIFE CYCLE     | PCD-16-1400B:SUPPOSE C105 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta= 25 ℃ LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta= 50 ℃ LIFE TIME                                | (1) 347252 HRS<br>(2) 88034 HRS | P |
| 9  | MTBF                        | MIL-HDBK-217F NOTICES2 PARTS COUNT<br>TOTAL FAILURE RATE : 906.5 HRS                                                                                                                                  |                                 | P |
| 10 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure(Expected Life) :<br>30,000 hours @ Tcase 75℃ ; 50,000 hours @ Tcase 65℃                                                                                       |                                 | P |

| DATE       | SAMPLE         | TEST RESULT | TESTER     | APPROVAL      |
|------------|----------------|-------------|------------|---------------|
| 2010/10/6  | RD SAMPLE      | PASS        | SANFORD SU | VINCENT TSENG |
| 2010/11/10 | PRODUCT SAMPLE | PASS        | SANFORD SU | VINCENT TSENG |

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