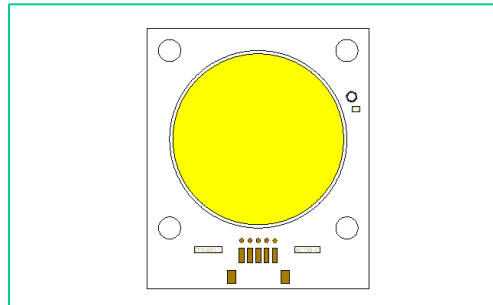


# Preliminary



**Product : Multi Chip Array LED (40W)**

**Part No. : IWC-AC COB –C8402**

**Date : 2014. 05. 12 Ver 0. 1**

| Proposed By | Checked By | Checked By | Checked By | Approval |
|-------------|------------|------------|------------|----------|
|             |            |            |            |          |

**Comment**

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## 1. Product Outline

### 1.1 Features

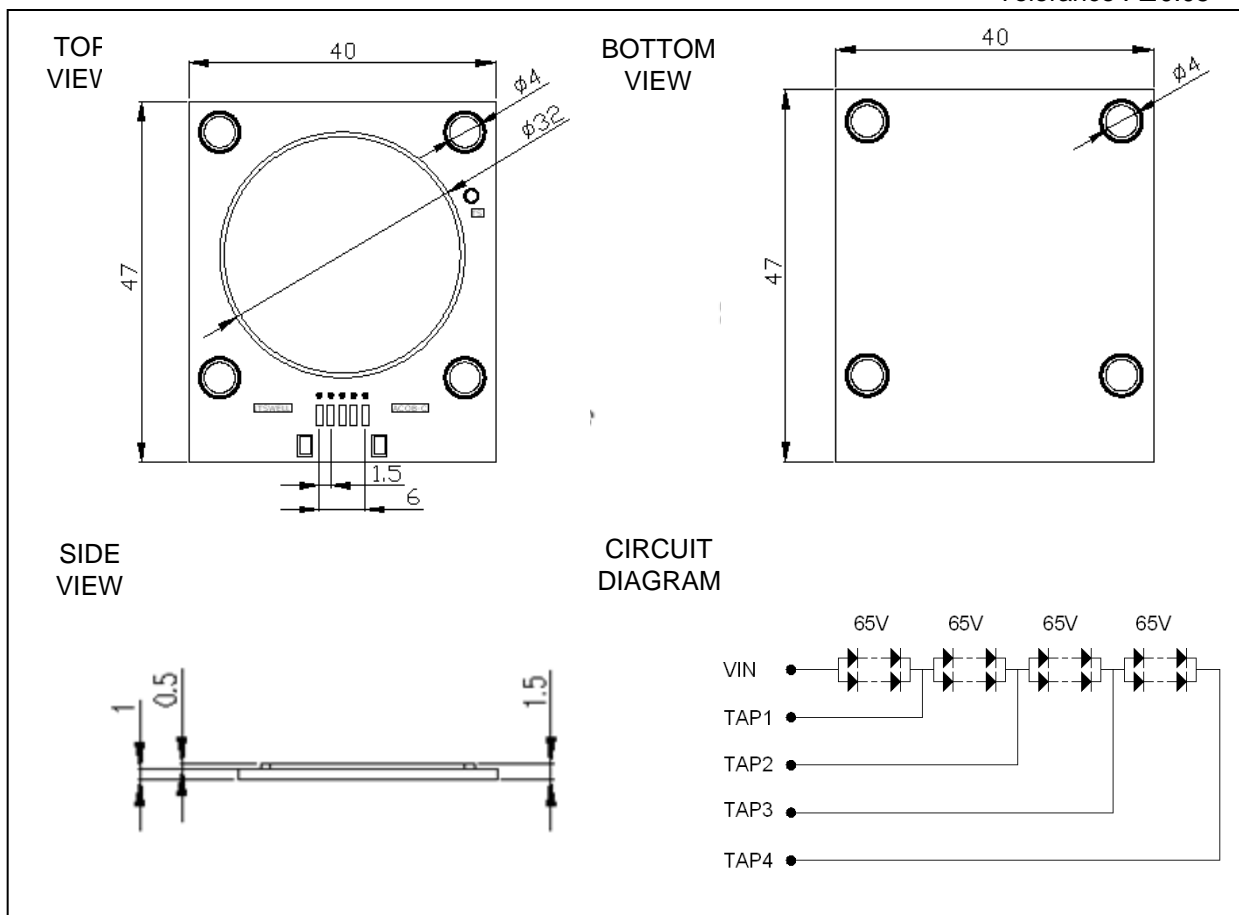
- Direct 220V AC Connection
- High Power Efficiency & Factor
- Low THD
- Simple BOM
- Reliable, Fast & Easy, Plug & Play
- Long Operating Life

### 1.2 Applications

- General Lighting and Interior Lighting
- Indoor Lighting for Incandescent and Halogen Lamps
- Flood Lighting

## 2. Outline Drawing and Dimension

Unit : mm  
Tolerance :  $\pm 0.05$



### Note

1. All dimensions are in millimeters
2. All dimensions without tolerances are for reference only

# Multi Chip Array LED ( 40W) IWC-AC COB –C8402



## 3. Absolute Maximum Ratings ( Ta : 25 °C )

| Parameter                     | Symbol       | Value      | Unit |
|-------------------------------|--------------|------------|------|
| Power Dissipation             | $P_d$        | 48         | W    |
| Maximum Input Voltage @220Vac | $V_{in}$     | 264        | V    |
| Operating Temperature         | $T_{opr}$    | -30 ~ +85  | °C   |
| Storage Temperature           | $T_{stg}$    | -40 ~ +100 | °C   |
| Junction Temperature          | $T_{jmax}$   | 120        | °C   |
| Thermal Resistance            | $R_{th J-S}$ | 0.31       | K/W  |

## 4. Electrical & Optical Characteristics ( Ta : 25 °C )

| Parameter                     | Symbol          | Min.                            | Typ.      | Max.  | Unit. |
|-------------------------------|-----------------|---------------------------------|-----------|-------|-------|
| Power Dissipation             | $P_d$           |                                 | 40        |       | W     |
| Input Voltage                 | $V_{in}$        |                                 | 220       |       | V     |
| Operating Frequency           | f               |                                 | 50/60     |       | Hz    |
| Power Factor                  | PF              |                                 | Over 0.95 |       |       |
| Luminous Flux* <sup>1</sup>   | $\Phi_v$        | 3,500                           | -         | 4,000 | lm    |
| Color Coordinates             | CIE x<br>CIE y  | Refer to Color Coordinates Rank |           |       |       |
| General Color Rendering Index | RA              | 80                              |           |       |       |
| View Angle* <sup>2</sup>      | $2\theta_{1/2}$ | -                               | 120       | -     | deg.  |

\*<sup>1</sup> Radiant Flux is measured with an integrating sphere and has an accuracy of 10%

\*<sup>2</sup> Viewing angle is the angle until 50% of brightness measured from the front part of LED.

# Multi Chip Array LED ( 40W)

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### 5. Rank (Vin = 220V, Ta = 25°C)

#### 5.1 Luminous Flux Rank

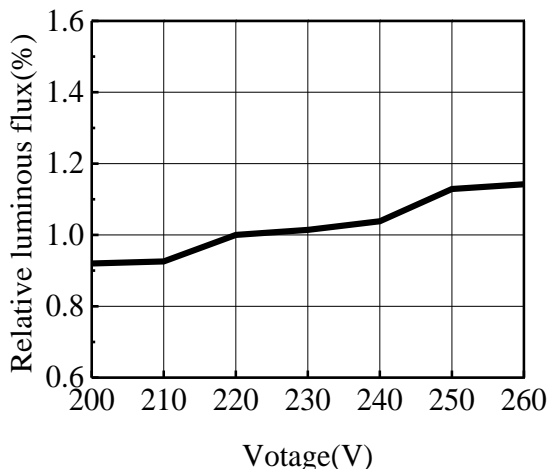
| Rank | Luminous Flux (lm) |
|------|--------------------|
| L35  | 3,500 ~ 3,999      |
| L40  | 4,000 ~ 4,499      |

#### 5.2 Color Coordinates Rank

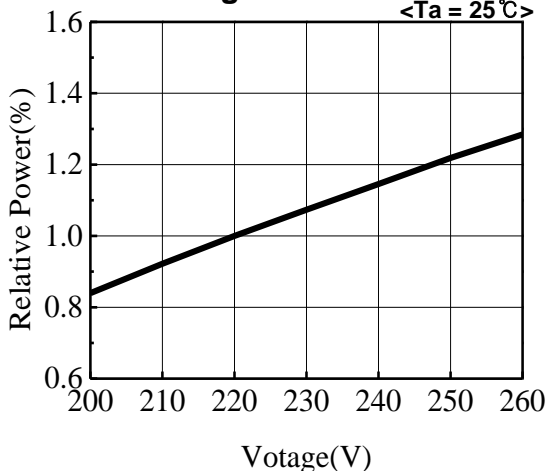
| CW          |        |             |        |             |        |             |        | PW          |        |             |        |
|-------------|--------|-------------|--------|-------------|--------|-------------|--------|-------------|--------|-------------|--------|
| A1          |        | A2          |        | B1          |        | B2          |        | 7500K       |        | 6700K       |        |
|             |        |             |        |             |        |             |        | 8145-7040K  |        | 7040K-6530K |        |
|             |        |             |        |             |        |             |        | Y           |        | Z           |        |
| x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      |
| 0.2600      | 0.2200 | 0.2700      | 0.2300 | 0.2800      | 0.2400 | 0.2900      | 0.2500 | 0.3057      | 0.2671 | 0.3089      | 0.3012 |
| 0.2600      | 0.2800 | 0.2700      | 0.2900 | 0.2800      | 0.3000 | 0.2900      | 0.3100 | 0.2891      | 0.3175 | 0.3008      | 0.3399 |
| 0.2700      | 0.2900 | 0.2800      | 0.3000 | 0.2900      | 0.3100 | 0.3000      | 0.3200 | 0.3025      | 0.3321 | 0.3095      | 0.3484 |
| 0.2700      | 0.2300 | 0.2800      | 0.2400 | 0.2900      | 0.2500 | 0.3000      | 0.2600 | 0.3140      | 0.2770 | 0.3152      | 0.3070 |
| PW          |        |             |        |             |        |             |        |             |        | NW          |        |
| 6200K       |        | 5800K       |        | 5500K       |        | 5100K       |        | 4900K       |        | 4600K       |        |
| 6530K-6020K |        | 6020K-5665K |        | 5665K-5311K |        | 5311K-5028K |        | 5028K-4746K |        | 4746K-4503K |        |
| A           |        | B           |        | C           |        | L           |        | M           |        | D           |        |
| x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      |
| 0.3152      | 0.3070 | 0.3229      | 0.3142 | 0.3292      | 0.3200 | 0.3362      | 0.3259 | 0.3429      | 0.3317 | 0.3500      | 0.3371 |
| 0.3095      | 0.3484 | 0.3198      | 0.3585 | 0.3282      | 0.3652 | 0.3381      | 0.3732 | 0.3465      | 0.3797 | 0.3562      | 0.3843 |
| 0.3198      | 0.3585 | 0.3282      | 0.3652 | 0.3381      | 0.3732 | 0.3465      | 0.3797 | 0.3567      | 0.3881 | 0.3650      | 0.3899 |
| 0.3229      | 0.3142 | 0.3292      | 0.3200 | 0.3362      | 0.3259 | 0.3429      | 0.3317 | 0.3500      | 0.3371 | 0.3574      | 0.3428 |
| NW          |        |             |        |             |        | WW          |        |             |        |             |        |
| 4400K       |        | 4000K       |        |             |        | 3600K       |        | 3300K       |        | 3100K       |        |
| 4503K-4260K |        | 4260K-3985K |        | 3985K-3710K |        | 3710K-3465K |        | 3465K-3220K |        | 3220K-3045K |        |
| E           |        | F           |        | G           |        | J           |        | K           |        | P           |        |
| x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      |
| 0.3574      | 0.3428 | 0.3648      | 0.3479 | 0.3755      | 0.3550 | 0.3865      | 0.3617 | 0.3988      | 0.3684 | 0.4117      | 0.3745 |
| 0.3650      | 0.3899 | 0.3756      | 0.3966 | 0.3882      | 0.4044 | 0.4022      | 0.4094 | 0.4165      | 0.4169 | 0.4332      | 0.4241 |
| 0.3756      | 0.3966 | 0.3882      | 0.4044 | 0.4035      | 0.4134 | 0.4165      | 0.4169 | 0.4332      | 0.4241 | 0.4456      | 0.4287 |
| 0.3648      | 0.3479 | 0.3755      | 0.3550 | 0.3865      | 0.3617 | 0.3988      | 0.3684 | 0.4117      | 0.3745 | 0.4221      | 0.3790 |
| WW          |        |             |        |             |        | Yellow      |        |             |        |             |        |
| 2900K       |        | 2700K       |        |             |        | Y1          |        | Y2          |        | Y3          |        |
| 3045K-2870K |        | 2870K-2670K |        | 2670K-2500K |        |             |        |             |        |             |        |
| Q           |        | R           |        | S           |        |             |        |             |        |             |        |
| x           | y      | x           | y      | x           | y      | x           | y      | x           | y      | x           | y      |
| 0.4221      | 0.3790 | 0.4599      | 0.4329 | 0.4767      | 0.4360 | 0.4599      | 0.4949 | 0.4763      | 0.4987 | 0.4921      | 0.4994 |
| 0.4456      | 0.4287 | 0.4767      | 0.4360 | 0.4921      | 0.4374 | 0.4763      | 0.4970 | 0.4921      | 0.4994 | 0.5048      | 0.5007 |
| 0.4599      | 0.4329 | 0.4486      | 0.3875 | 0.4621      | 0.3902 | 0.4546      | 0.4502 | 0.4679      | 0.4520 | 0.4790      | 0.4536 |
| 0.4344      | 0.3833 | 0.4344      | 0.3833 | 0.4486      | 0.3875 | 0.4403      | 0.4474 | 0.4546      | 0.4502 | 0.4679      | 0.4520 |

### 6. Typical Characteristic Curve

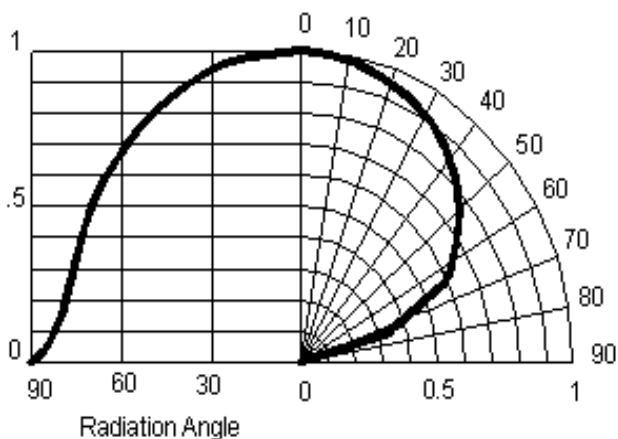
**Relative Luminous Flux vs. Voltage**  
<Ta = 25°C>



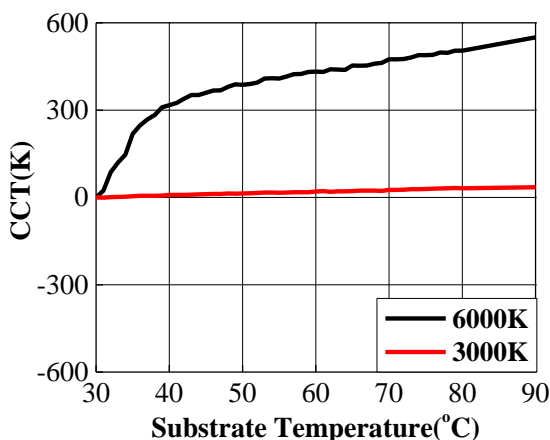
**Relative Power Distribution vs. Voltage**  
<Ta = 25°C>



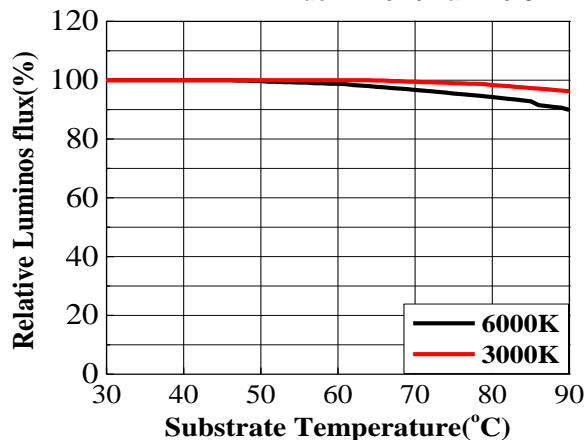
**Radiation Diagram**  
<Vac = 220V / Ta = 25°C >



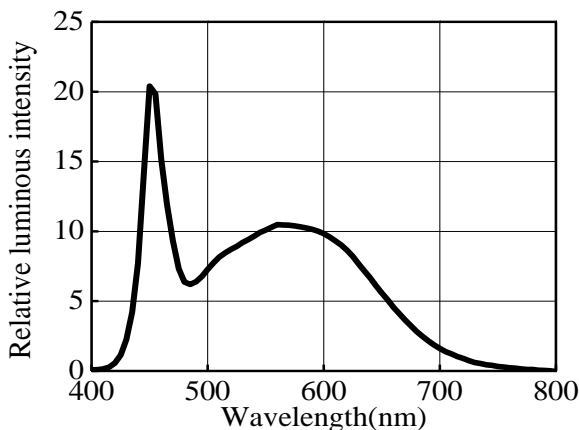
**Relative Radiant Flux vs. Wavelength**  
<Vac = 220V / Ta = 25°C >



**Relative Radiant Flux vs. Substrate Temperature**  
<Vac = 220V / Ta = 25°C >



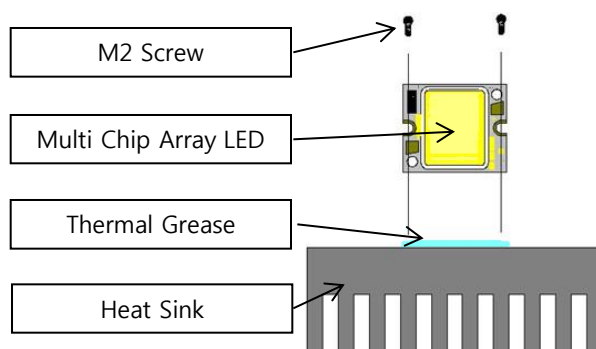
**Relative Luminous Intensity vs. Wavelength**



## 7. Precaution in use

### 7.1 Assembly Method

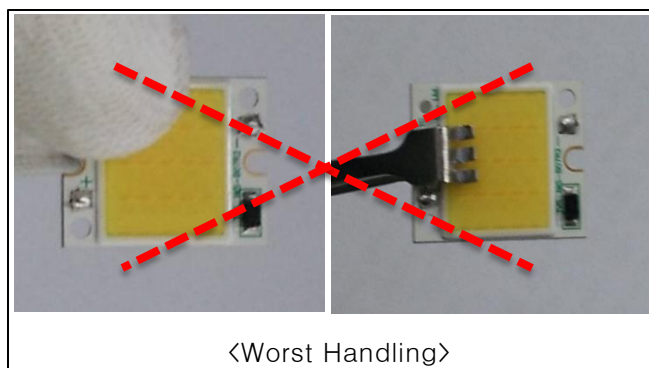
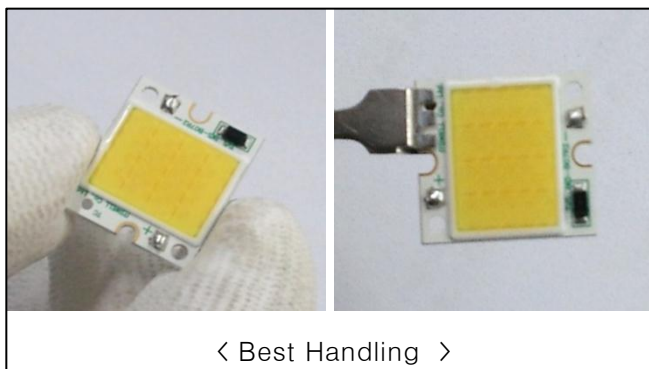
- A thin layer of thermal grease should be applied to the bottom surface of the array, between the bottom of the array the heat sink. All air gaps and voids between the heat sink and array should be eliminated.
- Ensure that sufficient thermal grease is used to cover the entire bottom surface of the array, but not so much that the thermal grease creeps up to the top of the array.
- Product should be firmly secured onto appropriate heat sink by fastening M2 screws on 2 positions of the product. The use of hard non - electrically conductive that washers with lock washers is recommended.



<Assembly Drawing>

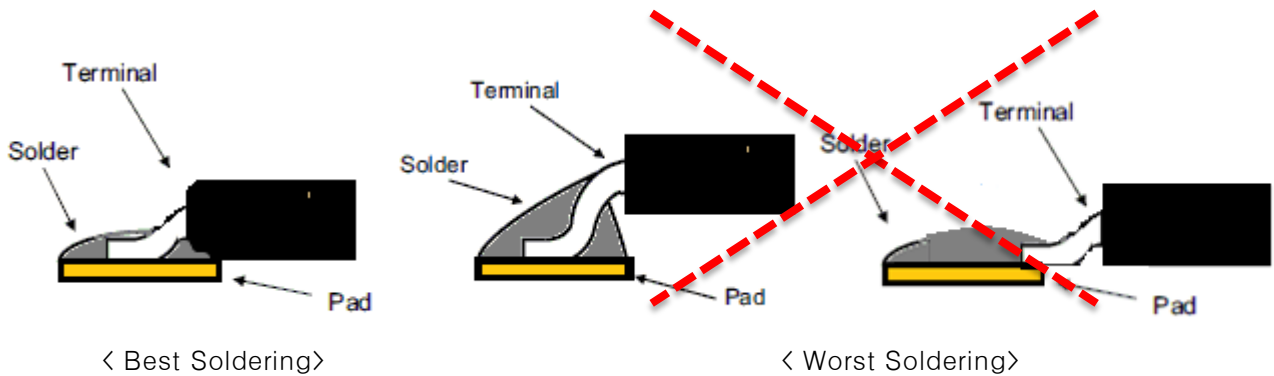
### 7.2 Handling

- Do not touch the optical area of the Multi Chip Array LED
- Avoid and contact With the optical area
- Applying stress to the phosphor resin area can result in damage to the Multi Chip Array LED



## 7.3 Recommend Soldering Profile

- The Assembly process enables the solder pads of the LED Arrays to reach 255 ~260°C (7~10sec) to ensure consistent melting of this solder paste.  
Peak Temp Max. 260 / Peak Time Max 10sec



## 7.4 Storage

- Before opening the package, the LEDs should be kept at 30°C or less and 70%RH or less.
- The LEDs should be used within a year.
- After opening the package, the LEDs should be kept at 30°C or less and 30%RH or less.
- The LEDs should be used within 572 hours (4 Week) after opening the package.
- If the moisture absorbent material (silicagel) has faded away or the LED have exceeded the storage time, baking treatment should be performed using the following conditions.  
Baking treatment: 60°C ±5 for 24 hours.

## 7.5 Static Electricity

- Static electricity or surge voltage damages the LEDs. It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.
- A tip soldering iron is requested to be grounded. An ionizer should also be installed where risk of static.
- All devices, equipment and machinery must be properly grounded (via 1MΩ). It is recommended that measures be taken against surge voltage to the equipment that mounts the Power SMD.

## 7.6 Cleaning

- Isopropyl Alcohol or Ethylene Alcohol is recommended in 5 minutes at room temperature.  
Don't use unspecified chemical may cause crack or haze on the surface of the epoxy resin.
- Before cleaning, a pre-test should be done to confirm whether any damage to the LED will occur.
- Freon solvents should not be used to clean the LEDs because of worldwide regulations.

## 7.7 Heat generation

- When the LEDs are illuminating, operating current should be decided after being considering the ambient maximum temperature.
- Please consider the heat generation of the LED when it is designed the PCB.
- The LED's must be mounted on MCPCB or heat sink or applied thermal pad.



### 7.8 JEDEC Information

JEDEC has defined a moisture sensitivity classification. So that the users can properly store and Handle the devices and to avoid subsequent thermal and mechanical damage during the assembly reflow attachment or repair operation.

The present moisture sensitivity standard contains six levels, the lower the level, the longer the devices floor life.

| Level      | Floor Life          |             | Soak Requirements |            |                        |           |             |
|------------|---------------------|-------------|-------------------|------------|------------------------|-----------|-------------|
|            |                     |             | Standard          |            | Accelerated Equivalent |           |             |
|            | Time                | Condition   |                   |            | Time (hrs)             | condition | 0.40~0.48eV |
| Time (hrs) |                     |             | Time (hrs)        |            |                        |           |             |
| 1          | Unlimited           | ≤30℃/85% RH | 168 +5/-0         | 85℃/85% RH | N/A                    | N/A       | N/A         |
| 2          | 1 year              | ≤30℃/60% RH | 168 +5/-0         | 85℃/60% RH | N/A                    | N/A       | N/A         |
| 2a         | 4 week              | ≤30℃/60% RH | 696 +5/-0         | 30℃/60% RH | 120 +1/-0              | 168 +1/-0 | 60℃/60% RH  |
| 3          | 168 hrs             | ≤30℃/60% RH | 192 +5/-0         | 30℃/60% RH | 40 +1/-0               | 52 +5/-0  | 60℃/60% RH  |
| 4          | 72 hrs              | ≤30℃/60% RH | 96 +5/-0          | 30℃/60% RH | 20 +1/-0               | 24 +5/-0  | 60℃/60% RH  |
| 5          | 48 hrs              | ≤30℃/60% RH | 72 +5/-0          | 30℃/60% RH | 15 +1/-0               | 20 +5/-0  | 60℃/60% RH  |
| 5a         | 24 hrs              | ≤30℃/60% RH | 48 +5/-0          | 30℃/60% RH | 10 +1/-0               | 13 +5/-0  | 60℃/60% RH  |
| 6          | Time On Level (TOL) | ≤30℃/60% RH | TOL               | 30℃/60% RH | N/A                    | N/A       | N/A         |

#### <Note>

1. The standard soak time includes a default value of 24 hour for semiconductor manufacture's exposure time between bake and bag, and includes the maximum time allowed out of the bag at the distributor's facility
2. Joint Electron Devices Engineering Councils (JEDEC) is the leading developer of standards for the solid-state industry. Almost 3100 participants, appointed by some 290 companies work together in 50 JEDEC committees to meet the needs of every segment of the industry, manufacturers and consumers alike. The publications and standards that they generate are accepted throughout the world. (<http://www.jedec.org>)

# Multi Chip Array LED ( 40W)

## IWC-AC COB –C8402



### 8. Part List

| No | Description  | Specification   | Type       | Location No. | Q'TY |
|----|--------------|-----------------|------------|--------------|------|
| 1  | PCB          | 68 * 27         | MCCL       |              | 1    |
| 2  | IC           | ACS1404S        | SOIC16     | U1,U2        | 2    |
| 3  | CHIP-RES     | 6.8 Ohm F (1%)  | 1608       | RIS1,RIS2    | 2    |
|    | CHIP-RES     | 15 Ohm F (1%)   | 1608       | RIS2         |      |
|    | CHIP-RES     | 10.5 Ohm F (1%) | 1608       | RIS1,2       |      |
| 4  | CHIP-RES     | 2K Ohm J (5%)   | 1608       | R1,R2        | 2    |
| 5  | CHIP-RES     | 0 Ohm J (5%)    | 2012       | JP1~6        | 6    |
| 6  | CHIP-RES     | 0 Ohm J (5%)    | 2012       | OP1,OP3      | 2    |
| 7  | CHIP-RES     | 100 Ohm J (5%)  | 3216       | RV1,2        | 2    |
| 8  | CHIP-CAP     | 0.1μF 50V       | 1608       | VC1,VC2      | 2    |
| 9  | TVS DIODE    | SMF 100A        | SOD-123    | ZD2          | 1    |
| 10 | TVS DIODE    | SMBJ400A        | SMB        | ZD1          | 1    |
| 11 | FUSE         | 2A 250Vac       | SMD        | F1           | 1    |
| 12 | Varistor     | TVB9S471KR      | SMD        | TNS1         | 1    |
| 13 | Bridge Diode | 600V, 1.0A      | DBS        | BD1          | 1    |
| 14 | Connector    | 5Pin, 1.5mm     | 15001WS-05 | CN1          | 1    |

