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**Opto Plus LED Corp.**  
**Case Mold Type LED Display**  
**OPD-DR54WLE-Z-W**

● **EDIT HISTORY**

Version A: Sep. 29, 2020

Preliminary Spec.

| Prepared by | Checked by | Approved by |
|-------------|------------|-------------|
|             |            |             |



## Opto Plus LED Corp. Case Mold Type LED Display OPD-DR54WLE-Z-W

### ● INTERNAL FEATURES

1. One Circle Two Color.
2. Ø 54.3mm Case Mold Type LED Display
3. Ø 44.5mm Hollow Circle.
4. PIN 1 & PIN 3 Description : Supply voltage terminal.
5. PIN 2 & PIN 4 Description : Ground terminal.
6. Operating Voltage Range : 2.6 ~ 5V. (White Color)
7. Operating Voltage Range : 1.6 ~ 5V. (Red Color)
8. Operating Current Range : 112 ~ 150mA. (White Color)
9. Operating Current Range : 125 ~ 142mA. (Red Color)
10. Operating temperature: -25°C to +85°C

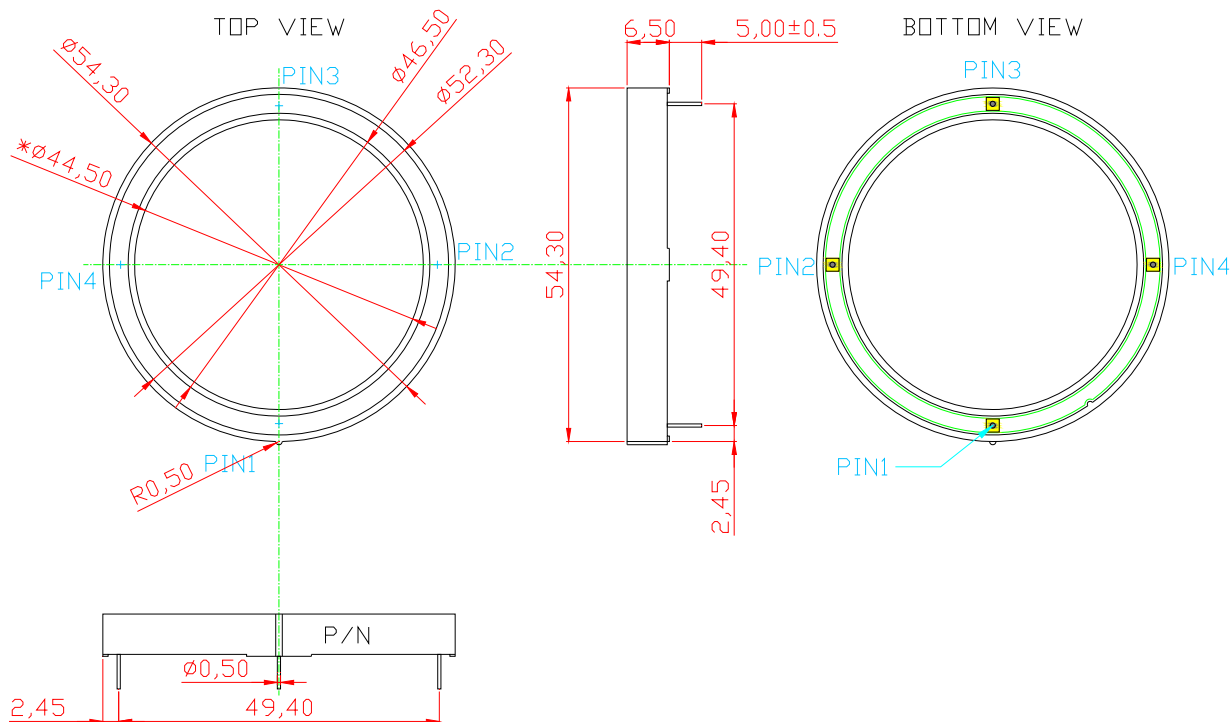
Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of the devices at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.



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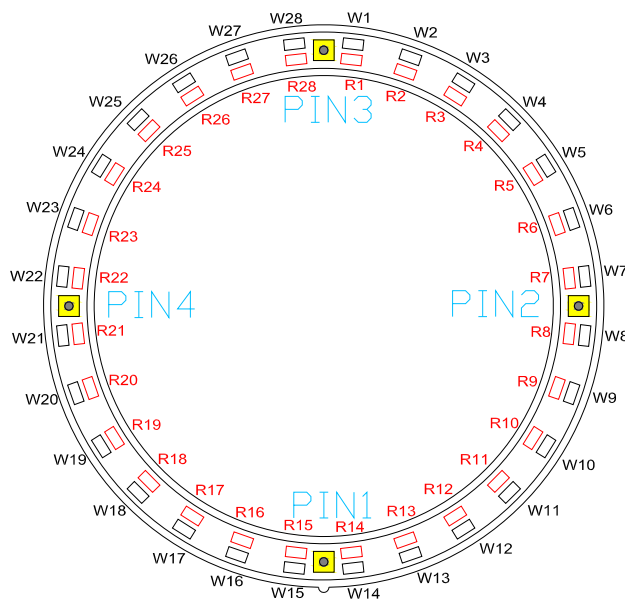
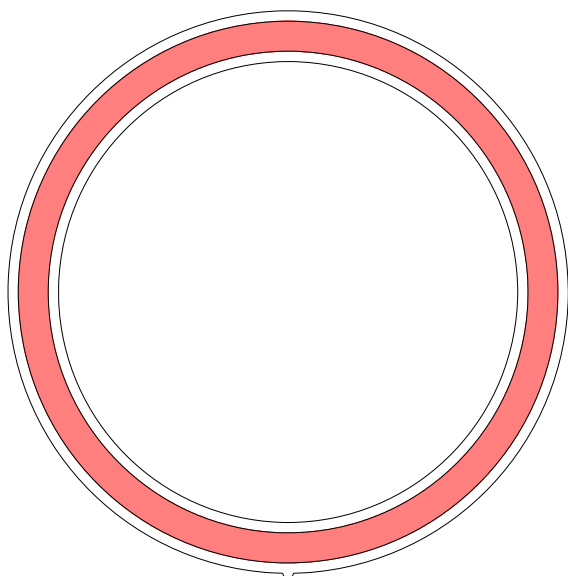
## Opto Plus LED Corp. Case Mold Type LED Display OPD-DR54WLE-Z-W

### ● MECHANICAL DIMENSIONS

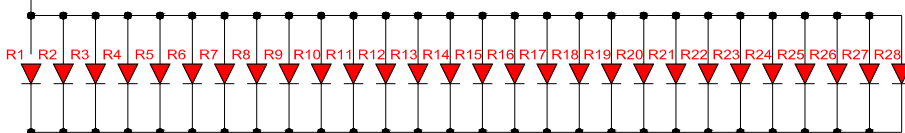


NOTES: All dimensions are in millimeters. Tolerances are  $\pm 0.25$  mm unless otherwise noted.

#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT



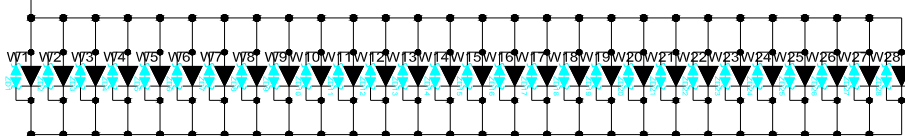
PIN1



PIN2

Super Bright Red SMD LED

PIN3



PIN4

Super Bright White SMD LED With Zener Diode



# Opto Plus LED Corp. Case Mold Type LED Display OPD-DR54WLE-Z-W

## ● Zener

### ELECTRICAL CHARACTERISTICS (Ta=25°C) – ONE ZENER

#### Two Way Zener Diode

(Ta = +25 °C)

| Parameter               | Symbol | Condition                   | Min. | Typ. | Max. | Unit. |
|-------------------------|--------|-----------------------------|------|------|------|-------|
| Forward Voltage         | $V_F$  | Rank A: $I_F = 10\text{mA}$ | 3    |      | 5    | V     |
|                         |        | Rank B: $I_F = 10\text{mA}$ | 5    |      | 7    | V     |
|                         |        | Rank C: $I_F = 10\text{mA}$ | 6    |      | 8    | V     |
| Forward Leakage current | $I_F$  | Rank A: $V_F = 2.5\text{V}$ |      |      | 500  | nA    |
|                         |        | Rank B: $V_F = 4\text{V}$   |      |      | 500  | nA    |
|                         |        | Rank C: $V_F = 5\text{V}$   |      |      | 500  | nA    |
| Reverse Voltage         | $V_Z$  | Rank A: $I_R = 10\text{mA}$ | 3.5  |      | 6    | V     |
|                         |        | Rank B: $I_R = 10\text{mA}$ | 8    |      | 13   | V     |
|                         |        | Rank C: $I_R = 10\text{mA}$ | 8    |      | 13   | V     |
| Reverse Leakage current | $I_R$  | Rank A: $V_R = 3\text{V}$   |      |      | 500  | nA    |
|                         |        | Rank B: $V_R = 4\text{V}$   |      |      | 500  | nA    |
|                         |        | Rank C: $V_R = 5\text{V}$   |      |      | 500  | nA    |

Machine Model (MM) 8000 V



# Opto Plus LED Corp. Case Mold Type LED Display OPD-DR54WLE-Z-W

## ● W: SUPER BRIGHT WHITE (W1-W28)

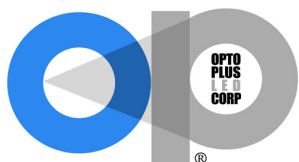
ABSOLUTE MAXIMUM RATING AT Ta=25°C

| Parameter                  | Symbol           | Super Bright White | Unit |
|----------------------------|------------------|--------------------|------|
| Power dissipation          | P <sub>AD</sub>  | 384                | mW   |
| Continuous forward current | I <sub>AF</sub>  | 120                | mA   |
| Reverse voltage            | V <sub>R</sub>   | 5                  | V    |
| Operating temperature      | T <sub>OPR</sub> | -25 to +85         | °C   |
| Storage temperature        | T <sub>STG</sub> | -25 to +85         | °C   |

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

| Characteristic               | Symbol         | Condition              | Min. | Typ.  | Max. | Unit |
|------------------------------|----------------|------------------------|------|-------|------|------|
| Forward voltage              | V <sub>F</sub> | I <sub>F</sub> = 120mA | 2.6  | 2.9   | 3.2  | V    |
| Reverse Current              | I <sub>R</sub> | V <sub>R</sub> = 5V    | -    | -     | 10   | μA   |
| Peak Wavelength              | λ <sub>P</sub> | I <sub>F</sub> = 120mA | X    | 0.265 | -    | nm   |
|                              |                |                        | Y    | 0.275 | -    |      |
| Average Luminous Intensity   | I <sub>V</sub> | I <sub>F</sub> = 120mA | 1000 | 2000  | 3000 | mcd  |
| Spectrum Radiation Bandwidth | Δλ             | I <sub>F</sub> = 120mA | -    | 30    | -    | nm   |

Note: It maintains a tolerance of ±10% on VF Bin



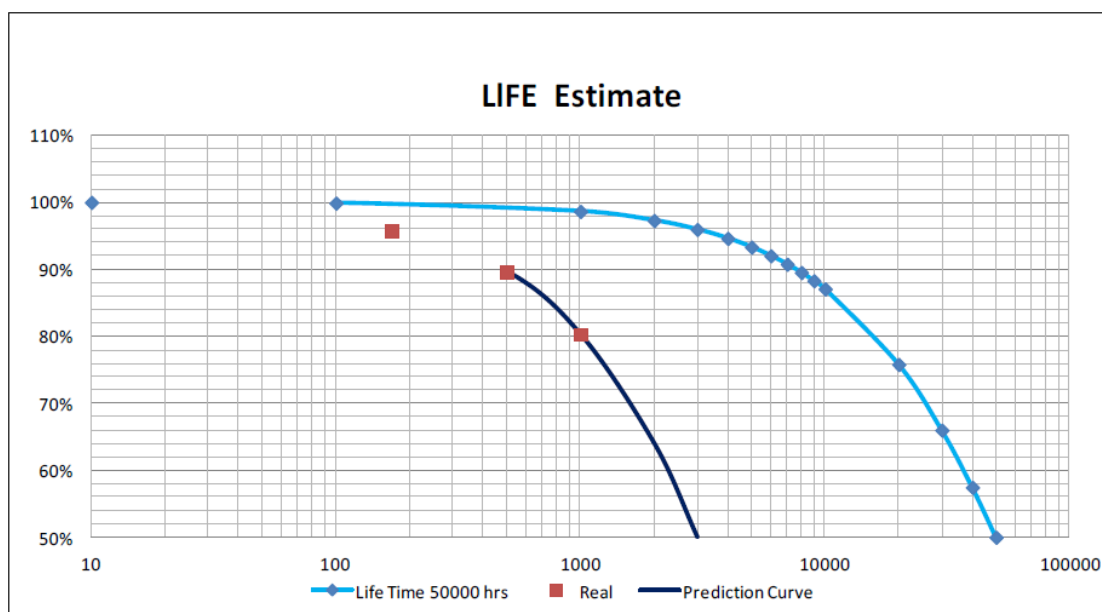
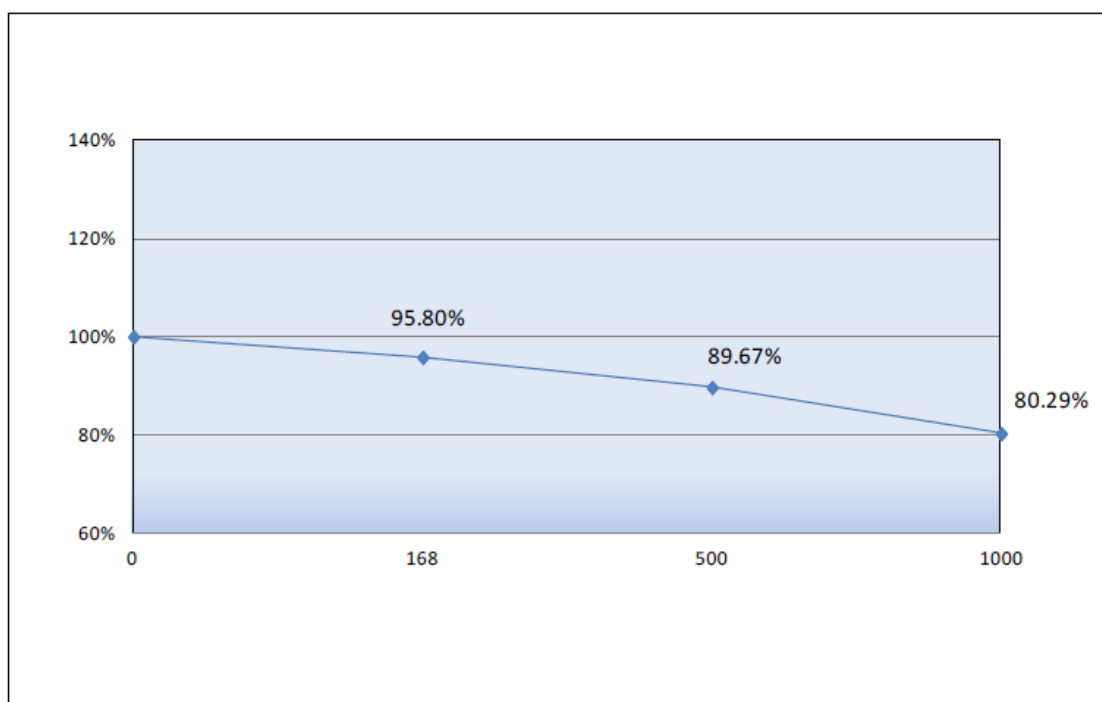
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## Opto Plus LED Corp. Case Mold Type LED Display OPD-DR54WLE-Z-W

Temperature and Humidity Bias 60°C 90%R.H 20mA Operation Test Time  
1000hrs (Per White SMD LED)

### Life Time

60°C 90%R.H. 20mA





# Opto Plus LED Corp. Case Mold Type LED Display OPD-DR54WLE-Z-W

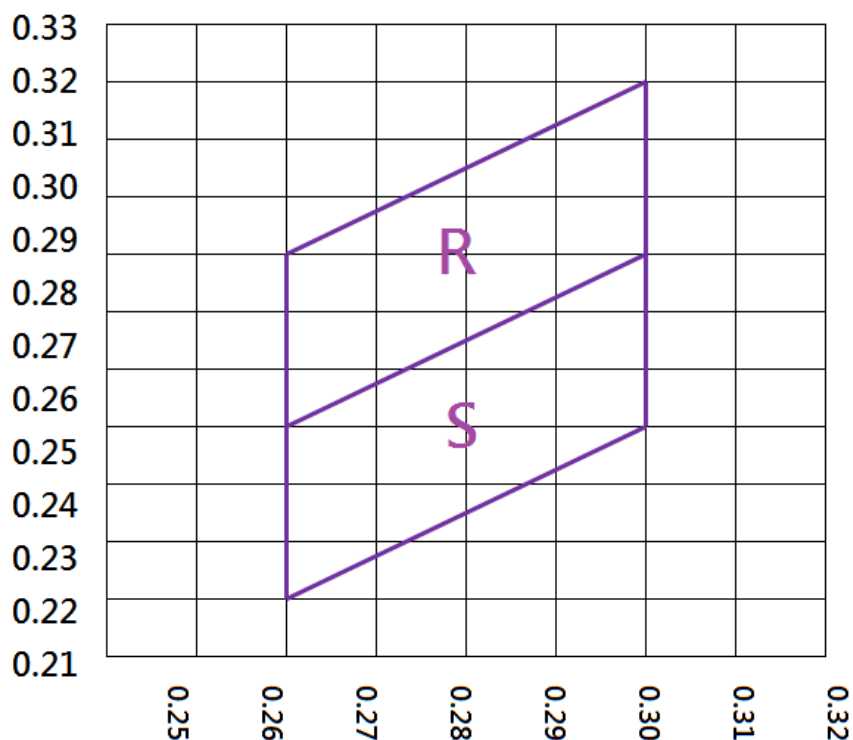
## ● AVAILABLE BIN / HUE TABLE (WBIN / WHUE / LEBIN / LEHUE)

|      |      |      |      |
|------|------|------|------|
| 1S1U | 2S1U | 1R1U | 2R1U |
| 1S2U | 2S2U | 1R2U | 2R2U |
| 1S1V | 2S1V | 1R1V | 2R1V |
| 1S2V | 2S2V | 1R2V | 2R2V |

## ● W: BIN GRADE (Unit : mcd)

|             |             |
|-------------|-------------|
| 1           | 2           |
| 1000 - 2000 | 2001 - 3000 |

## ● Chromaticity Coordinate (X,Y)







# Opto Plus LED Corp. Case Mold Type LED Display OPD-DR54WLE-Z-W

## ● LE: SUPER BRIGHT RED (R1-R28)

ABSOLUTE MAXIMUM RATING AT Ta=25°C

| Parameter                  | Symbol           | Super Bright Red | Unit |
|----------------------------|------------------|------------------|------|
| Power dissipation          | P <sub>AD</sub>  | 240              | mW   |
| Continuous forward current | I <sub>AF</sub>  | 120              | mA   |
| Reverse voltage            | V <sub>R</sub>   | 5                | V    |
| Operating temperature      | T <sub>OPR</sub> | -25 to +85       | °C   |
| Storage temperature        | T <sub>STG</sub> | -25 to +85       | °C   |

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

| Characteristic                | Symbol         | Condition              | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------|------------------------|------|------|------|------|
| Forward voltage               | V <sub>F</sub> | I <sub>F</sub> = 120mA | 1.6  | 1.8  | 2.0  | V    |
| Reverse current               | I <sub>R</sub> | V <sub>R</sub> = 5V    | -    | -    | 10   | μA   |
| Peak wavelength               | λ <sub>P</sub> | I <sub>F</sub> = 120mA | -    | 632  | -    | nm   |
| Dominant Wavelength (per SMD) | λ <sub>D</sub> | I <sub>F</sub> = 120mA | 615  | 624  | 630  | nm   |
| Luminous intensity (per SMD)  | I <sub>v</sub> | I <sub>F</sub> = 120mA | 225  | 425  | 625  | mcd  |
| Spectrum Radiation Bandwidth  | Δλ             | I <sub>F</sub> = 120mA | -    | 15   | -    | nm   |

Note: It maintains a tolerance of ±10% on VF Bin



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● **LE: BIN GRADE (Unit : mcd)**

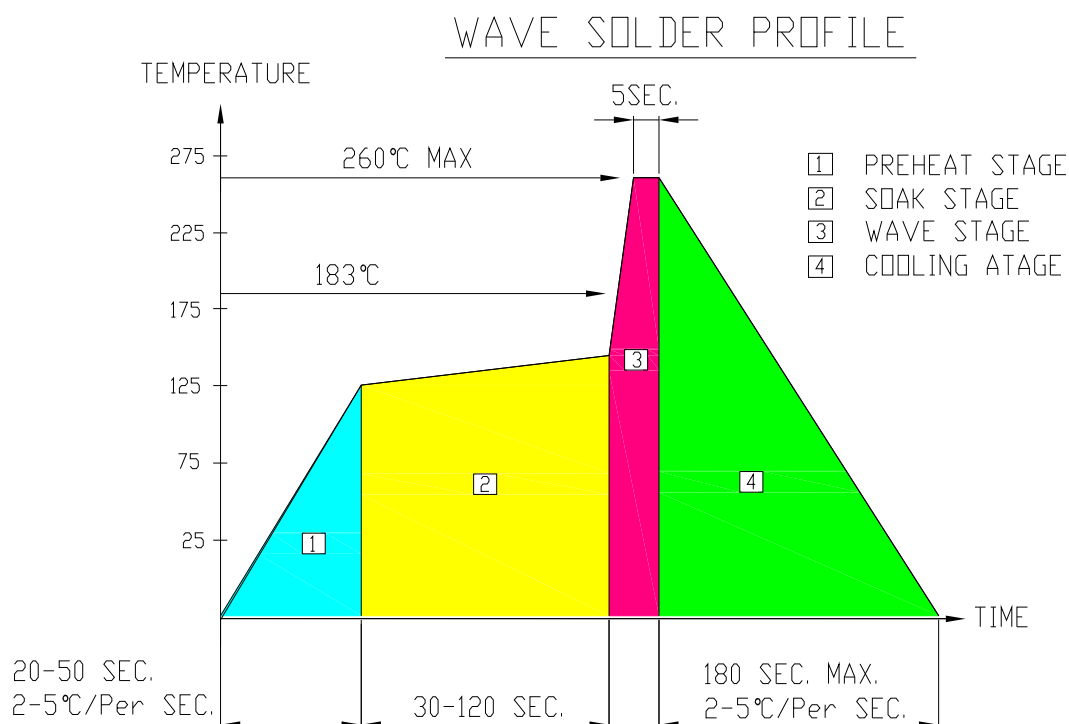
| 1             | 2             |
|---------------|---------------|
| 225.0 – 425.9 | 426.0 – 625.0 |

● **LE: HUE GRADE ( $\lambda D$  : nm)**

| U         | V         |
|-----------|-----------|
| 615 - 625 | 625 - 630 |

Note: It maintains a tolerance of  $\pm 0.5\text{nm}$  on Color Bin.

## ● RECOMMEND SOLDERING PROFILE



## ● Note:

- Recommend pre-heat temperature of 105°C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260°C
- Peak wave soldering temperature between 245°C ~ 225°C for 3 sec (5 sec max)
- No more than one wave soldering pass

## ● SOLDERING IRON

Basic spec is  $\leq 4$  sec when 260°C. If temperature is higher, time should be shorter (+10°C → 1 sec). Power dissipation of Iron should be smaller than 15W, and temperature should be controllable. Surface temperature of the device should be under 230°C.

## ● REWORK

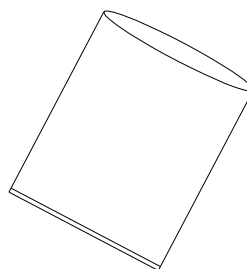
Customer must finish rework within  $\leq 3$  sec under 350°C.  
 The head of soldering iron cannot touch copper foil.



# Opto Plus LED Corp. Case Mold Type LED Display OPD-DR54WLE-Z-W

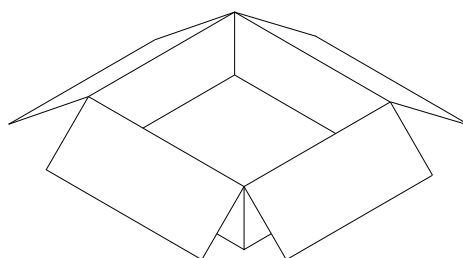
## ● PACKAGE DIMENSIONS

30 PCS / 1 ESD TRAY.  
180 PCS / 6 ESD TRAY / TOP & BOTTOM 1 Corrugates Paper / 1 PINK ESD BAG.



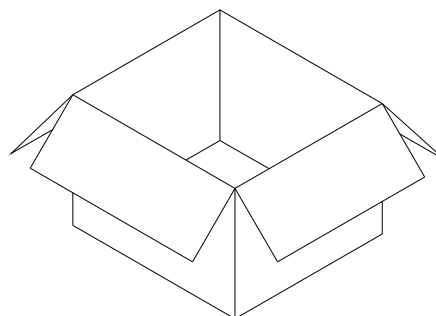
BAG SIZE :450X410X560

180 PCS / 1 Inner Carton.



INNER BOX SIZE : 394 x 370 x 138 mm

360 PCS / 2 Inner Carton / 1 Outer Carton.



OUTER BOX SIZE : 430 x 390 x 300 mm

## ● Note:

LED DISPLAY STANDARD STORED CONDITION

Product in the original packaging material state is the recommended storage conditions.

| TERATURE CONDITION | HUMIDITY CONDITION |
|--------------------|--------------------|
| 5°C ~ 30°C         | Below 60%RH        |

If the storage conditions do not meet specification standards, the component pins may become oxidized requiring re-plating and re-sorting before use. Suggest customers consume LEDs as soon as possible, and avoid long-term storage of large inventories.