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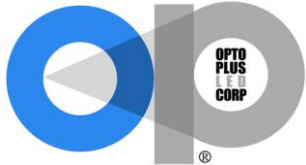
**Opto Plus LED Corp**  
**OPS-L0404F1A**  
Top View Chip LED

● **EDIT HISTORY**

Version A : APR. 22, 2024

Preliminary Spec.

Confidential Document



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# Opto Plus LED Corp

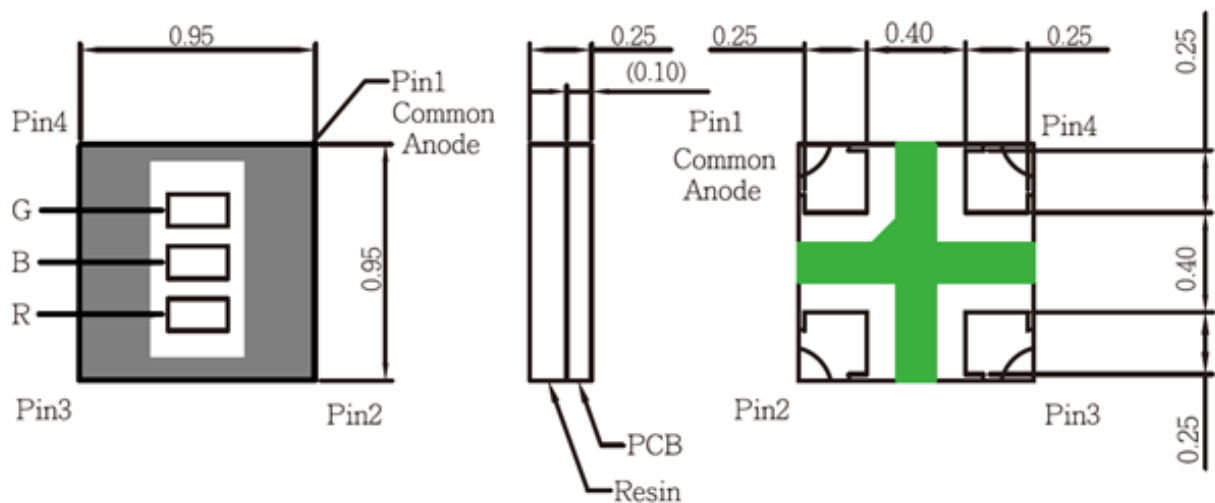
## OPS-L0404F1A

### Top View Chip LED

#### ● FEATURES

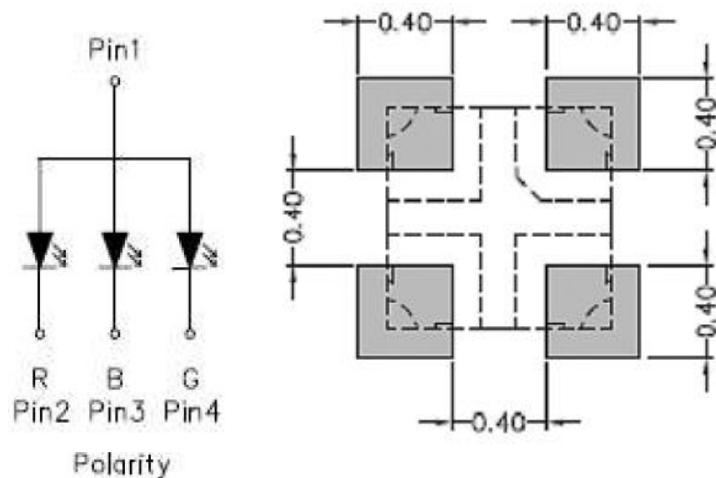
- 0.95mm x 0.95 mm x 0.25 mm. [0.04 inch x 0.04 inch x 0.01 inch]
- Top View Chip LED.
- Low power consumption.
- RoHS compliant.

#### ● PACKAGE DIMENSIONS



Unit:mm Tolerance: +/-0.1

#### SOLDERING PATTERN



Unit:mm Tolerance: +/-0.1

Suggested pad dimension is just for reference only.  
Please modify the pad dimension based on individual need.



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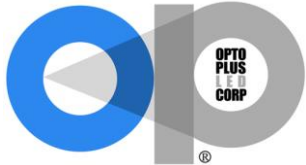
Top View Chip LED

### ABSOLUTE MAXIMUM RATING AT Ta=25°C

| Parameter                                 | Symbol    | Maximum Rating | Unit |
|-------------------------------------------|-----------|----------------|------|
| Power dissipation                         | $P_{AD}$  | 25             | mW   |
| Continuous forward current (Red)          | $I_{AF}$  | 5              | mA   |
| Continuous forward current (Green) (Blue) | $I_{AF}$  | 2              | mA   |
| Peak current (duty cycle 1/10, 1kHz)      | $I_{PF}$  | 20             | mA   |
| Reverse voltage                           | $V_R$     | 5              | V    |
| Operating temperature                     | $T_{OPR}$ | -30 to +80     | °C   |
| Storage temperature                       | $T_{STG}$ | -40 to +85     | °C   |

### ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

| Characteristic              | Symbol      | Condition   | Min. | Type. | Max. | Unit    |
|-----------------------------|-------------|-------------|------|-------|------|---------|
| Forward Voltage (Red)       | $V_F$       | $I_F = 5mA$ | 1.5  | 1.9   | 2.7  | V       |
| Forward Voltage (Green)     | $V_F$       | $I_F = 2mA$ | 2.0  | 2.5   | 3.3  | V       |
| Forward Voltage (Blue)      | $V_F$       | $I_F = 2mA$ | 2.0  | 2.5   | 3.3  | V       |
| Reverse Current             | $I_R$       | $V_R = 5V$  | -    | -     | 10   | $\mu A$ |
| Dominant Wavelength (Red)   | $\lambda_D$ | $I_F = 5mA$ | -    | 620   | -    | nm      |
| Dominant Wavelength (Green) | $\lambda_D$ | $I_F = 2mA$ | -    | 533   | -    | nm      |
| Dominant Wavelength (Blue)  | $\lambda_D$ | $I_F = 2mA$ | -    | 470   | -    | nm      |
| Luminous Intensity(Red)     | $I_v$       | $I_F = 5mA$ | -    | 28    | -    | mcd     |
| Luminous Intensity(Green)   | $I_v$       | $I_F = 2mA$ | -    | 37    | -    | mcd     |



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|                                      |                 |                    |   |    |   |     |
|--------------------------------------|-----------------|--------------------|---|----|---|-----|
| Luminous Intensity(Blue)             | $I_v$           | $I_F = 2\text{mA}$ | - | 7  | - | mcd |
| Spectrum Radiation Bandwidth (Red)   | $\Delta\lambda$ | $I_F = 5\text{mA}$ | - | 11 | - | nm  |
| Spectrum Radiation Bandwidth (Green) | $\Delta\lambda$ | $I_F = 2\text{mA}$ | - | 28 | - | nm  |
| Spectrum Radiation Bandwidth ( Blue) | $\Delta\lambda$ | $I_F = 2\text{mA}$ | - | 16 | - | nm  |



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**Top View Chip LED**

● **LUMINOUS INTENSITY (IV) BIN :**

| BIN        | R           | S           | T           |
|------------|-------------|-------------|-------------|
| (Red) @5mA | 112-180 mcd | 181-285 mcd | 285-360 mcd |

| BIN          | T           | U           | V           | W           |
|--------------|-------------|-------------|-------------|-------------|
| (Green) @2mA | 285-360 mcd | 361-450 mcd | 451-560 mcd | 561-715 mcd |

| BIN         | Q          | R           | S           |
|-------------|------------|-------------|-------------|
| (Blue) @2mA | 71-112 mcd | 113-180 mcd | 181-285 mcd |

Note: It maintains a tolerance of  $\pm 10\%$  on Luminous Intensity.

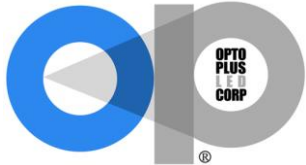
● **WAVELENGTH(  $\lambda$ D) BIN :**

| BIN        | 2          | 3           | 4          |
|------------|------------|-------------|------------|
| (Red) @5mA | 618-623 nm | 623-628 mcd | 628-633 nm |

| BIN          | 0          | 2           | 4          |
|--------------|------------|-------------|------------|
| (Green) @2mA | 524-528 nm | 528-532 mcd | 532-536 nm |

| BIN         | 1            | 3            |
|-------------|--------------|--------------|
| (Blue) @2mA | 464 – 468 nm | 468 – 472 nm |

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



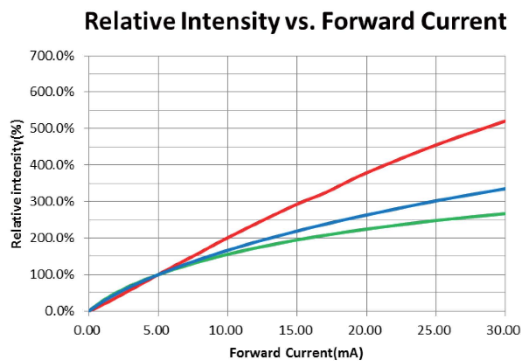
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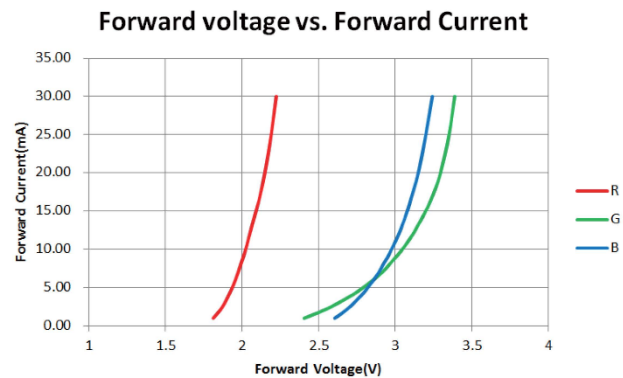
## OPS-L0404F1A

### Top View Chip LED

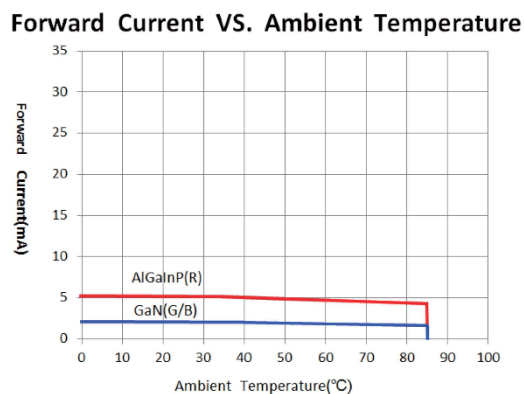
Relative Intensity vs. Forward Current  
(相對光強度與順向電流變化圖)



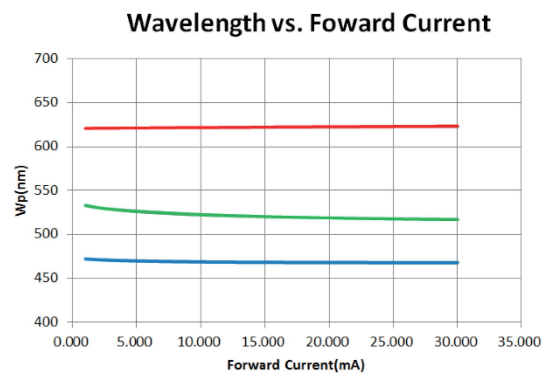
Forward Voltage vs. Forward Current  
(順向偏壓與順向電流對應圖)



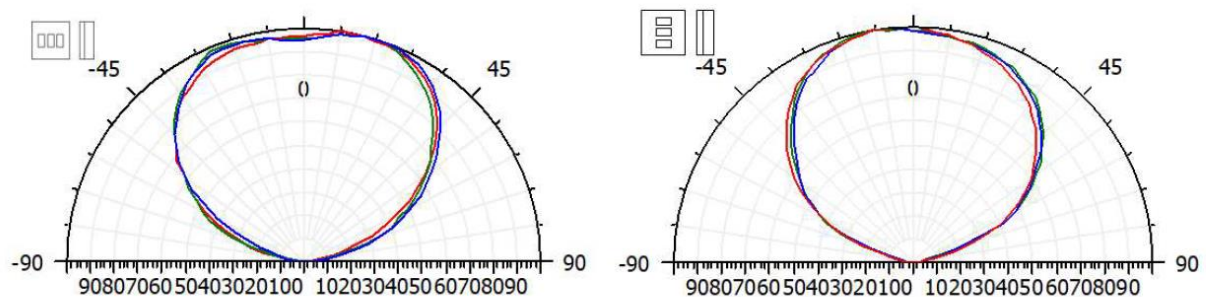
Forward Current vs. Ambient Temperature  
(順向電流與環境溫度變化圖)

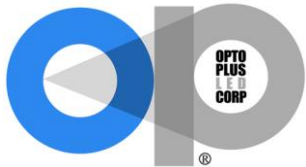


Wavelength vs. Forward Current  
(波長與順向電流變化圖)



Radiation Diagram(發光角度圖)





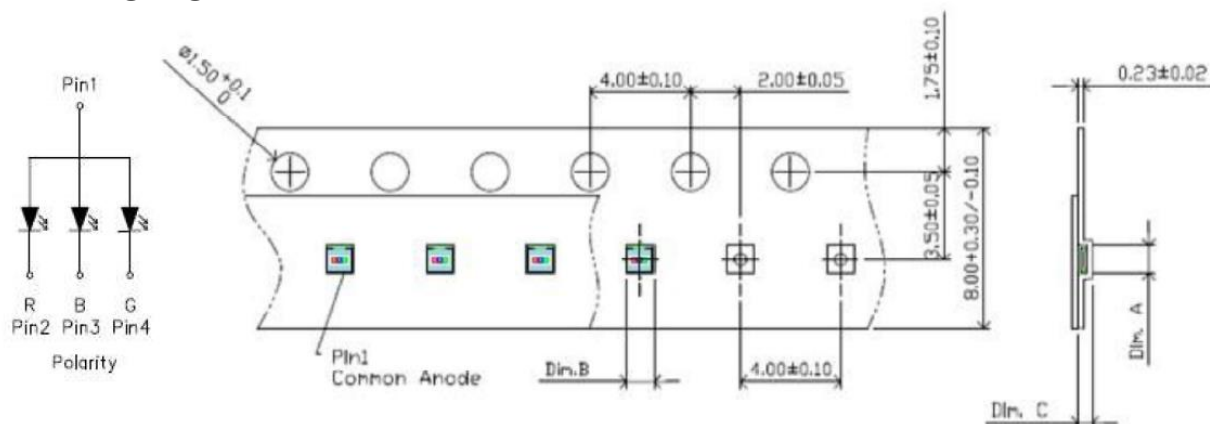
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## OPS-L0404F1A

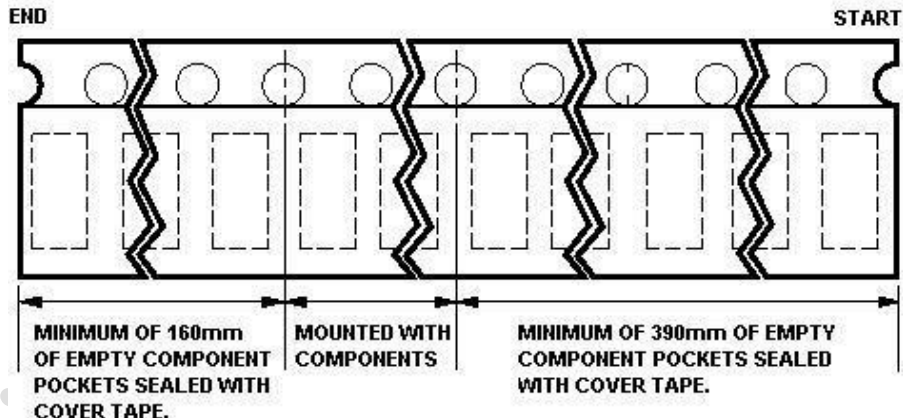
### Top View Chip LED

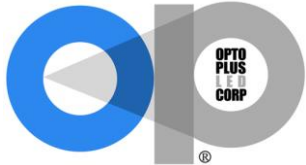
## ● Packaging



Unit:mm Tolerance: +/-0.1

| Dim. A    | Dim. B    | Dim. C    | Q'ty/Reel |
|-----------|-----------|-----------|-----------|
| 1.11±0.05 | 1.11±0.05 | 0.35±0.05 | 4k        |





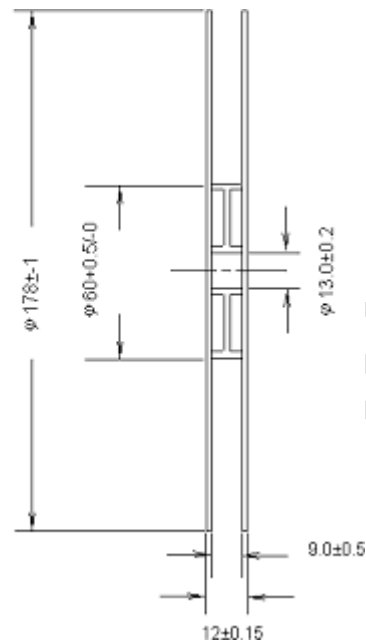
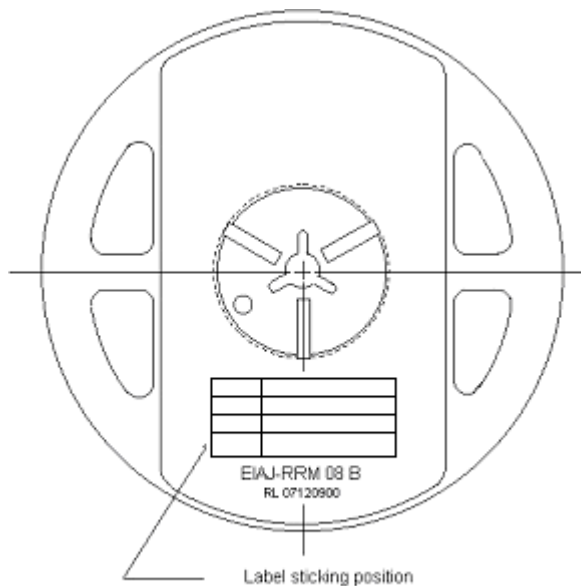
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## OPS-L0404F1A

Top View Chip LED

### ● Reel Dimension



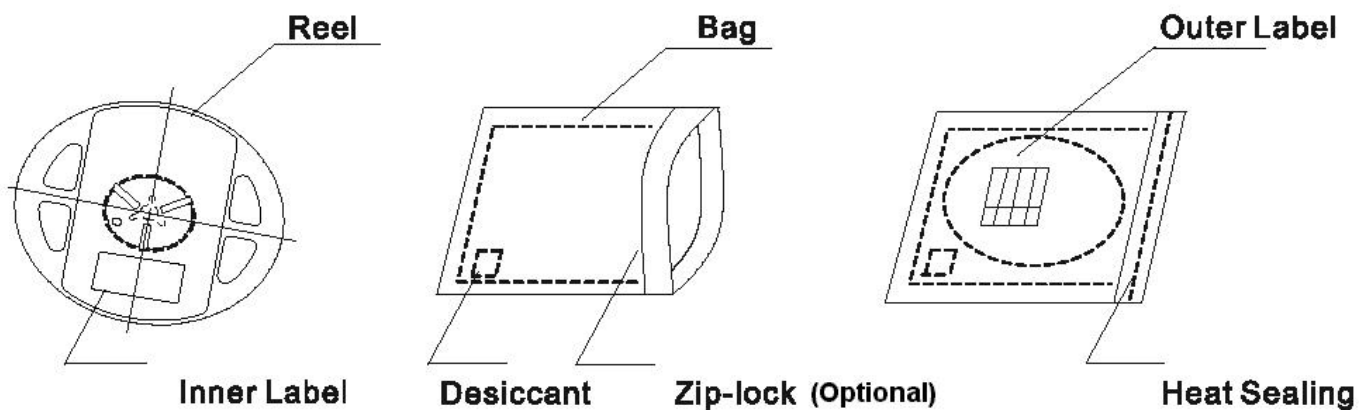


## ● Dry Pack

All SMD optical devices are **MOISTURE SENSITIVE**. Avoid exposure to moisture at all times during transportation or storage. Every reel is packaged in a moisture protected anti-static bag. Each bag is properly sealed prior to shipment.

A humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

The packaging sequence is as follows:



## ● Baking

Baking before soldering is recommended when the package has been unsealed for 4 weeks.

The conditions are as followings:

1.  $60 \pm 3^{\circ}\text{C} \times (12 \sim 24\text{hrs})$  and  $< 5\% \text{RH}$ , taped reel type.
2.  $100 \pm 3^{\circ}\text{C} \times (45\text{min} \sim 1\text{hr})$ , bulk type.
3.  $130 \pm 3^{\circ}\text{C} \times (15\text{min} \sim 30\text{min})$ , bulk type.

## ● Precautions

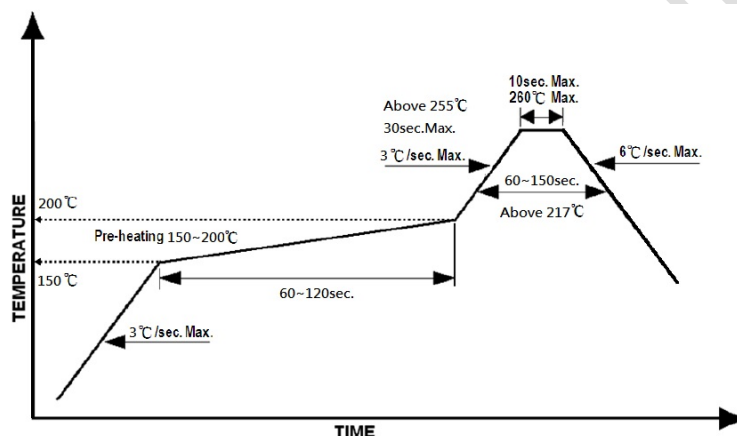
1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the specified limit.
4. Avoid operation beyond the limits as specified by the absolute maximum ratings.
5. Avoid direct contact with the surface through which the LED emits light.
6. If possible, assemble the unit in a clean room or dust-free environment.

## ● Reflow Soldering

Recommend soldering paste specifications:

1. Operating temp.: Above 217°C ,60~150 sec.
2. Peak temp.:260°C Max.,10sec Max.
3. Reflow soldering should not be done more than two times.
4. Never attempt next process until the component is cooled down to room temperature after reflow.
5. The recommended reflow soldering profile (measured on the surface of the LED terminal) is as following:

## ● Lead-free Solder Profile



## ● Reworking

- Rework should be completed within 5 seconds under 260°C.
- The iron tip must not come in contact with the copper foil.
- Twin-head type is preferred.

## ● Cleaning

Following are cleaning procedures after soldering:

- An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.
- Temperature x Time should be 50°C x 30sec. or <30°C x 3min
- Ultrasonic cleaning: < 15W/ bath; bath volume ≤ 1liter

Curing: 100°C max, <3min