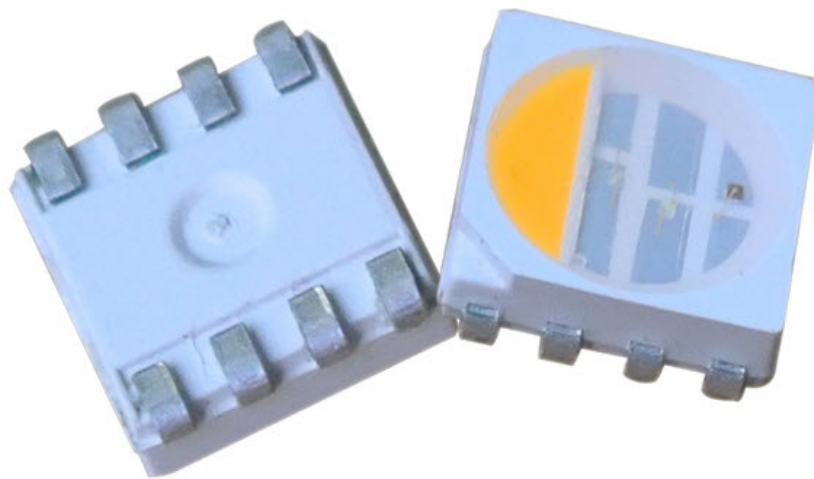


# GESMD5050RGBW

## Datasheet



### Features :

- High Luminous Intensity
- Based on Blue/Green : InGaN, Red : AlGaInP technology
- Wide viewing angle : 120°
- Excellent performance and visibility
- Suitable for all SMT assembly methods
- IR reflow process compatible
- Environmental friendly; RoHS compliance

### Typical Applications :

- Signal and Symbol Luminaire
- Indoor and Outdoor Displays
- Backlighting (illuminated advertising, general lighting)
- Interior Automotive Lighting

## Absolute Maximum Ratings

Absolute maximum ratings ( $T_a=25^{\circ}\text{C}$ )

| Parameter  | Symbol             | Value  | Units              |
|--|--------------------|--|--------------------|
| DC Forward Current   | (R)                | 35   | mA                 |
|  | (T/B)              | 30   |                    |
| Pulse Forward Current ( $t_p \leq 100\mu\text{s}$ , Duty cycle=0.25) | $I_{\text{pulse}}$ | 80   | mA                 |
|  |                    | 100  |                    |
| Reverse Voltage  | $V_R$              | 5  | V                  |
| LED Junction Temperature   | $T_J$              | 115  | $^{\circ}\text{C}$ |
| Operating Temperature  | -                  | -40 ~ +85  | $^{\circ}\text{C}$ |
| Storage Temperature  | -                  | -40 ~ +125   | $^{\circ}\text{C}$ |
| ESD Sensitivity (HBM)  | $V_B$              | 2,000  | V                  |
| Soldering Temperature  | $T_s$              | Reflow Soldering : 255~260 $^{\circ}\text{C}/10\sim 30\text{sec}$<br>Manual Soldering : 350 $^{\circ}\text{C}/3\text{sec}$ |                    |

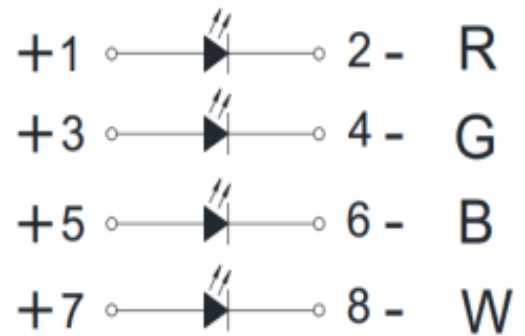
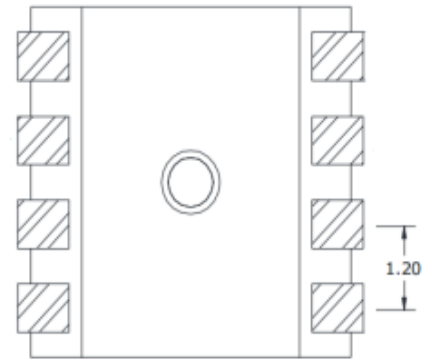
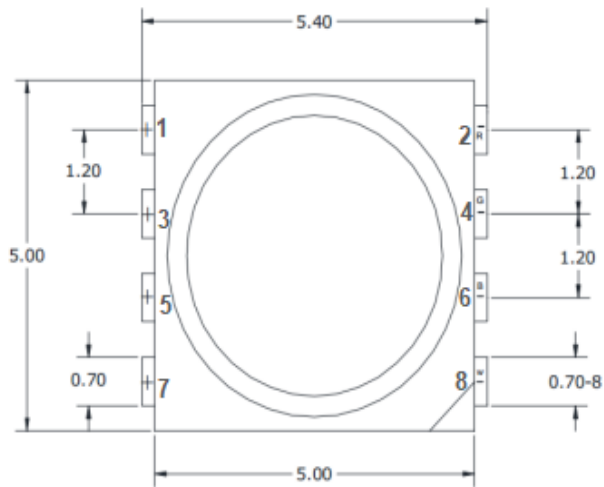
Notes:

- The values are based on 1-die performance.
- \*  $I_{\text{FP}}$  condition: pulse width  $\leq 0.1\text{msec}$  and duty  $\leq 1/10$ .

## Electronic optical Parameters

| M/N: GESMD5050RGBW ( $T_a=25^{\circ}\text{C}$ ) |                   |           |       |       |      |               |      |
|---|-------------------|-----------|-------|-------|------|---------------|------|
| Parameter                                       | Test condition    | Symbol    | Color | Value |      |               | Unit |
|   |                   |           |       | Min   | Typ  | Max           |      |
| Wavelength                                      | $I_f=20\text{mA}$ | $\lambda$ | R     | 620   | 625  | 630           | nm   |
|   |                   |           | G     | 520   | 525  | 530           | nm   |
|   |                   |           | B     | 460   | 465  | 470           | nm   |
| Color Temperature                               | $I_f=20\text{mA}$ | CCT       | WW    | 2800  | 3000 | 3200          | K    |
|   |                   |           | NW    | 4000  | 4500 | 5000          | K    |
|   |                   |           | W     | 6000  | 6500 | 7000          | K    |
|   |                   |           | R     | 1.8   | 2.0  | 2.2           | V    |
| Forward Voltage                                 | $I_f=20\text{mA}$ | VF        | G     | 3.0   | 3.2  | 3.4           | V    |
|   |                   |           | B     | 3.0   | 3.2  | 3.4           | V    |
|   |                   |           | W     | 3.0   | 3.2  | 3.4           | V    |
| Luminous Intensity                              | $I_f=20\text{mA}$ | $I_v$     | R     | 600   | 640  | 720           | mcd  |
|   |                   |           | G     | 1500  | 1650 | 1800          | mcd  |
|   |                   |           | B     | 400   | 450  | 500           | mcd  |
|   |                   |           | WW    | 1950  | 2000 | 2100          | mcd  |
|   |                   |           | NW    | 1980  | 2065 | 2170          | mcd  |
| View angle                                      | $I_f=20\text{mA}$ | $\theta$  | W     | 2000  | 2100 | 2200          | mcd  |
|   |                   |           |       |       | 120  | Deg           |      |
| Reverse current                                 | $I_f=20\text{mA}$ | $I_r$     |       |       | 10   | $\mu\text{A}$ |      |

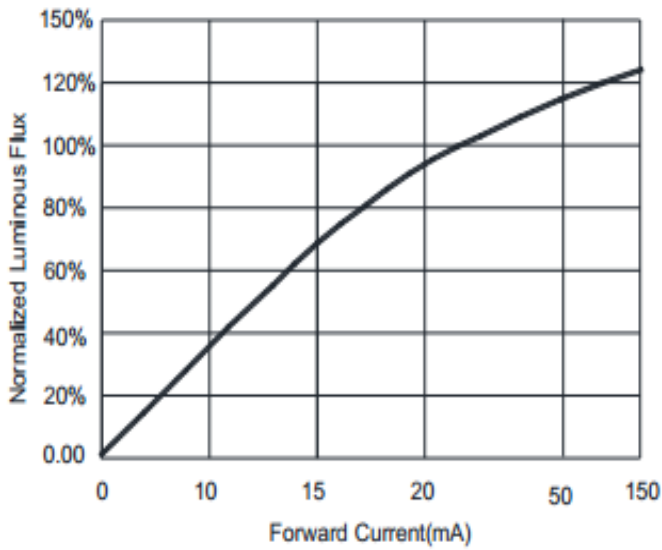
## Mechanical Dimensions



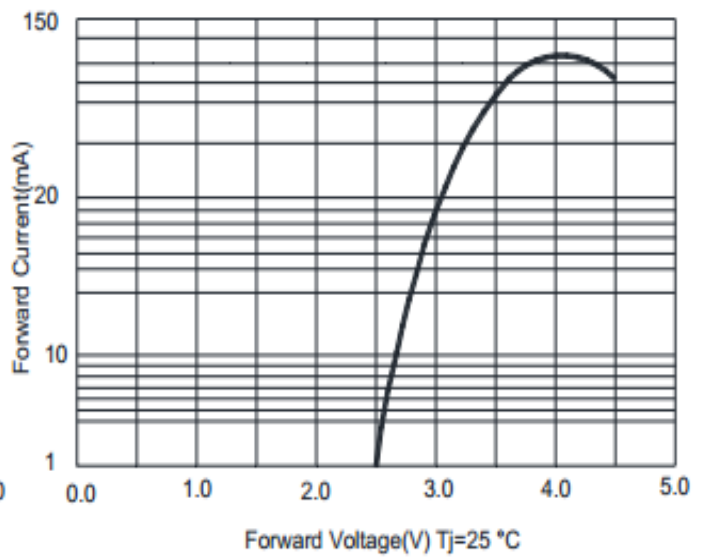
- Notes:  
 1. All dimensions are measured in mm.  
 2. Tolerance :  $\pm 0.2$  mm

# Characteristic Curve

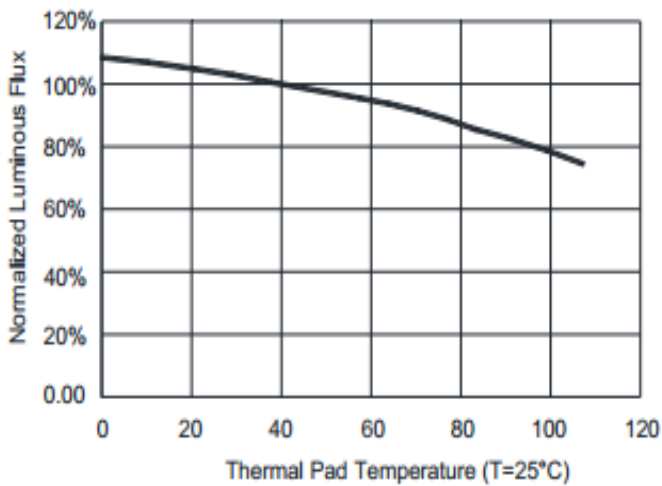
Typical Relative Luminous Flux vs. Forward Current



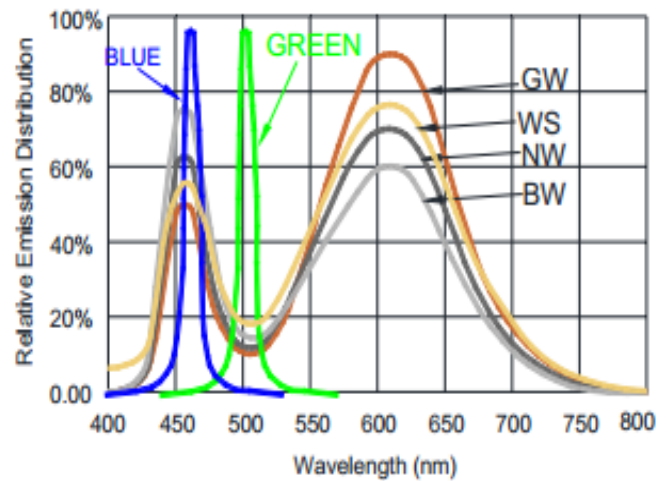
Forward Voltage vs. Forward Current



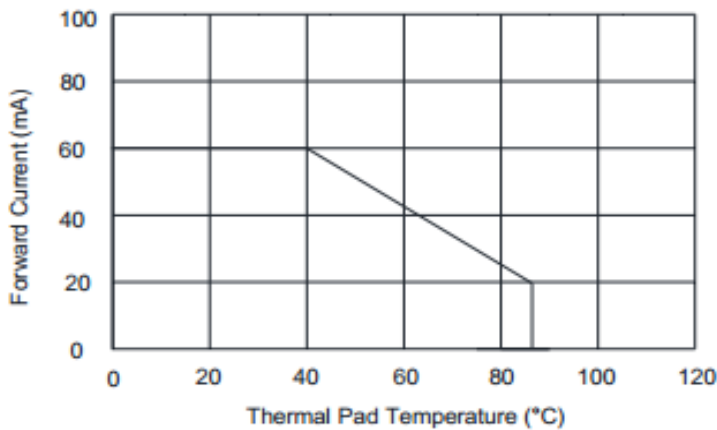
Thermal Pad Temperature vs. Relative Light Output



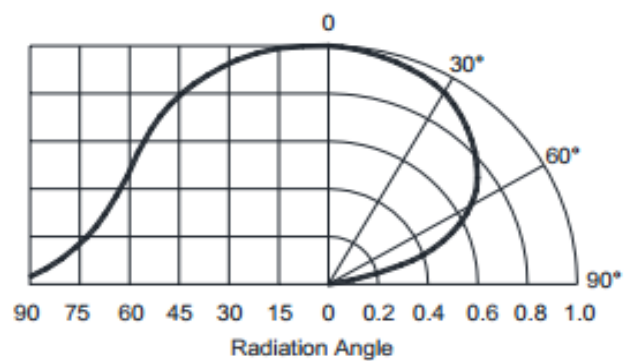
Wavelength Characteristics



Thermal Pad Temperature vs. Forward Current

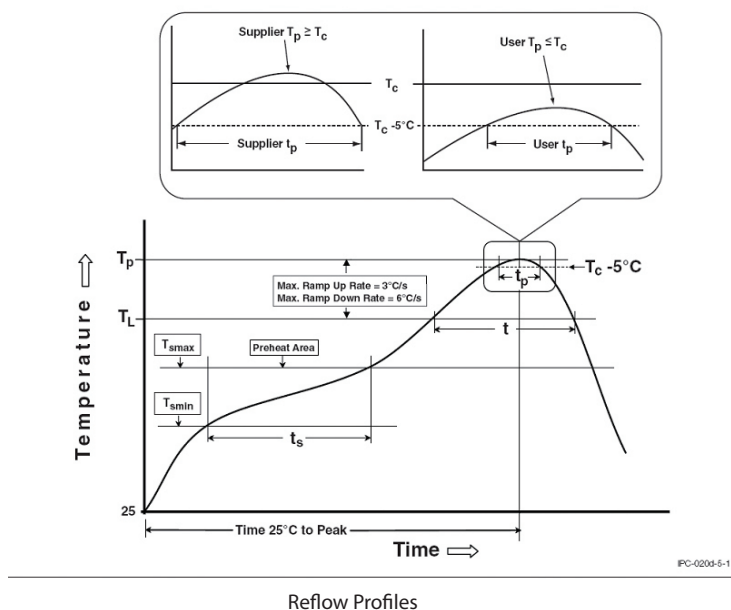


Typical Radiation Pattern 120°



## Reflow Profile

The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



Reflow Profiles

### Classification Reflow Profiles

| Profile Feature  | Pb-Free Assembly |
|--|------------------|
| Preheat & Soak   | 150 °C           |
| Temperature min (T <sub>smin</sub> )   | 200 °C           |
| Temperature max (T <sub>smax</sub> )   | 60-120 seconds   |
| Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )                                   |                  |
| Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )  | 3 °C/second max. |
| Liquidous temperature (T <sub>L</sub> )  | 217 °C           |
| Time at liquidous (t <sub>L</sub> )  | 60-150 seconds   |
| Peak package body temperature (T <sub>p</sub> )*   | 255 °C ~260 °C * |
| Classification temperature (T <sub>c</sub> )   | 260 °C           |
| Time (t <sub>p</sub> )** within 5 °C of the specified classification temperature (T <sub>c</sub> ) | 30** seconds     |
| Average ramp-down rate (T <sub>p</sub> to T <sub>smax</sub> )                                      | 6°C/second max.  |
| Time 25°C to peak temperature  | 8 minutes max.   |

Notes:

- \* Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.
- \*\* Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as a supplier minimum and a user maximum.

## Reliability

| NO . | Test Item                               | Test Condition                       | Remark     |
|------|---|--------------------------------------|------------|
| 1    | Temperature Cycle                       | -40°C~100°C<br>30, 30, mins          | 100 Cycle  |
| 2    | Thermal Shock                           | -40°C~100°C<br>15, 15 mins ≤ 10 sec  | 100 Cycle  |
| 3    | Resistance to Soldering Heat            | T <sub>SOL</sub> =260°C, 30 sec      | 3 times    |
| 4    | Moisture Resistance                     | 25°C~65°C 90% RH<br>24 hrs / 1 cycle | 10 Cycle   |
| 5    | High-Temperature Storage                | T <sub>A</sub> =100°C                | 1,000 hrs  |
| 6    | Humidity Heat Storage                   | T <sub>A</sub> =85°C<br>RH=85%       | 1,000 hrs  |
| 7    | Low-Temperature Storage                 | T <sub>A</sub> =-40°C                | 1,000 hrs  |
| 8    | Operation Life test                     | 25°C                                 | 1,000 hrs  |
| 9    | High Temperature<br>Operation Life test | 85°C                                 | 1,000 hrs  |
| 10   | High Humidity Heat Life Test            | 85°C, 85%RH                          | 1,000 hrs  |
| 11   | ON/OFF Test                             | 30 sec ON, 30 sec OFF                | 1.5W times |

## Failure Criteria

| Item                            | Criteria for Judgment          |                    |
|---------------------------------|--------------------------------|--------------------|
|                                 | Min.                           | Max.               |
| Lumen Maintenance               | 85%                            | -                  |
| $\Delta u'v'$                   | -                              | 0.006              |
| Forward Voltage                 | -                              | Initial Data x 1.1 |
| Reverse Current                 | -                              | 10 $\mu$ A         |
| Resistance to<br>Soldering Heat | No dead lamps or visual damage |                    |

# Product Packaging Information

