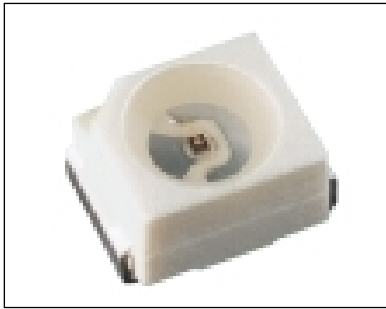




# 1104B Series

Single Color PLCC-2 Bathtub Type  
(High Reliability type, V-Series)

## Product features

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Package                     | PLCC-2 Bathtub Type. Water clear epoxy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| Product features            | <ul style="list-style-type: none"> <li>• Outer Dimension 3.5 x 2.8 x 1.9mm( L x W x H )</li> <li>• Wide operation temperature range<br/>Storage Temperature : -40℃~110℃<br/>Operating Temperature : -40℃~100℃ Operation Guarantee</li> <li>• Ramification of luminosity group sorting. It is possible to have a uniform transmission with little irregularities even when several are lined up.</li> <li>• Systematization of luminosity groups and color tone groups. Unified to a simple standard.</li> <li>• Corresponding to a use requiring high reliability in cars etc...</li> <li>• Spatial distribution characteristics. ( 2θ 1/2 : 120deg)</li> <li>• No lead package and lead-free soldering compatible</li> <li>• RoHS compliant</li> </ul> |  |
| Dominant wavelength         | Blue : 470nm (VUB)<br>Green : 530nm (VUG) , 558nm(VYBG)<br>Yellow-Green : 572nm (VYPY)<br>Yellow : 590nm (VFY)<br>Orange : 605nm (VFA)<br>Red : 626nm (VFR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| Spatial distribution        | 120 deg.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| Die materials               | VUB,VUG : InGaN VYBG, VYPY, VFY, VFA, VFR :AlGaInP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Optical efficiency          | VUB : 4.4 lm/W VFY : 15.0 lm/W<br>VUG : 17.6 lm/W VFA : 15.0 lm/W<br>VYBG : 1.9 lm/W VFR : 13.8 lm/W<br>VYPY : 7.1 lm/W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
| Rank grouping parameter     | Sorted by luminous intensity and wavelength and taped according to rank.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| Assembly methods (customer) | Corresponding to surface mounter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| Soldering methods           | Corresponding to reflow soldering and manual soldering.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
| Taping dimensions           | 2,000pcs(standard) per reel in a 8mm width tape.<br>Reel diameter:Φ180mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| ESD                         | AlInGaP:2kV (HBM) InGaN:1kV (HBM)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |

## Recommended Applications

SW lighting for car indicators, meter panel, car audio and heater control, etc...



## 1104B Series

Single Color PLCC-2 Bathtub Type  
(High Reliability type, V-Series)

### Color Variations and Luminous Intensity

(T<sub>a</sub>=25°C)

| Part No.  | Material | Emitted Color | Lens Color  | Dominant Wavelength |       | Luminous Intensity |      |       | Luminous Flux |       |
|-----------|----------|---------------|-------------|---------------------|-------|--------------------|------|-------|---------------|-------|
|           |          |               |             | $\lambda_d$ (nm)    |       | $I_v$ (mcd)        |      |       | $\Phi_v$ (lm) |       |
|           |          |               |             | TYP.                | $I_F$ | MIN.               | MAX. | $I_F$ | TYP.          | $I_F$ |
| VUB1104B  | InGaN    | Blue          | Water Clear | 470                 | 20    | 33                 | 150  | 20    | 300           | 20    |
| VUG1104B  | InGaN    | Green         |             | 530                 | 20    | 100                | 470  | 20    | 1,200         | 20    |
| VYBG1104B | AlGaInP  |               |             | 558                 | 20    | 8.2                | 33   | 20    | 80            | 20    |
| VYPY1104B | AlGaInP  | Yellow-Green  |             | 572                 | 20    | 47                 | 150  | 20    | 300           | 20    |
| VFY1104B  | AlGaInP  | Yellow        |             | 590                 | 20    | 100                | 330  | 20    | 600           | 20    |
| VFA1104B  | AlGaInP  | Orange        |             | 605                 | 20    | 82                 | 270  | 20    | 600           | 20    |
| VFR1104B  | AlGaInP  | Red           |             | 626                 | 20    | 100                | 330  | 20    | 550           | 20    |

※ Note : The luminous intensity( $I_v$ ) and dominant wavelength( $\lambda_d$ ) above are the setup values of the sorting machine.  
(Tolerance :  $I_v$ ... =10%,  $\lambda_d$ ...  $\pm 1$ nm)

## Absolute Maximum Ratings

(T<sub>a</sub>=25℃)

| Item                             | Symbol            | Absolute Maximum Ratings |        |      |      |      |      |      | Unit |
|----------------------------------|-------------------|--------------------------|--------|------|------|------|------|------|------|
|                                  |                   | VUB                      | VUG    | VYBG | VYPY | VFY  | VFA  | VFR  |      |
| Power Dissipation                | P <sub>d</sub>    | 78                       | 78     | 81   | 81   | 81   | 81   | 81   | mW   |
| Forward Current                  | I <sub>F</sub>    | 20                       | 20     | 30   | 30   | 30   | 30   | 30   | mA   |
| Pulse Forward Current ※1         | I <sub>FRM</sub>  | 50                       | 50     | 100  | 100  | 100  | 100  | 100  | mA   |
| Derating<br>(Ta=72.5℃ or higher) | ΔI <sub>F</sub>   | 0.4 ※2                   | 0.4 ※2 | 0.8  | 0.8  | 0.8  | 0.8  | 0.8  | mA/℃ |
|                                  | ΔI <sub>FRM</sub> | 1.0 ※2                   | 1.0 ※2 | 2.67 | 2.67 | 2.67 | 2.67 | 2.67 | mA/℃ |
| Reverse Voltage                  | V <sub>R</sub>    | 5                        | 5      | 5    | 5    | 5    | 5    | 5    | V    |
| Operating Temperature            | T <sub>opr</sub>  | -40 ~ +100               |        |      |      |      |      |      | ℃    |
| Storage Temperature              | T <sub>stg</sub>  | -40 ~ +110               |        |      |      |      |      |      | ℃    |

※1 I<sub>FRM</sub> Measurement condition : Pulse Width ≤ 1ms., Duty ≤ 1/20.

※2 Temperature Condition: Ta=60℃ or higher.

## Thermal Characteristics

| Item                                                  | Symbol                | Ratings |     |      |      |     |     |     | Unit |
|-------------------------------------------------------|-----------------------|---------|-----|------|------|-----|-----|-----|------|
|                                                       |                       | VUB     | VUG | VYBG | VYPY | VFY | VFA | VFR |      |
| Junction Temperature (MAX.)                           | T <sub>j</sub>        | 110     | 110 | 110  | 110  | 110 | 110 | 110 | ℃    |
| Thermal Resistance (TYP.)<br>(Junction/ Solder Point) | R <sub>(th J-S)</sub> | 350     | 350 | 400  | 400  | 400 | 400 | 400 | ℃/W  |

※R<sub>th(J-S)</sub> Measurement Condition / Substrate: FR4(t=1.6mm) Pattern Size: 16mm<sup>2</sup>.



## 1104B Series

Single Color PLCC-2 Bathtub Type  
(High Reliability type, V-Series)

### Electro-Optical Characteristics (VUB,VUG)

(T<sub>a</sub>=25°C)

| Item                     | Conditions           | Symbol            | Characteristic Ratings |     |     | Unit |
|--------------------------|----------------------|-------------------|------------------------|-----|-----|------|
|                          |                      |                   |                        | VUB | VUG |      |
| Forward Voltage          | I <sub>F</sub> =20mA | V <sub>F</sub>    | TYP.                   | 3.4 | 3.4 | V    |
|                          |                      |                   | MAX.                   | 3.9 | 3.9 |      |
| Reverse Current          | V <sub>R</sub> =5V   | I <sub>R</sub>    | MAX.                   | 100 | 100 | μA   |
| Peak Wavelength          | I <sub>F</sub> =20mA | λ <sub>p</sub>    | TYP.                   | 465 | 517 | nm   |
| Dominant Wavelength      | I <sub>F</sub> =20mA | λ <sub>d</sub>    | TYP.                   | 470 | 530 | nm   |
| Spectral Line Half Width | I <sub>F</sub> =20mA | Δλ                | TYP.                   | 26  | 35  | nm   |
| Half Intensity Angle     | I <sub>F</sub> =20mA | 2θ <sub>1/2</sub> | TYP.                   | 120 | 120 | deg. |

※Note: The dominant wave length (λ<sub>d</sub>) above is the setup value of the sorting machine.  
(Tolerance: λ<sub>d</sub> ...± 1nm)

### Electro-Optical Characteristics (VYBG, VYPY, VFY, VFA, VFR)

(T<sub>a</sub>=25°C)

| Item                     |                      | Symbol         | Characteristic Rating |      |      |     |     |     | Unit |
|--------------------------|----------------------|----------------|-----------------------|------|------|-----|-----|-----|------|
|                          | Conditions           |                |                       | VYBG | VYPY | VFY | VFA | VFR |      |
| Forward Voltage          | I <sub>F</sub> =20mA | V <sub>F</sub> | TYP.                  | 2.1  | 2.1  | 2.0 | 2.0 | 2.0 | V    |
|                          |                      |                | MAX.                  | 2.5  | 2.5  | 2.5 | 2.5 | 2.5 |      |
| Reverse Current          | V <sub>R</sub> =5V   | I <sub>R</sub> | MAX.                  | 100  | 100  | 100 | 100 | 100 | μ A  |
| Peak Wavelength          | I <sub>F</sub> =20mA | λ p            | TYP.                  | 565  | 575  | 592 | 609 | 635 | nm   |
| Dominant Wavelength      | I <sub>F</sub> =20mA | λ d            | TYP.                  | 558  | 572  | 590 | 605 | 626 | nm   |
| Spectral Line Half Width | I <sub>F</sub> =20mA | Δ λ            | TYP.                  | 15   | 15   | 15  | 15  | 15  | nm   |
| Half Intensity Angle     | I <sub>F</sub> =20mA | 2 θ 1/2        | TYP.                  | 120  | 120  | 120 | 120 | 120 | deg. |

※Note: The dominant wave length (λ<sub>d</sub>) above is the setup value of the sorting machine.  
(Tolerance: λ<sub>d</sub> ...± 1nm)

## Luminous Intensity Rank

(T<sub>a</sub>=25℃)

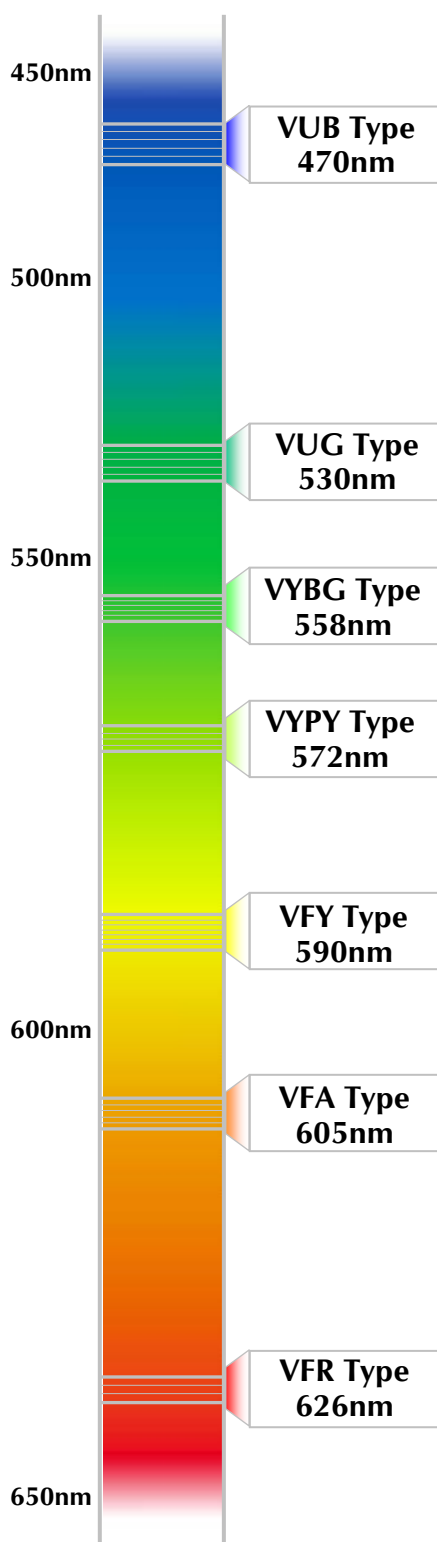
### Standard Chart(Unit: mcd)

| Rank | I <sub>v</sub> (mcd) |       | VUB                  | VUG | VYBG | VYPY | VFY | VFA | VFR |
|------|----------------------|-------|----------------------|-----|------|------|-----|-----|-----|
|      | MIN.                 | MAX.  | I <sub>F</sub> =20mA |     |      |      |     |     |     |
| A9   | 4.7                  | 5.6   |                      |     |      |      |     |     |     |
| AX   | 5.6                  | 6.8   |                      |     |      |      |     |     |     |
| AY   | 6.8                  | 8.2   |                      |     |      |      |     |     |     |
| AZ   | 8.2                  | 10    |                      |     | AZ   |      |     |     |     |
| B1   | 10                   | 12    |                      |     |      |      |     |     |     |
| B2   | 12                   | 15    |                      |     |      |      |     |     |     |
| B3   | 15                   | 18    |                      |     |      |      |     |     |     |
| B4   | 18                   | 22    |                      |     |      |      |     |     |     |
| B5   | 22                   | 27    |                      |     |      |      |     |     |     |
| B6   | 27                   | 33    |                      |     | B6   |      |     |     |     |
| B7   | 33                   | 39    | B7                   |     |      |      |     |     |     |
| B8   | 39                   | 47    |                      |     |      |      |     |     |     |
| B9   | 47                   | 56    |                      |     |      | B9   |     |     |     |
| BX   | 56                   | 68    |                      |     |      |      |     |     |     |
| BY   | 68                   | 82    |                      |     |      |      |     |     |     |
| BZ   | 82                   | 100   |                      |     |      |      | BZ  |     |     |
| C1   | 100                  | 120   | C1                   | C1  |      | C2   | C1  | C1  | C1  |
| C2   | 120                  | 150   | C2                   |     |      | C2   |     |     |     |
| C3   | 150                  | 180   |                      |     |      |      |     |     |     |
| C4   | 180                  | 220   |                      |     |      |      |     |     |     |
| C5   | 220                  | 270   |                      |     |      |      |     | C5  |     |
| C6   | 270                  | 330   |                      |     |      |      | C6  |     | C6  |
| C7   | 330                  | 390   |                      |     |      |      |     |     |     |
| C8   | 390                  | 470   |                      | C8  |      |      |     |     |     |
| C9   | 470                  | 560   |                      |     |      |      |     |     |     |
| CX   | 560                  | 680   |                      |     |      |      |     |     |     |
| CY   | 680                  | 820   |                      |     |      |      |     |     |     |
| CZ   | 820                  | 1,000 |                      |     |      |      |     |     |     |

※ Limited width of luminous intensity rank is from Min.4 rank width.

## Color Tone Groups (λd)

( unit: nm )  
Tolerance: +/-1nm



### VUB Type (I<sub>F</sub>=20mA)

|      | A     | B     | C     | D     | E     |
|------|-------|-------|-------|-------|-------|
| MIN. | 460.0 | 464.0 | 468.0 | 472.0 | 476.0 |
| MAX. | 464.0 | 468.0 | 472.0 | 476.0 | 480.0 |

### VUG Type (I<sub>F</sub>=20mA)

|      | A     | B     | C     | D     | E     |
|------|-------|-------|-------|-------|-------|
| MIN. | 515.0 | 520.0 | 525.0 | 530.0 | 535.0 |
| MAX. | 520.0 | 525.0 | 530.0 | 535.0 | 540.0 |

### VYBG Type (I<sub>F</sub>=20mA)

|      | A     | B     | C     | D     | E     |
|------|-------|-------|-------|-------|-------|
| MIN. | 552.0 | 555.0 | 558.0 | 561.0 | 564.0 |
| MAX. | 555.0 | 558.0 | 561.0 | 564.0 | 567.0 |

### VYPY Type (I<sub>F</sub>=20mA)

|      | A     | B     | C     | D     |
|------|-------|-------|-------|-------|
| MIN. | 567.0 | 570.0 | 573.0 | 576.0 |
| MAX. | 570.0 | 573.0 | 576.0 | 579.0 |

### VFY Type (I<sub>F</sub>=20mA)

|      | A     | B     | C     | D     | E     | F     | G     |
|------|-------|-------|-------|-------|-------|-------|-------|
| MIN. | 577.0 | 580.0 | 583.0 | 586.0 | 589.0 | 592.0 | 595.0 |
| MAX. | 580.0 | 583.0 | 586.0 | 589.0 | 592.0 | 595.0 | 598.0 |

### VFA Type (I<sub>F</sub>=20mA)

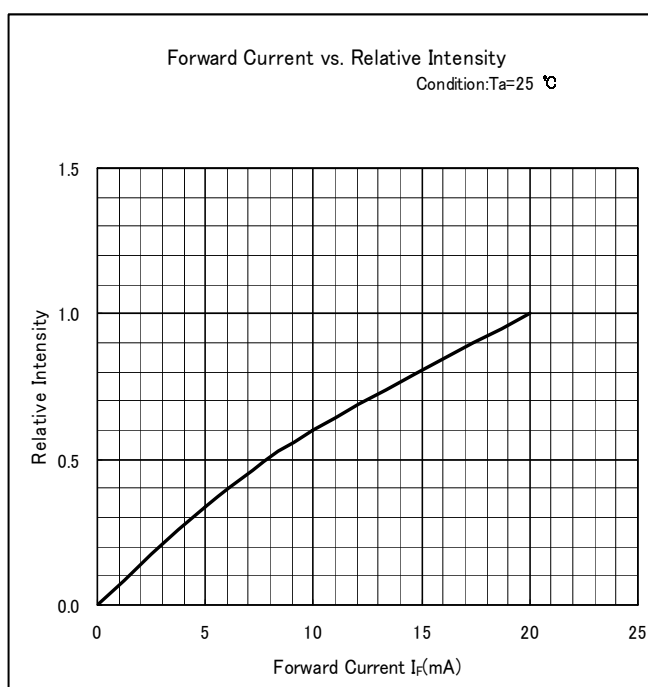
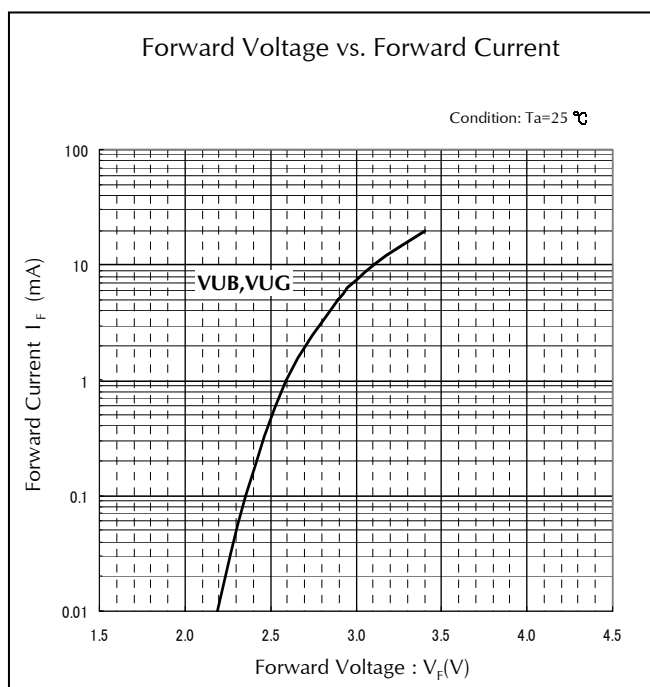
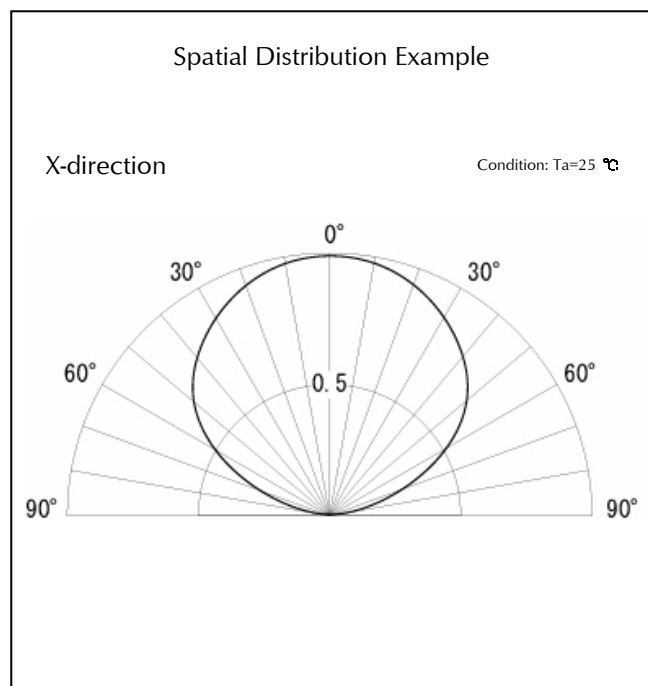
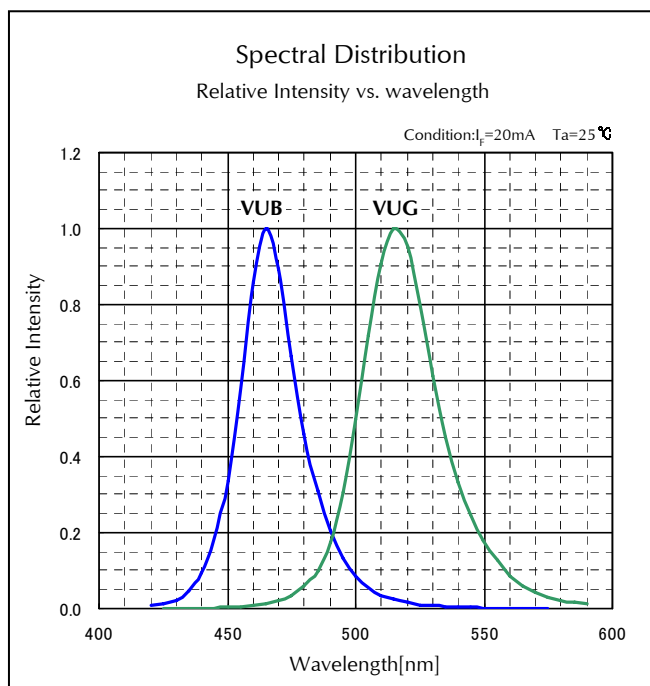
|      | A     | B     | C     | D     | E     |
|------|-------|-------|-------|-------|-------|
| MIN. | 597.0 | 600.0 | 603.0 | 606.0 | 609.0 |
| MAX. | 600.0 | 603.0 | 606.0 | 609.0 | 612.0 |

### VFR Type (I<sub>F</sub>=20mA)

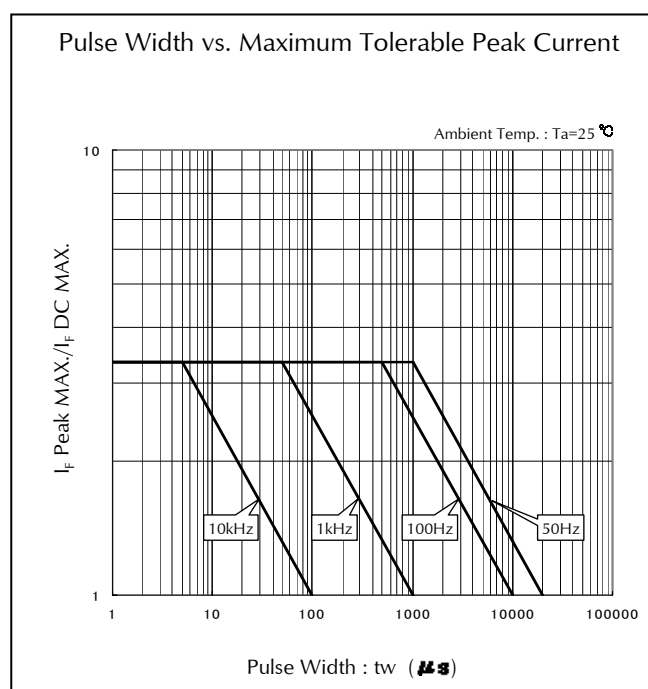
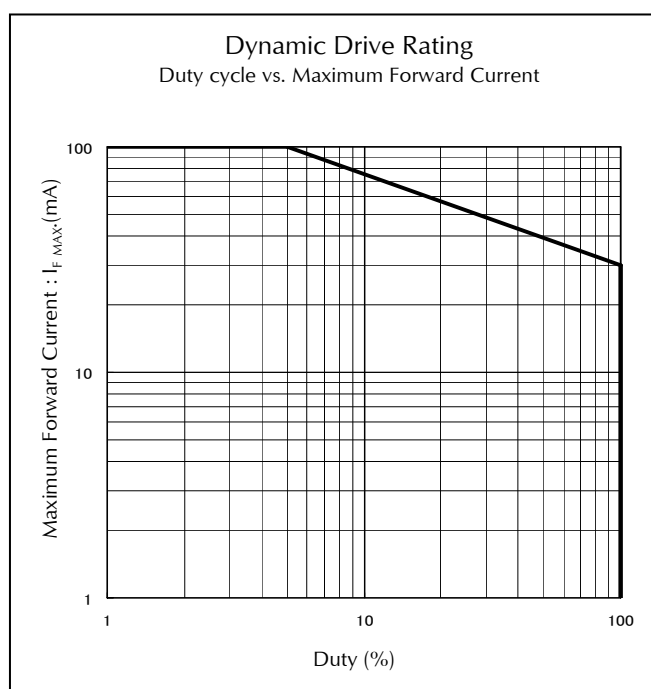
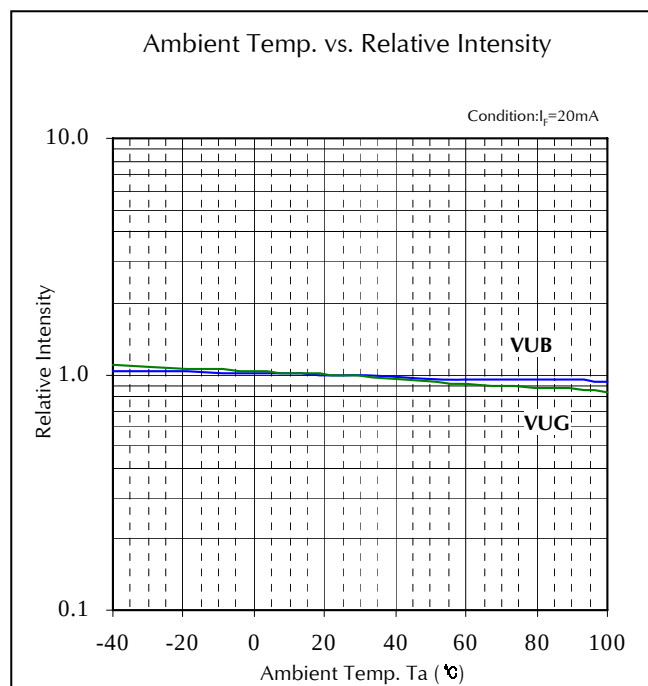
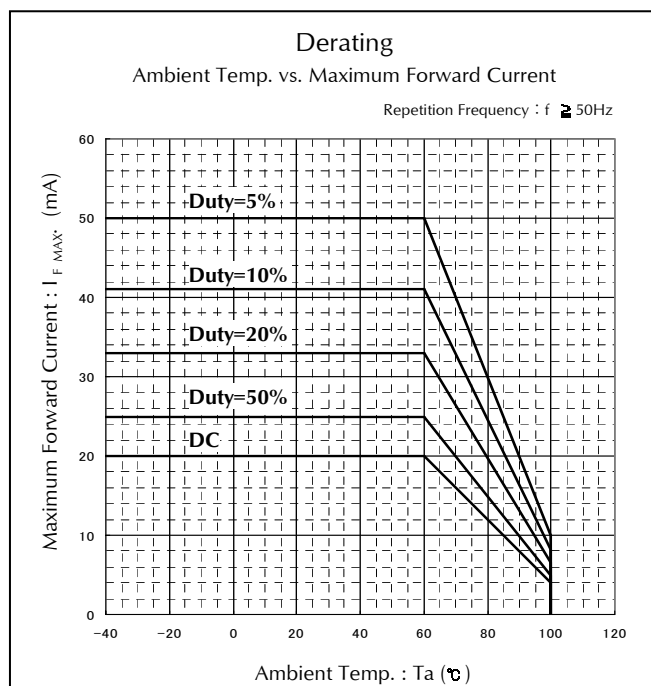
|      | A     | B     | C     |
|------|-------|-------|-------|
| MIN. | 620.0 | 626.0 | 632.0 |
| MAX. | 626.0 | 632.0 | 638.0 |

※ Limited width of luminous intensity rank is from Min.5 to Min.6 rank width.  
(It changes with product.)

## Characteristic Graph (VUB,VUG)

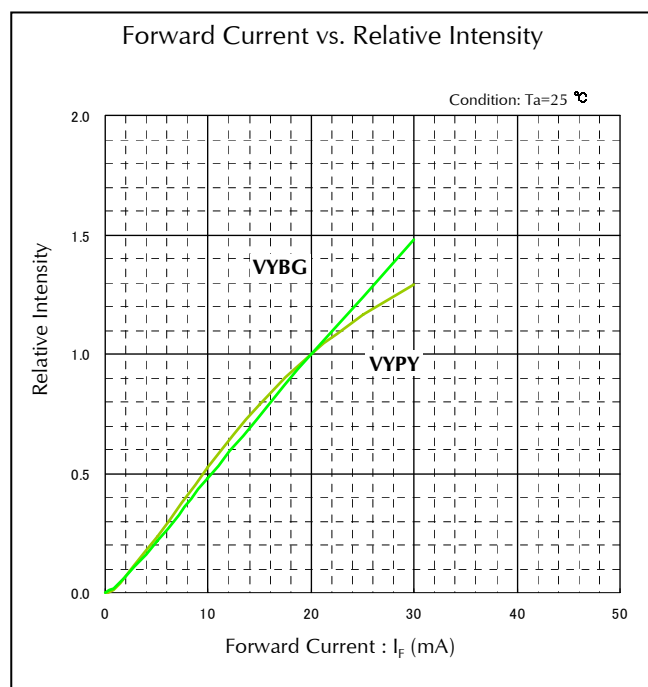
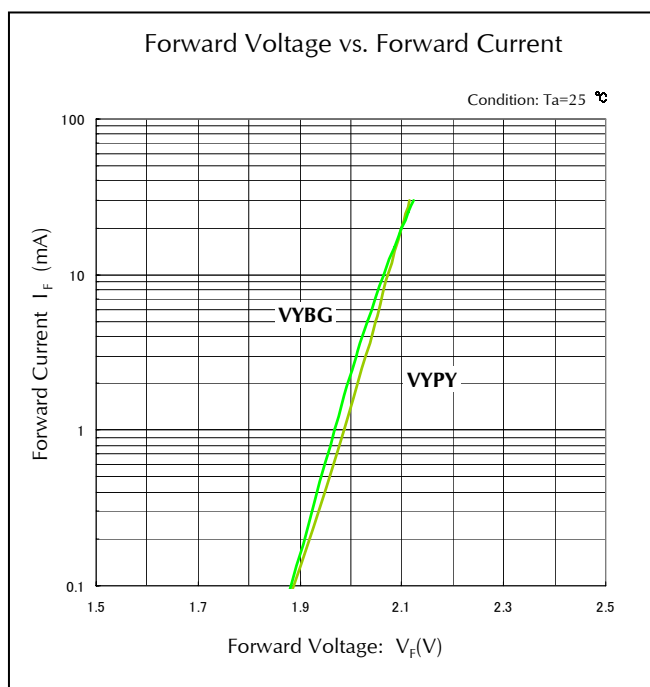
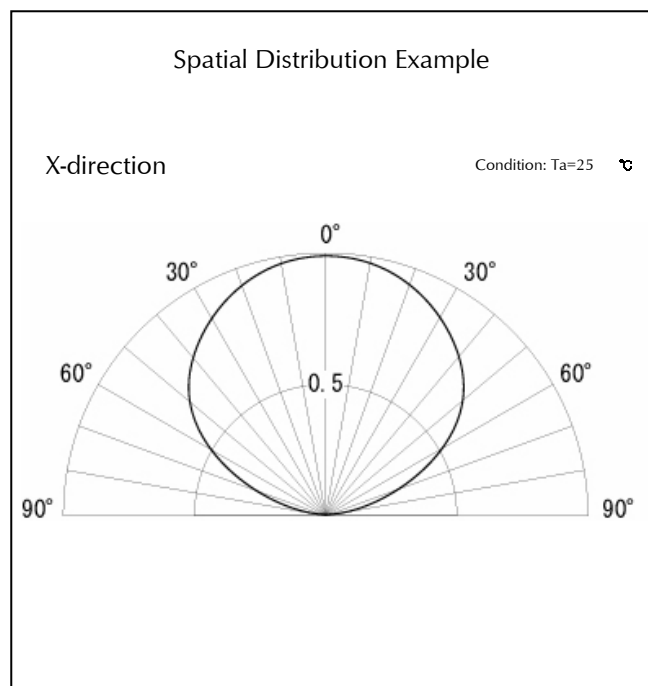
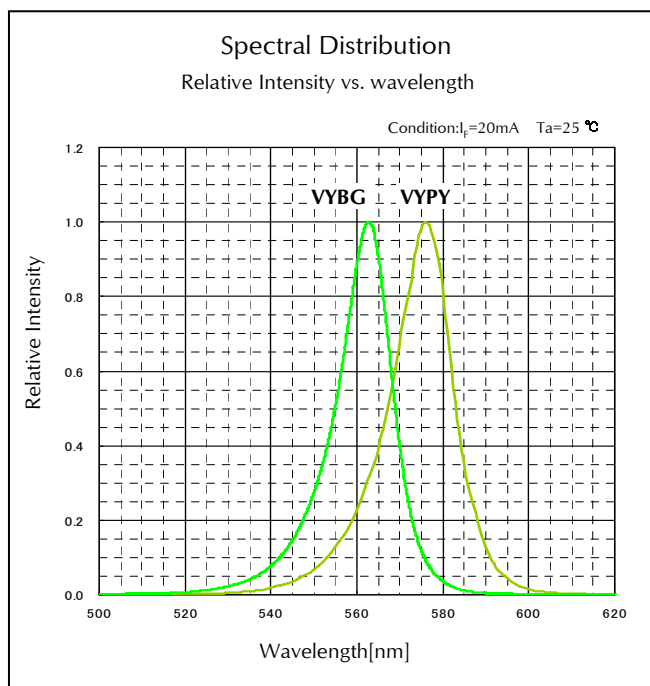


## Characteristics Chart(VUB,VUG)

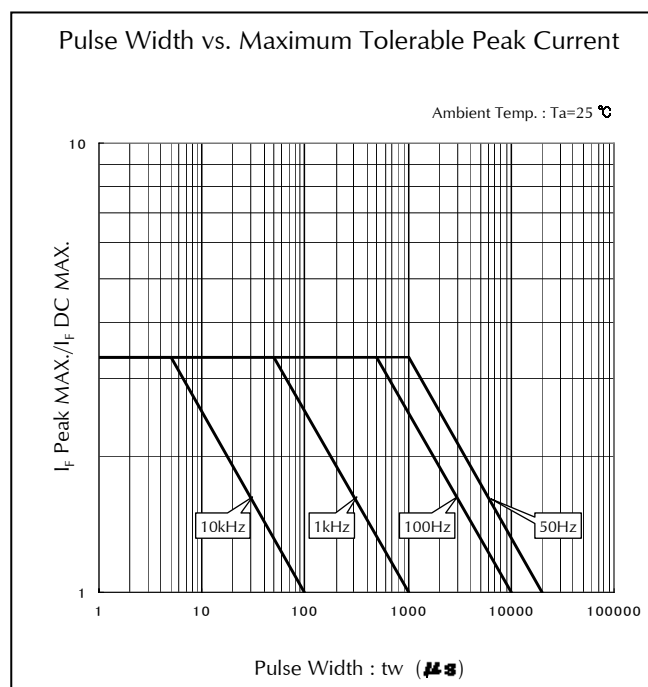
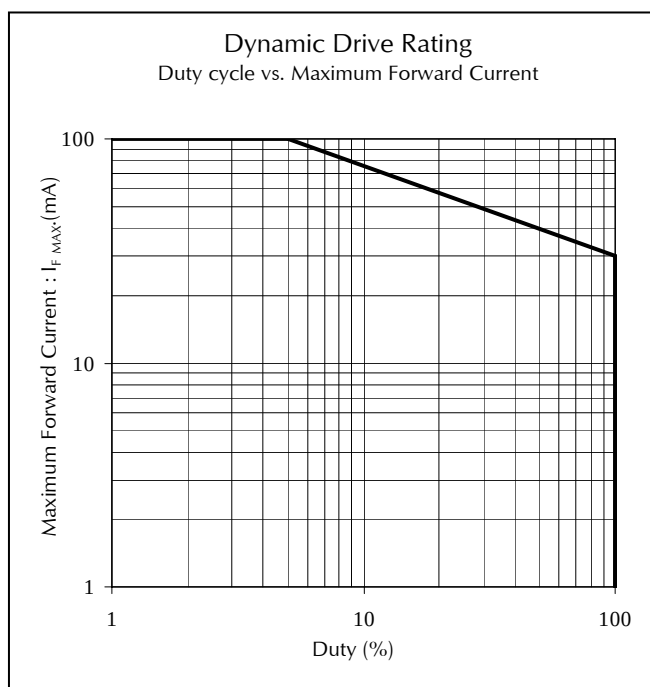
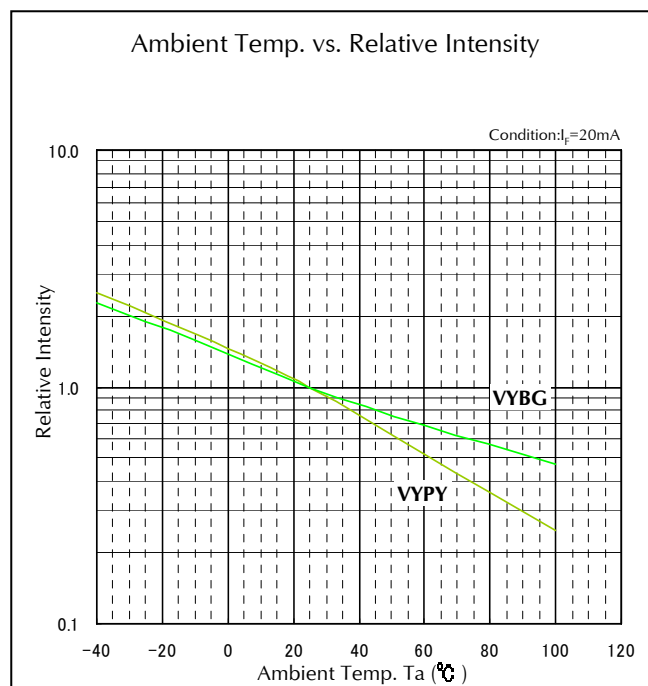
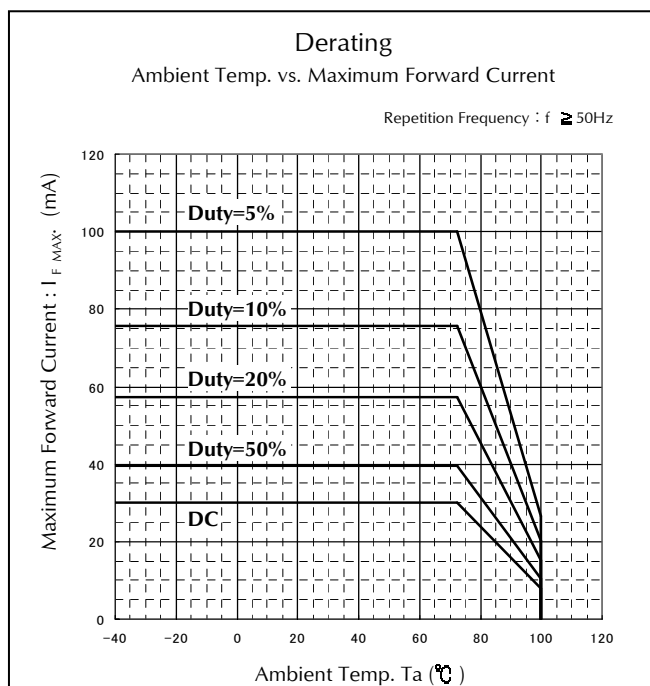




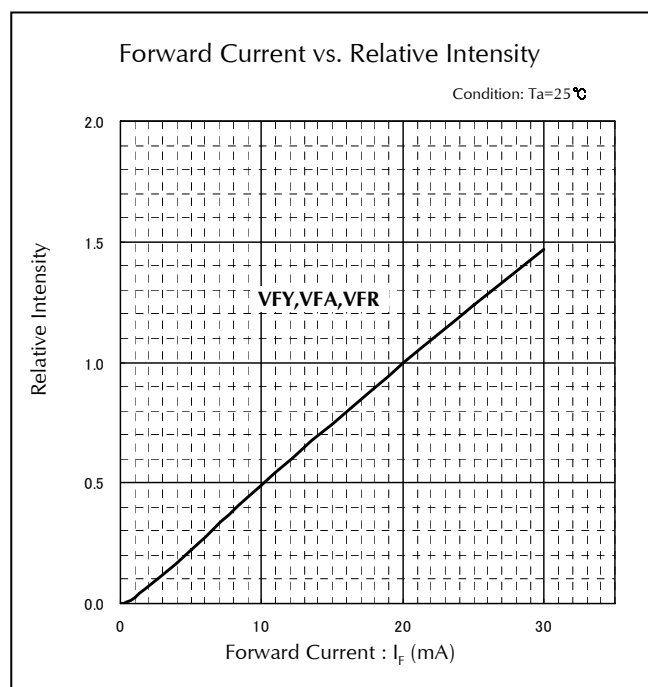
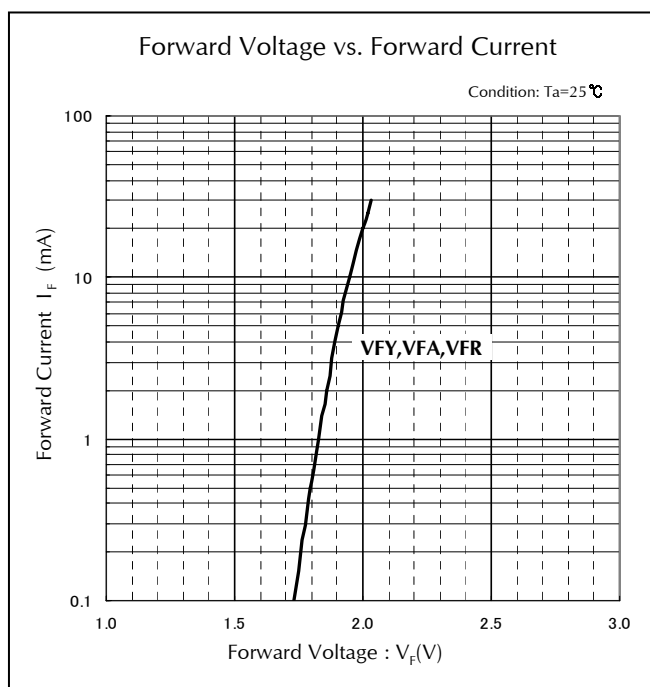
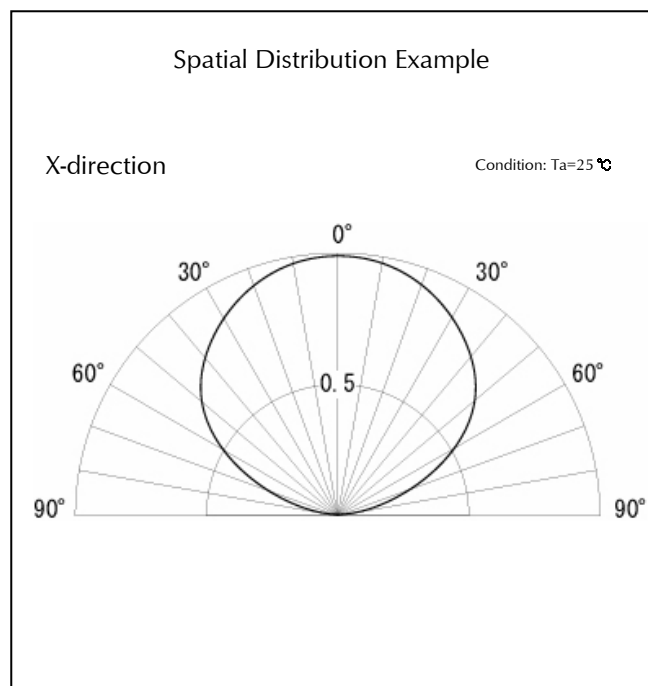
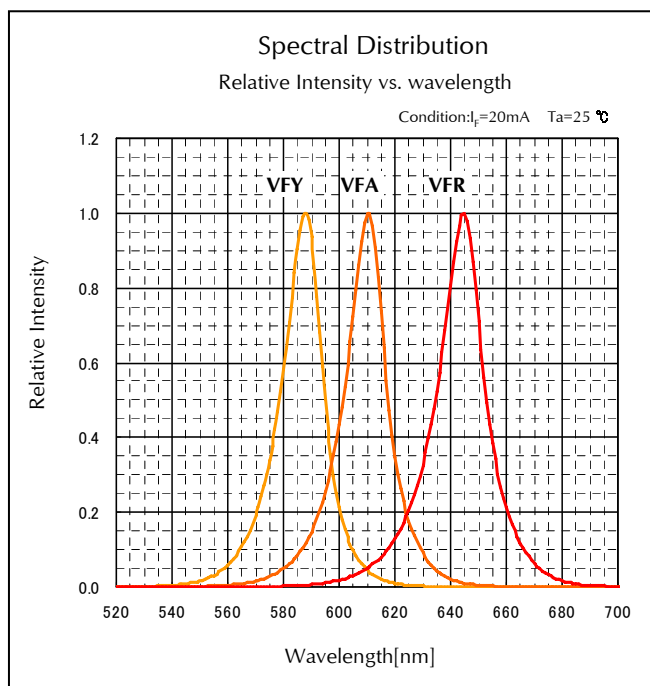
## Characteristics Chart(VYBG,VYPY)



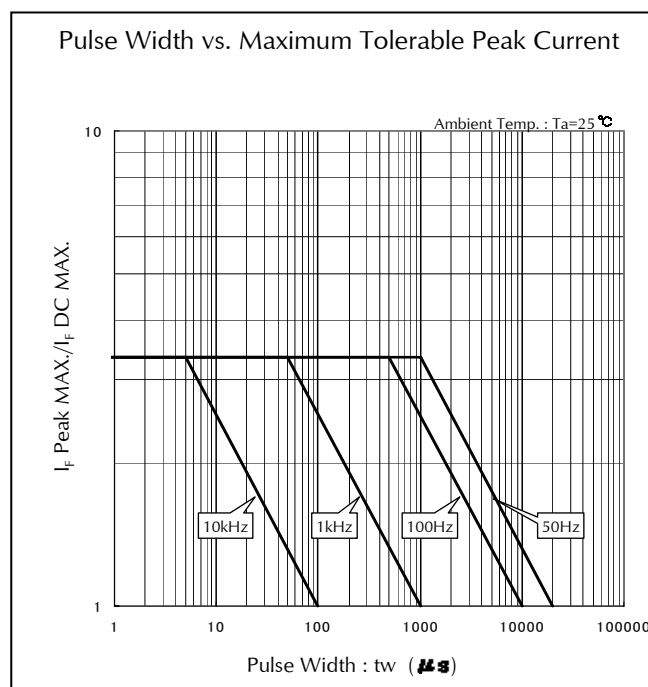
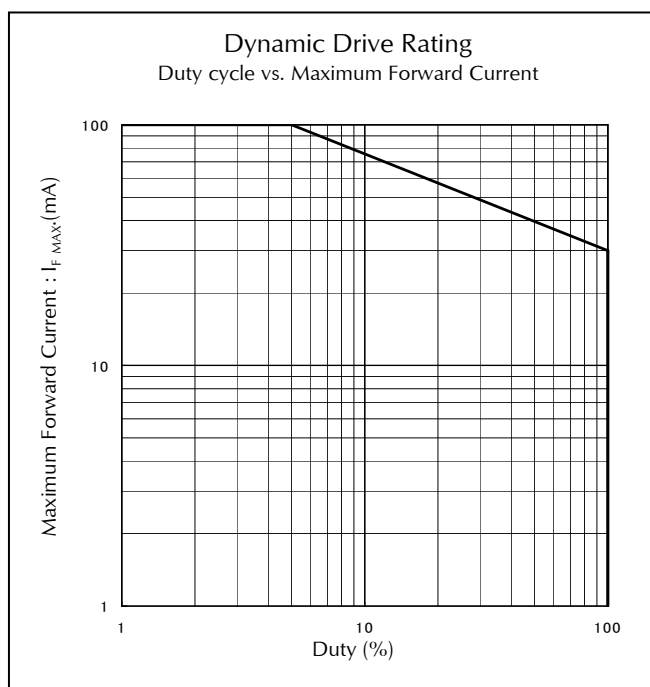
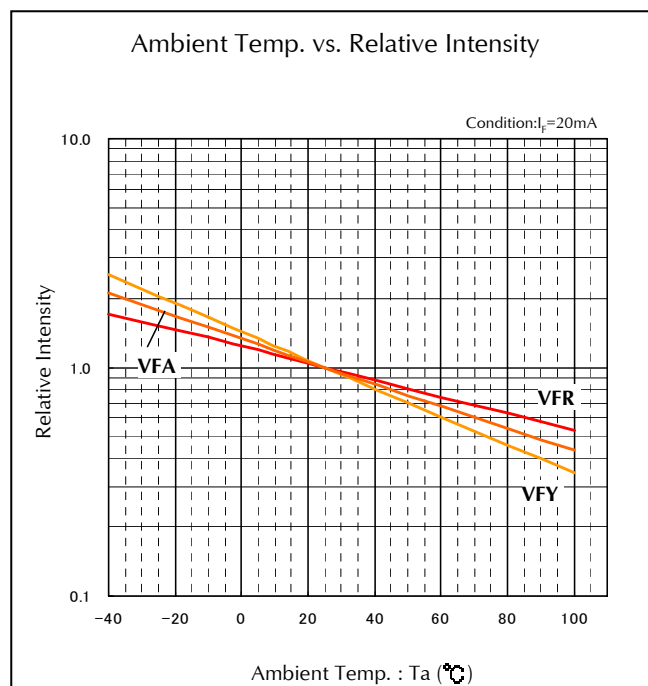
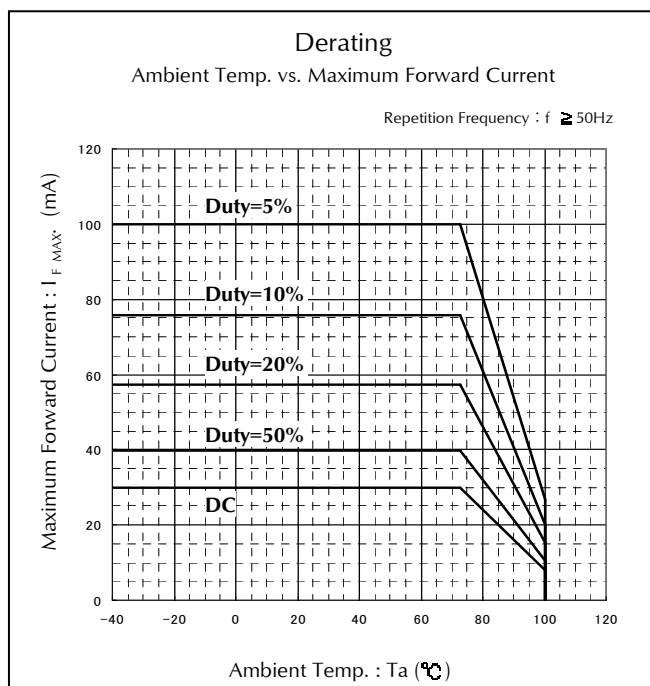
## Characteristics Chart(VYBG,VYPY)



## Characteristics Chart(VFY,VFA,VFR)



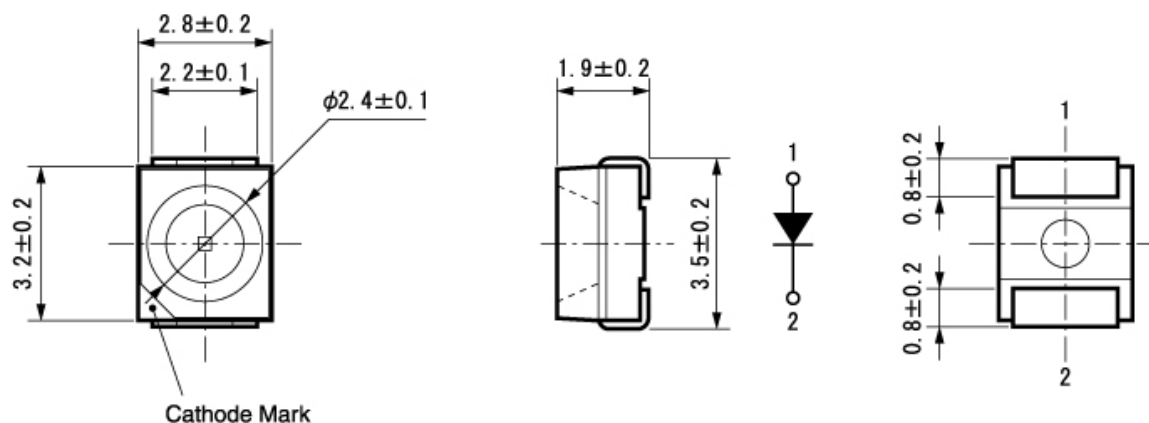
## Characteristics Chart(VFY,VFA,VFR)



## Package Dimensions

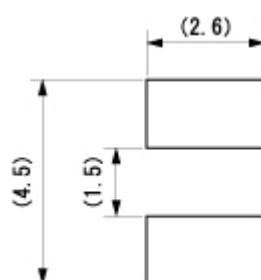
(Unit: mm)

Weight: (36.30)mg



## Recommended Soldering Pattern

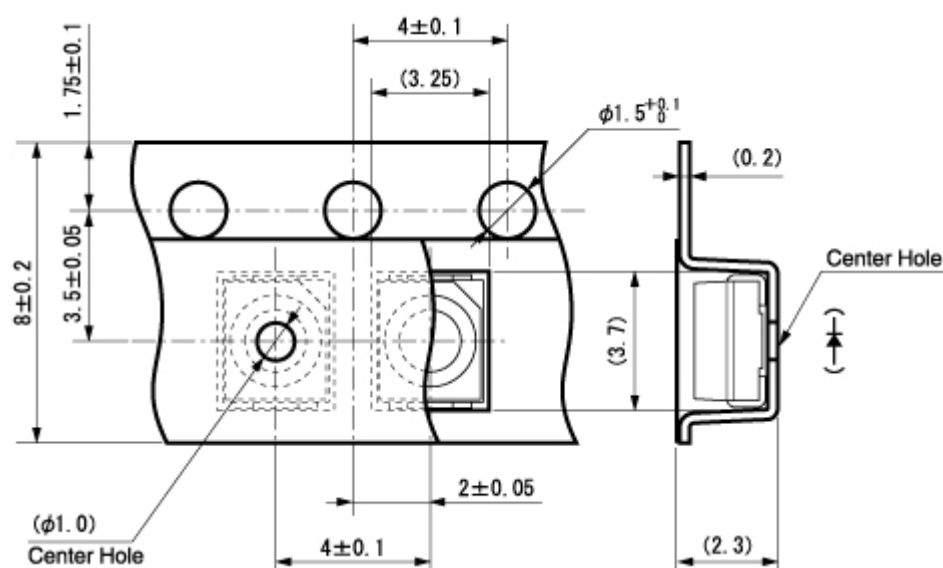
(Unit: mm)



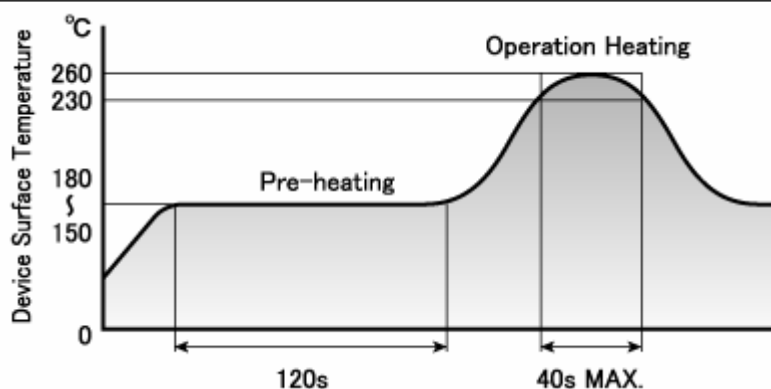
## Taping Specification

(Unit: mm)

Quantity: 2,000pcs/ reel (standard)



## Reflow Soldering Conditions



- 1) The above profile temperature gives the maximum temperature of the LED resin surface. Please set the temperature so as to avoid exceeding this range.
- 2) Total times of reflow soldering process shall be no more than 2 times. When the second reflow soldering process is performed, intervals between the first and second reflow should be short as possible (while allowing some time for the component to return to normal temperature after the first reflow) in order to prevent the LED from absorbing moisture.
- 3) Temperature fluctuation to the LED during the pre-heating process shall be minimized. (6°C maximum)

## Manual Soldering Conditions

|                              |        |        |
|------------------------------|--------|--------|
| Iron tip temp.               | 350 °C | (MAX.) |
| Soldering time and frequency | 3 s    | (MAX.) |
|                              | 1 time | (MAX.) |

## Special Notice to Customers Using the Products and Technical Information Shown in This Data Sheet

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- 1) The technical information shown in the data sheets are limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license.
- 2) For the purpose of product improvement, the specifications, characteristics and technical data described in the data sheets are subject to change without prior notice. Therefore it is recommended that the most updated specifications be used in your design.
- 3) When using the products described in the data sheets, please adhere to the maximum ratings for operating voltage, heat dissipation characteristics, and other precautions for use. We are not responsible for any damage which may occur if these specifications are exceeded.
- 4) The products described in the data sheets are made to be used in standard electronic applications such as office automation appliances, communication devices, audio visual, home appliances, and measuring instruments.
- 5) If the products in the data sheets are to be used for purposes other than the above which requires high level reliability and safety where failure and or malfunction of the product may cause death or other serious effects on the human body such as airplane, space activity, transportation, medical, nuclear), please contact our sales personnel.
- 6) In order to export the products or technologies described in this data sheet which are under the "Foreign Exchange and Foreign Trade Control Law," it is necessary to first obtain an export permit from the Japanese government.
- 7) No part of this data sheet may be reprinted or reproduced without prior written permission from Stanley Electric Co., Ltd.
- 8) The most updated edition of this data sheet can be obtained from the address below:  
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