



# 5353K Series

Single Color Rectangular Shape Type

## Features

|                         |                                                                                                                                                                                                                                                                                                                         |  |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Package                 | 5 × 5 Rectangular shape type,<br>MBG,MPG : Green Surface Diffused epoxy<br>MPY,MAY : Yellow Surface Diffused epoxy<br>MAA : Orange Surface Diffused epoxy<br>MVR,BR,MPR : Red Surface Diffused epoxy                                                                                                                    |  |
| Product features        | <ul style="list-style-type: none"> <li>• Outer Dimension 5 × 5 Rectangular shape type</li> <li>• Operation temperature range.<br/>               Storage Temperature : -30°C~100°C<br/>               Operating Temperature : -30°C~85°C</li> <li>• Lead-free soldering compatible</li> <li>• RoHS compliant</li> </ul> |  |
| Dominant wavelength     | Green : 558nm (MBG)<br>567nm (MPG)<br>Yellow Green : 572nm (MPY)<br>Yellow : 590nm (MAY)<br>Orange : 606nm (MAA)<br>Red : 624nm (MVR)<br>647nm (BR)<br>630nm (MPR)                                                                                                                                                      |  |
| Half Intensity Angle    | MBG, MVR : 130 deg.,<br>MPY : 142 deg.,<br>MAA : 136 deg.,<br>MPG : 128 deg.<br>MAY : 134 deg.<br>BR,MPR : 140 deg.                                                                                                                                                                                                     |  |
| Die materials           | MBG, MPG, MPY, MPR : GaP<br>MAY, MAA, MVR : GaAsP<br>BR : GaAlAs                                                                                                                                                                                                                                                        |  |
| Rank grouping parameter | Sorted by luminous intensity per rank taping                                                                                                                                                                                                                                                                            |  |
| Soldering methods       | TTW (Through The Wave) soldering and manual soldering                                                                                                                                                                                                                                                                   |  |
| ESD                     | More than 2kV(HBM)                                                                                                                                                                                                                                                                                                      |  |
| Packing                 | Bulk : 200pcs(MIN.)                                                                                                                                                                                                                                                                                                     |  |

## Recommended Applications

Amusement Equipment, Electric Household Appliances, OA/FA, Other General Applications

## Color and Luminous Intensity

(Ta=25°C)

| Part No. | Material | Emitted Color | Lens Color |                  | Dominant Wavelength |                | Luminous Intensity |      |                |
|----------|----------|---------------|------------|------------------|---------------------|----------------|--------------------|------|----------------|
|          |          |               |            |                  | $\lambda$ d (nm)    |                | Iv (mcd)           |      |                |
|          |          |               |            |                  | TYP.                | I <sub>F</sub> | MIN.               | TYP. | I <sub>F</sub> |
| MBG5353K | GaP      | Green         | Green      | Surface Diffused | 558                 | 20             | 0.5                | 1.0  | 20             |
| MPG5353K | GaP      | Green         |            |                  | 567                 | 20             | 1.5                | 3.0  | 20             |
| MPY5353K | GaP      | Yellow Green  | Yellow     |                  | 572                 | 20             | 2.0                | 4.0  | 20             |
| MAY5353K | GaAsP    | Yellow        |            |                  | 590                 | 20             | 1.2                | 2.4  | 20             |
| MAA5353K | GaAsP    | Orange        | Orange     |                  | 606                 | 20             | 1.2                | 2.4  | 20             |
| MVR5353K | GaAsP    | Red           | Red        |                  | 624                 | 20             | 1.2                | 2.4  | 20             |
| BR5353K  | GaAlAs   | Red           |            |                  | 647                 | 20             | 1.5                | 3.0  | 20             |
| MPR5353K | GaP      | Red           |            |                  | 630                 | 10             | 0.3                | 0.5  | 10             |

# Absolute Maximum Ratings

(Ta=25°C)

| Item                            | Symbol       | Absolute Maximum Ratings |      |      |      |      |      |      |      | Unit  |
|---------------------------------|--------------|--------------------------|------|------|------|------|------|------|------|-------|
|                                 |              | MBG                      | MPG  | MPY  | MAY  | MAA  | MVR  | BR   | MPR  |       |
| Power Dissipation               | $P_d$        | 70                       | 70   | 85   | 85   | 70   | 75   | 100  | 75   | mW    |
| Forward Current                 | $I_F$        | 25                       | 25   | 30   | 30   | 25   | 30   | 50   | 30   | mA    |
| Pulse Forward Current ※1        | $I_{FRM}$    | 60                       | 60   | 75   | 75   | 60   | 75   | 300  | 75   | mA    |
| Derating<br>(Ta=25°C or higher) | $\Delta I_F$ | 0.33                     | 0.33 | 0.40 | 0.40 | 0.33 | 0.40 | 0.67 | 0.40 | mA/°C |
| Reverse Voltage                 | $V_R$        | 4                        | 4    | 4    | 4    | 4    | 4    | 4    | 4    | V     |
| Operating Temperature           | $T_{opr}$    | -30~+85                  |      |      |      |      |      |      |      | °C    |
| Storage Temperature             | $T_{stg}$    | -30~+100                 |      |      |      |      |      |      |      | °C    |

※1  $I_{FRM}$  Measurement condition : Pulse Width  $\leq 1ms.$ , Duty  $\leq 1/20$ .

# Electro-Optical Characteristics(MBG,MPG,MPY,MAY,MAA,MVR,BR) (Ta=25°C)

| Item                     | Conditions           | Symbol         | Characteristics |     |     |     |     |     |     |     | Unit |
|--------------------------|----------------------|----------------|-----------------|-----|-----|-----|-----|-----|-----|-----|------|
|                          |                      |                |                 | MBG | MPG | MPY | MAY | MAA | MVR | BR  |      |
| Forward Voltage          | I <sub>F</sub> =20mA | V <sub>F</sub> | TYP.            | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.0 | 1.7 | V    |
|                          |                      |                | MAX.            | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.0 |      |
| Reverse Current          | V <sub>R</sub> =4V   | I <sub>R</sub> | MAX.            | 20  | 20  | 20  | 20  | 20  | 20  | 100 | μ A  |
| Peak Wavelength          | I <sub>F</sub> =20mA | λ <sub>p</sub> | TYP.            | 555 | 560 | 570 | 580 | 605 | 630 | 660 | nm   |
| Dominant Wavelength      | I <sub>F</sub> =20mA | λ <sub>d</sub> | TYP.            | 558 | 567 | 572 | 590 | 606 | 624 | 647 | nm   |
| Spectral Line Half Width | I <sub>F</sub> =20mA | Δλ             | TYP.            | 30  | 30  | 30  | 30  | 30  | 30  | 30  | nm   |
| Half Intensity Angle     | I <sub>F</sub> =20mA | 2θ 1/2         | TYP.            | 130 | 128 | 142 | 134 | 136 | 130 | 140 | deg. |

# Electro-Optical Characteristics(MPR)

(Ta=25°C)

| Item                     | Conditions           | Symbol         | Characteristics |     | Unit |
|--------------------------|----------------------|----------------|-----------------|-----|------|
|                          |                      |                |                 | MPR |      |
| Forward Voltage          | I <sub>F</sub> =10mA | V <sub>F</sub> | TYP.            | 2.1 | V    |
|                          |                      |                | MAX.            | 2.8 |      |
| Reverse Current          | V <sub>R</sub> =4V   | I <sub>R</sub> | MAX.            | 20  | μ A  |
| Peak Wavelength          | I <sub>F</sub> =10mA | λ <sub>p</sub> | TYP.            | 700 | nm   |
| Dominant Wavelength      | I <sub>F</sub> =10mA | λ <sub>d</sub> | TYP.            | 630 | nm   |
| Spectral Line Half Width | I <sub>F</sub> =10mA | Δλ             | TYP.            | 100 | nm   |
| Half Intensity Angle     | I <sub>F</sub> =10mA | 2θ 1/2         | TYP.            | 140 | deg. |

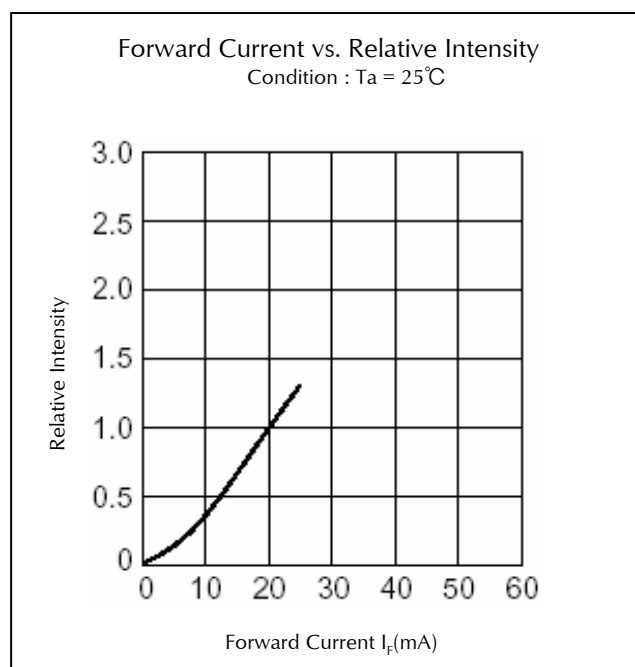
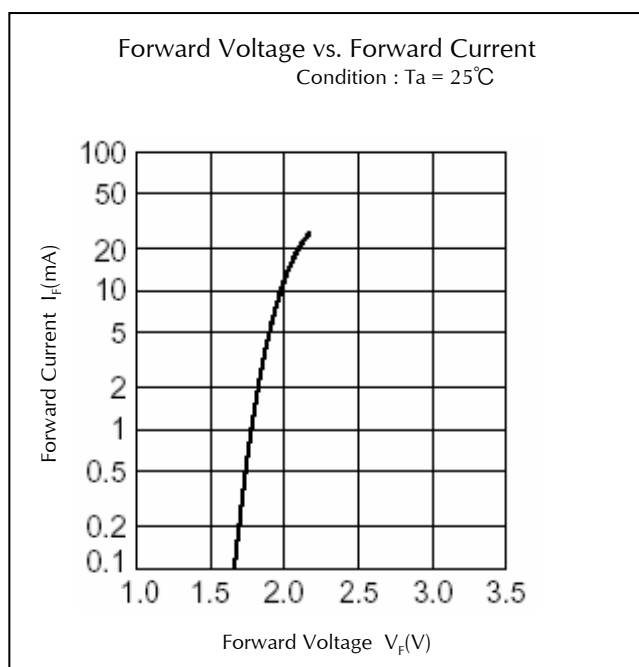
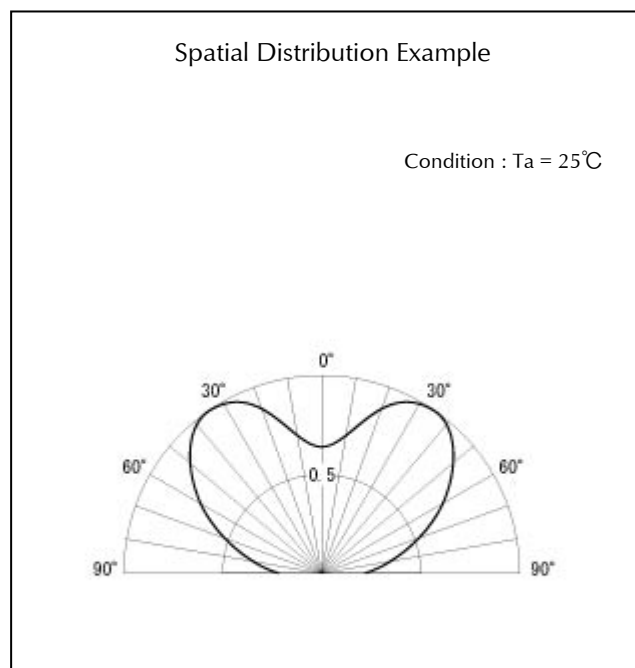
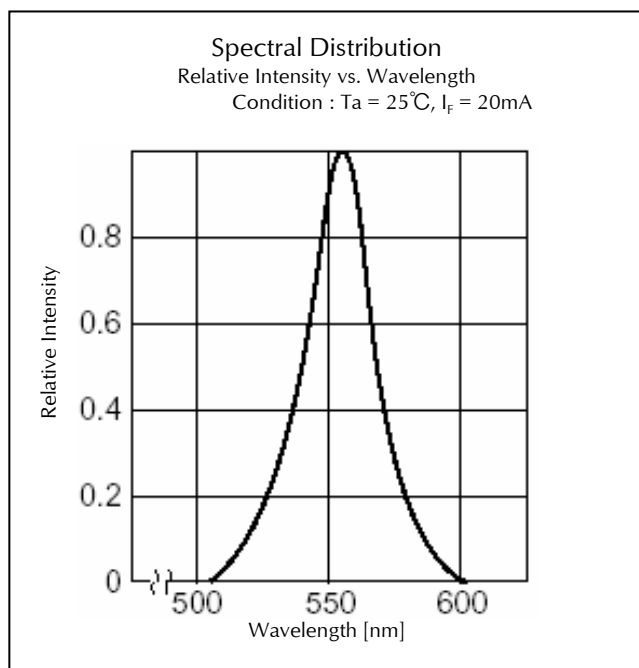
## Luminous Intensity Rank

(Ta=25°C)

| Rank | I <sub>v</sub> (mcd) |      |                      |      |                      |      |                      |      |                      |      |                      |      |                      |      |                      |      |
|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|
|      | MBG                  |      | MPG                  |      | MPY                  |      | MAY                  |      | MAA                  |      | MVR                  |      | BR                   |      | MPR                  |      |
|      | I <sub>f</sub> =20mA |      | I <sub>f</sub> =20mA |      | I <sub>f</sub> =20mA |      | I <sub>f</sub> =20mA |      | I <sub>f</sub> =20mA |      | I <sub>f</sub> =20mA |      | I <sub>f</sub> =20mA |      | I <sub>f</sub> =10mA |      |
|      | MIN.                 | MAX. | MIN.                 | MAX. | MIN.                 | MAX. | MIN.                 | MAX. | MIN.                 | MAX. | MIN.                 | MAX. | MIN.                 | MAX. | MIN.                 | MAX. |
| A    | 0.5                  | 1.0  | 1.5                  | 3.0  | 2.0                  | 4.0  | 1.2                  | 2.4  | 1.2                  | 2.4  | 1.2                  | 2.4  | 1.5                  | 3.0  | 0.30                 | 0.60 |
| B    | 0.7                  | 1.4  | 2.1                  | 4.2  | 2.8                  | 5.6  | 1.6                  | 3.2  | 1.6                  | 3.2  | 1.6                  | 3.2  | 2.1                  | 4.2  | 0.42                 | 0.84 |
| C    | 1.0                  | 2.0  | 3.0                  | 6.0  | 4.0                  | 8.0  | 2.4                  | 4.8  | 2.4                  | 4.8  | 2.4                  | 4.8  | 3.0                  | 6.0  | 0.60                 | 1.20 |
| D    | 1.4                  | 2.8  | 4.2                  | 8.4  | 5.6                  | 11.2 | 3.2                  | 6.4  | 3.2                  | 6.4  | 3.2                  | 6.4  | 4.2                  | 8.4  | 0.84                 | 1.68 |
| E    | 2.0                  | -    | 6.0                  | -    | 8.0                  | -    | 4.8                  | -    | 4.8                  | -    | 4.8                  | -    | 6.0                  | -    | 1.20                 | -    |

※Please contact our sales staff concerning rank designation.

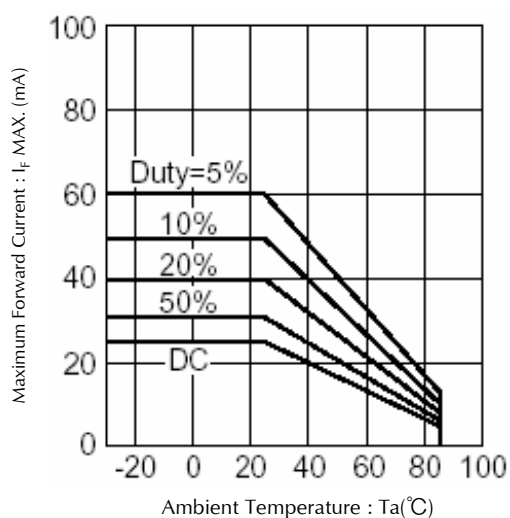
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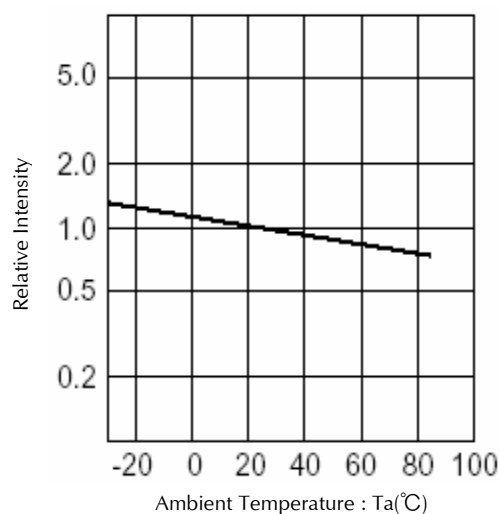
### Derating

Ambient Temperature vs. Maximum Forward Current  
Repetition Frequency :  $f \geq 50\text{Hz}$

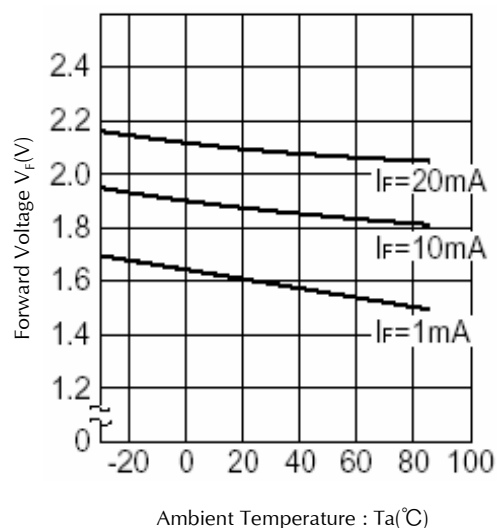


### Ambient Temperature vs. Relative Intensity

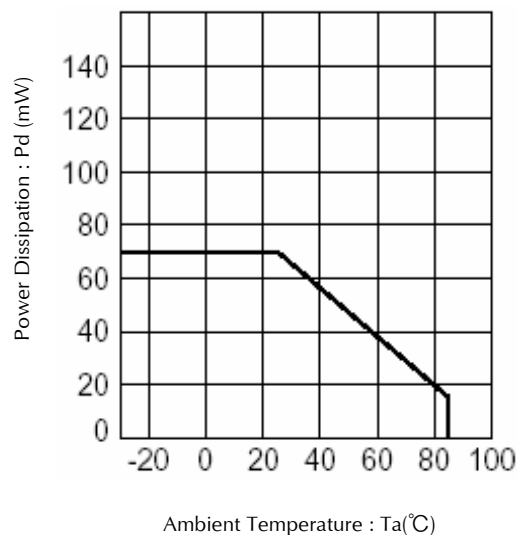
Condition :  $I_F=20\text{mA}$



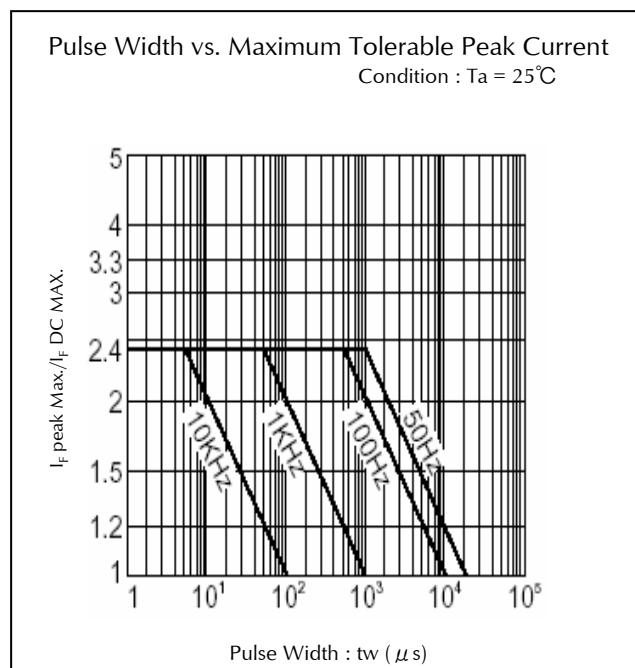
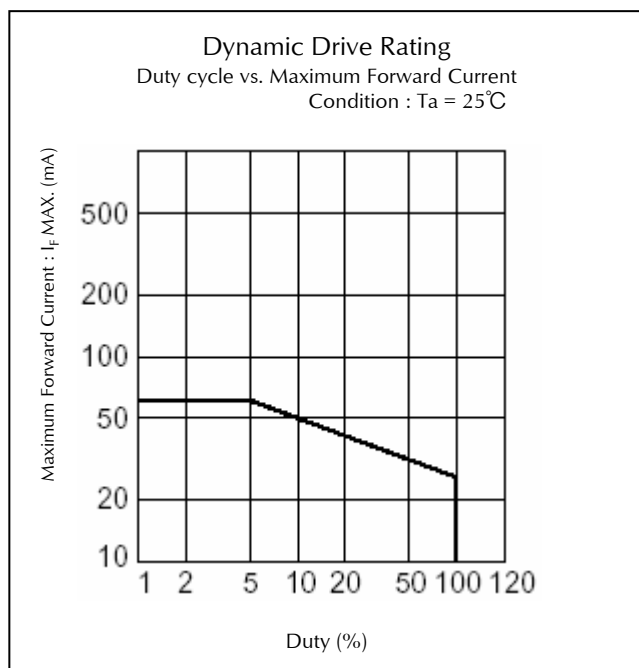
### Ambient Temperature vs. Forward Voltage



### Power Dissipation vs. Ambient Temperature

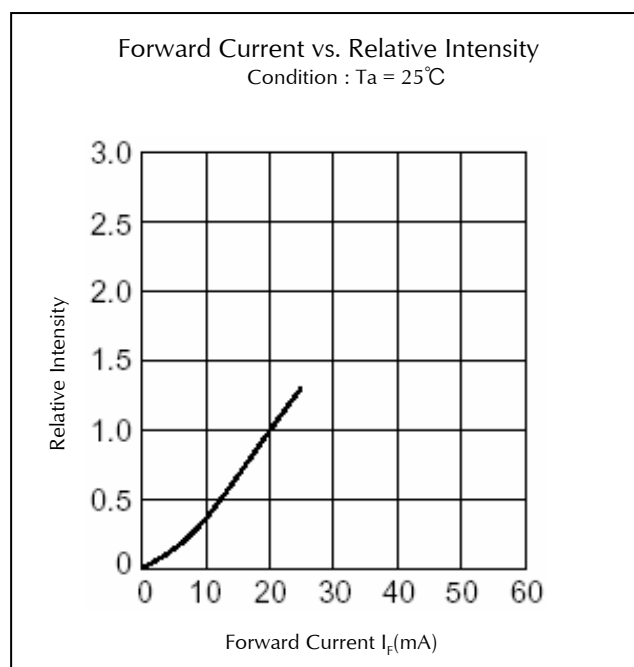
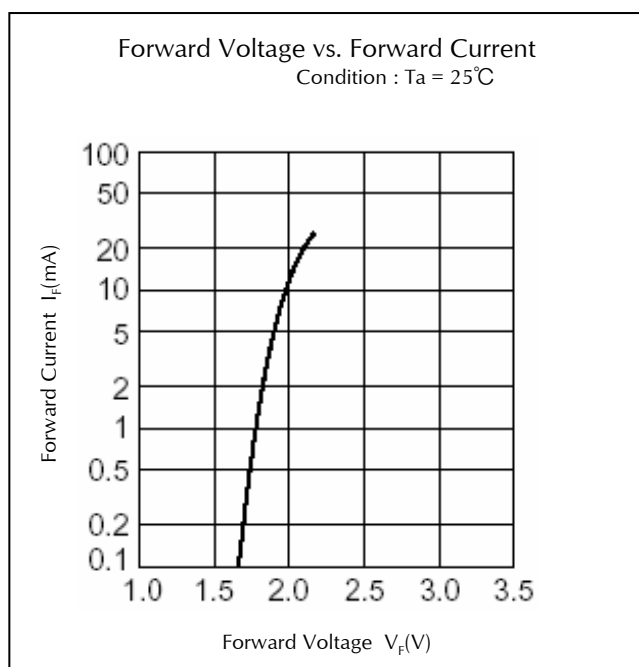
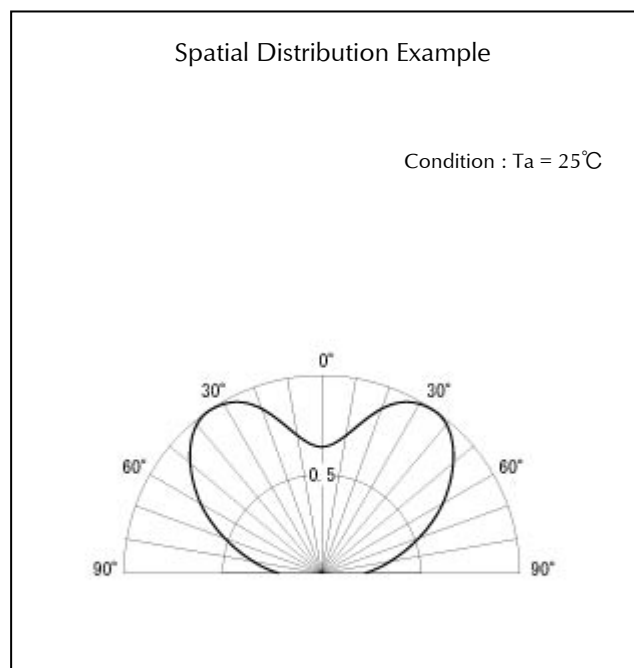
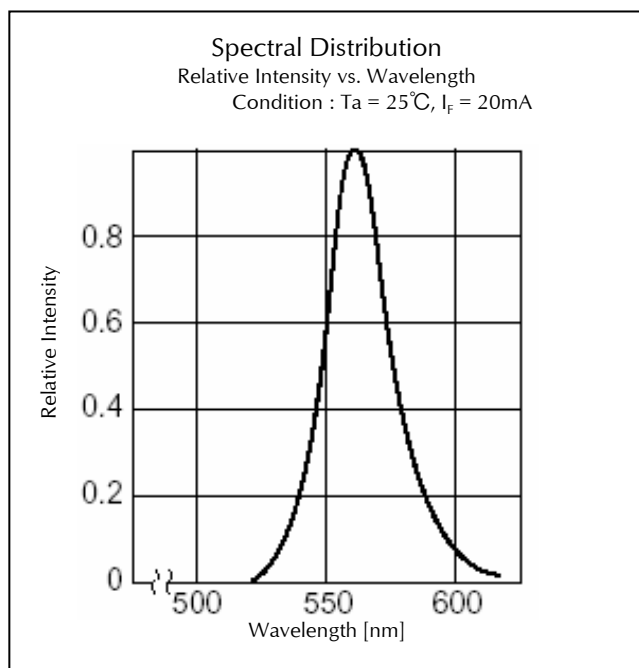


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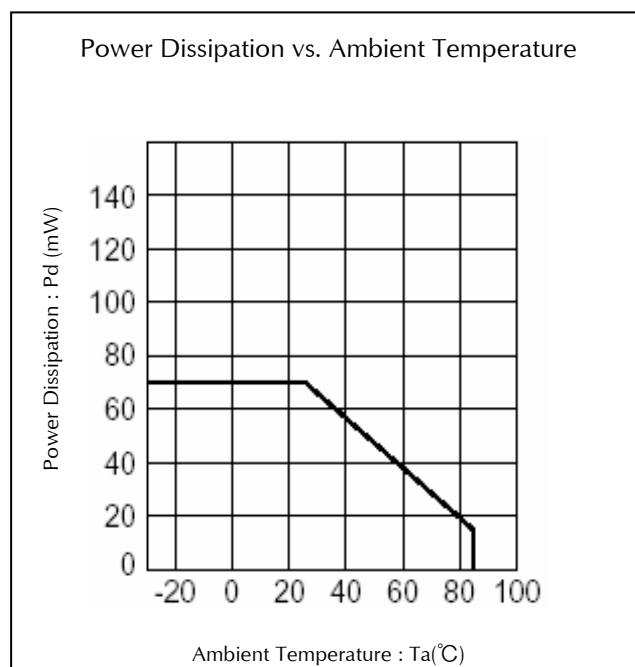
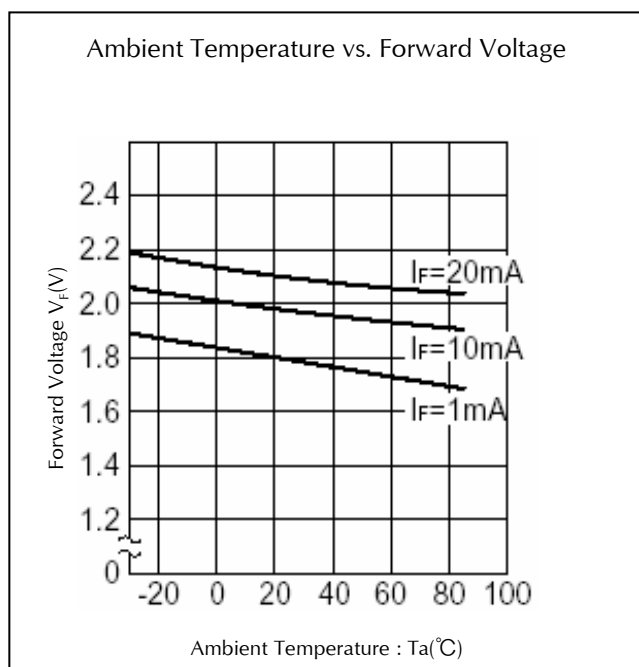
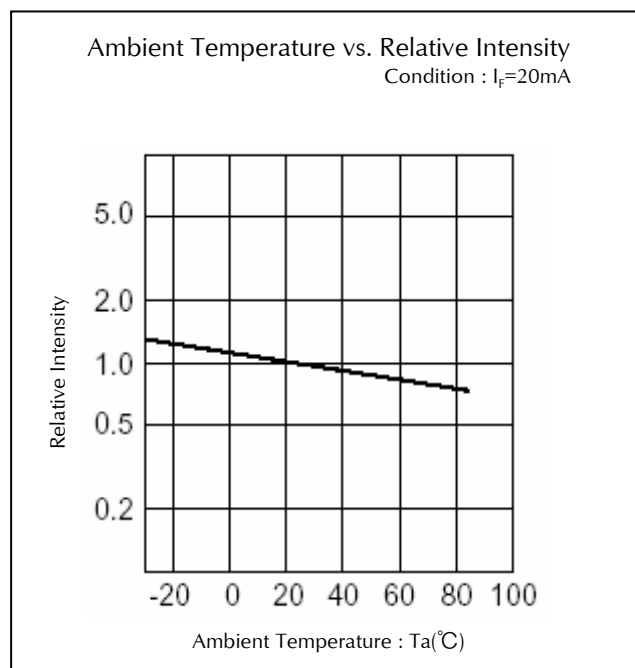
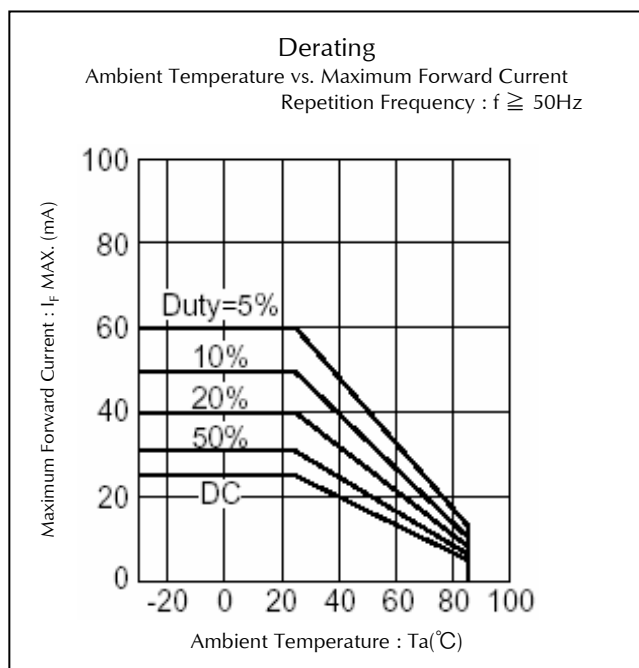




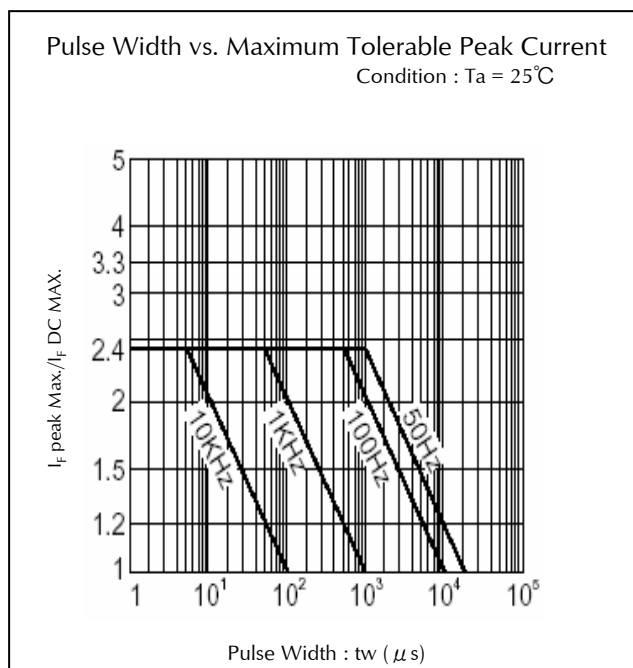
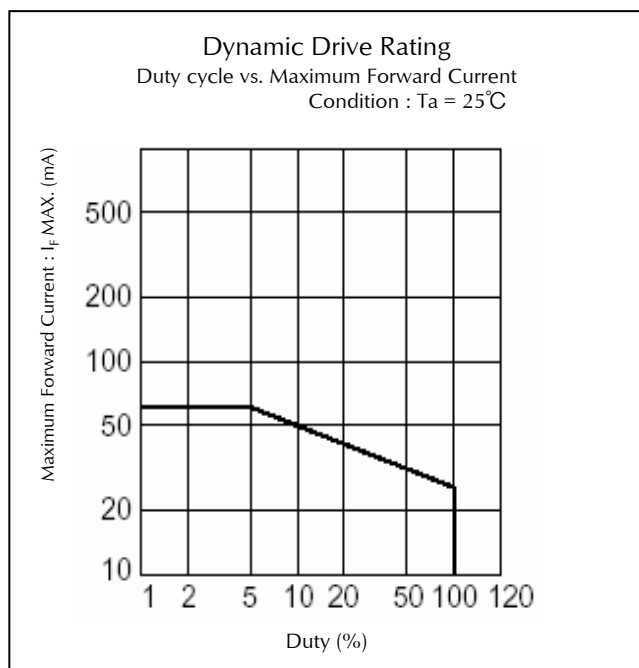
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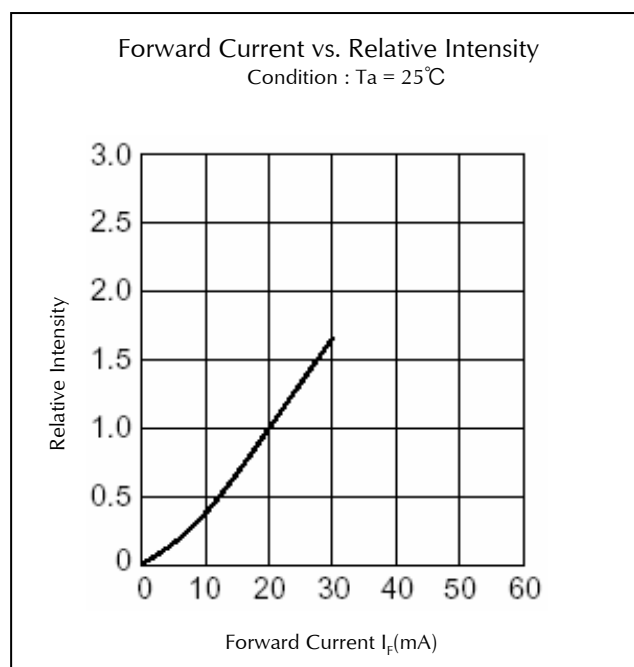
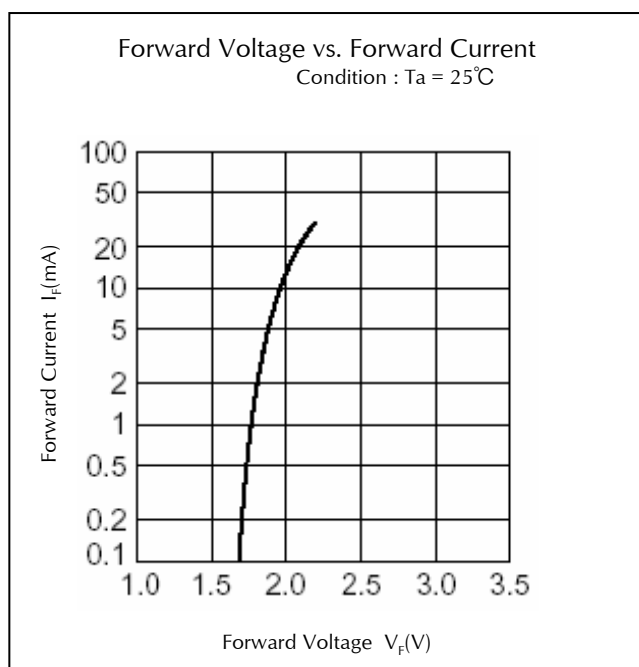
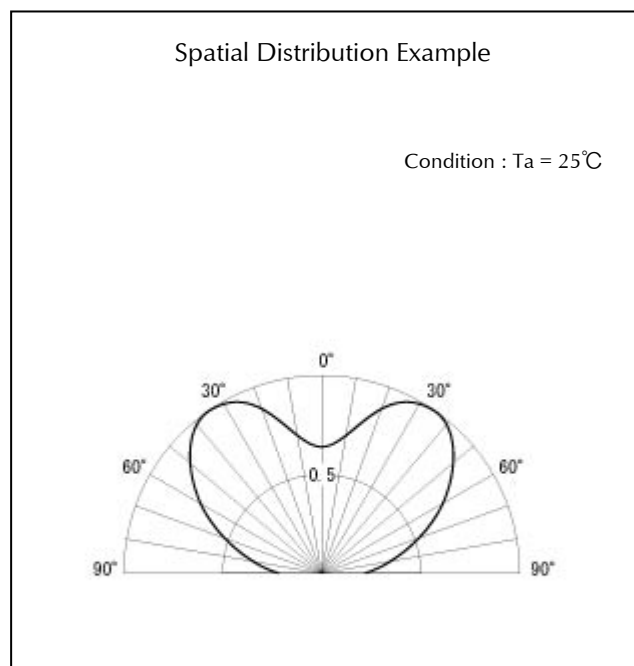
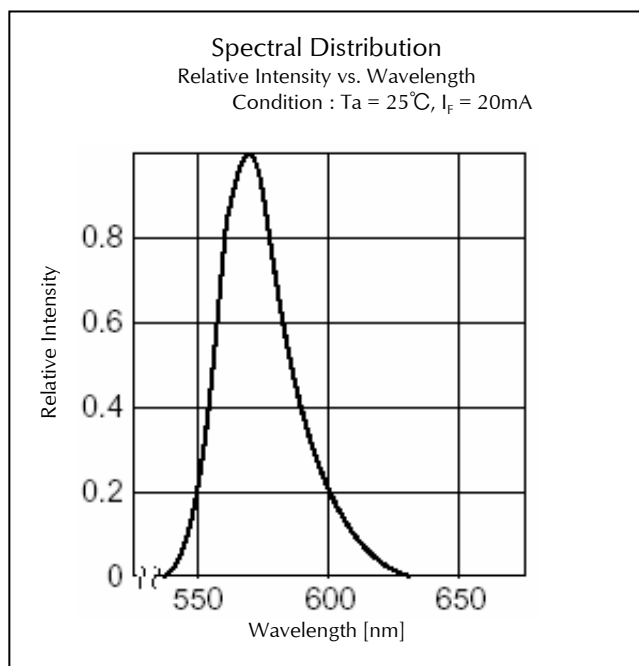
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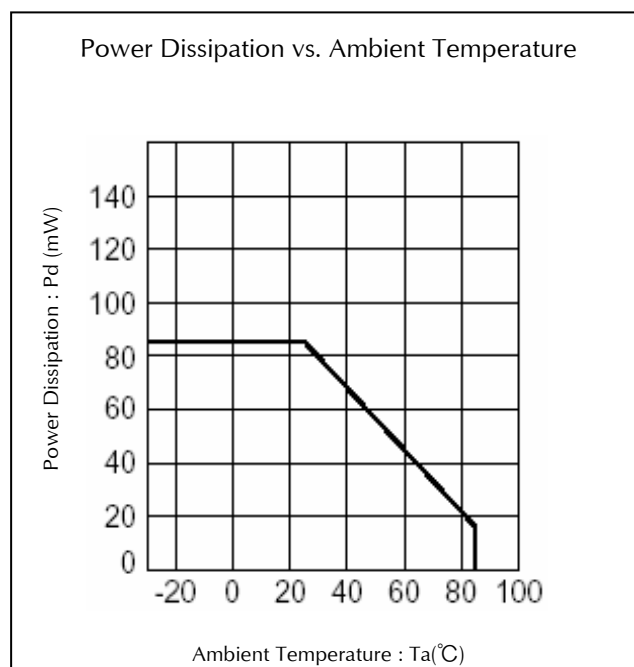
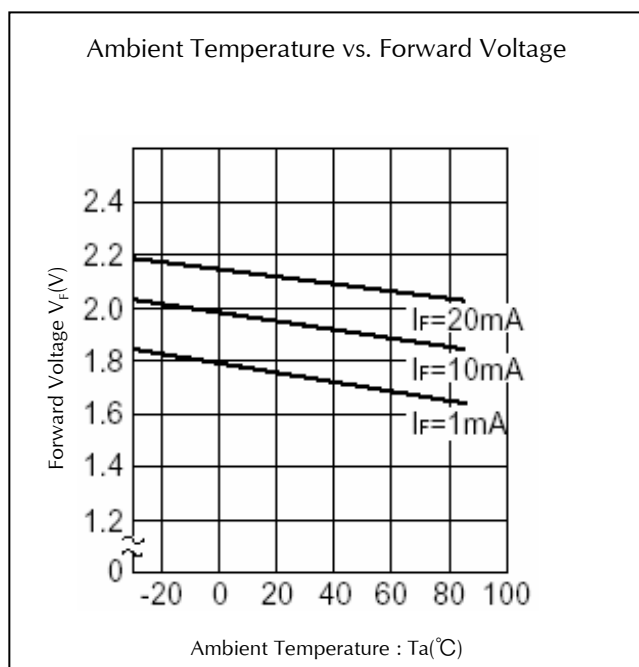
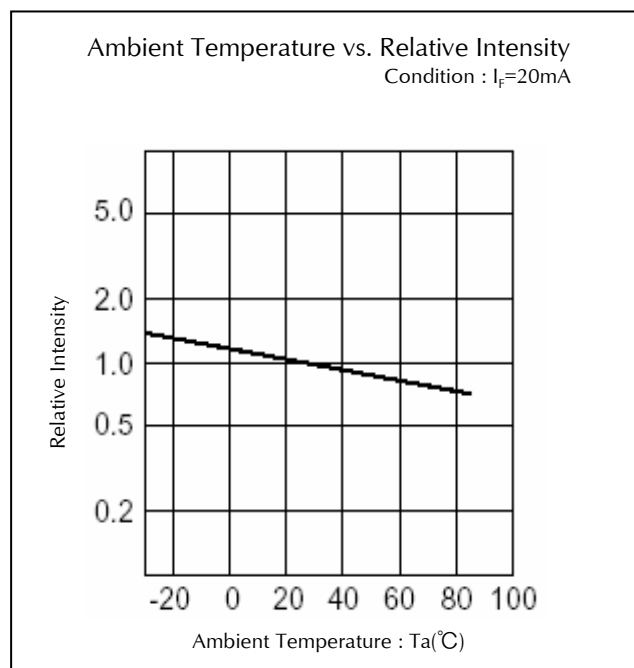
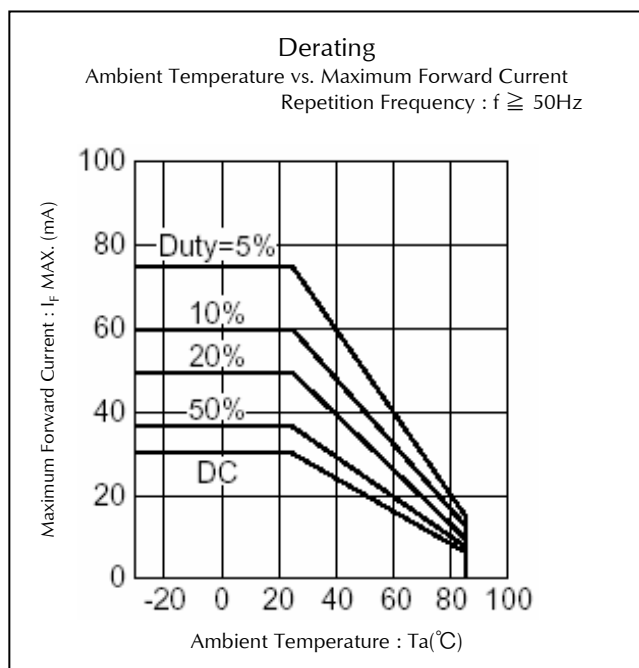
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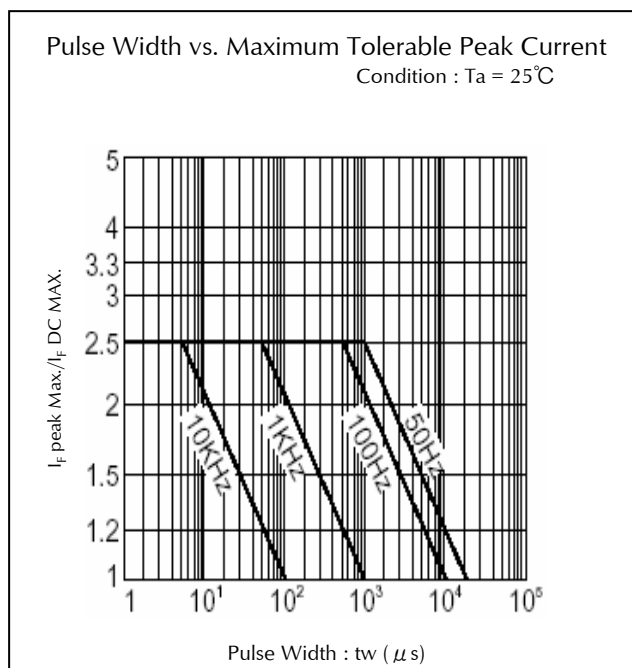
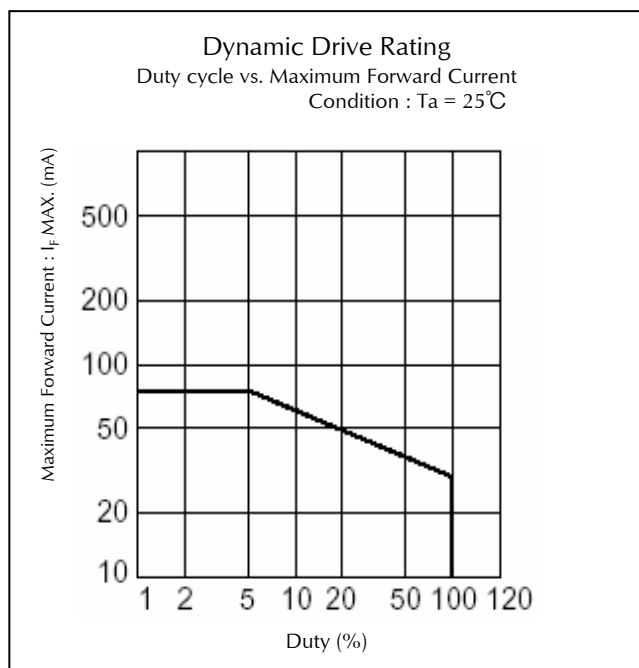
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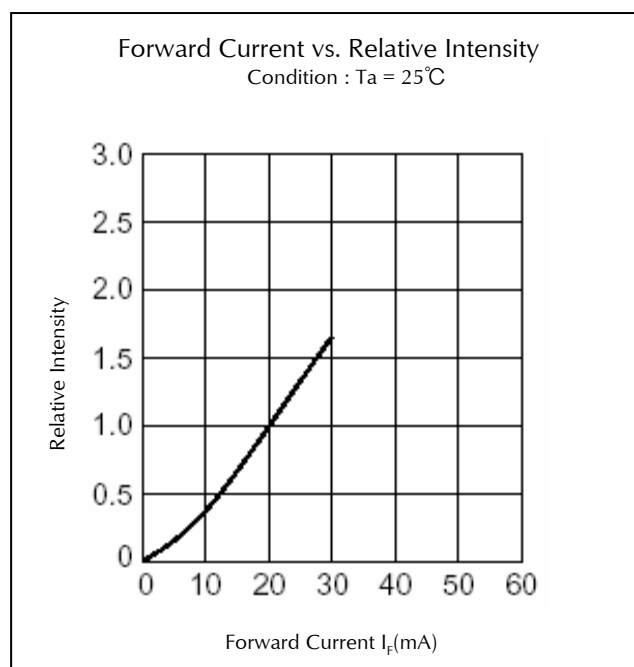
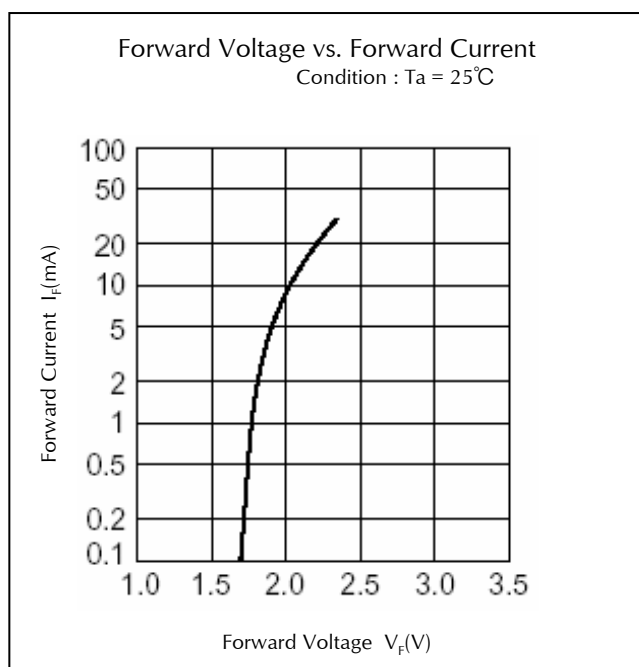
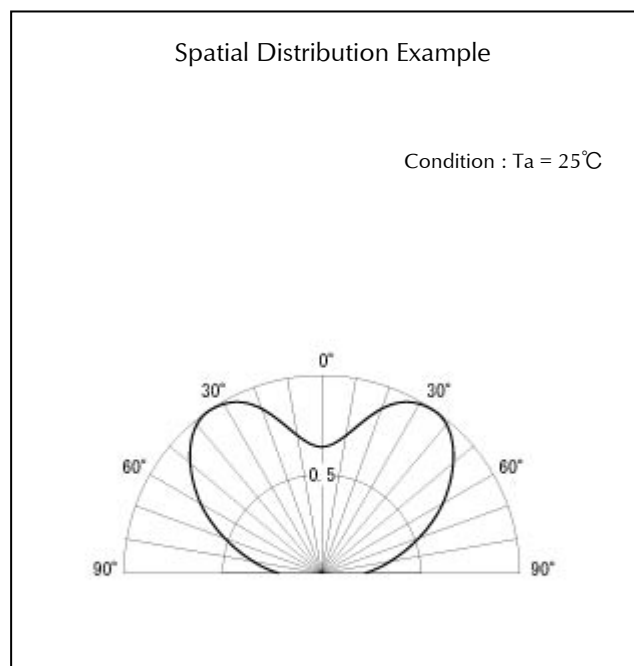
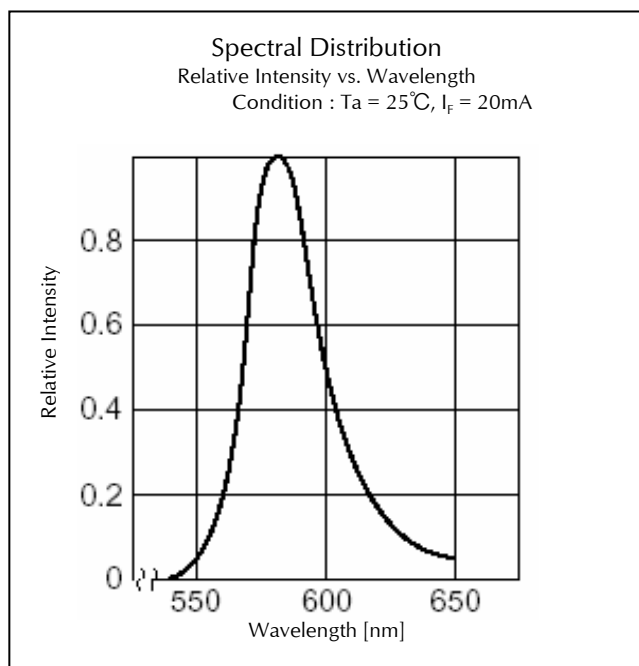
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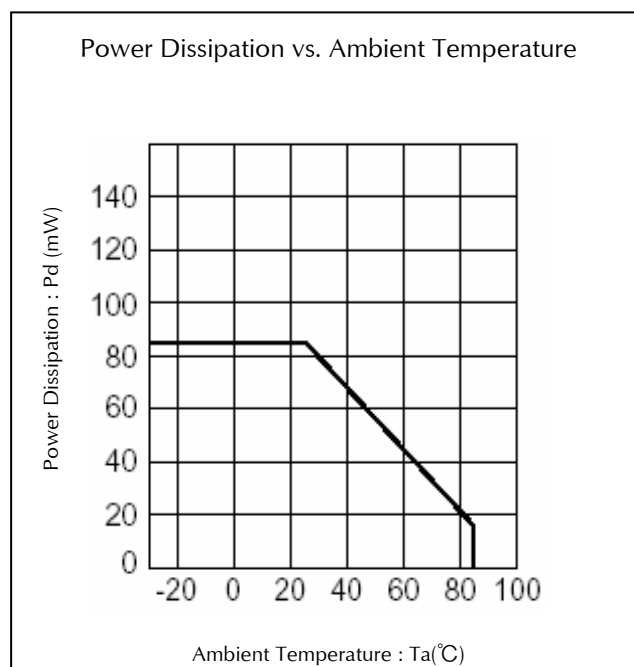
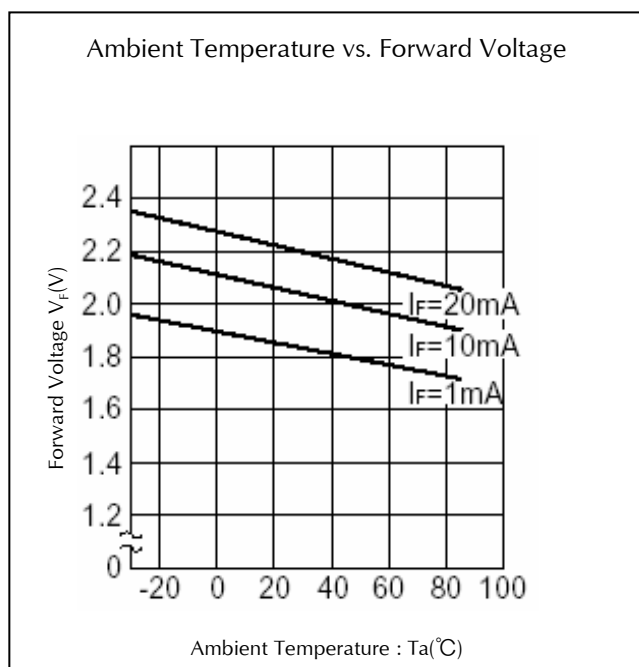
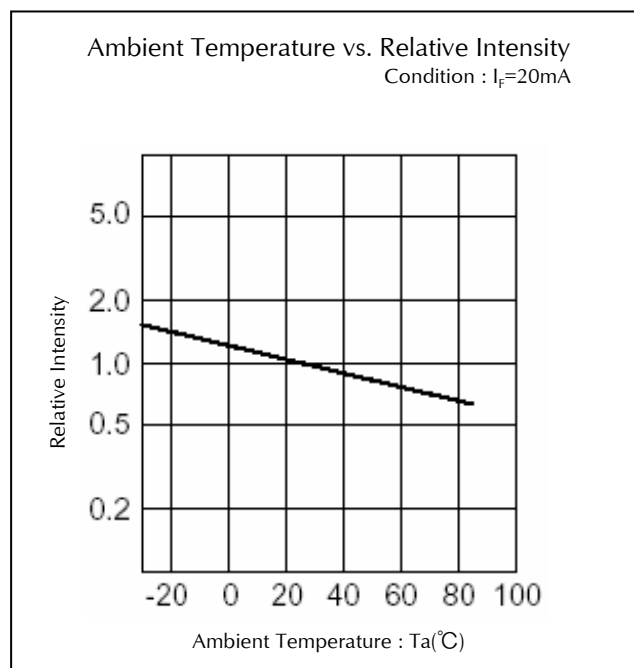
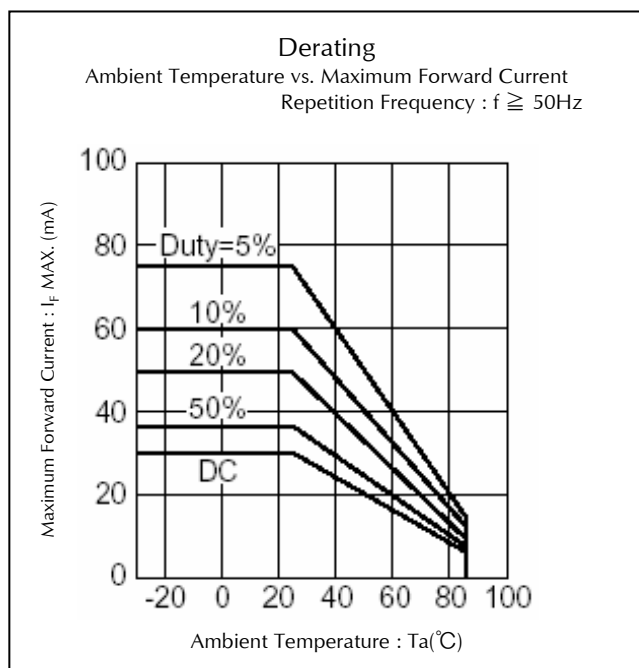
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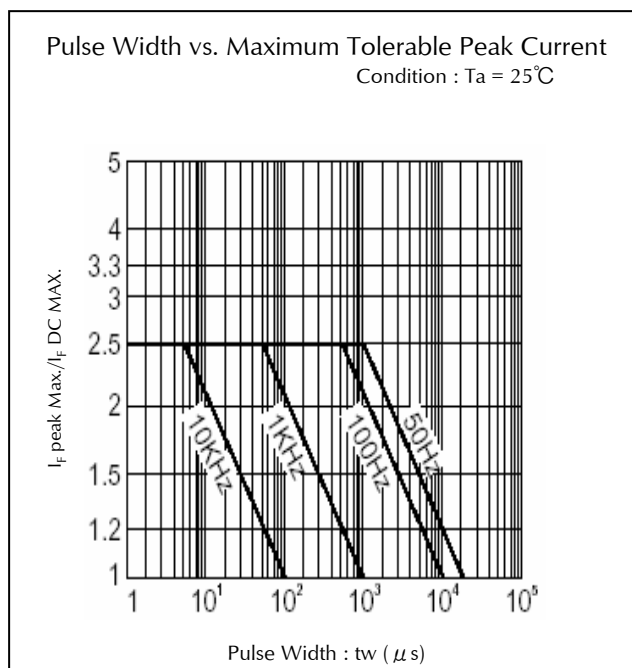
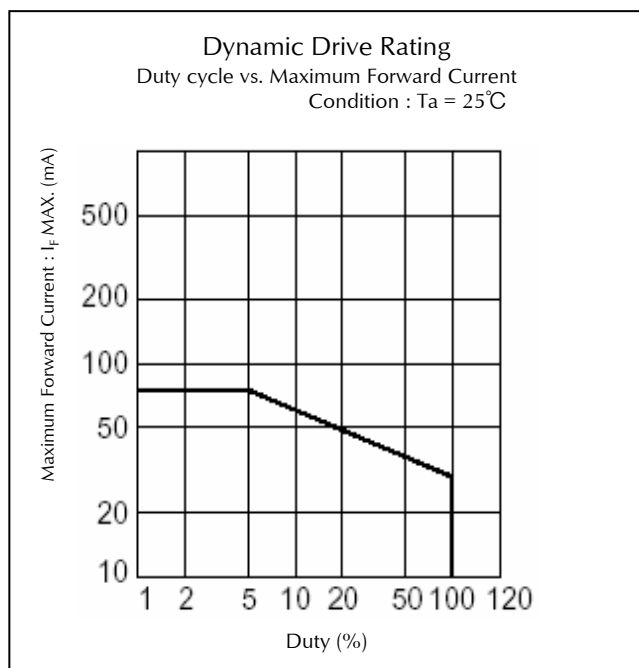


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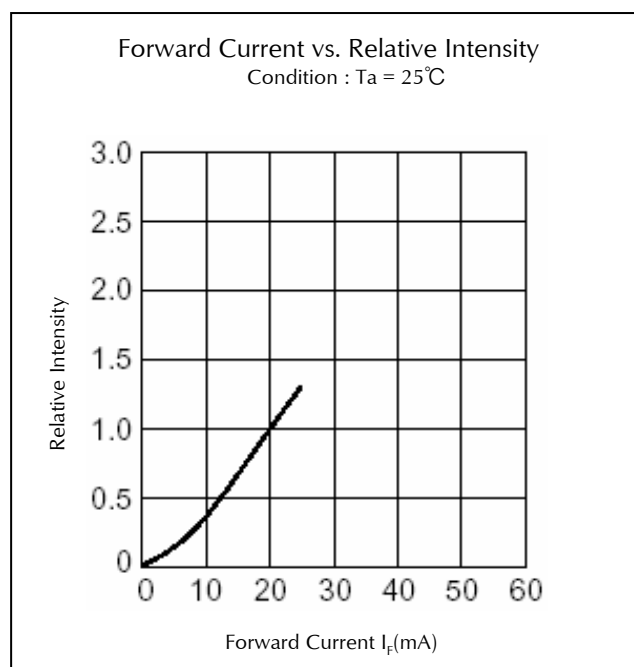
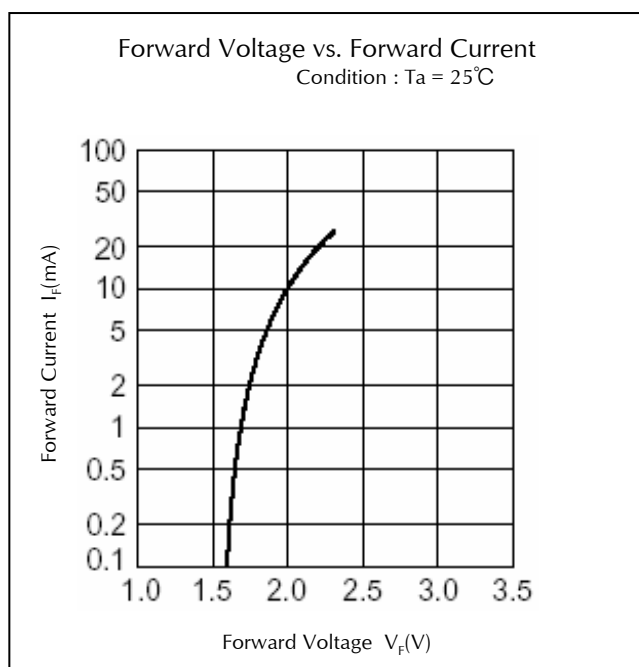
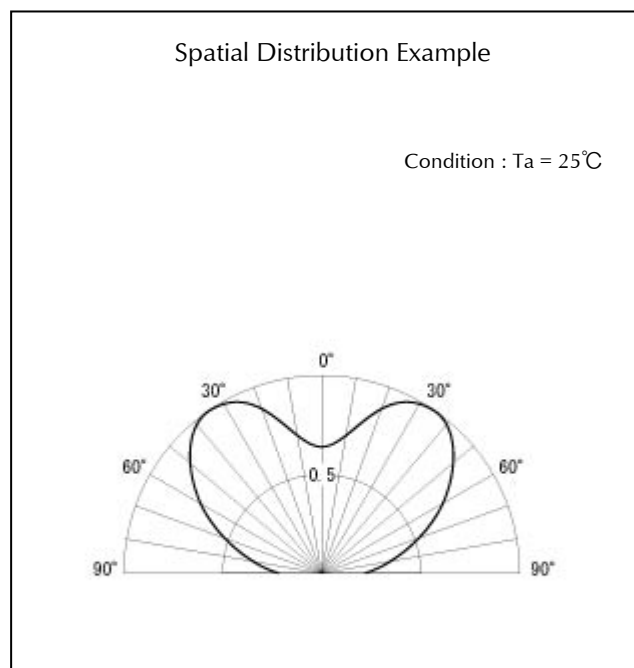
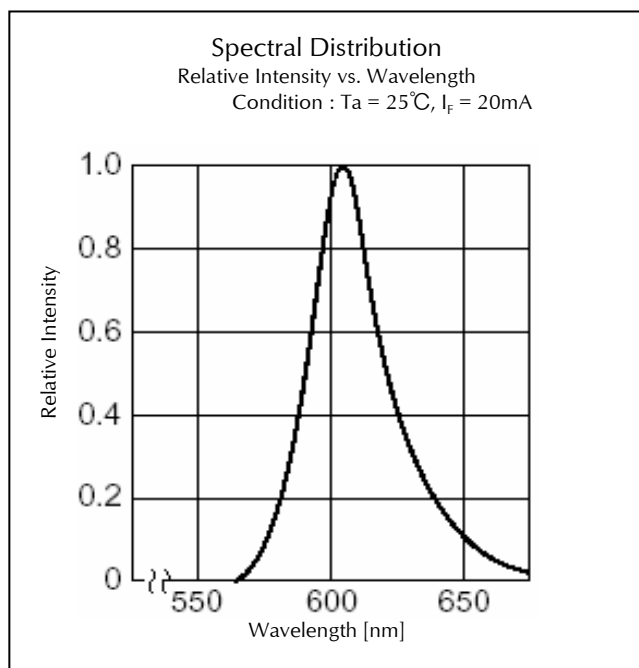




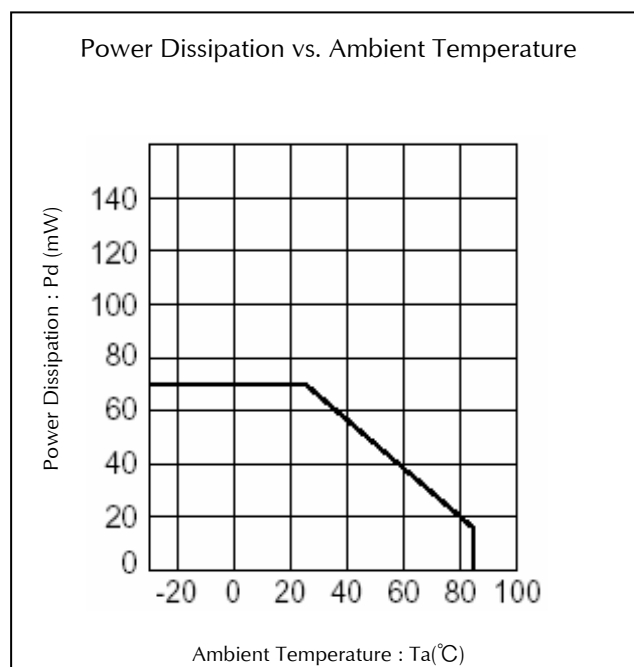
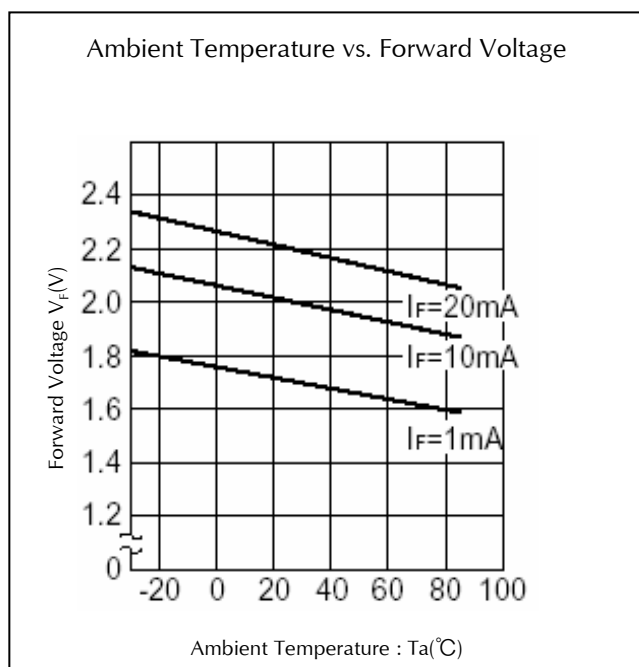
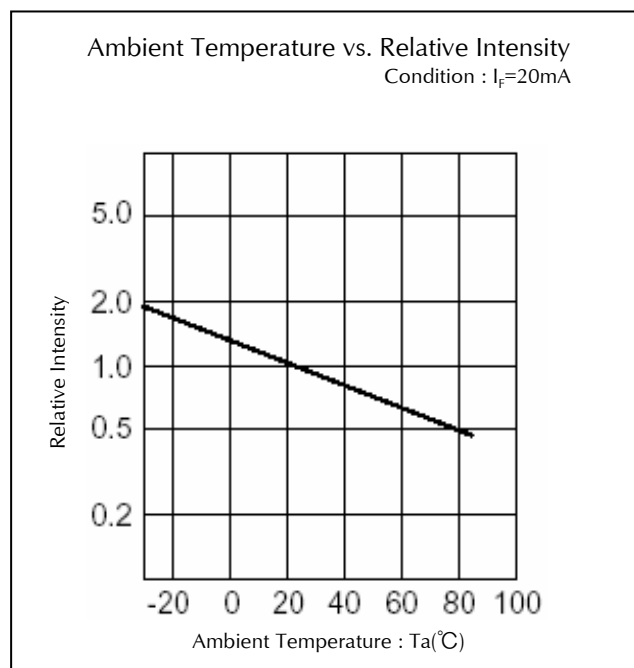
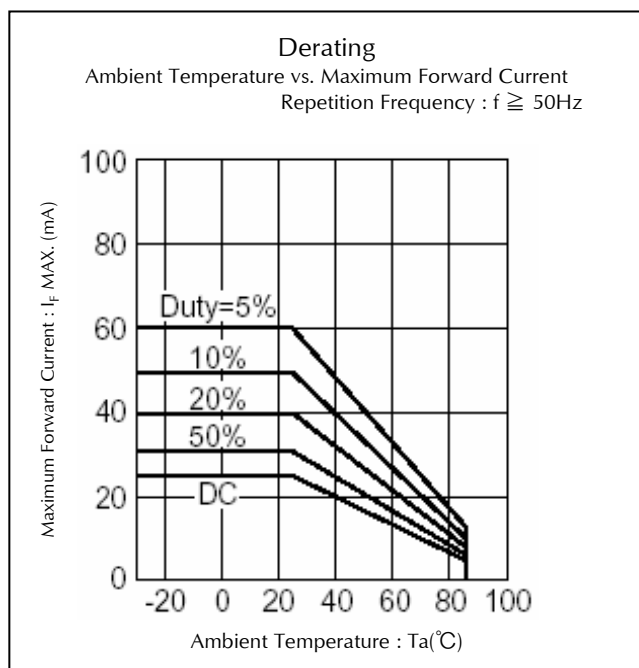
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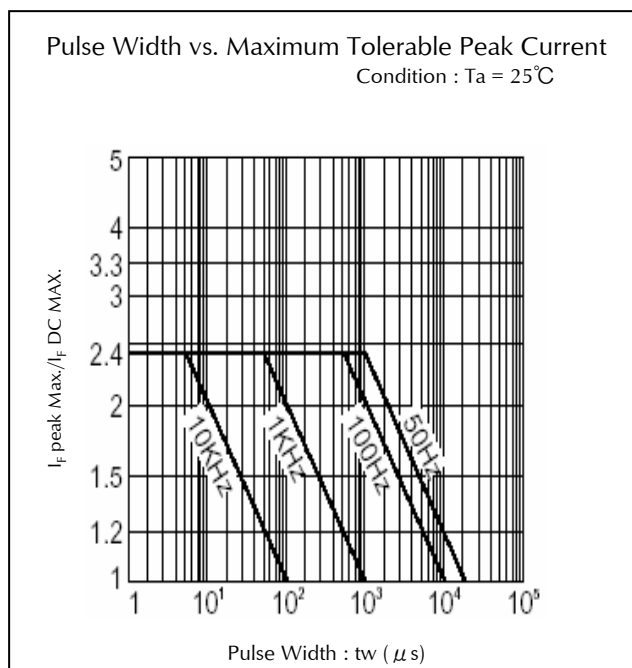
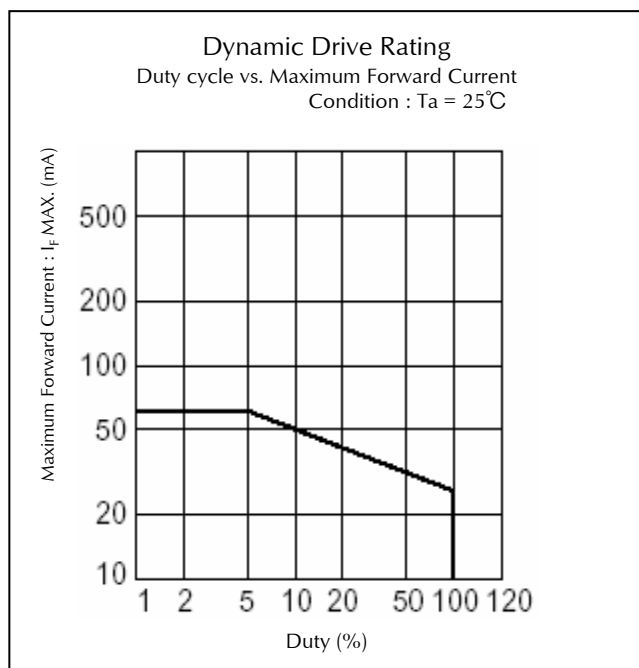
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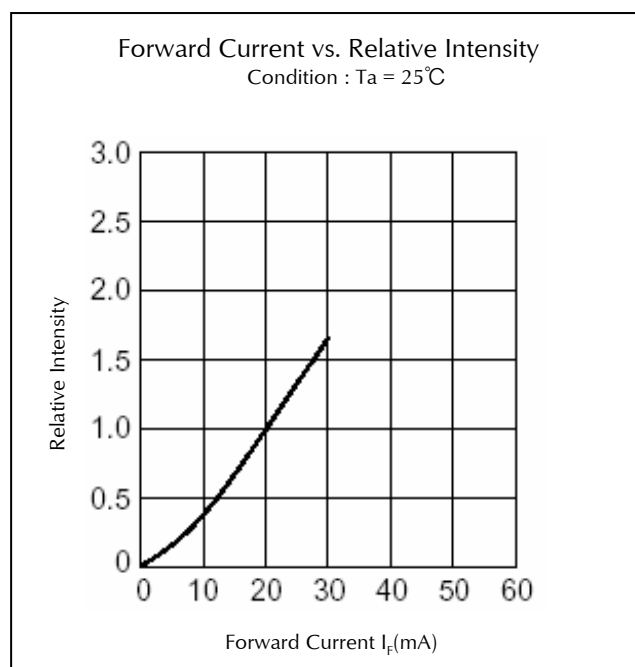
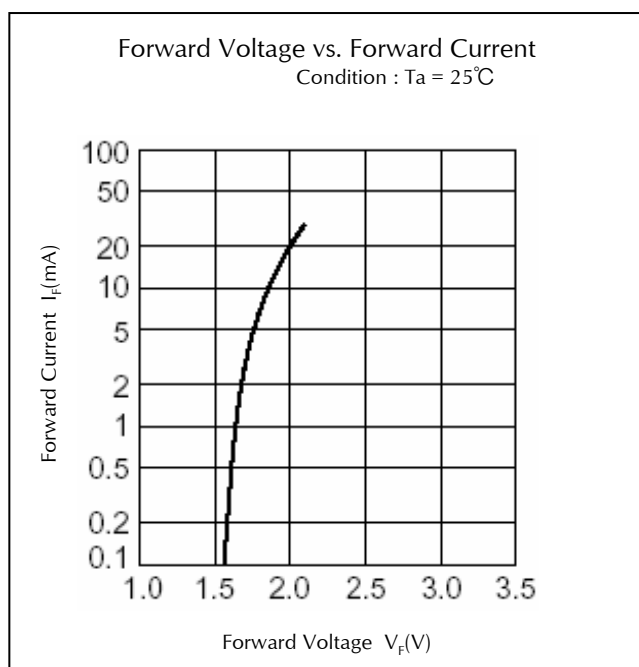
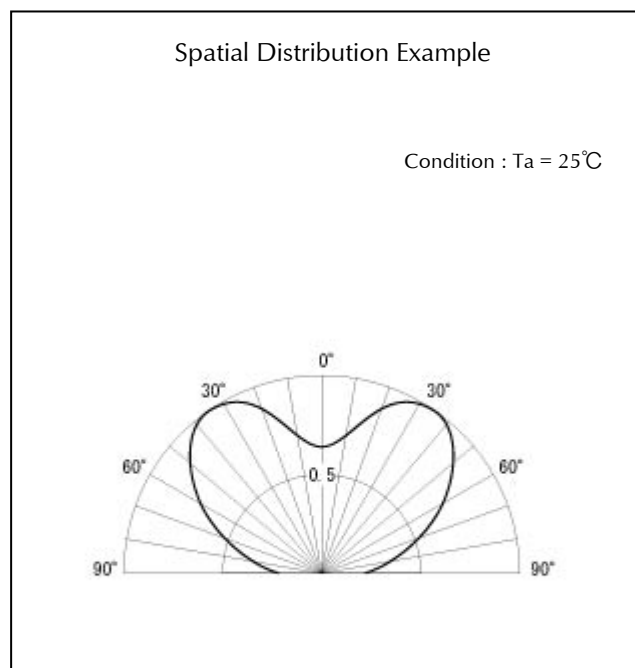
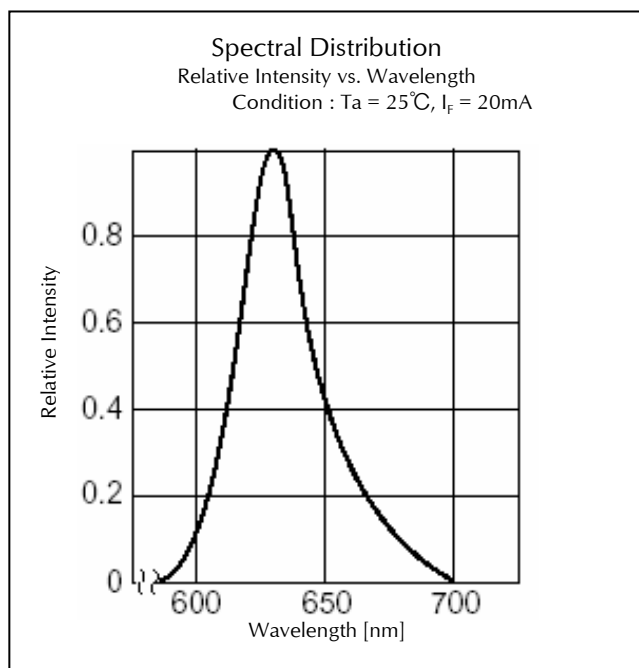
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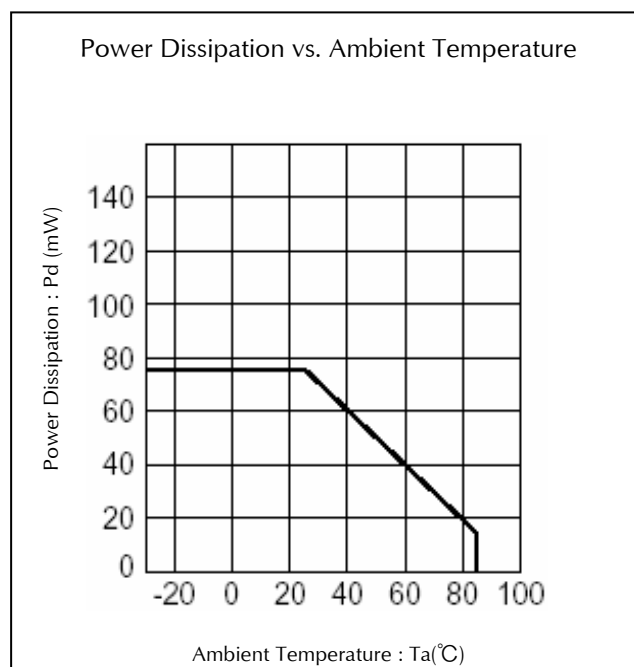
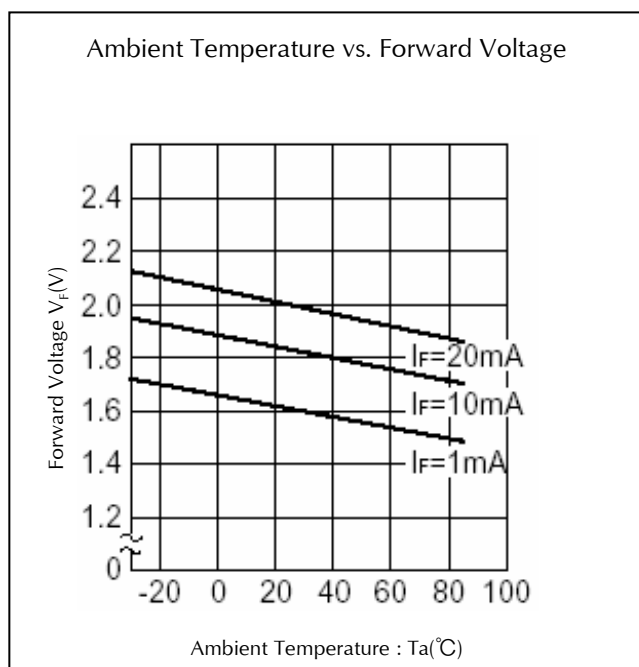
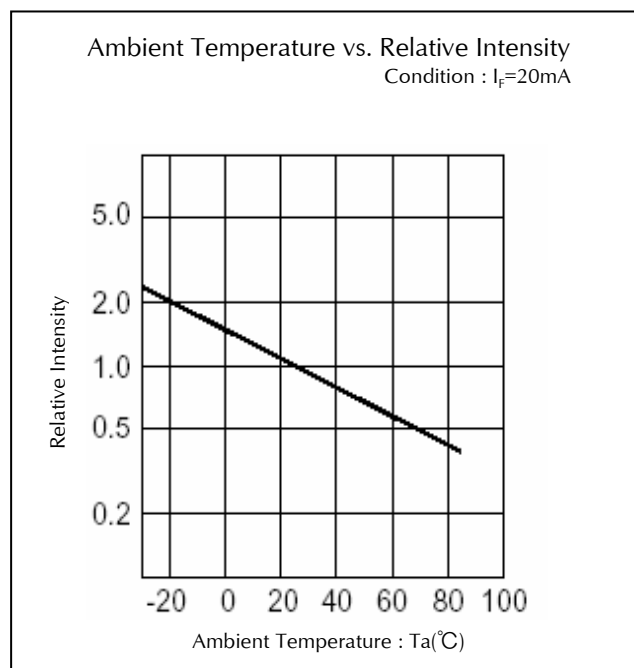
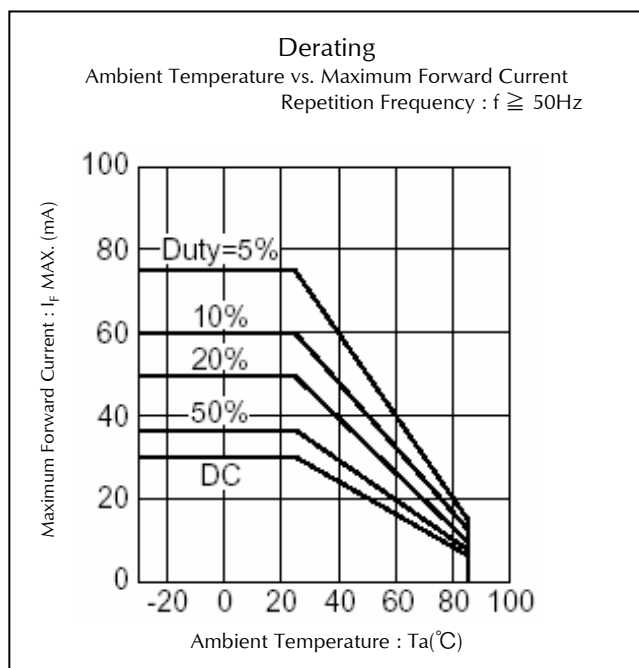
## Technical Data(MAA)



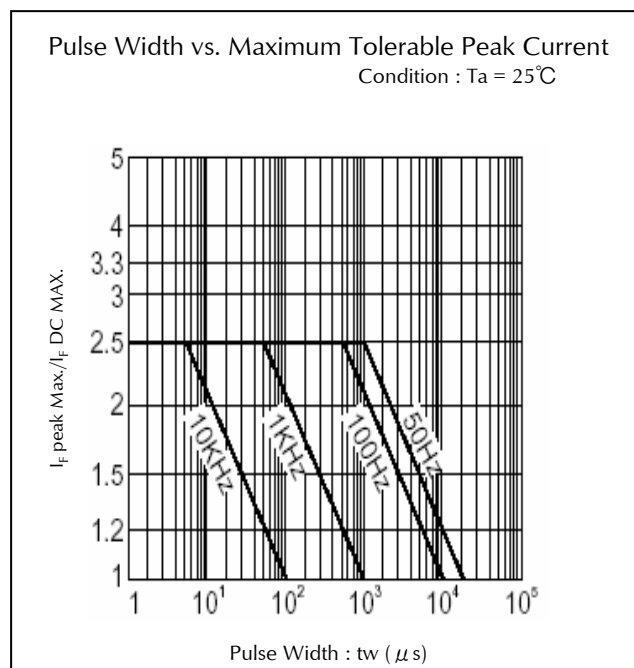
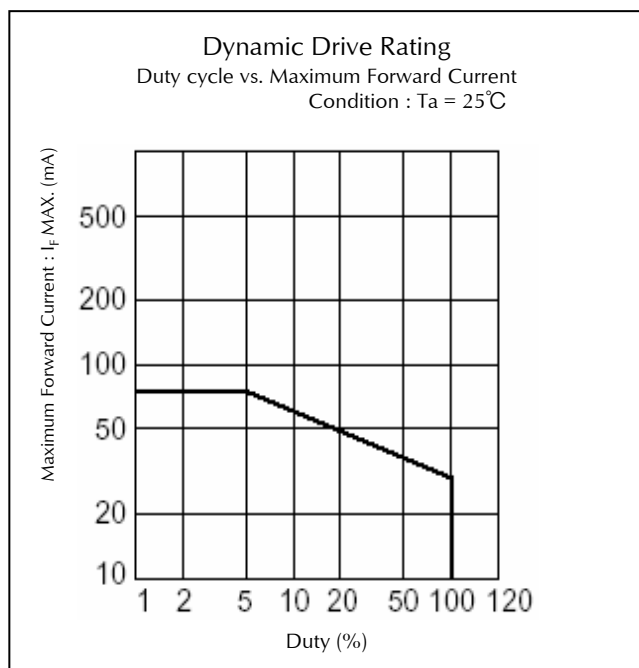
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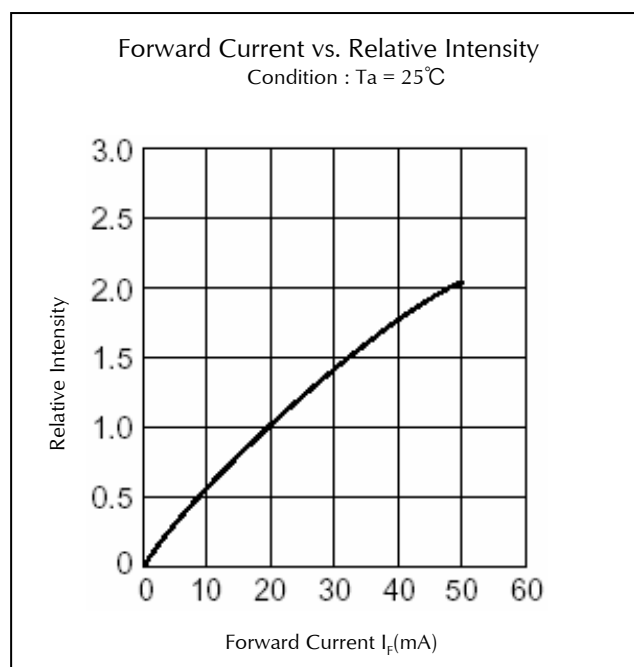
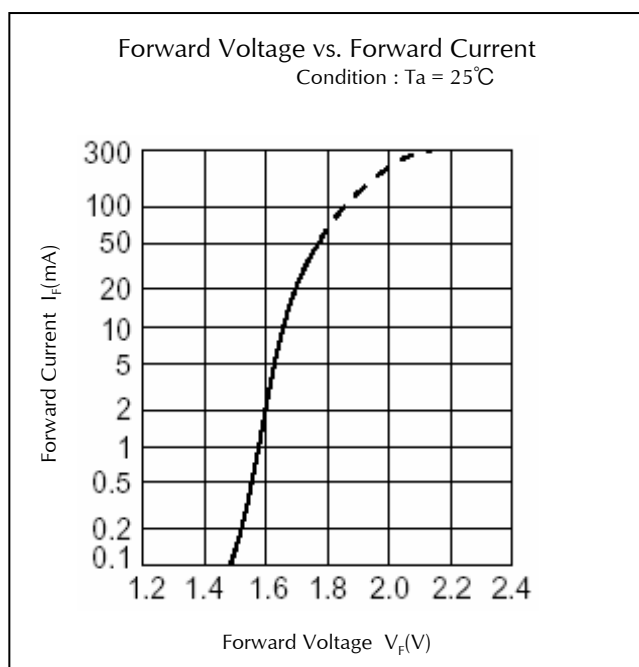
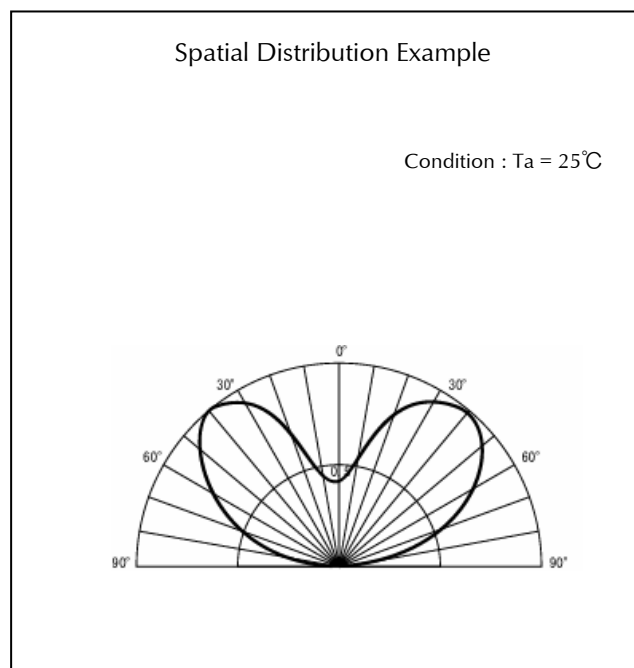
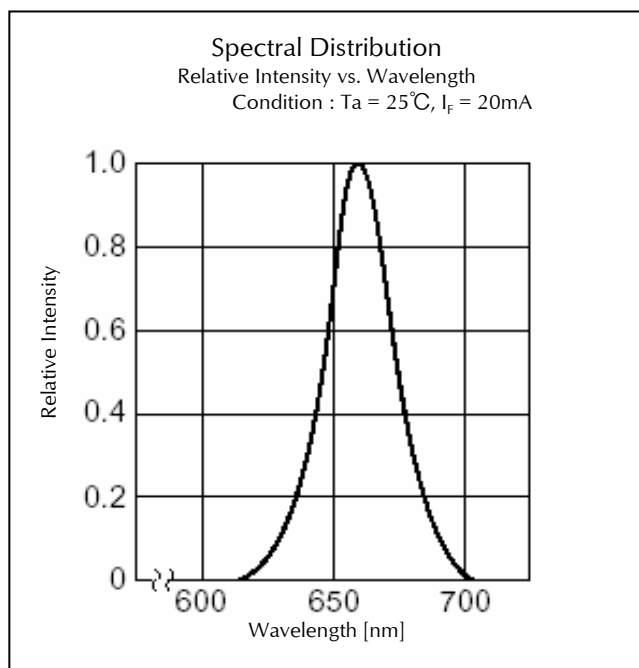
## Technical Data(MVR)



## Technical Data(MVR)

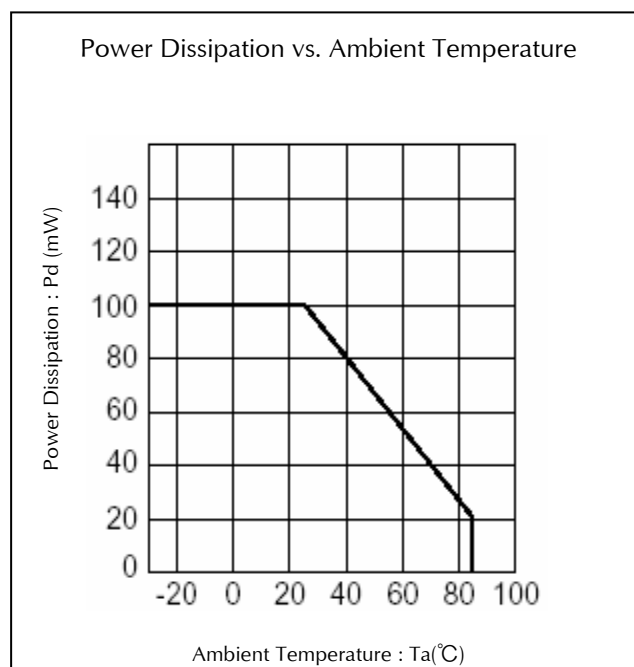
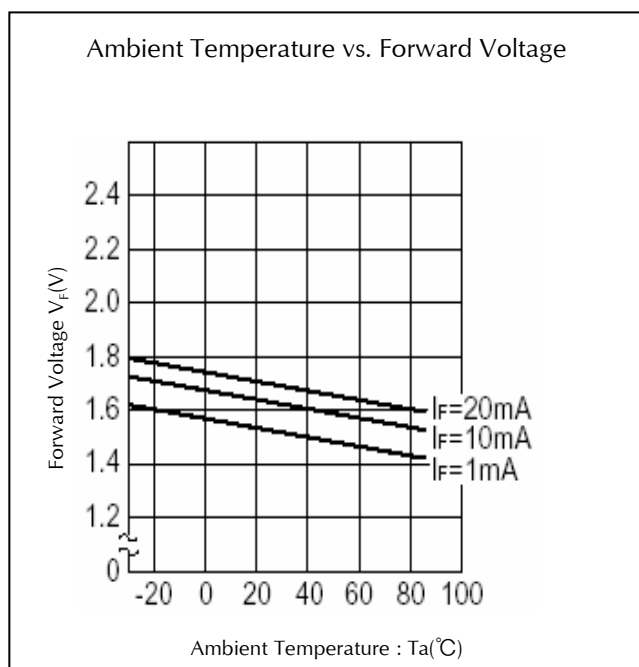
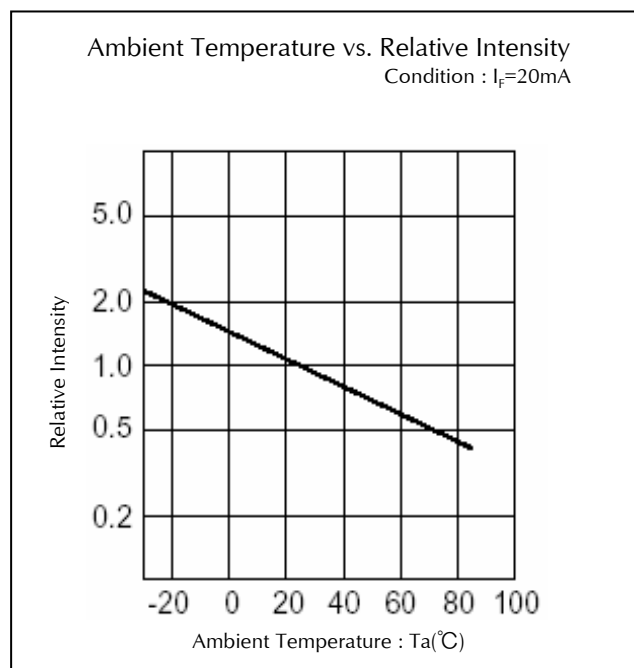
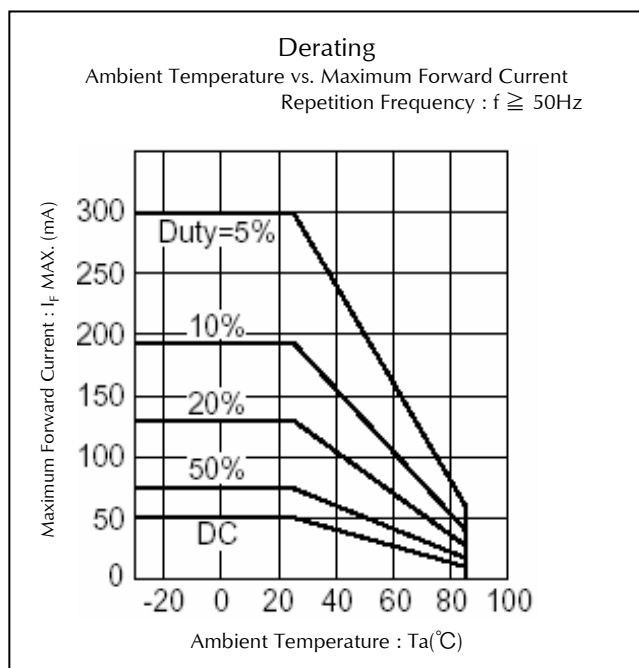


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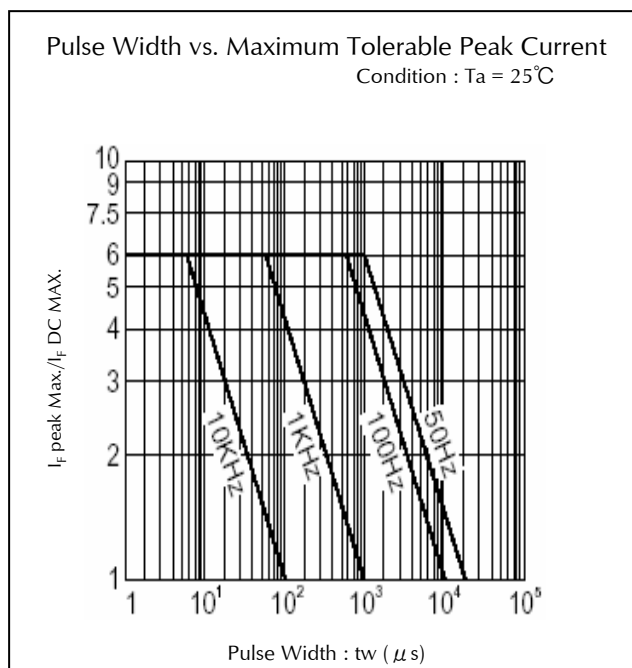
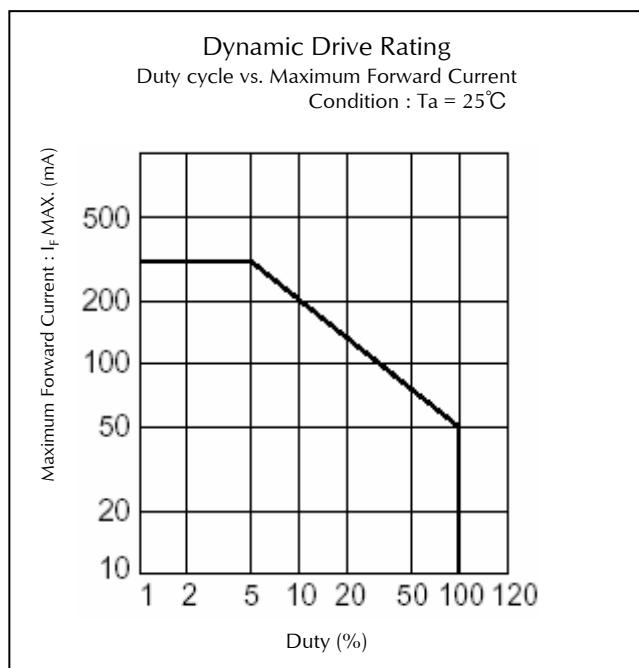




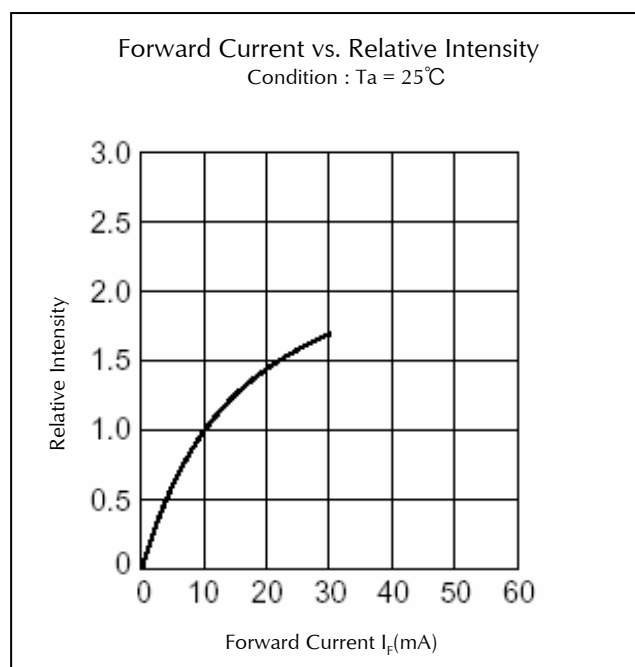
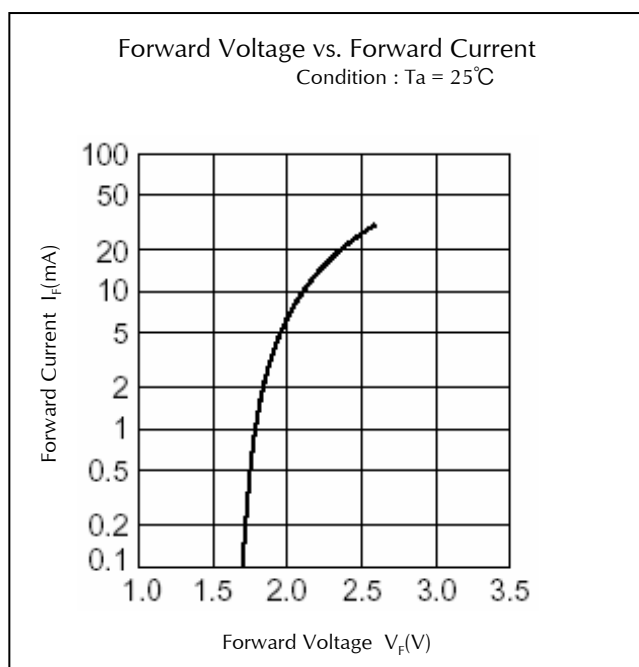
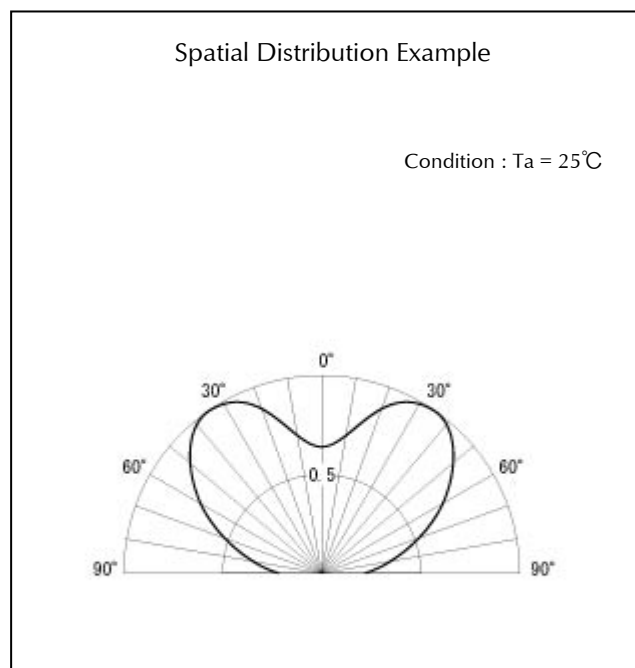
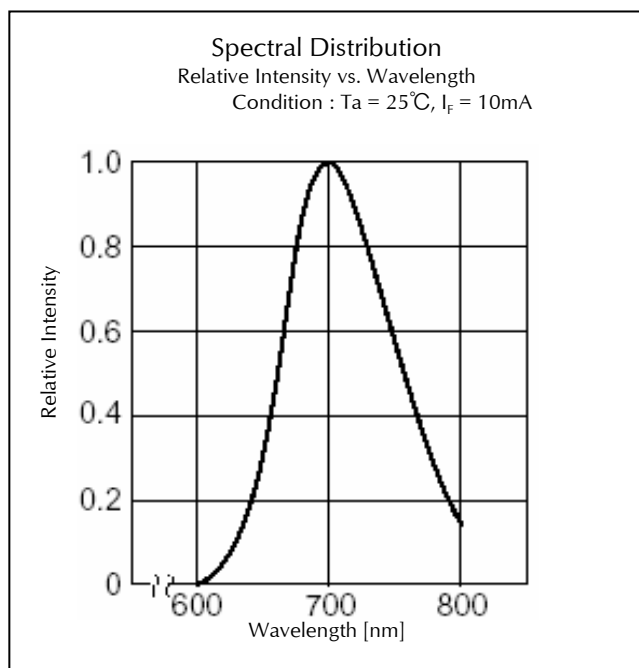
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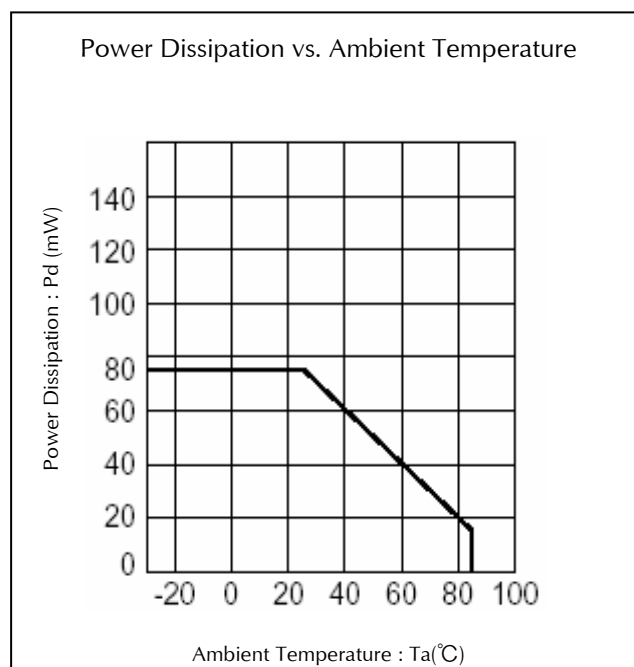
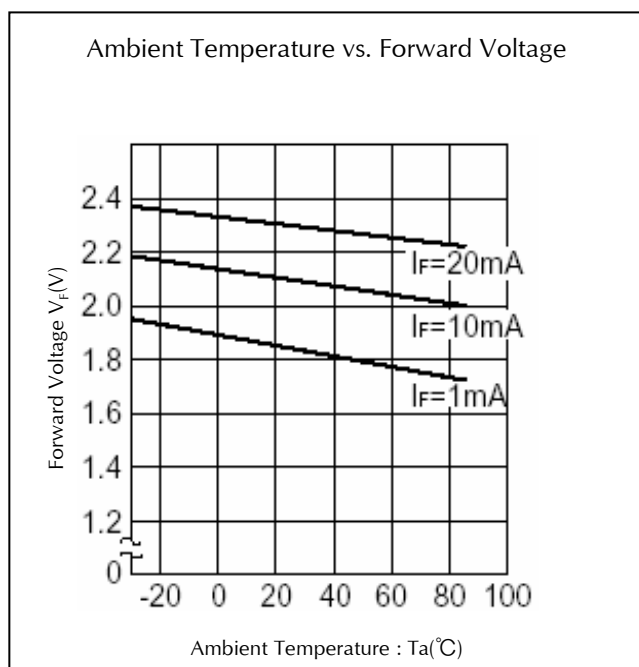
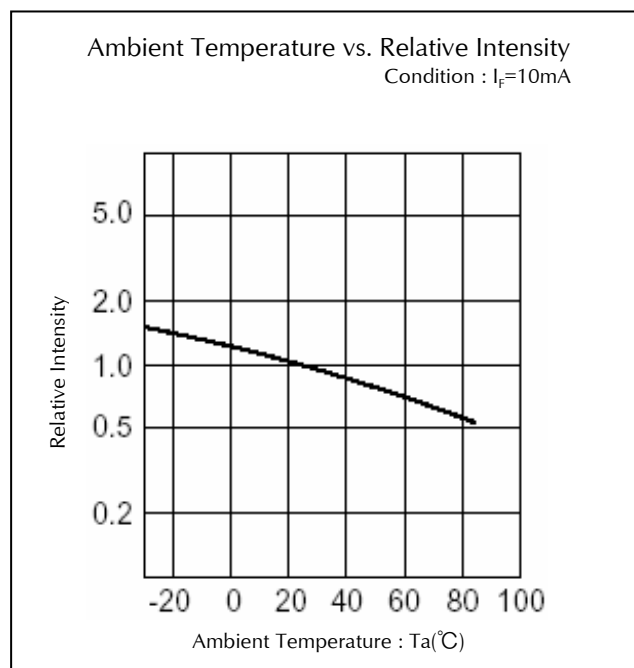
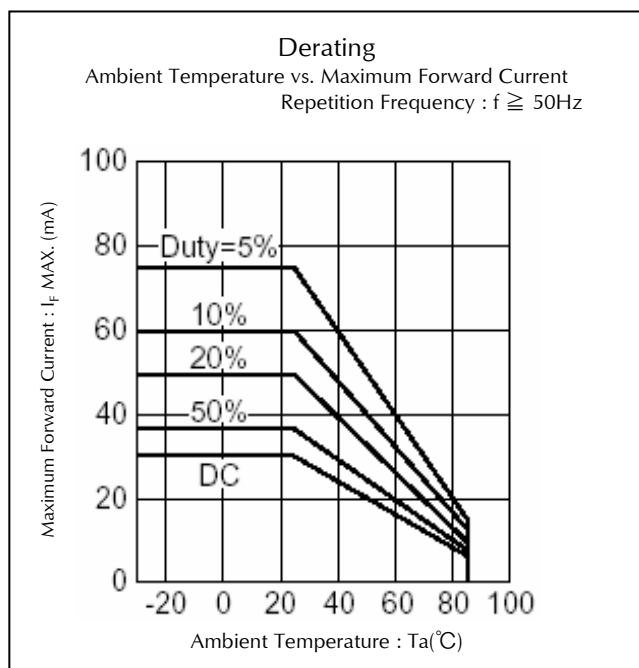
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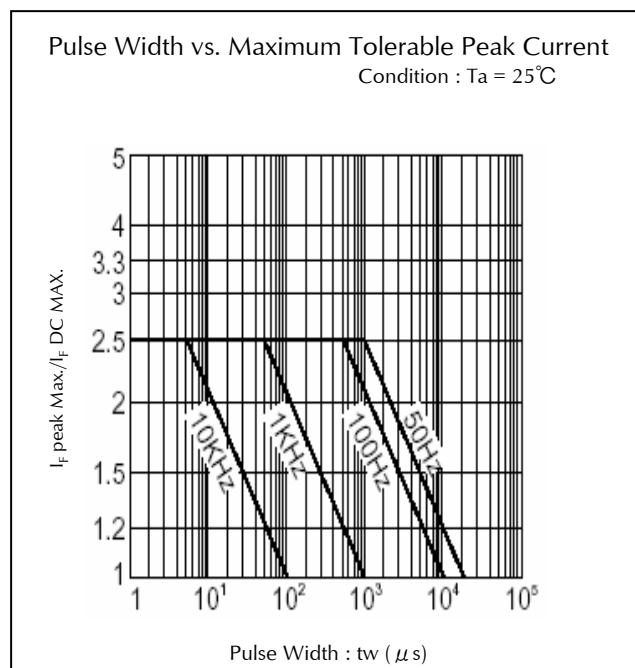
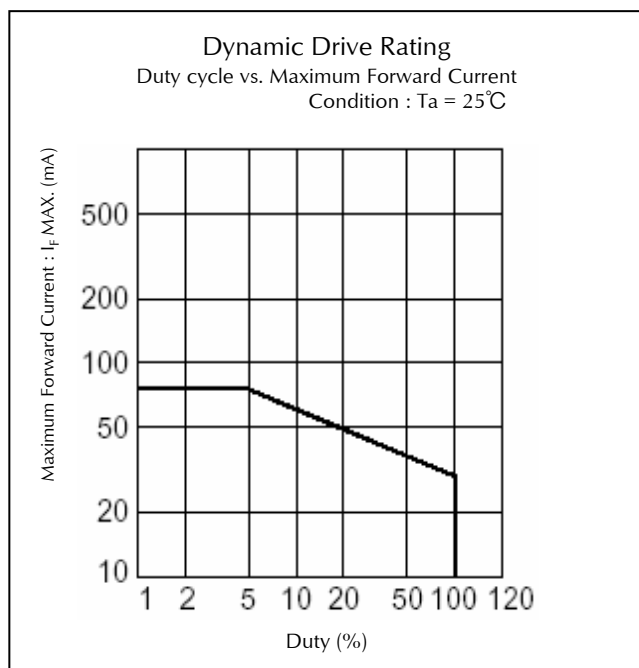
## Technical Data(MPR)



## Technical Data(MPR)

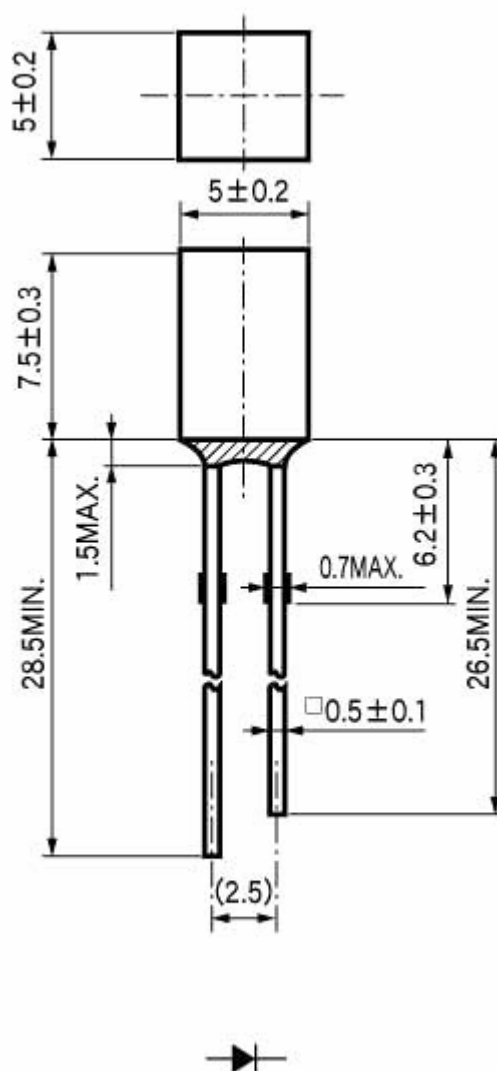


## Technical Data(MPR)



## Package Dimensions

(Unit: mm)



## TTW (Through The Wave) soldering Conditions

|                   |        |        |
|-------------------|--------|--------|
| Pre-heating       | 100 °C | (MAX.) |
| Solder Bath Temp. | 265°C  | (MAX.) |
| Dipping Time      | 5 s    | (MAX.) |

- 1) The dip soldering process shall be 2 times maximum.
  - 2) The product shall be cooled to room temp. before the second dipping process.
- ※The detail is described to LED and Photodetector handling precautions of home page:  
"Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation, please.

## Manual Soldering Conditions

|                              |         |        |
|------------------------------|---------|--------|
| Iron tip temp.               | 400°C   | (MAX.) |
| Soldering time and frequency | 3 s     | (MAX.) |
|                              | 2 times | (MAX.) |

※The detail is described to LED and Photodetector handling precautions of home page:  
"Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation, please.

## Reliability Testing Result

| Reliability Testing Result    | Applicable Standard   | Testing Conditions                                                                                                                                | Duration | Failure |
|-------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| Room Temp. Operating Life     | EIAJ ED-4701/100(101) | Ta = 25°C, If = Maximum Rated Current                                                                                                             | 1,000 h  | 0/25    |
| Resistance to Soldering Heat  | EIAJ ED-4701/300(302) | 260±5°C, 3mm from package base                                                                                                                    | 10s      | 0/25    |
| Temperature Cycling           | EIAJ ED-4701/100(105) | Minimum Rated Storage Temperature(30min)<br>~Normal Temperature(15min)<br>~Maximum Rated Storage Temperature(30min)<br>~Normal Temperature(15min) | 5 cycles | 0/25    |
| Wet High Temp. Storage Life   | EIAJ ED-4701/100(103) | Ta = 60±2°C, RH = 90±5%                                                                                                                           | 1,000 h  | 0/25    |
| High Temp. Storage Life       | EIAJ ED-4701/200(201) | Ta = Maximum Rated Storage Temperature                                                                                                            | 1,000 h  | 0/25    |
| Low Temp. Storage Life        | EIAJ ED-4701/200(202) | Ta = Minimum Rated Storage Temperature                                                                                                            | 1,000 h  | 0/25    |
| Lead Tension                  | EIAJ ED-4701/400(401) | 10N, 1time (□0.4 and Flat Package : 5N)                                                                                                           | 10s      | 0/10    |
| Vibration, Variable Frequency | EIAJ ED-4701/400(403) | 98.1m/s <sup>2</sup> (10G), 100 ~ 2KHz sweep for 20min., XYZ each direction                                                                       | 2 h      | 0/10    |

## Failure Criteria

| Items               | Symbols        | Conditions                                          | Failure criteria                                                |
|---------------------|----------------|-----------------------------------------------------|-----------------------------------------------------------------|
| Luminous Intensity  | Iv             | If Value of each product<br>Luminous Intensity      | Testing Min. Value < Spec. Min. Value x 0.5                     |
| Forward Voltage     | V <sub>F</sub> | If Value of each product<br>Forward Voltage         | Testing Max. Value ≥ Spec. Max. Value x 1.2                     |
| Reverse Current     | I <sub>R</sub> | V <sub>R</sub> = Maximum Rated<br>Reverse Voltage V | Testing Max. Value ≥ Spec. Max. Value x 2.5                     |
| Cosmetic Appearance | -              | -                                                   | Occurrence of notable decoloration,<br>deformation and cracking |



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