

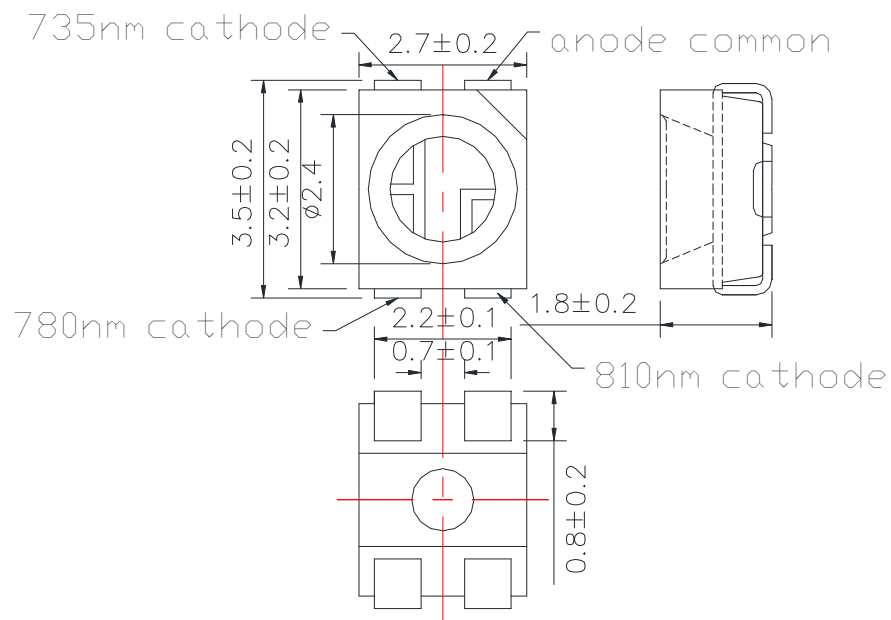
## Data Sheet

# SMT735/780/810

High Performance Multi-color TOP LED

USHIO

### Outline and Internal Circuit



(Unit : mm)

### Features

- Chip Material : AlGaAs
- Chip Dimension : 400um \* 400um
- Number of Chips : 3pcs
- Peak Wavelength: 735nm / 780nm / 810nm typ.
- Lead Frame Die : Silver Plated
- Package Resin : PA6T
- Lens : Silicone or Epoxy Resin

### Application

## 735nm

### Absolute Maximum Ratings (Tc=25°C)

| Item                  | Symbol | Ratings    | Unit |
|-----------------------|--------|------------|------|
| Power Dissipation     | PD     | 150        | mW   |
| Forward Current       | IF     | 75         | mA   |
| Pulse Forward Current | IFP    | 500        | mA   |
| Reverse Voltage       | VR     | 5          | V    |
| Thermal Resistance    | Rthja  | 80         | K/W  |
| Junction Temperature  | Tj     | 120        | °C   |
| Operating Temperature | Topr   | -40 ~ +100 | °C   |
| Storage Temperature   | Tstg   | -40 ~ +100 | °C   |
| Soldering Temperature | TSOL   | 250        | °C   |

‡Pulse Forward Current condition: Duty 1% and Pulse Width=10us.

‡Soldering condition: Soldering condition must be completed with 5 seconds at 250°C.

### Optical and Electrical Characteristics (Tc=25°C)

| Parameter            | Symbol          | Min | Typ | Max | Unit | Test Condition |
|----------------------|-----------------|-----|-----|-----|------|----------------|
| Forward Voltage      | VF              |     | 1.8 | 2.0 | V    | IF=50mA        |
|                      | VFP             |     | 3.3 |     |      | IFP=500mA      |
| Total Radiated Power | PO              |     | 17  |     | mW   | IF=50mA        |
|                      |                 |     | 170 |     |      | IFP=500mA      |
| Peak Wavelength      | $\lambda_p$     | 725 |     | 745 | nm   | IF=50mA        |
| Half Width           | $\Delta\lambda$ |     | 23  |     | nm   | IF=50mA        |
| Rise Time            | tr              |     | 10  |     | ns   | IF=50mA        |
| Fall Time            | tf              |     | 20  |     | ns   | IF=50mA        |

‡ Radiated Power is measured by S3584-08.

## 780nm

### Absolute Maximum Ratings (Tc=25°C)

| Item                  | Symbol | Ratings    | Unit |
|-----------------------|--------|------------|------|
| Power Dissipation     | PD     | 200        | mW   |
| Forward Current       | IF     | 100        | mA   |
| Pulse Forward Current | IFP    | 500        | mA   |
| Reverse Voltage       | VR     | 5          | V    |
| Thermal Resistance    | Rthja  | 80         | K/W  |
| Junction Temperature  | Tj     | 120        | °C   |
| Operating Temperature | Topr   | -40 ~ +100 | °C   |
| Storage Temperature   | Tstg   | -40 ~ +100 | °C   |
| Soldering Temperature | TSOL   | 250        | °C   |

‡Pulse Forward Current condition: Duty 1% and Pulse Width=10us.

‡Soldering condition: Soldering condition must be completed with 5 seconds at 250°C.

### Optical and Electrical Characteristics (Tc=25°C)

| Parameter            | Symbol          | Min | Typ | Max | Unit | Test Condition |
|----------------------|-----------------|-----|-----|-----|------|----------------|
| Forward Voltage      | VF              |     | 1.7 | 2.0 | V    | IF=50mA        |
|                      | VFP             |     | 3.5 |     |      | IFP=500mA      |
| Total Radiated Power | PO              |     | 20  |     | mW   | IF=50mA        |
|                      |                 |     | 190 |     |      | IFP=500mA      |
| Peak Wavelength      | $\lambda_p$     | 770 |     | 790 | nm   | IF=50mA        |
| Half Width           | $\Delta\lambda$ |     | 27  |     | nm   | IF=50mA        |
| Rise Time            | tr              |     | 30  |     | ns   | IF=50mA        |
| Fall Time            | tf              |     | 30  |     | ns   | IF=50mA        |

‡ Radiated Power is measured by S3584-08.

## 810nm

### Absolute Maximum Ratings (Tc=25°C)

| Item                  | Symbol | Ratings    | Unit |
|-----------------------|--------|------------|------|
| Power Dissipation     | PD     | 200        | mW   |
| Forward Current       | IF     | 100        | mA   |
| Pulse Forward Current | IFP    | 500        | mA   |
| Reverse Voltage       | VR     | 5          | V    |
| Thermal Resistance    | Rthja  | 80         | K/W  |
| Junction Temperature  | Tj     | 120        | °C   |
| Operating Temperature | Topr   | -40 ~ +100 | °C   |
| Storage Temperature   | Tstg   | -40 ~ +100 | °C   |
| Soldering Temperature | TSOL   | 250        | °C   |

‡Pulse Forward Current condition: Duty 1% and Pulse Width=10us.

‡Soldering condition: Soldering condition must be completed with 5 seconds at 250°C.

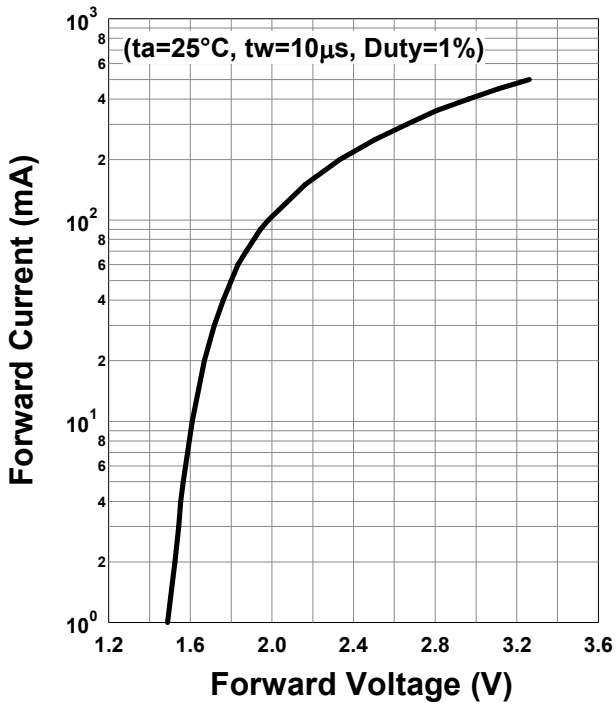
### Optical and Electrical Characteristics (Tc=25°C)

| Parameter            | Symbol          | Min | Typ | Max | Unit | Test Condition |
|----------------------|-----------------|-----|-----|-----|------|----------------|
| Forward Voltage      | VF              |     | 1.6 | 2.0 | V    | IF=50mA        |
|                      | VFP             |     | 2.6 |     |      | IFP=500mA      |
| Total Radiated Power | PO              |     | 20  |     | mW   | IF=50mA        |
|                      |                 |     | 200 |     |      | IFP=500mA      |
| Peak Wavelength      | $\lambda_p$     | 800 |     | 820 | nm   | IF=50mA        |
| Half Width           | $\Delta\lambda$ |     | 30  |     | nm   | IF=50mA        |
| Rise Time            | tr              |     | 20  |     | ns   | IF=50mA        |
| Fall Time            | tf              |     | 30  |     | ns   | IF=50mA        |

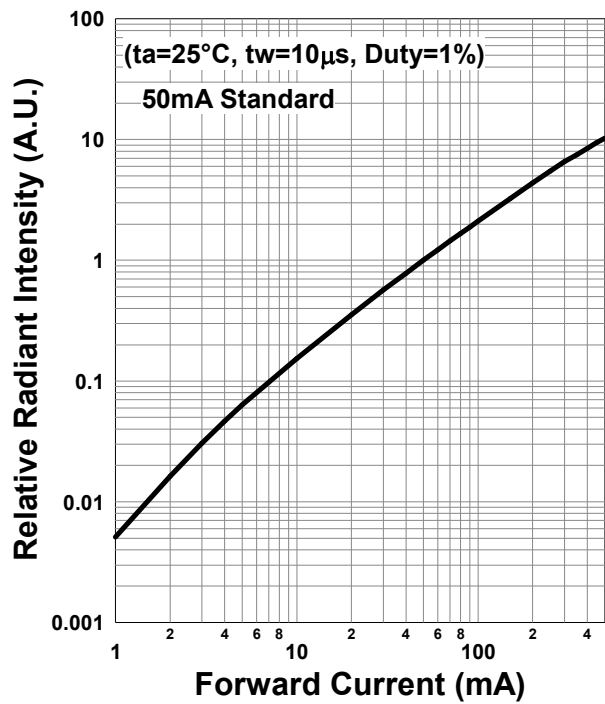
‡ Radiated Power is measured by S3584-08.

## Typical Characteristic Curves 735nm

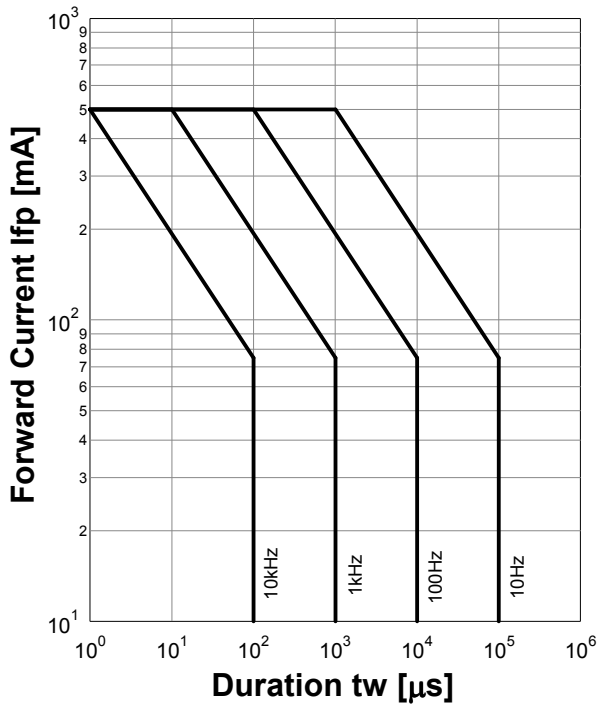
### Forward Current - Forward Voltage



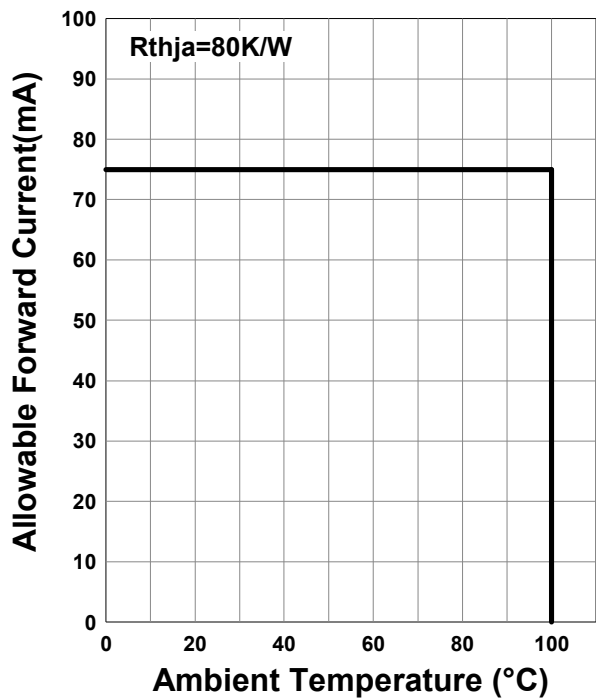
### Relative Radiant Intensity - Forward Current



### Forward Current - Pulse Duration

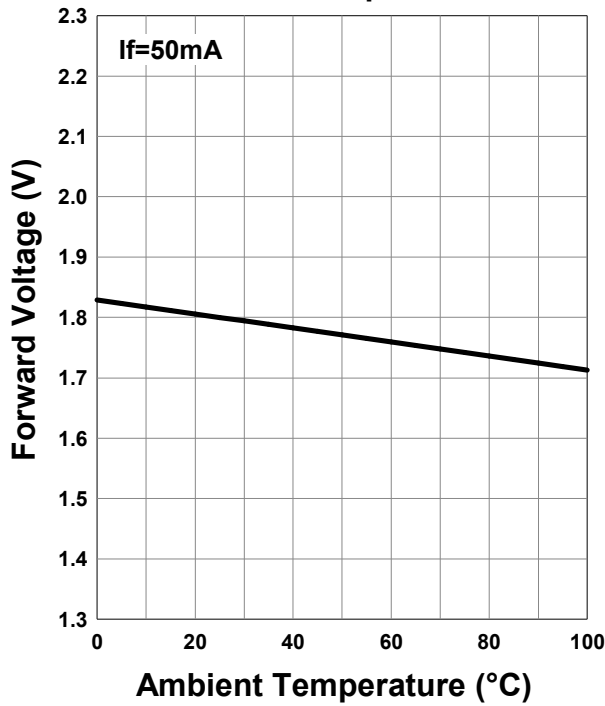


### Allowable Forward Current - Ambient Temperature

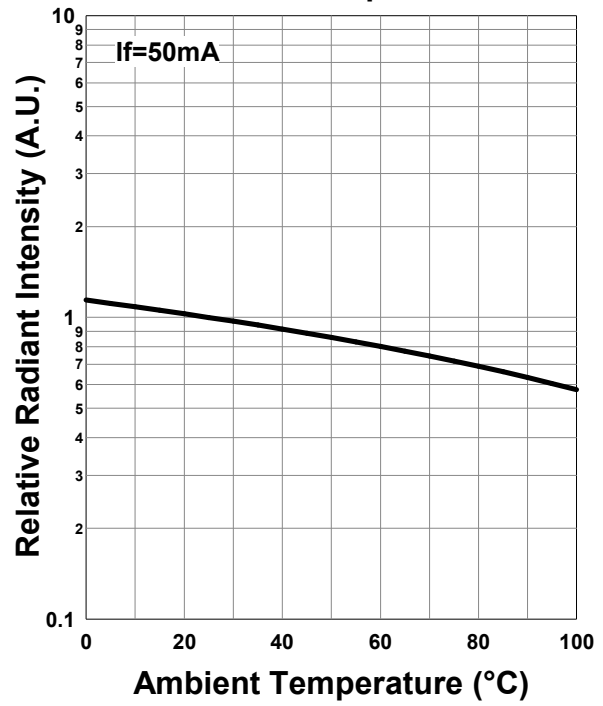


735nm

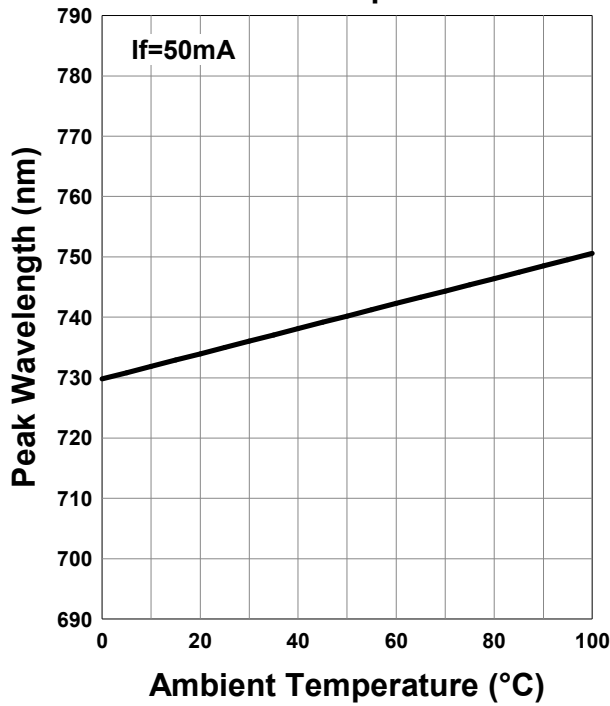
**Forward Voltage - Ambient Temperature**



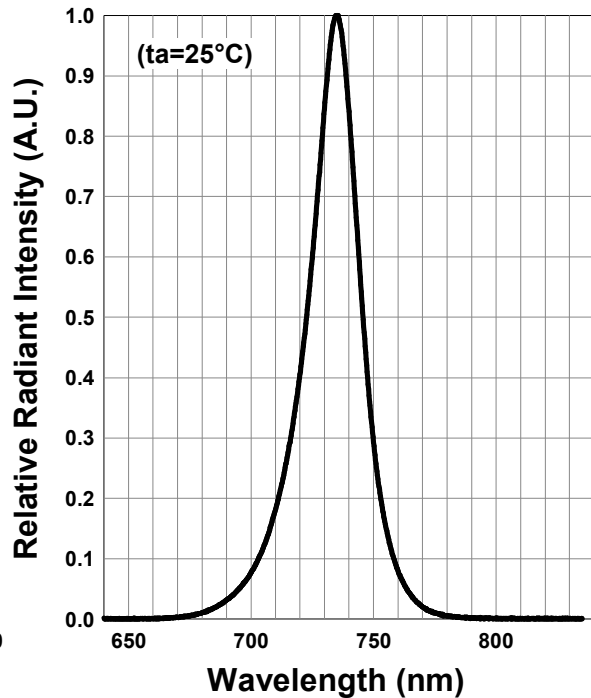
**Relative Radiant Intensity - Ambient Temperature**



**Peak Wavelength - Ambient Temperature**



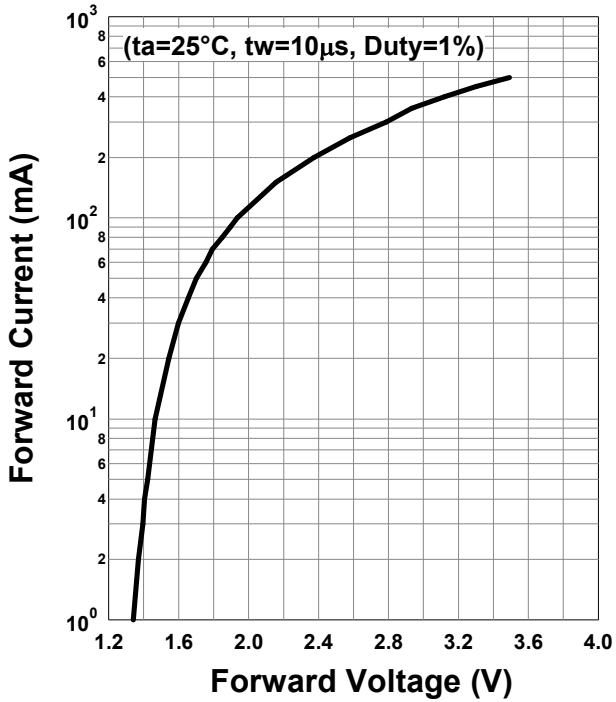
**Relative Spectral Emission**



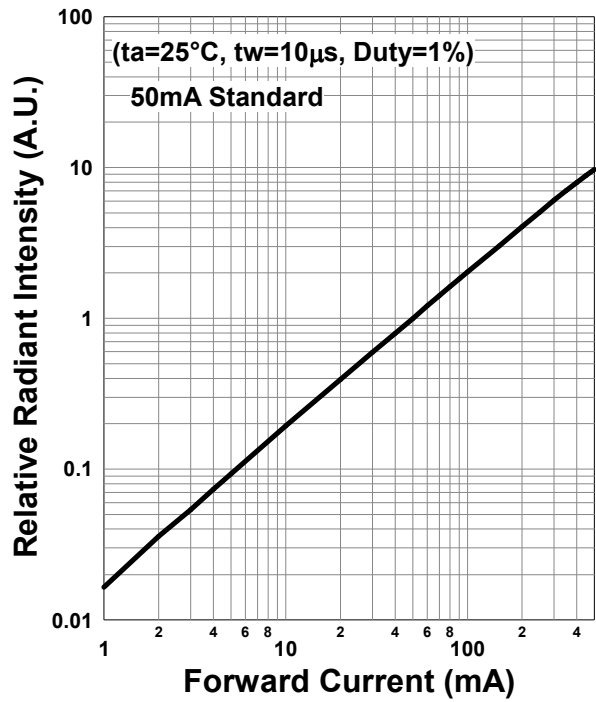
## Typical Characteristic Curves

780nm

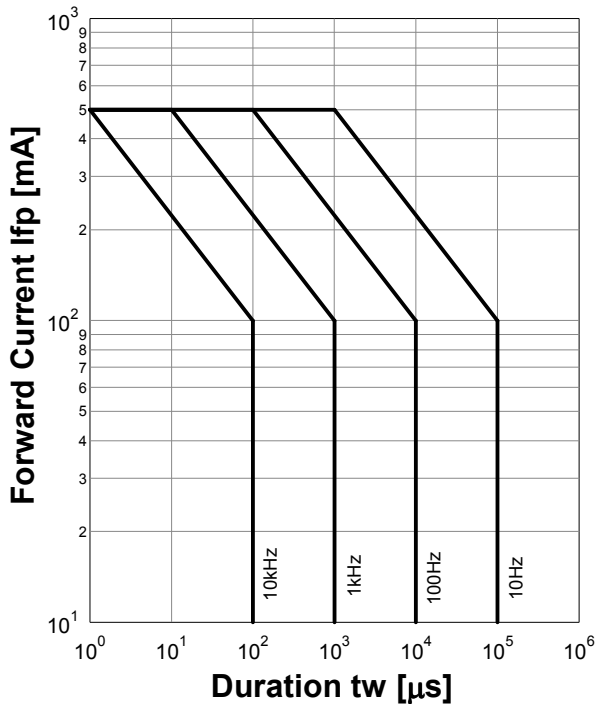
**Forward Current - Forward Voltage**



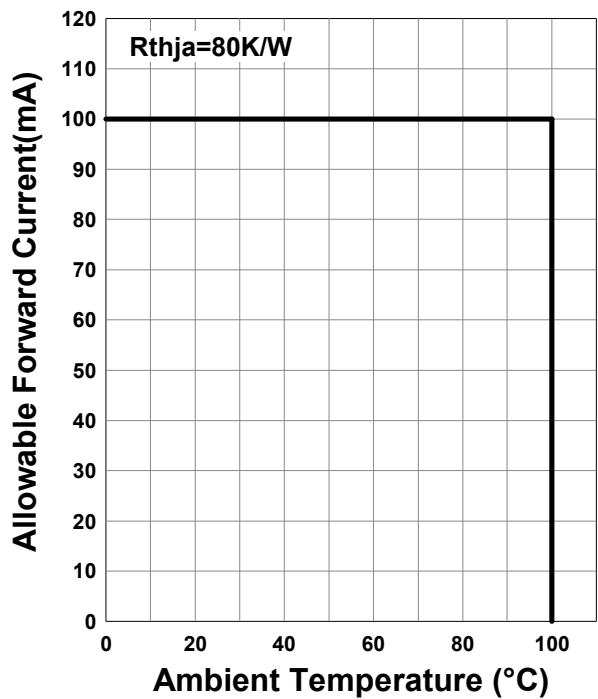
**Relative Radiant Intensity - Forward Current**



**Forward Current - Pulse Duration**



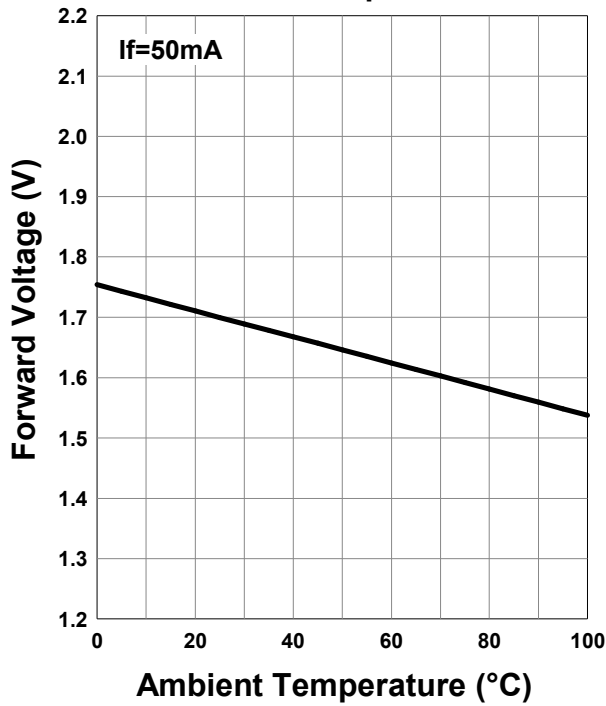
**Allowable Forward Current - Ambient Temperature**



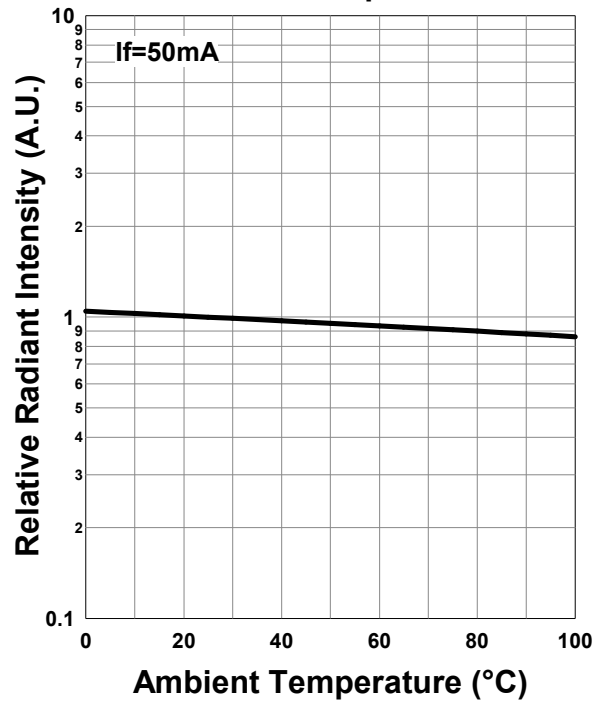
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780nm

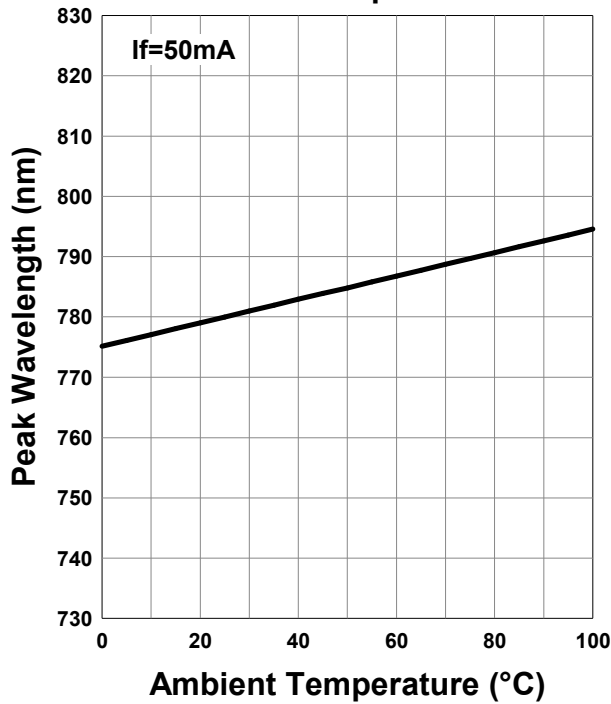
**Forward Voltage - Ambient Temperature**



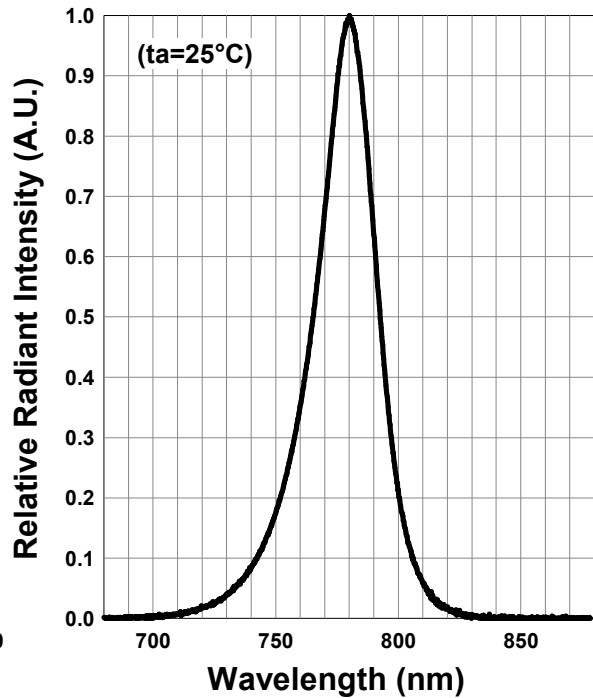
**Relative Radiant Intensity - Ambient Temperature**



**Peak Wavelength - Ambient Temperature**



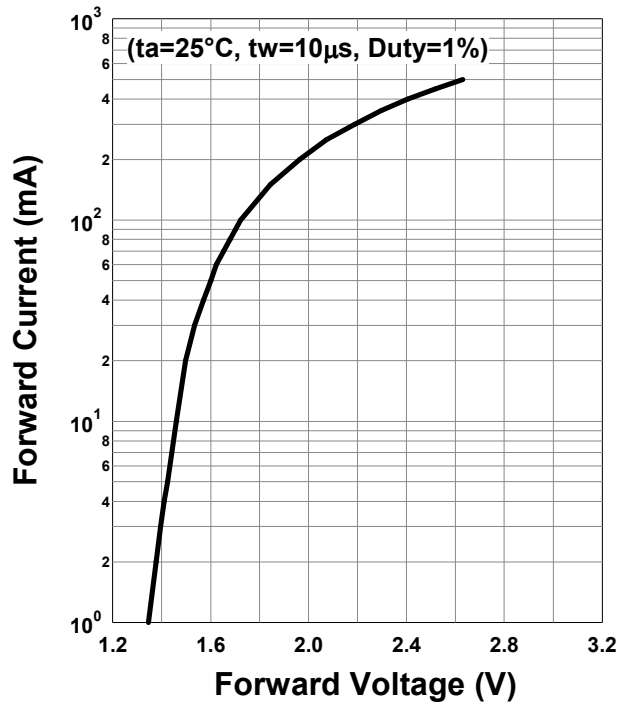
**Relative Spectral Emission**



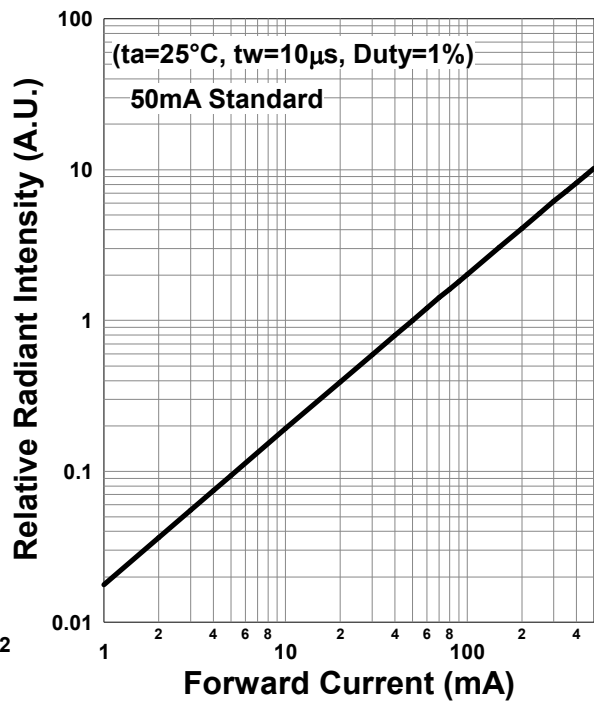


## Typical Characteristic Curves 810nm

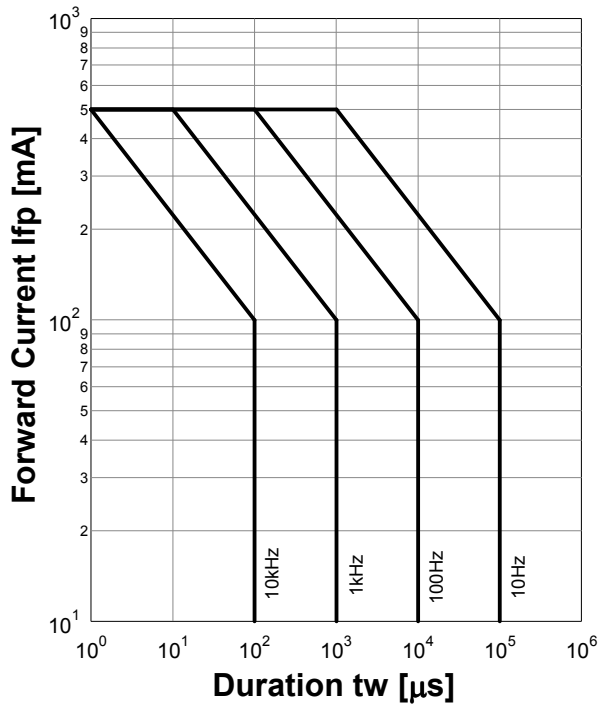
### Forward Current - Forward Voltage



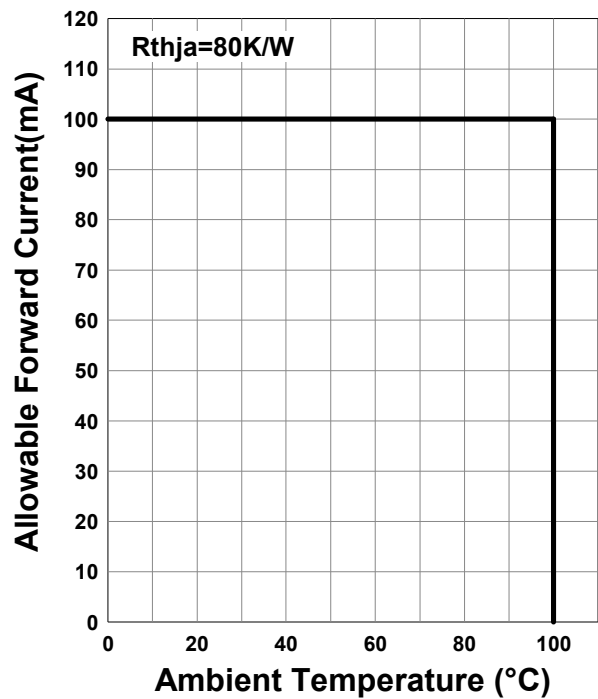
### Relative Radiant Intensity - Forward Current



### Forward Current - Pulse Duration

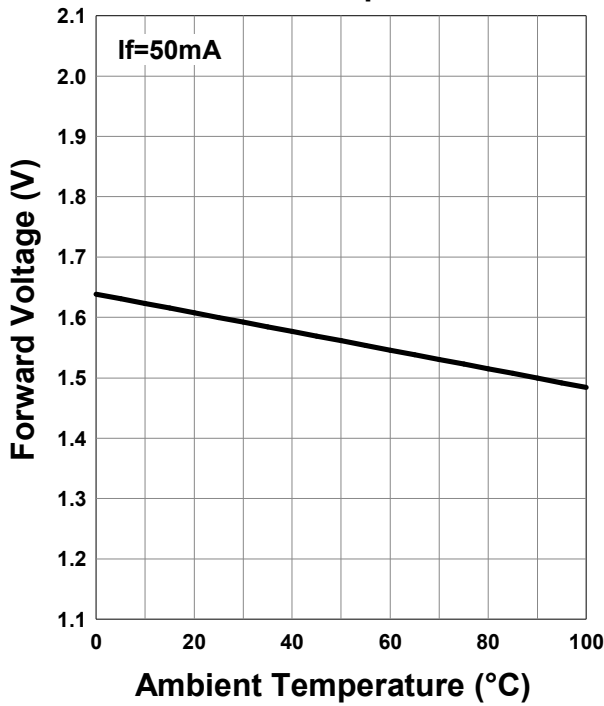


### Allowable Forward Current - Ambient Temperature

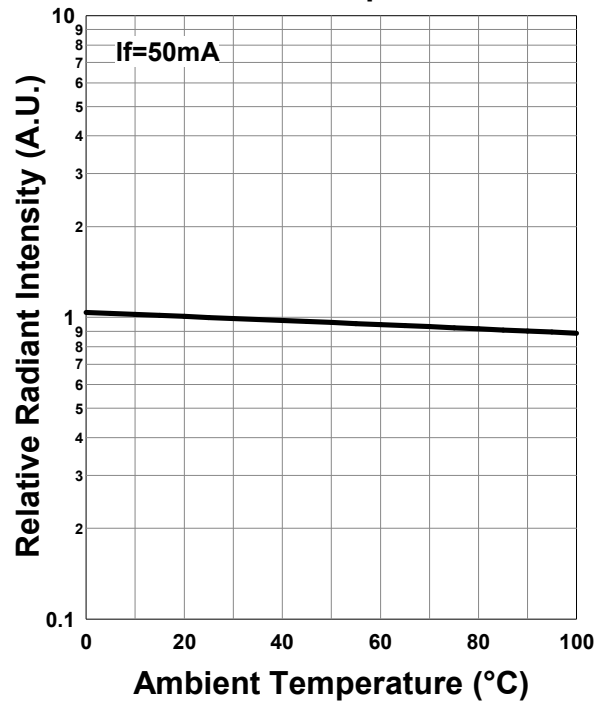


810nm

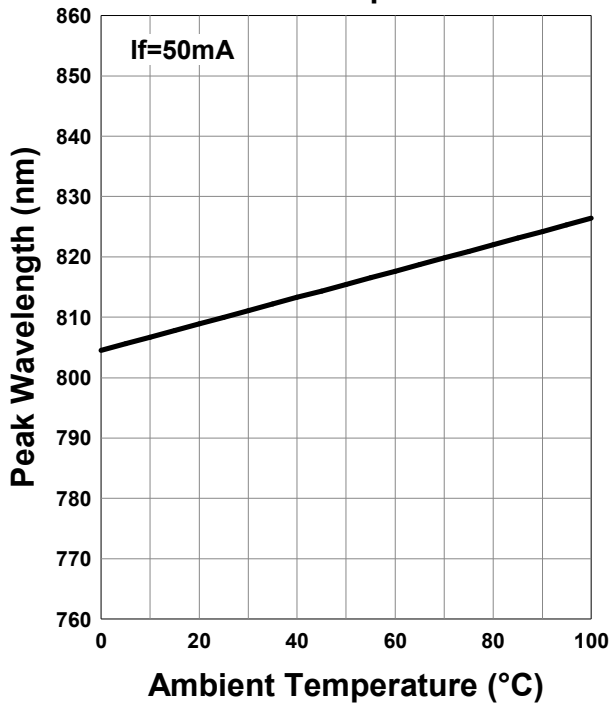
**Forward Voltage - Ambient Temperature**



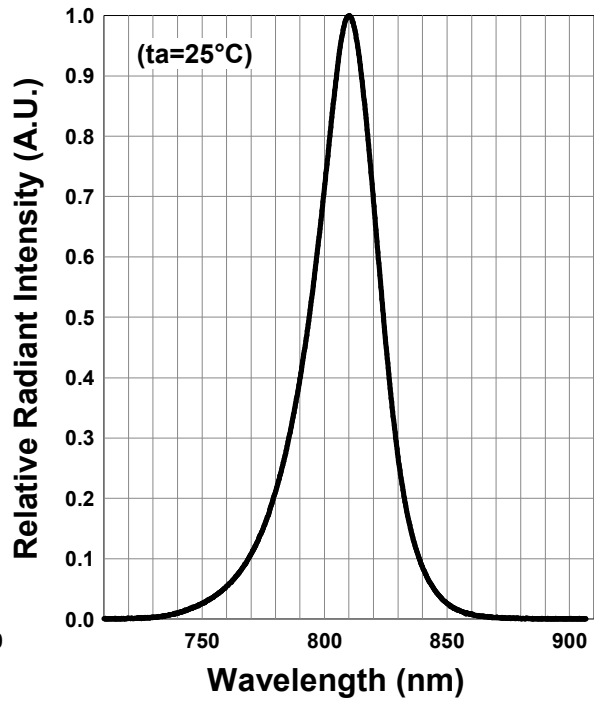
**Relative Radiant Intensity - Ambient Temperature**



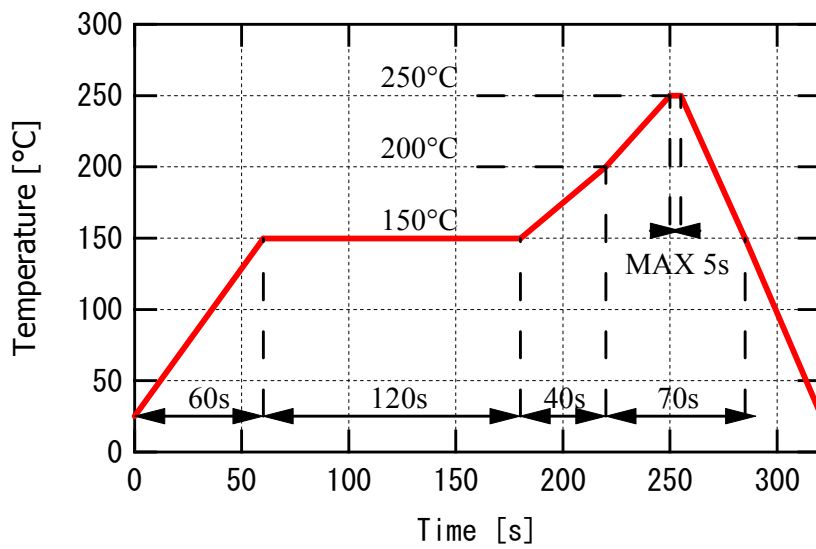
**Peak Wavelength - Ambient Temperature**



**Relative Spectral Emission**

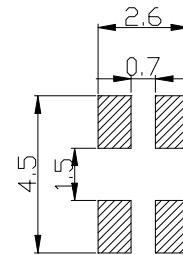


## Recommended reflow soldering profile



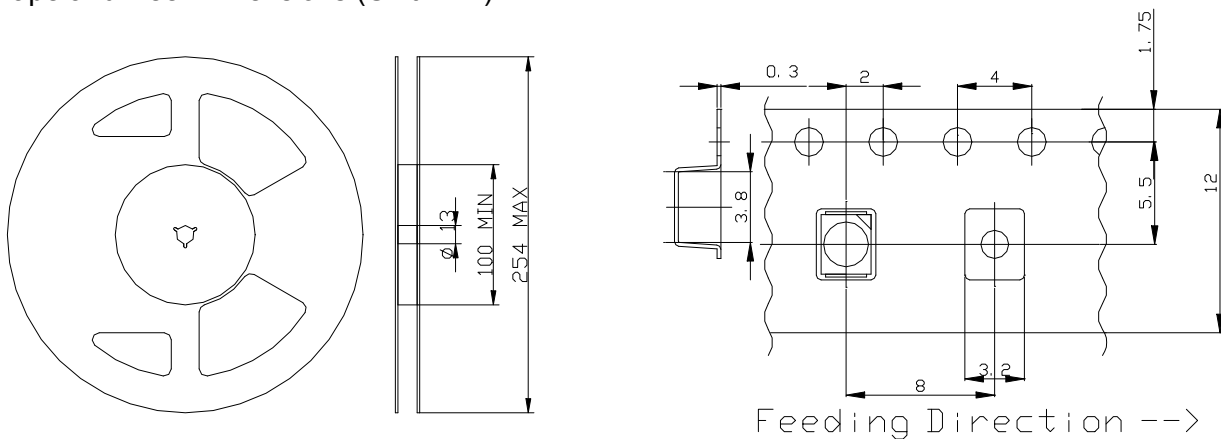
Don't put stress on SMD and a circuit board after soldering

## Recommended Land Layout (Unit: mm)



## SMD Packing

Tape and Reel Dimensions (Unit: mm)



## Wrapping

Moisture barrier bag aluminum laminated film with a desiccant to keep out the moisture absorption during the transportation and storage.

## SMD LED storage and handling precautions

### Storage Conditions before Opening a Moisture-Barrier Aluminum Bag

- Before opening a moisture-barrier aluminum bag, please store it at <30°C, <60%RH.
- Please note that the maximum shelf life is 12 months under these conditions.

### Storage Conditions after Opening a Moisture-Barrier Aluminum Bag

- After opening a moisture-barrier aluminum bag, store the aluminum bag and silica gel in a desiccator.
- After opening the bag, please solder the LEDs within 72 hours in a room with 5 - 30°C, <50%RH.
- Please put any unused, remaining LEDs and silica gel back in the same aluminum bag and then vacuum-seal the bag.
- It is recommended to keep the re-sealed bag in a desiccator at <30%RH.
- The 72-hour- long floor life does not include the time while LEDs are stored in the moisture-barrier aluminum bag. However, we strongly recommend to solder the LEDs as soon as possible after opening the aluminum bag

### Notes about Re-sealing a Moisture-Barrier Aluminum Bag

- When vacuum-sealing an opened aluminum bag, if you find the moisture-indicator of the silica gel has changed to pink from blue (indicating a relative humidity of 30 % or more), please do not use the unused LEDs, the aluminum bag, or the silica gel.

### Notes about Opening a Re-sealed Moisture-Barrier Aluminum Bag

- When opening a vacuumed and re-sealed aluminum bag in order to use the remaining LEDs stored in the bag, if you find that the moisture-indicator of the silica has changed to pink, please do not use the LEDs.

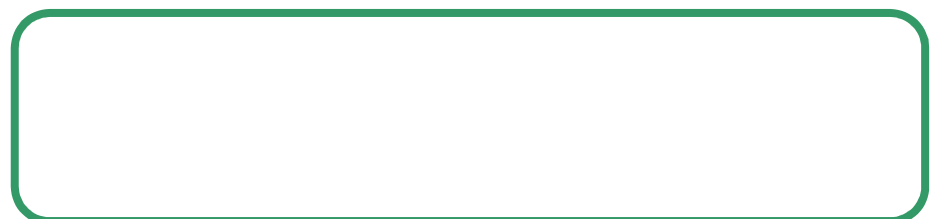
## Disclaimer

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Product data and parameters in this catalog are typical values based on reasonably up-to-date measurements.

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