

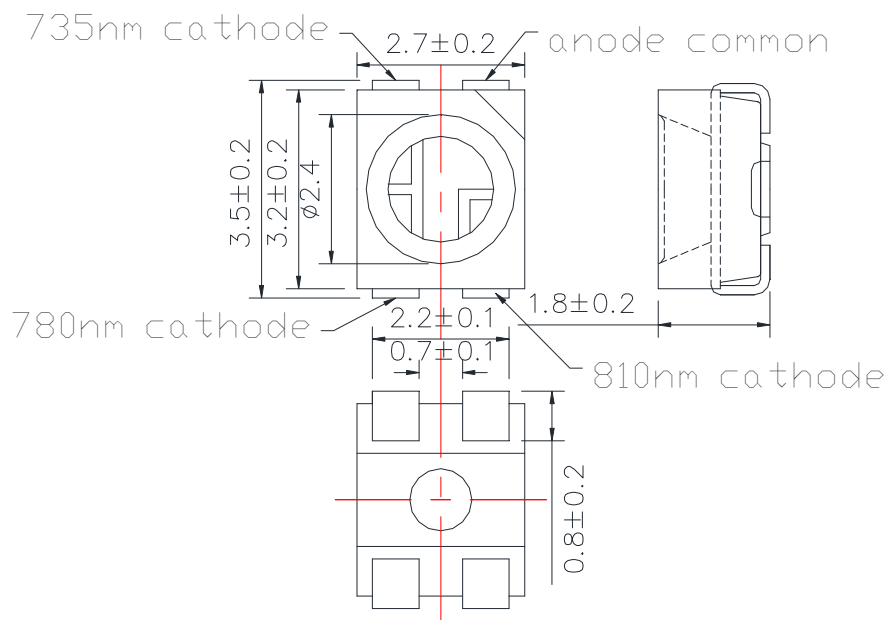
## Data Sheet

# SMT735/780/810

High Performance Multi-color TOP LED

USHIO

### Outline and Internal Circuit



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(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.

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## 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.

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## 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

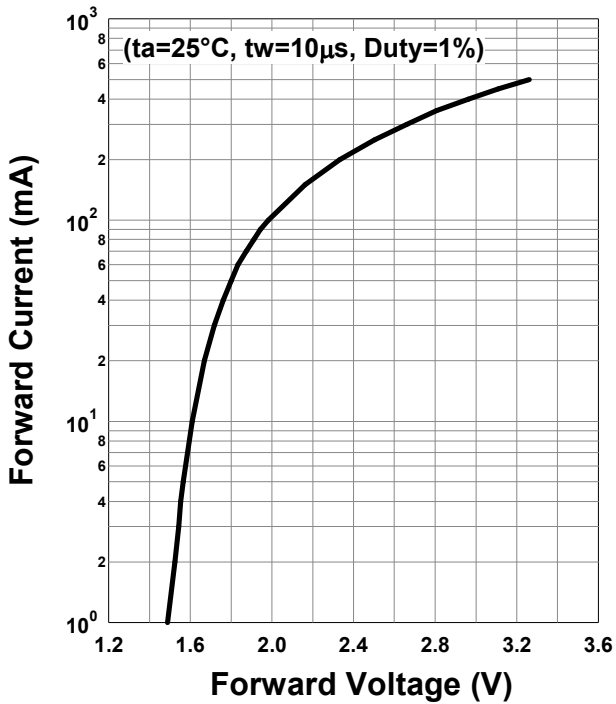
‡ Radiated Power is measured by S3584-08.

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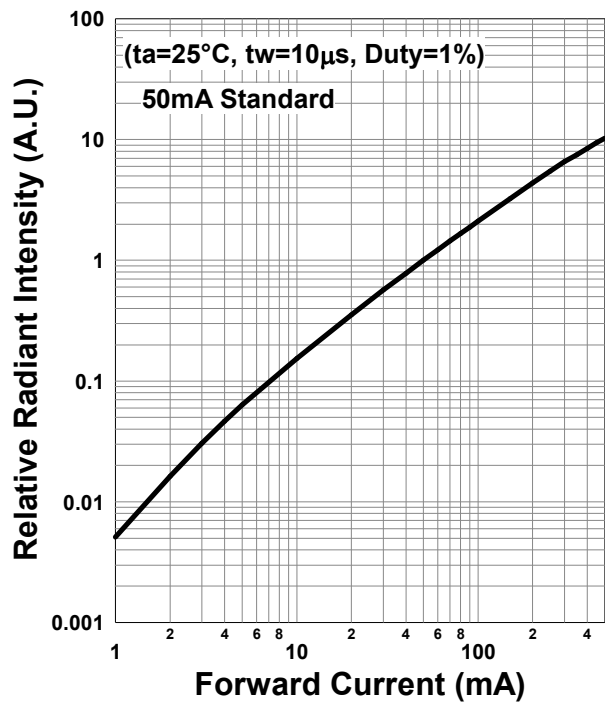
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## Typical Characteristic Curves 735nm

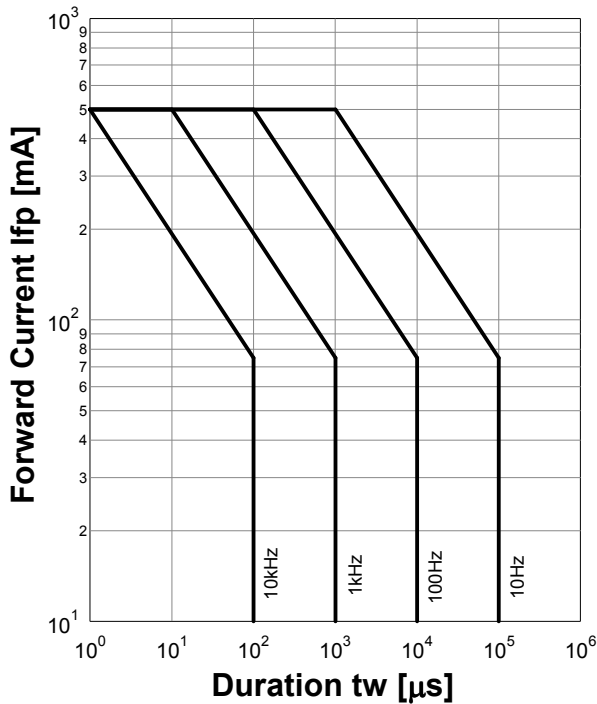
### Forward Current - Forward Voltage



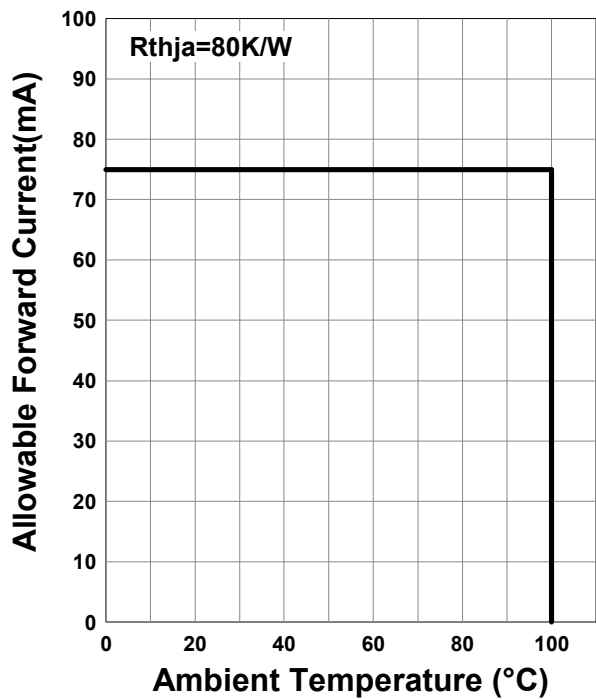
### Relative Radiant Intensity - Forward Current



### Forward Current - Pulse Duration



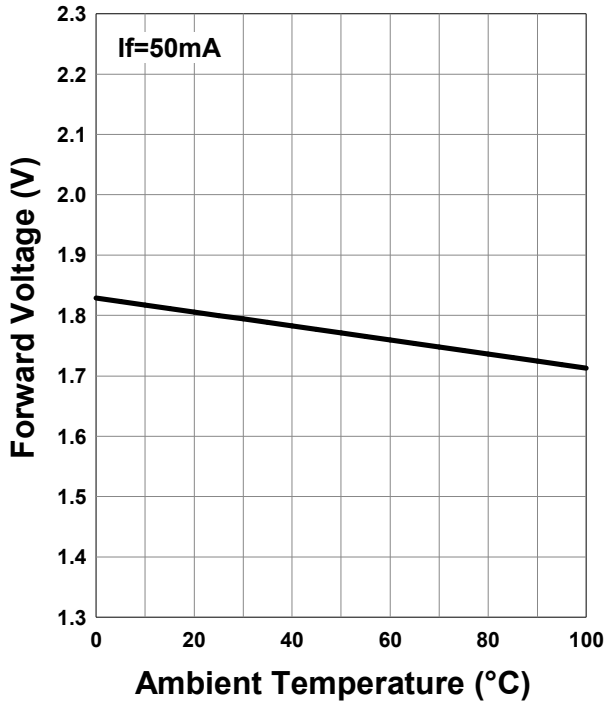
### Allowable Forward Current - Ambient Temperature



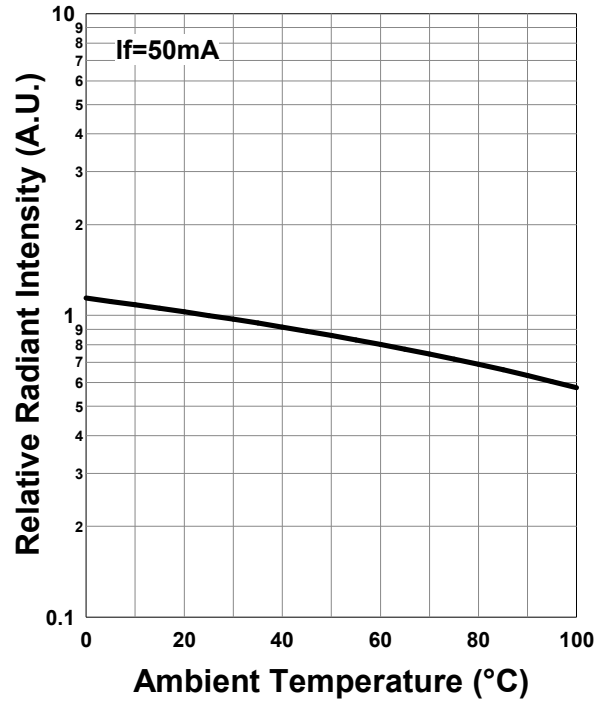
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735nm

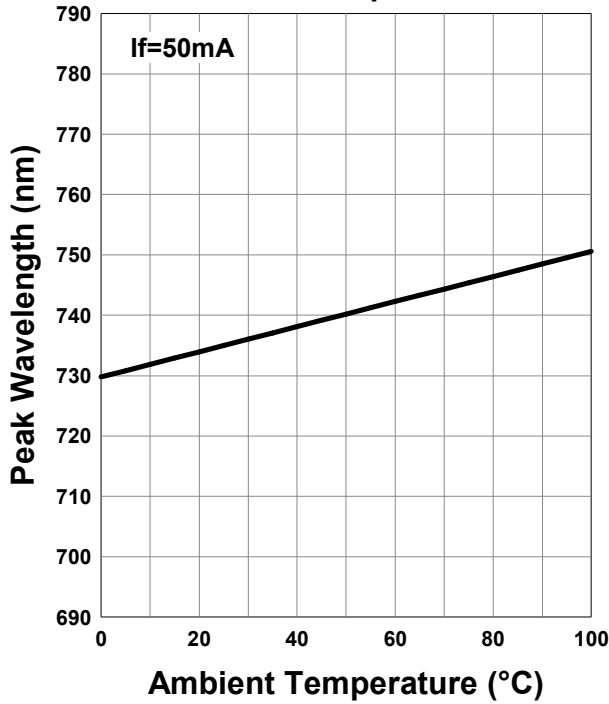
**Forward Voltage - Ambient Temperature**



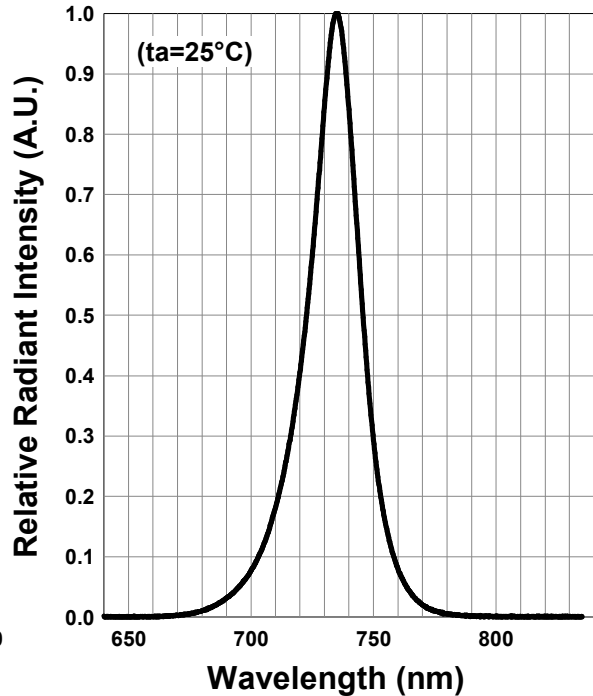
**Relative Radiant Intensity - Ambient Temperature**



**Peak Wavelength - Ambient Temperature**



**Relative Spectral Emission**



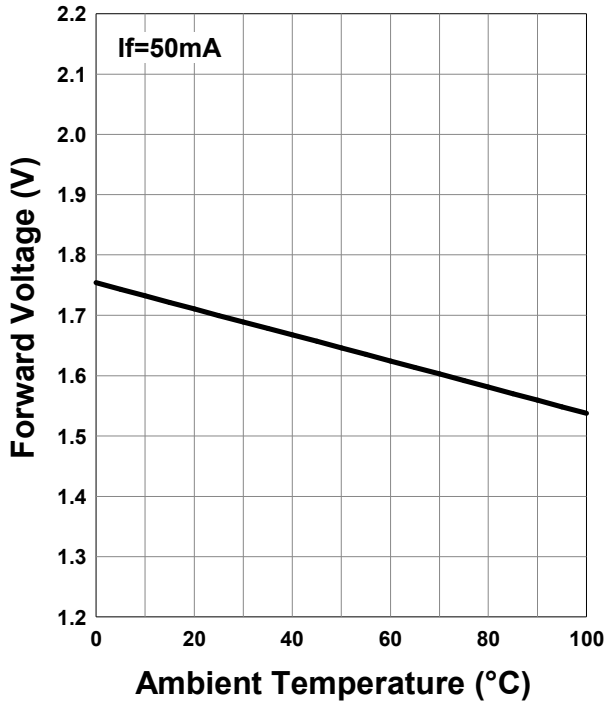
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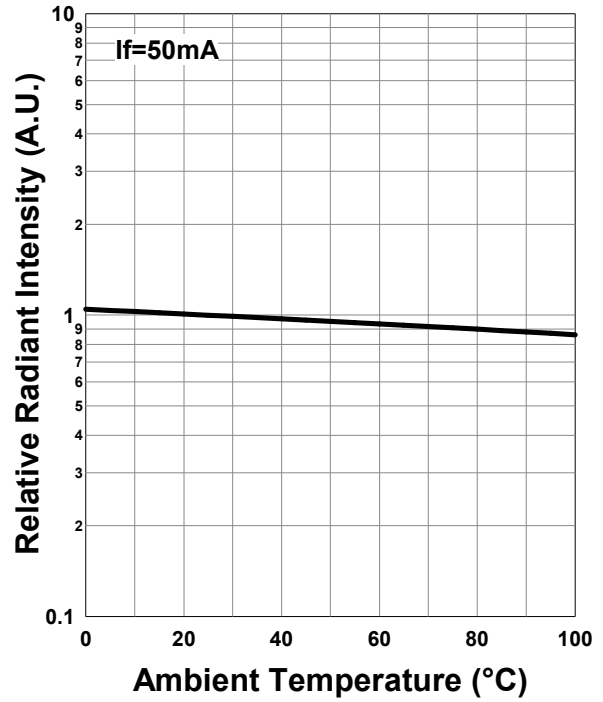


780nm

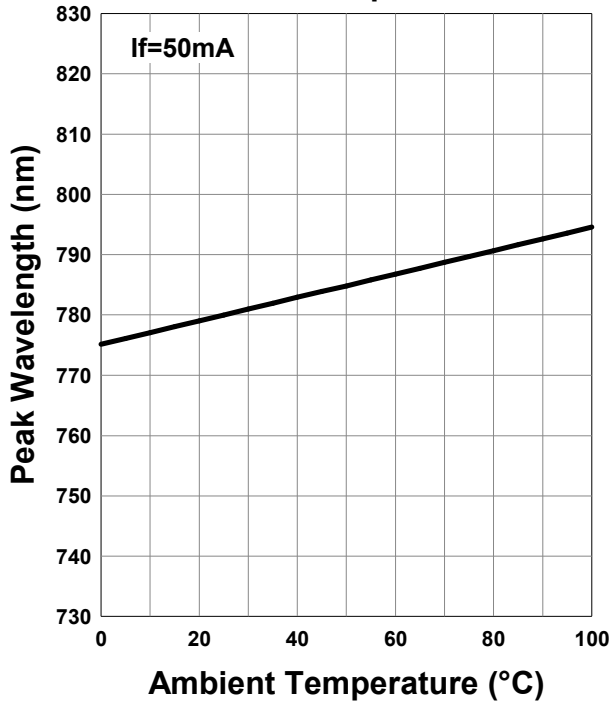
**Forward Voltage - Ambient Temperature**



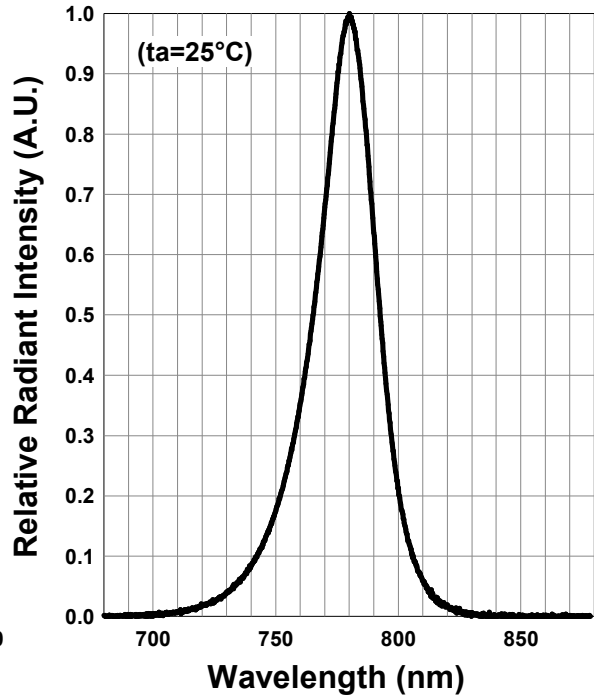
**Relative Radiant Intensity - Ambient Temperature**



**Peak Wavelength - Ambient Temperature**



**Relative Spectral Emission**



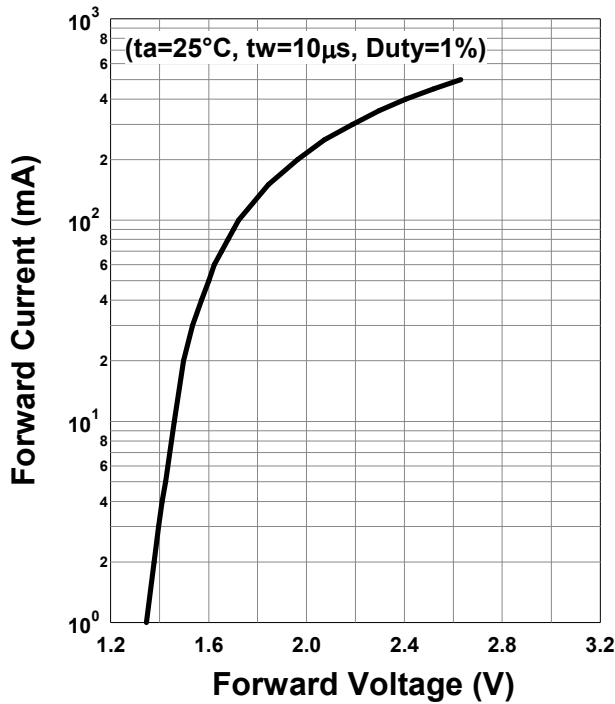
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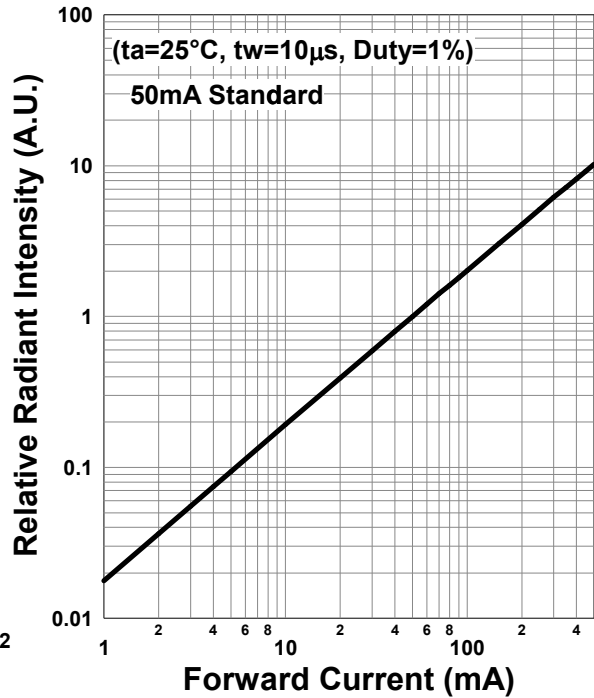


## Typical Characteristic Curves 810nm

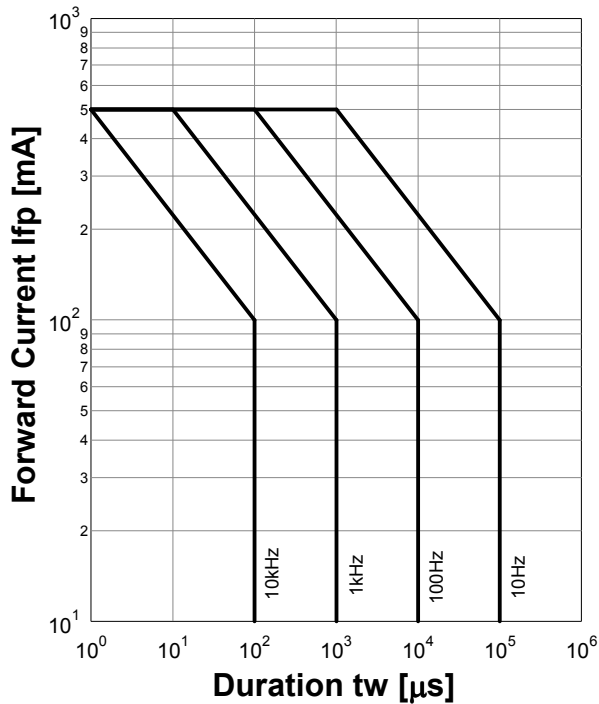
### Forward Current - Forward Voltage



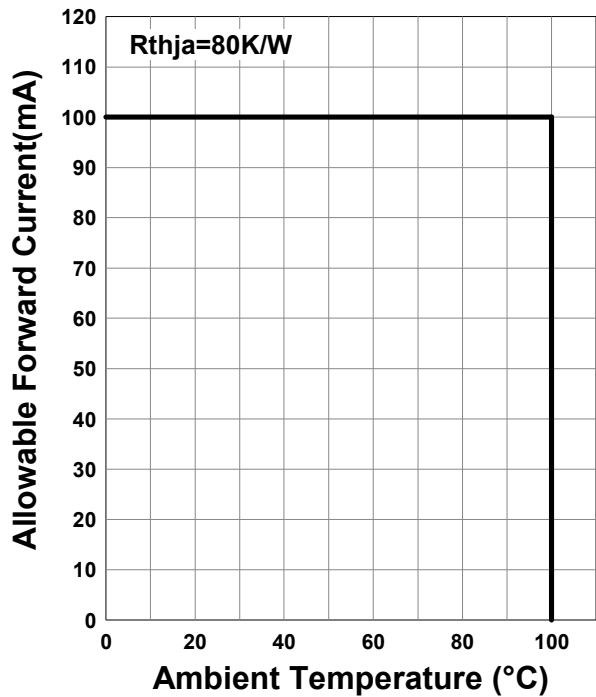
### Relative Radiant Intensity - Forward Current



### Forward Current - Pulse Duration



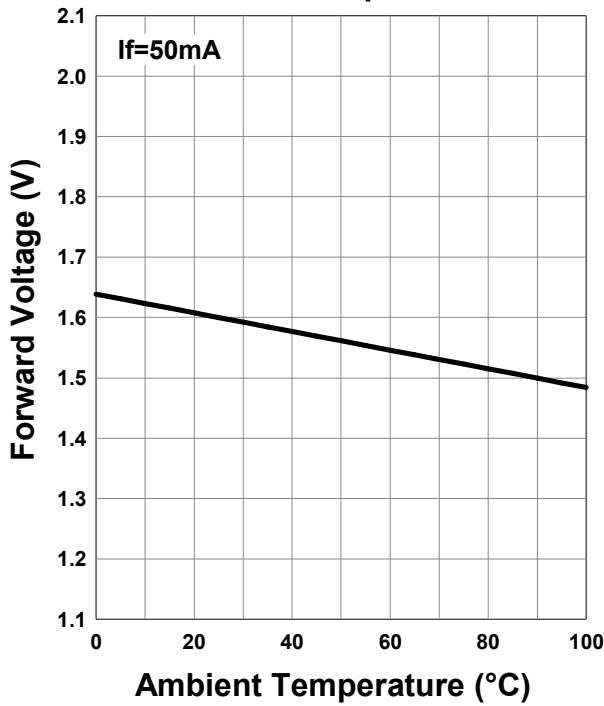
### Allowable Forward Current - Ambient Temperature



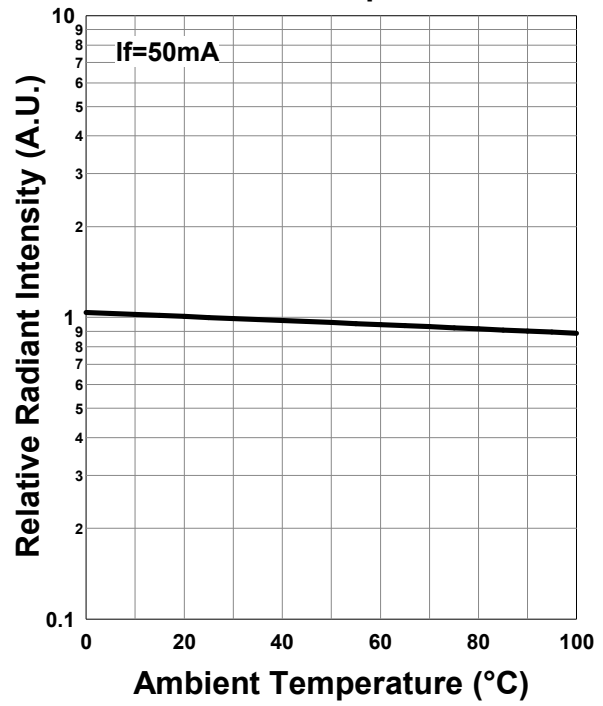
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810nm

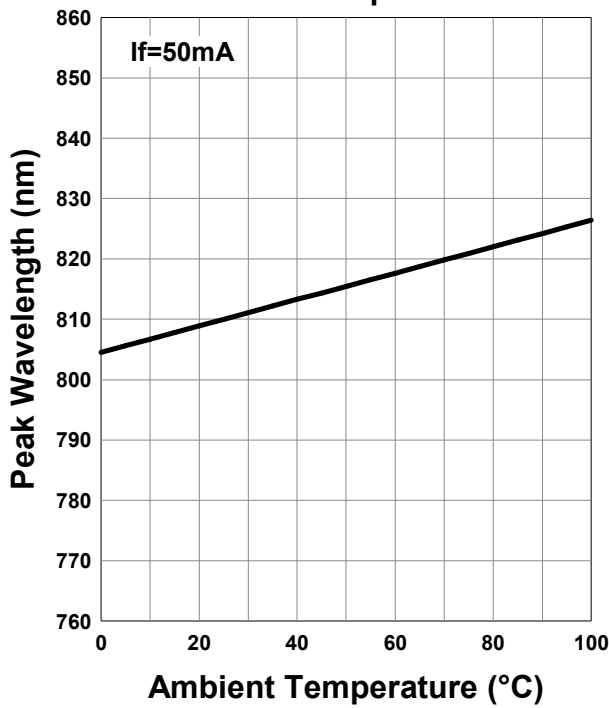
**Forward Voltage - Ambient Temperature**



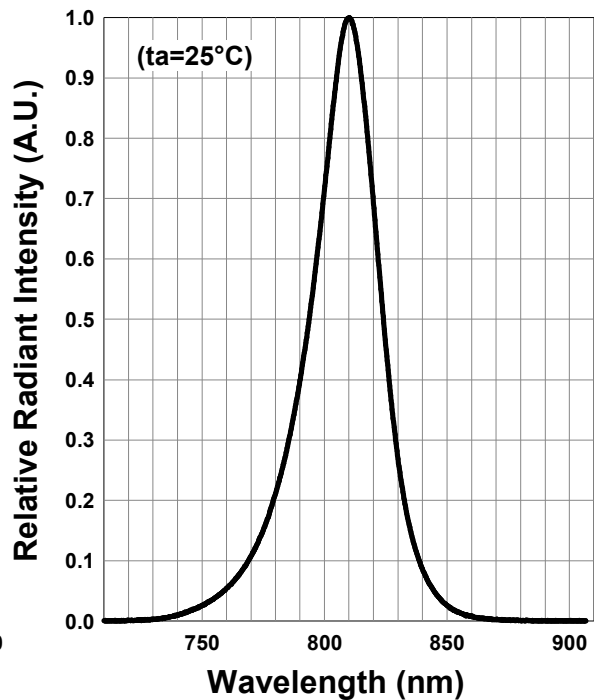
**Relative Radiant Intensity - Ambient Temperature**



**Peak Wavelength - Ambient Temperature**



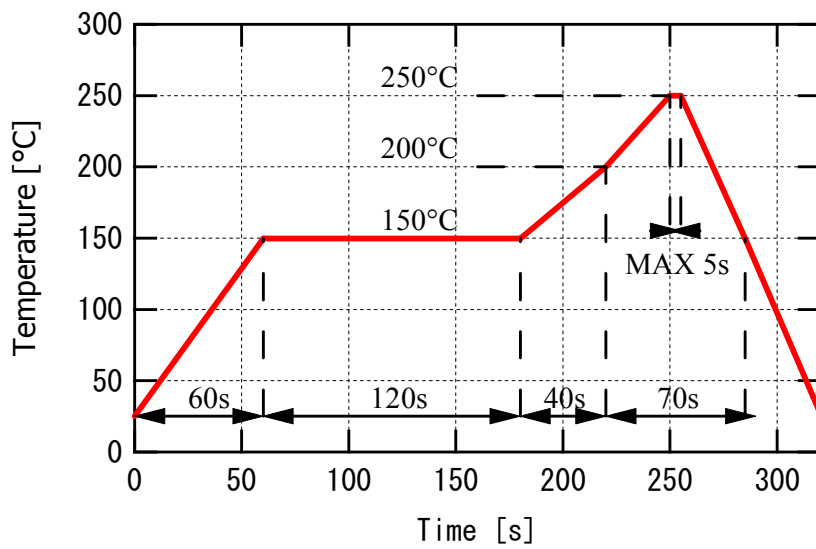
**Relative Spectral Emission**



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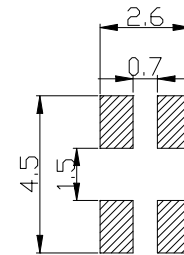
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## Recommended reflow soldering profile



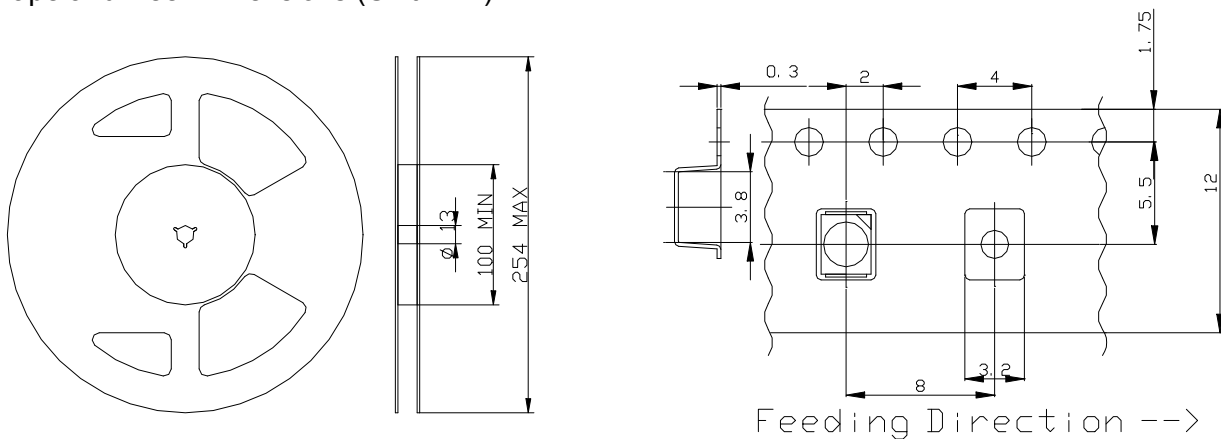
Don't put stress on SMD and a circuit board after soldering

## Recommended Land Layout (Unit: mm)



## SMD Packing

Tape and Reel Dimensions (Unit: mm)



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## 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.

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\*Effective July 2016, Ushio Epitex Inc. is now USHIO OPTO SEMICONDUCTORS, INC.