



Pb-free  
HEAT



# 1107B Series

Single Color PLCC-4 Bathtub Type  
(High Reliability type, V-Series)

## Product features

Package	PLCC-4 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 Storage Temperature : -40℃~110℃ 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>• Through heat dissipation design, a maximum forward current of <math>I_F=30\text{mA}(\text{InGaN})</math>, <math>I_F=70\text{mA}(\text{AlInGaP})</math> is made possible, and a high luminosity is then possible.</li> <li>• Spatial distribution characteristics. (<b>201/2</b> : 120deg)</li> <li>• No lead package and lead-free soldering compatible</li> <li>• RoHS compliant</li> </ul>
Dominant wavelength	Blue : 469nm (VUB) Green : 528nm (VUG) , 560nm(VYBG) Yellow-Green : 573nm (VYPY) Yellow : 589nm (VFY) Orange : 606nm (VFA) Red : 633nm (VFR)
Spatial distribution	120 deg.
Die materials	VUB,VUG : InGaN VYBG, VYPY, VFY, VFA, VFR :AlGaInP
Optical efficiency	VUB : 4.3 lm/W VFY : 14.3 lm/W VUG : 17.1 lm/W VFA : 14.3 lm/W VYBG : 1.8 lm/W VFR : 12.9 lm/W VYPY : 6.8 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. Reel diameter: $\phi 180\text{mm}$
ESD	AllInGaP:2kV (HBM) InGaN:1kV (HBM)

## Recommended Applications

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

## Color Variations and Luminous Intensity

Part No.	Material	Emitted Color	Lens Color	Dominant Wavelength		Luminous Intensity			Luminous Flux	
				$\lambda_d$ (nm)		$I_v$ (mcd)			$\Phi_v$ (mlm)	
				TYP.	$I_f$	MIN.	MAX.	$I_f$	TYP.	$I_f$
VUB1107B	InGaN	Blue	Water Clear	469	30	56	220	30	450	30
VUG1107B	InGaN	Green		528	30	150	560	30	1,800	30
VYBG1107B	AlGaInP			560	50	27	100	50	200	50
VYPY1107B	AlGaInP	Yellow-Green		573	50	100	330	50	750	50
VFY1107B	AlGaInP	Yellow		589	50	270	820	50	1,500	50
VFA1107B	AlGaInP	Orange		606	50	390	1,000	50	1,500	50
VFR1107B	AlGaInP	Red		633	50	180	560	50	1,350	50

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

## Absolute Maximum Ratings

Item	Symbol	Absolute Maximum Ratings							Unit
		VUB	VUG	VYBG	VYPY	VFY	VFA	VFR	
Power Dissipation	P <sub>d</sub>	120	120	196	196	196	196	196	mW
Forward Current	I <sub>F</sub>	30	30	70	70	70	70	70	mA
Pulse Forward Current <sup>※1</sup>	I <sub>FRM</sub>	100	100	100	100	100	100	100	mA
Derating (T <sub>a</sub> =65 °C or higher)	ΔI <sub>F</sub>	0.6 <sup>※2</sup>	0.6 <sup>※2</sup>	1.27	1.27	1.27	1.27	1.27	mA/°C
	ΔI <sub>FRM</sub>	2.0 <sup>※2</sup>	2.0 <sup>※2</sup>	1.82	1.82	1.82	1.82	1.82	mA/°C
Reverse Voltage	V <sub>R</sub>	5	5	5	5	5	5	5	V
Operating Temperature	T <sub>opr</sub>	-40 ~ +100							°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +110							°C

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

※2 Temperature Condition: T<sub>a</sub>=60 °C or higher.

## Thermal Characteristics

Item	Symbol	Ratings							Unit
		VUB	VUG	VYBG	VYPY	VFY	VFA	VFR	
Junction Temperature (MAX.)	T <sub>j</sub>	110	110	120	120	120	120	120	°C
Thermal Resistance (TYP.) (Junction/ Solder Point)	R <sub>(th J-S)</sub>	220	220	280	280	280	280	280	°C/W

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

## Electro-Optical Characteristics (VUB,VUG)

Item	Conditions	Symbol	Characteristic Ratings		Unit	
			VUB	VUG		
Forward Voltage	I <sub>F</sub> =30mA	V <sub>F</sub>	TYP.	3.5	3.5	V
			MAX.	4.0	4.0	
Reverse Current	V <sub>R</sub> =5V	I <sub>R</sub>	MAX.	100	100	μA
Peak Wavelength	I <sub>F</sub> =30mA	λ <sub>p</sub>	TYP.	464	516	nm
Dominant Wavelength	I <sub>F</sub> =30mA	λ <sub>d</sub>	TYP.	469	528	nm
Spectral Line Half Width	I <sub>F</sub> =30mA	Δλ	TYP.	26	36	nm
Half Intensity Angle	I <sub>F</sub> =30mA	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	Conditions	Symbol	Characteristic Rating					Unit	
			VYBG	VYPY	VFY	VFA	VFR		
Forward Voltage	I <sub>F</sub> =50mA	V <sub>F</sub>	TYP.	2.2	2.2	2.1	2.1	2.1	V
			MAX.	2.6	2.6	2.6	2.6	2.6	
Reverse Current	V <sub>R</sub> =5V	I <sub>R</sub>	MAX.	100	100	100	100	100	μA
Peak Wavelength	I <sub>F</sub> =50mA	λ <sub>p</sub>	TYP.	567	577	594	611	636	nm
Dominant Wavelength	I <sub>F</sub> =50mA	λ <sub>d</sub>	TYP.	560	573	589	606	633	nm
Spectral Line Half Width	I <sub>F</sub> =50mA	Δλ	TYP.	16	16	15	15	15	nm
Half Intensity Angle	I <sub>F</sub> =50mA	2θ <sub>1/2</sub>	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)

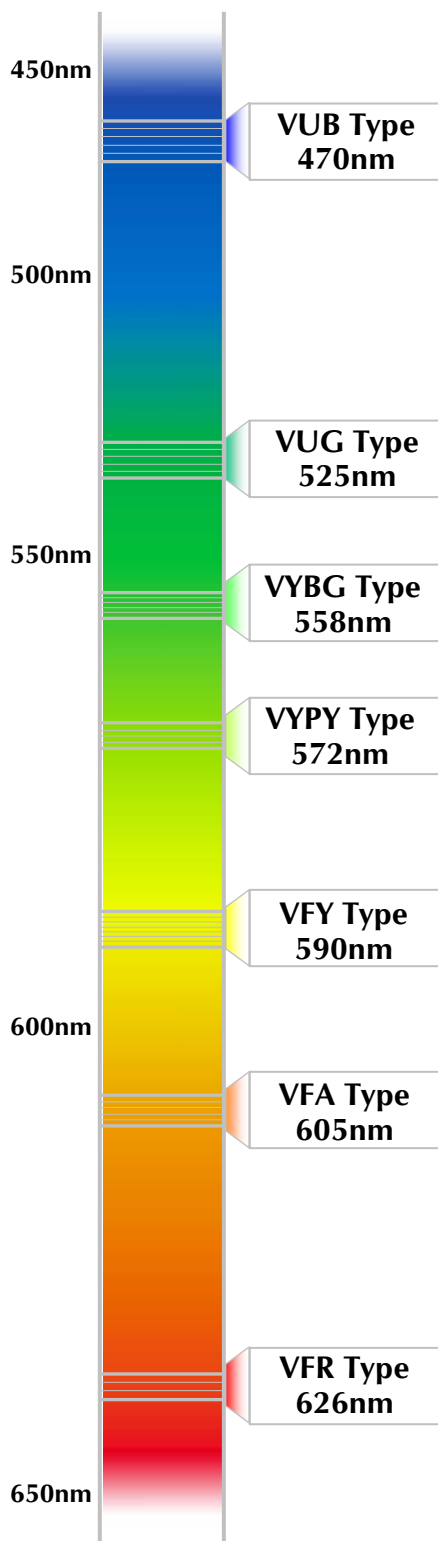
## Luminous Intensity Rank

### Standard Chart(Unit: mcd)

Rank	I <sub>v</sub> (mcd)		VUB	VUG	VYBG	VYPY	VFY	VFA	VFR
	MIN.	MAX.	I <sub>F</sub> =30mA			I <sub>F</sub> =50mA			
B2	12	15							
B3	15	18							
B4	18	22							
B5	22	27							
B6	27	33			B6				
B7	33	39							
B8	39	47							
B9	47	56							
BX	56	68	BX						
BY	68	82							
BZ	82	100			BZ				
C1	100	120				C1			
C2	120	150							
C3	150	180		C3					
C4	180	220	C4						C4
C5	220	270							
C6	270	330			C6	C6			
C7	330	390							
C8	390	470						C8	
C9	470	560		C9					C9
CX	560	680					CY		
CY	680	820							
CZ	820	1,000						CZ	
D1	1,000	1,200							
D2	1,200	1,500							
D3	1,500	1,800							
D4	1,800	2,200							
D5	2,200	2,700							

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

## Color Tone Groups (A d)



### VUB Type (I<sub>F</sub>=30mA)

	A	B	C	D
MIN.	460.0	464.0	468.0	472.0
MAX.	464.0	468.0	472.0	476.0

### VUG Type (I<sub>F</sub>=30mA)

	A	B	C	D
MIN.	515.0	520.0	525.0	530.0
MAX.	520.0	525.0	530.0	535.0

### VYBG Type (I<sub>F</sub>=50mA)

	B	C	D
MIN.	555.0	558.0	561.0
MAX.	558.0	561.0	564.0

### VYPY Type (I<sub>F</sub>=50mA)

	A	B	C
MIN.	567.0	570.0	573.0
MAX.	570.0	573.0	576.0

### VFY Type (I<sub>F</sub>=50mA)

	D	E	F
MIN.	586.0	589.0	592.0
MAX.	589.0	592.0	595.0

### VFA Type (I<sub>F</sub>=50mA)

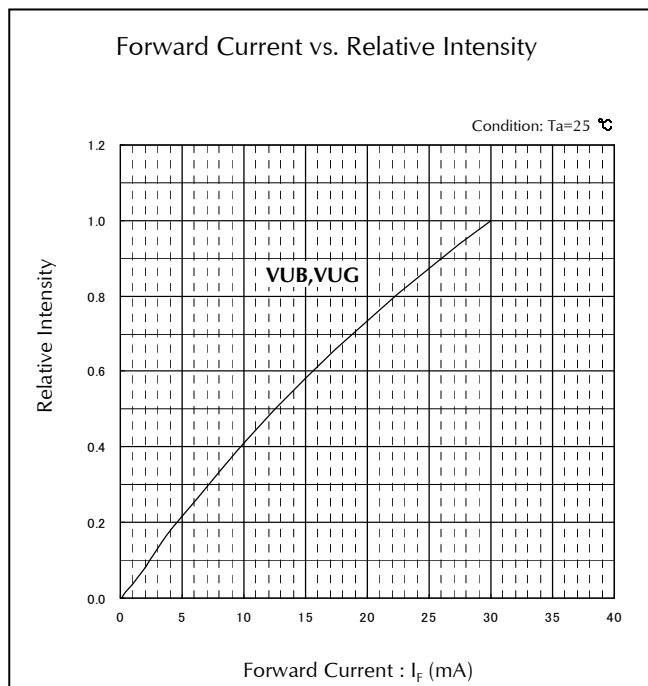
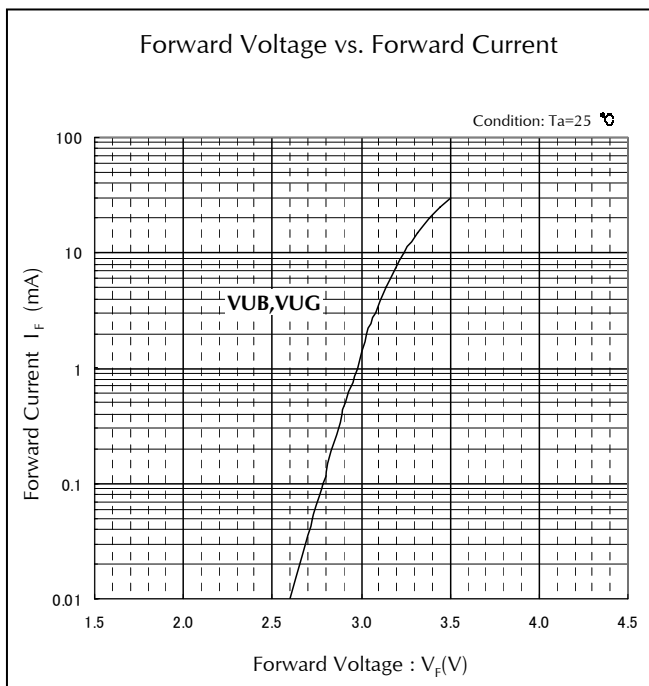
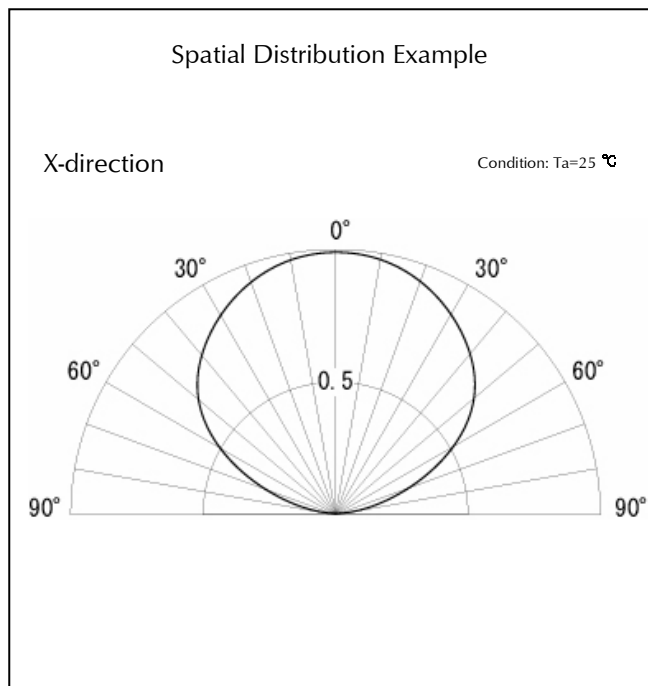
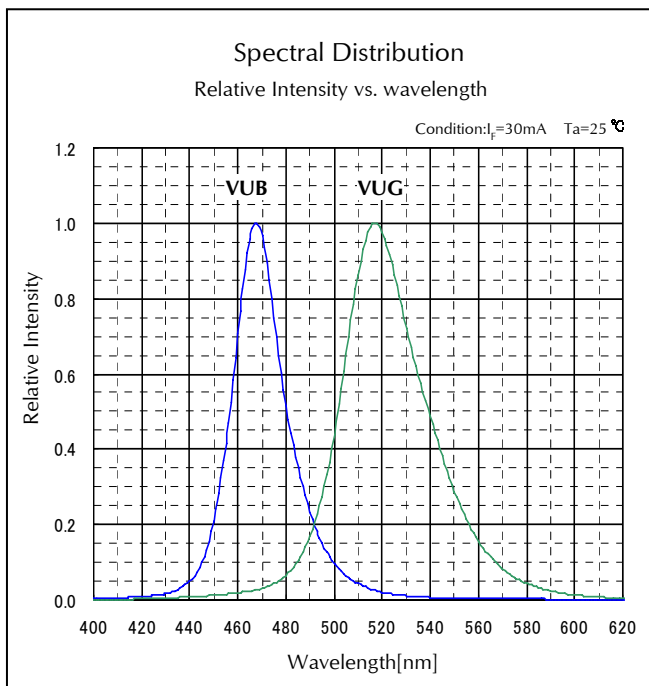
	C	D	E
MIN.	603.0	606.0	609.0
MAX.	606.0	609.0	612.0

### VFR Type (I<sub>F</sub>=50mA)

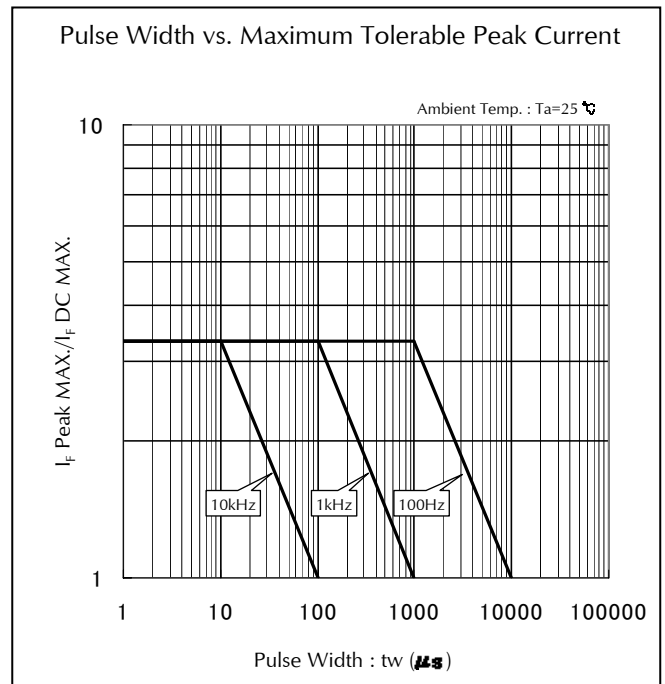
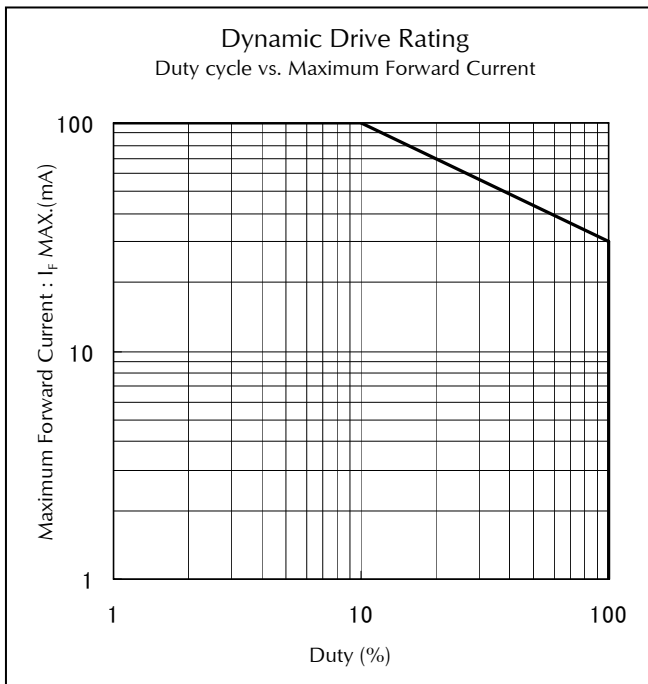
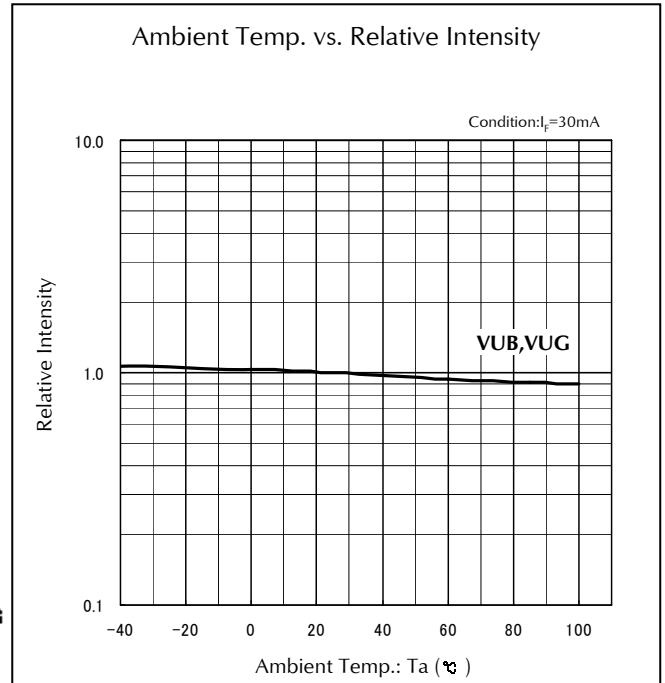
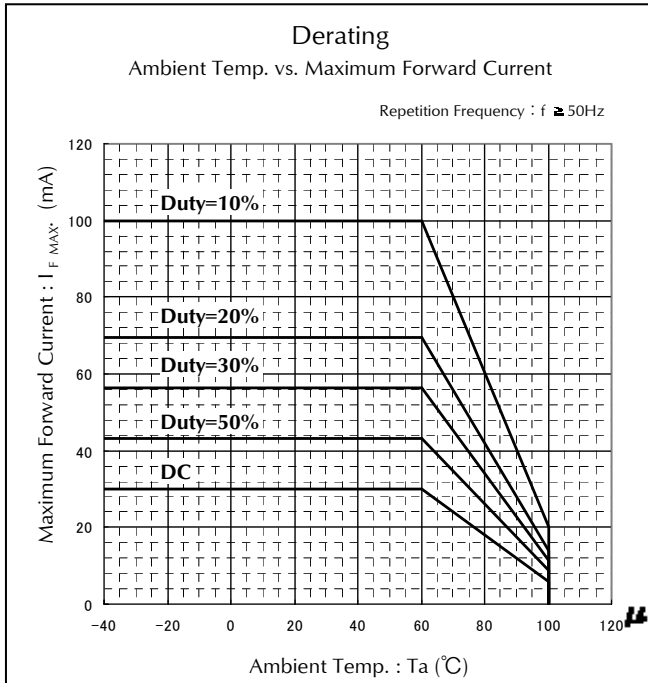
	A	B	C
MIN.	620.0	626.0	632.0
MAX.	626.0	632.0	638.0

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

## Characteristic Graph (VUB,VUG)

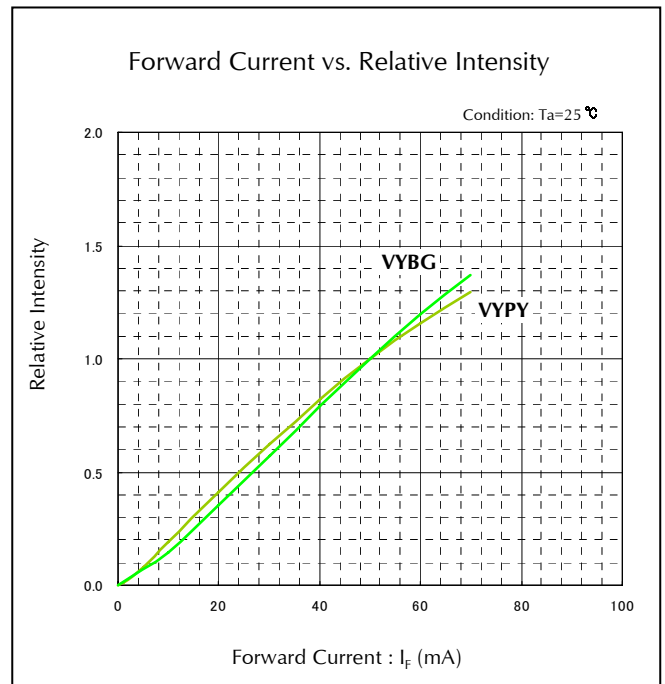
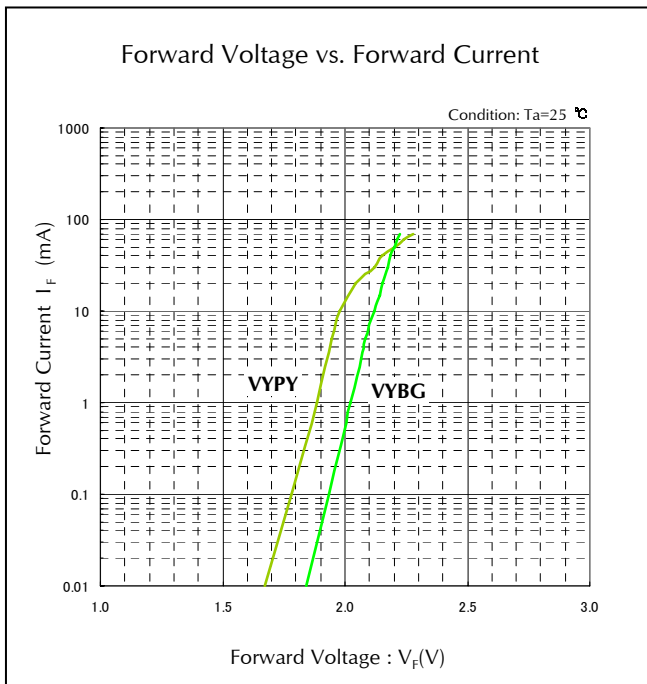
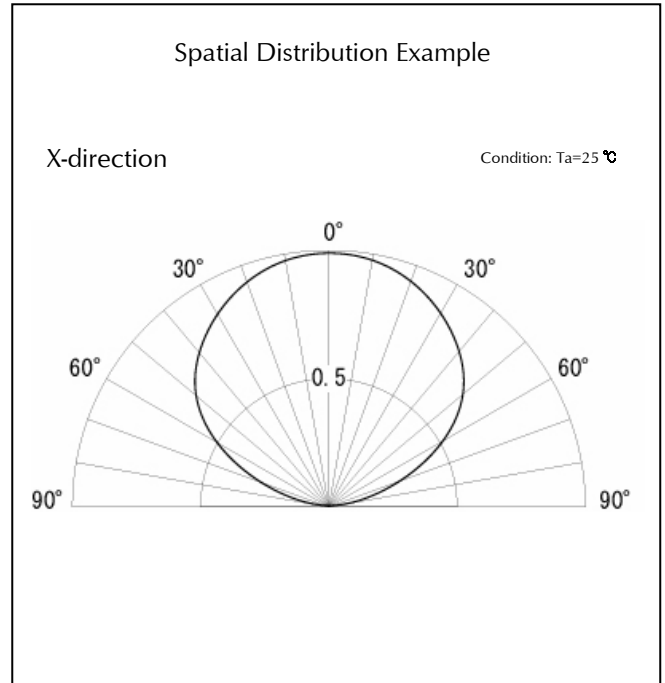
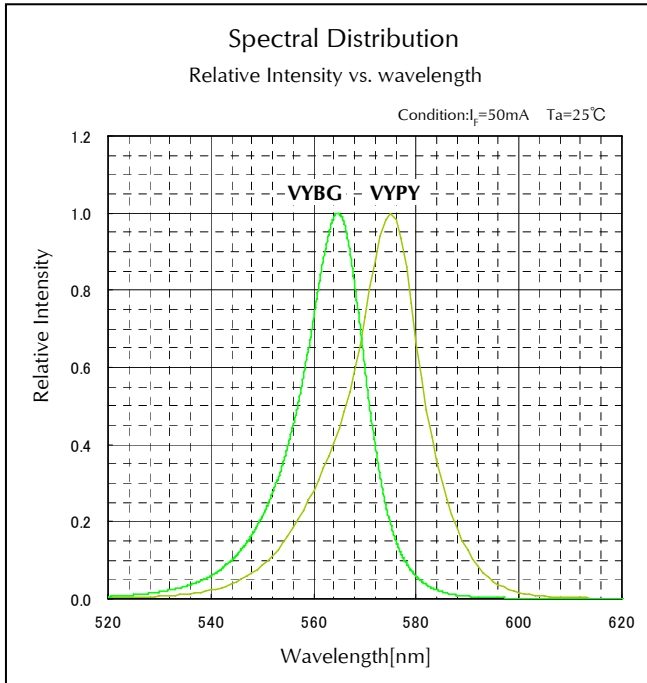


## Characteristics Chart (VUB, VUG)

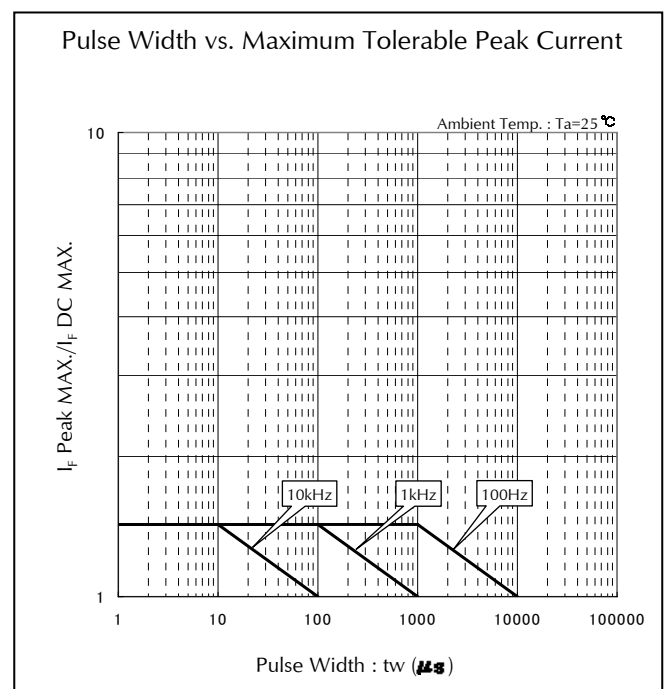
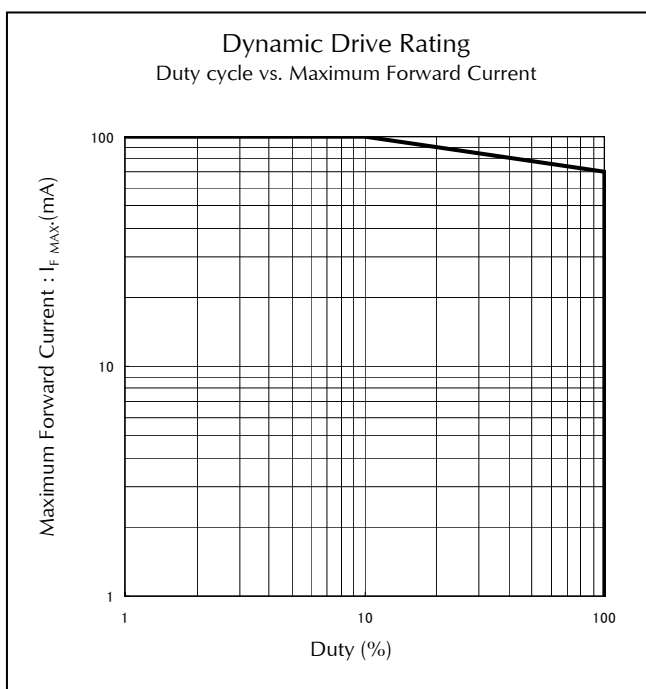
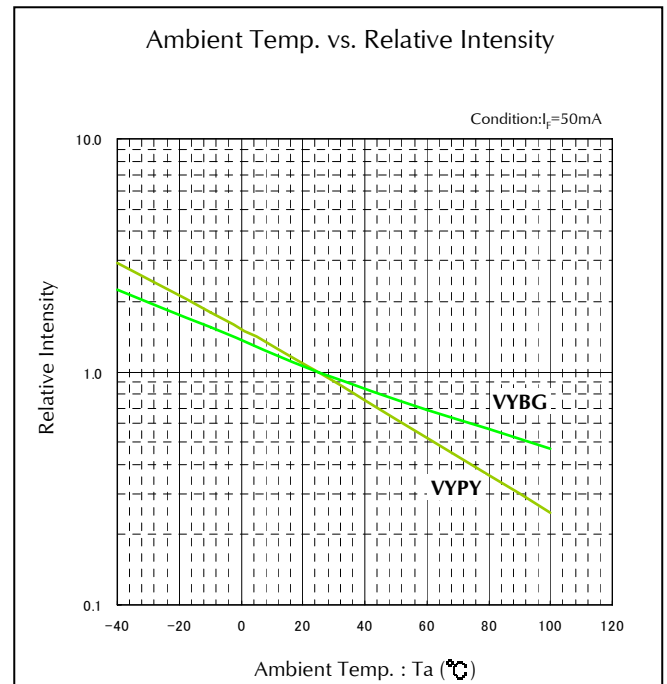
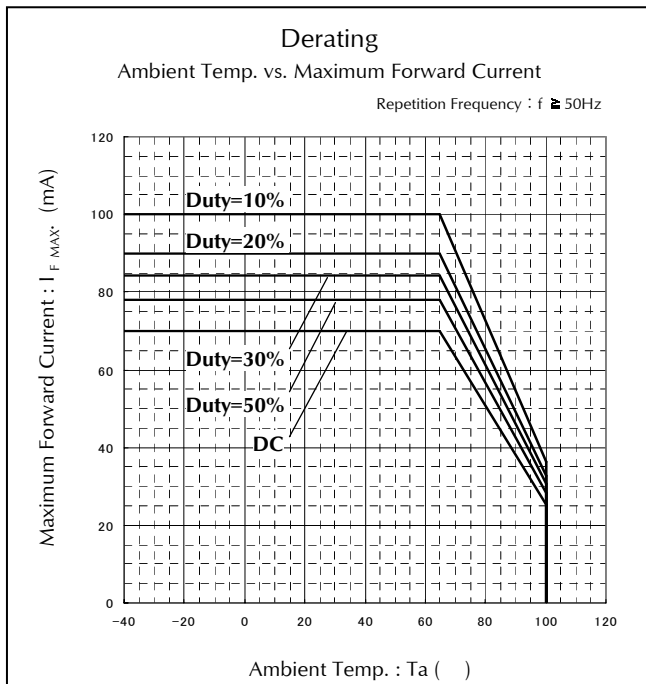




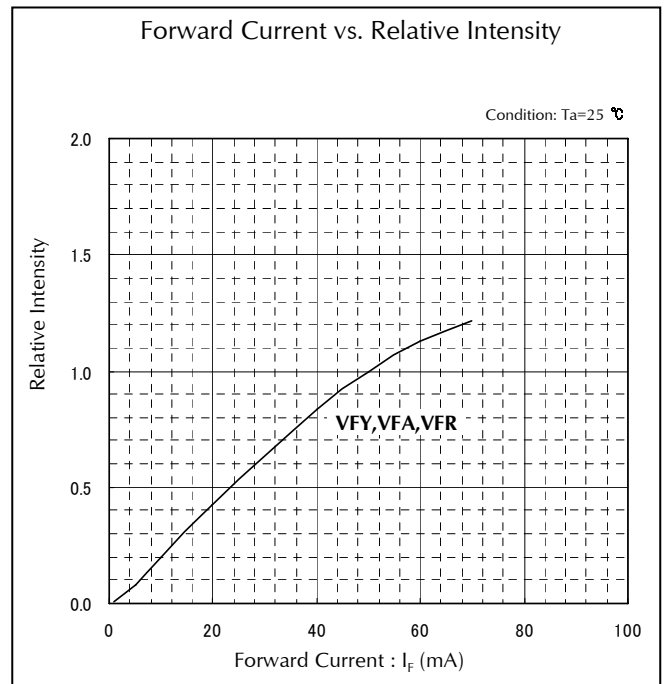
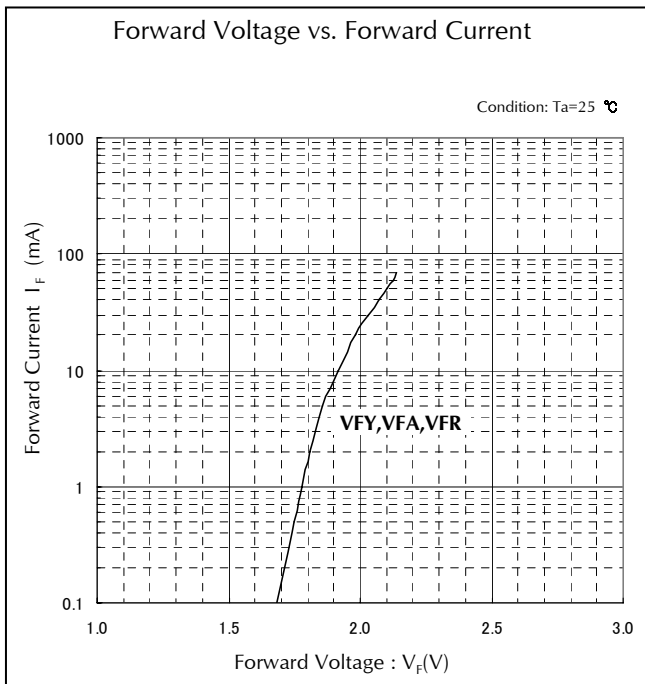
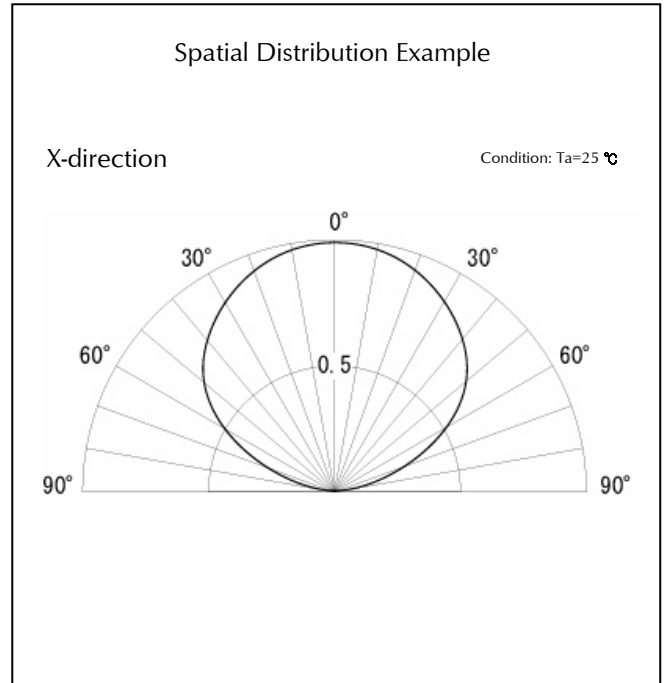
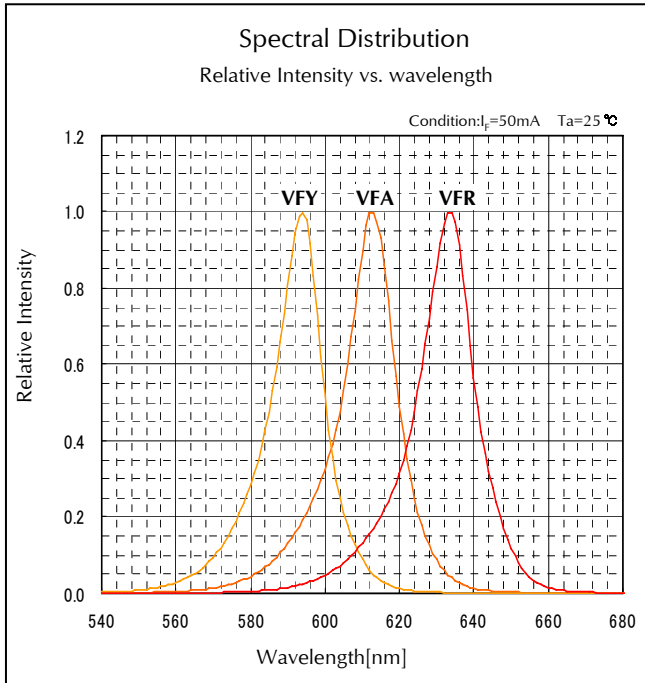
## Characteristics Chart (VYBG, VYPY)



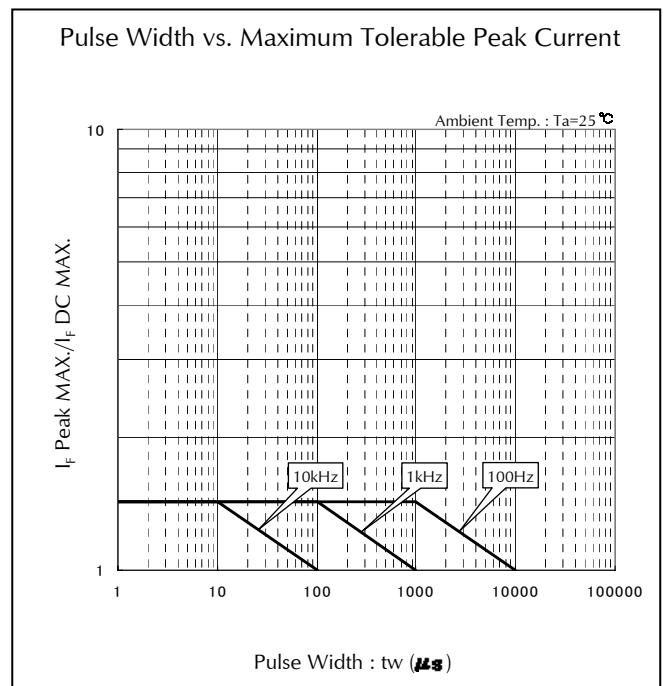
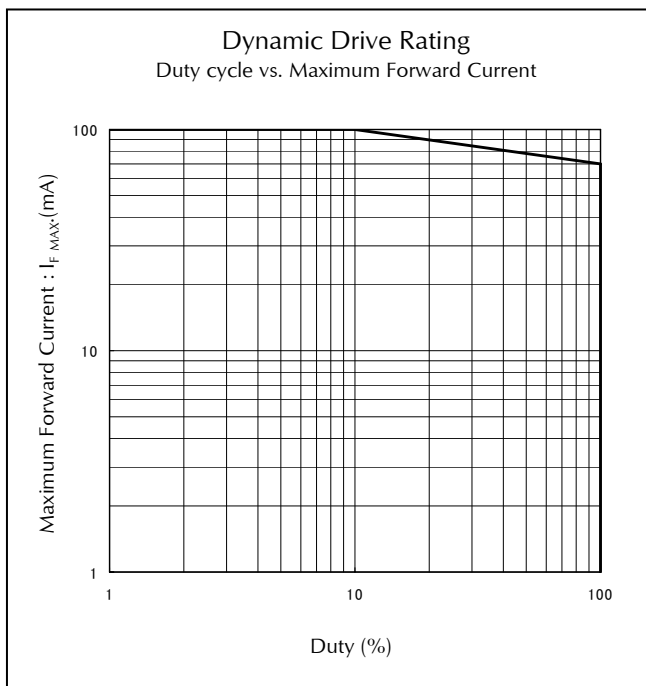
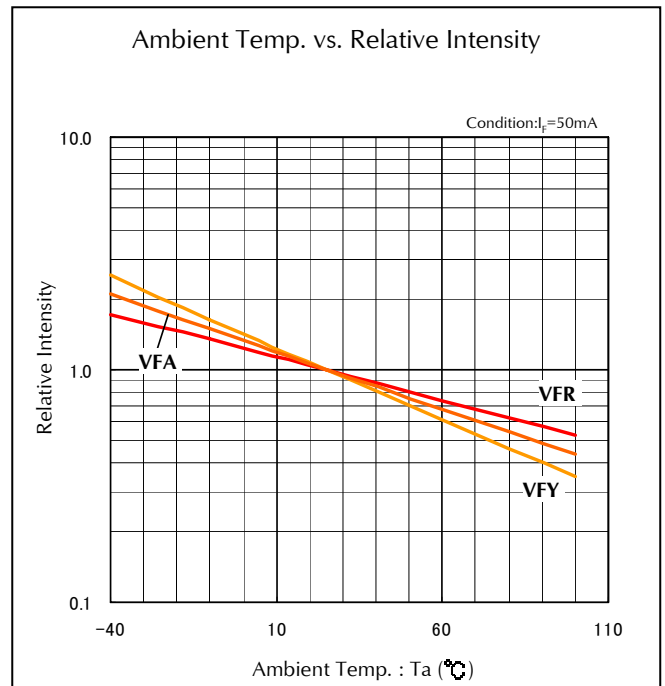
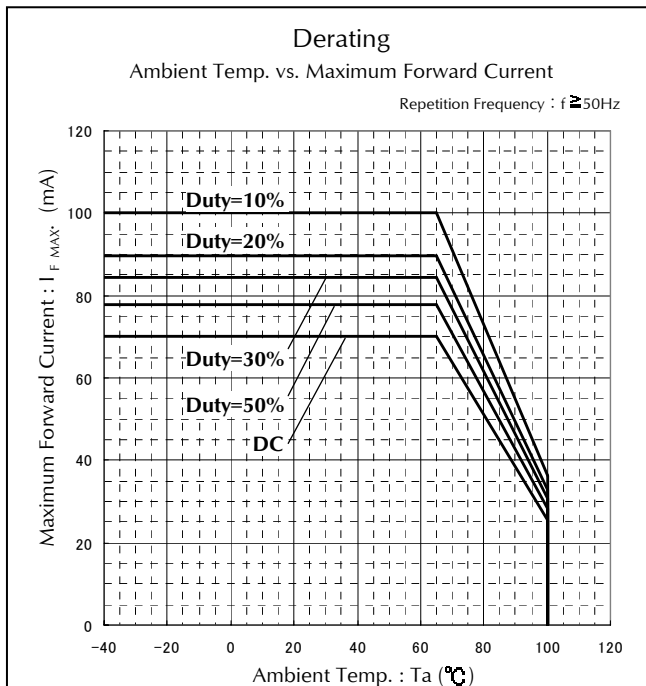
## Characteristics Chart (VYBG, VYPY)



## Characteristics Chart (VFY, VFA, VFR)



## Characteristics Chart (VFY, VFA, VFR)



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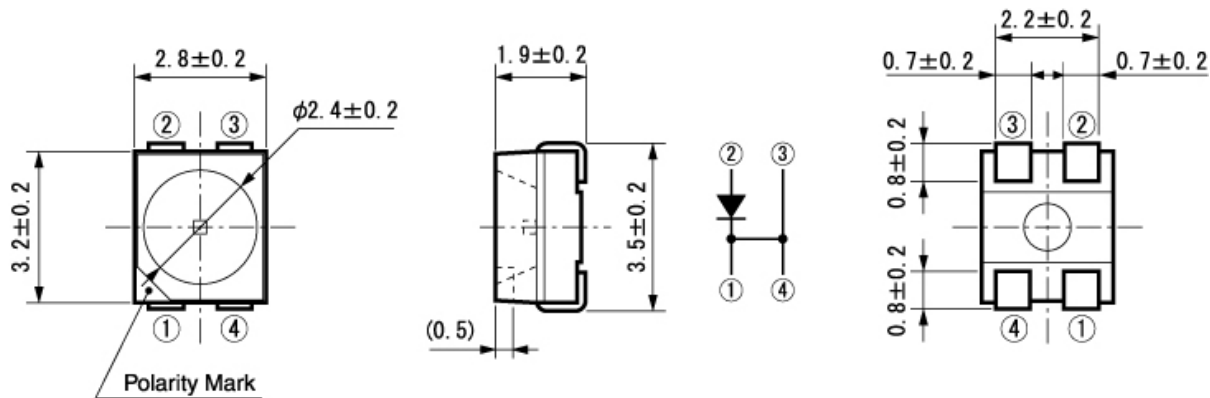
Single Color PLCC-4 Bathtub Type  
(High Reliability type, V-Series)

## Package Dimensions

(Unit: mm)

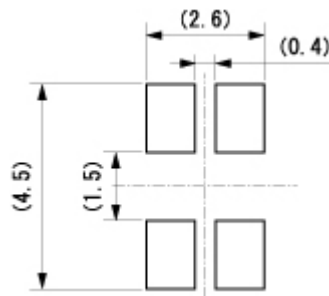
Weight: (36.5)mg

Tolerance:  $\pm 0.2$



## Recommended Soldering Pattern

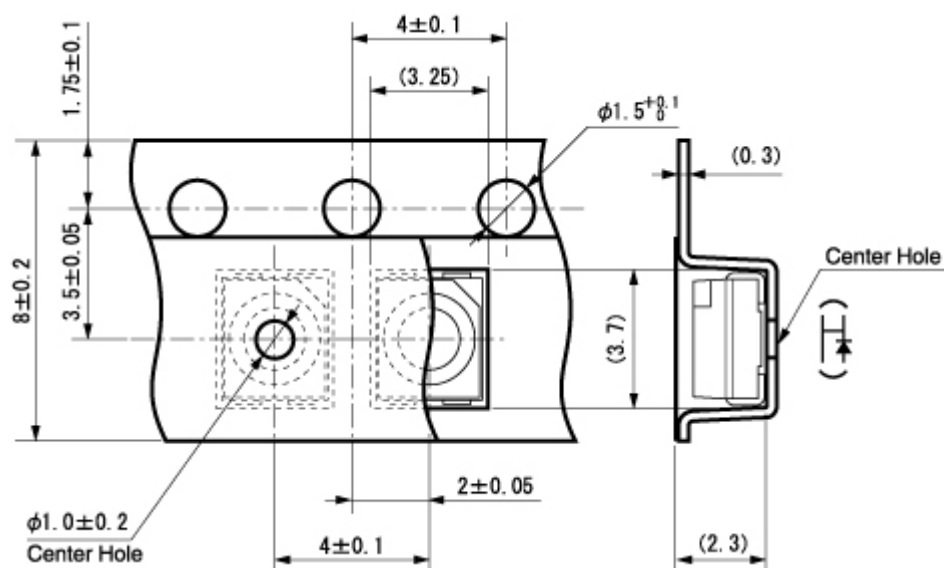
(Unit: mm)



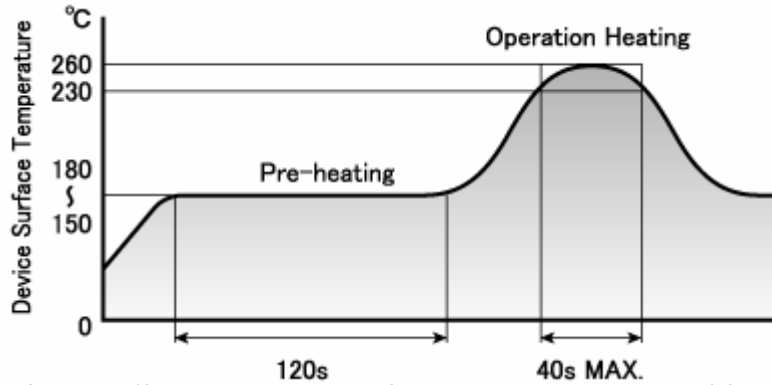
## Taping Specification

(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.)

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