



**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"> • Outer Dimension 3.5 x 2.8 x 1.9mm(L x W x H) • Wide operation temperature range Storage Temperature : -40°C~110°C Operating Temperature : -40°C~100°C Operation Guarantee • Ramification of luminosity group sorting. It is possible to have a uniform transmission with little irregularities even when several are lined up. • Systematization of luminosity groups and color tone groups. Unified to a simple standard. • Corresponding to a use requiring high reliability in cars etc... • Spatial distribution characteristics. (2θ 1/2 : 120deg) • Through heat dissipation design, a maximum forward current of I_F=30m(InGaN), I_F=70mA(AlGaInP) is made possible, and a high luminosity is then possible. • Lead-free soldering compatible • RoHS compliant
Dominant wavelength	Blue : 469nm (VUB) Green : 528nm (VUG) , 562nm(VYBG) Yellow Green : 573nm (VYPY) Yellow : 589nm (VFY) Orange : 606nm (VFA) Red : 615nm (VFV) , 633nm (VFR)
Spatial distribution	120 deg.
Die materials	VUB,VUG : InGaN VYBG, VYPY, VFY, VFA, VFV, 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 VFV : 14.3 lm/W VYPY : 6.8 lm/W VFR : 12.9 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 : φ 180mm
ESD	AlGaInP: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 λd (nm)		Luminous Intensity I_v (mcd)			Luminous Flux ϕ_v (mlm)	
				TYP.	I_f	MIN.	MAX.	I_f	TYP.	I_f
				VUB1107B	InGaN	Blue	Water Clear	469	30	56
VUG1107B	InGaN	Green	528	30	150	560		30	1,800	30
VYBG1107B	AlGaInP		562	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
VFV1107B	AlGaInP	Red	615	50	390	620		50	1,500	50
VFR1107B	AlGaInP	Red	633	50	180	560		50	1,350	50

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

Absolute Maximum Ratings

Item	Symbol	Absolute Maximum Ratings								Unit
		VUB	VUG	VYBG	VYPY	VFY	VFA	VFV	VFR	
Power Dissipation	P_d	120	120	196	196	196	196	196	196	mW
Forward Current	I_F	30	30	70	70	70	70	70	70	mA
Pulse Forward Current ^{※1}	I_{FRM}	100	100	100	100	100	100	100	100	mA
Derating (Ta=65°C or higher)	ΔI_F	0.6 ^{※2}	0.6 ^{※2}	1.27	1.27	1.27	1.27	1.27	1.27	mA/°C
	ΔI_{FRM}	2.0 ^{※2}	2.0 ^{※2}	1.82	1.82	1.82	1.82	1.82	1.82	mA/°C
Reverse Voltage	V_R	5	5	5	5	5	5	5	5	V
Operating Temperature	T_{opr}	-40~+100								°C
Storage Temperature	T_{stg}	-40~+110								°C

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

※2 Temperature Condition: Ta=60°C or higher.

Thermal Characteristics

Item	Symbol	Ratings								Unit
		VUB	VUG	VYBG	VYPY	VFY	VFA	VFA	VFR	
Junction Temperature (MAX.)	T_j	110	110	120	120	120	120	120	120	°C
Thermal Resistance (TYP.) (Junction/ ambient)	$R_{(th\ j-a)}$	220	220	280	280	280	280	280	280	°C/W

※ $R_{(th\ j-a)}$ Measurement Condition / Substrate: FR4(t=1.6mm) Pattern Size: 16mm².

Electro-Optical Characteristics (VUB,VUG)

Item	Conditions	Symbol	Characteristic Ratings		Unit	
			VUB	VUG		
Forward Voltage	I _F =30mA	V _F	TYP.	3.5	3.5	V
			MAX.	4.0	4.0	
Reverse Current	V _R =5V	I _R	MAX.	100	100	μ A
Peak Wavelength	I _F =30mA	λ _p	TYP.	464	516	nm
Dominant Wavelength	I _F =30mA	λ _d	TYP.	469	528	nm
Spectral Line Half Width	I _F =30mA	Δλ	TYP.	26	36	nm
Half Intensity Angle	I _F =30mA	2θ 1/2	TYP.	120	120	deg.

※Note: The dominant wave length (λ_d) above is the setup value of the sorting machine.
(Tolerance : λ_d...±1nm)

Electro-Optical Characteristics (VYBG, VYPY, VFY, VFA, VFV, VFR) (Ta=25°C)

Item	Conditions	Symbol	Characteristic Rating						Unit	
			VYBG	VYPY	VFY	VFA	VFV	VFR		
Forward Voltage	I _F =50mA	V _F	TYP.	2.2	2.2	2.1	2.1	2.1	2.1	V
			MAX.	2.6	2.6	2.6	2.6	2.6	2.6	
Reverse Current	V _R =5V	I _R	MAX.	100	100	100	100	100	100	μ A
Peak Wavelength	I _F =50mA	λ _p	TYP.	567	577	594	611	626	636	nm
Dominant Wavelength	I _F =50mA	λ _d	TYP.	562	573	589	606	615	633	nm
Spectral Line Half Width	I _F =50mA	Δλ	TYP.	16	16	15	15	15	15	nm
Half Intensity Angle	I _F =50mA	2θ 1/2	TYP.	120	120	120	120	120	120	deg.

※Note: The dominant wave length (λ_d) above is the setup value of the sorting machine.
(Tolerance : λ_d...±1nm)

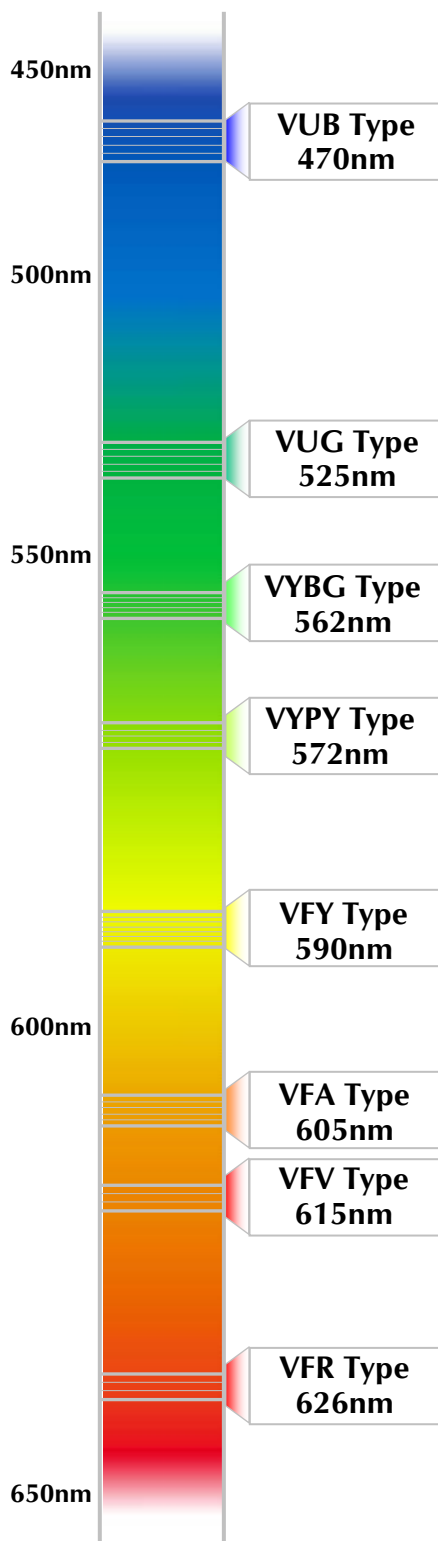
Luminous Intensity Rank

Standard Chart(Unit: mcd)

Rank	I _v (mcd)		VUB	VUG	VYBG	VYPY	VFY	VFA	VFV	VFR
	MIN.	MAX.	I _F =30mA		I _F =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	C8	
C9	470	560		C9						C9
CX	560	680								
CY	680	820					CY			
CZ	820	1,000						CZ	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 (λd)



VUB Type (I_F=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_F=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_F=50mA)

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

VYPY Type (I_F=50mA)

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

VFY Type (I_F=50mA)

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

VFA Type (I_F=50mA)

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

VFV Type (I_F=50mA)

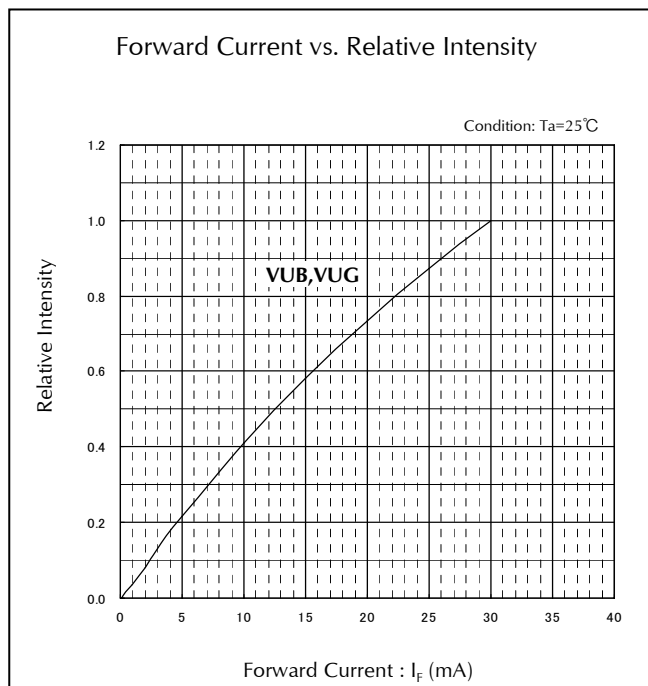
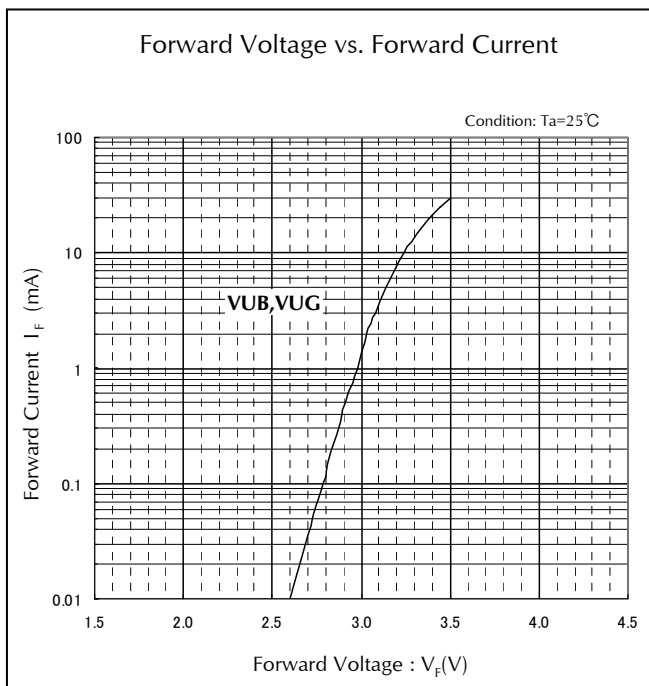
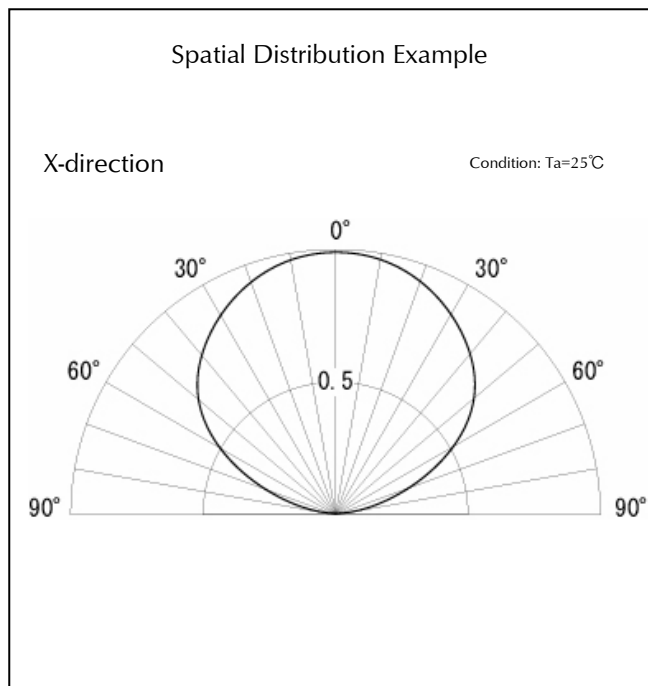
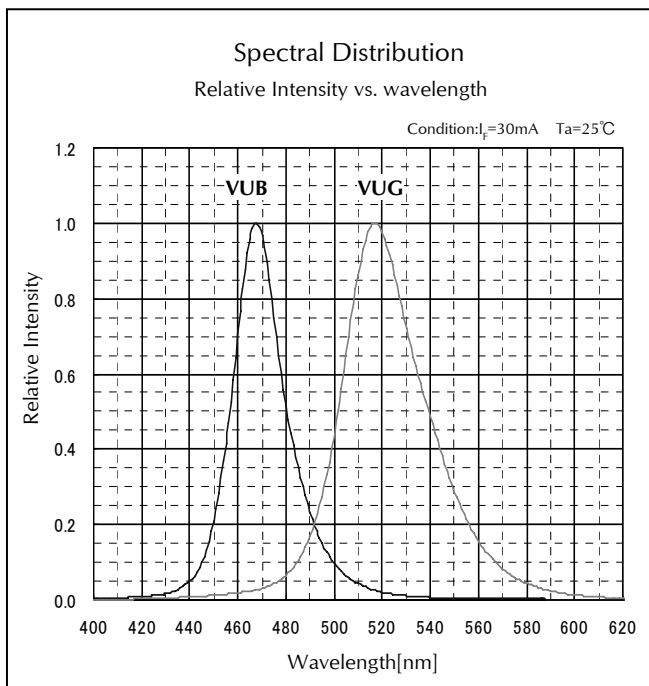
	A	B	C
MIN.	613.0	616.0	619.0
MAX.	616.0	619.0	622.0

VFR Type (I_F=50mA)

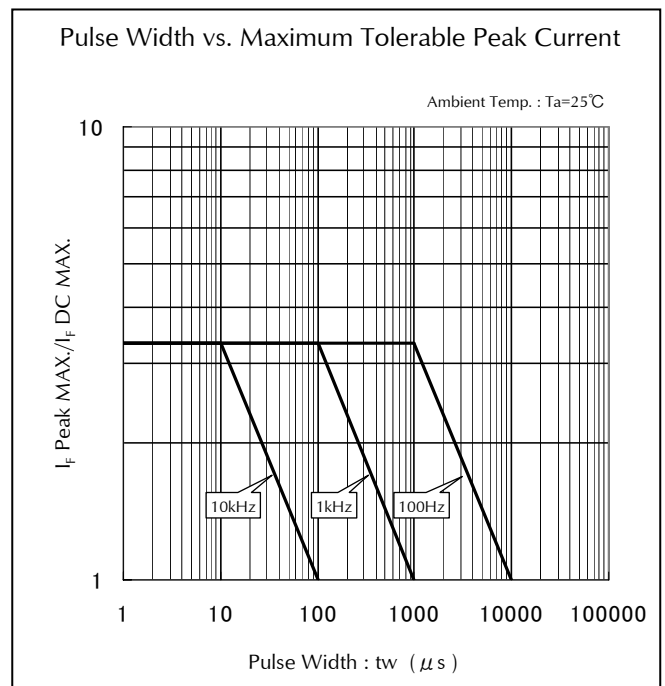
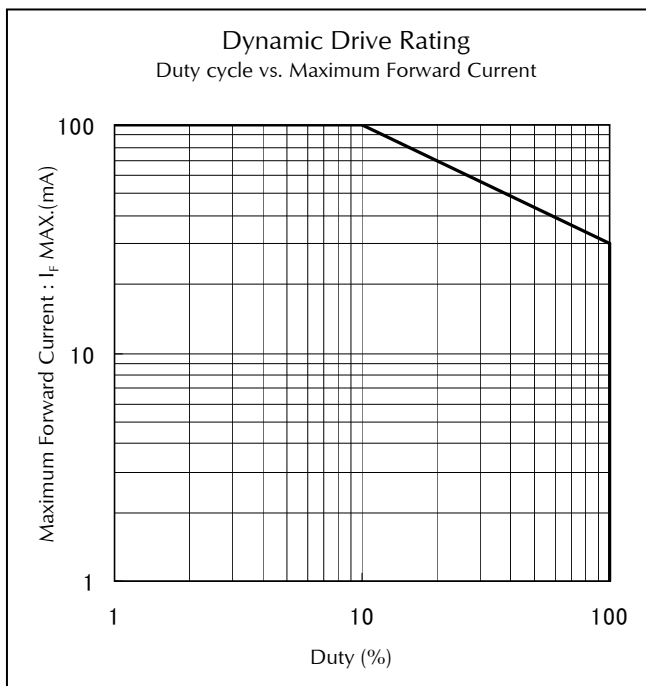
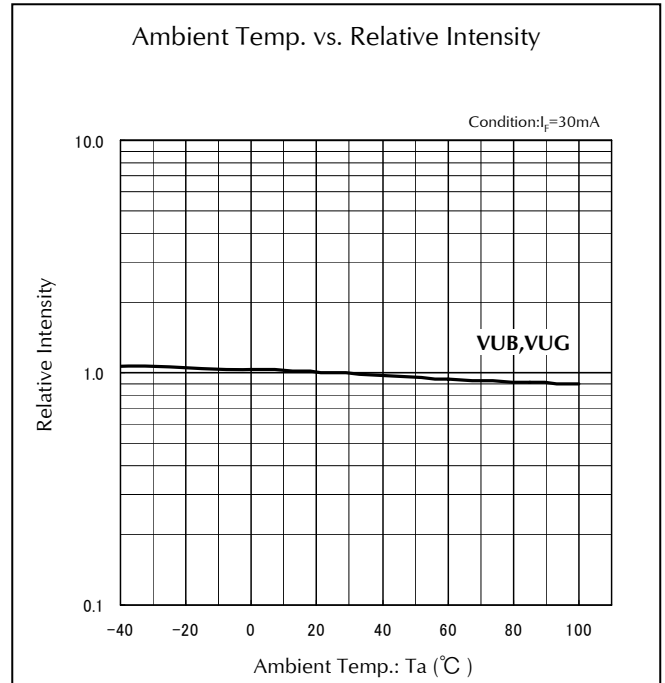
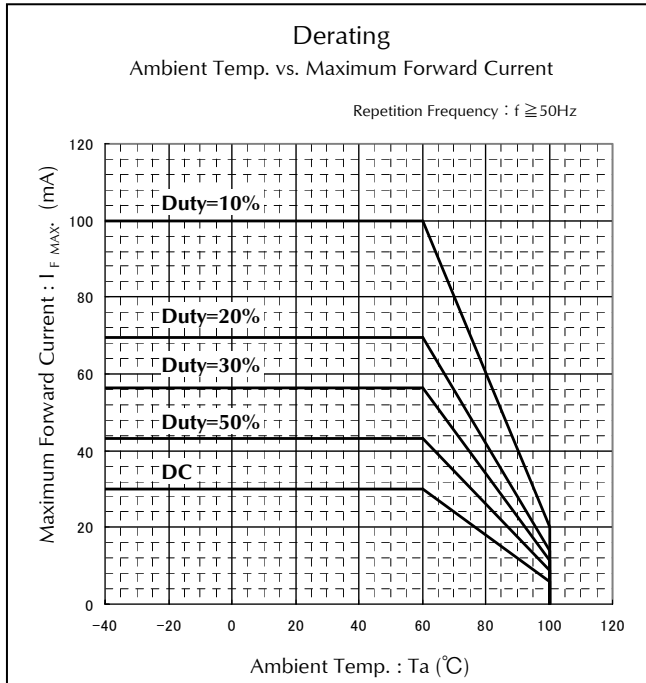
	A	B	C
MIN.	620.0	626.0	632.0
MAX.	626.0	632.0	638.0

※Limited width of luminous intensity rank is from Min.3 to Min.4 rank width.
(It changes with product.)

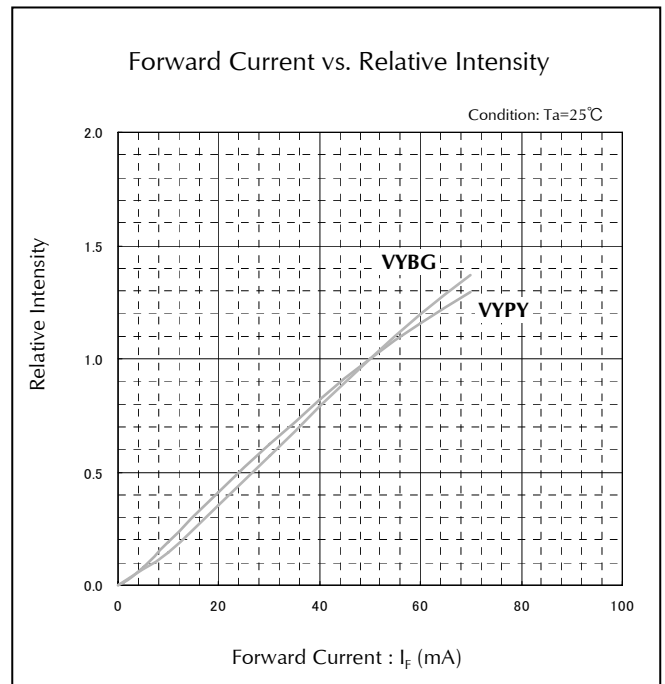
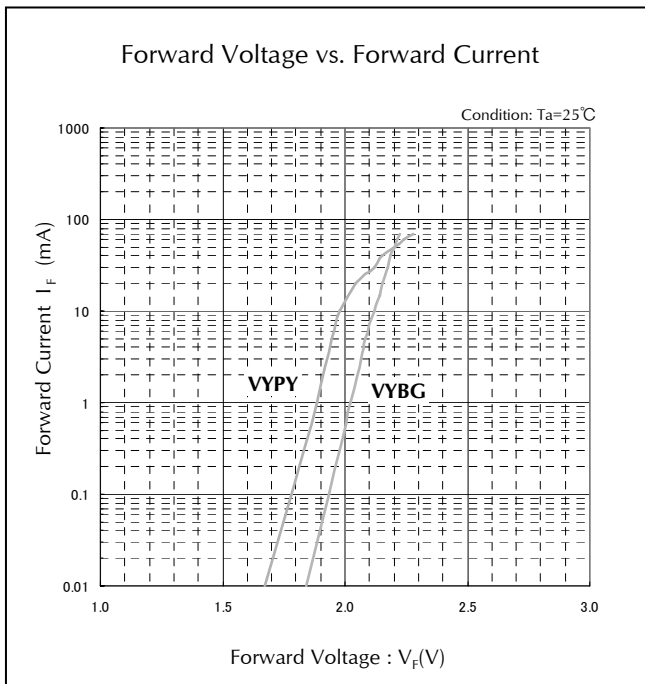
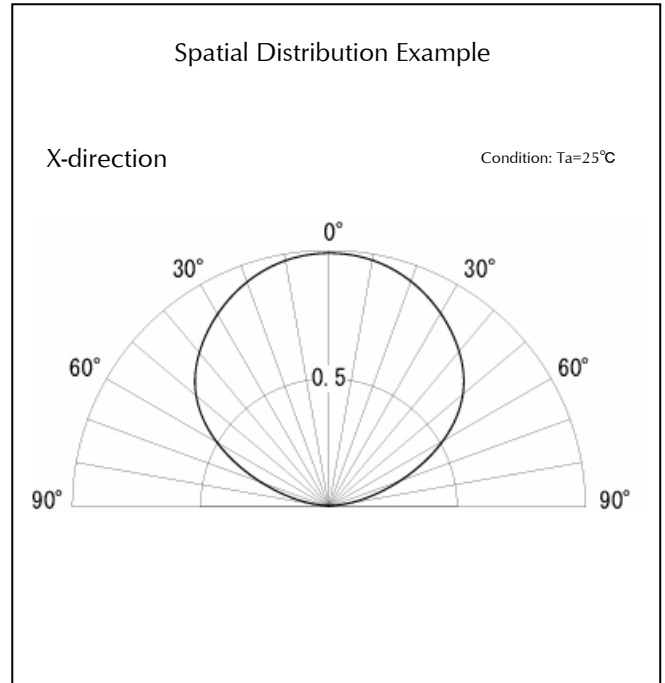
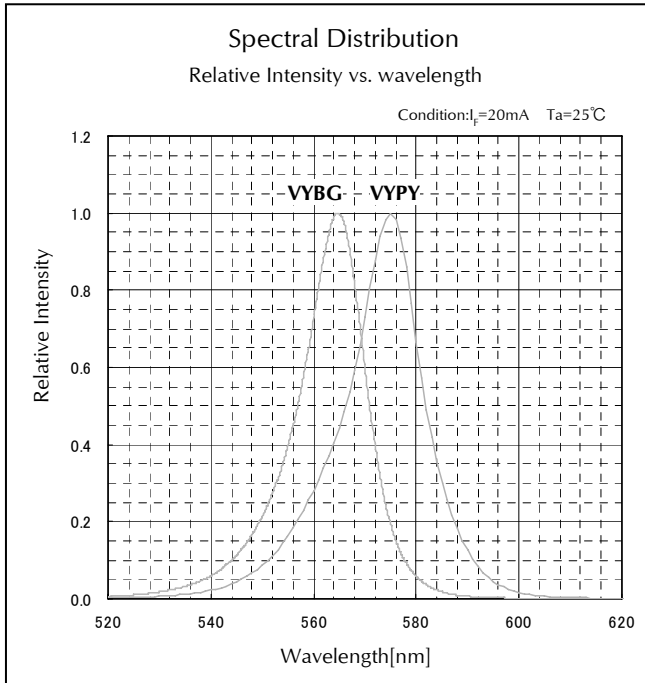
Characteristic Graph (VUB,VUG)



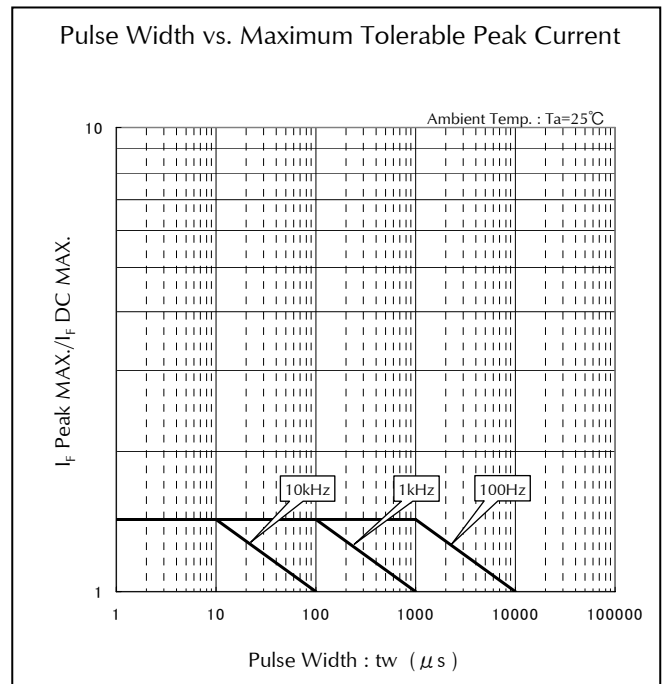
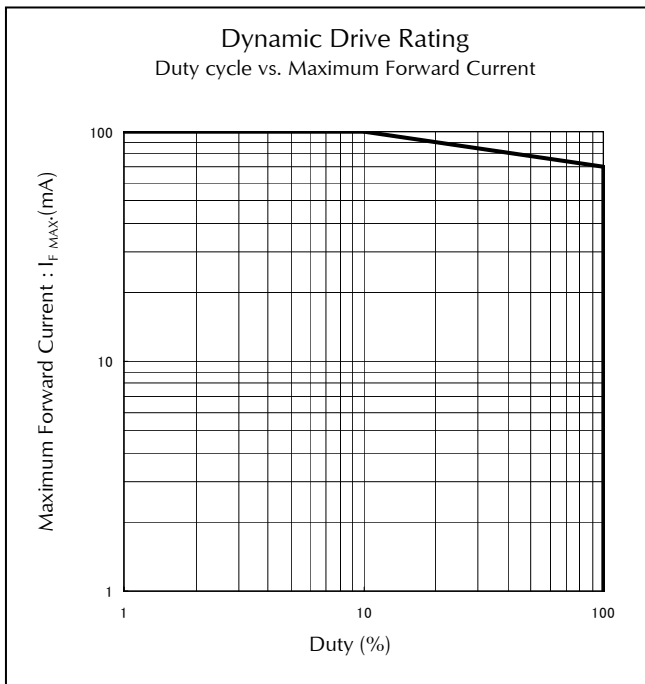
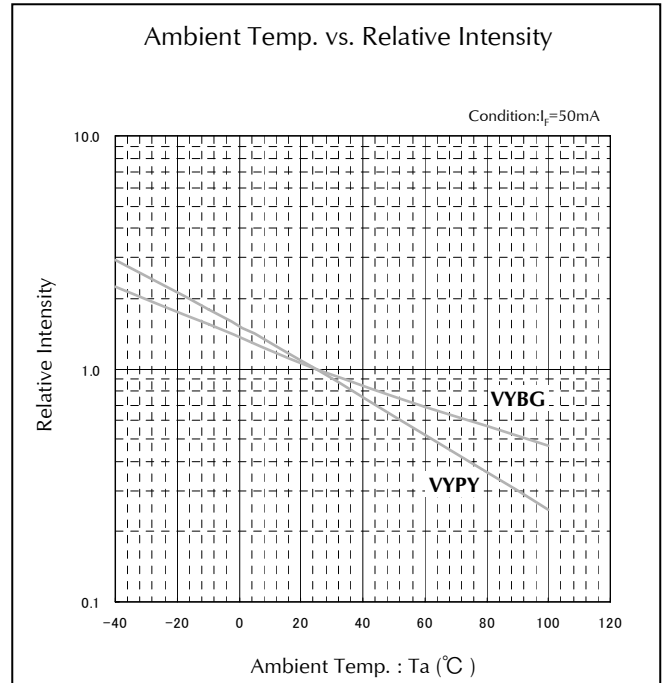
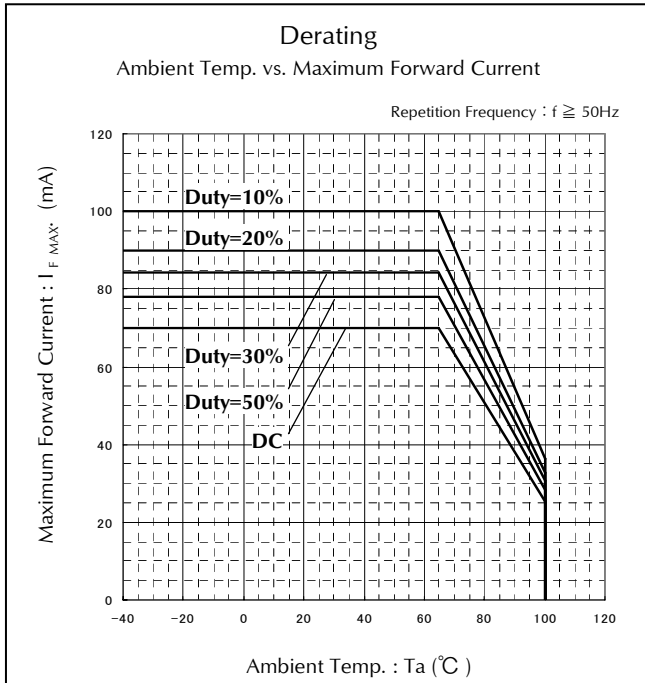
Characteristics Chart (VUB, VUG)



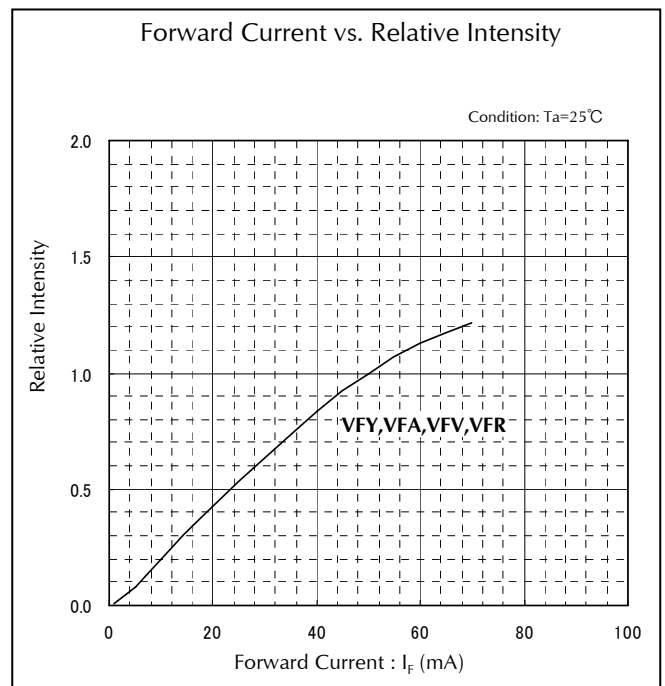
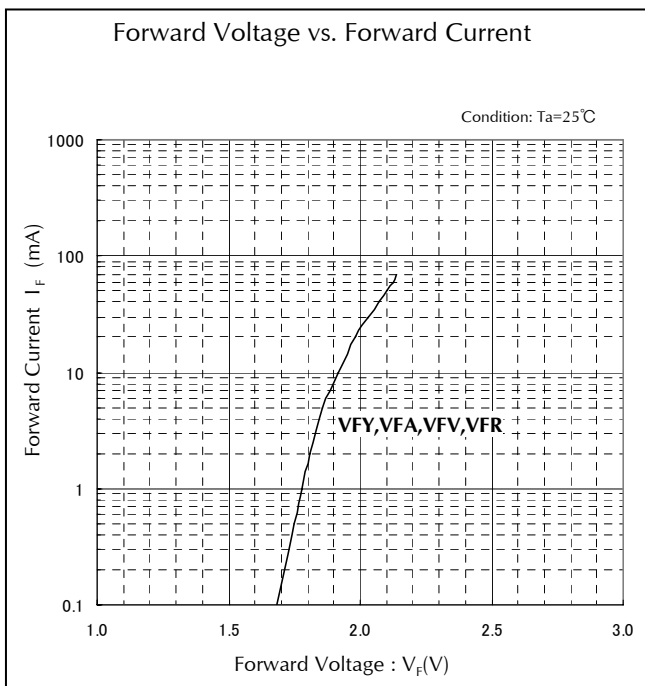
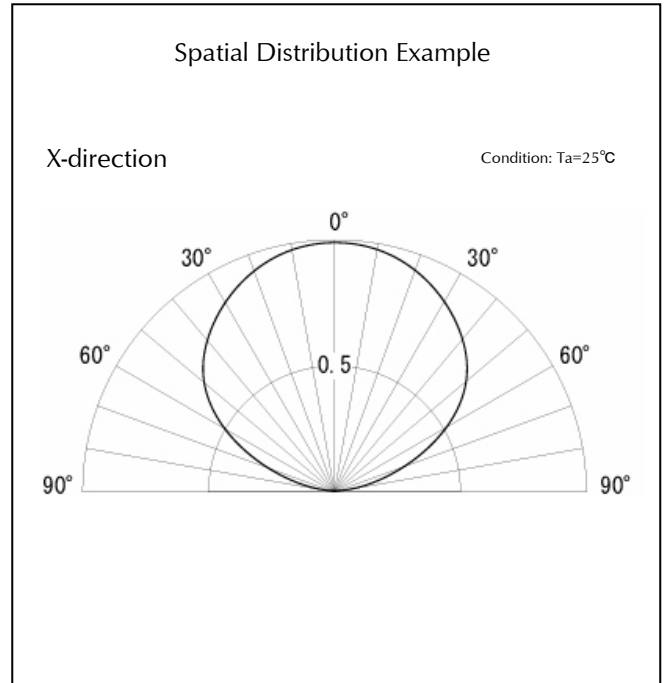
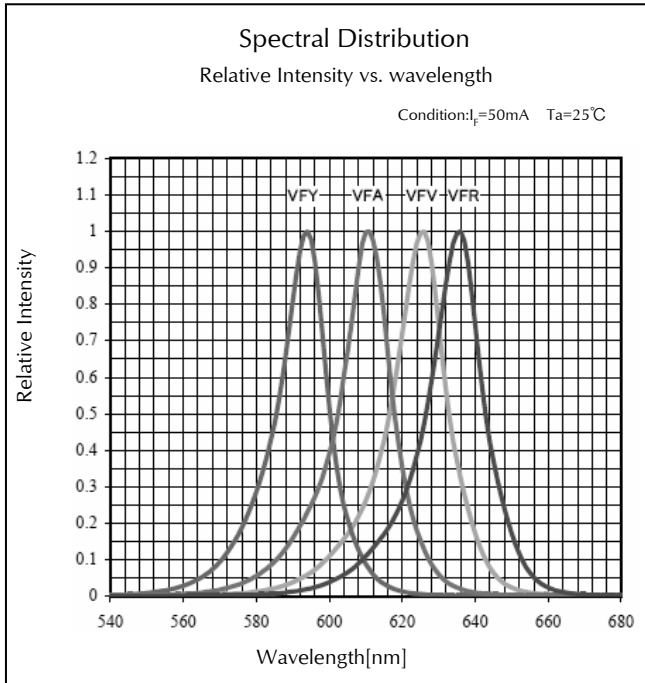
Characteristics Chart (VYBG, VYPY)



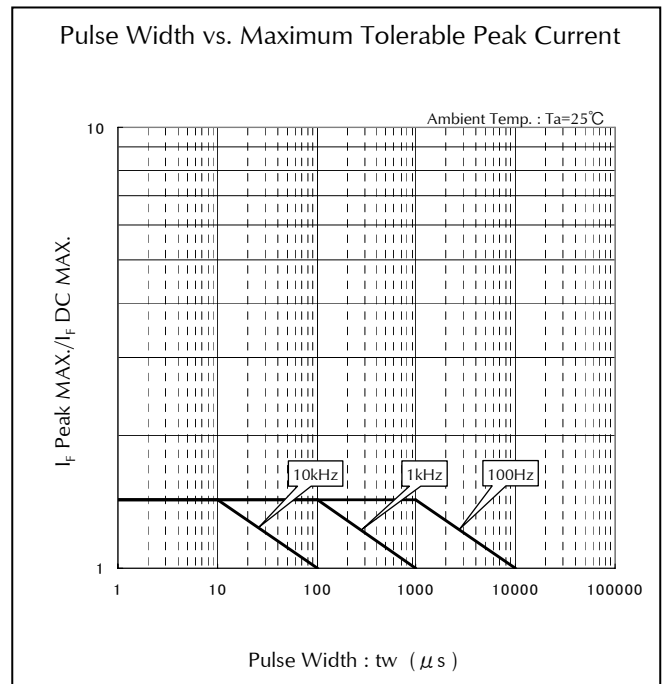
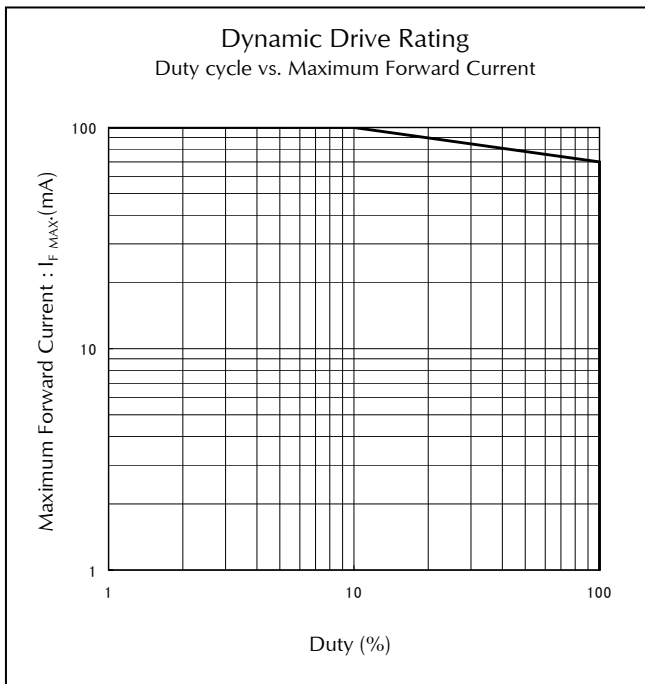
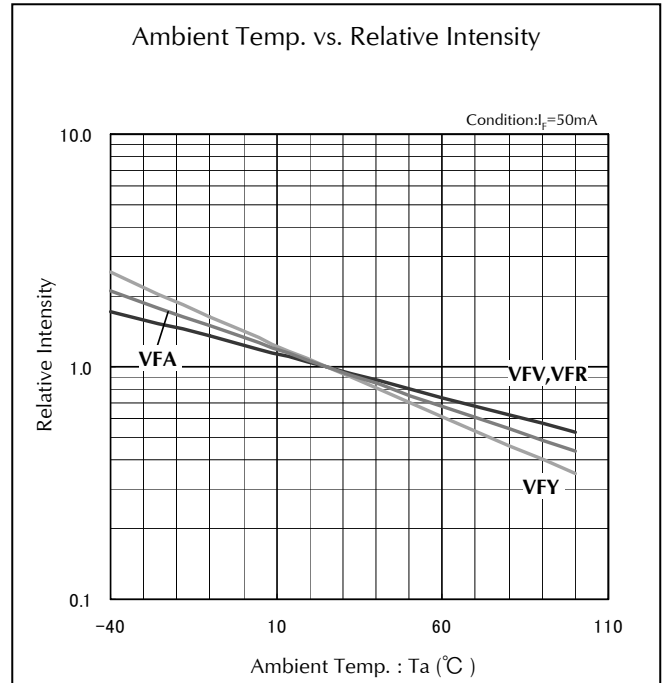
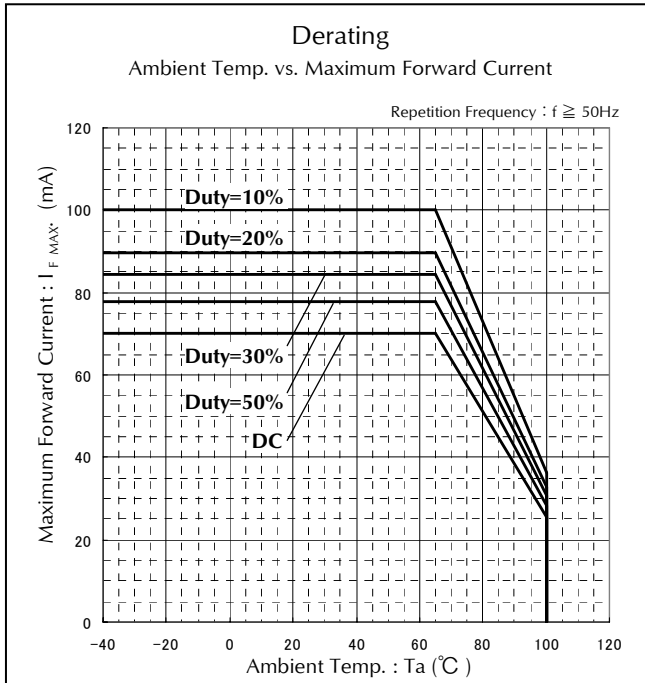
Characteristics Chart (VYBG, VYPY)



Characteristics Chart (VFY, VFA, VFV, VFR)



Characteristics Chart (VFY, VFA, VFV, VFR)



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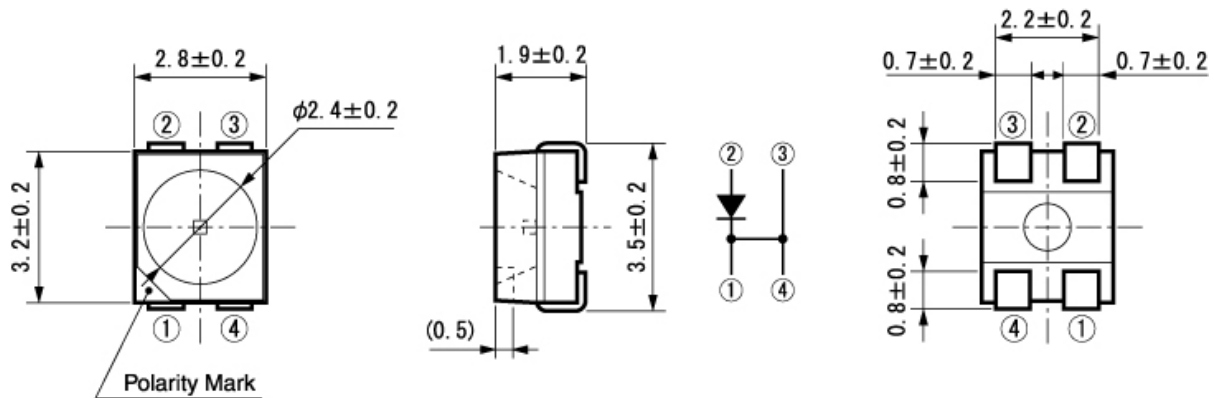
1107B Series

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

Package Dimensions

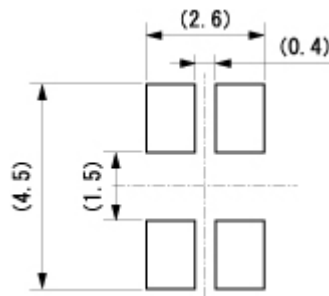
(Unit: mm)

Weight: (36.5)mg



Recommended Soldering Pattern

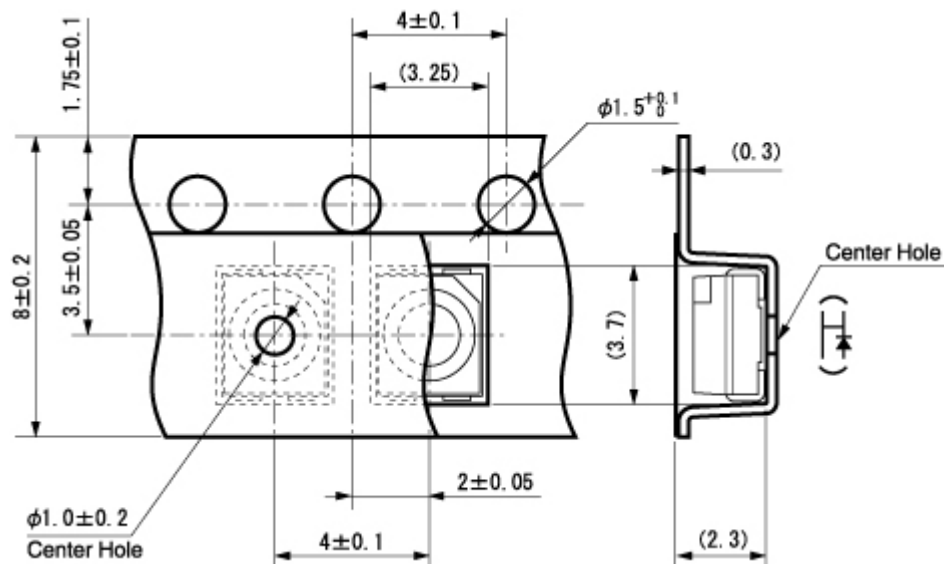
(Unit: mm)



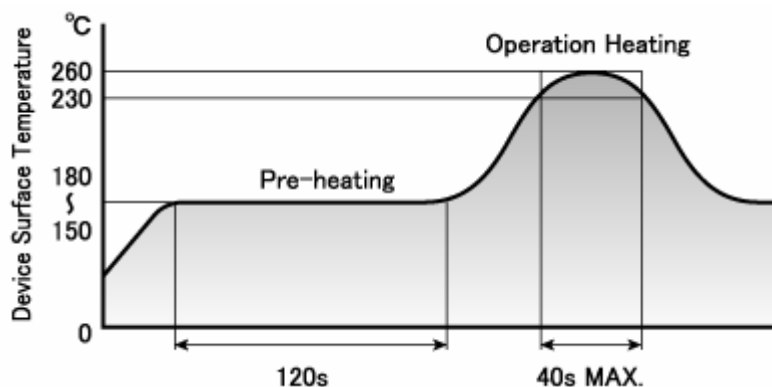
Taping Specification

(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.)

Reliability Testing Result

Reliability Testing Result	Applicable Standard	Testing Conditions	Duration	Failure
Room Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 25°C, I _F = Maximum Rated Current	1,000 h	0/20
High Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = Maximum Rated Operating Temperature, I _F = Derating Value	1,000 h	0/20
Low Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = -40°C, I _F = Maximum Rated Current	1,000 h	0/20
Wet High Temp. Operating Life	EIAJ ED-4701/100(102)	Ta = 60°C, 90%, I _F = Maximum Rated Current	1,000 h	0/20
Wet High Temp. Storage Life	EIAJ ED-4701/100(103)	Ta = 60°C, 90%	1,000 h	0/20
Thermal Shock	EIAJ ED-4701/100(105)	Ta = -40°C ~ Maximum Rated Storage Temperature (each 15min.)	1,000 cycles	0/20
Thermal Shock Operating	EIAJ ED-4701/100(105)	Ta = -40°C(off) ~ 85°C (I _F = Derating Value on), (each 15min.)	1,000 cycles	0/20
High Temp. Storage Life	EIAJ ED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/20
Low Temp. Storage Life	EIAJ ED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/20
Cycled Temp. Humidity Life	EIAJ ED-4701/200(203)	Ta = -30°C(2h) ~ 80°C, 95%(2h), 8h/cycle, I _F = Derating Value, 5min on-off	30 cycles	0/20
Resistance to Reflow Soldering	EIAJ ED-4701/300(301)	Moisture Soak : 30°C, 70%, 72h Preheat : 150 ~ 180°C(120s Max.) Soldering Temp. : 260°C(5s)	2 times	0/20
Electric Static Discharge (ESD) ^{※1}	EIAJ ED-4701/300(304)	C = 100pF, R2 = 1.5KΩ, ±2,000V	once each polarity	0/10
Vibration, Variable Frequency	EIAJ ED-4701/400(403)	98.1m/s ² (10G), 100 ~ 2KHz, 20min, XYZ each direction	2 h	0/10

※1 Reference test

Failure Criteria

Items	Symbols	Conditions	Failure criteria
Luminous Intensity	I _v	I _F Value of each product Luminous Intensity	Testing Min. Value < Spec. Min. Value x 0.5
Forward Voltage	V _F	I _F Value of each product Forward Voltage	Testing Max. Value ≥ Spec. Max. Value x 1.2
Reverse Current	I _R	V _R = Maximum Rated Reverse Voltage V	Testing Max. Value ≥ Spec. Max. Value x 2.5
Cosmetic Appearance	-	-	No notable, decoloration, deformation and cracking

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