



**Pb-free
HEAT**

STANLEY

1102W Series

Single color Inner-lens Type
(High Reliability type, V-Series)

Product features

Package	3216 fixed Inner-lens type, Water clear epoxy		
Product features	•Outer Dimension 3.2 x 1.6 x 1.5mm(L x W x H) •Wide operation temperature range. Storage Temperature : InGaN : -40℃~110℃ : AlInGaP : -40℃~120℃ Operating Temperature : -40℃~100℃ 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... •Shape resin into an inner lens to make high luminosity possible. •Corresponding to reflow soldering, dip soldering, and manual soldering. •No lead package and lead-free soldering compatible •RoHS compliant		
Dominant wavelength	Blue	: 470nm (VUB)	
	Green	: 530nm (VUG) , 558nm(VYBG)	
	Yellow-Green	: 572nm (VYPY)	
	Yellow	: 590nm (VFY)	
	Orange	: 605nm (VFA)	
	Red	: 626nm (VFR)	
Spatial distribution	VUB,VUG : 50deg. VYBG,VYPY,VFY,VFA,VFR : 60 deg.		
Die materials	VUB,VUG : InGaN VYBG, VYPY, VFY, VFA, VFR :AlGaInP		
Optical efficiency	VUB	: 13.3 lm/W	VFY : 13.2 lm/W
	VUG	: 30.3 lm/W	VFA : 13.2 lm/W
	VYBG	: 1.2 lm/W	VFR : 13.2 lm/W
	VYPY	: 3.8 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, dip soldering, and manual soldering.		
Taping dimensions	2,500pcs(standard) per reel in a 8mm width tape. Reel diameter: ϕ 180mm		
ESD	AlInGaP: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

(T_a=25℃)

Part No.	Material	Emitted Color	Lens Color	Dominant Wavelength		Luminous Intensity			Luminous Flux	
				λ_d (nm)		I_v (mcd)			Φ_v (lm)	
				TYP.	I _F	MIN.	MAX.	I _F	TYP.	I _F
VUB1102W	InGaP	Blue	Water Clear	470	10	47	180	10	440	10
VUG1102W	InGaP	Green		530	10	150	560	10	1,000	10
VYBG1102W	AlGaInP			558	20	15	68	20	50	20
VYPY1102W	AlGaInP	Yellow-Green		572	20	47	180	20	160	20
VFY1102W	AlGaInP	Yellow		590	20	120	390	20	500	20
VFA1102W	AlGaInP	Orange		605	20	120	390	20	500	20
VFR1102W	AlGaInP	Red		626	20	120	470	20	500	20

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

Absolute Maximum Ratings

(T_a=25℃)

Item	Symbol	Absolute Maximum Ratings							Unit
		VUB	VUG	VYBG	VYPY	VFY	VFA	VFR	
Power Dissipation	P _d	80	84	81	81	78	78	78	mW
Forward Current	I _F	20	20	30	30	30	30	30	mA
Pulse Forward Current ※1	I _{FRM}	48	48	100	100	100	100	100	mA
Derating (Ta=75℃ or higher)	ΔI _F	0.40 ※2	0.40 ※2	1.0	1.0	1.0	1.0	1.0	mA/℃
	ΔI _{FRM}	0.96 ※2	0.96 ※2	3.33	3.33	3.33	3.33	3.33	mA/℃
Reverse Voltage	V _R	5	5	5	5	5	5	5	V
Operating Temperature	T _{opr}	-40 ~ +100							℃
Storage Temperature	T _{stg}	-40 ~ +110		-40 ~ +120					℃

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

※2 Temperature Condition: Ta=60℃ or higher.

Thermal Characteristics

Item	Symbol	Ratings							Unit
		VUB	VUG	VYBG	VYPY	VFY	VFA	VFR	
Junction Temperature (MAX.)	T _j	110	110	120	120	120	120	120	℃
Thermal Resistance (TYP.) (Junction/ Solder Point)	R _(th J-S)	600	600	700	650	650	650	650	℃ /W

※R_{th(J-S)} Measurement Condition / Substrate: FR4(t=1.6mm) Pattern Size: 16mm².

Electro-Optical Characteristics (VUB,VUG)

(T_a=25°C)

Item	Conditions	Symbol	Characteristic Ratings		Unit
			VUB	VUG	
Forward Voltage	I _F =10mA	V _F	TYP.	3.3	V
			MAX.	3.8	
Reverse Current	V _R =5V	I _R	MAX.	100	μA
Peak Wavelength	I _F =10mA	λ _p	TYP.	465	nm
Dominant Wavelength	I _F =10mA	λ _d	TYP.	470	nm
Spectral Line Half Width	I _F =10mA	Δλ	TYP.	26	nm
Half Intensity Angle	I _F =10mA	2θ _{1/2}	TYP.	50	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, VFR)

(T_a=25°C)

Item	Conditions	Symbol	Characteristic Rating					Unit
			VYBG	VYPY	VFY	VFA	VFR	
Forward Voltage	I _F =20mA	V _F	TYP.	2.1	2.1	1.9	1.9	V
			MAX.	2.5	2.5	2.4	2.4	
Reverse Current	V _R =5V	I _R	MAX.	100	100	100	100	μA
Peak Wavelength	I _F =20mA	λ _p	TYP.	565	572	592	609	nm
Dominant Wavelength	I _F =20mA	λ _d	TYP.	558	572	590	605	nm
Spectral Line Half Width	I _F =20mA	Δλ	TYP.	15	15	15	15	nm
Half Intensity Angle	I _F =20mA	2θ _{1/2}	TYP.	60	60	60	60	deg.

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

Luminous Intensity Rank

(T_a=25℃)

Standard Chart(Unit: mcd)

Rank	I _v (mcd)		VUB	VUG	VYBG	VYPY	VFY	VFA	VFR
	MIN.	MAX.	I _F =10mA		I _F =20mA				
AZ	8.2	10							
B1	10	12							
B2	12	15							
B3	15	18			B3				
B4	18	22							
B5	22	27							
B6	27	33							
B7	33	39							
B8	39	47							
B9	47	56	B9			B9			
BX	56	68			BX				
BY	68	82							
BZ	82	100							
C1	100	120	C3			C3	C2	C2	C2
C2	120	150		C3					
C3	150	180				C3			
C4	180	220							
C5	220	270							
C6	270	330							
C7	330	390					C7	C7	
C8	390	470							C8
C9	470	560		C9					
CX	560	680							
CY	680	820							
CZ	820	1,000							
D1	1,000	1,200							
D2	1,200	1,500							
D3	1,500	1,800							
D4	1,800	2,200							

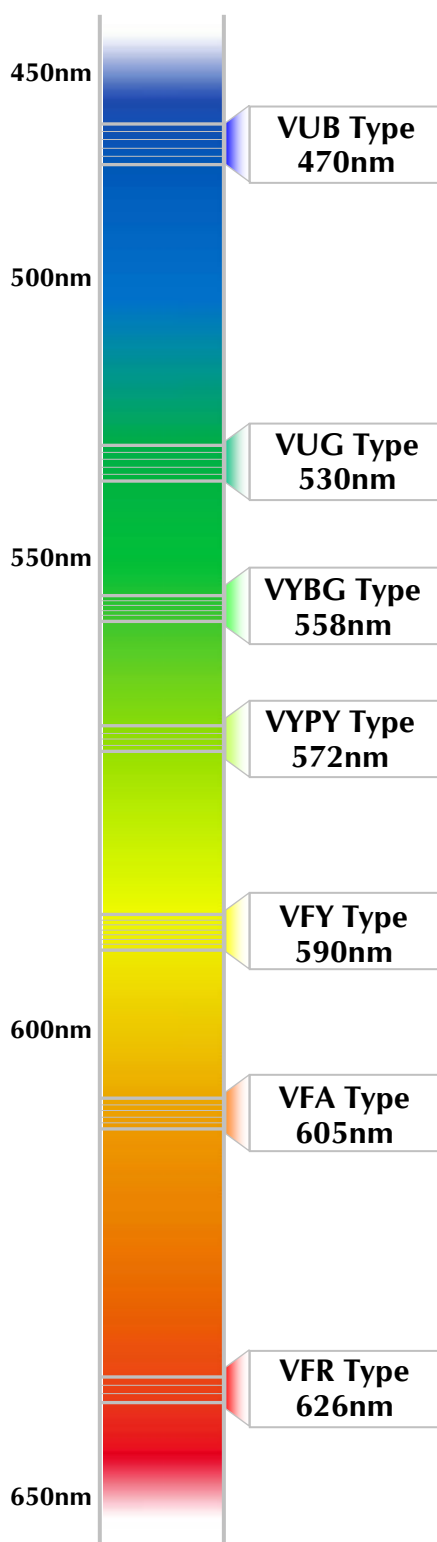
※ Limited width of luminous intensity rank is from Min.4 rank width.

Color Tone Groups (λ_d)

($T=25^{\circ}\text{C}$)

(unit: nm)

Tolerance: +/-1nm



VUB Type ($I_F=10\text{mA}$)

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

VUG Type ($I_F=10\text{mA}$)

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

VYBG Type ($I_F=20\text{mA}$)

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

VYPY Type ($I_F=20\text{mA}$)

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

VFY Type ($I_F=20\text{mA}$)

	C	D	E	F
MIN.	583.0	586.0	589.0	592.0
MAX.	586.0	589.0	592.0	595.0

VFA Type ($I_F=20\text{mA}$)

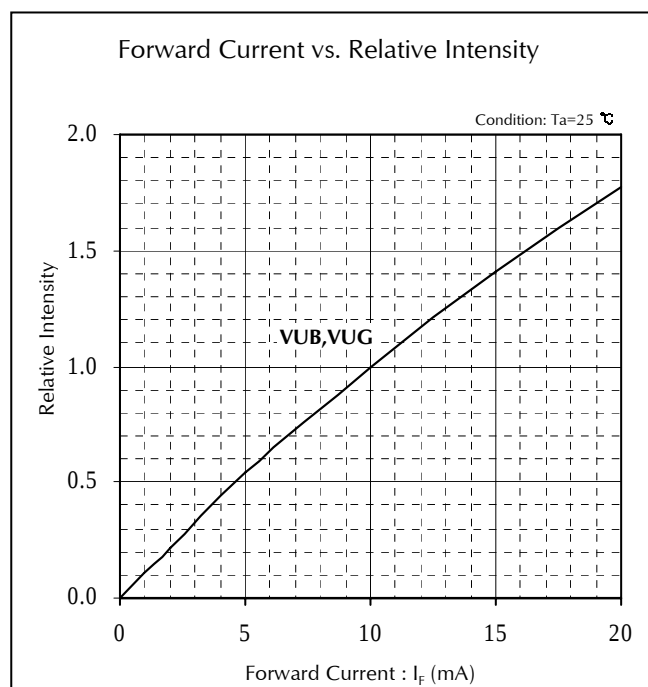
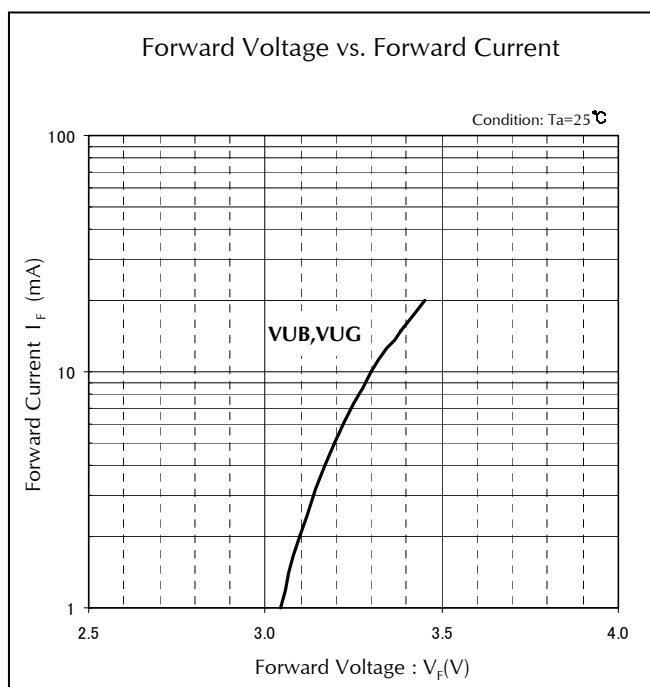
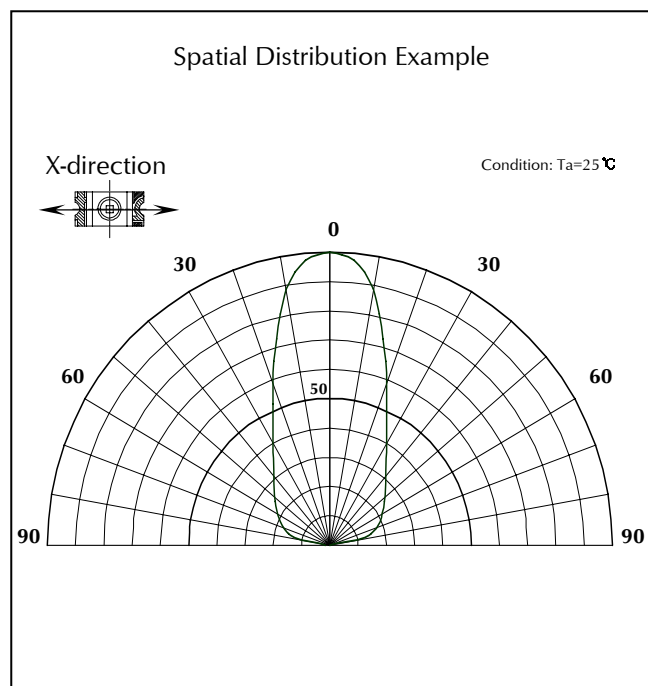
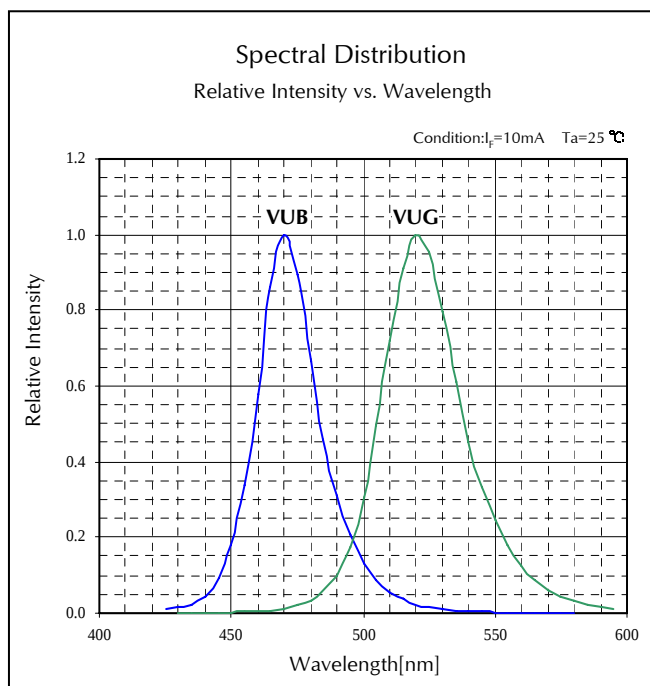
	A	B	C	D
MIN.	597.0	600.0	603.0	606.0
MAX.	600.0	603.0	606.0	609.0

VFR Type ($I_F=20\text{mA}$)

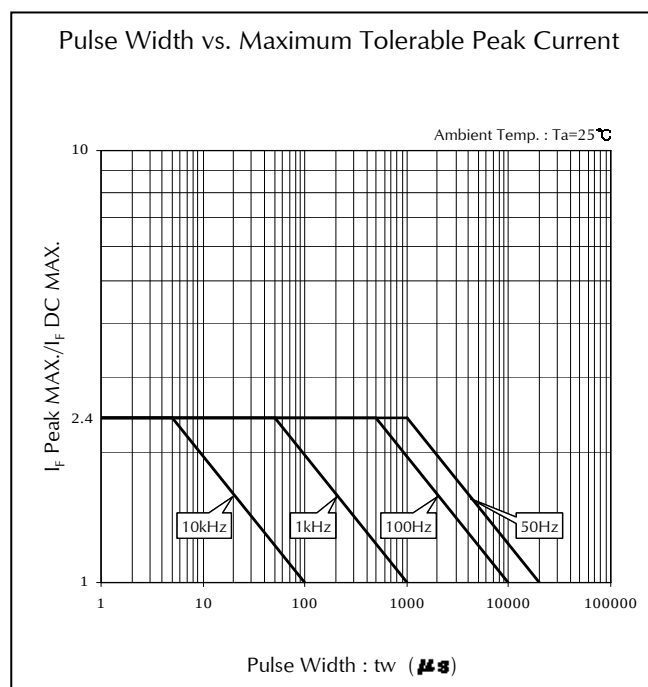
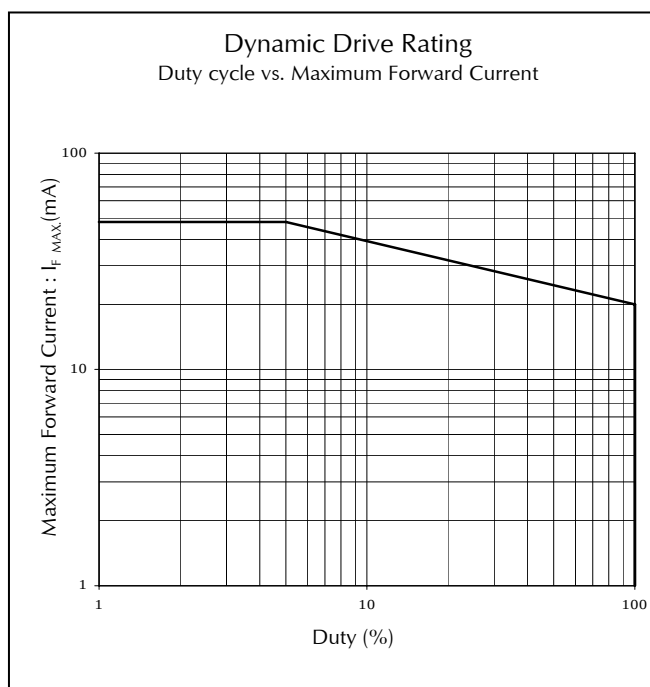
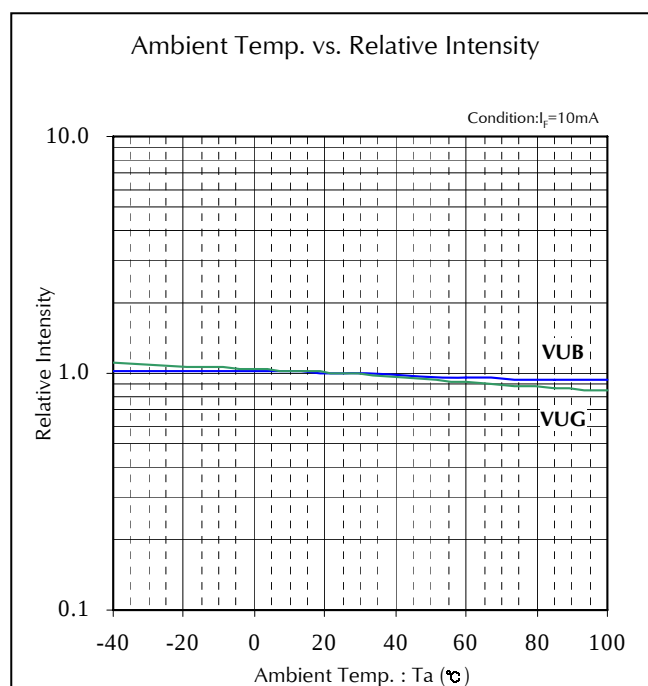
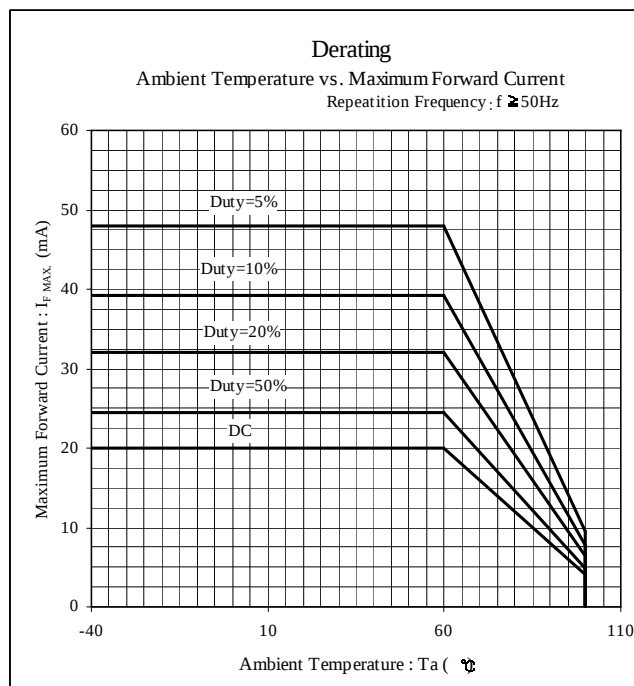
	A	B	C
MIN.	620.0	626.0	632.0
MAX.	626.0	632.0	638.0

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

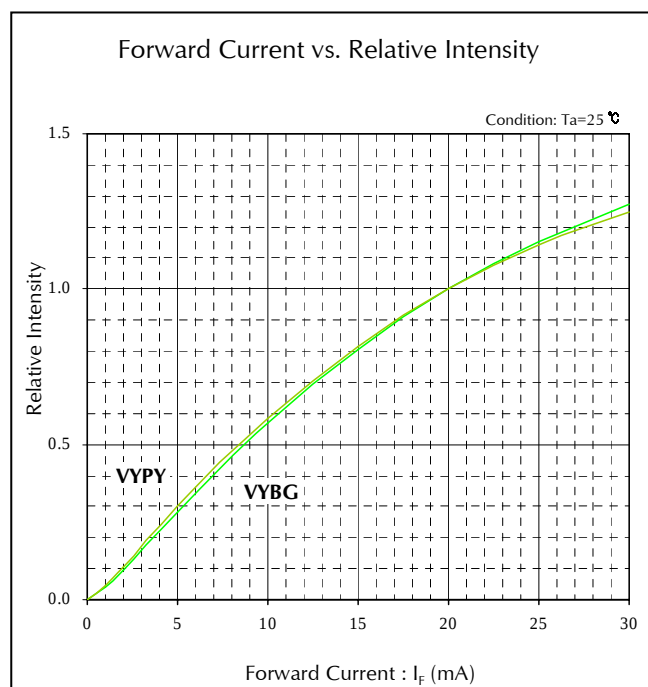
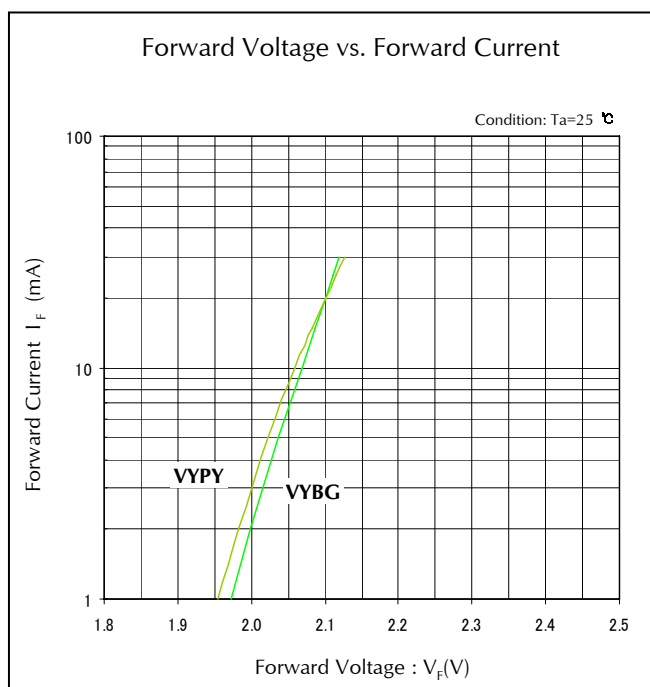
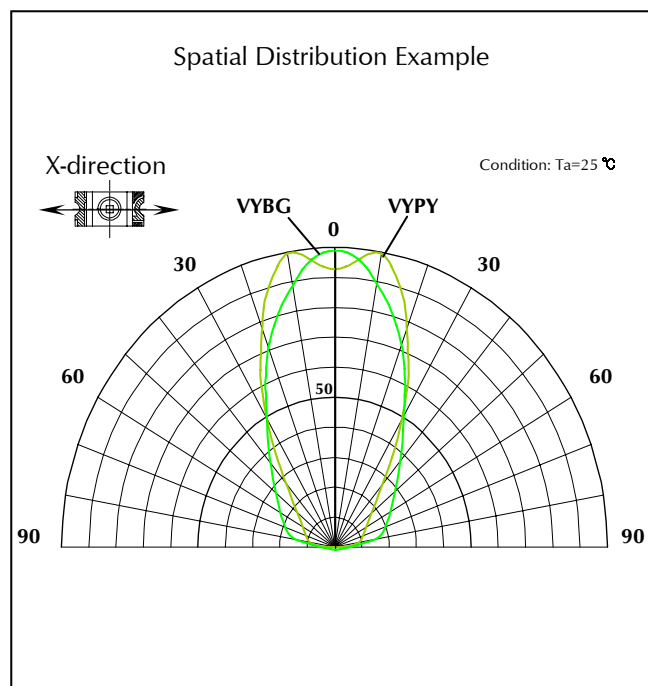
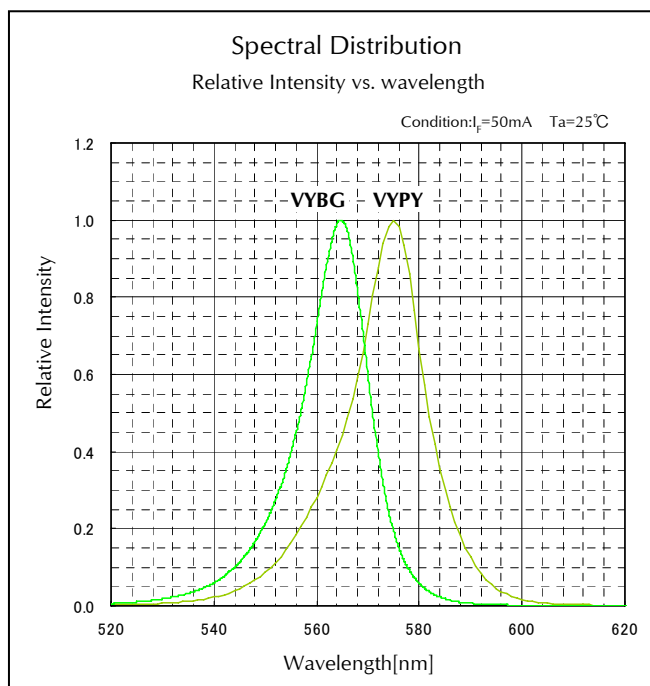
Characteristics Chart (VUB,VUG)



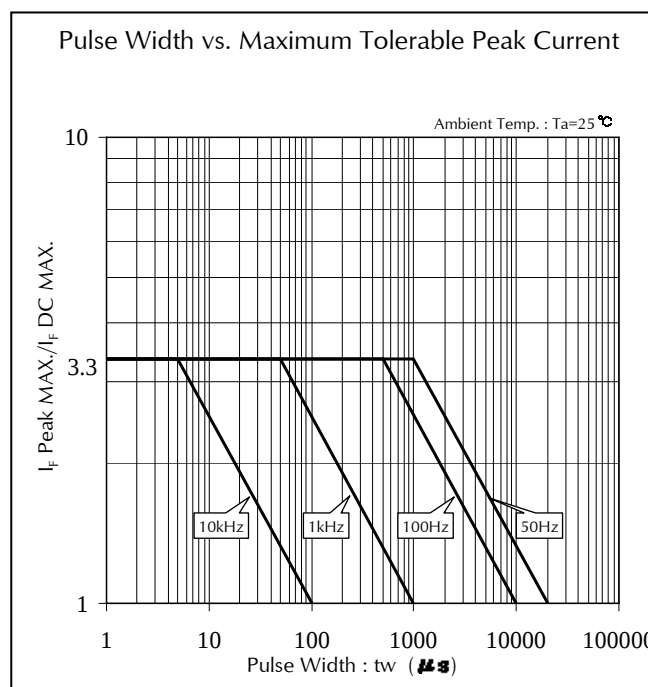
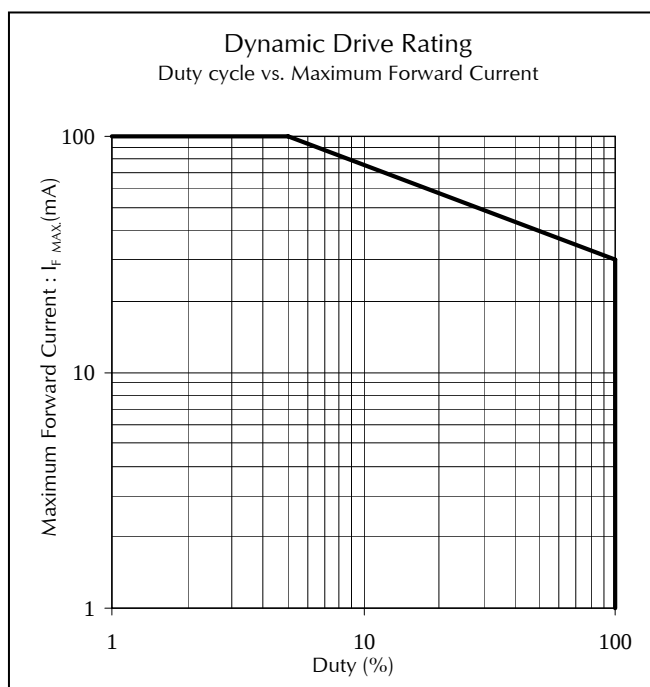
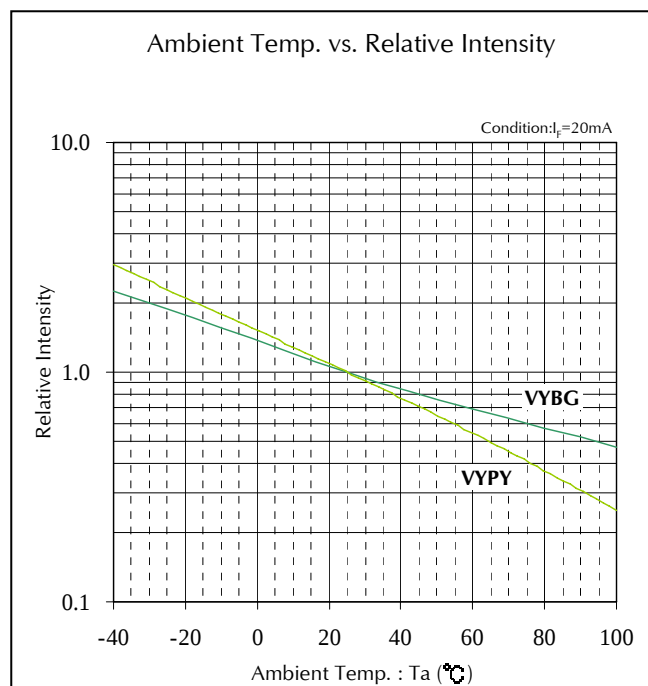
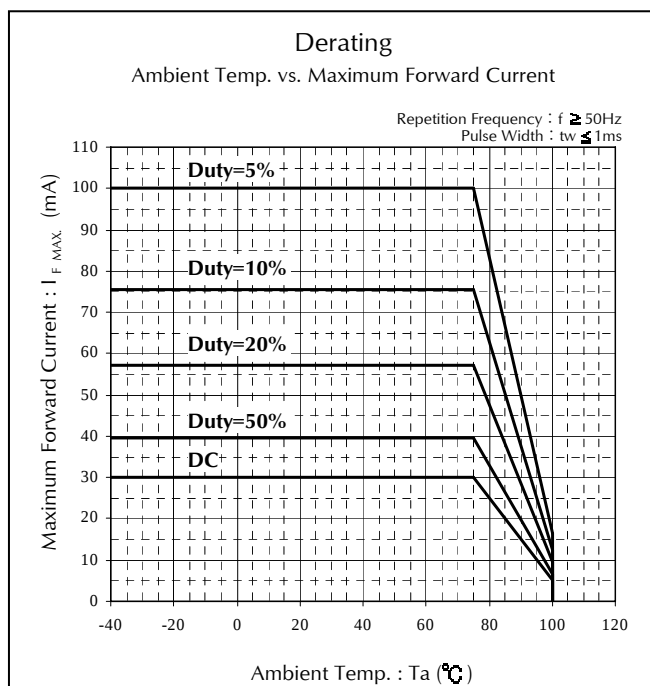
Characteristics Chart (VUB,VUG)



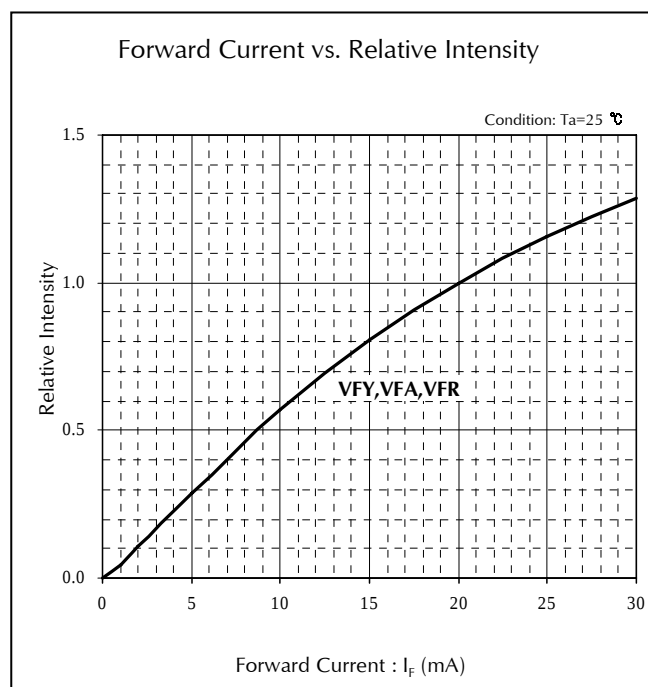
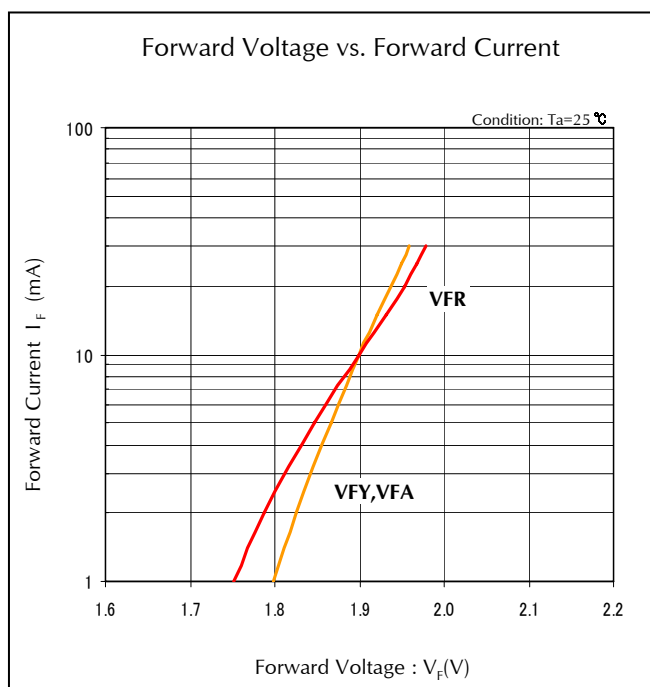
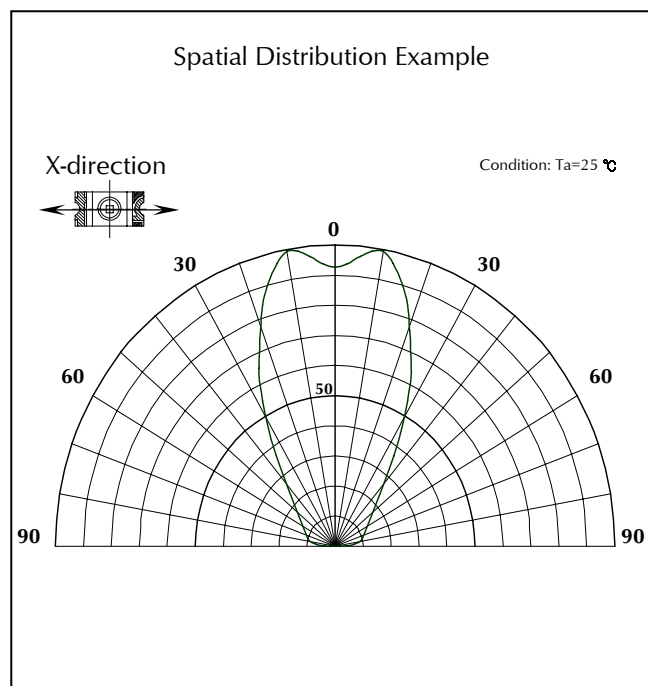
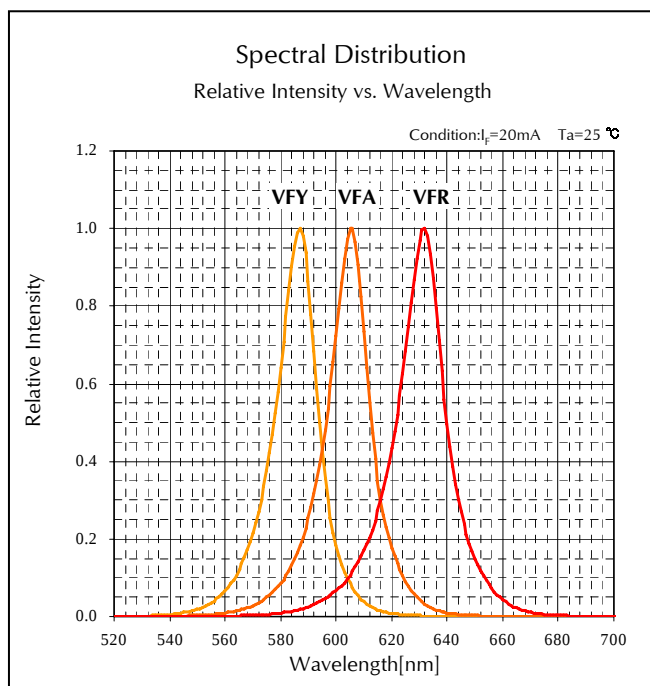
Characteristics Chart(VYBG,VYPY)



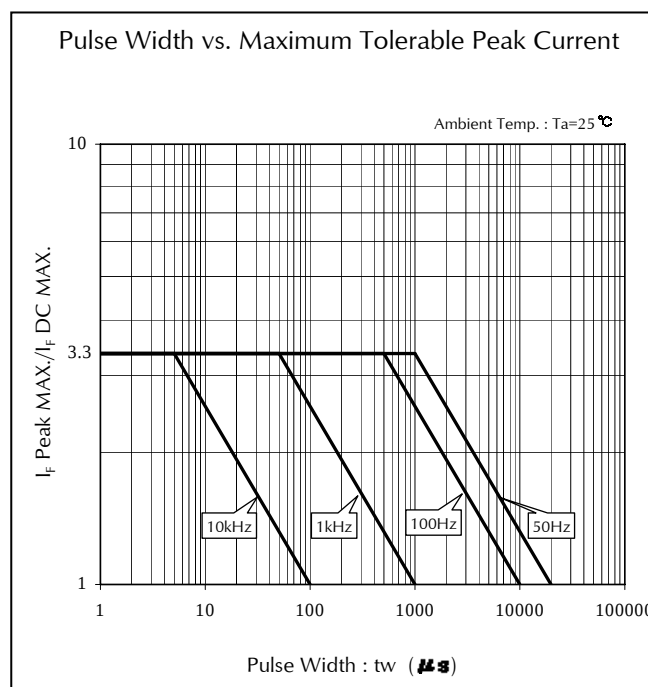
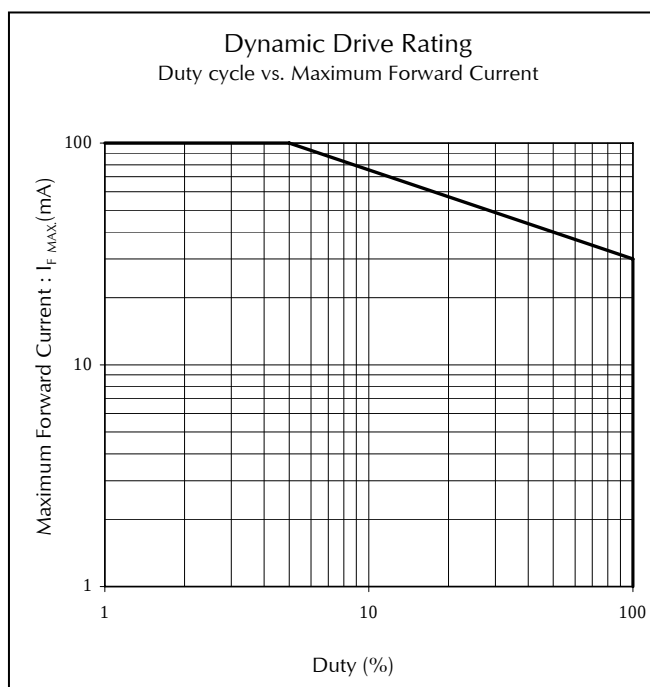
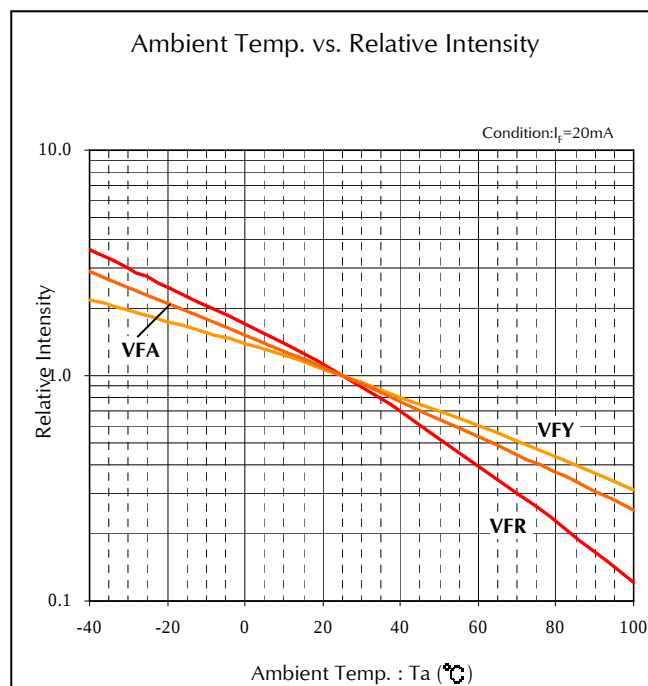
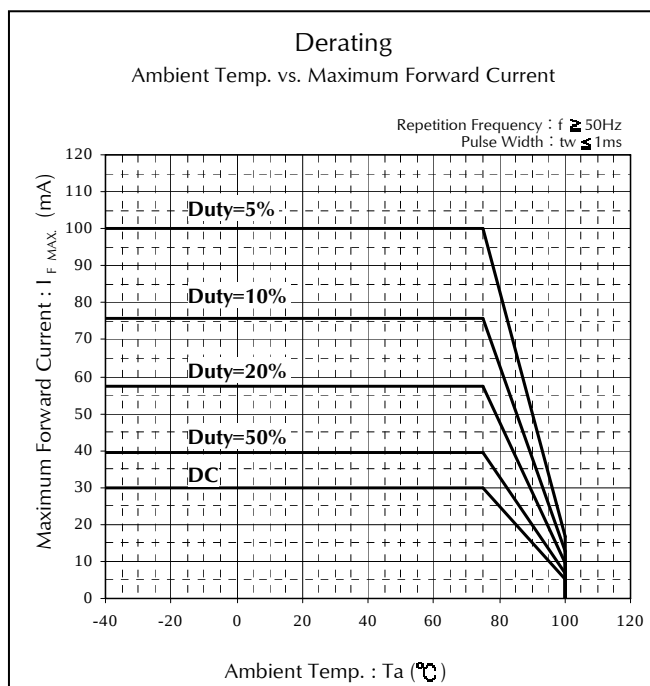
Characteristics Chart(VYBG,VYPY)



Characteristics Chart(VFY,VFA,VFR)



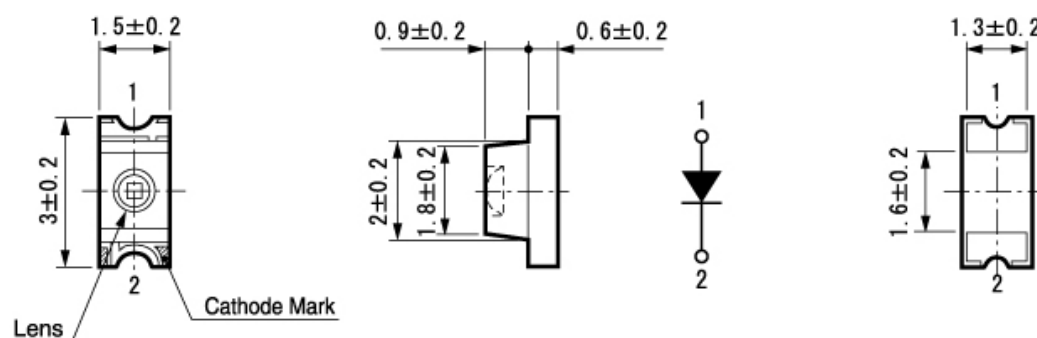
Characteristics Chart(VFY,VFA,VFR)



Package Dimensions

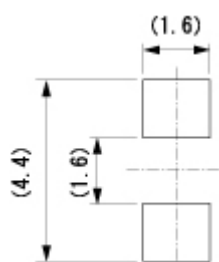
(Unit: mm)

Weight: (7.80)mg



Recommended Soldering Pattern

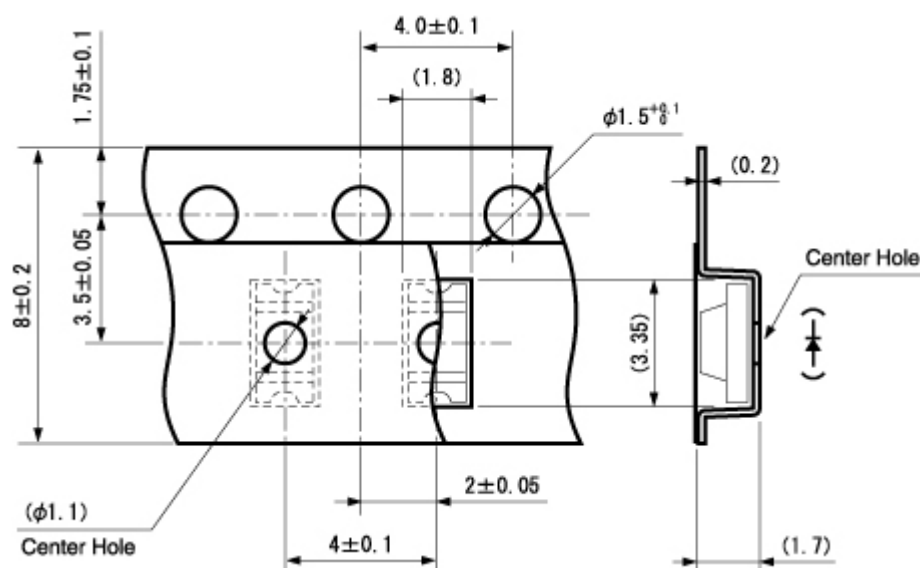
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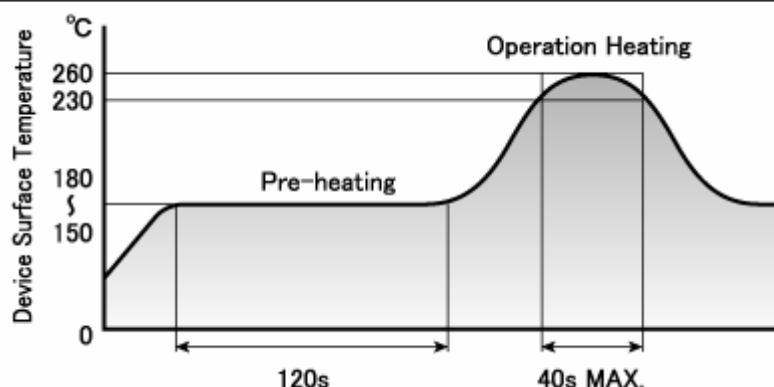
Taping Specification

(Unit: mm)

Quantity: 2,500pcs/ 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 room temperature after the first reflow) in order to prevent the LED resin from absorbing moisture.
- 3) Temperature fluctuation to the LED during the pre-heating process shall be minimized. (6 °C maximum)

Dip Soldering Conditions

Pre-heating	120 °C 60 s	(MAX.) (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.

Manual Soldering Conditions

Iron tip temp.	350 °C	(MAX.)
Soldering time and frequency	3 s 1 time	(MAX.) (MAX.)

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