



**Pb-free
HEAT**



1111C Series

Single Color Ultra High Brightness Type

Features

Package	1608 (h=0.7mm) Type, Milky White resin
Product features	• Outer Dimension 1.6 x 0.8 x 0.7mm (L x W x H) • Temperature range Storage Temperature : -40°C~100°C Operating Temperature : -40°C~85°C • Lead-free soldering compatible • RoHS compliant
Dominant wavelength	Blue : 470nm(UB) Blue Green : 508nm(UC) Green : 530nm(UG) Yellow : 590nm(UY) Red : 630nm(UR)
Half Intensity Angle	UB, UC, UG : $\theta_x = 150 \text{ deg.}, \theta_y = 165 \text{ deg.}$ UY, UR : $\theta_x = 150 \text{ deg.}, \theta_y = 140 \text{ deg.}$
Die materials	UB,UC,UG : InGaN UY,UR : AlGaInP
Rank grouping parameter	Sorted by luminous intensity and wavelength per rank taping
Assembly method	Auto pick & place machine (Auto Mounter)
Soldering methods	Reflow soldering / Manual Soldering
Taping and reel	4,000pcs per reel in a 8mm width tape. (Standard) Reel diameter: $\phi 180\text{mm}$
ESD	InGaN : Up to 1kV(HBM), AlGaInP : Up to 2kV (HBM)

Recommended Applications

Communication Machine, Electric Household Appliances, OA/FA, Other General Applications

Color and Luminous Intensity

(Ta=25°C)

Part No.	Material	Emitted Color	Lens Color	Dominant Wavelength λ_d (nm)		Luminous Intensity I_v (mcd)		
				TYP.	I_f (mA)	MIN.	TYP.	I_f (mA)
UB1111C	InGaN	Blue	Milky White	470	10	17	34	10
UC1111C	InGaN	Blue Green		508	10	80	160	10
UG1111C	InGaN	Green		530	10	96	160	10
UY1111C	AlGaInP	Yellow		590	20	50	100	20
UR1111C	AlGaInP	Red		630	20	50	100	20

Absolute Maximum Ratings

(Ta=25°C)

Item	Symbol	Absolute Maximum Ratings					Unit
		UB	UC	UG	UY	UR	
Power Dissipation	P_d	78	78	78	87	87	mW
Continuous Forward Current	I_F	20	20	20	30	30	mA
Repetitive Peak Forward Current※1	I_{FRM}	48	48	48	100	100	mA
Derating (Ta=25°C or higher)	ΔI_F	0.28	0.28	0.28	0.43	0.43	mA/°C
	ΔI_{FRM}	0.69	0.69	0.69	1	1	mA/°C
Reverse Voltage	V_R	5	5	5	5	5	V
Operating Temperature	T_{opr}	-40~+85					°C
Storage Temperature	T_{stg}	-40~+100					°C

※1 I_{FRM} Measurement condition : Pulse Width ≤ 1 ms., Duty $\leq 1/20$. (UY,UR : Duty $\leq 1/10$)

Electro-Optical Characteristics (UB,UC,UG)

(Ta=25°C)

Item	Conditions	Symbol	Characteristics				Unit
				UB	UC	UG	
Forward Voltage	I _F =10mA	V _F	TYP.	3.4	3.4	3.4	V
			MAX.	3.9	3.9	3.9	
Reverse Current	V _R =5V	I _R	MAX.	100	100	100	μ A
Peak Wavelength	I _F =10mA	λ _p	TYP.	465	502	522	nm
Dominant Wavelength	I _F =10mA	λ _d	TYP.	470	508	530	nm
Spectral Line Half Width	I _F =10mA	Δ λ	TYP.	26	30	35	nm
Half Intensity Angle※	I _F =10mA	2 θ 1/2	TYP.	150(θ x)	150(θ x)	150(θ x)	deg.
				165(θ y)	165(θ y)	165(θ y)	

※ θ_x: Product long side axis, θ_y: Product short side axis

Electro-Optical Characteristics (UY,UR)

(Ta=25°C)

Item	Conditions	Symbol	Characteristics			Unit
				UY	UR	
Forward Voltage	I _F =20mA	V _F	TYP.	2.2	2.2	V
			MAX.	2.8	2.8	
Reverse Current	V _R =5V	I _R	MAX.	100	100	μ A
Peak Wavelength	I _F =20mA	λ _p	TYP.	592	641	nm
Dominant Wavelength	I _F =20mA	λ _d	TYP.	590	630	nm
Spectral Line Half Width	I _F =20mA	Δ λ	TYP.	18	18	nm
Half Intensity Angle※	I _F =20mA	2 θ 1/2	TYP.	150(θ x)	150(θ x)	deg.
				140(θ y)	140(θ y)	

※ θ_x: Product long side axis, θ_y: Product short side axis

Luminous Intensity Rank (Unit : mcd)

(Ta=25°C)

Tolerance : +/-10%

Rank	I _V (mcd)									
	UB		UC		UG		UY		UR	
	I _F =10mA		I _F =10mA		I _F =10mA		I _F =20mA		I _F =20mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A			80	112			50	100	50	100
B			96	136			70	140	70	140
C			112	160			96	136	100	200
D	17	24	136	192	112	160	140	280	140	280
E	20	28	160	224	136	192	200	400	200	400
F	24	34	192	320	160	224	280	-	280	-
G	28	40	224	-	192	272				
H	34	48			224	320				
J	40	56			272	-				
K	48	-								

※ Please contact our sales staff concerning rank designation.

Color Tone Groups (λd)

(Ta=25°C)

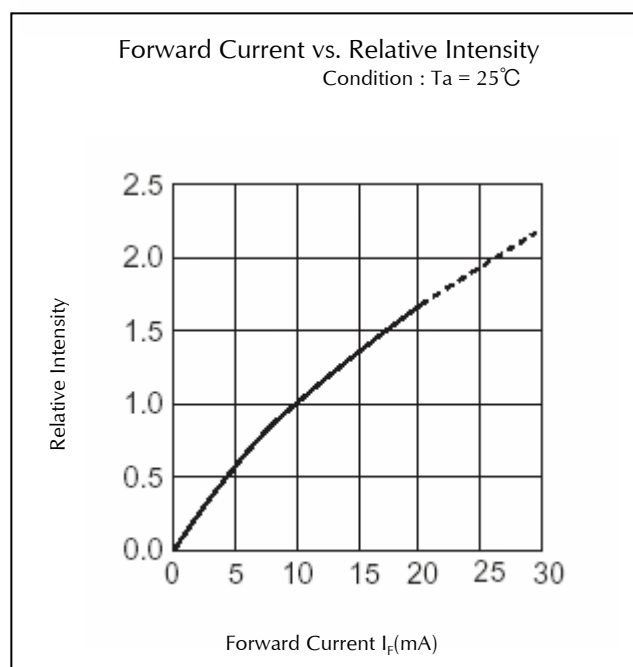
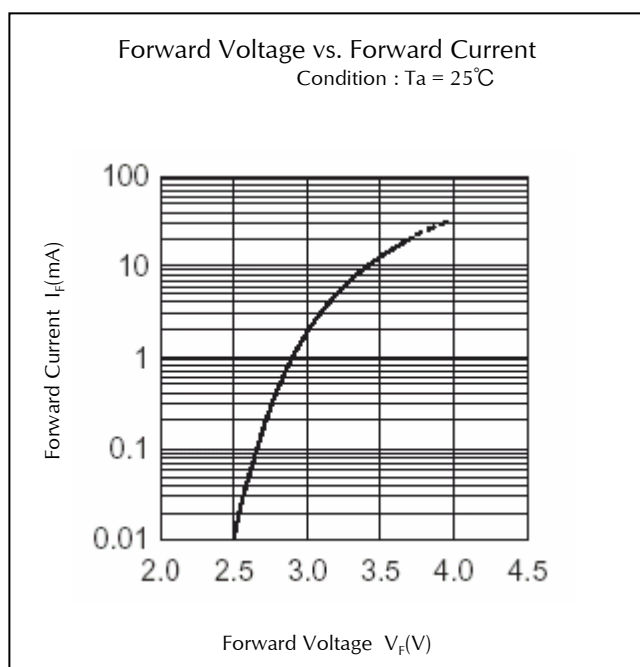
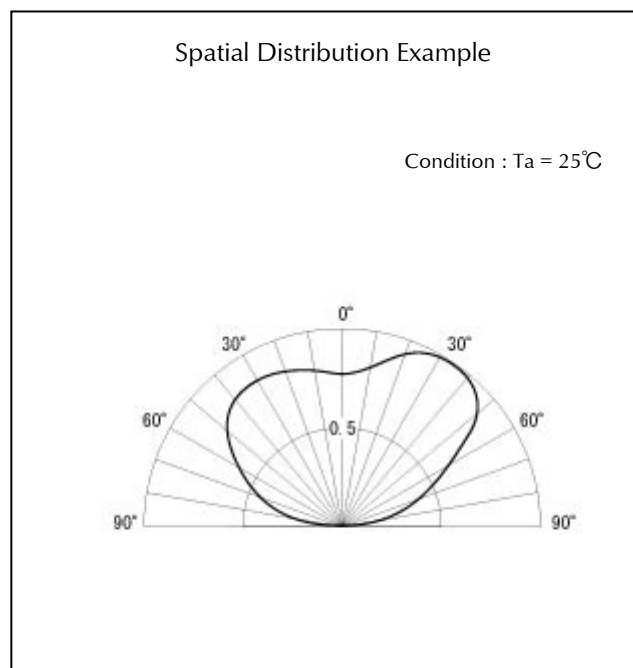
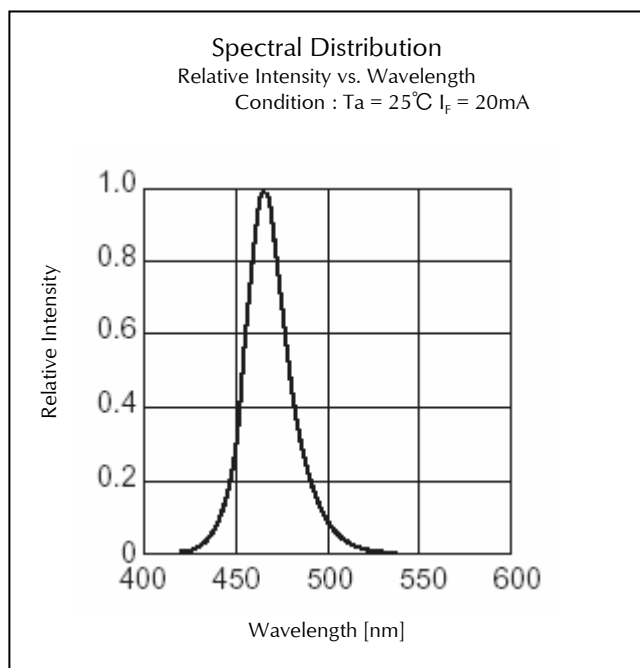
Tolerance : +/-3nm

Rank	Dominant Wavelength λd (nm)					
	UB		UC		UG	
	I _F =10mA		I _F =10mA		I _F =10mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
-	460	480	500	520	520	545

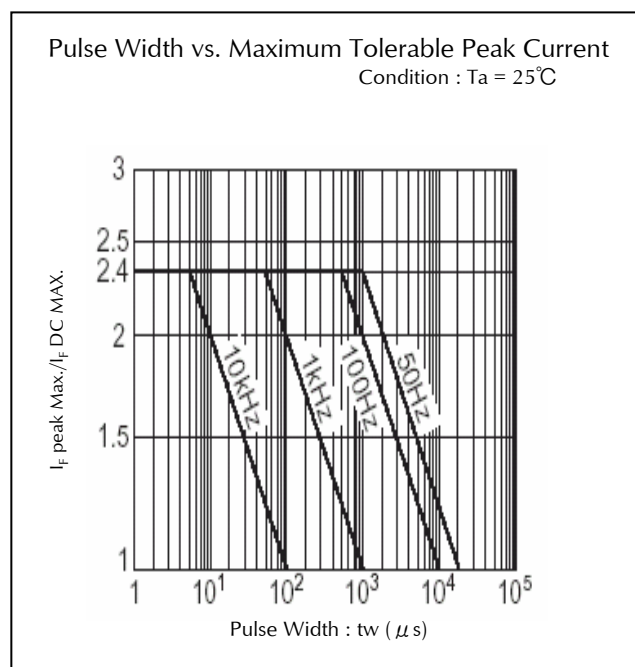
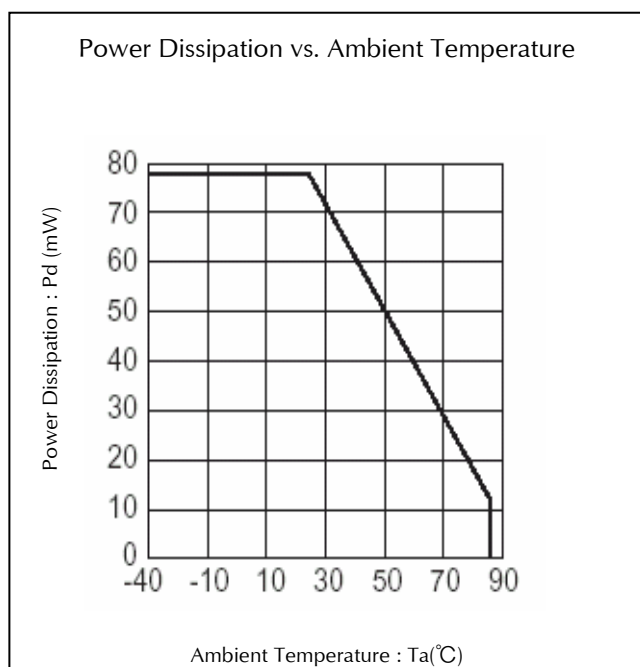
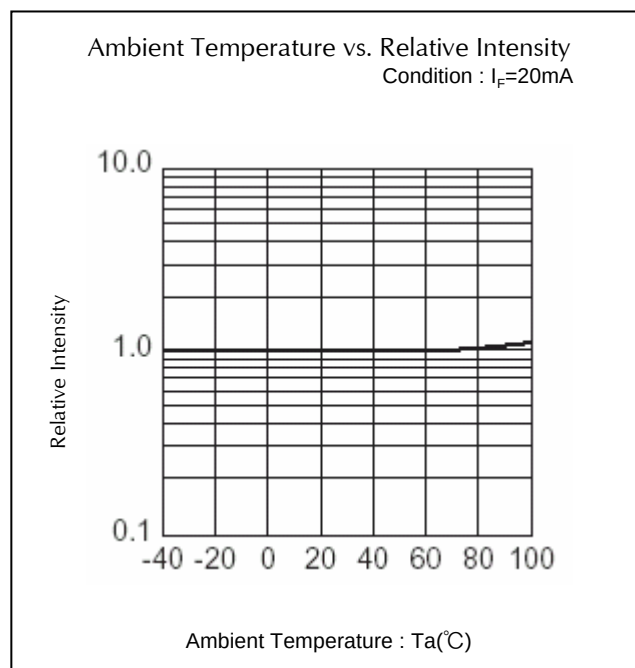
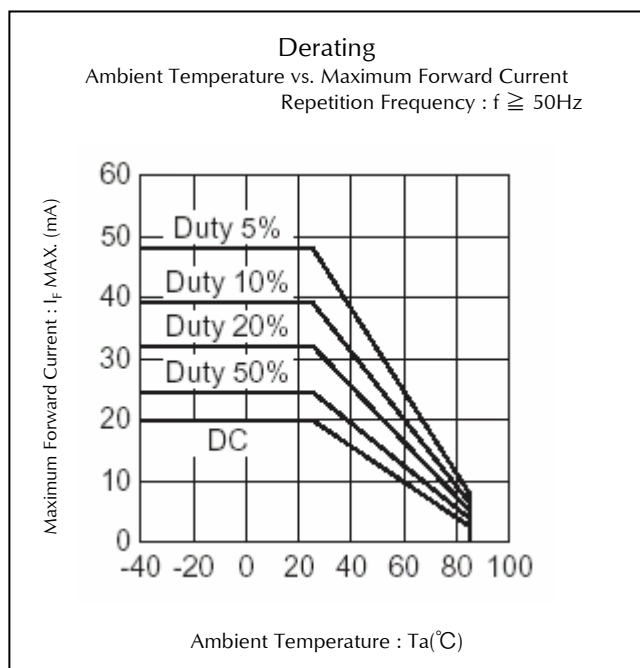
Rank	Dominant Wavelength λd (nm)			
	UY		UR	
	I _F =20mA		I _F =20mA	
	MIN.	MAX.	MIN.	MAX.
A	580	585	620	630
B	584	589	628	638
C	588	593		
D	592	597		
E	596	601		

※ Please contact our sales staff concerning rank designation.

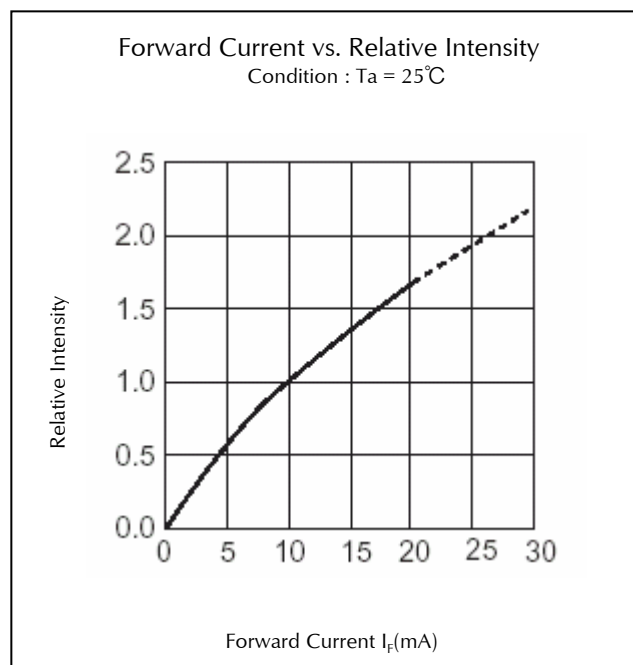
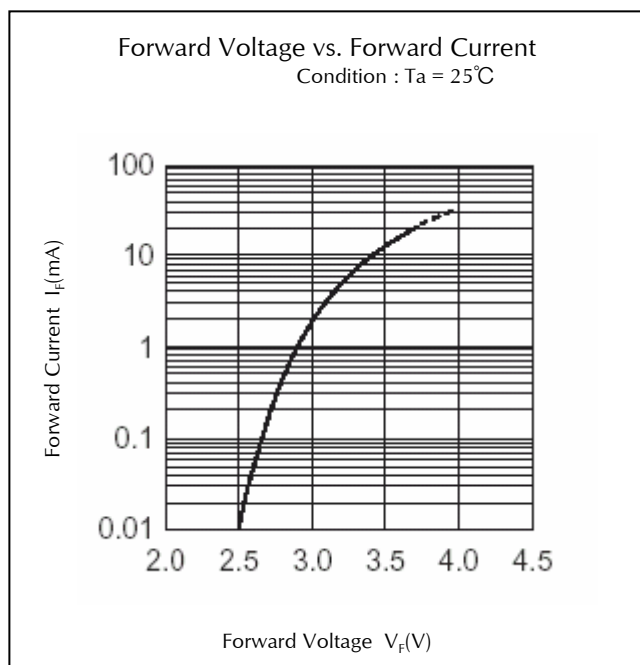
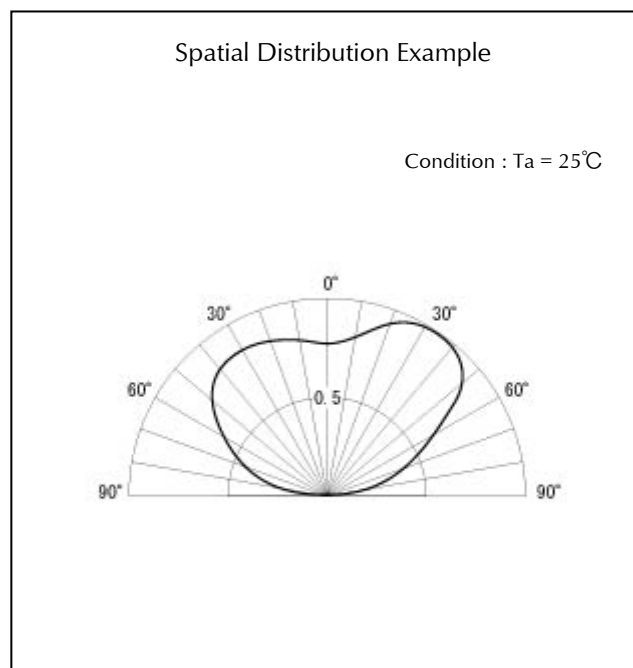
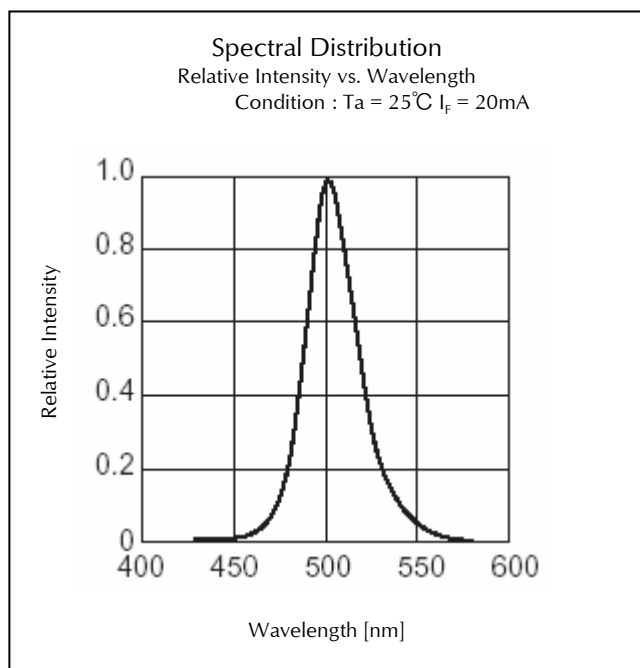
Technical Data (UB)



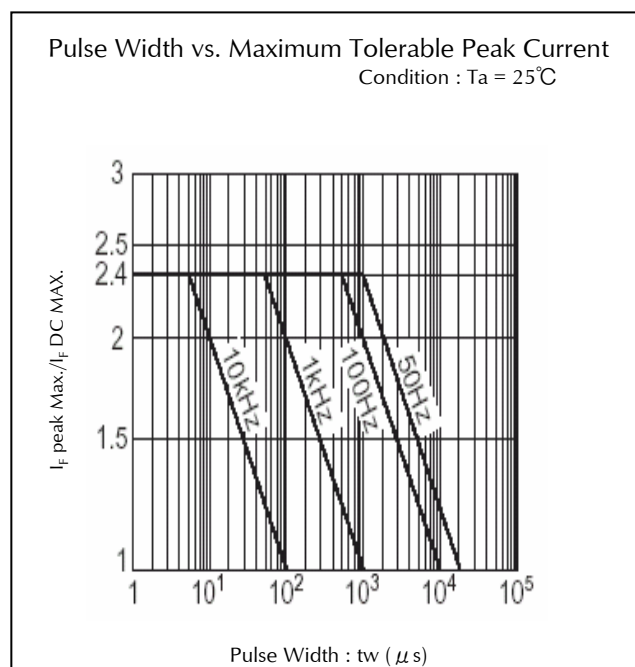
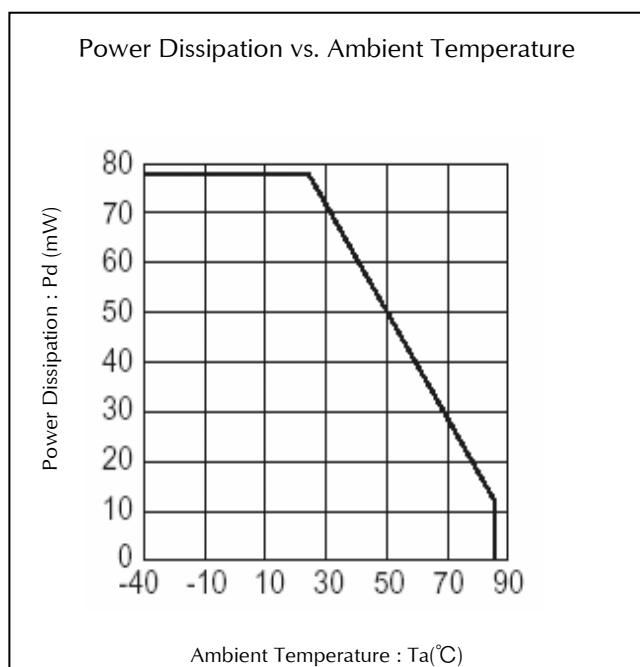
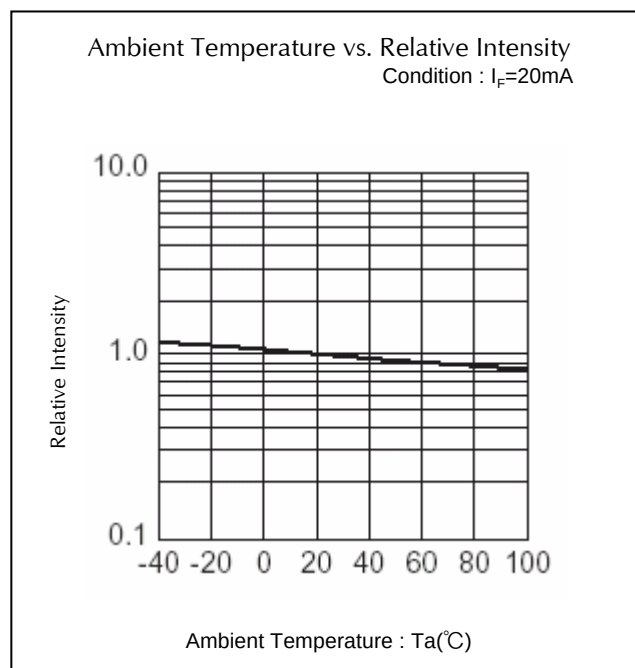
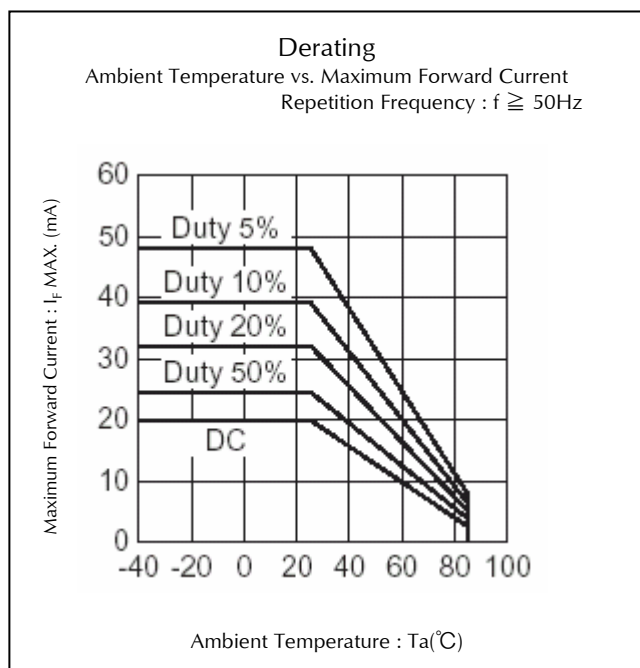
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Technical Data (UC)

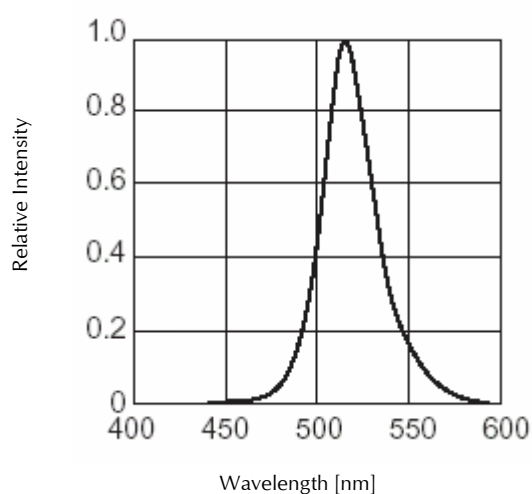


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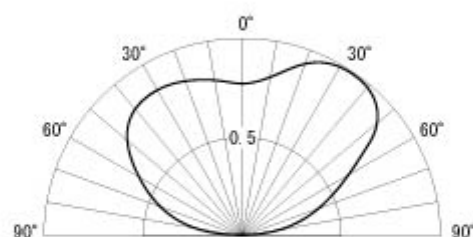
Technical Data (UG)

Spectral Distribution
Relative Intensity vs. Wavelength
Condition : $T_a = 25^\circ\text{C}$ $I_F = 20\text{mA}$

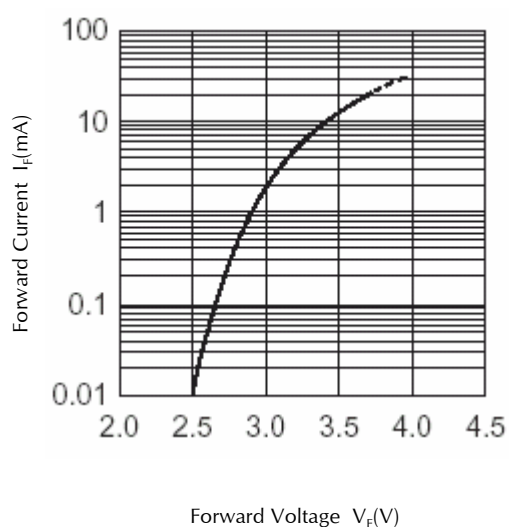


Spatial Distribution Example

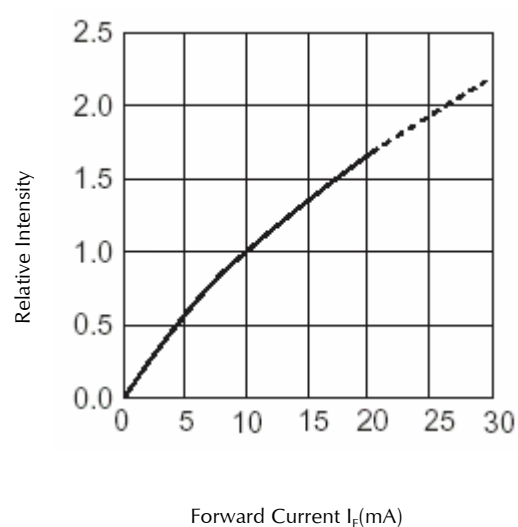
Condition : $T_a = 25^\circ\text{C}$



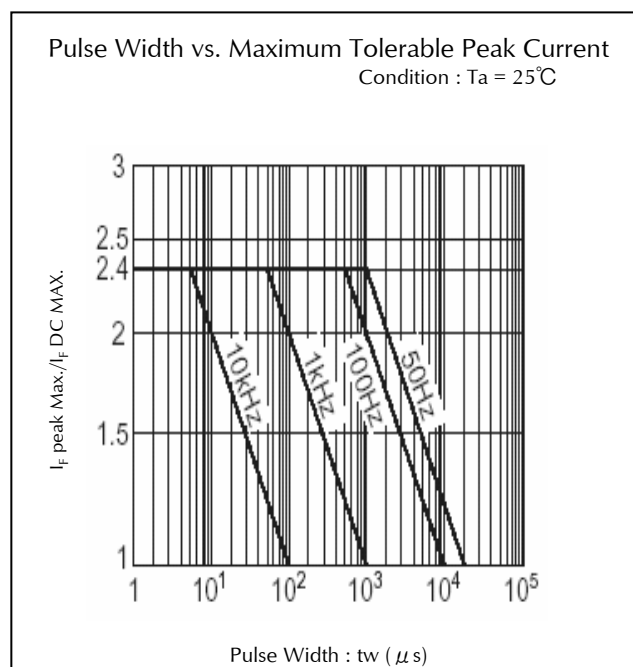
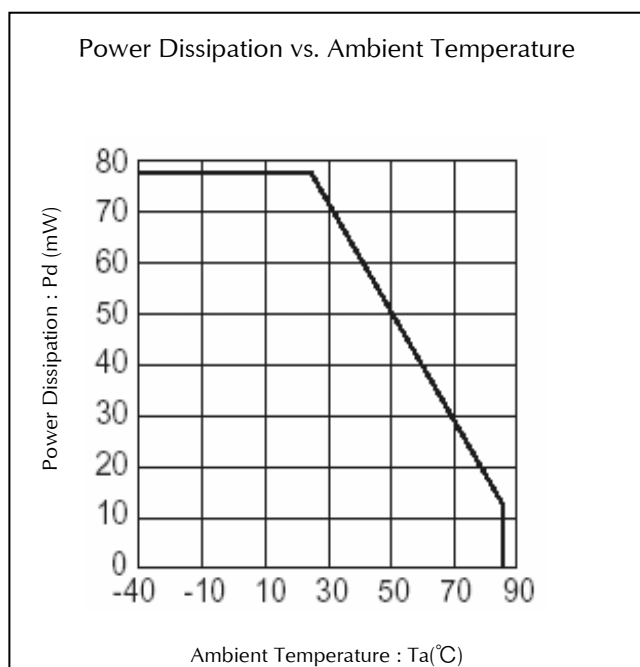
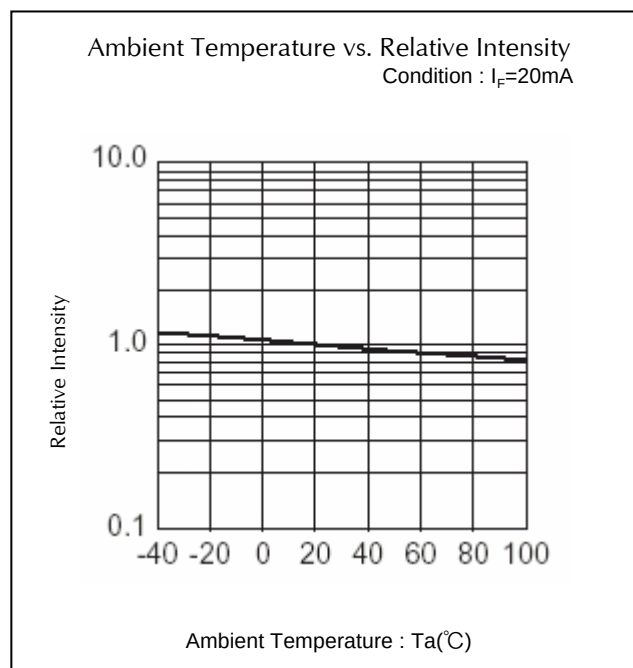
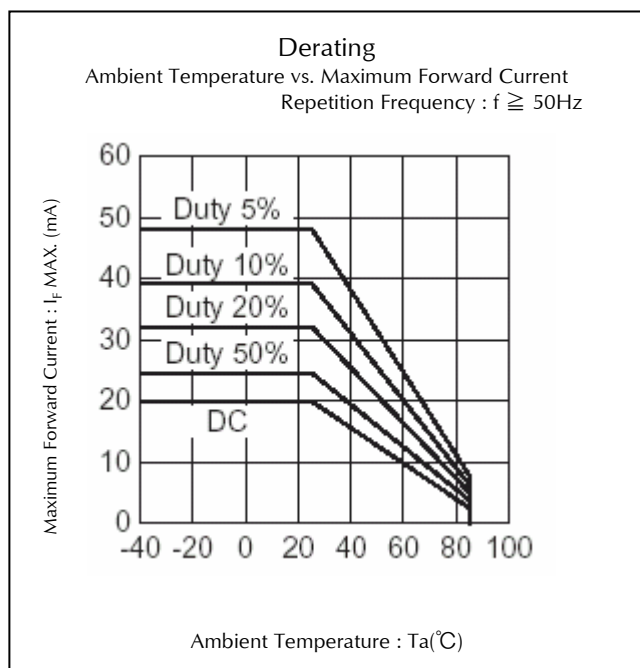
Forward Voltage vs. Forward Current
Condition : $T_a = 25^\circ\text{C}$



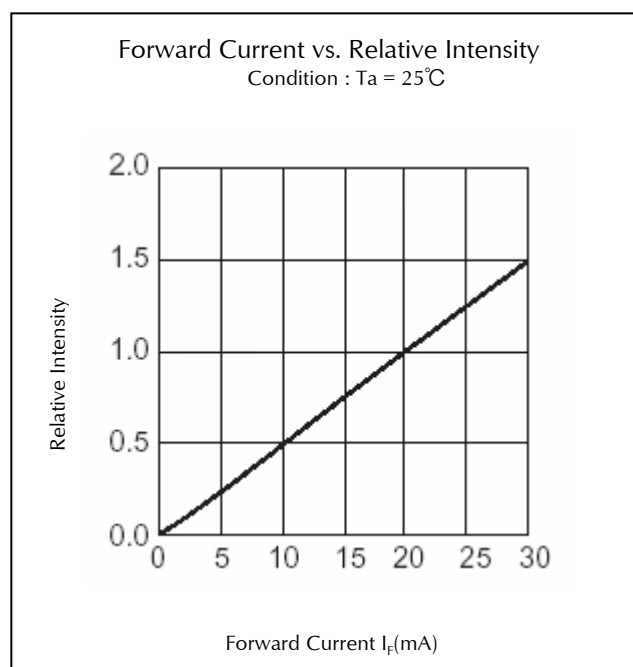
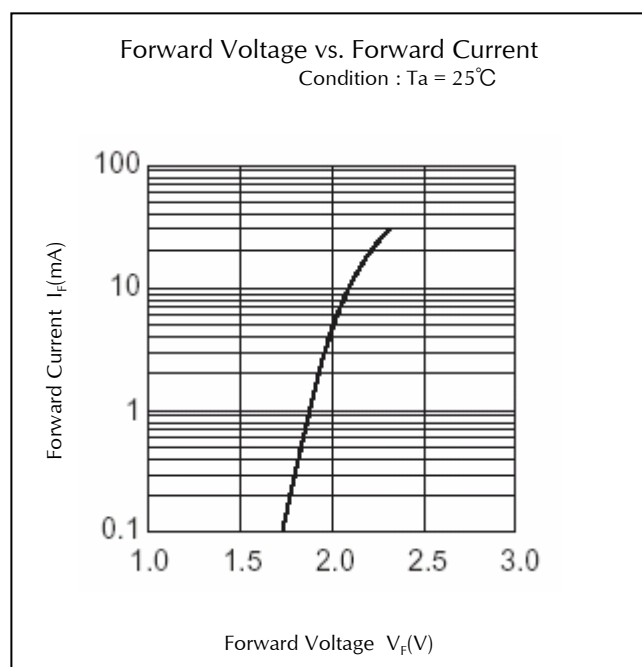
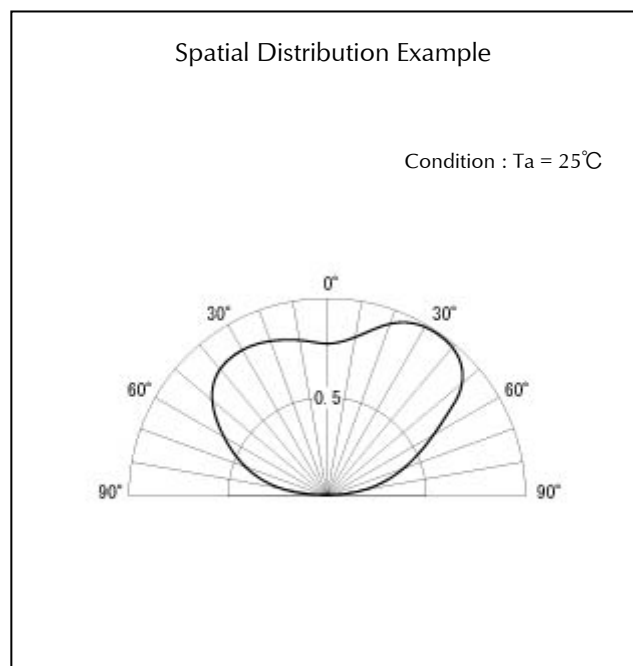
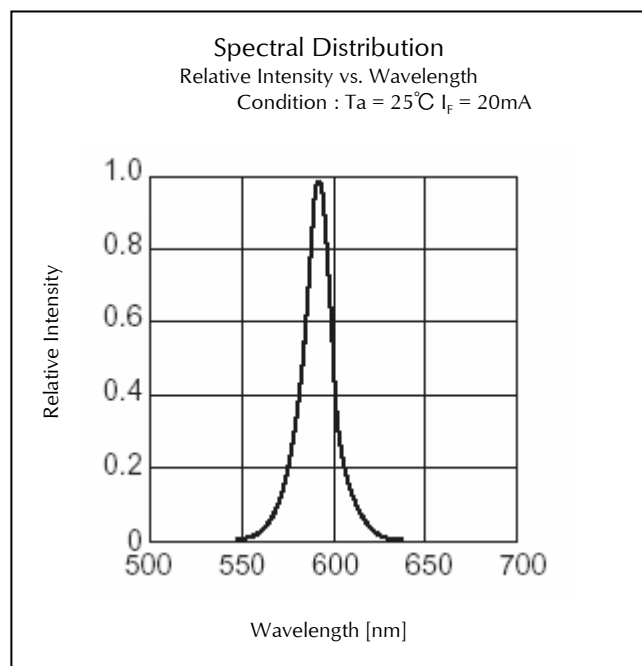
Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



Technical Data (UG)



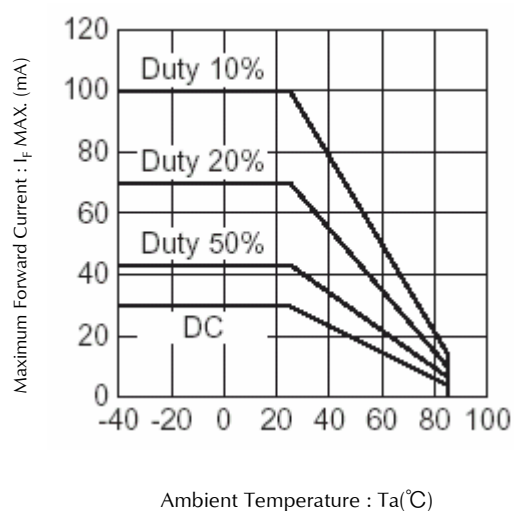
Technical Data (UY)



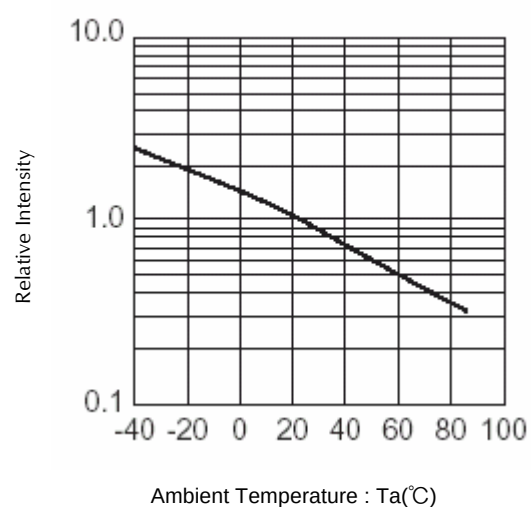
Technical Data (UY)

Derating

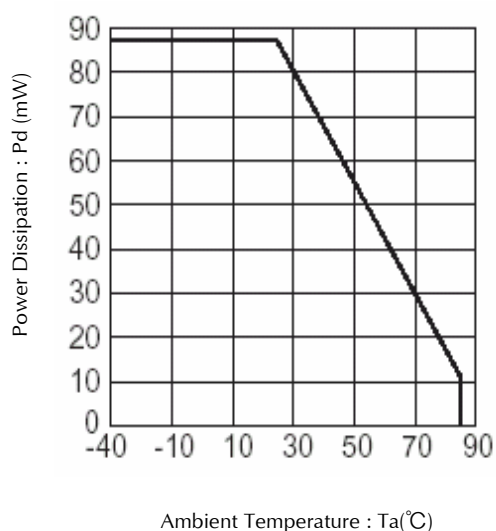
Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 50\text{Hz}$



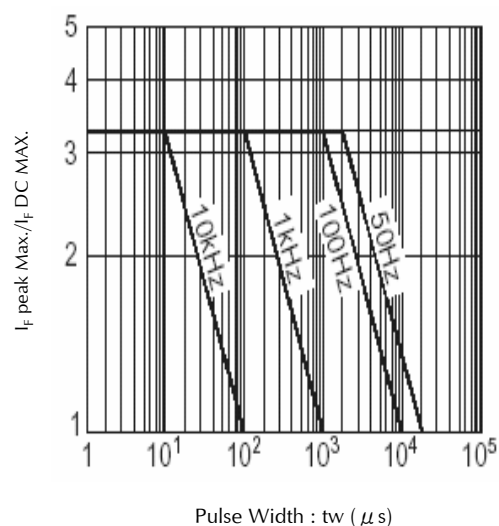
Ambient Temperature vs. Relative Intensity
Condition : $I_F = 20\text{mA}$



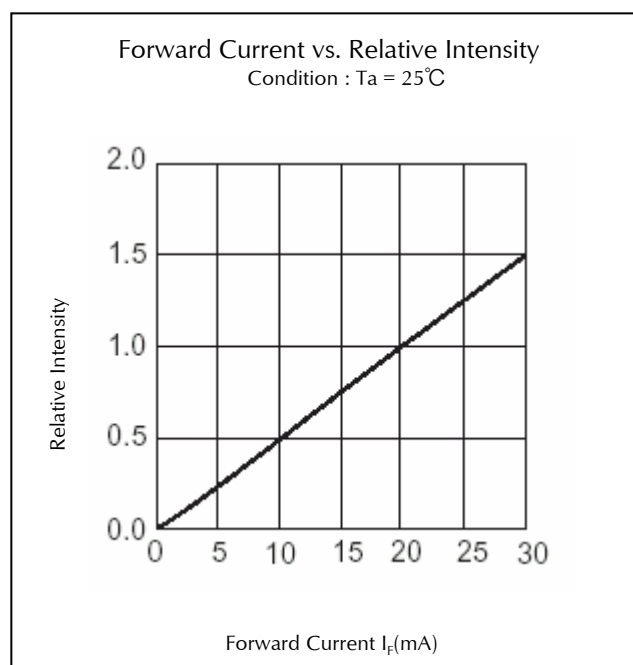
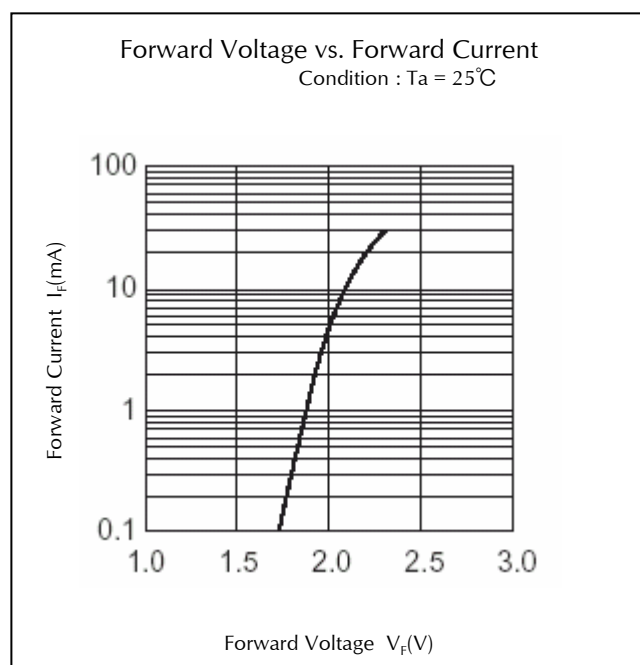
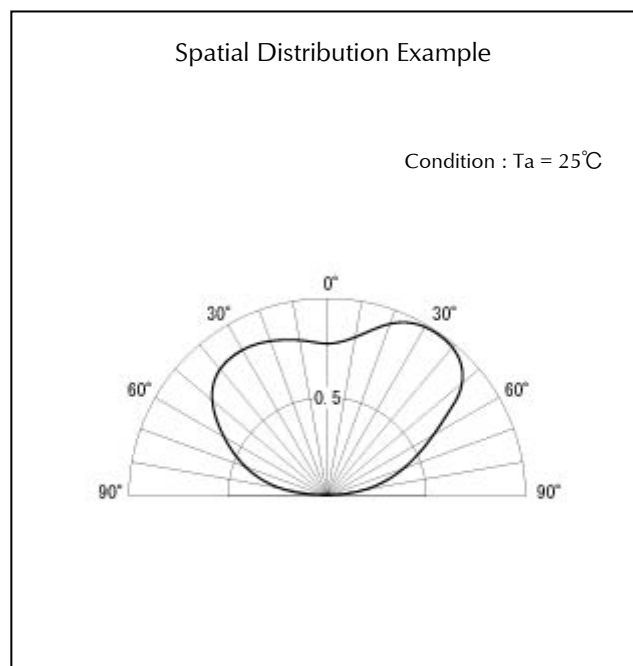
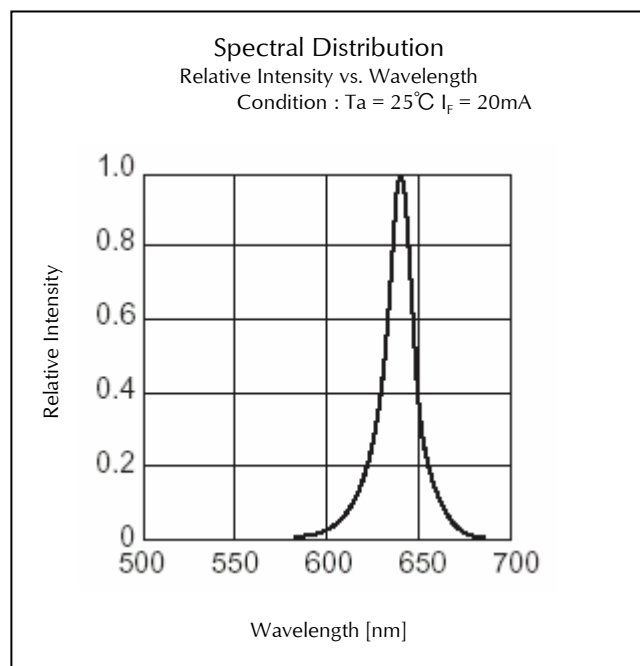
Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current
Condition : $T_a = 25^{\circ}\text{C}$



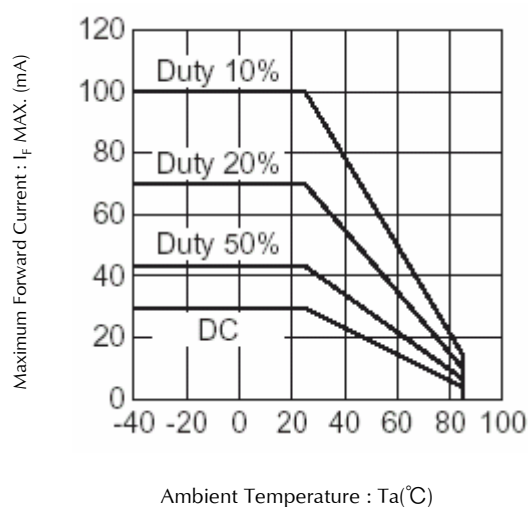
Technical Data (UR)



Technical Data (UR)

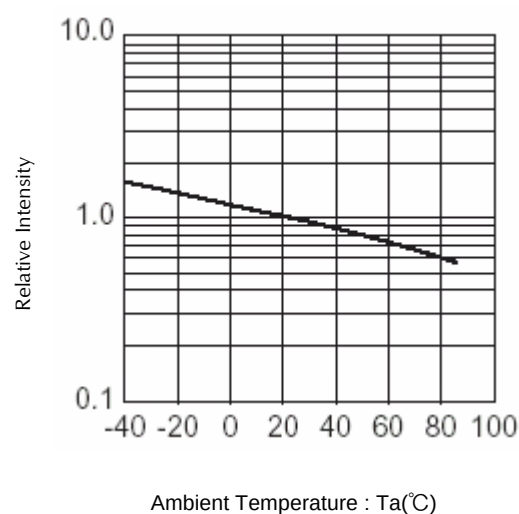
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 50\text{Hz}$

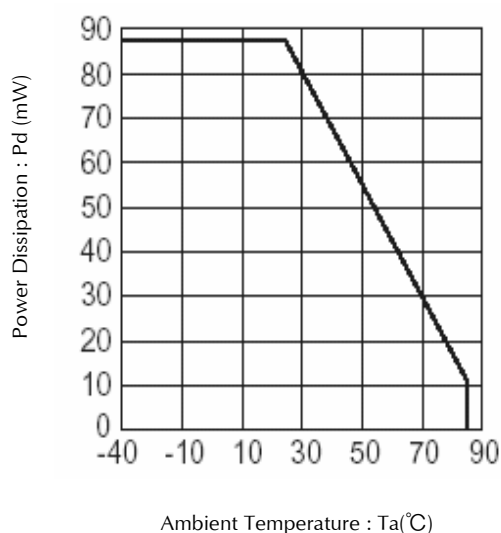


Ambient Temperature vs. Relative Intensity

Condition : $I_F = 20\text{mA}$

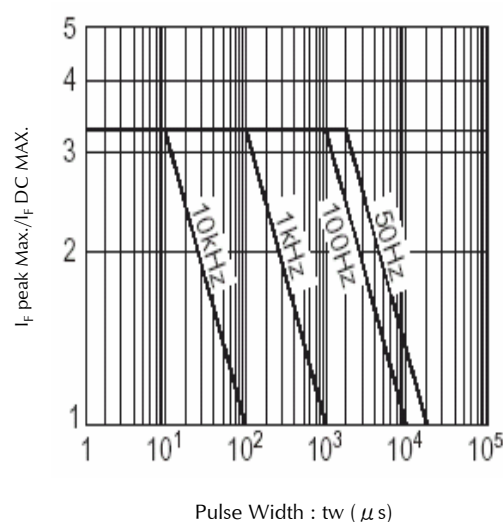


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

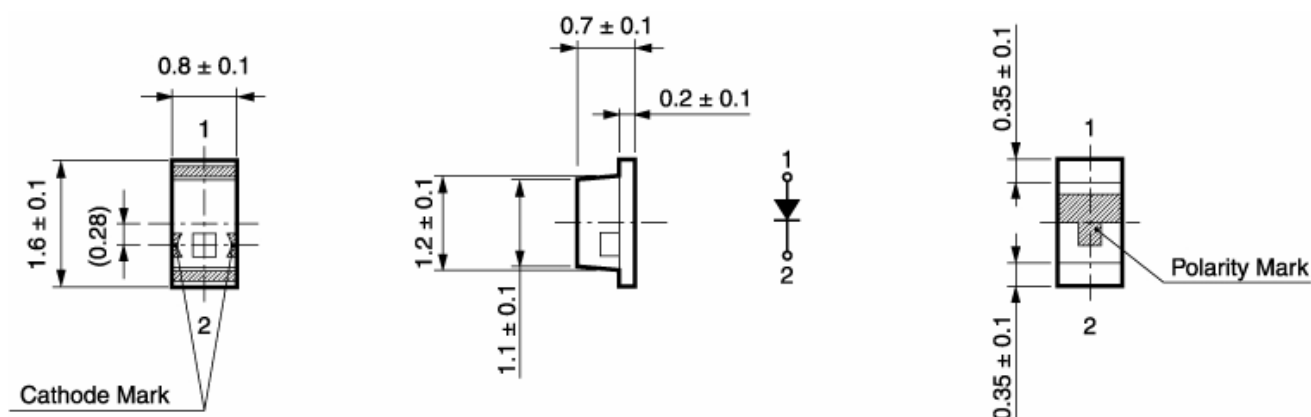
Condition : $T_a = 25^{\circ}\text{C}$



Package Dimensions

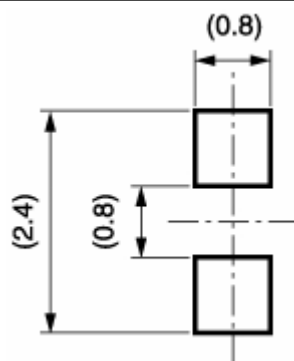
(Unit: mm)

MASS: (1.40)mg



Recommended Soldering Pattern

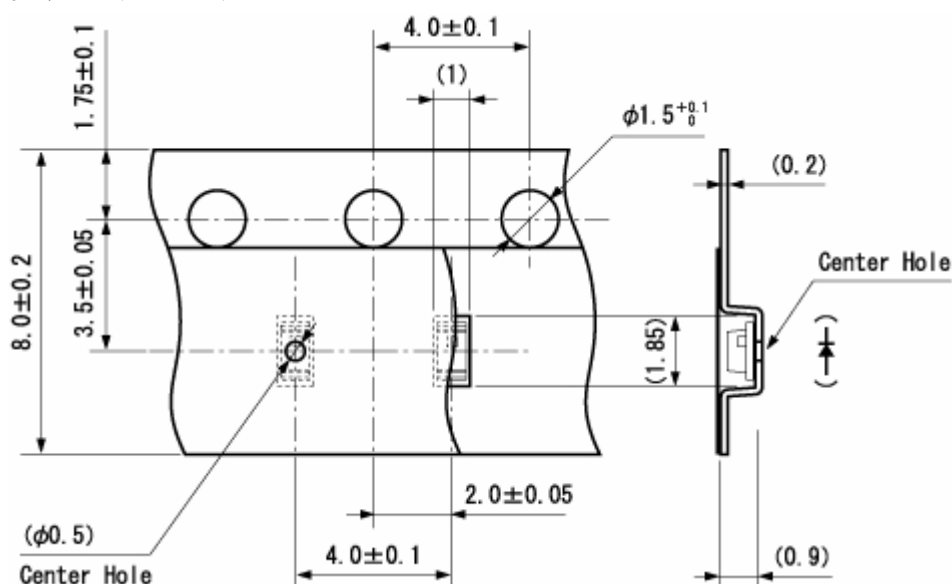
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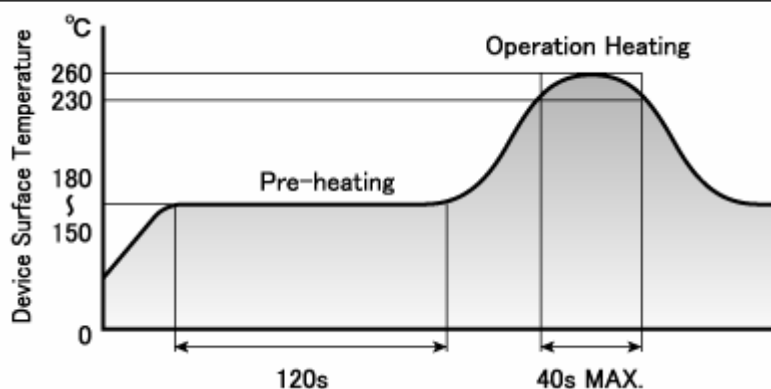
Taping Specification

(Unit: mm)

Quantity : 4,000pcs/ 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.

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, If = Maximum Rated Current	1,000 h	0/25
Resistance to Soldering Heat	EIAJ ED-4701/300(301)	Pre-heating : 150~180°C 120s Max. Operation Heating : 230°C 40s Max. Peak Temperature : 260°C	Twice	0/25
Temperature Cycling	EIAJ ED-4701/100(105)	Minimum Rated Storage Temperature(30min) ~Normal Temperature(15min) ~Maximum Rated Storage Temperature(30min) ~Normal Temperature(15min)	5 cycles	0/25
Wet High Temp. Storage Life	EIAJ ED-4701/100(103)	Ta = 60±2°C, RH = 90±5%	1,000 h	0/25
High Temp. Storage Life	EIAJ ED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/25
Low Temp. Storage Life	EIAJ ED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/25
Vibration, Variable Frequency	EIAJ ED-4701/400(403)	98.1m/s ² (10G), 100 ~ 2KHz sweep for 20min., XYZ each direction	2 h	0/10

Failure Criteria

Items	Symbols	Conditions	Failure criteria
Luminous Intensity	Iv	If Value of each product Luminous Intensity	Testing Min. Value < Spec. Min. Value x 0.5
Forward Voltage	V _F	If 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	-	-	Occurrence of notable decoloration, deformation and cracking

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