Pb-free HEAT

U□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 • No lead package and lead–free soldering compatible
Dominant wavelength	Blue : 470nm(UB) Blue Green : 508nm(UC) Green : 530nm(UG) Yellow : 590nm(UY) Red : 630nm(UR)
Half Intensity Angle	UB, UC, UG : θ x = 150 deg., θ y =165 deg. UY, UR : θ x = 150 deg., θ y =140 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, TTW (Through The Wave) soldering and manual soldering
Taping and reel	4,000pcs per reel in a 8mm width tape. (Standard) Reel diameter: ϕ180mm
ESD	1kV (HBM)

Recommended Applications

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

Color and Luminous Intensity

(Ta=25℃)

Part No.	Material	Emitted Color	Lens Color	Dominant Wavelength λd (nm)		Luminous Intensity Iv (mcd)		
				TYP.	I_F	MIN.	TYP.	I_F
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℃)

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

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

Electro-Optical Characteristics (**UB,UG**)

(Ta=25℃)

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	μA
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	$\Delta\lambda$	TYP.	26	30	35	nm
Half Intensity Angle	I_F=10mA	2θ 1/2	TYP.	150(θ x)	150(θ x)	150(θ x)	deg.
				165(θ y)	165(θ y)	165(θ y)	

Electro-Optical Characteristics (**UY,UR**)

(Ta=25℃)

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	μA
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	$\Delta\lambda$	TYP.	18	18	nm
Half Intensity Angle	I_F=20mA	2θ 1/2	TYP.	150(θ x)	150(θ x)	deg.
				140(θ y)	140(θ y)	

Luminous Intensity Rank

(Ta=25℃)

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	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 (λ d)

(Ta=25℃)

Rank	Dominant Wavelength λ d (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		

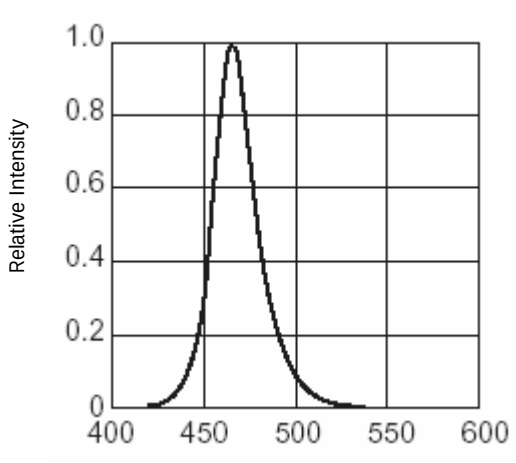
※ Please contact our sales staff concerning rank designation.

Technical Data **(UB)**

Spectral Distribution

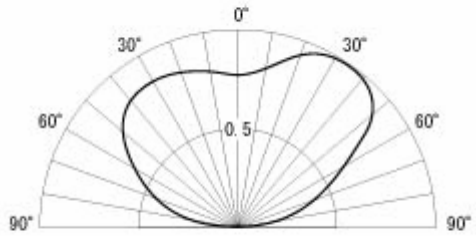
Relative Intensity vs. Wavelength

Condition : Ta = 25°C I_F = 20mA



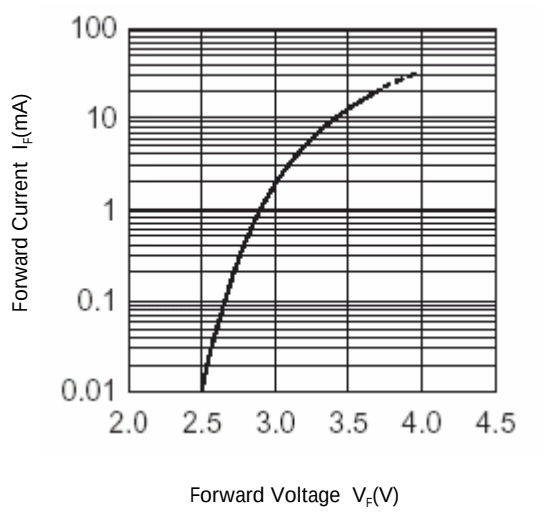
Spatial Distribution Example

Condition : Ta = 25°C



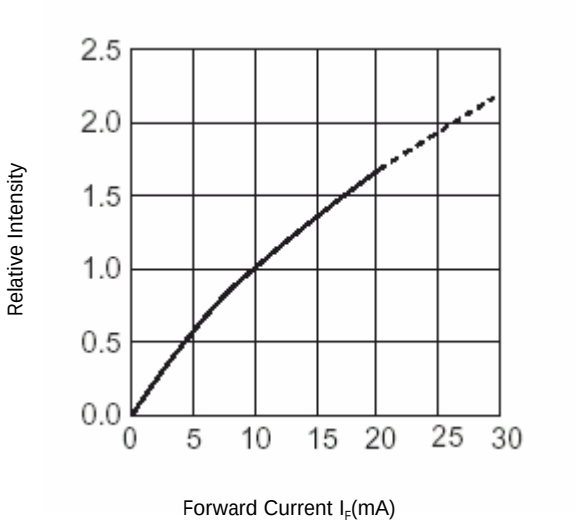
Forward Voltage vs. Forward Current

Condition : Ta = 25°C



Forward Current vs. Relative Intensity

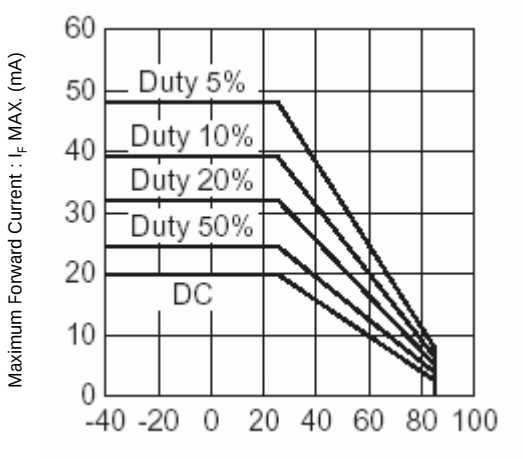
Condition : Ta = 25°C



Technical Data **(UB)**

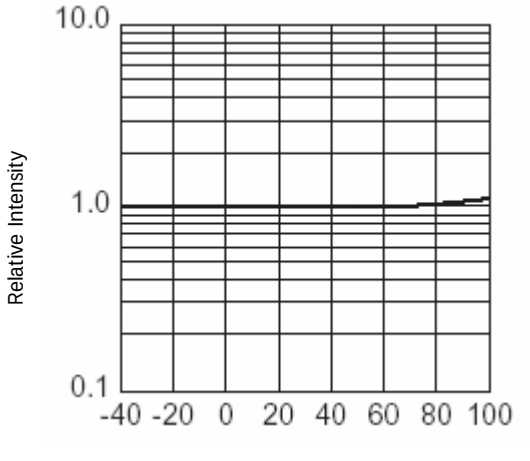
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

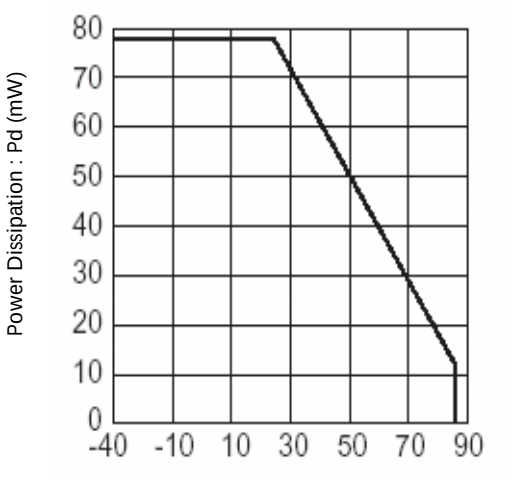


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

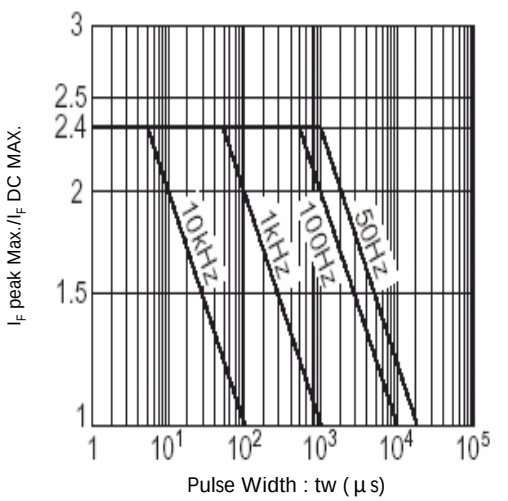


Power Dissipation vs. Ambient Temperature



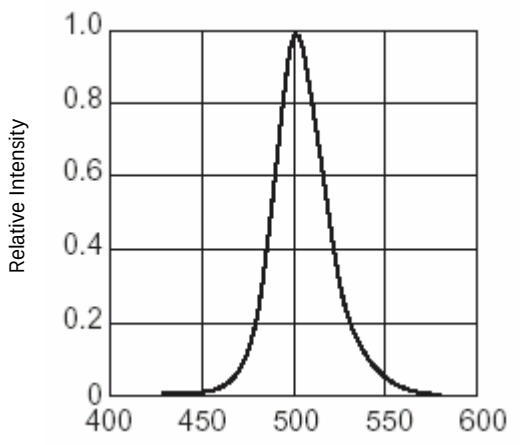
Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25°C



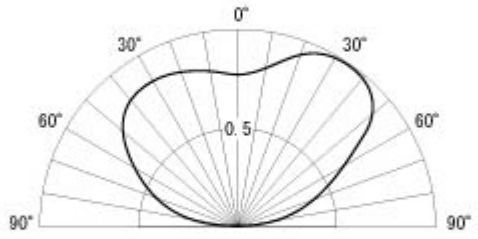
Technical Data **(UC)**

Spectral Distribution
Relative Intensity vs. Wavelength
Condition : Ta = 25°C I_F = 20mA

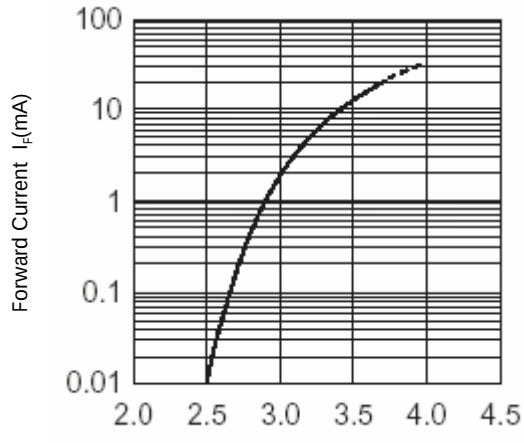


Spatial Distribution Example

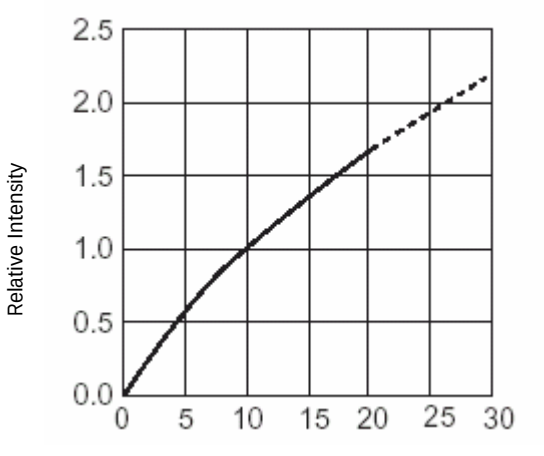
Condition : Ta = 25°C



Forward Voltage vs. Forward Current
Condition : Ta = 25°C



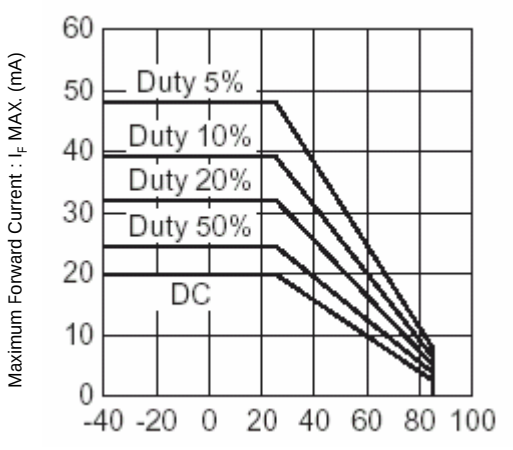
Forward Current vs. Relative Intensity
Condition : Ta = 25°C



Technical Data **(UC)**

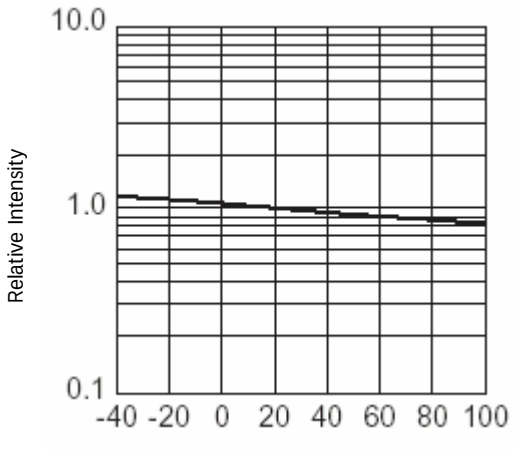
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

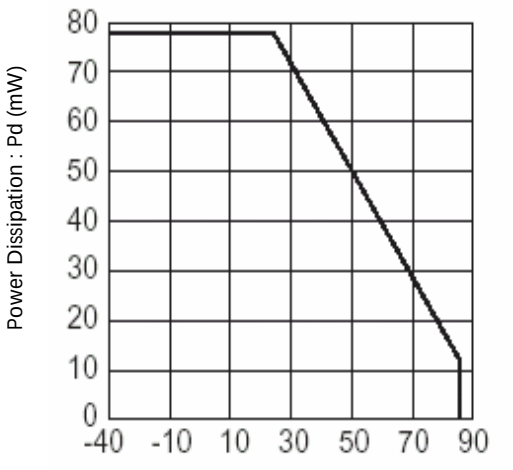


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

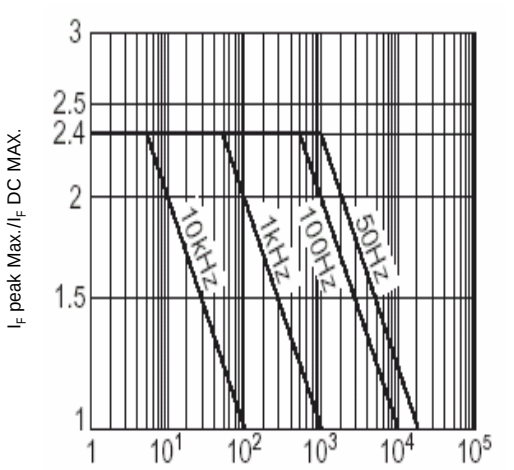


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25°C

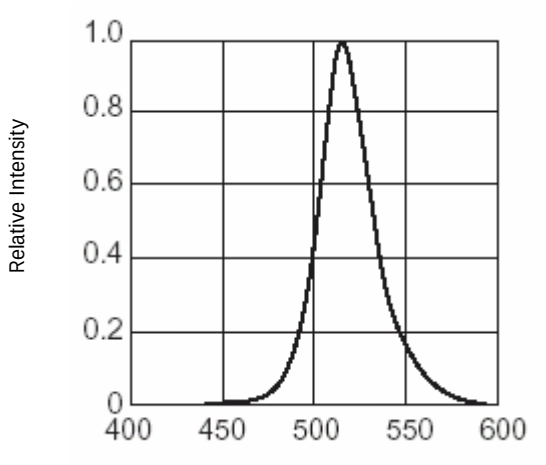


Technical Data **(UG)**

Spectral Distribution

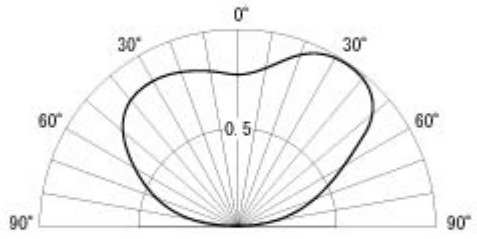
Relative Intensity vs. Wavelength

Condition : Ta = 25°C I_F = 20mA



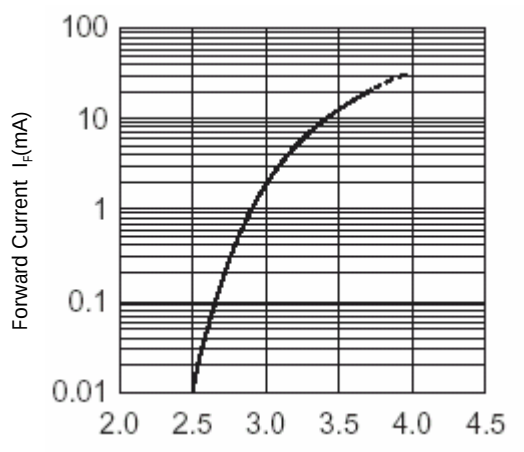
Spatial Distribution Example

Condition : Ta = 25°C



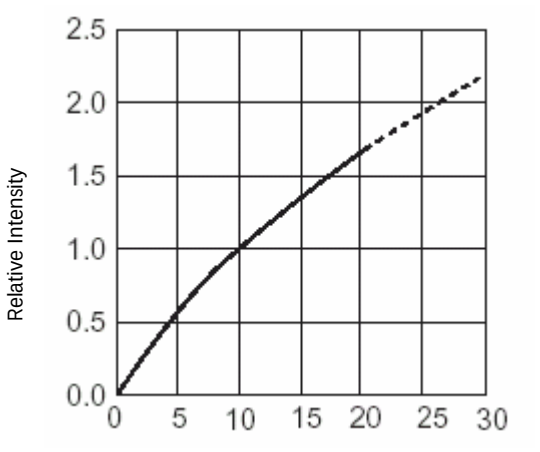
Forward Voltage vs. Forward Current

Condition : Ta = 25°C



Forward Current vs. Relative Intensity

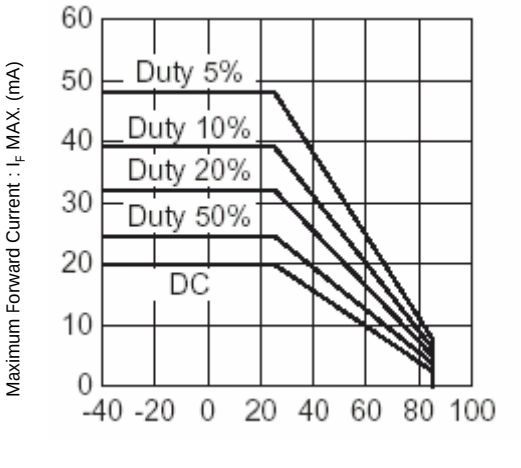
Condition : Ta = 25°C



Technical Data **(UG)**

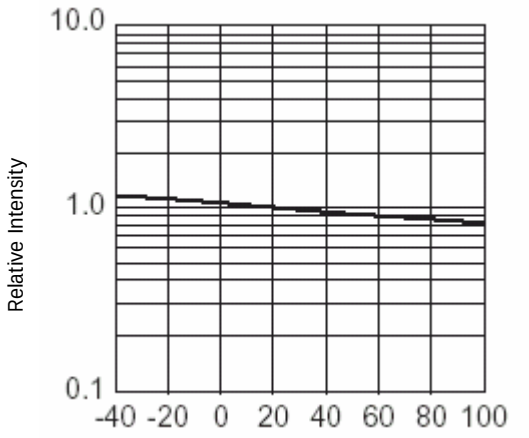
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

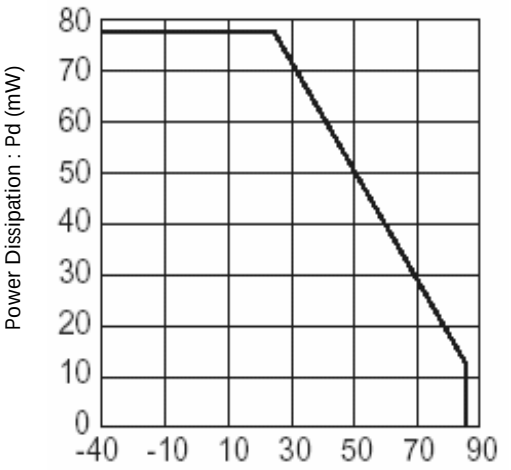


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

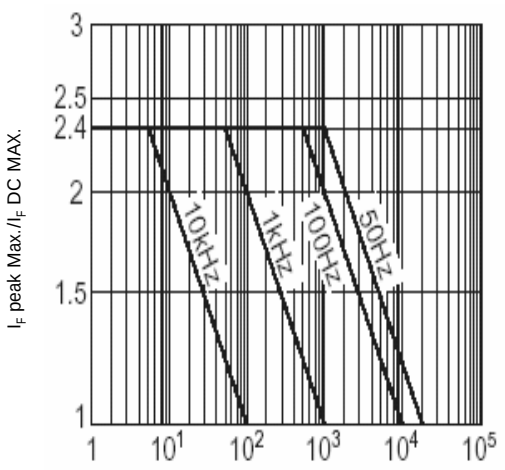


Power Dissipation vs. Ambient Temperature



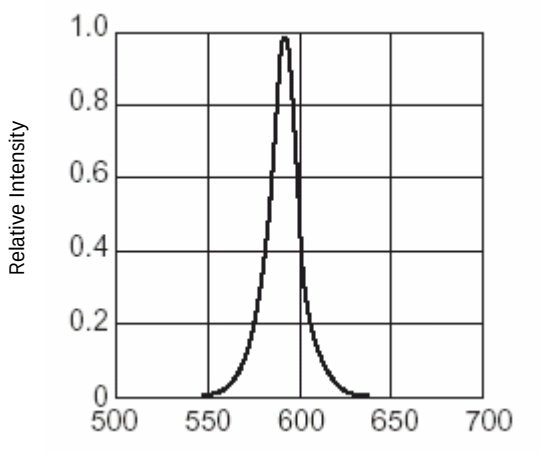
Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25°C



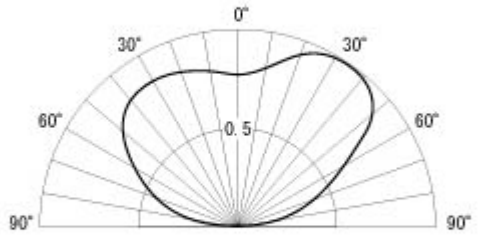
Technical Data **(UY)**

Spectral Distribution
Relative Intensity vs. Wavelength
Condition : Ta = 25°C I_F = 20mA

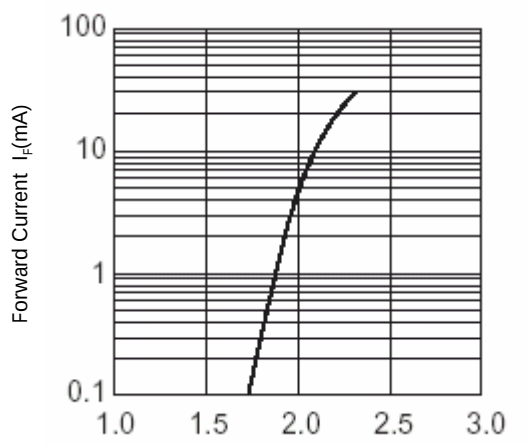


Spatial Distribution Example

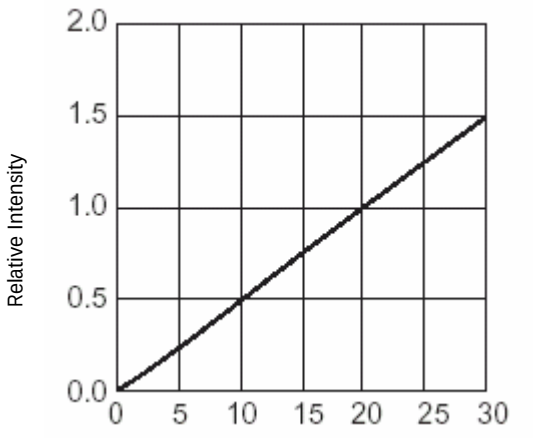
Condition : Ta = 25°C



Forward Voltage vs. Forward Current
Condition : Ta = 25°C



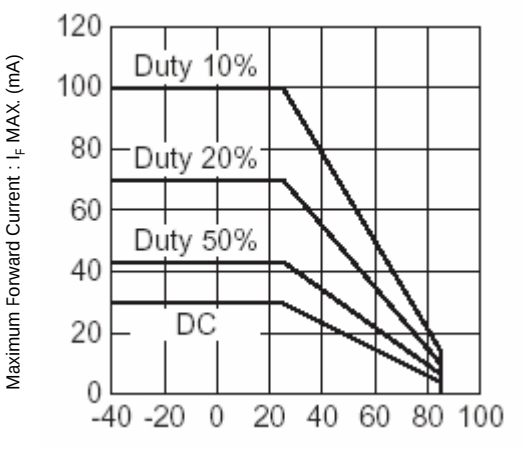
Forward Current vs. Relative Intensity
Condition : Ta = 25°C



Technical Data **(UY)**

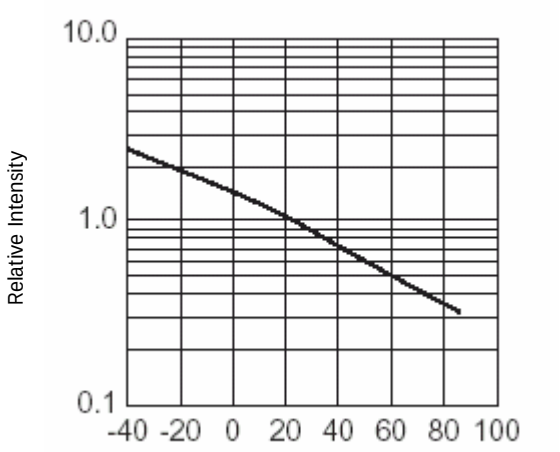
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

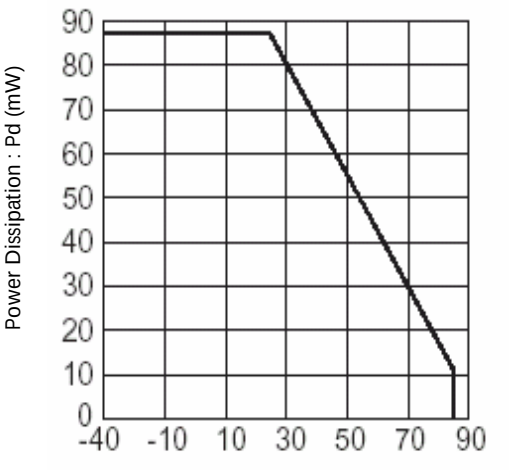


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

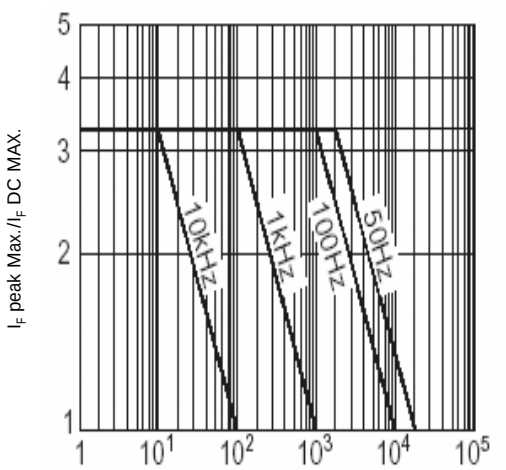


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25°C

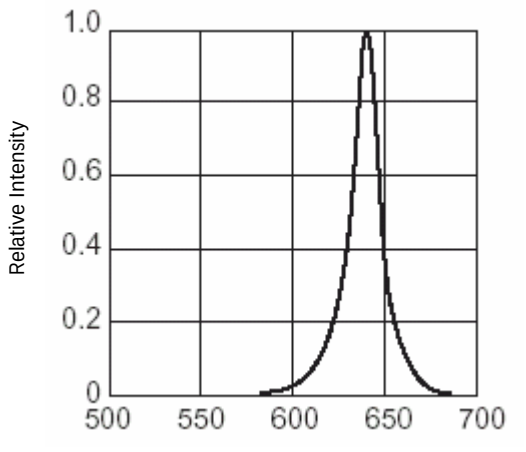


Technical Data **(UR)**

Spectral Distribution

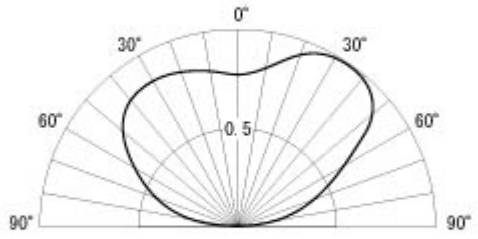
Relative Intensity vs. Wavelength

Condition : Ta = 25°C I_F = 20mA



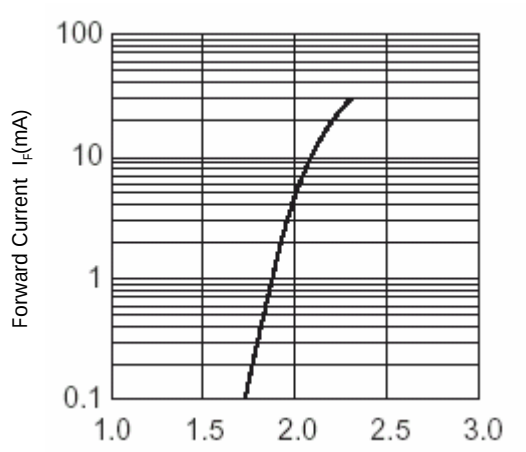
Spatial Distribution Example

Condition : Ta = 25°C



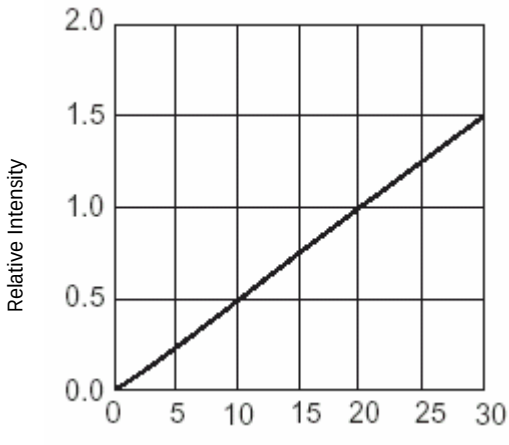
Forward Voltage vs. Forward Current

Condition : Ta = 25°C



Forward Current vs. Relative Intensity

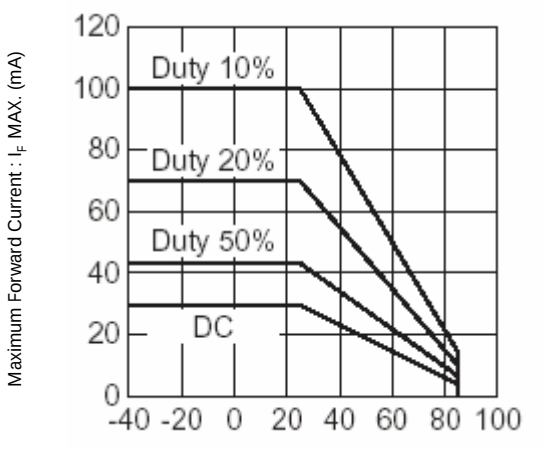
Condition : Ta = 25°C



Technical Data **(UR)**

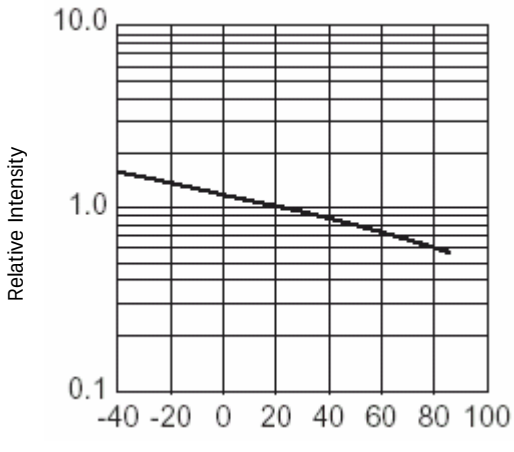
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

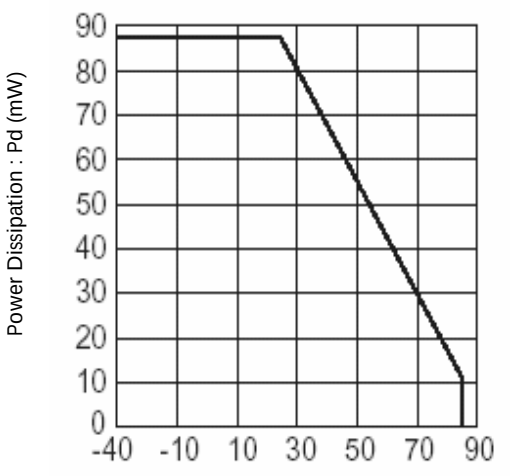


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

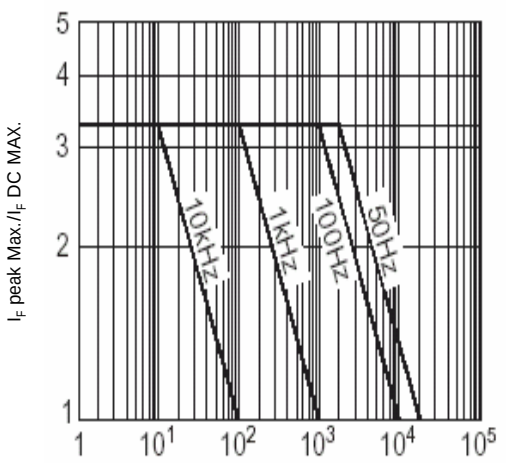


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

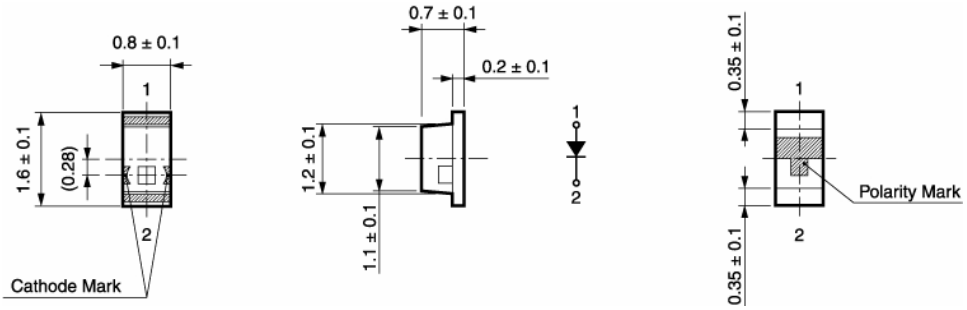
Condition : Ta = 25°C



Package Dimensions

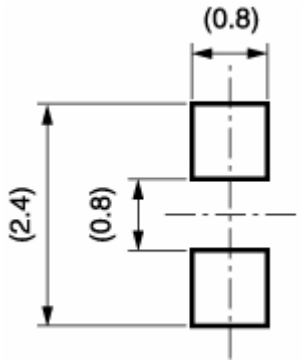
(Unit: mm)

Weight: (1.40)mg



Recommended Soldering Pattern

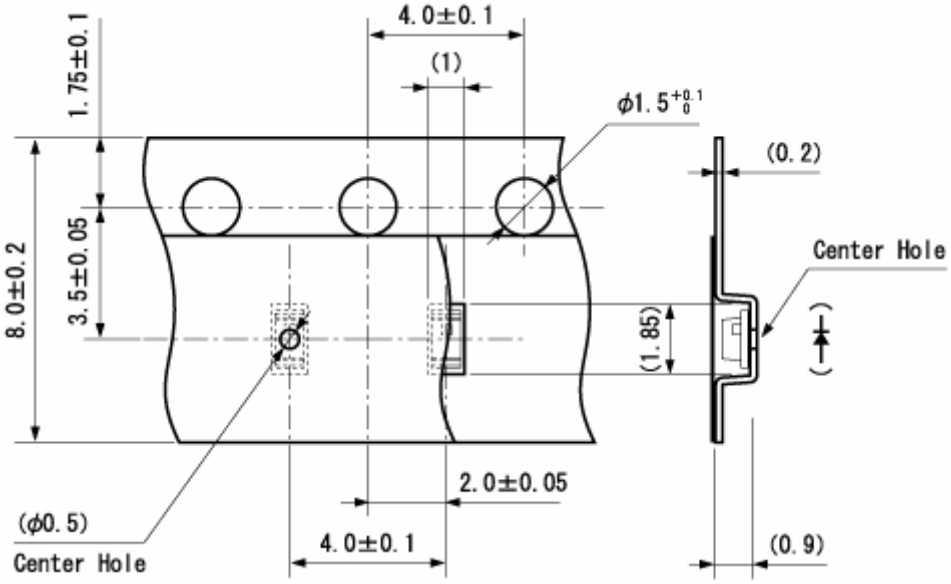
(Unit: mm)



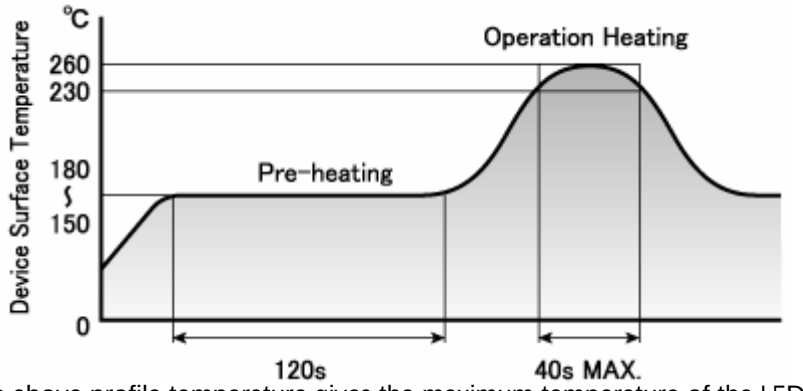
Taping Specification

(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. (6°C maximum)

TTW (Through The Wave) 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 normal temperature before the second dipping process.

Manual Soldering Conditions

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

Reliability Testing Result

Reliability Testing Result	Applicable Standard	Testing Conditions	Duration	Failure
Room Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 25℃, I_F = Maxium Rated Current	1,000 h	0/25
Resistance to Soldering Heat	EIAJ ED-4701/300(302)	260±5℃	5sec	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℃, 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	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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1) The technical information shown in the data sheets are limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license.

2) For the purpose of product improvement, the specifications, characteristics and technical data described in the data sheets are subject to change without prior notice. Therefore it is recommended that the most updated specifications be used in your design.

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8) The most updated edition of this data sheet can be obtained from the address below:
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