

Pb-free HEAT

1101F Series

Single Color High Brightness Type

Features

Package	Right Angle Type (3.0 x 2.0 mm), Water Clear resin
Product features	• Outer Dimension 3.0 x 2.0 x 1.0mm (L x W x H) • Temperature range Storage Temperature : -40℃～100℃ Operating Temperature : -40℃～85℃ • Lead-free soldering compatible • RoHS compliant
Dominant wavelength	Yellow : 590nm(FY) Orange : 605nm(FA) Red : 626nm(FR)
Half Intensity Angle	θ x = 140 deg., θ y = 130 deg.
Die materials	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 and manual soldering
Taping and reel	3,000pcs per reel in a 8mm width tape. (Standard) Reel diameter: ϕ 180mm
ESD	More than 2kV(HBM)

Recommended Applications

Amusement Equipment, Electric Household Appliances, Cellular Phone, 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
FY1101F	AlGaInP	Yellow	Water Clear	590	20	25	65	20
FA1101F	AlGaInP	Orange		605	20	25	65	20
FR1101F	AlGaInP	Red		626	20	25	50	20

Absolute Maximum Ratings

(Ta=25℃)

Item	Symbol	Absolute Maximum Ratings			Unit
		FY	FA	FR	
Power Dissipation	P_d	81	81	81	mW
Forward Current	I_F	30	30	30	mA
Pulse Forward Current ※1	I_{FRM}	100	100	100	mA
Derating (Ta=25℃ or higher)	ΔI_F	0.43	0.43	0.43	mA/℃
	ΔI_{FRM}	1	1	1	mA/℃
Reverse Voltage	V_R	5	5	5	V
Operating Temperature	T_{opr}	-40~+85			℃
Storage Temperature	T_{stg}	-40~+100			℃

※1 I_{FRM} Measurement condition : tw≦1ms., Duty≦1/10.

Electro-Optical Characteristics

(Ta=25℃)

Item	Conditions	Symbol		Characteristics FY	FA	FR	Unit
Forward Voltage	I_F=20mA	V_F	TYP.	1.9	1.9	1.9	V
			MAX.	2.4	2.4	2.4	
Reverse Current	V_R=5V	I_R	MAX.	100	100	100	μA
Peak Wavelength	I_F=20mA	λ_p	TYP.	592	609	635	nm
Dominant Wavelength	I_F=20mA	λ_d	TYP.	590	605	626	nm
Spectral Line Half Width	I_F=20mA	$\Delta\lambda$	TYP.	15	15	15	nm
Half Intensity Angle	I_F=20mA	2θ 1/2	TYP.	140(θ x)	140(θ x)	140(θ x)	deg.
				130(θ y)	130(θ y)	130(θ y)	

Luminous Intensity Rank

(Ta=25℃)

Rank	I_V(mcd)					
	FY		FA		FR	
	I_F=20mA		I_F=20mA		I_F=20mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A	25	50	25	50	25	50
B	35	70	35	70	35	70
C	50	100	50	100	50	100
D	70	140	70	140	70	140
E	100	200	100	200	100	200
F	140	-	140	-	140	-

※ Please contact our sales staff concerning rank designation.

Color Tone Groups (λ d)

(Ta=25℃)

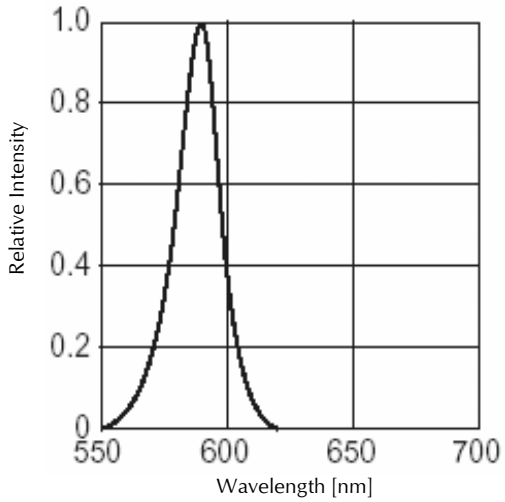
Rank	Dominant Wavelength λ d (nm)					
	FY		FA		FR	
	I_F=20mA		I_F=20mA		I_F=20mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A	581.5	585.0	596.1	600.9	621.0	632.0
B	584.0	587.5	599.1	603.9		
C	586.5	590.0	602.1	606.9		
D	589.0	592.5	605.1	609.9		
E	591.5	595.0	608.1	612.9		
F	594.0	597.5				

※ Please contact our sales staff concerning rank designation.

Technical Data(**FY**)

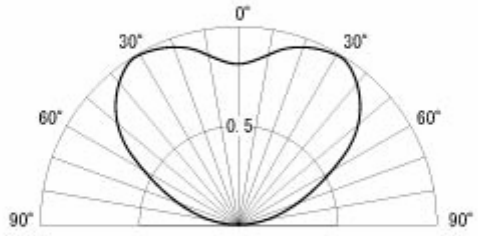
Spectral Distribution

Relative Intensity vs. Wavelength
Condition : Ta = 25℃, I_F = 20mA



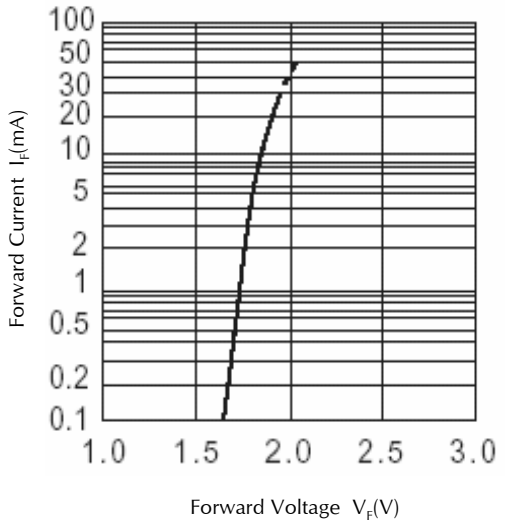
Spatial Distribution Example

Condition : Ta = 25℃



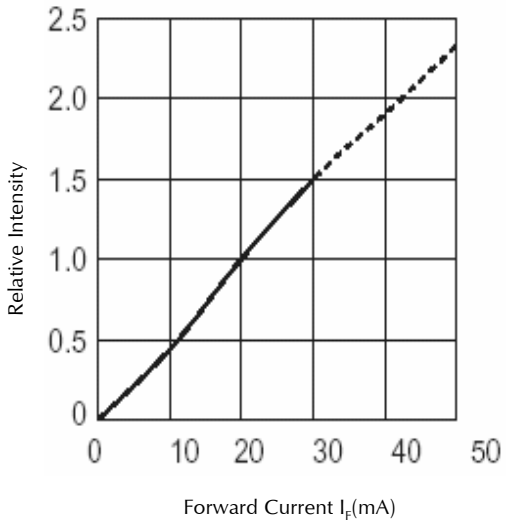
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



Forward Current vs. Relative Intensity

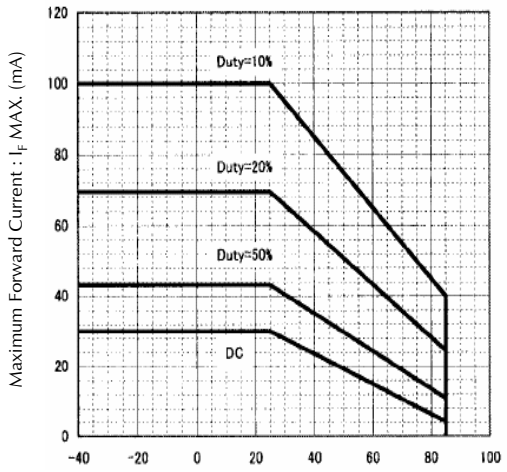
Condition : Ta = 25℃



Technical Data(**FY**)

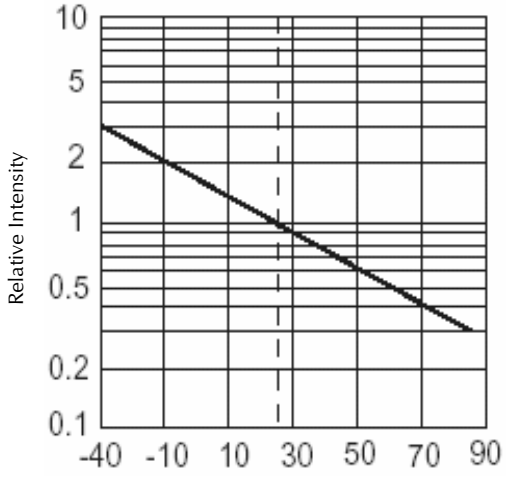
Derating

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

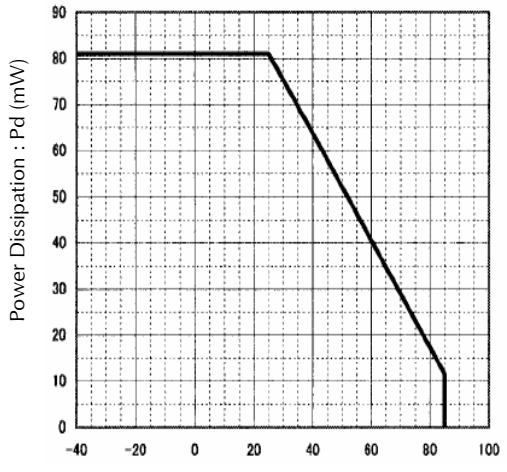


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

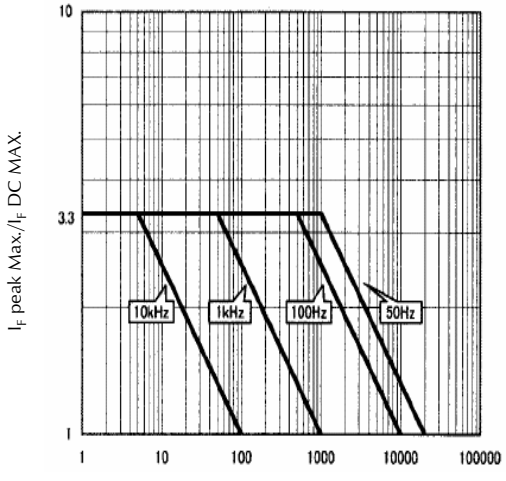


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25℃

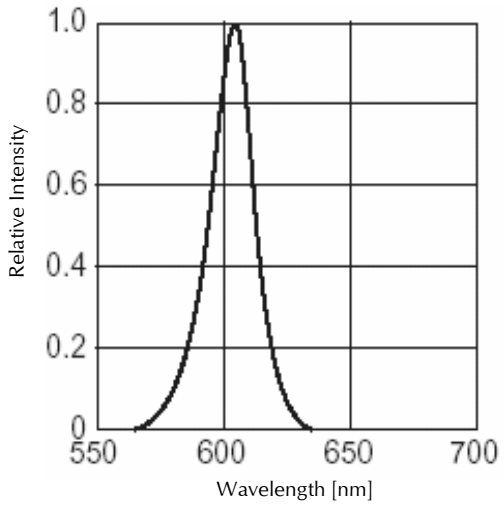


Technical Data(**FA**)

Spectral Distribution

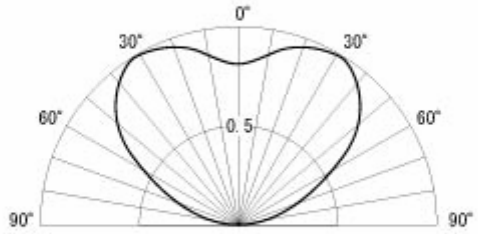
Relative Intensity vs. Wavelength

Condition : Ta = 25℃, I_F = 20mA



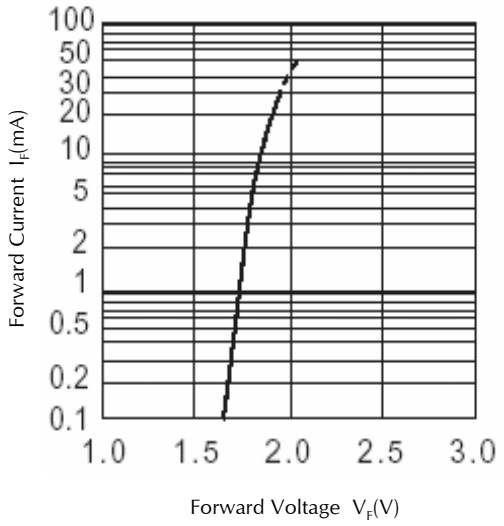
Spatial Distribution Example

Condition : Ta = 25℃



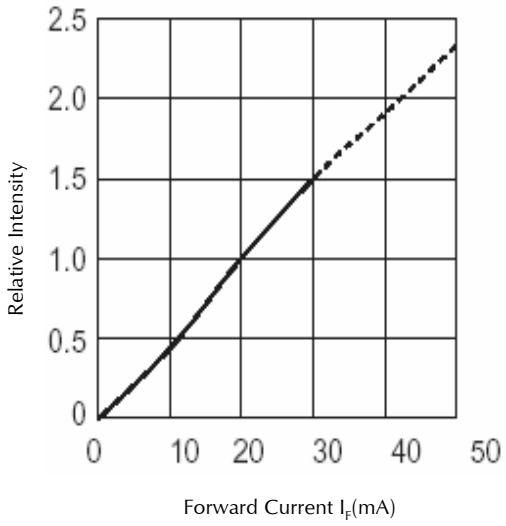
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



Forward Current vs. Relative Intensity

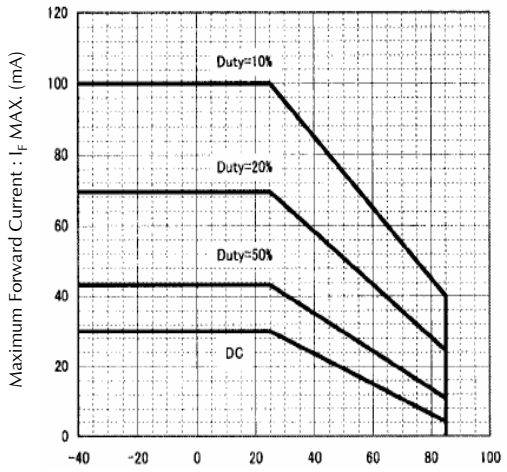
Condition : Ta = 25℃



Technical Data(**FA**)

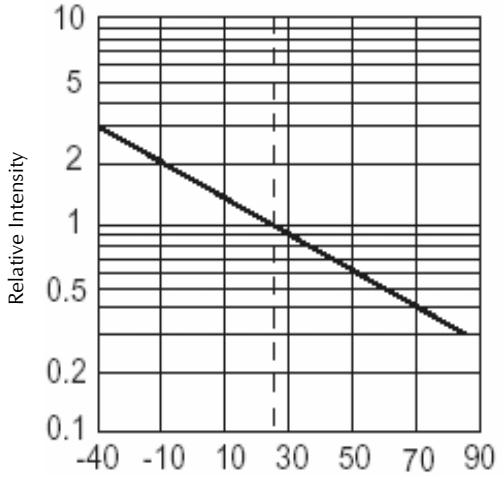
Derating

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

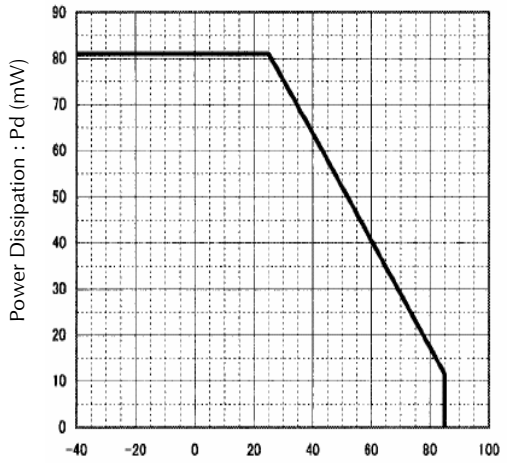


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

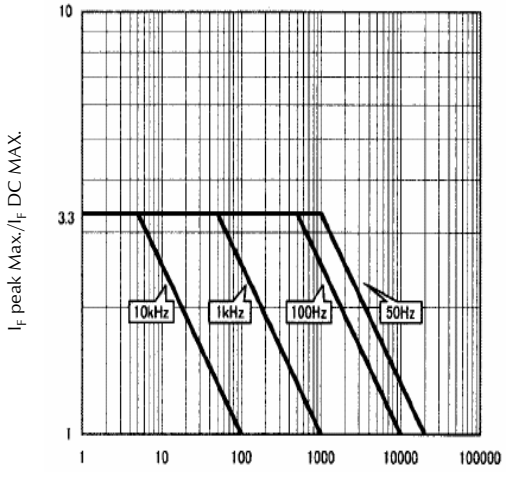


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

Condition : Ta = 25℃

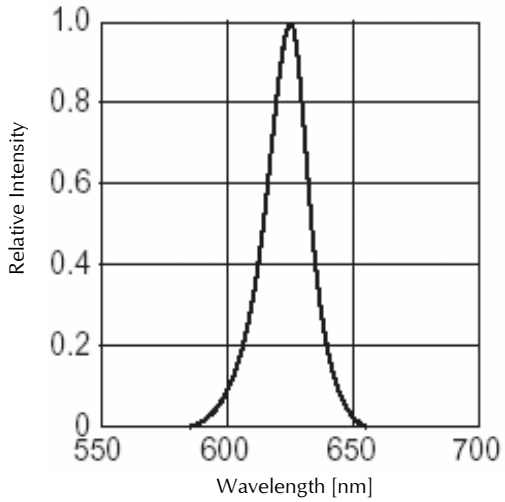


Technical Data(**FR**)

Spectral Distribution

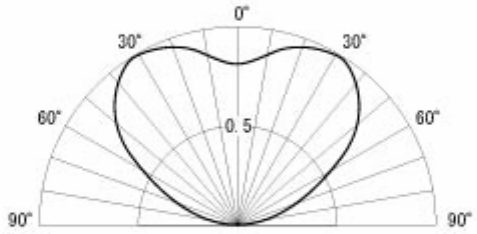
Relative Intensity vs. Wavelength

Condition : Ta = 25℃, I_F = 20mA



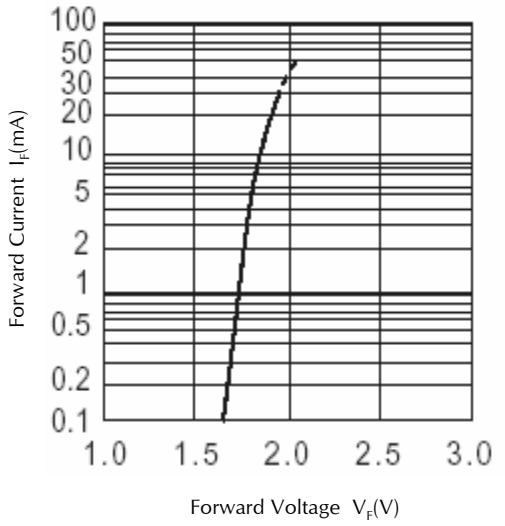
Spatial Distribution Example

Condition : Ta = 25℃



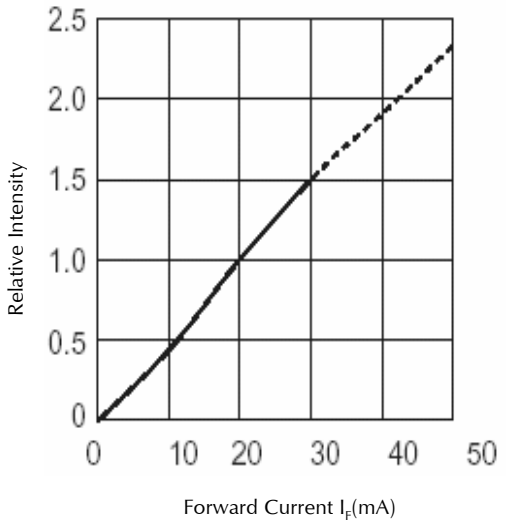
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



Forward Current vs. Relative Intensity

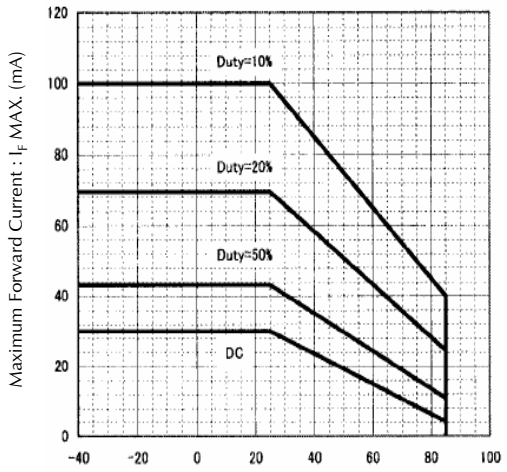
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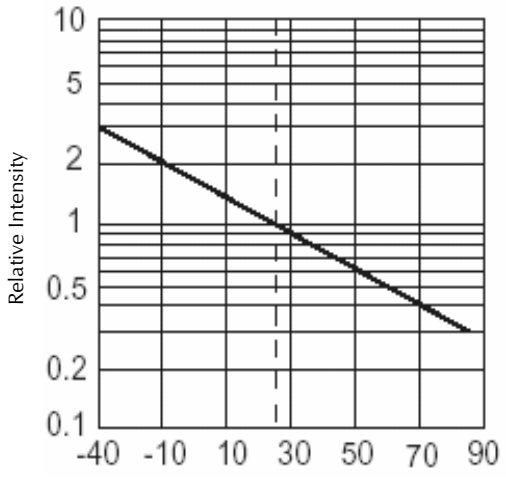
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Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz

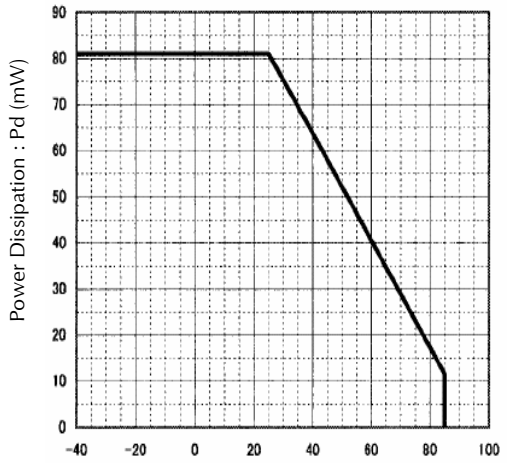


Ambient Temperature vs. Relative Intensity

Condition : I_F=20mA

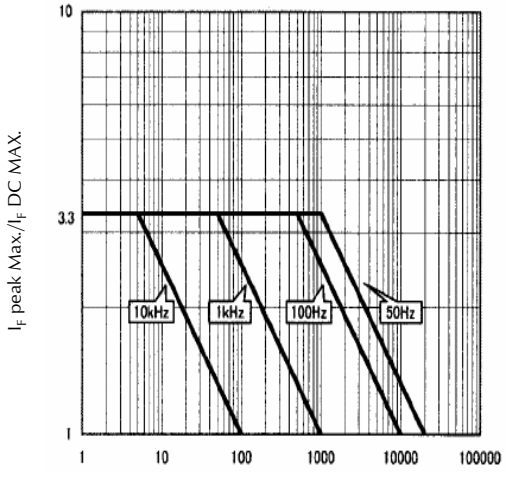


Power Dissipation vs. Ambient Temperature



Pulse Width vs. Maximum Tolerable Peak Current

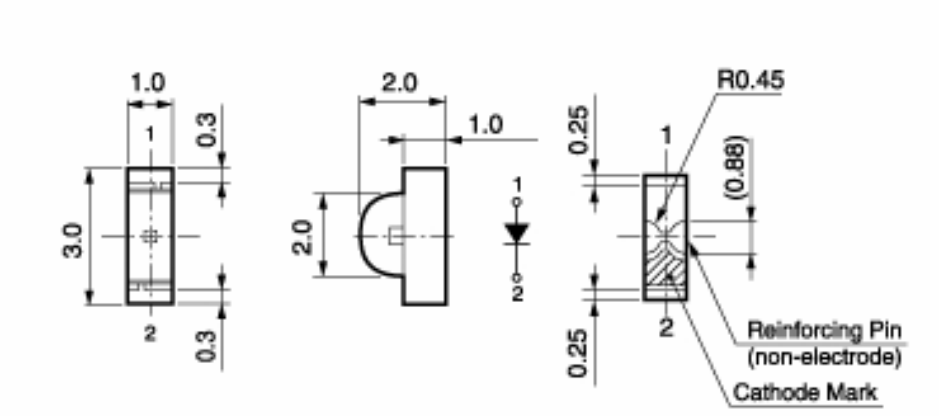
Condition : Ta = 25℃



Package Dimensions

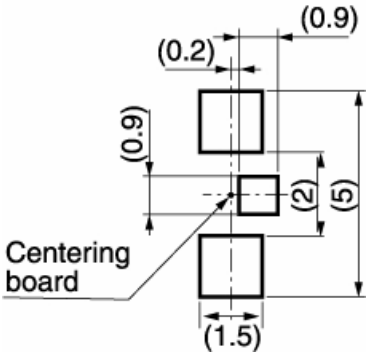
(Unit: mm)

Weight: (8.5)mg



Recommended Soldering Pattern

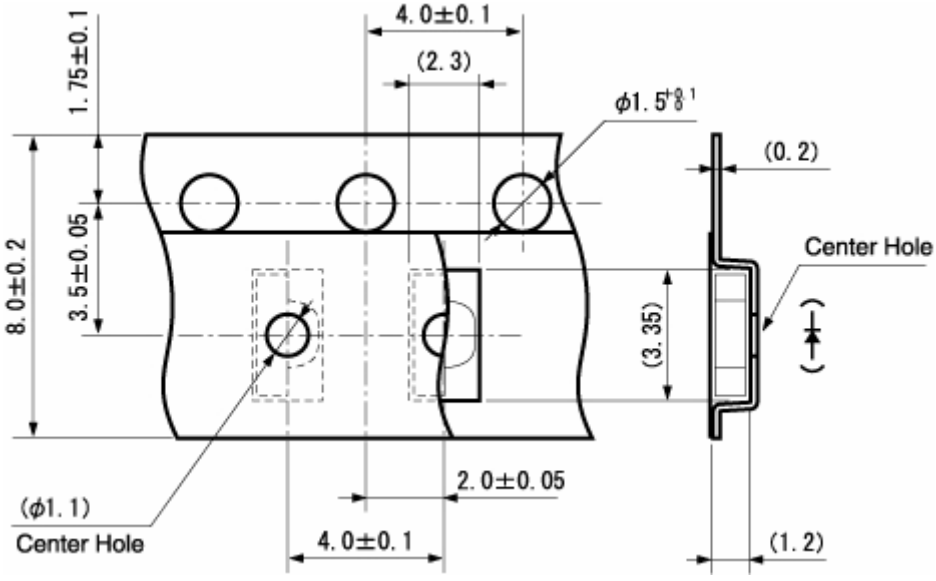
(Unit: mm)



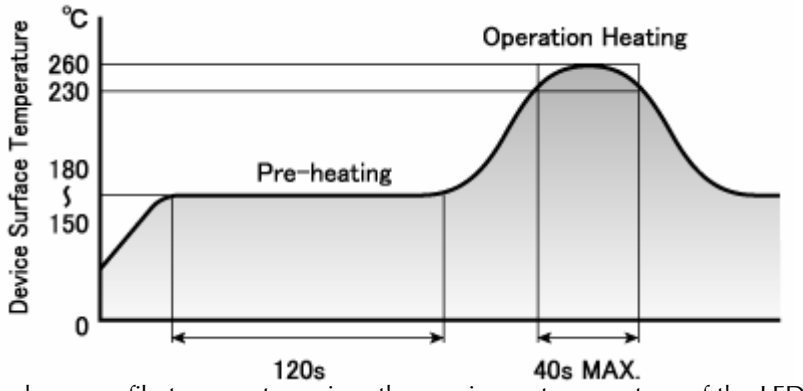
Taping Specification

(Unit: mm)

Quantity : 3,000pcs/ 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℃ maximum)

Manual Soldering Conditions

Iron tip temp.	350 ℃	(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(301)	Pre-heating : 150～180℃ 120s Max. Operation Heating : 230℃ 40s Max. Peak Temperature : 260℃	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℃, 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	-	-	Occurrence of notable decoloration, deformation and cracking

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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.

3) When using the products described in the data sheets, please adhere to the maximum ratings for operating voltage, heat dissipation characteristics, and other precautions for use. We are not responsible for any damage which may occur if these specifications are exceeded.

4) The products that have been described to this catalog are manufactured so that they will be used for the electrical instrument of the benchmark (OA equipment, telecommunications equipment, AV machine, home appliance and measuring instrument).
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7) The most updated edition of this data sheet can be obtained from the address below:
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