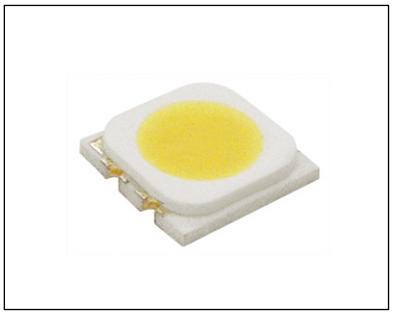


Pb-free HEAT

SCW16□3US Series

High Flux Type LED

Features

Package	Ceramic LCC Type SCW1643US (High efficiency type) : Pale yellow resin SCW1653US (High color rendering type) : Pale orange resin
Product features	・100lm/W(High efficiency type) of environmentally friendly like CO2 reduction, white color source. ・Wide variety of color temperatures correspond to general lighting uses.* ・High color rendering type :Color Rendering Properties 1A group(Ra≧90)* ・Outer dimension : 5.0 x 5.0 x 1.0 mm (L x W x H) ・Long life : 40,000h / 70% (retention of initial luminosity) ・Storage temperature :-40℃～100℃ ・Operating temperature :-40℃～ 85℃ ・Lead-free soldering compatible ・RoHS compliant * Efficiency varies with optical color
Color temperature	*High efficiency type : 6,500K, 5,000K *High color rending type : 5,000K, 4,200K, 3,500K, 3,000K, 2,600K
Half Intensity Angle	120 deg.
Die materials	InGaN
Rank grouping parameter	Sorted by luminous flux and chromaticity per rank taping
Assembly method	Auto pick & place machine (Auto Mounter)
Soldering methods	Recommendation of Reflow soldering / Dip soldering: Not recommended
Taping and reel	1,000pcs per reel in a 12mm width tape. (Standard) Reel diameter: φ180mm

Recommended Applications

・Residential lighting, Office lighting, Plant lighting, Store lighting, and Special lighting etc.

Color and Luminous Flux (High Efficiency Type)

(Ta=25℃)

Part No.	Material	Emitted Color	Lens Color	Luminous flux ϕv (lm)		
				MIN.	TYP.	I_F
SCW1643US-65	InGaN	Cool White	Pale Yellow	82	111	300mA
SCW1643US-50	InGaN	Cool White	Pale Yellow	82	111	

Color and Luminous Flux (High Color Rendering Index Type)

(Ta=25℃)

Part No.	Material	Emitted Color	Lens Color	Luminous flux ϕv (lm)		
				MIN.	TYP.	I_F
SCW1653US-50	InGaN	Natural White	Pale Orange	39	70	300mA
SCW1653US-42	InGaN	White	Pale Orange	39	65	
SCW1653US-35	InGaN	Warm White	Pale Orange	39	60	
SCW1653US-30	InGaN	Lamp color	Pale Orange	39	60	
SCW1653US-26	InGaN	Lamp color	Pale Orange	39	60	

Absolute Maximum Ratings

(Ta=25℃)

Item	Symbol	Absolute Maximum Ratings		Unit
		SCW1643US	SCW1653US	
Power Dissipation	P_d	1,580	1,580	mW
Forward Current	I_F	360	360	mA
Pulse Forward Current ※1	I_{FRM}	600	600	mA
Forward Current Derating※2 (Ta=55℃ or higher)	ΔI_F	5.33	5.33	mA/℃
Pulse Forward Current Derating (Ta=60℃ or higher)	ΔI_{FRM}	10.7	10.7	mA/℃
Reverse Voltage	V_R	5	5	V
Operating Temperature	T_{opr}	-40～+85		℃
Storage Temperature	T_{stg}	-40～+100		℃

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

※2 $R_{(th\ j\text{-}a)}$ = 40 ℃/W

Thermal Characteristics

(Ta=25℃)

Item	Symbol	Ratings		Unit
		SCW1643US	SCW1653US	
Junction Temperature (MAX.)	T_j	120	120	℃
Thermal Resistance (TYP.) (Junction/ ambient)	$R_{(th\ j\text{-}a)}$	40	40	℃/W
Thermal Resistance (TYP.) (Junction/ Solder Point)	$R_{(th\ j\text{-}s)}$	20	20	℃/W

※$R_{(th\ j\text{-}a)}$ Measurement Condition / Substrate: Aluminum (t=2.0mm) PCB Size : 36 x 36 mm

Electro-Optical Characteristics (High Efficiency Type)

(Ta=25℃)

Item	Condition	Symbol		Characteristics SCW1643US -65	Characteristics SCW1643US -50	Unit
Forward Voltage	I_F=300mA	V_F	TYP.	3.7	3.7	V
			MAX.	4.4	4.4	
Reverse Current	V_R=5V	I_R	MAX.	2	2	μA
Half Intensity Angle	I_F=300mA	2θ 1/2	TYP.	120	120	deg.
Chromaticity Coordinates	I_F=300mA	x	TYP.	0.318	0.345	-
		y	TYP.	0.328	0.352	-
Color Rendering Index	I_F=300mA	Ra	TYP.	70		-

Electro-Optical Characteristics (High Color Rendering Index Type)

(Ta=25℃)

Item	Condition	Symbol		Characteristics SCW1653US -50	SCW1653US -42	SCW1653US -35	SCW1653US -30	SCW1653US -26	Unit
Forward Voltage	I_F=300mA	V_F	TYP.	3.7	3.7	3.7	3.7	3.7	V
			MAX.	4.4	4.4	4.4	4.4	4.4	
Reverse Current	V_R=5V	I_R	MAX.	2	2	2	2	2	μA
Half Intensity Angle	I_F=300mA	2θ 1/2	TYP.	120	120	120	120	120	deg.
Chromaticity Coordinates	I_F=300mA	x	TYP.	0.345	0.372	0.408	0.437	0.464	-
		y	TYP.	0.352	0.371	0.392	0.404	0.412	-
Color Rendering Index	I_F=300mA	Ra	TYP.	95					-

Luminous Flux Rank (High Efficiency Type)

(Ta=25℃)

【SCW1643US】

Flux Tolerance each Rank : +/-10%

Rank	ϕv (lm)		Condition
	MIN.	MAX.	
BZ	82	100	I_F=300mA
C1	100	120	
C2	120	150	

Luminous Flux Rank (High Color Rendering Index Type)

(Ta=25℃)

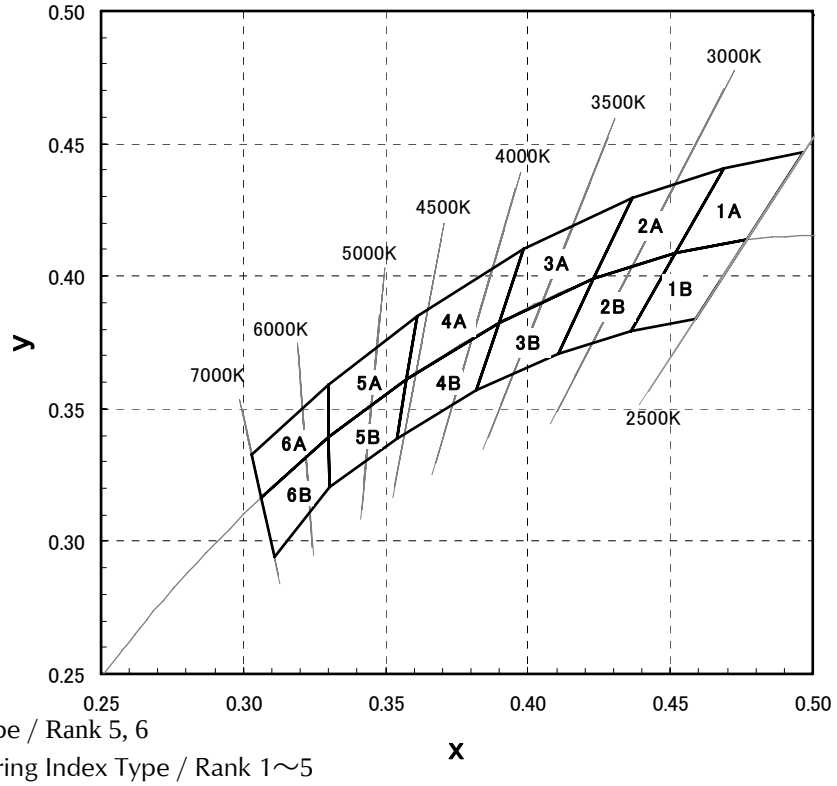
【SCW1653US】

Flux Tolerance each Rank : +/-10%

Rank	ϕv (lm)		Condition
	MIN.	MAX.	
B8	39	47	I_F=300mA
B9	47	56	
BX	56	68	
BY	68	82	
BZ	82	100	

Sorting Chart for Chromaticity Coordinates

(Ta=25℃)



・High Efficiency Type / Rank 5, 6
・High Color Rendering Index Type / Rank 1～5

(I_F=300mA)

	LEFT DOWN point		LEFT UP point		RIGHT UP point		RIGHT UP point	
Rank	x	y	x	y	x	y	x	y
1A	0.4519	0.4086	0.4689	0.4409	0.4969	0.4466	0.477	0.4137
1B	0.4361	0.3793	0.4519	0.4086	0.477	0.4137	0.4587	0.3838
2A	0.4232	0.3989	0.4367	0.4297	0.4689	0.4409	0.4519	0.4086
2B	0.4109	0.3709	0.4232	0.3989	0.4519	0.4086	0.4361	0.3793
3A	0.3897	0.3823	0.3982	0.4101	0.4367	0.4297	0.4232	0.3989
3B	0.3817	0.3568	0.3897	0.3823	0.4232	0.3989	0.4109	0.3709
4A	0.3573	0.361	0.3611	0.3849	0.3982	0.4101	0.3897	0.3823
4B	0.3538	0.3389	0.3573	0.361	0.3897	0.3823	0.3817	0.3568
5A	0.3301	0.3391	0.3299	0.3591	0.3611	0.3849	0.3573	0.361
5B	0.3302	0.3205	0.3301	0.3391	0.3573	0.361	0.3538	0.3389
6A	0.3063	0.3165	0.303	0.3327	0.3299	0.3591	0.3301	0.3391
6B	0.3109	0.294	0.3063	0.3165	0.3301	0.3391	0.3302	0.3205

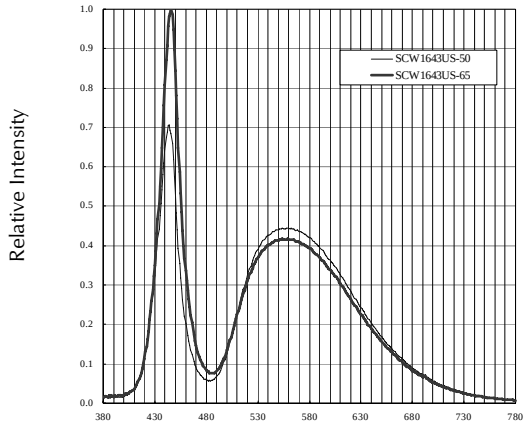
Chromaticity Coordinates Tolerance Each Rank : +/-0.01

Technical Data (High Efficiency Type)

Spectral Distribution

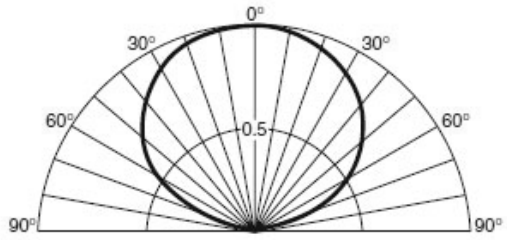
Relative Intensity vs. Wavelength

Condition : Ta = 25℃, I_F = 300mA



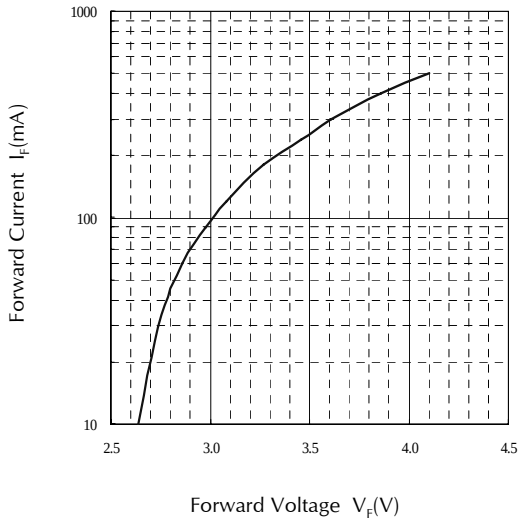
Spatial Distribution Example

Condition : Ta = 25℃



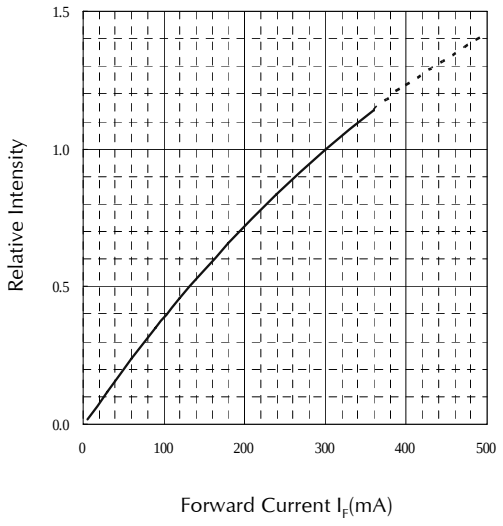
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



Forward Current vs. Relative Intensity

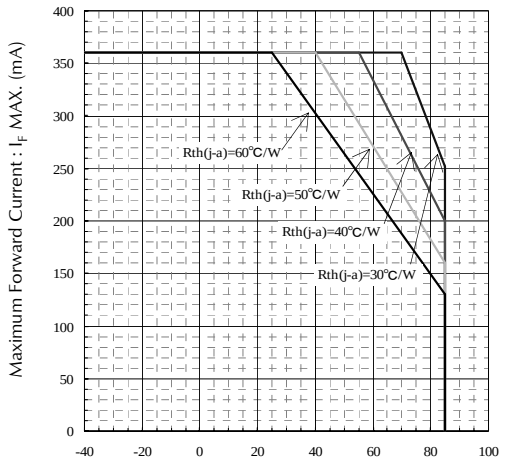
Condition : Ta = 25℃



Technical Data (High Efficiency Type)

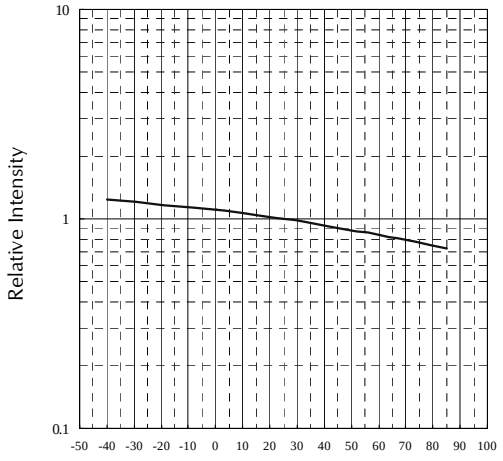
Derating

Ambient Temperature vs. Maximum Forward Current



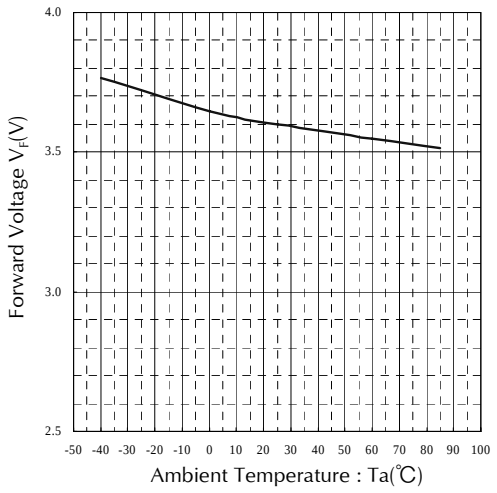
Ambient Temperature vs. Relative Intensity

Condition : I_F = 300mA



Ambient Temperature vs. Forward Voltage

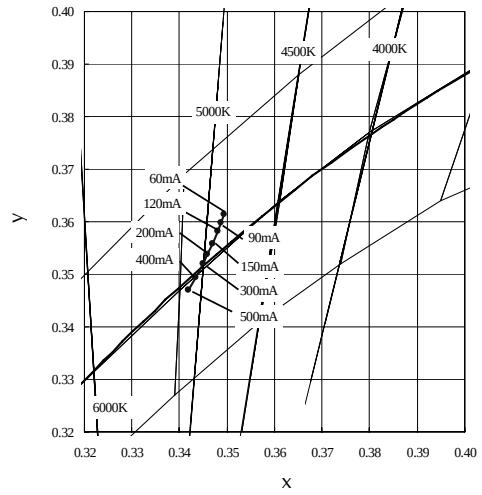
Condition : I_F = 300mA



Forward Current vs. Chromaticity

Condition : Ta = 25℃

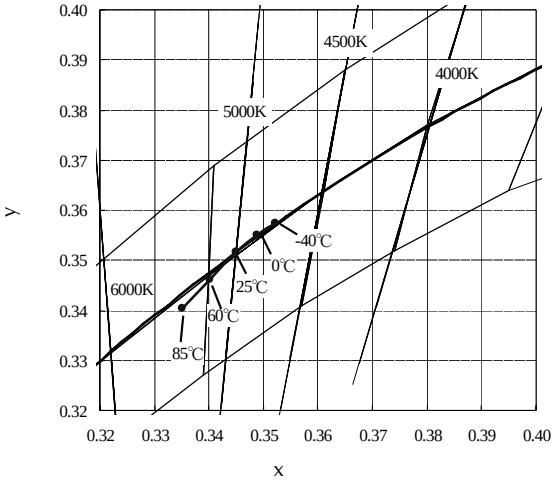
(5,000K)



Technical Data (High Efficiency Type)

Ambient Temperature vs. Chromaticity

Condition : I_F = 300mA

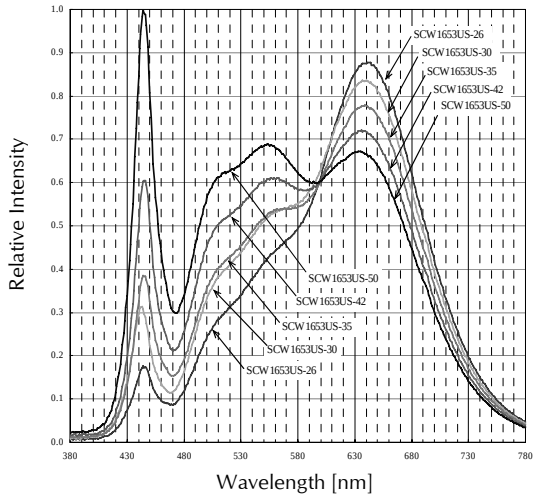


Technical Data (High Color Rendering Index Type)

Spectral Distribution

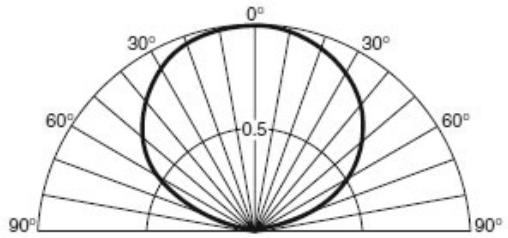
Relative Intensity vs. Wavelength

Condition : Ta = 25℃, I_F = 300mA



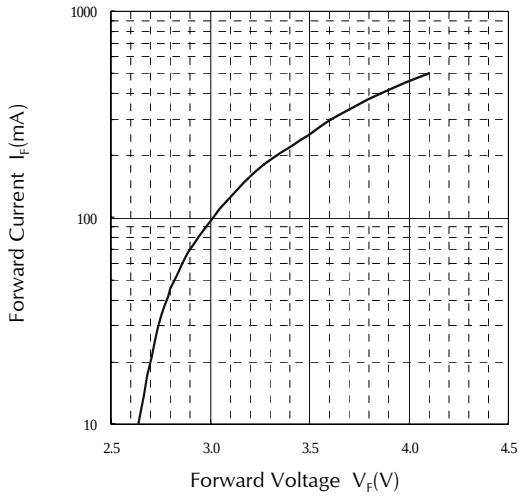
Spatial Distribution Example

Condition : Ta = 25℃



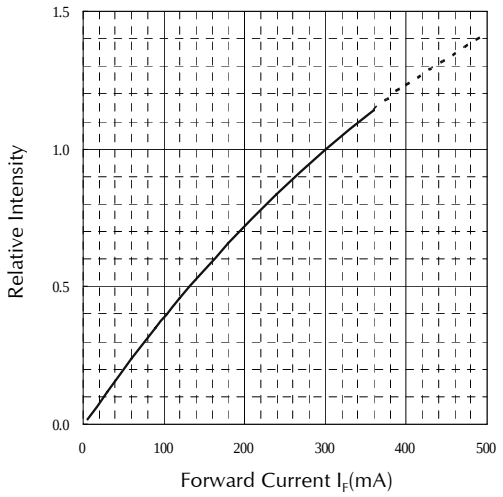
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



Forward Current vs. Relative Intensity

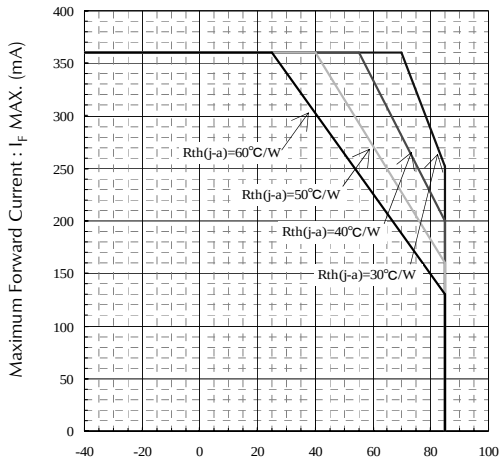
Condition : Ta = 25℃



Technical Data (High Color Rendering Index Type)

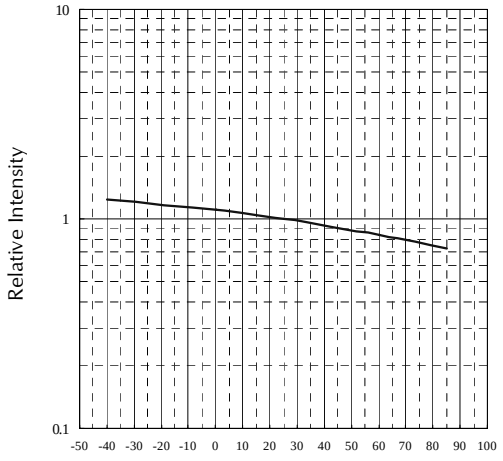
Derating

Ambient Temperature vs. Maximum Forward Current



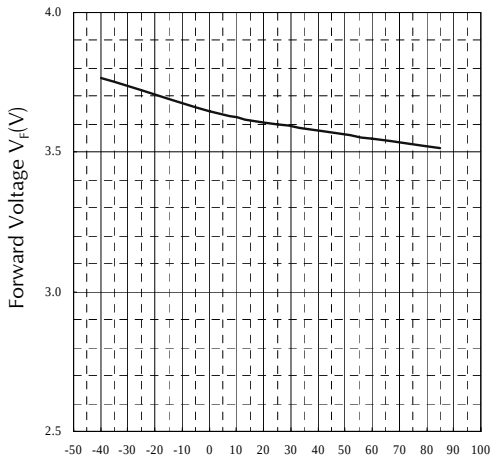
Ambient Temperature vs. Relative Intensity

Condition : I_F = 300mA



Ambient Temperature vs. Forward Voltage

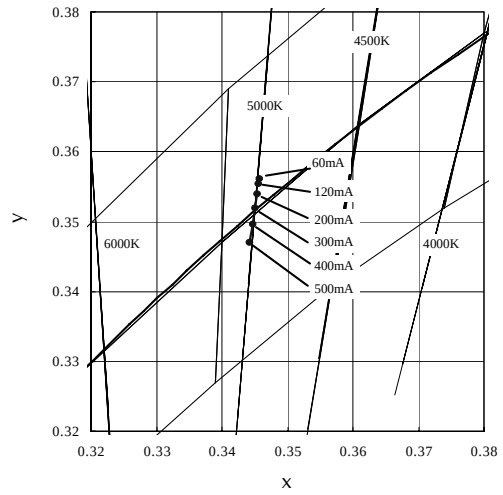
Condition : I_F = 300mA



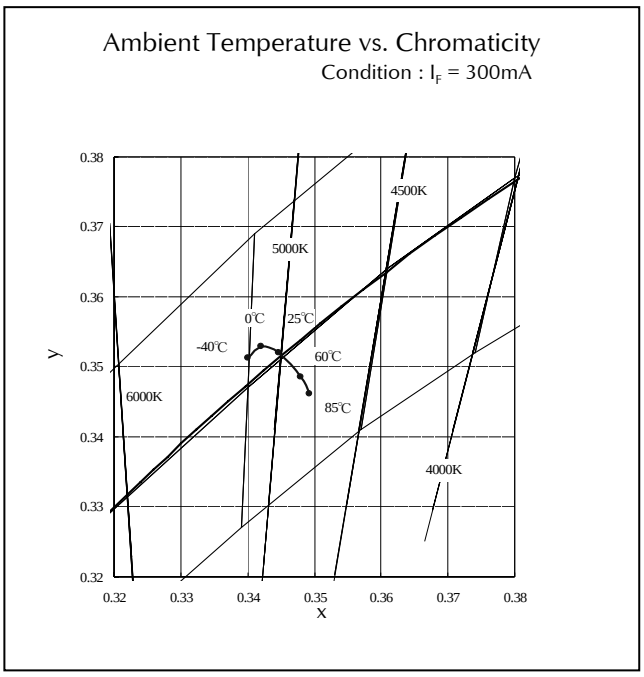
Forward Current vs. Chromaticity

Condition : Ta = 25℃

(5,000K)



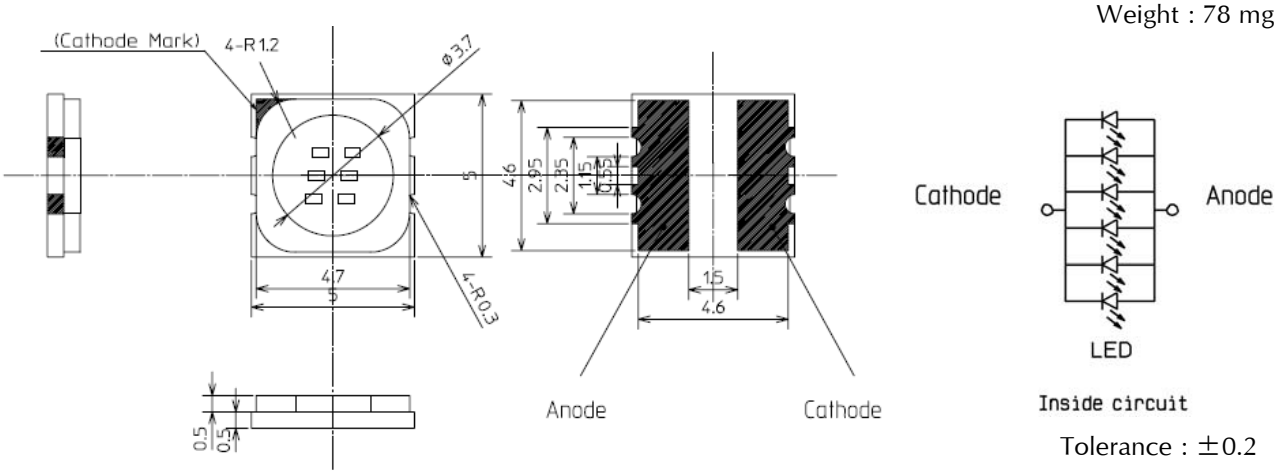
Technical Data (High Color Rendering Index Type)



Package Dimensions

(Unit : mm)

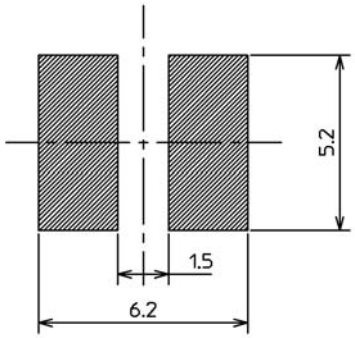
Weight : 78 mg



Tolerance : ±0.2

Recommended Soldering Pattern

(Unit : mm)

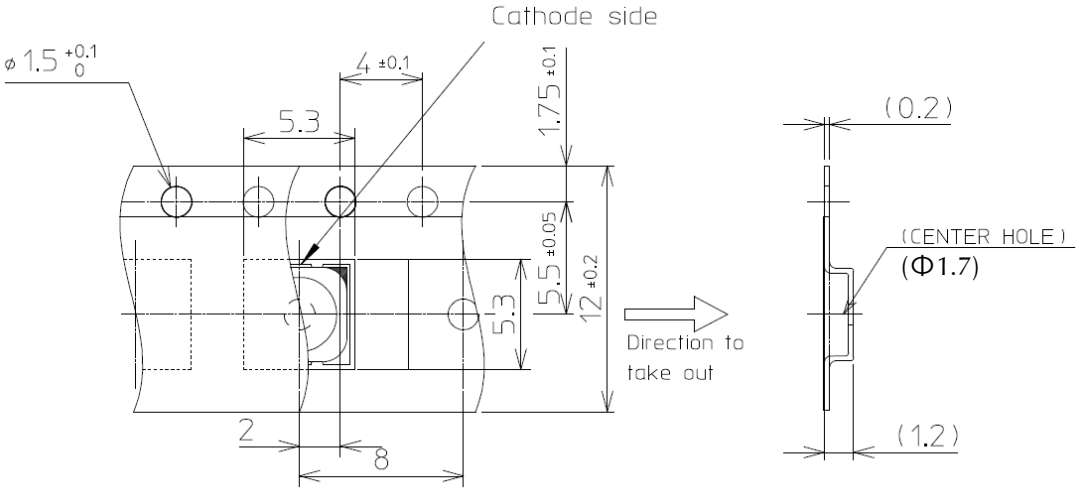


Tolerance : ±0.2

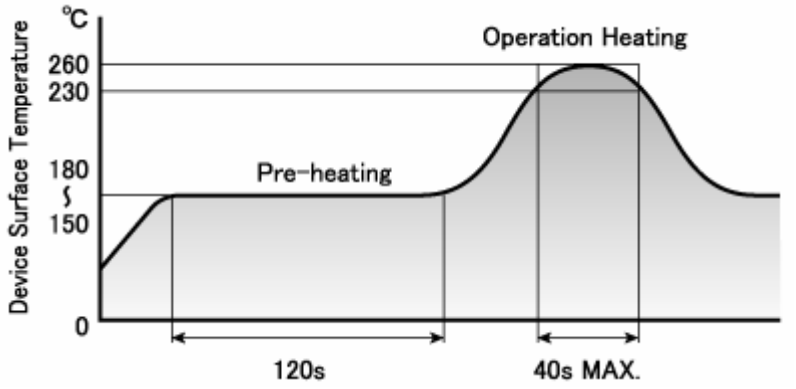
Taping Specification

(Unit : mm)

・Quantity: 1,000pcs/ 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 room temperature after the first reflow) in order to prevent the LED resin from absorbing moisture.

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℃, IF = Maxium Rated Current	1,000 h	0/16
High Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = Maximum Rated Operating Temp., I_F = 275mA	1,000 h	0/16
Low Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = -40℃, I_F = Maxium Rated Current	1,000 h	0/16
Wet High Temp. Operating Life	EIAJ ED-4701/100(102)	Ta = 60℃, 90%, I_F = Maxium Rated Current	1,000 h	0/16
Temperature Cycling	EIAJ ED-4701/100(105)	Ta = -40℃ ～ Maximum Rated Storage Temp. (each 30min.)	1,000 cycles	0/16
Resistance to Soldering Heat	EIAJ ED-4701/300(301)	Preheating : 150 ～ 180℃(120s Max.) Operation Heating : 230℃(40s) → 260℃(5s)	5 times	0/16

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 0.7
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.

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