



**Pb-free  
HEAT**



**G**

**3809X**

3 Flush Mount Type LED

## Features

Package	3 Flush Mount Type. Water clear resin
Product features	<ul style="list-style-type: none"> <li>• Outer Dimension 3 Flush Mount Type.</li> <li>• Low power consumption type ( recommended operating conditions: <math>I_F=5mA</math>)</li> <li>• Operation temperature range Storage Temperature Operating Temperature</li> <li>• Lead-free soldering compatible</li> <li>• RoHs compliant</li> </ul>
Chromaticity coordinates	$x = 0.31TYP.$ , $y = 0.32TYP.$ (GSW, GLW)
Dominant wavelength	Blue : 470nm(GSB) Green : 530nm(GSG)
Spatial distribution	GSW : 100deg. GLW : 120deg. GSB : 90deg. GSG : 90deg.
Die materials	InGaN
Rank grouping parameter	Sorted by luminous intensity rank and chromaticity rank (GSW, GLW) Sorted by luminous intensity rank (GSB, GSG)
Soldering methods	TTW (Through The Wave) soldering and manual soldering
ESD-withstand voltage	Up to 1kV (HBM)
Packing	Bulk : 200pcs(MIN.)

## Recommended Applications

Amusement Equipment, OA/FA, Other General Applications

## Color and Luminous Intensity

(Ta=25 )

Part No.	Material	Emitted Color	Lens Color	Chromaticity Coordinates x,y		Dominant Wavelength $\lambda_d$ (nm)		Luminous Intensity Iv (mcd)		
				TYP.	I <sub>F</sub> (mA)	TYP.	I <sub>F</sub> (mA)	MIN.	TYP.	I <sub>F</sub> (mA)
<b>GSW3809X</b>	<b>InGaN</b>	White	Water Clear	<b>0.31,0.32</b>	<b>5</b>	-	-	<b>100</b>	<b>200</b>	<b>5</b>
<b>GLW3809X</b>		White		<b>0.31,0.32</b>	<b>5</b>	-	-	<b>15</b>	<b>34</b>	<b>5</b>
<b>GSB3809X</b>		Blue		-	-	<b>470</b>	<b>5</b>	<b>35</b>	<b>70</b>	<b>5</b>
<b>GSG3809X</b>		Green		-	-	<b>530</b>	<b>5</b>	<b>90</b>	<b>180</b>	<b>5</b>

## Absolute Maximum Ratings

(Ta=25 )

Item	Symbol	Absolute Maximum Ratings				Unit
		GSW	GLW	GSB	GSG	
Power Dissipation	$P_d$	36	120	36	38	mW
Forward Current	$I_F$	10	30	10	10	mA
Pulse Forward Current <sup>1</sup>	$I_{FRM}$	20	100	20	20	mA
Derating (Ta=25 or higher)	$I_F$	0.130	0.400	0.130	0.130	mA/
	$I_{FRM}$	0.267	1.333	0.267	0.267	mA/
Reverse Voltage	$V_R$	5				V
Operating Temperature	$T_{opr}$	-40 ~ +85				
Storage Temperature	$T_{stg}$	-40 ~ +100				

<sup>1</sup>  $I_{FRM}$  Measurement condition : Pulse Width 1ms., Duty 1/20.

## Electro-Optical Characteristics

(Ta=25 )

Item	Condition	Symbol	Characteristics				Unit	
			GSW	GLW	GSB	GSG		
Forward Voltage	$I_F=5mA$	$V_F$	TYP.	2.9	2.9	2.9	3.0	V
			MAX.	3.3	3.2	3.5	3.5	
Reverse Current	$V_R=5V$	$I_R$	MAX.	100	100	100	100	$\mu A$
Chromaticity Coordinates	$I_F=5mA$	x	TYP.	0.31	0.31	-	-	-
		y	TYP.	0.32	0.32	-	-	-
Peak Wavelength	$I_F=5mA$	$\lambda_p$	TYP.	-	-	465	524	nm
Dominant Wavelength	$I_F=5mA$	$\lambda_d$	TYP.	-	-	470	530	nm
Spectral Line Half Width	$I_F=5mA$	$\lambda$	TYP.	-	-	25	40	nm
Half Intensity Angle	$I_F=5mA$	$2\theta_{1/2}$	TYP.	100	120	90	90	deg.

## Luminous Intensity Rank

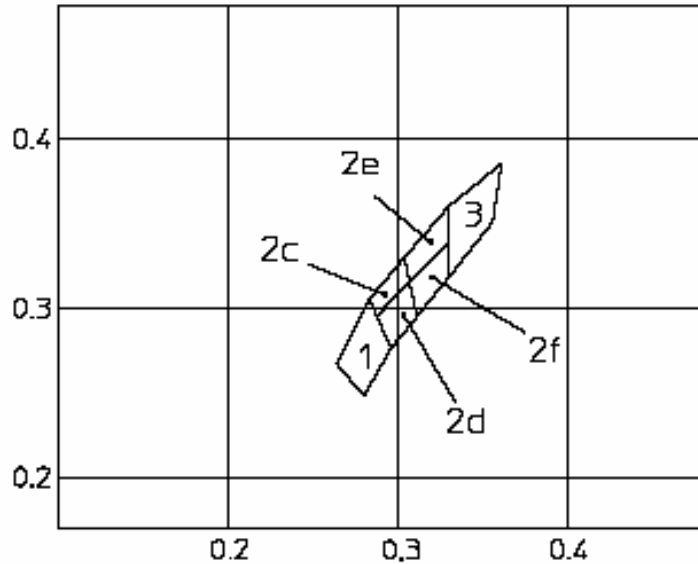
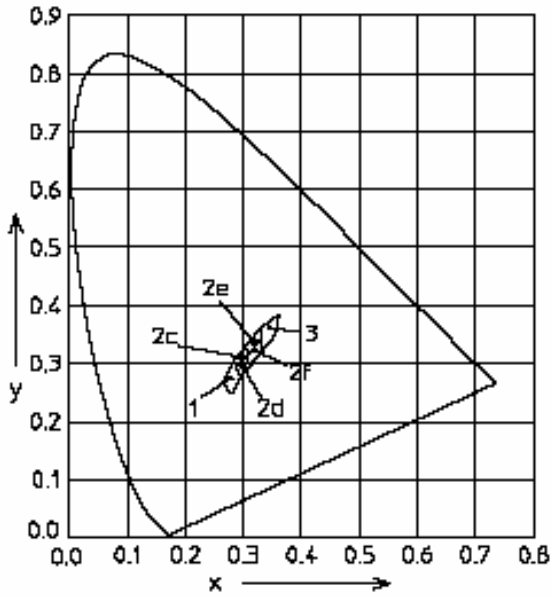
(Ta=25 )

Rank	I <sub>v</sub> (mcd)							
	GSW		GLW		GSB		GSG	
	I <sub>F</sub> =5mA		I <sub>F</sub> =5mA		I <sub>F</sub> =5mA		I <sub>F</sub> =5mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A	100	200	15	30	35	70	90	180
B	140	280	21	42	50	100	130	260
C	200	400	30	60	70	140	180	360
D	280	560	42	84	100	200	260	520
E	400	-	60	-	140	-	360	-

Please contact our sales staff concerning rank designation.

**Sorting Chart for Chromaticity Coordinates (GSW, GLW)**

(Ta=25 )

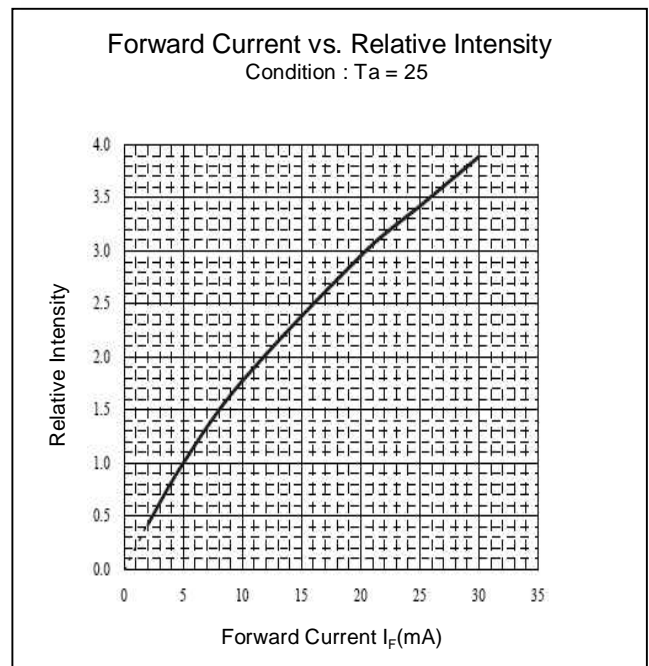
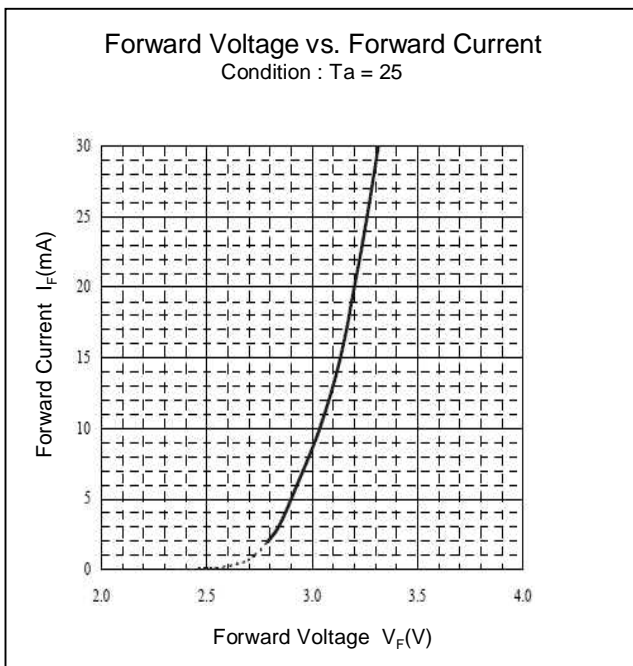
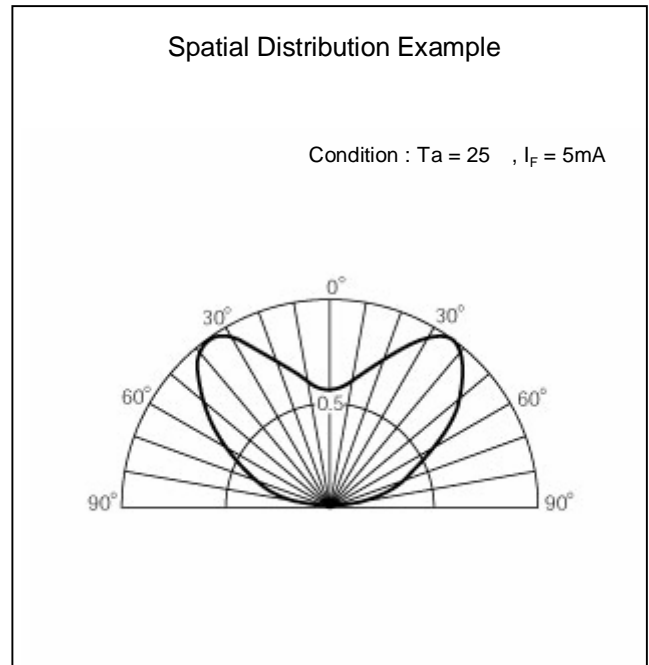
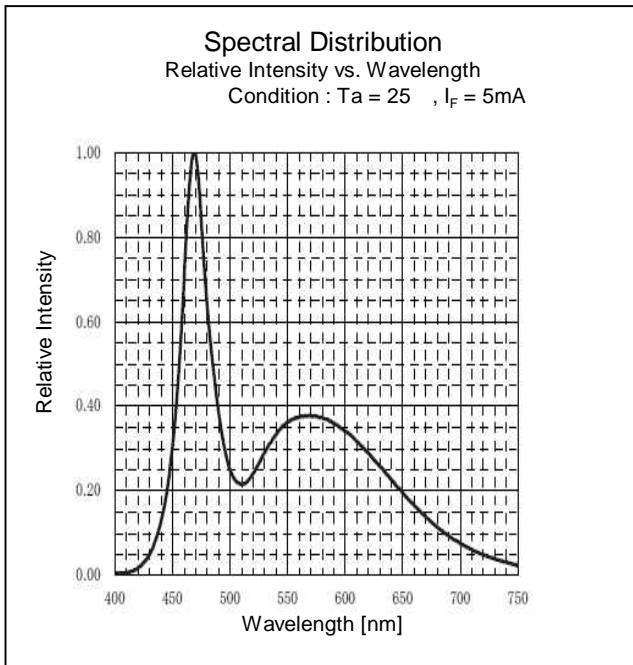


Rank	LEFT DOWN point		LEFT UP point		RIGHT UP point		RIGHT UP point		Conditions
	x	y	x	y	x	y	x	y	
1	0.280	0.248	0.264	0.267	0.283	0.305	0.296	0.276	I <sub>F</sub> =5mA
2c	0.287	0.295	0.283	0.305	0.304	0.330	0.307	0.315	
2d	0.296	0.276	0.287	0.295	0.307	0.315	0.311	0.294	
2e	0.307	0.315	0.304	0.330	0.330	0.360	0.330	0.339	
2f	0.311	0.294	0.307	0.315	0.330	0.339	0.330	0.318	
3	0.330	0.318	0.330	0.360	0.361	0.385	0.356	0.351	

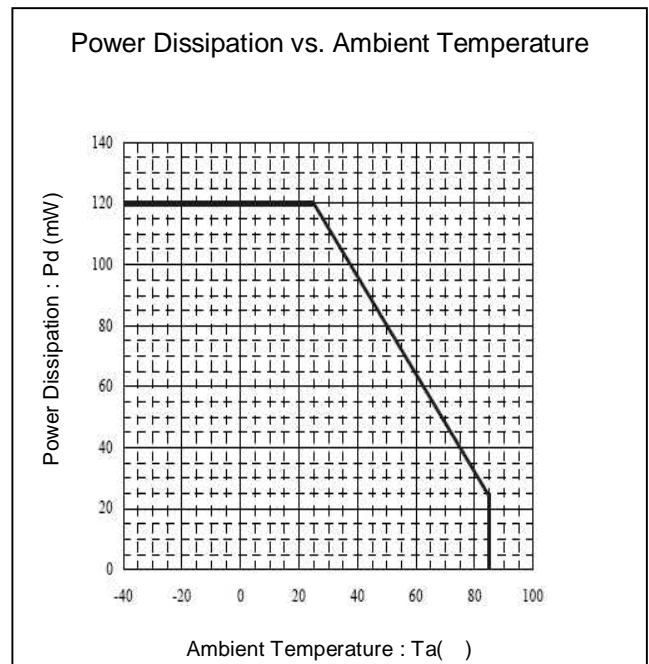
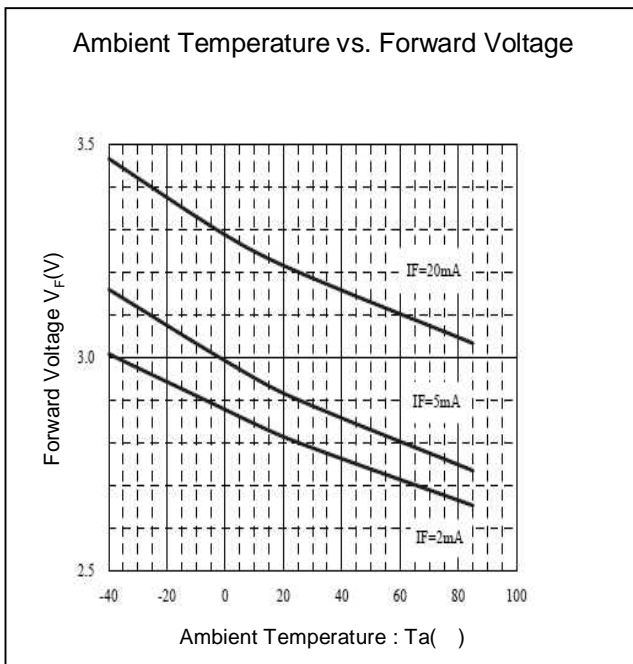
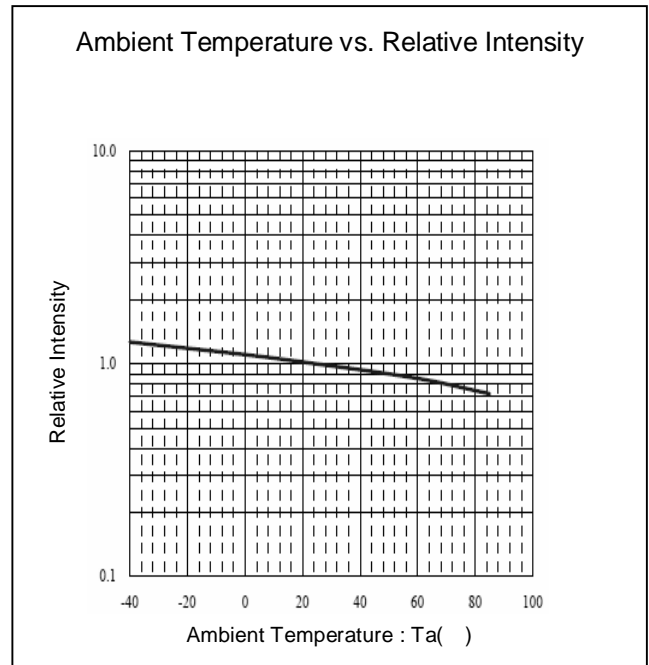
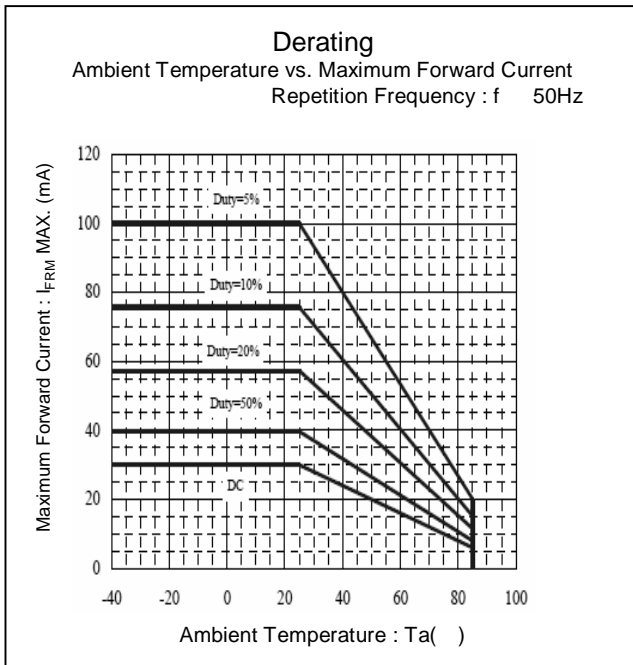
Chromaticity Coordinates Tolerance Each Rank : +/-0.02

Please contact our sales staff concerning rank designation.

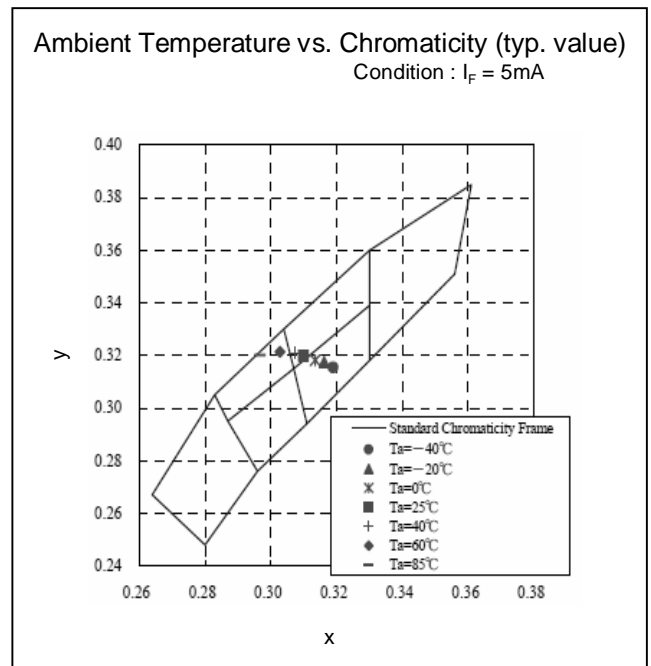
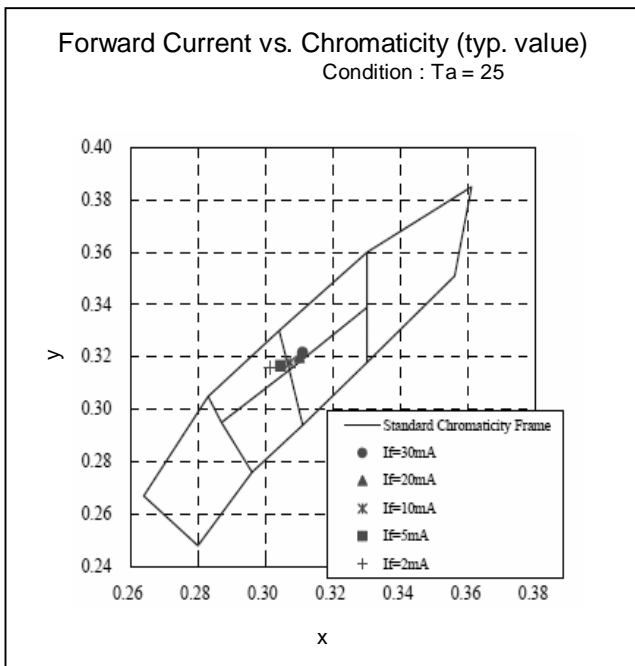
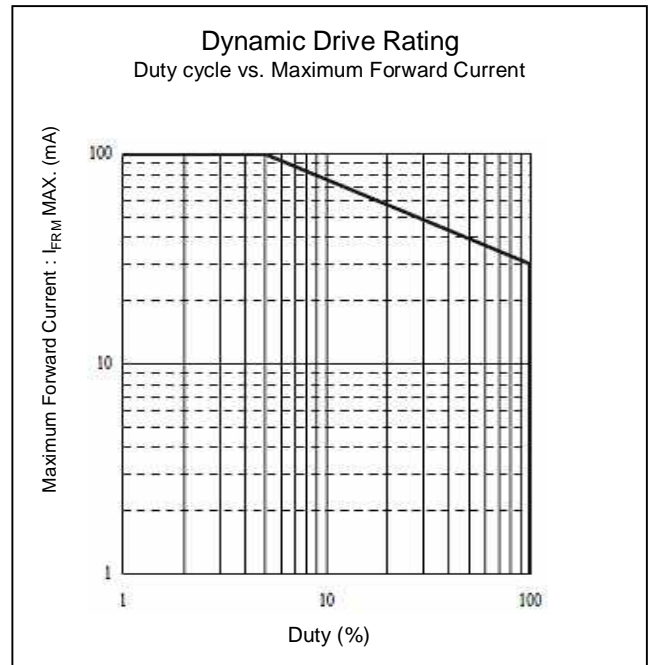
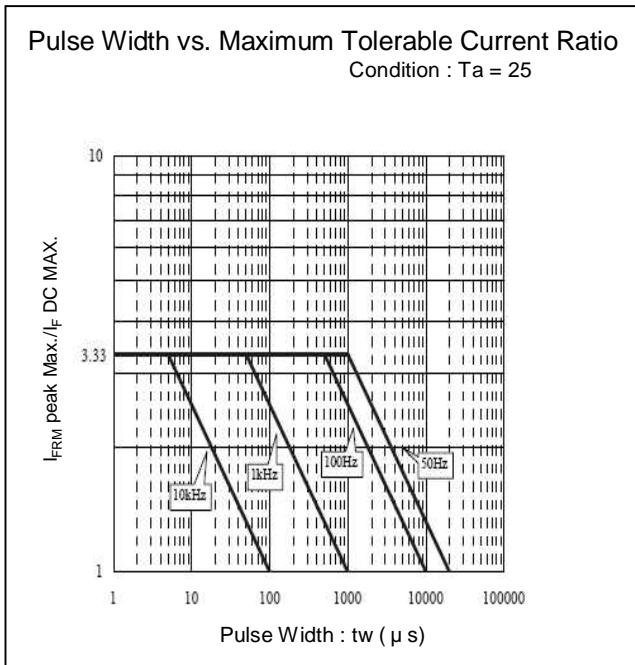
## Technical Data (GLW)



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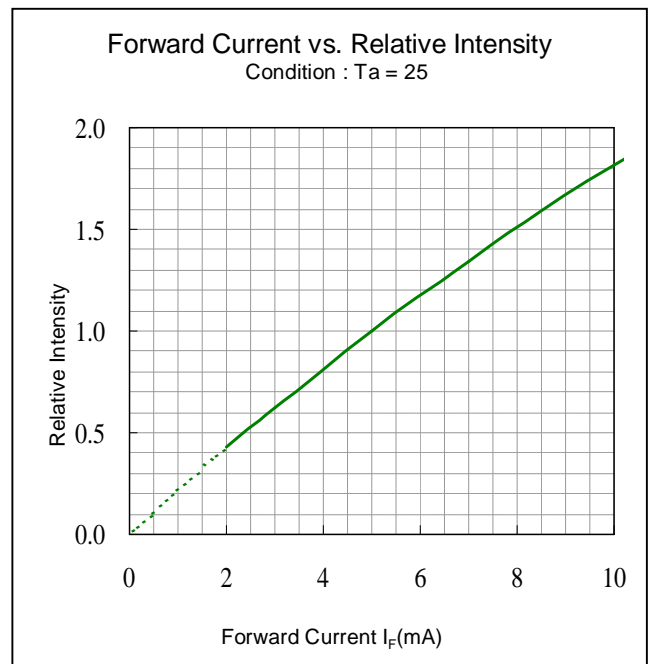
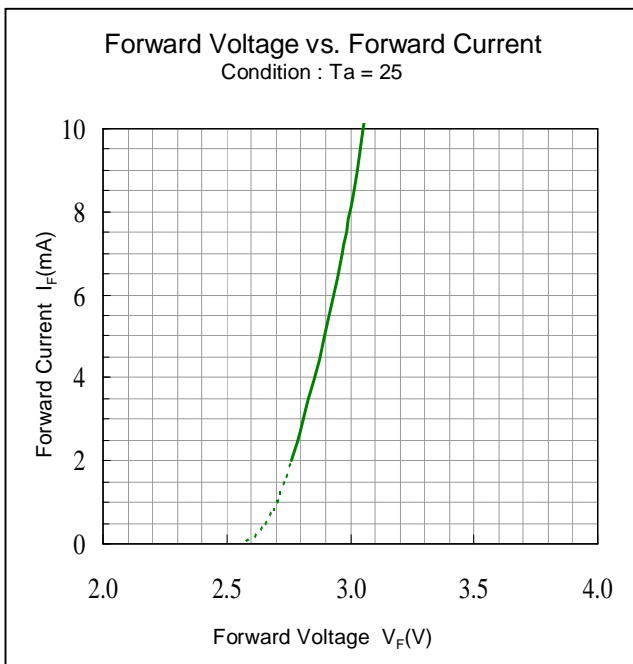
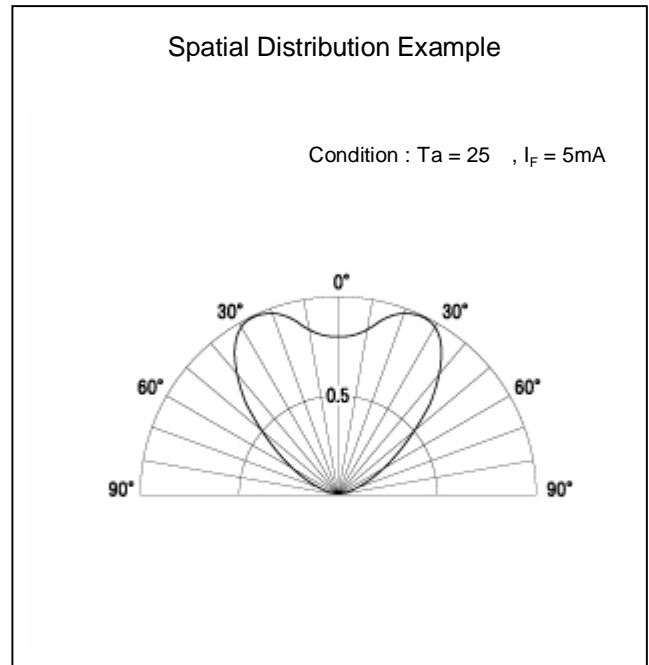
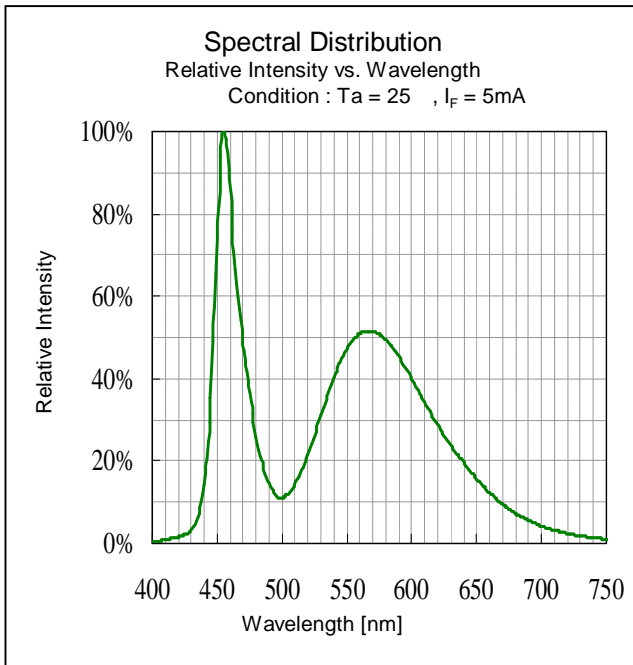


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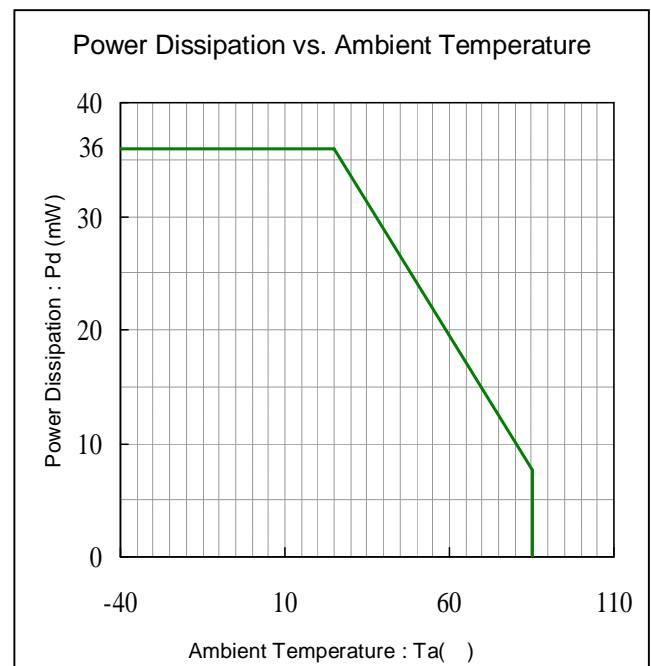
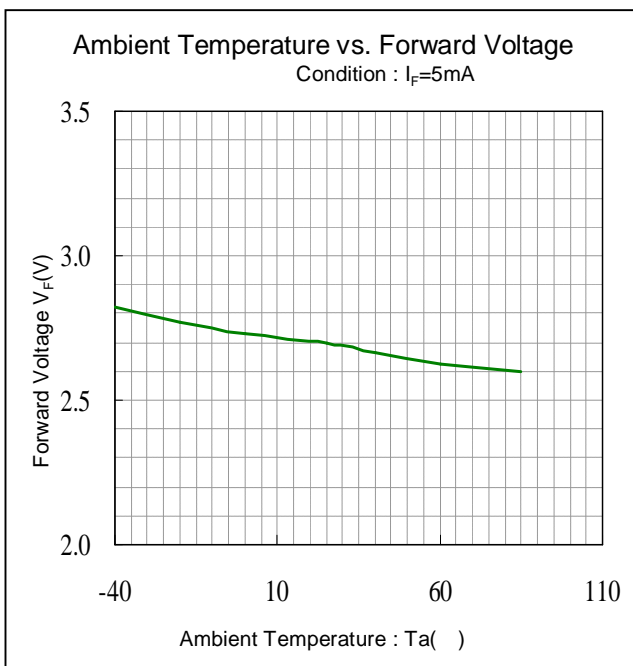
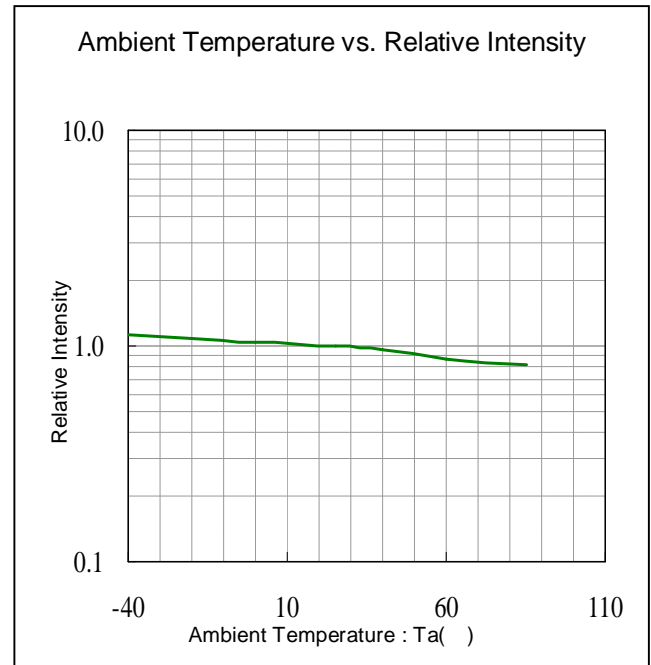
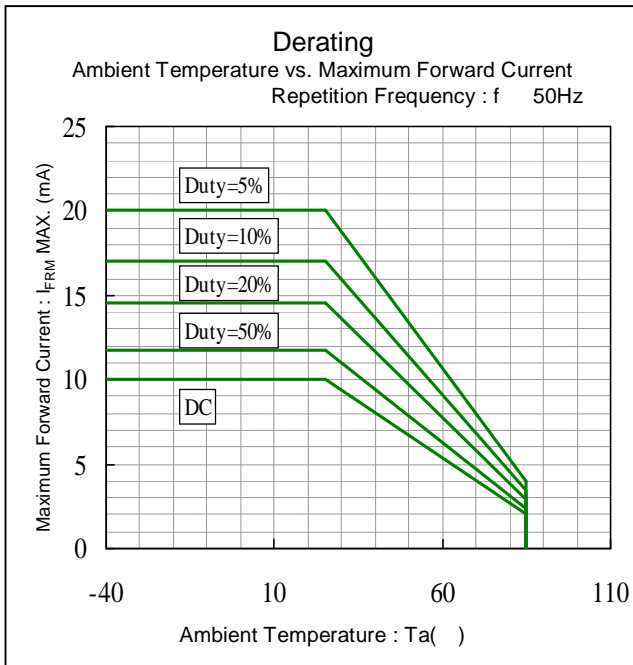




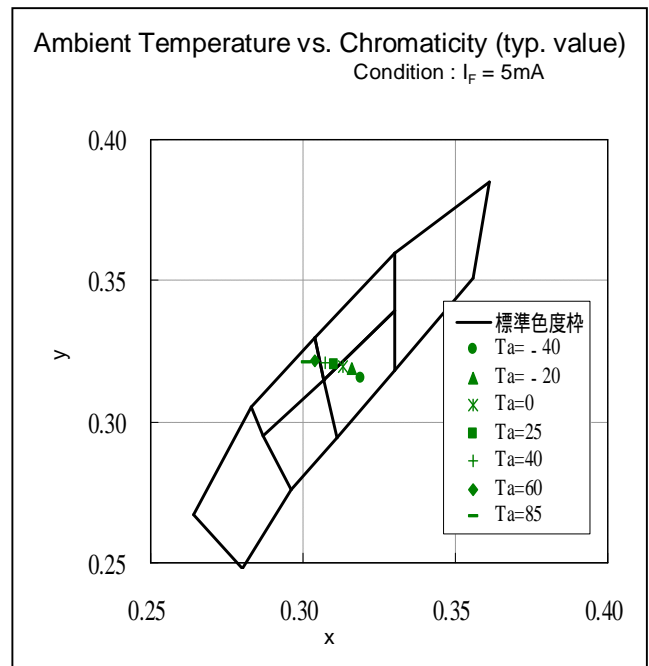
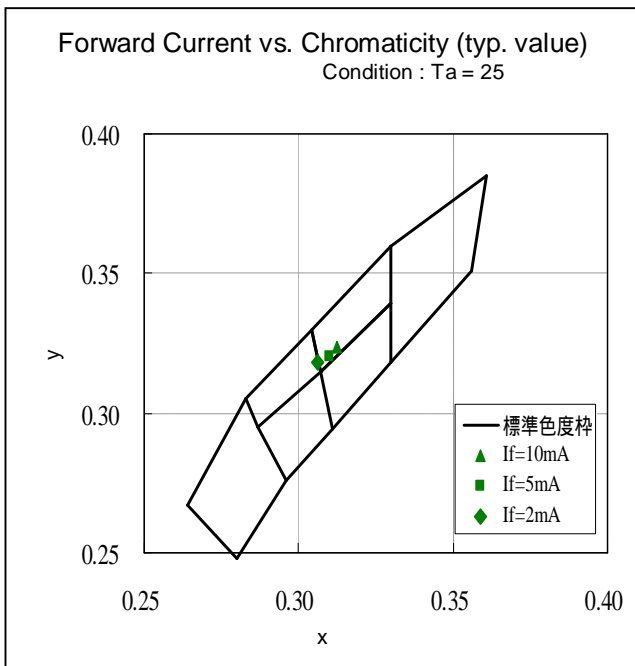
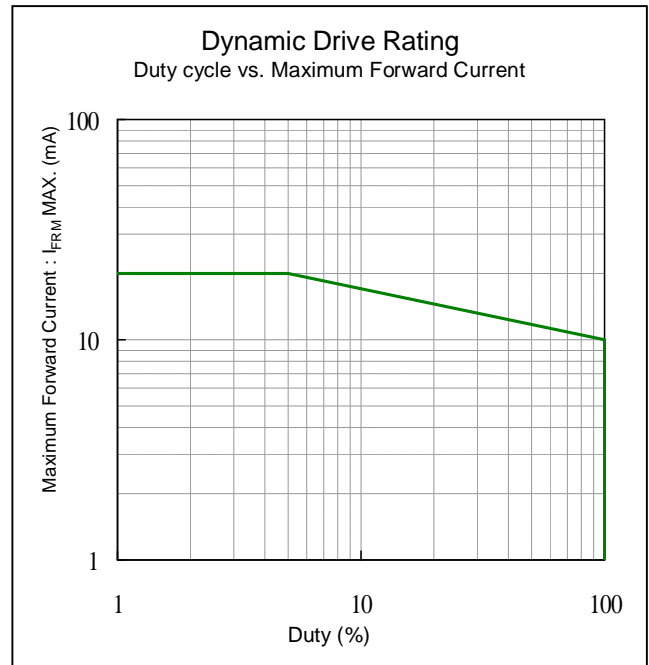
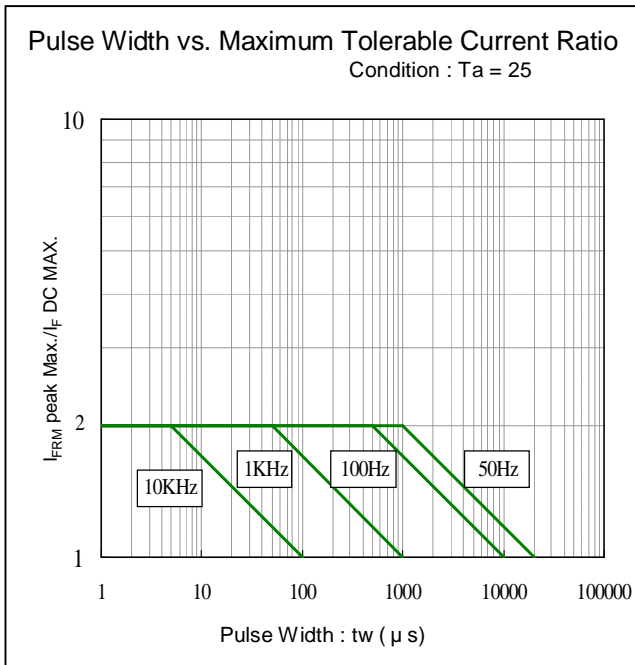
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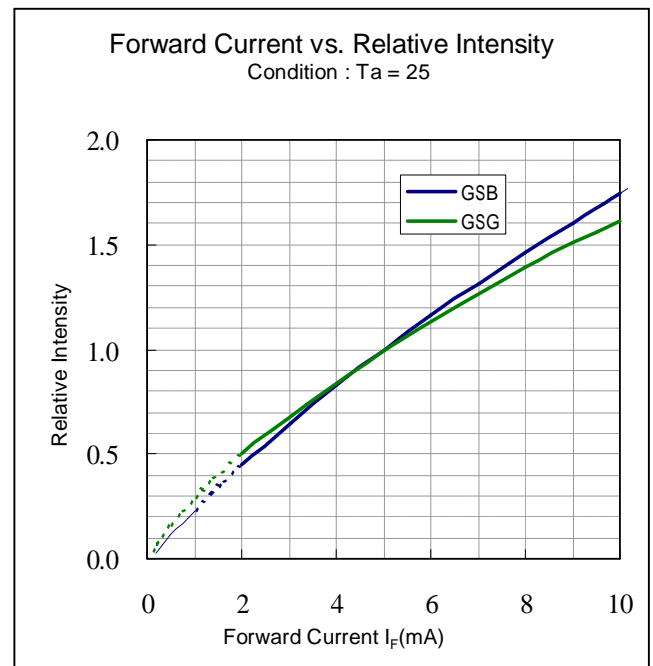
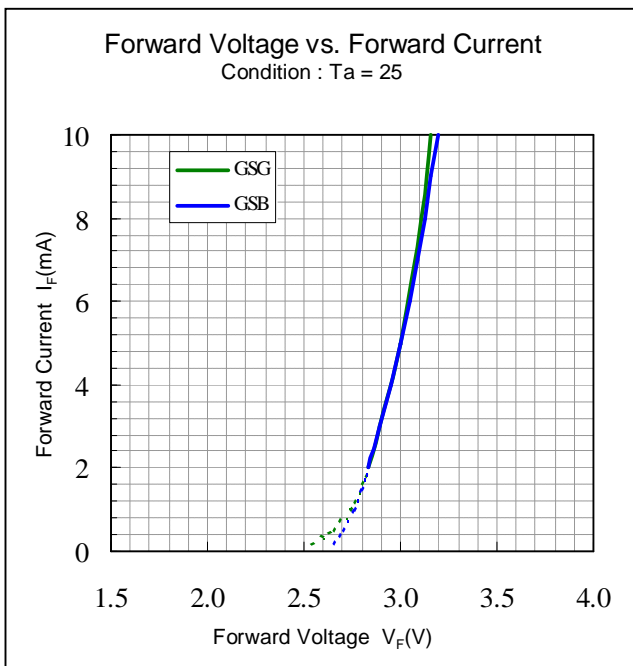
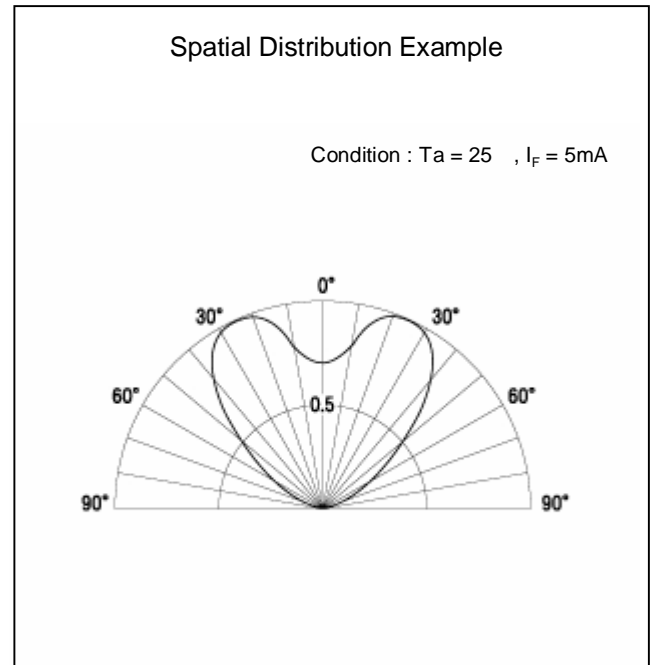
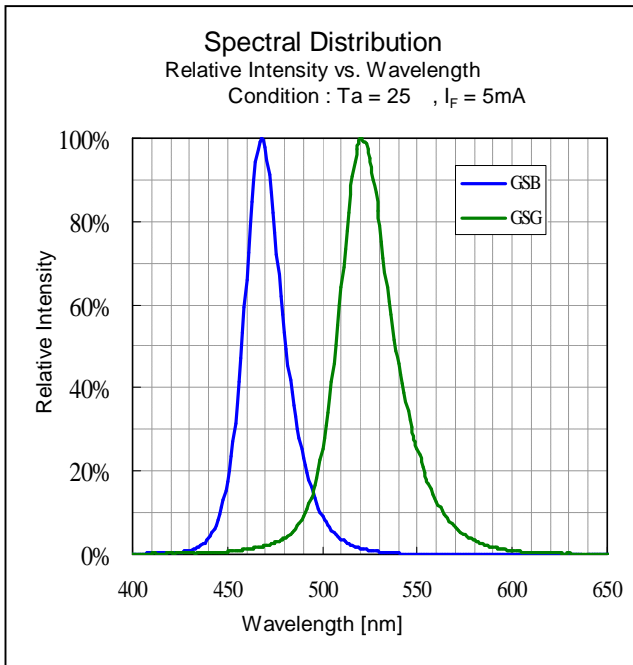
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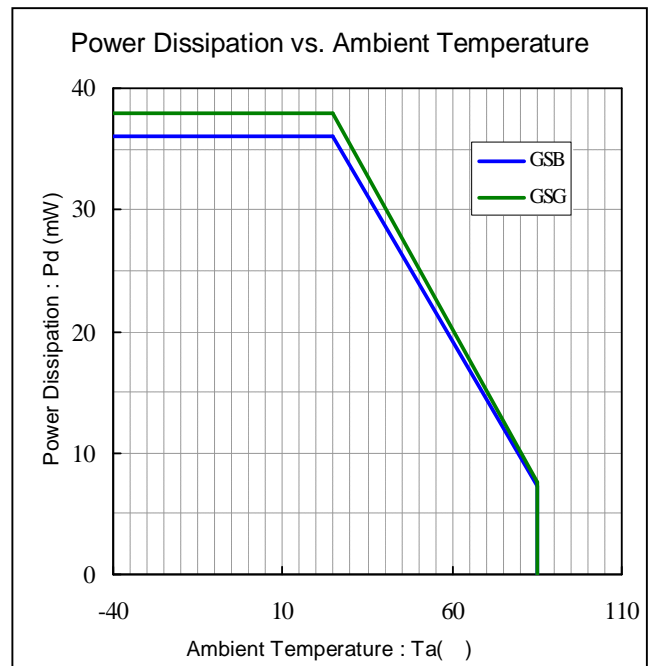
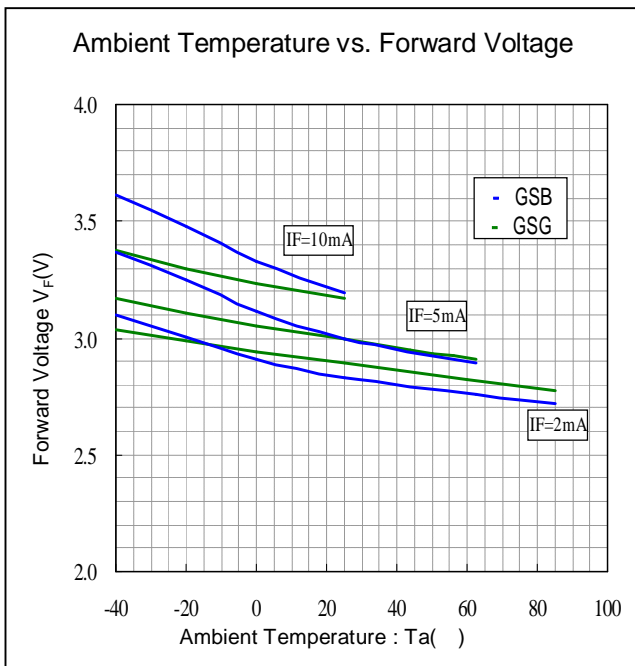
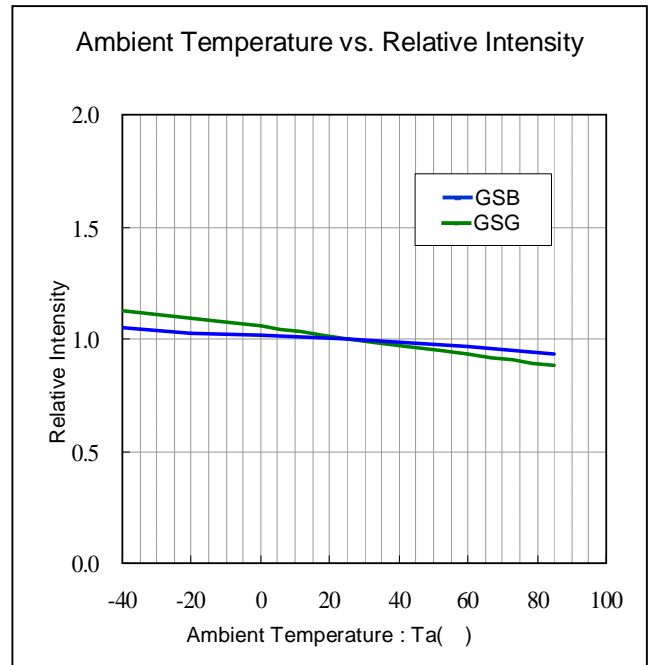
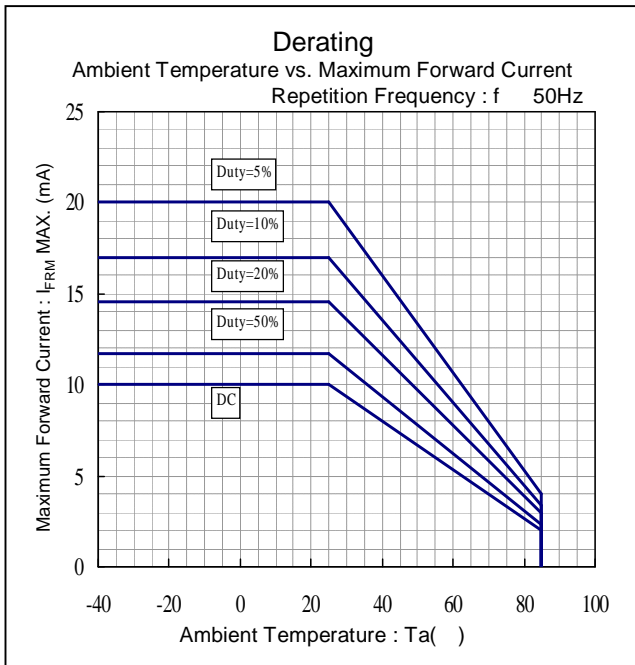
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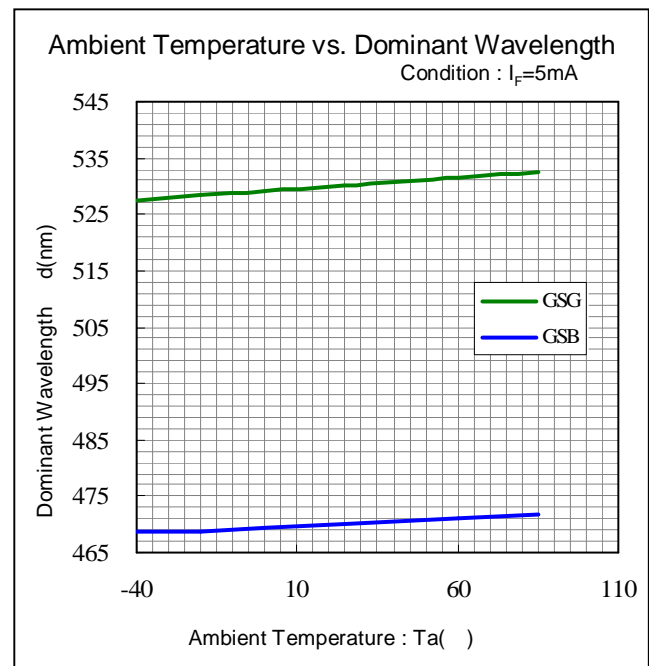
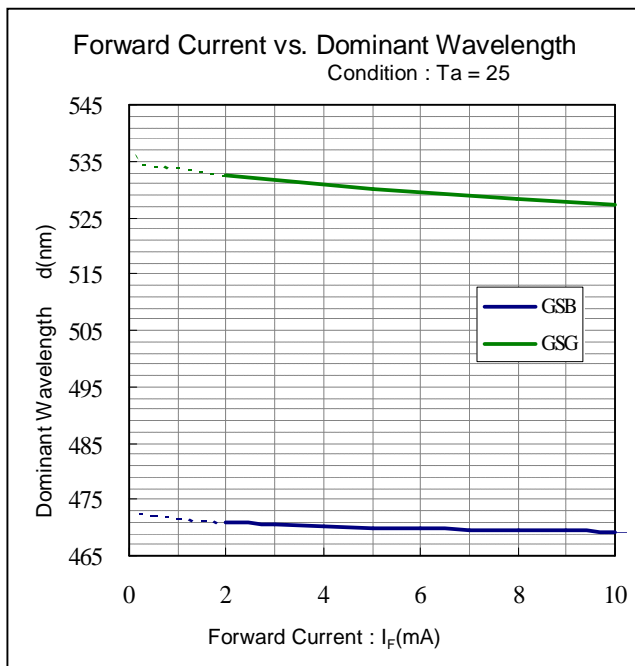
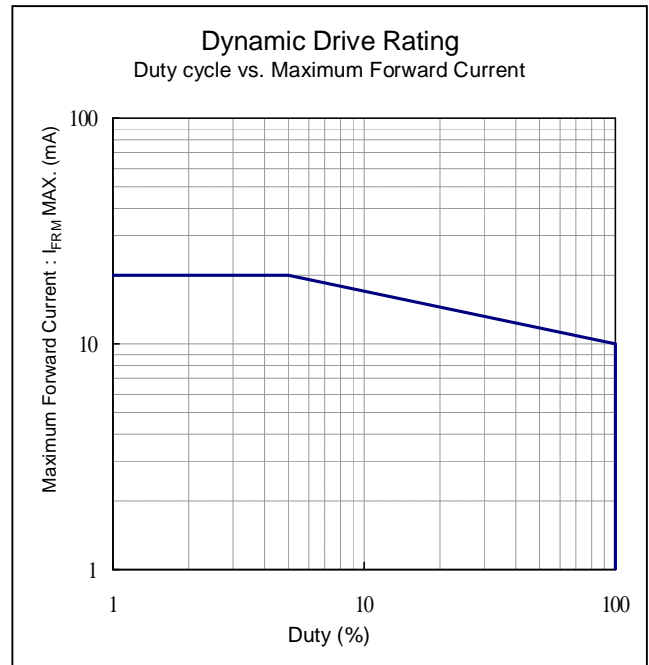
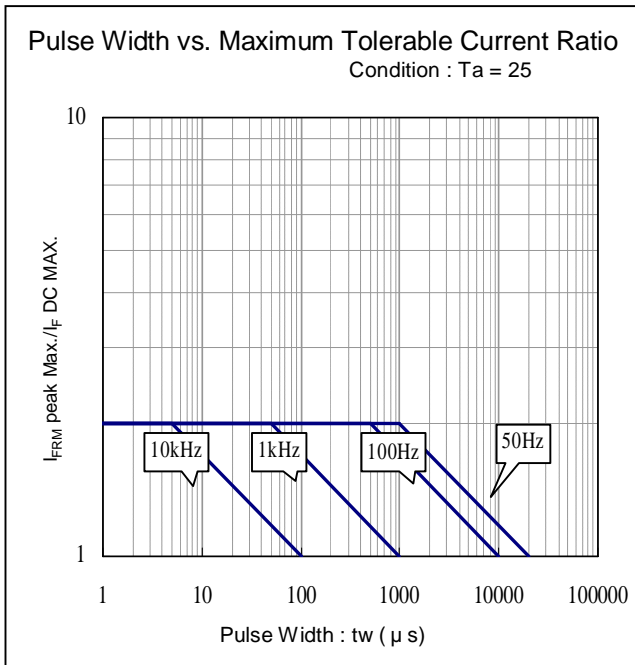
## Technical Data (GSB,GSG)



## Technical Data (GSB,GSG)



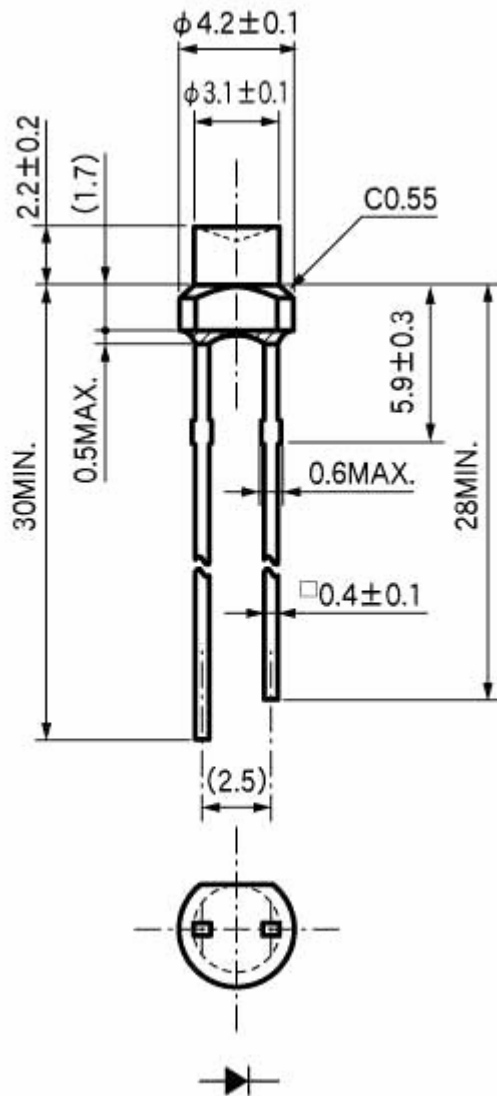
## Technical Data (GSB,GSG)



Package Dimensions

(Unit: mm)

Weight: (0.16)g



## TTW (Through The Wave) soldering Conditions

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Pre-heating	100	(MAX.)
Solder Bath Temp.	265	(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.

The detail is described to LED and Photodetector handling precautions of home page:  
 "Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation,  
 please.

## Manual Soldering Conditions

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Iron tip temp.	400	(MAX.)
Soldering time and frequency	3 s	(MAX.)
	2 times	(MAX.)

The detail is described to LED and Photodetector handling precautions of home page:  
 "Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation, please.



## Reliability Testing Result

Reliability Testing Result	Applicable Standard	Testing Conditions	Duration	Failure
Room Temp. Operating Life	EAJED-4701/100(101)	Ta = 25 , If = Maximum Rated Current	1,000 h	0/25
Resistance to Soldering Heat	EAJED-4701/300(302)	260 ± 5 , 1.6mm from package base	10s	0/25
Temperature Cycling	EAJED-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	EAJED-4701/100(103)	Ta = 60 ± 2 , RH = 90 ± 5%	1,000 h	0/25
High Temp. Storage Life	EAJED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/25
Low Temp. Storage Life	EAJED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/25
Lead Tension	EAJED-4701/400(401)	10N, 1time ( 0.4 and Flat Package : 5N)	10s	0/10
Vibration, Variable Frequency	EAJED-4701/400(403)	98.1m/s <sup>2</sup> (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 <sub>F</sub>	If Value of each product Forward Voltage	Testing Max. Value > Spec. Max. Value x 1.2
Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 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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