Pb-free HEAT

G□□3809X

ϕ3 Flush Mount Type LED

Features

Package	ϕ3 Flush Mount Type. Water clear resin
Product features	• Outer Dimension ϕ3 Flush Mount Type. • Low power consumption type (recommended operating conditions：I_F=5mA) • Operation temperature range Storage Temperature Operating Temperature • Lead–free soldering compatible • RoHs compliant
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 λd (nm)		Luminous Intensity Iv (mcd)		
				TYP.	IF (mA)	TYP.	I_F (mA)	MIN.	TYP.	I_F (mA)
GSW3809X	InGaN	White	Water Clear	0.31,0.32	5	–	–	100	200	5
GLW3809X		White		0.31,0.32	5	–	–	15	34	5
GSB3809X		Blue		–	–	470	5	35	70	5
GSG3809X		Green		–	–	530	5	90	180	5

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 ※1	I_{FRM}	20	100	20	20	mA
Derating (Ta=25℃ or higher)	ΔI_F	0.130	0.400	0.130	0.130	mA/℃
	ΔI_{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				℃

※1 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	μA
Chromaticity Coordinates	I_F=5mA	x	TYP.	0.31	0.31	-	-	-
		y	TYP.	0.32	0.32	-	-	-
Peak Wavelength	I_F=5mA	λ_p	TYP.	-	-	465	524	nm
Dominant Wavelength	I_F=5mA	λ_d	TYP.	-	-	470	530	nm
Spectral Line Half Width	I_F=5mA	$\Delta\lambda$	TYP.	-	-	25	40	nm
Half Intensity Angle	I_F=5mA	2θ1/2	TYP.	100	120	90	90	deg.

Luminous Intensity Rank

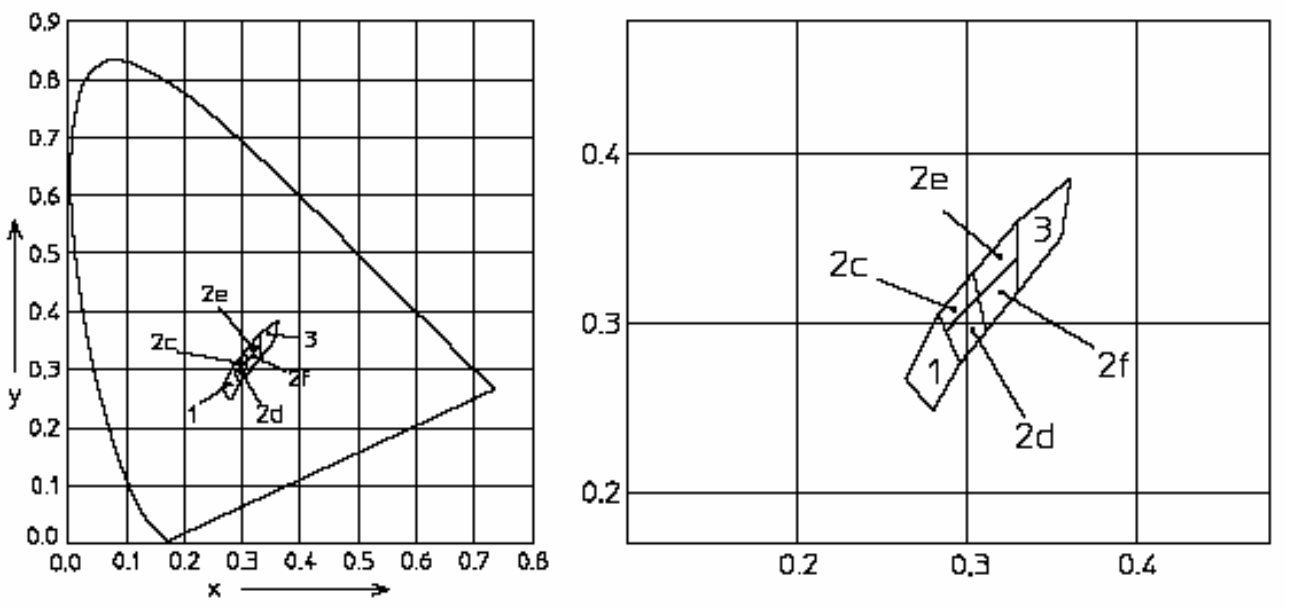
(Ta=25℃)

Rank	I_V (mcd)							
	GSW		GLW		GSB		GSG	
	I_F=5mA		I_F=5mA		I_F=5mA		I_F=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℃)



	LEFT DOWN point		LEFT UP point		RIGHT UP point		RIGHT UP point		Condtions
Rank	**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**	
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**	**I_F =5mA**
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

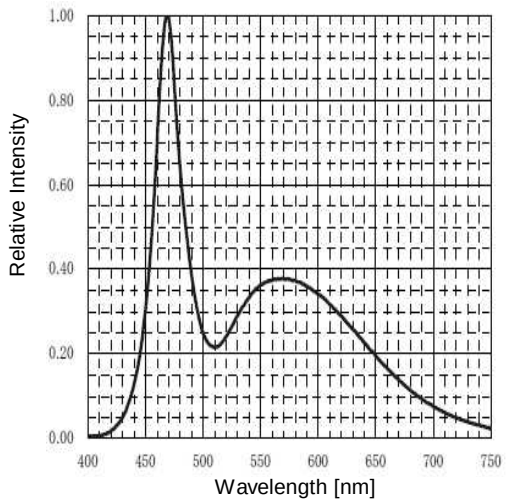
※Please contact our sales staff concerning rank designation.

Technical Data (GLW)

Spectral Distribution

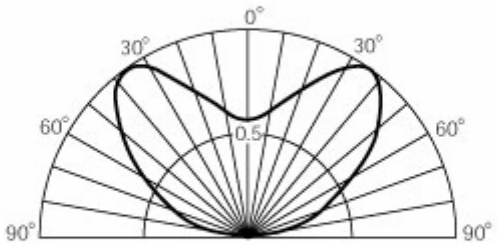
Relative Intensity vs. Wavelength

Condition : Ta = 25℃, I_F = 5mA



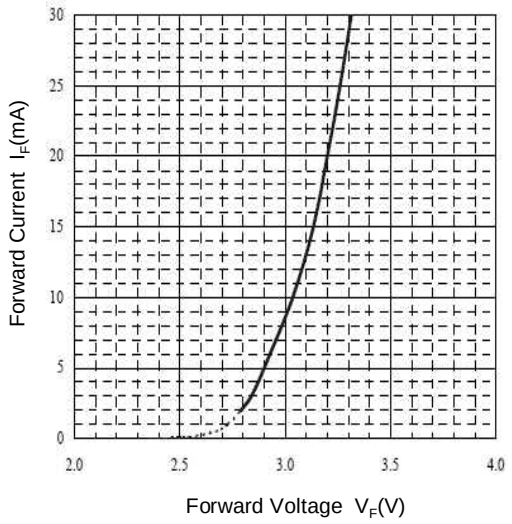
Spatial Distribution Example

Condition : Ta = 25℃, I_F = 5mA



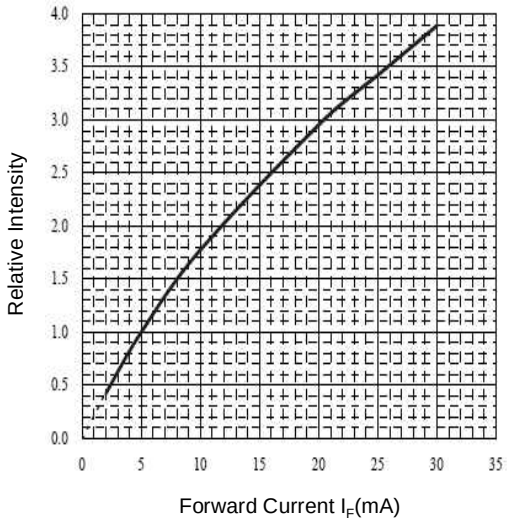
Forward Voltage vs. Forward Current

Condition : Ta = 25℃



Forward Current vs. Relative Intensity

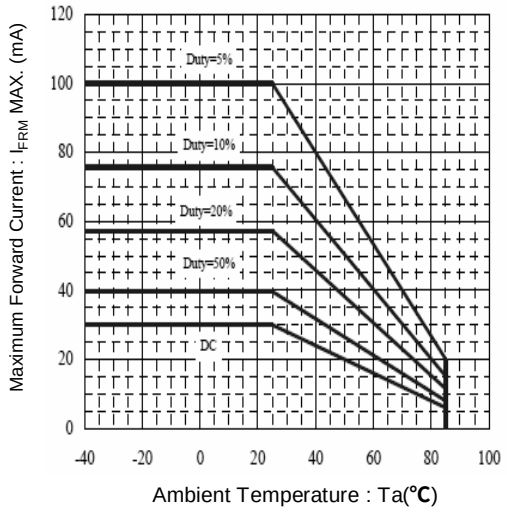
Condition : Ta = 25℃



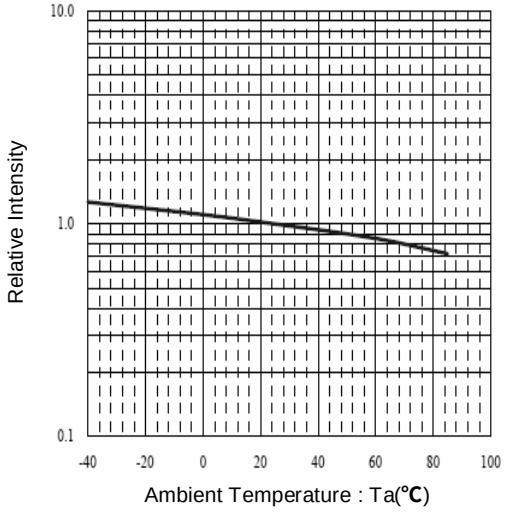
Technical Data (GLW)

Derating

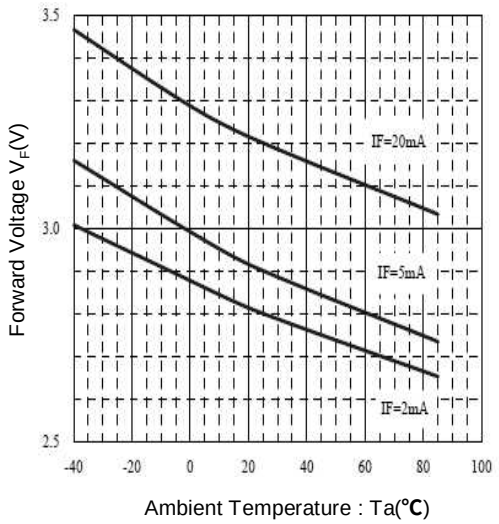
Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : f ≧ 50Hz



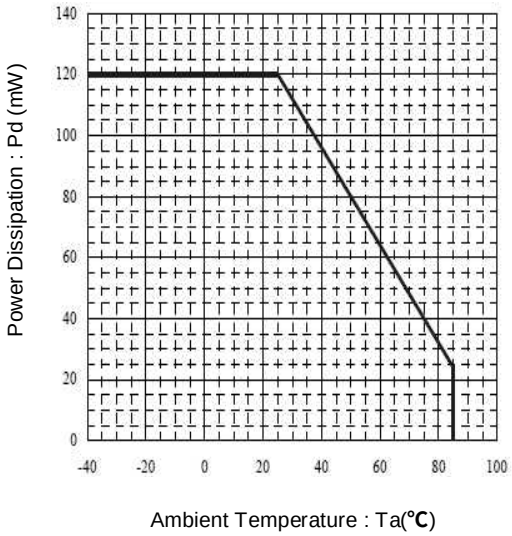
Ambient Temperature vs. Relative Intensity



Ambient Temperature vs. Forward Voltage



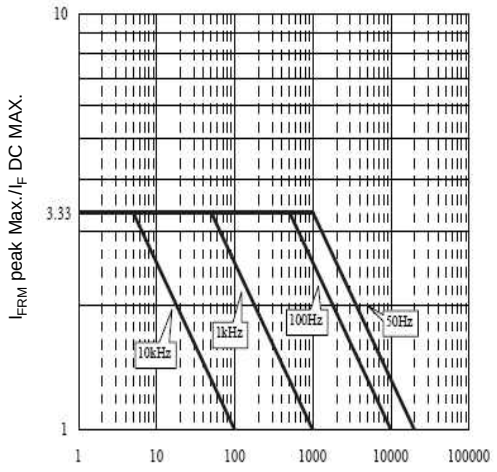
Power Dissipation vs. Ambient Temperature



Technical Data (GLW)

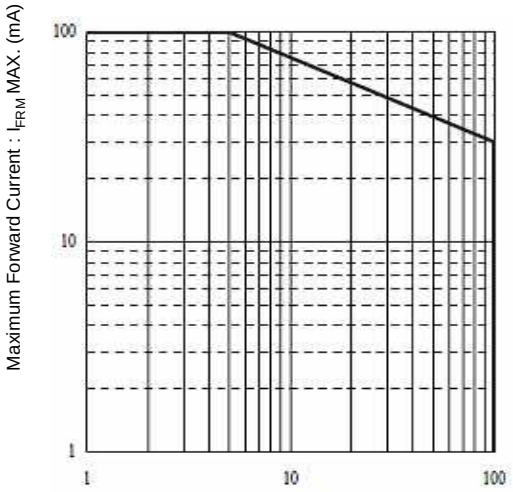
Pulse Width vs. Maximum Tolerable Current Ratio

Condition : Ta = 25℃



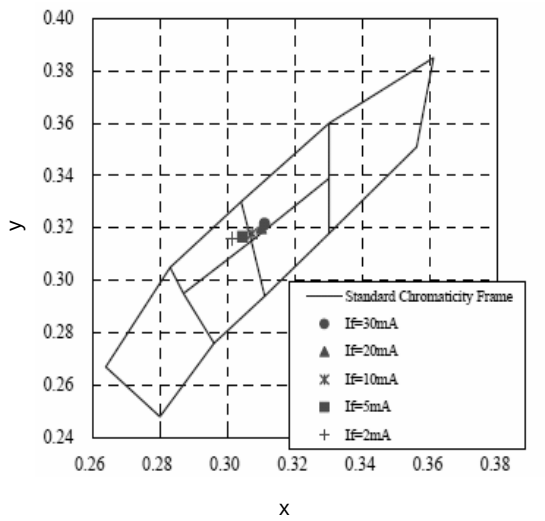
Dynamic Drive Rating

Duty cycle vs. Maximum Forward Current



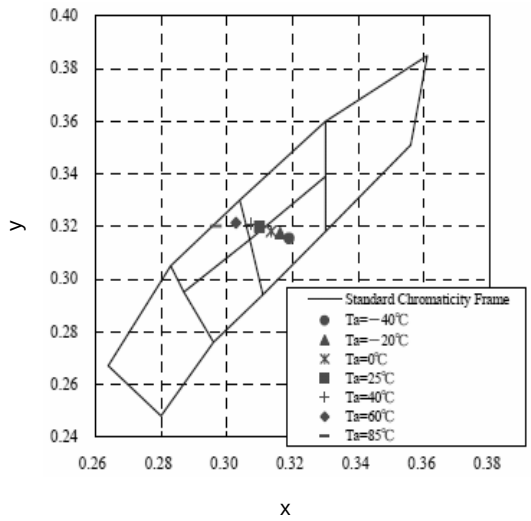
Forward Current vs. Chromaticity (typ. value)

Condition : Ta = 25℃

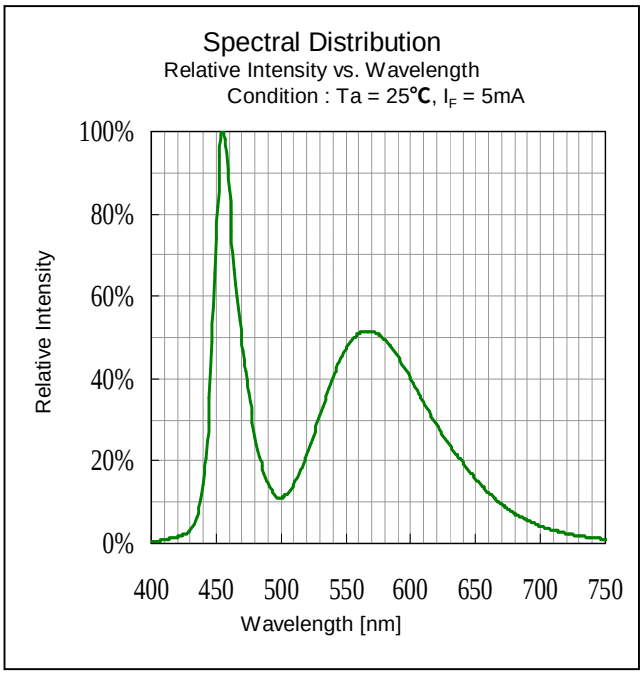


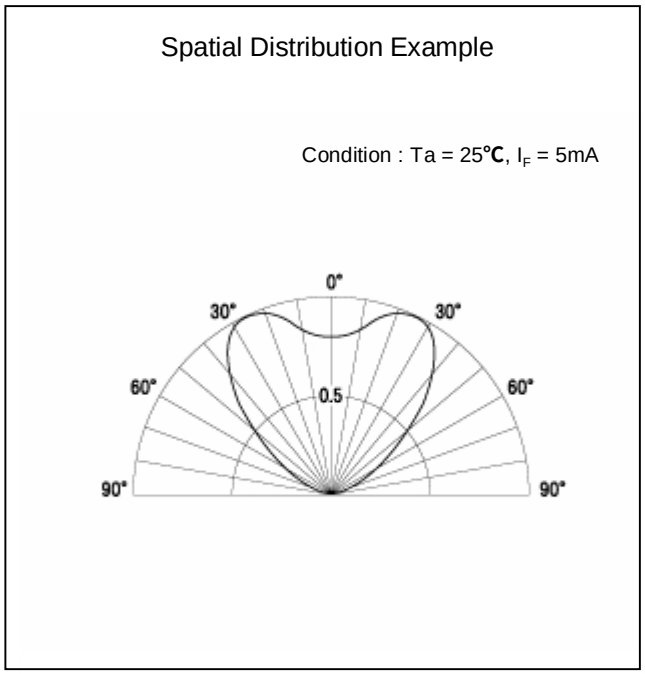
Ambient Temperature vs. Chromaticity (typ. value)

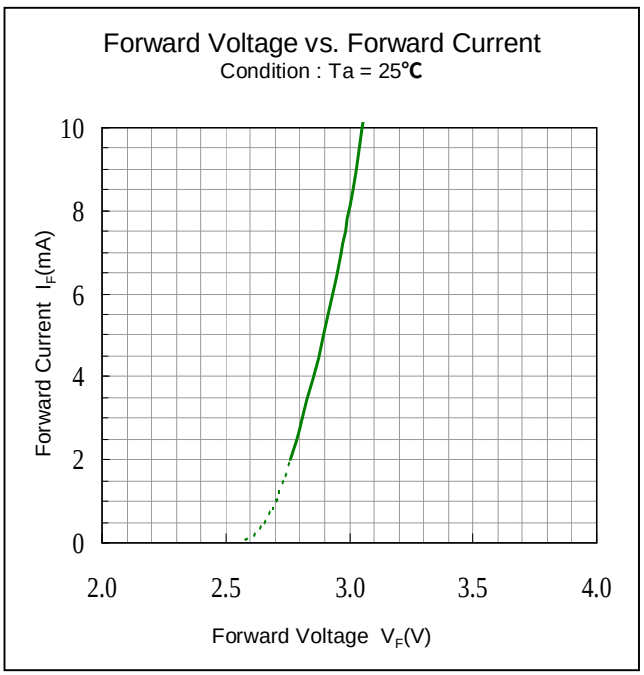
Condition : I_F = 5mA

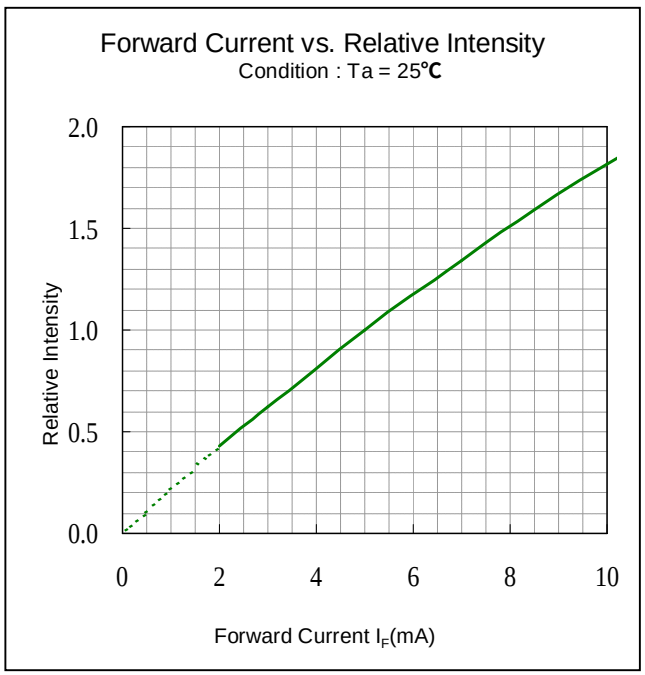


Technical Data (GSW)









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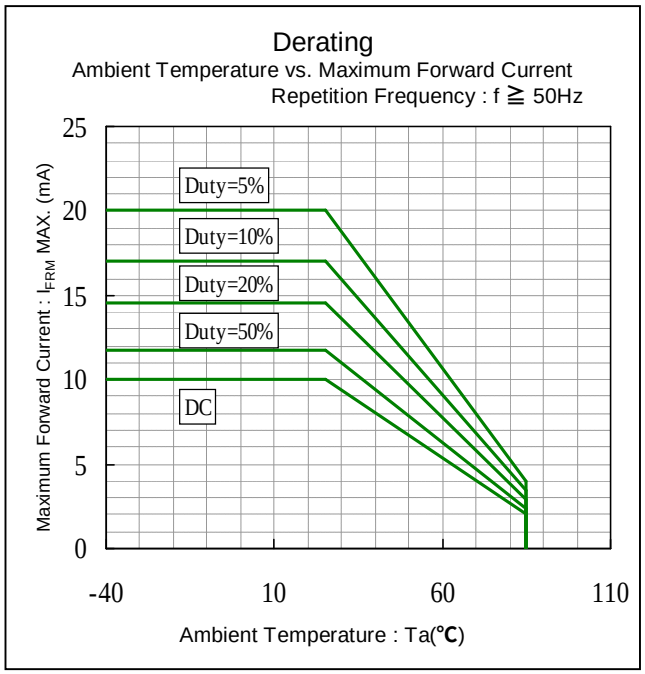
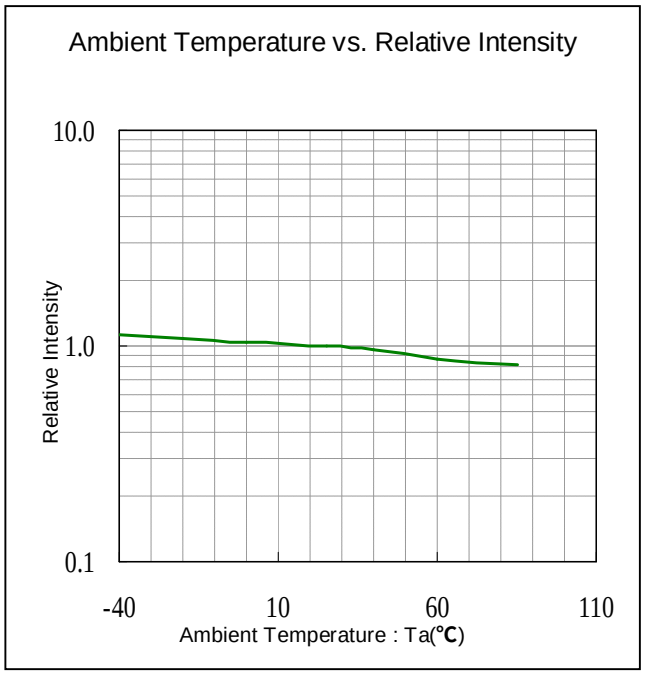
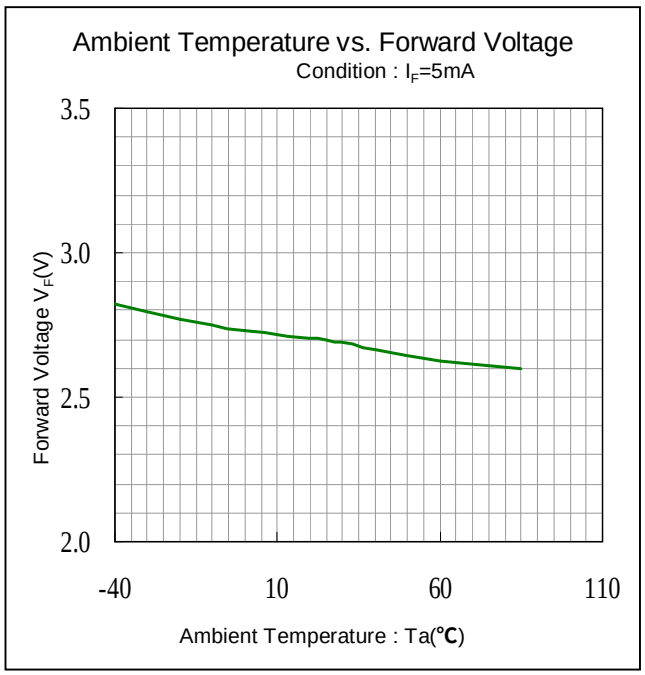
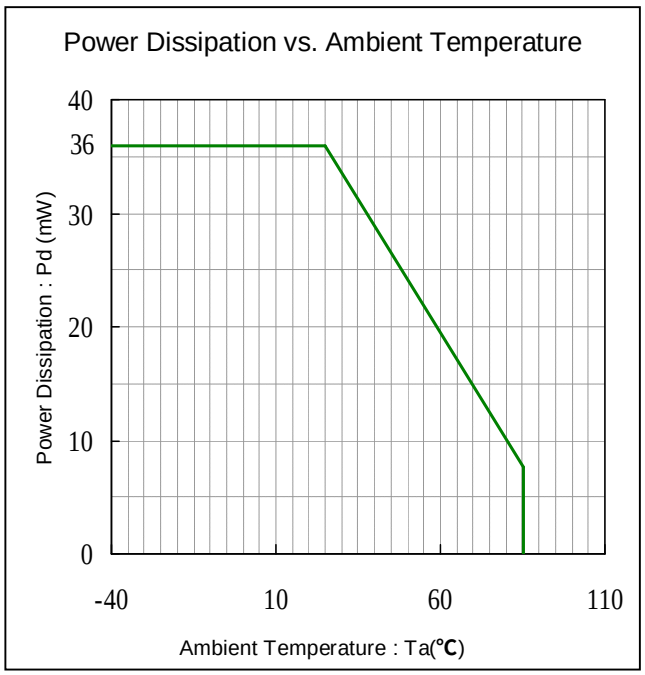
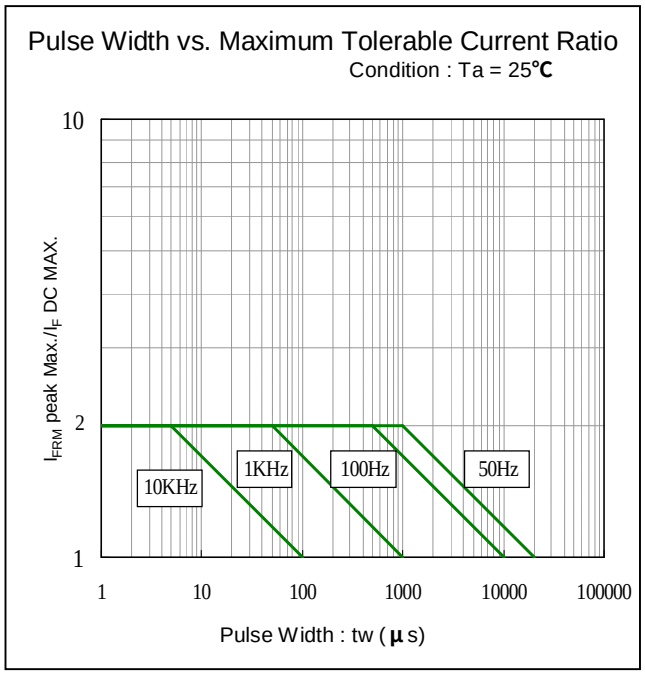


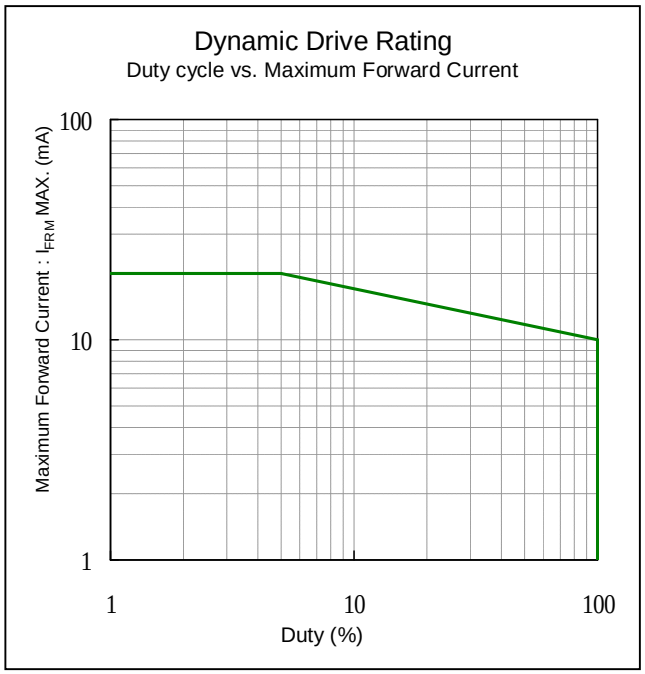


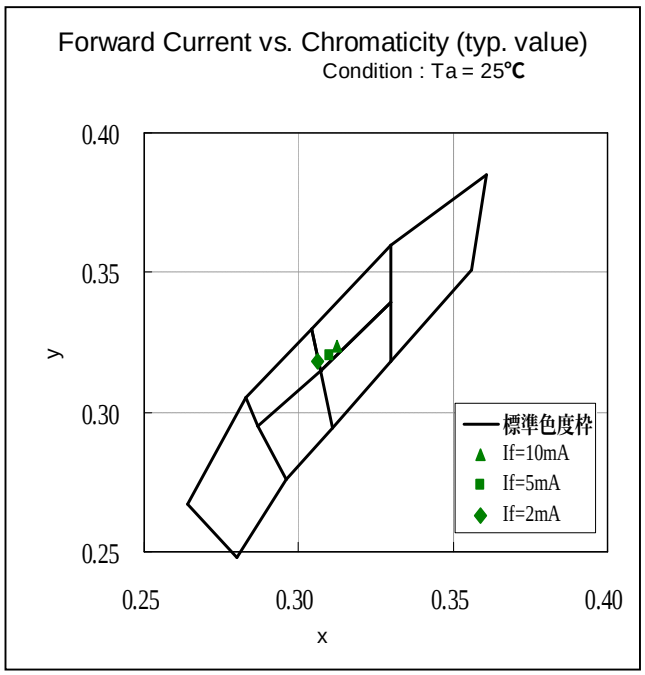


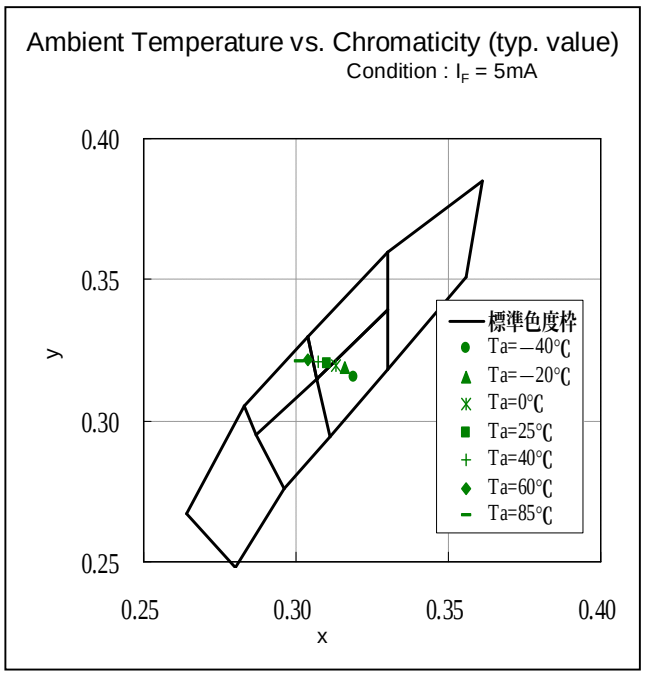


Technical Data (GSW)

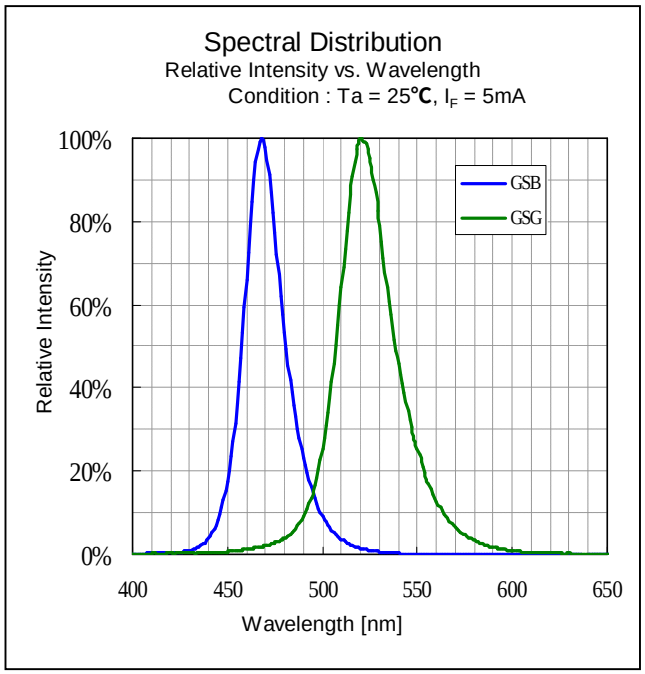


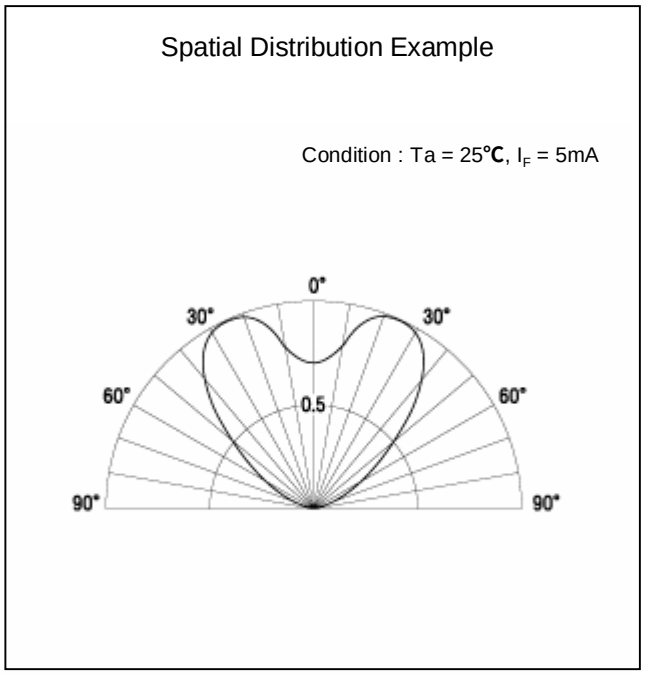


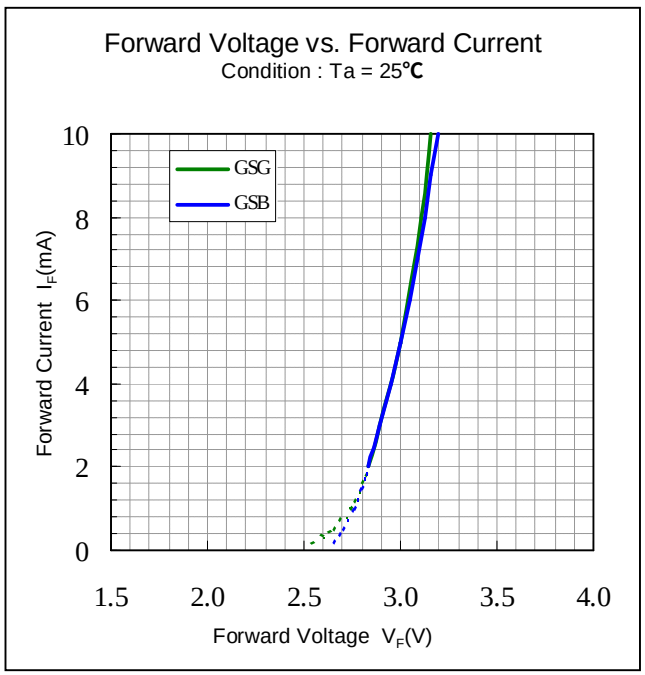


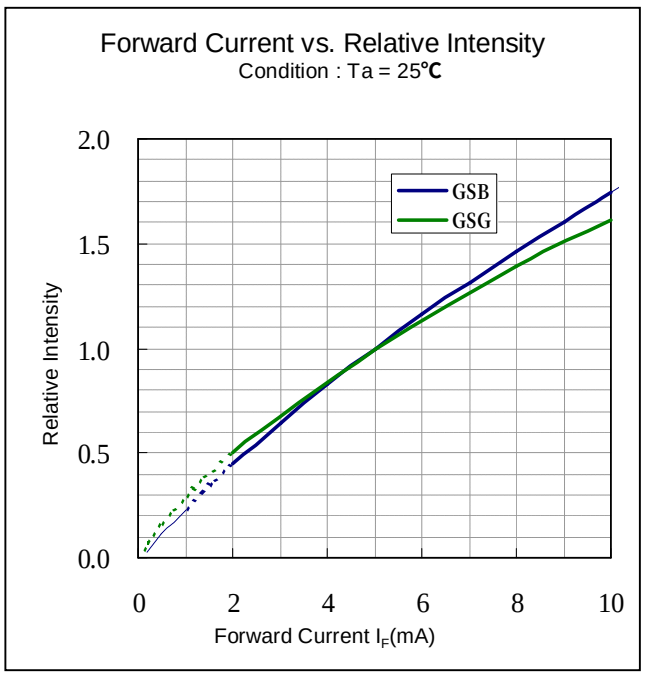


Technical Data (GSB,GSG)

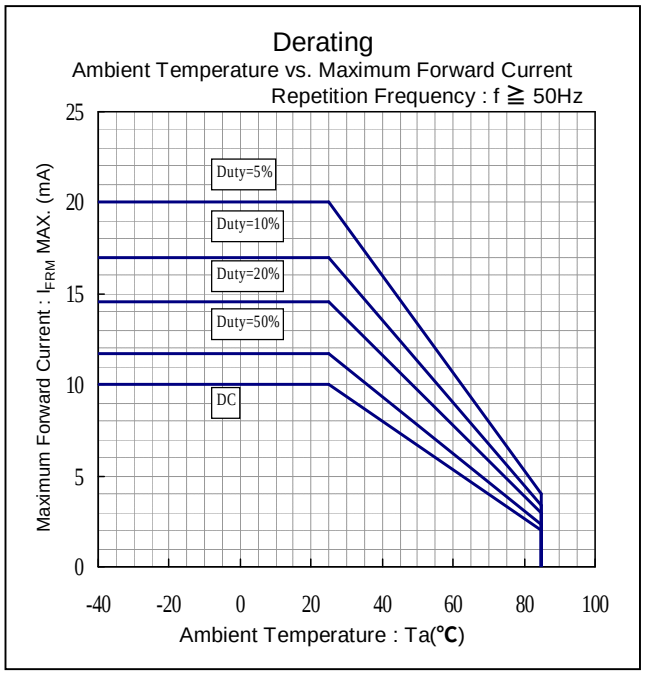


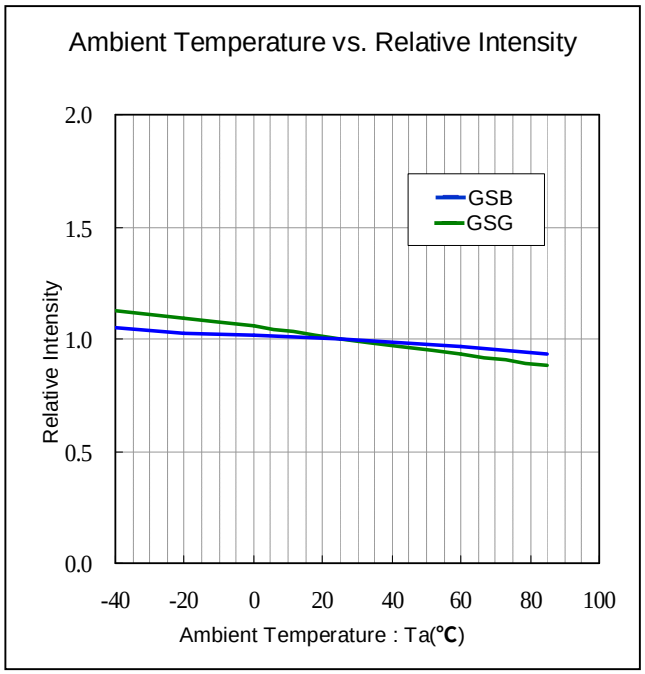


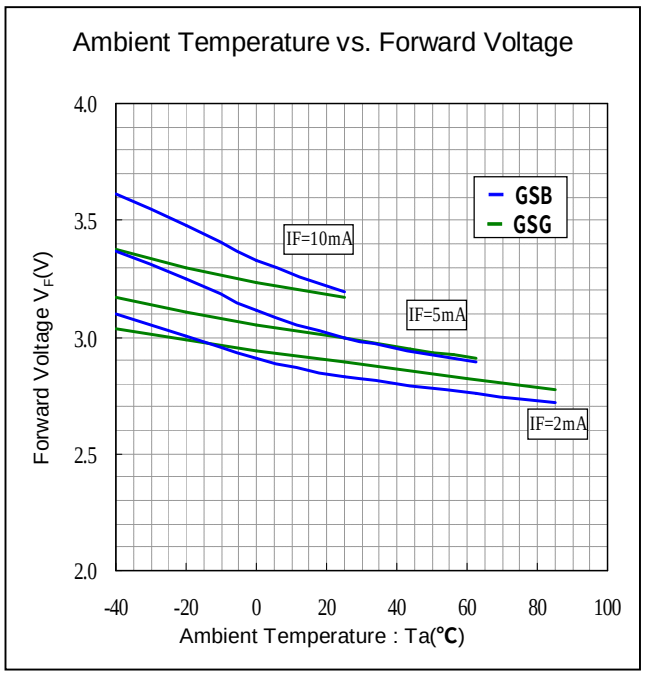


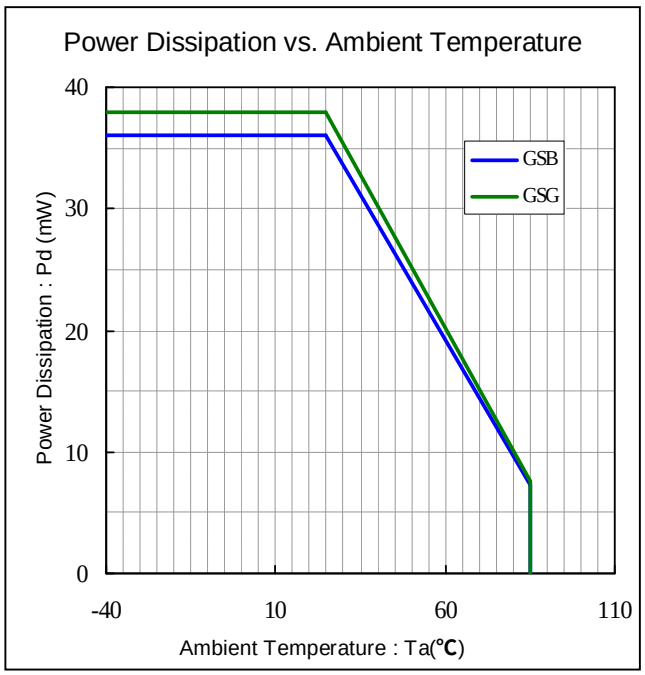


Technical Data (GSB,GSG)

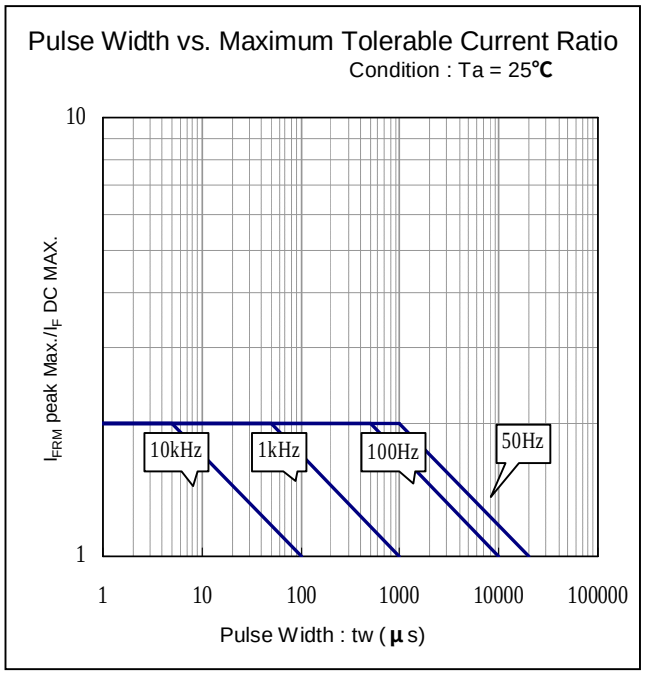


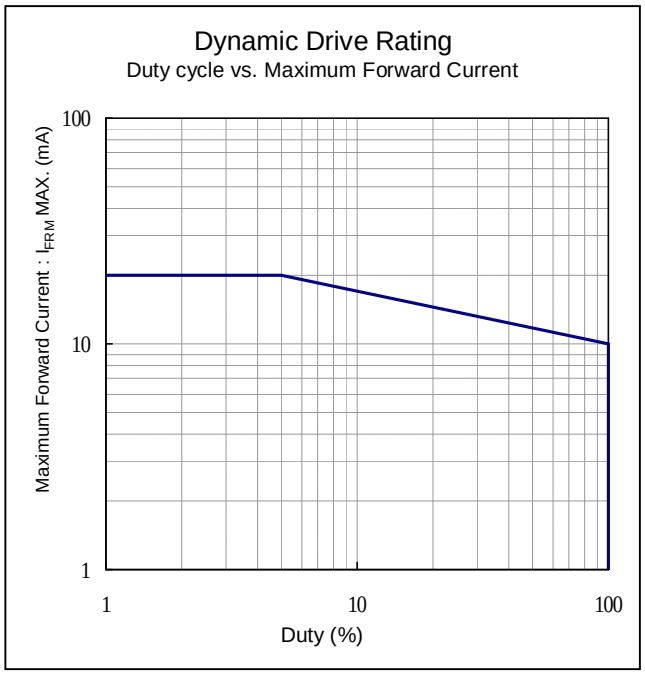


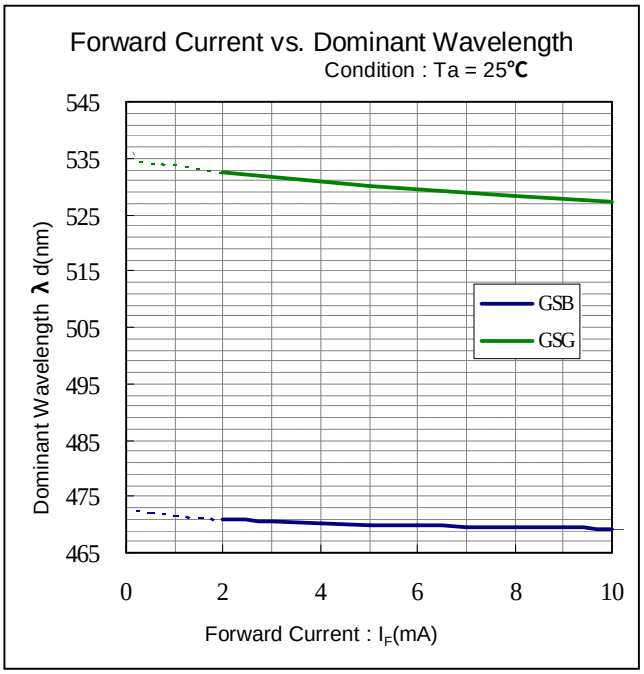


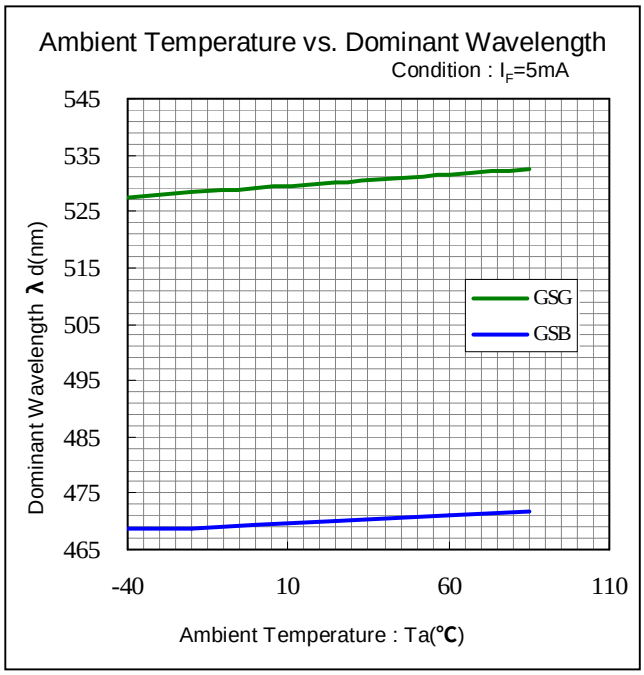


Technical Data (GSB,GSG)





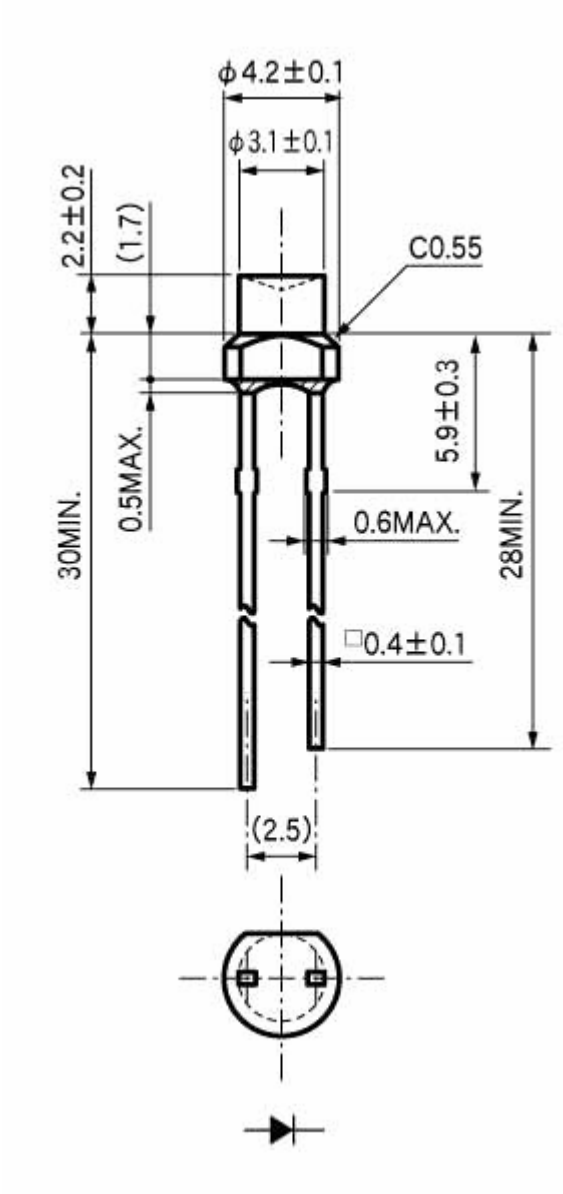




Package Dimensions

(Unit: mm)

Weight: (0.16)g



TTW (Through The Wave) soldering Conditions

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

Iron tip temp.	400℃	(MAX.)
Soldering time and frequency	3 s 2 times	(MAX.) (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	EIAJED-4701/100(101)	Ta = 25℃, I_F = Maxium Rated Current	1,000 h	0/25
Resistance to Soldering Heat	EIAJED-4701/300(302)	260±5℃, 1.6mm from package base	10s	0/25
Temperature Cycling	EIAJED-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	EIAJED-4701/100(103)	Ta = 60±2℃, RH = 90±5%	1,000 h	0/25
High Temp. Storage Life	EIAJED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/25
Low Temp. Storage Life	EIAJED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/25
Lead Tension	EIAJED-4701/400(401)	10N,1time (□0.4 and Flat Package : 5N)	10s	0/10
Vibration, Variable Frequency	EIAJED-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

Special Notice to Customers Using the Products and Technical Information Shown in This Data Sheet

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.

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).
The application of aircrafts, space borne application, transportation equipment, medical equipment and nuclear power control equipment, etc. needs a high reliability and safety, and the breakdown and the wrong operation might influence the life or the human body. Please consult us beforehand if you plan to use our product for the usages of aircrafts, space borne application, transportation equipment, medical equipment and nuclear power control equipment, etc. except OA equipment, telecommunications equipment, AV machine, home appliance and measuring instrument.

5) In order to export the products or technologies described in this data sheet which are under the "Foreign Exchange and Foreign Trade Control Law," it is necessary to first obtain an export permit from the Japanese government.

6) No part of this data sheet may be reprinted or reproduced without prior written permission from Stanley Electric Co., Ltd.

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