



**Pb-free
HEAT**

STANLEY

5066X Series

Single Color High Brightness ϕ 5 Type

Features

Package	ϕ 5 Round shape type, HBG,HPG : Pale Green Clear epoxy HPY,HAY : Pale Yellow Clear epoxy HAA : Pale Orange Clear epoxy HBR : Pale Red Clear epoxy
Product features	• Outer Dimension ϕ 5 Round shape type • Operation temperature range. Storage Temperature : $-30^{\circ}\text{C}\sim 100^{\circ}\text{C}$ Operating Temperature : $-30^{\circ}\text{C}\sim 85^{\circ}\text{C}$ • Lead-free soldering compatible • RoHS compliant
Dominant wavelength	Green : 558nm (HBG) : 567nm (HPG) Yellow Green : 572nm (HPY) Yellow : 590nm (HAY) Orange : 606nm (HAA) Red : 647nm (HBR)
Half Intensity Angle	HBG, HPG,HAY,HAA : 8 deg. HPY : 10 deg. HBR : 6 deg.
Die materials	HBG,HPG,HPY : GaP HAY,HAA : GaAsP HBR : GaAlAs
Rank grouping parameter	Sorted by luminous intensity per rank taping
Soldering methods	TTW (Through The Wave) soldering and manual soldering
ESD	More than 2kV(HBM)
Packing	Bulk : 200pcs(MIN.)

Recommended Applications

Amusement Equipment, Electric Household Appliances, OA/FA, Other General Applications

Color and Luminous Intensity

(Ta=25°C)

Part No.	Material	Emitted Color	Lens Color		Dominant Wavelength λ_d (nm)		Luminous Intensity I_v (mcd)		
					TYP.	I_F	MIN.	TYP.	I_F
HBG5066X	GaP	Green	Pale Green	Clear	558	20	100	150	20
HPG5066X	GaP	Green	Green		567	20	150	200	20
HPY5066X	GaP	Yellow Green	Pale Yellow		572	20	200	300	20
HAY5066X	GaAsP	Yellow	Yellow		590	20	100	150	20
HAA5066X	GaAsP	Orange	Pale Orange		606	20	160	250	20
HBR5066X	GaAlAs	Red	Pale Red		647	20	200	300	20

Absolute Maximum Ratings

(Ta=25°C)

Item	Symbol	Absolute Maximum Ratings						Unit
		HBC	HPG	HPY	HAY	HAA	HBR	
Power Dissipation	P_d	125	125	125	125	125	100	mW
Forward Current	I_F	50	50	50	50	50	50	mA
Pulse Forward Current ※1	I_{FRM}	100	100	100	100	100	300	mA
Derating (Ta=25°C or higher)	ΔI_F	0.67	0.67	0.67	0.67	0.67	0.67	mA/°C
Reverse Voltage	V_R	4	4	4	4	4	4	V
Operating Temperature	T_{opr}	-30~+85						°C
Storage Temperature	T_{stg}	-30~+100						°C

※1 I_{FRM} Measurement condition : Pulse Width ≤ 1 ms., Duty $\leq 1/20$.

Electro-Optical Characteristics

(Ta=25°C)

Item	Conditions	Symbol	Characteristics							Unit
				HBG	HPG	HPY	HAY	HAA	HBR	
Forward Voltage	$I_F=20\text{mA}$	V_F	TYP.	2.1	2.1	2.1	2.2	2.2	1.7	V
			MAX.	2.5	2.5	2.5	2.5	2.5	2.0	
Reverse Current	$V_R=4\text{V}$	I_R	MAX.	20	20	20	20	20	100	μA
Peak Wavelength	$I_F=20\text{mA}$	λ_p	TYP.	555	560	570	580	605	660	nm
Dominant Wavelength	$I_F=20\text{mA}$	λ_d	TYP.	558	567	572	590	606	647	nm
Spectral Line Half Width	$I_F=20\text{mA}$	$\Delta\lambda$	TYP.	30	30	30	30	30	30	nm
Half Intensity Angle	$I_F=20\text{mA}$	$2\theta_{1/2}$	TYP.	8	8	10	8	8	6	deg.

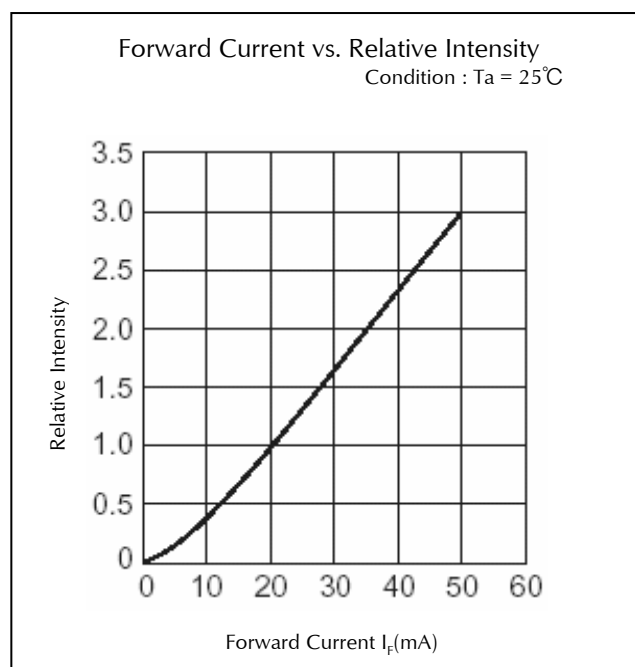
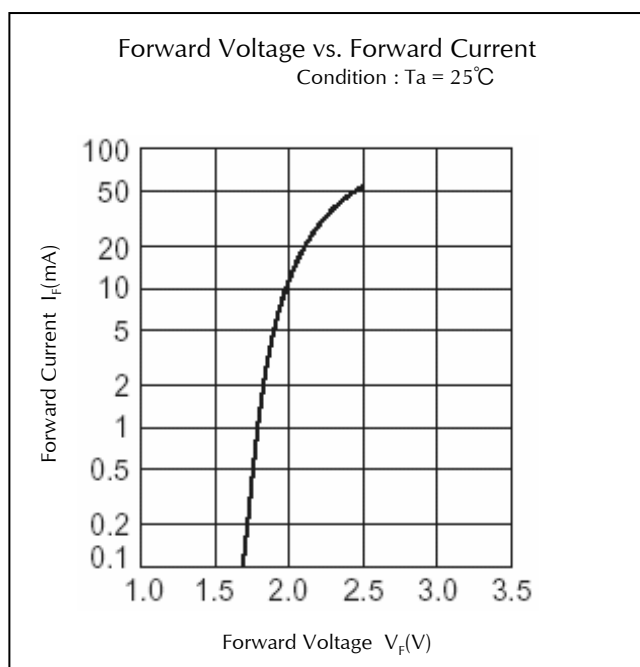
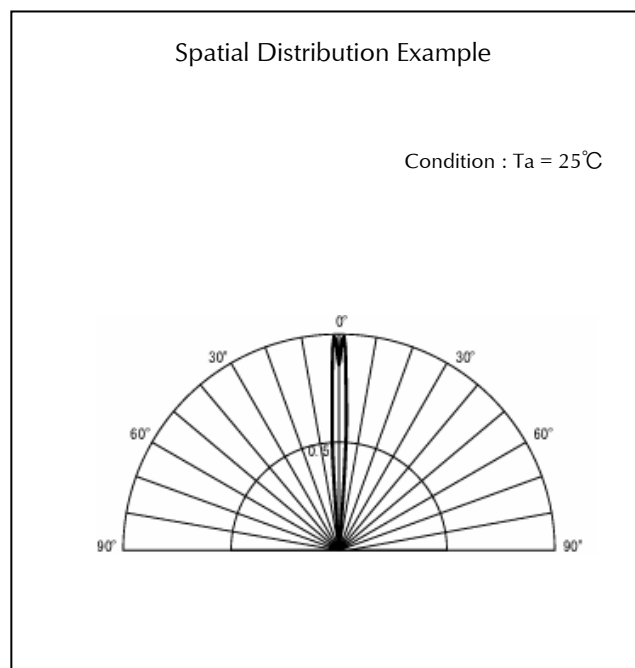
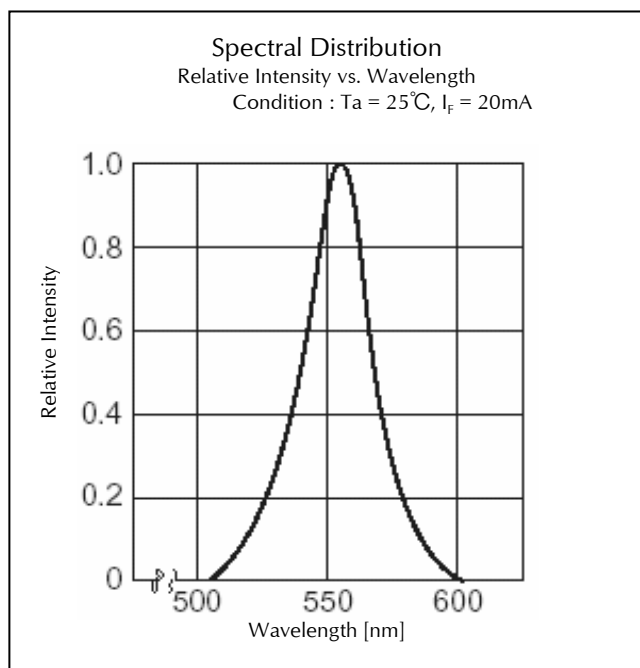
Luminous Intensity Rank

(Ta=25°C)

Rank	I_v (mcd)											
	HBG		HPG		HPY		HAY		HAA		HBR	
	$I_F=20mA$		$I_F=20mA$		$I_F=20mA$		$I_F=20mA$		$I_F=20mA$		$I_F=20mA$	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A	100	200	150	300	200	400	100	200	160	320	200	400
B	140	280	210	420	280	560	140	280	224	448	280	560
C	200	400	300	600	400	800	200	400	320	640	400	800
D	280	560	420	840	560	1120	280	560	448	896	560	1120
E	400	-	600	-	800	-	400	-	640	-	800	1600

※Please contact our sales staff concerning rank designation.

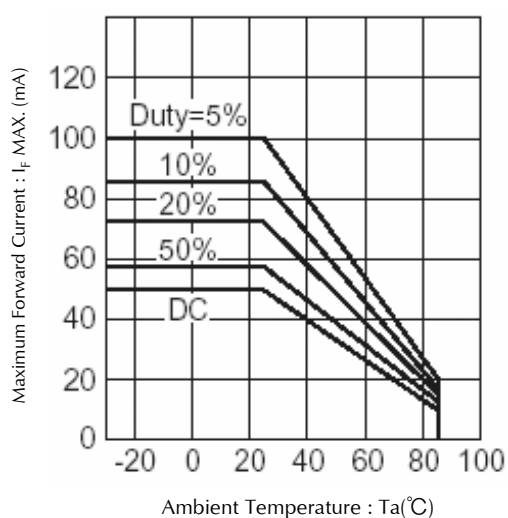
Technical Data(HBG)



Technical Data(HBG)

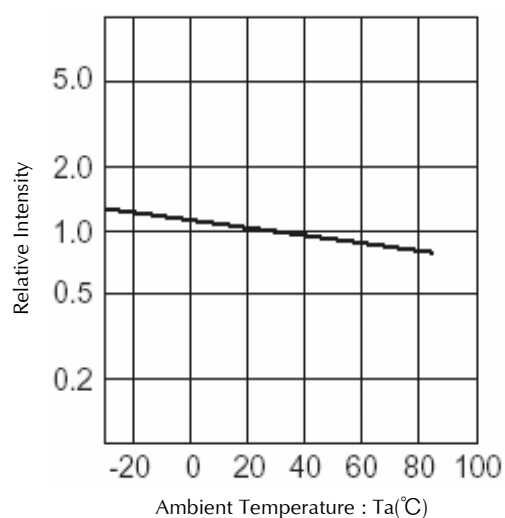
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 50\text{Hz}$

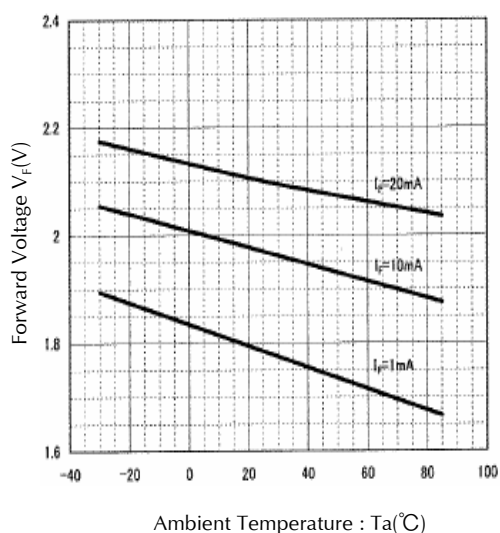


Ambient Temperature vs. Relative Intensity

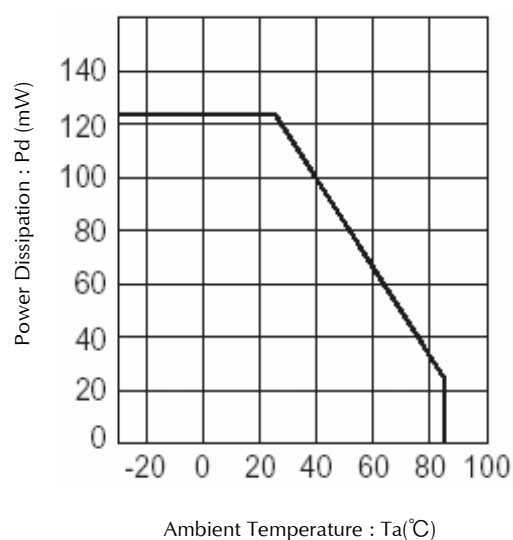
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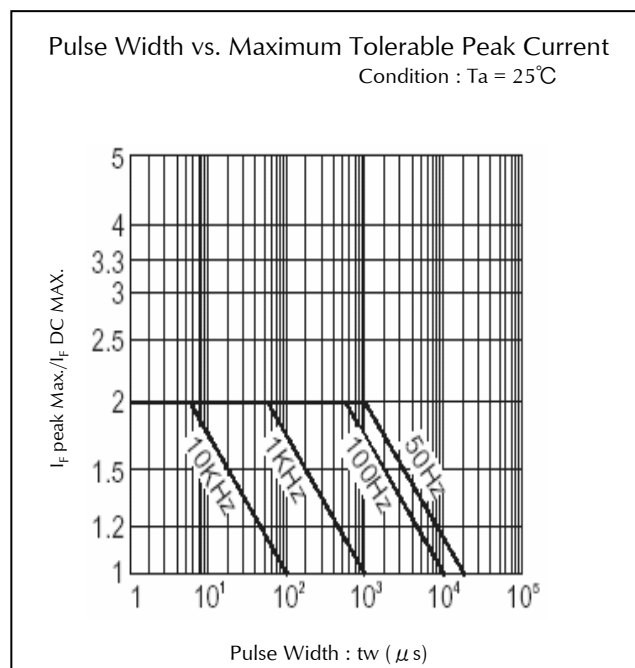
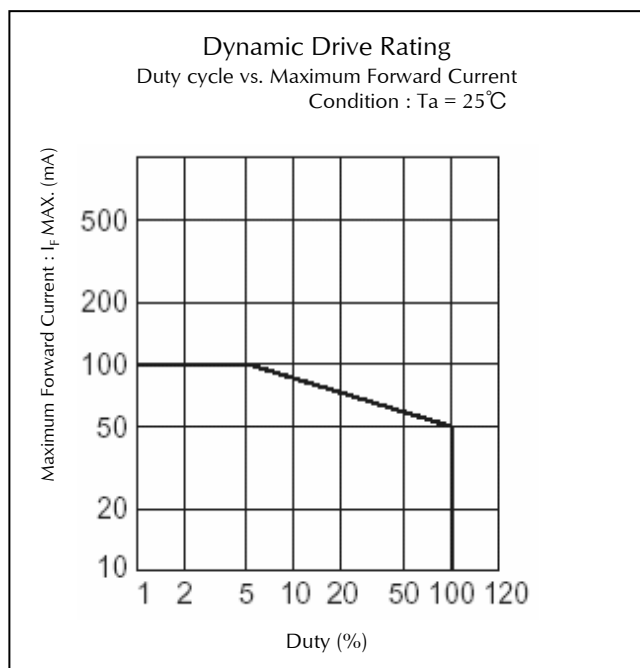
Ambient Temperature vs. Forward Voltage



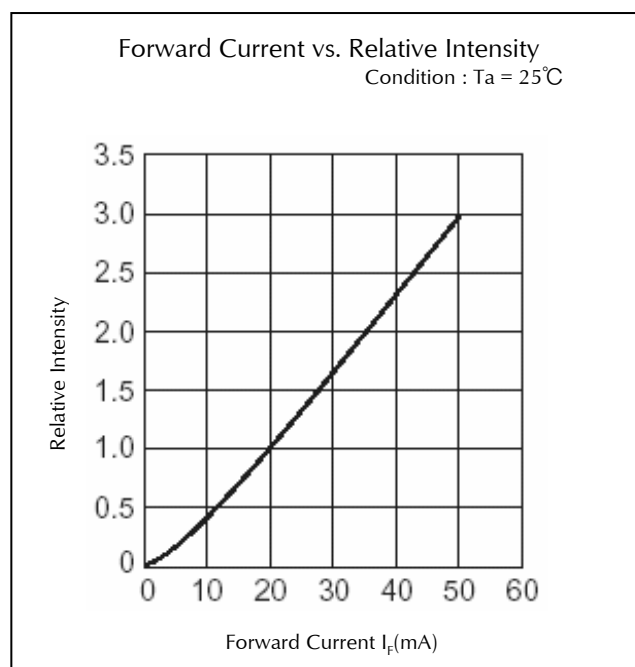
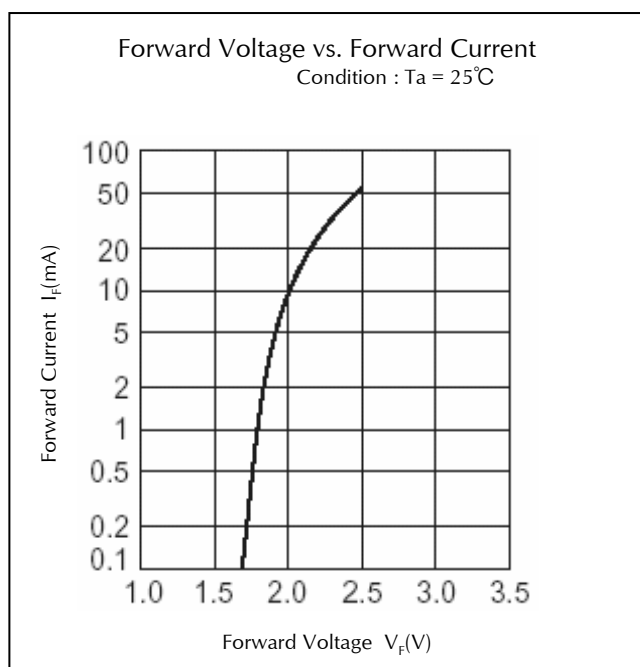
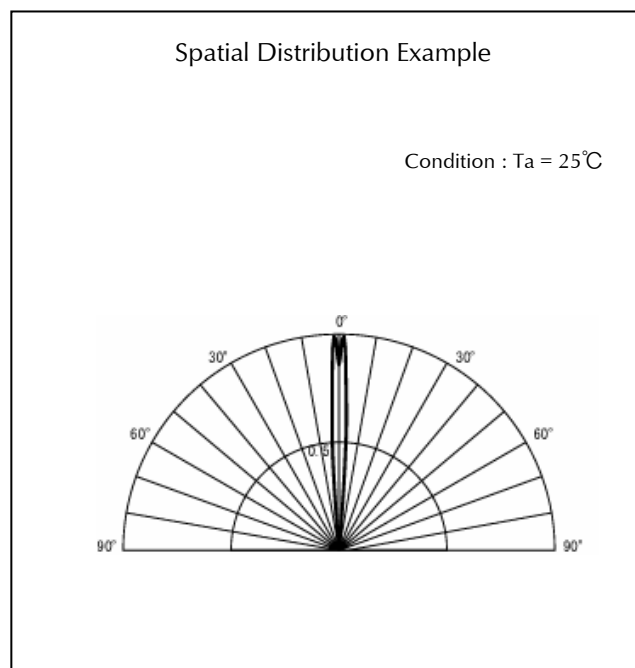
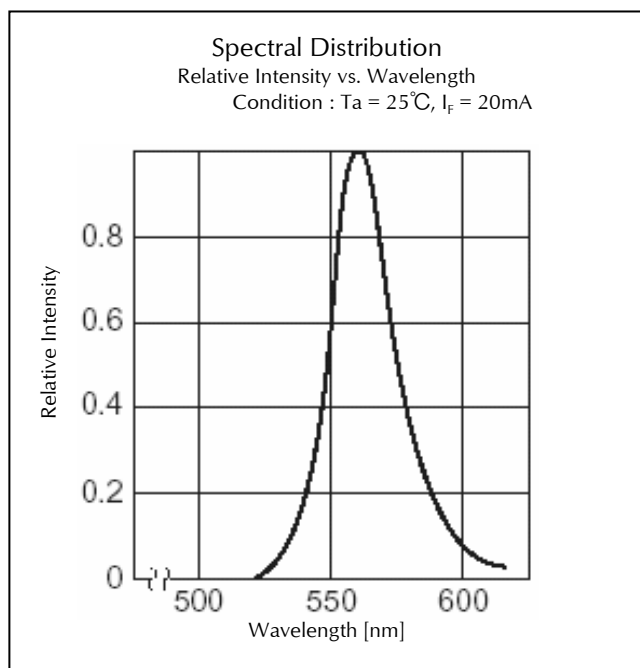
Power Dissipation vs. Ambient Temperature



Technical Data(HBG)



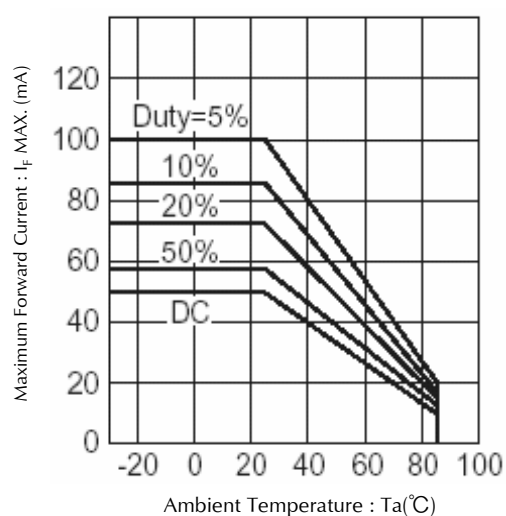
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Technical Data(HPG)

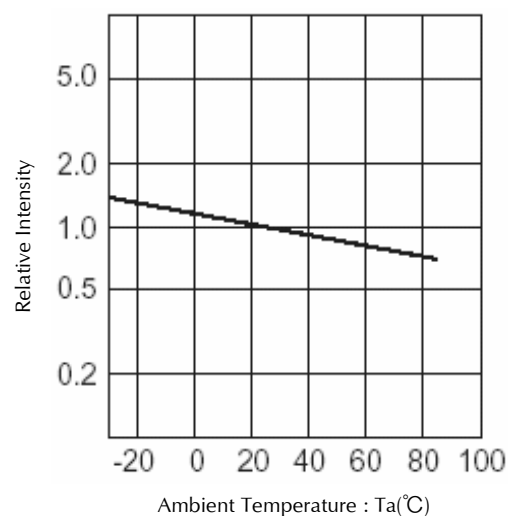
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 50\text{Hz}$

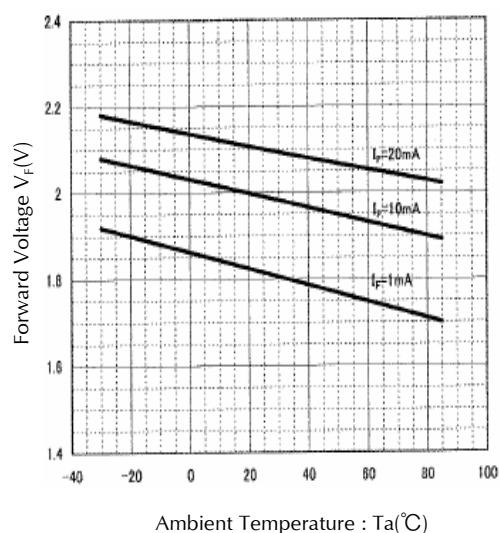


Ambient Temperature vs. Relative Intensity

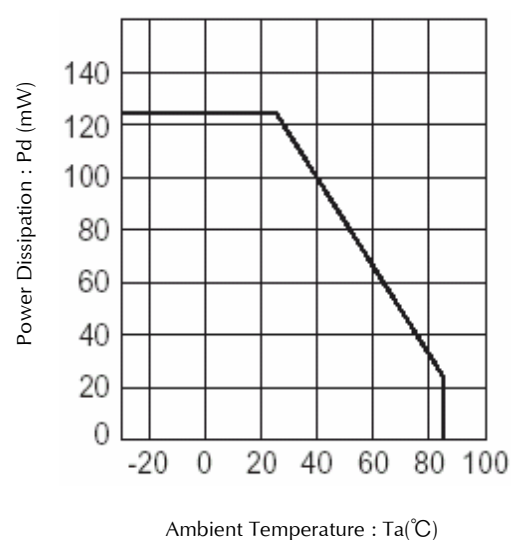
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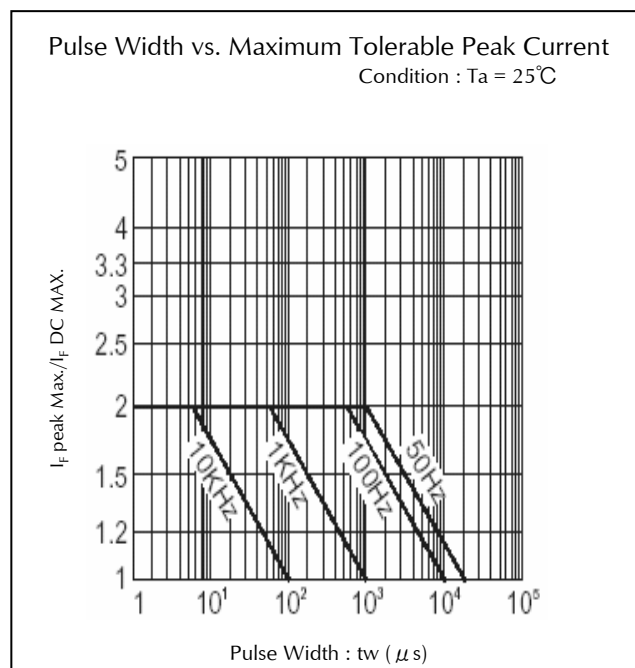
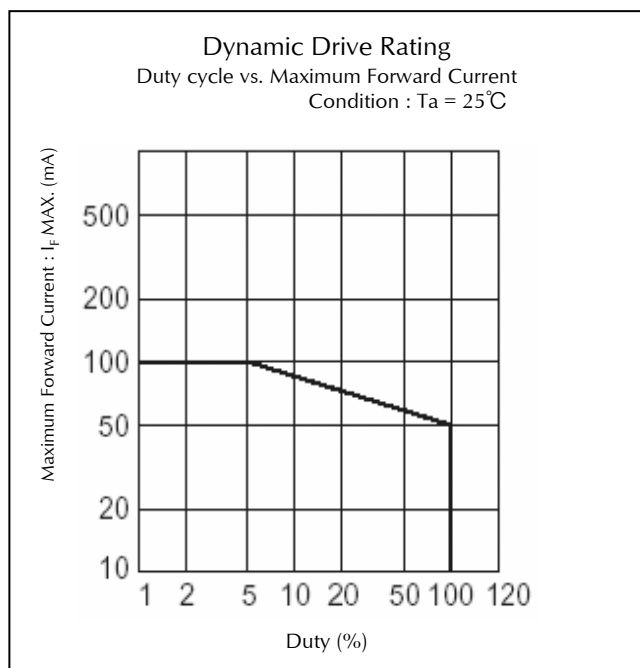
Ambient Temperature vs. Forward Voltage



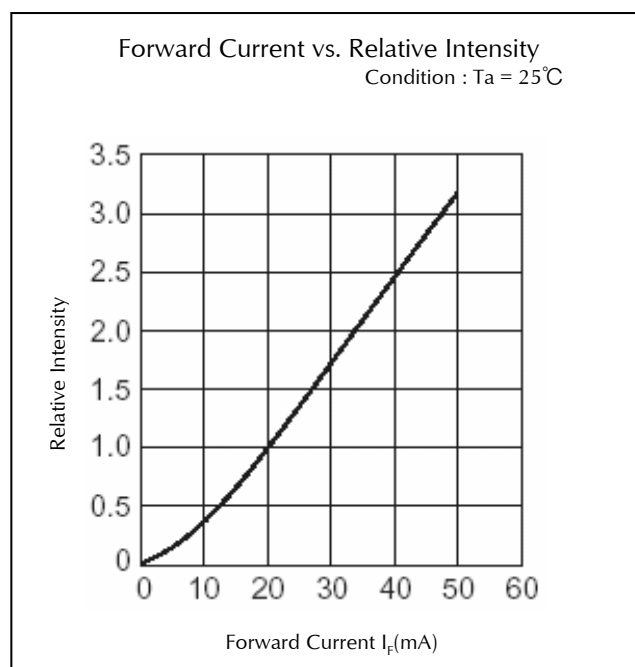
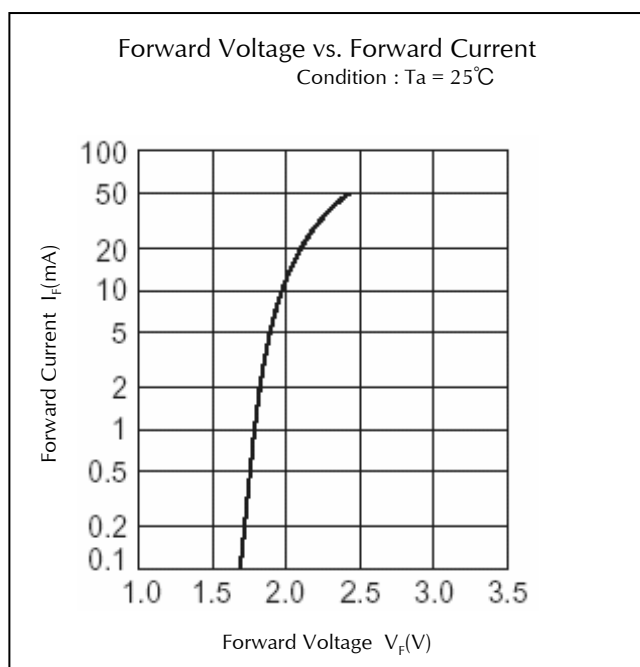
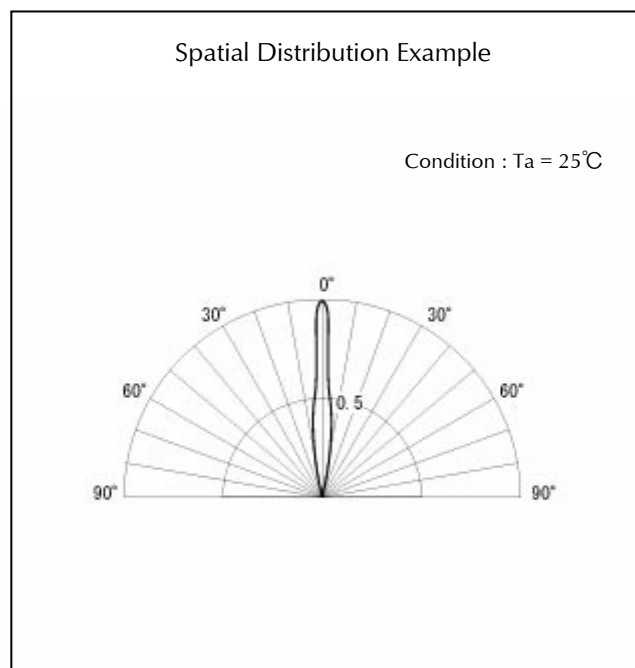
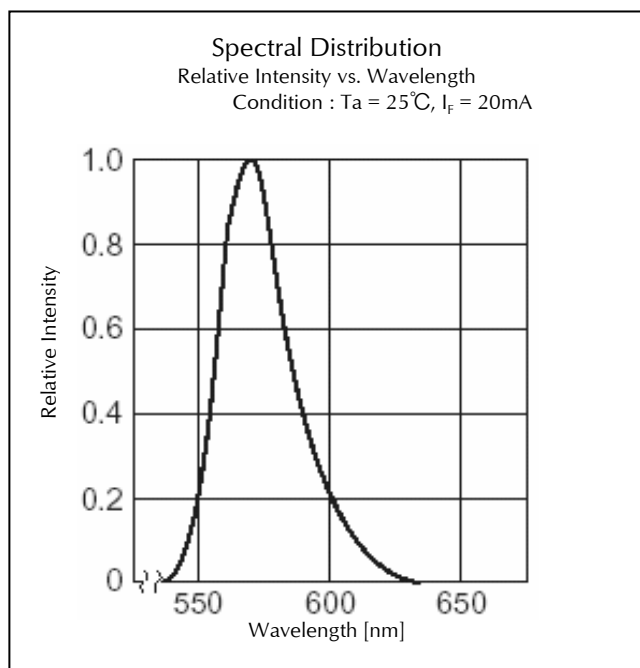
Power Dissipation vs. Ambient Temperature



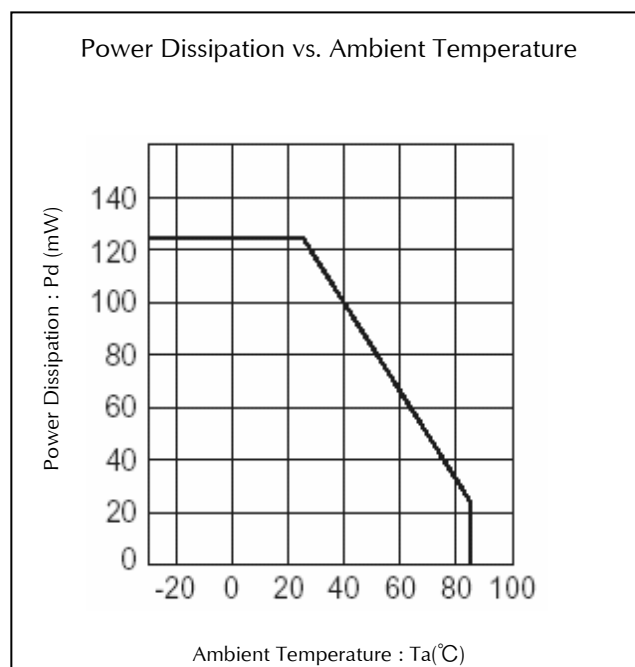
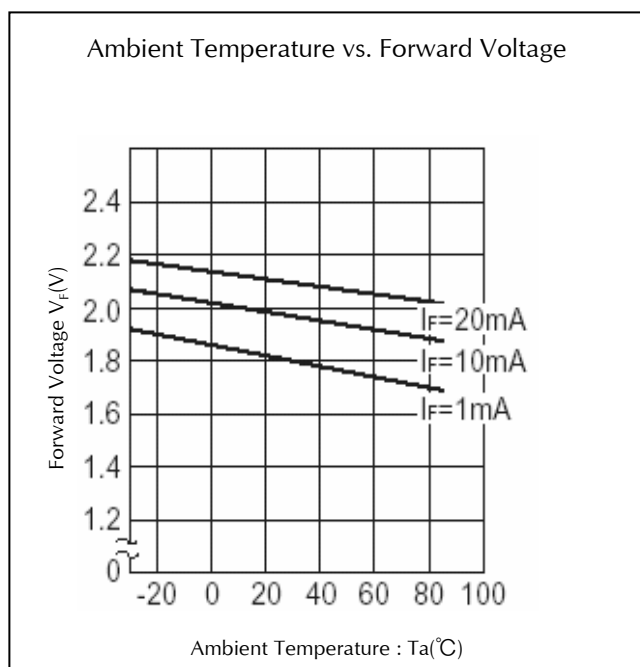
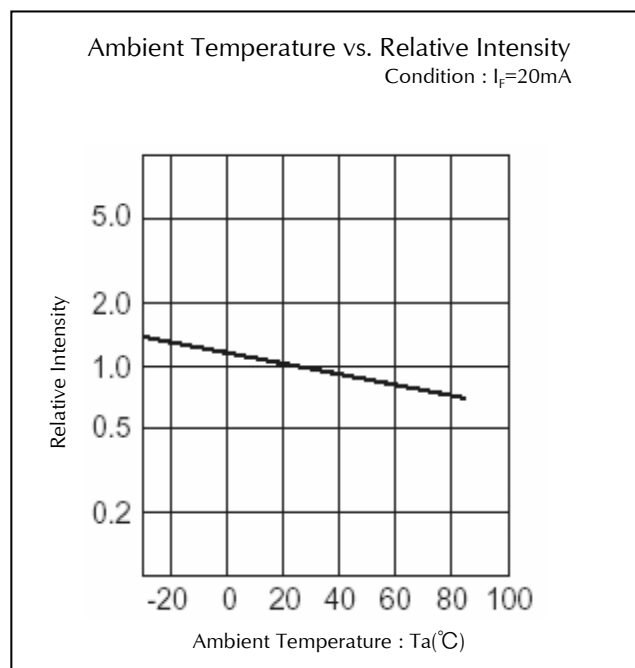
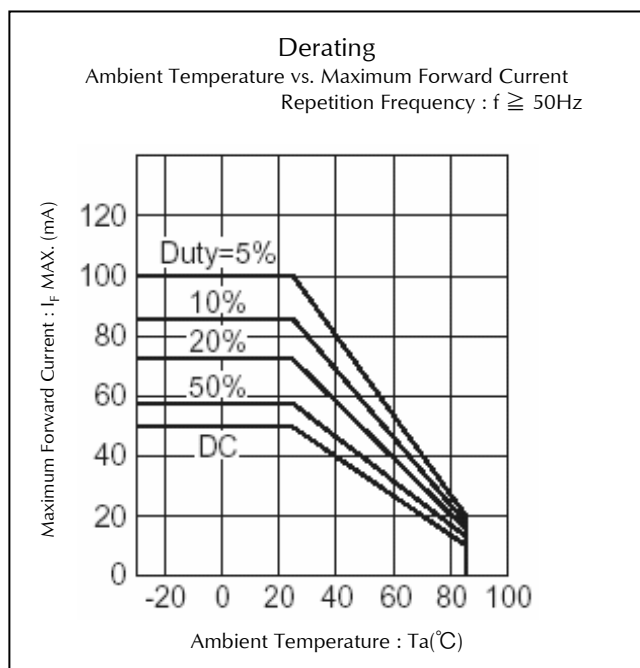
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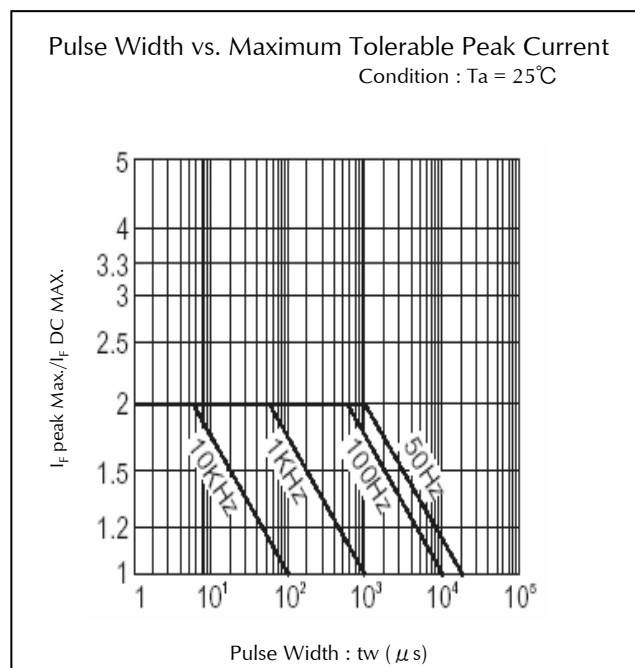
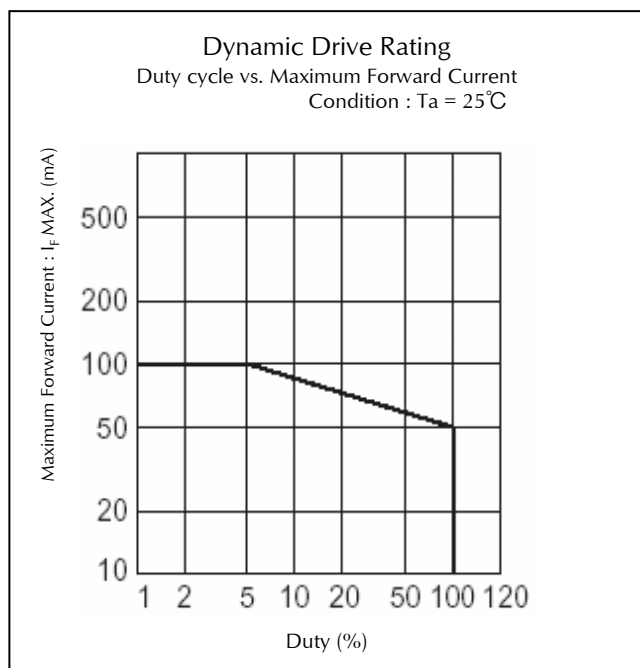
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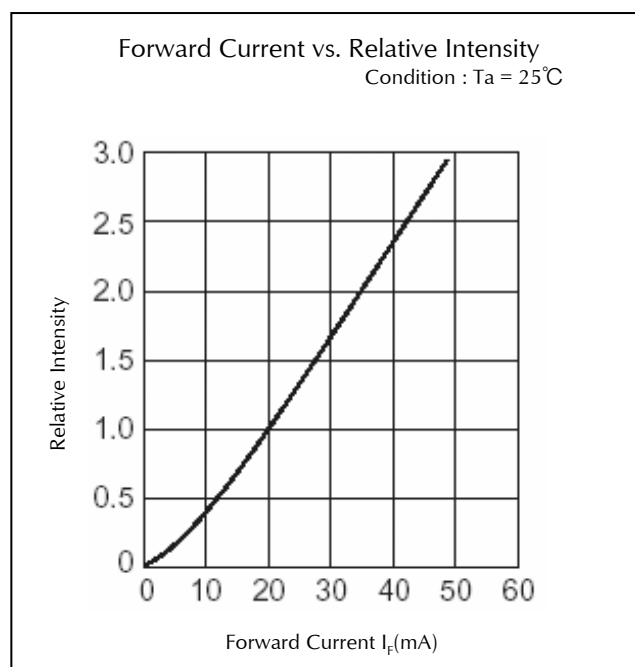
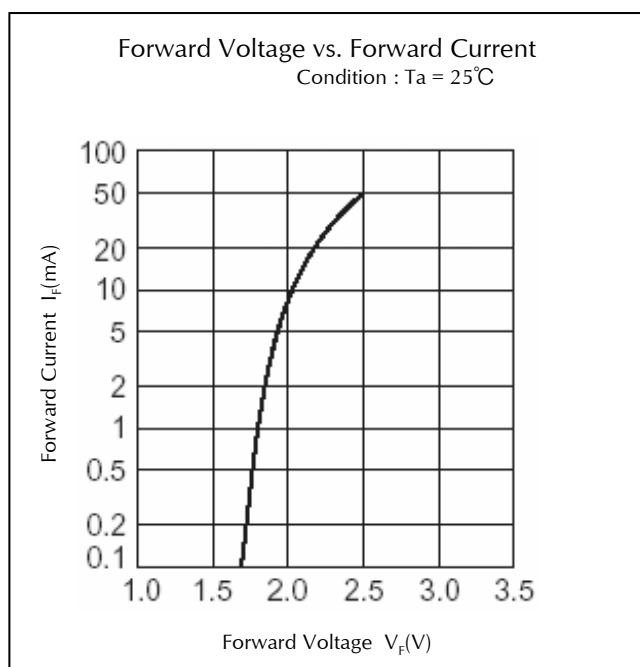
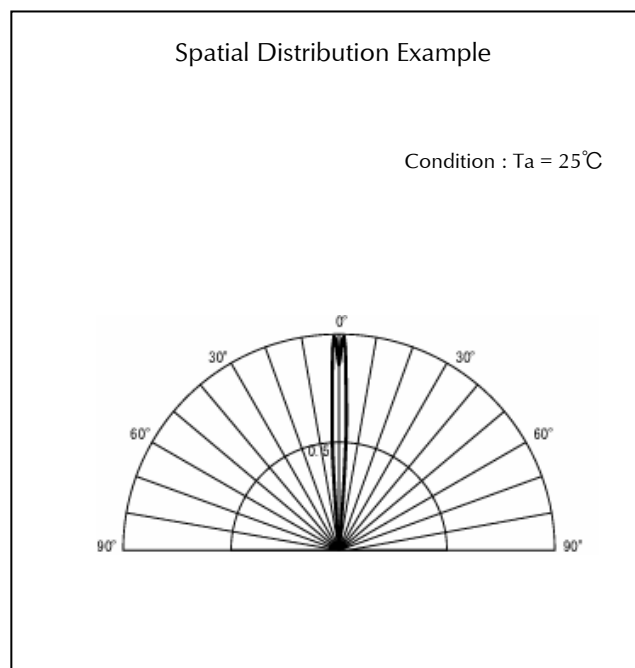
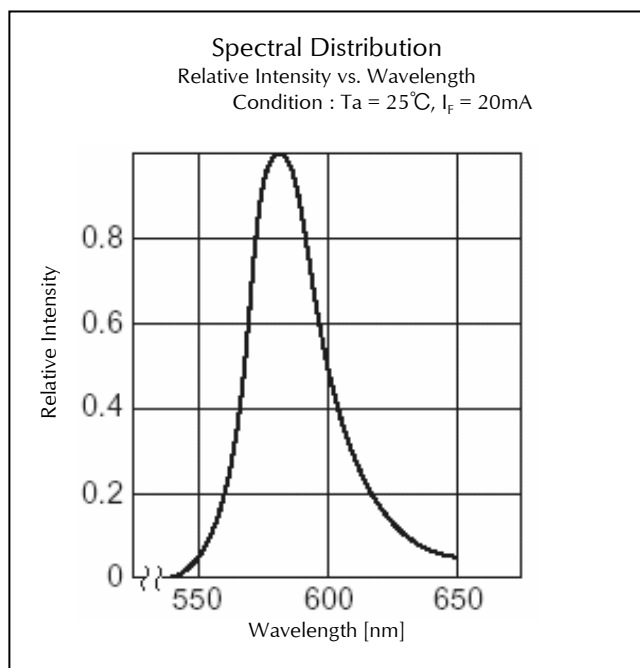
Technical Data(HPY)



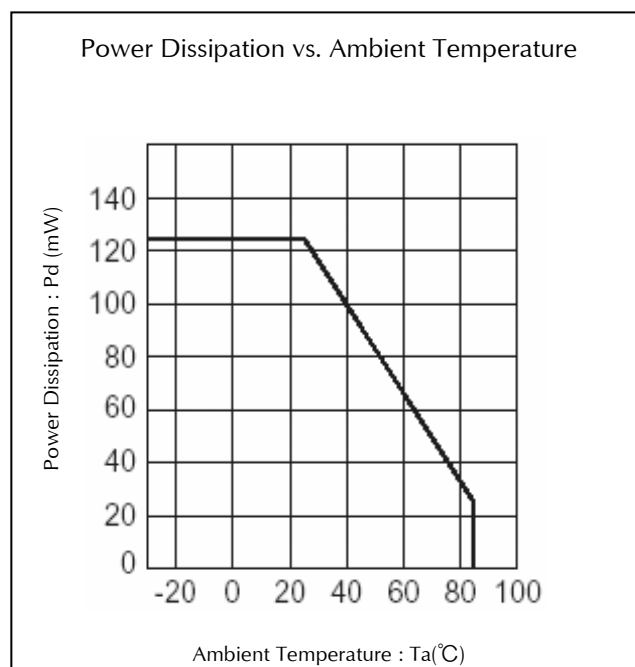
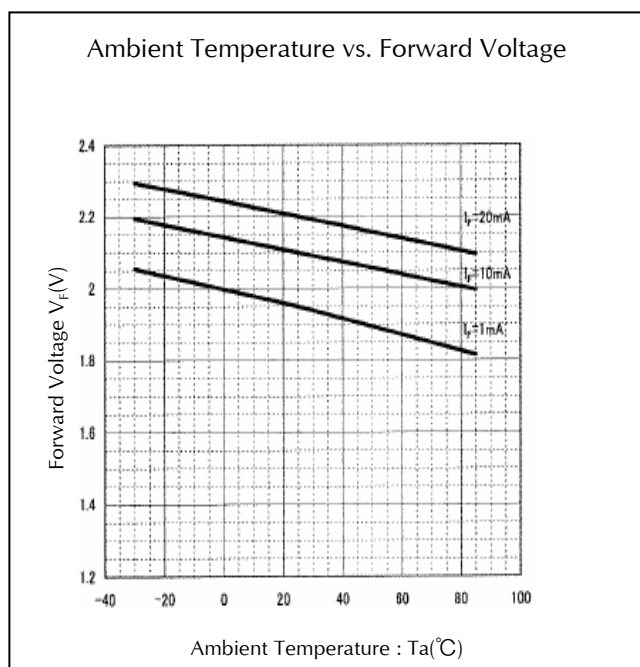
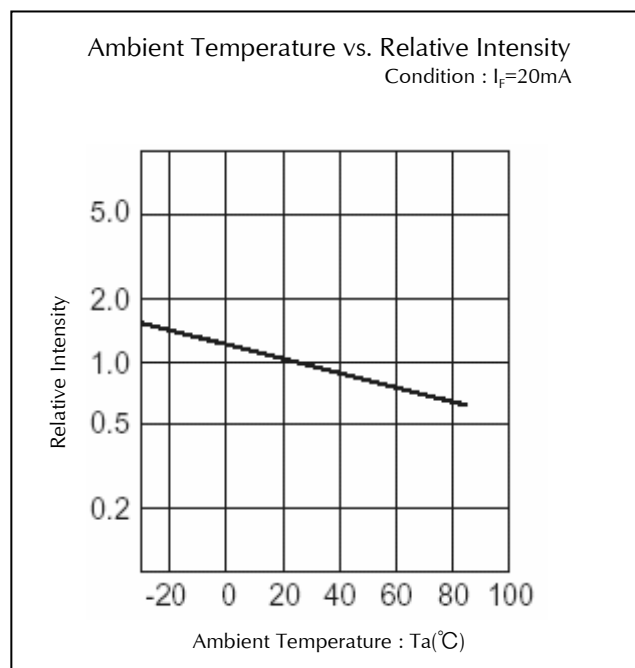
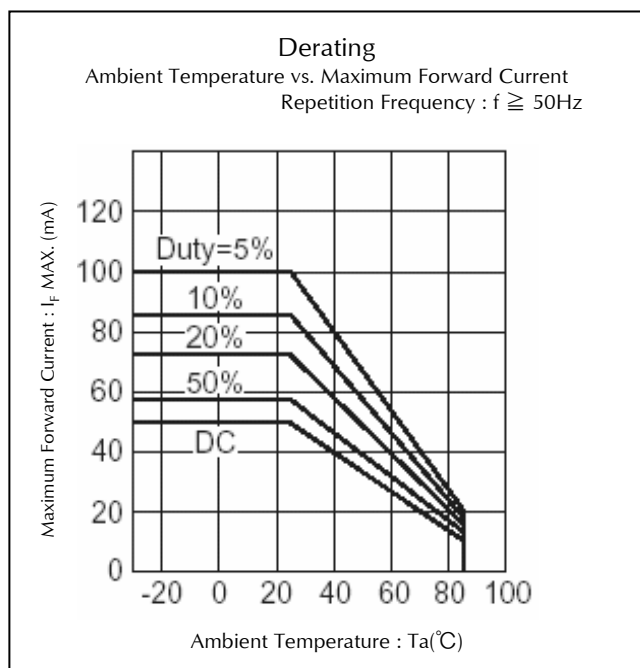
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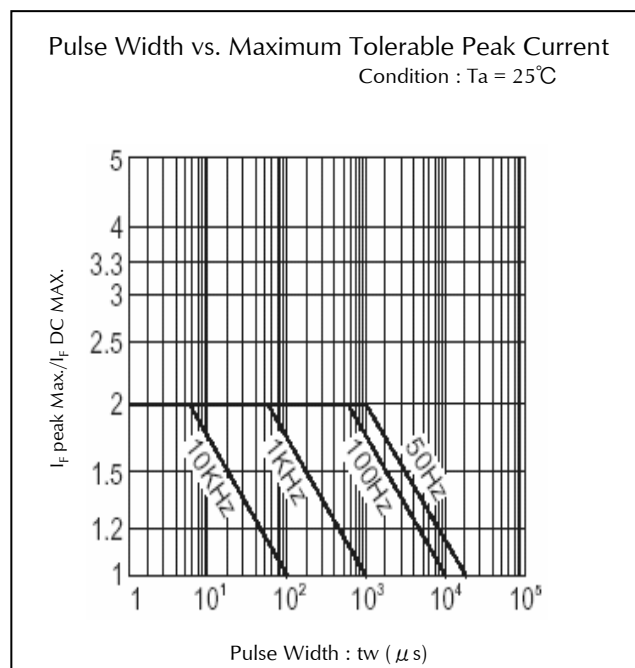
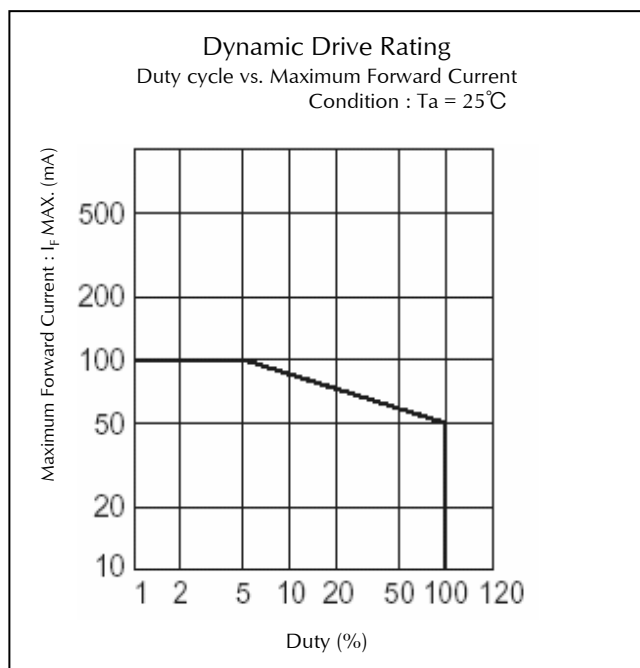
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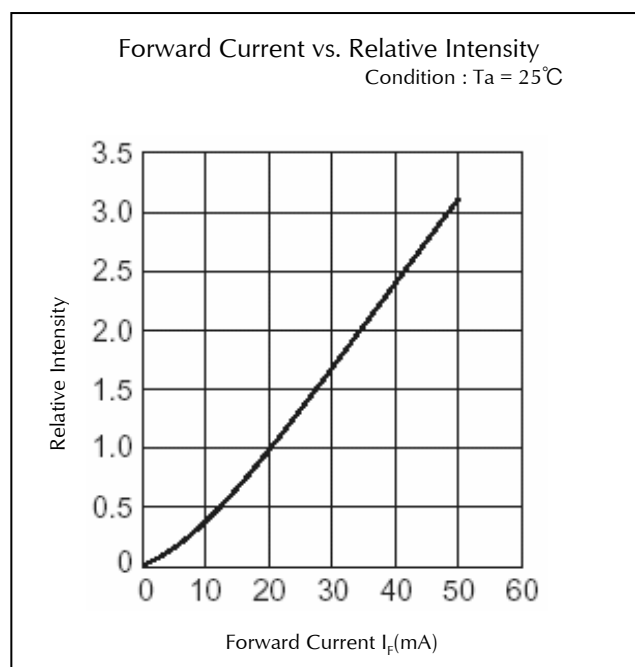
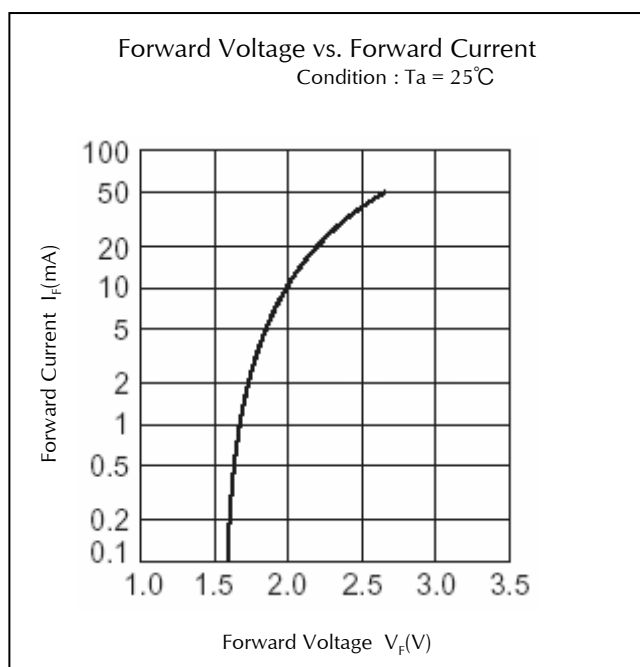
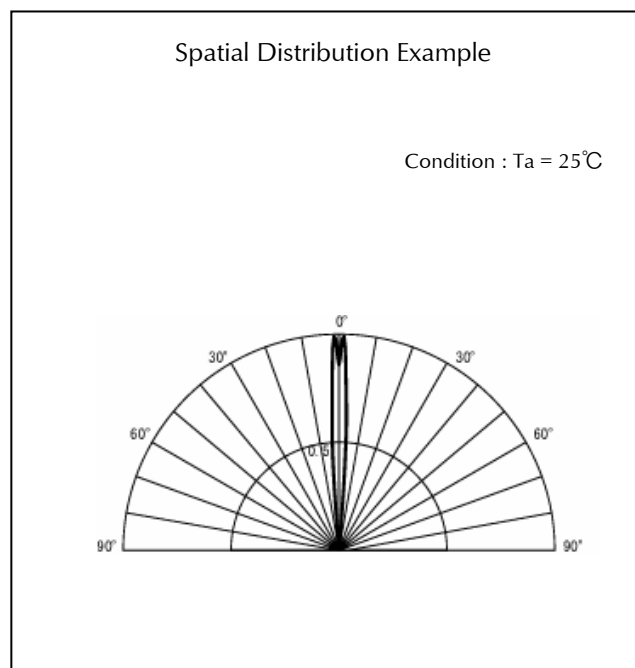
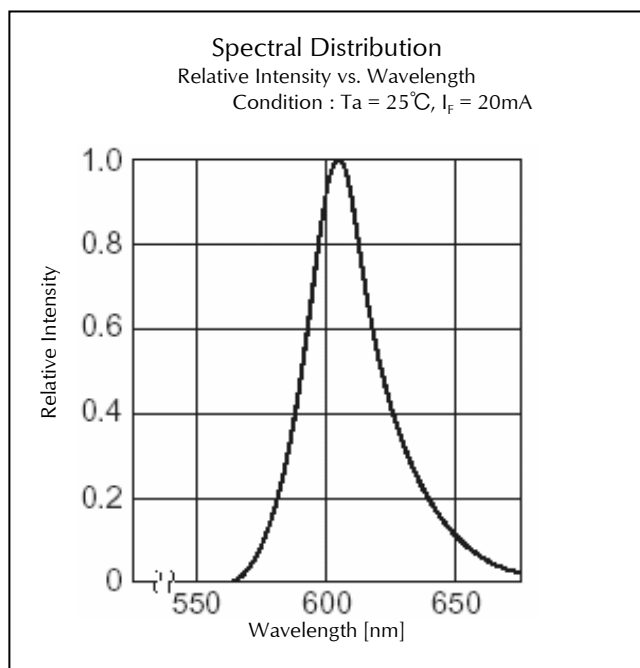
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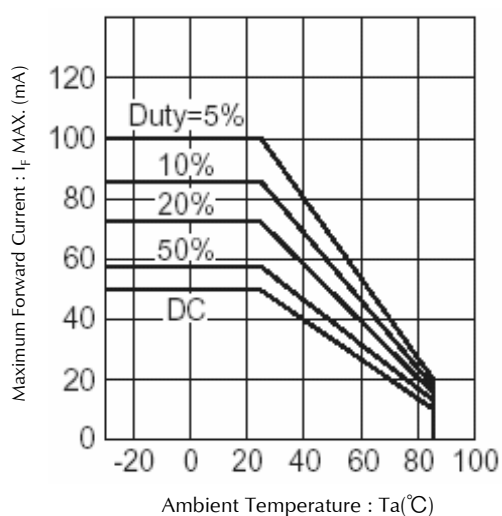
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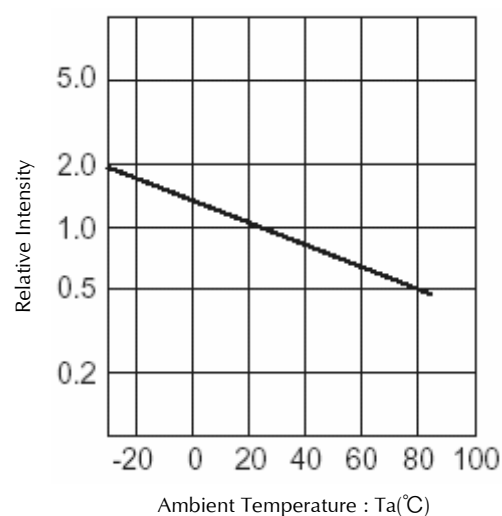
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 50\text{Hz}$

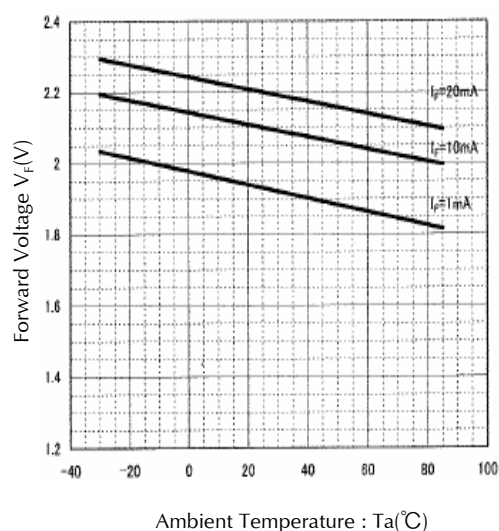


Ambient Temperature vs. Relative Intensity

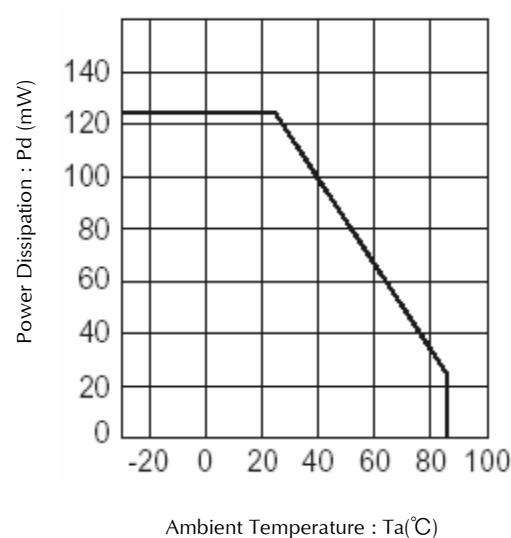
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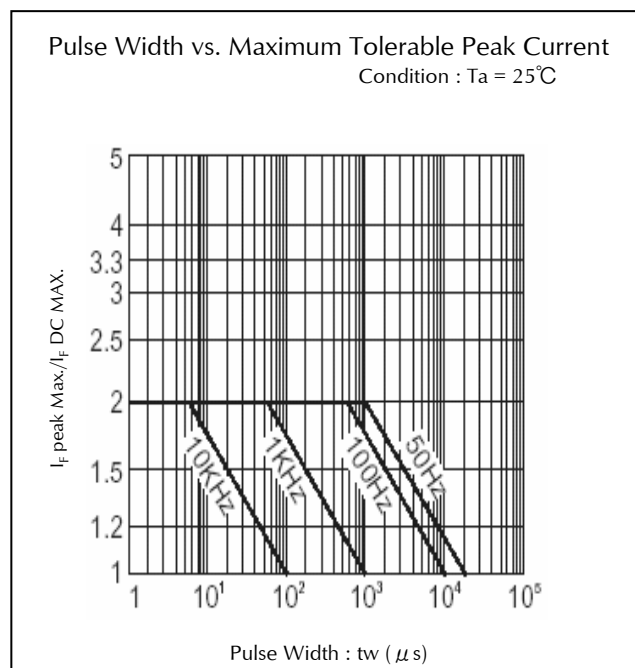
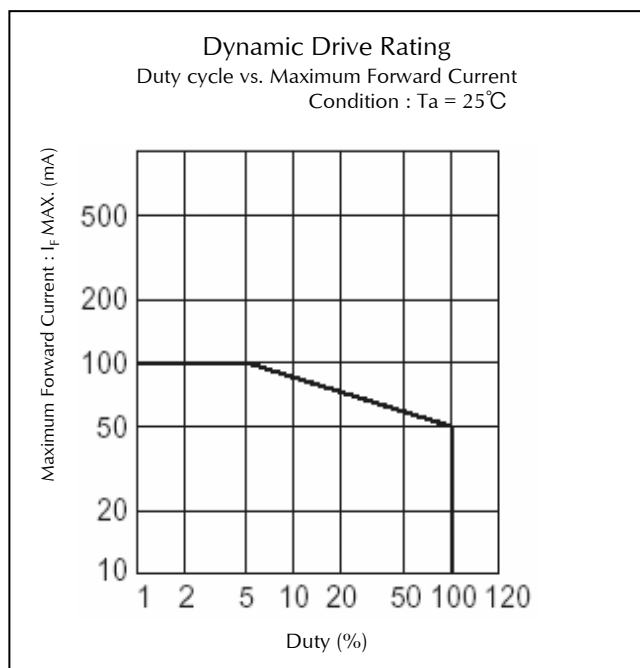
Ambient Temperature vs. Forward Voltage



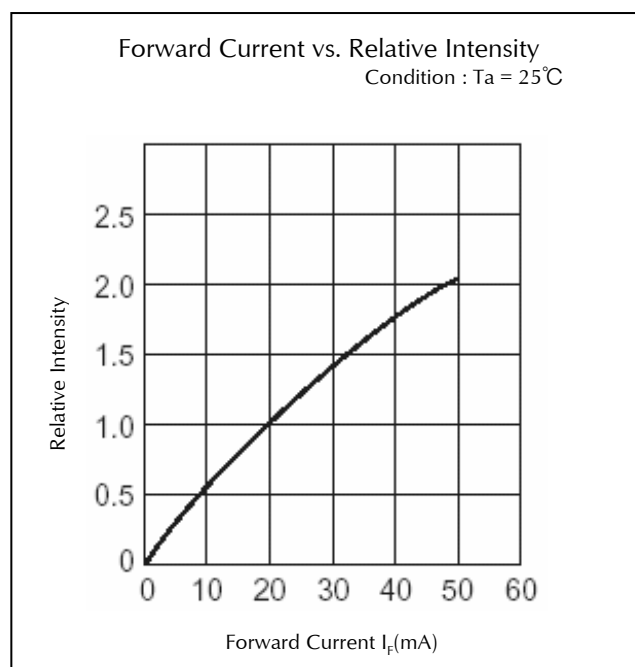
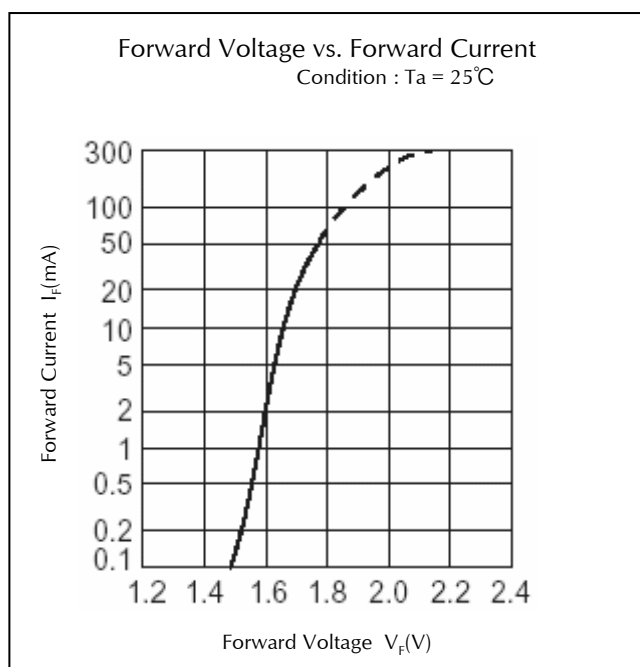
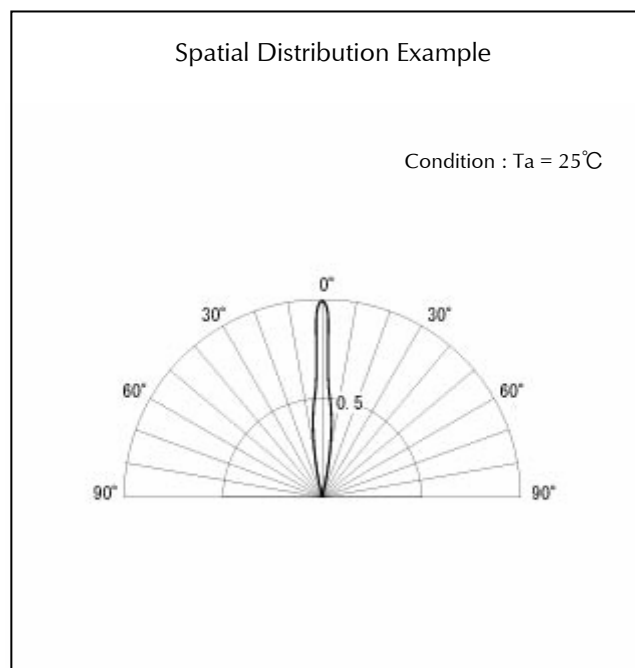
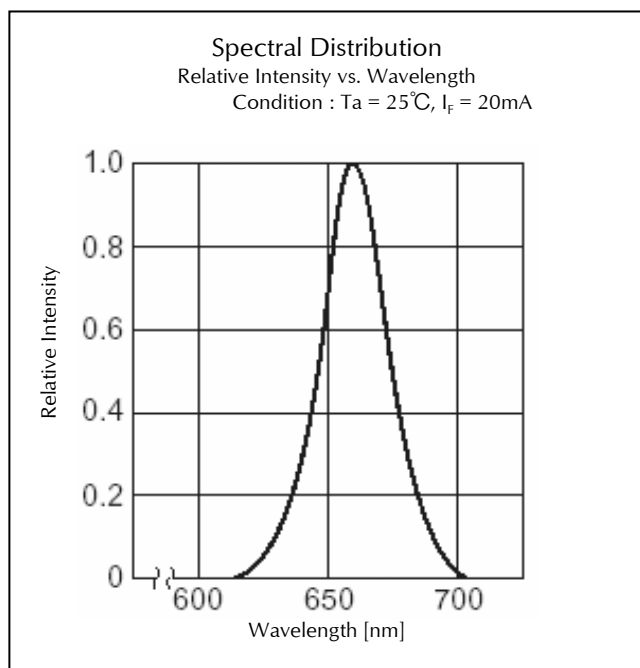
Power Dissipation vs. Ambient Temperature



Technical Data(HAA)



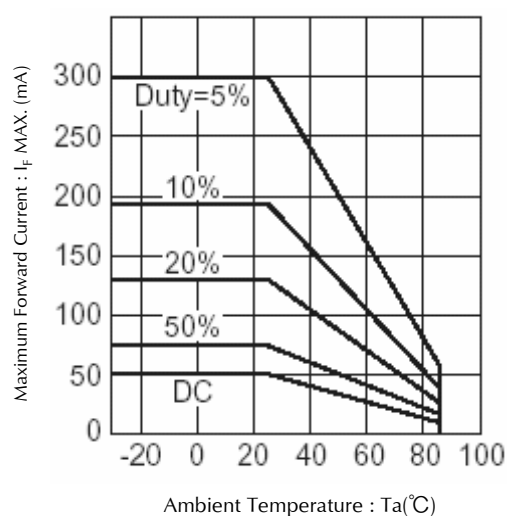
Technical Data(HBR)



Technical Data(HBR)

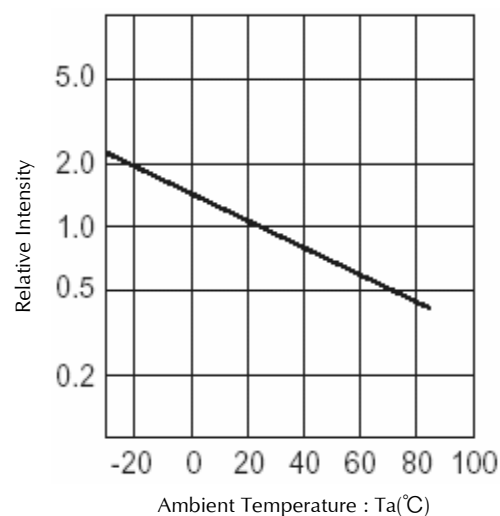
Derating

Ambient Temperature vs. Maximum Forward Current
Repetition Frequency : $f \geq 50\text{Hz}$

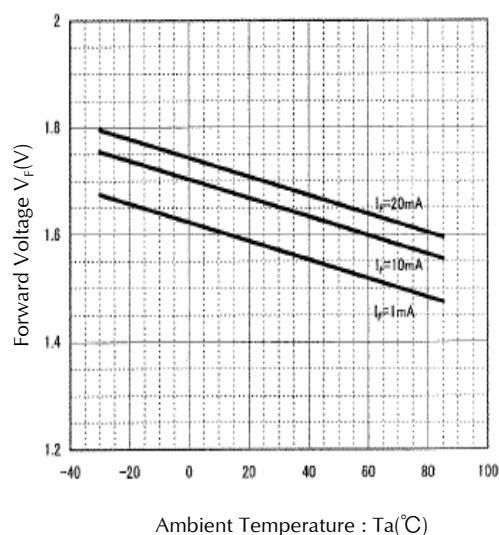


Ambient Temperature vs. Relative Intensity

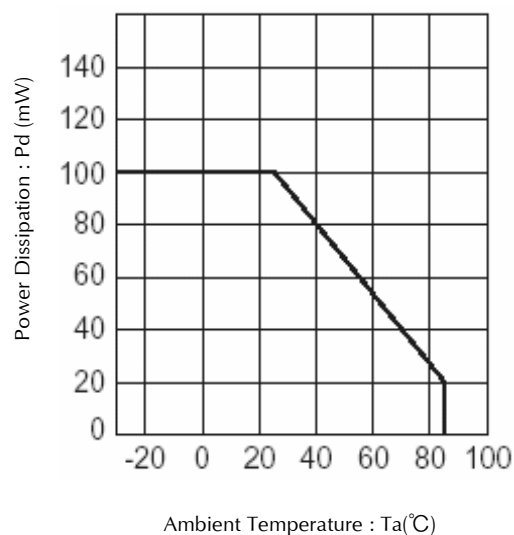
Condition : $I_F=20\text{mA}$



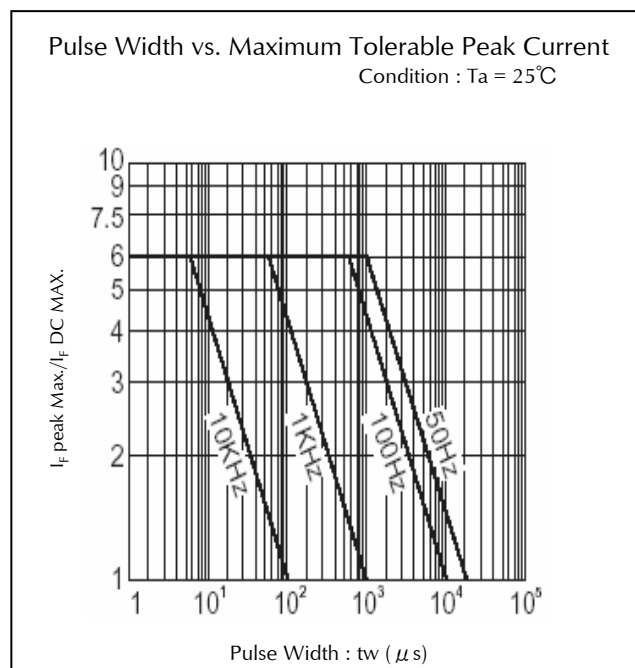
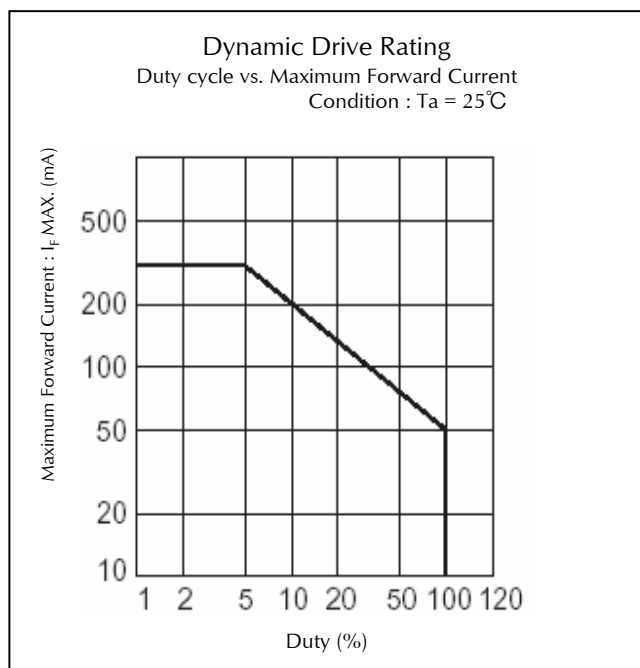
Ambient Temperature vs. Forward Voltage



Power Dissipation vs. Ambient Temperature

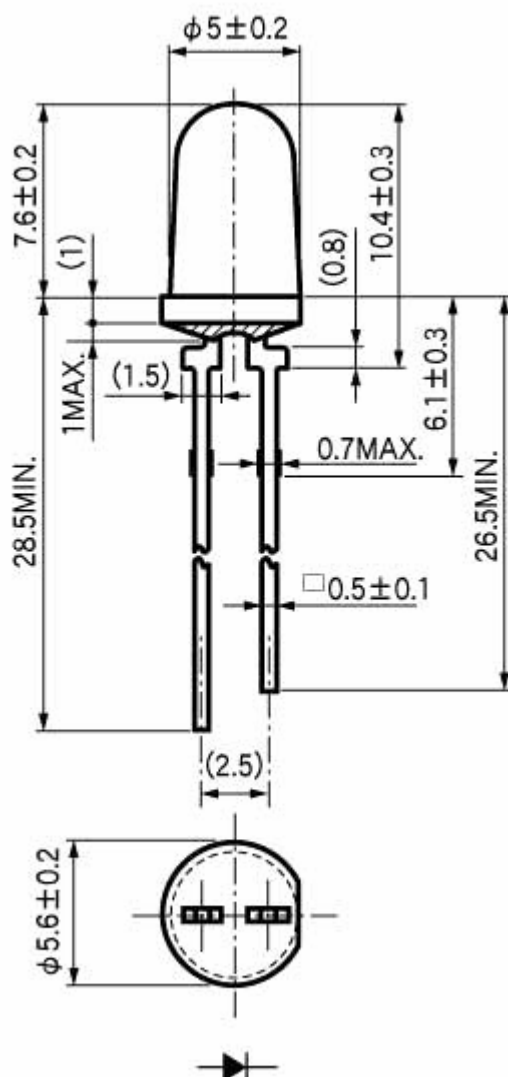


Technical Data(HBR)



Package Dimensions

(Unit: mm)



TTW (Through The Wave) soldering Conditions

Pre-heating	100 °C	(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 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°C	(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	EIAJ ED-4701/100(101)	Ta = 25°C, If = Maximum Rated Current	1,000 h	0/25
Resistance to Soldering Heat	EIAJ ED-4701/300(302)	260±5°C, 3mm from package base	10s	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°C, 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
Lead Tension	EIAJ ED-4701/400(401)	10N, 1time (□0.4 and Flat Package : 5N)	10s	0/10
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	If Value of each product Luminous Intensity	Testing Min. Value < Spec. Min. Value x 0.5
Forward Voltage	V _F	If 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.
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- 7) The most updated edition of this data sheet can be obtained from the address below:
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