



**Pb-free  
HEAT**



# 5304S Series

Single Color  $\phi$  5 Round Shape Type

## Features

Package	$\phi$ 5 Round shape type Water Clear epoxy
Product features	<ul style="list-style-type: none"> <li>• Outer Dimension <math>\phi</math> 5 Round shape type</li> <li>• Operation temperature range. Storage Temperature : -30°C~100°C Operating Temperature : -30°C~85°C</li> <li>• Lead-free soldering compatible</li> <li>• RoHS compliant</li> </ul>
Dominant wavelength	Green : 558nm (EBG/BG) : 567nm (EPG/PG) Yellow Green : 572nm (EPY/PY) Yellow : 590nm (EAY/AY) Orange : 606nm (EAA/AA) Red : 624nm (EVR/VR) : 647nm (EBR/BR) : 630nm (PR)
Half Intensity Angle	EBG/BG,EPG/PG,,EAY/AY,EAA/AA,EVR/VR,PR : 20 deg. EPY/PY : 16 deg. EBR/BR : 12 deg.
Die materials	EBG/BG,EPG/PG,EPY/PY,PR : GaP EAY/AY,EAA/AA,EVR/VR : GaAsP EBR/BR : 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		Luminous Intensity		
					$\lambda d$ (nm)		Iv (mcd)		
					TYP.	I <sub>F</sub>	MIN.	TYP.	I <sub>F</sub>
EBG/BG5304S	GaP	Green	Water Clear	Clear	558	20	50/25	80/50	20
EPG/PG5304S	GaP				567	20	60/30	90/60	20
EPY/PY5304S	GaP	Yellow Green			572	20	80/40	160/80	20
EAY/AY5304S	GaAsP	Yellow			590	20	60/30	90/60	20
EAA/AA5304S	GaAsP	Orange			606	20	60/30	90/60	20
EVR/VR5304S	GaAsP	Red			624	20	60/30	90/60	20
EBR/BR5304S	GaAlAs				647	20	80/40	160/80	20
PR5304S	GaP				630	10	6	12	10

## Absolute Maximum Ratings

(Ta=25°C)

Item	Symbol	Absolute Maximum Ratings								Unit
		EBG/BG	EPG/PG	EPY/PY	EAY/AY	EAA/AA	EVR/VR	EBR/BR	PR	
Power Dissipation	$P_d$	125	125	125	125	125	75	100	75	mW
Forward Current	$I_F$	50	50	50	50	50	30	50	30	mA
Pulse Forward Current ※1	$I_{FRM}$	100	100	100	100	100	100	300	100	mA
Derating (Ta=25°C or higher)	$\Delta I_F$	0.67	0.67	0.67	0.67	0.67	0.33	0.67	0.33	mA/°C
Reverse Voltage	$V_R$	4	4	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  $\leq 1$ ms., Duty  $\leq 1/20$ .

**Electro-Optical Characteristics**(EBG/BG,EPG/PG,EPY/PY,EAY/AY,EAA/AA,EVR/VR,EBR/BR) (Ta=25°C)

Item	Conditions	Symbol	Characteristics								Unit
			EBG/BG	EPG/PG	EPY/PY	EAY/AY	EAA/AA	EVR/VR	EBR/BR		
Forward Voltage	I <sub>F</sub> =20mA	V <sub>F</sub>	TYP.	2.1	2.1	2.1	2.2	2.2	2.0	1.7	V
			MAX.	2.5	2.5	2.5	2.5	2.5	2.5	2.0	
Reverse Current	V <sub>R</sub> =4V	I <sub>R</sub>	MAX.	100	100	100	100	100	100	100	$\mu$ A
Peak Wavelength	I <sub>F</sub> =20mA	$\lambda_p$	TYP.	555	560	570	580	605	630	660	nm
Dominant Wavelength	I <sub>F</sub> =20mA	$\lambda_d$	TYP.	558	567	572	590	606	624	647	nm
Spectral Line Half Width	I <sub>F</sub> =20mA	$\Delta \lambda$	TYP.	30	30	30	30	30	30	30	nm
Half Intensity Angle	I <sub>F</sub> =20mA	2 $\theta$ 1/2	TYP.	20	20	16	20	20	20	12	deg.

**Electro-Optical Characteristics(PR)** (Ta=25°C)

Item	Conditions	Symbol	Characteristics		Unit
				PR	
Forward Voltage	I <sub>F</sub> =10mA	V <sub>F</sub>	TYP.	2.1	V
			MAX.	2.5	
Reverse Current	V <sub>R</sub> =4V	I <sub>R</sub>	MAX.	100	$\mu$ A
Peak Wavelength	I <sub>F</sub> =10mA	$\lambda_p$	TYP.	700	nm
Dominant Wavelength	I <sub>F</sub> =10mA	$\lambda_d$	TYP.	630	nm
Spectral Line Half Width	I <sub>F</sub> =10mA	$\Delta \lambda$	TYP.	100	nm
Half Intensity Angle	I <sub>F</sub> =10mA	2 $\theta$ 1/2	TYP.	20	deg.

## Luminous Intensity Rank

(Ta=25°C)

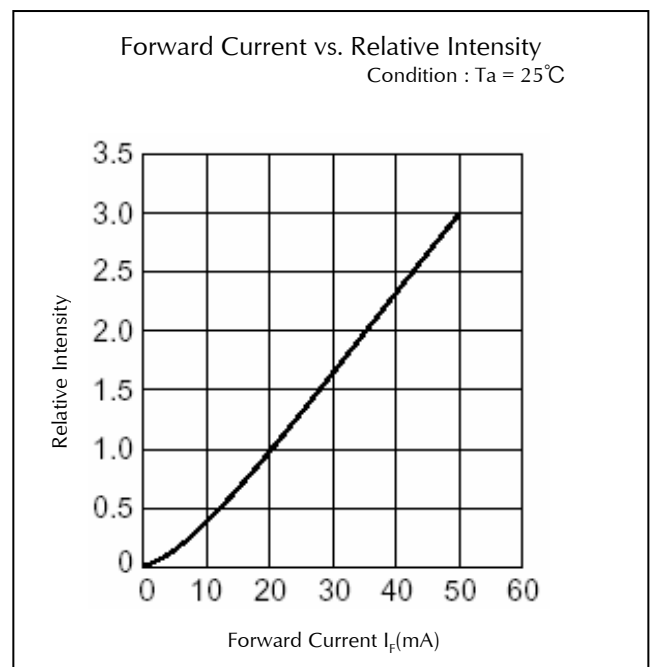
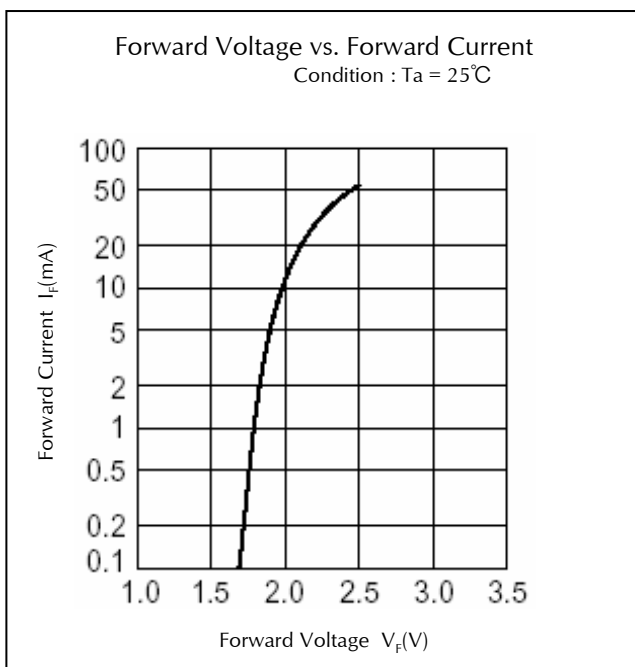
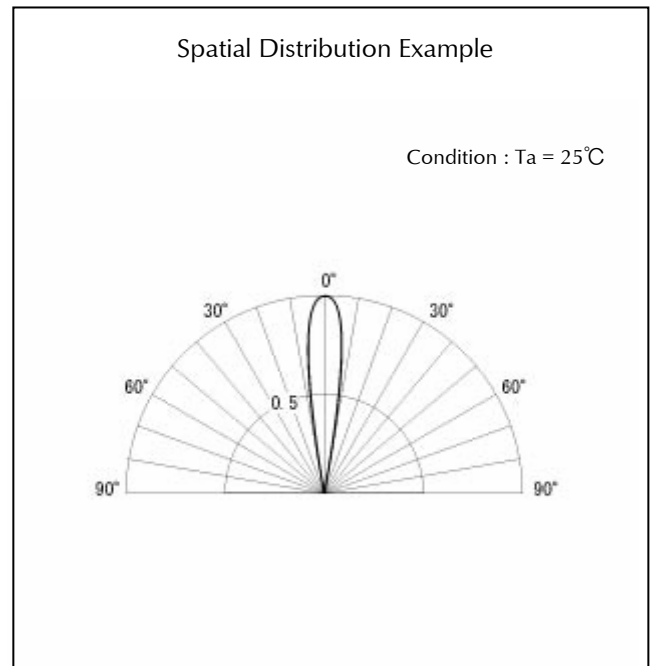
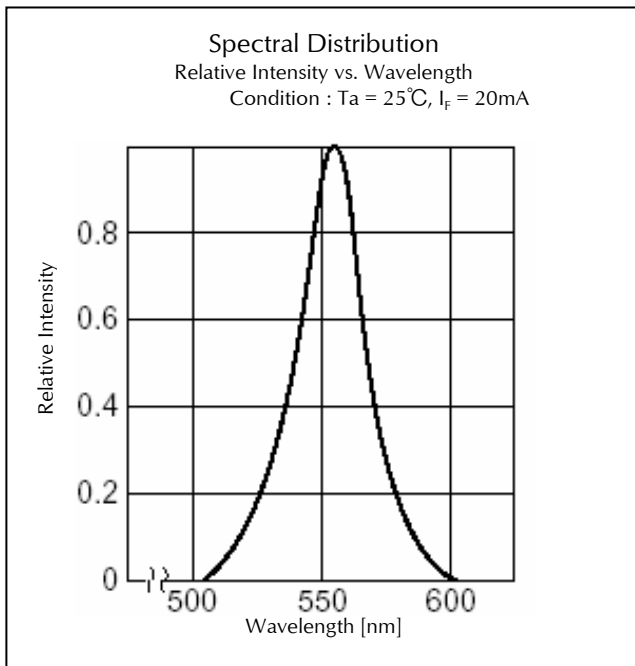
Rank	I <sub>v</sub> (mcd)															
	BG		PG		PY		AY		AA		VR		BR		PR	
	I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =10mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
<b>A</b>	25.0	50.0	30.0	60.0	40.0	80.0	30.0	60.0	30.0	60.0	30.0	60.0	40.0	80.0	6.0	12.0
<b>B</b>	35.0	70.0	42.0	84.0	56.0	112.0	42.0	84.0	42.0	84.0	42.0	84.0	56.0	112.0	8.4	16.8
<b>C</b>	50.0	100.0	60.0	120.0	80.0	160.0	60.0	120.0	60.0	120.0	60.0	120.0	80.0	160.0	12.0	24.0
<b>D</b>	70.0	140.0	84.0	168.0	112.0	224.0	84.0	168.0	84.0	168.0	84.0	168.0	112.0	224.0	16.8	33.6
<b>E</b>	100.0	-	120.0	-	160.0	-	120.0	-	120.0	-	120.0	-	160.0	-	24.0	-

Please contact our sales staff concerning rank designation.

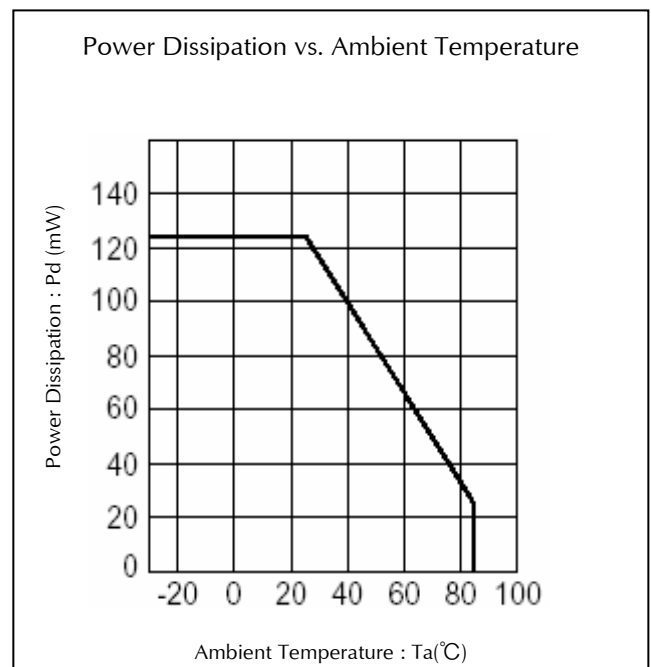
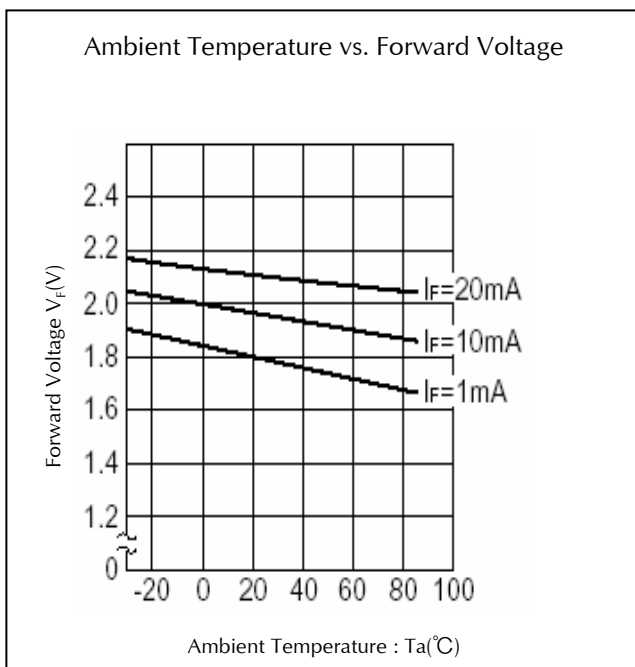
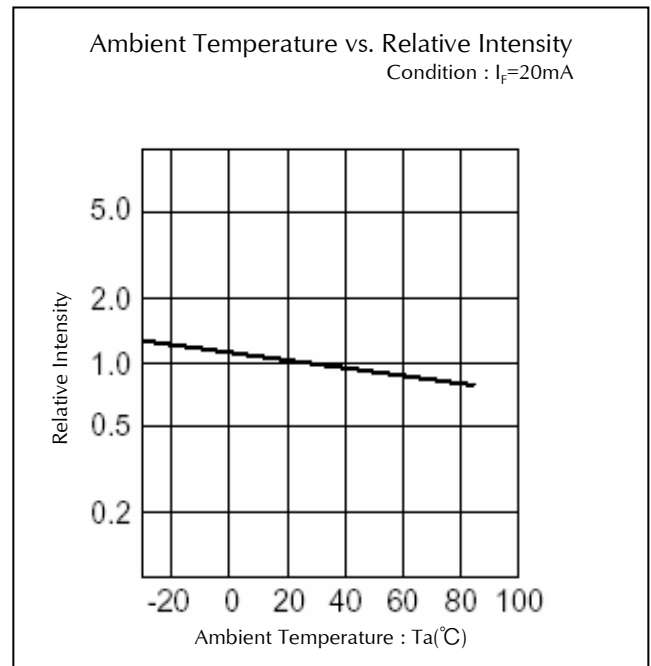
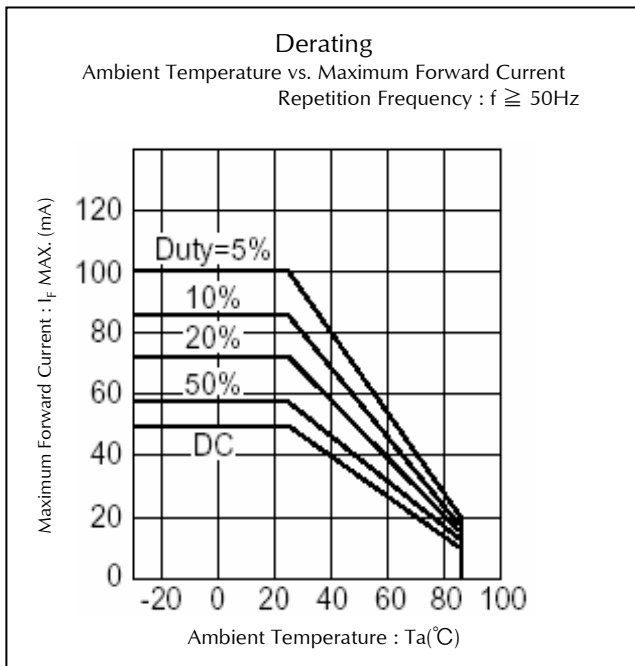
Rank	I <sub>v</sub> (mcd)													
	EBG		EPG		EPY		EAY		EAA		EVR		EBR	
	I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
<b>C</b>	50.0	100.0	60.0	120.0	80.0	160.0	60.0	120.0	60.0	120.0	60.0	120.0	80.0	160.0
<b>D</b>	70.0	140.0	84.0	168.0	112.0	224.0	84.0	168.0	84.0	168.0	84.0	168.0	112.0	224.0
<b>E</b>	100.0	-	120.0	-	160.0	-	120.0	-	120.0	-	120.0	-	160.0	-

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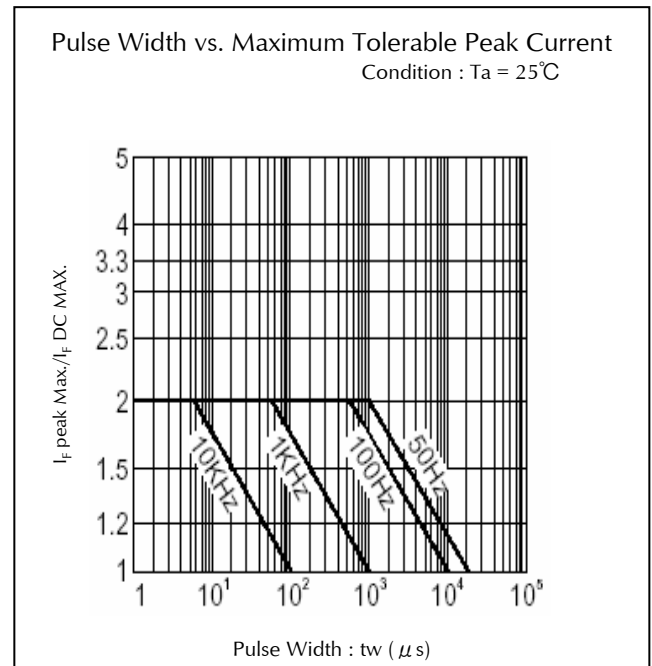
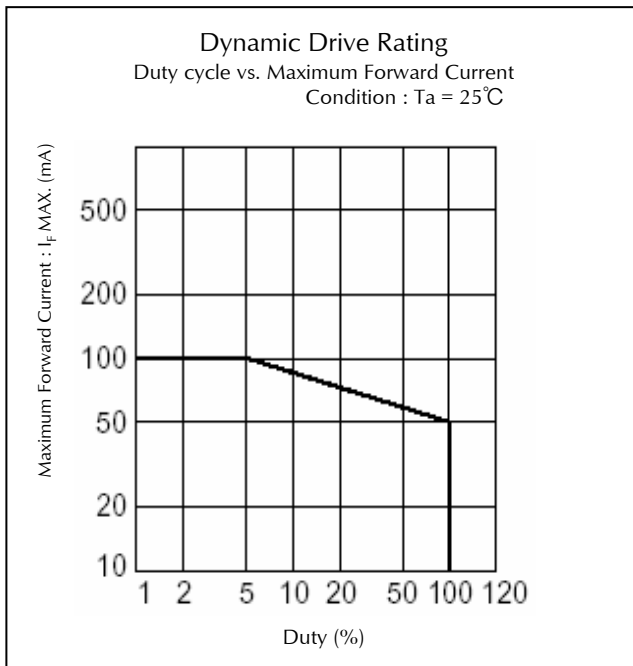
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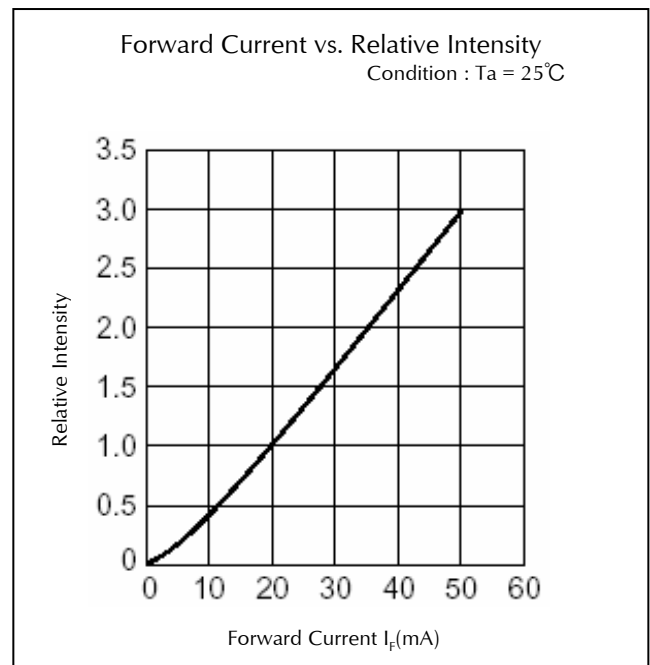
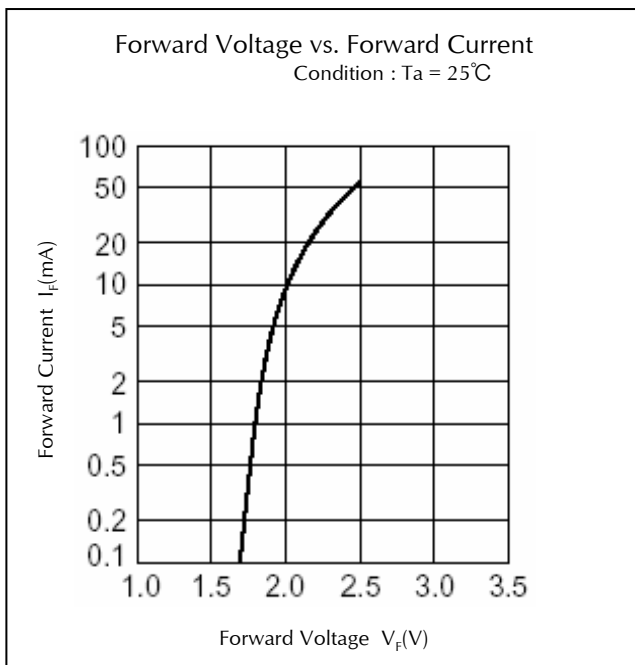
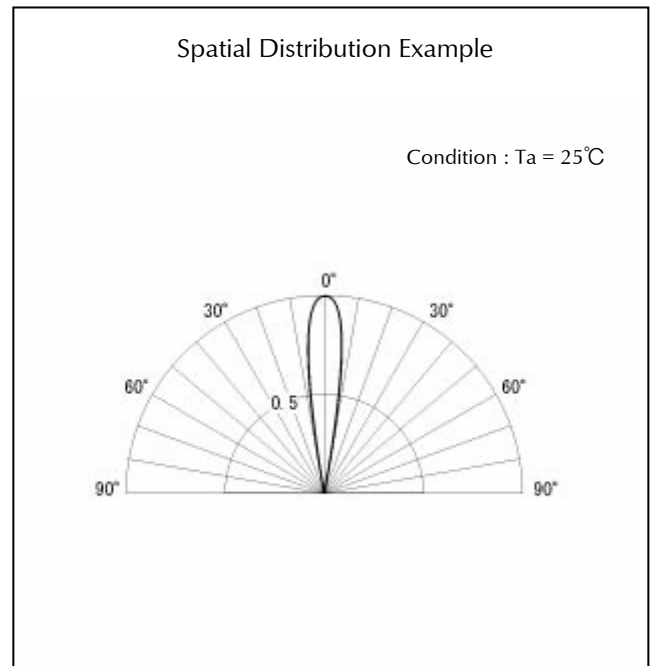
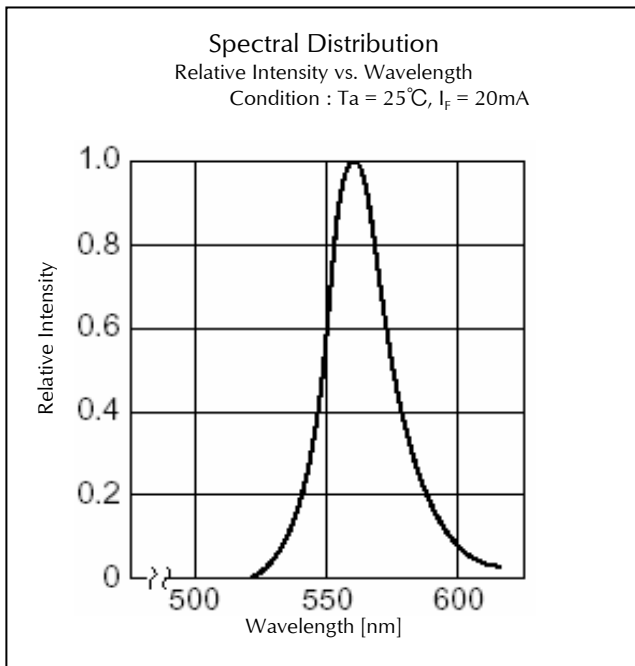


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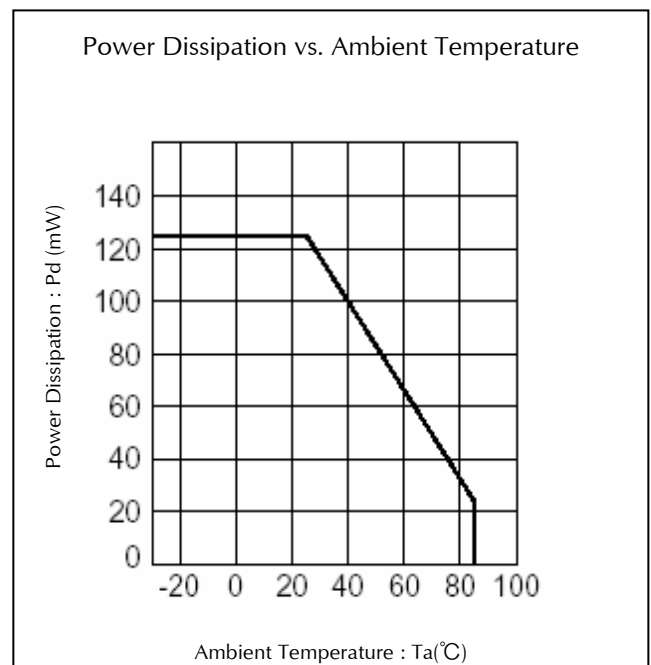
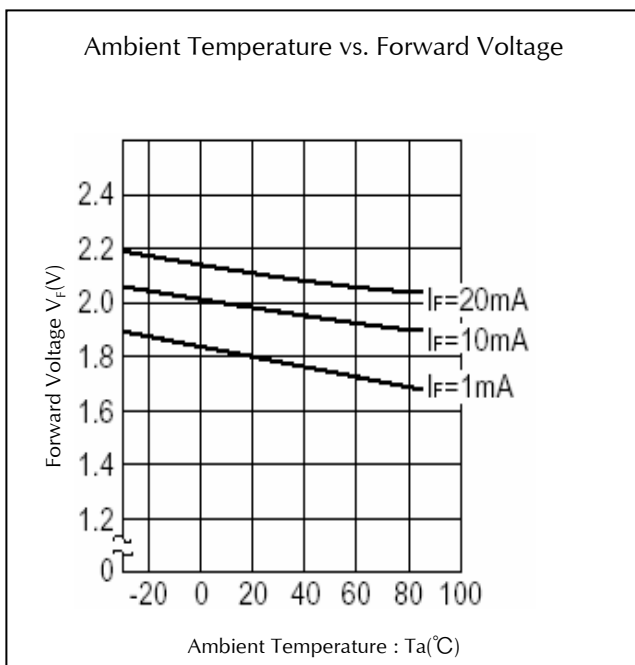
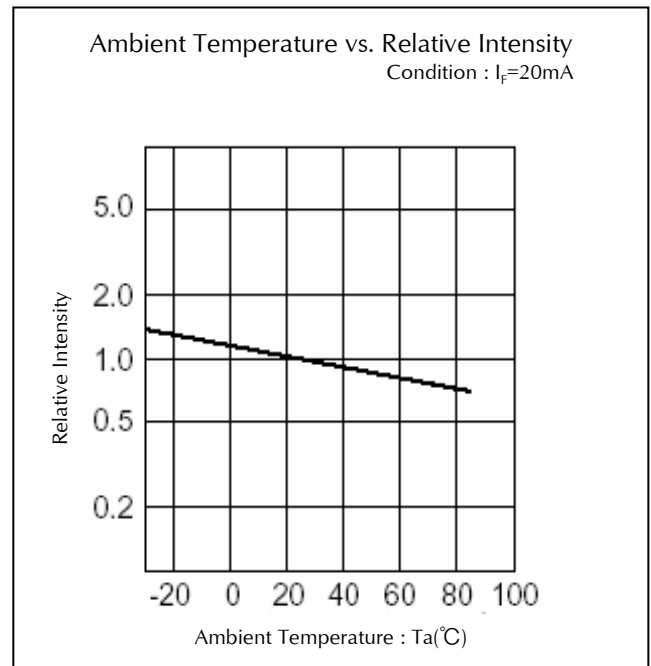
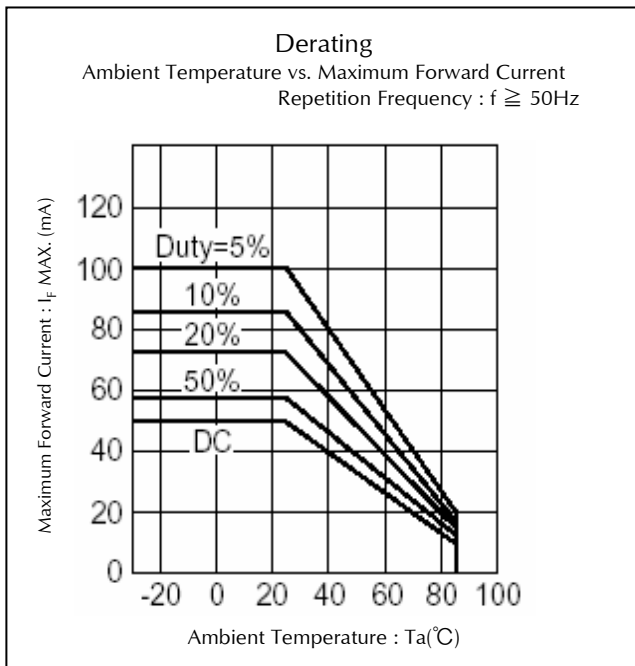




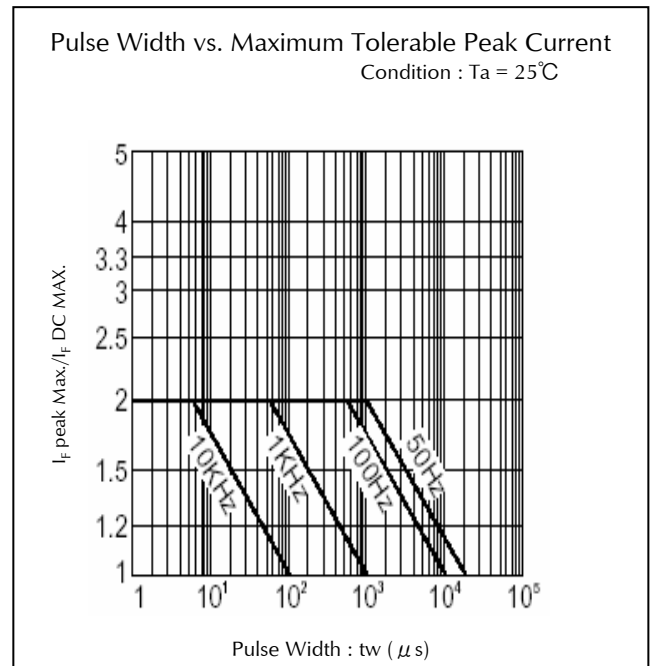
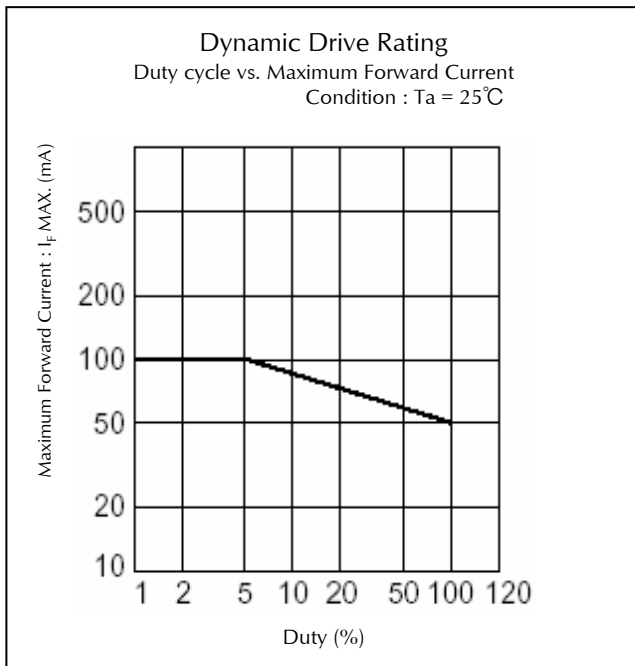
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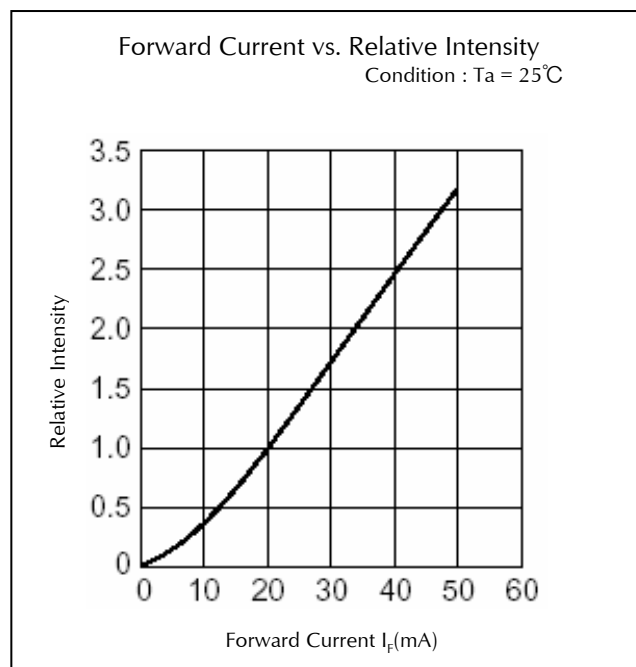
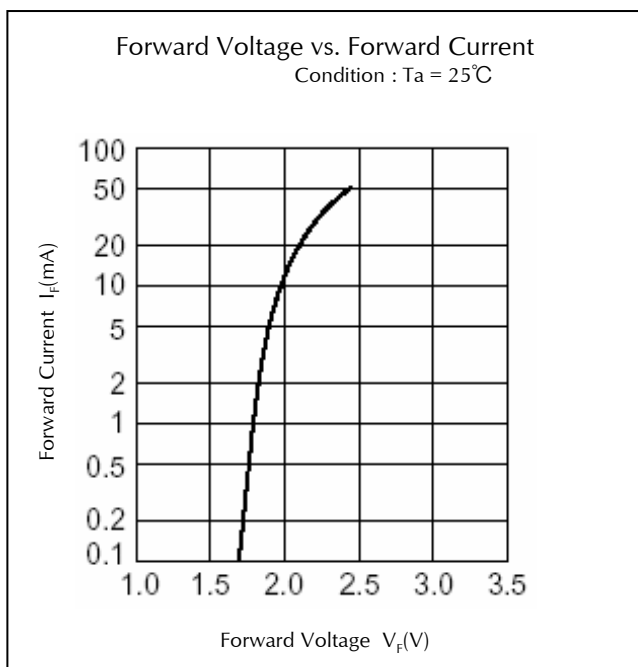
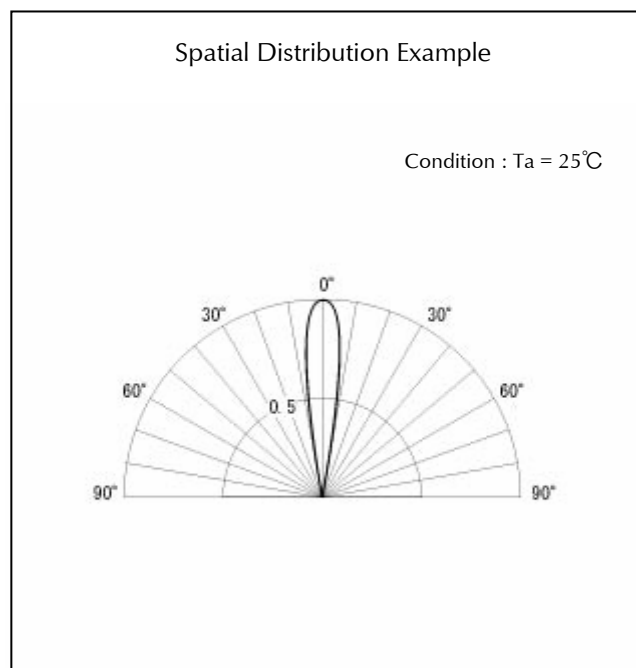
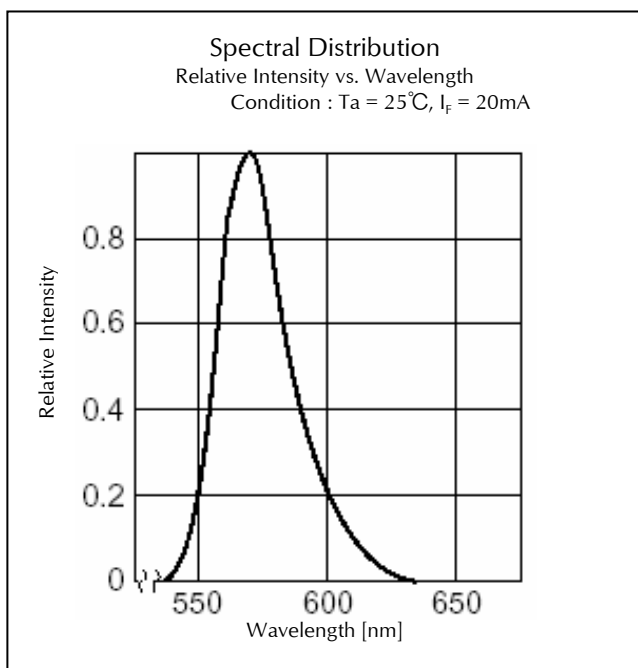
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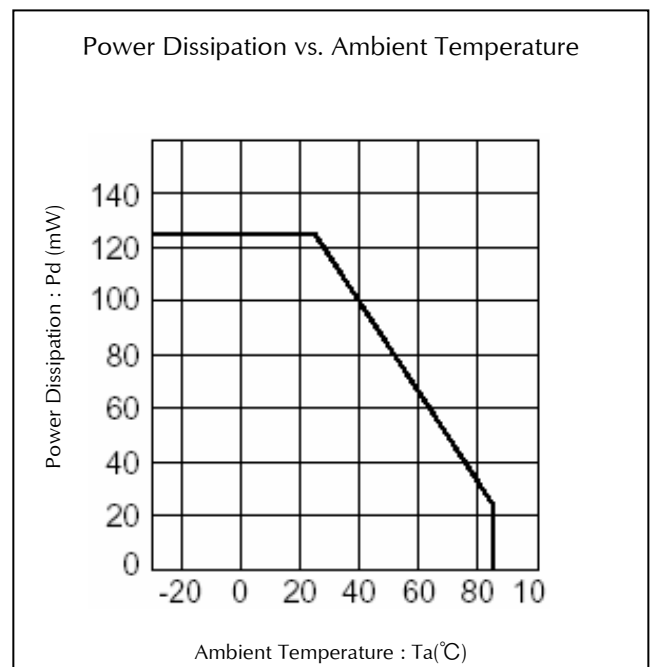
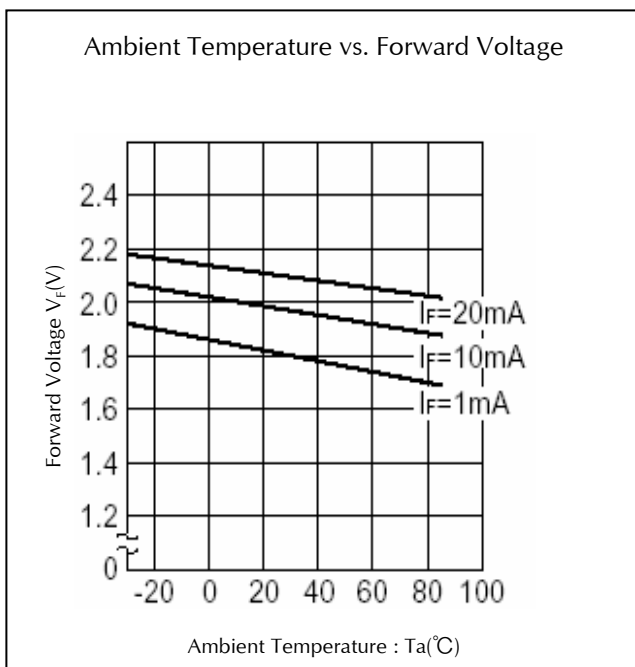
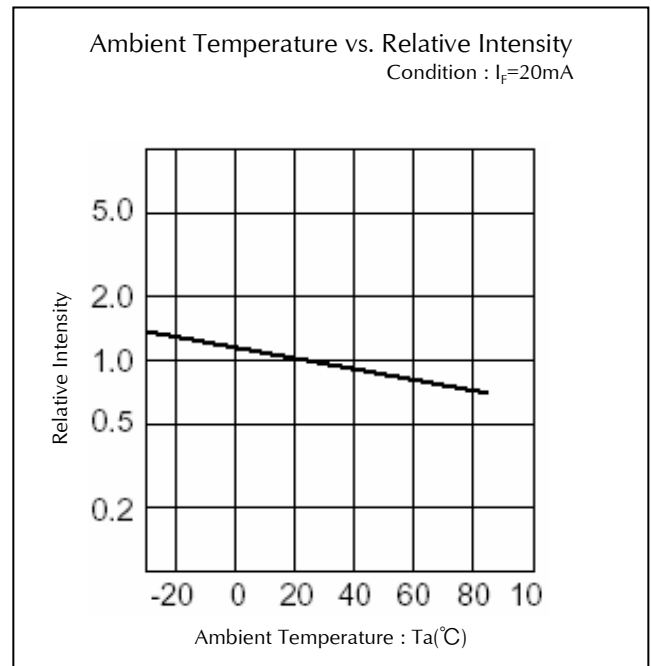
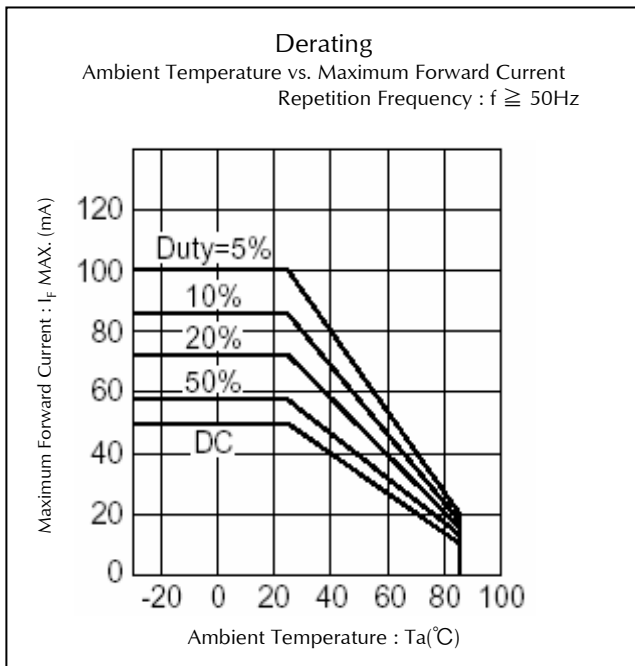
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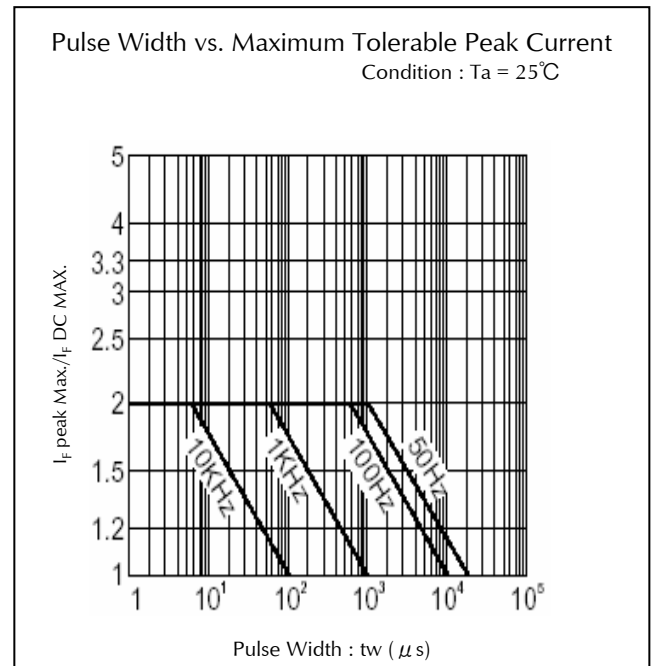
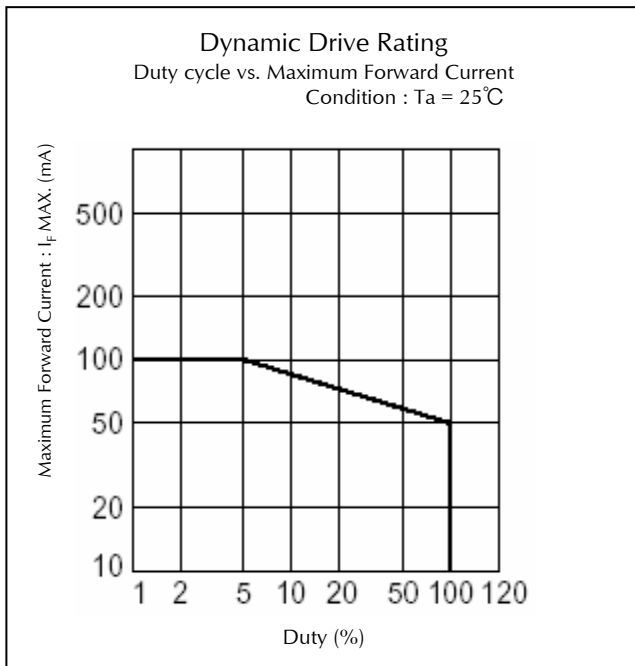
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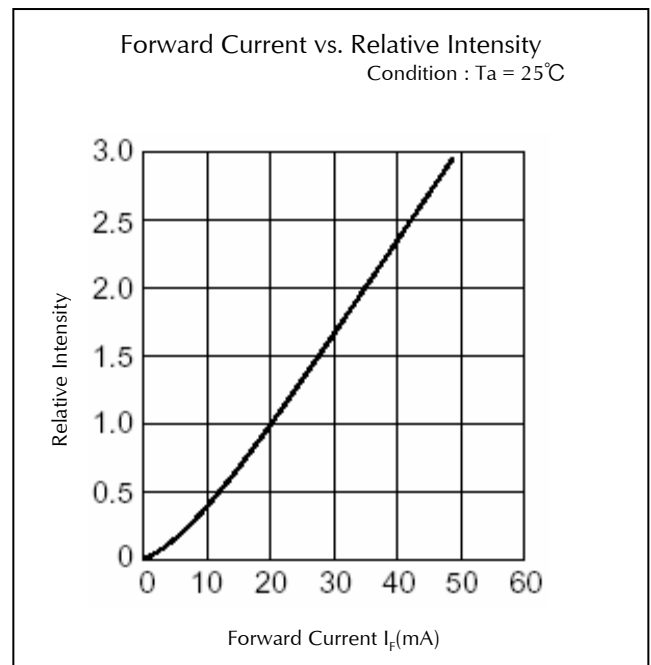
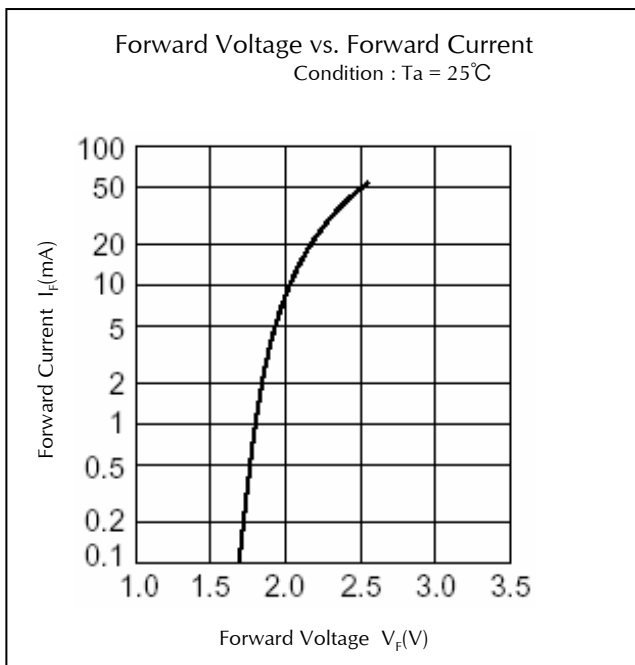
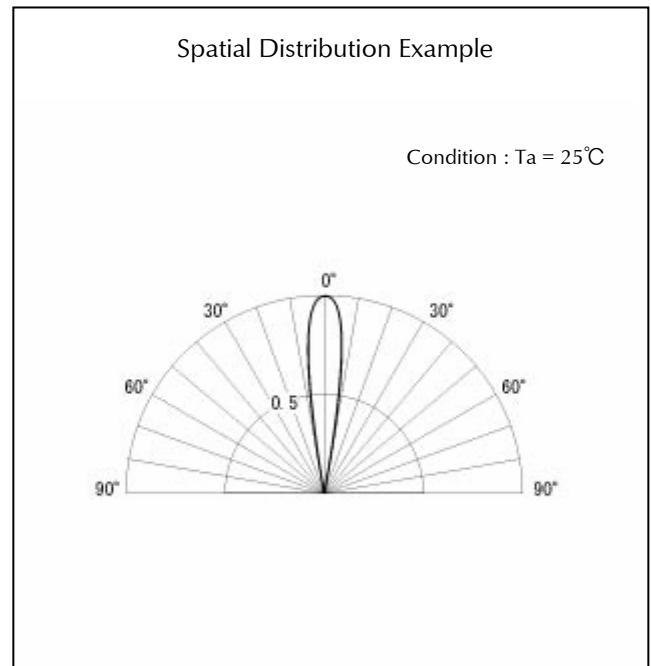
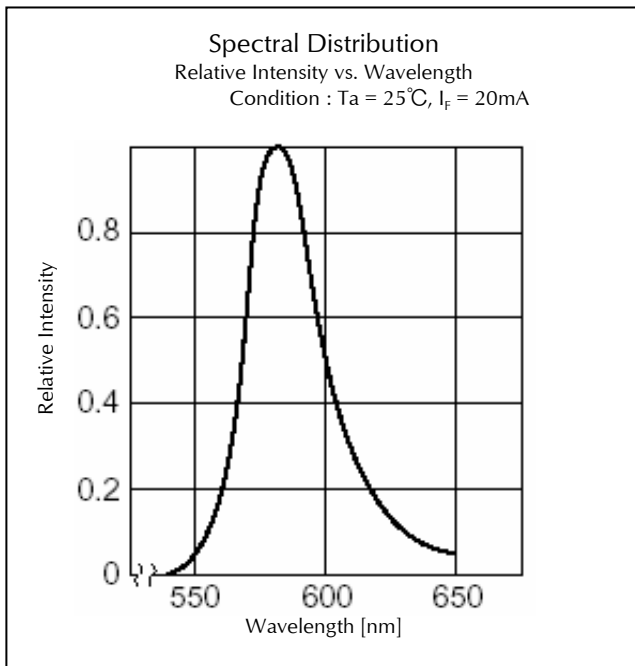
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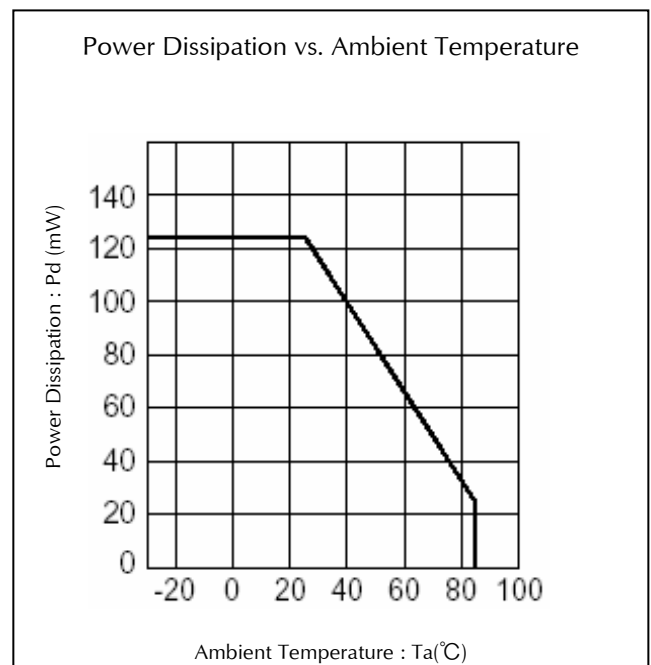
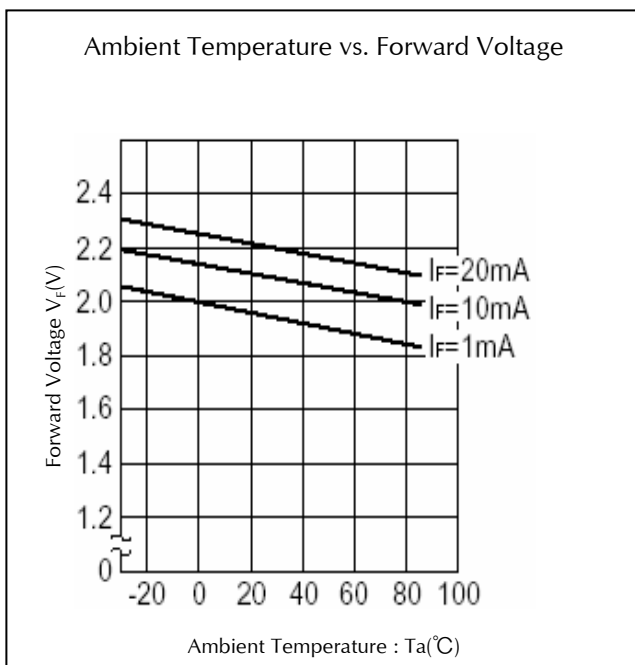
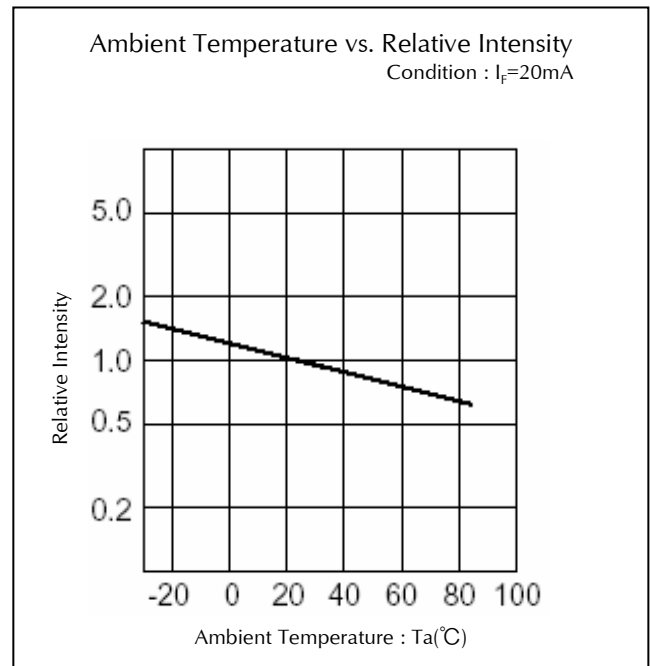
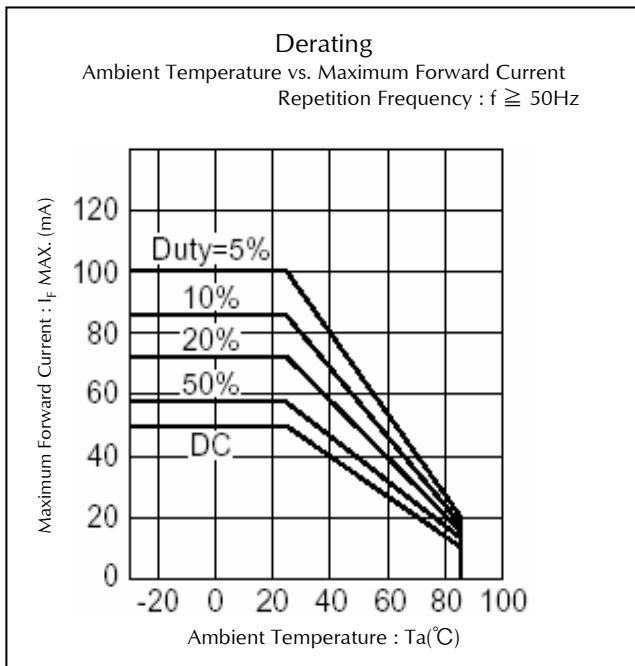
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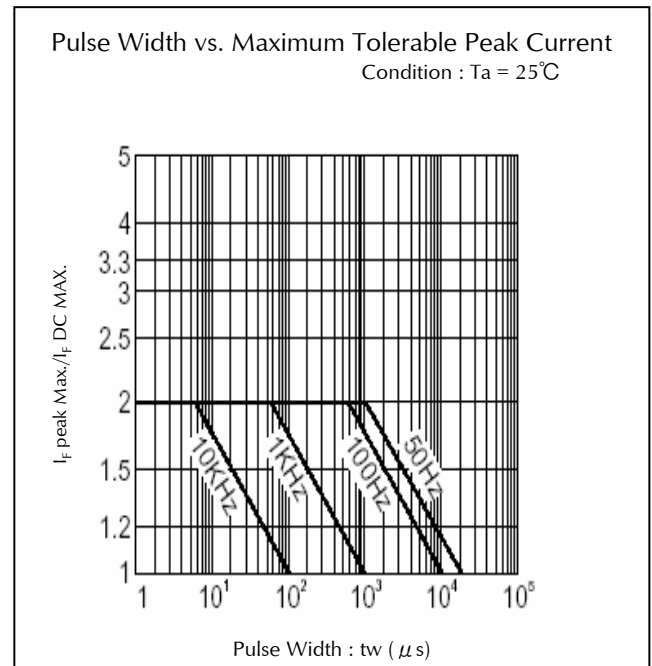
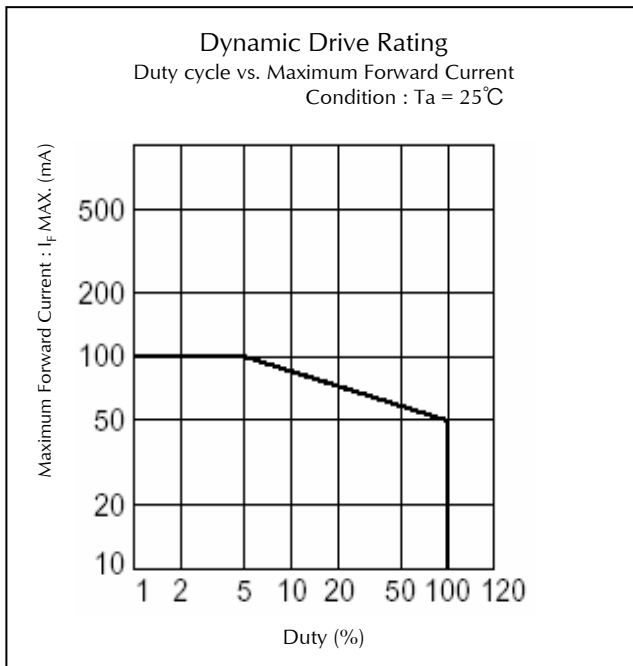


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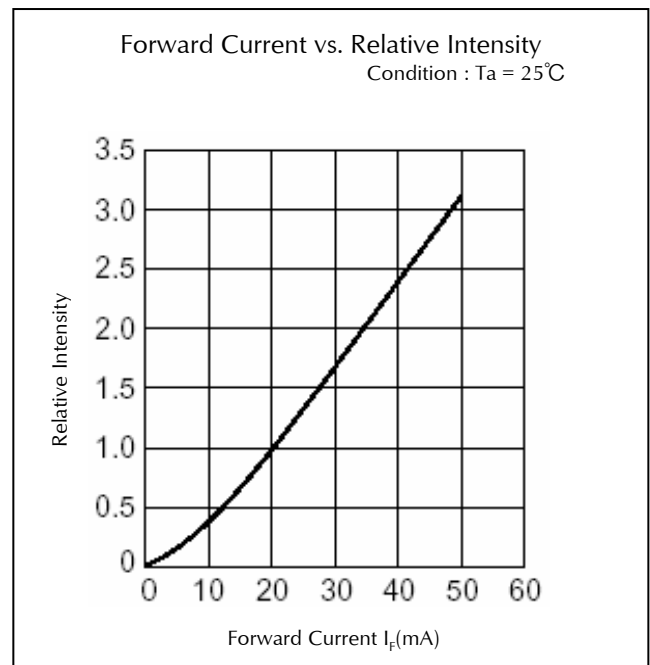
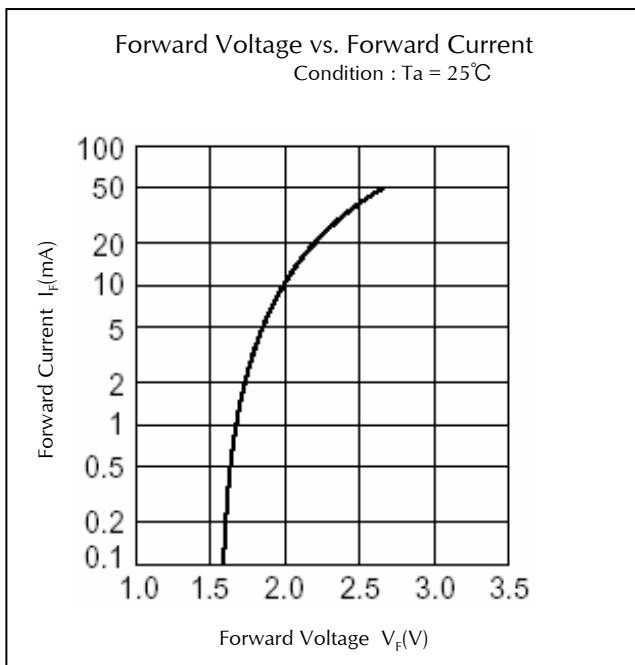
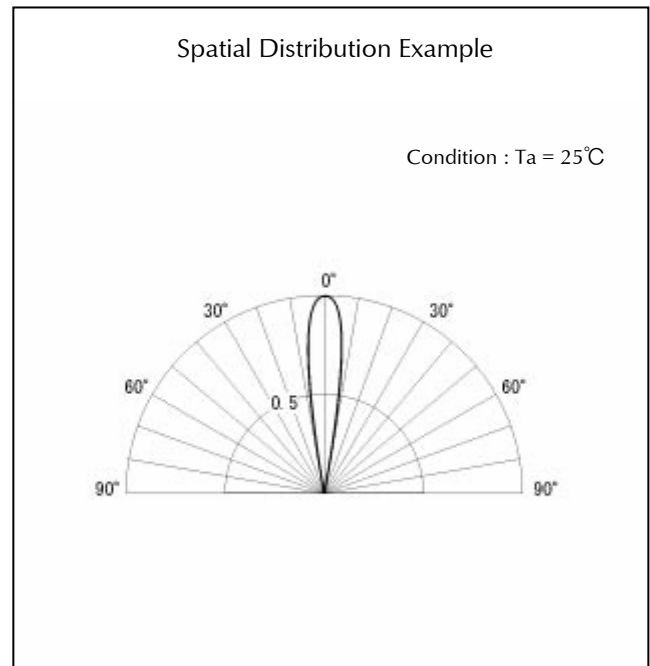
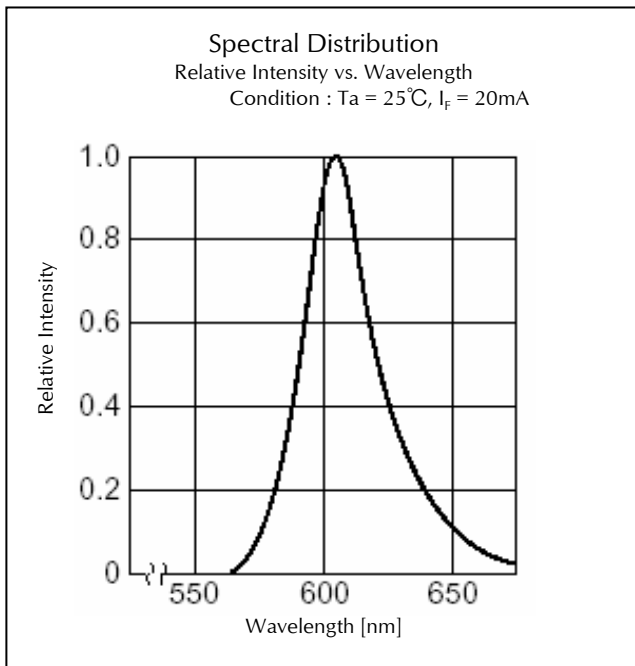




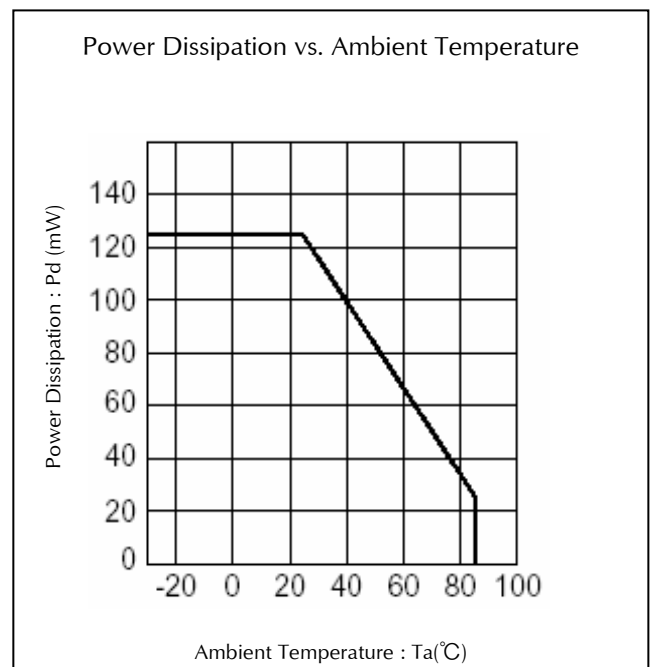
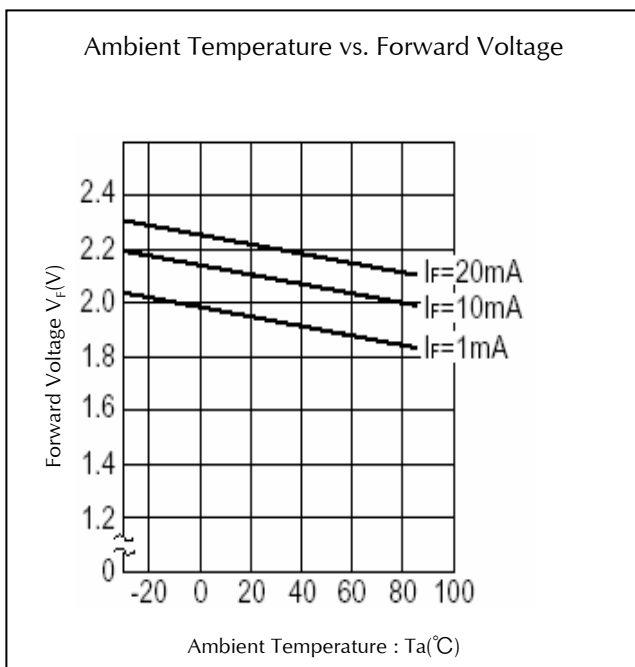
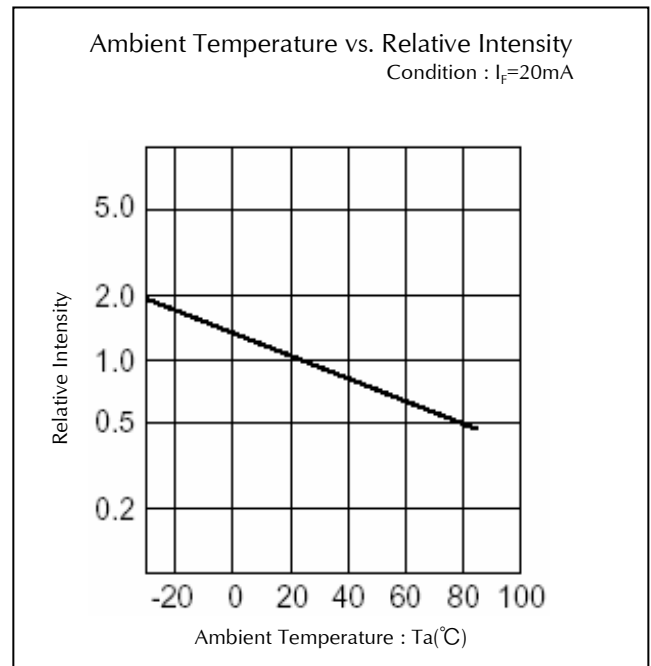
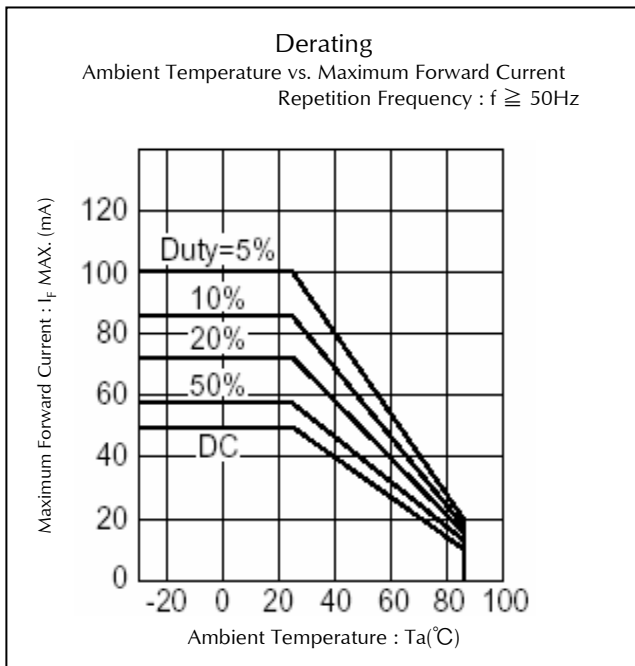
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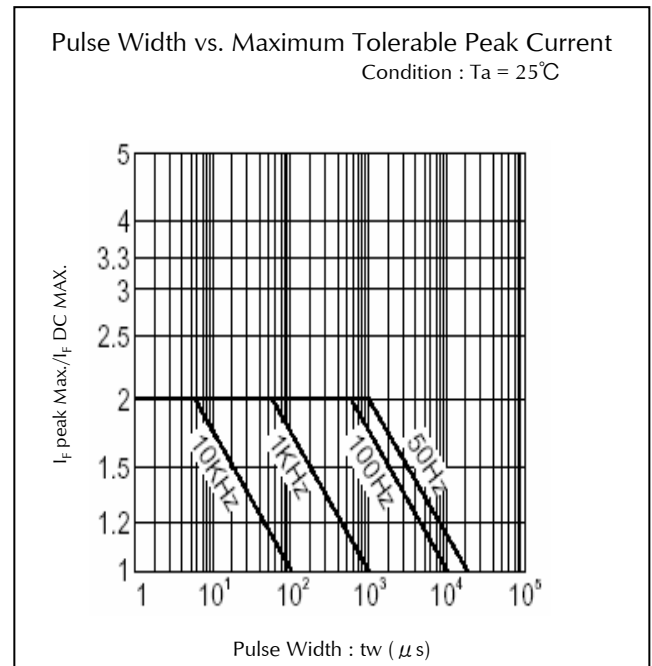
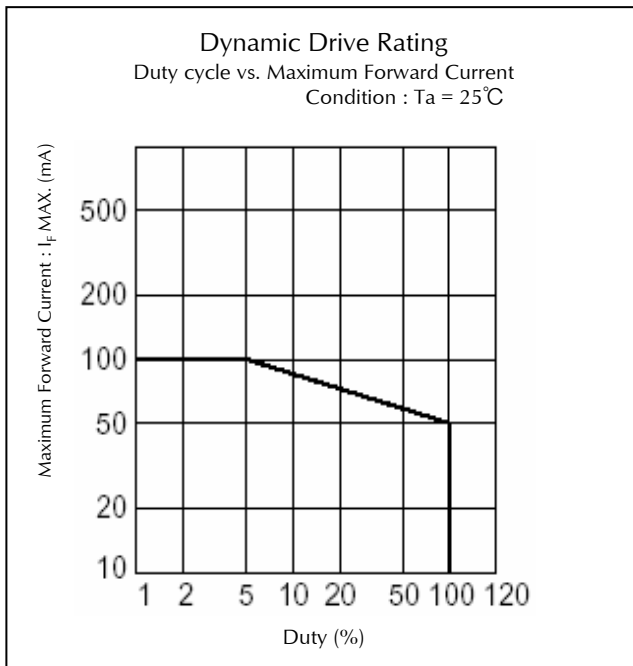
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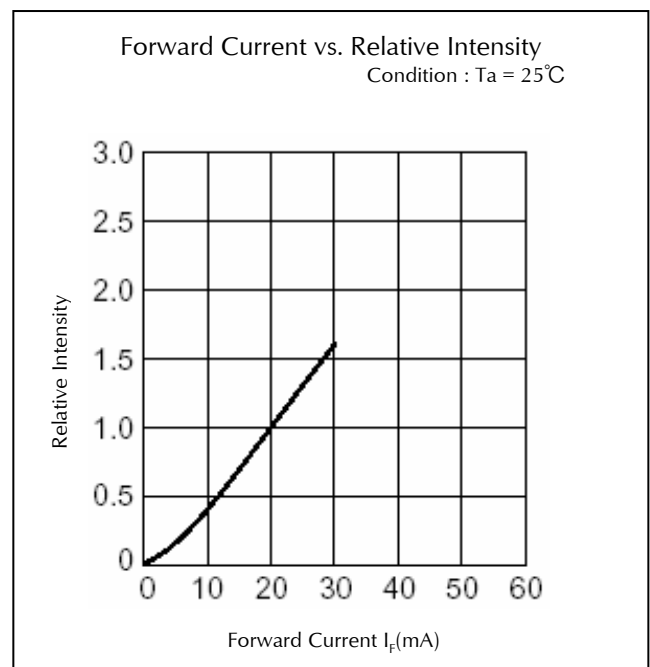
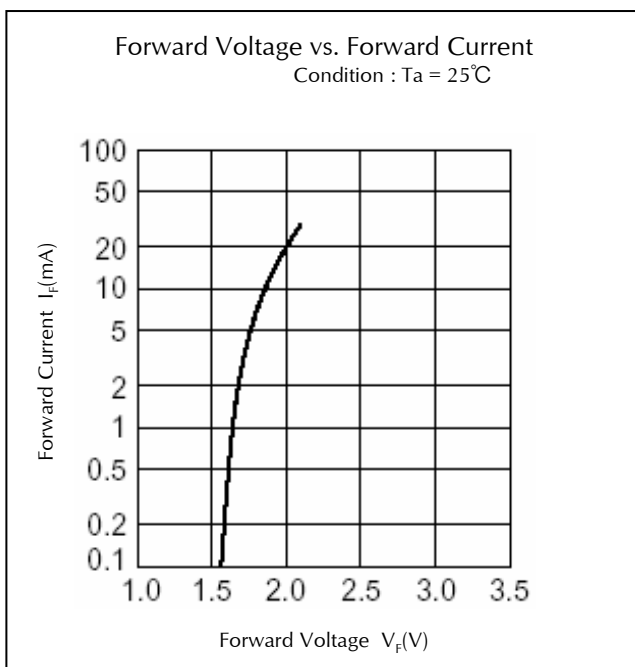
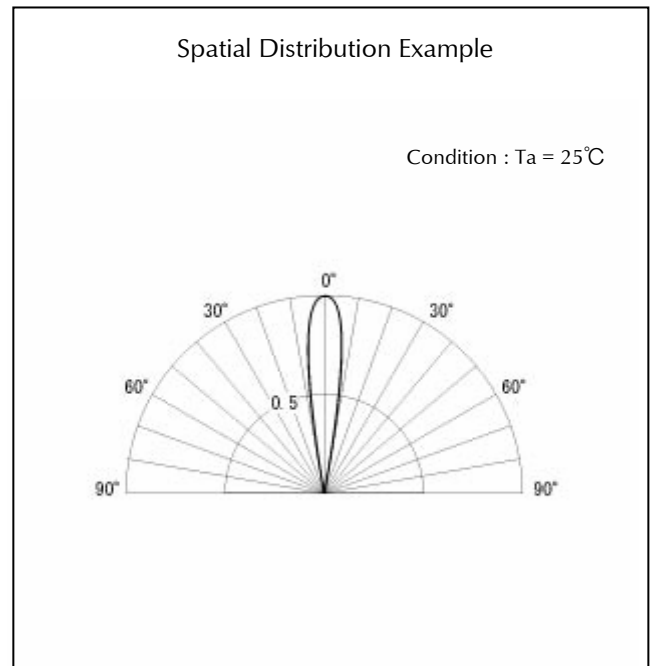
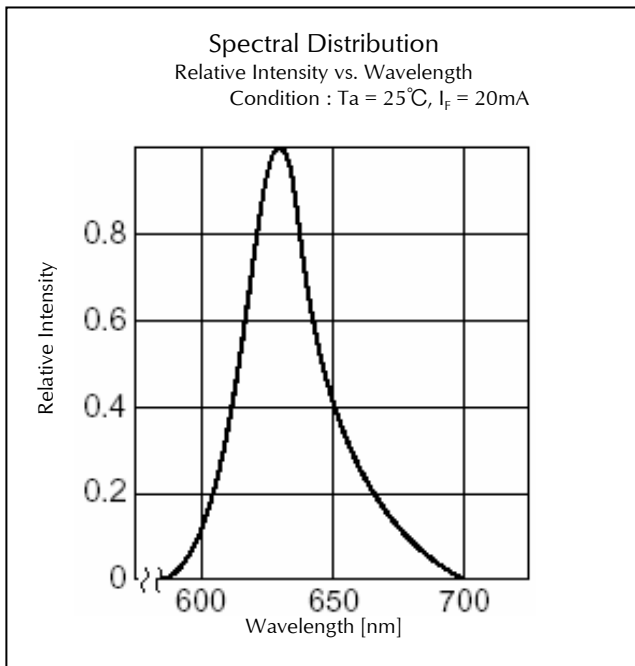
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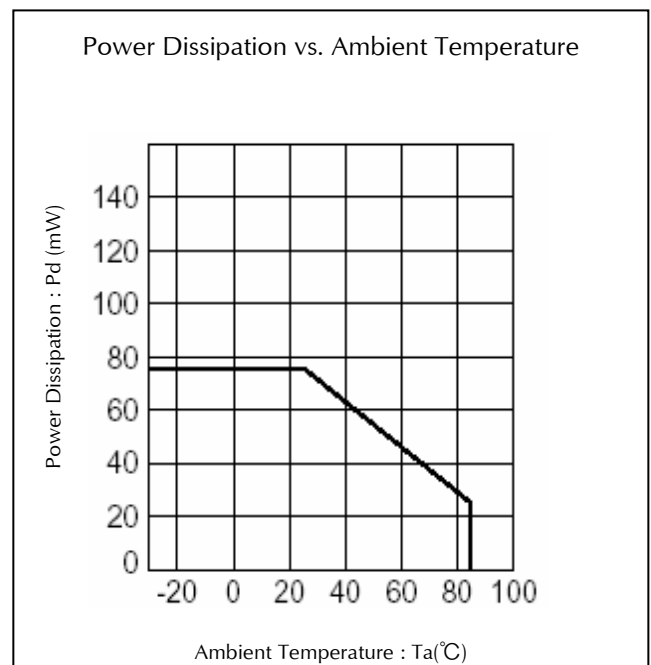
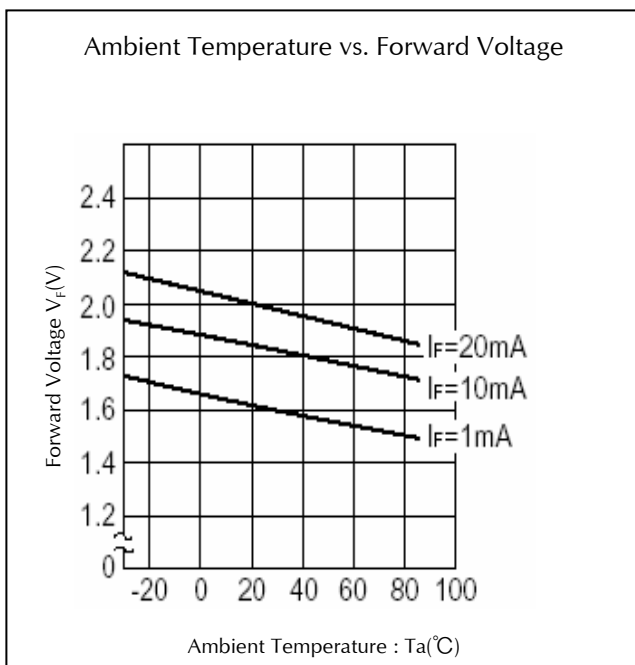
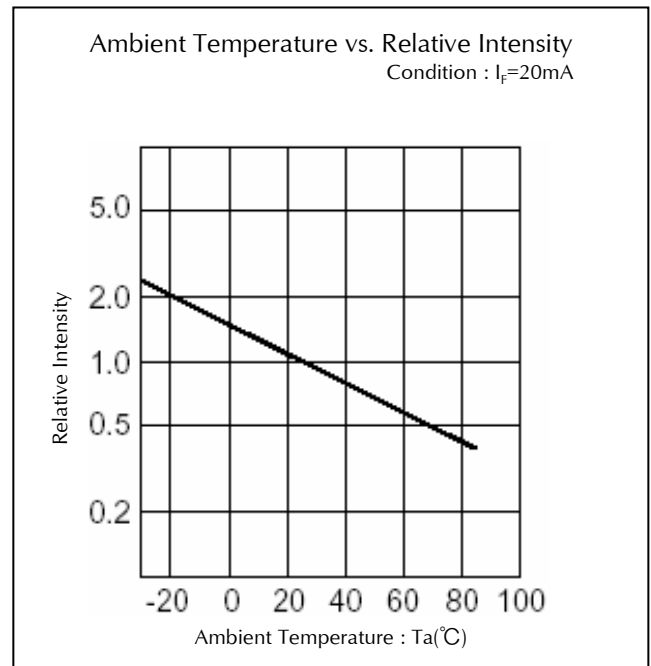
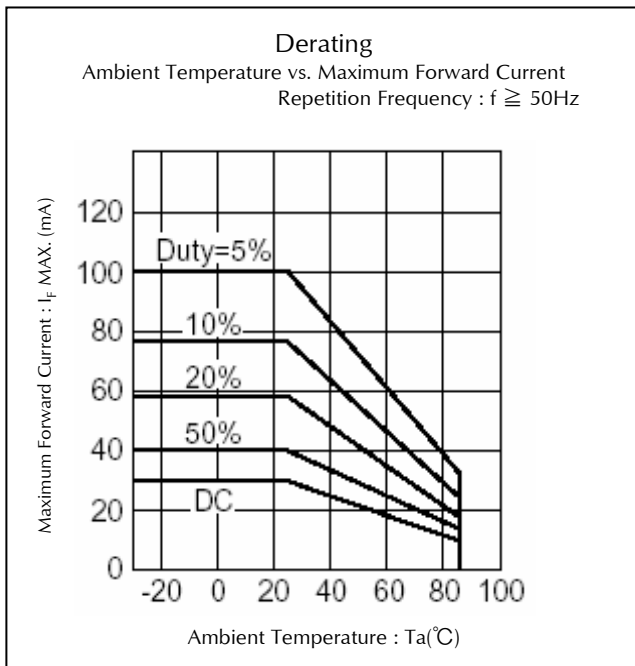
## Technical Data(EAA/AA)



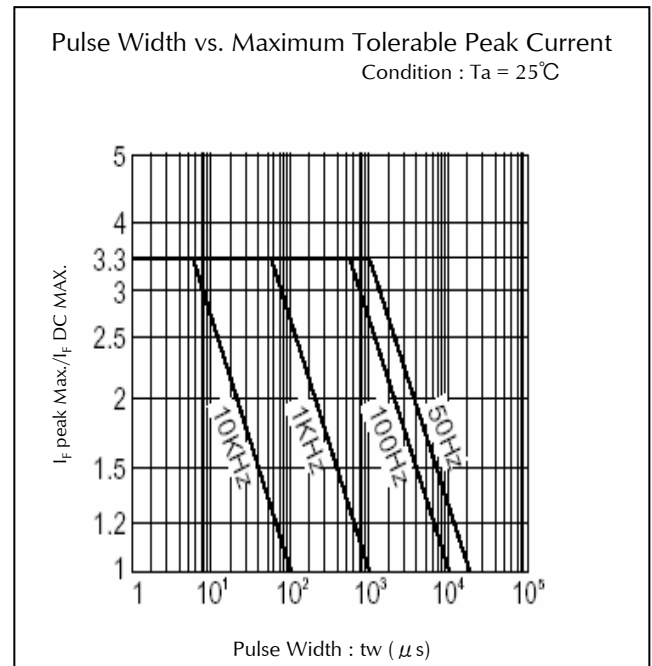
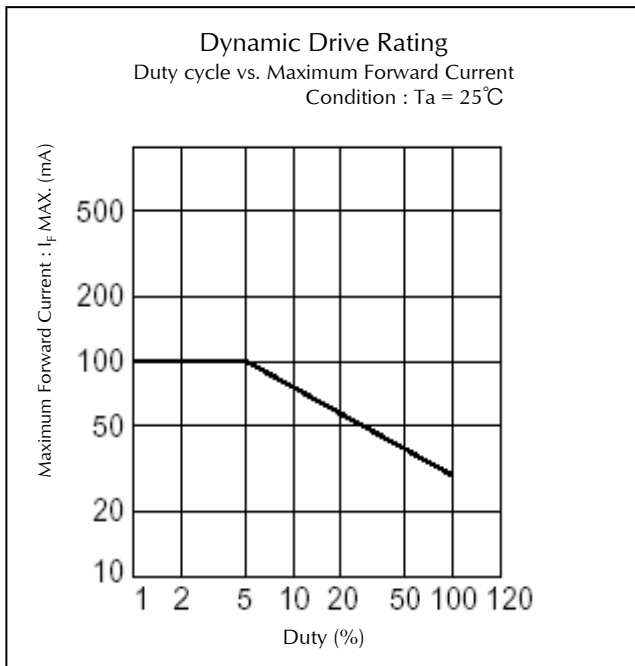
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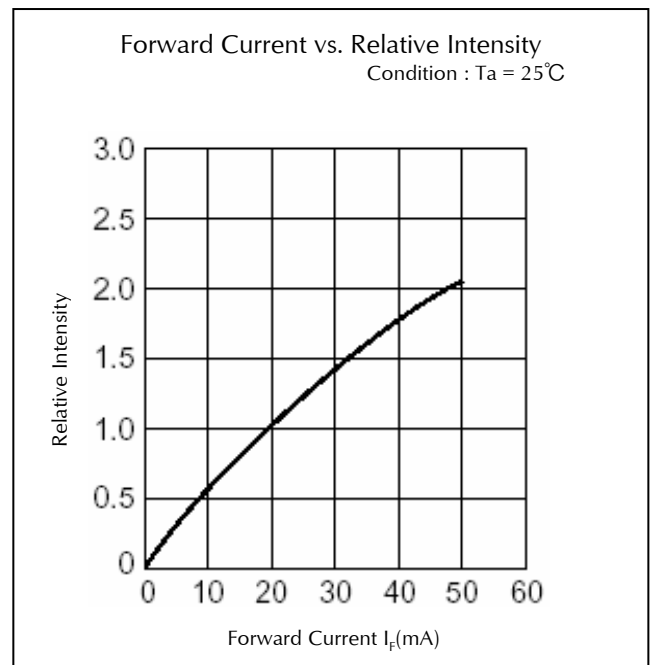
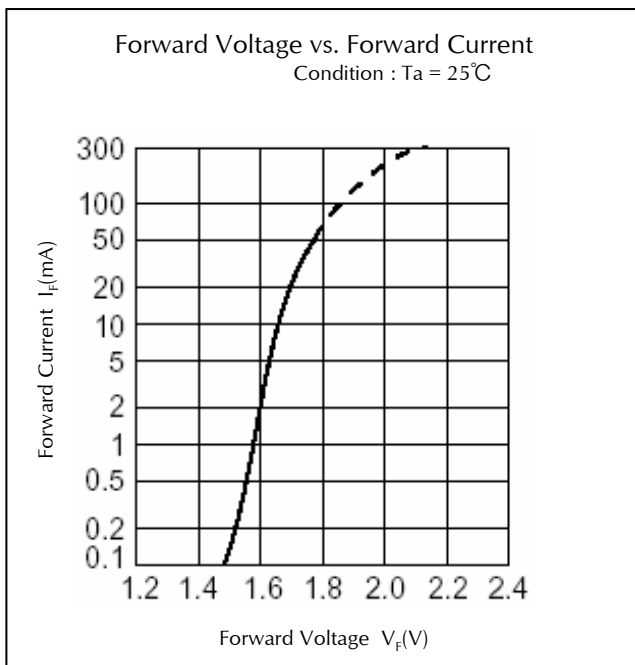
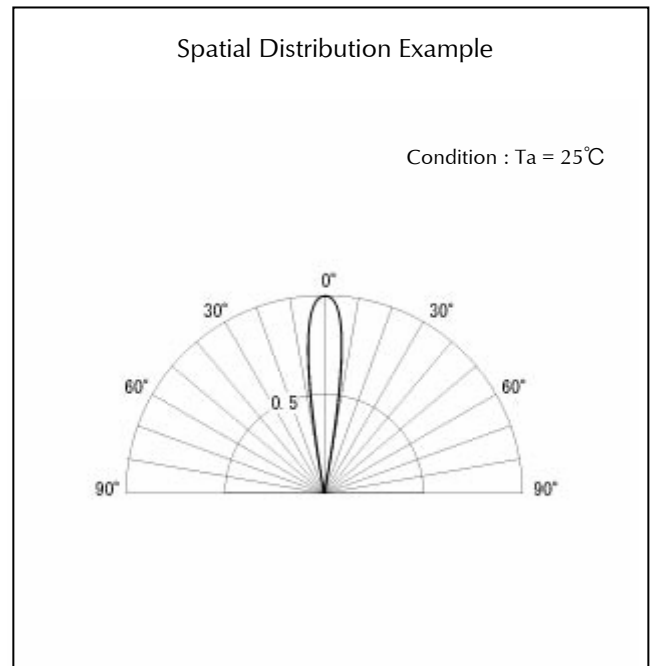
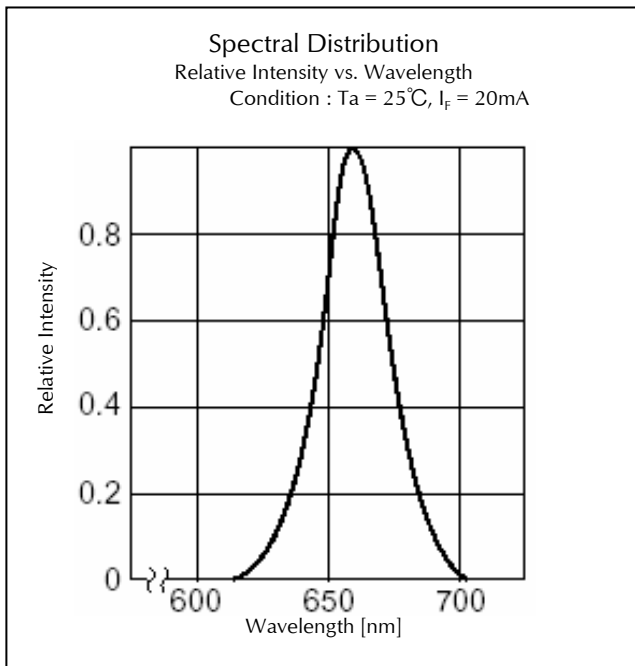
## Technical Data(EVR/VR)



## Technical Data(EVR/VR)

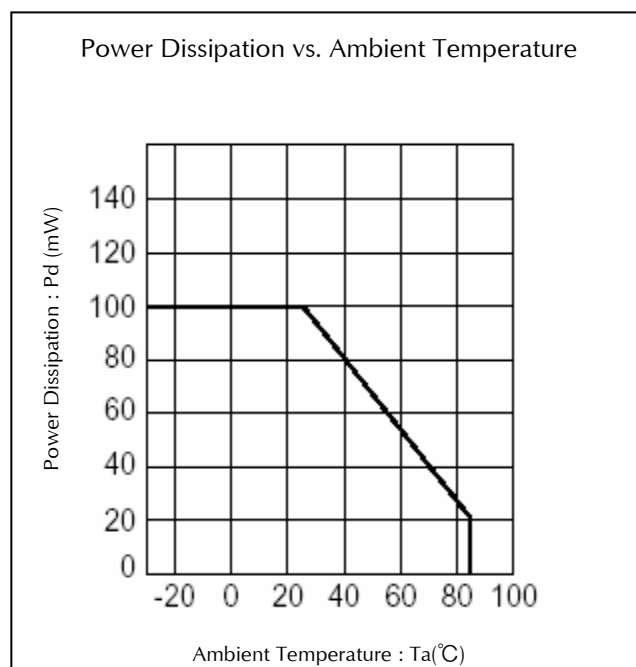
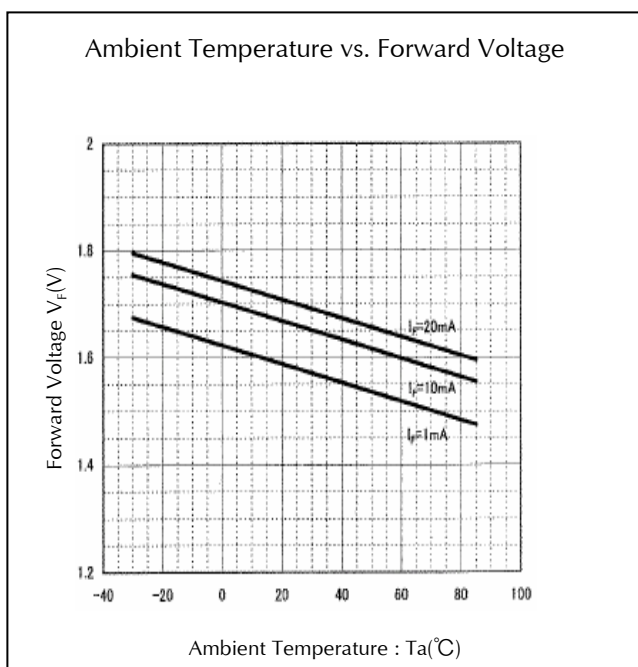
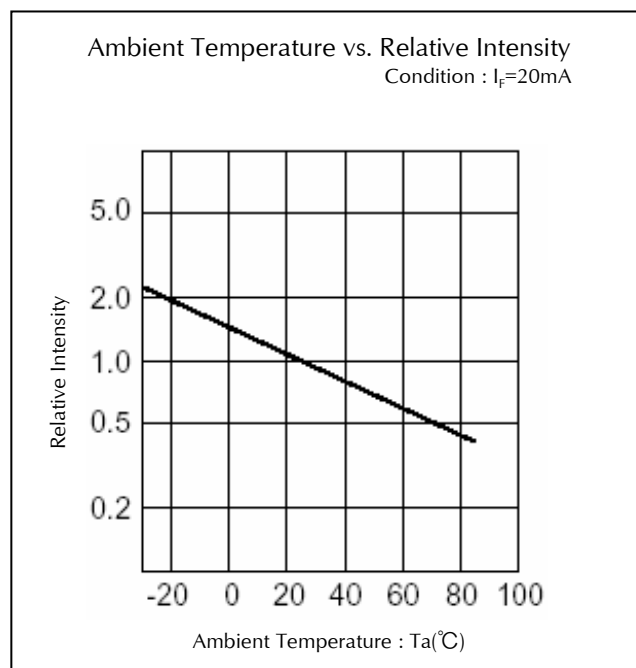
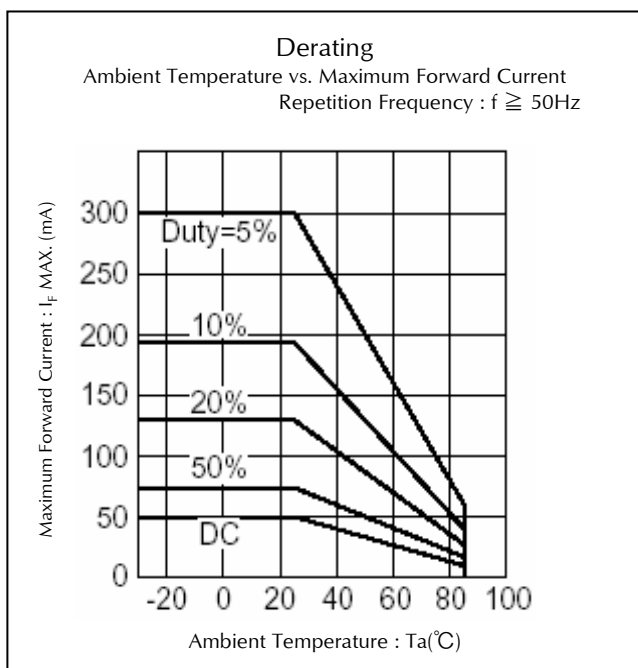


## Technical Data(EBR/BR)

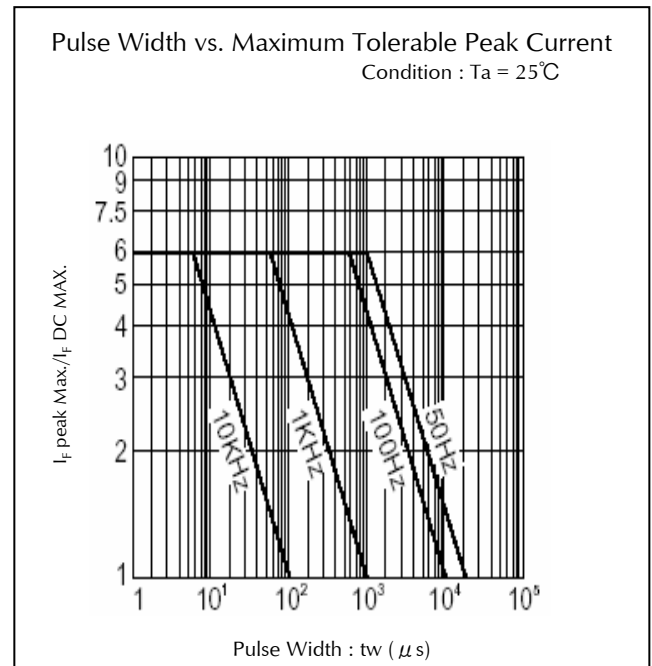
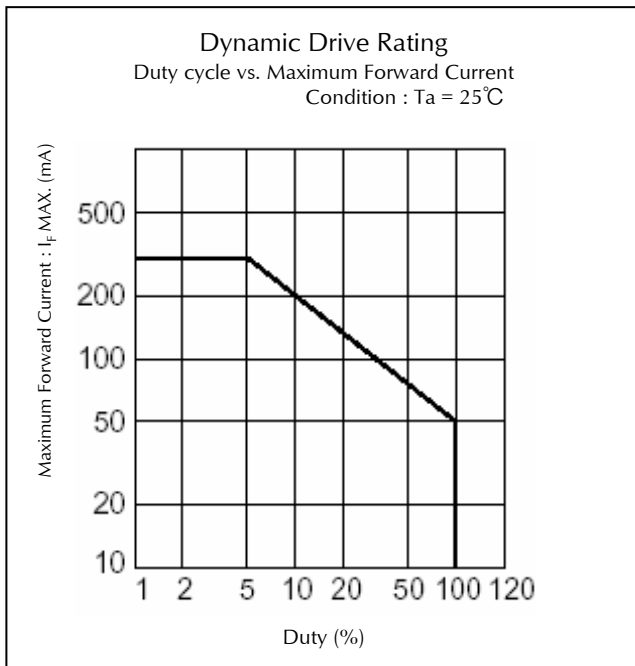




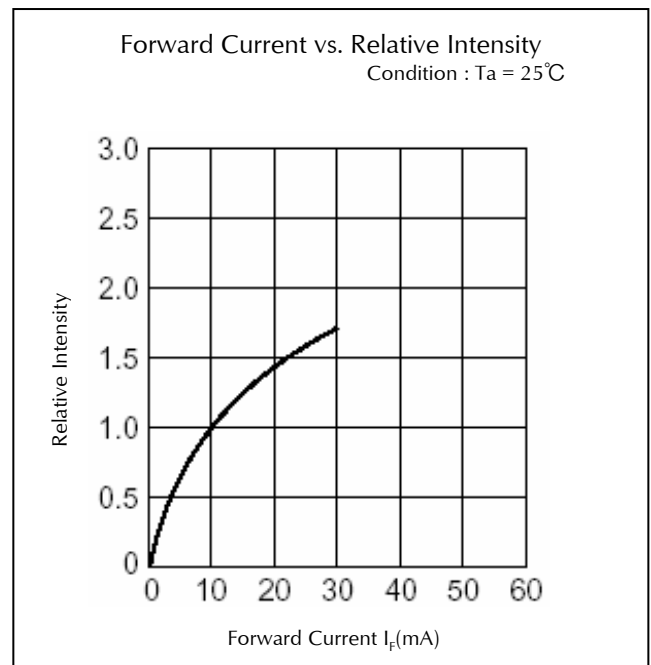
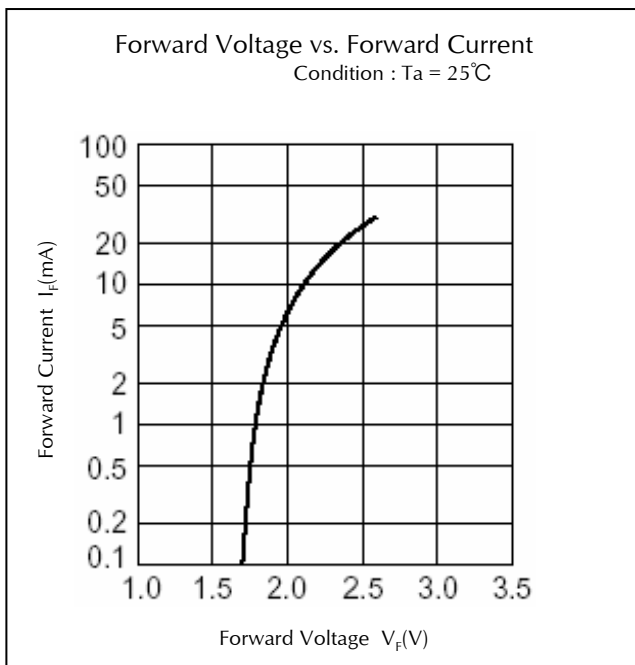
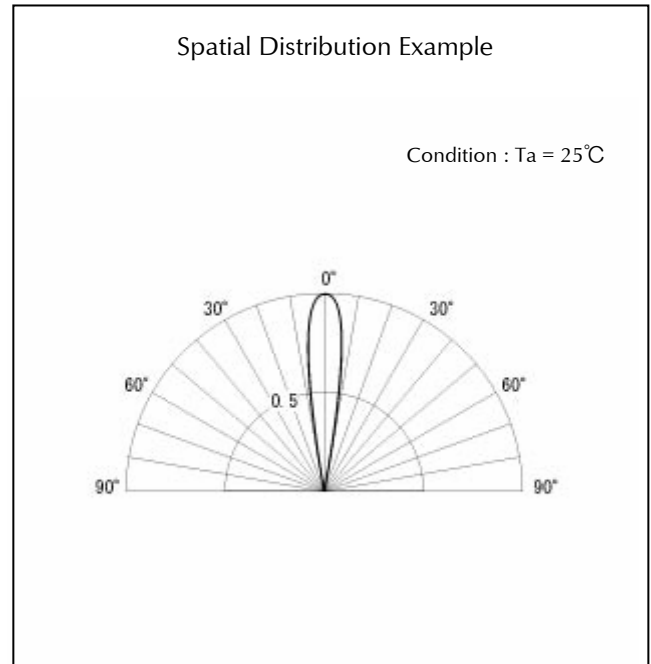
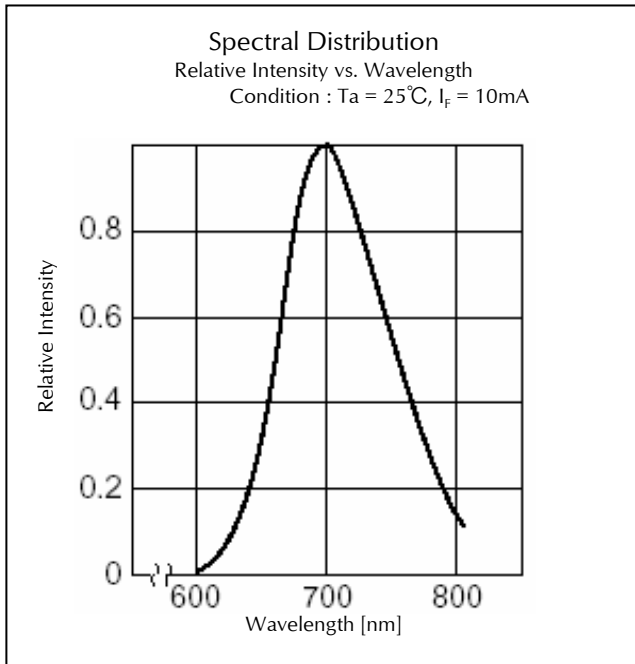
## Technical Data(EBR/BR)



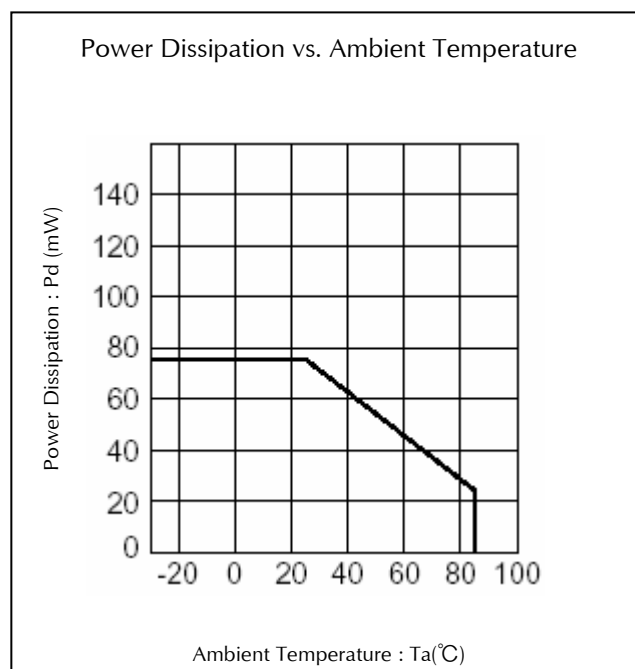
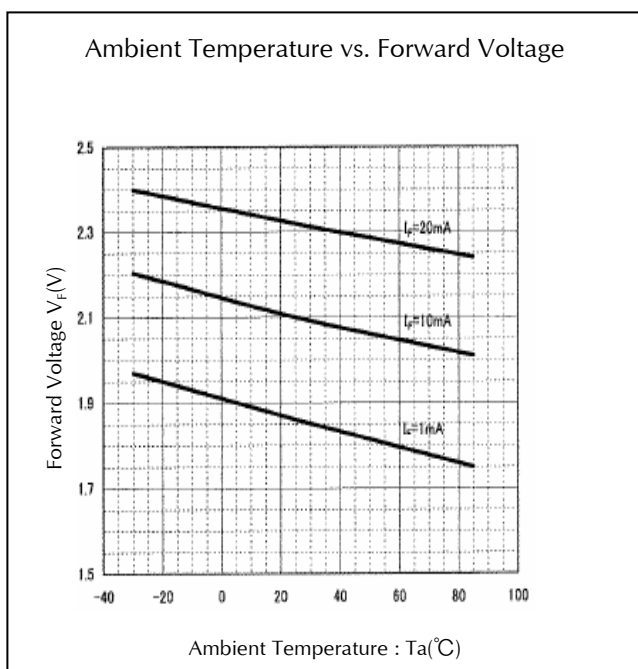
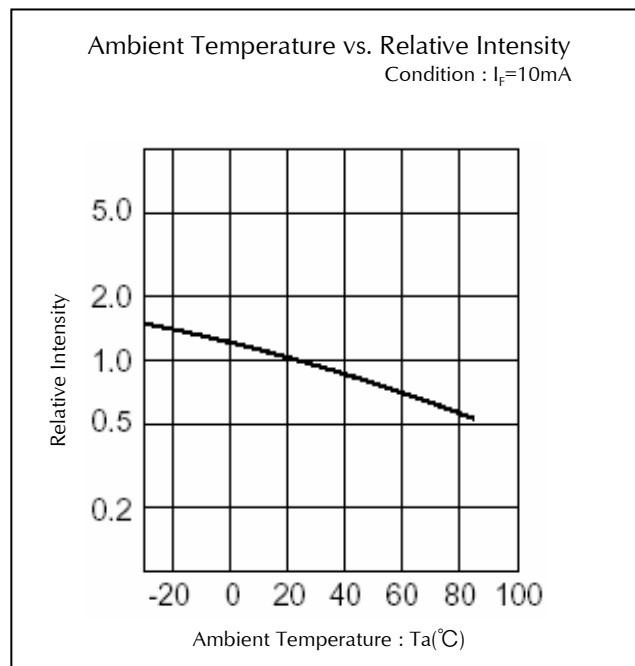
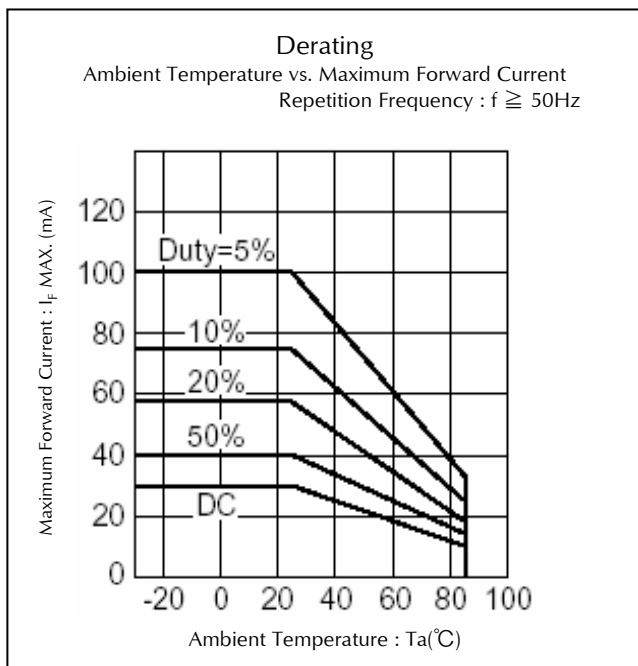
## Technical Data(EBR/BR)



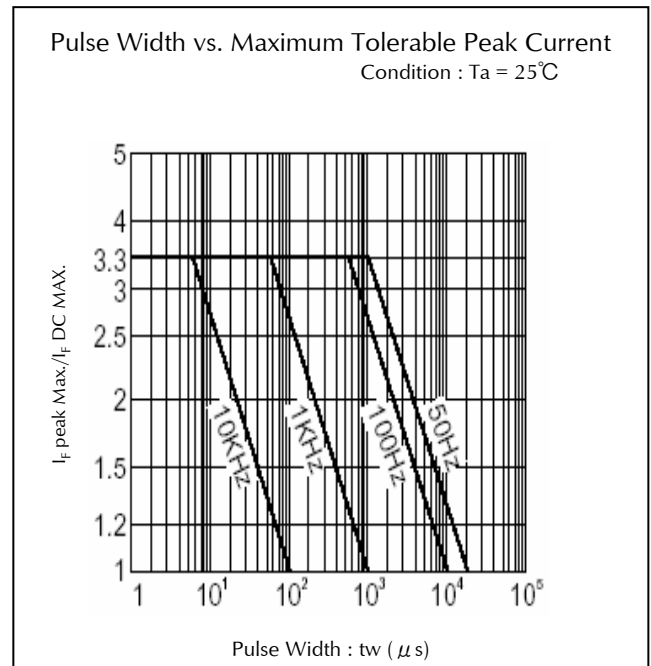
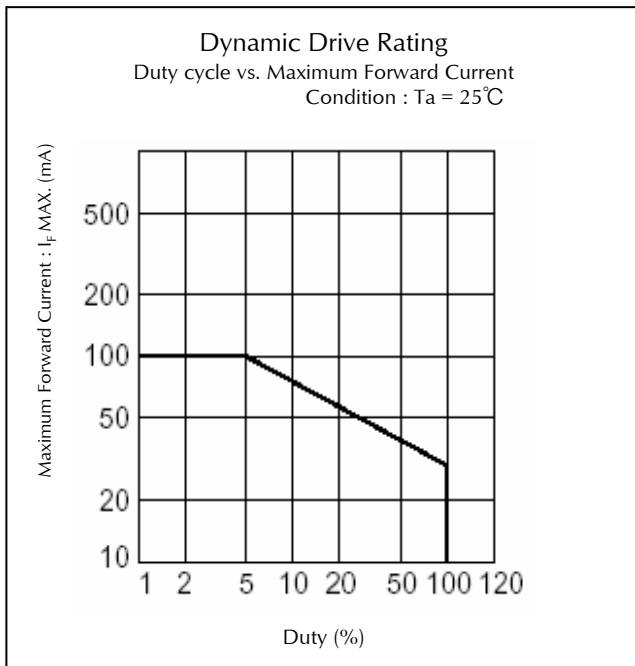
## Technical Data(PR)



## Technical Data(PR)

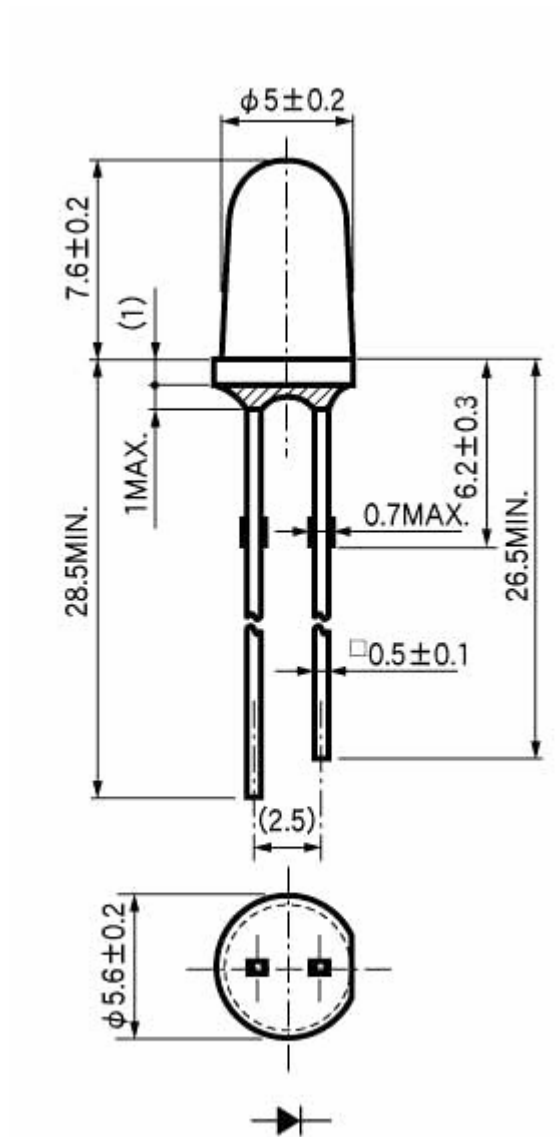


## Technical Data(PR)



## Package Dimensions

(Unit: mm)



## TTW (Through The Wave) soldering Conditions

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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

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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 <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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