



**Pb-free  
HEAT**



# 3864K Series

Single Color Flush Mount Round Shape Type

## Features

Package	<p><math>\phi</math> 3 Flush Mount Round shape type,            MBG,MPG : Pale Green Clear epoxy            MPY,MAY : Pale Yellow Clear epoxy            MAA : Pale Orange Clear epoxy            MVR,BR,MPR : Pale Red Clear epoxy</p>
Product features	<ul style="list-style-type: none"> <li>• Outer Dimension <math>\phi</math> 3 Flush Mount 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	<p>Green : 558nm (MBG)            : 567nm (MPG)            Yellow Green : 572nm (MPY)            Yellow : 590nm (MAY)            Orange : 606nm (MAA)            Red : 624nm (MVR)            : 647nm (BR)            : 630nm (MPR)</p>
Half Intensity Angle	<p>MBG,MPG,MPY : <math>\theta_x=39</math> deg. <math>\theta_y=20</math> deg.            MAY,MAA,MVR,BR,MPR : <math>\theta_x=40</math> deg. <math>\theta_y=20</math> deg.</p>
Die materials	<p>MBG, MPG, MPY, MPR : GaP            MAY, MAA, MVR : GaAsP            BR : GaAlAs</p>
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 $\lambda d$ (nm)		Luminous Intensity Iv (mcd)		
					TYP.	I <sub>F</sub>	MIN.	TYP.	I <sub>F</sub>
					MBG3864K	GaP	Green	Pale Green	Clear
MPG3864K	GaP	Green	567	20	15	30	20		
MPY3864K	GaP	Yellow Green	Pale Yellow	572	20	30	60	20	
MAY3864K	GaAsP	Yellow		590	20	20	40	20	
MAA3864K	GaAsP	Orange	Pale Orange	606	20	20	40	20	
MVR3864K	GaAsP	Red	Pale Red	624	20	8	16	20	
BR3864K	GaAlAs	Red		647	20	10	20	20	
MPR3864K	GaP	Red		630	10	2	4	10	

## Absolute Maximum Ratings

(Ta=25°C)

Item	Symbol	Absolute Maximum Ratings								Unit
		MBG	MPG	MPY	MAY	MAA	MVR	BR	MPR	
Power Dissipation	$P_d$	70	70	85	85	70	75	100	75	mW
Forward Current	$I_F$	25	25	30	30	25	30	50	30	mA
Pulse Forward Current ※1	$I_{FRM}$	60	60	75	75	60	75	300	75	mA
Derating (Ta=25°C or higher)	$\Delta I_F$	0.33	0.33	0.40	0.40	0.33	0.40	0.67	0.40	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(MBG,MPG,MPY,MAY,MAA,MVR,BR) (Ta=25°C)

Item	Conditions	Symbol	Characteristics								Unit
			MBG	MPG	MPY	MAY	MAA	MVR	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.	2.8	2.8	2.8	2.8	2.8	2.8	2.0	
Reverse Current	V <sub>R</sub> =4V	I <sub>R</sub>	MAX.	20	20	20	20	20	20	100	μ A
Peak Wavelength	I <sub>F</sub> =20mA	λ <sub>p</sub>	TYP.	555	560	570	580	605	630	660	nm
Dominant Wavelength	I <sub>F</sub> =20mA	λ <sub>d</sub>	TYP.	558	567	572	590	606	624	647	nm
Spectral Line Half Width	I <sub>F</sub> =20mA	Δλ	TYP.	30	30	30	30	30	30	30	nm
Half Intensity Angle	I <sub>F</sub> =20mA	2θ 1/2	TYP.	39(θx)	39(θx)	39(θx)	40(θx)	40(θx)	40(θx)	40(θx)	deg.
				20(θy)	20(θy)	20(θy)	20(θy)	20(θy)	20(θy)	20(θy)	

## Electro-Optical Characteristics(MPR)

(Ta=25°C)

Item	Conditions	Symbol	Characteristics		Unit
				MPR	
Forward Voltage	I <sub>F</sub> =10mA	V <sub>F</sub>	TYP.	2.1	V
			MAX.	2.8	
Reverse Current	V <sub>R</sub> =4V	I <sub>R</sub>	MAX.	20	μ A
Peak Wavelength	I <sub>F</sub> =10mA	λ <sub>p</sub>	TYP.	700	nm
Dominant Wavelength	I <sub>F</sub> =10mA	λ <sub>d</sub>	TYP.	630	nm
Spectral Line Half Width	I <sub>F</sub> =10mA	Δλ	TYP.	100	nm
Half Intensity Angle	I <sub>F</sub> =10mA	2θ 1/2	TYP.	40(θx)	deg.
				20(θy)	

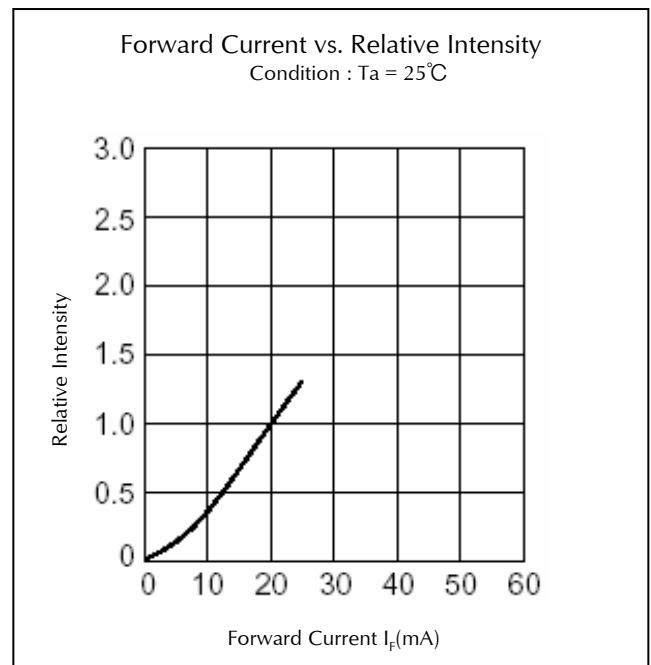
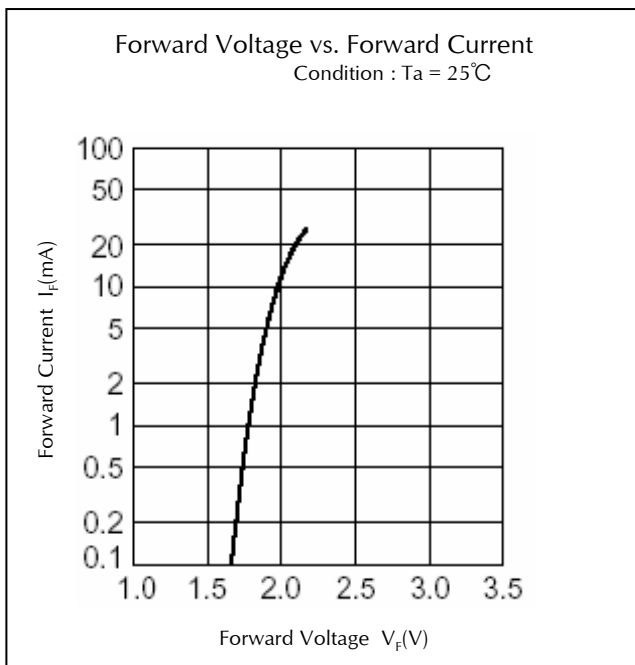
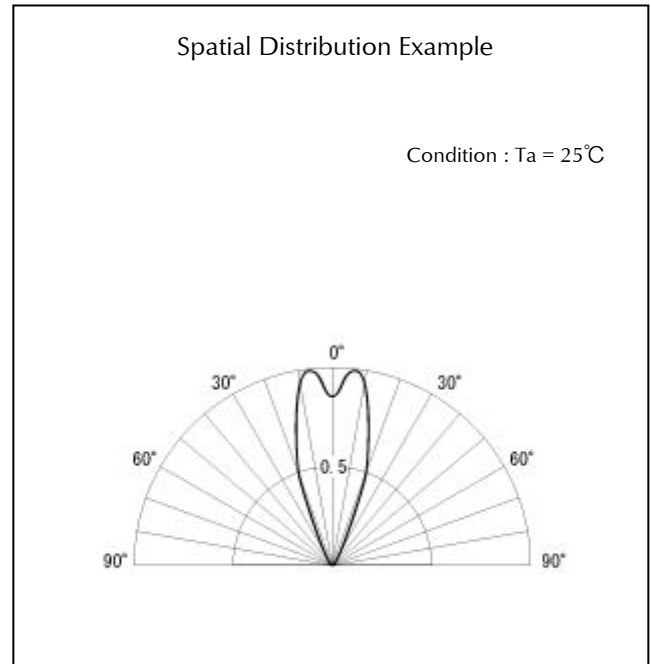
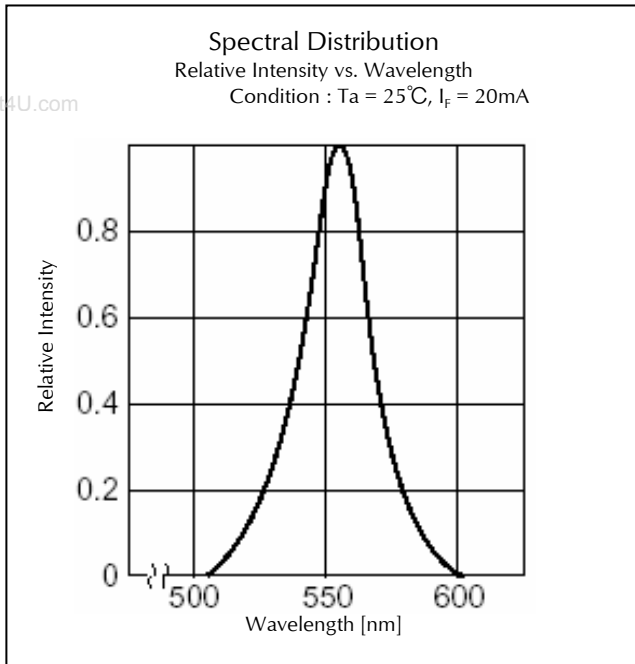
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(Ta=25°C)

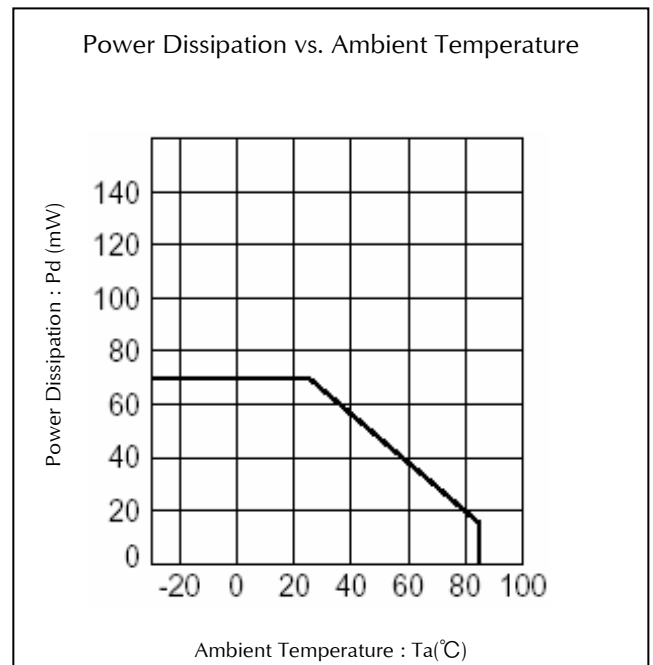
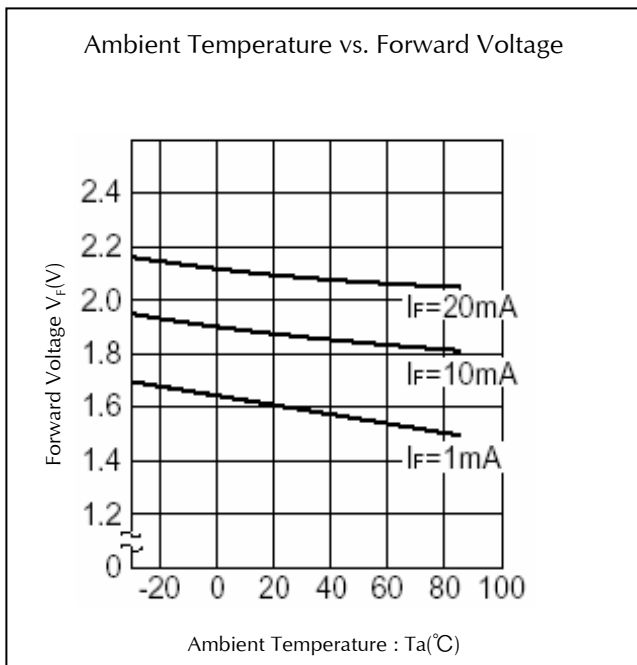
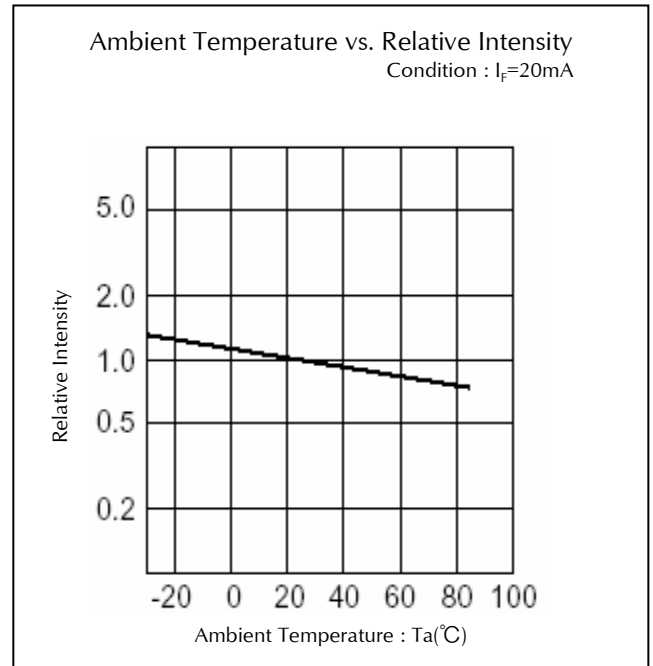
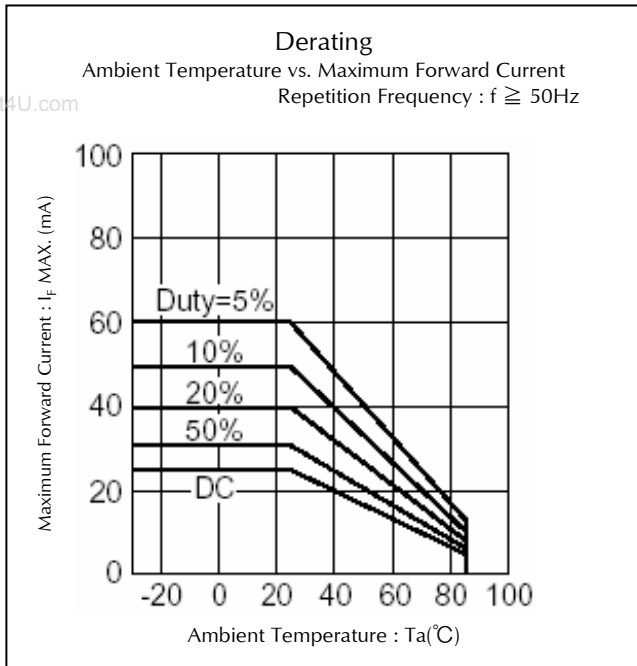
Rank	I <sub>v</sub> (mcd)															
	MBG		MPG		MPY		MAY		MAA		MVR		BR		MPR	
	I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =10mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A	8.0	16.0	15	30	30	60	20	40	20	40	8.0	16.0	10	20	2.0	4.0
B	11.2	22.4	21	42	42	84	28	56	28	56	11.2	22.4	14	28	2.8	5.6
C	16.0	32.0	30	60	60	120	40	80	40	80	16.0	32.0	20	40	4.0	8.0
D	22.4	44.8	42	84	84	168	56	112	56	112	22.4	44.8	28	56	5.6	11.2
E	32.0	-	60	-	120	-	80	-	80	-	32.0	-	40	-	8.0	-

Please contact our sales staff concerning rank designation.

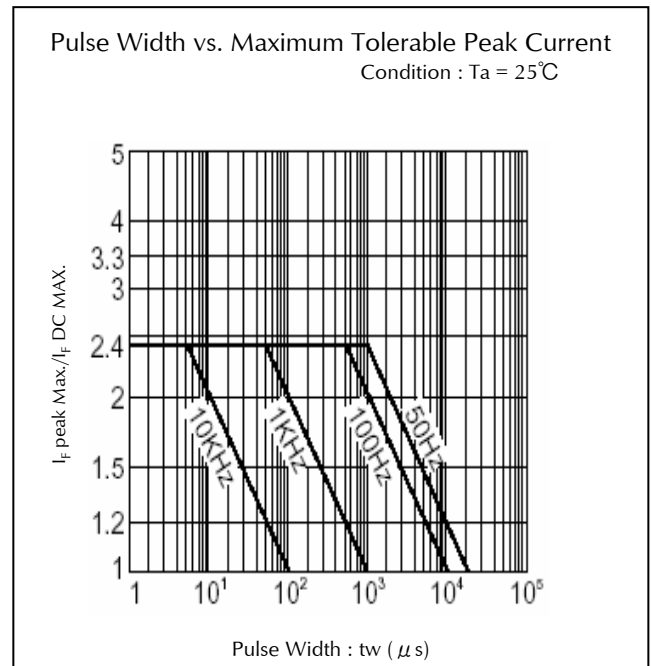
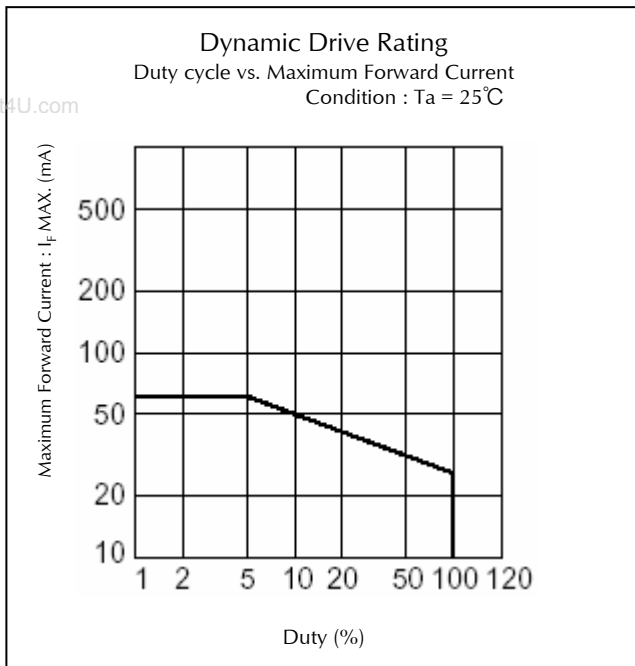
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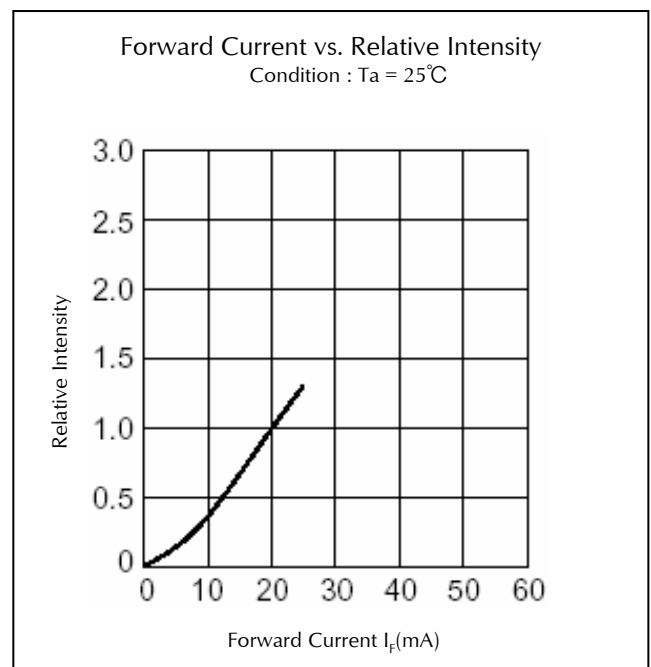
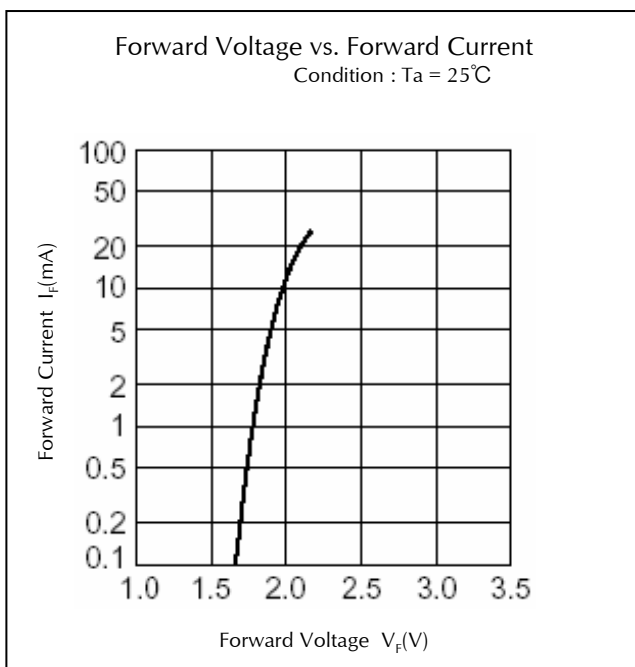
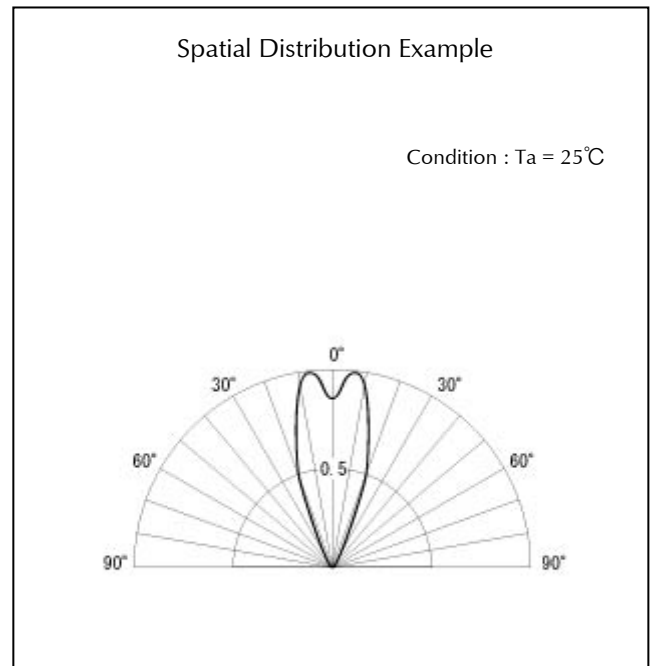
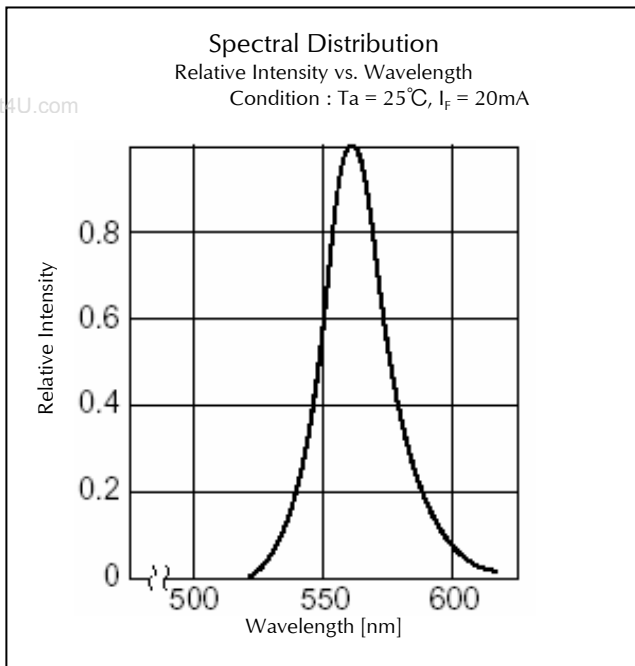


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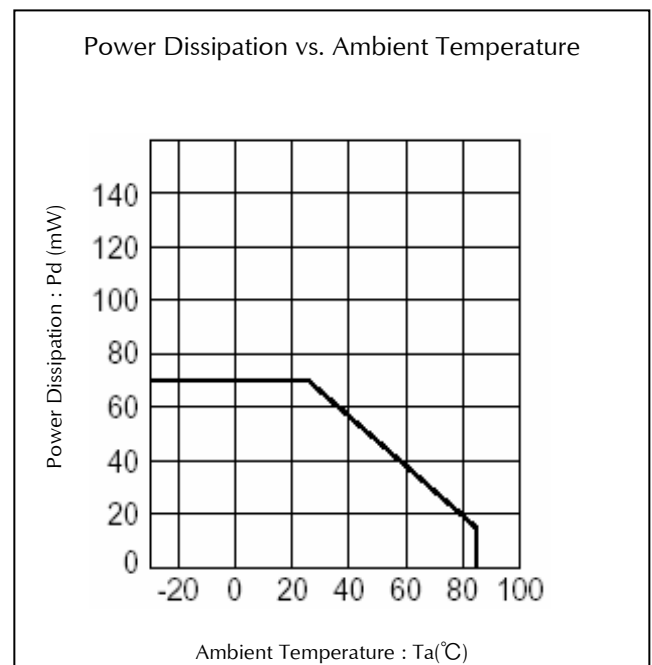
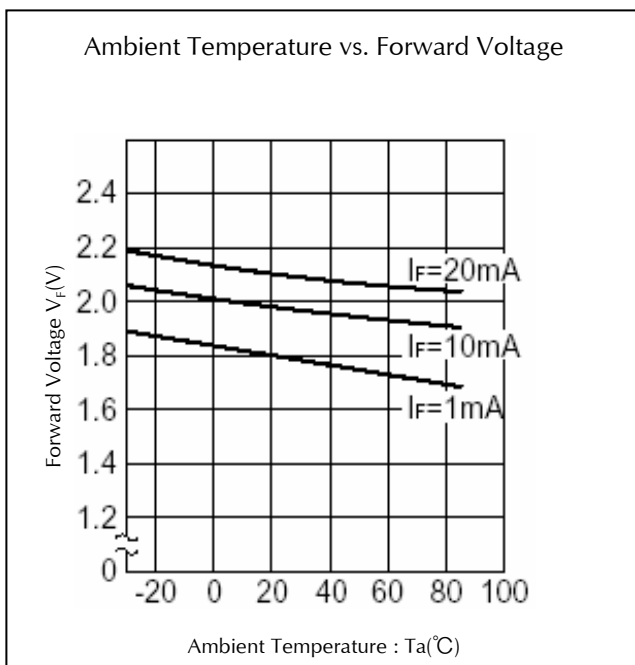
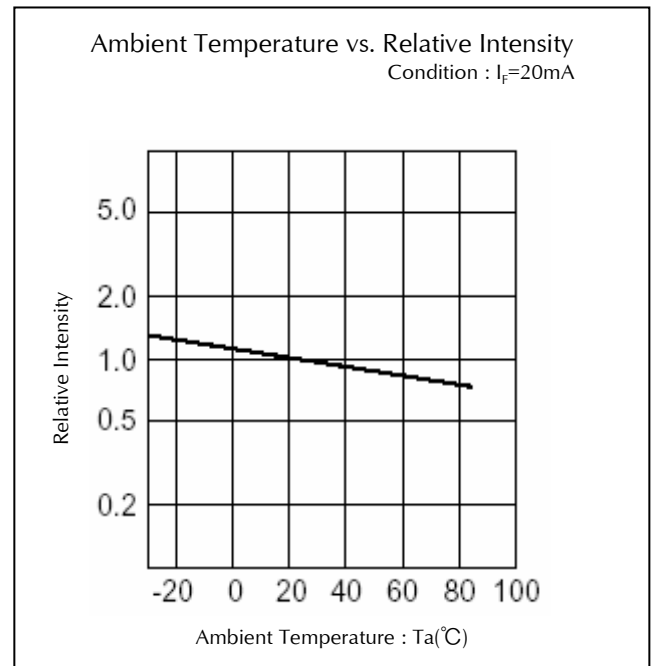
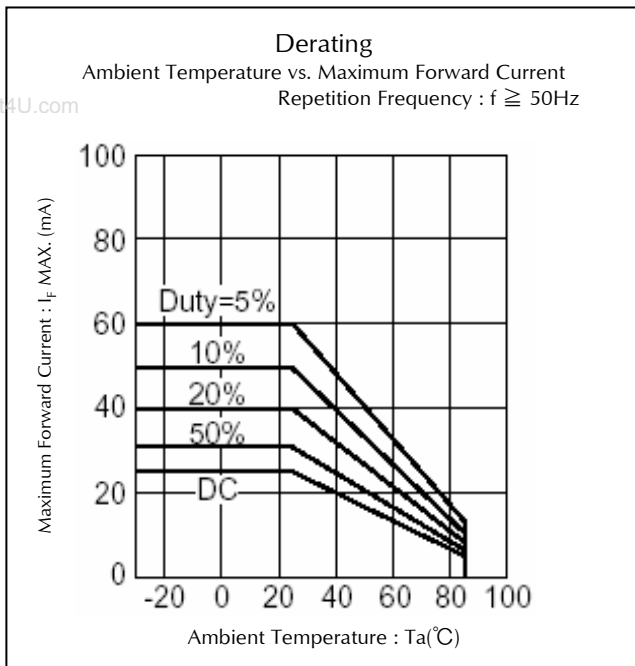




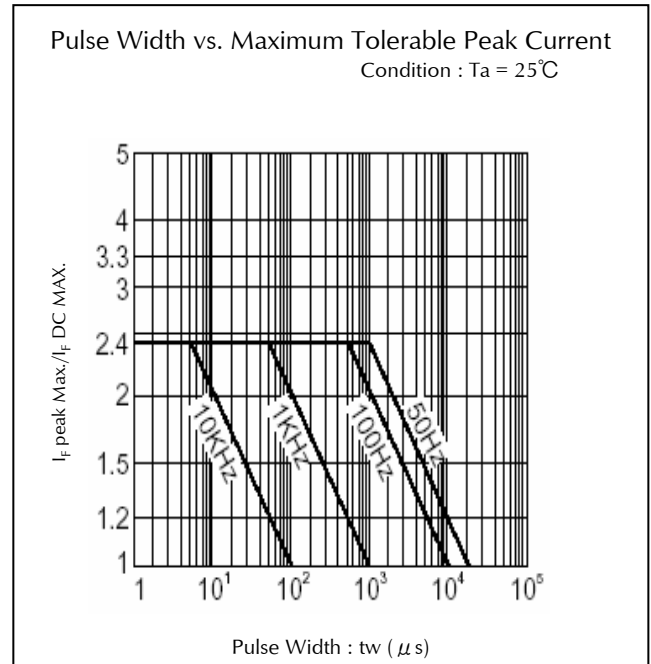
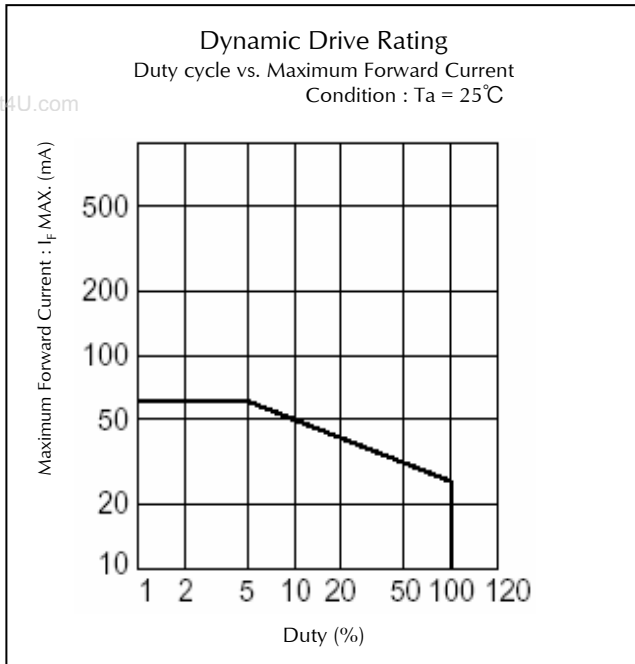
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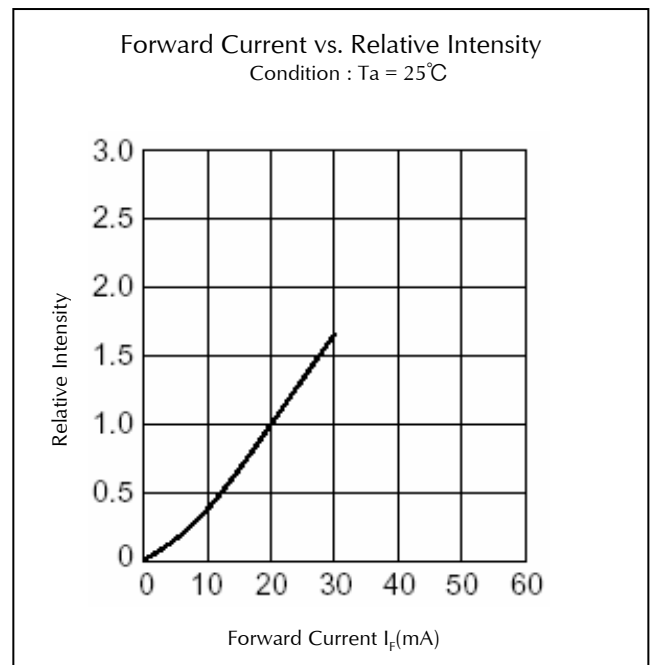
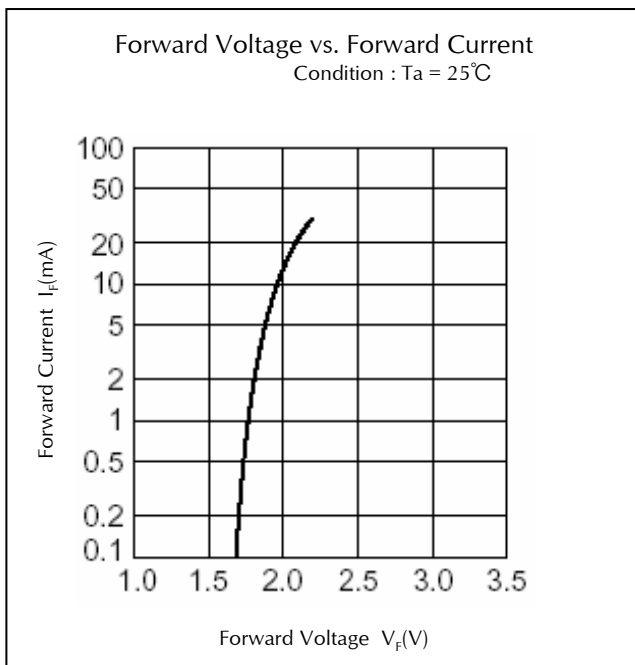
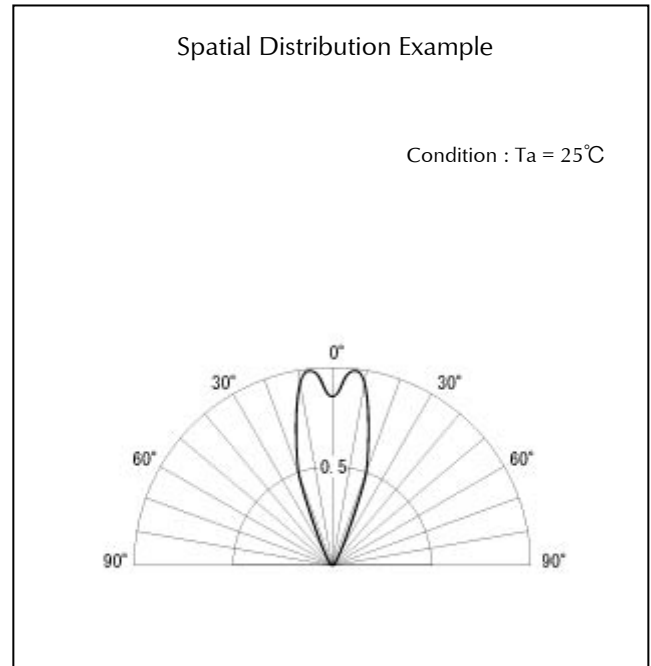
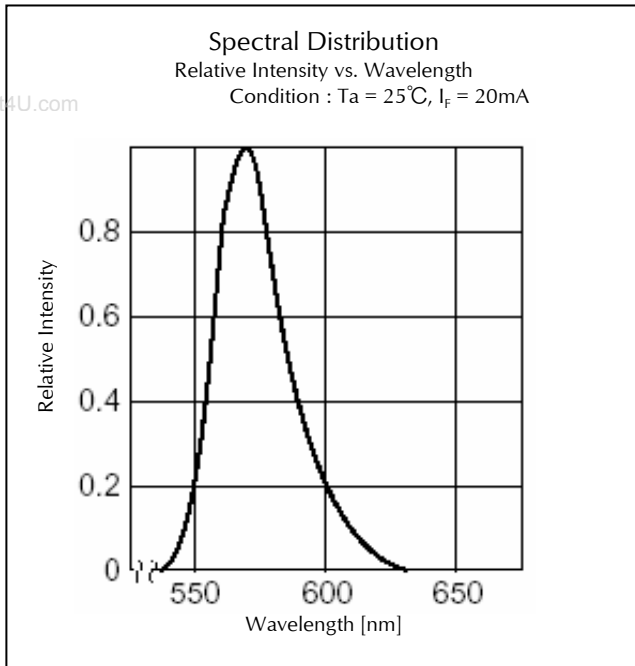
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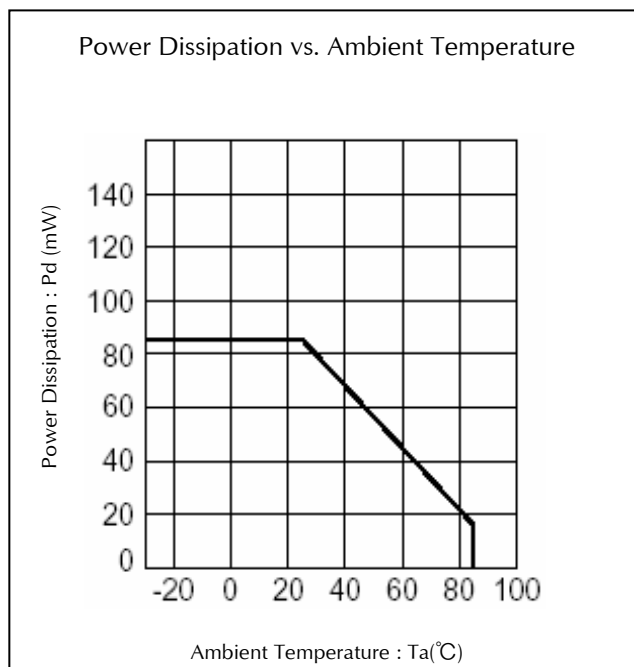
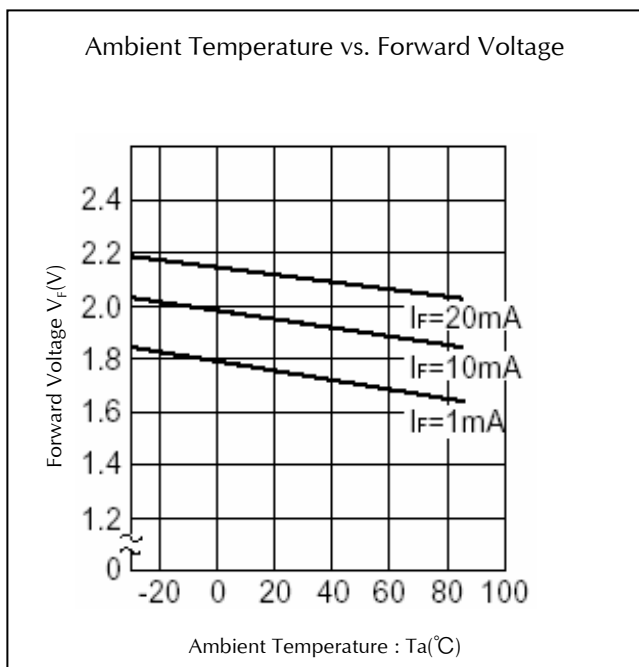
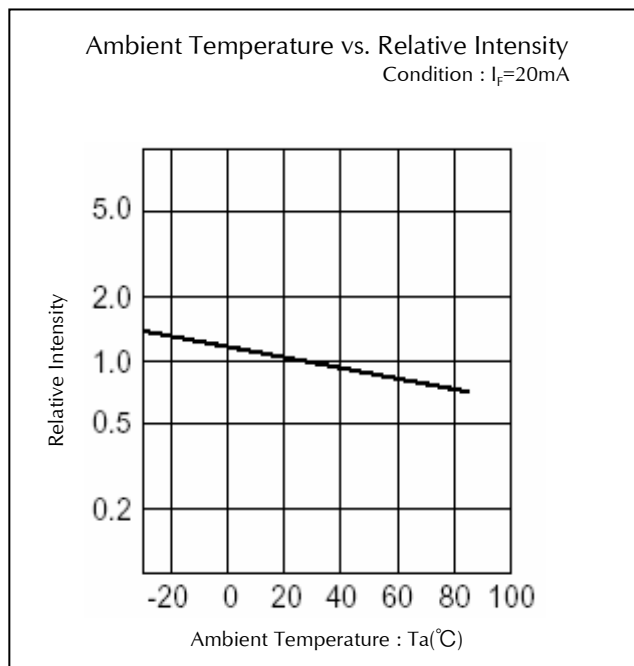
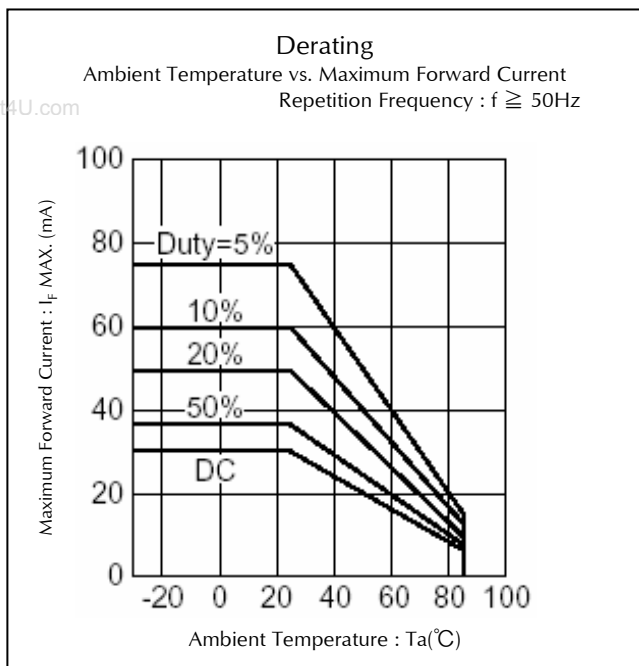
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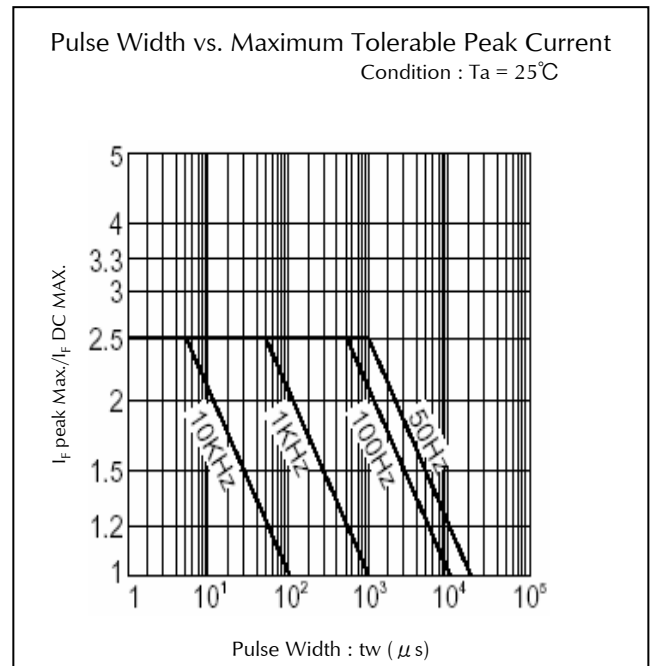
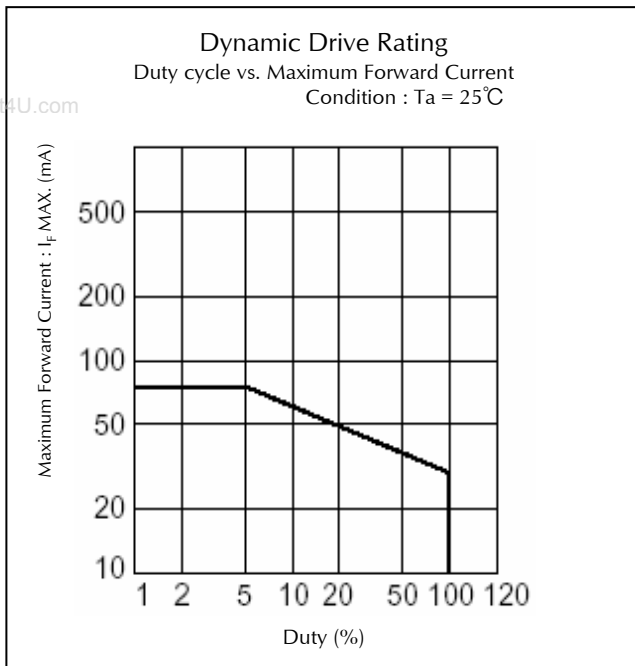
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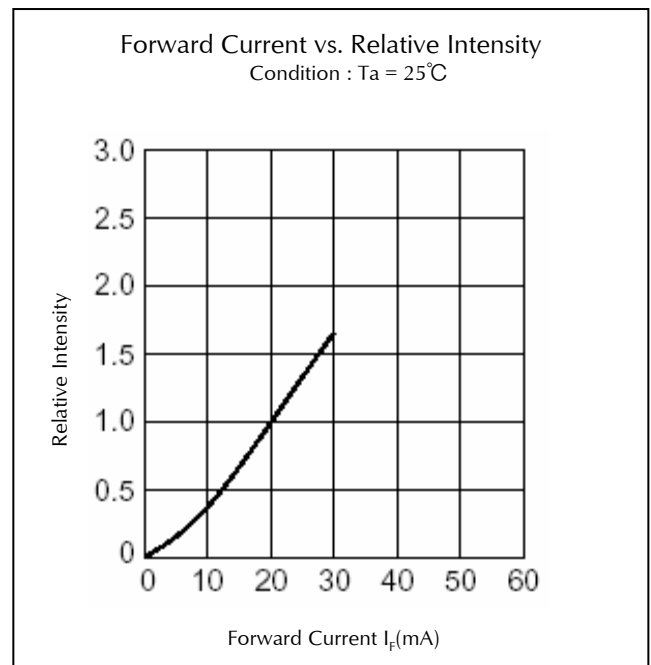
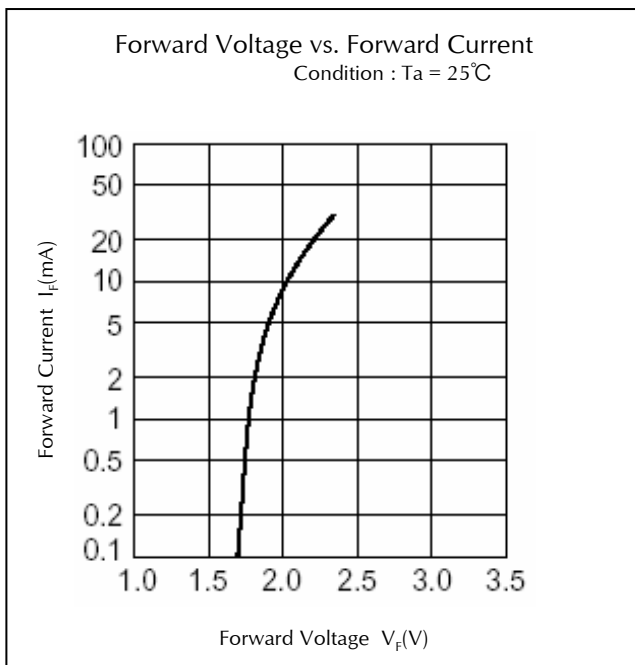
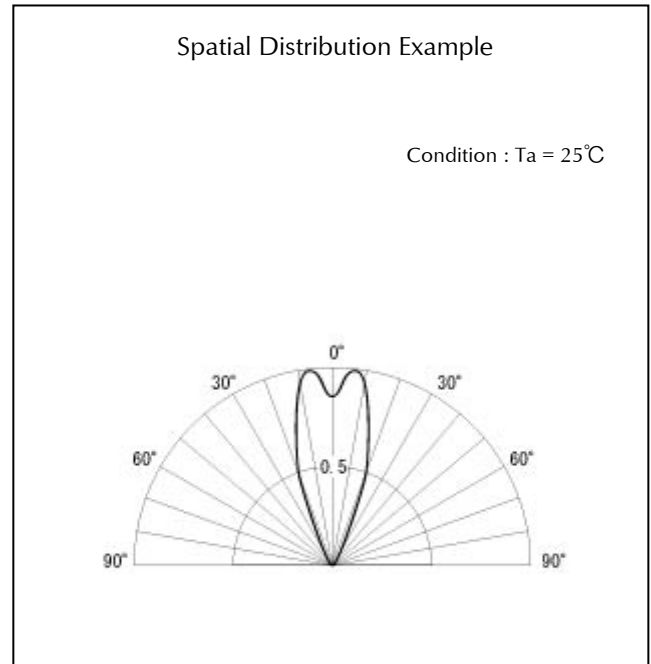
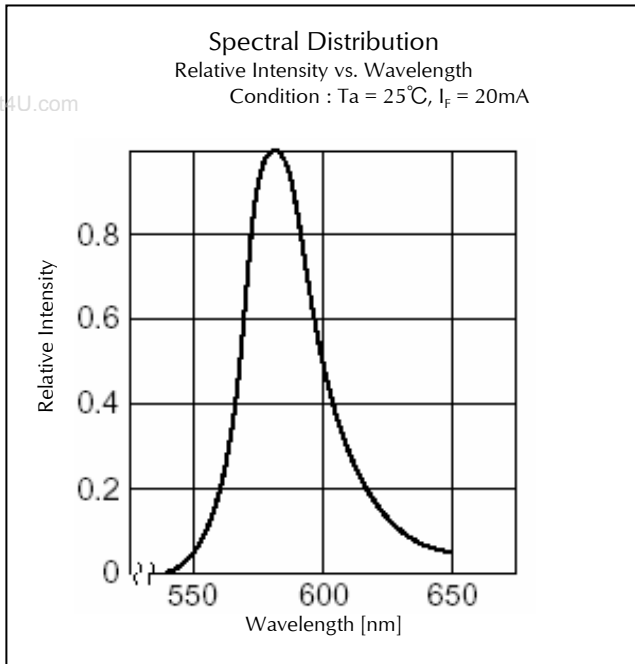
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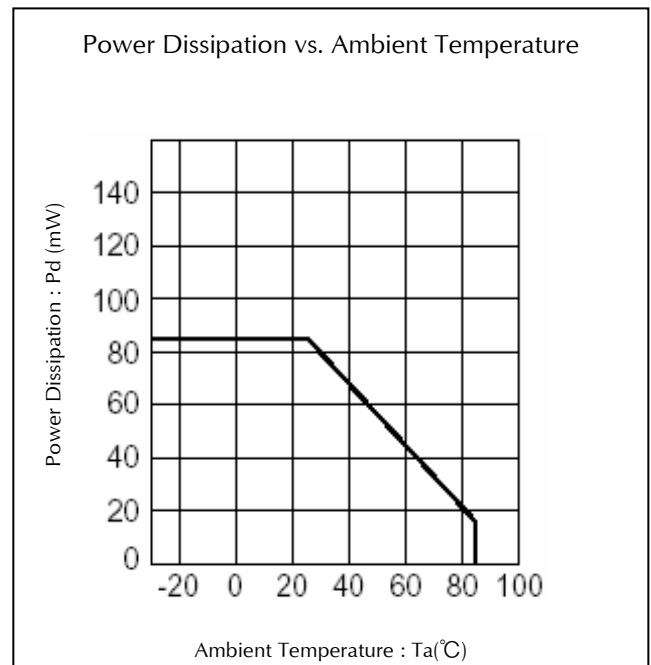
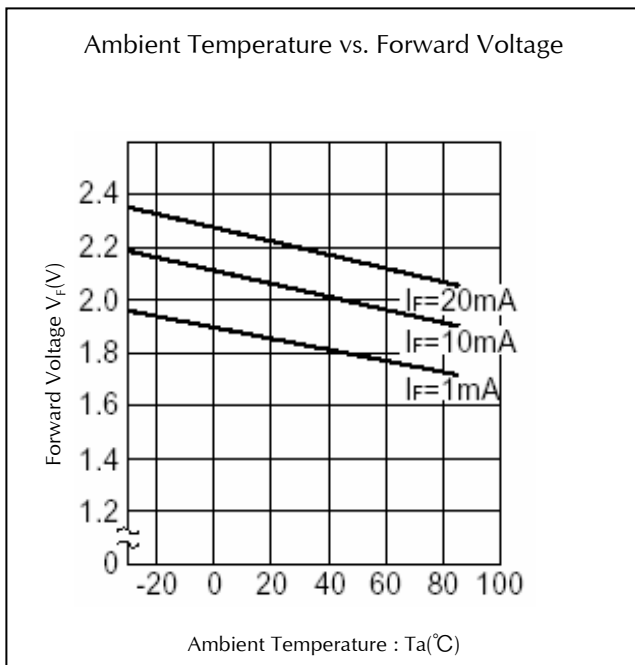
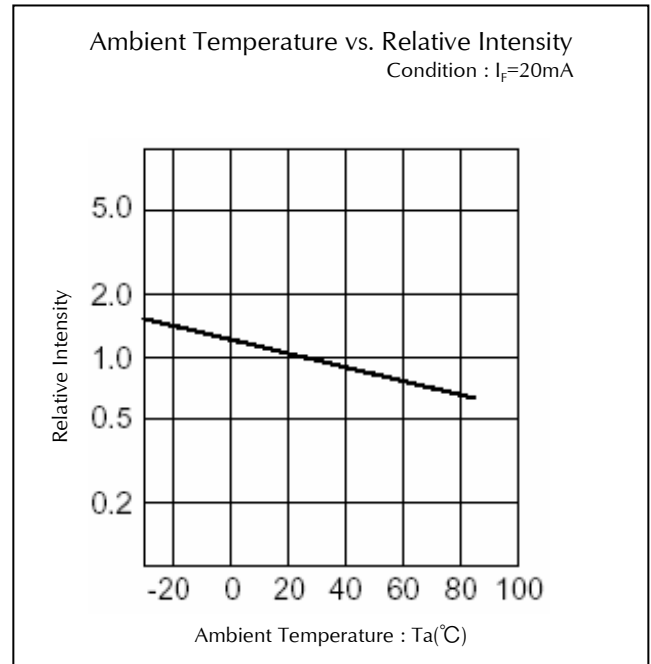
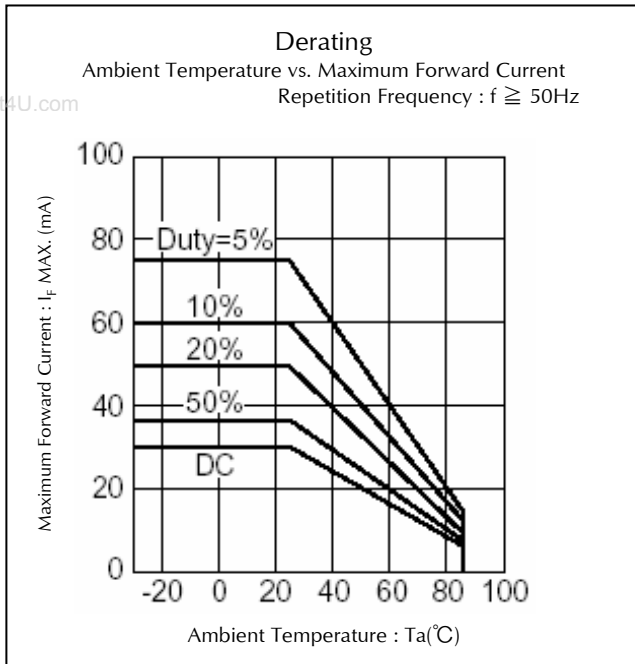
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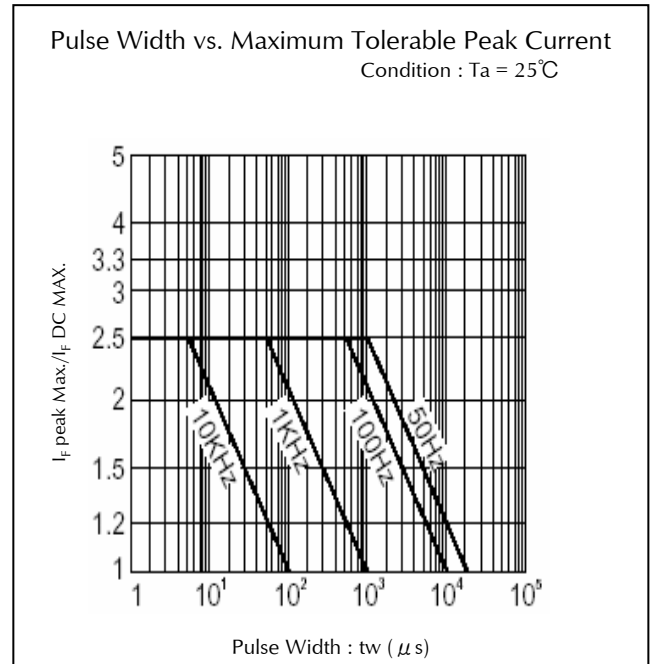
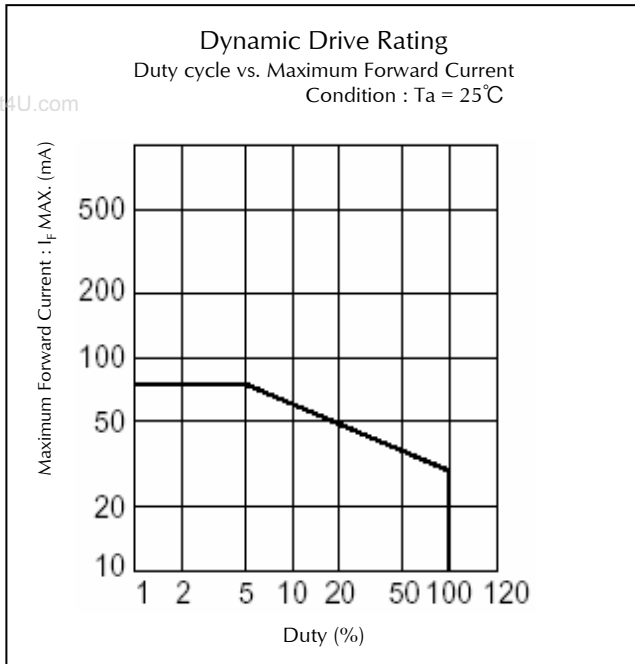


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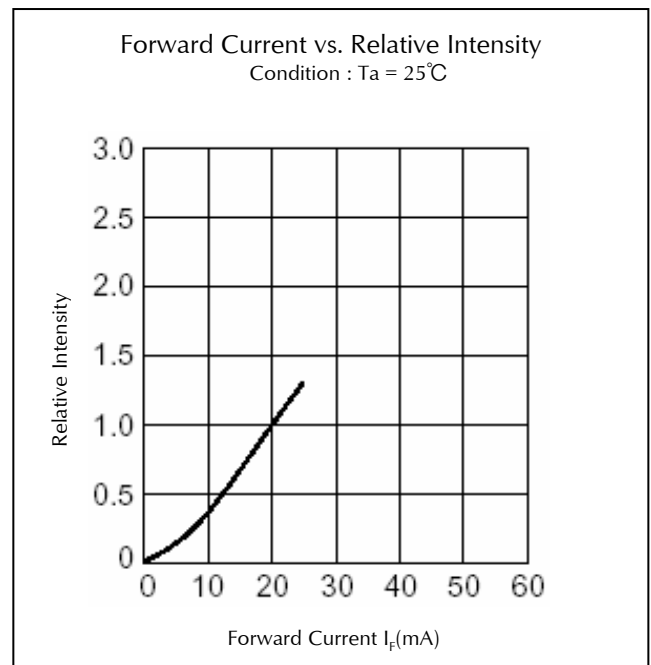
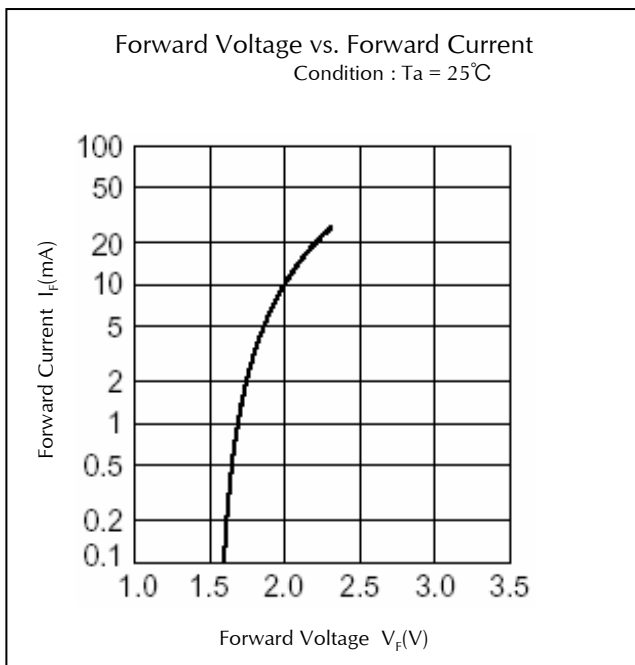
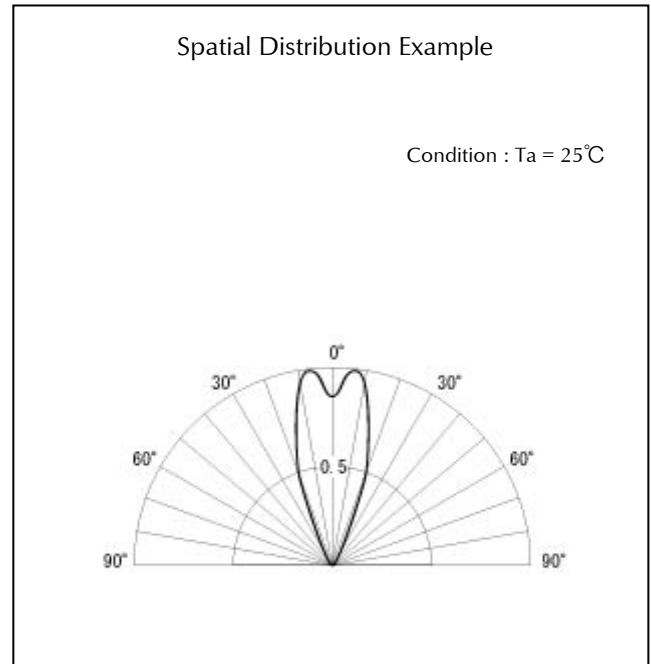
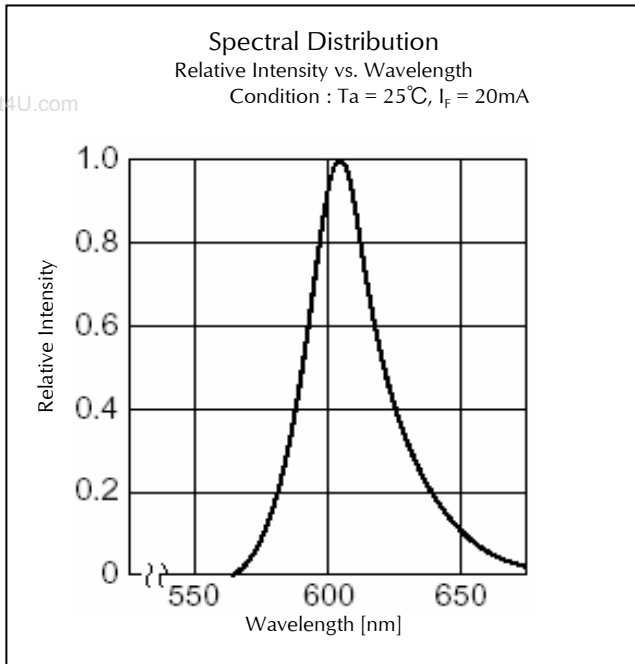




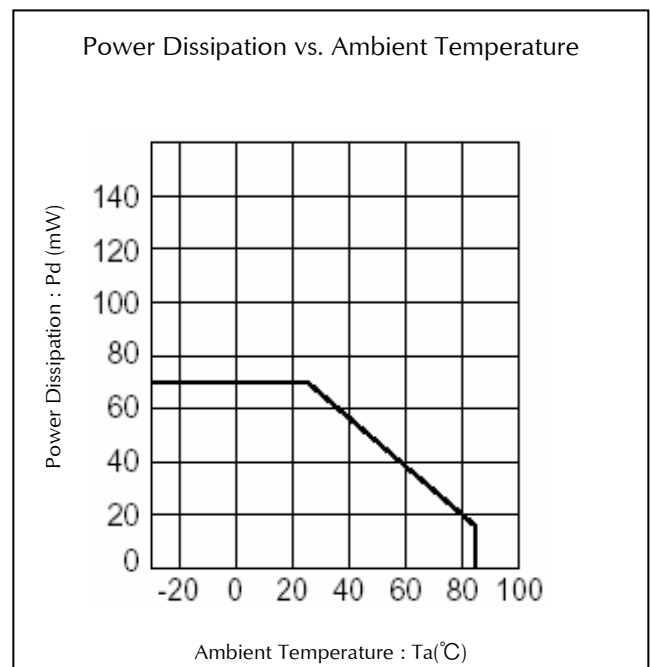
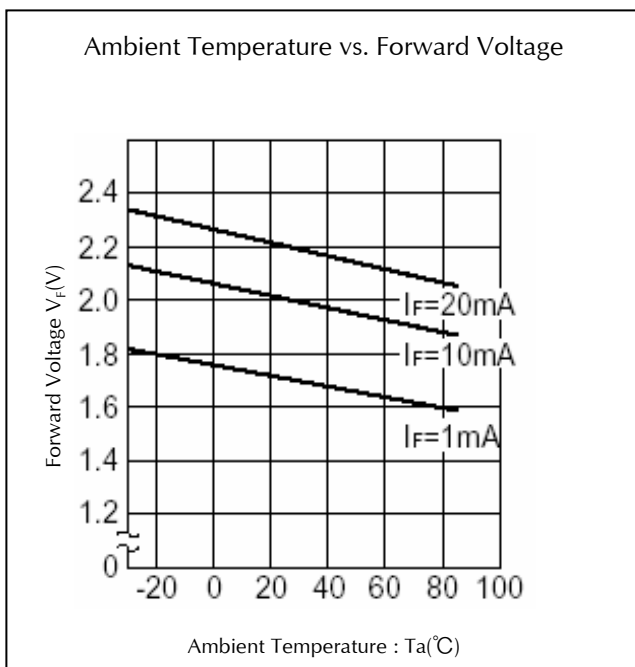
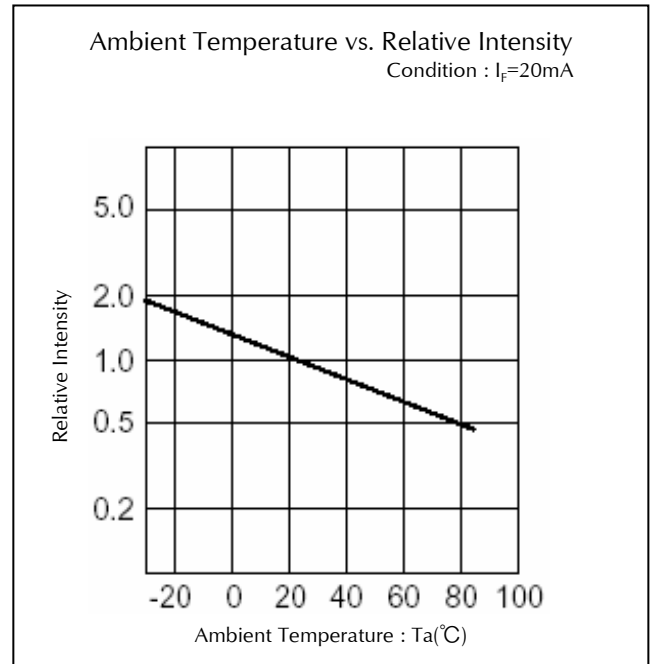
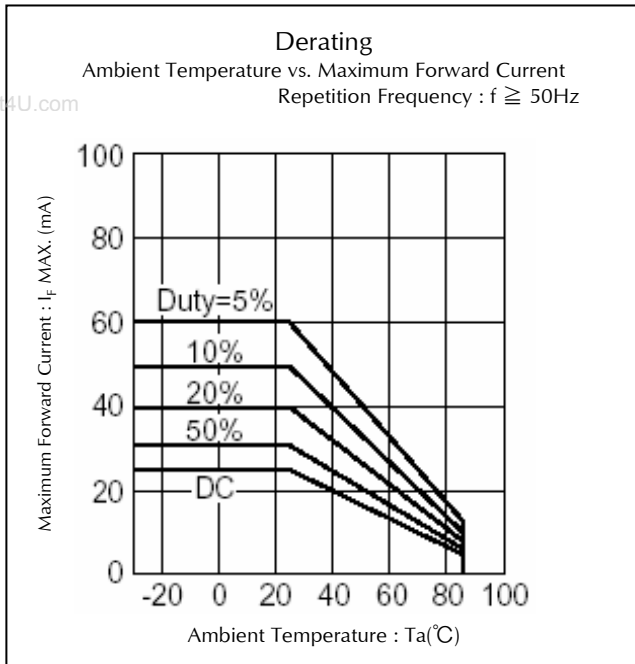
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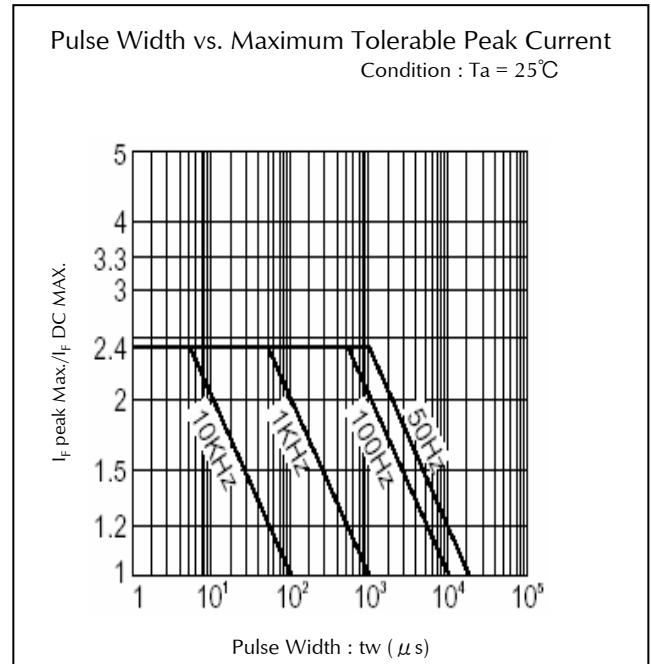
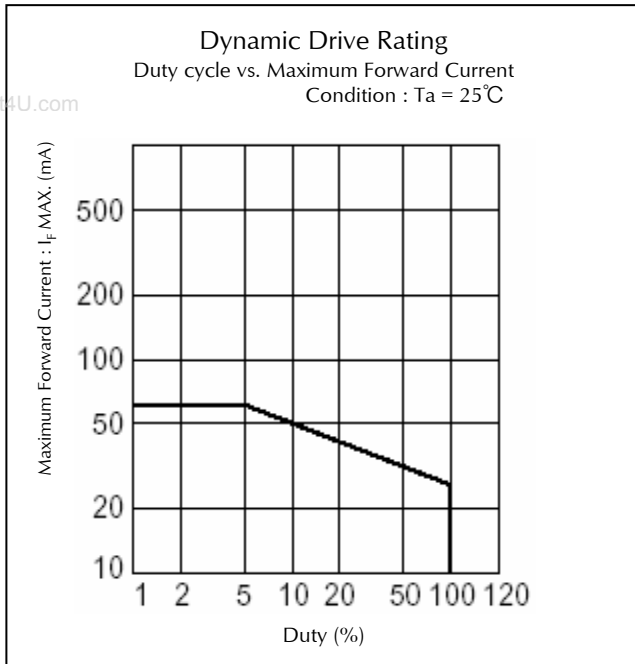
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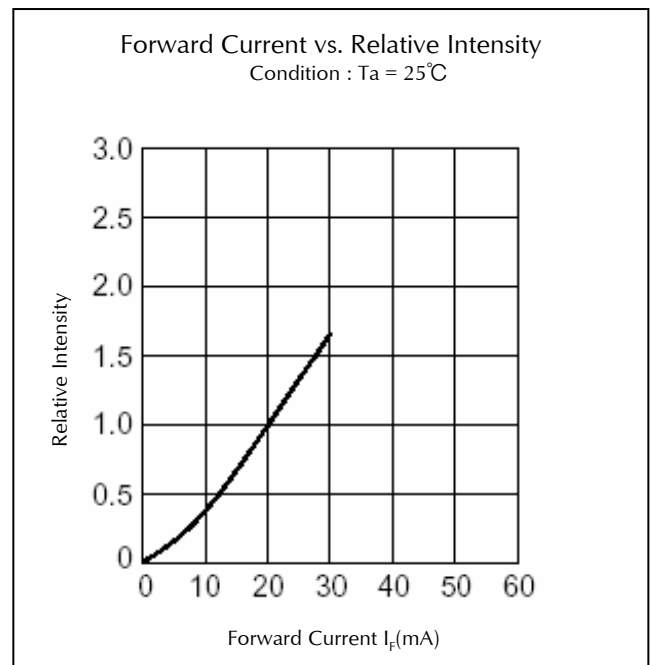
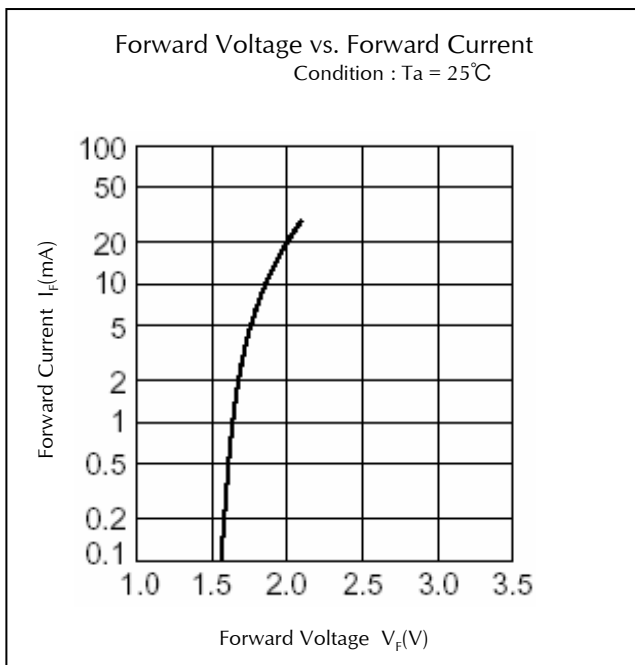
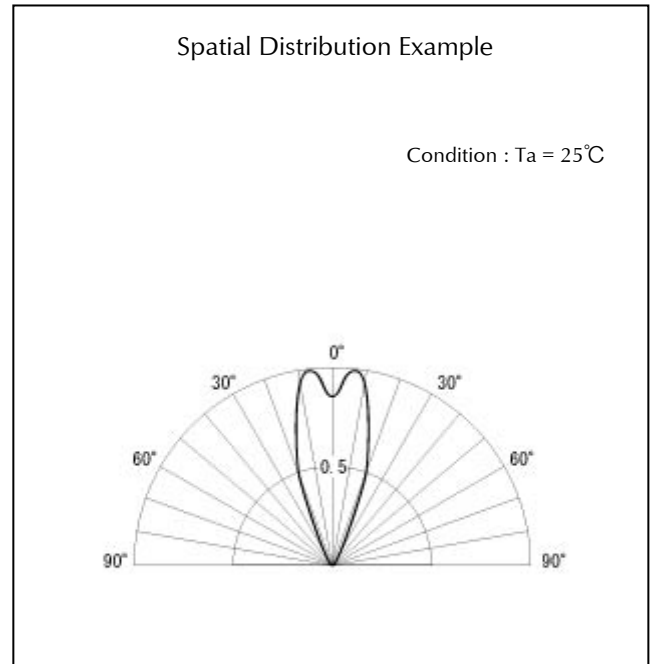
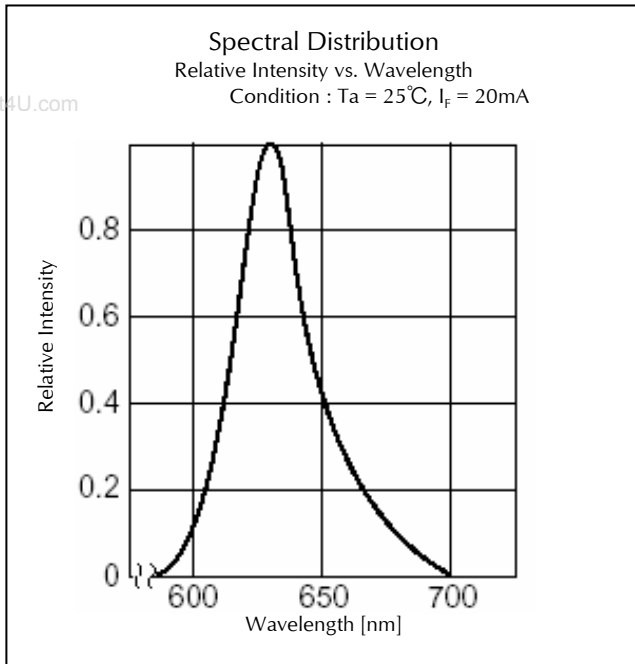
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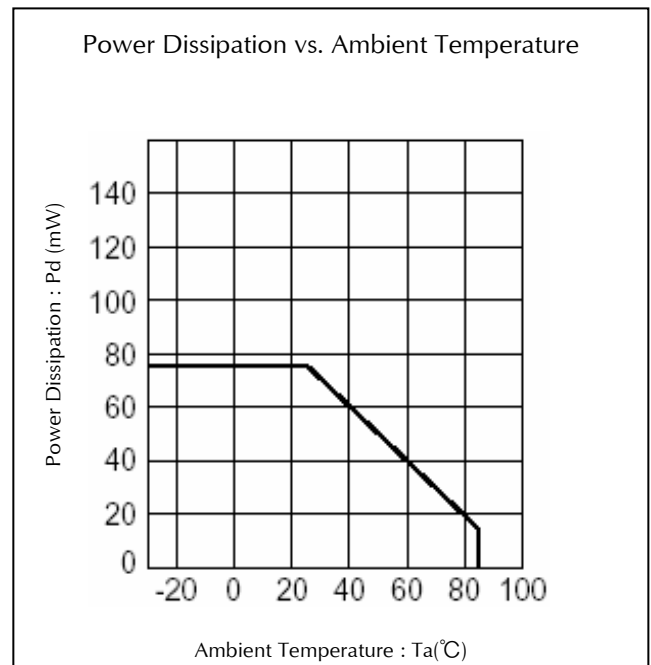
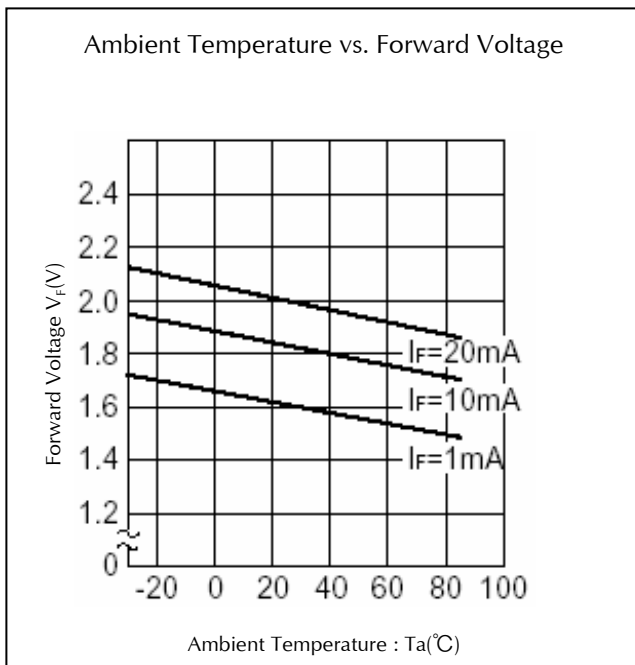
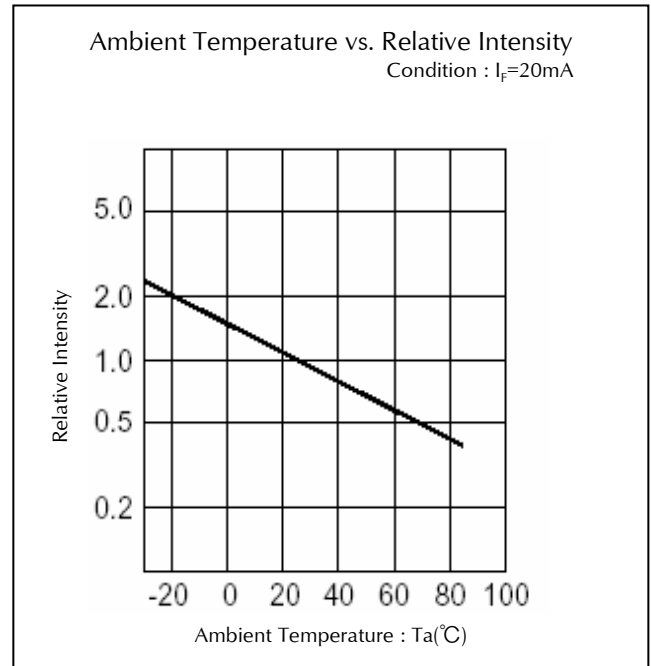
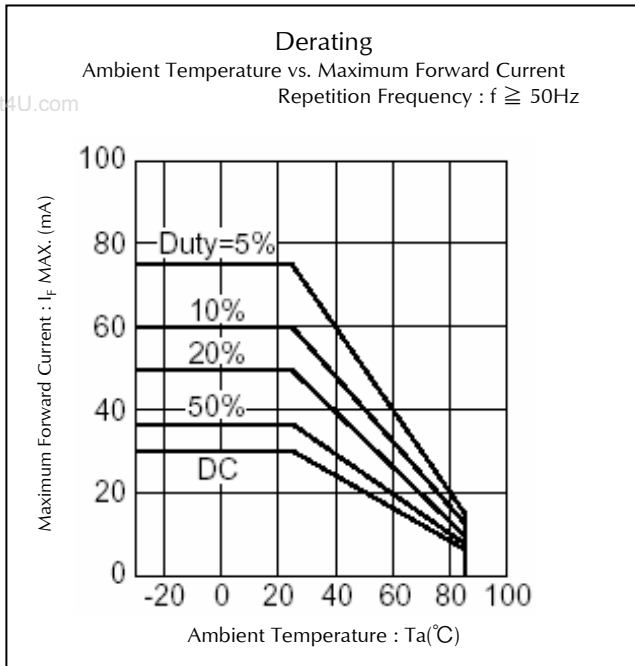
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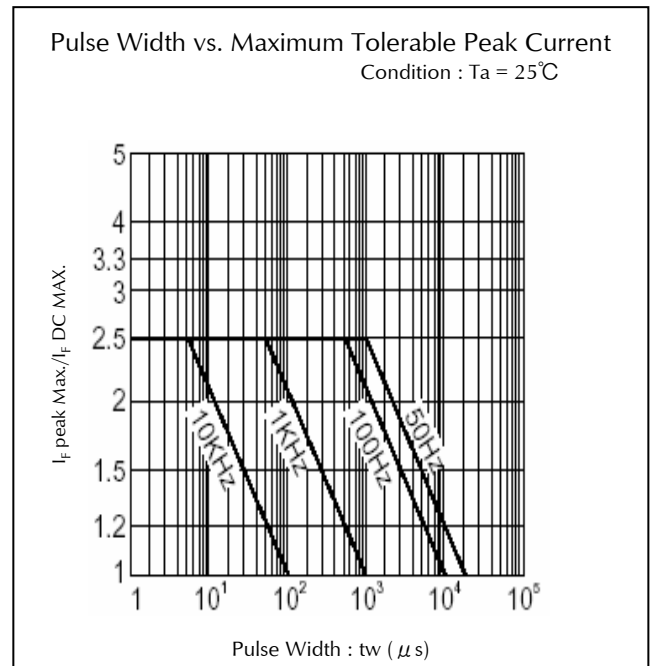
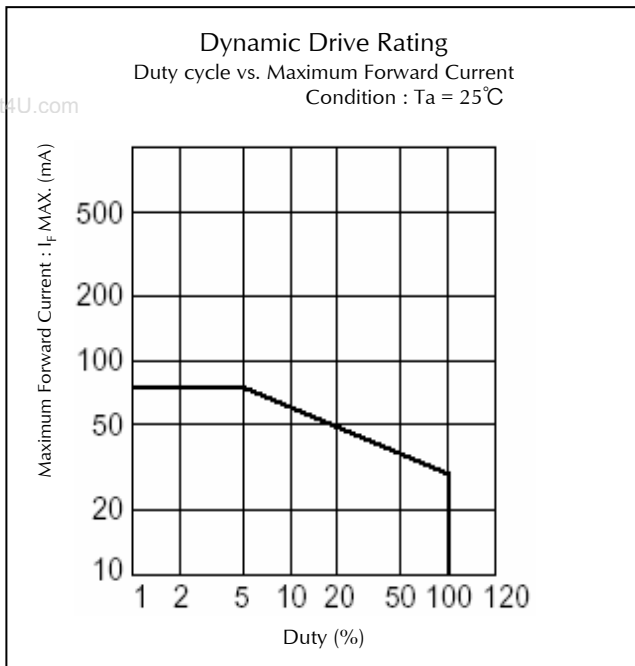
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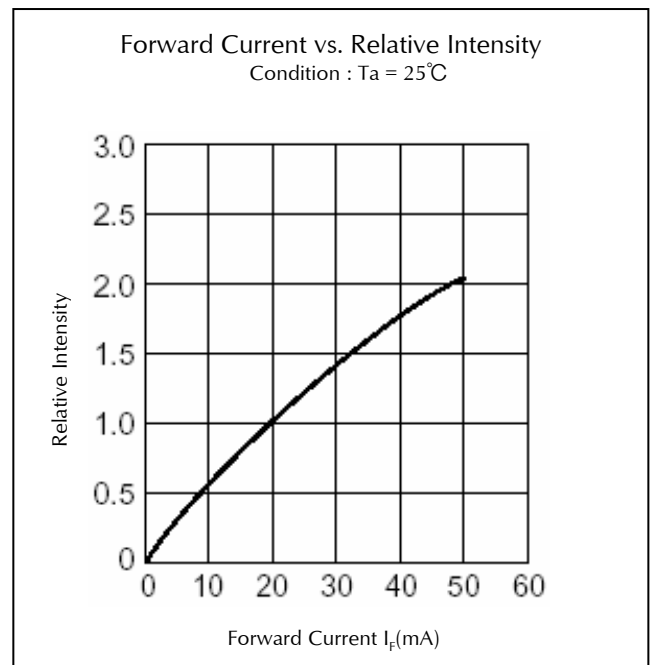
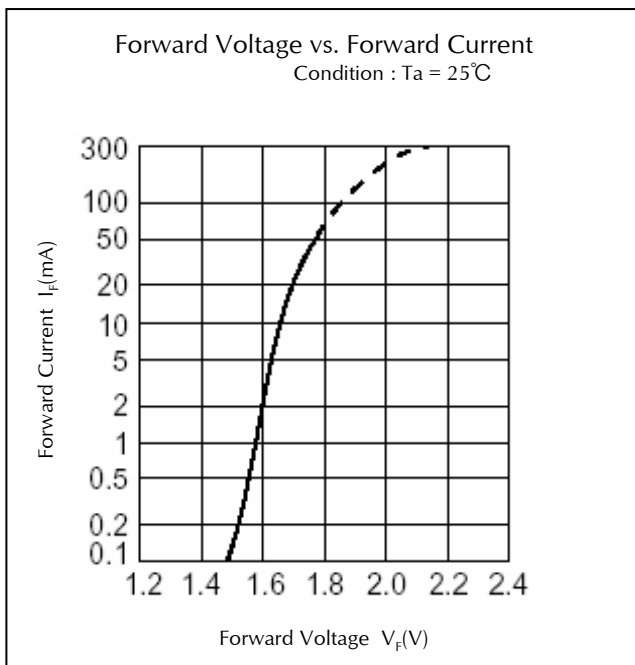
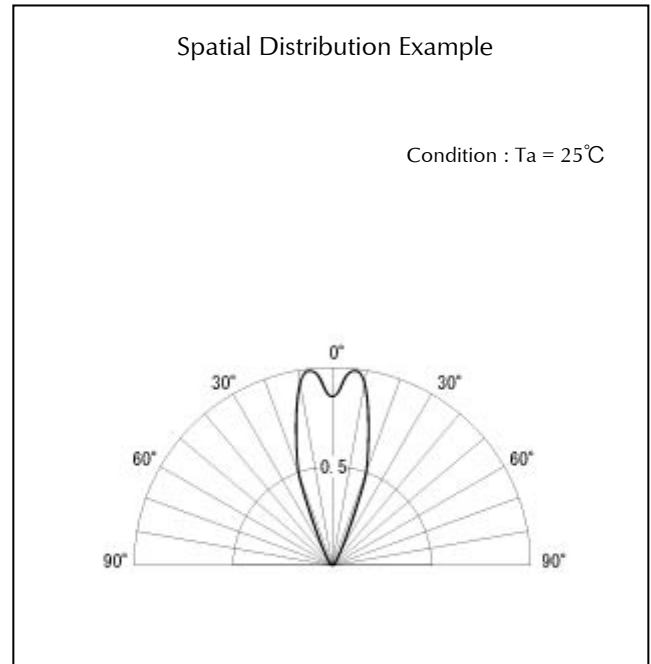
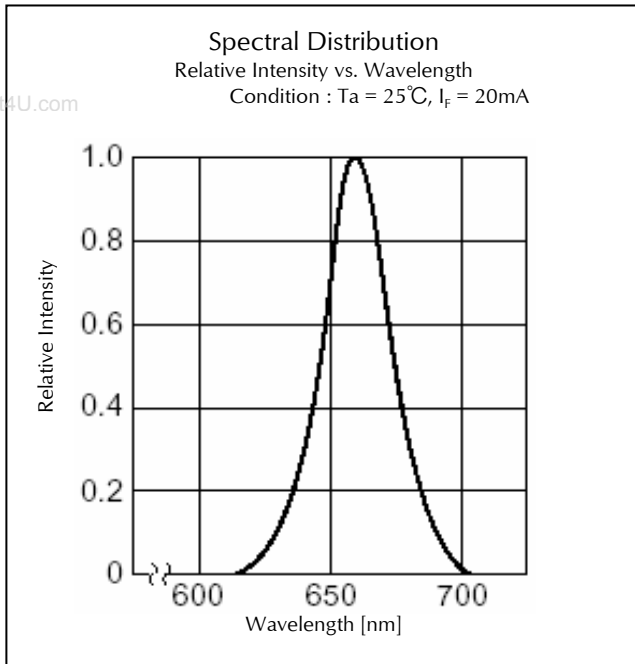
## Technical Data(MVR)



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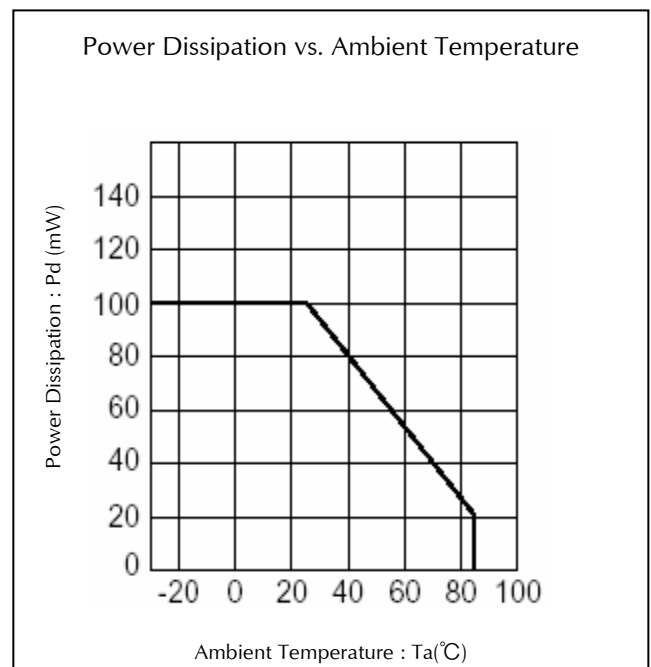
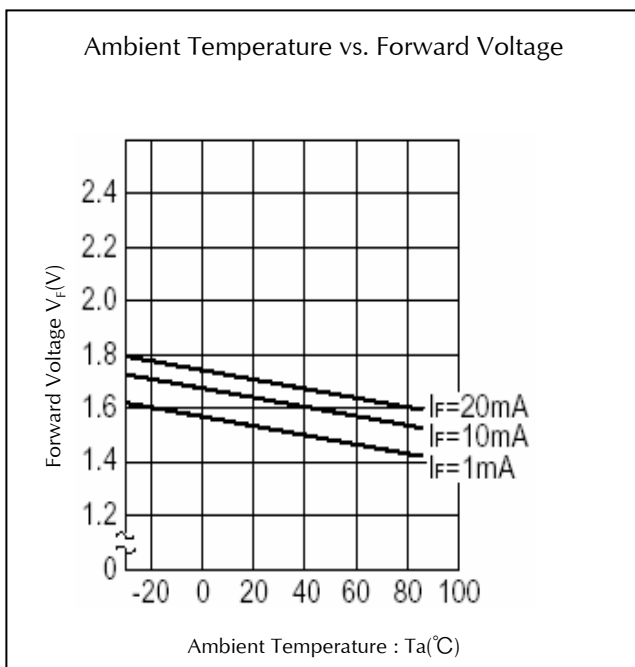
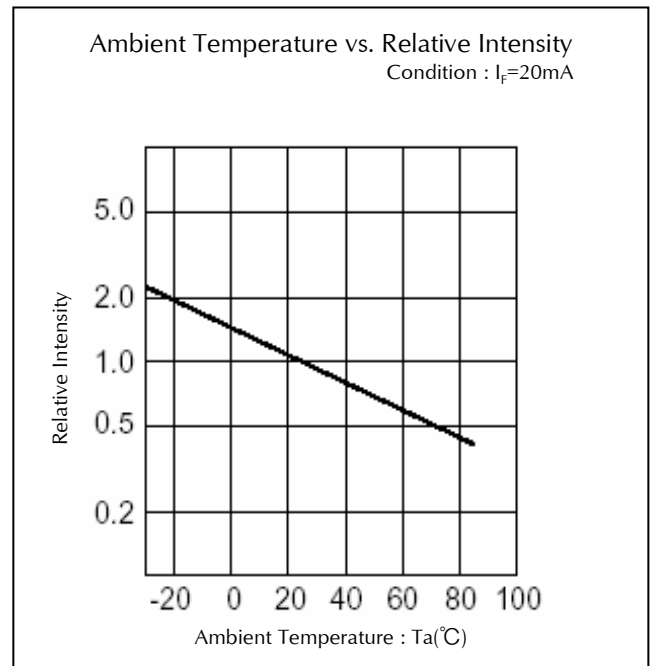
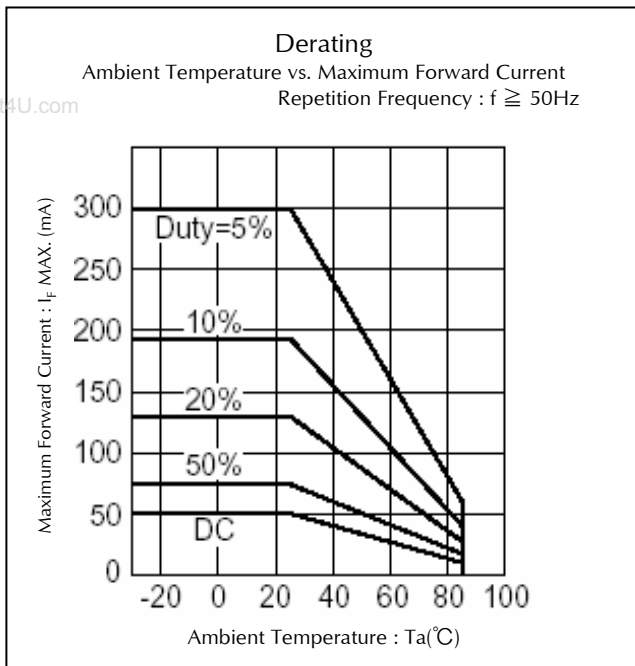


## Technical Data(BR)

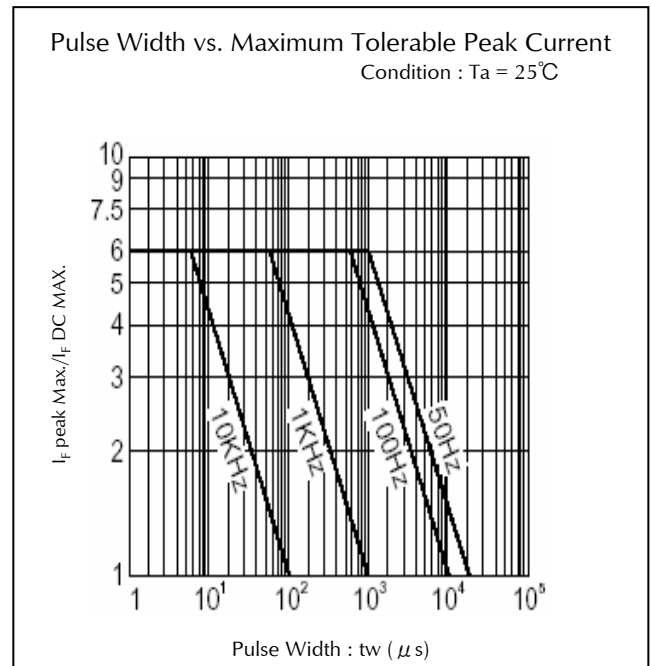
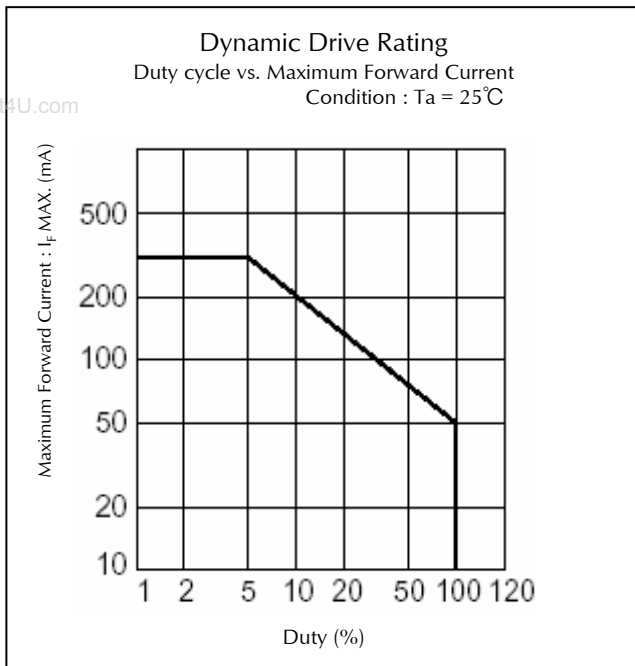




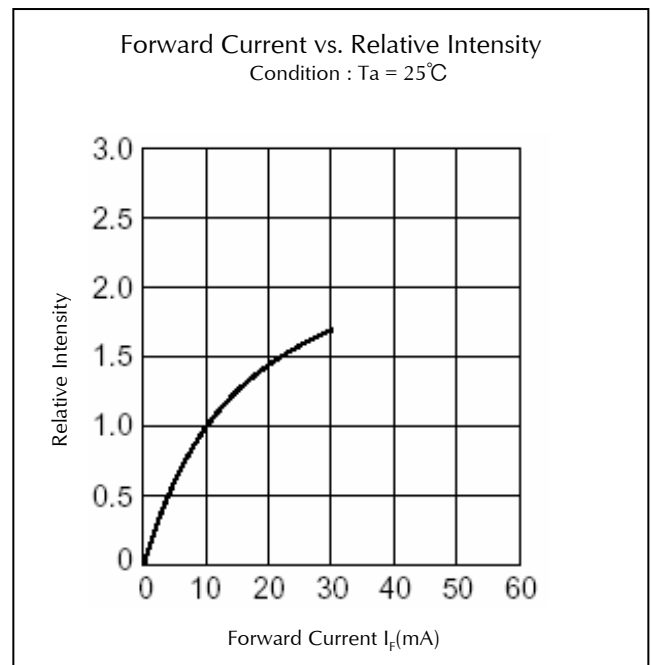
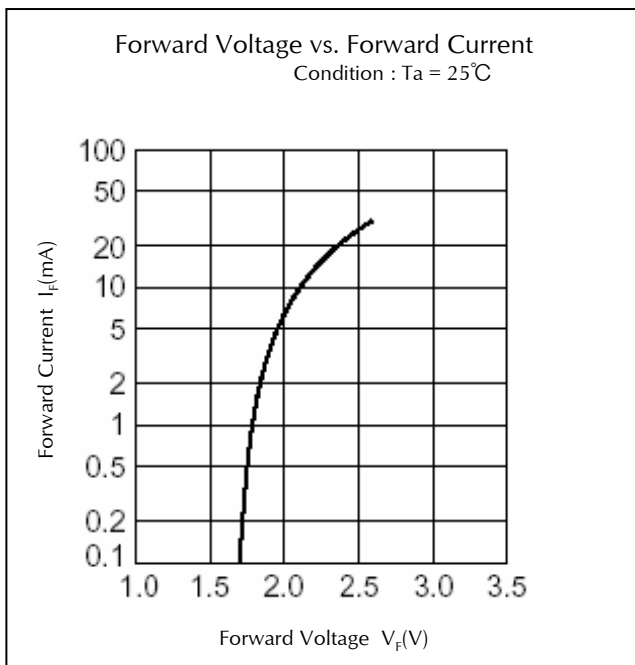
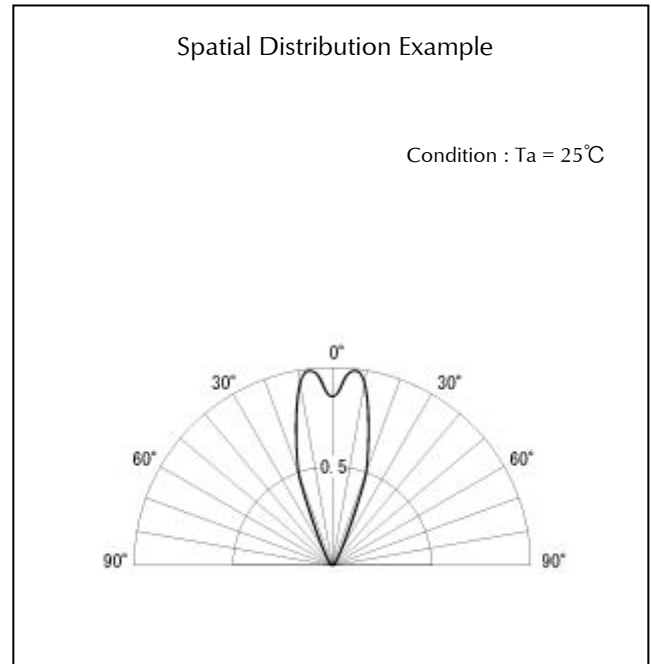
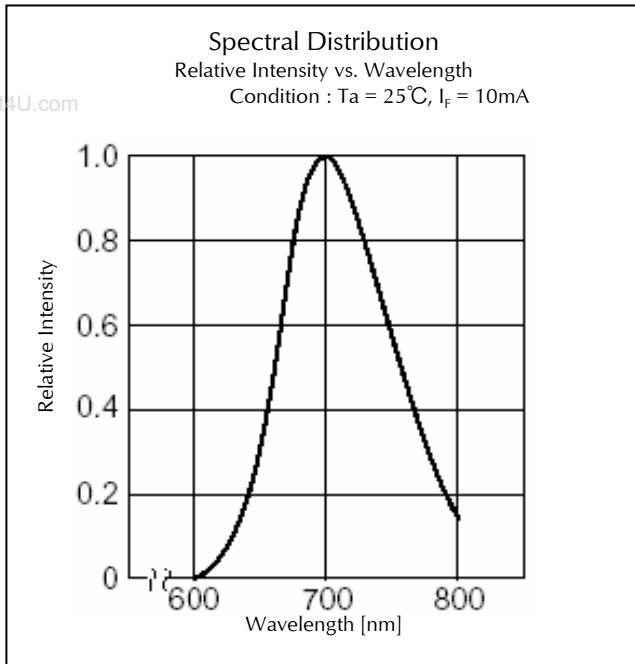
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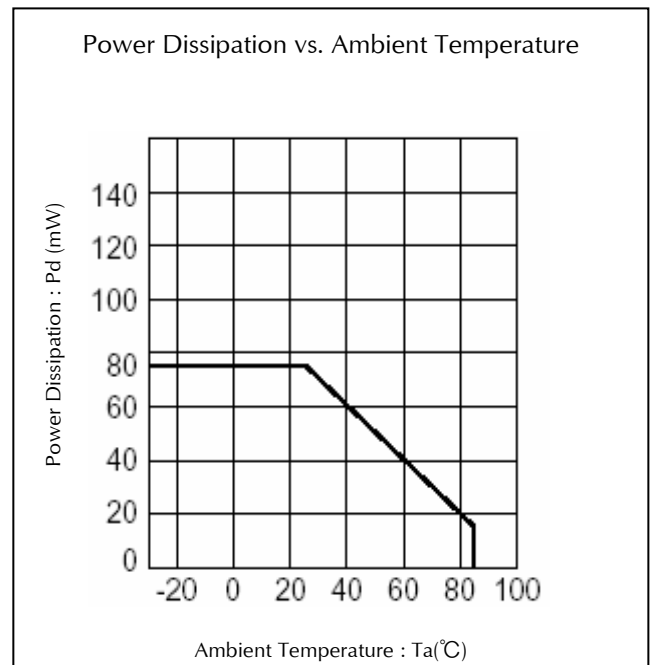
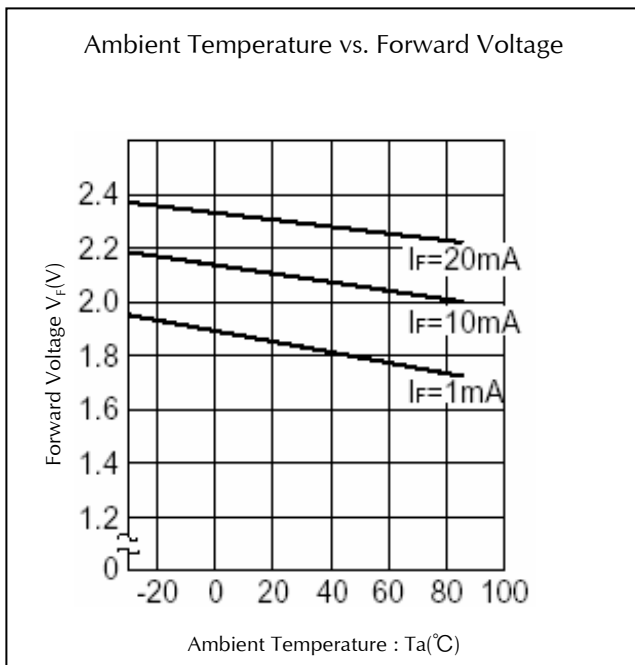
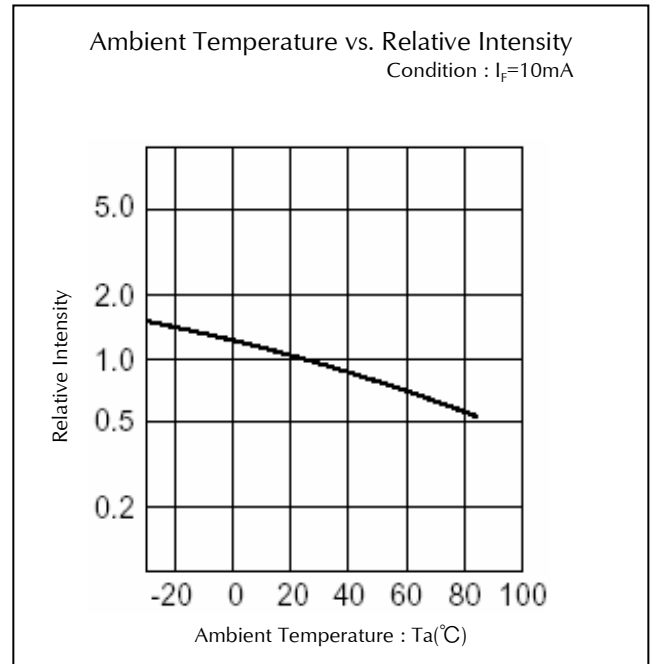
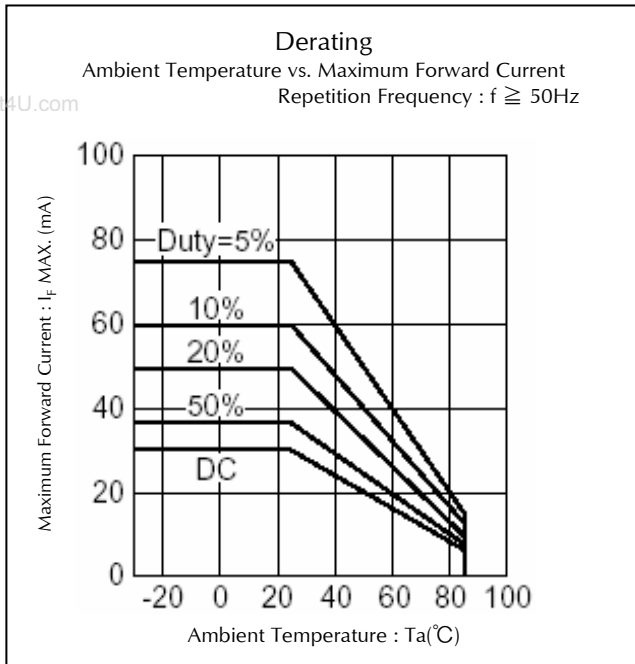
## Technical Data(BR)



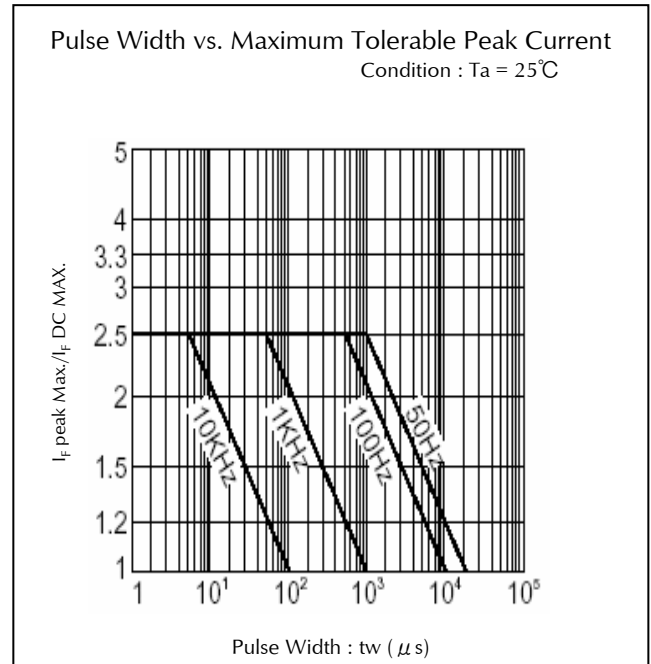
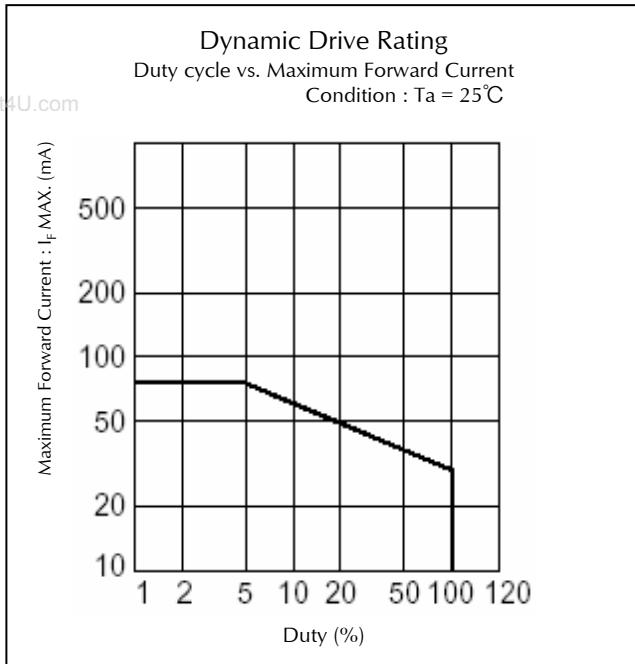
## Technical Data(MPR)



## Technical Data(MPR)

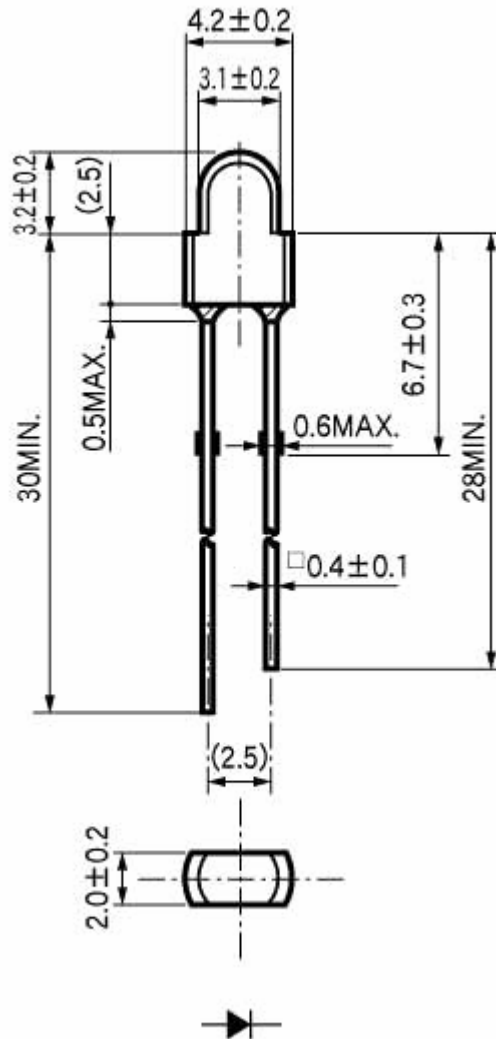


## Technical Data(MPR)



## Package Dimensions

(Unit: mm)



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## 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.)

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- 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, 1.6mm 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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