



**Pb-free  
HEAT**



# 3338S Series

Single Color  $\phi$  3 Round Shape Type

## Features

Package	$\phi$ 3 Round shape type, EMBG/MBG,EMPG/MPG : Green Diffused epoxy EMPY/MPY,EMAY/MAY : Yellow Diffused epoxy EMAA/MAA : Orange Diffused epoxy EMVR/MVR,EBR/BR,MPR : Red Diffused epoxy
Product features	<ul style="list-style-type: none"> <li>Outer Dimension <math>\phi</math> 3 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 (EMBG/MBG), 567nm(EMPG/MPG) Yellow Green : 572nm (EMPY/MPY) Yellow : 590nm (EMAY/MAY) Orange : 606nm (EMAA/MAA) Red : 624nm (EMVR/MVR) 647nm (EBR/BR) 630nm (MPR)
Half Intensity Angle	EMBG/MBG,EMPG/MPG : 30 deg. EMPY/MPY,EMAY/MAY,EMAA/MAA : 28 deg. EMVR/MVR,EBR/BR : 25 deg. MPR : 29 deg.
Die materials	EMBG/MBG,EMPG/MPG, EMPY/MPY,MPR : GaP EMAY/MAY,EMAA/MAA,EMVR/MVR : 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>
EMBG/MBG3338S	GaP	Green	Green	Diffused	558	20	8/4	12/8	20
EMPG/MPG3338S	GaP				567	20	20/10	30/20	20
EMPY/MPY3338S	GaP	Yellow Green	Yellow		572	20	30/15	45/30	20
EMAY/MAY3338S	GaAsP	Yellow			590	20	20/10	30/20	20
EMAA/MAA3338S	GaAsP	Orange	Orange		606	20	20/10	30/20	20
EMVR/MVR3338S	GaAsP	Red	Red		624	20	20/10	30/20	20
EBR/BR3338S	GaAlAs				647	20	30/15	45/30	20
MPR3338S	GaP				630	10	1.5	3	10

## Absolute Maximum Ratings

( $T_a=25^\circ\text{C}$ )

Item	Symbol	Absolute Maximum Ratings								Unit
		EMBG/MBG	EMPG/MPG	EMPY/MPY	EMAY/MAY	EMAA/MAA	EMVR/MVR	EBR/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 ( $T_a=25^\circ\text{C}$ or higher)	$\Delta I_F$	0.33	0.33	0.40	0.40	0.33	0.40	0.67	0.40	mA/ $^\circ\text{C}$
Reverse Voltage	$V_R$	4	4	4	4	4	4	4	4	V
Operating Temperature	$T_{opr}$	-30~+85								$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-30~+100								$^\circ\text{C}$

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

## Electro-Optical Characteristics (EMBG/MBG,EMPG/MPG,EMPY/MPY,EMAY/MAY,EMAA/MAA,EMVR/MVR,EBR/BR) (Ta=25°C)

Item	Conditions	Symbol	Characteristics								Unit
			EMBG/MBG	EMPG/MPG	EMPY/MPY	EMAY/MAY	EMAA/MAA	EMVR/MVR	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.	2.8	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	$\mu$ 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.	30	30	28	28	28	25	25	deg.

## 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	$\mu$ 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.	29	deg.

## Luminous Intensity Rank

(Ta=25°C)

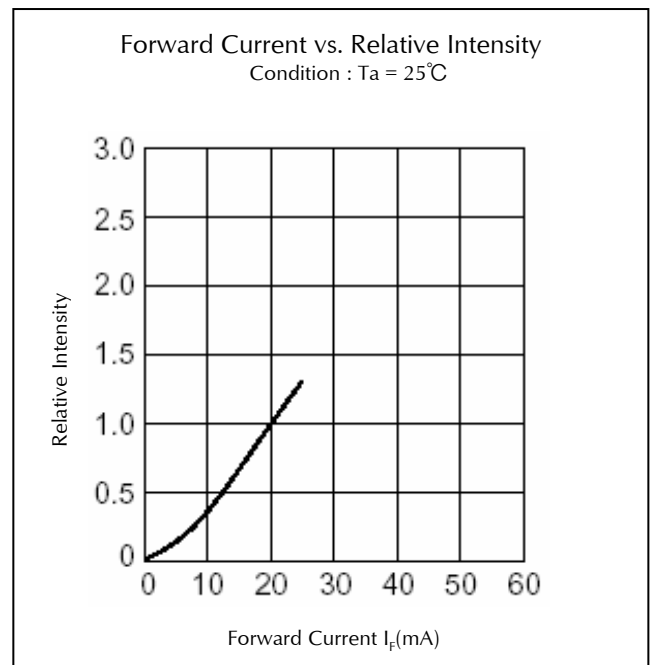
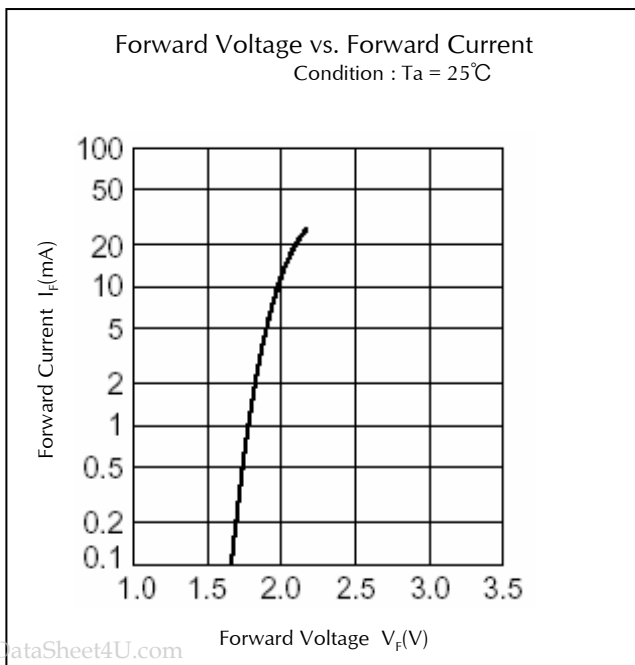
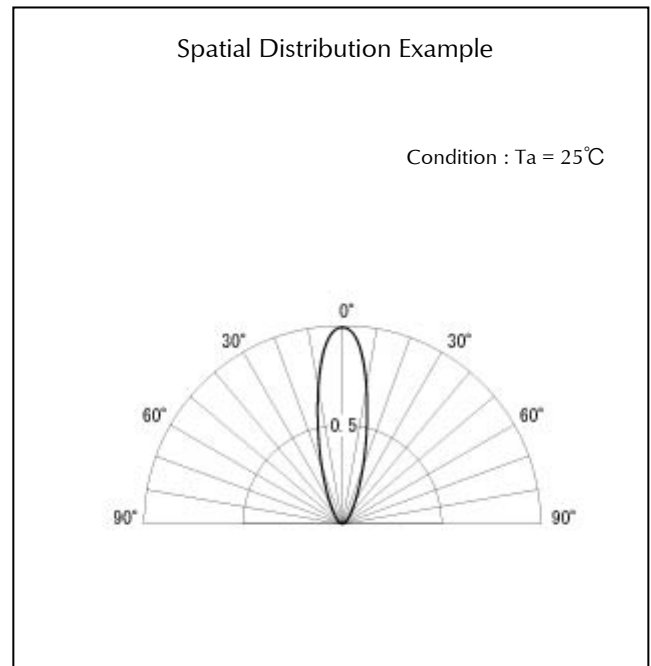
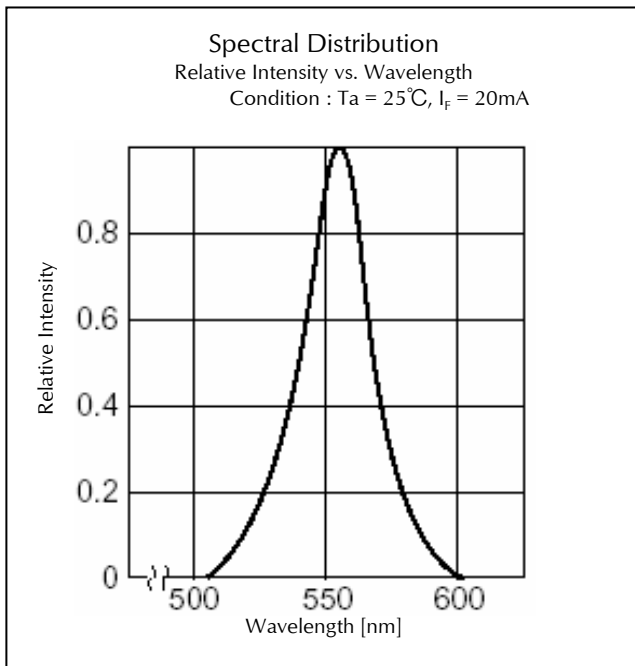
Rank	I <sub>v</sub> (mcd)															
	MBG		MPG		MPY		MAY		MAA		MVR		BR		MPR	
	I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =10mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A	4.0	8.0	10.0	20.0	15.0	30.0	10.0	20.0	10.0	20.0	10.0	20.0	15.0	30.0	1.5	3.0
B	5.6	11.2	14.0	28.0	21.0	42.0	14.0	28.0	14.0	28.0	14.0	28.0	21.0	42.0	2.1	4.2
C	8.0	16.0	20.0	40.0	30.0	60.0	20.0	40.0	20.0	40.0	20.0	40.0	30.0	60.0	3.0	6.0
D	11.2	22.4	28.0	56.0	42.0	84.0	28.0	56.0	28.0	56.0	28.0	56.0	42.0	84.0	4.2	8.4
E	16.0	-	40.0	-	60.0	-	40.0	-	40.0	-	40.0	-	60.0	-	6.0	-

Please contact our sales staff concerning rank designation.

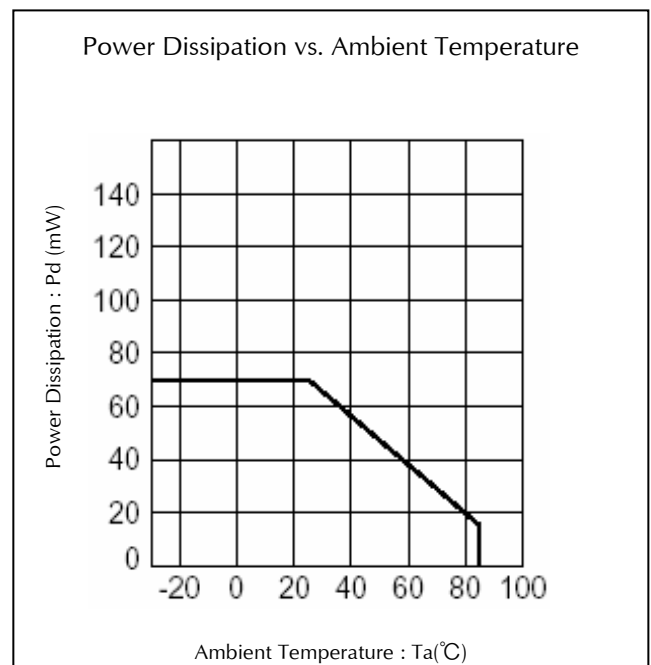
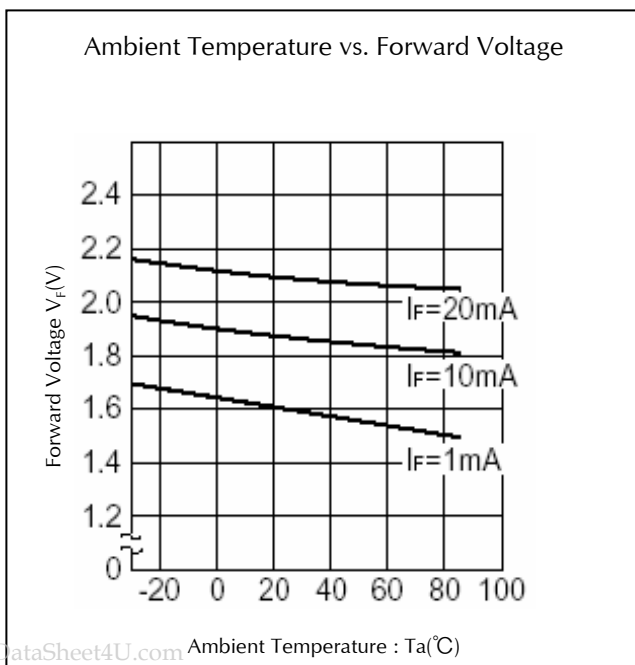
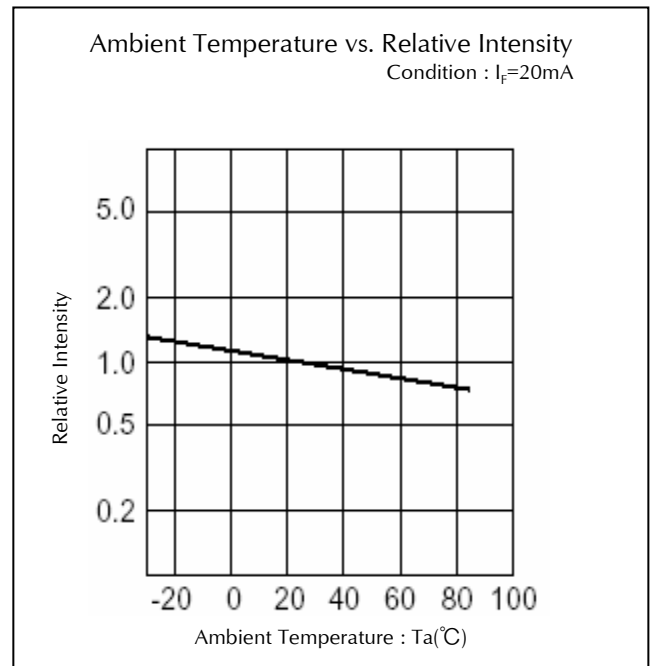
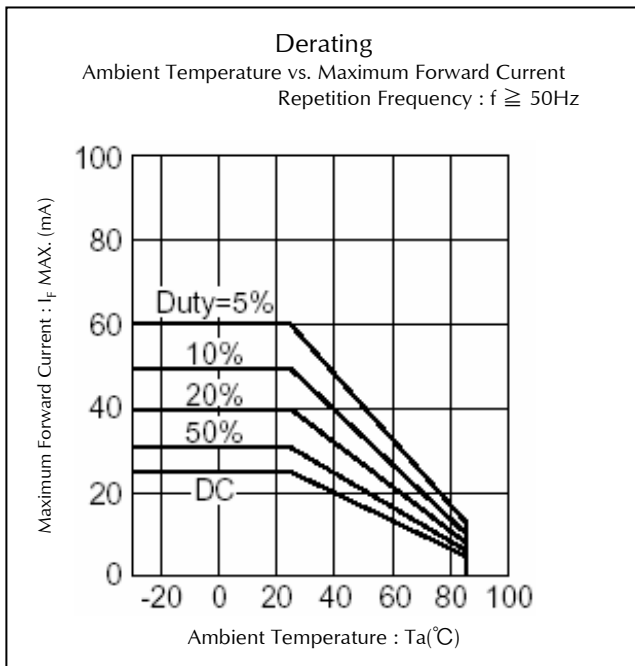
Rank	I <sub>v</sub> (mcd)													
	EMBG		EMPG		EMPY		EMAY		EMAA		EMVR		EBR	
	I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA		I <sub>f</sub> =20mA	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
C	8.0	16.0	20.0	40.0	30.0	60.0	20.0	40.0	20.0	40.0	20.0	40.0	30.0	60.0
D	11.2	22.4	28.0	56.0	42.0	84.0	28.0	56.0	28.0	56.0	28.0	56.0	42.0	84.0
E	16.0	-	40.0	-	60.0	-	40.0	-	40.0	-	40.0	-	60.0	-

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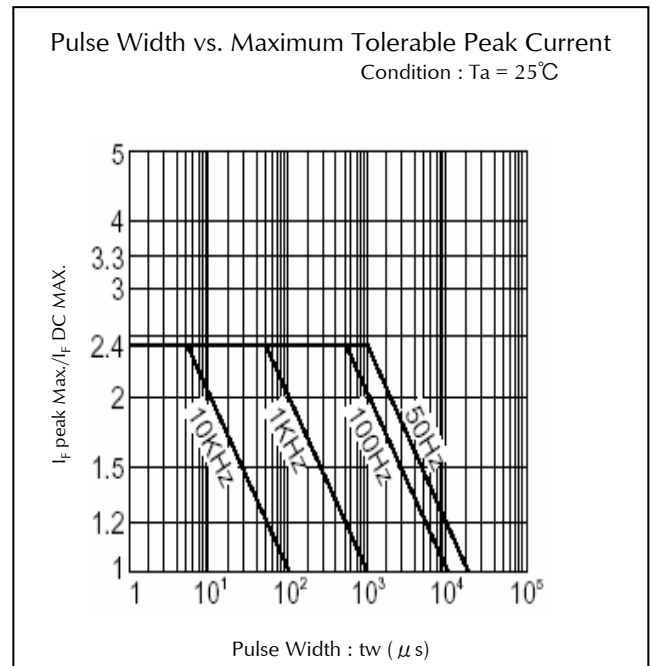
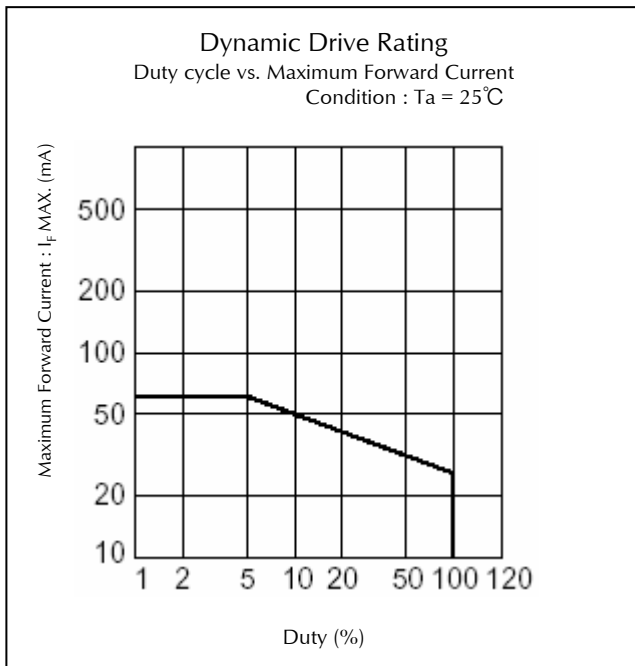


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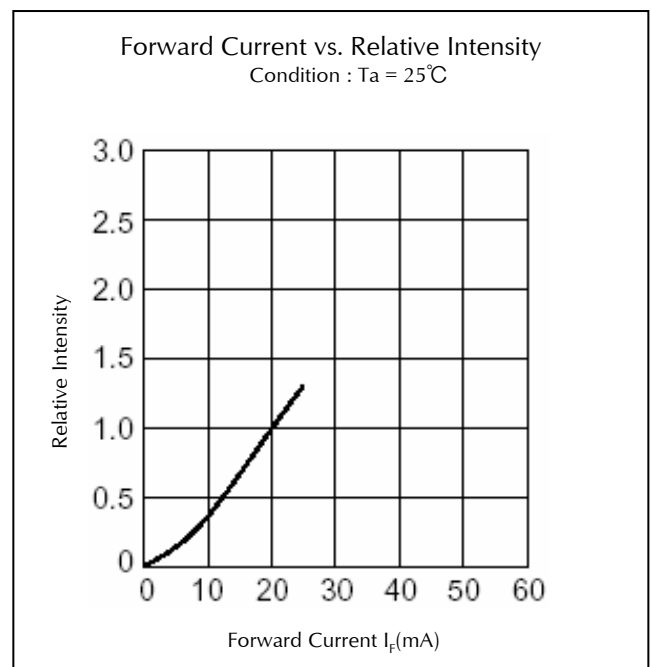
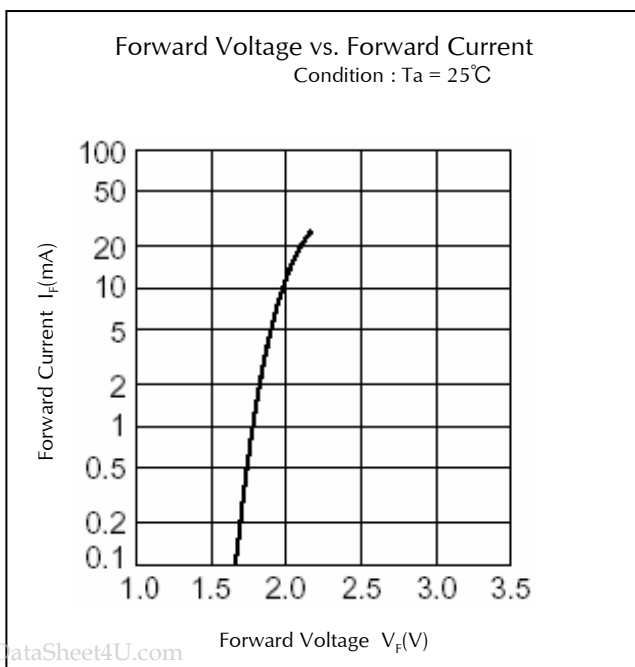
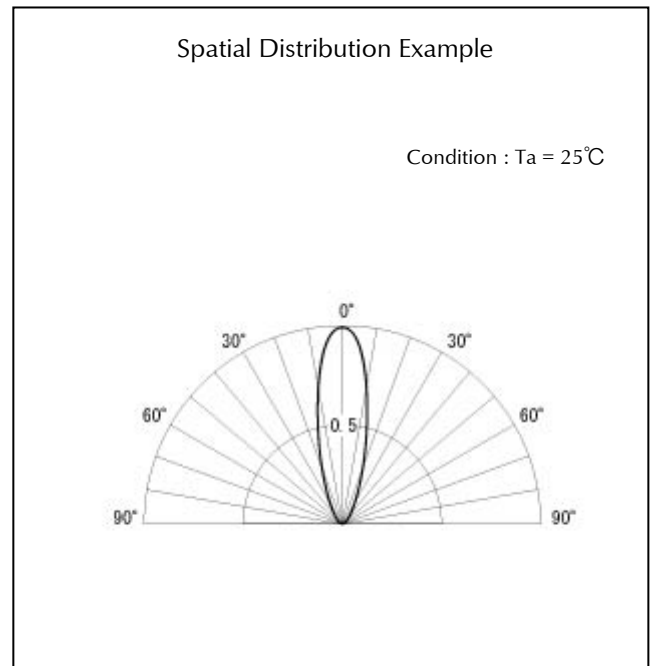
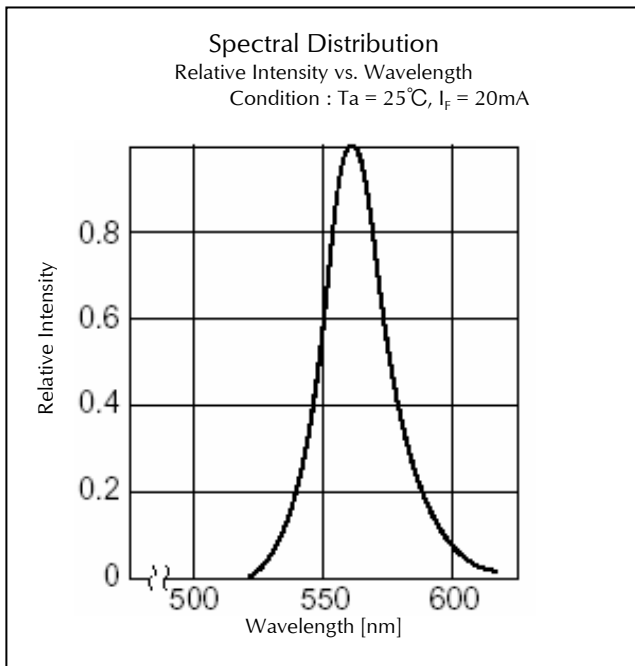
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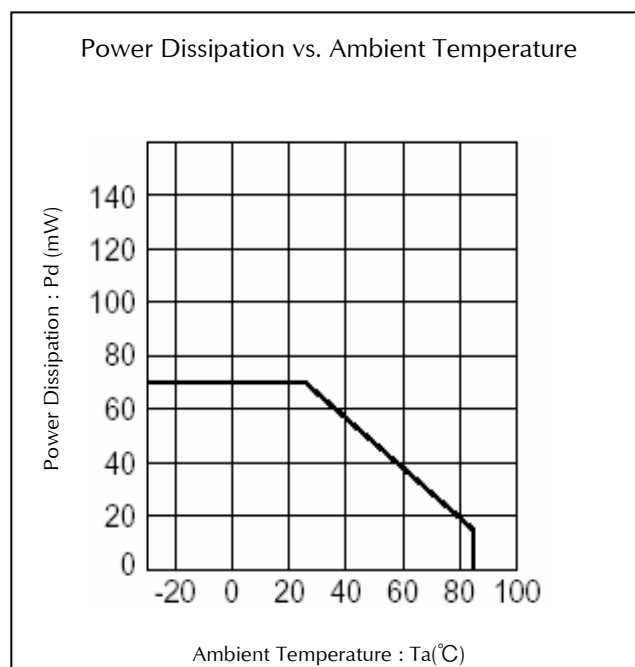
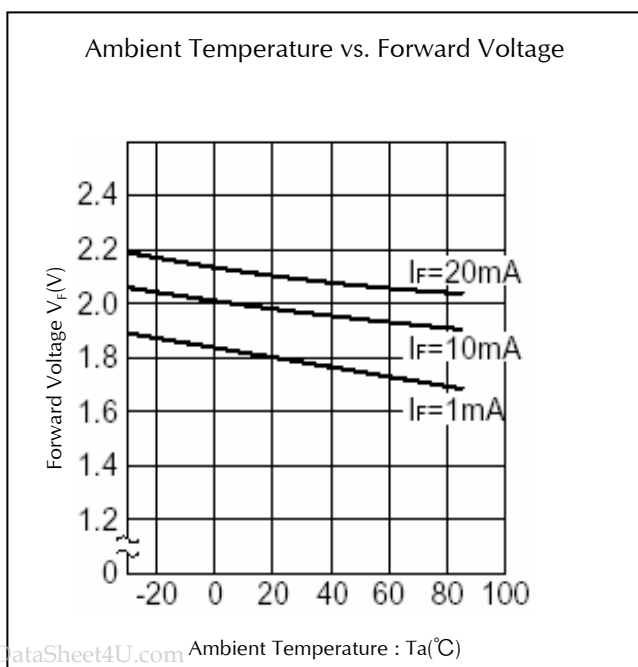
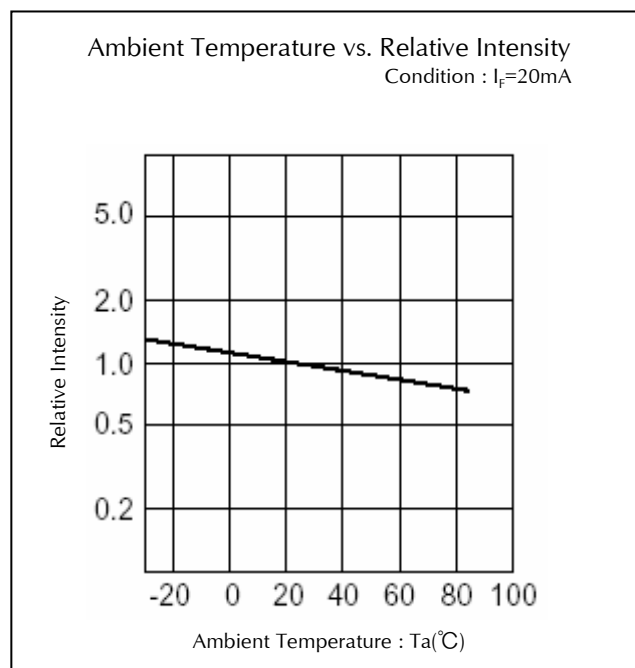
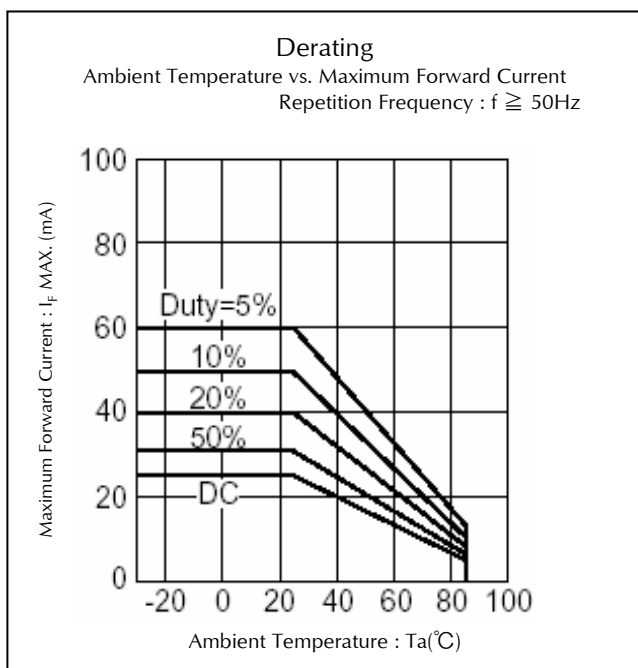




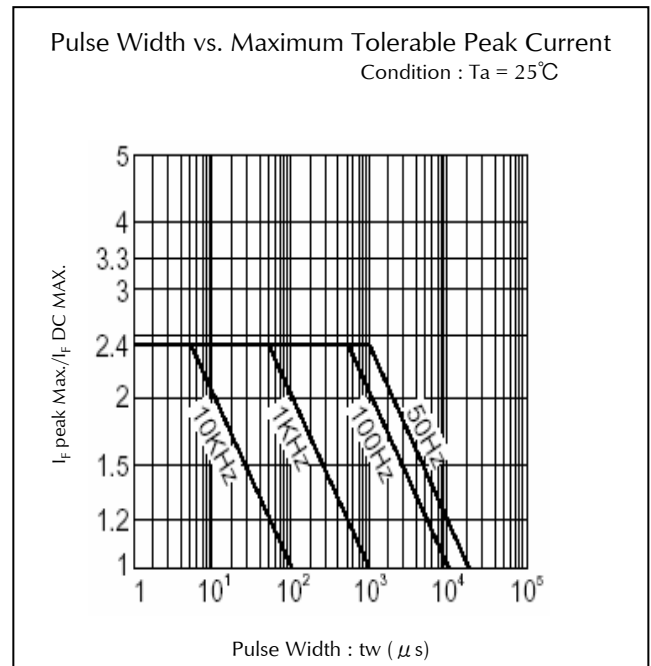
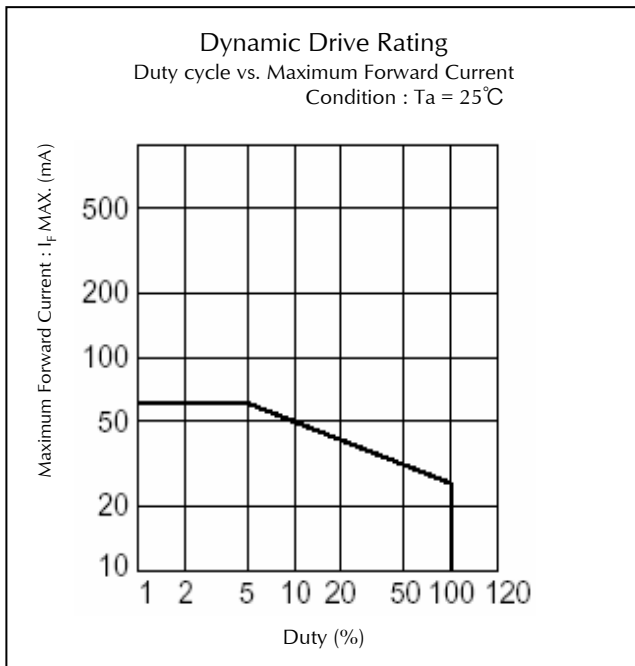
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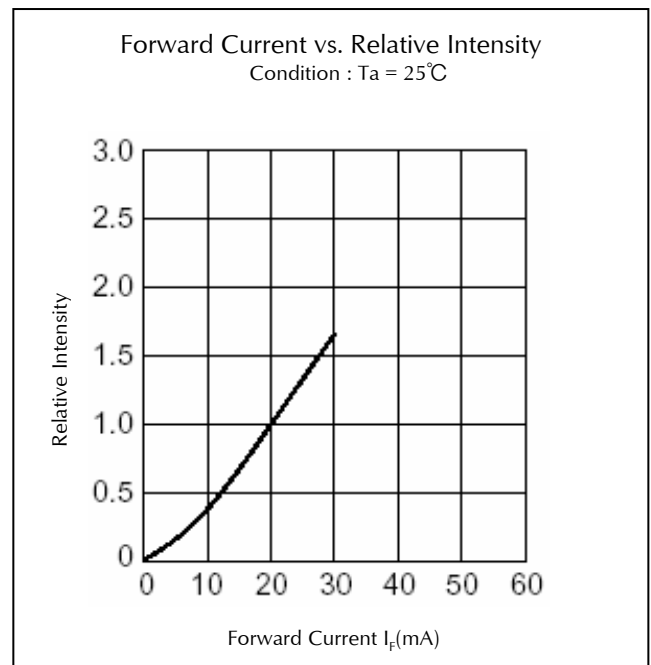
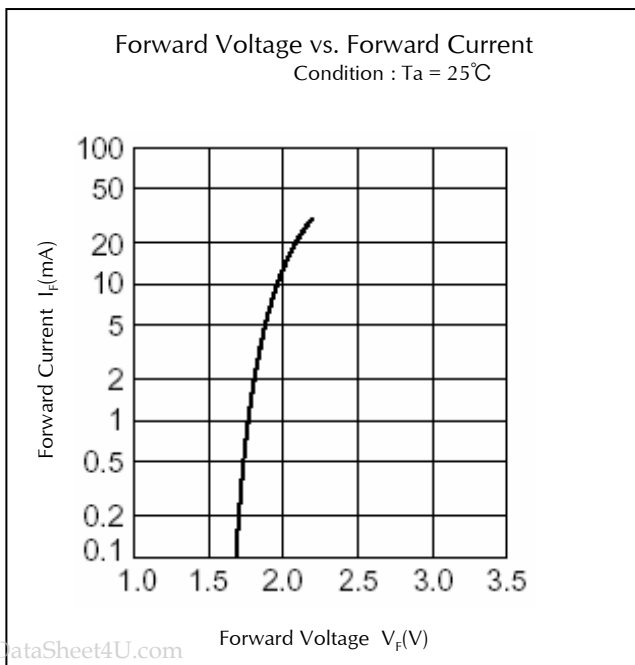
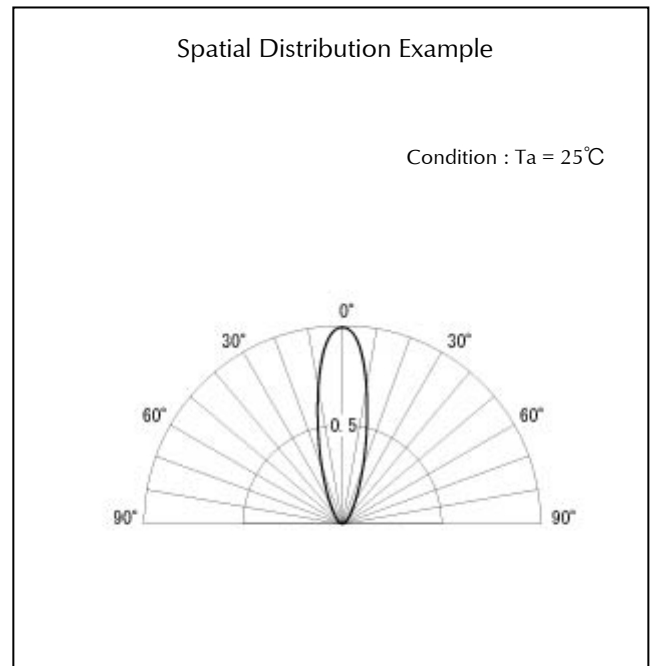
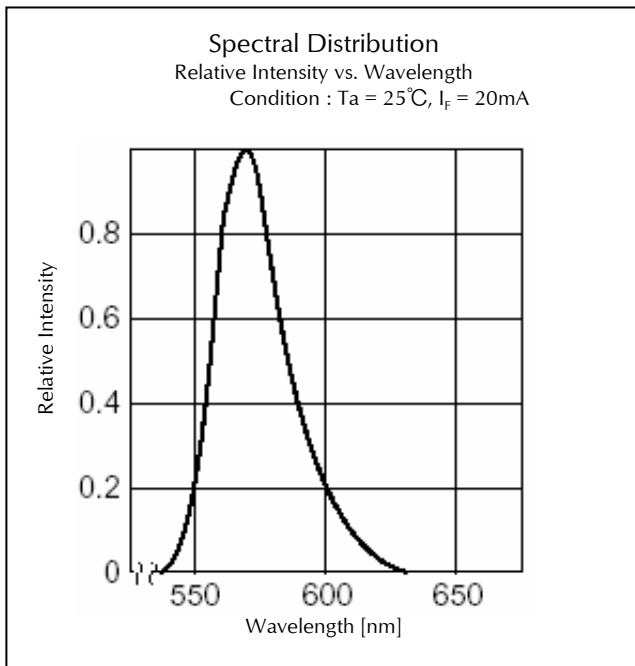
## Technical Data(EMPG/MPG)



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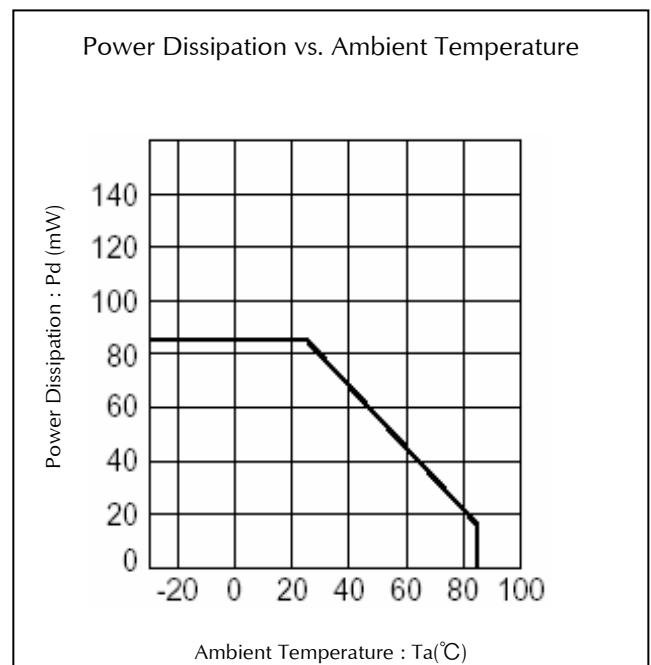
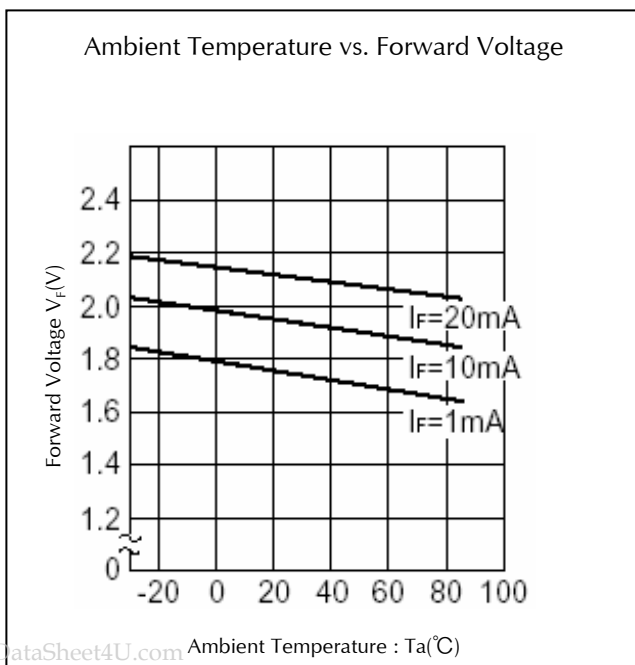
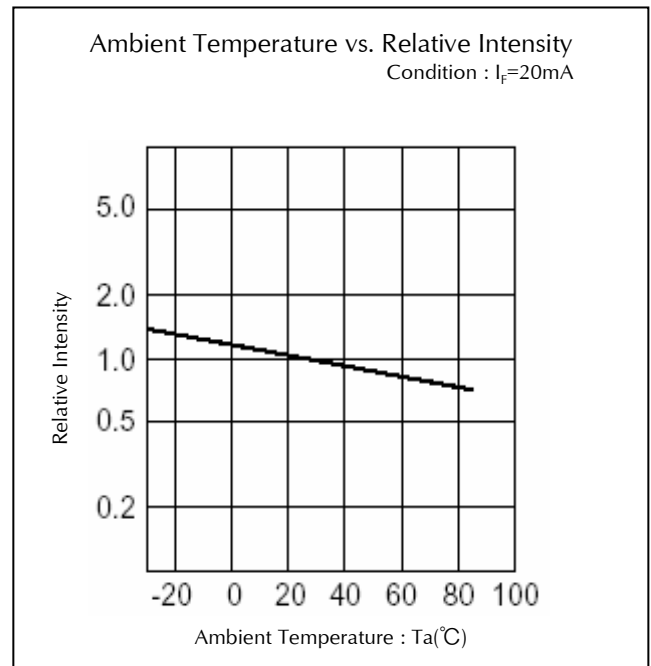
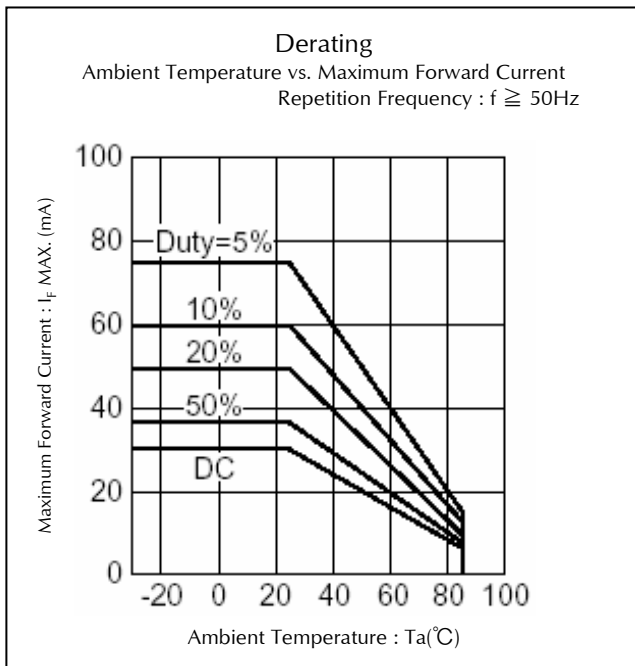


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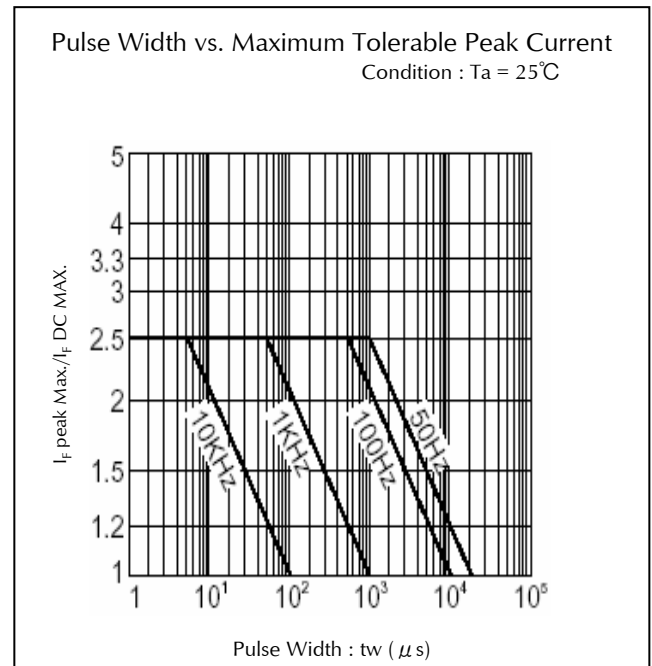
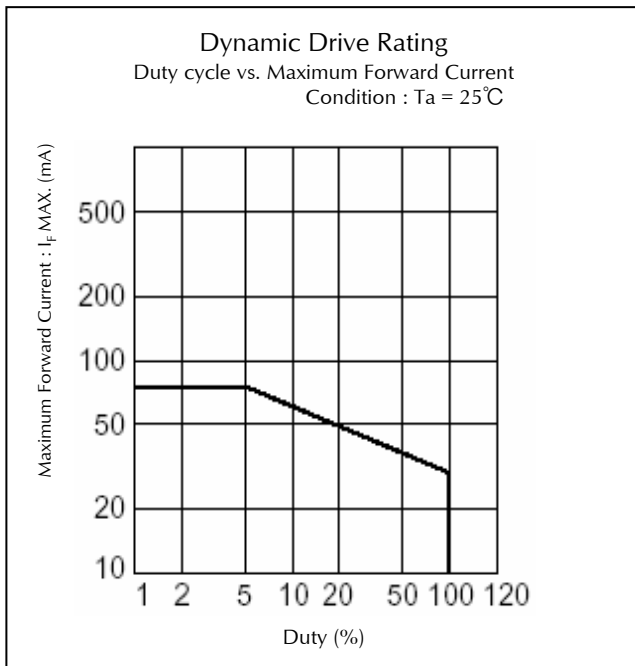
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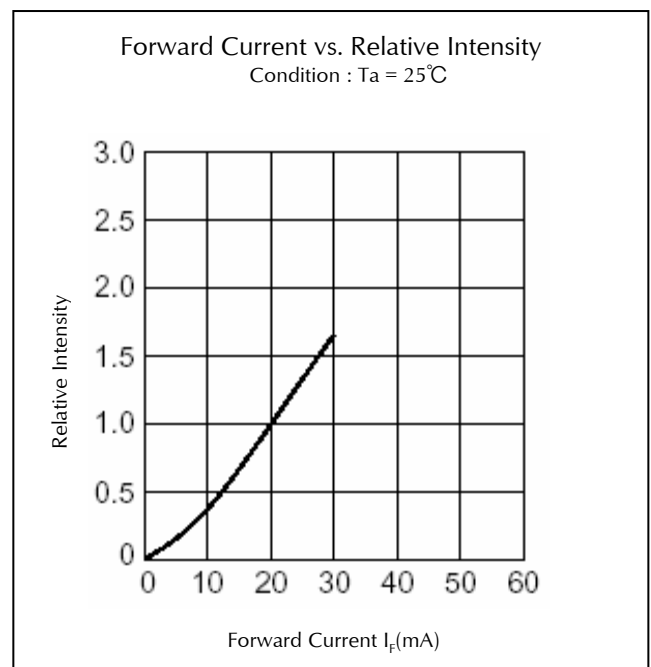
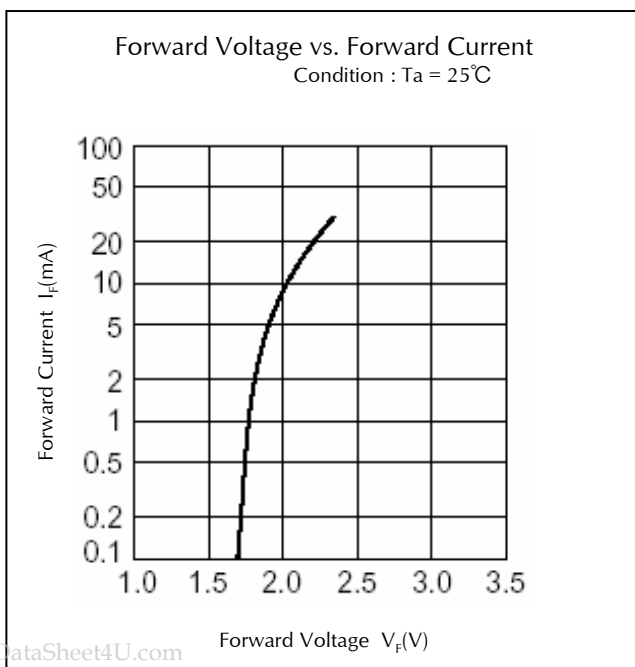
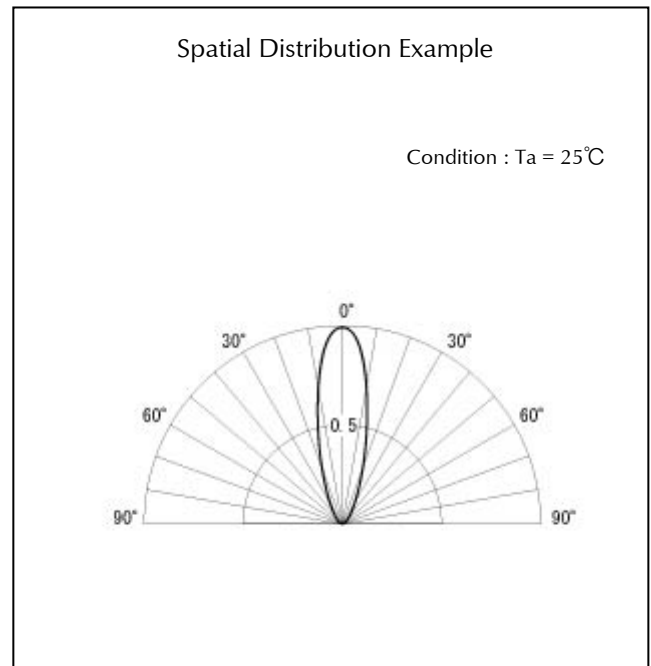
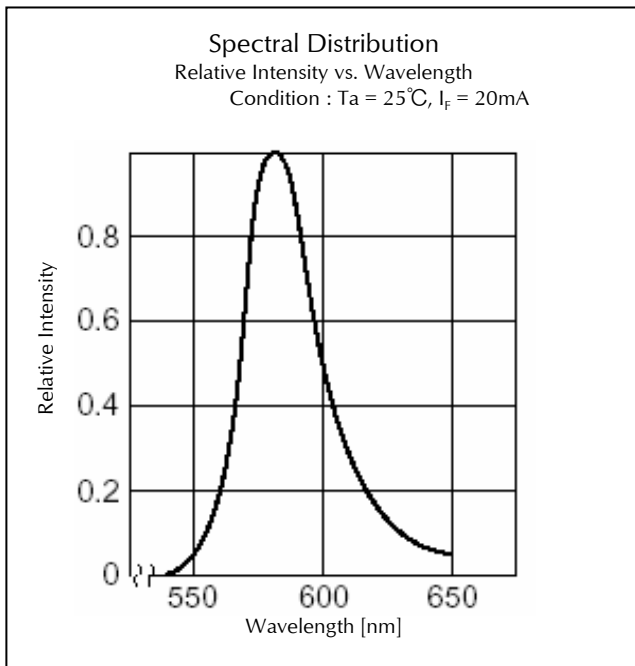


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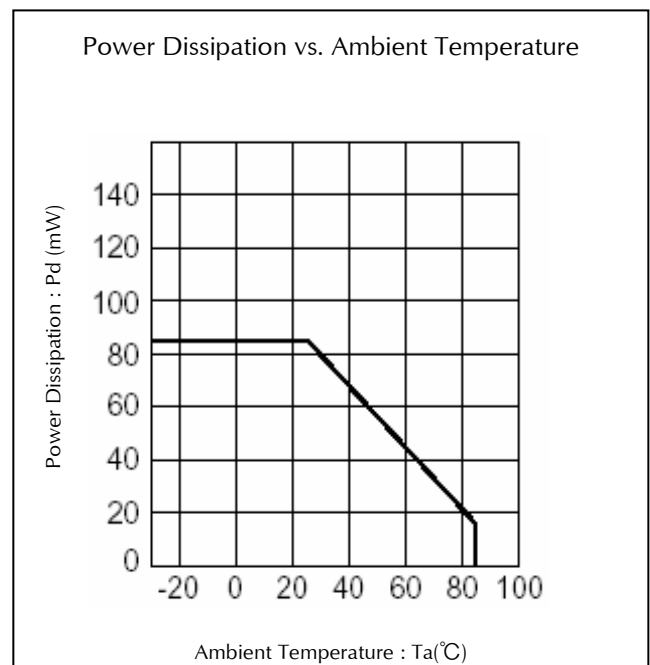
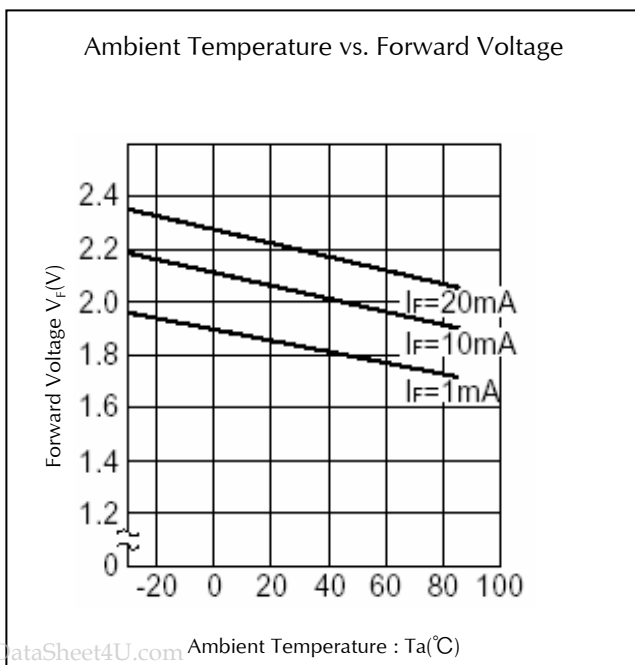
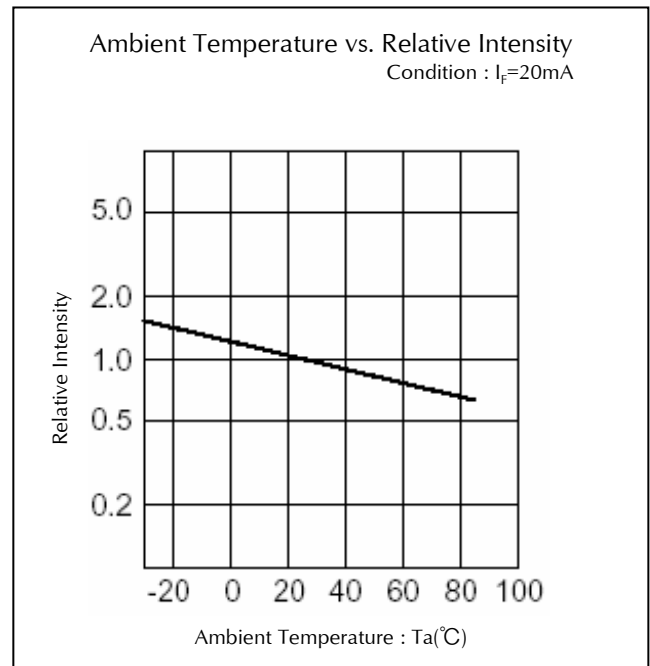
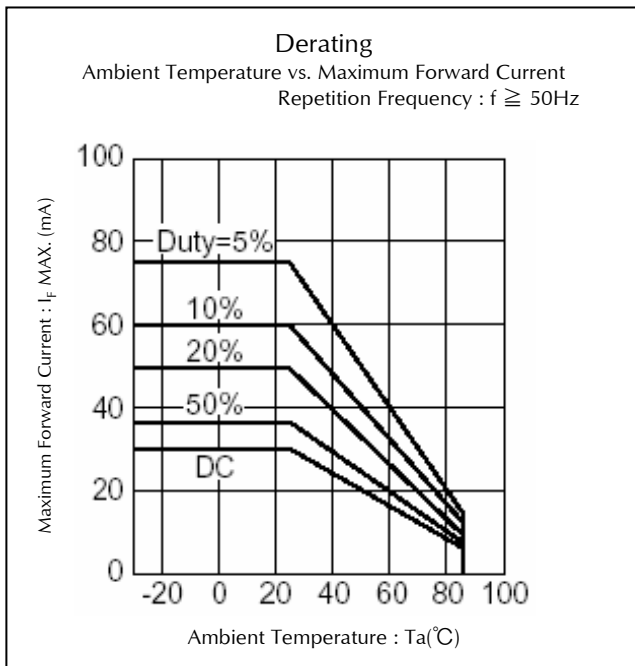
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Technical Data(EMAY/MAY)



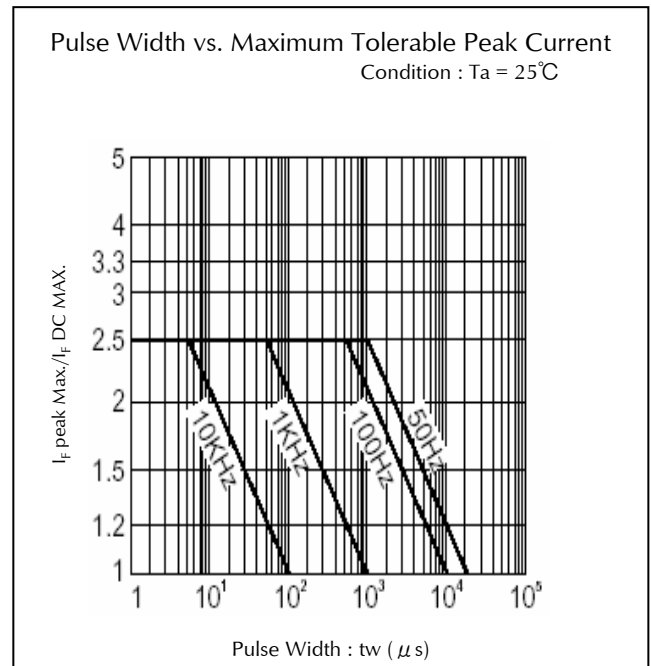
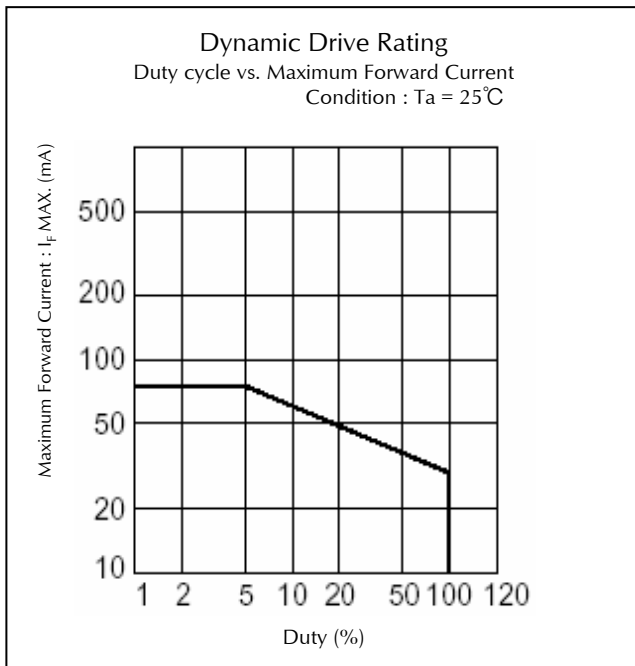
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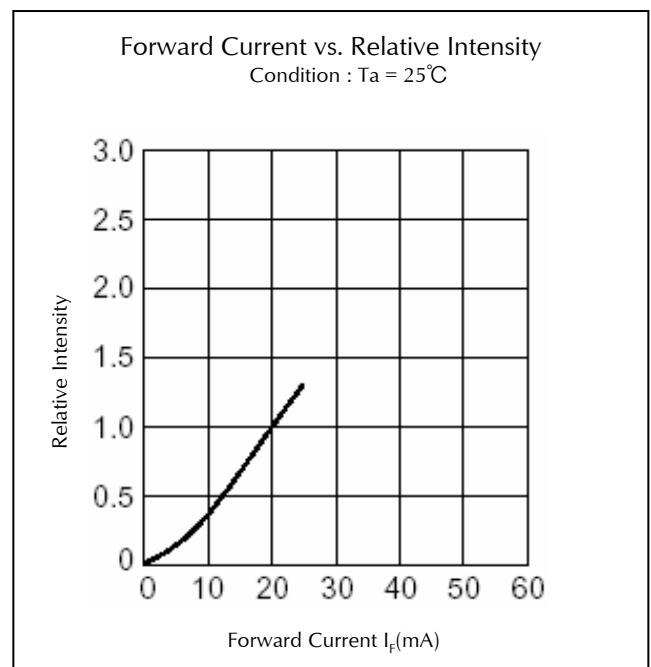
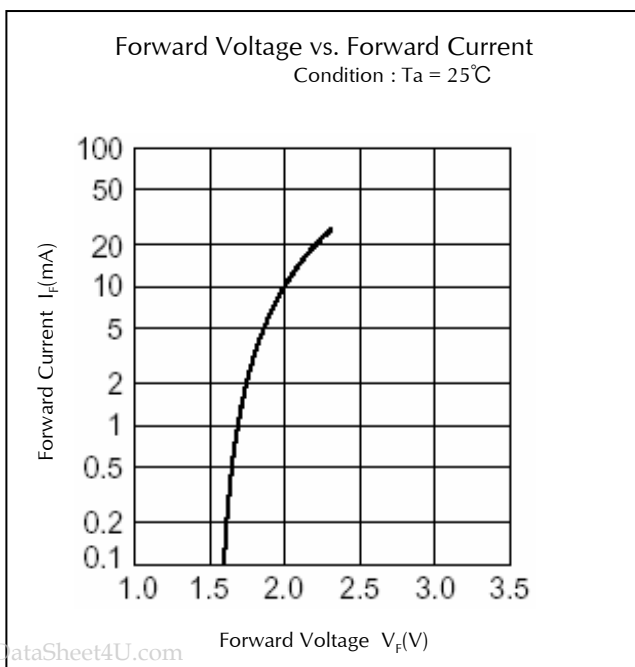
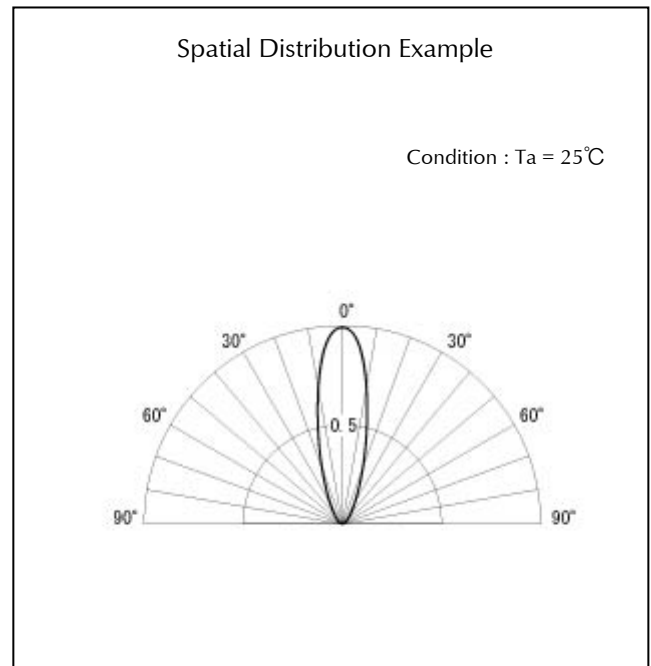
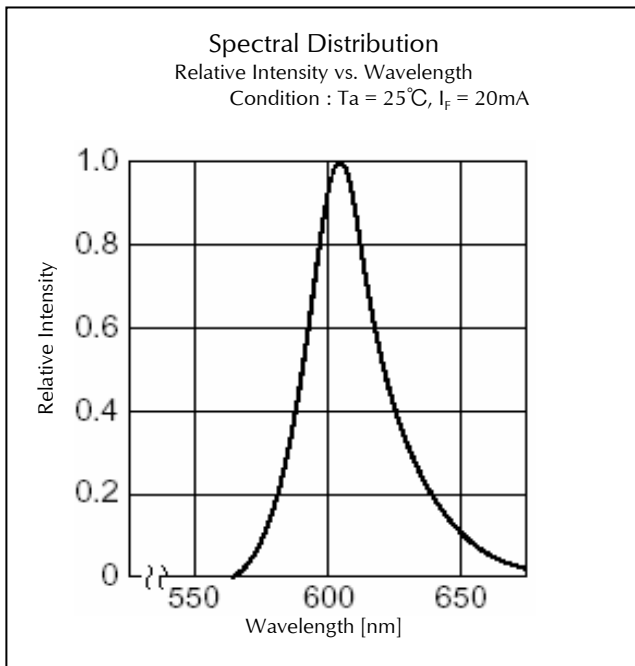
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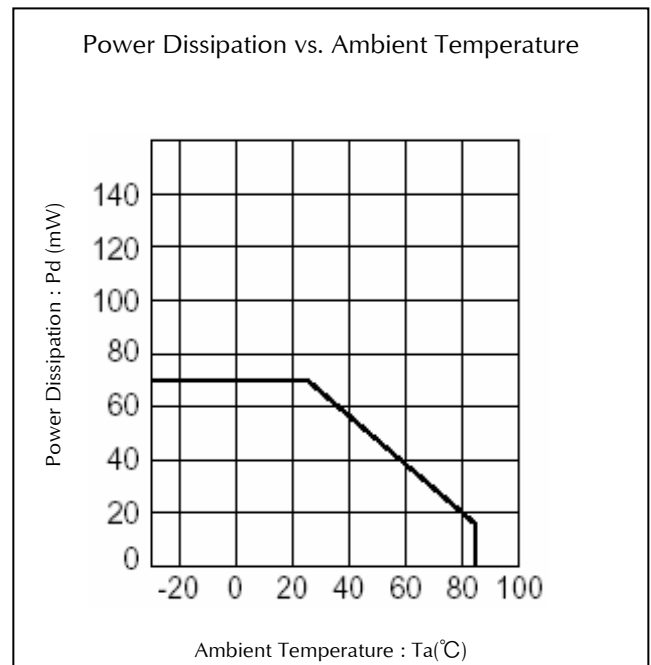
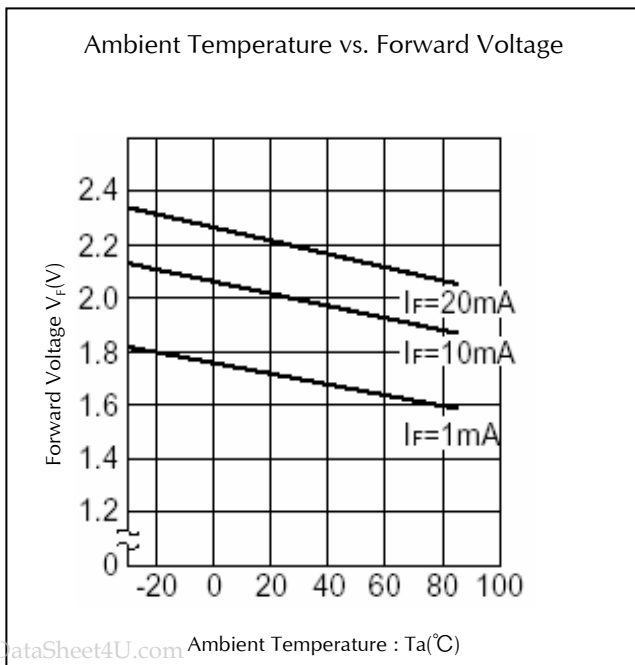
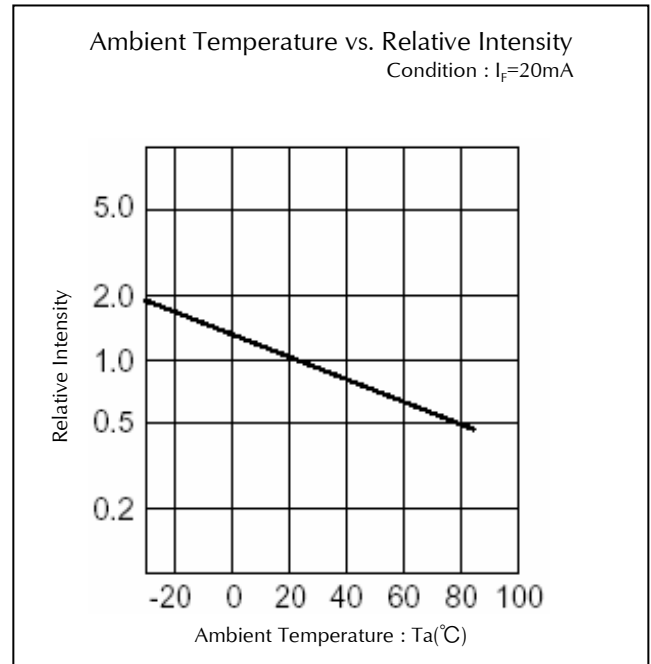
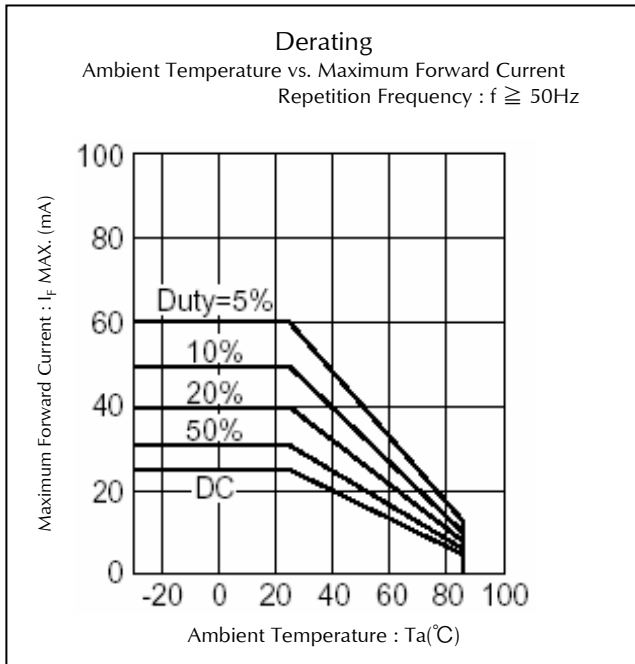


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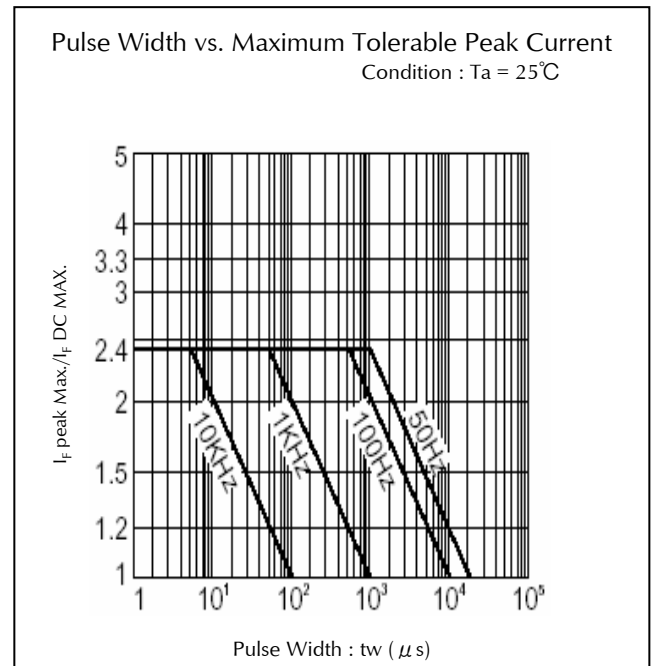
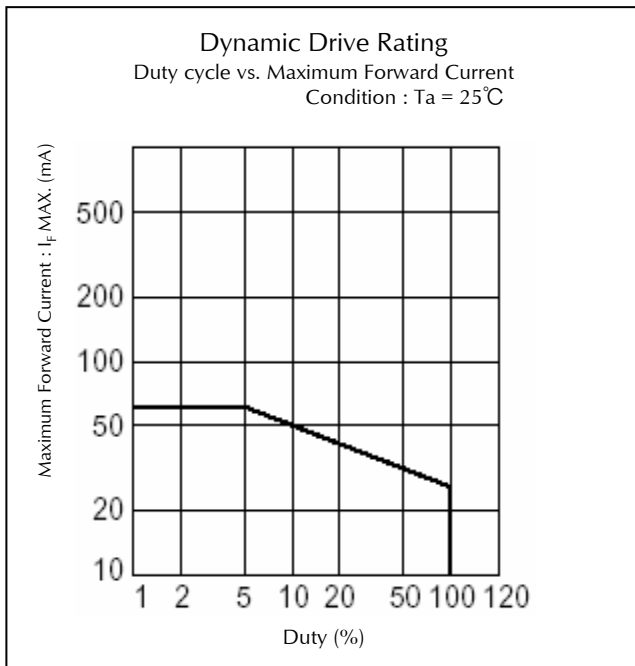
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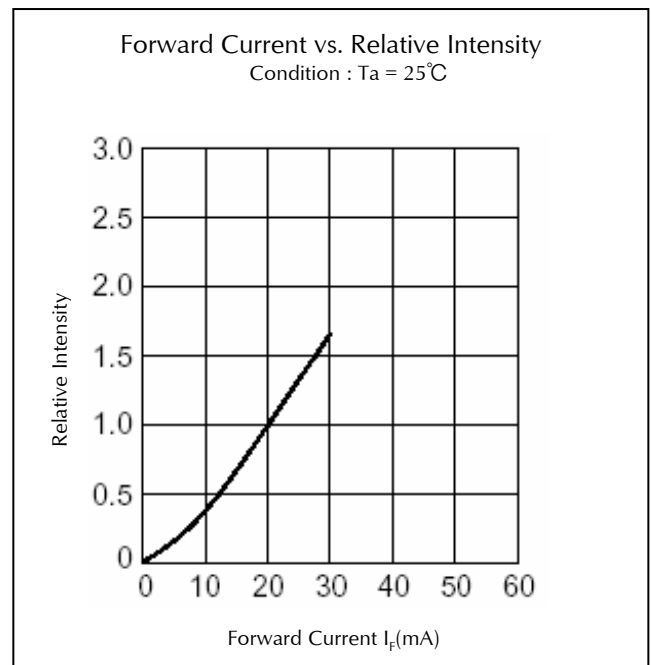
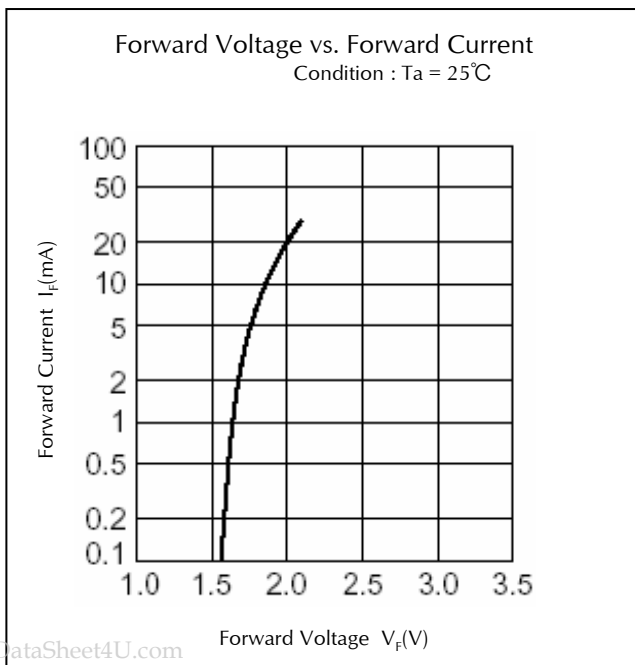
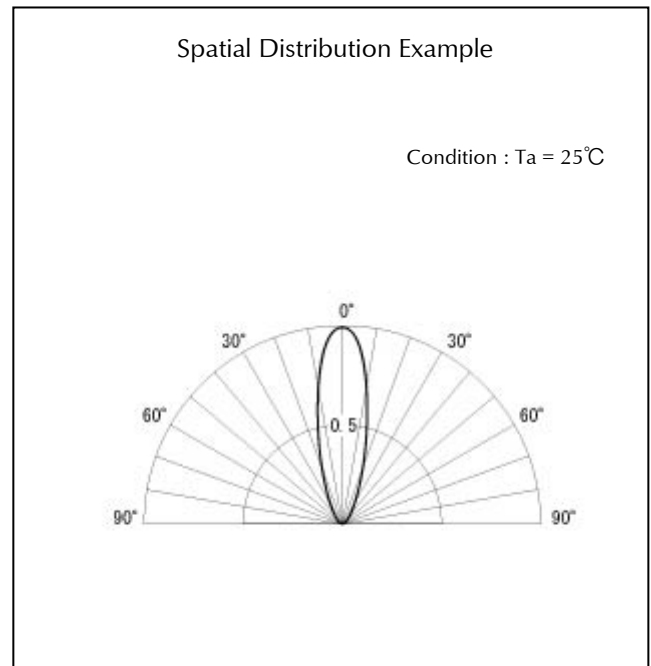
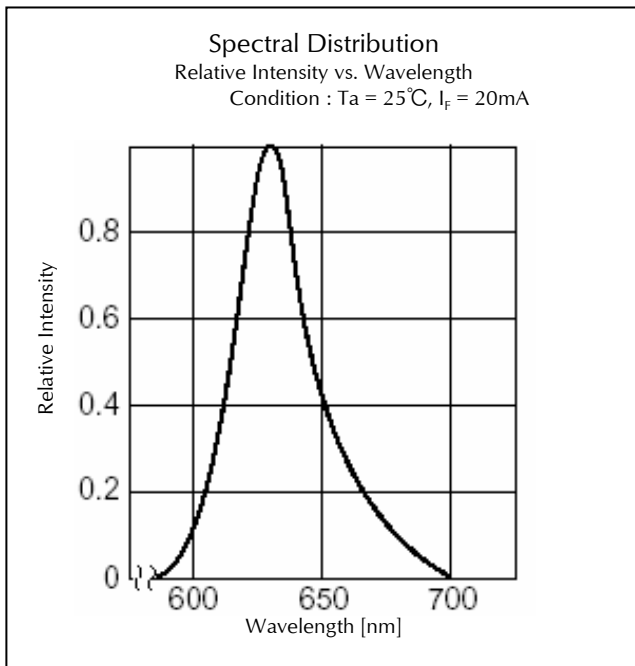


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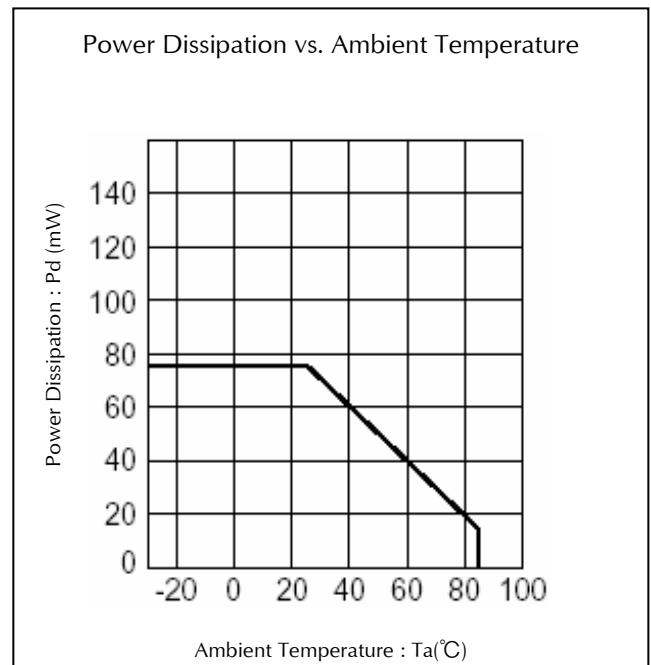
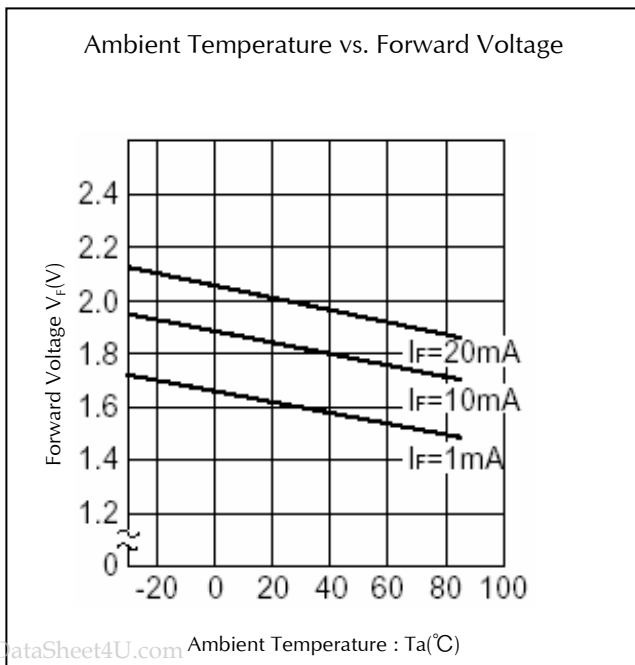
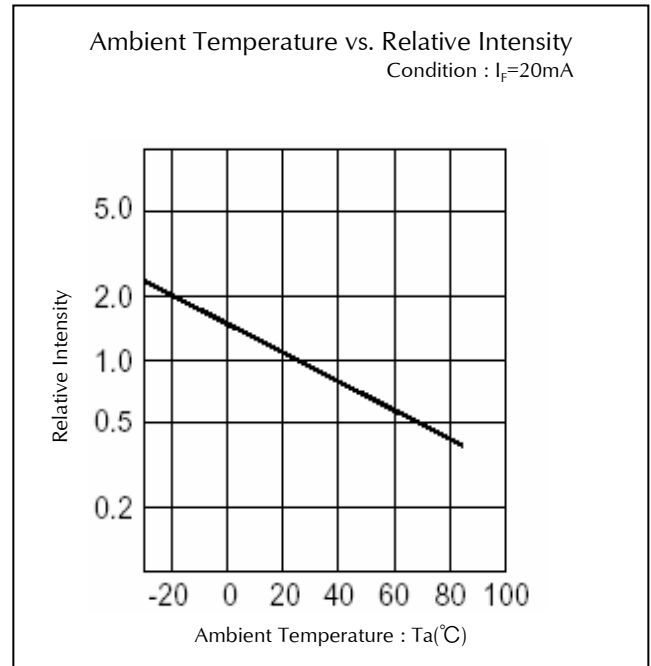
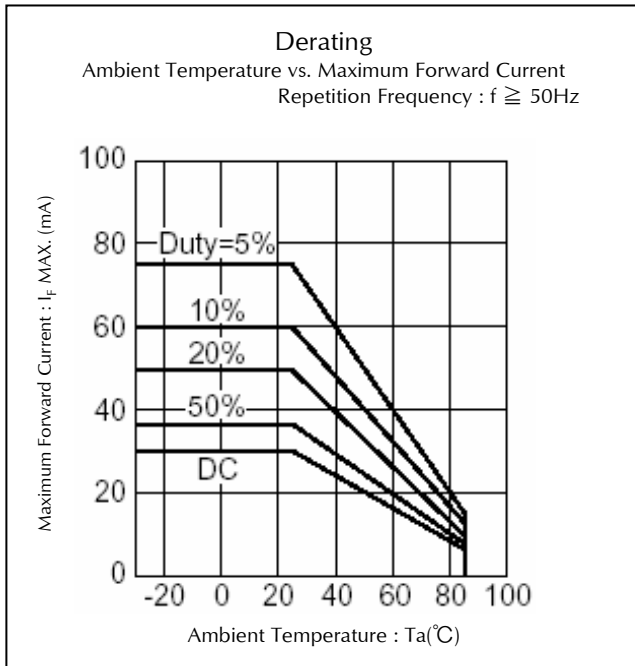
## Technical Data(EMAA/MAA)



## Technical Data(EMVR/MVR)

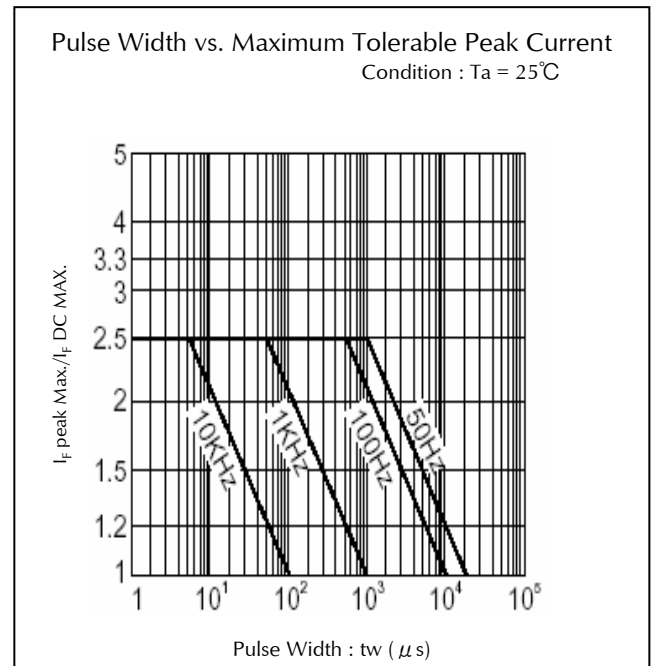
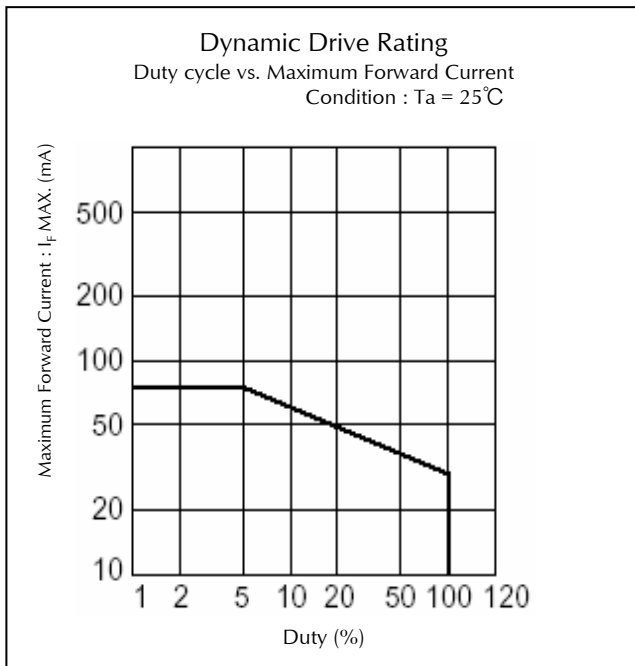


## Technical Data(EMVR/MVR)

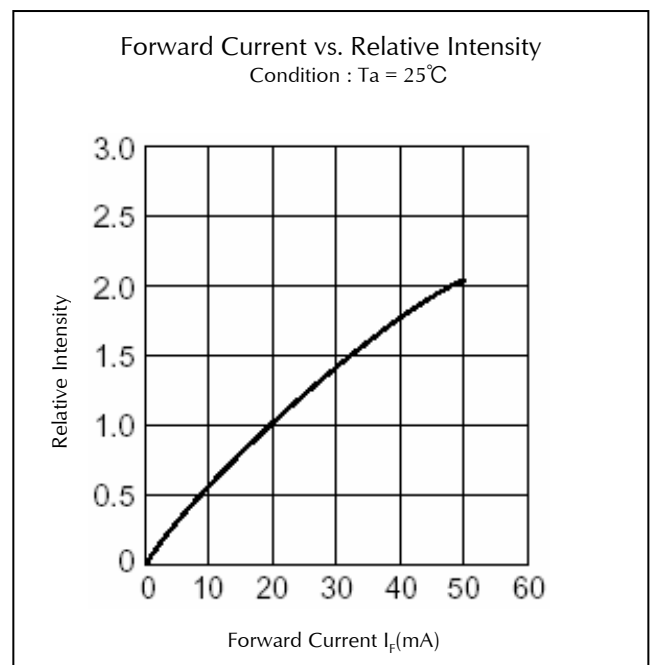
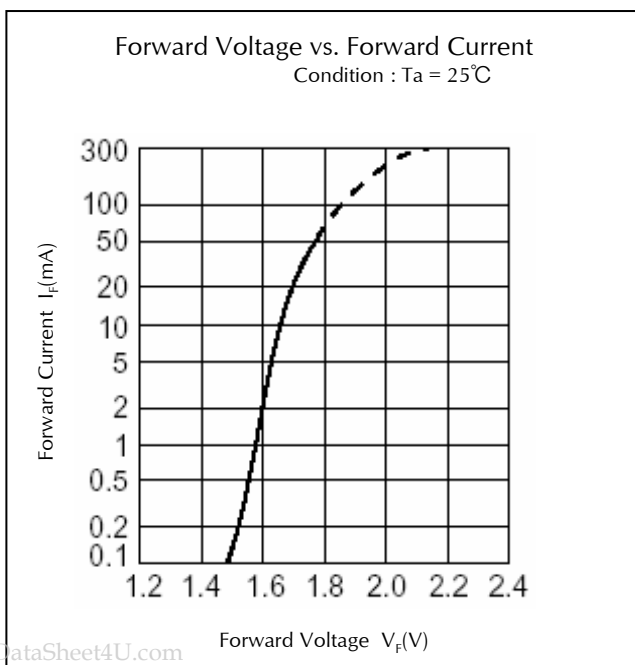
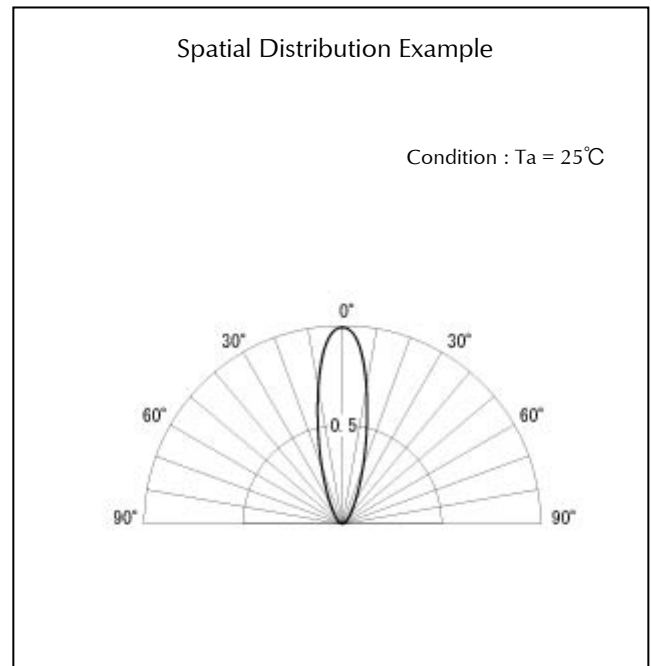
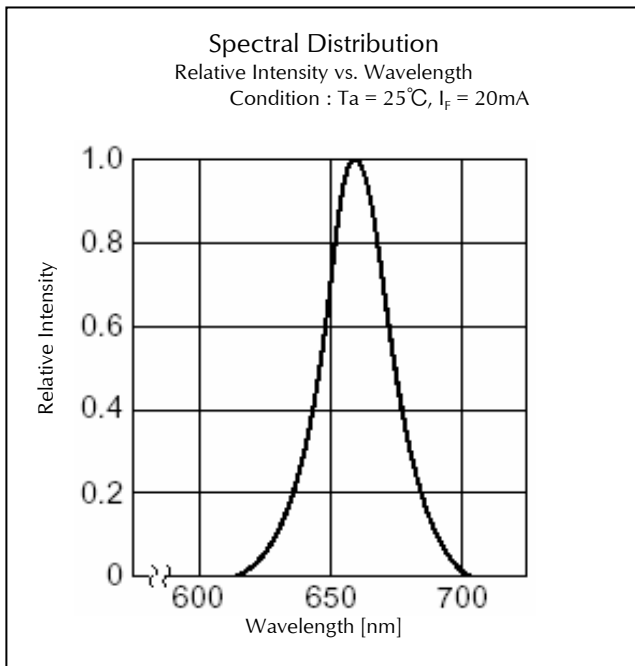


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## Technical Data(EMVR/MVR)



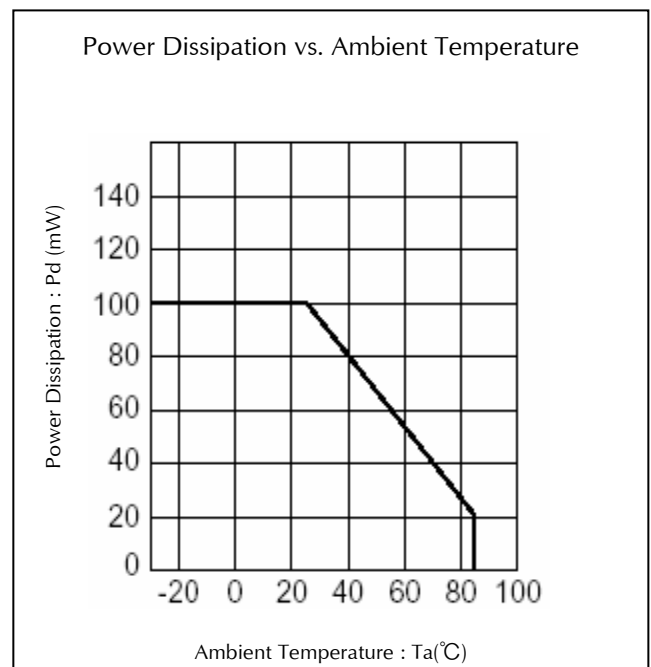
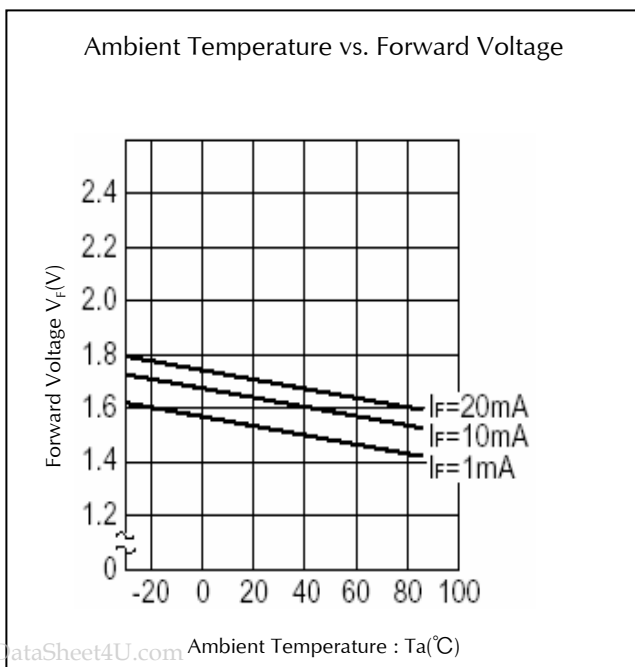
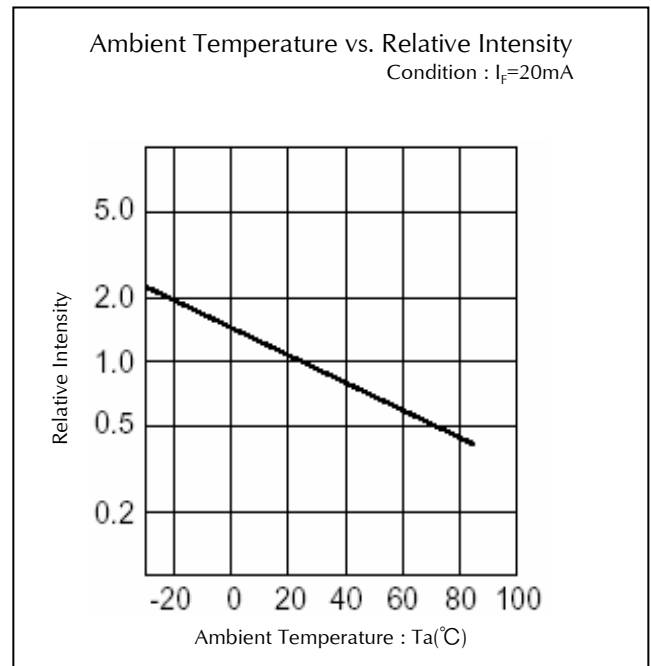
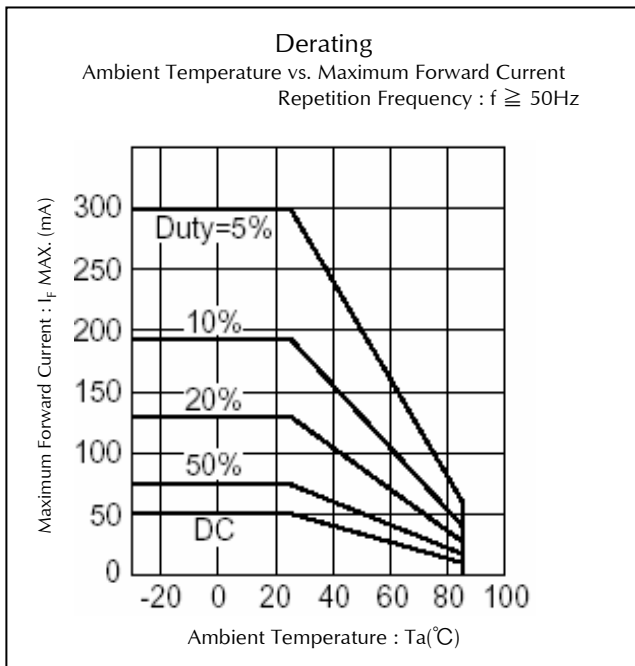
Technical Data(**EBR/BR**)



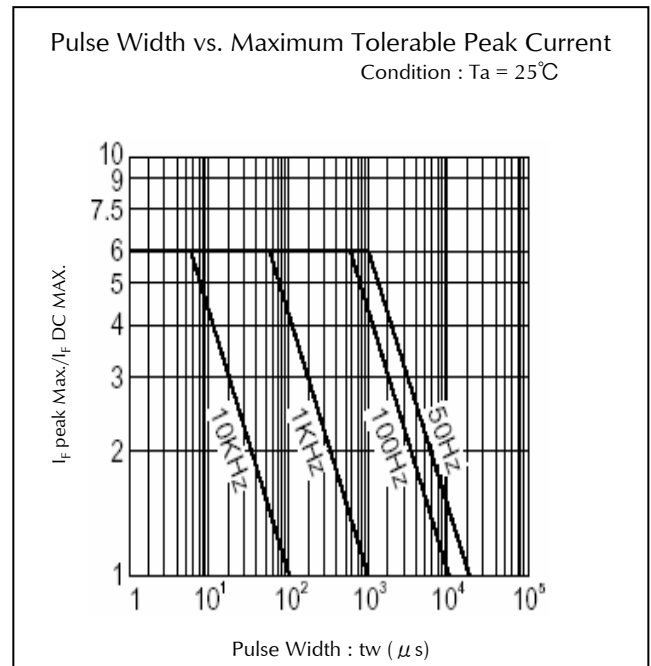
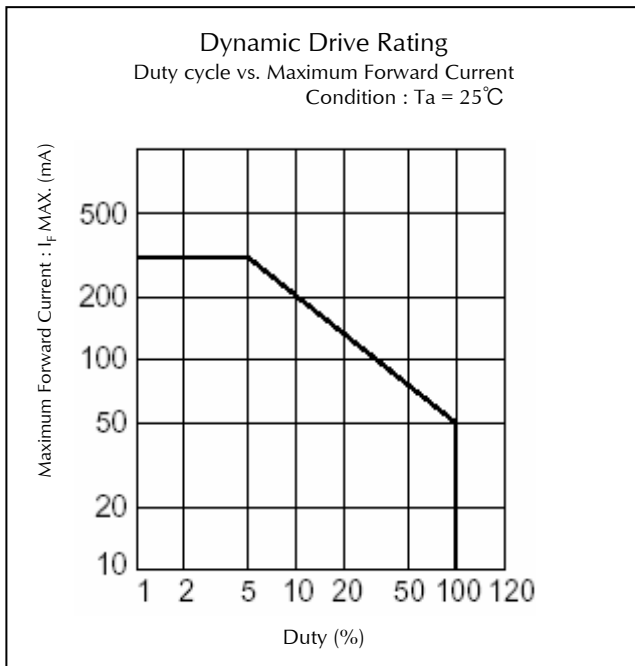
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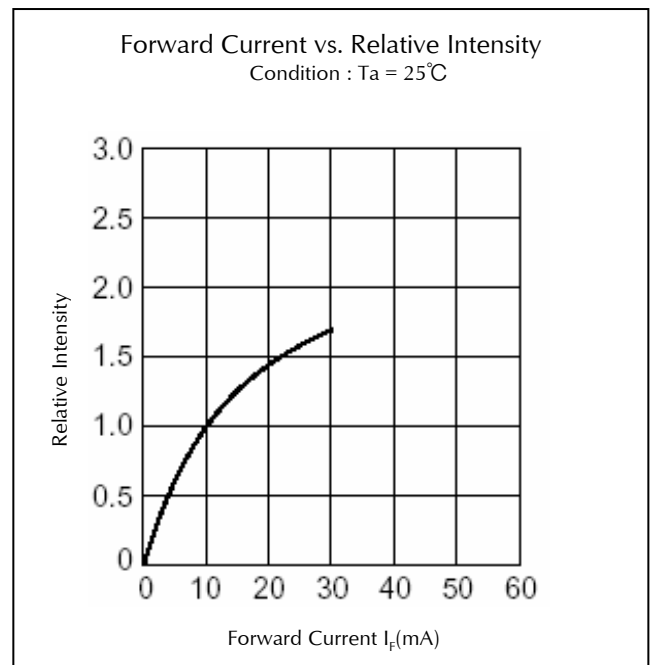
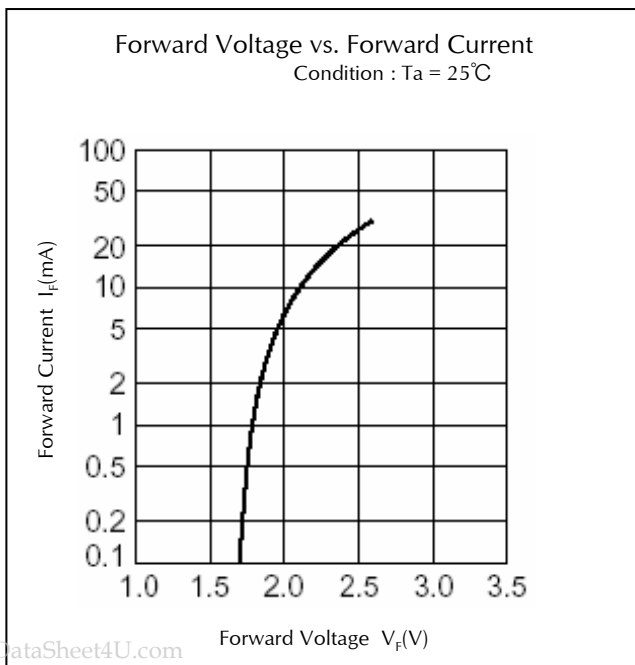
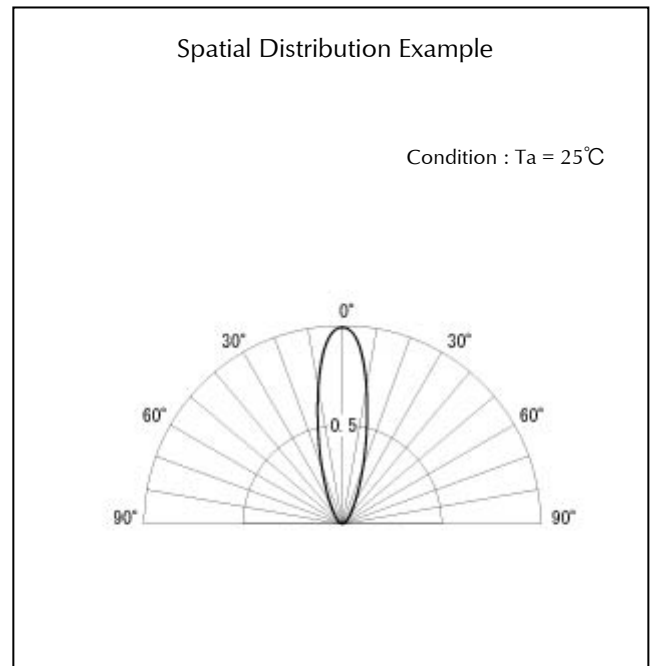
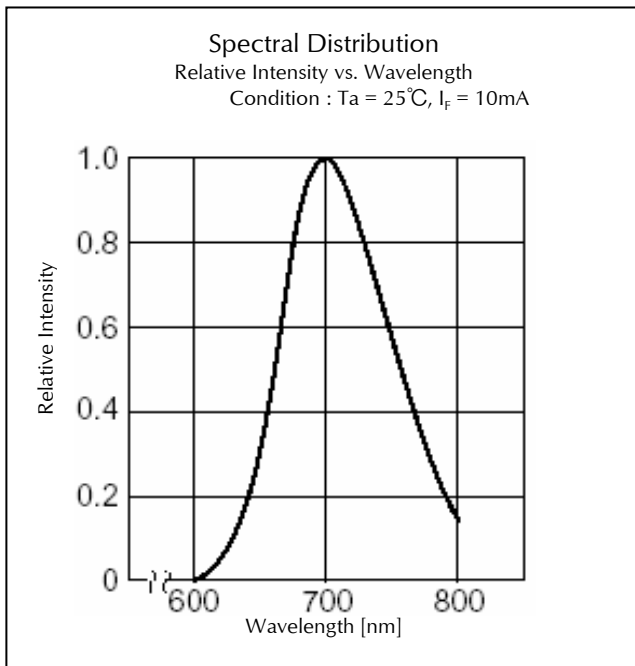
## Technical Data(EBR/BR)



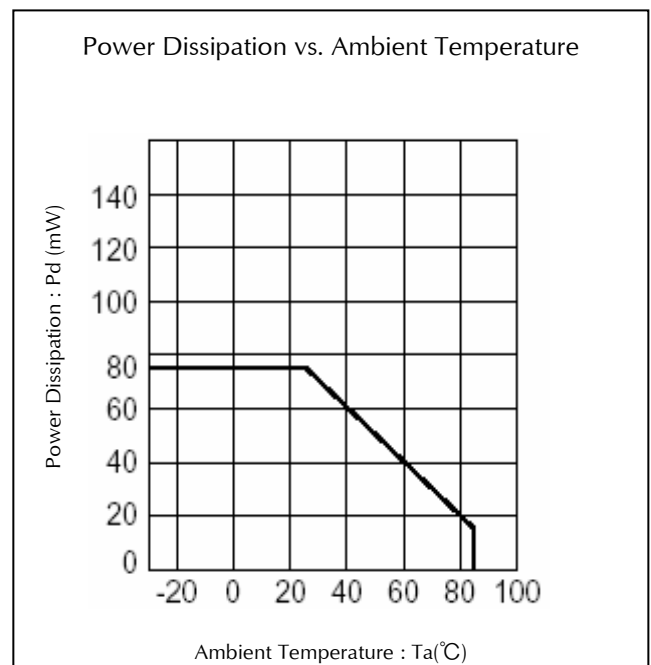
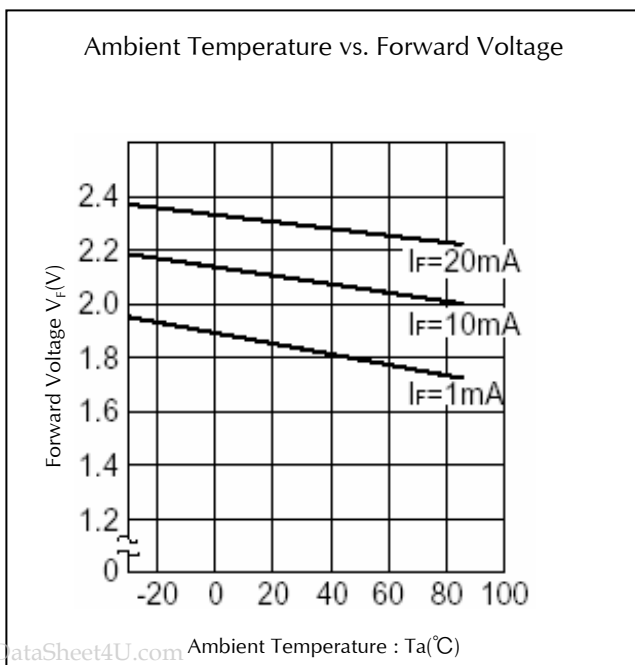
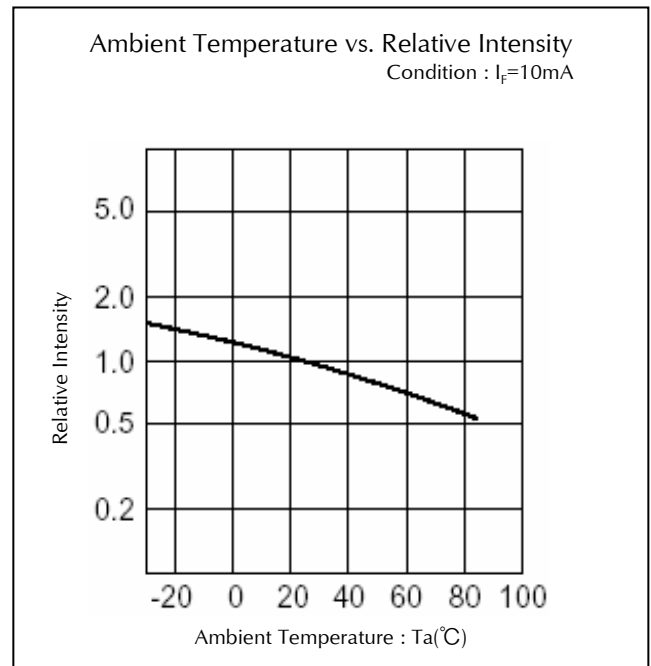
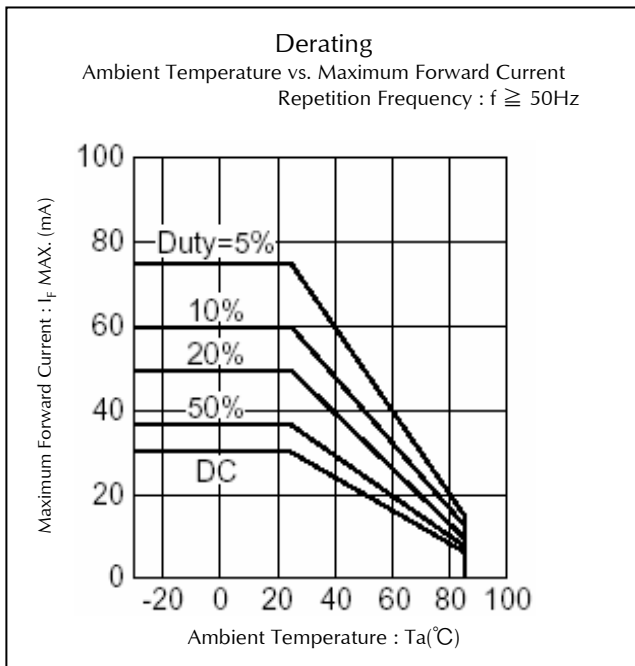
## Technical Data(EBR/BR)



## Technical Data(MPR)

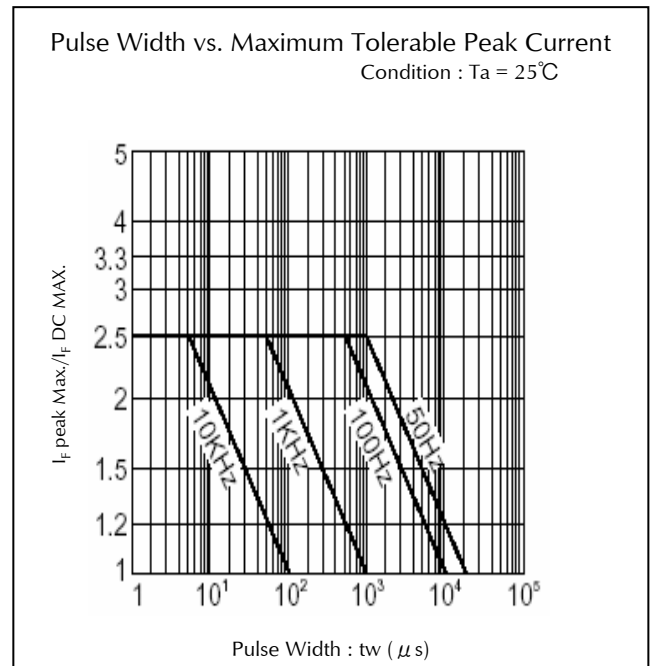
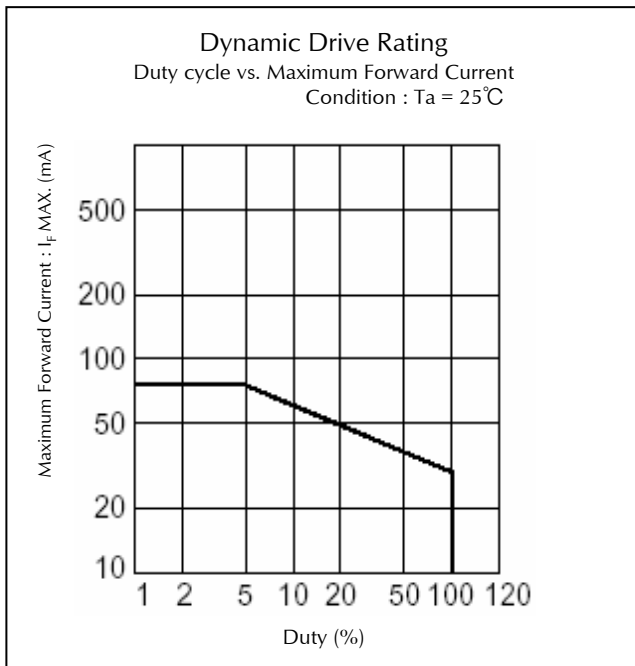


## Technical Data(MPR)



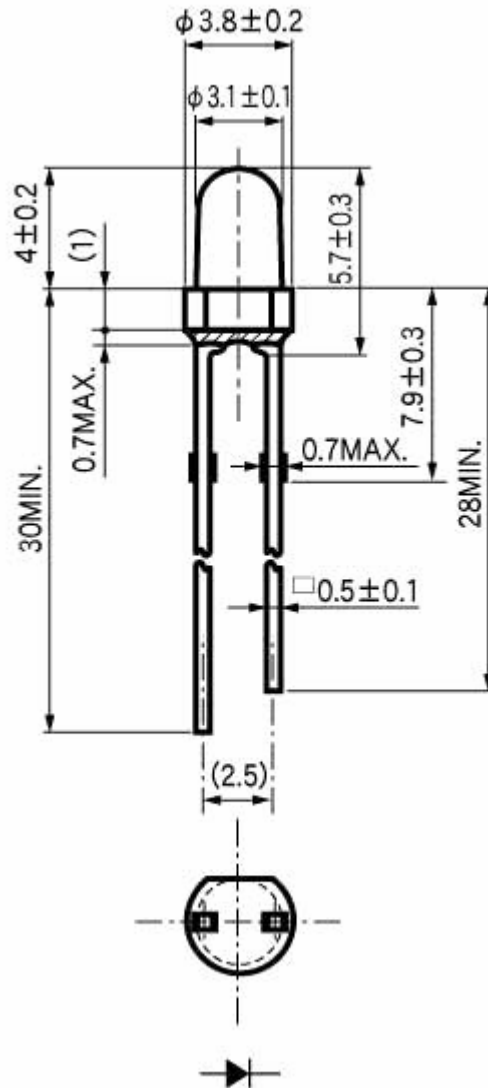
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## Technical Data(MPR)



## 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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