



3378S Series

Single Color ϕ 3 Round Shape Type

Features

Package	ϕ 3 Round shape type, EMBG/MBG,EMPG/MPG : Pale Green Diffused epoxy EMPY/MPY,EMAY/MAY : Pale Yellow Diffused epoxy EMAA/MAA : Pale Orange Diffused epoxy EMVR/MVR,EBR/BR,MPR : Pale Red Diffused epoxy
Product features	• Outer Dimension ϕ 3 Round shape type • Operation temperature range. Storage Temperature : -30°C~100°C Operating Temperature : -30°C~85°C • No lead package and lead-free soldering compatible • RoHS compliant
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 λ d (nm)		Luminous Intensity Iv (mcd)		
					TYP.	I _F	MIN.	TYP.	I _F
EMBG/MBG3378S	GaP	Green	Pale Green	Diffused	558	20	10/5	15/10	20
EMPG/MPG3378S	GaP				567	20	20/10	30/20	20
EMPY/MPY3378S	GaP	Yellow Green	Pale Yellow		572	20	30/15	45/30	20
EMAY/MAY3378S	GaAsP	Yellow			590	20	20/10	30/20	20
EMAA/MAA3378S	GaAsP	Orange	Pale Orange		606	20	20/10	30/20	20
EMVR/MVR3378S	GaAsP	Red	Pale Red		624	20	20/10	30/20	20
EBR/BR3378S	GaAlAs				647	20	30/15	45/30	20
MPR3378S	GaP				630	10	1.5	3	10

Absolute Maximum Ratings

(Ta=25°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 (Ta=25°C or higher)	ΔI_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 $\leq 1ms.$, 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 _F =20mA	V _F	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 _R =4V	I _R	MAX.	20	20	20	20	20	20	100	μ A
Peak Wavelength	I _F =20mA	λ_p	TYP.	555	560	570	580	605	630	660	nm
Dominant Wavelength	I _F =20mA	λ_d	TYP.	558	567	572	590	606	624	647	nm
Spectral Line Half Width	I _F =20mA	$\Delta \lambda$	TYP.	30	30	30	30	30	30	30	nm
Half Intensity Angle	I _F =20mA	2 θ 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 _F =10mA	V _F	TYP.	2.1	V
			MAX.	2.8	
Reverse Current	V _R =4V	I _R	MAX.	20	μ A
Peak Wavelength	I _F =10mA	λ_p	TYP.	700	nm
Dominant Wavelength	I _F =10mA	λ_d	TYP.	630	nm
Spectral Line Half Width	I _F =10mA	$\Delta \lambda$	TYP.	100	nm
Half Intensity Angle	I _F =10mA	2 θ 1/2	TYP.	29	deg.

Luminous Intensity Rank

(Ta=25°C)

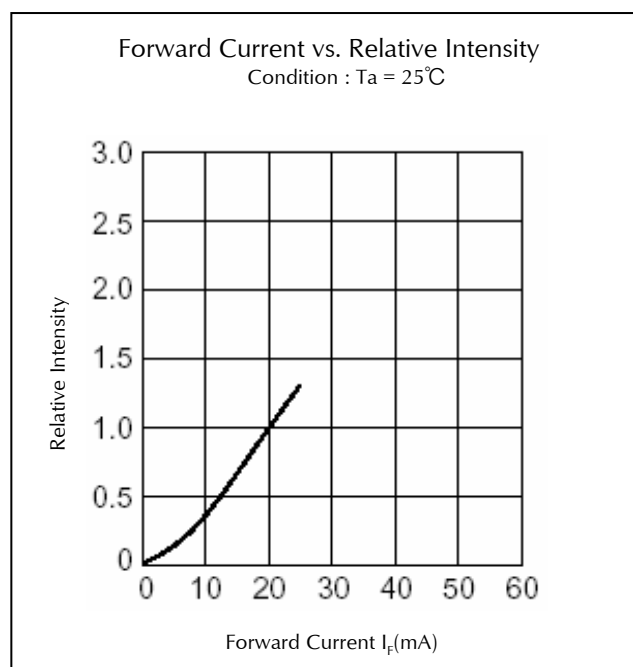
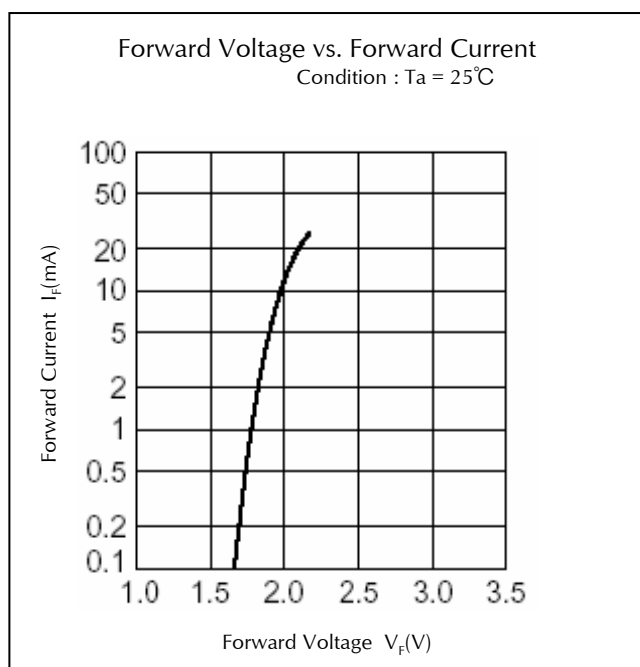
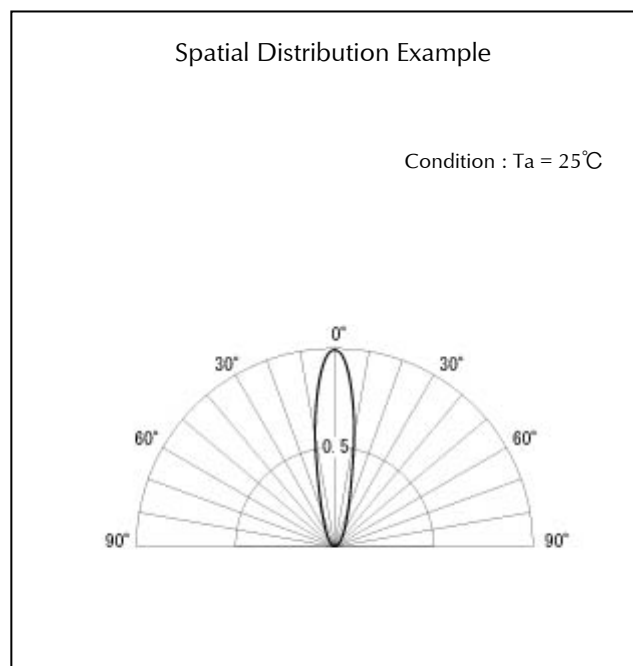
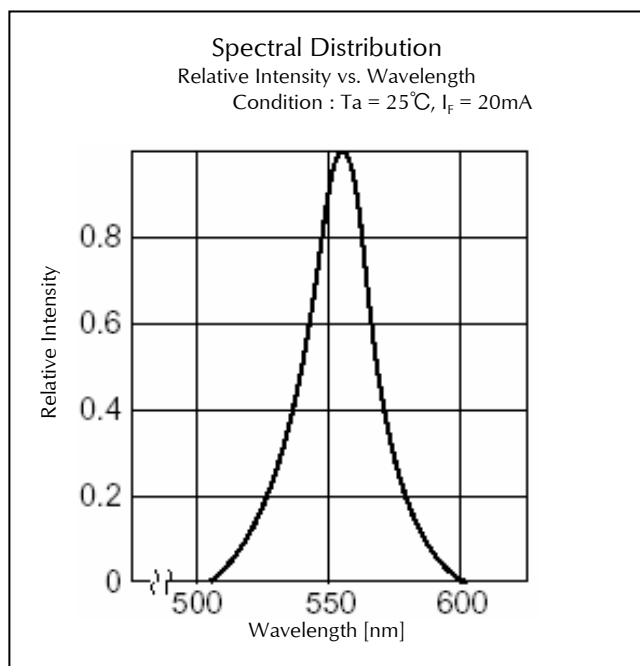
Rank	I_v (mcd)															
	MBG		MPG		MPY		MAY		MAA		MVR		BR		MPR	
	$I_f=20mA$		$I_f=20mA$		$I_f=20mA$		$I_f=20mA$		$I_f=20mA$		$I_f=20mA$		$I_f=20mA$		$I_f=10mA$	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A	5.0	10.0	10.0	20.0	15.0	30.0	10.0	20.0	10.0	20.0	10.0	20.0	15.0	30.0	1.5	3.0
B	7.0	14.0	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	10.0	20.0	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	14.0	28.0	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	20.0	-	40.0	-	60.0	-	40.0	-	40.0	-	40.0	-	60.0	-	6.0	-

※Please contact our sales staff concerning rank designation.

Rank	I_v (mcd)													
	EMBG		EMPG		EMPY		EMAY		EMAA		EMVR		EBR	
	$I_f=20mA$		$I_f=20mA$		$I_f=20mA$		$I_f=20mA$		$I_f=20mA$		$I_f=20mA$		$I_f=20mA$	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
C	10.0	20.0	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	14.0	28.0	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	20.0	-	40.0	-	60.0	-	40.0	-	40.0	-	40.0	-	60.0	-

※Please contact our sales staff concerning rank designation.

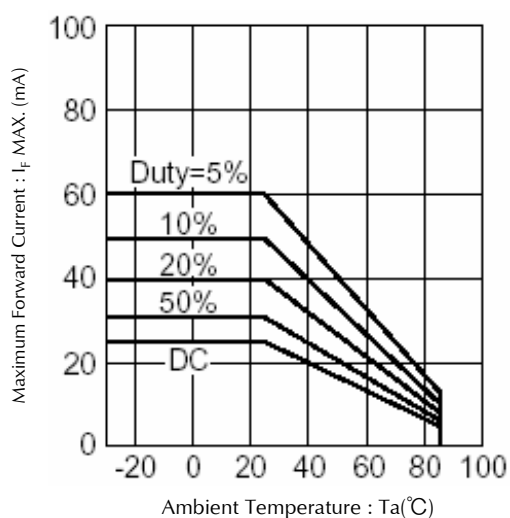
Technical Data(EMBG/MBG)



Technical Data(EMBG/MBG)

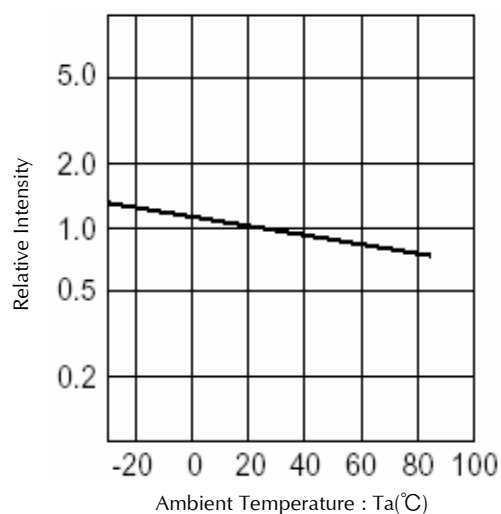
Derating

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

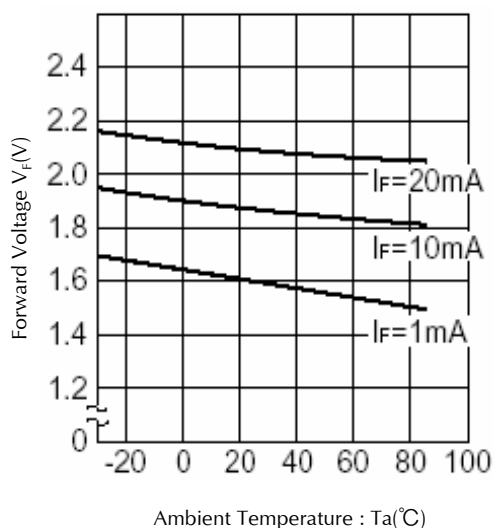


Ambient Temperature vs. Relative Intensity

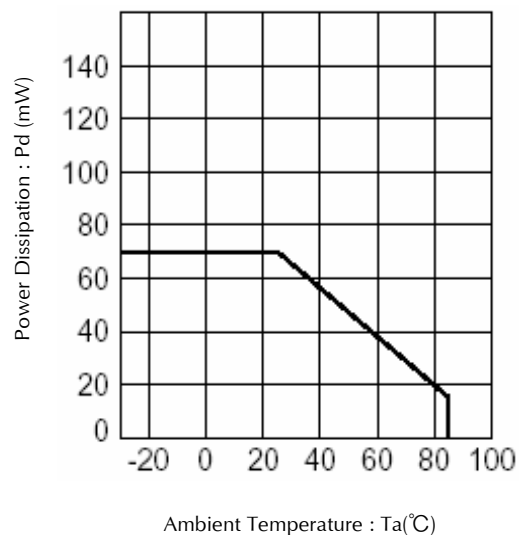
Condition : $I_F=20\text{mA}$



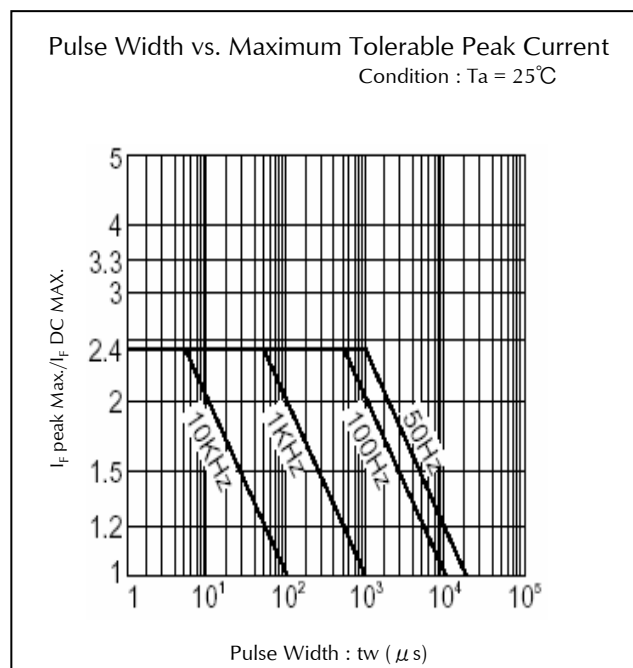
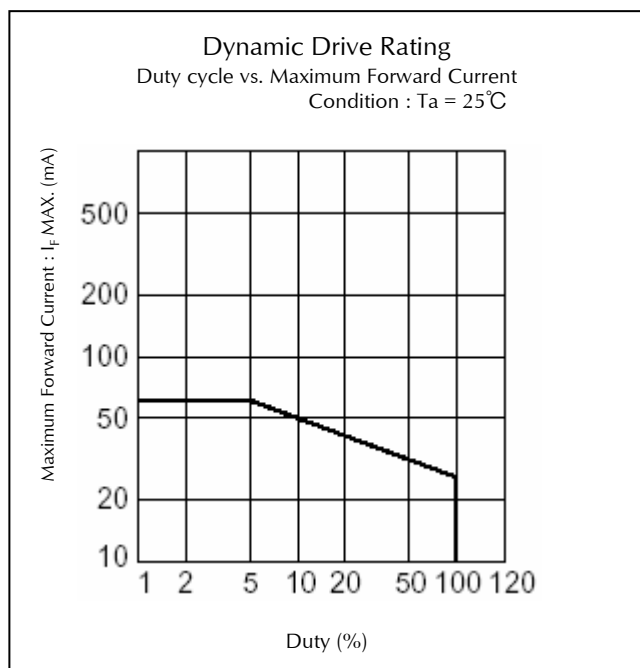
Ambient Temperature vs. Forward Voltage



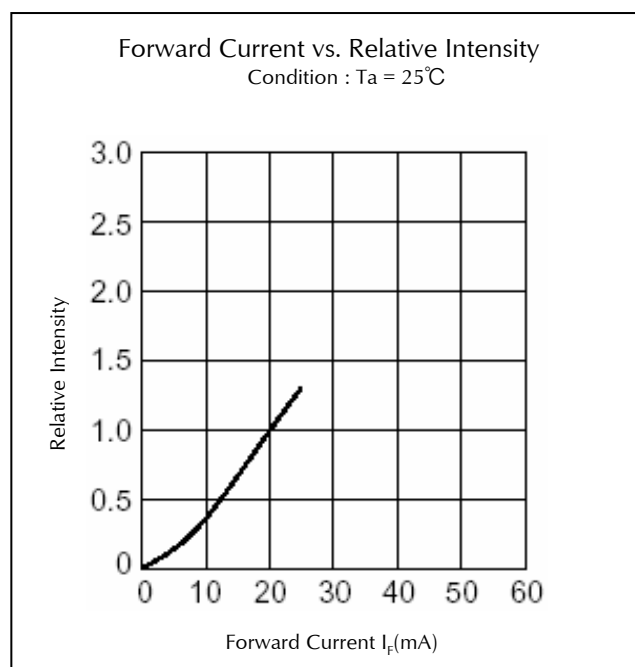
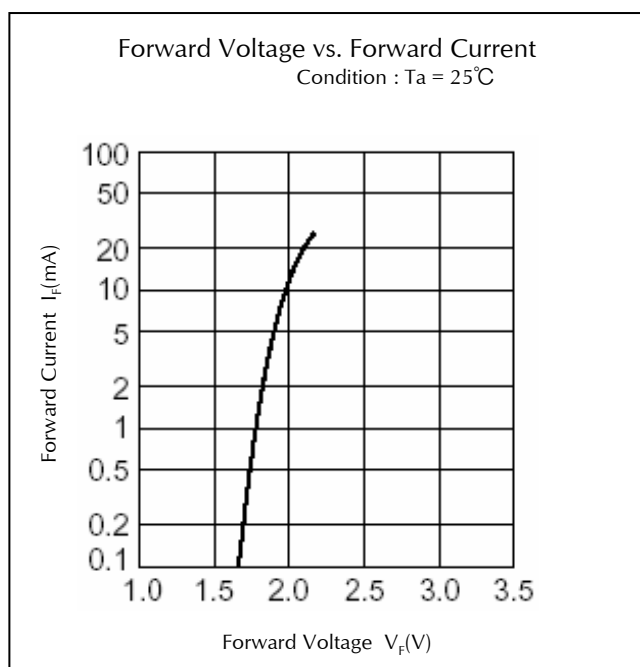
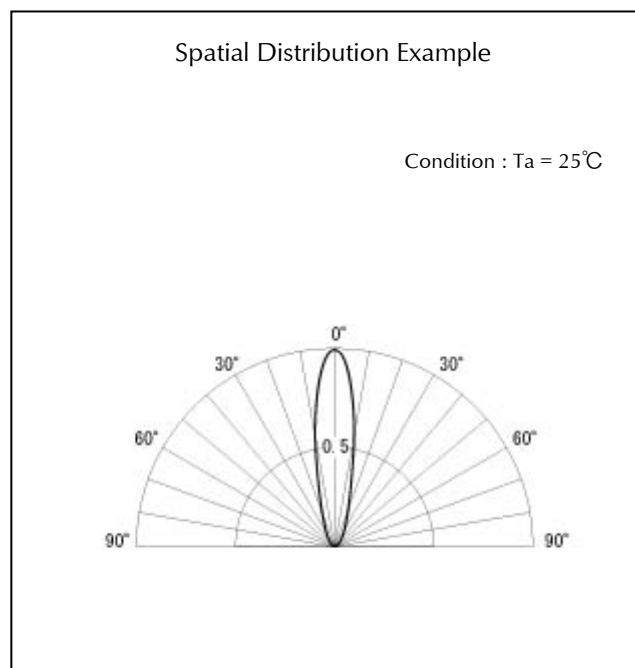
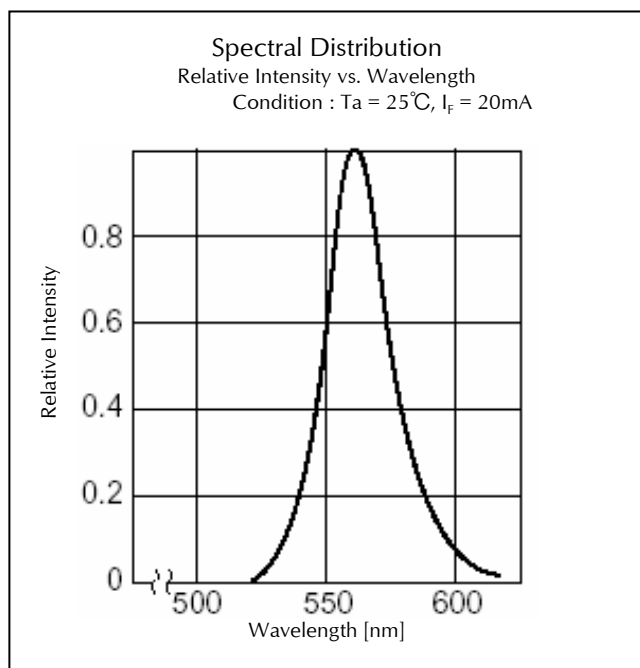
Power Dissipation vs. Ambient Temperature



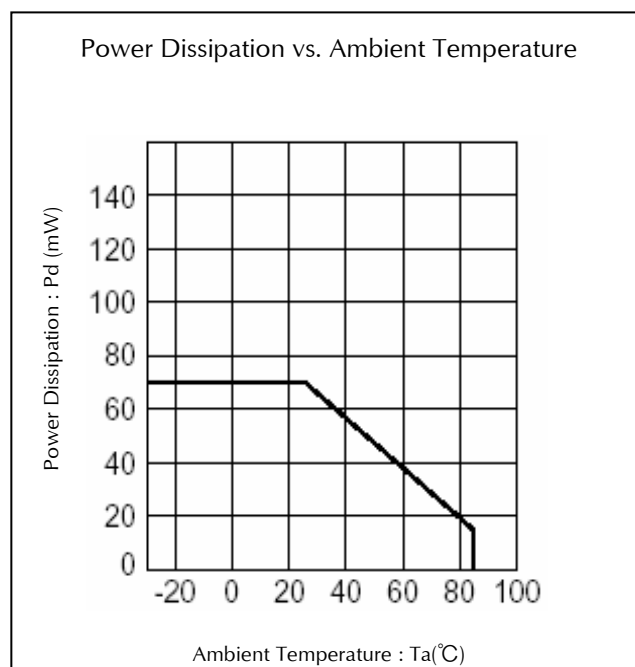
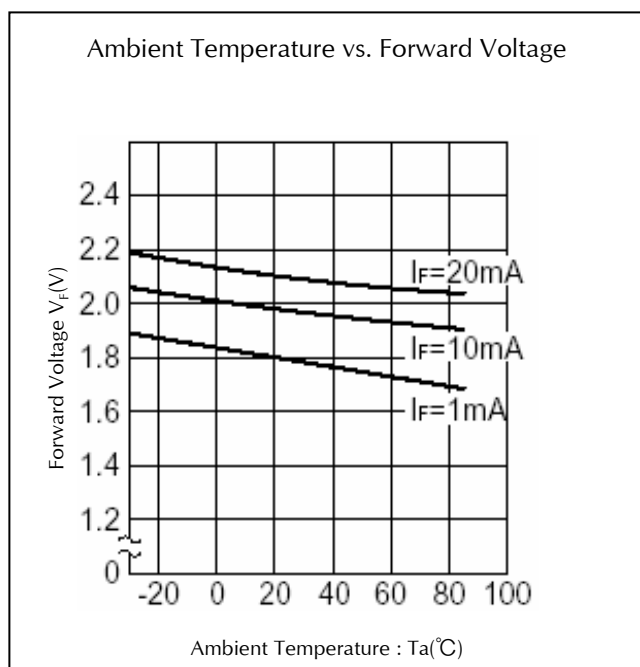
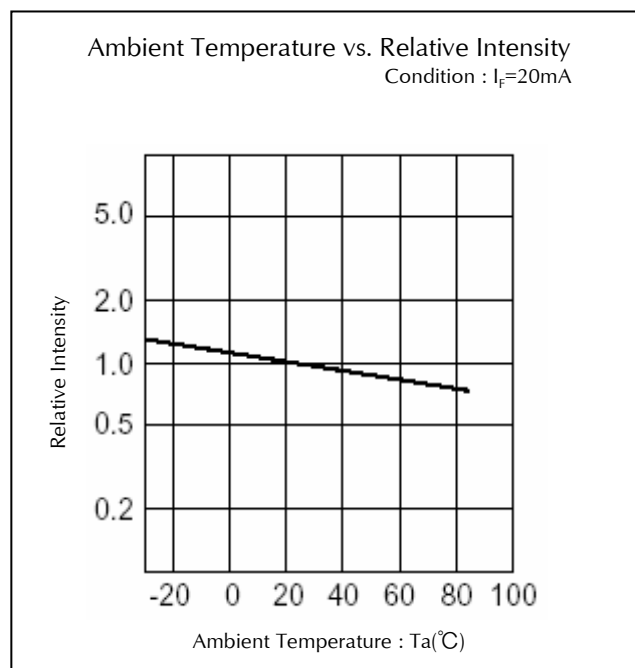
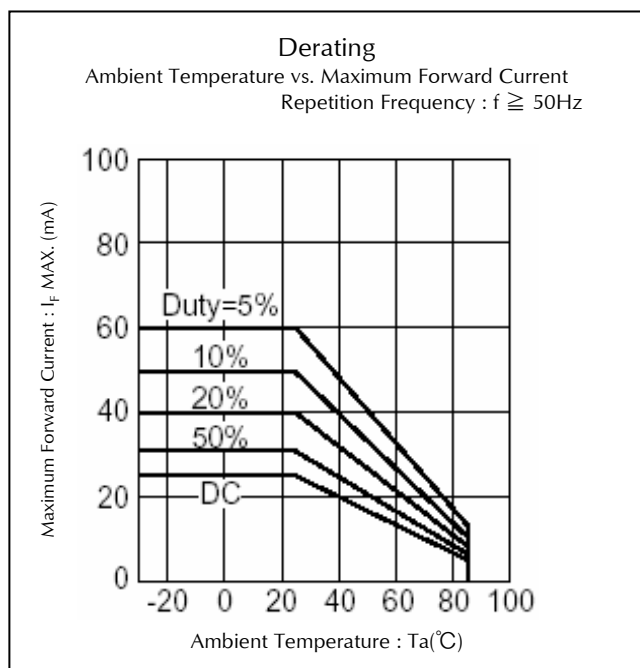
Technical Data(EMBG/MBG)



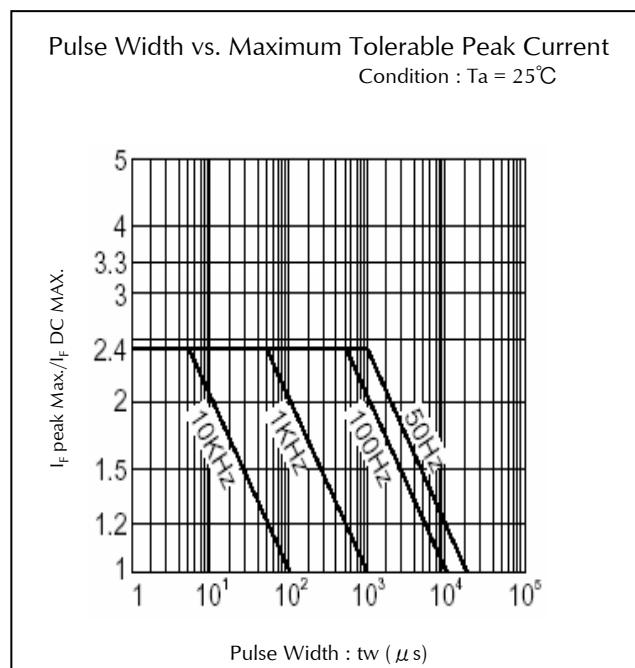
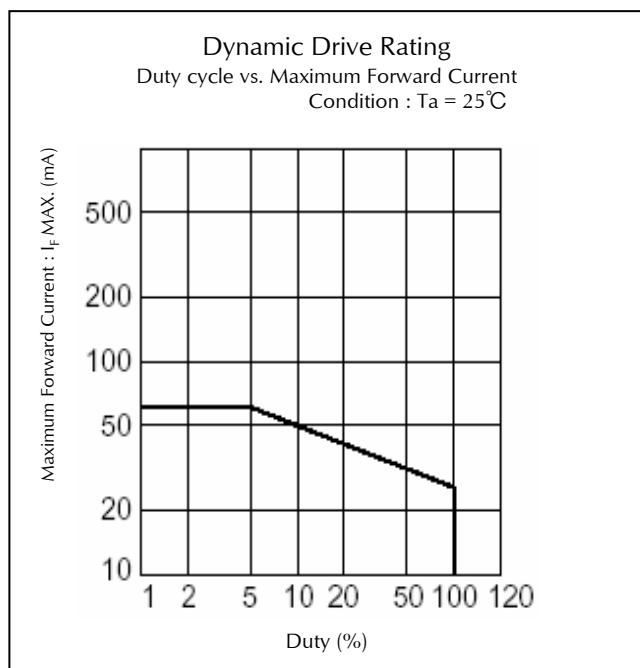
Technical Data(EMPG/MPG)



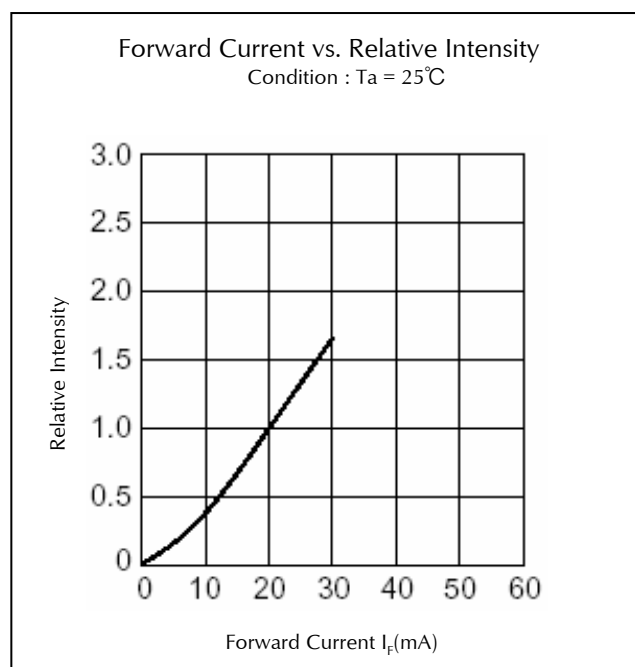
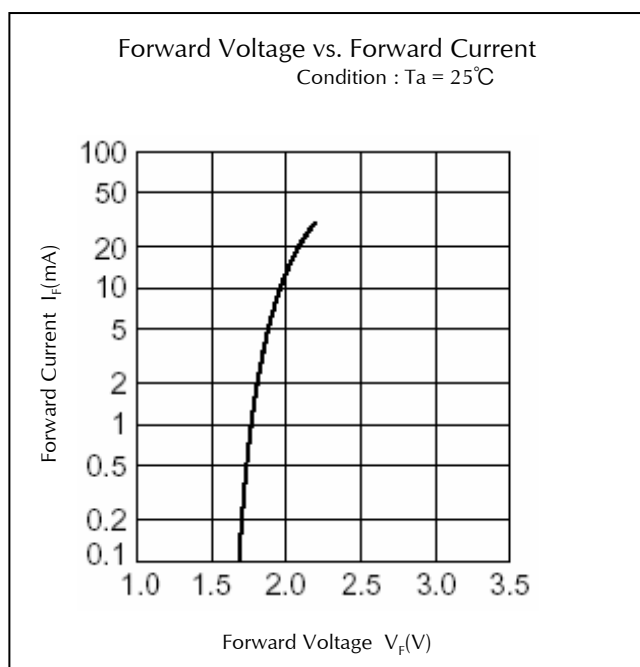
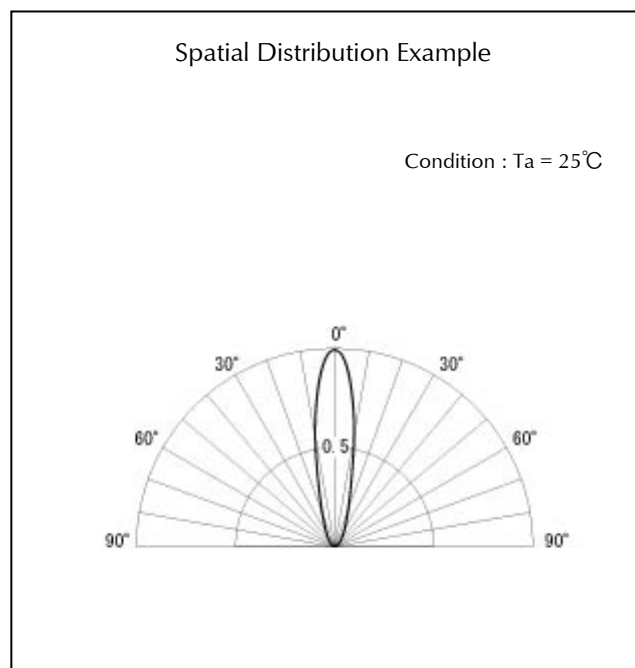
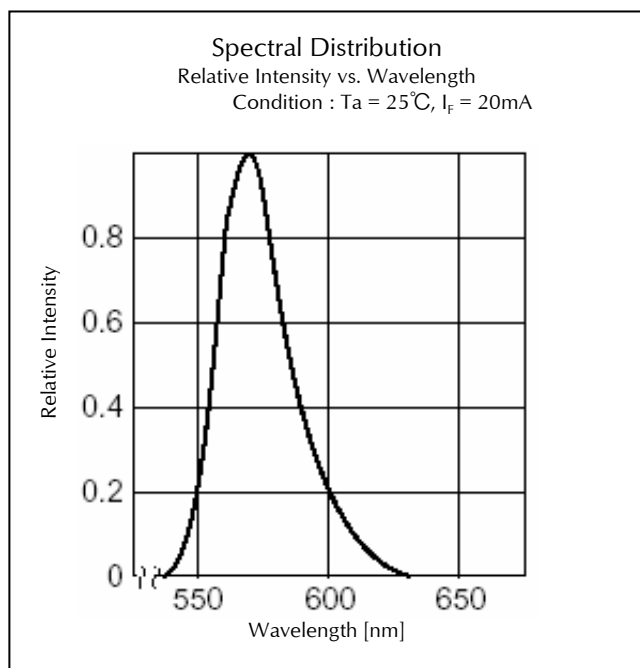
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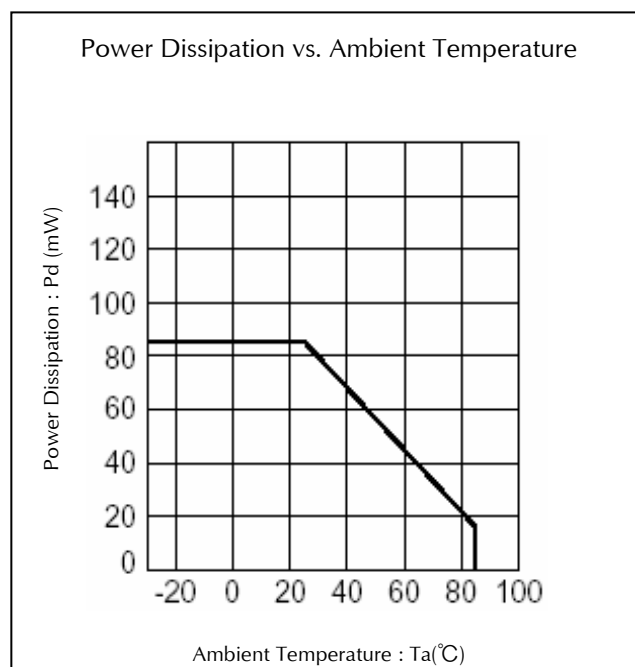
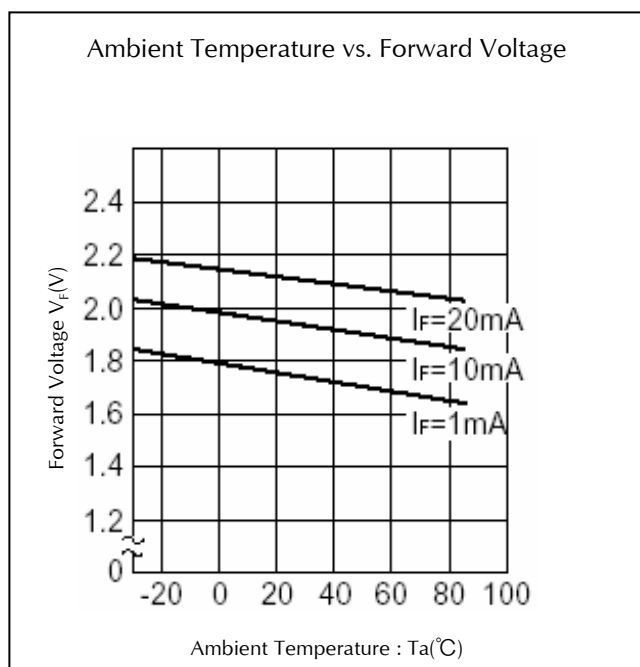
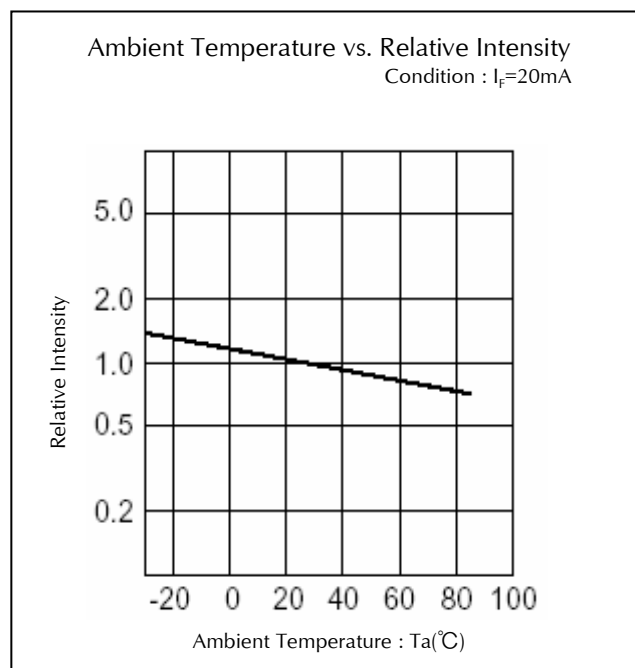
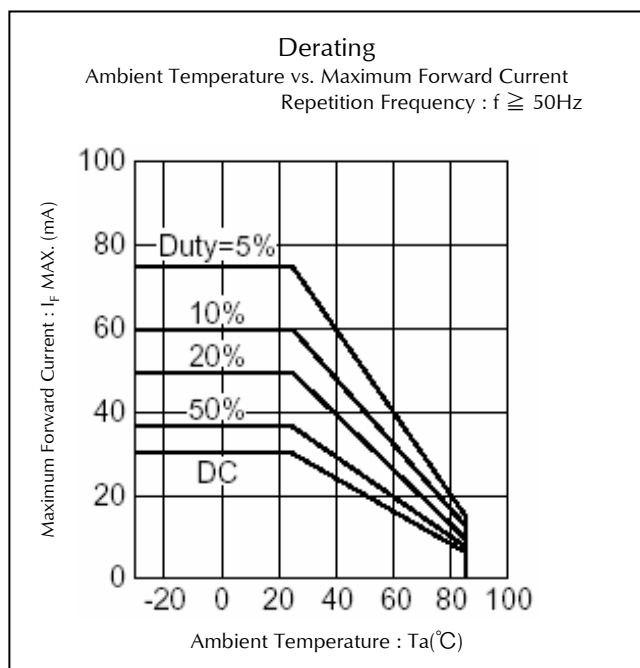
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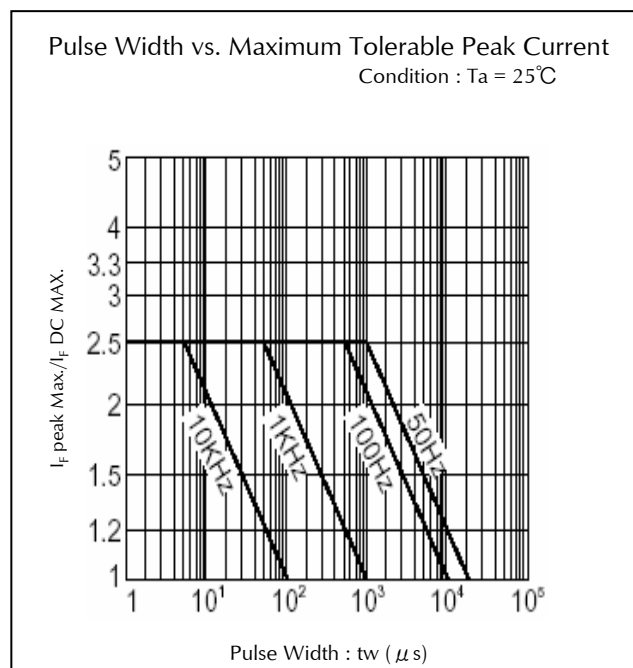
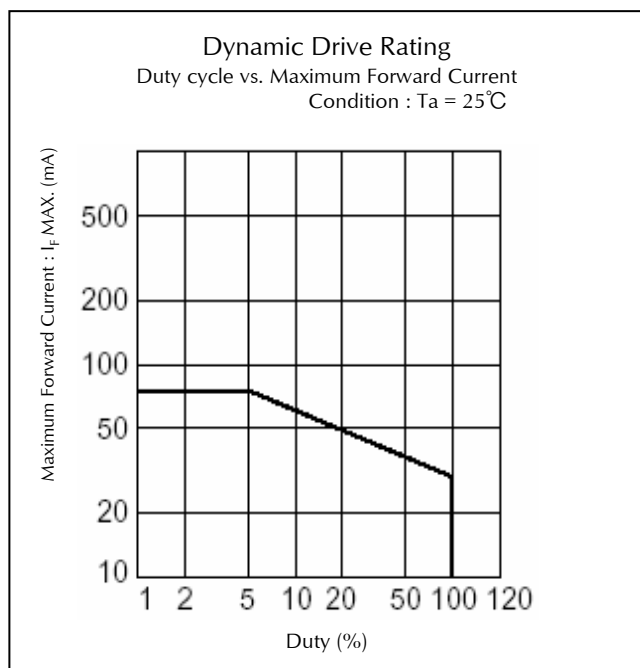
Technical Data(EMPY/MPY)



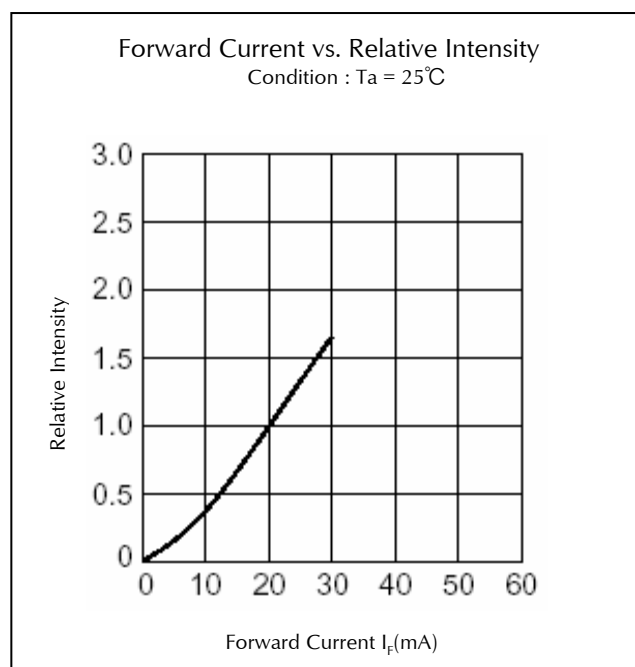
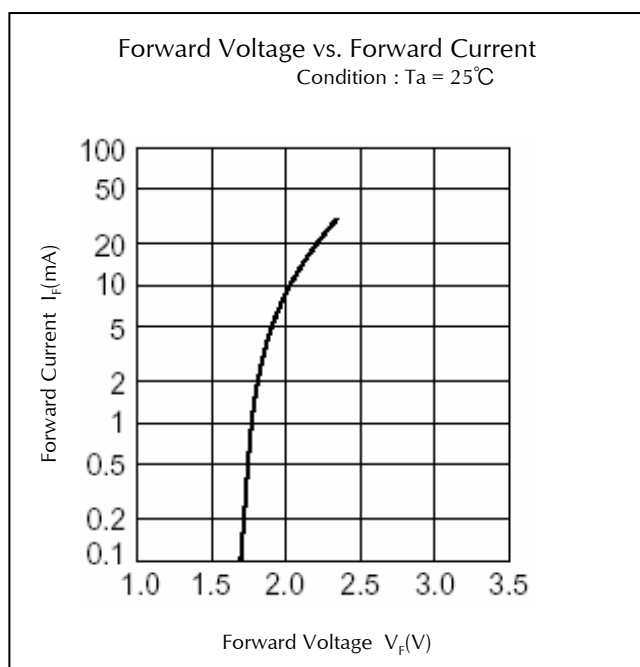
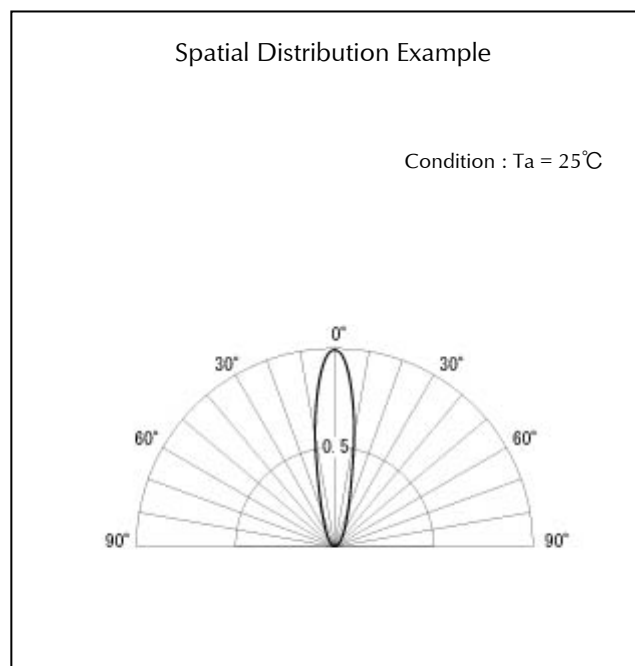
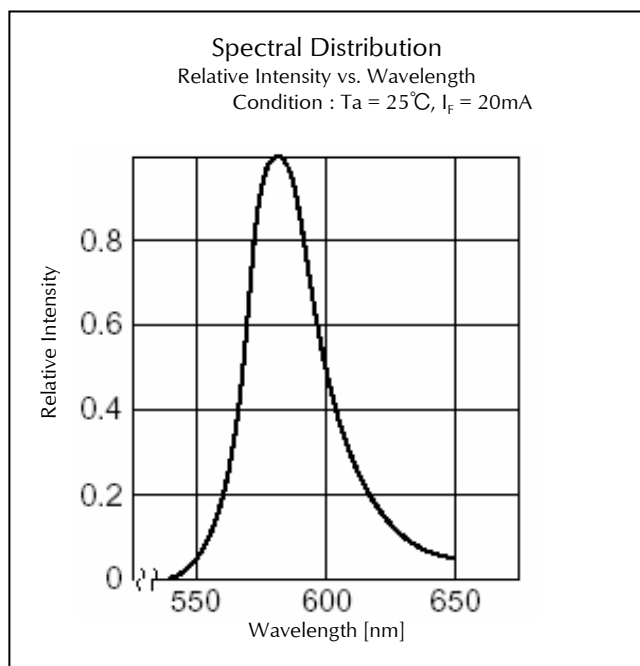
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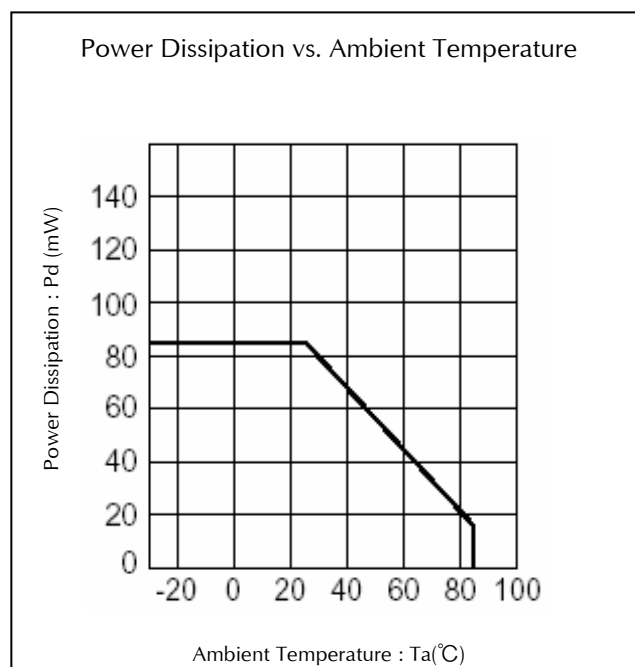
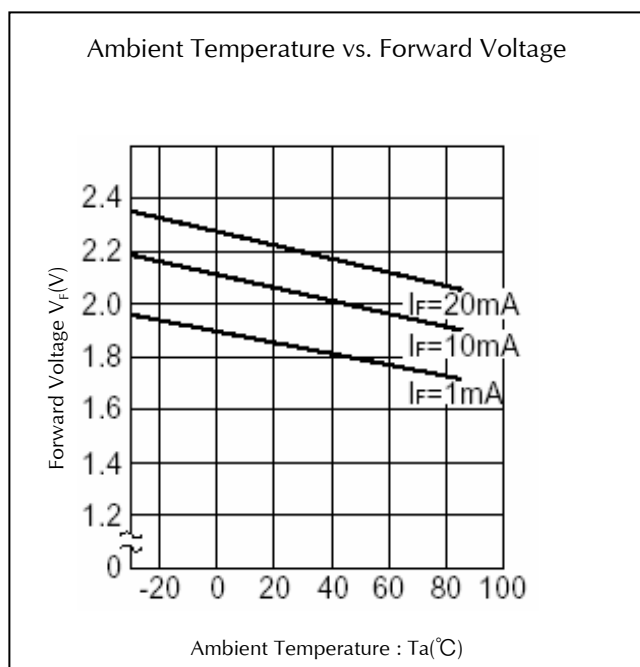
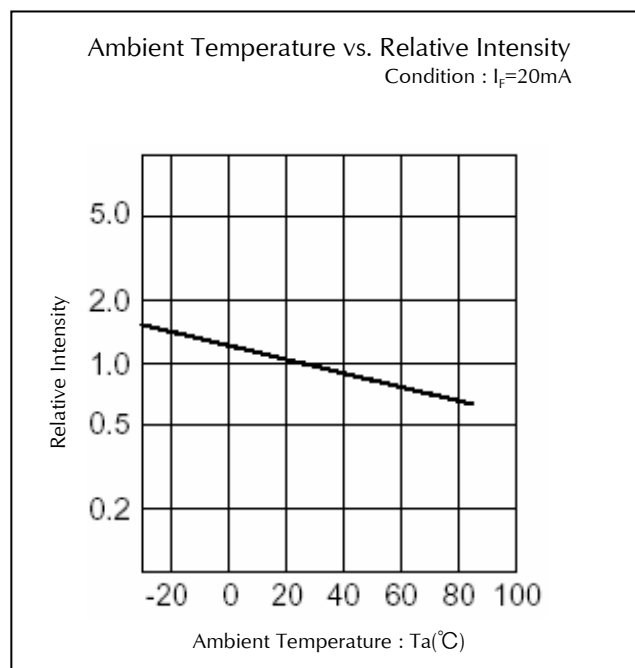
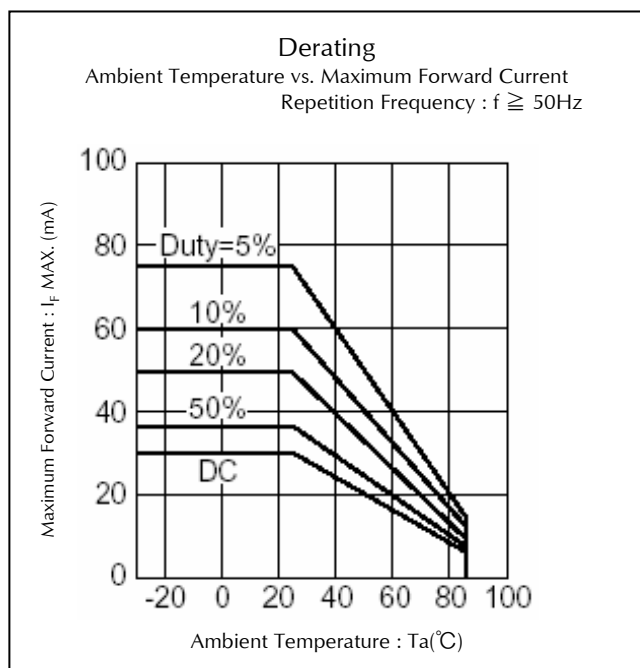
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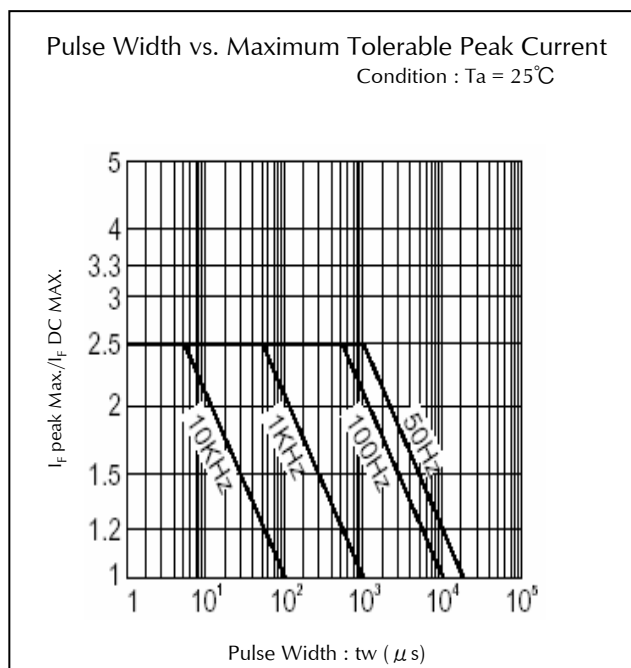
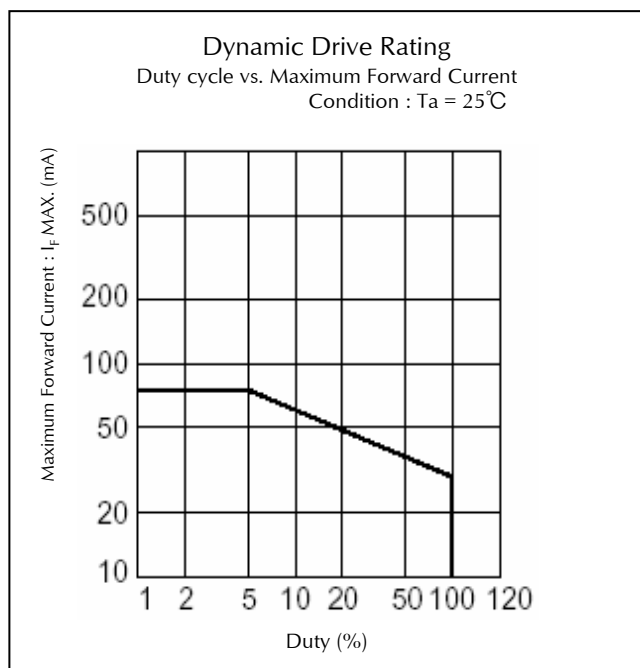
Technical Data(EMAY/MAY)



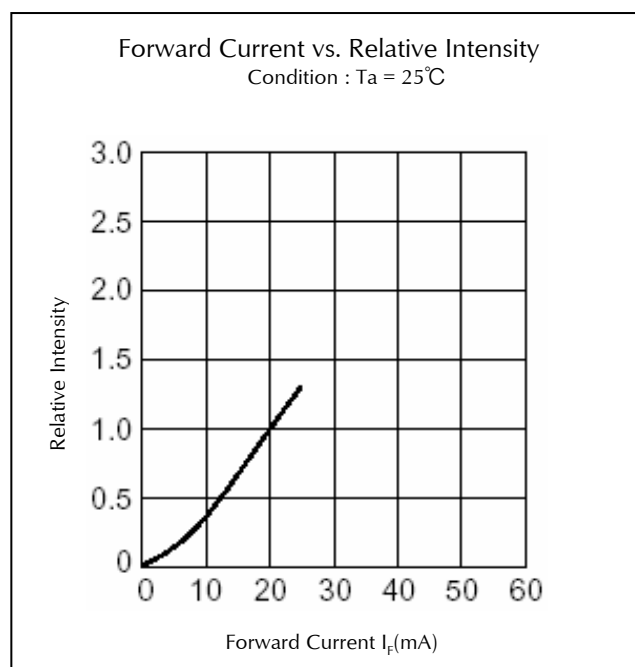
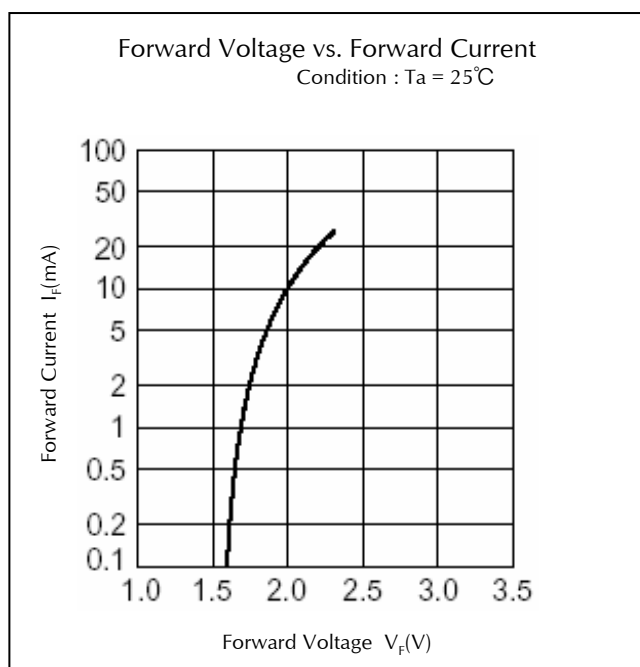
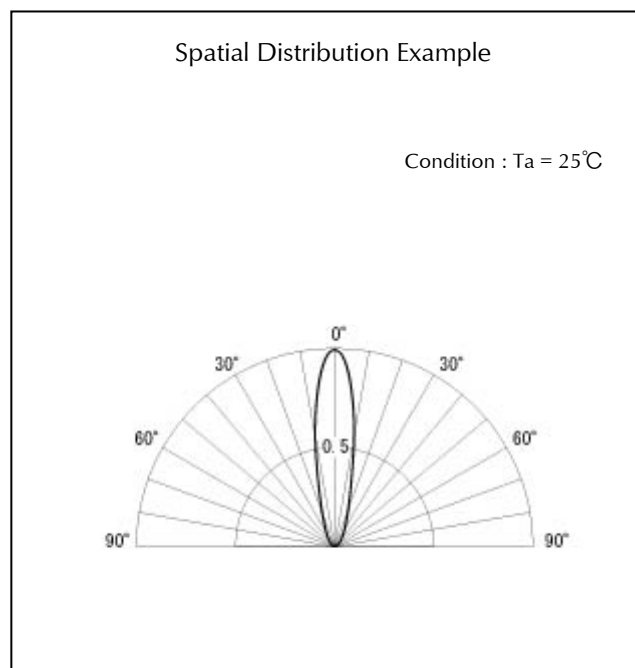
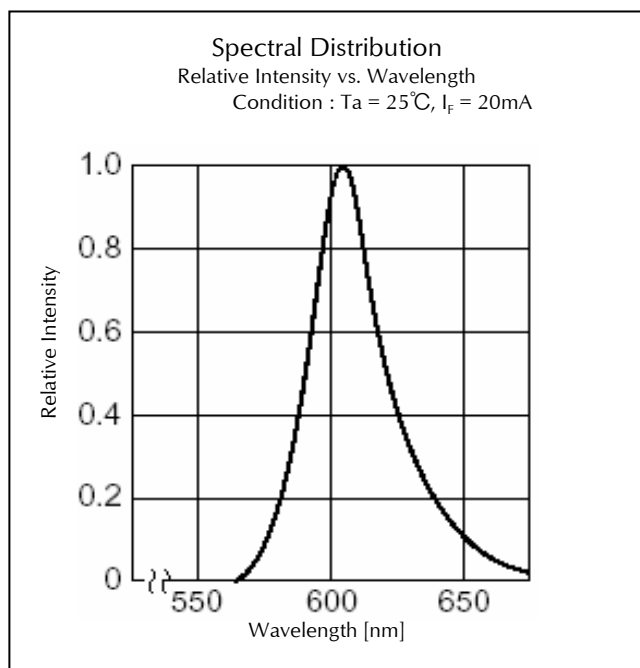
Technical Data(EMAY/MAY)



Technical Data(EMAY/MAY)



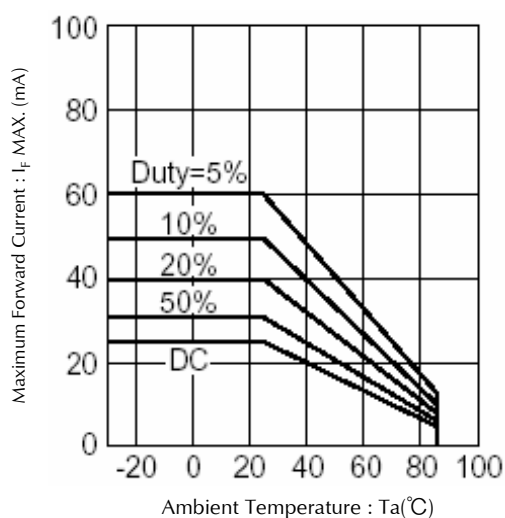
Technical Data(EMAA/MAA)



Technical Data(EMAA/MAA)

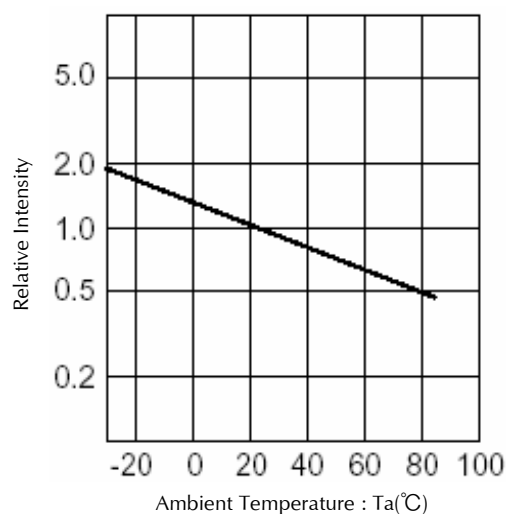
Derating

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

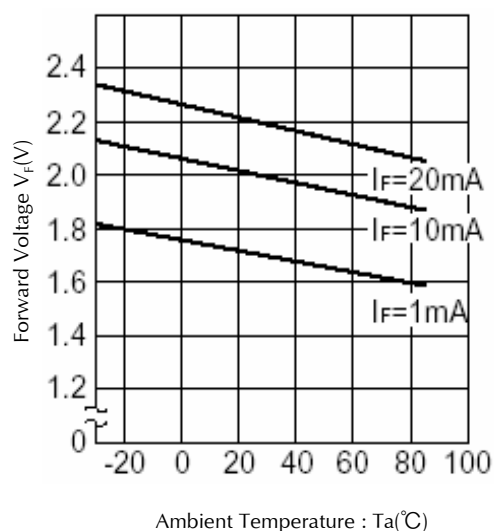


Ambient Temperature vs. Relative Intensity

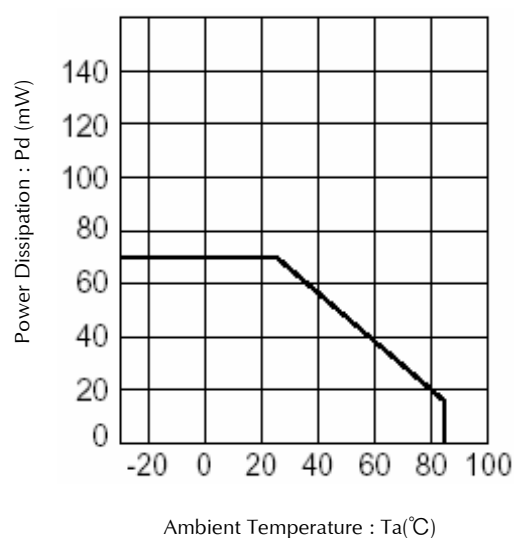
Condition : $I_F=20\text{mA}$



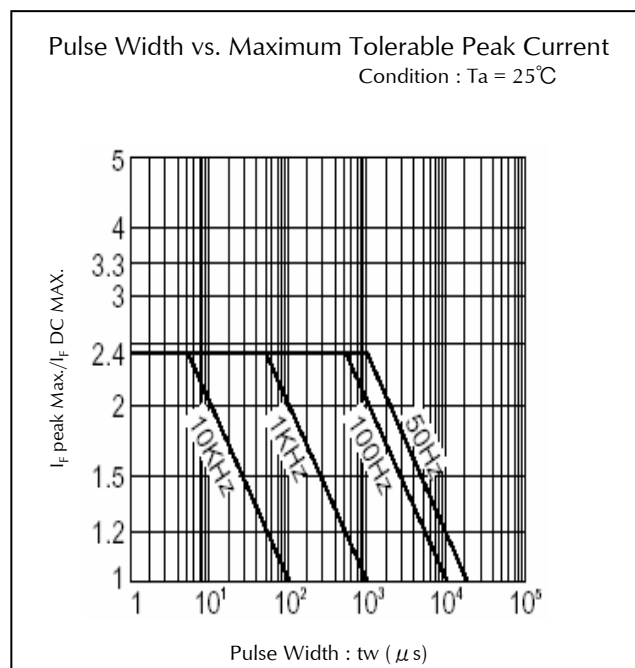
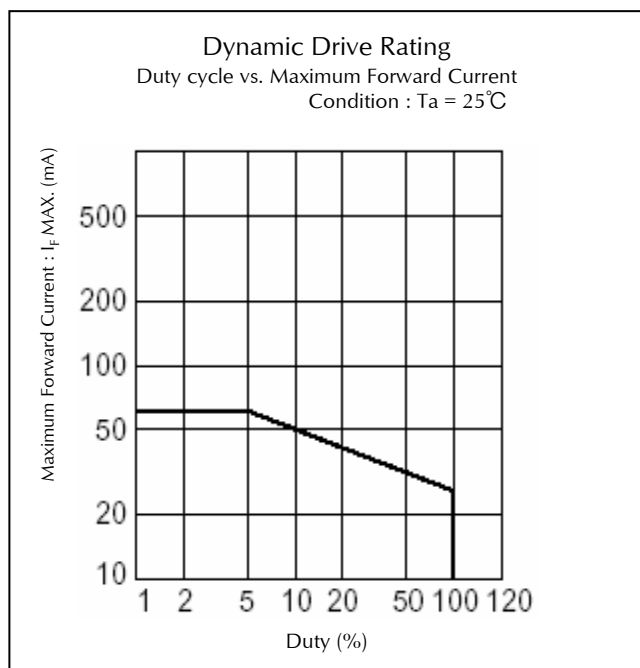
Ambient Temperature vs. Forward Voltage



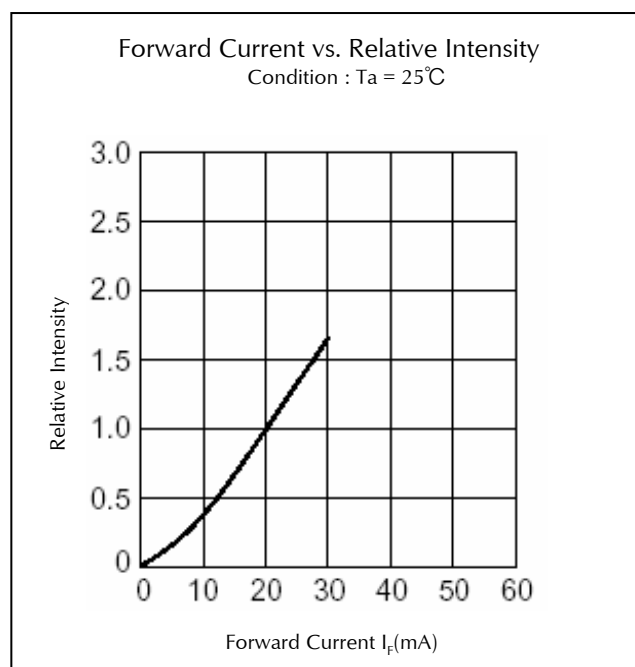
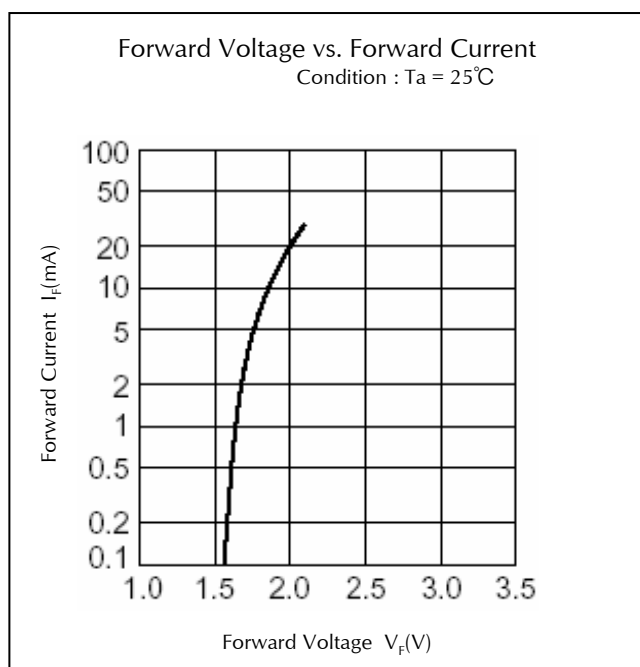
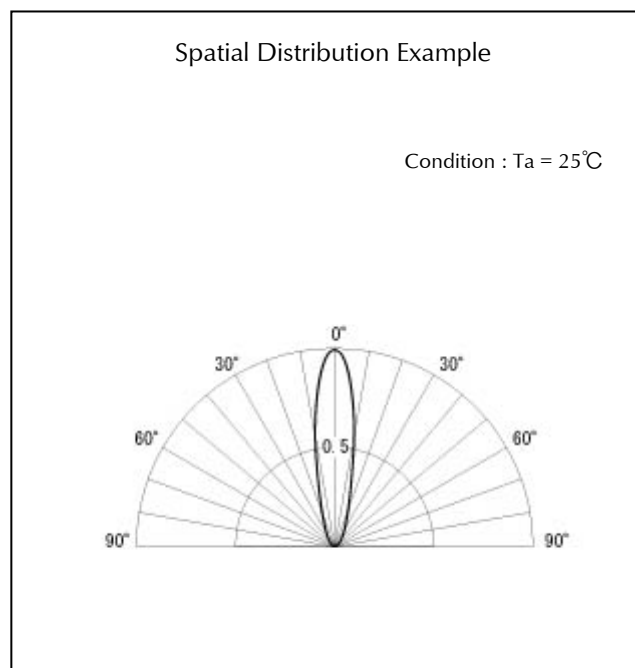
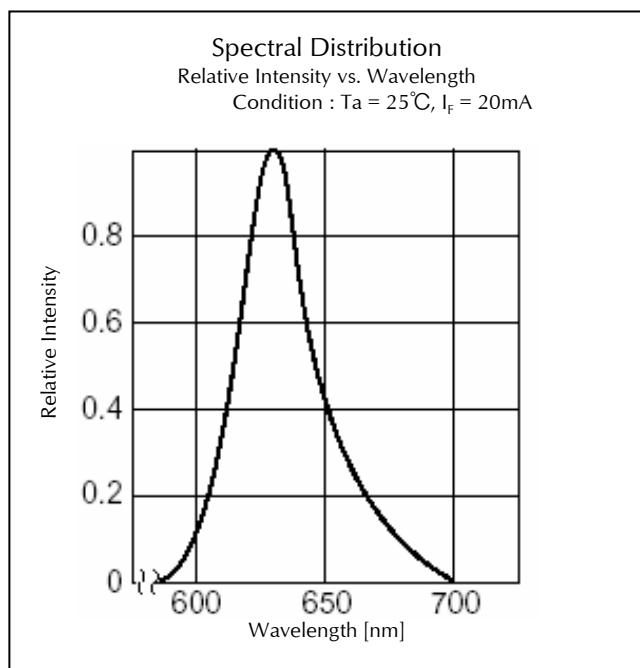
Power Dissipation vs. Ambient Temperature



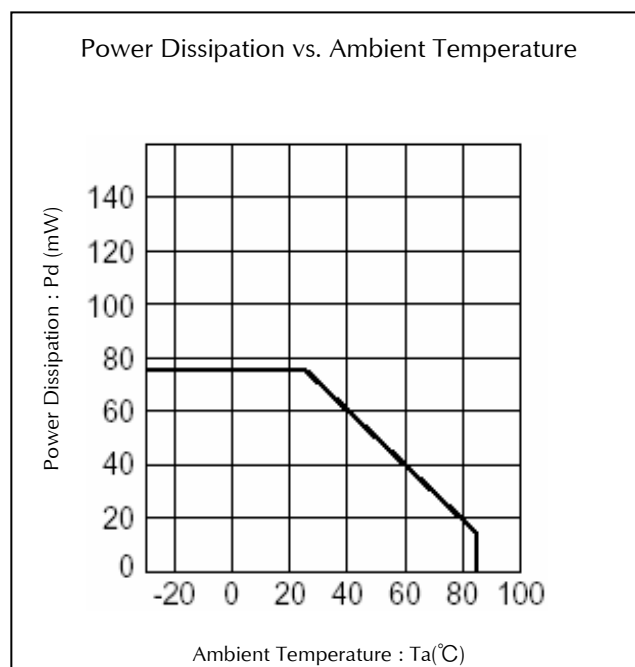
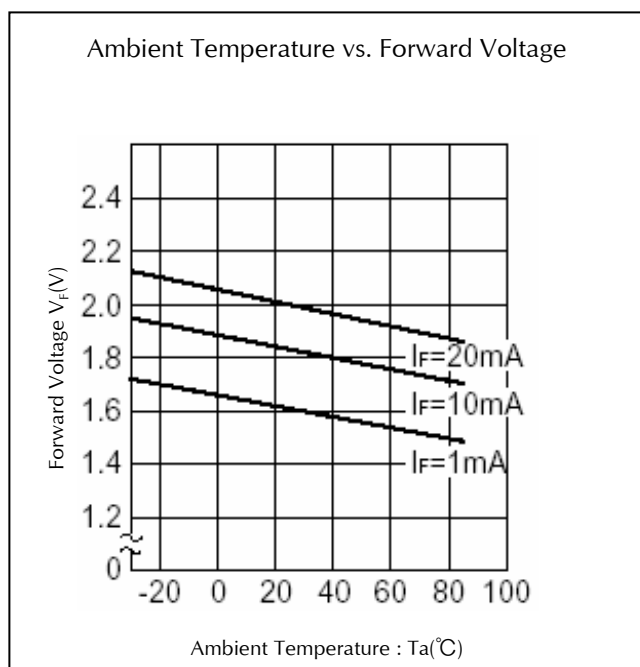
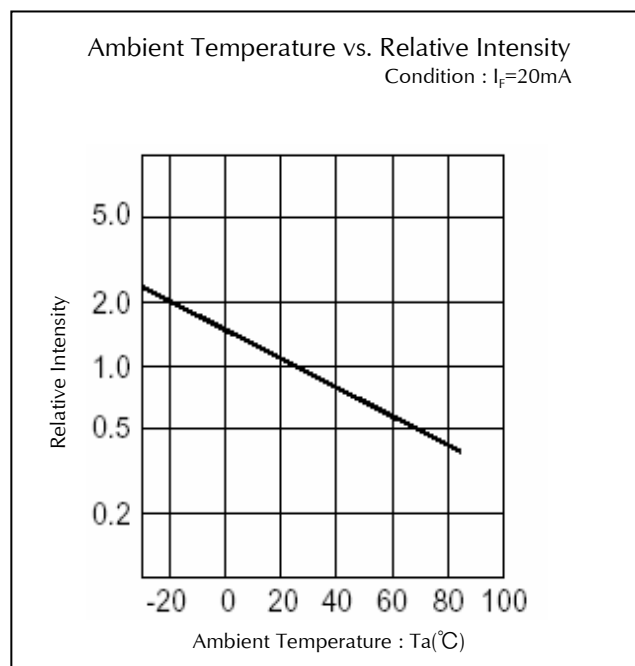
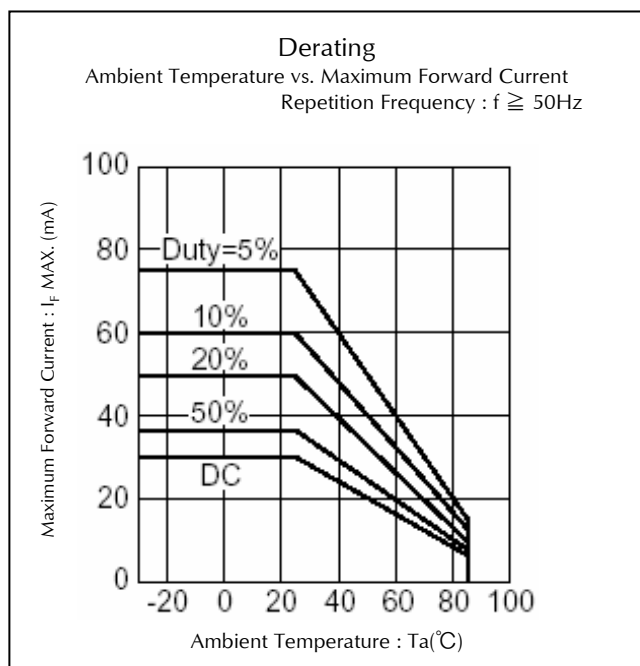
Technical Data(EMAA/MAA)



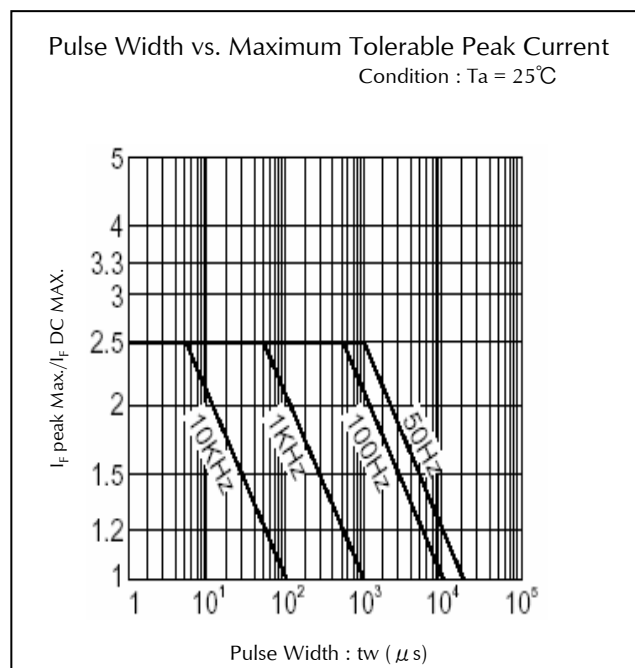
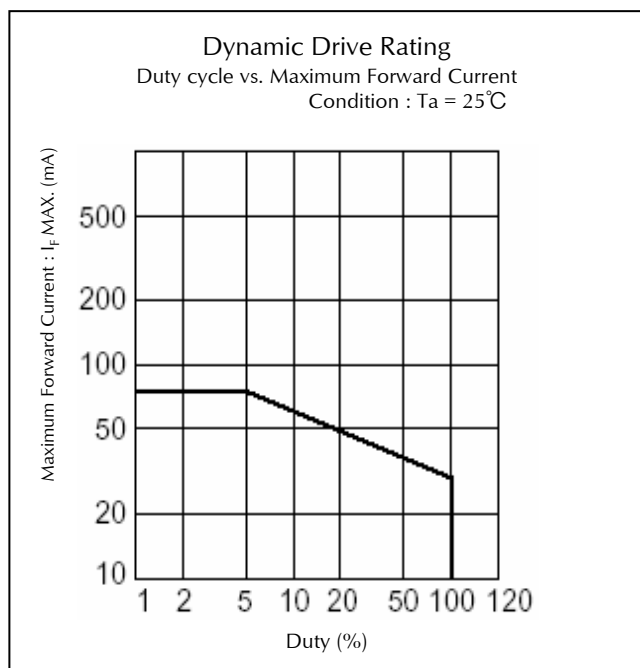
Technical Data(EMVR/MVR)



Technical Data(EMVR/MVR)

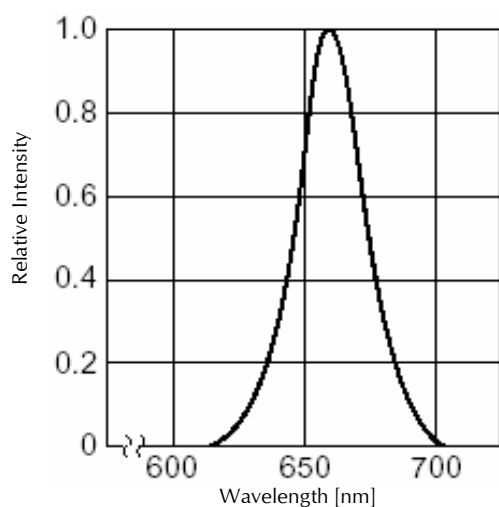


Technical Data(EMVR/MVR)



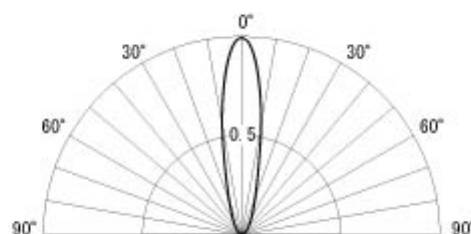
Technical Data(EBR/BR)

Spectral Distribution
Relative Intensity vs. Wavelength
Condition : $T_a = 25^\circ\text{C}$, $I_F = 20\text{mA}$

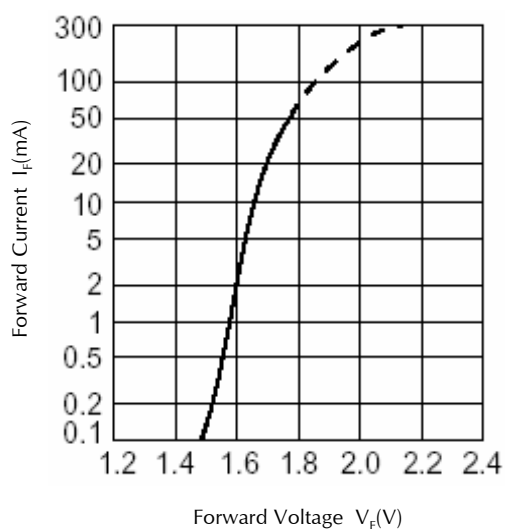


Spatial Distribution Example

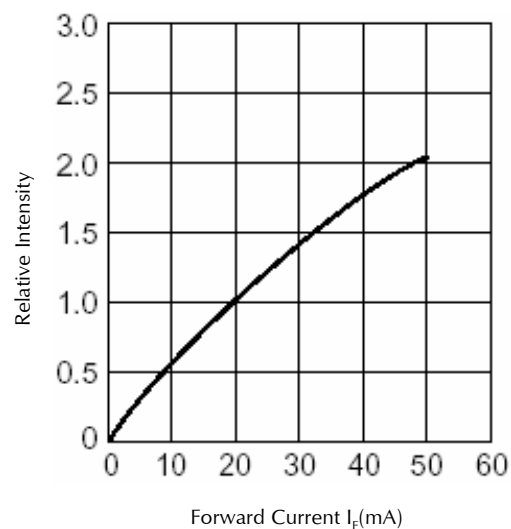
Condition : $T_a = 25^\circ\text{C}$



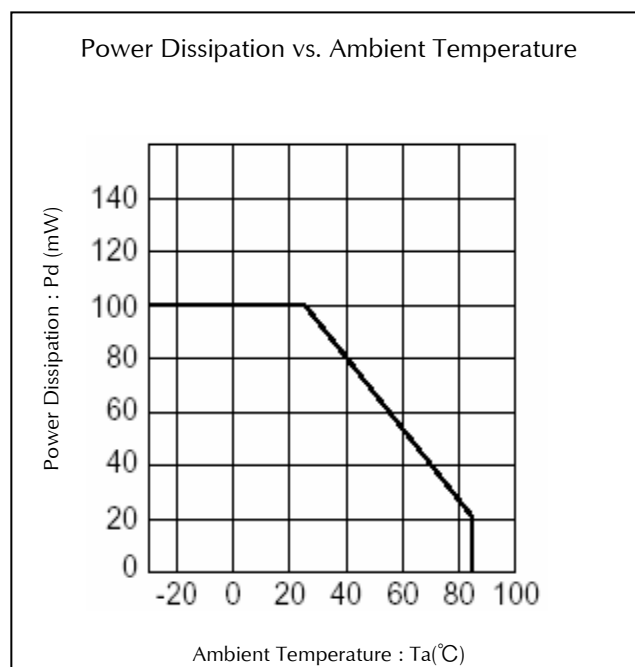
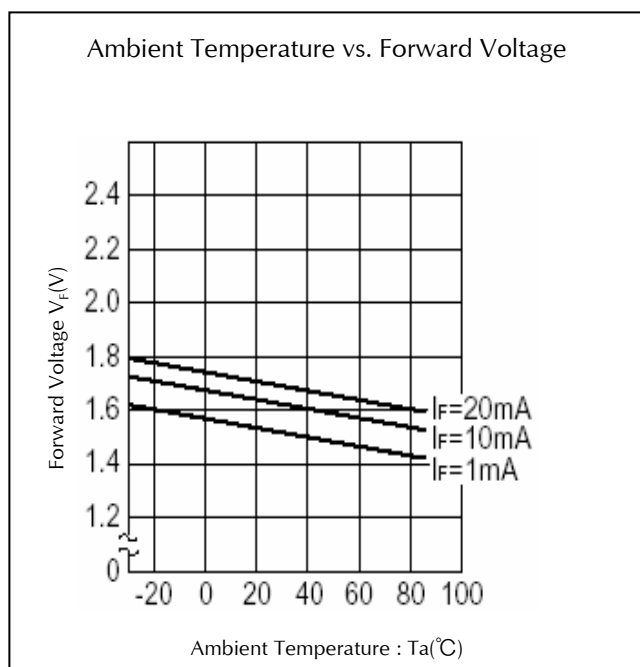
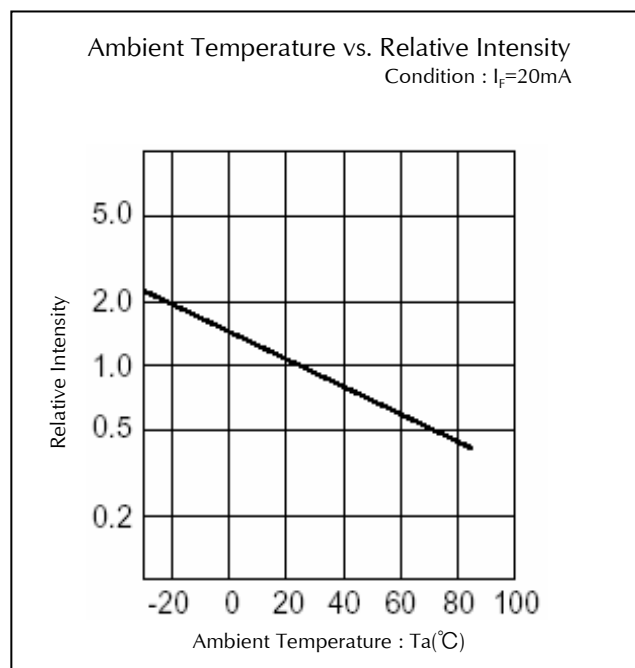
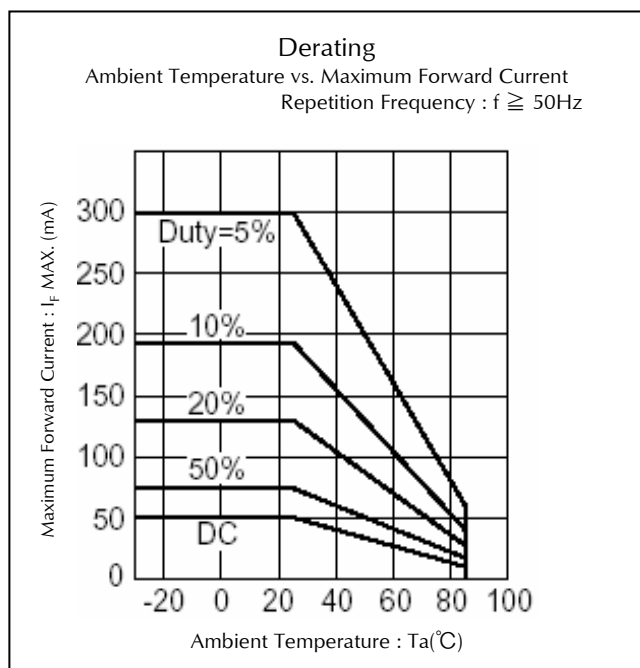
Forward Voltage vs. Forward Current
Condition : $T_a = 25^\circ\text{C}$



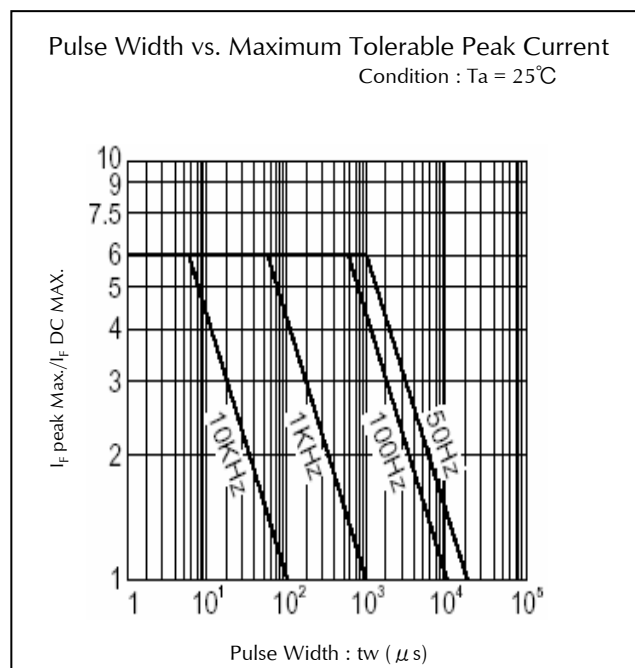
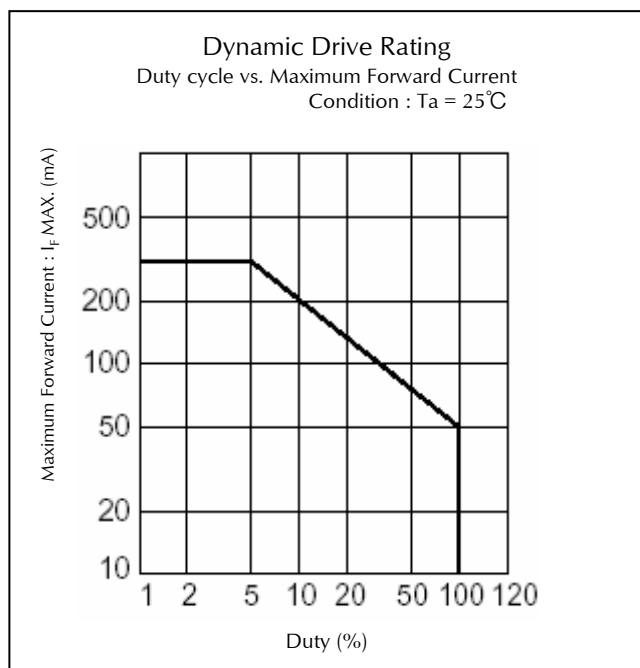
Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



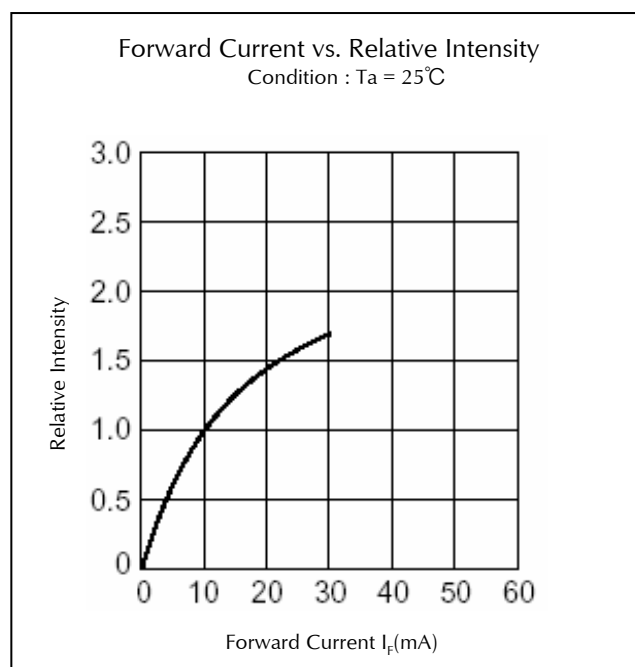
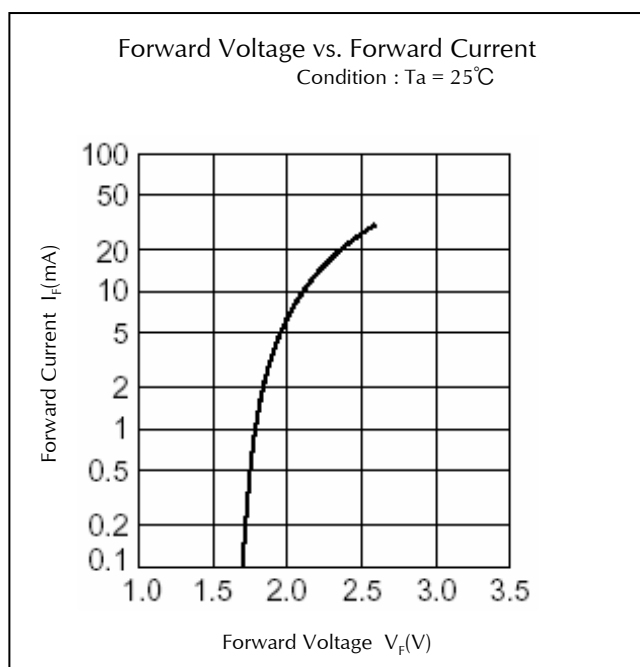
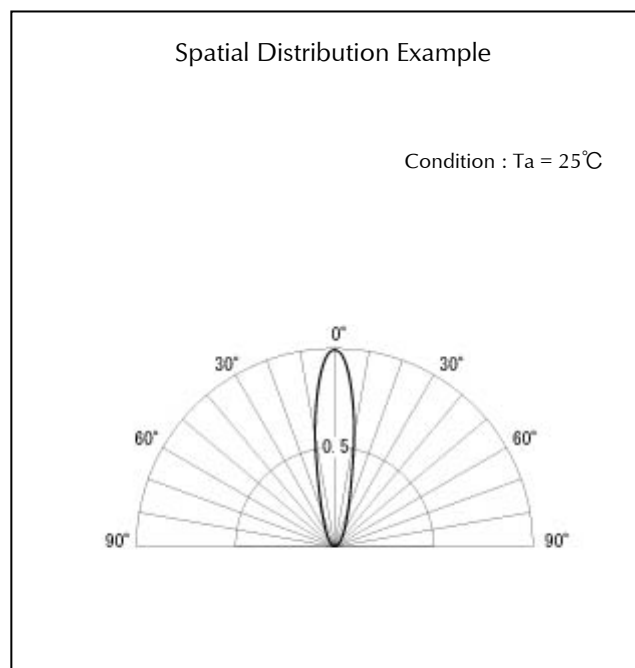
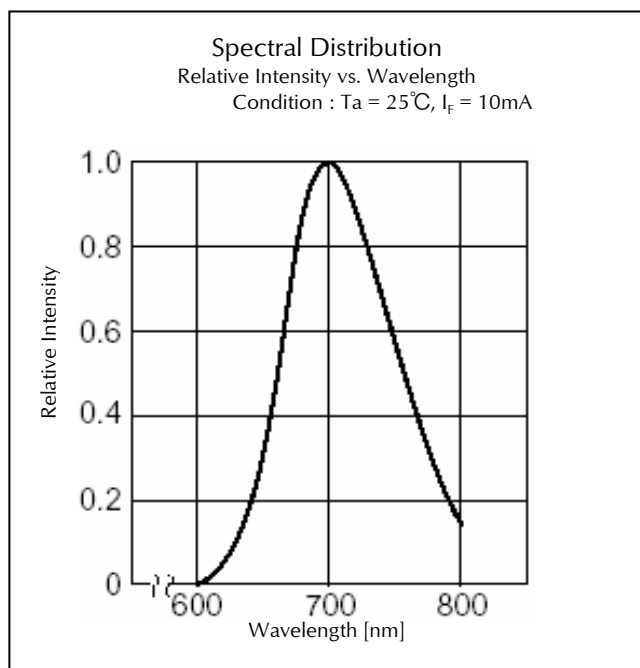
Technical Data(EBR/BR)



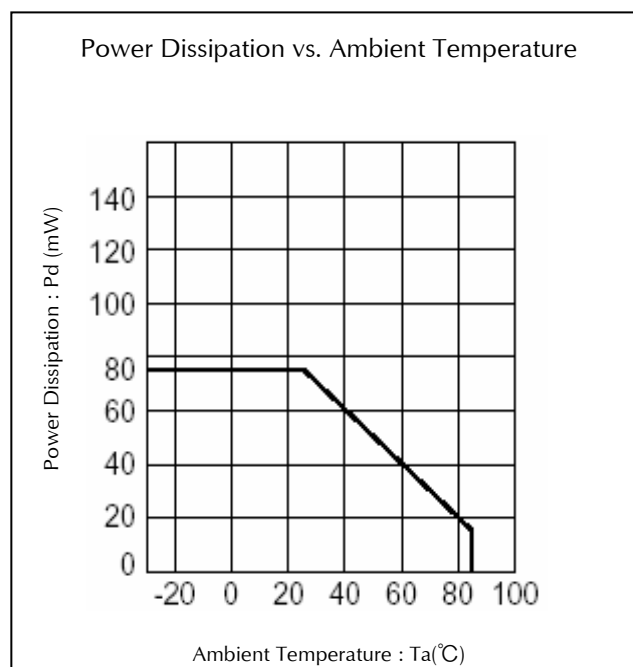
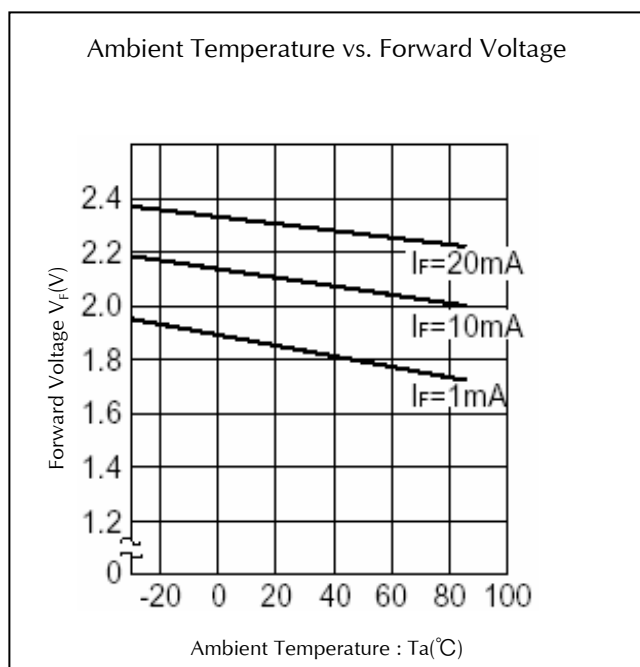
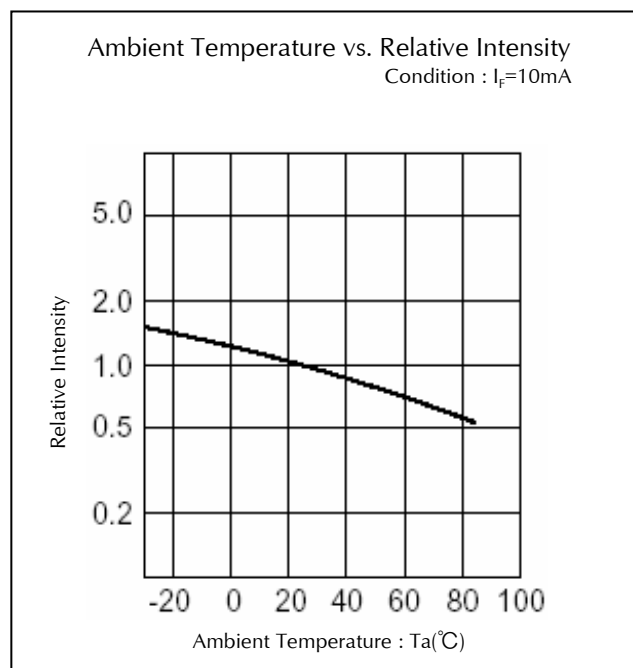
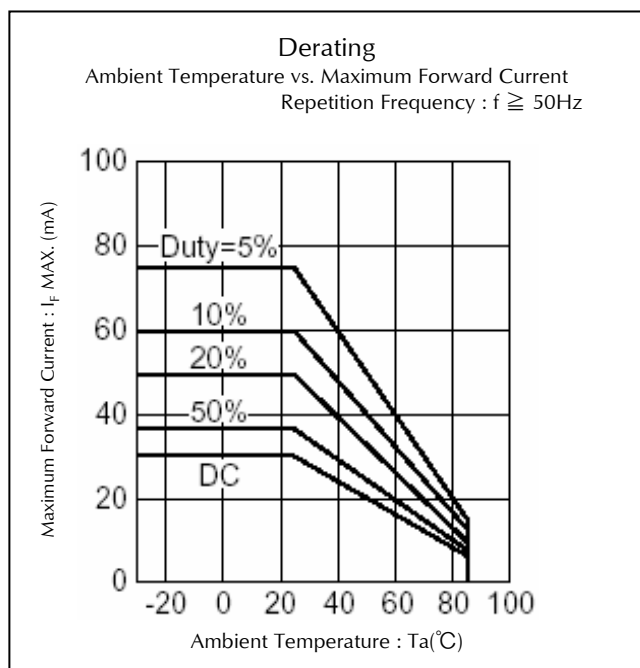
Technical Data(EBR/BR)



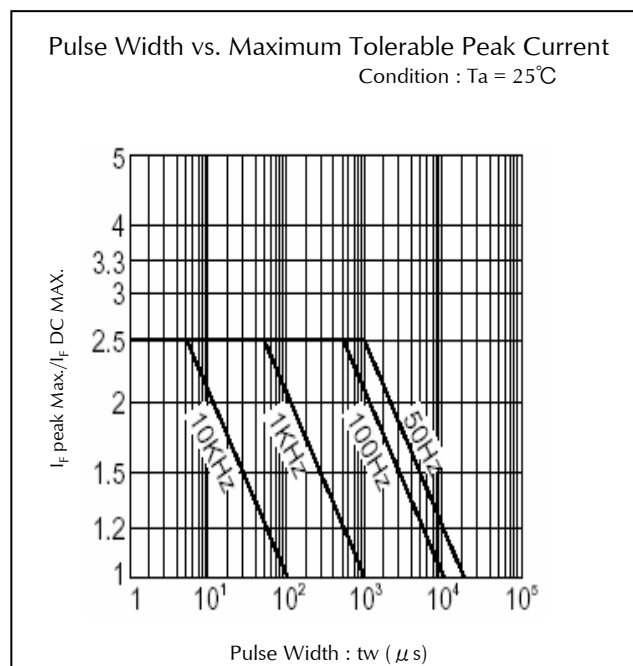
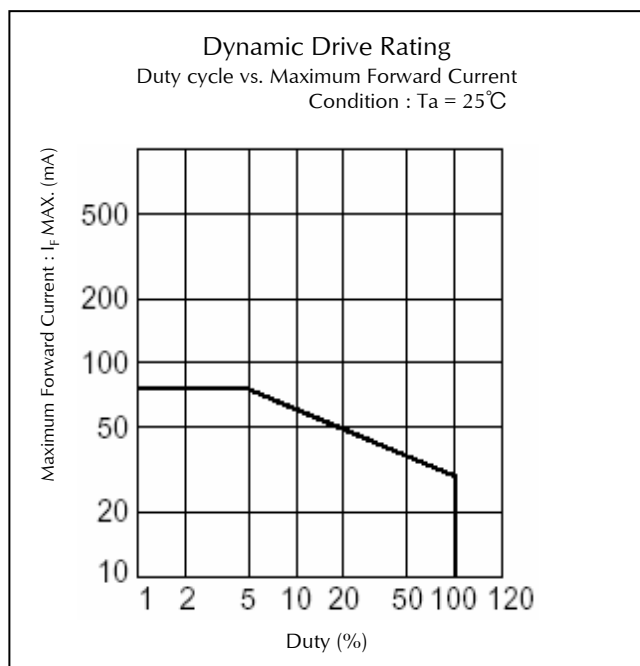
Technical Data(MPR)



Technical Data(MPR)

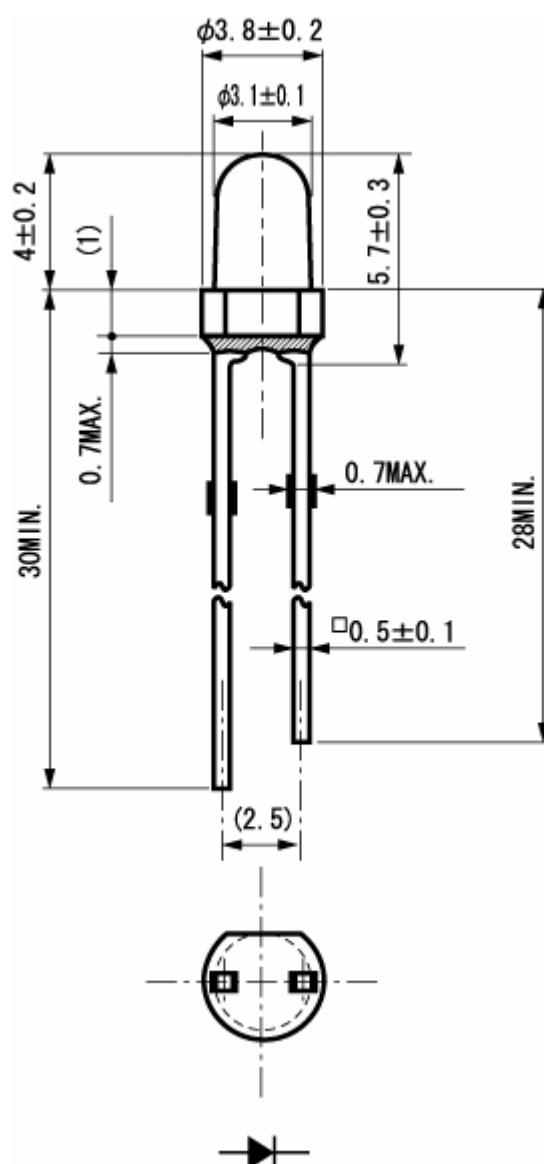


Technical Data(MPR)



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	10sec	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)	10sec	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	-	-	No notable, decoloration, deformation and cracking

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