



**Pb-free
HEAT**

STANLEY

3889S Series

Single Color ϕ 3 Round Shape Type

Features

Package	ϕ 3 Round shape type, BG,PG : Pale Green Surface Diffused epoxy PY,AY : Pale Yellow Surface Diffused epoxy AA : Pale Orange Surface Diffused epoxy VR,BR,PR : Pale Red Surface 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 (BG) : 567nm (PG) Yellow Green : 572nm (PY) Yellow : 590nm (AY) Orange : 606nm (AA) Red : 624nm (VR) : 647nm (BR) : 630nm (PR)
Half Intensity Angle	GB,PG,PG : 128 deg. AY,AA : 132 deg. VR,PR : 130 deg. BR : 160 deg.
Die materials	BG,PG,PY,PR : GaP AY,AA,VR : GaAsP 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		
					λ d (nm)		I _v (mcd)		
					TYP.	I _F	MIN.	TYP.	I _F
BG3889S	GaP	Green	Pale Green	Surface Diffused	558	20	0.8	1.6	20
PG3889S	GaP				567	20	2.0	4.0	20
PY3889S	GaP	Yellow Green	Pale Yellow		572	20	2.5	5.0	20
AY3889S	GaAsP	Yellow			590	20	2.0	4.0	20
AA3889S	GaAsP	Orange	Pale Orange		606	20	2.5	5.0	20
VR3889S	GaAsP	Red	Pale Red		624	20	3.0	6.0	20
BR3889S	GaAlAs				647	20	4.0	8.0	20
PR3889S	GaP				630	10	0.6	0.9	10

Absolute Maximum Ratings

(Ta=25°C)

Item	Symbol	Absolute Maximum Ratings								Unit
		BG	PG	PY	AY	AA	VR	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)	ΔI_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 $\leq 1ms$, Duty $\leq 1/20$.

Electro-Optical Characteristics(BG,PG,PY,AY,AA,VR,BR)

(Ta=25°C)

Item	Conditions	Symbol	Characteristics								Unit
				BG	PG	PY	AY	AA	VR	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.	2.5	2.5	2.5	2.5	2.5	2.5	2.0	
Reverse Current	V _R =4V	I _R	MAX.	100	100	100	100	100	100	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	Δλ	TYP.	30	30	30	30	30	30	30	nm
Half Intensity Angle	I _F =20mA	2θ 1/2	TYP.	128	128	128	132	132	130	160	deg.

Electro-Optical Characteristics(PR)

(Ta=25°C)

Item	Conditions	Symbol	Characteristics		Unit
				PR	
Forward Voltage	I _F =10mA	V _F	TYP.	2.1	V
			MAX.	2.5	
Reverse Current	V _R =4V	I _R	MAX.	100	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	Δλ	TYP.	100	nm
Half Intensity Angle	I _F =10mA	2θ 1/2	TYP.	130	deg.

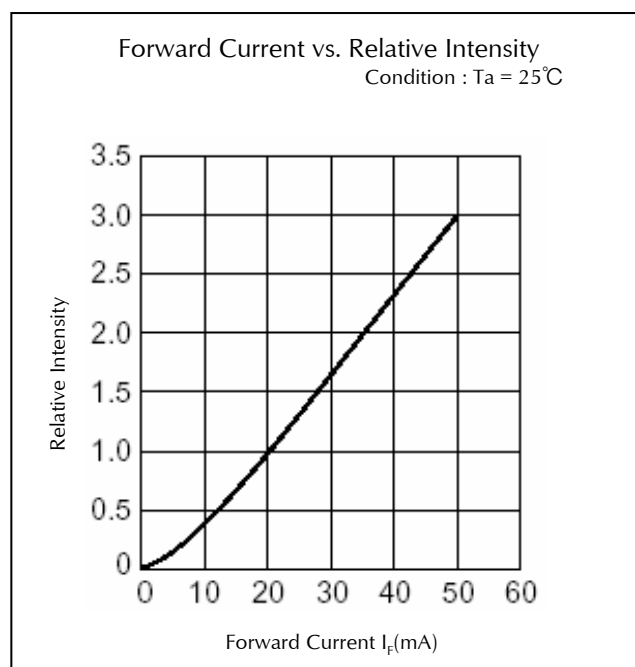
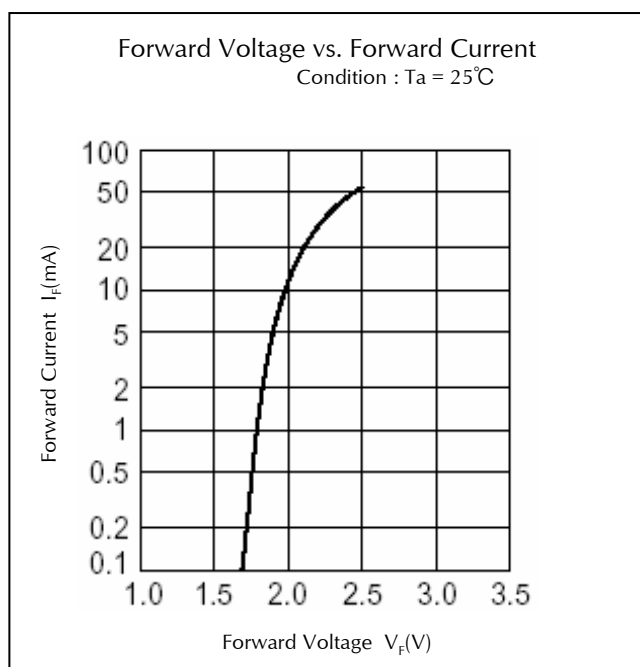
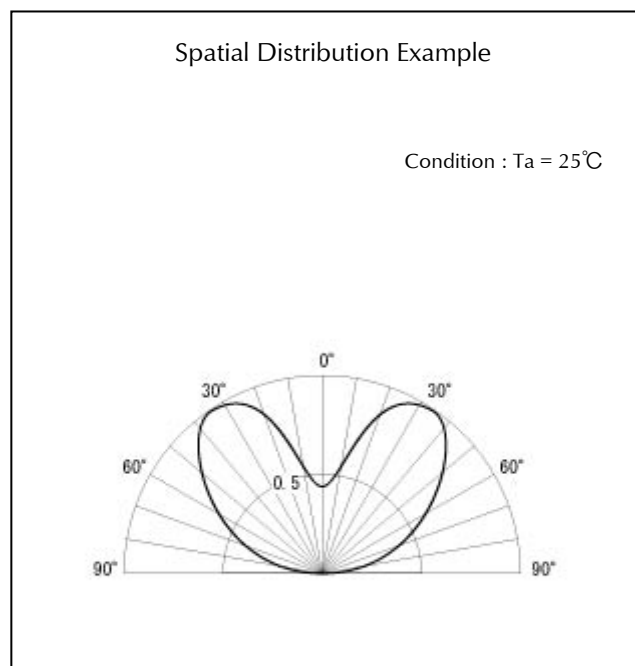
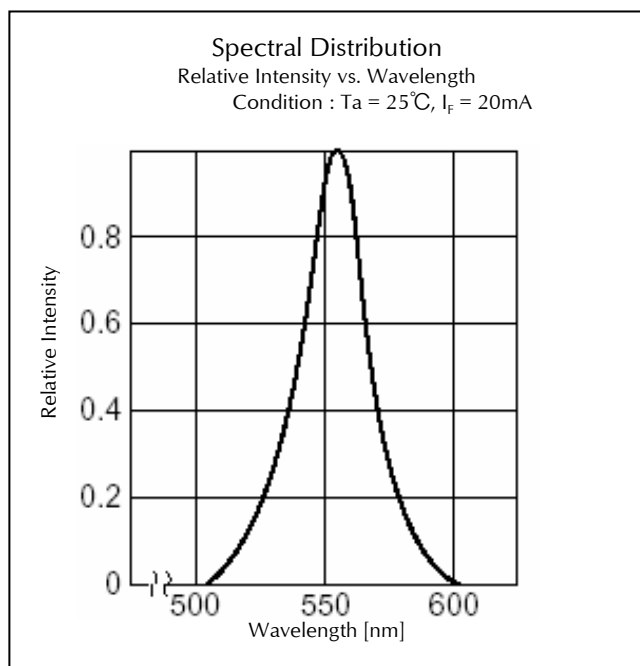
Luminous Intensity Rank

(Ta=25°C)

Rank	I _v (mcd)															
	BG		PG		PY		AY		AA		VR		BR		PR	
	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	0.80	1.60	2.0	4.0	2.5	5.0	2.0	4.0	2.5	5.0	3.0	6.0	4.0	8.0	0.60	1.20
B	1.12	2.24	2.8	5.6	3.5	7.0	2.8	5.6	3.5	7.0	4.2	8.4	5.6	11.2	0.84	1.68
C	1.60	3.20	4.0	8.0	5.0	10.0	4.0	8.0	5.0	10.0	6.0	12.0	8.0	16.0	1.20	2.40
D	2.24	4.48	5.6	11.2	7.0	14.0	5.6	11.2	7.0	14.0	8.4	16.8	11.2	22.4	1.68	3.36
E	3.20	-	8.0	-	10.0	-	8.0	-	10.0	-	12.0	-	16.0	-	2.40	-

Please contact our sales staff concerning rank designation.

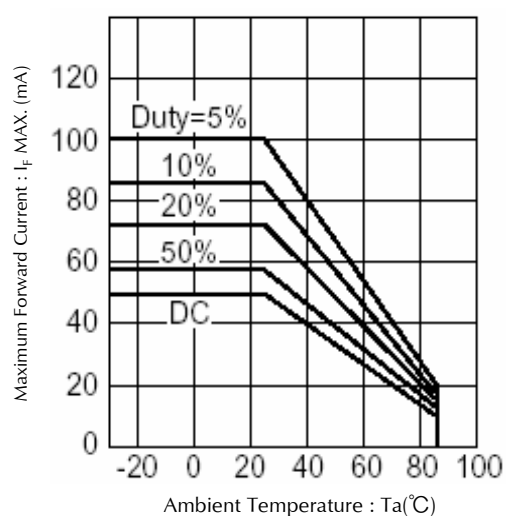
Technical Data(BG)



Technical Data(BG)

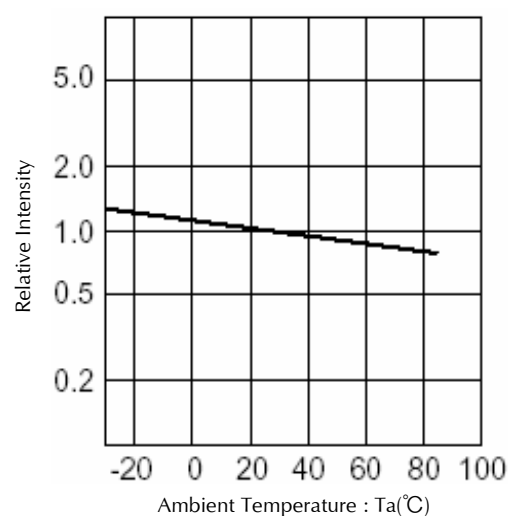
Derating

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

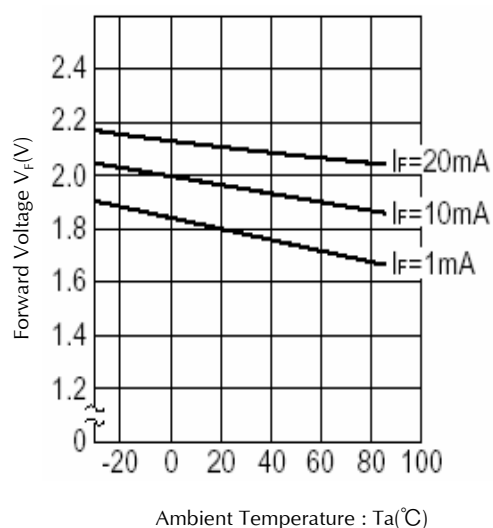


Ambient Temperature vs. Relative Intensity

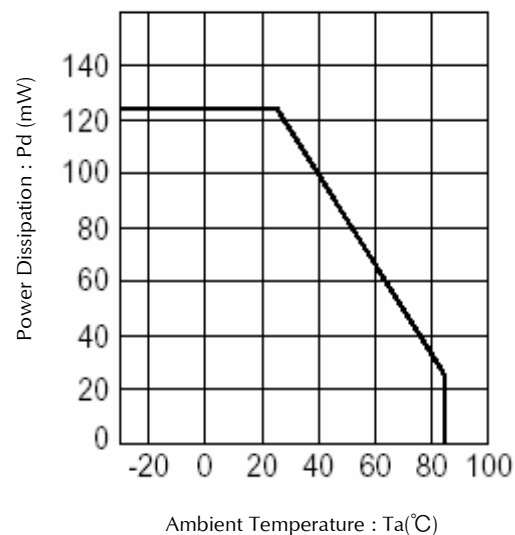
Condition : $I_F=20\text{mA}$



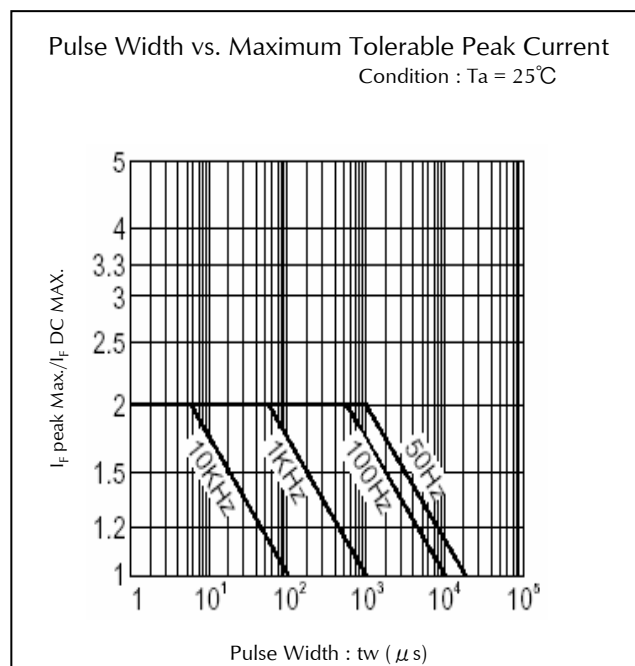
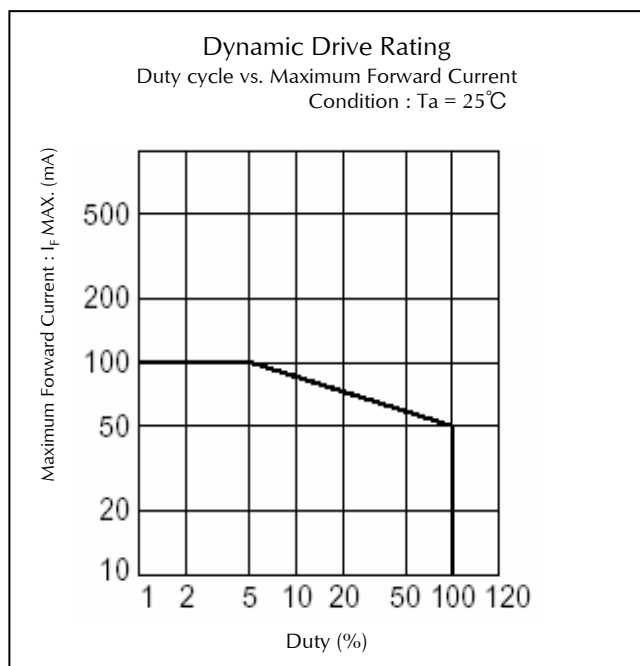
Ambient Temperature vs. Forward Voltage



Power Dissipation vs. Ambient Temperature

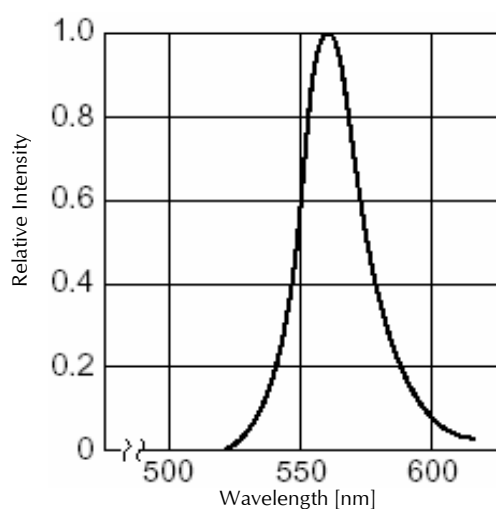


Technical Data(BG)



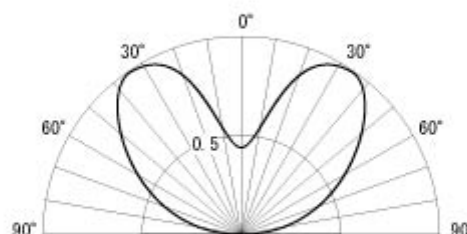
Technical Data(PG)

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

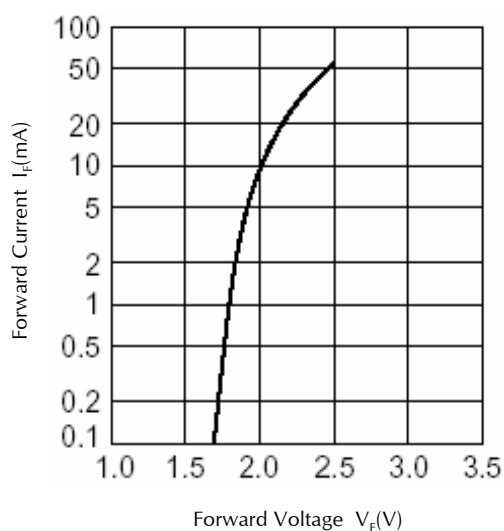


Spatial Distribution Example

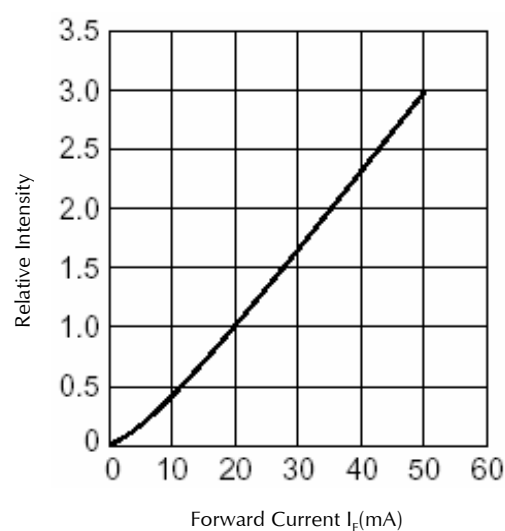
Condition : $T_a = 25^\circ\text{C}$



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



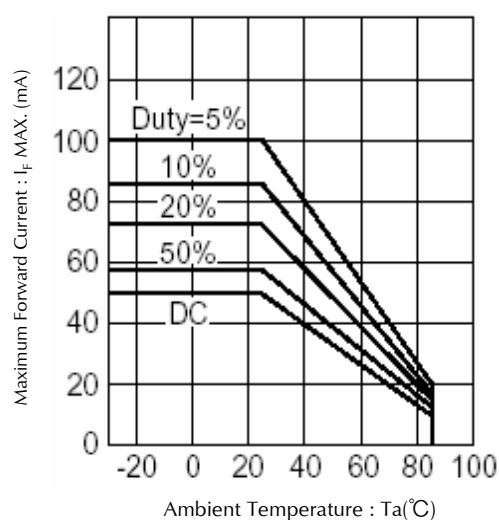
Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



Technical Data(PG)

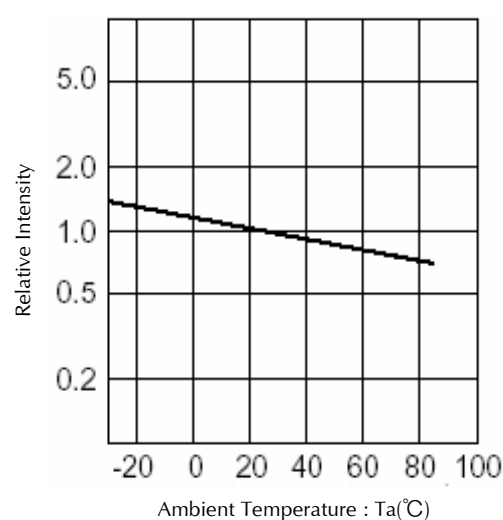
Derating

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

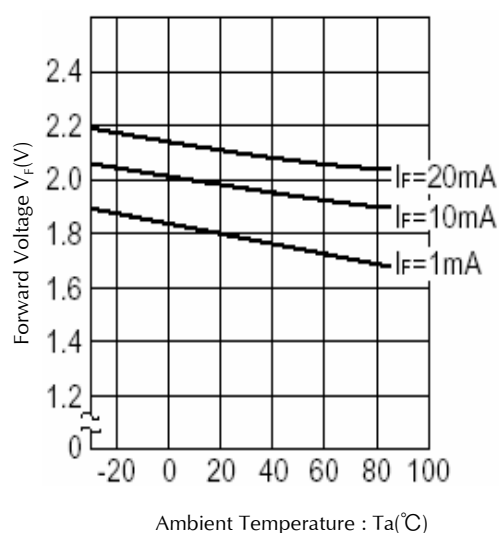


Ambient Temperature vs. Relative Intensity

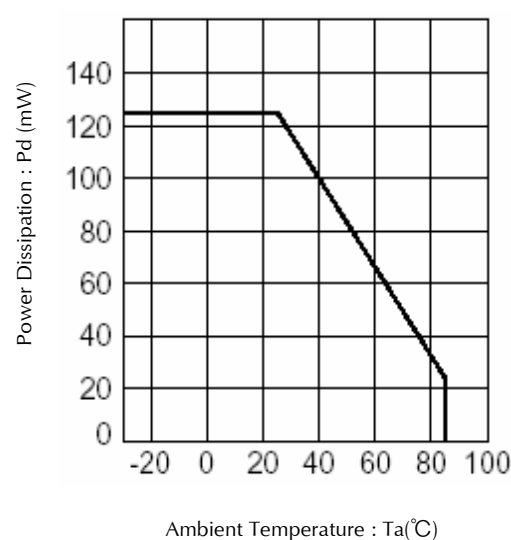
Condition : $I_F=20\text{mA}$



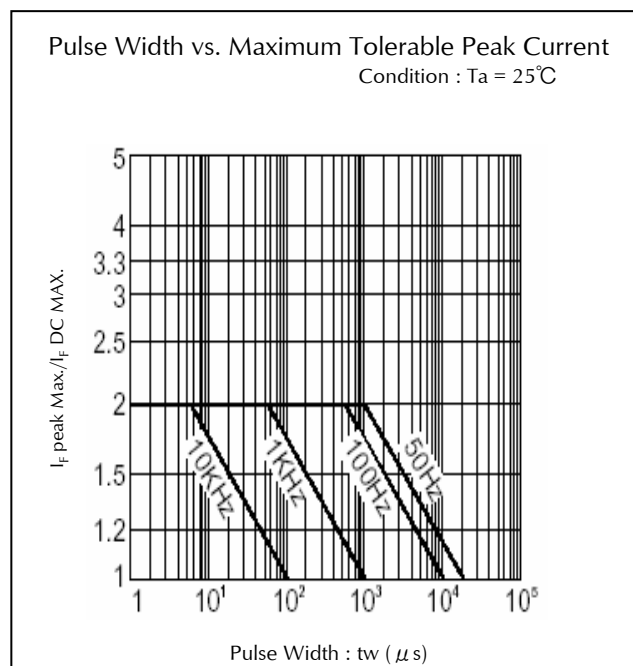
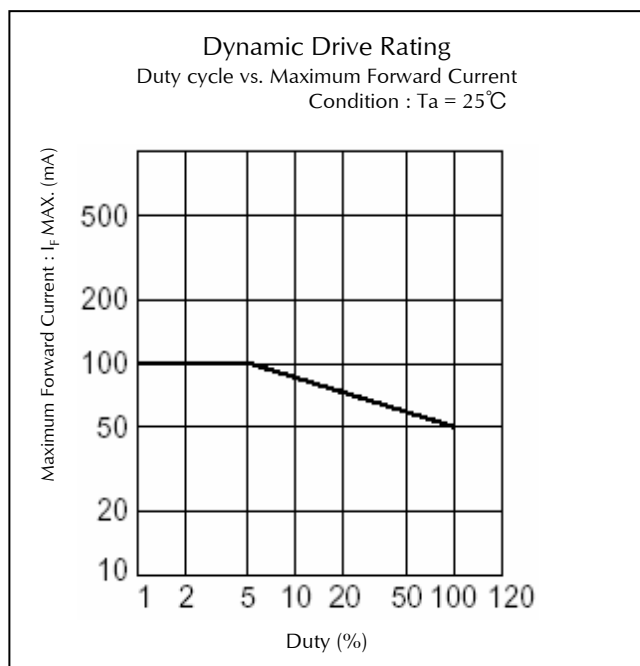
Ambient Temperature vs. Forward Voltage



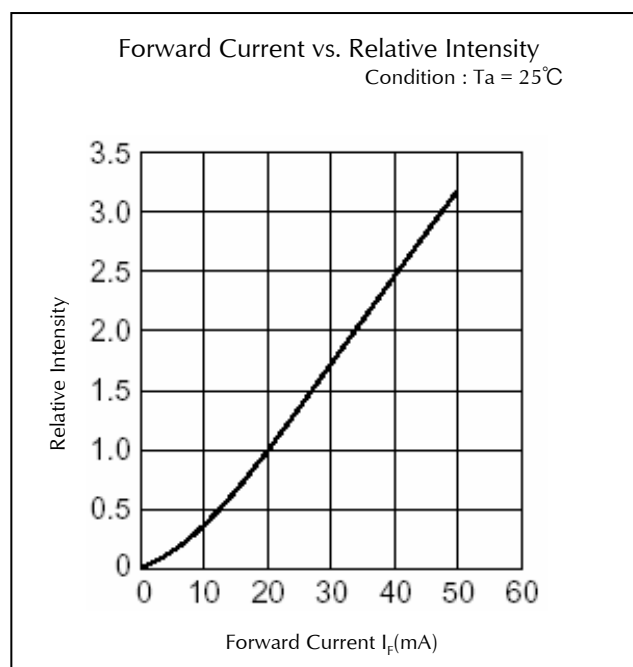
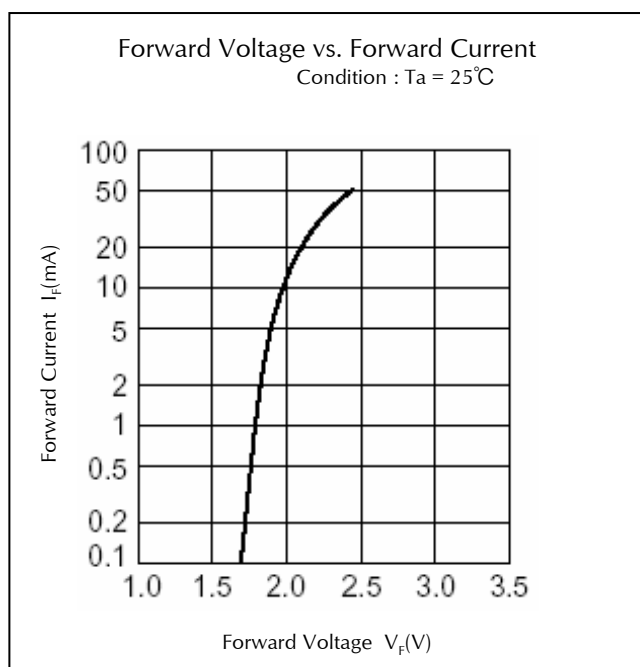
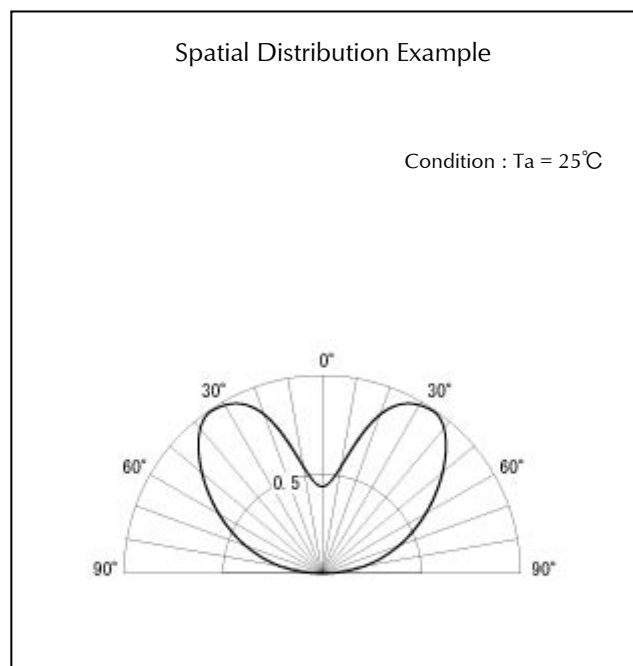
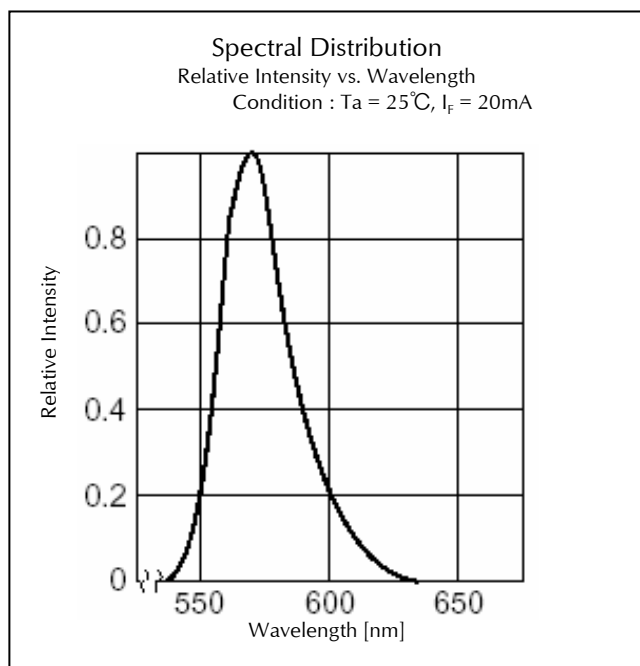
Power Dissipation vs. Ambient Temperature



Technical Data(PG)



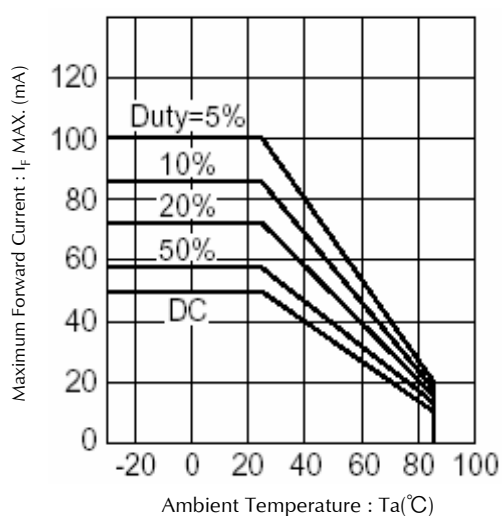
Technical Data(PY)



Technical Data(PY)

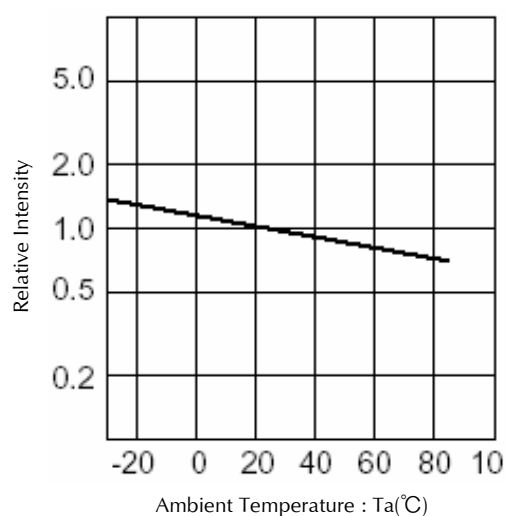
Derating

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

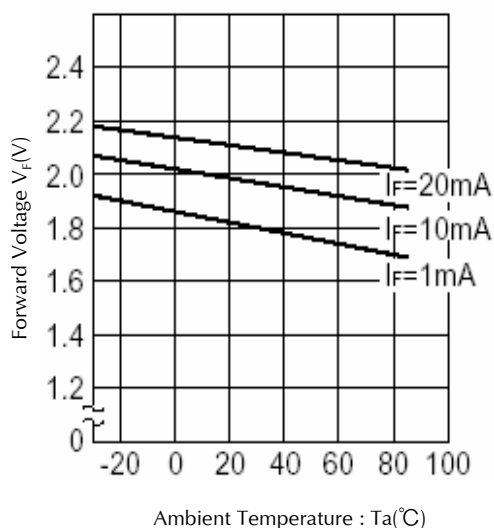


Ambient Temperature vs. Relative Intensity

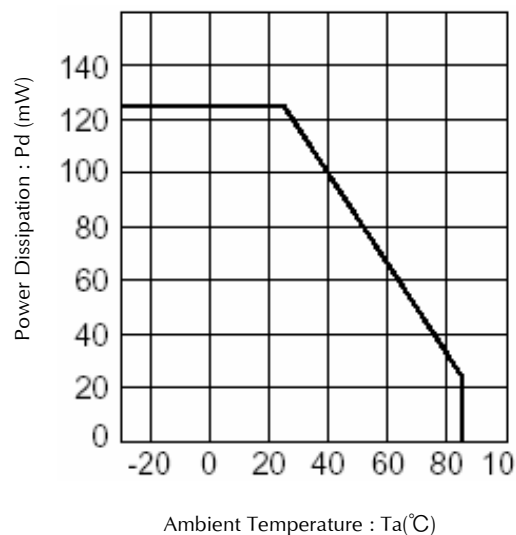
Condition : $I_F=20\text{mA}$



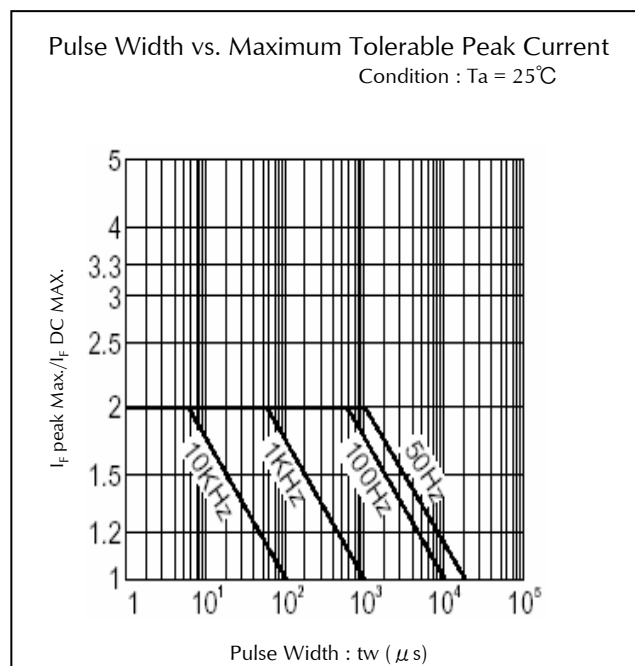
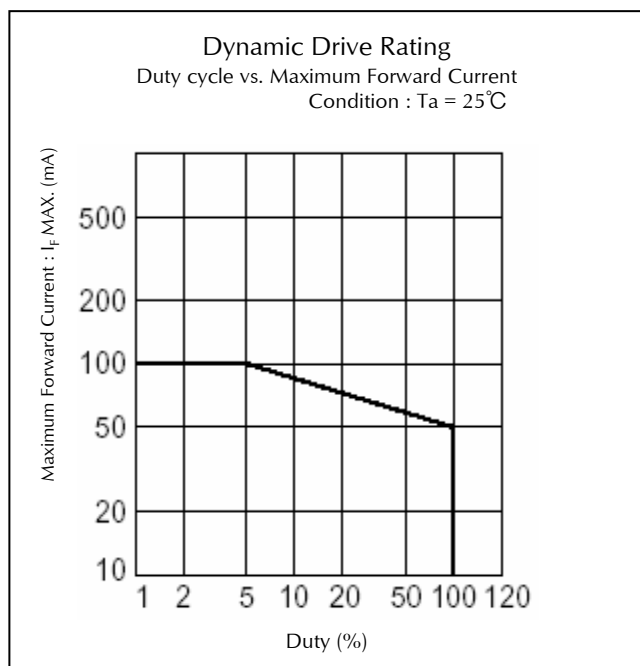
Ambient Temperature vs. Forward Voltage



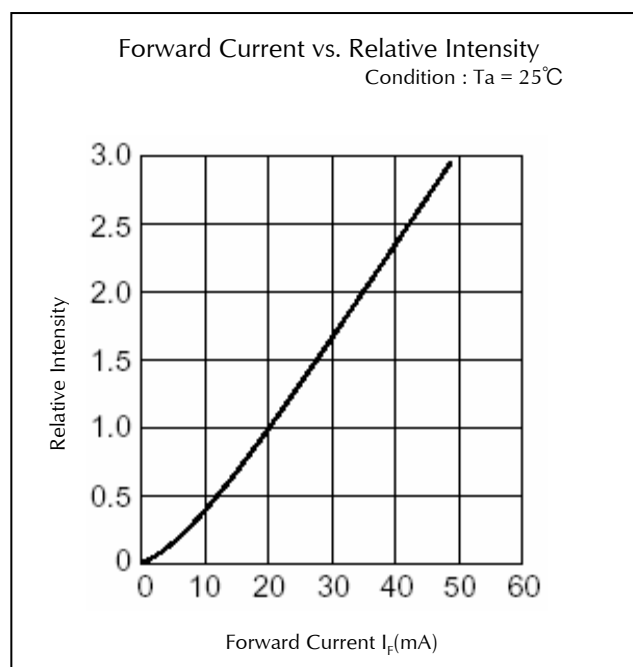
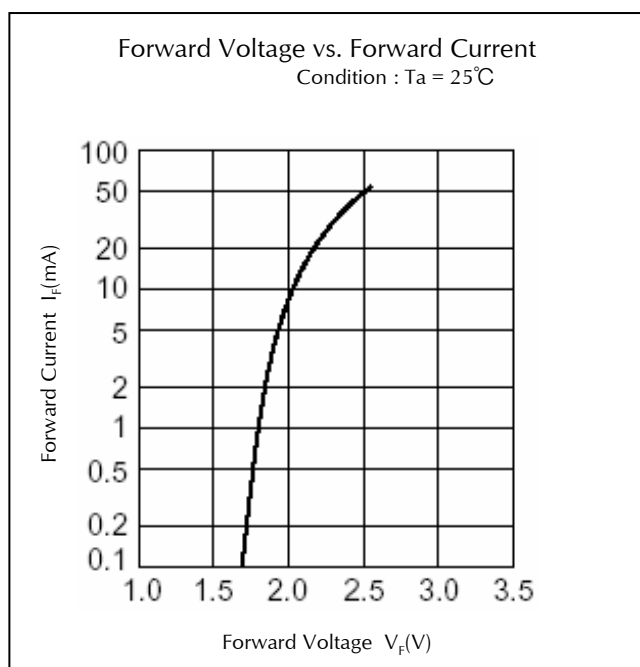
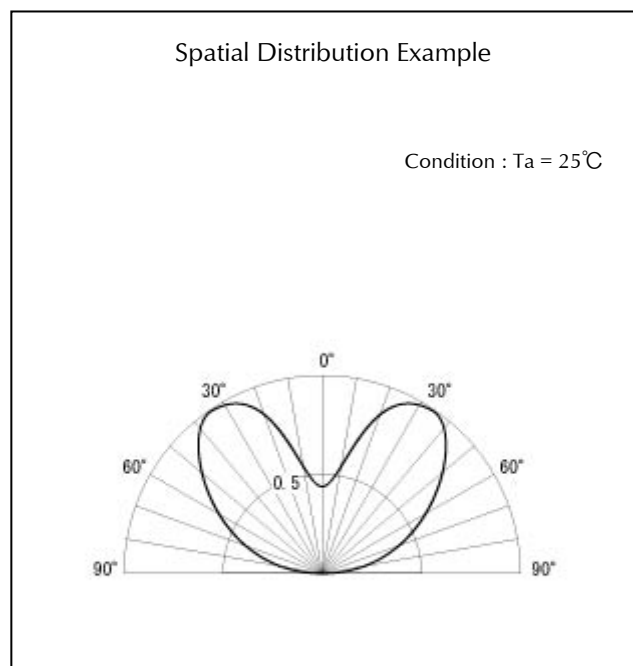
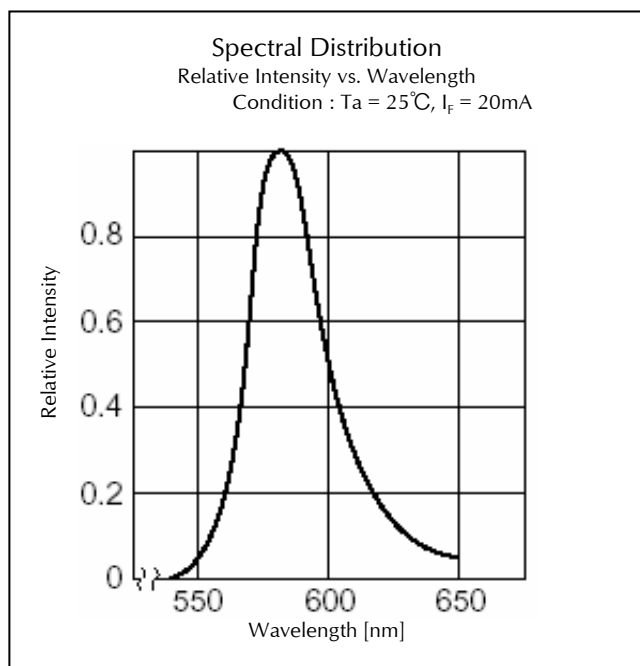
Power Dissipation vs. Ambient Temperature



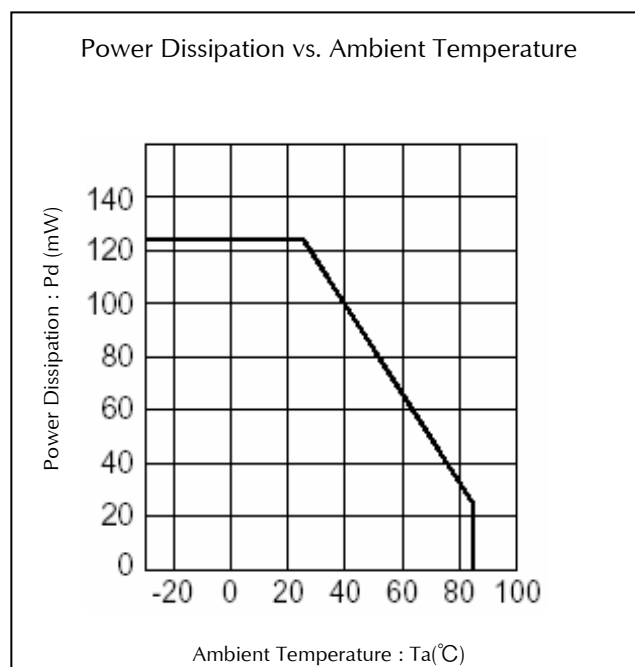
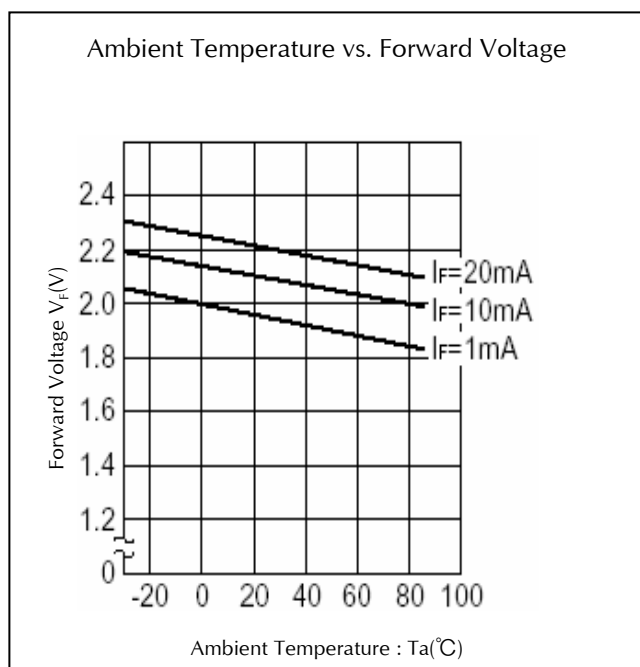
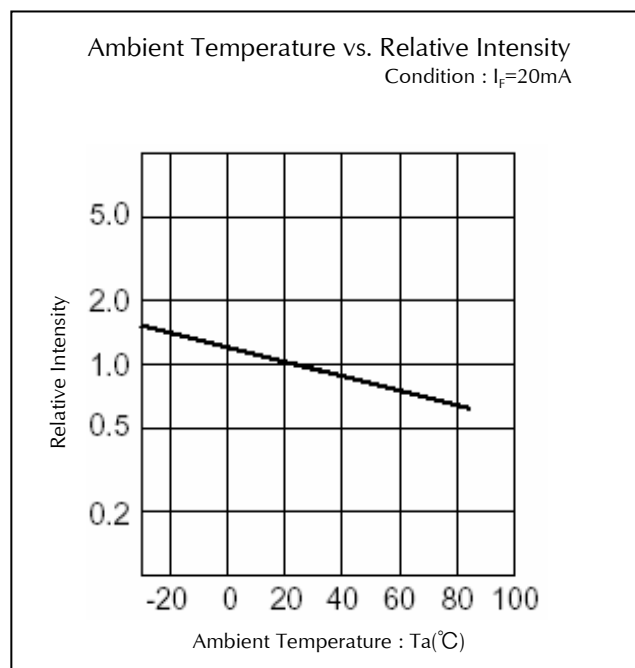
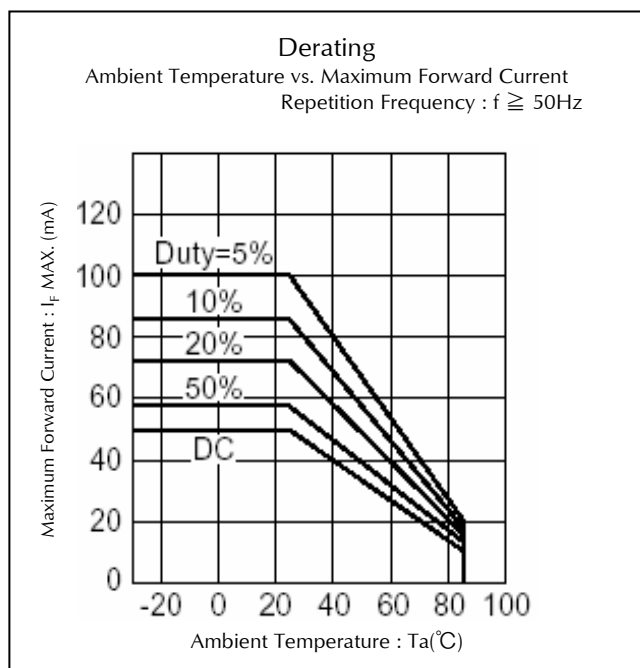
Technical Data(PY)



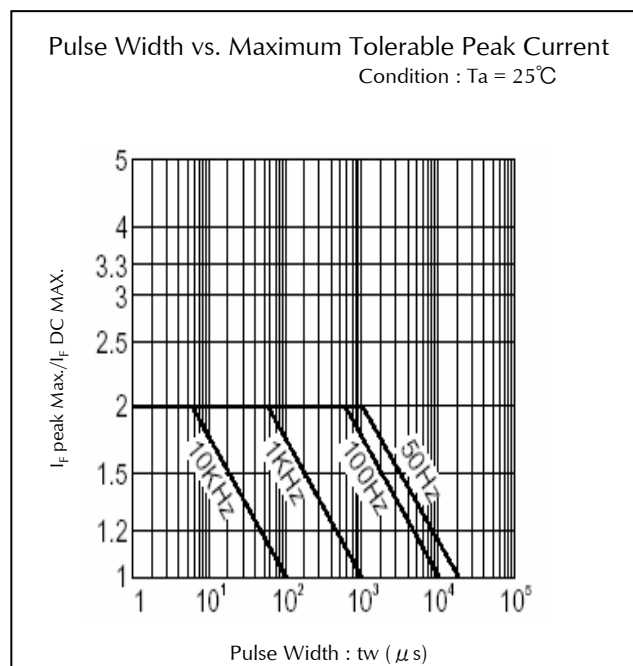
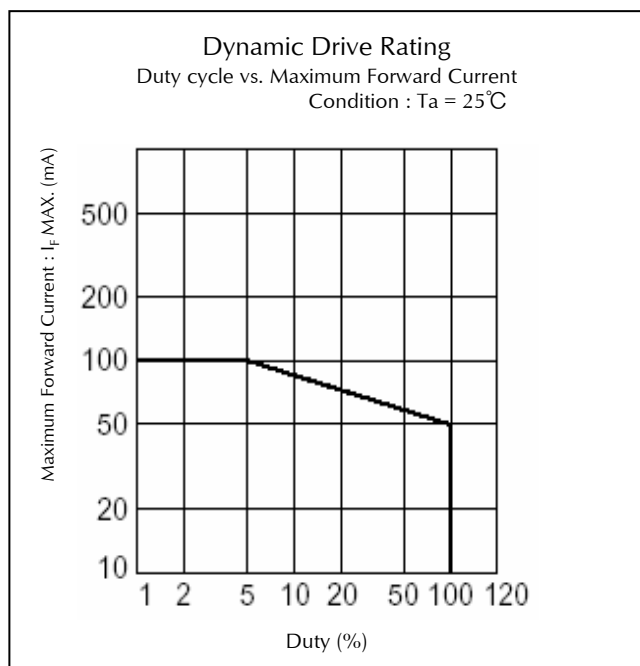
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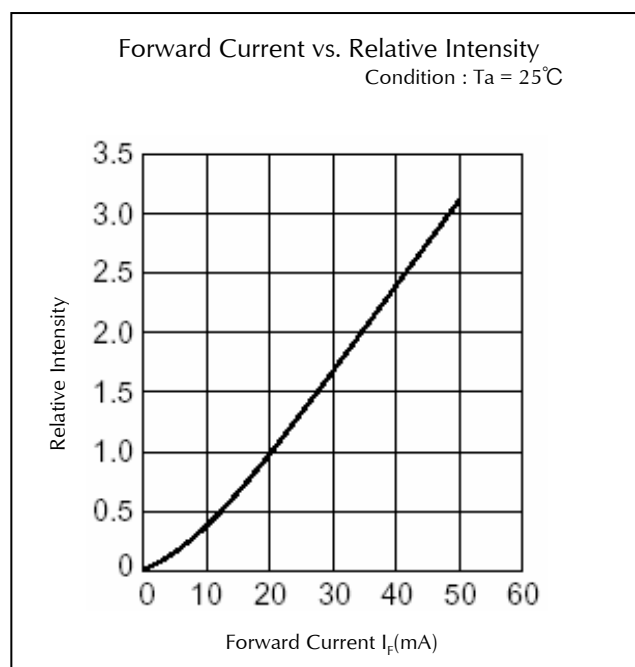
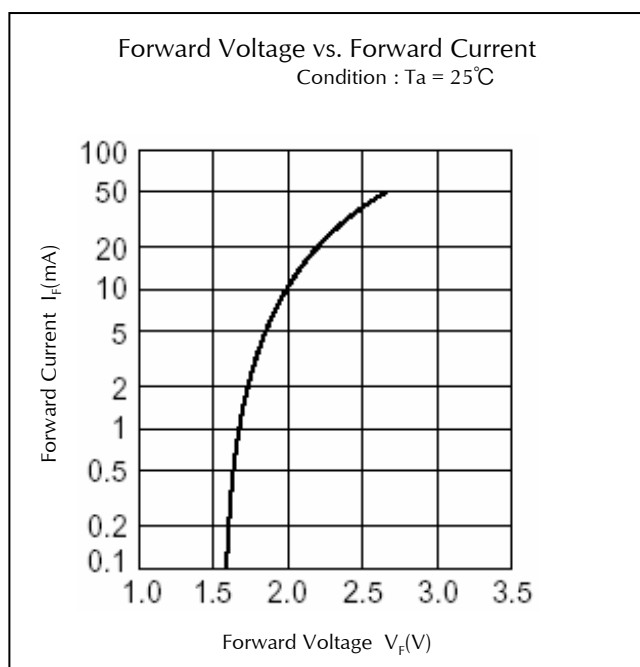
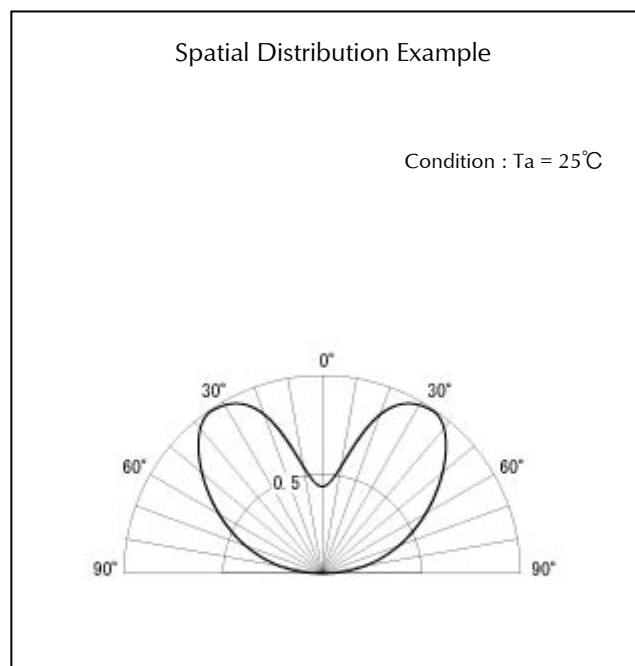
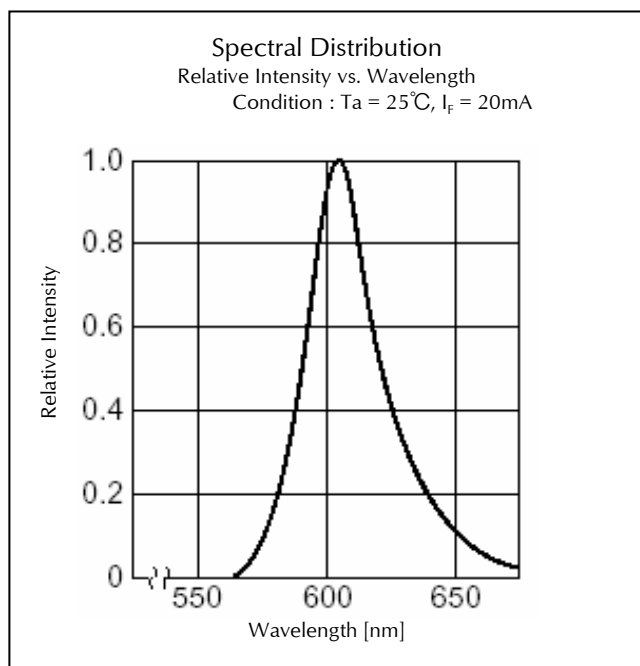
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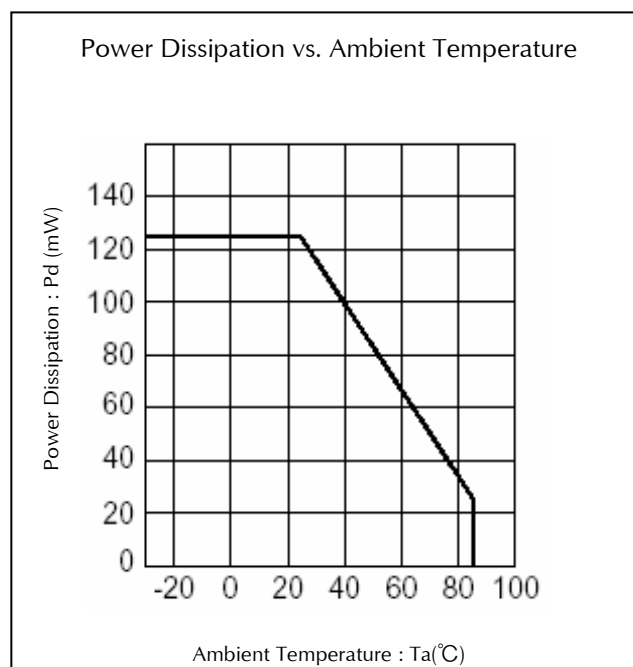
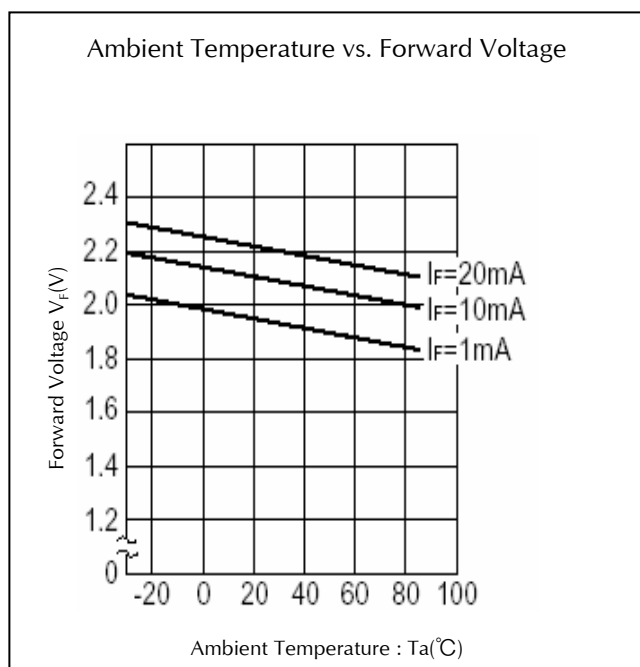
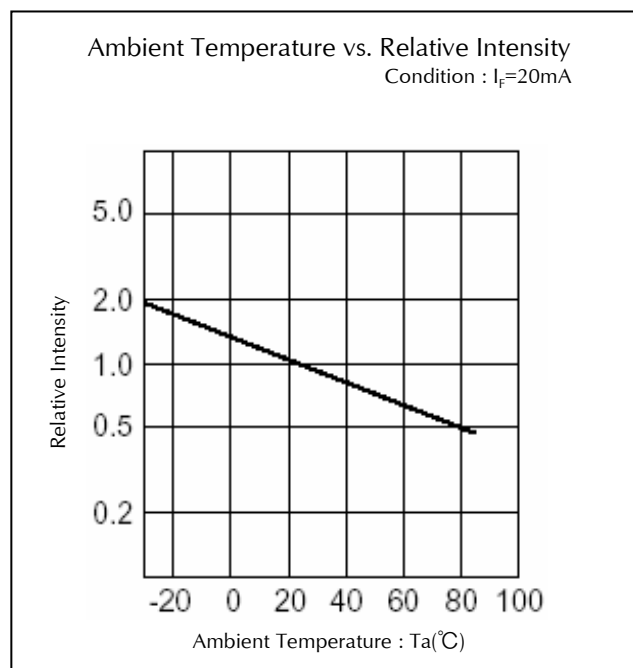
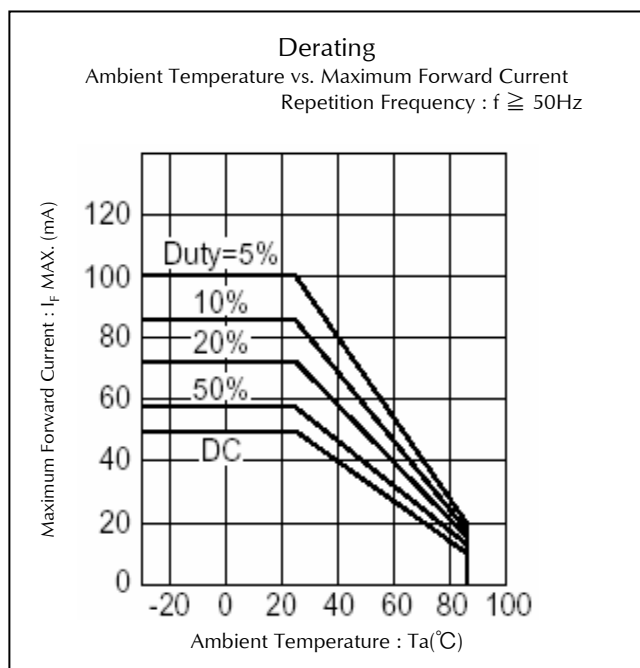
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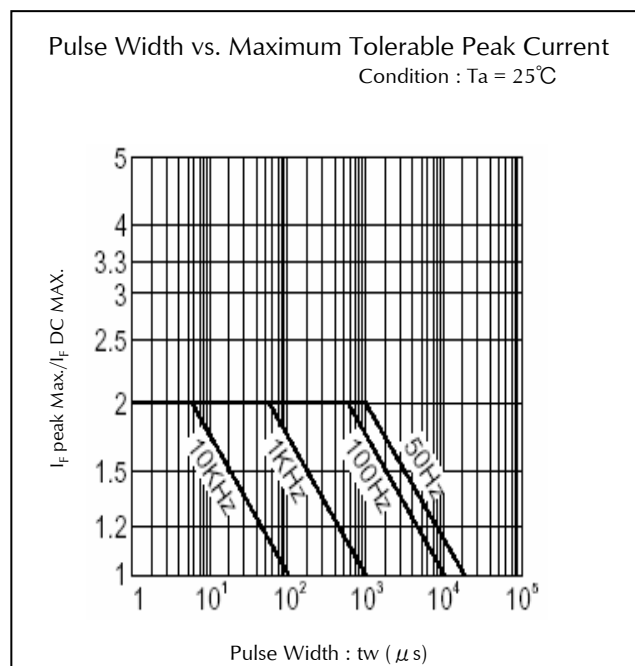
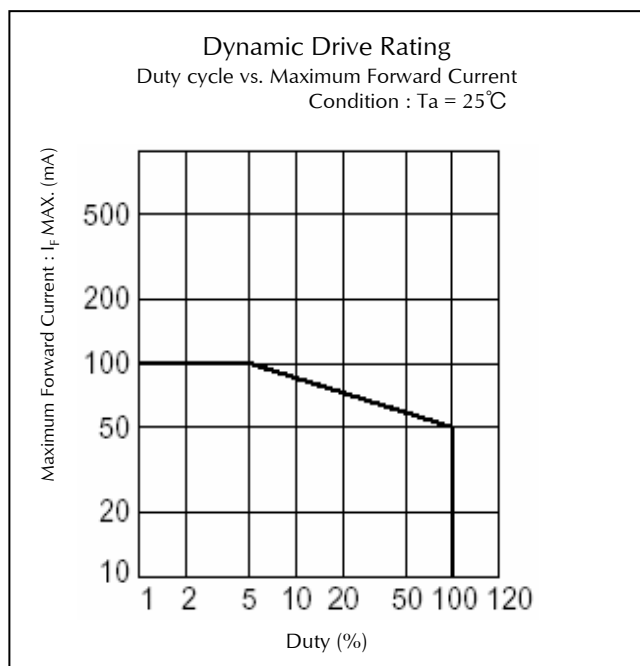
Technical Data(AA)



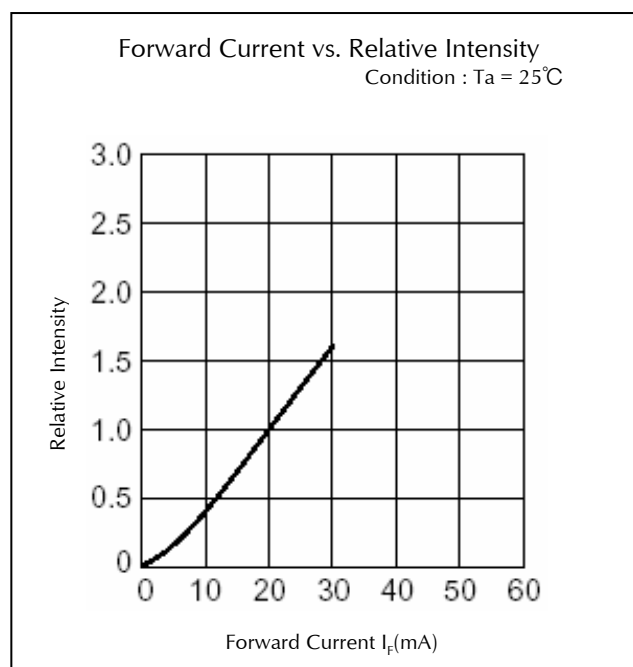
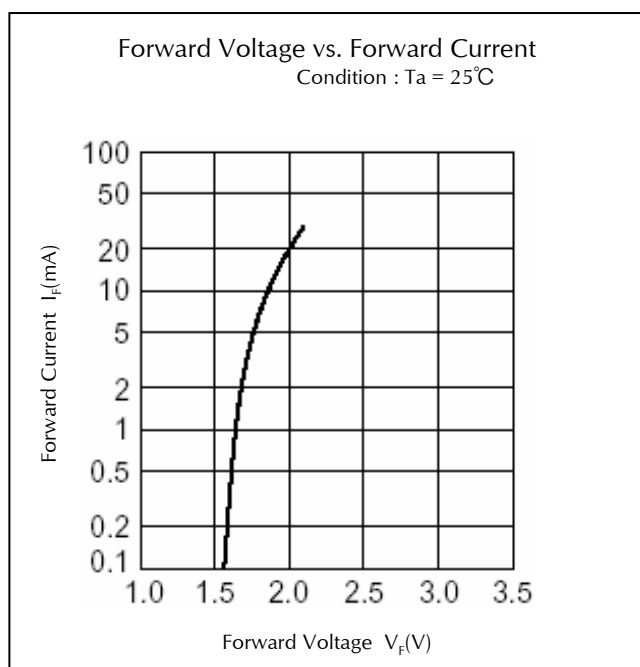
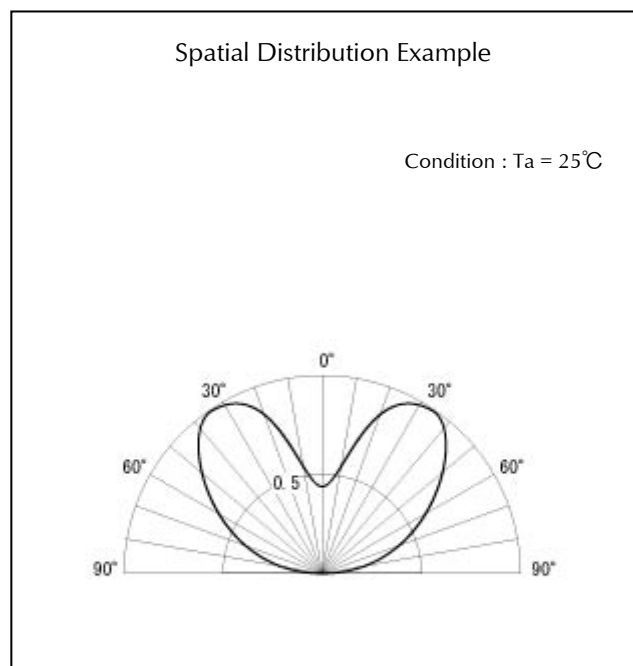
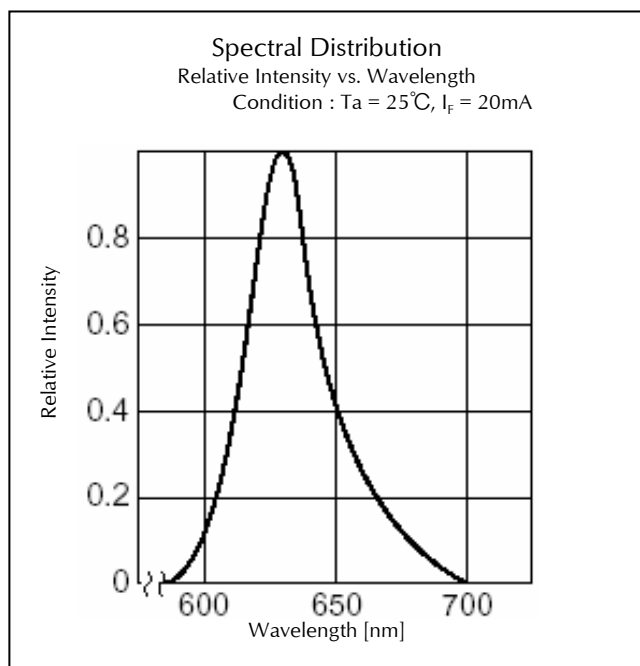
Technical Data(AA)



Technical Data(AA)



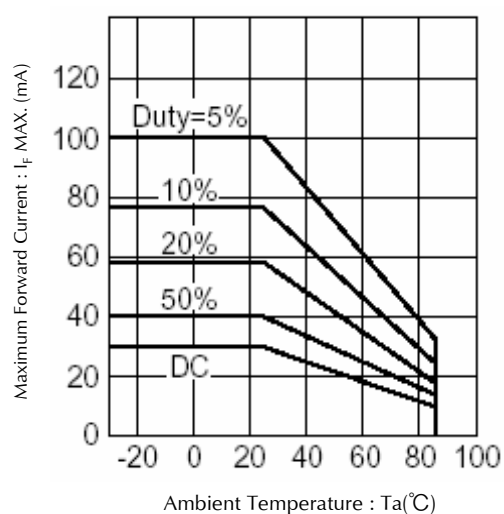
Technical Data(VR)



Technical Data(VR)

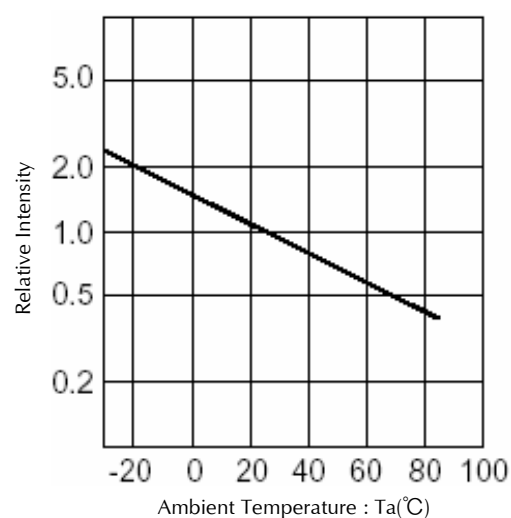
Derating

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

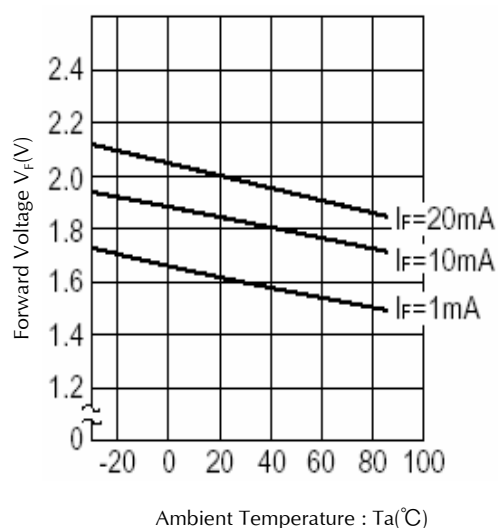


Ambient Temperature vs. Relative Intensity

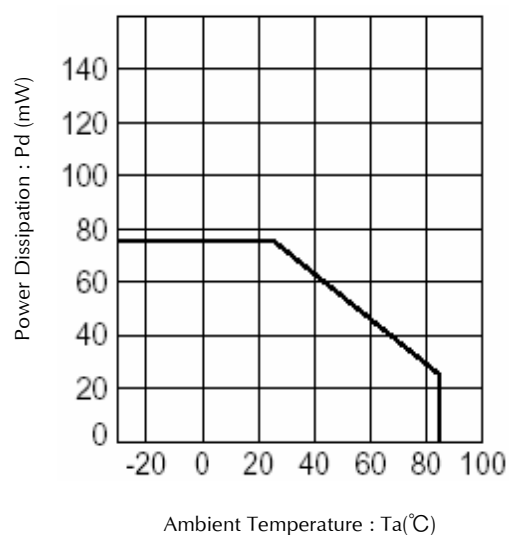
Condition : $I_F=20\text{mA}$



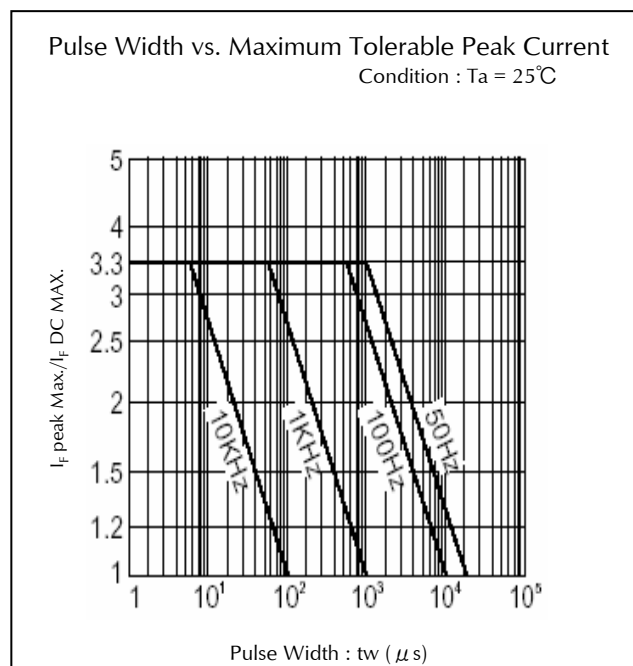
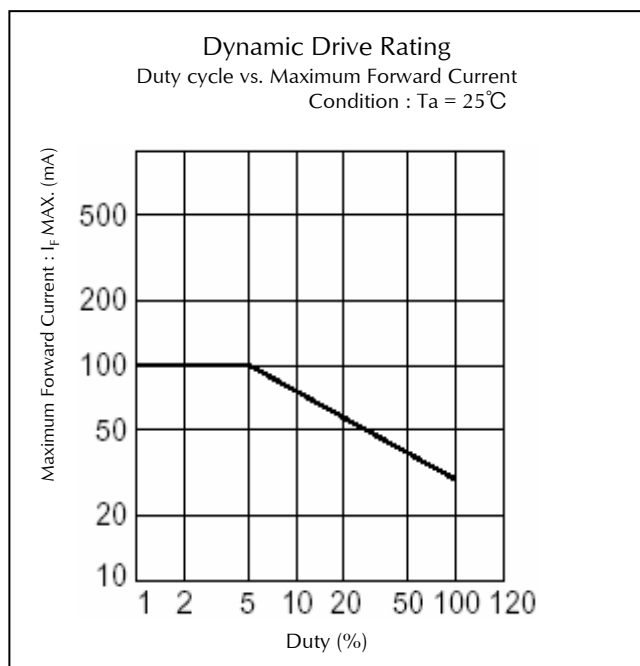
Ambient Temperature vs. Forward Voltage



Power Dissipation vs. Ambient Temperature

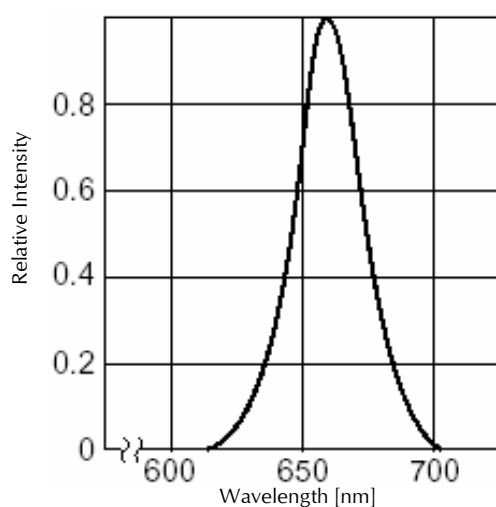


Technical Data(VR)



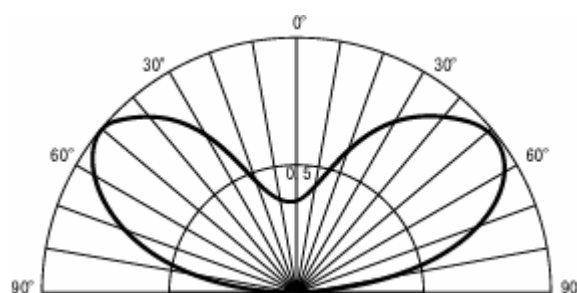
Technical Data(BR)

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

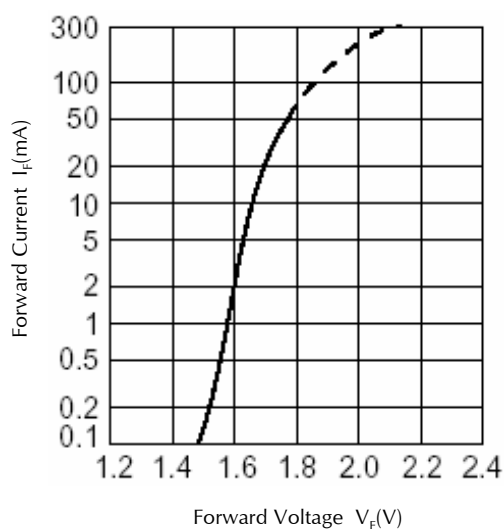


Spatial Distribution Example

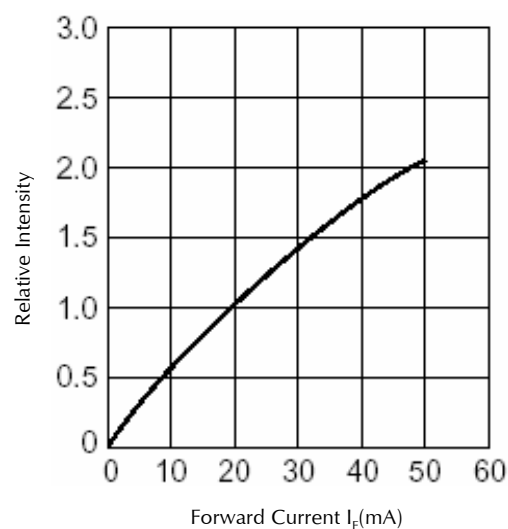
Condition : $T_a = 25^\circ\text{C}$



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



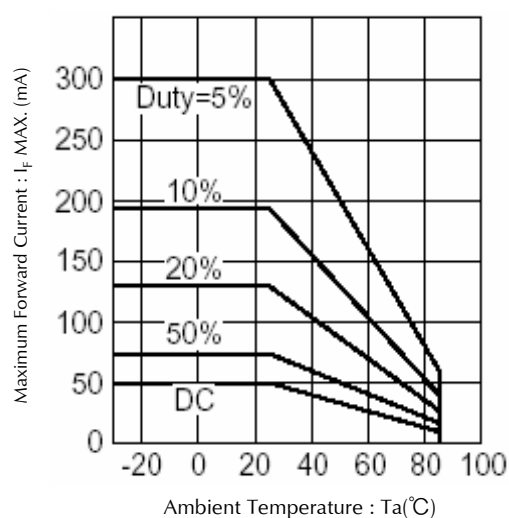
Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



Technical Data(BR)

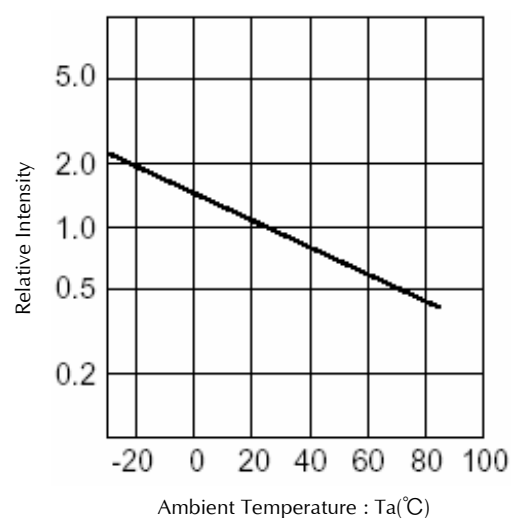
Derating

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

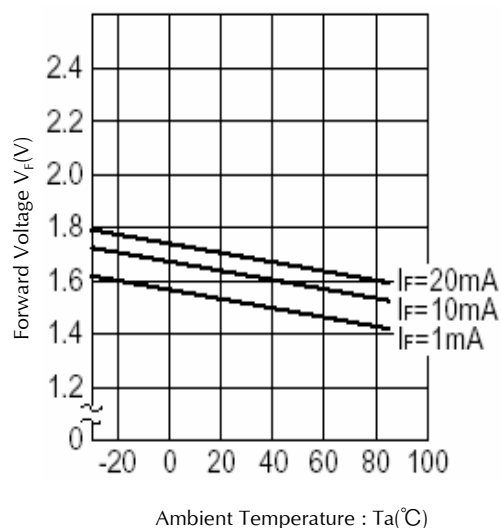


Ambient Temperature vs. Relative Intensity

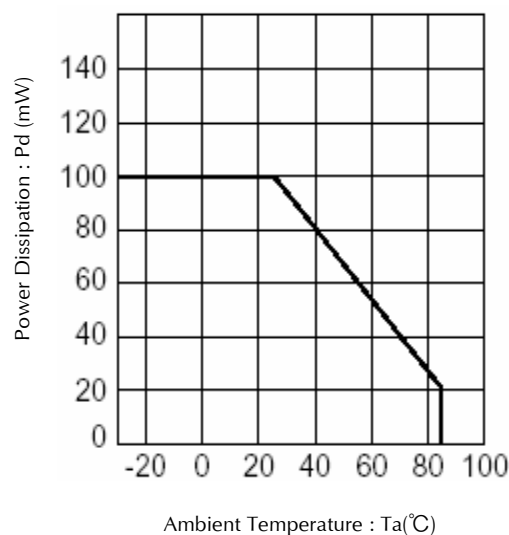
Condition : $I_F=20\text{mA}$



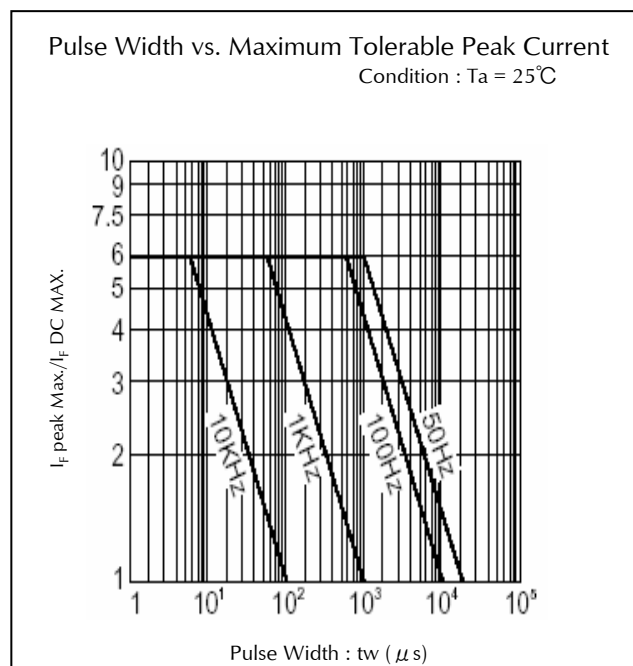
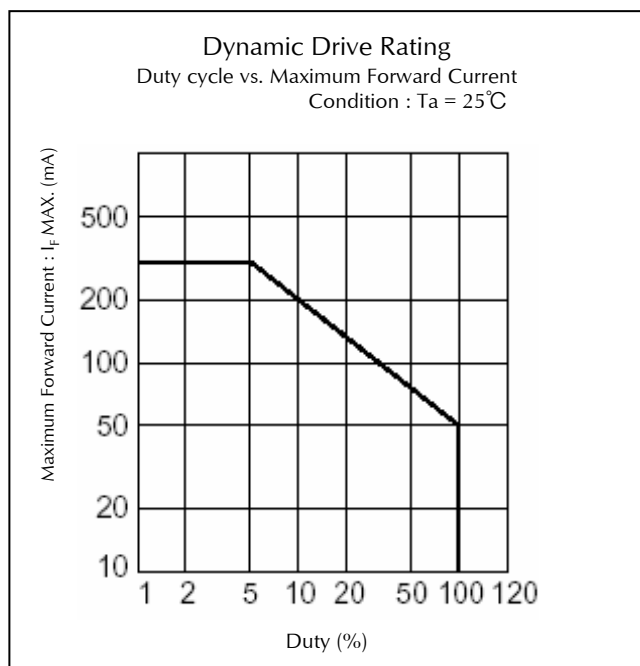
Ambient Temperature vs. Forward Voltage



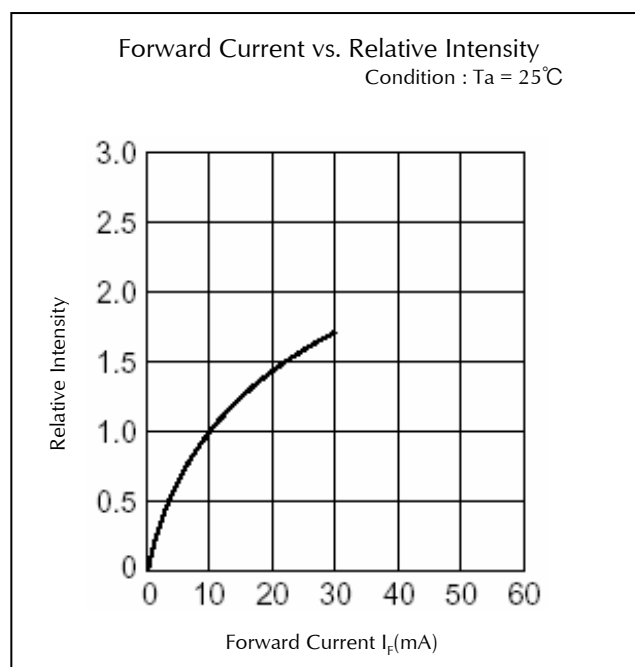
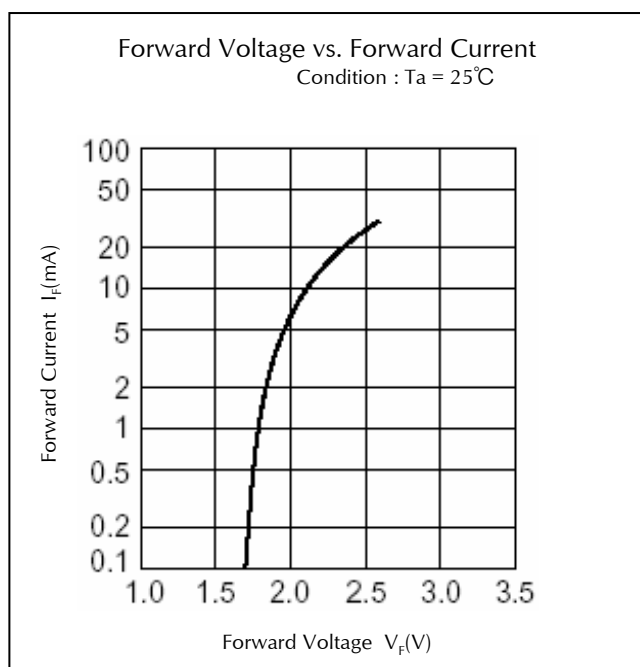
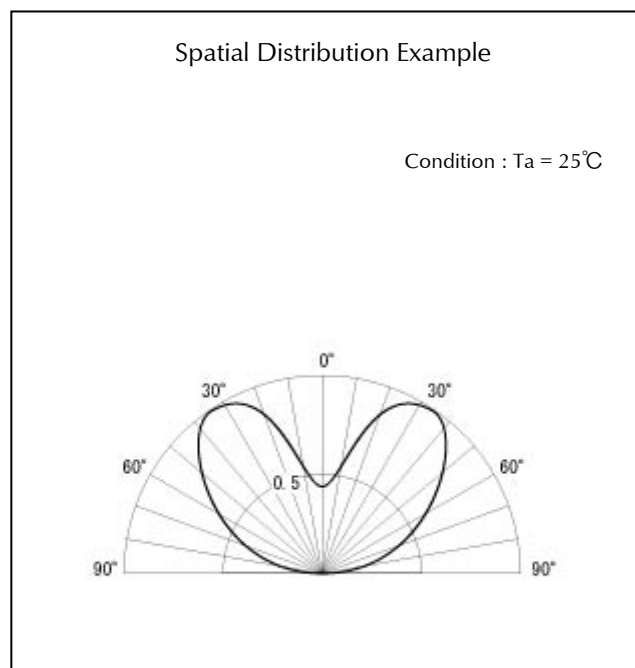
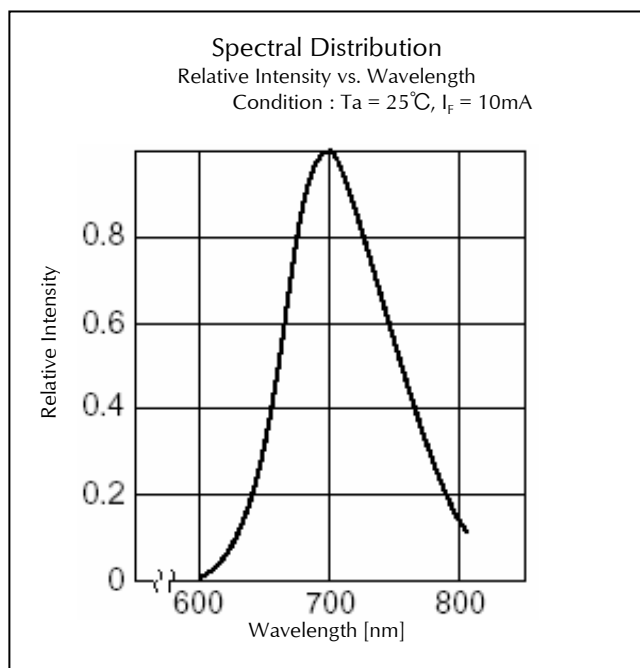
Power Dissipation vs. Ambient Temperature



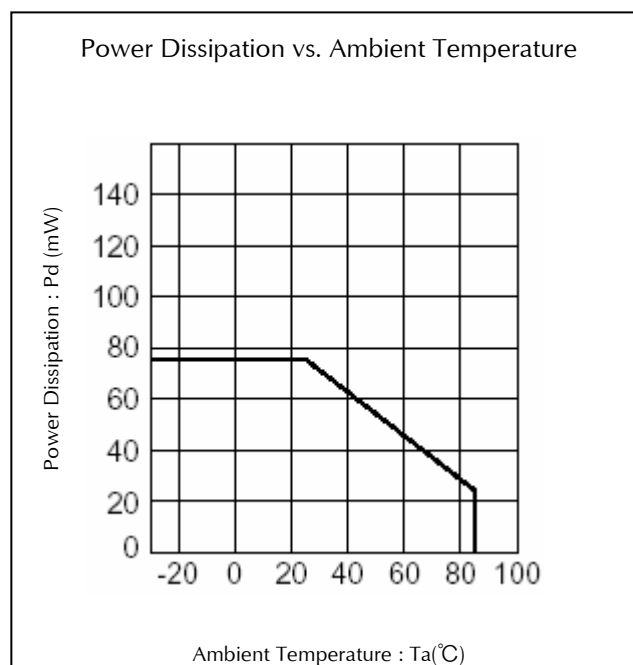
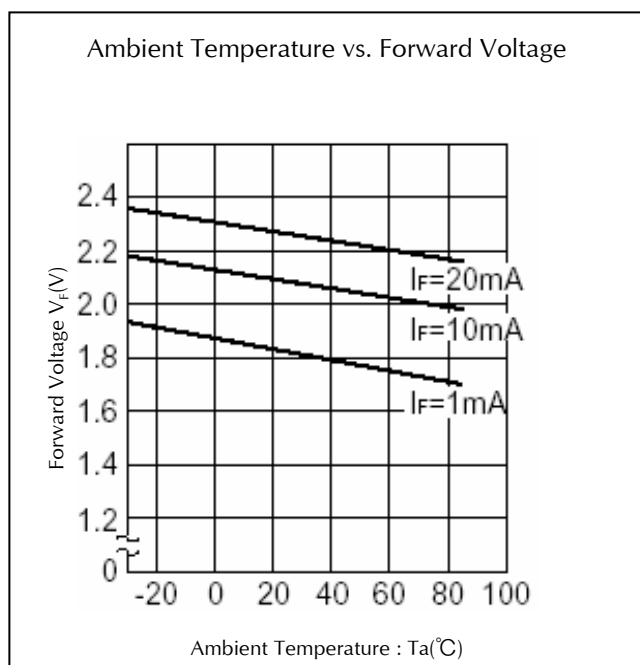
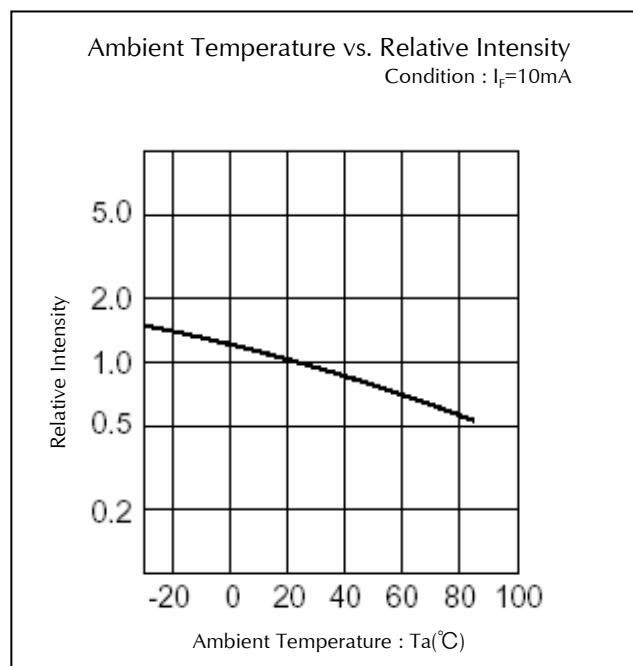
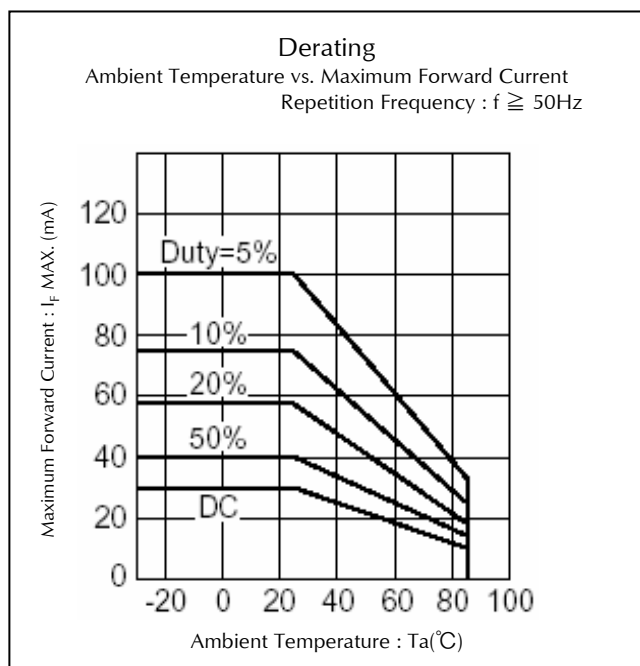
Technical Data(BR)



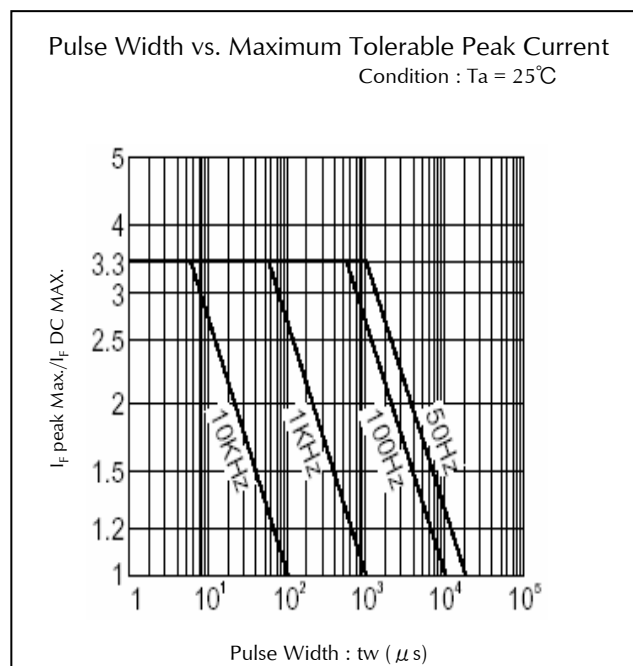
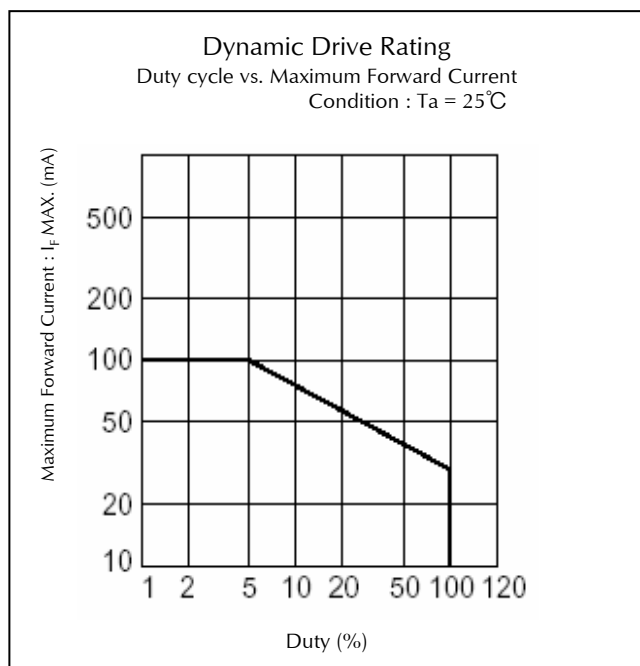
Technical Data(PR)



Technical Data(PR)

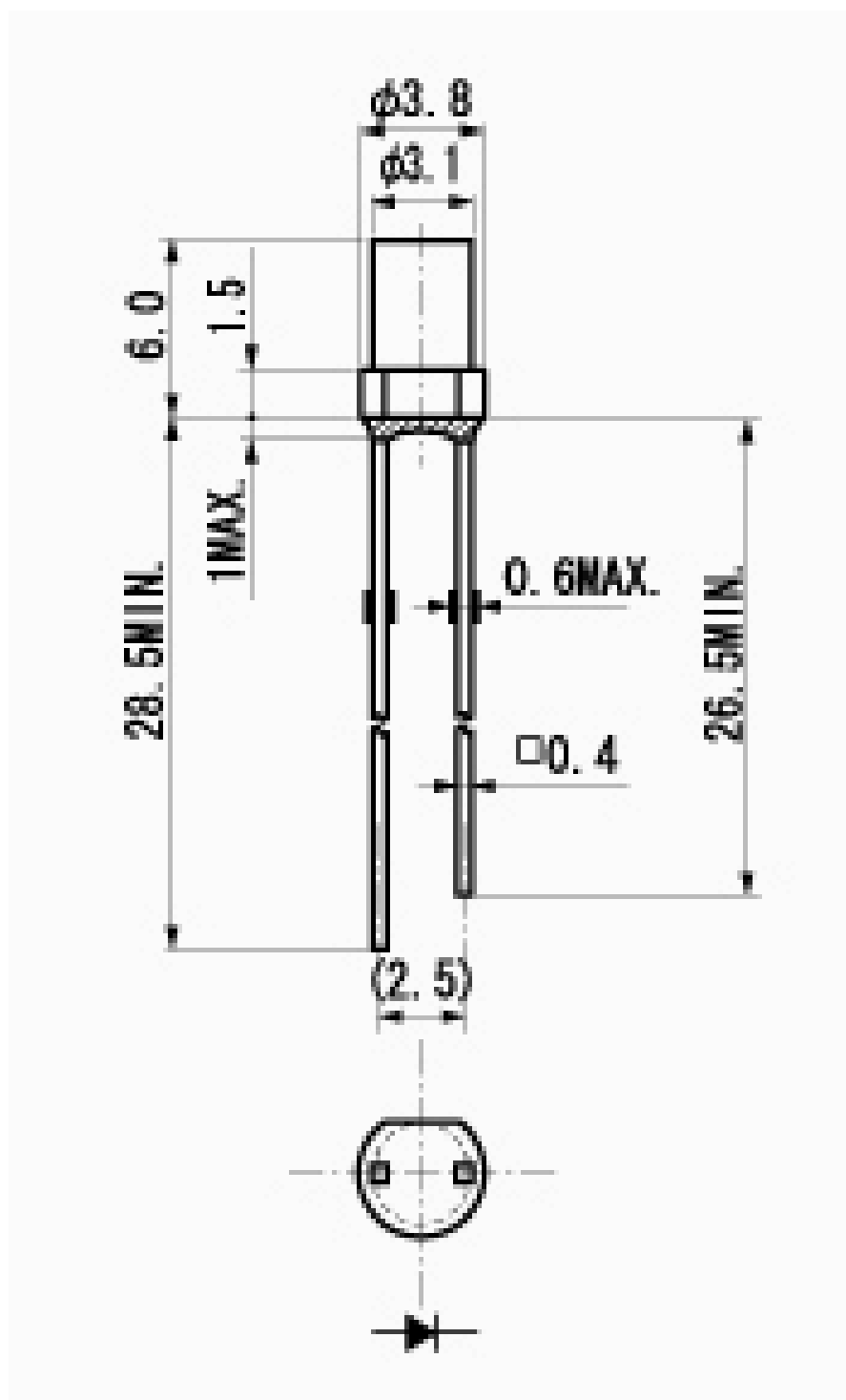


Technical Data(PR)



Package Dimensions

(Unit: mm)



TTW (Through The Wave) soldering Conditions

Pre-heating	100 °C 60 s	(MAX.) (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 normal temperature before the second dipping process.

Manual Soldering Conditions

Iron tip temp.	400 °C	(MAX.)
Soldering time and frequency	3 s 2 times	(MAX.) (MAX.)

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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