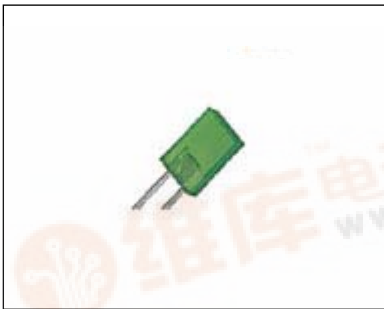




Pb-free
HEAT

STANLEY

5351K Series

Single Color Rectangular Shape Type

Features

Package	2 × 5 Rectangular shape type, BG,PG : Green Surface Diffused epoxy PY,AY : Yellow Surface Diffused epoxy AA : Orange Surface Diffused epoxy VR,BR,PR : Red Surface Diffused epoxy
Product features	- Outer Dimension 2 × 5 Rectangular shape type - Operation temperature range. Storage Temperature : -30℃~100℃ Operating Temperature : -30℃~85℃ - Lead-free soldering compatible - RoHS compliant
Dominant wavelength	Green : 558nm (BG) Yellow Green : 567nm (PG) : 572nm (PY) Yellow : 590nm (AY) Orange : 606nm (AA) Red : 624nm (VR) : 647nm (BR) : 630nm (PR)
Half Intensity Angle	BG,PG,PY : $\theta_x = 139 \text{ deg.}$ $\theta_y = 134 \text{ deg.}$ AY : $\theta_x = 150 \text{ deg.}$ $\theta_y = 120 \text{ deg.}$ AA,VR : $\theta_x = 126 \text{ deg.}$ $\theta_y = 120 \text{ deg.}$ BR : $\theta_x = 148 \text{ deg.}$ $\theta_y = 135 \text{ deg.}$ PR : $\theta_x = 151 \text{ deg.}$ $\theta_y = 129 \text{ deg.}$
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
BG5351K	GaP	Green	Green	Surface Diffused	558	20	0.5	1.0	20
PG5351KY	GaP	Yellow Green			567	20	1.5	3.0	20
PY5351K	GaP		Yellow		572	20	2.0	4.0	20
AY5351K	GaAsP	Yellow			590	20	1.2	2.4	20
AA5351K	GaAsP	Orange	Orange		606	20	1.2	2.4	20
VR5351K	GaAsP	Red	Red		624	20	1.2	2.4	20
BR5351K	GaAlAs				647	20	1.5	3.0	20
PR5351K	GaP				630	10	0.3	0.5	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 ≤ 1 ms., 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.	139(θ _x)	139(θ _x)	139(θ _x)	150(θ _x)	126(θ _x)	126(θ _x)	148(θ _x)	deg.
				134(θ _y)	134(θ _y)	134(θ _y)	120(θ _y)	120(θ _y)	120(θ _y)	135(θ _y)	

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.	151(θ _x)	deg.
				129(θ _y)	



5351K Series

Single Color Rectangular Shape Type

Luminous Intensity Rank

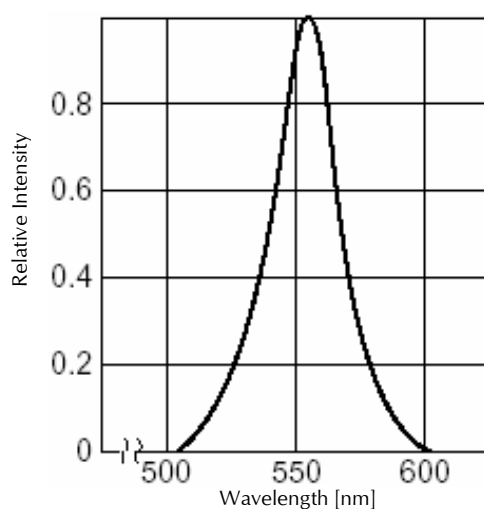
(Ta=25°C)

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	0.5	1.0	1.5	3.0	2.0	4.0	1.2	2.4	1.2	2.4	1.2	2.4	1.5	3.0	0.30	0.60
B	0.7	1.4	2.1	4.2	2.8	5.6	1.6	3.2	1.6	3.2	1.6	3.2	2.1	4.2	0.42	0.84
C	1.0	2.0	3.0	6.0	4.0	8.0	2.4	4.8	2.4	4.8	2.4	4.8	3.0	6.0	0.60	1.20
D	1.4	2.8	4.2	8.4	5.6	11.2	3.2	6.4	3.2	6.4	3.2	6.4	4.2	8.4	0.84	1.68
E	2.0	-	6.0	-	8.0	-	4.8	-	4.8	-	4.8	-	6.0	-	1.20	-

Please contact our sales staff concerning rank designation.

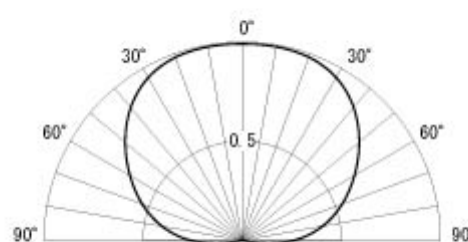
Technical Data(BG)

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

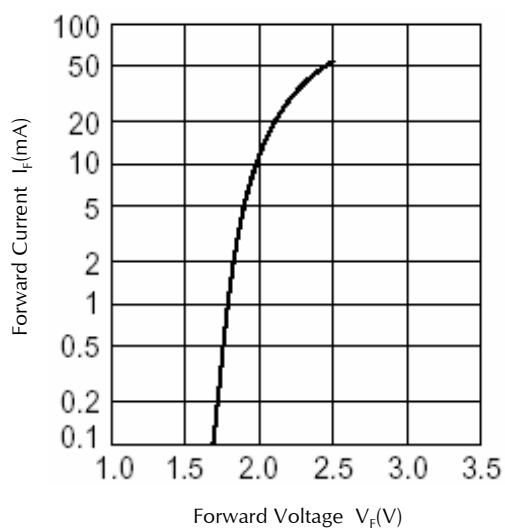


Spatial Distribution Example

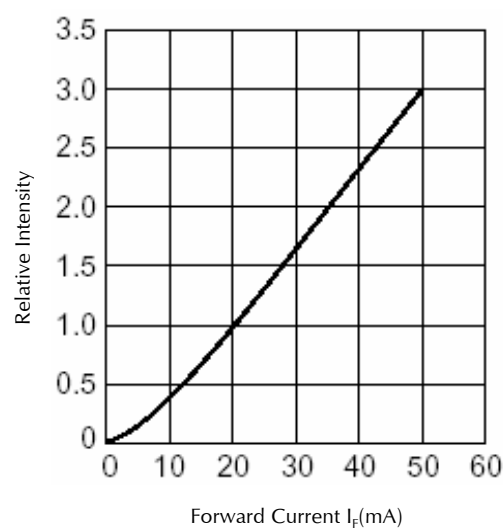
Condition : $T_a = 25^\circ\text{C}$



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



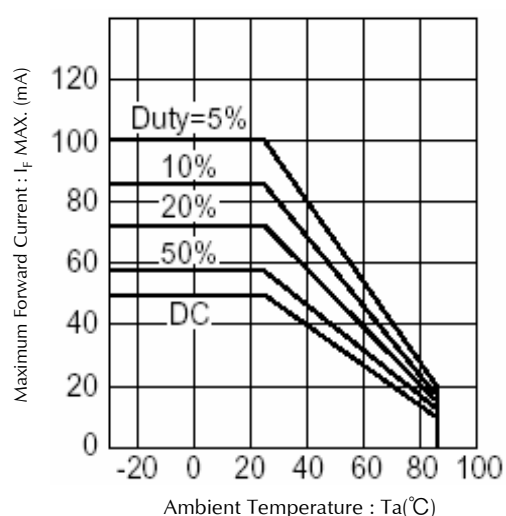
Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



Technical Data(BG)

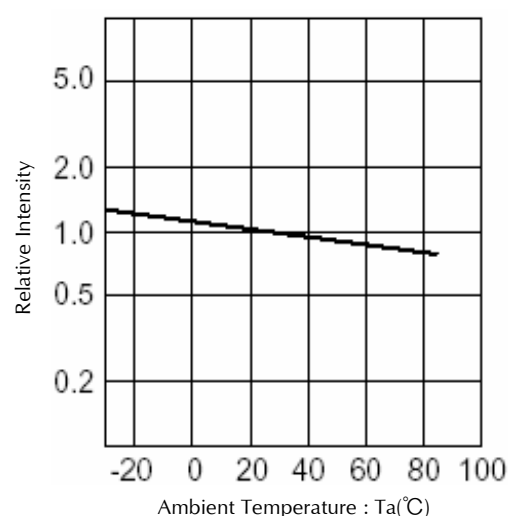
Derating

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

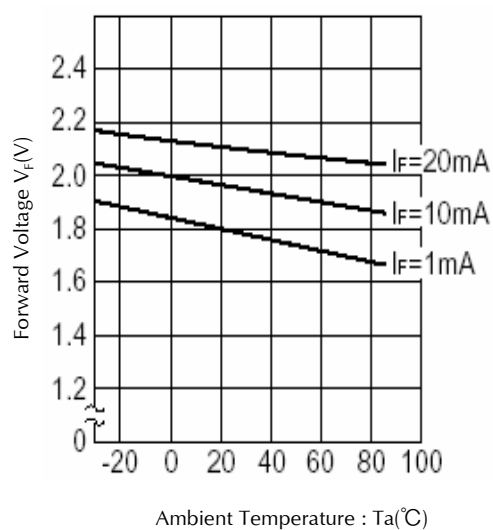


Ambient Temperature vs. Relative Intensity

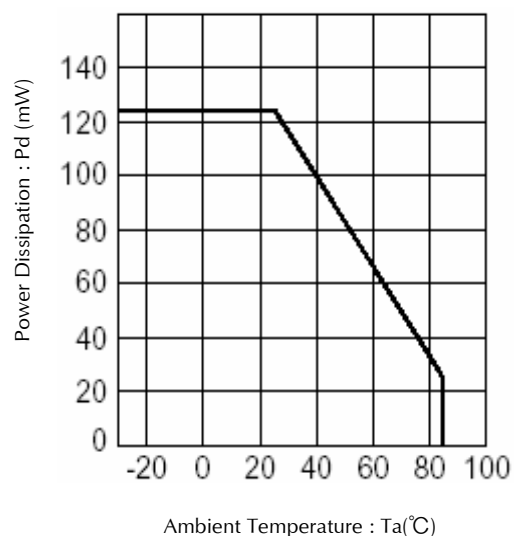
Condition : $I_F=20\text{mA}$



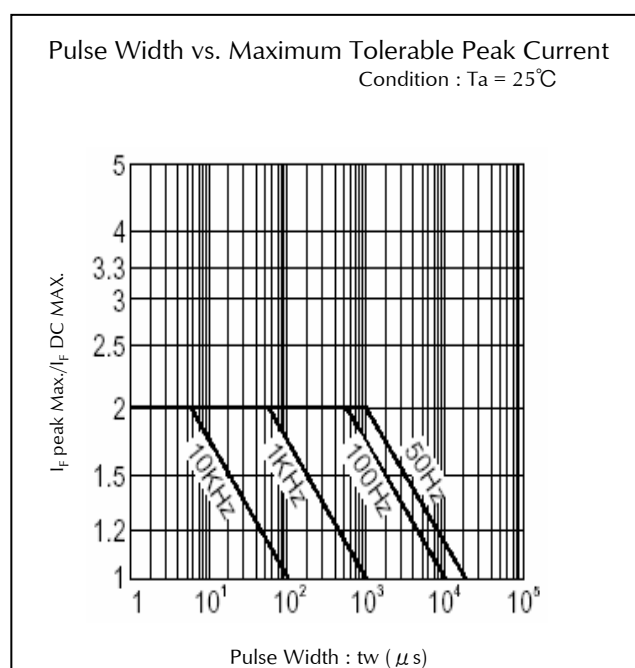
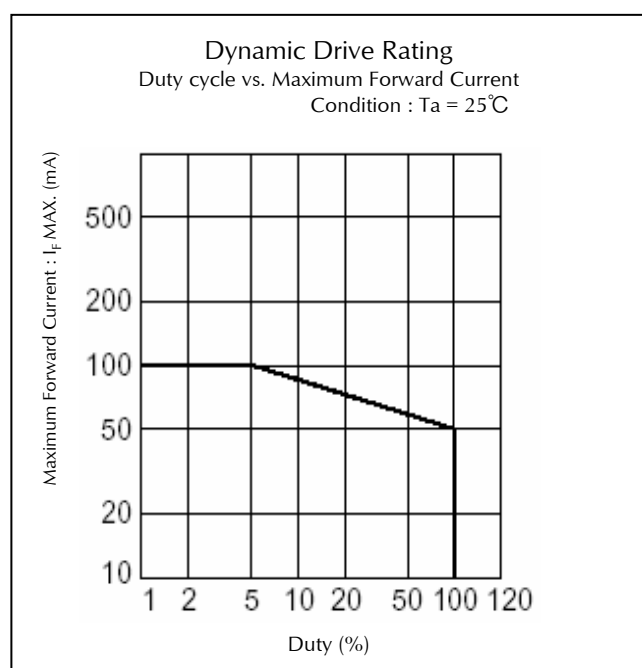
Ambient Temperature vs. Forward Voltage



Power Dissipation vs. Ambient Temperature

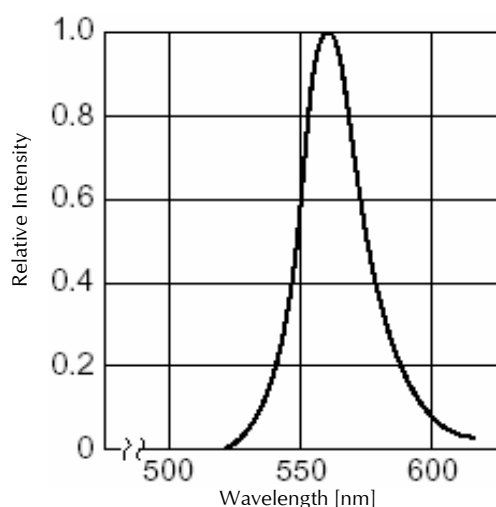


Technical Data(BG)



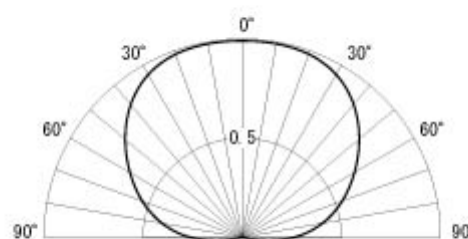
Technical Data(PG)

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

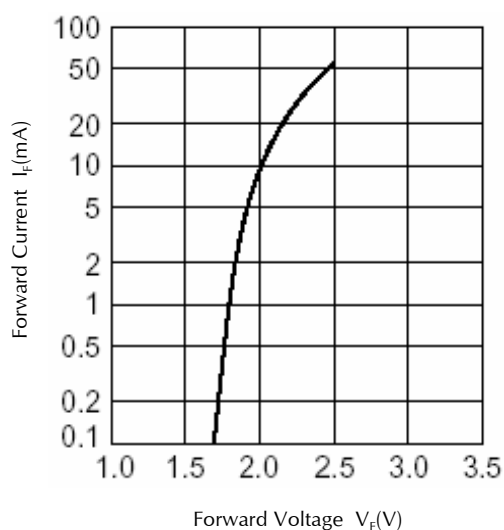


Spatial Distribution Example

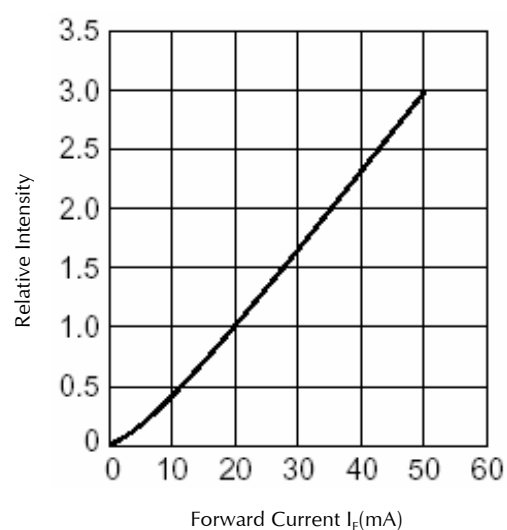
Condition : $T_a = 25^\circ\text{C}$



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



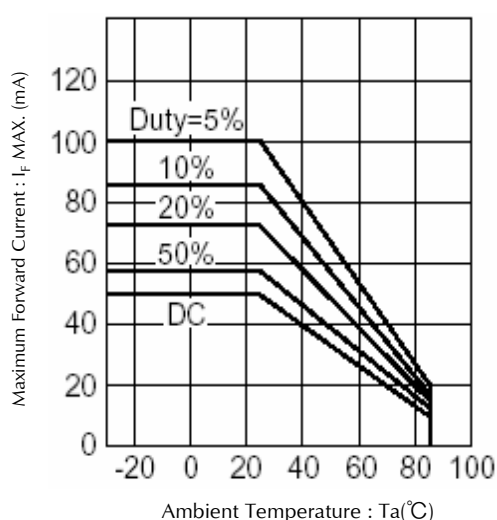
Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



Technical Data(PG)

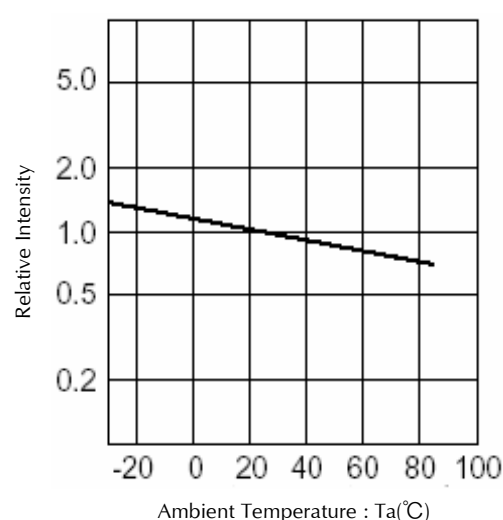
Derating

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

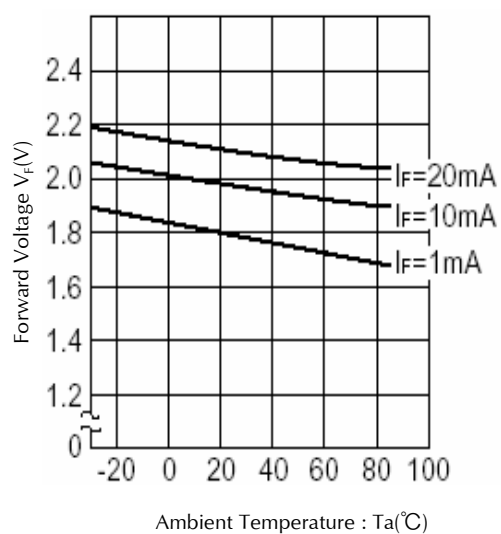


Ambient Temperature vs. Relative Intensity

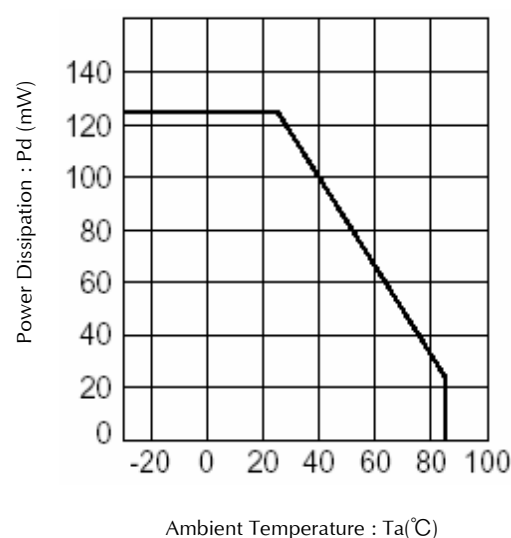
Condition : $I_F=20\text{mA}$



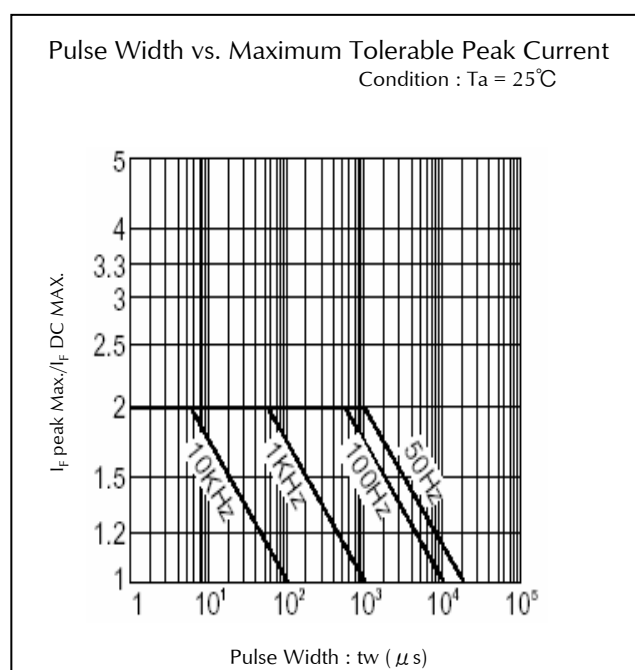
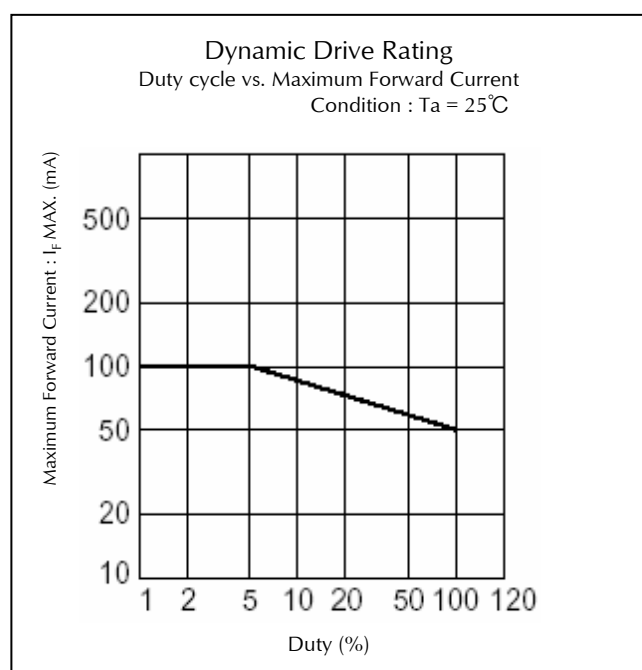
Ambient Temperature vs. Forward Voltage



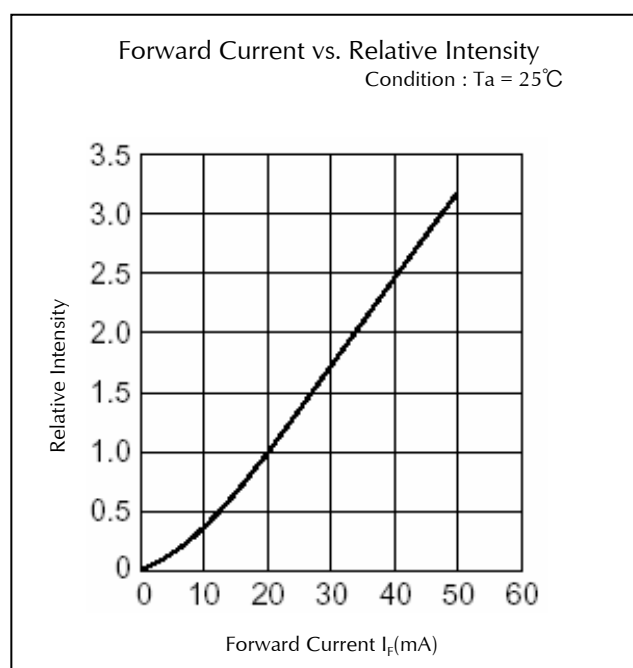
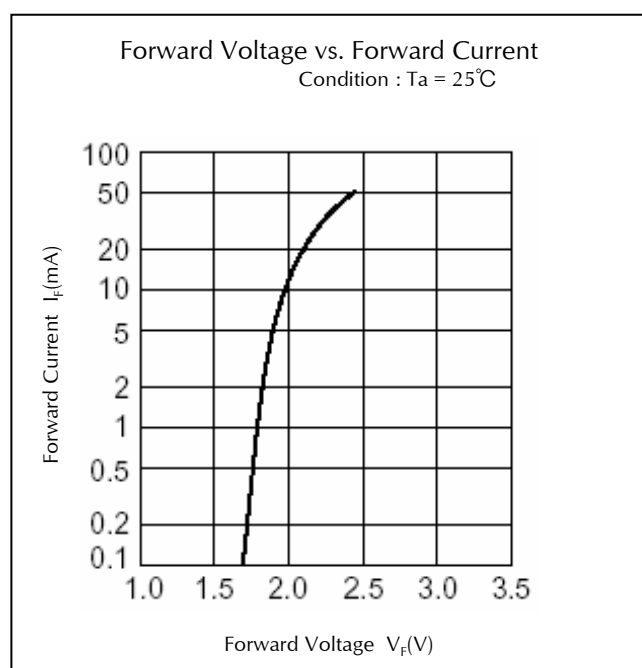
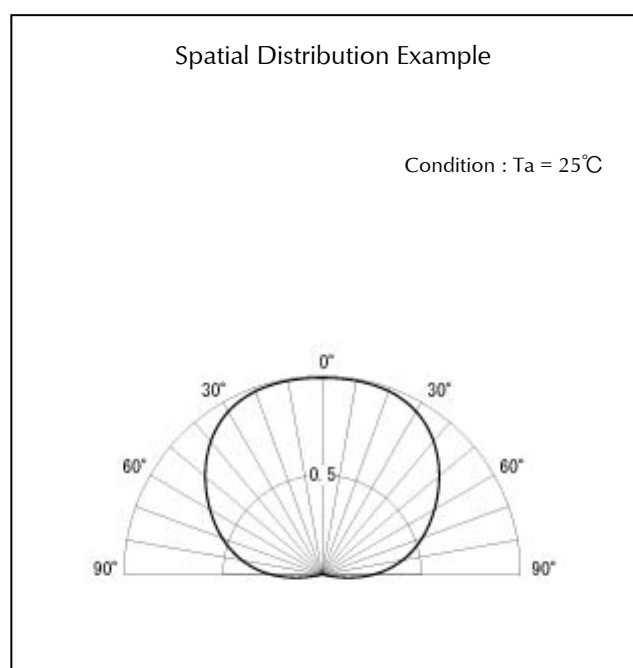
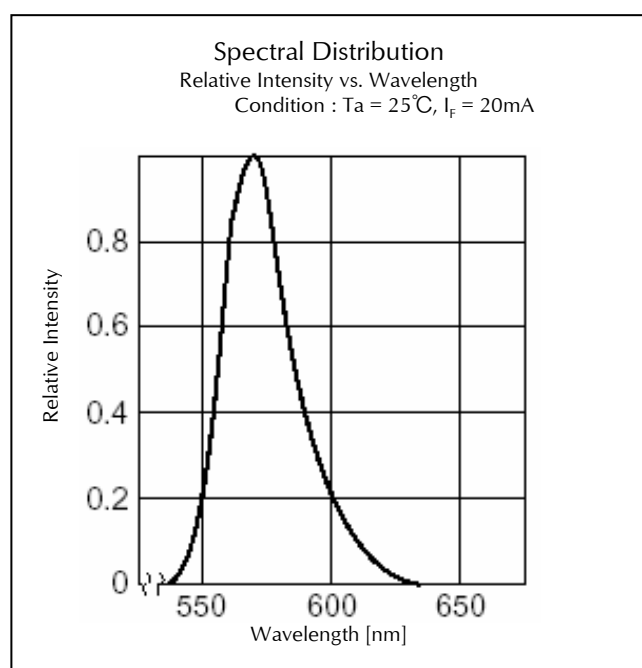
Power Dissipation vs. Ambient Temperature



Technical Data(PG)



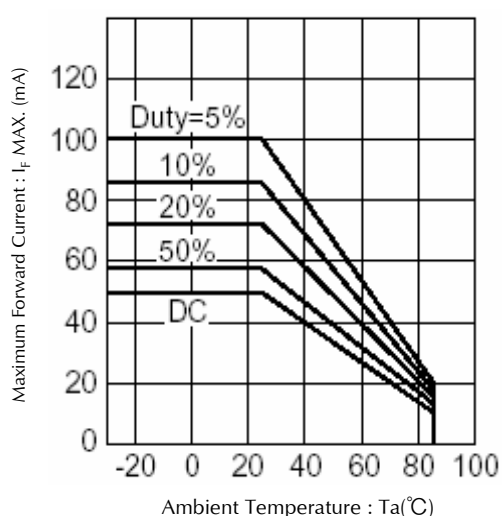
Technical Data(PY)



Technical Data(PY)

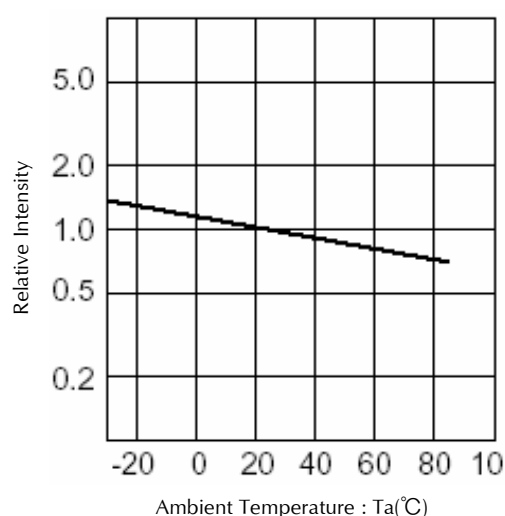
Derating

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

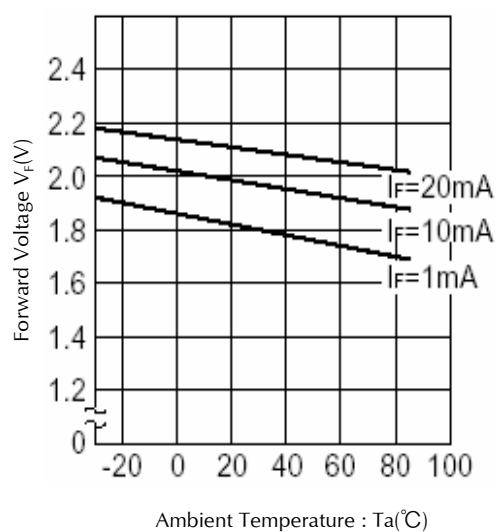


Ambient Temperature vs. Relative Intensity

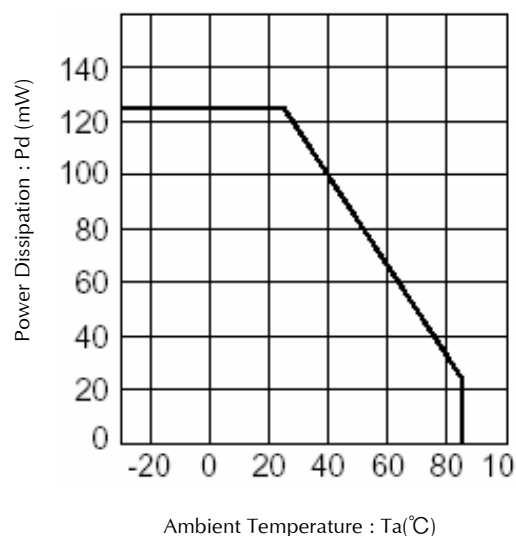
Condition : $I_F=20\text{mA}$



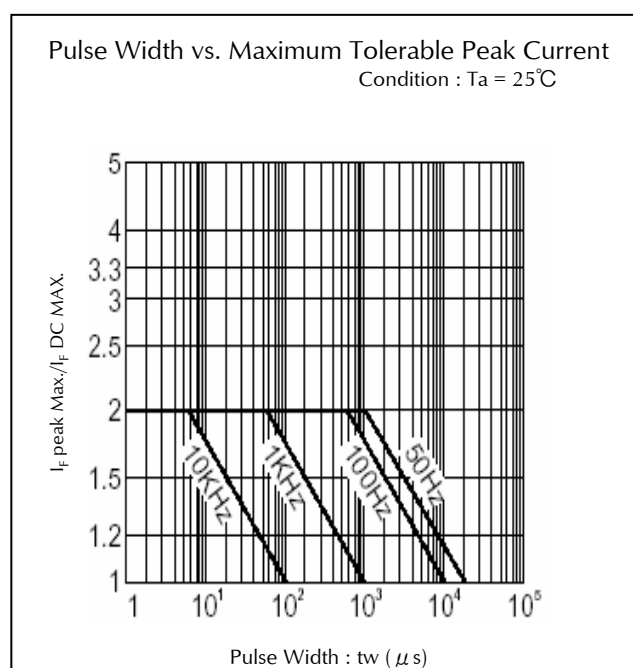
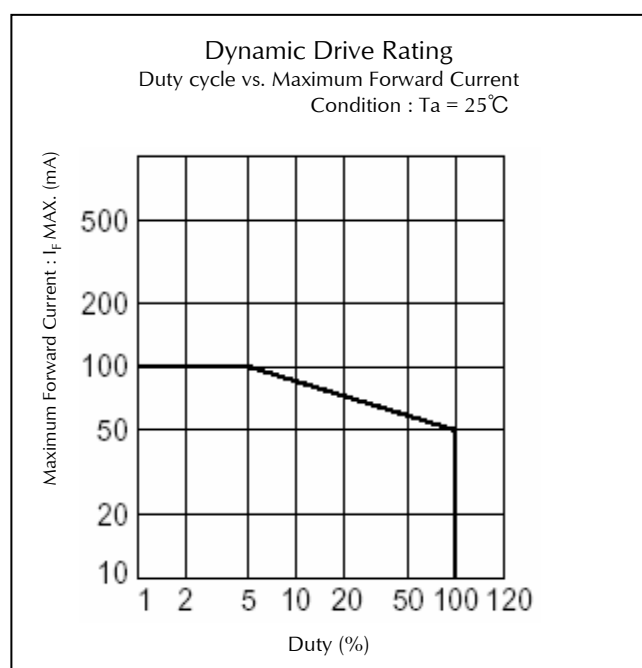
Ambient Temperature vs. Forward Voltage



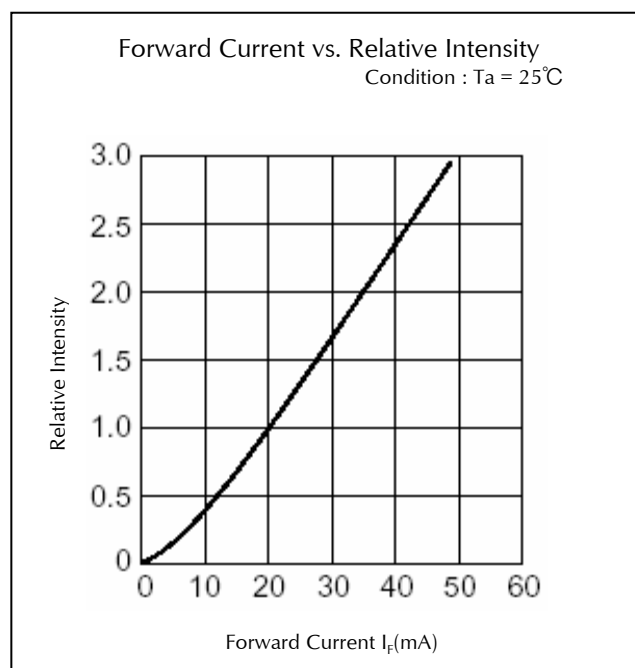
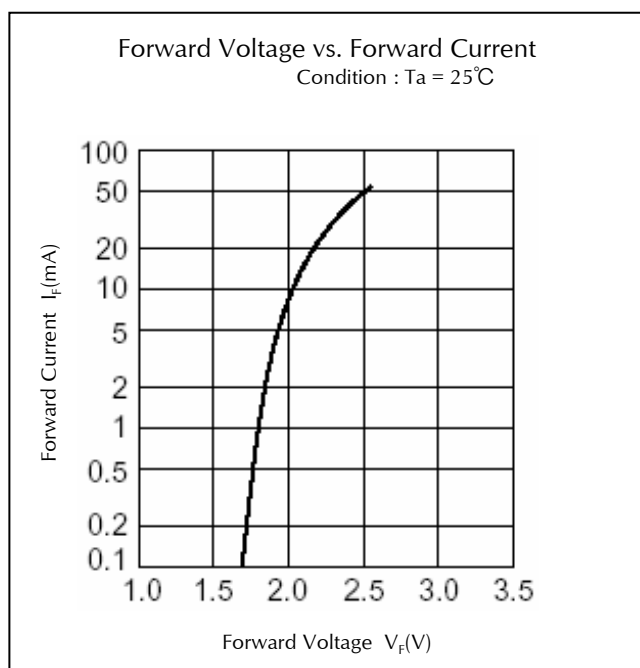
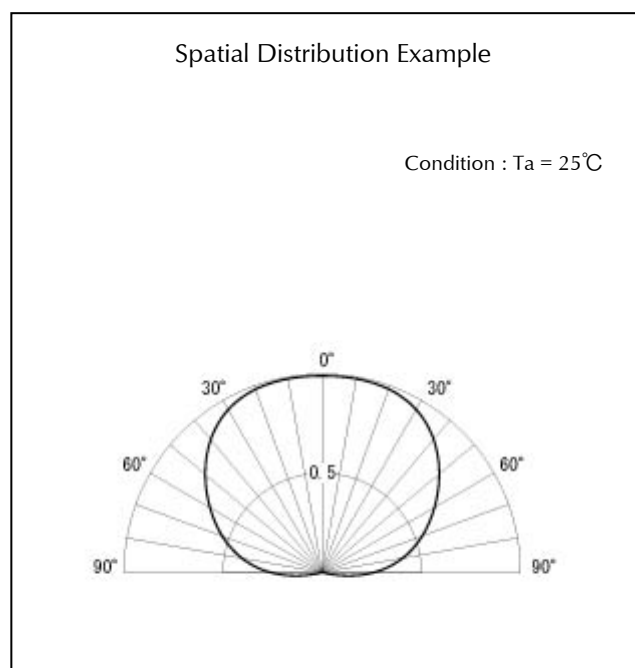
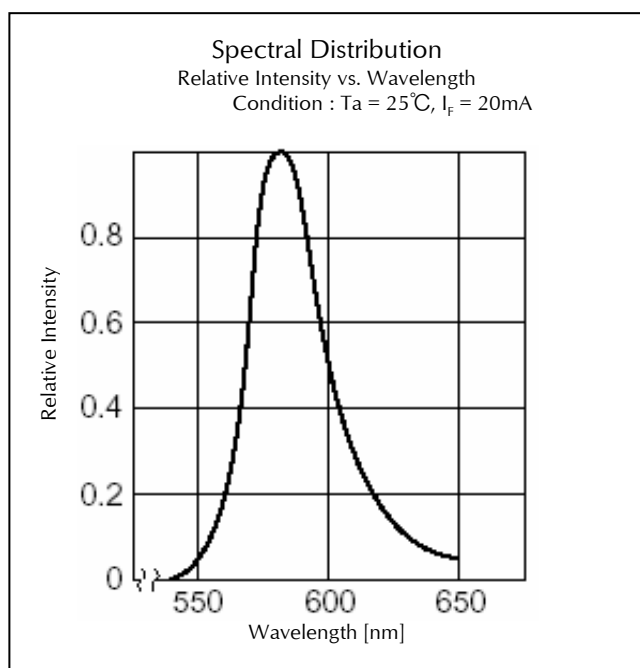
Power Dissipation vs. Ambient Temperature



Technical Data(PY)



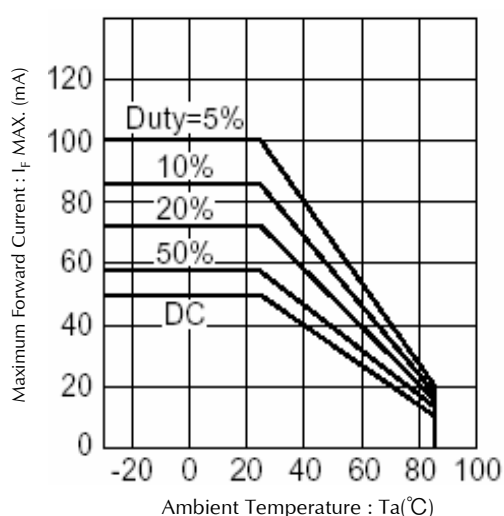
Technical Data(AY)



Technical Data(AY)

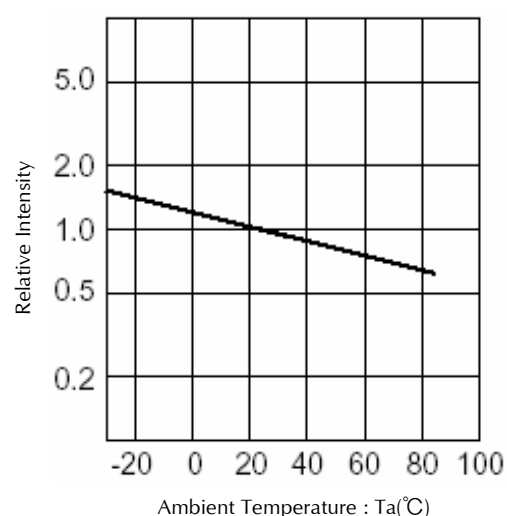
Derating

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

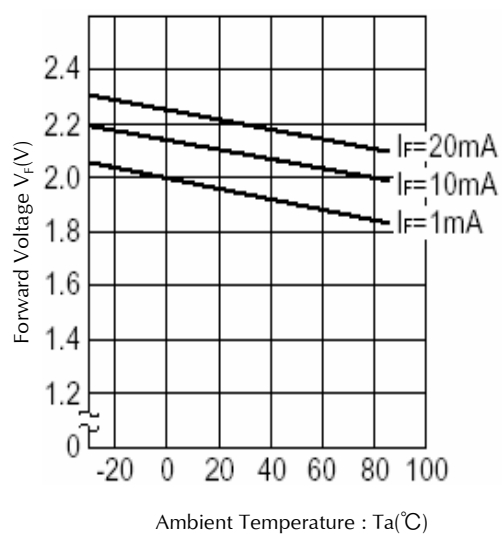


Ambient Temperature vs. Relative Intensity

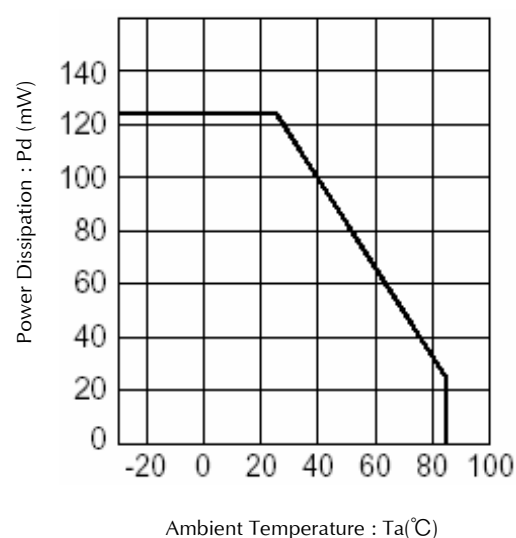
Condition : $I_f = 20\text{mA}$



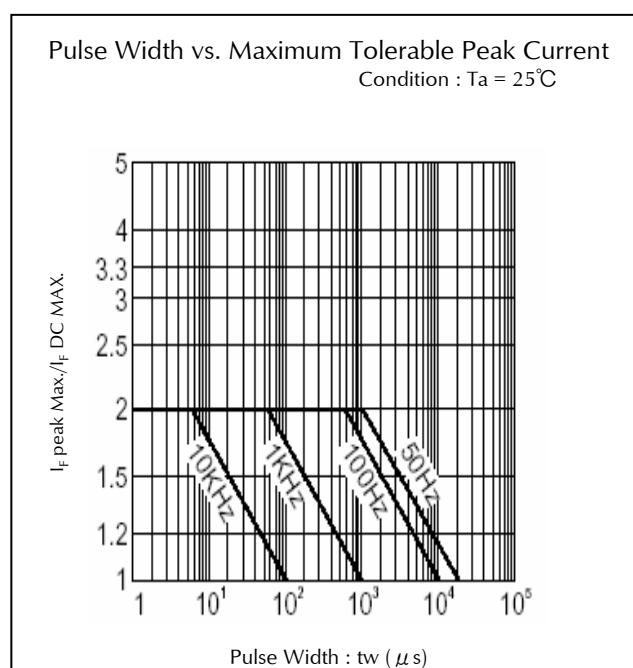
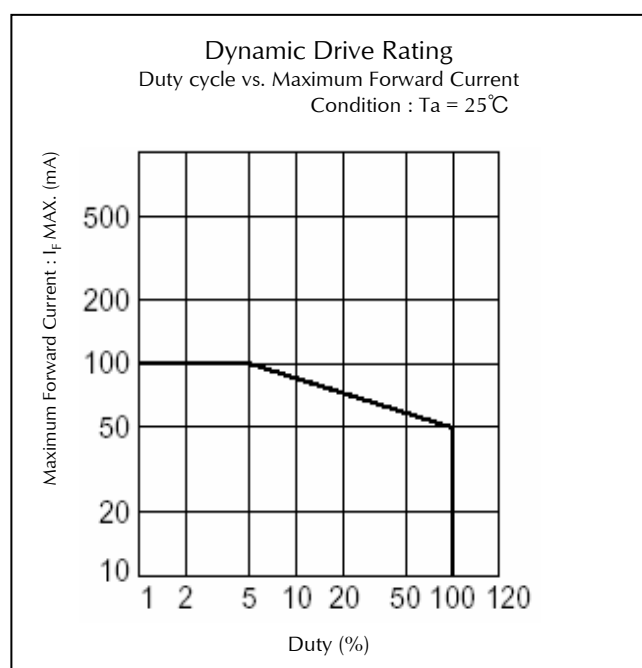
Ambient Temperature vs. Forward Voltage



Power Dissipation vs. Ambient Temperature

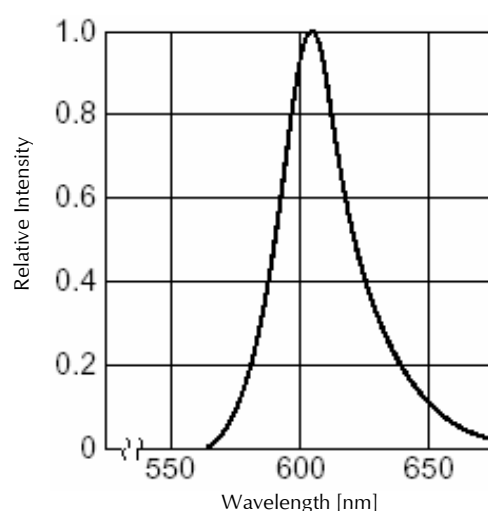


Technical Data(AY)



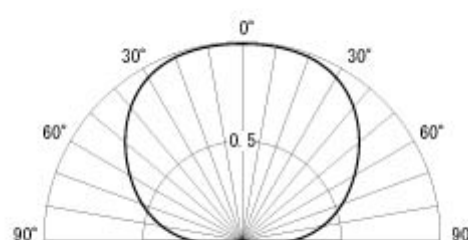
Technical Data(AA)

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

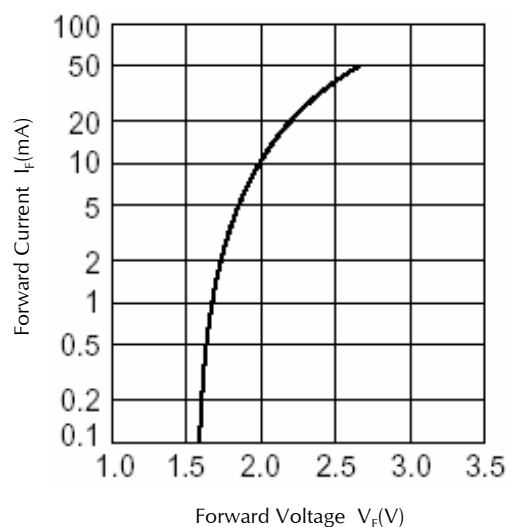


Spatial Distribution Example

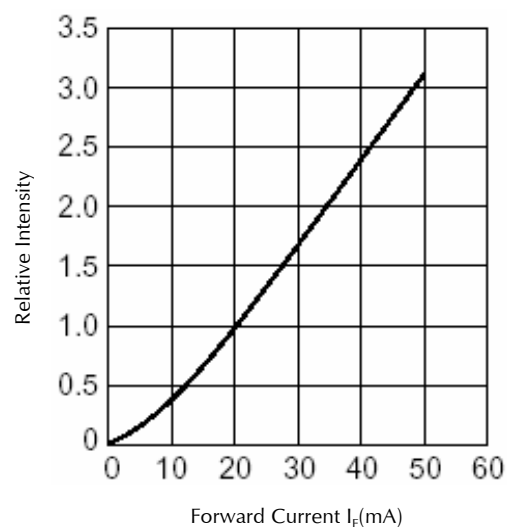
Condition : $T_a = 25^\circ\text{C}$



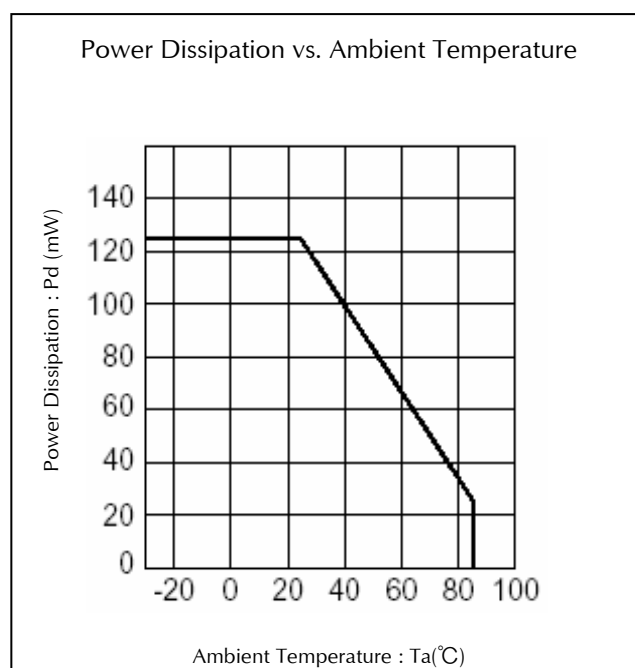
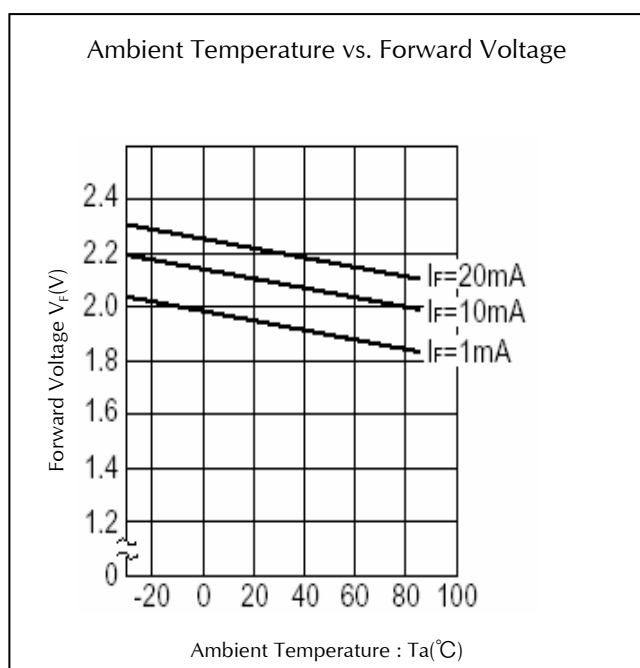
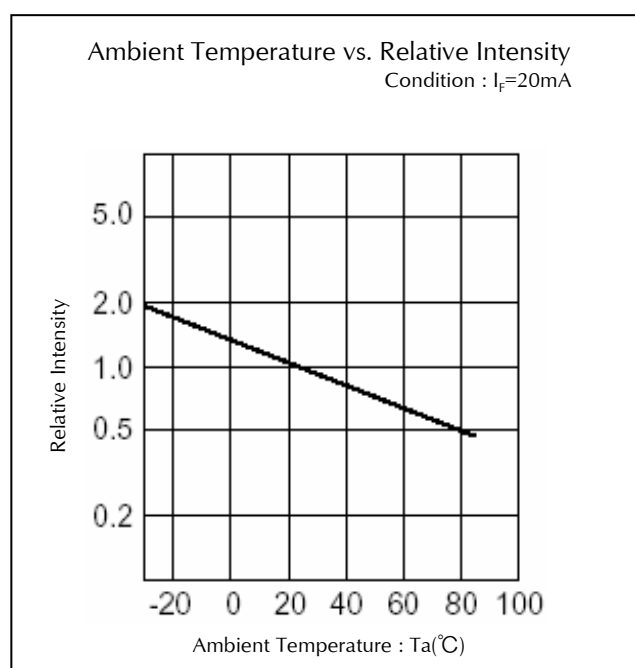
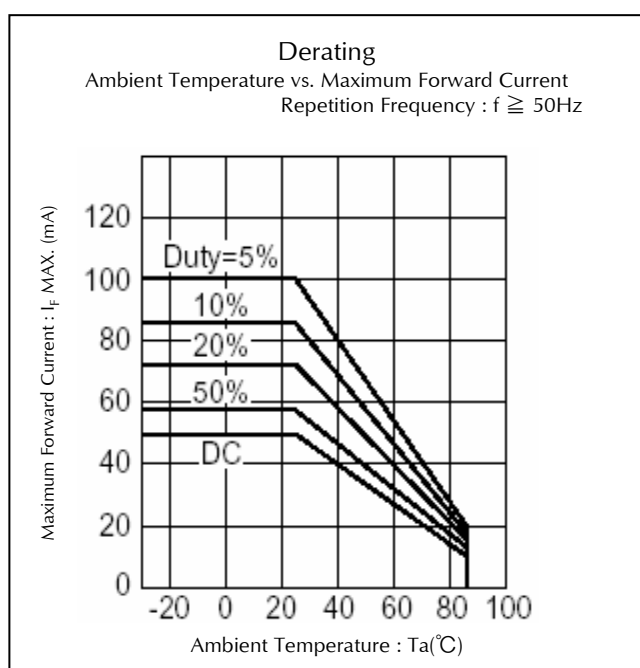
Forward Voltage vs. Forward Current
Condition : $T_a = 25^\circ\text{C}$



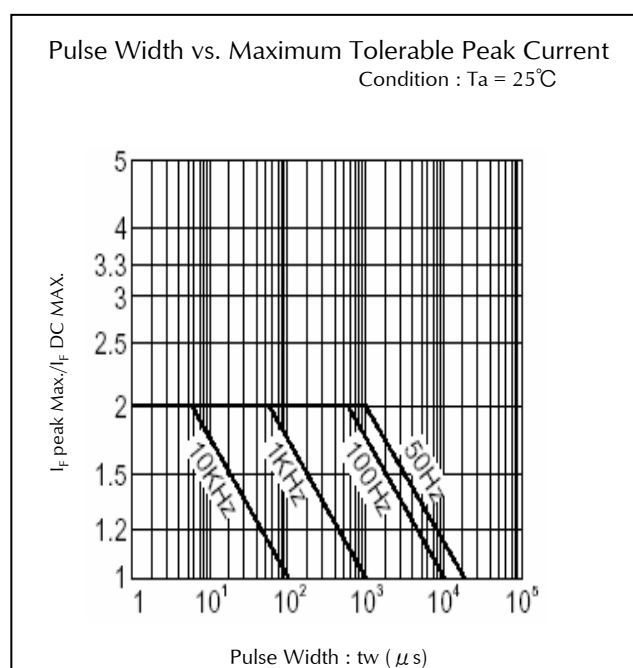
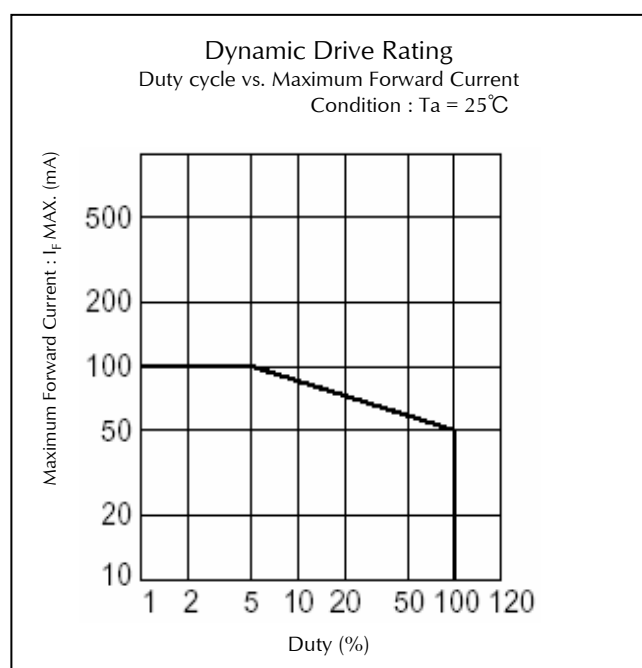
Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



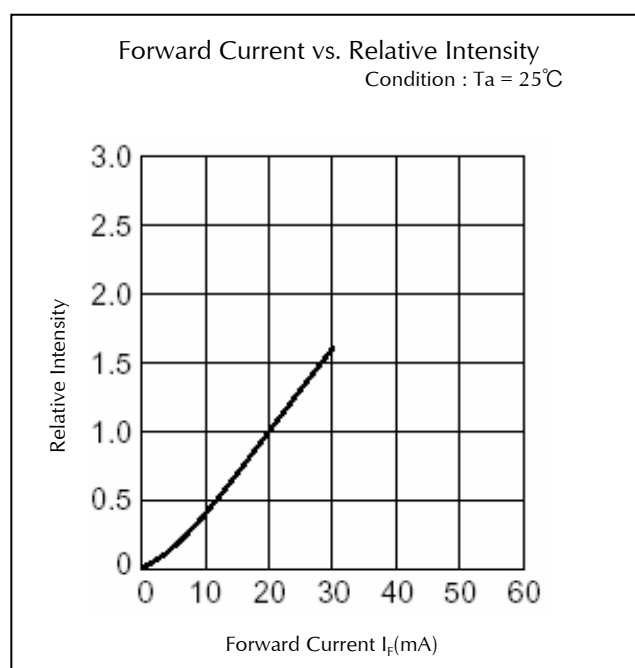
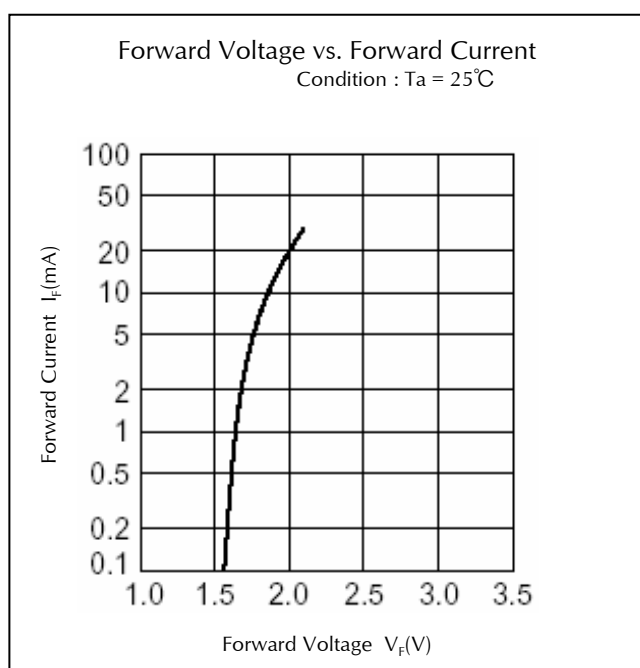
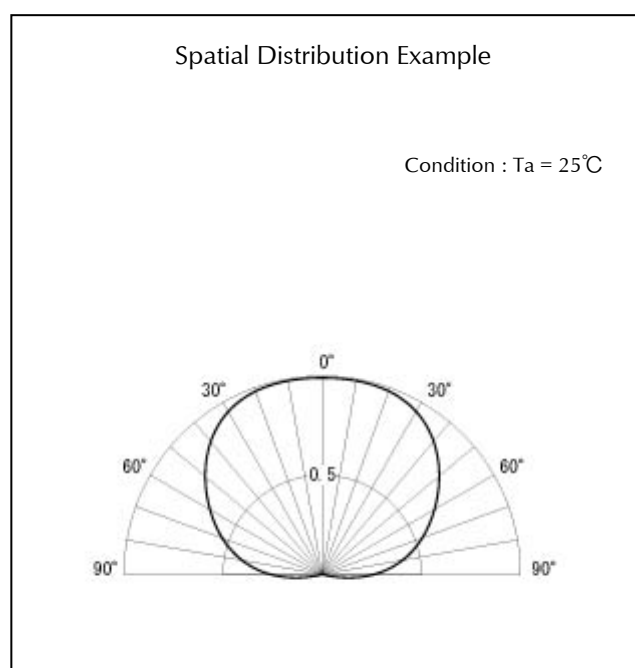
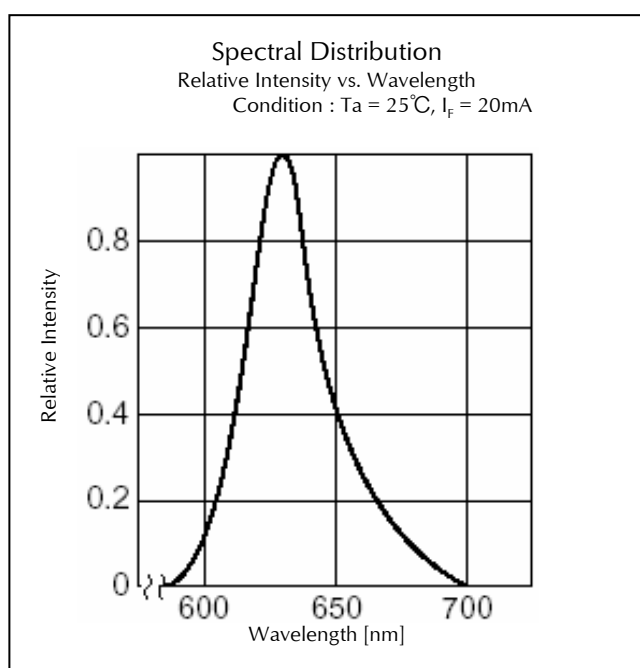
Technical Data(AA)



Technical Data(AA)



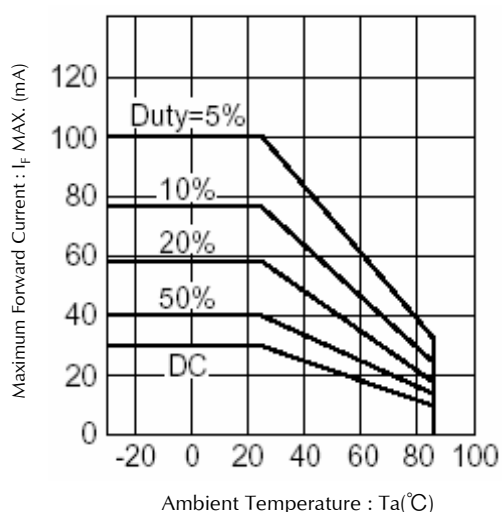
Technical Data(VR)



Technical Data(VR)

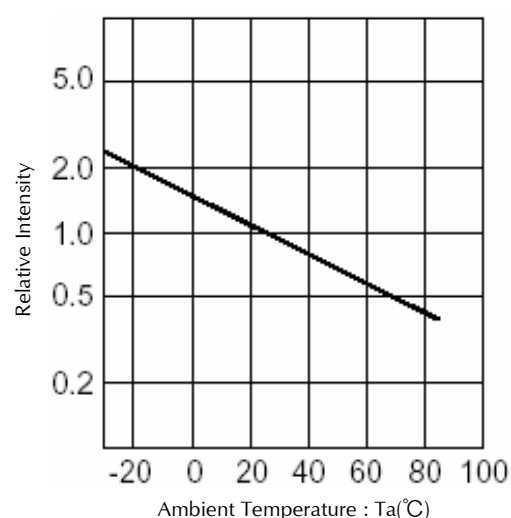
Derating

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

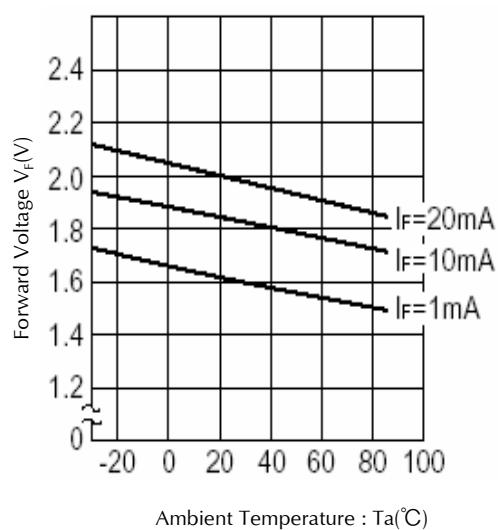


Ambient Temperature vs. Relative Intensity

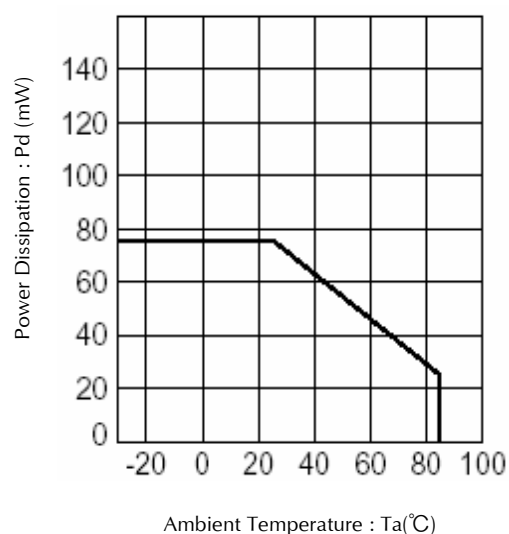
Condition : $I_F=20\text{mA}$



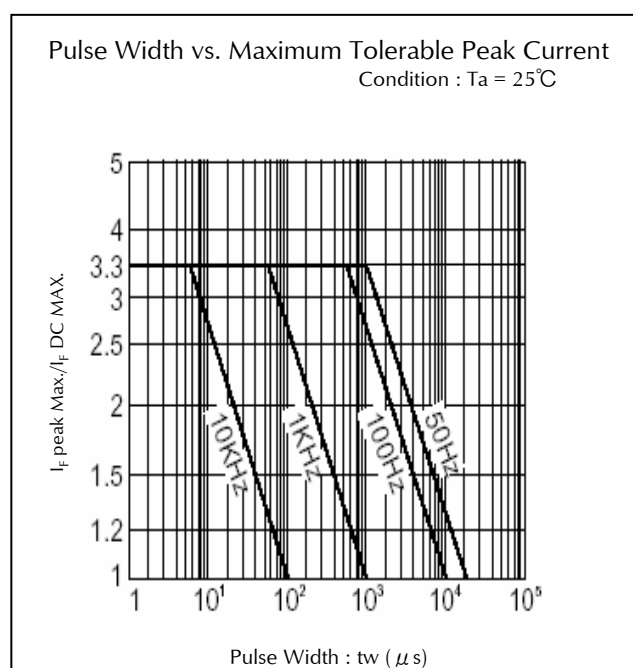
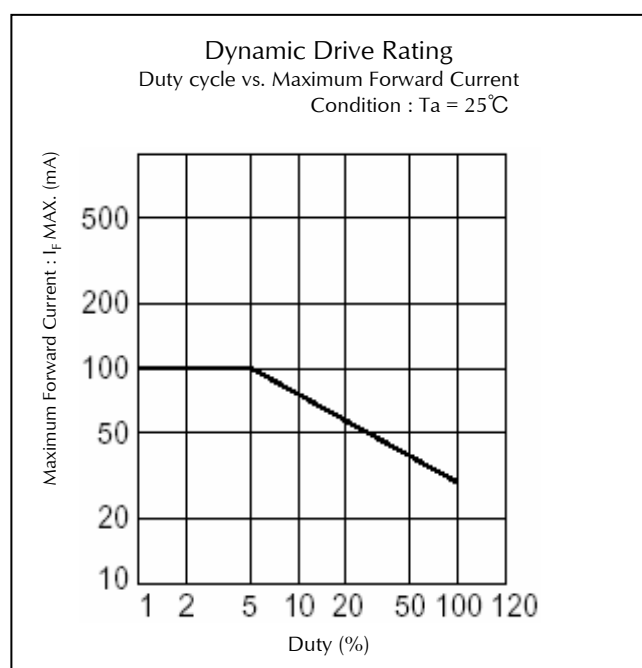
Ambient Temperature vs. Forward Voltage



Power Dissipation vs. Ambient Temperature

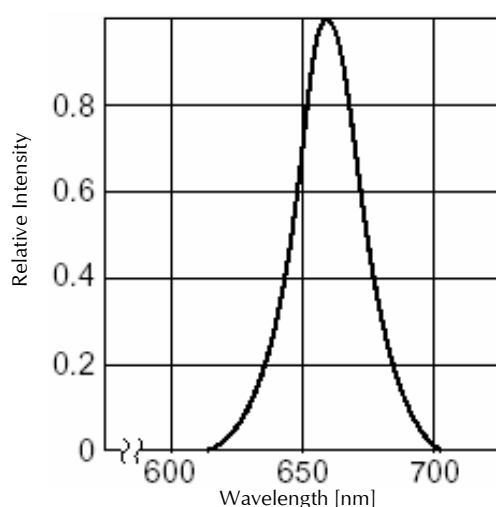


Technical Data(VR)



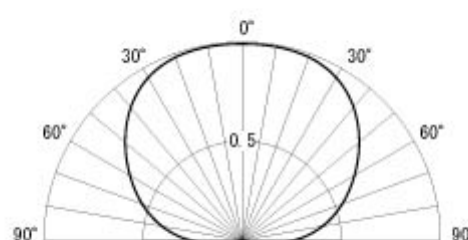
Technical Data(BR)

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

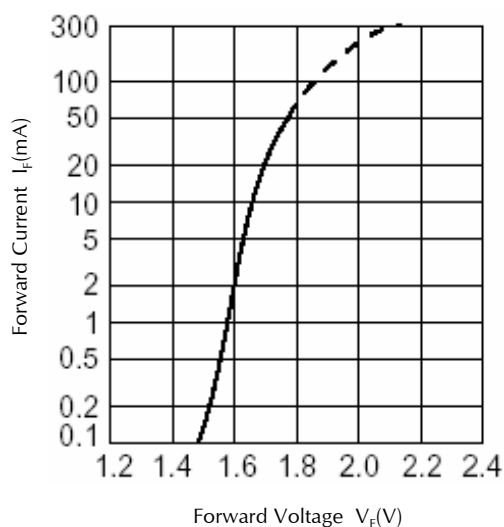


Spatial Distribution Example

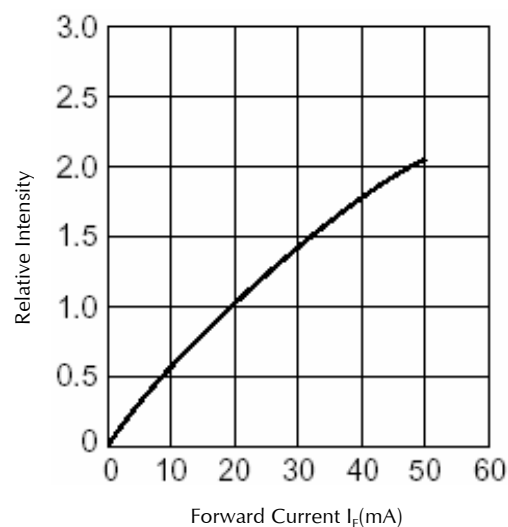
Condition : $T_a = 25^\circ\text{C}$



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



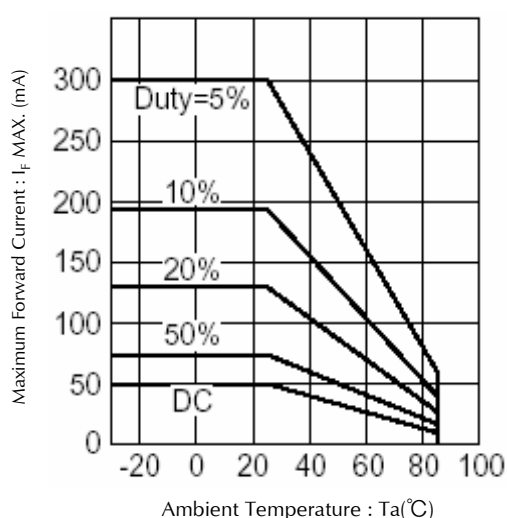
Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



Technical Data(BR)

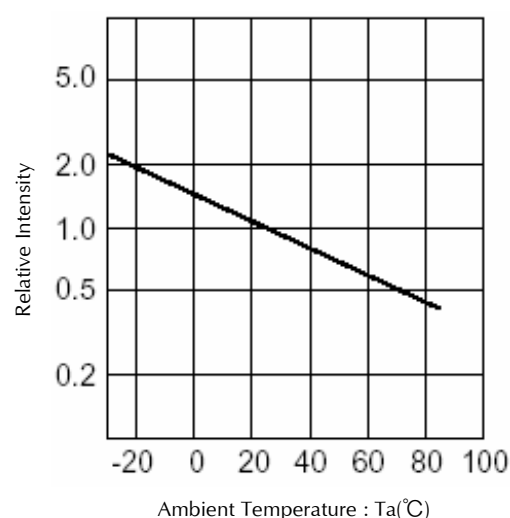
Derating

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

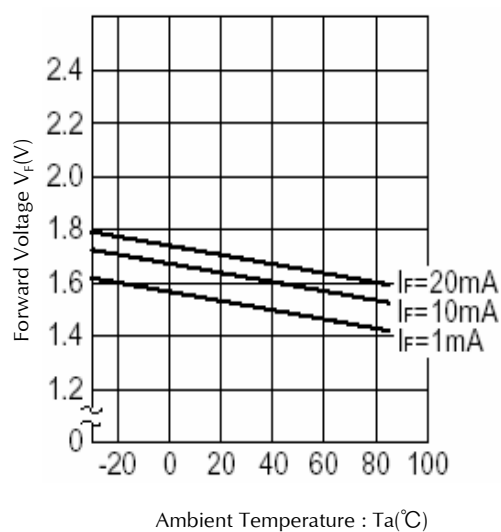


Ambient Temperature vs. Relative Intensity

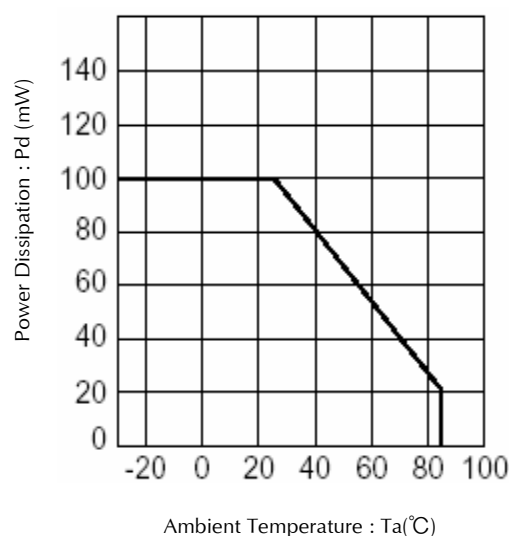
Condition : $I_f=20\text{mA}$



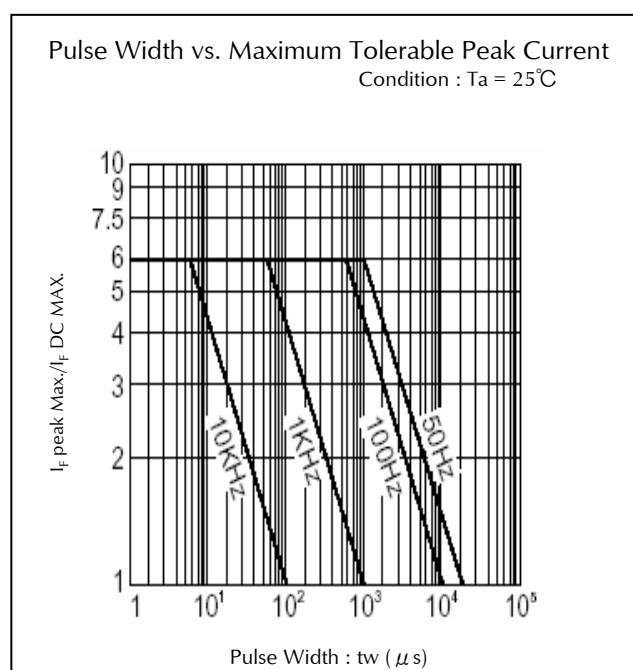
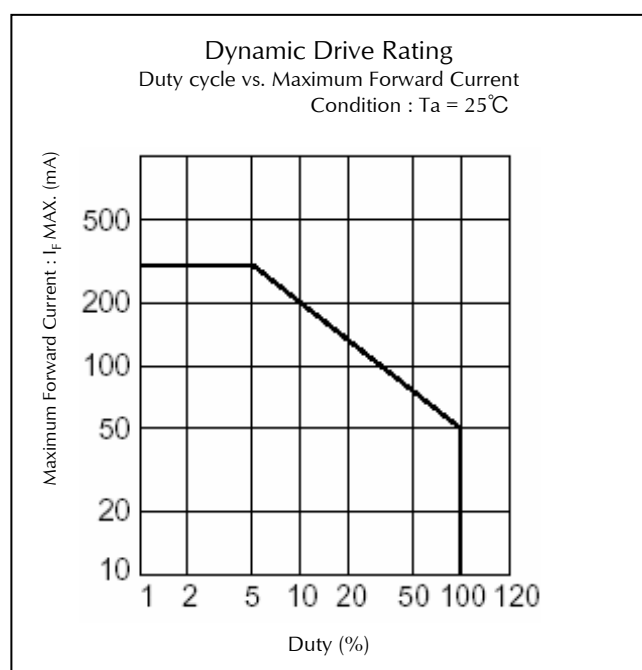
Ambient Temperature vs. Forward Voltage



Power Dissipation vs. Ambient Temperature

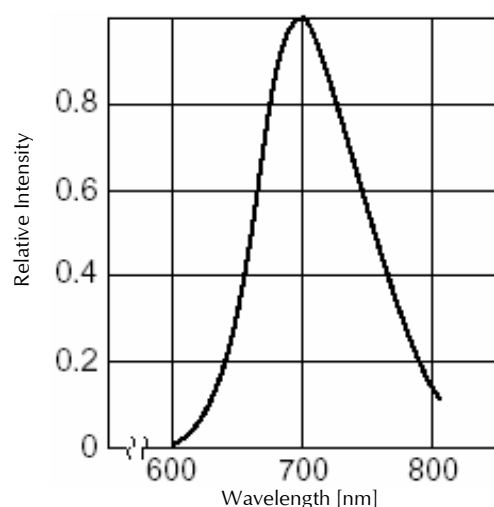


Technical Data(BR)



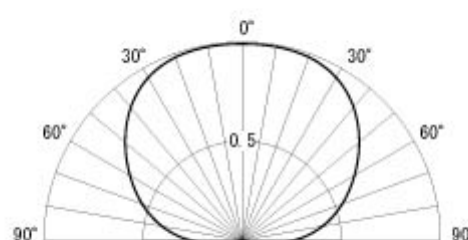
Technical Data(PR)

Spectral Distribution
Relative Intensity vs. Wavelength
Condition : $T_a = 25^\circ\text{C}$, $I_f = 10\text{mA}$

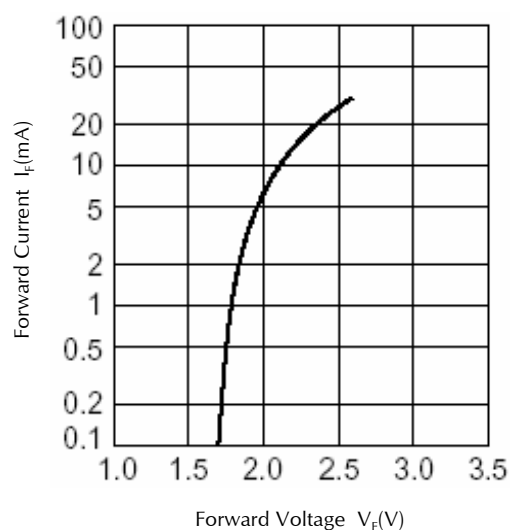


Spatial Distribution Example

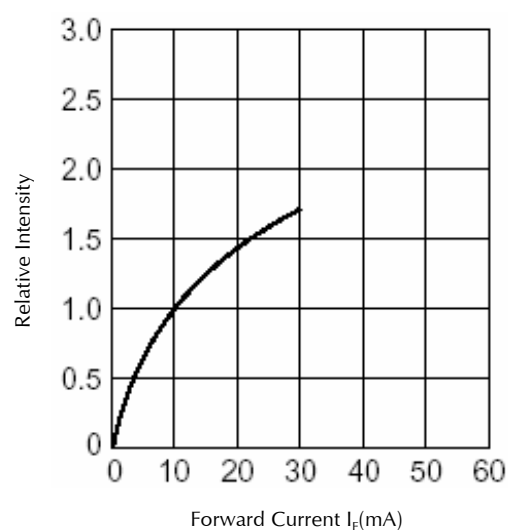
Condition : $T_a = 25^\circ\text{C}$



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



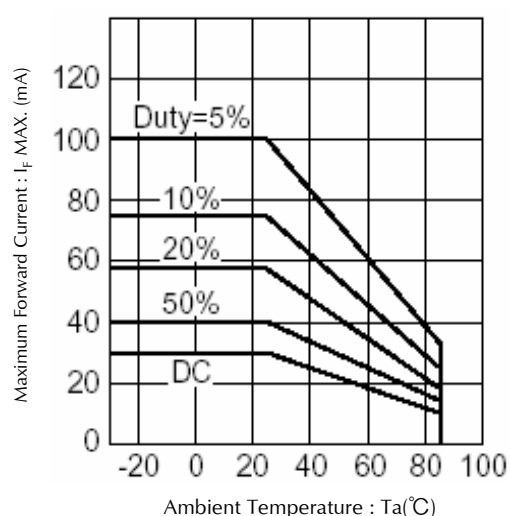
Forward Current vs. Relative Intensity
Condition : $T_a = 25^\circ\text{C}$



Technical Data(PR)

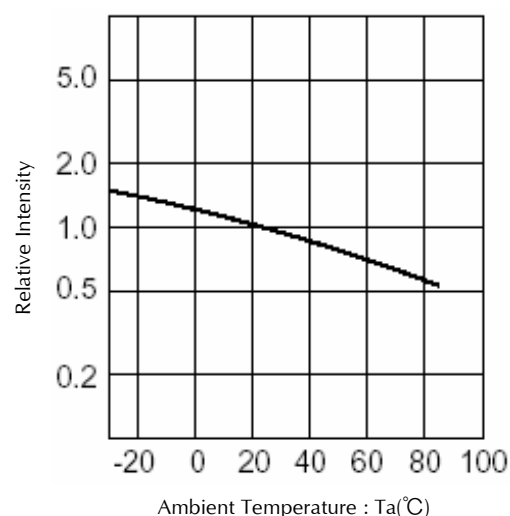
Derating

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

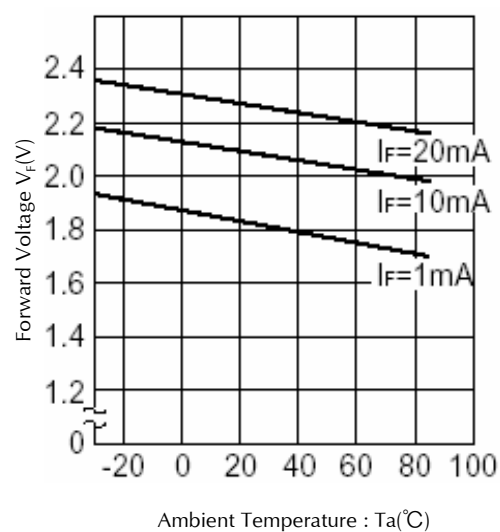


Ambient Temperature vs. Relative Intensity

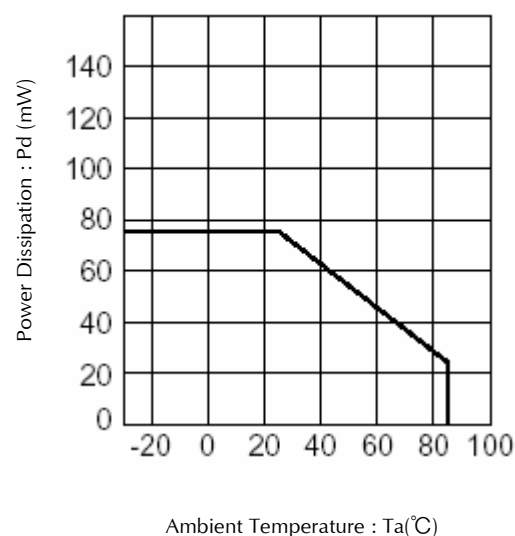
Condition : $I_F=10\text{mA}$



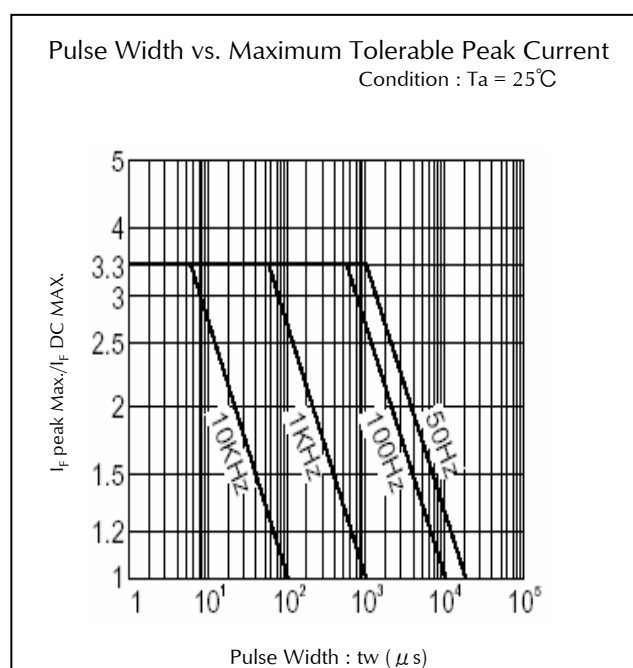
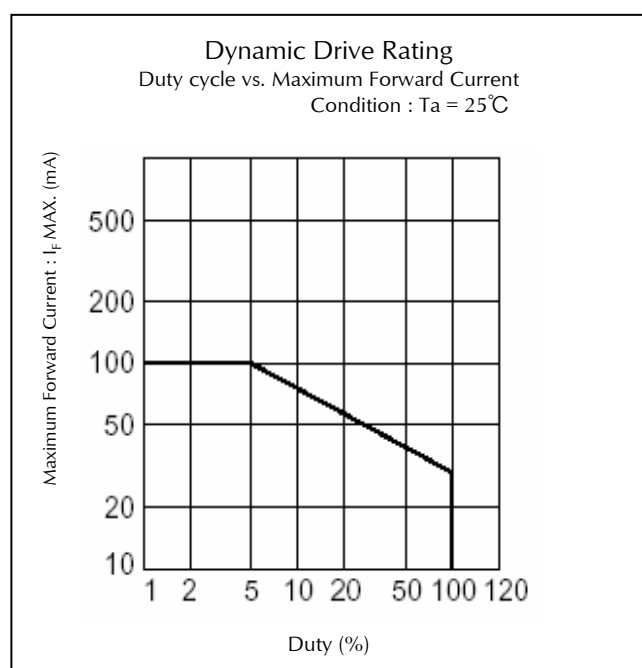
Ambient Temperature vs. Forward Voltage



Power Dissipation vs. Ambient Temperature

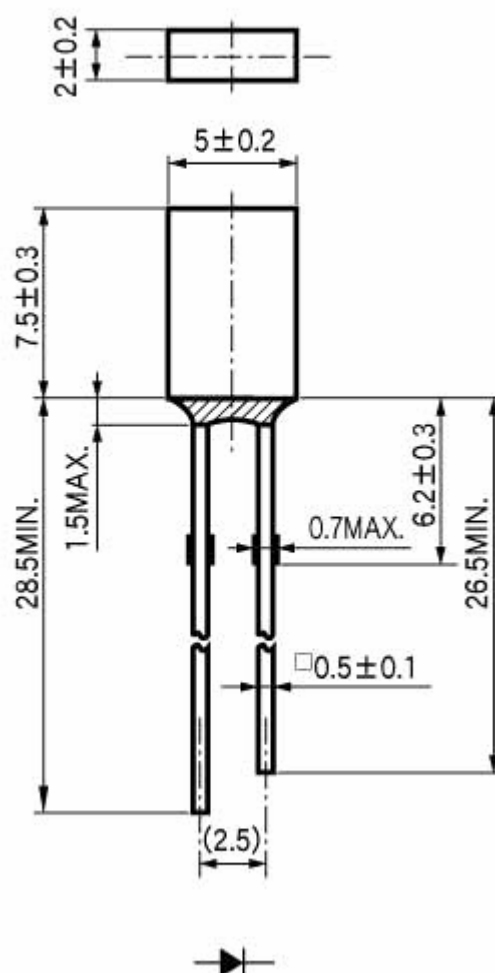


Technical Data(PR)



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	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 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	-	-	Occurrence of notable decoloration, deformation and cracking

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