



## Color Variations and Luminous Intensity

(Ta=25 )

Part No.	Material	Emitted Color	Lens Color	Dominant Wavelength		Luminous Intensity			Luminous Flux	
				$\lambda d$ (nm)		$I_v$ (mcd)			$\phi v$ (mlm)	
				TYP.	$I_F$	MIN.	MAX.	$I_F$	TYP.	$I_F$
VUB1111C	InGaN	Blue	Milky White	470	10	18	56	10	300	10
VUG1111C	InGaN	Green		530	10	56	180	10	700	10
VYBG1111C	AlGaInP			562	20	6.8	22	20	45	20

Note : The luminous intensity( $I_v$ ) and dominant wavelength ( $\lambda d$ ) above are the setup values of the sorting machine.  
(Tolerance :  $I_v$ ...  $\pm 10\%$ ,  $\lambda d$  ...  $\pm 1$ nm)

## Absolute Maximum Ratings

(Ta=25 )

Item	Symbol	Absolute Maximum Ratings			Unit
		VUB	VUG	VYBG	
Power Dissipation	$P_d$	84	84	81	mW
Forward Current	$I_F$	20	20	30	mA
Pulse Forward Current ※1	$I_{FRM}$	48	48	100	mA
Derating (Ta=75°C or higher)	$\Delta I_F$	0.40※2	0.40※2	1.0	mA/°C
	$\Delta I_{FRM}$	0.96※2	0.96※2	3.33	mA/°C
Reverse Voltage	$V_R$	5	5	5	V
Operating Temperature	$T_{opr}$	-40~+100			°C
Storage Temperature	$T_{stg}$	-40~+110	-40~+120		°C

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

※2 Temperature Condition: Ta=60°C or higher.

## Thermal Characteristics

Item	Symbol	Ratings			Unit
		VUB	VUG	VYBG	
Junction Temperature (MAX.)	$T_j$	110	110	120	°C
Thermal Resistance (TYP.) (Junction/ ambient)	$R_{(th\ j-a)}$	500	500	600	°C/W
Thermal Resistance (TYP.) (Junction/ Solder Point)	$R_{(th\ j-s)}$	300	300	400	°C/W

※ $R_{(th\ j-a)}$  Measurement Condition /

Substrate: FR4( $t=1.6$ mm) Pattern Size: 16mm<sup>2</sup>.

## Electro-Optical Characteristics (VUB,VUG)

(Ta=25 )

Item	Conditions	Symbol	Characteristic Ratings		Unit	
			VUB	VUG		
Forward Voltage	I <sub>F</sub> =10mA	V <sub>F</sub>	TYP.	3.3	V	
			MAX.	3.8		
Reverse Current	V <sub>R</sub> =5V	I <sub>R</sub>	MAX.	100	μ A	
Peak Wavelength	I <sub>F</sub> =10mA	λ <sub>p</sub>	TYP.	465	522	nm
Dominant Wavelength	I <sub>F</sub> =10mA	λ <sub>d</sub>	TYP.	470	530	nm
Spectral Line Half Width	I <sub>F</sub> =10mA	Δλ	TYP.	26	35	nm
Half Intensity Angle	I <sub>F</sub> =10mA	2θ 1/2	TYP.	150(θ x)	150(θ x)	deg.
				165(θ y)	165(θ y)	

Note: The dominant wave length (λ<sub>d</sub>) above is the setup value of the sorting machine.  
(Tolerance : λ<sub>d</sub>...±1nm)

## Electro-Optical Characteristics (VYBG)

(Ta=25 )

Item	Conditions	Symbol	Characteristic Rating		Unit
			VYBG		
Forward Voltage	I <sub>F</sub> =20mA	V <sub>F</sub>	TYP.	2.1	V
			MAX.	2.5	
Reverse Current	V <sub>R</sub> =5V	I <sub>R</sub>	MAX.	100	μ A
Peak Wavelength	I <sub>F</sub> =20mA	λ <sub>p</sub>	TYP.	565	nm
Dominant Wavelength	I <sub>F</sub> =20mA	λ <sub>d</sub>	TYP.	562	nm
Spectral Line Half Width	I <sub>F</sub> =20mA	Δλ	TYP.	15	nm
Half Intensity Angle	I <sub>F</sub> =20mA	2θ 1/2	TYP.	120(θ x)	deg.
				140(θ y)	

Note: The dominant wave length (λ<sub>d</sub>) above is the setup value of the sorting machine.  
(Tolerance : λ<sub>d</sub>...±1nm)

## Luminous Intensity Rank

(Ta=25 )

### Standard Chart(Unit: mcd)

Rank	I <sub>v</sub> (mcd)		VUB	VUG	VYBG
	MIN.	MAX.	I <sub>f</sub> =10mA		I <sub>f</sub> =20mA
A7	3.3	3.9			
A8	3.9	4.7			
A9	4.7	5.6			
AX	5.6	6.8			
AY	6.8	8.2			AY
AZ	8.2	10.0			
B1	10.0	12.0			
B2	12.0	15.0			
B3	15.0	18.0			
B4	18.0	22.0	B4		B4
B5	22.0	27.0			
B6	27.0	33.0			
B7	33.0	39.0			
B8	39.0	47.0			
B9	47.0	56.0	B9		
BX	56.0	68.0		BX	
BY	68.0	82.0			
BZ	82.0	100.0			
C1	100.0	120.0			
C2	120.0	150.0			
C3	150.0	180.0		C3	
C4	180.0	220.0			
C5	220.0	270.0			
C6	270.0	330.0			
C7	330.0	390.0			
C8	390.0	470.0			
C9	470.0	560.0			

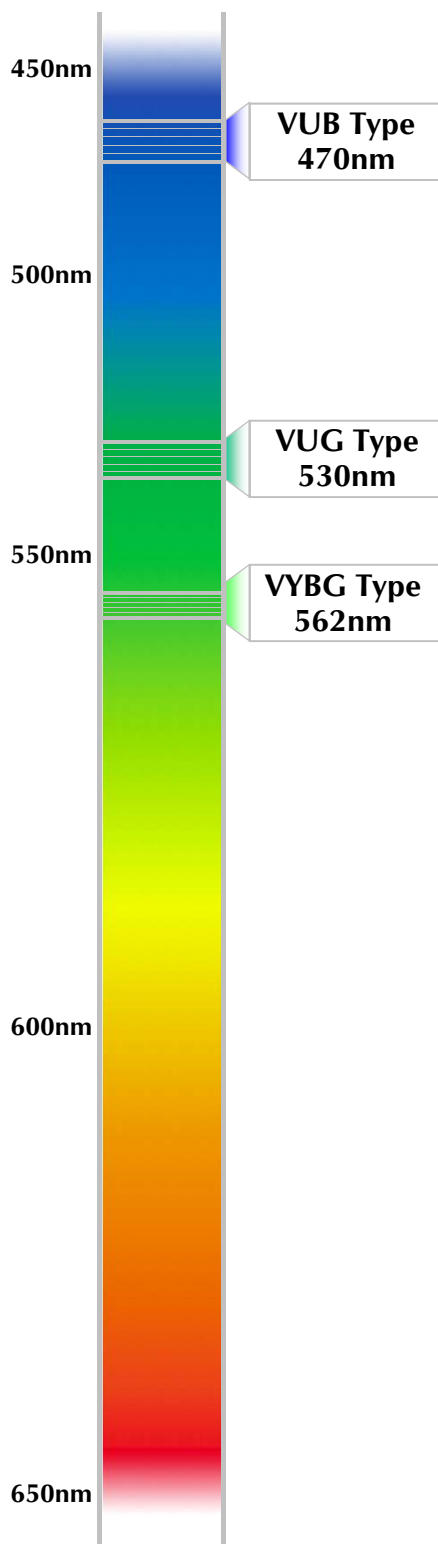
Limited width of luminous intensity rank is from Min.4 rank width.

## Color Tone Groups ( $\lambda_d$ )

( $T_a=25$  )

( unit : nm )

Tolerance: +/-1nm



### VUB Type ( $I_F=10mA$ )

	B	C	D
MIN.	464.0	468.0	472.0
MAX.	468.0	472.0	476.0

### VUG Type ( $I_F=10mA$ )

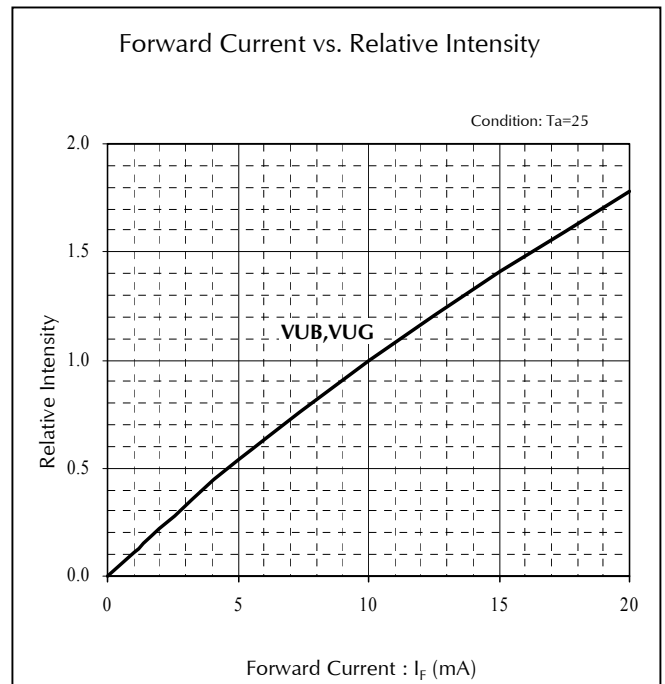
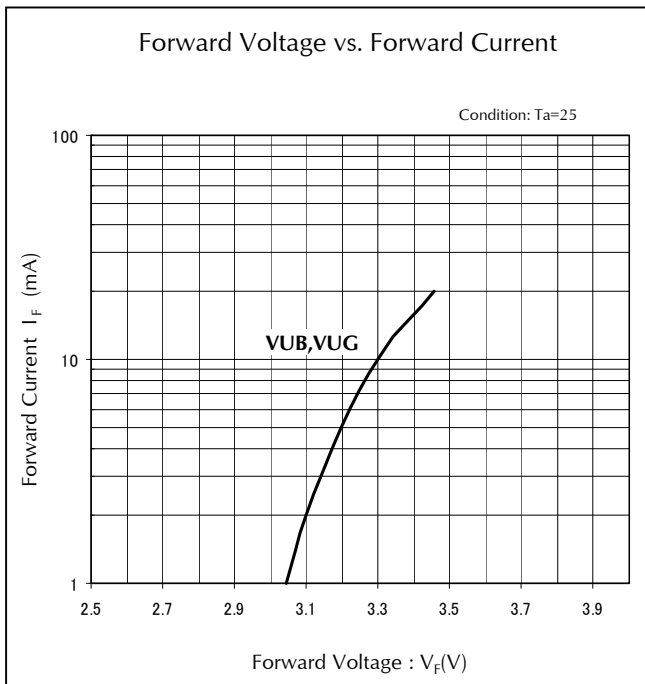
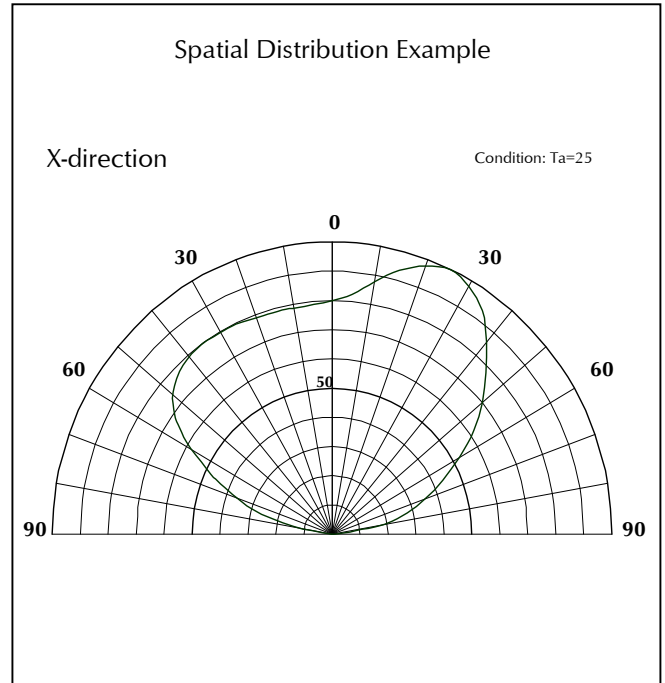
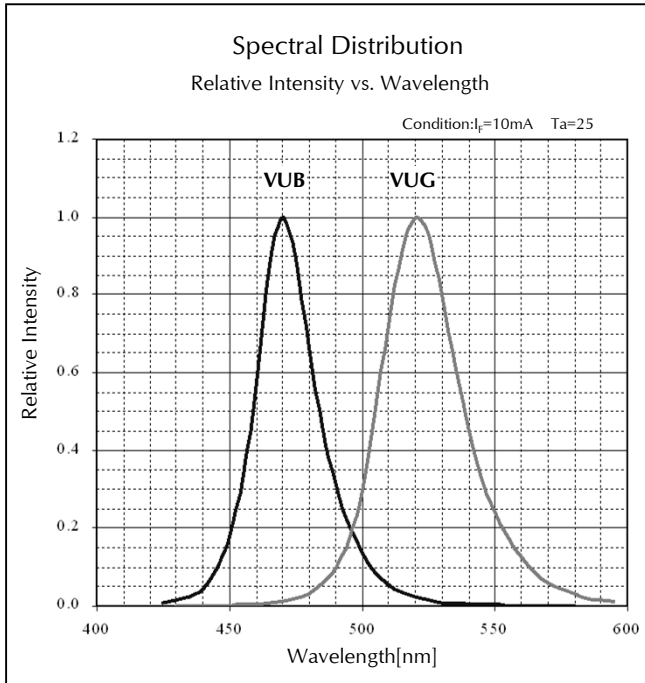
	B	C	D
MIN.	520.0	525.0	530.0
MAX.	525.0	530.0	535.0

### VYBG Type ( $I_F=20mA$ )

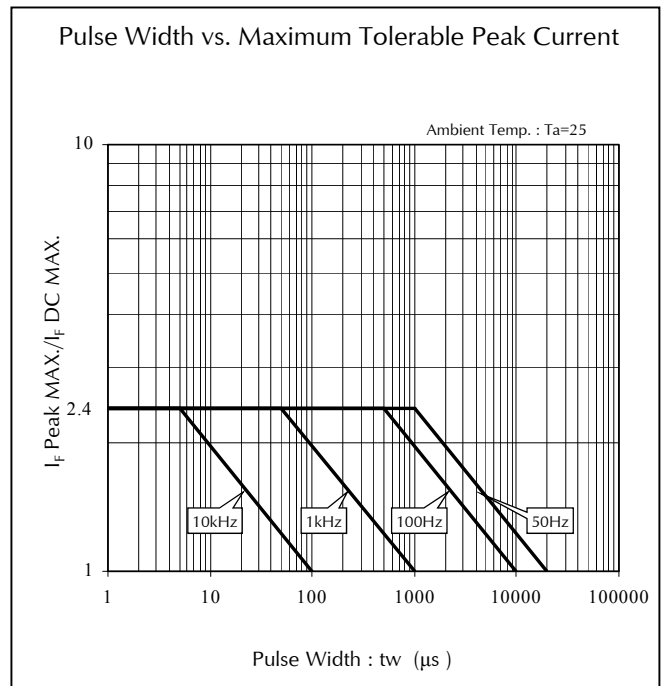
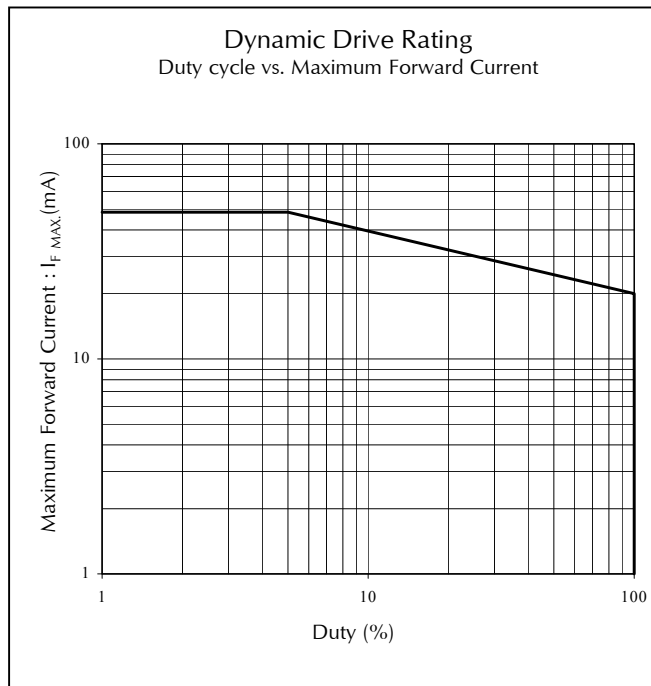
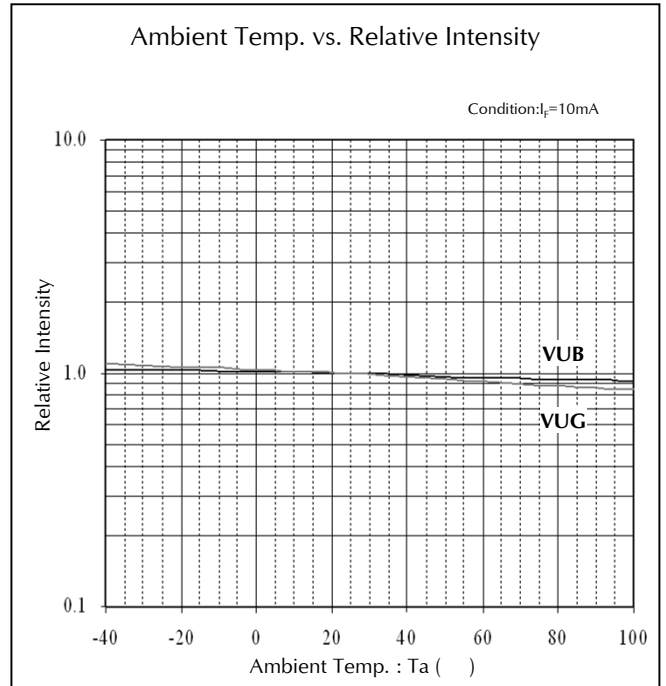
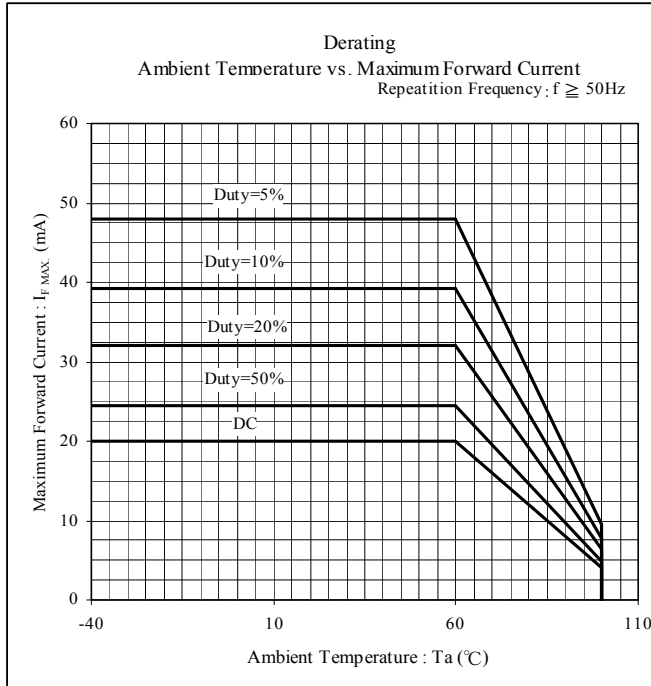
	B	C	D
MIN.	555.0	558.0	561.0
MAX.	558.0	561.0	564.0

Limited width of color tone rank is from Min.3 to Min.4 rank width.  
(It changes with product.)

## Characteristics Chart (VUB,VUG)

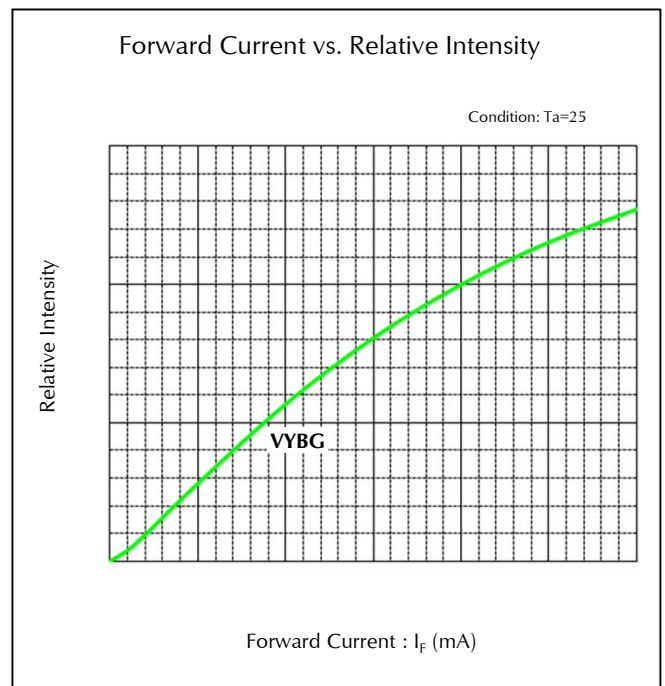
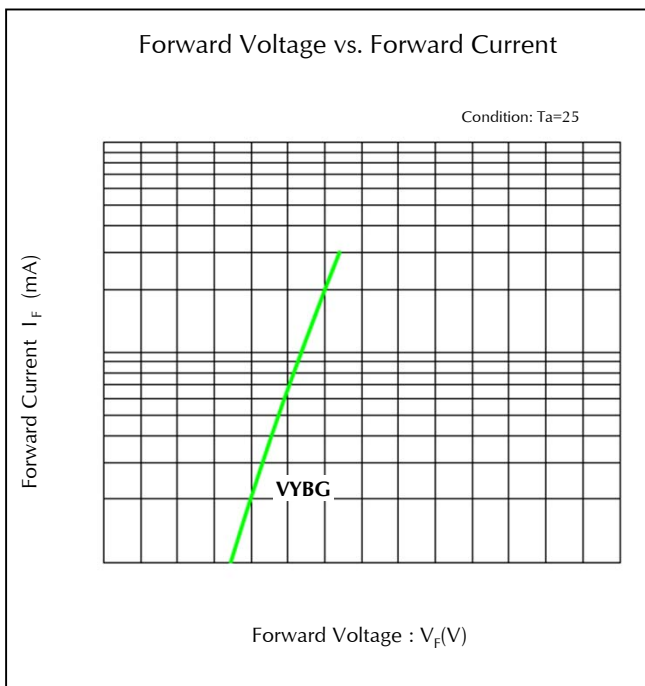
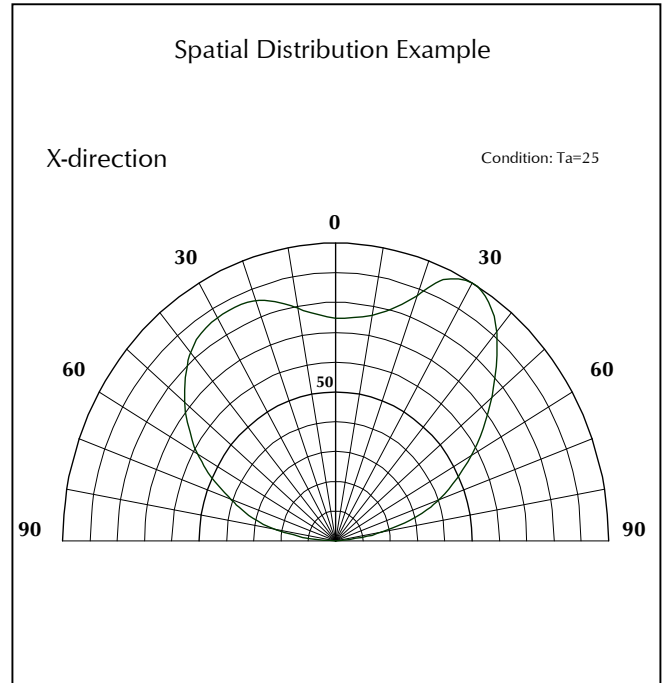
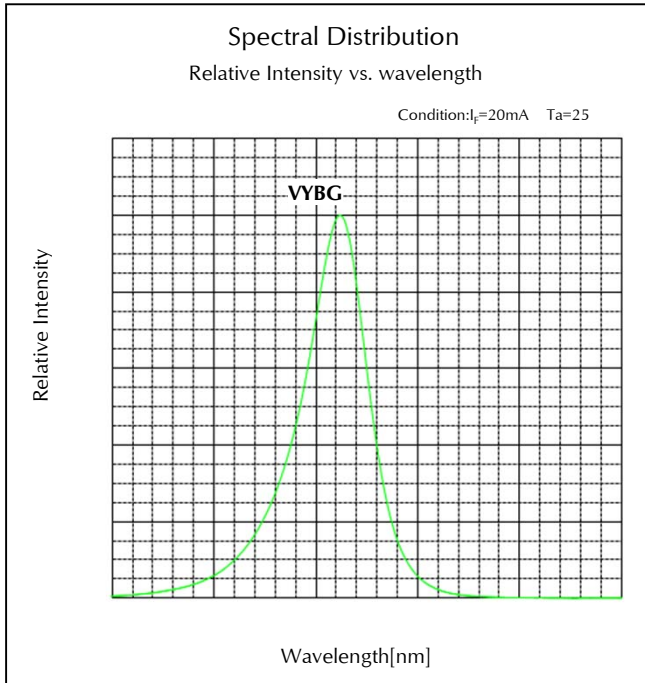


## Characteristics Chart (VUB,VUG)

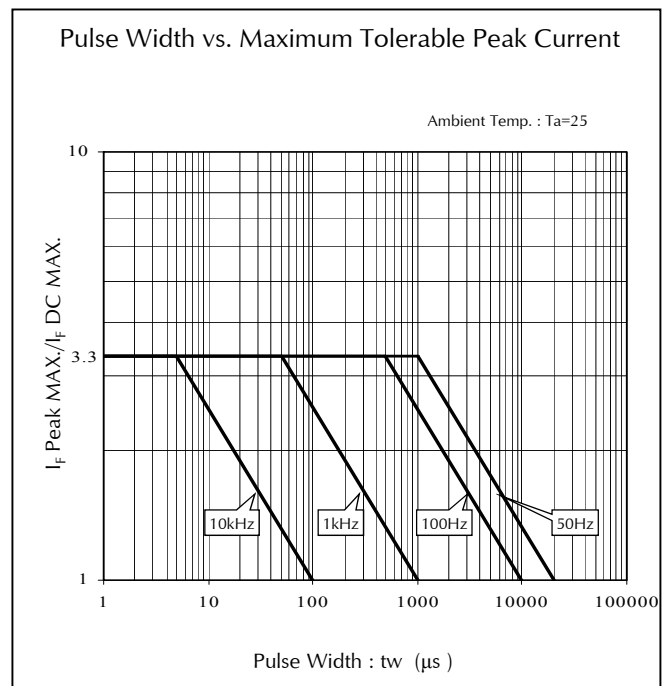
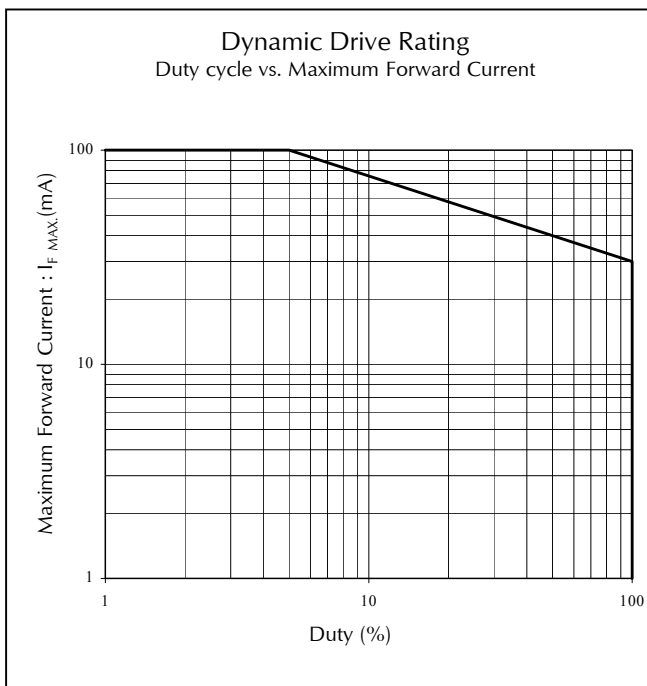
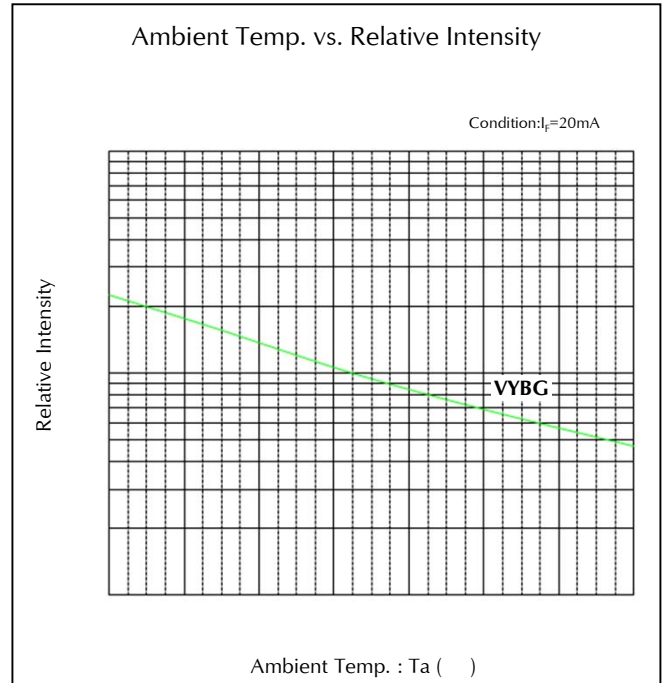
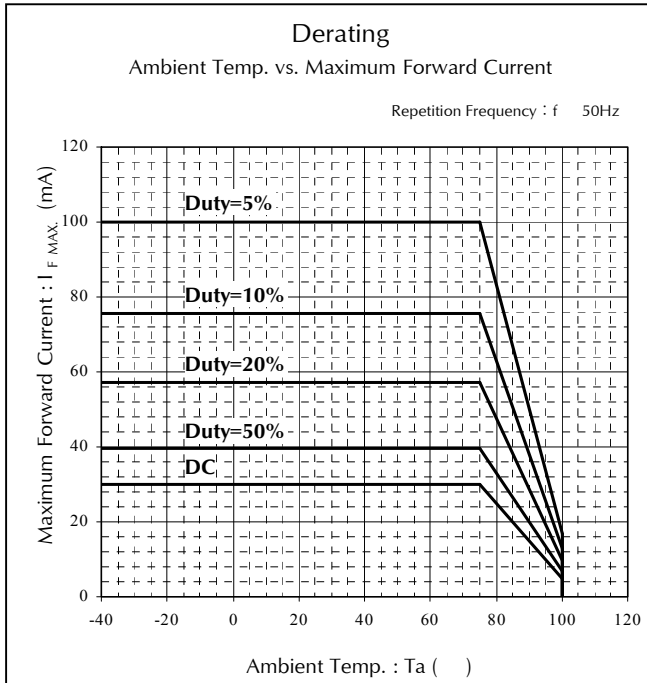




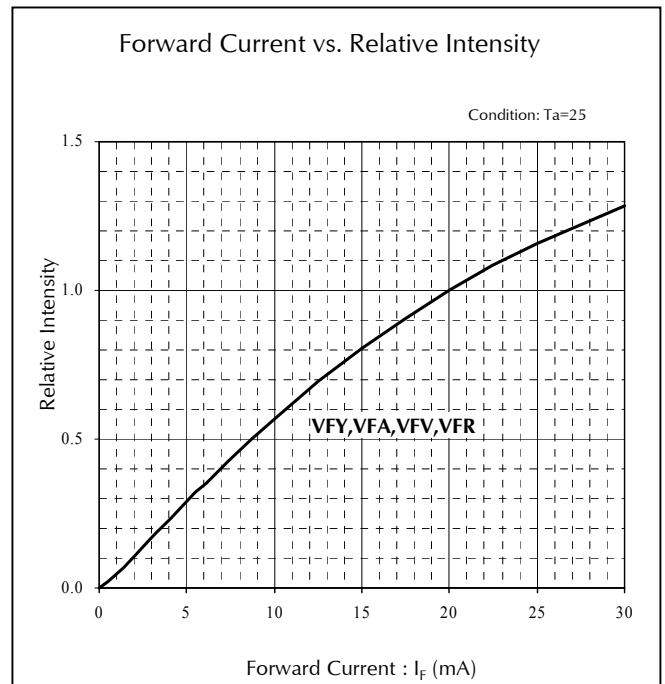
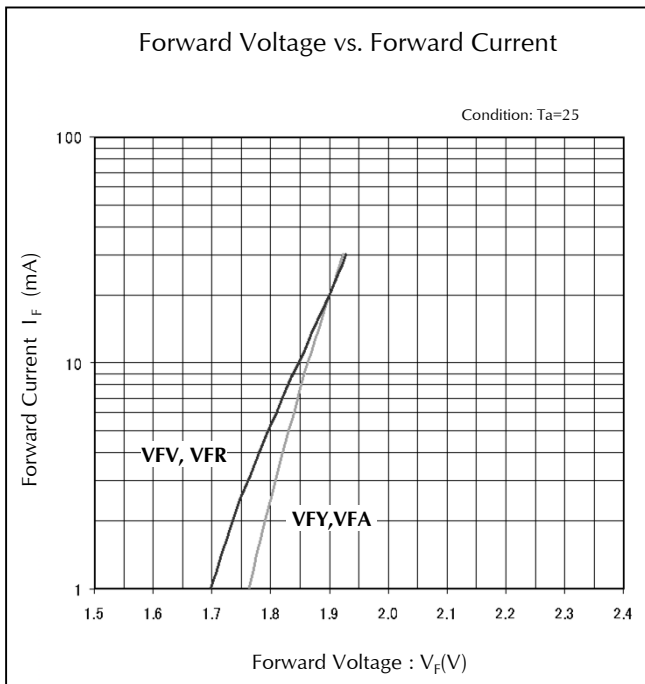
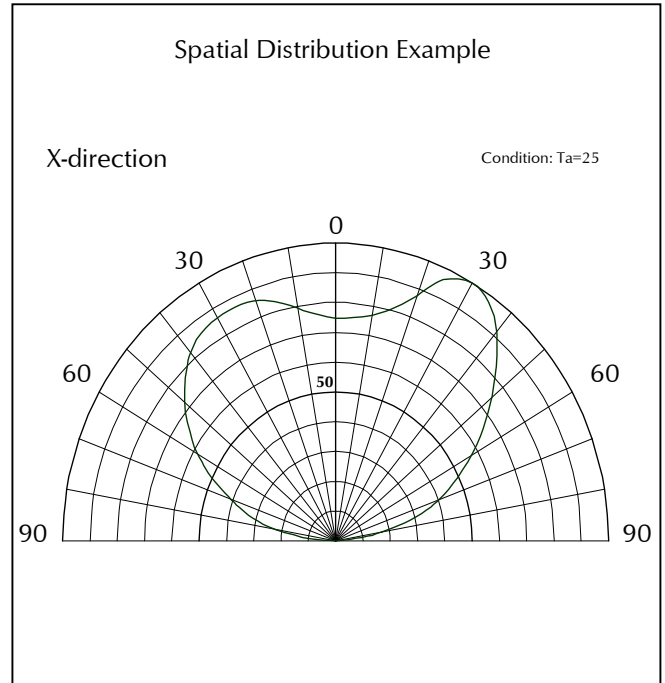
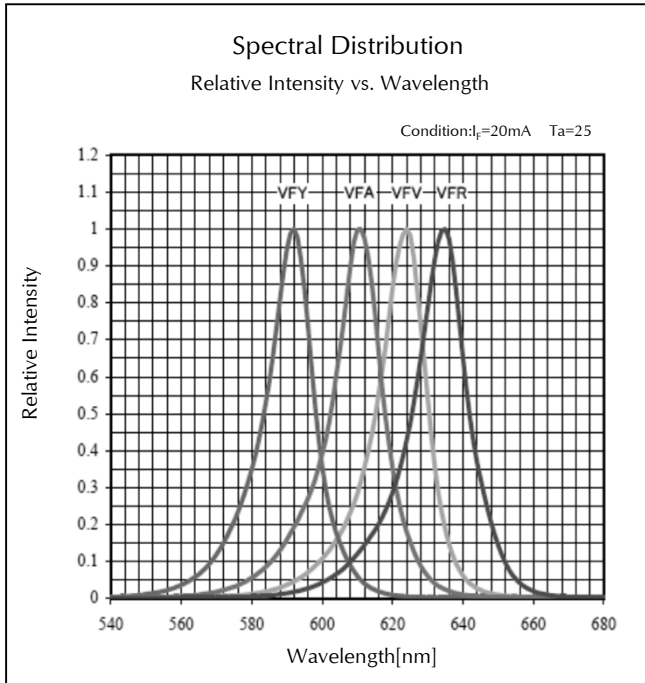
## Characteristics Chart (VYBG)



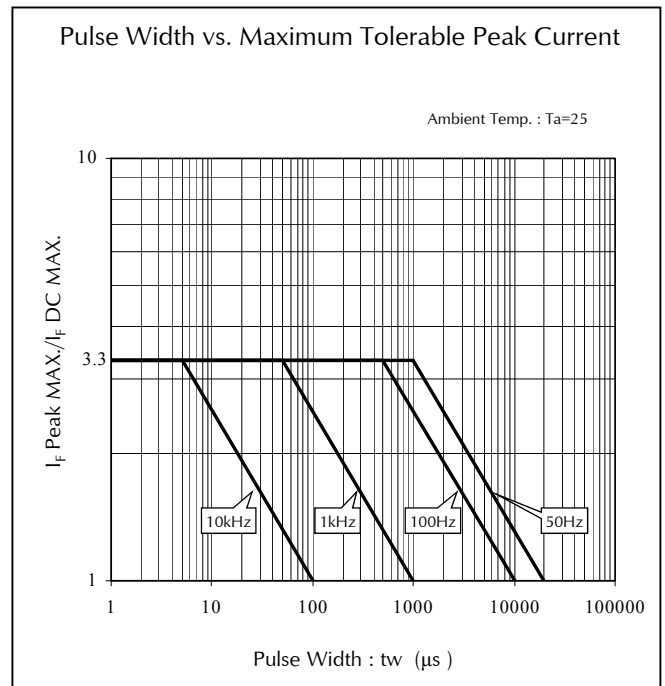
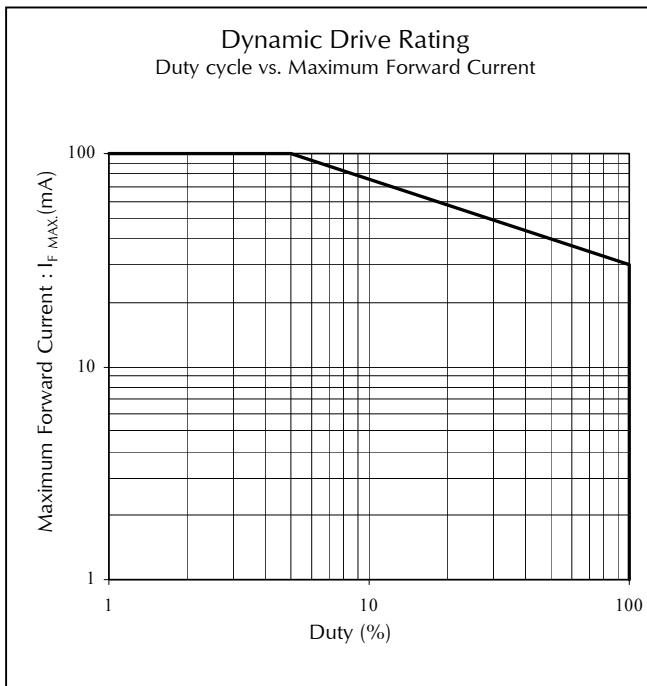
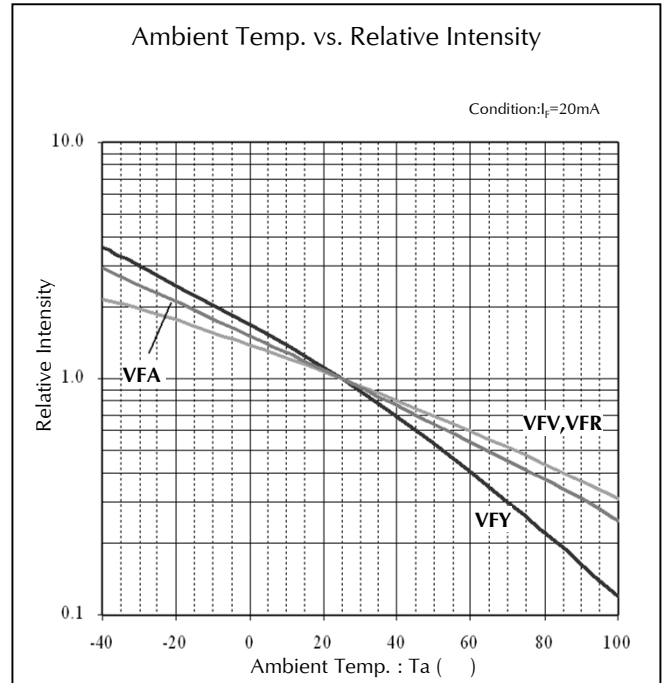
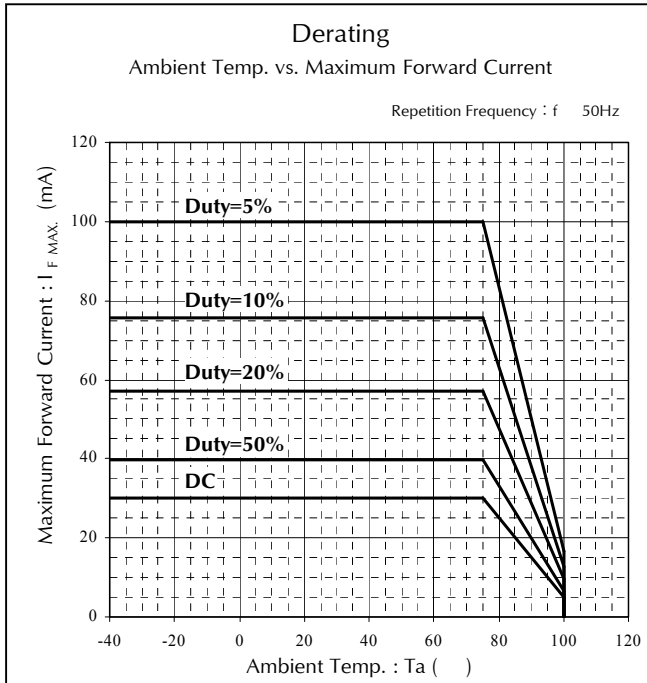
## Characteristics Chart (VYBG)



## Characteristics Chart (VFY, VFA, VFV, VFR)



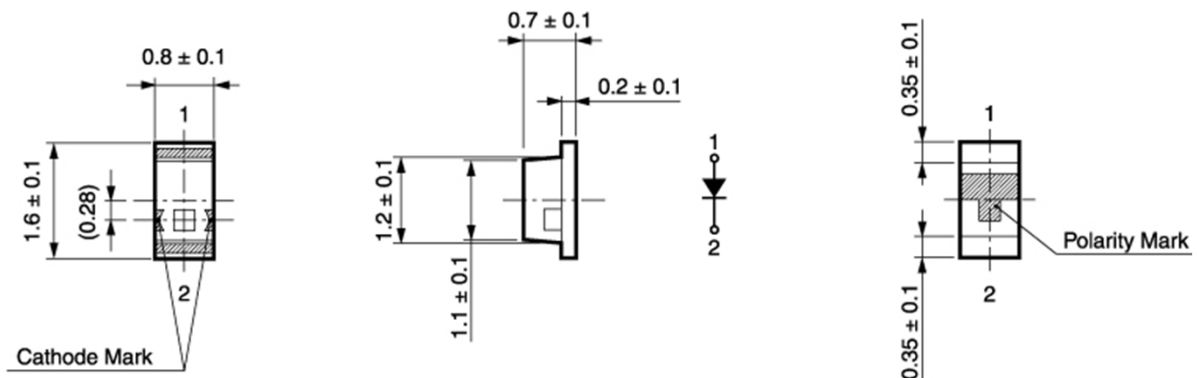
## Characteristics Chart (VFY, VFA, VFV, VFR)



## Package Dimensions

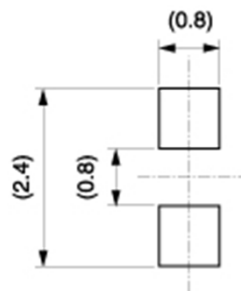
(Unit: mm)

Weight: (1.40)mg



## Recommended Soldering Pattern

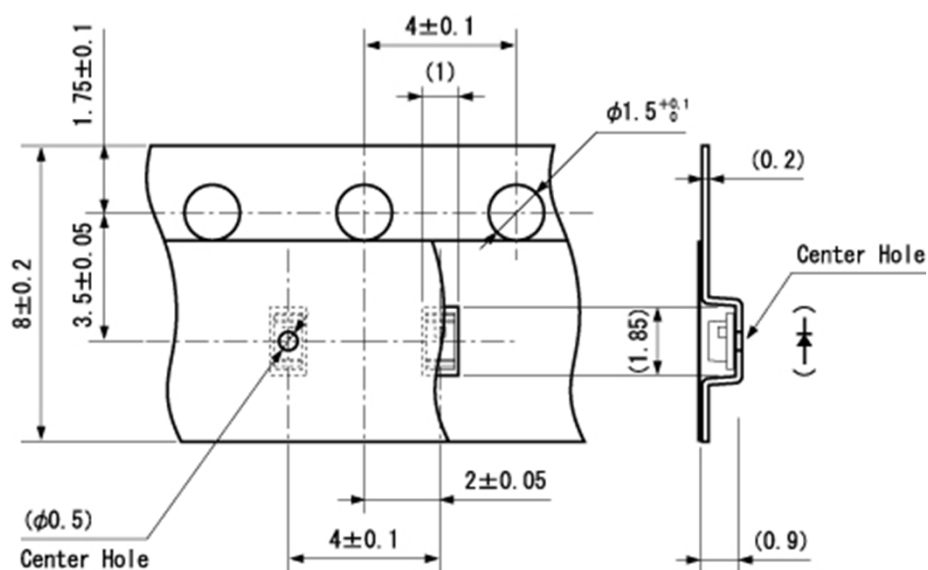
(Unit: mm)



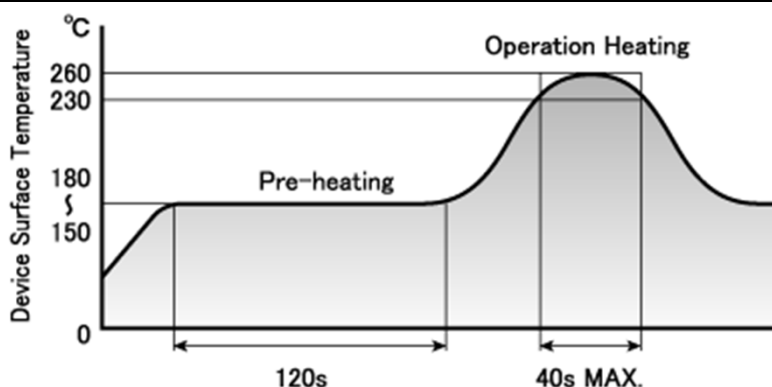
## Taping Specification

(Unit: mm)

•Quantity: 4,000pcs/ reel (standard)



## Reflow Soldering Conditions



- 1) The above profile temperature gives the maximum temperature of the LED resin surface. Please set the temperature so as to avoid exceeding this range.
- 2) Total times of reflow soldering process shall be no more than 2 times. When the second reflow soldering process is performed, intervals between the first and second reflow should be short as possible (while allowing some time for the component to return to normal temperature after the first reflow) in order to prevent the LED from absorbing moisture.
- 3) Temperature fluctuation to the LED during the pre-heating process shall be minimized.

## Manual Soldering Conditions

Iron tip temp.	350	(MAX.)
Soldering time and frequency	3 s	(MAX.)
	1 time	(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	0/20
High Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = Maximum Rated Operating Temperature, If = Derating Value	1,000 h	0/20
Low Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = -40°C, If = Maximum Rated Current	1,000 h	0/20
Wet High Temp. Operating Life	EIAJ ED-4701/100(102)	Ta = 60°C, 90%, If = Maximum Rated Current	1,000 h	0/20
Wet High Temp. Storage Life	EIAJ ED-4701/100(103)	Ta = 60°C, 90%	1,000 h	0/20
Thermal Shock	EIAJ ED-4701/100(105)	Ta = -40°C ~ Maximum Rated Storage Temperature (each 15min.)	1,000 cycles	0/20
Thermal Shock Operating	EIAJ ED-4701/100(105)	Ta = -40°C(off) ~ 85°C (If = Derating Value on), (each 15min.)	1,000 cycles	0/20
High Temp. Storage Life	EIAJ ED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/20
Low Temp. Storage Life	EIAJ ED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/20
Cycled Temp. Humidity Life	EIAJ ED-4701/200(203)	Ta = -30°C(2h) ~ 80°C, 95%(2h), 8h/cycle, If = Derating Value, 5min on-off	30 cycles	0/20
Resistance to Reflow Soldering	EIAJ ED-4701/300(301)	Moisture Soak : 30°C, 70%, 72h Preheat : 150 ~ 180°C(120s Max.) Soldering Temp. : 260°C(5s)	Twice	0/20
Electric Static Discharge (ESD) <sup>**1</sup>	EIAJ ED-4701/300(304)	C = 100pF, R2 = 1.5KΩ, ±2,000V	once each polarity	0/10
Vibration, Variable Frequency	EIAJ ED-4701/400(403)	98.1m/s <sup>2</sup> (10G), 100 ~ 2KHz, 20min, XYZ each direction	2 h	0/10

1 Reference test

## 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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