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BAR DIGIT LED DISPLAY

LBD356B-XX

DATA SHEET

DOC. NO : QW0905-LBD356B-XX

REV. : B

DATE : 18 - Jan. - 2007



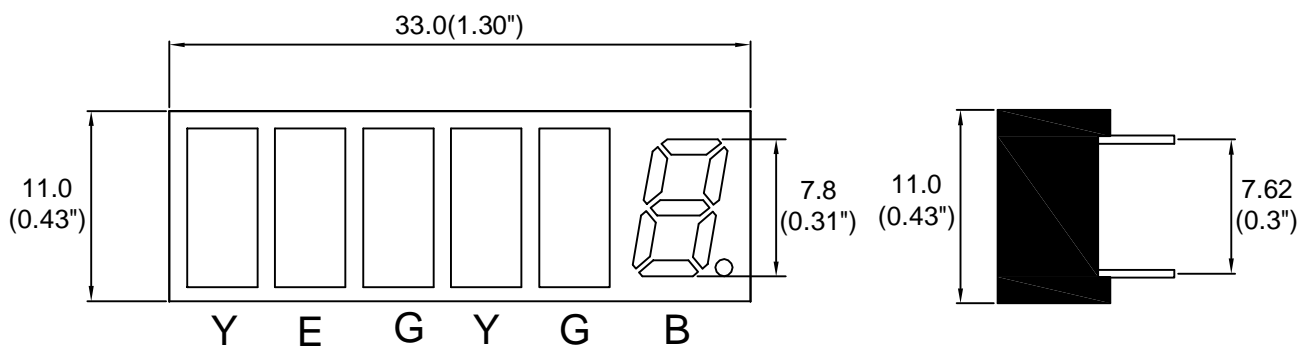
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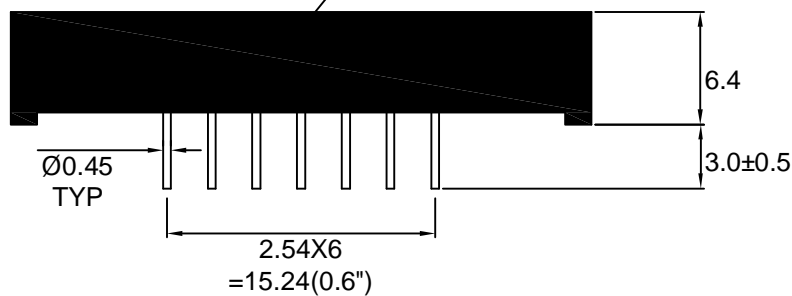
PART NO. LBD356B-XX

Page 1/10

Package Dimensions



LBD356B-XX
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PIN NO.1 →

- Note : 1.All dimension are in millimeters and (Inch) tolerance is $\pm 0.25\text{mm}(0.01")$ unless otherwise noted.
2.Specifications are subject to change without notice.
3.Film:temperature-resistant $\leq 100^{\circ}\text{C}$.



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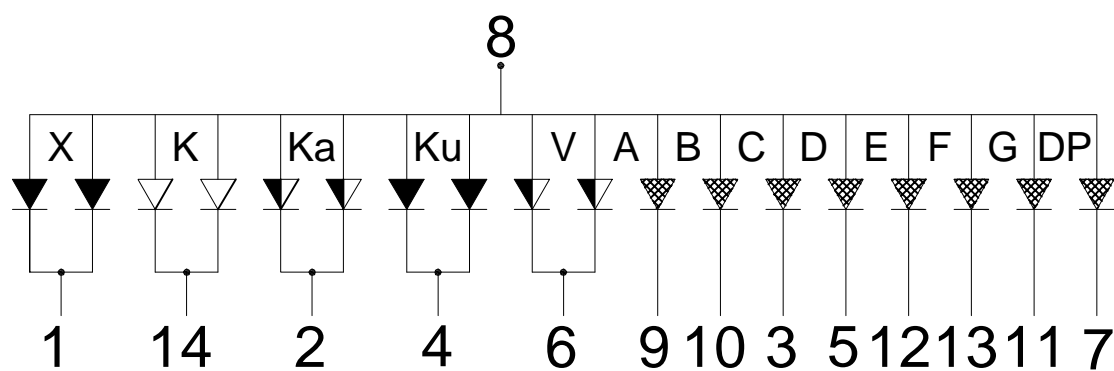
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PART NO. LBD356B-XX

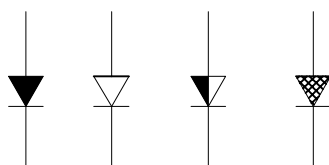
Page 2/10

Internal Circuit Diagram

LBD356B-XX



HYS HE 9UG SBKS



**Electrical Connection**

PIN NO.	LBD356B-XX
1.	Cathode X
2.	Cathode Ka
3.	Cathode C
4.	Cathode Ku
5.	Cathode D
6.	Cathode V
7.	Cathode DP
8.	Common Anode
9.	Cathode A
10.	Cathode B
11.	Cathode G
12.	Cathode E
13.	Cathode F
14.	Cathode K



Absolute Maximum Ratings at Ta=25 °C

Parameter	Symbol	Ratings				UNIT
		HYS	HE	9UG	SBKS	
Forward Current Per Chip	IF	30	30	30	30	mA
Peak Forward Current Per Chip (Duty 1/10,0.1ms Pulse Width)	IFP	60	60	60	100	mA
Power Dissipation Per Chip	PD	75	75	75	120	mW
Reverse Current Per Any Chip	Ir	10			50	μA
Electrostatic Discharge(*)	ESD	2000			500	V
Operating Temperature	Topr	-25 ~ +85				℃
Storage Temperature	Tstg	-25 ~ +85				℃
Solder Temperature 1/16 Inch Below Seating Plane For 3 Seconds At 260 ℃						

* Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handling these LED. All devices, equipment and machinery must be properly grounded.

Part Selection And Application Information(Ratings at 25°C)

PART NO	CHIP		common cathode or anode	λ D (nm)	$\Delta \lambda$ (nm)	Electrical					IV-M
	Material	Emitted				Vf(v)			Iv(mcd)		
						Min.	Typ.	Max.	Min.	Typ.	
LBD356B-XX	AlGaInP	Yellow	Common Anode	587	15	1.7	2.1	2.6	---	---	2:1
	AlGaInP	Orange		620	17	1.7	2.1	2.6	---	---	
	AlGaInP	Green		574	20	1.7	2.1	2.6	---	---	
	InGaN/SiC	Blue		475	26	---	3.5	4.2	3.05	5.0	

Note : 1.The forward voltage data did not including $\pm 0.1V$ testing tolerance.

2. The luminous intensity data did not including $\pm 15\%$ testing tolerance.

**Test Condition For Each Parameter**

Parameter	Symbol	Unit	Test Condition
Forward Voltage Per Chip	V _f	volt	I _f =20mA
Luminous Intensity Per Chip	I _v	mcd	I _f =10mA
Dominant Wavelength	λ_D	nm	I _f =20mA
Spectral Line Half-Width	$\Delta \lambda$	nm	I _f =20mA
Reverse Current Any Chip	I _r	μA	V _r =5V
Luminous Intensity Matching Ratio	IV-M		



Typical Electro-Optical Characteristics Curve HYS CHIP

Fig.1 Forward current vs. Forward Voltage

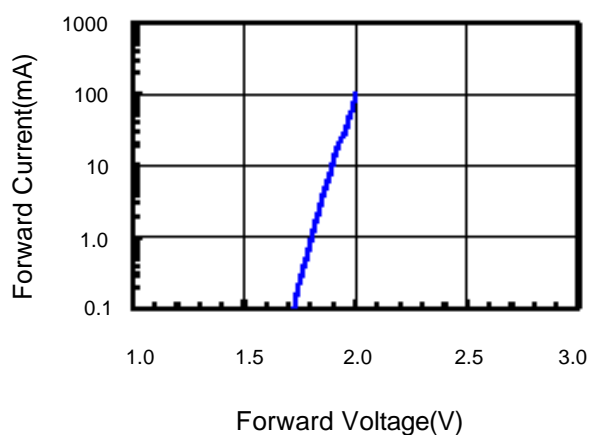


Fig.2 Relative Intensity vs. Forward Current

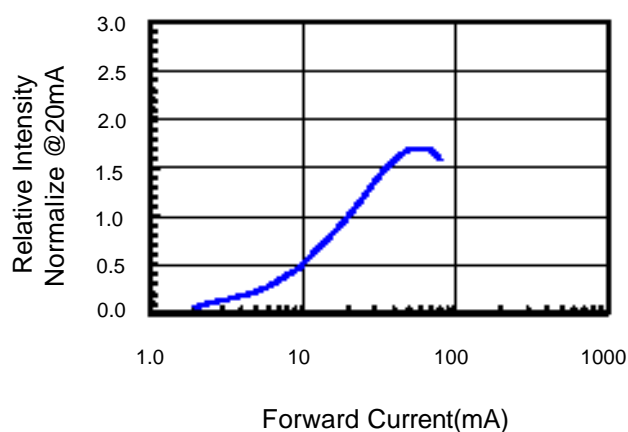


Fig.3 Forward Voltage vs. Temperature

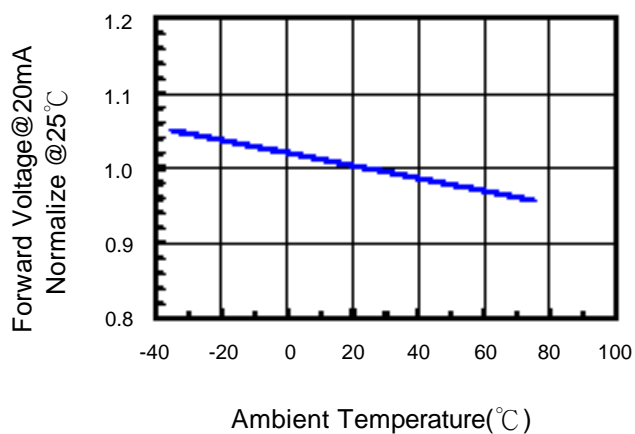


Fig.4 Relative Intensity vs. Temperature

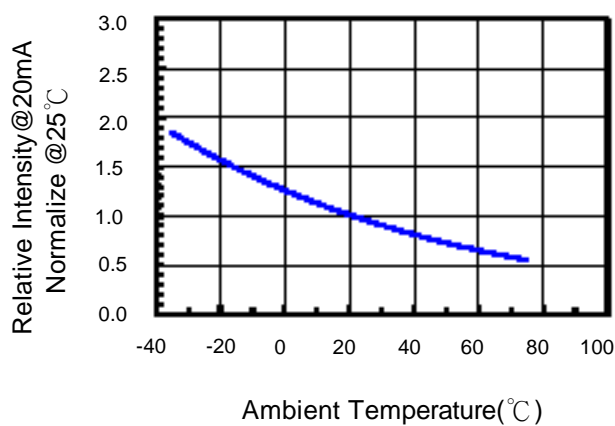
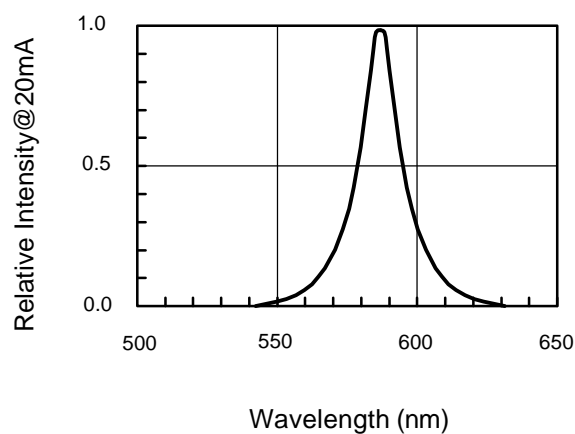


Fig.5 Relative Intensity vs. Wavelength





Typical Electro-Optical Characteristics Curve HE CHIP

Fig.1 Forward current vs. Forward Voltage

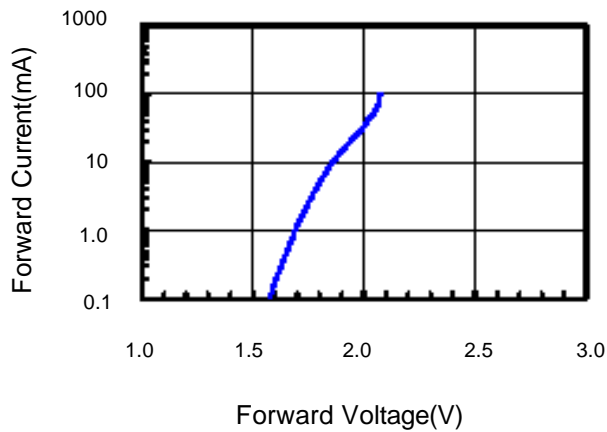


Fig.2 Relative Intensity vs. Forward Current

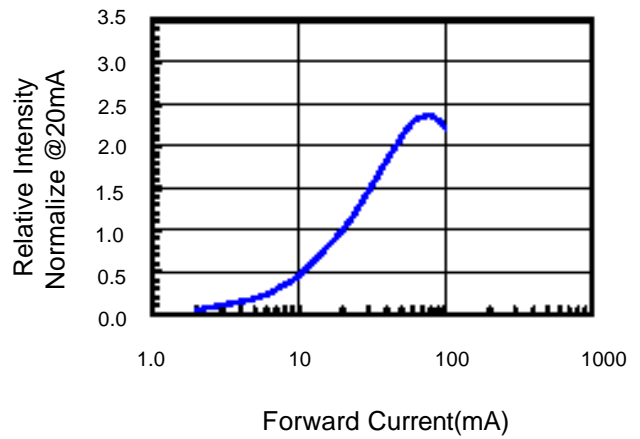


Fig.3 Forward Voltage vs. Temperature

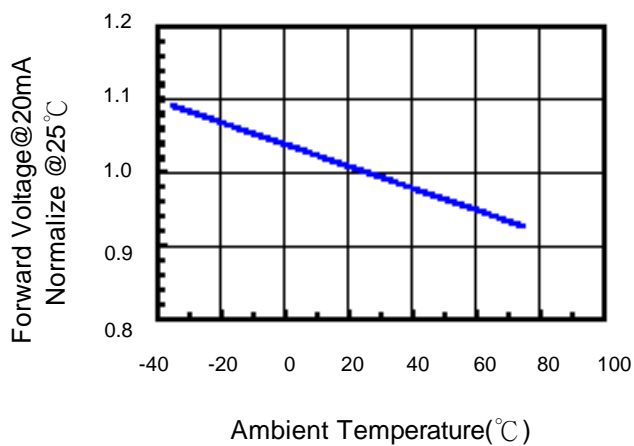


Fig.4 Relative Intensity vs. Temperature

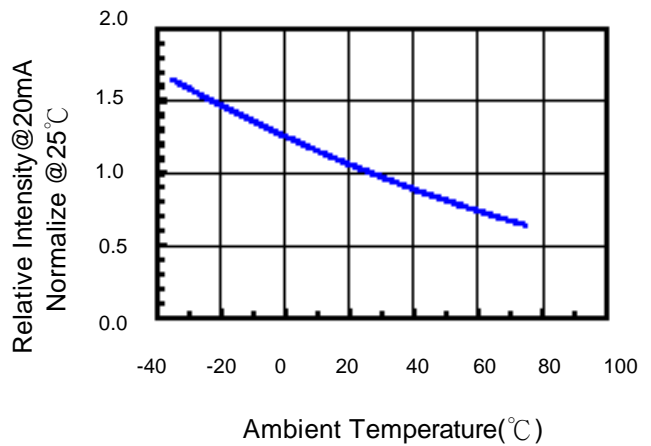
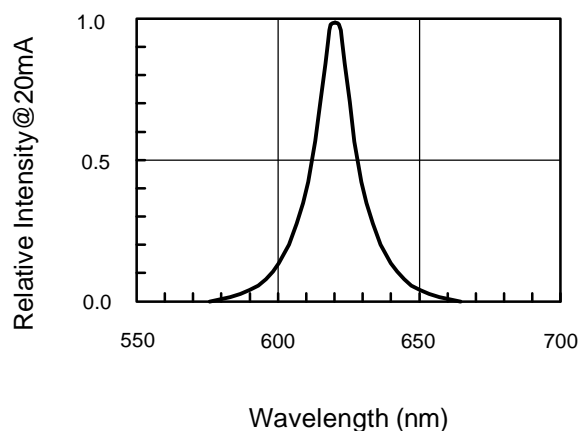


Fig.5 Relative Intensity vs. Wavelength





Typical Electro-Optical Characteristics Curve 9UG CHIP

Fig.1 Forward current vs. Forward Voltage

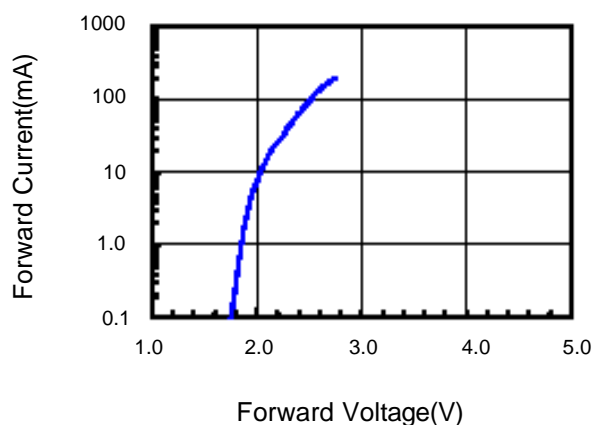


Fig.2 Relative Intensity vs. Forward Current

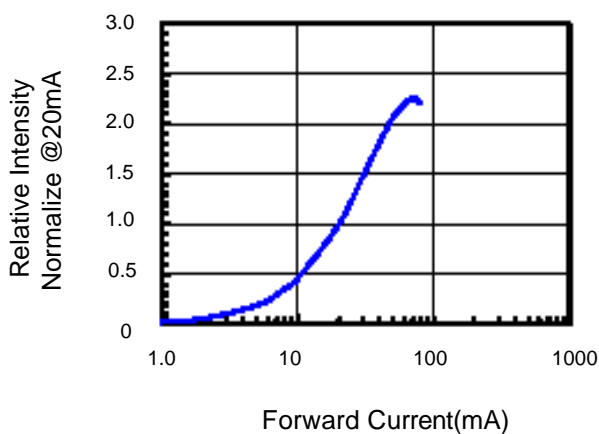


Fig.3 Forward Voltage vs. Temperature

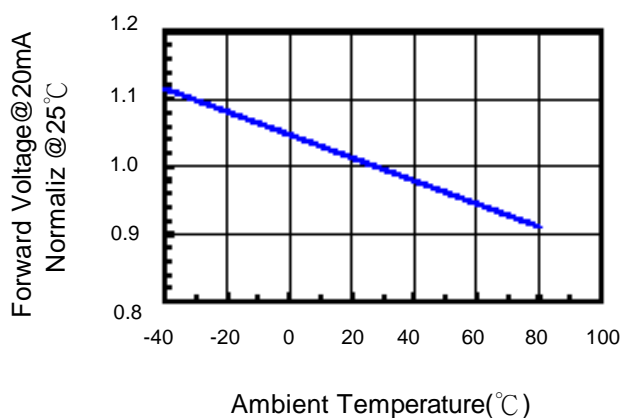


Fig.4 Relative Intensity vs. Temperature

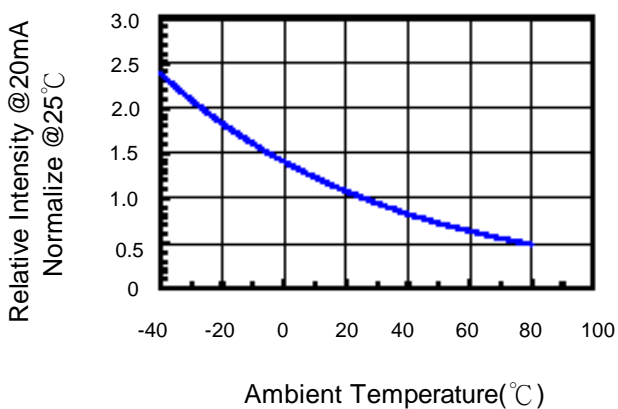
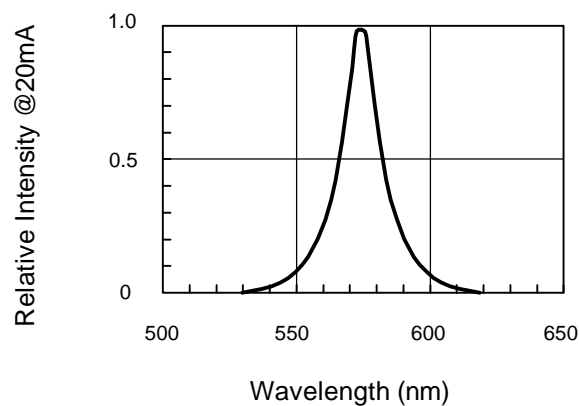


Fig.5 Relative Intensity vs. Wavelength





Typical Electro-Optical Characteristics Curve

SBK-S CHIP

Fig.1 Forward current vs. Forward Voltage

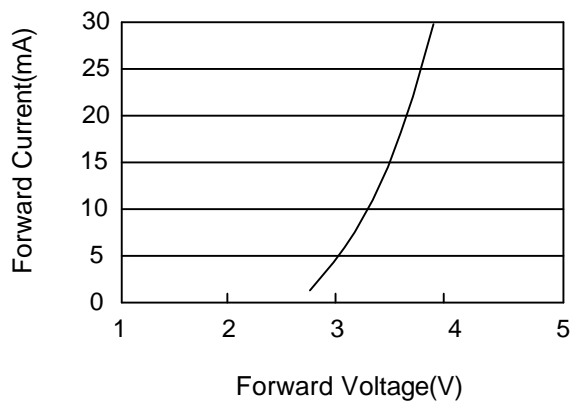


Fig.2 Relative Intensity vs. Forward Current

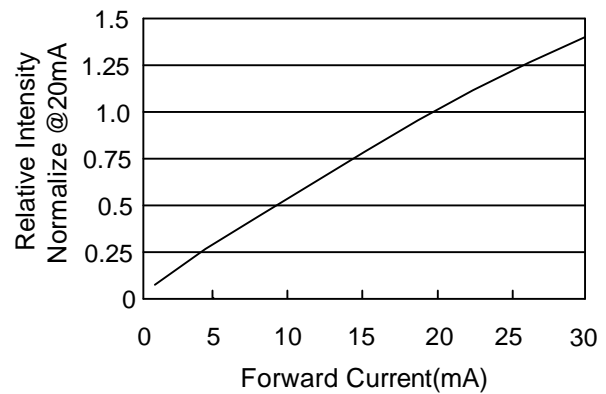


Fig.3 Forward Current vs. Temperature

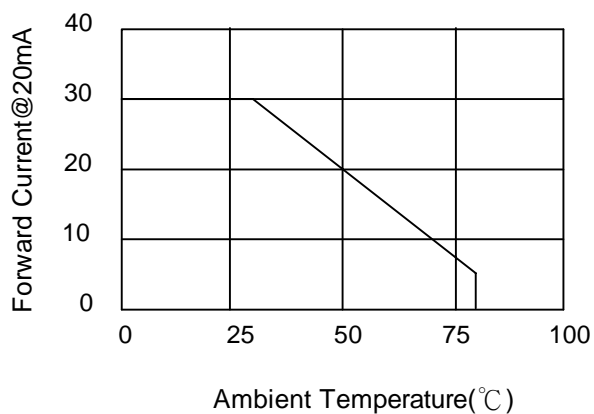
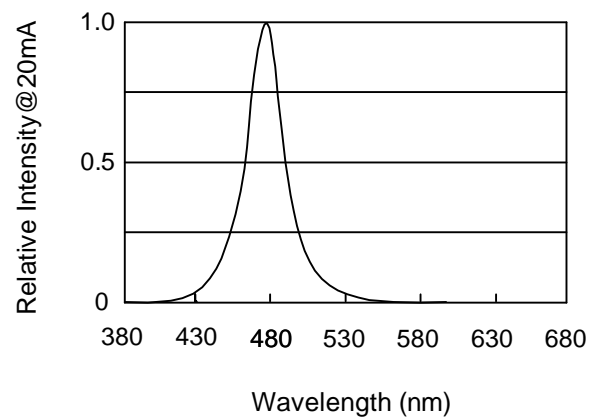


Fig.4 Relative Intensity vs. Wavelength



**Reliability Test:**

Test Item	Test Condition	Description	Reference Standard
Operating Life Test	1.Under Room Temperature 2.If=10mA 3.t=1000 hrs (-24hrs, +72hrs)	This test is conducted for the purpose of determining the resistance of a part in electrical and thermal stressed.	MIL-STD-750: 1026 MIL-STD-883: 1005 JIS C 7021: B-1
High Temperature Storage Test	1.Ta=105 °C ±5°C 2.t=1000 hrs (-24hrs, +72hrs)	The purpose of this is the resistance of the device which is laid under condition of high temperature for hours.	MIL-STD-883:1008 JIS C 7021: B-10
Low Temperature Storage Test	1.Ta=-40 °C ±5°C 2.t=1000 hrs (-24hrs, +72hrs)	The purpose of this is the resistance of the device which is laid under condition of low temperature for hours.	JIS C 7021: B-12
High Temperature High Humidity Test	1.Ta=65 °C ±5°C 2.RH=90%~95% 3.t=240hrs ±2hrs	The purpose of this test is the resistance of the device under tropical for hours.	MIL-STD-202:103B JIS C 7021: B-11
Thermal Shock Test	1.Ta=105 °C ±5°C & -40 °C ±5°C (10min) (10min) 2.total 10 cycles	The purpose of this is the resistance of the device to sudden extreme changes in high and low temperature.	MIL-STD-202: 107D MIL-STD-750: 1051 MIL-STD-883: 1011
Solder Resistance Test	1.T.Sol=260 °C ±5°C 2.Dwell time= 10 ±1sec.	This test intended to determine the thermal characteristic resistance of the device to sudden exposures at extreme changes in temperature when soldering the lead wire.	MIL-STD-202: 210A MIL-STD-750: 2031 JIS C 7021: A-1
Solderability Test	1.T.Sol=230 °C ±5°C 2.Dwell time=5 ±1sec	This test intended to see soldering well performed or not.	MIL-STD-202: 208D MIL-STD-750: 2026 MIL-STD-883: 2003 JIS C 7021: A-2