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BAR GRAPM LED DISPLAY

LBD1311URFUGHYS-XX/RP55

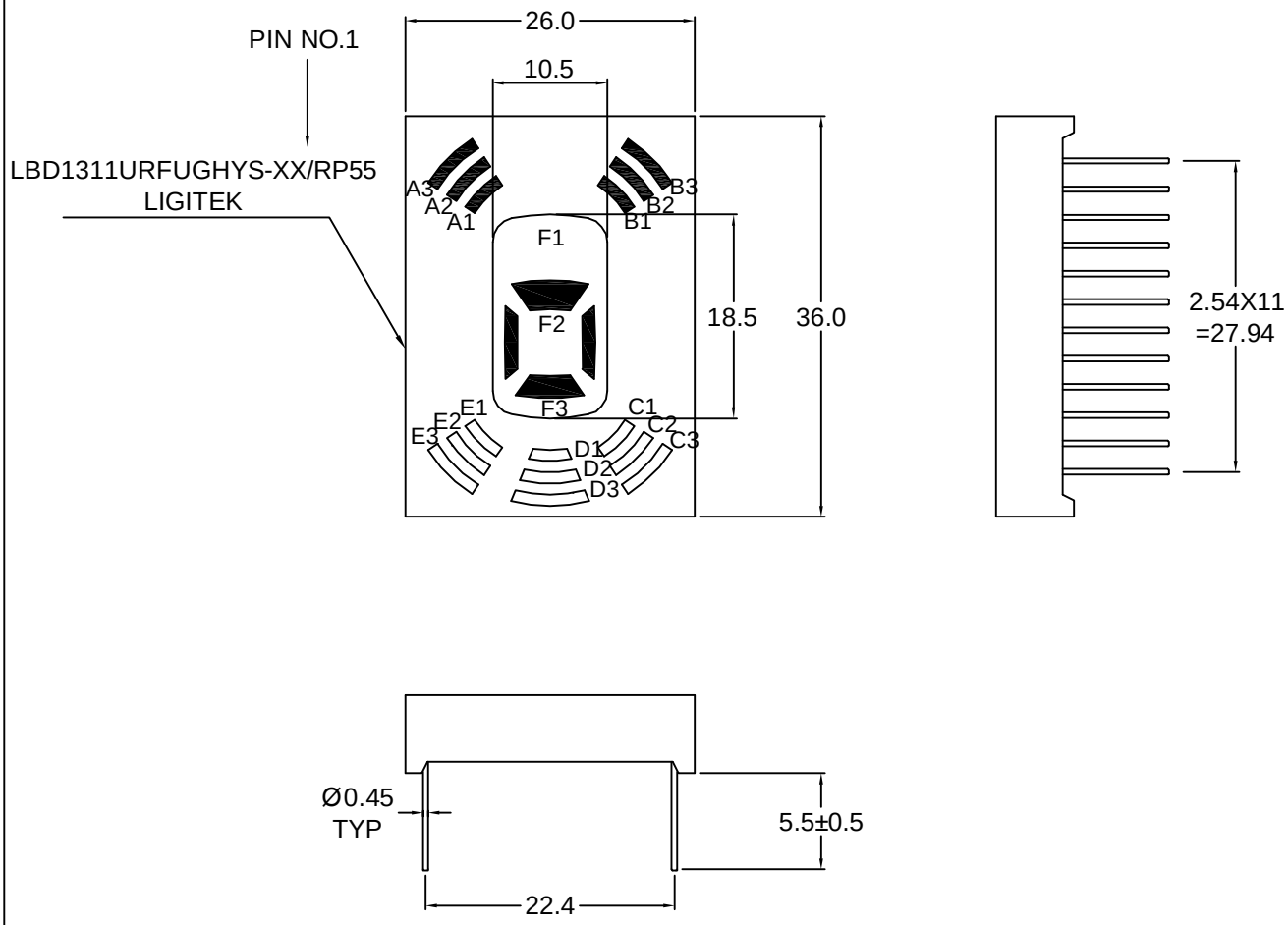
DATA SHEET

DOC. NO : QW0905- LBD1311URFUGHYS-XX/RP55

REV. : B

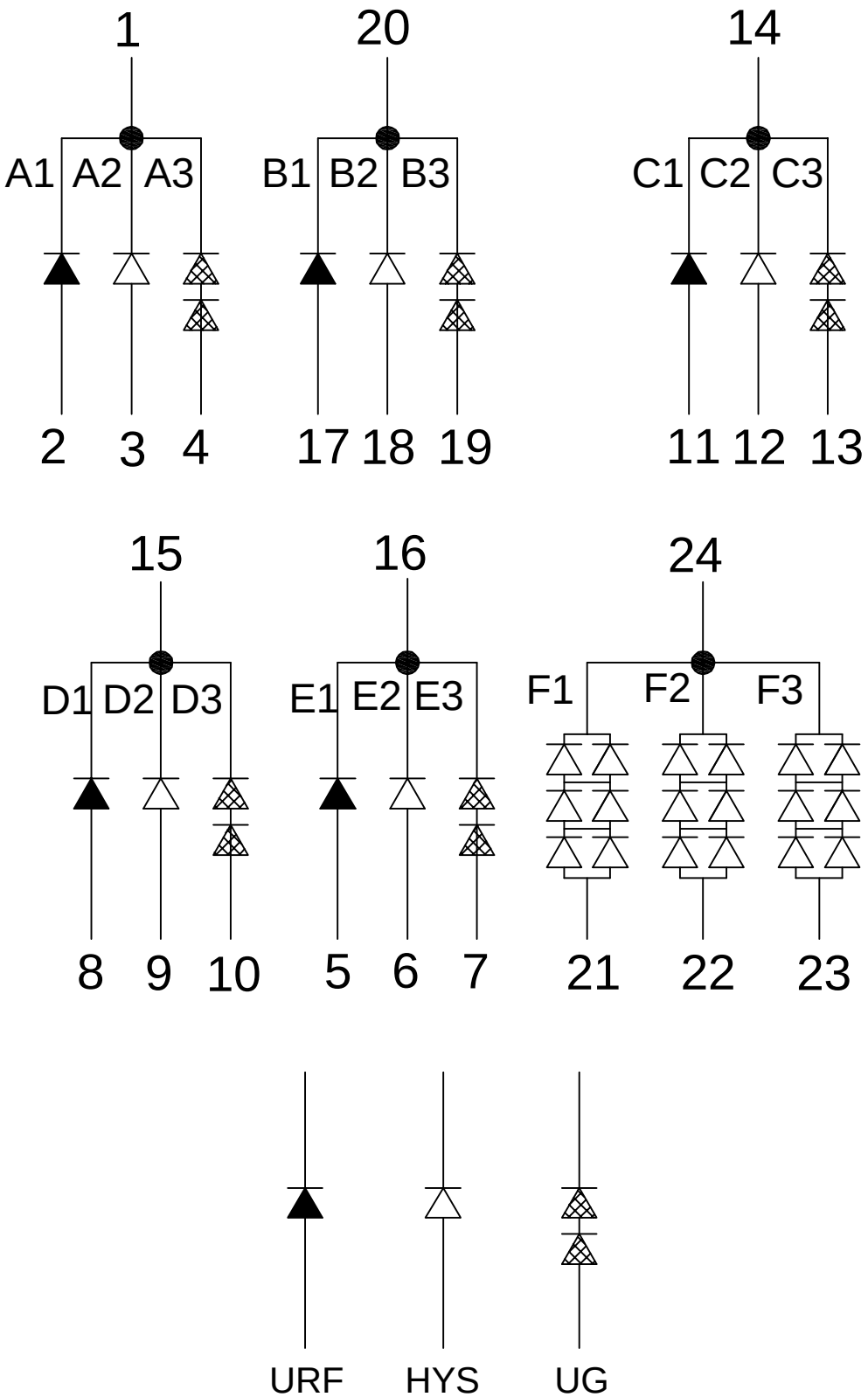
DATE : 19 - Oct. - 2006

Package Dimensions



Note : 1.All dimension are in millimeters and (Inch) tolerance is ±0.25mm unless otherwise noted.
2.Specifications are subject to change without notice.

Internal Circuit Diagram



Electrical Connection

PIN NO.1	LBD1311URFUGHYS-XX/RP55
1	Common Cathode A1,A2,A3
2	Anode A1
3	Anode A2
4	Anode A3
5	Anode E1
6	Anode E2
7	Anode E3
8	Anode D1
9	Anode D2
10	Anode D3
11	Anode C1
12	Anode C2
13	Anode C3
14	Common Cathode C1,C2,C3
15	Common Cathode D1,D2,D3
16	Common Cathode E1,E2,E3
17	Anode B1
18	Anode B2
19	Anode B3
20	Common Cathode B1,B2,B3
21	Anode F1
22	Anode F2
23	Anode F3
24	Common Cathode F1,F2,F3

Absolute Maximum Ratings at Ta=25 ℃

PARAMETER	MAXIMUM RATING			UNIT
	RED	GREEN	YELLOW	
Power Dissipation Per Die	120	75	75	mW
Peak Forward Current Per Die (1/10 Duty Cycle,0.1ms Pulse Width)	130	60	60	mA
Forward Current Per Chip	50	30	30	mA
Reverse Voltage Per Die	5	5	5	V
Electrostatic Discharge(*)	2000			V
Operation Temperature Range	-25℃ to +85℃			
Storage Temperature Range	-25℃ to +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-electrosatic glove is recommended when handing these LED. All devices, equipment and machinery must be properly grounded.

ELECTRICAL /OPTICAL CHARACTERISTICS AT T_A=25℃

RED(A1,B1,C1,D1,E1)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	14	24		mcd	I_F=10mA
Spectral Line Half-Width	$\Delta\lambda$		20		nm	I_F=20mA
Dominant Wavelength	λd		630		nm	I_F=20mA
Forward Voltage Per Die	V_F	1.5	1.8	2.4	V	I_F=20mA
Reverse Current Per Die	I_R			10	μA	V_R=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		I_F=10mA

UG(A3,B3,C3,D3,E3)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	13	22		mcd	I_F=10mA
Spectral Line Half-Width	$\Delta\lambda$		20		nm	I_F=20mA
Dominant Wavelength	λd		587		nm	I_F=20mA
Forward Voltage Per Die	V_F	1.7	1.9	2.8	V	I_F=20mA
Reverse Current Per Die	I_R			10	μA	V_R=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		I_F=10mA

ELECTRICAL /OPTICAL CHARACTERISTICS AT T_A=25℃

YELLOW(A2,B2,C2,D2,E2)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	18	30		mcd	I_F=10mA
Spectral Line Half-Width	$\Delta\lambda$		15		nm	I_F=20mA
Dominant Wavelength	λd		587		nm	I_F=20mA
Forward Voltage Per Die	V_F	1.7	1.9	2.8	V	I_F=20mA
Reverse Current Per Die	I_R			10	μA	V_R=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		I_F=10mA

HYS(F1,F2,F3)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	108	180		mcd	I_F=20mA
Spectral Line Half-Width	$\Delta\lambda$		15		nm	I_F=20mA
Dominant Wavelength	λd		587		nm	I_F=20mA
Forward Voltage Per Die	V_F	1.7	1.9	2.8	V	I_F=20mA
Reverse Current Per Die	I_R			10	μA	V_R=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		I_F=10mA

Note : 1.The forward voltage data did not including ±0.1V testing tolerance.
2. The luminous intensity data did not including ±15% testing tolerance.

Typical Electro-Optical Characteristics Curve

URF CHIP

Fig.1 Forward current vs. Forward Voltage

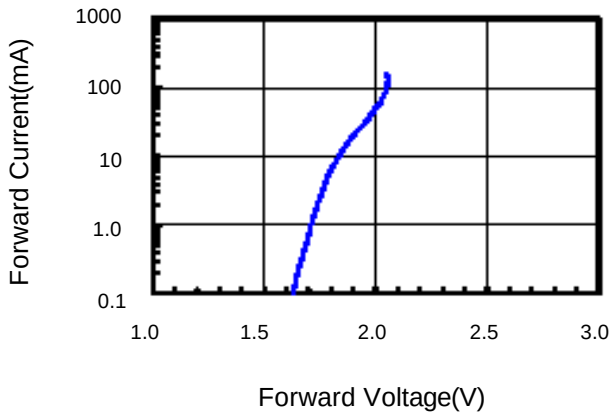


Fig.2 Relative Intensity vs. Forward Current

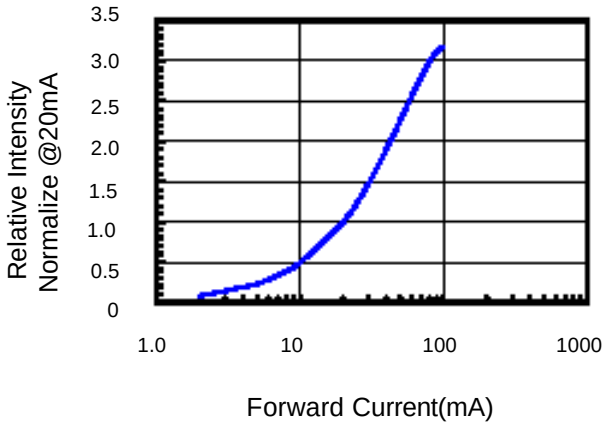


Fig.3 Forward Voltage vs. Temperature

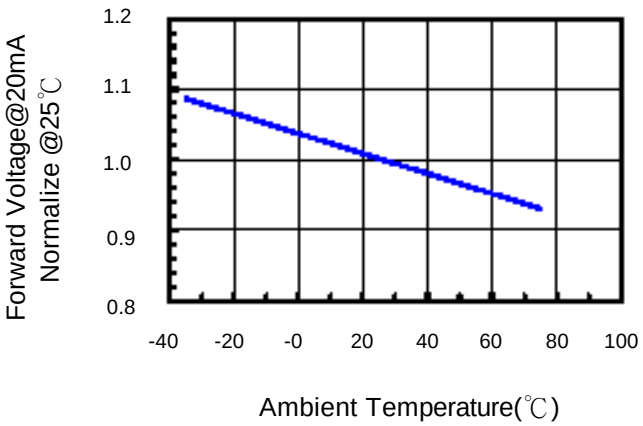


Fig.4 Relative Intensity vs. Temperature

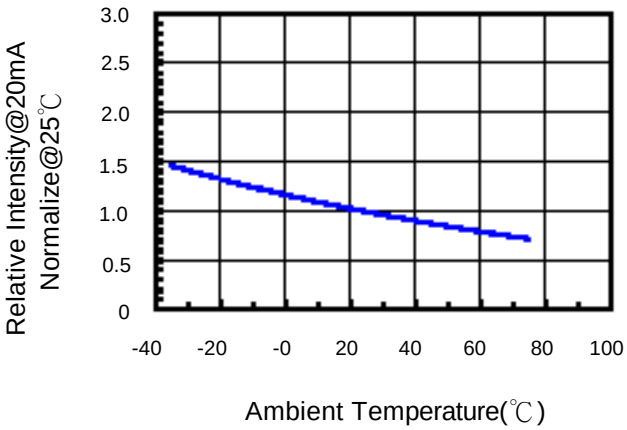
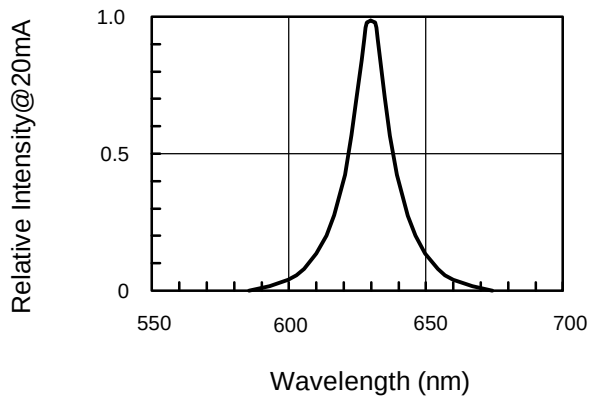


Fig.5 Relative Intensity vs. Wavelength



Typical Electro-Optical Characteristics Curve

UG CHIP

Fig.1 Forward current vs. Forward Voltage

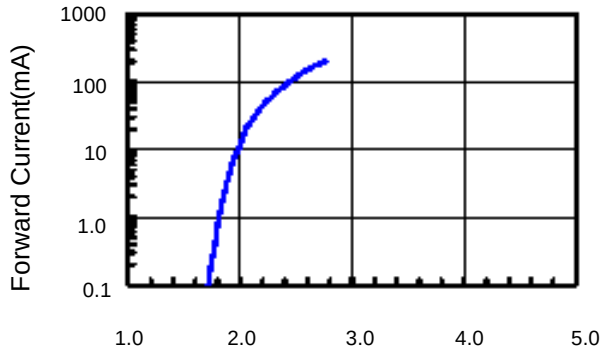


Fig.2 Relative Intensity vs. Forward Current

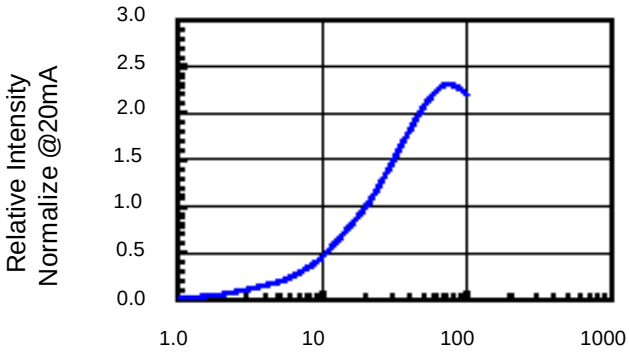


Fig.3 Forward Voltage vs. Temperature

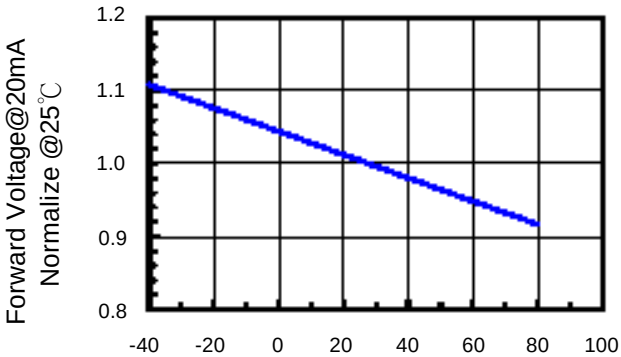


Fig.4 Relative Intensity vs. Temperature

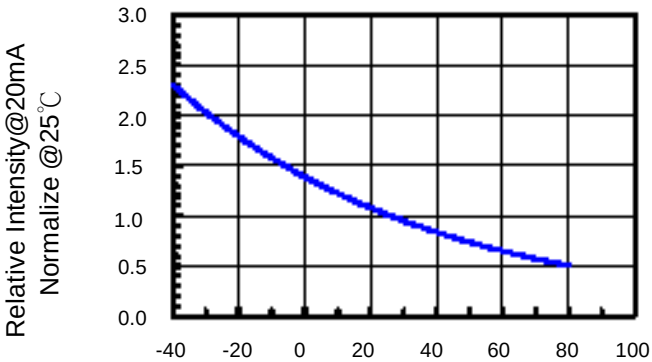
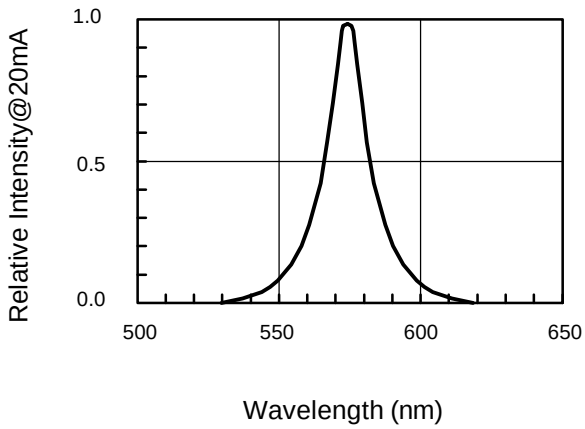


Fig.5 Relative Intensity vs. Wavelength



Typical Electro-Optical Characteristics Curve

HYS CHIP

Fig.1 Forward current vs. Forward Voltage

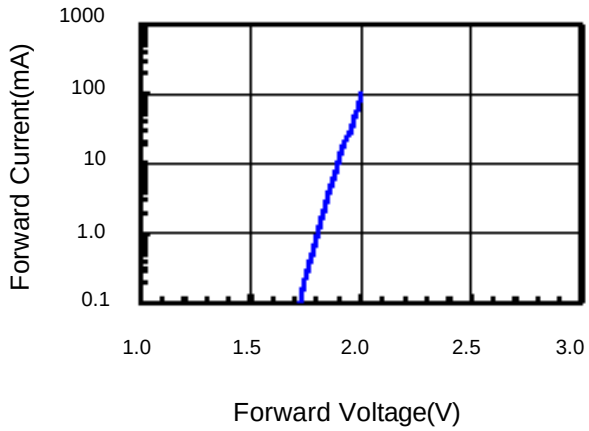


Fig.2 Relative Intensity vs. Forward Current

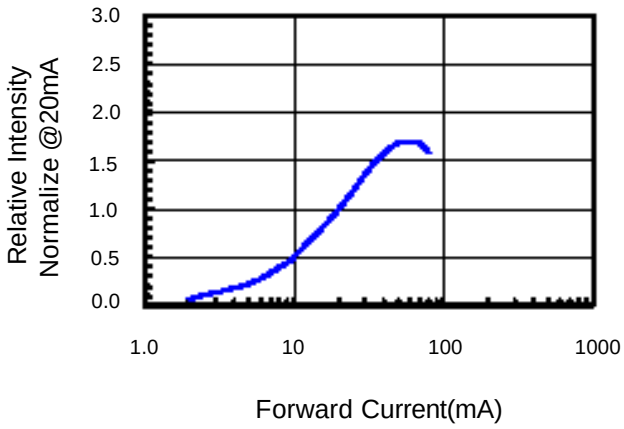


Fig.3 Forward Voltage vs. Temperature

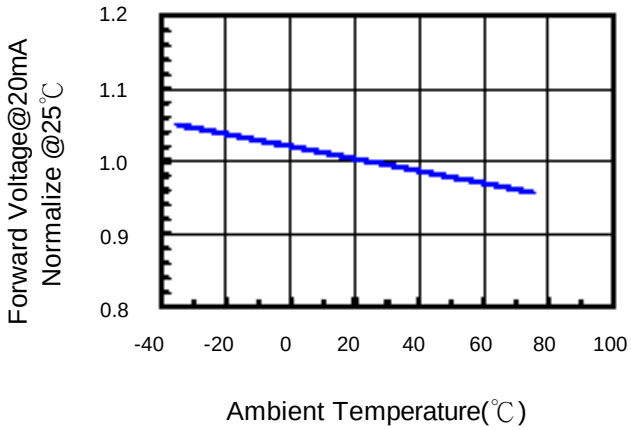


Fig.4 Relative Intensity vs. Temperature

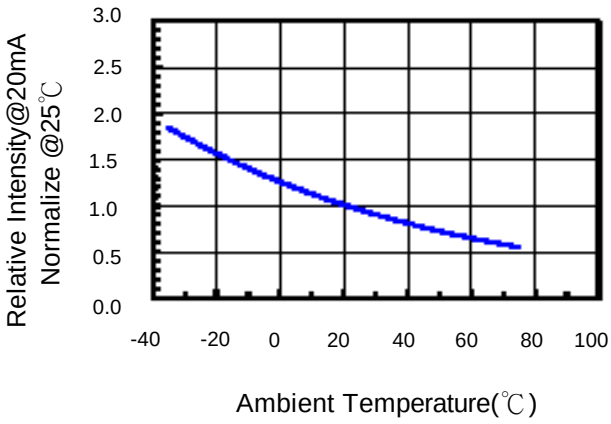
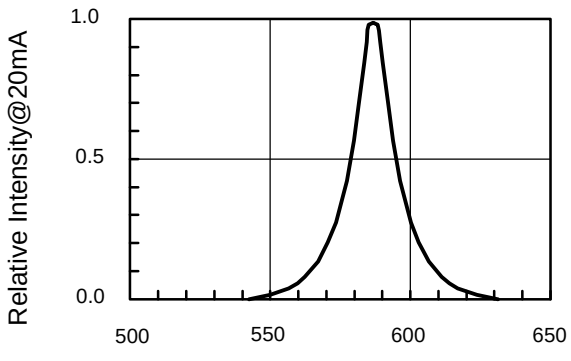


Fig.5 Relative Intensity vs. Wavelength



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 detemining the resistance of a part in electrical and themal stressed.	MIL-STD-750: 1026 MIL-STD-883: 1005 JIS C 7021: B-1
High Temperature Storage Test	1.Ta=105℃±5℃ 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℃±5℃ 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℃±5℃ 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℃±5℃&-40℃±5℃ (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℃±5℃ 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℃±5℃ 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