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DUAL COLOR LED LAMPS



Lead-Free Parts

LHRFDBK2092/A

DATA SHEET

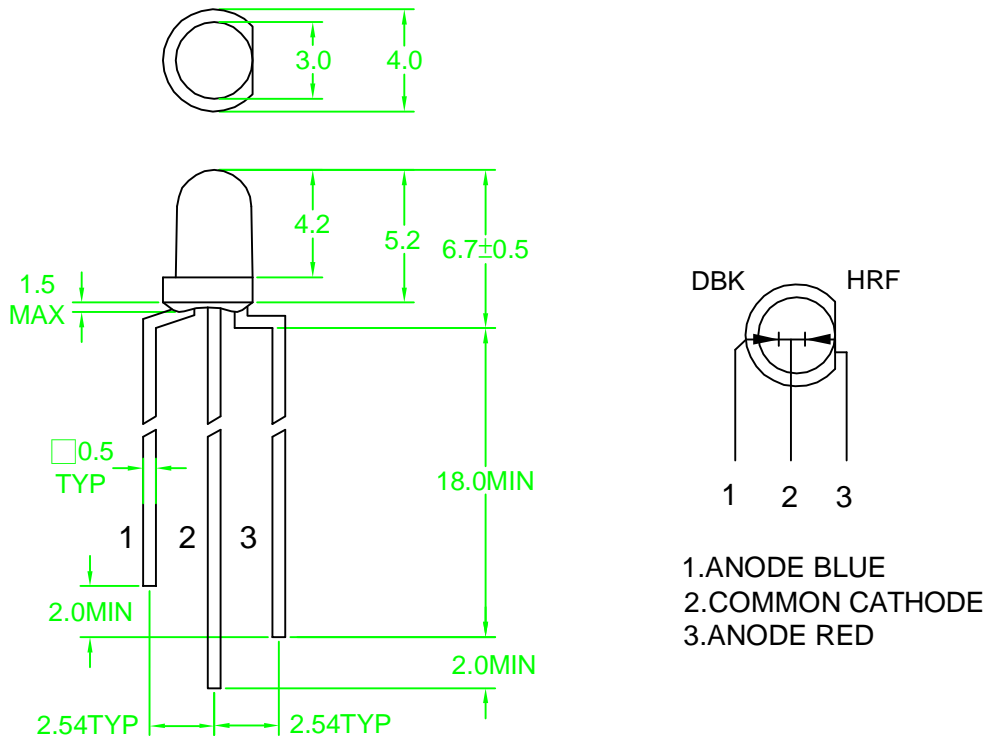
DOC. NO : QW0905- LHRFDBK2092/A

REV. : A

DATE : 05 - Jul. - 2013

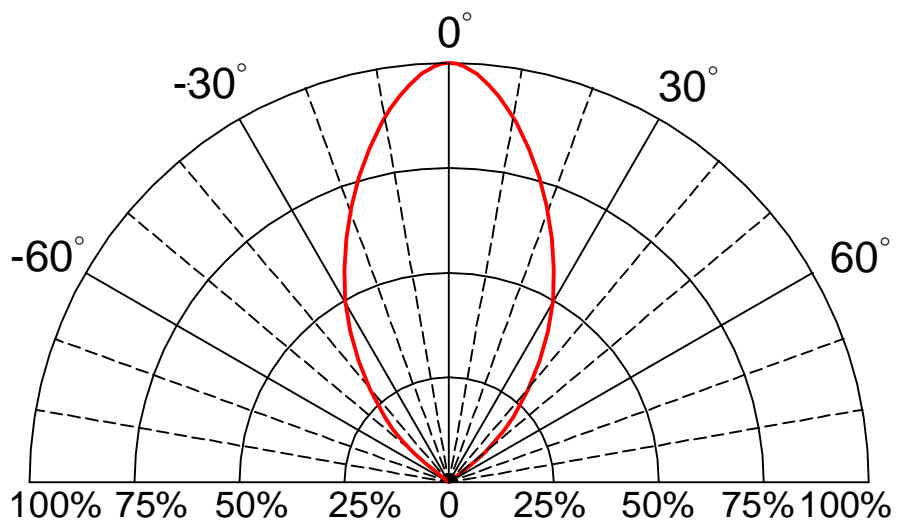


## Package Dimensions



Note : 1.All dimension are in millimeter tolerance is  $\pm 0.25$ mm unless otherwise noted.  
2.Specifications are subject to change without notice.

## Directivity Radiation



Absolute Maximum Ratings at Ta=25 °C

Parameter	Symbol	Ratings		UNIT
		HRF	DBK	
Forward Current	I <sub>F</sub>	30	30	mA
Peak Forward Current Duty 1/10@10KHz	I <sub>FP</sub>	90	100	mA
Power Dissipation	PD	75	120	mW
Reverse Current @5V	I <sub>r</sub>	10	50	μA
Electrostatic Discharge	ESD	2000	500	V
Operating Temperature	T <sub>opr</sub>	-25 ~ +85		°C
Storage Temperature	T <sub>stg</sub>	-25 ~ +85		°C

Typical Electrical & Optical Characteristics (Ta=25 °C)

PART NO	MATERIAL	COLOR		Dominant wave length λ Dnm	Spectral halfwidth Δλ nm	Forward voltage @20mA(V)			Luminous intensity @20mA(mcd)		Viewing angle 2θ 1/2 (deg)
		Emitted	Lens			Min.	Typ.	Max.	Min.	Typ.	
LHRFDBK2092/A	AlGaInP	Red	White Diffused	630	20	1.5	---	2.4	220	350	60
	In/GaN	Blue		470	30	---	3.5	4.0	220	450	60

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

**Brightness Code For Standard LED Lamps**

## HRF CHIP

Group	Luminous Intensity(mcd) at 20 mA	
	Min.	Max.
A15	220	300
A16	300	350
A17	350	450
A18	450	550
A19	550	700

**Brightness Code For Standard LED Lamps**

DBK CHIP

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A19	550	700

**Color Code**

DBK CHIP

Group	Wave length(nm) at 20 mA	
	Min.	Max.
0D	465	468
0C	468	471
0B	471	474
0A	474	477

## Typical Electro-Optical Characteristics Curve

### HRF CHIP

Fig.1 Forward current vs. Forward Voltage

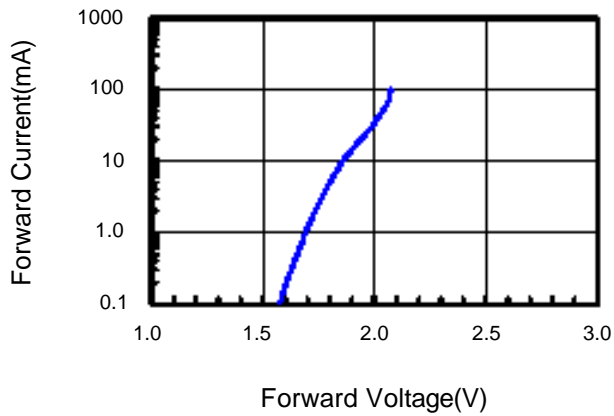


Fig.2 Relative Intensity vs. Forward Current

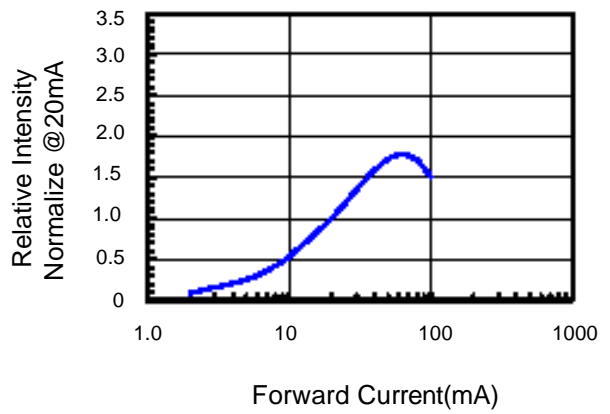


Fig.3 Forward Voltage vs. Temperature

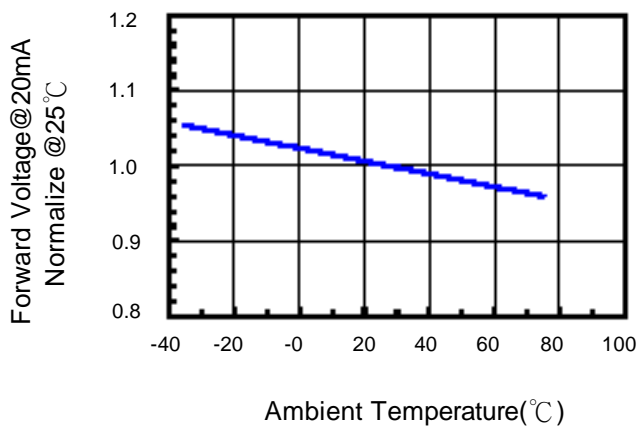


Fig.4 Relative Intensity vs. Temperature

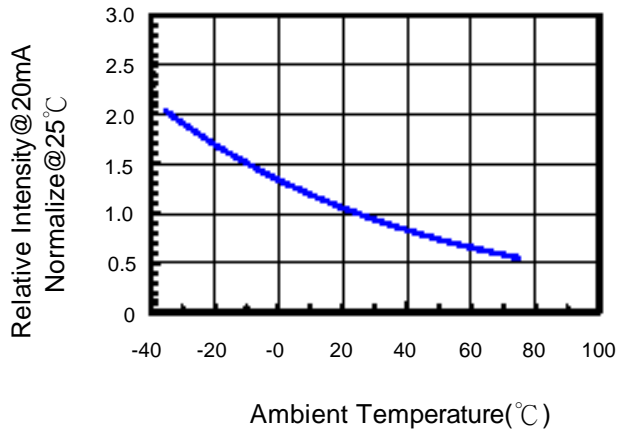
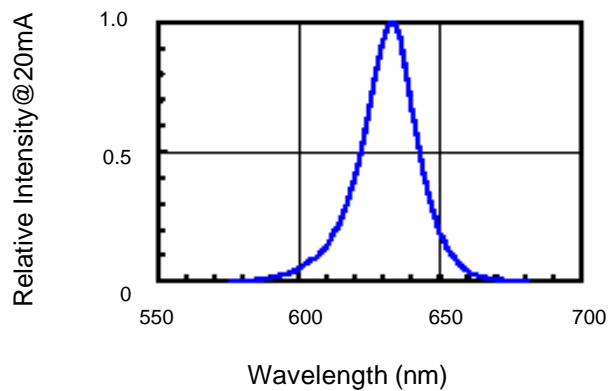


Fig.5 Relative Intensity vs. Wavelength



## Typical Electro-Optical Characteristics Curve

DBK CHIP

Fig.1 Forward current vs. Forward Voltage

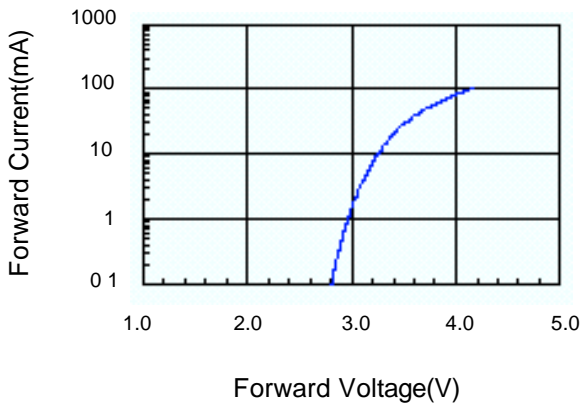


Fig.2 Relative Intensity vs. Forward Current

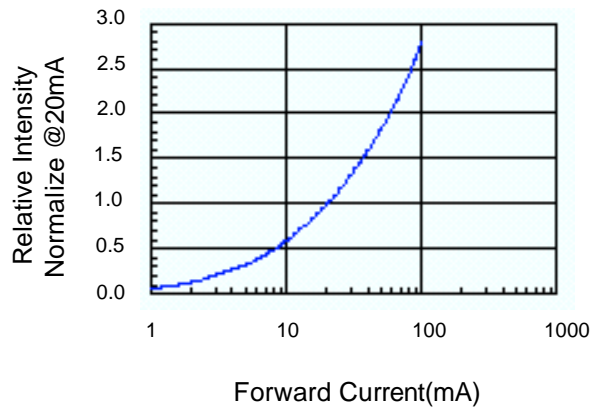


Fig.3 Forward Voltage vs. Temperature

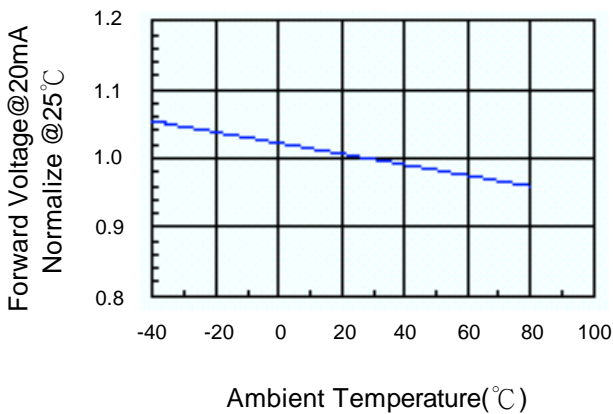


Fig.4 Relative Intensity vs. Temperature

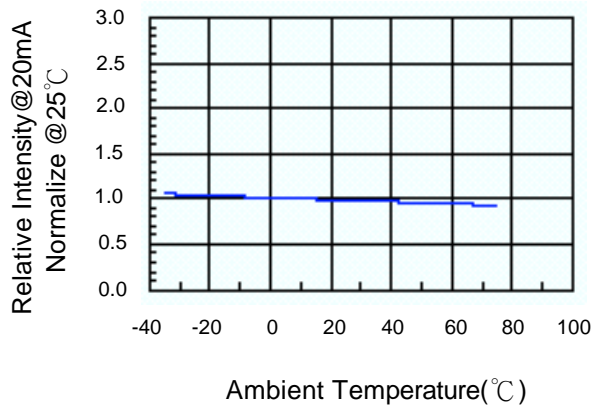
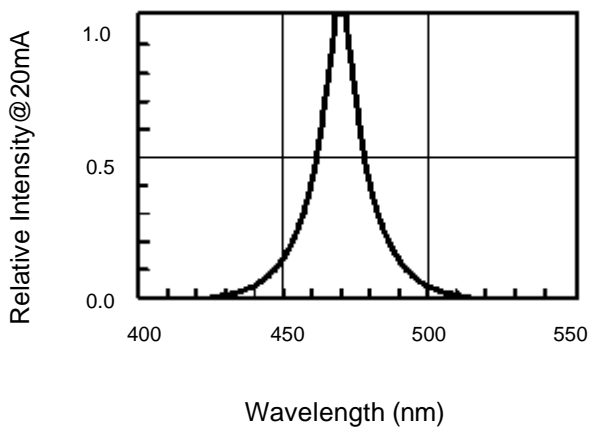


Fig.5 Relative Intensity vs. Wavelength



**Soldering Condition(Pb-Free)****1.Iron:**

Soldering Iron:30W Max

Temperature 350° C Max

Soldering Time:3 Seconds Max(One time only)

Distance:2mm Min(From solder joint to body)

**2.Wave Soldering Profile**

Dip Soldering

Preheat: 120° C Max

Preheat time: 60seconds Max

Ramp-up

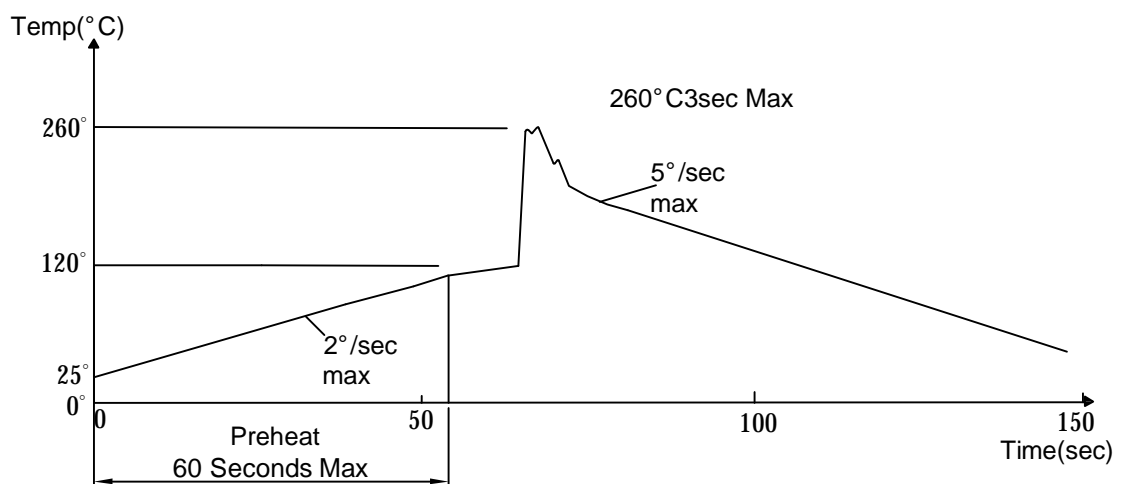
2° C/sec(max)

Ramp-Down:-5° C/sec(max)

Solder Bath:260° C Max

Dipping Time:3 seconds Max

Distance:2mm Min(From solder joint to body)



- Note: 1.Wave solder should not be made more than one time.  
2.You can just only select one of the soldering conditions as above.



### Reliability Test:

Test Item	Test Condition	Description	Reference Standard
Operating Life Test	1.Under Room Temperature 2.If=20mA 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=245 °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