

GENERAL INFORMATION

HOW TO USE LED

FORMING:

1. Please do not form the LED after soldering. If forming is necessary, it must be done before soldering.
2. Any unsuitable stress applied to the epoxy may break bonding wires in LED.

SOLDERING:

1. Soldering Bath — $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ within 5 seconds: Soldering Iron—Under 30W within 5 seconds. (1.6mm from epoxy body)
2. Do not apply any force or mechanical stress onto the leads or epoxy body during soldering heat is remained.
3. If soldering one line of LED on a P.C. board by using a soldering iron, don t solder both the leads of the LED at same time.

CLEANING:

1. Use Alcohol, Freon TE or Chlorosen to clean LED at normal temperature for less than 1 minute.
2. Do not use unspecified Chemical liquid because it may cause crack or haze on the surface of the epoxy body.

PREVENTING OVER CURRENT:

1. In order to operate LED in stable condition, please put protective resistors in series.
2. Resistor value can be dertermined by the formula

$$R = \frac{V_s - V_F}{I_F} \quad \text{WHERE:}$$

V_s = Source Voltage

V_F = Forward Voltage of LED

I_F = Recommended Current of LED (10–20 mA)

BRIGHTNESS:

1. For the purpose of obtaining uniform brightness, LEDs shall be kept at the same current.
2. It is useful for uniform brightness if you use larger source voltage and protective resistor.

QUALITY CONTROL AND ASSURANCE

SAMPLING PLAN

U.S. Ministry of defense MIL–STD–105D level II (single sampling plans)

INSPECTION ITEMS AND CRITERIONS FOR JUDGEMENTS

“Measuring Methods for light Emitting Diodes(No.11830)” and “Light Emitting Diodes(No.11829)”

Stipulated by ministry of economical affairs of R.O.C. and by reference to Q.C. standards prevailing in prominent LED plants worldwide.

RELIABILITY TESTS

“General Provisions for Environmental Tests of CNS–Categorized Electronic Parts”, 3623–3634, 5637, 11233–11238, and U.S. Ministry of National Defense MIL–STD–750 Specifications.

TEST	CONDITIONS
THERMAL SHOCK TEST	LED placed in a chamber (-35°C) for 20 minutes, temperature increased instantaneously to $+85^{\circ}\text{C}$ for 20 minutes. The duration of the test shall be for 10 complete cycles. (MIL–STD–202:107D)
HUMIDITY TEST	LED placed in a humidity chamder which is maintained at 65°C , 95% RH. The duration of the test is for 96 hours. (MIL–STD–202:103D)
LIFE TEST	LED connected to a source of power and charged with 20mA at room temperature (25°C) for 1000 hours. (MIL–STD–750:1026)
SOLDERABILITY TEST	The pins of LED (1.6mm form body) dipped into Solden bath which is maintained at $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ The duration of the test is for 5seconds. (MIL–STD–202:208D)
VIBRATION TEST	LED placed on a vibrator which is maintained at 10–55–10 Hz/minute. 0.82 mm amplitude. The duration of the test is for 30 minutes.
PACKING TEST	LED packed in a corrugated fiberboard box and fallen on 6 faces at a diagonal angle to the ground. The altitude of the fall will be in the range of 229–609 mm considering of the packed product.

THE MEASURING TERMS AFTER TEST AND FAILURE CRITERIA AS FOLLOWS:

MEASURE TERMS	FAILURE CRITERIA
LUMINOUS INTENSITY (I_V)	LOWER STANDARD LIMIT $\times 0.5$
FORWARD VOLTAGE (V_F)	UPPER STANDARD LIMIT $\times 1.2$
REVERSE CURRENT (I_R)	UPPER STANDARD LIMIT $\times 2.0$

GENERAL INFORMATION

ABSOLUTE MAXIMUM RATINGS

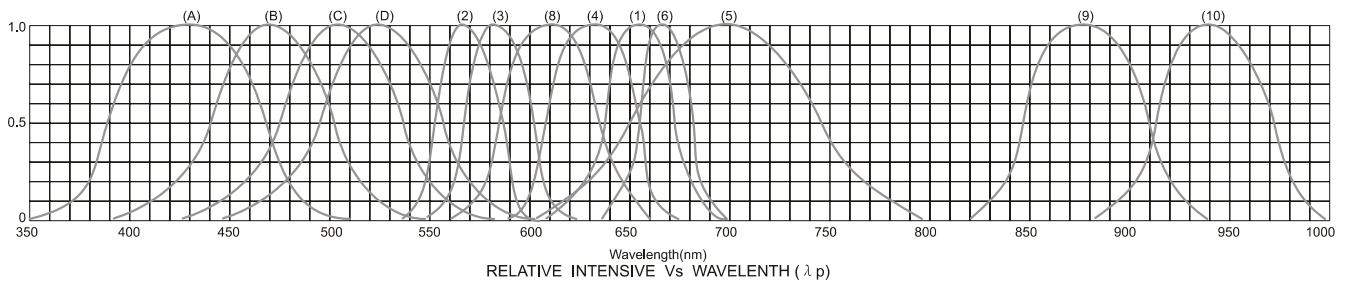
1. Test Condition For Each Parameter:

Parameter	Symdol	Unit	Test Condition
Reverse Voltage	V_R	V	
Reverse Current	I_R	μA	$V_R = 5.0$ Volt
Forward Voltage	V_F	V	$I_F = 20$ mA
Luminous Intensity	I_V	mcd	$I_F = 20$ mA
Viewing Angle	2 θ 1/2	Degree	$I_F = 20$ mA
Spectral Line Half-Width	$\Delta \lambda$	nm	$I_F = 20$ mA
Power Dissipation	P_D	mW	$I_F = 20$ mA
Peak Forward Current (Duty 1/10 1KHz)	$I_F(\text{Peak})$	mA	$I_F(\text{Peak}) = 150$ mA

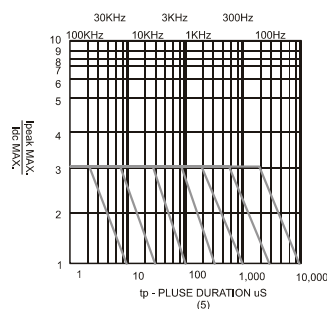
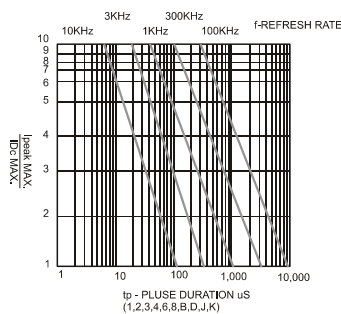
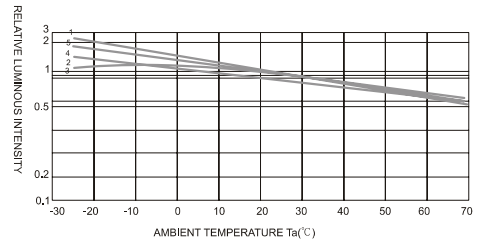
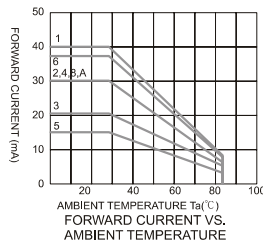
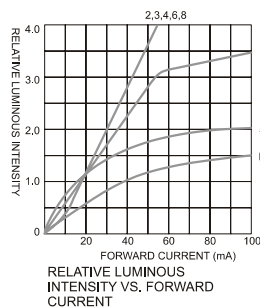
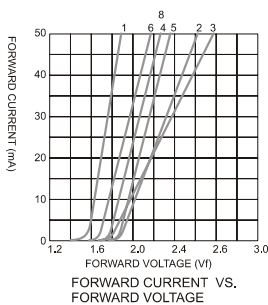
2. Absolute Maximum Rating: ($T_a = 25^\circ C$)

Reverse Voltage	5.0 Volt
Reverse Current($V_R = 5V$)	$\leq 100 \mu A$
Operating Temperature Range	$40^\circ C \sim +80^\circ C$
Storage Temperature Range	$40^\circ C \sim +85^\circ C$

TYPICAL ELECTRICAL-OPTICAL CHARACTERISTICS CURVES



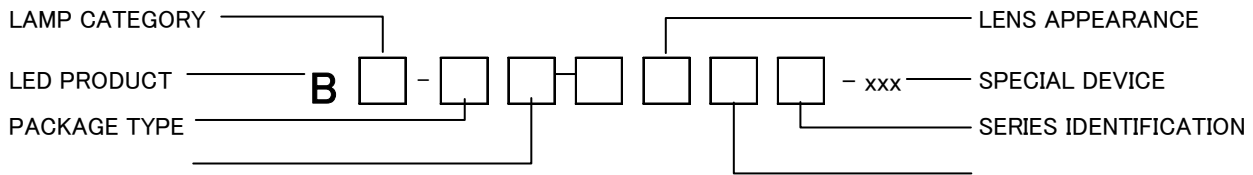
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|--|------------------------------------|
| (1) wGaAsP/GaAs 655nm/Red | (9) GaAlAs 880nm |
| (2) wGaP 568nm/Yellow Green | (10) GaAs/GaAs & GaAlAs/GaAs 940nm |
| (3) wGaAsP/GaP 585nm/Yellow | (A) GaN/SiC 430nm/Blue |
| (4) wGaAsP/GaP 635nm/Orange & Hi-Eff Red | (B) InGaN/SiC 470nm/Blue |
| (5) wGaP 700nm/Bright Red | (C) InGaN/SiC 502nm/Ultra Green |
| (6) wGaAlAs/GaAs 660nm/Super Red | (D) InGaAl/SiC 523nm/Ultra Green |
| (8) wGaAsP/GaP 610nm/Super Red | |



LED LAMPS

SELECTION GUIDE (PART NO. SYSTEM)

LED LAMPS:



LAMP CATEGORY:

- L : Standard Lamp
- B : Blinking Lamp
- R : Resistor Lamp

PACKAGE TYPE:

- A : Array
- B : Round
- C : Cylindrical
- R : Rectangular
- L : BackLight LED Lamp
- S : Tower
- T : Triangular
- W : Oval

LENS APPEARANCE:

- 1 : Color Diffused
- 2 : White Diffused
- 3 : Water Clear
- 4 : Color Transparent
- 5 : Hi-Eff Red Diffused
- 6 : Hi-Eff Red Transparent

LIGHT SOURCE:

- 1 : GaAsP/GaAs 655nm/Red (R_x)
- 2 : GaP 568nm/Yellow Green (G_x)
- 3 : GaAsP/GaP585nm/Yellow (Y_x)
- 4 : GaAsP/GaP635nm/Orange & Hi-Eff Red (E_x)
- 5 : GaP 700nm/Bright Red (H_x)
- 6 : GaAlAs/GaAs 660nm/SH Red (S_x)
- 8 : GaAsP/GaP 610nm/Amber (A_x)
- 9 : GaP 555nm/ Pure Green (W_x)
- B0 : GaN/SiC 430nm/Super Blue
- B1 : InGaN/SiC 470nm/Super Blue
- B2 : InGaN/SiC 450nm/Super Blue
- C- : GaAsP/GaP 655nm/Hi-Eff. Red(HR)
- D : GaAlAs/GaAs 660nm/DH Red (SRD)
- E- : GaAsP/GaP 635nm/Orange & Hi-Eff Red
- F- : GaAlAs/GaAlAs 660nm/DDH Red (UR)
- G3 : InGaAlP 574nm/Ultra Green
- G4 : InGaN/SiC 502nm/Super Green Blue
- G5 : InGaAlP 574nm/Ultra Green
- G6 : InGaN/SiC 523nm/Ultra Green
- J- : InGaAlP 620nm/Ultra Orange(UE)
- K- : InGaAlP 595nm/Ultra Yellow (UY)
- T- : GaP 568nm/Yellow Green (N/P)
- U- : AlGaInP 645nm/Ultra Red (UR)
- V- : GaAsP/GaP 635nm/Orange (N/P)
- X- : GaP 568nm/Hi-Eff Green (YGU)

LEADS TYPE:

- 0 : Tri-State Type
- 1 : 0.8" Long, Stand-Off Type
- 2 : 0.5" Long, Non-Reflective Type
- 3 : 1.0" Long, Reflective Type
- 4 : 1.0" Long, Reflective Type
- 7 : 2-pin Leads For Blinking Lamp Type
- 8 : Type
- 9 : Reflective Type
- A : 1.75" Long, Reflective Type
- B : 1.75" Long, Non-Reflective Type

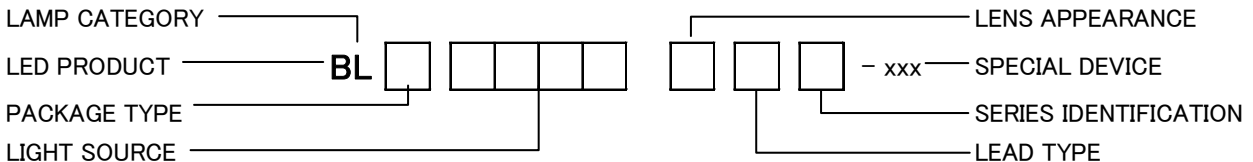
SPECIAL DEVICE

- AT—Bin Selection
- 1—Wider Viewing Angle
- T—Top Diffused
- 1/2T—Half Top Diffused
- S—Leads With Stand Off (Stopper)
- P—Without Reflector
- L—Low Current Lamp
- LxxV—Low Forwarding Voltage
- xxV—Supply DC Voltage
- xx % —Percentage Of Diffusion
- G.Y.O.DG.—Lens Color
- AB—Flat Denotes Anode
- TRFxxx—Formed Leads/Tapped And Reel
- TBFxxx—Formed Leads/Tapped And Box
- TRSxxx—Straight Leads/Tapped And Reel
- TBSxxx—Straight Leads/Tapped And Box
- LC-xx—Leads Length-Cut Leads Length
- NC—NoCutting

LEADS TYPE:

- E : 1.0" Long, Reflective Type
- F : Flux Led Type
- G : BackLight LED Type
- H : BackLight LED Type
- J : 1.0" Long, Reflective Type
- K : 1.0" Long, Reflective Type
- L : Type
- M : 1.0" Long, Reflective Type
- N : 1.0" Long, Reflective Type
- R : 1.0" Long, Reflective Type
- S : Pitch 0.05" Tri-State Reflective Type

LED LAMPS: (Dual Color & Full Color Type)



PACKAGE TYPE:

- B : Round
- R : Rectangular

LENS APPEARANCE:

- 2 : White Diffused
- 3 : Water Clear

LIGHT SOURCE:

- H- : GaP/700nm/Red
- G- : GaP/568nm/Yellow Green
- X- : GaP/568nm/Yellow Green (YGU)
- W- : GaP/555nm/Pure Green (PG)
- Y- : GaAsP/GaP 585nm/Yellow
- E- : GaAsP/GaP 635nm/Orange
- S- : GaAlAs/GaAs 660nm/Super Red (SR)
- D- : GaAlAs/GaAs 660nm/Super Red (SRD)
- A- : GaAsP/GaP 610nm/Amber
- B0- : GaN/SiC 430nm/Super Blue
- B1- : InGaN/SiC 470nm/Super Blue
- C- : GaAsP/GaP 655nm/Hi-Eff. Red (HR)

LEADS TYPE :

- 0 : 3-pin Leads For Dual Chip Lamp (2009)(2016)
- 5 : 3-pin Leads For SMD Lamp Type(SOT-23)
- 7 : 2-pin Leads For Dual Chip Type (2007)

SPECIAL DEVICE:

- A : Angle Leads-Com.Anode
- B : Center Leads-Com.Anode