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Notes: Specification and dimensions in this catalogue are subject to change without notice.

LED LAMPS 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 determined 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 From 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 freely 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 $\times 2.0$

LED LAMPS GENERAL INFORMATION

ABSOLUTE MAXIMUM RATINGS

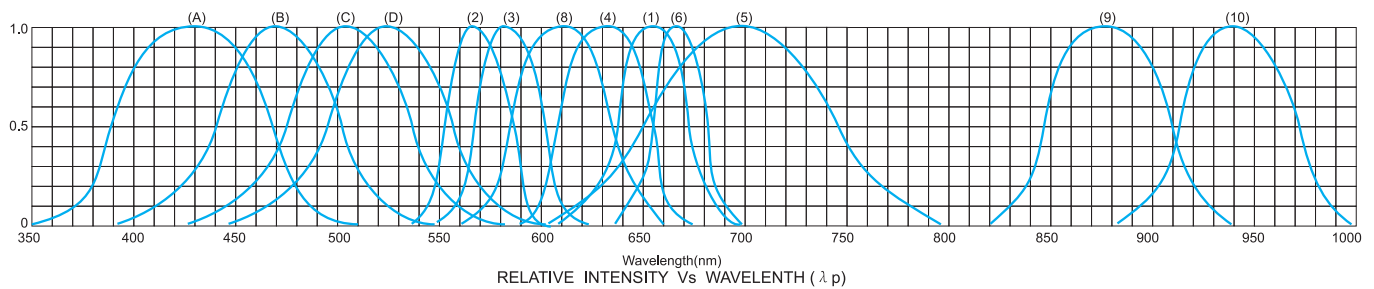
1. Test Condition For Each Parameter:

Parameter	Symdol	Unit	Test Condition
Reverse Voltage	V_R	V	
Reverse Current	I_R	μA	$V_R = 5$ Volt
Forward Voltage	V_F	V	$I_F = 20$ mA
Luminous Intensity	I_V	mcd	$I_F = 20$ mA
Viewing Angle	2θ 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

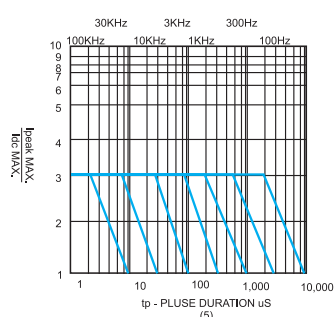
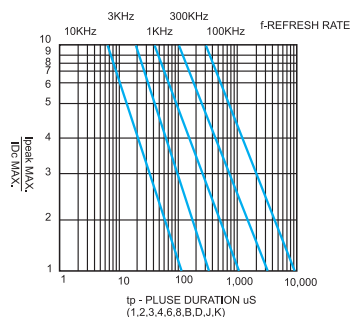
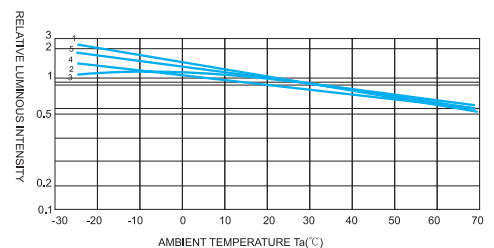
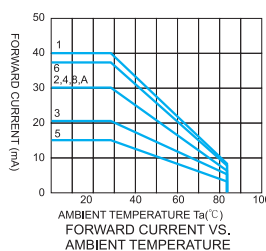
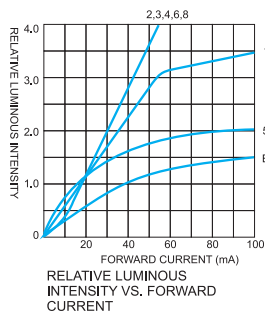
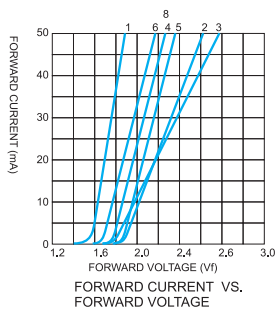
2. Absolute Maximum Rating: ($T_a = 25^\circ C$)

Reverse Voltage	5 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



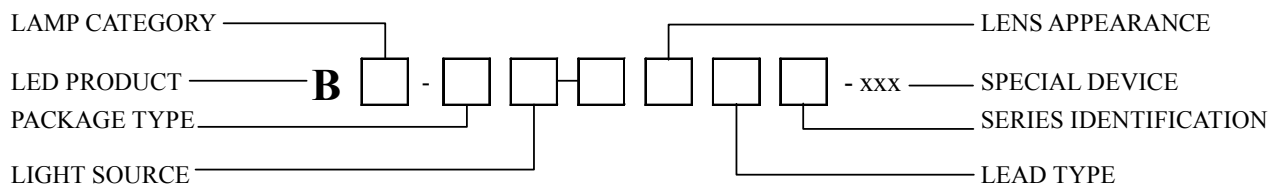
- | | |
|--|-----------------------------------|
| (1) wGaAsP/GaAs 655nm/Red | (8) GaAlAs 880nm |
| (2) wGaP 568nm/Yellow Green | (9) GaAs/GaAs & GaAlAs/GaAs 940nm |
| (3) wGaAsP/GaP 585nm/Yellow | (A) GaN/SiC 430nm/Blue |
| (4) wGaAsP/GaP 635nm/Orange & Hi-Eff Red | (B) InGaN/SiC 470nm/Blue |
| (5) wGaP 700nm/Bright Red | (C) InGaN/SiC 502nm/Ultra Green |
| (6) wGaAlAs/GaAs 660nm/Super Red | (D) InGaAl/SiC 523nm/Ultra Green |
| (7) wGaAsP/GaP 610nm/Super Red | |



SELECTION GUIDE TO LED LAMPS

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/GaP 585nm/Yellow (Y_x)
- 4 : GaAsP/GaP 635nm/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)
- Z1 : InGaN/SiC/Super White

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

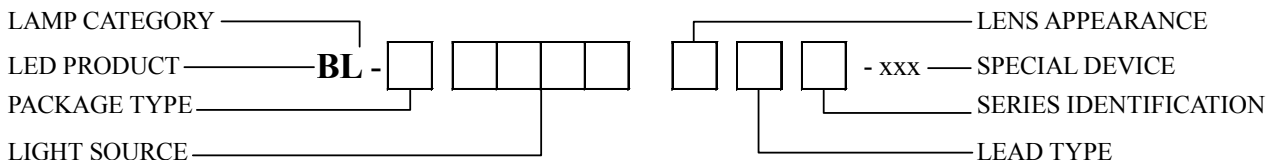
SPECIAL DEVICE

- 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 — No Cutting

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

RESISTOR LED LAMPS (ROUND TYPES)

Package	Part No.	Chip		Lens Appearance	Operating Voltage (V)		Forward Current (mA)		Luminous Intensity (mA)		Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λp (nm)		Typ.	Max.	Typ.	Max.	Min.	Typ.		
T-1 Standard 1.0" Lead 3φ	BR-B51V1-05V	GaP/GaP/Bright Red	700	Red Diffused	-	5	8	12	2.0	4.5	30	L-003
	BR-B45V1-05V	GaAsP/GaP/Hi-Eff Red	635						6.0	20.0		
	BR-B61V1-05V	GaAlAs/SH Super Red	660						10.0	30.0		
	BR-B21V1-12V	GaP/GaP/Green	568	Green Diffused	-	12			6.0	20.0		
	BR-BX11V1-12V	GaP/GaP/Hi-Eff Green	568						6.5	22.0		
	BR-B31V1-15V	GaAsP/GaP/Yellow	585	Yellow Diffused	-	15			5.0	15.0		
	BR-B41V1-15V	GaAsP/GaP/Orange	635	Orange Diffused					6.0	20.0		
T-13/4 Standard 1.0" Lead 5φ	BR-B5134-05V	GaP/GaP/Bright Red	700	Red Diffused	-	5	8	12	3.0	10.0	12	L-004
	BR-B4534-05V	GaAsP/GaP/Hi-Eff Red	635						10.0	40.0		
	BR-B6134-05V	GaAlAs/SH Super Red	660						20.0	60.0		
	BR-B2134-12V	GaP/GaP/Green	568	Green Diffused		12			10.0	40.0		
	BR-BX1134-12V	GaP/GaP/Hi-Eff Green	568						10.0	45.0		
	BR-B4534-15V	GaAsP/GaP/Hi-Eff Red	635	Red Diffused		15			10.0	40.0		
	BR-B4134-15V	GaAsP/GaP/Orange	635	Orange Diffused					10.0	40.0		

Remark: 1. Hi-Eff Red/High-Efficiency Red.

2. Trans/Transparent.

3. 2θ 1/2 The off-axis angle at which the luminous intensity is half the axial luminous intensity.

L-003	BR-BxxV1-xxV Series	L-004	BR-Bxx34-xxV Series
FLAT DENOTES CATHODE		FLAT DENOTES CATHODE	

Notes: 1. All dimensions are millimeters (inches).

2. Tolerance is $\pm 0.25\text{mm}$ (.010")

STANDARD LED LAMPS (ROUND TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.	
		Material/Emitted Color	Peak Wave Length λ _p (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)			
									Typ	Max	Typ.			
T-1 Standard 1.0" Lead 3 ϕ	BL-B4541	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	80	30	150	2.0	2.6	40.0	35	L-005	
	BL-B2141	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	40.0			
	BL-B3141	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	30.0			
	BL-B2441	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	80.0	30		
	BL-B3441	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	65.0			
	BL-B2341	GaP/GaP/Green	568	Water Clear	30	80	30	150	2.2	2.6	80.0			
	BL-BX1341	GaP/GaP/Hi-Eff Green	568		35	80	30	150	2.1	2.6	120.0			
T-1 Standard 1.0" Lead 3 ϕ	BL-B45V1	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	80	30	150	2.0	2.6	40	35	L-006	
	BL-B21V1	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	40			
	BL-B31V1	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	30			
	BL-B24V1	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	80	30		
	BL-B34V1	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	65			
	BL-B43V1	GaAsP/GaP/Hi-Eff Red	635	Water Clear	45	80	30	150	2.0	2.6	80			
	BL-BX13V1	GaP/GaP/Hi-Eff Green	568		35	80	30	150	2.1	2.6	120			
T-1 1.0" Lead 3 ϕ	BL-B45V1G	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	80	30	150	2.0	2.6	40	35	L-007	
	BL-B21V1G	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	40			
	BL-B31V1G	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	30			
	BL-B24V1G	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	80	30		
	BL-B34V1G	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	65			
	BL-B43V1G	GaAsP/GaP/Hi-Eff Red	635	Water Clear	45	80	30	150	2.0	2.6	80			
	BL-BX13V1G	GaP/GaP/Hi-Eff Green	568		35	80	30	150	2.1	2.6	120			
1.0 Lead High Flangeless 3.4 ϕ	BL-B51V1H	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	13.0	30	L-008	
	BL-B45V1H	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	40.0			
	BL-B21V1H	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	50.0			
	BL-B31V1H	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	30.0			
	BL-B24V1H	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	100	25		
	BL-B46V1H	GaAsP/GaP/Hi-Eff Red	635	Red Trans	45	80	30	150	2.0	2.6	100			
T-1 1.0 Lead High Flangeless 3.0 ϕ	BL-B51V1J	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	13.0	35	L-009	
	BL-B45V1J	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	40.0			
	BL-B21V1J	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	50.0			
	BL-B31V1J	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	30.0	30		
	BL-B24V1J	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.0	2.6	100			
T-1 1.0 Lead 3.0 ϕ	BL-B43V1M	GaAsP/GaP/Hi-Eff Red	635	Water Clear	45	80	30	150	2.0	2.6	100	15	L-010	
	BL-B23V1M	GaP/GaP/Green	568		30	80	30	150	2.0	2.6	100			
	BL-B33V1M	GaAsP/GaP/Yellow	585	Orange Trans	35	80	30	150	2.1	2.6	30			
	BL-B44V1M	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	100			
	BL-B24V1M	GaP/GaP/Green	568		30	80	30	150	2.0	2.6	100			
T-1 1.0 Lead 3.0 ϕ	BL-B2141P	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	35	40	L-011	
	BL-B3141P	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	30			
	BL-B4541P	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	80	30	150	2.0	2.6	35	30		
	BL-B2341P	GaP/GaP/Green	568	Water Clear	30	80	30	150	2.2	2.6	80			
	BL-B3341P	GaAsP/GaP/Yellow	585		35	80	30	150	2.1	2.6	60			
	BL-B4341P	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	80			
T-1 Standard 1.0 Lead 3.1 ϕ	BL-B4541Q	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	80	30	150	2.0	2.6	60.0	40	L-012	
	BL-B2141Q	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	60.0			
	BL-B3141Q	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	50.0			
	BL-B4141Q	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	60.0			
	BL-B3341Q	GaAsP/GaP/Yellow	585	Water Clear	35	80	30	150	2.1	2.6	90.0	35		
	BL-B2341Q	GaP/GaP/Green	568		30	80	30	150	2.2	2.6	110.0			
	BL-BX1341Q	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.1	2.6	150.0			

Remark: 1. Hi-Eff Red/High-Efficiency Red.

2. Trans/Transparent.

3. 2θ 1/2 The off-axis angle at which the luminous intensity is half the axial luminous intensity.

STANDARD LED LAMPS (ROUND TYPES)

L-005 BL-Bxx41 Series Side view dimensions: $\phi 3.00(.118)$, $0.81(.032)$, $1.5(.059)$ MAX., $5.30(.209)$, $25.4(1.00)$ MIN, $0.5(.02)$ SQ. TYP., $2.54(.100)$ $1.00(.039)$ MIN. NOM. End view dimensions: $3.80(.150)$ FLAT DENOTES CATHODE	L-006 BL-BxxV1 Series Side view dimensions: $\phi 3.00(.118)$, $0.81(.032)$, $1.5(.059)$ MAX., $5.30(.209)$, $25.4(1.00)$ MIN, $0.5(.02)$ SQ. TYP., $1.00(.039)$ MIN., $2.54(.100)$ NOM. End view dimensions: $3.80(.150)$ FLAT DENOTES CATHODE
L-007 BL-BxxV1G Series Side view dimensions: $\phi 3.05(.120)$, $2.9(.114)$, $5.40(.213)$, $1.8(.071)$, $1.5(.059)$ MAX., $25.4(1.00)$ MIN, $0.5(.02)$ SQ. TYP., $1.00(.039)$ MIN, $2.54(.100)$ NOM. End view dimensions: $3.95(.156)$ Cathode	L-008 BL-BxxV1H Series Side view dimensions: $\phi 3.35(.132)$, $6.00(.236)$, $1.5(.059)$ MAX., $25.4(1.00)$ MIN, $0.5(.02)$ SQ. TYP., $1.0(.04)$ MIN, $2.54(.100)$ NOM. End view dimensions: $3.35(.132)$ CATHODE
L-009 BL-BxxV1J Series Side view dimensions: $\phi 3.0(.118)$, $5.10(.201)$, $1.5(.059)$ MAX., $25.4(1.00)$ MIN, $0.5(.02)$ SQ. TYP., $1.0(.04)$ MIN, $2.54(.100)$ NOM. End view dimensions: $3.00(.118)$ CATHODE	L-010 BL-BxxV1M Series Side view dimensions: $\phi 2.78(.109)$, $5.2(.205)$, $1.0(.039)$, $1.5(.059)$ MAX., $25.4(1.00)$ MIN, $0.5(.02)$ SQ. TYP., $1.0(.04)$ MIN, $2.54(.100)$ NOM. End view dimensions: $4.0(.158)$, $3.0(.118)$ FLAT DENOTES CATHODE
L-011 BL-Bxx41P Series Side view dimensions: $\phi 3.00(.118)$, $0.90(.035)$, $1.5(.059)$ MAX., $5.30(.209)$, $25.4(1.00)$ MIN, $0.5(.02)$ SQ. TYP., $2.54(.100)$ $1.00(.039)$ MIN. NOM. End view dimensions: $3.80(.150)$ Flat Denotes Cathode	L-012 BL-Bxx41Q Series Side view dimensions: $\phi 3.10(.122)$, $4.80(.189)$, $1.30(.051)$, $1.5(.059)$ MAX., $25.4(1.00)$ MIN, $1.00(.039)$ MIN., $2.54(.100)$ NOM. End view dimensions: $3.80(.150)$, $3.60(.142)$ CATHODE

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

STANDARD LED LAMPS (ROUND TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λp (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max	Typ.		
T-1 1.0" Lead 3.55 ϕ	BL-B51V1T	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	6.0	35	L-013
	BL-B45V1T	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	70.0		
	BL-B21V1T	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	70.0		
	BL-B31V1T	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	60.0		
	BL-B24V1T	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	120.0	30	
	BL-B34V1T	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	100.0		
Standard 1.0" Lead 4.0 ϕ	BL-B5132	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	12.0	55	L-014
	BL-B4532	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	70.0		
	BL-B2132	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	70.0		
	BL-B3132	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	60.0		
	BL-B4132	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	70.0	35	
	BL-B4632	GaAsP/GaP/Hi-Eff Red	635	Red Trans	45	80	30	150	2.0	2.6	120.0		
Medium Profile Flangeless 1.0" Lead 4.7 ϕ	BL-B4533	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	80	30	150	2.0	2.6	80.0	40	L-015
	BL-B2133	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	80.0		
	BL-B3133	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	70.0		
	BL-B4133	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	80.0		
	BL-B3333	GaAsP/GaP/Yellow	585	Water Clear	35	80	30	150	2.1	2.6	100.0	30	
	BL-B2333	GaP/GaP/Green	568		30	80	30	150	2.2	2.6	130.0		
	BL-B4333	GaAsP/GaP/Orange	635		45	80	30	150	2.0	2.6	130.0		
1.0" Lead 4.8 ϕ	BL-B5134B	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	4.0	30	L-016
	BL-B4534B	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	25.0		
	BL-B2134B	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	25.0		
	BL-B3134B	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	20		
	BL-B2434B	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	100	20	
	BL-B4634B	GaAsP/GaP/Orange	635	Red Trans	45	80	30	150	2.0	2.6	100		
Medium Profile Flangeless 1.0" Lead 4.8 ϕ	BL-B5133N	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	25.0	40	L-017
	BL-B4533N	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	80.0		
	BL-B2133N	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	80.0		
	BL-B3133N	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	70.0		
	BL-B2433N	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	130.0	35	
	BL-B3433N	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	100.0		
T-13/4 Standard 0.8 " Lead 5.0 ϕ	BL-B5114	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	6.0	45	L-018
	BL-B4114	GaAsP/GaP/Orange	635		45	80	30	150	2.0	2.6	50.0		
	BL-B2114	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	50.0		
	BL-B3114	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	40.0		
	BL-B2414	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.0	2.6	55.0	35	
	BL-B4614	GaAsP/GaP/Hi-Eff Red	635	Red Trans	45	80	30	150	2.0	2.6	55.0		
T-13/4 Standard 0.5 " Lead 5.0 ϕ	BL-B4524	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	80	30	150	2.0	2.6	25.0	40	L-019
	BL-B2124	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	25.0		
	BL-B3124	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	20.0		
	BL-B4124	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	25.0		
	BL-B2424	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	65.0	30	
	BL-B3424	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	50.0		
T-13/4 Standard 1.0 " Lead 5.0 ϕ	BL-B2324	GaP/GaP/Green	568	Water Clear	30	80	30	150	2.2	2.6	65.0	35	L-020
	BL-B5134	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	3.5		
	BL-B4534	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	65.0		
	BL-B2134	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	40.0		
	BL-B3134	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	45.0		
	BL-B2434	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.0	2.6	200	12	
BL-B4634	GaAsP/GaP/Yellow	635	Red Trans	45	80	30	150	2.0	2.6	200			

STANDARD LED LAMPS (ROUND TYPES)

L-013 BL-BxxV1T Series	L-014 BL-Bxx32 Series
L-015 BL-Bxx33 Series	L-016 BL-Bxx34B Series
L-017 BL-Bxx33N Series	L-018 BL-Bxx14 Series
L-019 BL-Bxx24 Series	L-020 BL-Bxx34 Series

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

STANDARD LED LAMPS (ROUND & RECTANGULAR TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λp (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max	Typ.		
T1 3/4 Wide Viewing Angle 1.0" Lead 5.0 ϕ	BL-B4534G-1	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	80	30	150	2.0	2.6	65.0	45	L-021
	BL-B2134G-1	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	65.0		
	BL-B3134G-1	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	60.0		
	BL-B4134G-1	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	65.0		
	BL-B3334G-1	GaAsP/GaP/Yellow	585	Water Clear	35	80	30	150	2.1	2.6	140.0	20	
	BL-B2334G-1	GaP/GaP/Green	568		30	80	30	150	2.2	2.6	150.0		
	BL-B4334G-1	GaAsP/GaP/Orange	635		45	80	30	150	2.0	2.6	150.0		
T1 3/4 Wide Viewing Angle 1.0" Lead 5.0 ϕ	BL-B4534J	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	80	30	150	2.0	2.6	65.0	40	L-022
	BL-B2134J	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	65.0		
	BL-B3134J	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	60.0		
	BL-B4134J	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	65.0		
	BL-B3334J	GaAsP/GaP/Yellow	585	Water Clear	35	80	30	150	2.1	2.6	120.0	20	
	BL-B2334J	GaP/GaP/Green	568		30	80	30	150	2.2	2.6	140.0		
	BL-B4334J	GaAsP/GaP/Orange	635		45	80	30	150	2.0	2.6	140.0		
T1 3/4 Flangeless 1.0" Lead 5.0 ϕ	BL-B5134N	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	13.0	40	L-023
	BL-B4534N	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	80.0		
	BL-B2134N	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	80.0		
	BL-B3134N	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	70.0		
	BL-B2434N	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.0	2.6	140.0	20	
	BL-B4334N	GaAsP/GaP/Orange	635	Water Clear	45	80	30	150	2.0	2.6	140.0		
T1 3/4 Flangeless 1.0" Lead 5.0 ϕ	BL-B5134Q	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	5.0	50	L-024
	BL-B4534Q	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	55		
	BL-B2134Q	GaP/Gap/Green	568	Green Diffused	30	80	30	150	2.2	2.6	55		
2.0x4.0x 7.0mm 1.0" Lead Rectangular Flangeless	BL-R5131	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.0	120	L-025
	BL-R4531	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	7.0		
	BL-R2131	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	7.0		
	BL-R3131	GaAsP/GaAs/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	6.0		
	BL-R4131	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	7.0		
	BL-R9131	GaP/GaP/Pure Green	555	Green Diffused	25	80	30	150	2.2	2.6	1.0		
1.3x4.0x 4.0mm 1.0" Lead Rectangular	BL-R5421D	GaP/GaP/Bright Red	700	Red Trans	90	40	15	50	2.2	2.6	6.0	80	L-026
	BL-R4621D	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	12.0		
	BL-R2421D	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	12.0		
	BL-R3421D	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	10.0		
	BL-R4421D	GaAsP/GaP/Orange	635	Orange Trans	25	80	30	150	2.0	2.6	12.0		
	BL-R9421D	GaP/GaP/Pure Green	555	Green Trans	30	80	30	150	2.2	2.6	1.0		
1.9x3.1x 4.0mm 0.5" Lead Rectangular	BL-R5121F	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	0.6	120	L-027
	BL-R4521F	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	3.0		
	BL-R2121F	GaP/Gap/Green	568	Green Diffused	30	80	30	150	2.2	2.6	3.0		
	BL-R3121F	GaAsP/GaP/ Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	2.5		
	BL-R4121F	GaAsP/GaP/Orange	635	Orange Diffused	25	80	30	150	2.0	2.6	3.0		
1.2x3.4x 4.0mm 0.5" Lead Rectangular	BL-R5421G	GaP/GaP/Bright Red	700	Red Trans	90	40	15	50	2.2	2.6	0.6	60	L-028
	BL-R4621G	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	3.5		
	BL-R2421G	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	3.5		
	BL-R3421G	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	3.0		

STANDARD LED LAMPS (ROUND & RECTANGULAR TYPES)

L-021 BL-Bxx34G-1 Series	L-022 BL-Bxx34J Series
L-023 BL-Bxx34N Series	L-024 BL-Bxx34Q Series
L-025 BL-Rxx31 Series	L-026 BL-Rxx21D Series
L-027 BL-Rxx21F Series	L-028 BL-Rxx21G Series

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

STANDARD LED LAMPS (RECTANGULAR TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λ _p (nm)		Δ λ (nm)	Pd (mw)	If (mA)	Peak (mA)	V _f (V)		I _v (mcd)		
									Typ	Max	Typ		
1.7x4.0x 6.9mm 1.0" Lead Rectangular	BL-R5141H	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.0	140	L-029
	BL-R4541H	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	4.0		
	BL-R2141H	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	4.0		
	BL-R3141H	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	3.0		
	BL-R4141H	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	4.0		
	BL-R9141H	GaP/GaP/Pure Green	555	Green Diffused	25	80	30	150	2.2	2.6	0.5		
2.0x5.0x 7.8mm 1.0" Lead Rectangular	BL-R5132	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	6.0	120	L-030
	BL-R4632	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	10.0		
	BL-R2132	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	10.0		
	BL-R3132	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	8.0		
	BL-R4132	GaAsP/GaP/Orange	635	Orange Diffused	25	80	30	150	2.0	2.6	10.0		
	BL-R9132	GaP/GaP/Pure Green	555	Green Diffused	30	80	30	150	2.2	2.6	1.5		
2.0x5.0x 7.5mm 1.0" Lead Rectangular	BL-R5132B	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	0.8	120	L-031
	BL-R4532B	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	5.0		
	BL-R2132B	GaP/Gap/Green	568	Green Diffused	30	80	30	150	2.2	2.6	5.0		
	BL-R3132B	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	4.0		
	BL-R4132B	GaAsP/GaP/Orange	635	Orange Diffused	25	80	30	150	2.0	2.6	0.4		
2.5x5.1x 5.4mm 1.0" Lead Rectangular	BL-R5132C	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	0.8	130	L-032
	BL-R4532C	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	4.0		
	BL-R2132C	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	4.0		
	BL-R3132C	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	3.0		
1.9x5.0x 6.8mm 1.0" Lead Rectangular	BL-R5132R	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.2	140	L-033
	BL-R4532R	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	8.0		
	BL-R2132R	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	8.0		
	BL-R3132R	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	7.0		
	BL-R4132R	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	8.0		
	BL-RX1132R	GaP/GaP/Hi-Eff Green	568	Green Diffused	30	80	30	150	2.2	2.6	12.0		
2.4x5.0x 8.6mm 1.0" Lead Rectangular	BL-R5432T	GaP/GaP/Bright Red	700	Red Trans	90	40	15	50	2.2	2.6	30.0	40	L-034
	BL-R4632T	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	80.0		
	BL-R2432T	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	80.0		
	BL-R3432T	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	70.0		
	BL-R4432T	GaAsP/GaP/Orange	635	Orange Trans	45	80	30	150	2.0	2.6	80.0		
	BL-RX1432T	GaP/GaP/Hi-Eff Green	568	Green Trans	30	100	30	150	2.2	2.6	100		
1.4x4.7x 7.0mm 1.0" Lead Rectangular	BL-R5133	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	0.8	125	L-035
	BL-R4533	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	5.0		
	BL-R2133	GaP/Gap/Green	568	Green Diffused	30	80	30	150	2.2	2.6	5.0		
	BL-R3133	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	4.0		
	BL-R4133	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	5.0		
	BL-RX1133	GaP/Gap/Pure Green	568	Green Diffused	30	80	30	150	2.2	2.6	8.0		
5.0x5.0x 7.1mm 1.0" Lead Rectangular	BL-R5130	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.0	150	L-036
	BL-R4530	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	7.0		
	BL-R2130	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	7.0		
	BL-R3130	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	6.0		
	BL-R4130	GaAsP/GaP/Orange	635	Orange Diffused	25	80	30	150	2.0	2.6	7.0		

STANDARD LED LAMPS (RECTANGULAR TYPES)

L-029 BL-Rxx41H Series Technical drawing of the BL-Rxx41H Series LED lamp. The side view shows a total height of 6.9(.272) and a base width of 4.0(.157). The base has a maximum height of 1.5(.059) MAX. and a minimum height of 2.54(.100) NOM. The end view shows a total height of 1.7(.067) and a base width of 1.8(.071). The base has a minimum height of 1.0(.039) MIN. and a typical square feature of 0.5(.02) SQ.TYP. The cathode is labeled CATHODE.	L-030 BL-Rxx32 Series Technical drawing of the BL-Rxx32 Series LED lamp. The side view shows a total height of 6.0(.236) and a base width of 5.0(.197). The base has a maximum height of 1.5(.059) MAX. and a minimum height of 2.54(.100) NOM. The end view shows a total height of 2.0(.079) and a base width of 2.8(.110). The base has a minimum height of 1.0(.039) MIN. and a typical square feature of 0.5(.02) SQ.TYP. The cathode is labeled CATHODE.
L-031 BL-Rxx32B Series Technical drawing of the BL-Rxx32B Series LED lamp. The side view shows a total height of 6.3(.248) and a base width of 4.8(.189). The base has a maximum height of 1.5(.059) MAX. and a minimum height of 2.54(.100) NOM. The end view shows a total height of 1.9(.075) and a base width of 2.8(.11). The base has a minimum height of 1.0(.04) MIN. and a typical square feature of 0.5(.02) SQ. TYP. The cathode is labeled CATHODE.	L-032 BL-Rxx32C Series Technical drawing of the BL-Rxx32C Series LED lamp. The side view shows a total height of 5.4(.213) and a base width of 5.0(.197). The base has a maximum height of 1.5(.059) MAX. and a minimum height of 2.54(.100) NOM. The end view shows a total height of 2.2(.087) and a base width of 2.3(.091). The base has a minimum height of 1.0(.039) MIN. and a typical square feature of 0.5(.02) SQ.TYP. The cathode is labeled CATHODE.
L-033 BL-Rxx32R Series Technical drawing of the BL-Rxx32R Series LED lamp. The side view shows a total height of 6.8(.268) and a base width of 5.0(.197). The base has a maximum height of 1.5(.059) MAX. and a minimum height of 2.54(.100) NOM. The end view shows a total height of 1.9(.075) and a base width of 2.0(.079). The base has a minimum height of 1.0(.04) MIN. and a typical square feature of 0.5(.02) SQ. TYP. The cathode is labeled CATHODE.	L-034 BL-Rxx32T Series Technical drawing of the BL-Rxx32T Series LED lamp. The side view shows a total height of 8.6(.339) and a base width of 4.9(.193). The base has a maximum height of 1.5(.059) MAX. and a minimum height of 2.54(.100) NOM. The end view shows a total height of 2.4(.094) and a base width of 2.4(.094). The base has a minimum height of 1.0(.04) MIN. and a typical square feature of 0.5(.02) SQ. TYP. The cathode is labeled CATHODE.
L-035 BL-Rxx33 Series Technical drawing of the BL-Rxx33 Series LED lamp. The side view shows a total height of 3.7(.146) and a base width of 3.7(.146). The base has a maximum height of 1.5(.059) MAX. and a minimum height of 2.54(.100) NOM. The end view shows a total height of 2.7(.106) and a base width of 2.7(.106). The base has a minimum height of 1.0(.039) MIN. and a typical square feature of 0.5(.02) SQ.TYP. The cathode is labeled CATHODE.	L-036 BL-Rxx30 Series Technical drawing of the BL-Rxx30 Series LED lamp. The side view shows a total height of 7.1(.280) and a base width of 5.0(.197). The base has a maximum height of 1.5(.059) MAX. and a minimum height of 2.54(.100) NOM. The end view shows a total height of 5.1(.201) and a base width of 5.9(.232). The base has a minimum height of 1.0(.04) MIN. and a typical square feature of 0.5(.02) SQ.TYP. The cathode is labeled CATHODE.

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

STANDARD LED LAMPS (RECTANGULAR & CYLINDRICAL TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data(At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λ _p (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max	Typ		
5.0x5.0x 7.1mm 1.0" Lead Rectangular	BL-R5130N	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.0	150	L-037
	BL-R4530N	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	7.0		
	BL-R2130N	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	7.0		
	BL-RX1130N	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	10.0		
	BL-R3130N	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	6.0		
	BL-R4130N	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	7.0		
3.7x6.3x 6.8mm 1.0" Lead Rectangular	BL-R513P	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	2.0	120	L-038
	BL-R453P	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	8.0		
	BL-R213P	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	8.0		
	BL-RX113P	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	11.0		
	BL-R313P	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	7.0		
	BL-R413P	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	8.0		
3.6x3.6x 7.2mm 1.0" Lead Rectangular	BL-R513T	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.0	120	L-039
	BL-R453T	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	6.0		
	BL-R213T	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	6.0		
	BL-RX113T	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	8.0		
	BL-R313T	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	5.0		
	BL-R413T	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	6.0		
Cylindrical 0.5" Lead 4.5 ϕ	BL-C5121	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.2	150	L-040
	BL-C4521	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	9.0		
	BL-C2121	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	9.0		
	BL-C3121	GaP/GaP/Hi-Eff Green	585	Yellow Diffused	35	80	30	150	2.1	2.6	8.0		
1.0" Lead Cylindrical ϕ 3.0	BL-C5132	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	3.0	130	L-041
	BL-C4532	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	9.0		
	BL-C2132	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	9.0		
	BL-CX1132	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	12.0		
	BL-C3132	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	8.0		
	BL-C4132	GaAsP/GaP/Orange	635	Orange Diffused	45	100	30	150	2.0	2.6	9.0		
1.0" Lead Cylindrical ϕ 3.0	BL-C5435	GaP/GaP/Bright Red	700	Red Trans	90	40	15	50	2.2	2.6	5.0	120	L-042
	BL-C4635	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	15.0		
	BL-C2435	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	15.0		
	BL-CX1435	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	18.0		
	BL-C3435	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	12.0		
	BL-C4435	GaAsP/GaP/Orange	635	Orange Trans	45	100	30	150	2.0	2.6	15.0		
1.0" Lead Cylindrical ϕ 5.0	BL-C5436	GaP/GaP/Bright Red	700	Red Trans	90	40	15	50	2.2	2.6	5.0	120	L-043
	BL-C4636	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	14.0		
	BL-C2436	GaP/GaP/Green	568	Green Trans	30	80	30	150	2.2	2.6	14.0		
	BL-CX1436	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	16.0		
	BL-C3436	GaAsP/GaP/Yellow	585	Yellow Trans	35	80	30	150	2.1	2.6	13.0		
	BL-C4436	GaAsP/GaP/Orange	635	Orange Trans	45	100	30	150	2.0	2.6	14.0		
Panel Dot 1.0" Lead ϕ 1.75	BL-S5131	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.2	75	L-044
	BL-S4531	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	6.0		
	BL-S2131	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	6.0		
	BL-S3131	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	4.0		

STANDARD LED LAMPS (RECTANGULAR & CYLINDRICAL TYPES)

L-037 BL-Rxx30N Series	L-038 BL-Rxx3P Series
L-039 BL-Rxx3T Series	L-040 BL-Cxx21 Series
L-041 BL-Cxx32 Series	L-042 BL-Cxx35 Series
L-043 BL-Cxx36 Series	L-044 BL-Sxx31 Series

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

STANDARD LED LAMPS (TOWER TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data(At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λ _p (nm)		Δ λ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max	Typ		
1.0" Lead Tower φ3.0	BL-S5132	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.2	100	L-045
	BL-S4532	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	6.0		
	BL-S2132	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	6.0		
	BL-SX1132	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	9.0		
	BL-S3132	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	5.0		
	BL-S4132	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	6.0		
1.0" Lead Tower φ2.75	BL-S5133	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.4	100	L-046
	BL-S4533	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	6.0		
	BL-S2133	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	6.0		
	BL-SX1133	GaP/Gap/Hi-Eff Green	568		30	80	30	150	2.2	2.6	9.0		
	BL-S3133	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	5.0		
	BL-S4133	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	6.0		
1.0" Lead Tower φ2.0	BL-S5136	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.2	70	L-047
	BL-S4536	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	7.0		
	BL-S2136	GaP/Gap/Green	568	Green Diffused	30	80	30	150	2.2	2.6	7.0		
	BL-SX1136	GaP/Gap/Hi-Eff Green	568		30	80	30	150	2.2	2.6	10.0		
	BL-S3136	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	6.0		
	BL-S4136	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	7.0		
1.0" Lead Tower φ2.8	BL-S5137	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	15	100	L-048
	BL-S4537	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	22		
	BL-S2137	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	22		
	BL-SX1137	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	25		
	BL-S3137	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	21		
	BL-S4137	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	22		
1.0" Lead Tower φ3.0	BL-S5137A	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	15	70	L-049
	BL-S4537A	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	22		
	BL-S2137A	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	22		
	BL-SX1137A	GaAsP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	25		
	BL-S3137A	GaAsP/GaP/Orange	585	Yellow Diffused	35	80	30	150	2.1	2.6	21		
	BL-S4137A	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	22		
1.0" Lead Tower φ1.8	BL-S51L8	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.0	70	L-050
	BL-S45L8	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	5.0		
	BL-S21L8	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	5.0		
	BL-SX11L8	GaAsP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	8.0		
	BL-S31L8	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	4.0		
	BL-S41L8	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	5.0		
1.0" Lead Tower φ2.0	BL-S5149	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.0	100	L-051
	BL-S4549	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	8.0		
	BL-S2149	GaP/Gap/Green	568	Green Diffused	30	80	30	150	2.2	2.6	8.0		
	BL-S3149	GaAsP/GaP/Green	568	Yellow Diffused	30	80	30	150	2.2	2.6	7.0		
	BL-S4149	GaAsP/GaP/Orange	635	Orange Diffused	35	80	30	150	2.1	2.6	8.0		
1.0" Lead Tower φ2.0	BL-S5149A	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	1.0	120	L-052
	BL-S4549A	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	8.0		
	BL-S2149A	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	8.0		
	BL-S3149A	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	7.0		

Remark: 1. Hi-eff Red/Hight-Efficiency Red.

2. Trans/Transparent.

3. 2θ 1/2 The off-axis angle at which the luminous intensity is half the axial luminous intensity.

STANDARD LED LAMPS (TOWER TYPES)

L-045 BL-Sxx32 Series Side view dimensions: 5.0(.197), 3.0(.118), 2.6(.102), 3.4(.134), 1.2(.047), 1.5(.059) MAX., 25.4(1.00) MIN., 0.5(.02) SQ. TYP., 1.0(.039) MIN., 2.54(.100) NOM. End view dimensions: 5.5(.217)	L-046 BL-Sxx33 Series Side view dimensions: 2.75(.108), 3.0(.118), 5.0(.197), 1.5(.059) MAX., 25.4(1.0) MIN., 0.5(.02) SQ. TYP., 1.0(.039) MIN., 2.54(.100) NOM. End view dimensions: 3.9(.154), 4.20(.165)
L-047 BL-Sxx36 Series Side view dimensions: 4.6(.181), 2.0(.079), 4.6(.181), 3.8(.150), 1.5(.059) MAX., 25.4(1.00) MIN., 0.5(.02) SQ. TYP., 1.0(.039) MIN., 2.54(.100) NOM. End view dimensions: 2.4(.094), 2.0(.079), 4.8(.189), 2.5(.098)	L-048 BL-Sxx37 Series Side view dimensions: 4.9(.193), 2.8(.110), 4.5(.177), 3.0(.118), 1.5(.059) MAX., 25.4(1.00) MIN., 0.5(.02) SQ. TYP., 1.0(.039) MIN., 2.54(.100) NOM. End view dimensions: 5.0(.197), FLAT DENOTES ANODE
L-049 BL-Sxx37A Series Side view dimensions: 3.45(.136), 2.92(.115), 4.50(.177), 9.50(.374), 13.08(.515), 1.5(.059) MAX., 25.40(1.00) MIN., 0.5(.02) SQ. TYP., 1.0(.039) MIN., 2.54(.10) NOM. End view dimensions: 4.78(.188)	L-050 BL-SxxL8 Series Side view dimensions: 3.3(.130), 1.8(.071), 1.6(.063), 3.0(.118), 1.5(.059) MAX., 25.4(.100) MIN., 0.5(.02) SQ. TYP., 1.0(.039) MIN., 2.54(.100) NOM. End view dimensions: 3.3(.130), 1.7R(.067), 2.4(.094)
L-051 BL-Sxx49 Series Side view dimensions: 3.7(.146), 2.0(.079), 2.5(.098), 2.9(.114), 1.5(.059) MAX., 25.4(1.00) MIN., 0.5(.02) SQ. TYP., 1.0(.039) MIN., 2.54(.100) NOM. End view dimensions: 3.9(.154), 2.0(.079)	L-052 BL-Sxx49A Series Side view dimensions: 1.6(.062), 2.0(.078), 3.1(.122), 3.5(.137), 1.5(.059) MAX., 25.4(1.00) MIN., 0.5(.02) SQ. TYP., 1.0(.039) MIN., 2.54(.100) NOM. End view dimensions: 2.65(.104), 2.75(.11), 3.7(.145), 2.75(.11)

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

BIGGER SIZE LED LAMPS (ROUND TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λp (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max	Typ.		
Round φ 8.0	BL-B5139	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	20.0	45	L-053
	BL-B4539	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	50.0		
	BL-B6139	GaAlAs/SH Red	660		20	60	30	150	1.7	2.6	100.0		
	BL-B2139	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	50.0		
	BL-BX139	GaAsP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	60.0		
	BL-B3139	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	40.0	20	
	BL-B4339	GaAsP/GaP/Orange	635	Water Clear	45	80	30	150	2.0	2.6	350.0		
Round φ 8.0	BL-B5139B	GaP/GaP/Bright Red	700	Red Diffused	90	40	15	50	2.2	2.6	15.0	50	L-054
	BL-B4539B	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	40.0		
	BL-B6139B	GaAlAs/SH Red	660		20	60	30	150	1.7	2.6	100.0		
	BL-B2139B	GaP/GaP/Green	568	Green Diffused	30	80	30	150	2.2	2.6	40.0		
	BL-BX139B	GaP/GaP/Hi-Eff Green	568		30	80	30	150	2.2	2.6	50.0		
	BL-B3139B	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	30.0	25	
	BL-B4339B	GaAsP/GaP/Orange	635	Water Clear	45	80	30	150	2.0	2.6	300.0		
8.0x8.0x 12.0mm 1.0" Lead Rectangular Round Head	BL-R513G	GaP/GaP/Bright Red	700	Red Diffused	90	50	15	50	2.2	2.6	30.0	35	L-055
	BL-R453G	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	100.0		
	BL-R613G	GaAlAs/SH Red	660		20	60	30	150	1.7	2.6	150.0		
	BL-RX113G	GaP/GaP/Hi-Eff Green	568	Green Diffused	30	80	30	150	2.2	2.6	180.0		
	BL-R213G	GaP/GaP/Green	568		30	80	30	150	2.2	2.6	150.0		
	BL-R313G	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	90.0	Orange Diffused	
	BL-R413G	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	100.0		
Round φ 10.0	BL-B5130A	GaP/GaP/Bright Red	700	Red Diffused	90	50	15	50	2.2	2.6	20.0	50	L-056
	BL-B4530A	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	100.0		
	BL-B6130A	GaAlAs/SH Red	660		20	60	30	150	1.7	2.6	140.0		
	BL-BX1130A	GaP/GaP/Hi-Eff Green	568	Green Diffused	30	80	30	150	2.2	2.6	130.0		
	BL-B2130A	GaP/GaP/Green	568		30	80	30	150	2.2	2.6	100.0		
	BL-B3130A	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	90.0	Orange Diffused	
	BL-B4130A	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	100.0		
Round φ 12.0	BL-B513C	GaP/GaP/Bright Red	700	Red Diffused	90	50	15	50	2.2	2.6	20.0	50	L-057
	BL-B453C	GaAsP/GaP/Hi-Eff Red	635		45	80	30	150	2.0	2.6	60.0		
	BL-B613C	GaAlAs/SH Red	660		20	60	30	150	1.7	2.6	100.0		
	BL-BX113C	GaP/GaP/Hi-Eff Green	568	Green Diffused	20	80	30	150	1.7	2.6	120.0		
	BL-B213C	GaP/GaP/Green	568		30	80	30	150	2.2	2.6	60.0		
	BL-B313C	GaAsP/GaP/Yellow	585	Yellow Diffused	35	80	30	150	2.1	2.6	50.0	Orange Diffused	
	BL-B413C	GaAsP/GaP/Orange	635	Orange Diffused	45	80	30	150	2.0	2.6	60.0		
Round φ 10.0	BL-B5330M	GaP/GaP/Bright Red	700	Water Clear	90	50	15	50	2.2	2.6	120.0	12	L-058
	BL-B6330M	GaAlAs/SH Red	660		20	60	30	150	1.7	2.6	450.0		
	BL-BD330M	GaAlAs/DH Red	660		20	60	30	150	1.7	2.6	600.0		
	BL-B2330M	GaP/GaP/Green	568		30	80	30	150	2.2	2.6	350.0		
	BL-BX1330M	GaP/GaP/Hi-Eff Green	568		20	80	30	150	1.7	2.6	120.0		
	BL-B3330M	GaAsP/GaP/Yellow	585		35	80	30	150	2.1	2.6	250.0		
	BL-B4330M	GaAsP/GaP/Orange	635		45	80	30	150	2.0	2.6	300.0		
Round φ 20.0	BL-B6H120U	GaP/GaP/Bright Red	700	Red Diffused	90	300	15	50	2.2	2.6	50.0	180	L-059
	BL-B6E520U	GaAsP/GaP/Orange	635		45	480	30	150	2.0	2.6	180.0		
	BL-B6D120U	GaAlAs/DH Red	660		20	360	30	150	1.7	2.6	200.0		
	BL-B6G120U	GaP/GaP/Green	568	Green Diffused	30	480	30	150	2.2	2.6	180.0		
	BL-B6X1120U	GaP/GaP/Hi-Eff Green	568		30	480	30	150	2.2	2.6	250.0		
	BL-B6Y120U	GaAsP/GaP/Yellow	585	Yellow Diffused	35	480	30	150	2.1	2.6	170.0		
Round φ 20.0	BL-B6H120-1S	GaP/GaP/Bright Red	700	Red Diffused	90	300	15	50	13.2	15.6	50.0	180	L-059
	BL-B6E520-1S	GaAsP/GaP/Orange	635		45	480	30	150	13.2	15.6	180.0		
	BL-B6D120-2P	GaAlAs/DH Red	660		20	480	30	150	5.1	7.8	200.0		
	BL-B6G120-2P	GaP/GaP/Green	568	Green Diffused	30	480	30	150	6.6	7.8	180.0		
	BL-B6Y120-3P	GaAsP/GaP/Yellow	585	Yellow Diffused	35	480	30	150	4.2	5.2	170.0		

Remark: 1. Hi-Eff Red/High-Efficiency Red.

2. Trans/Transparent.

3. 2θ 1/2 The off-axis angle at which the luminous intensity is half the axial luminous intensity.

BIGGER SIZE LED LAMPS (ROUND TYPES)

L-053 BL-Bxx39 Series	L-054 BL-Bxx39B Series
L-055 BL-Rxx3G Series	L-056 BL-Bxx30A Series
L-057 BL-Bxx3C Series	L-058 BL-Bx330M Series
L-059 BL-Bxxx20x & BL-Bxxx20-xx Series	

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

LOW-CURRENT LED LAMPS (ROUND TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings			Electro-optical Data (At 2mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λp (nm)		Δλ (nm)	Pd (mw)	If (mA)	Vf (V)		Iv (mcd)		
								Typ	Max	Typ.		
T-1 Standard 1.0" Lead 3 ϕ	BL-B5141-L	GaP/GaP/Bright Red	700	Red Diffused	90	14	7	1.9	2.2	1.0	35	L-060
	BL-B4541-L	GaAsP/GaP/Hi-Eff Red	635		45	14	7	1.8	2.2	4.0		
	BL-B2141-L	GaP/GaP/Green	568	Green Diffused	30	14	7	1.9	2.2	4.0		
	BL-BX1141-L	GaP/GaP/Hi-Eff Green	568		30	14	7	1.8	2.2	7.0		
	BL-B3141-L	GaAsP/GaP/Yellow	585	Yellow Diffused	35	14	7	1.9	2.2	3.0		
	BL-B4141-L	GaAsP/GaP/Orange	635	Orange Diffused	45	14	7	1.8	2.2	4.0		
	BL-B4341-L	GaAsP/GaP/Orange	635	Water Clear	45	14	7	1.8	2.2	12.0	30	
T-1 1.0" Lead 3 ϕ	BL-B45V1G-L	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	14	7	1.8	2.2	4.0	35	L-061
	BL-B21V1G-L	GaP/GaP/Green	568	Green Diffused	30	14	7	1.9	2.2	4.0		
	BL-B31V1G-L	GaAsP/GaP/Yellow	585	Yellow Diffused	35	14	7	1.9	2.2	3.0	30	
	BL-B24V1G-L	GaP/GaP/Green	568	Green Trans	30	14	7	1.9	2.2	8.0		
	BL-B34V1G-L	GaAsP/GaP/Yellow	585	Yellow Trans	35	14	7	1.9	2.2	6.5		
	BL-B23V1G-L	GaP/GaP/Green	568	Water Clear	30	14	7	1.9	2.2	8.0		
	BL-B33V1G-L	GaAsP/GaP/Yellow	585		35	14	7	1.9	2.2	6.5		
	1.0" Lead High Flangeless 3 ϕ	BL-B45V1H-L	GaAsP/GaP/Hi-Eff Red	635	Red Diffused	45	14	7	1.8	2.2		
BL-B21V1H-L		GaP/GaP/Green	568	Green Diffused	30	14	7	1.9	2.2	5.0		
BL-B31V1H-L		GaAsP/GaP/Yellow	585	Yellow Diffused	35	14	7	1.9	2.2	3.0		
BL-B24V1H-L		GaP/GaP/Green	568	Green Trans	30	14	7	1.9	2.2	10.0	25	
BL-B34V1H-L		GaAsP/GaP/Yellow	585	Yellow Trans	35	14	7	1.9	2.2	6.0		
BL-B23V1H-L		GaP/GaP/Green	568	Water Clear	30	14	7	1.9	2.2	10.0		
BL-B33V1H-L		GaAsP/GaP/Yellow	585		35	14	7	1.9	2.2	6.0		
T-13/4 Standard 1.0" Lead 5 ϕ	BL-B5134-L	GaP/GaP/Bright Red	700	Red Diffused	90	14	7	1.9	2.2	1.2	35	L-063
	BL-B4534-L	GaAsP/GaP/Hi-Eff Red	635		45	14	7	1.8	2.2	8.0		
	BL-B2134-L	GaP/GaP/Green	568	Green Diffused	30	14	7	1.9	2.2	8.0		
	BL-BX1134-L	GaP/GaP/Hi-Eff Green	568		30	14	7	1.8	2.2	12.5		
	BL-B3134-L	GaAsP/GaP/Yellow	585	Yellow Diffused	35	14	7	1.9	2.2	7.0		
	BL-B4134-L	GaAsP/GaP/Orange	635	Orange Diffused	45	14	7	1.8	2.2	8.0		
	BL-B4334-L	GaAsP/GaP/Orange	635	Water Clear	45	14	7	1.8	2.2	20.0	12	
T-13/4 Standard 1.0" Lead 5 ϕ	BL-B5134G-1-L	GaP/GaP/Bright Red	700	Red Diffused	90	14	7	1.9	2.2	0.8	45	L-064
	BL-B4534G-1-L	GaAsP/GaP/Hi-Eff Red	635		45	14	7	1.8	2.2	6.5		
	BL-B2134G-1-L	GaP/GaP/Green	568	Green Diffused	30	14	7	1.9	2.2	6.5		
	BL-BX1134G-1-L	GaP/GaP/Hi-Eff Green	568		30	14	7	1.9	2.2	10.5		
	BL-B3134G-1-L	GaAsP/GaP/Yellow	585	Yellow Diffused	35	14	7	1.9	2.2	5.5	20	
	BL-B4334G-1-L	GaAsP/GaP/Orange	635	Water Clear	45	14	7	1.8	2.2	16.0		
T-13/4 Flangeless 1.0" Lead 5 ϕ	BL-B5134N-1-L	GaP/GaP/Bright Red	700	Red Diffused	90	14	7	1.9	2.2	0.9	45	L-065
	BL-B4534N-1-L	GaAsP/GaP/Hi-Eff Red	635		45	14	7	1.8	2.2	7.0		
	BL-B2134N-1-L	GaP/GaP/Green	568	Green Diffused	30	14	7	1.9	2.2	7.0		
	BL-BX1134N-1-L	GaP/GaP/Hi-Eff Green	568		30	14	7	1.8	2.2	11.2		
	BL-B3134N-1-L	GaAsP/GaP/Yellow	585	Yellow Diffused	35	14	7	1.9	2.2	6.5		

Remark: 1. Hi-Eff Red/High-Efficiency Red.

2. Trans/Transparent.

3. 2θ 1/2 The off-axis angle at which the luminous intensity is half the axial luminous intensity.

LOW-CURRENT LED LAMPS (ROUND TYPES)

L-060 BL-Bxx41-L Series	L-061 BL-BxxV1G-L Series
L-062 BL-BxxV1H-L Series	L-063 BL-Bxx34-L Series
L-064 BL-Bxx34G-1-L Series	L-065 BL-Bxx34N-1-L Series

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

DUAL-CHIP LED LAMPS (ROUND & RECTANGULAR TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λp (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max	Typ.		
T-1 Standard 1.0" Lead 3 ϕ	BL-BHG271	GaP/GaP/Bright Red	700	White Diffused	90	40	15	50	2.2	2.6	6.0	45	L-066
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	30.0		
	BL-BEG271	GaAsP/GaP/Hi-Eff Red	635	White Diffused	45	80	30	150	2.0	2.6	30.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	30.0		
	BL-BYG271	GaAsP/GaP/Yellow	585	White Diffused	35	80	30	150	2.1	2.6	15.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	30.0		
T-13/4 Standard 1.0" Lead 5 ϕ	BL-BHG274	GaP/GaP/Bright Red	700	White Diffused	90	40	15	50	2.2	2.6	8.0	50	L-067
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	50.0		
	BL-BEG274	GaAsP/GaP/Hi-Eff Red	635	White Diffused	45	80	30	150	2.0	2.6	50.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	50.0		
	BL-BYG274	GaAsP/GaP/Yellow	585	White Diffused	35	80	30	150	2.1	2.6	45.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	50.0		
2.0×5.0 ×7.0mm 1.0" Lead Rectangular	BL-RHG272N	GaP/GaP/Yellow Green	568	White Diffused	30	80	30	150	2.2	2.6	0.8	125	L-068
		GaAsP/GaP/Yellow	585		35	80	30	150	2.1	2.6	4.0		
	BL-REG272N	GaAsP/GaP/Hi-Eff Red	635	White Diffused	45	80	30	150	2.0	2.6	4.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	4.0		
	BL-RYG272N	GaAsP/GaP/Yellow	585	White Diffused	35	80	30	150	2.1	2.6	3.5		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	4.0		
T-1 3/4- Flangeless 1.0" Lead 5 ϕ	BL-BGS234N-1	GaP/GaP/Yellow Green	568	White Diffused	30	80	30	150	2.2	2.6	80.0	55	L-069
		GaAlAs/Super Red	660		20	60	30	150	1.7	2.6	120		
	BL-BGS334N-1	GaP/GaP/Yellow Green	568	Water Clear	30	80	30	150	2.2	2.6	80.0	25	
		GaAlAs/Super Red	660		20	60	30	150	1.7	2.6	200		
	BL-BSS234N-1	GaAlAs/Super Red	660	White Diffused	30	80	30	150	2.2	2.6	50.0	55	
		GaAlAs/Super Red	660		20	60	30	150	1.7	2.6	50.0		

Remark: 1. Hi-Eff Red/High-Efficiency Red.

2. Trans/Transparent.

3. 2θ 1/2 The off-axis angle at which the luminous intensity is half the axial luminous intensity.

L-066 BL-Bxx271 Series	L-067 BL-Bxx274 Series
L-068 BL-Rxx272N Series	L-069 BL-Bxx234N-1 Series

Notes: 1. All dimensions are in millimeters (inches).

2. Tolerance is ±0.25mm (.010")

DUAL-CHIP & TRI-STATE LED LAMPS (ROUND TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λp (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max	Typ.		
T-1 Standard 1.0" Lead 3 ϕ	BL-BHG201	GaP/GaP/Bright Red	700	White Diffused	90	40	15	50	2.2	2.6	7.0	40	L-070
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	35.0		
	BL-BEG201	GaAsP/GaP/Hi-Eff Red	635	White Diffused	45	80	30	150	2.0	2.6	35.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	35.0		
	BL-BYG201	GaAsP/GaP/Yellow	585	White Diffused	35	80	30	150	2.1	2.6	30.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	35.0		
T-13/4 Standard 1.0" Lead 5 ϕ	BL-BHG204	GaP/GaP/Bright Red	700	White Diffused	90	40	15	50	2.2	2.6	8.0	50	L-071
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	45.0		
	BL-BEG204	GaAsP/GaP/Hi-Eff Red	635	White Diffused	45	80	30	150	2.0	2.6	45.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	45.0		
	BL-BYG204	GaAsP/GaP/Yellow	585	White Diffused	35	80	30	150	2.1	2.6	40.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	45.0		
T-13/4 Standard 1.0" Lead 5 ϕ	BL-BHG204-A	GaP/GaP/Bright Red	700	White Diffused	90	40	15	50	2.2	2.6	3.5	50	L-072
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	20.0		
	BL-BEG204-A	GaAsP/GaP/Hi-Eff Red	635	White Diffused	45	80	30	150	2.0	2.6	20.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	20.0		
	BL-BYG204-A	GaAsP/GaP/Yellow	585	White Diffused	35	80	30	150	2.1	2.6	18.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	20.0		
T-1 3/4- Standard 1.0" Lead 5 ϕ	BL-BHG204-E	GaP/GaP/Bright Red	700	White Diffused	90	40	15	50	2.2	2.6	3.5	50	L-073
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	20.0		
	BL-BEG204-E	GaAsP/GaP/Hi-Eff Red	635	White Diffused	45	80	30	150	2.0	2.6	20.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	20.0		
	BL-BYG204-E	GaAsP/GaP/Yellow	585	White Diffused	35	80	30	150	2.1	2.6	18.0		
		GaP/GaP/Yellow Green	568		30	80	30	150	2.2	2.6	20.0		

Remark: 1. Hi-Eff Red/High-Efficiency Red.

2. Trans/Transparent.

3. 2θ 1/2 The off-axis angle at which the luminous intensity is half the axial luminous intensity.

L-070 BL-Bxx201 Series	L-071 BL-Bxx204 Series
L-072 BL-Bxx204-A Series	L-073 BL-Bxx204-E Series

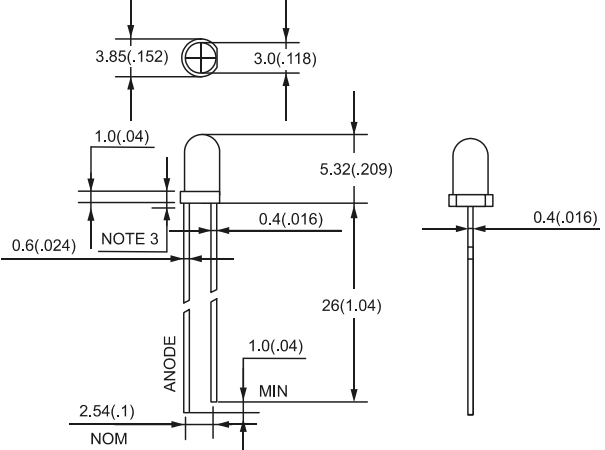
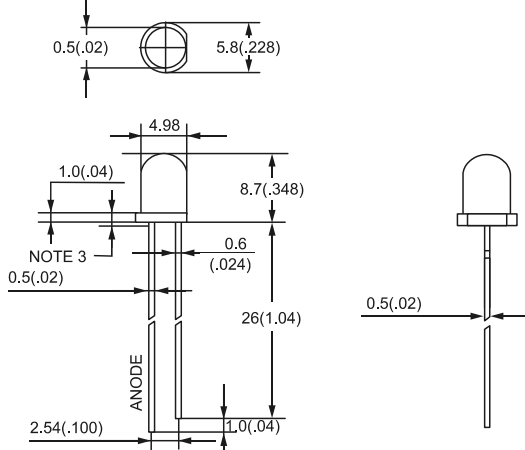
Notes: 1. All dimensions are in millimeters (inches).

2. Tolerance is ±0.25mm (.010")

ULTRA BRIGHT LED LAMPS (ROUND TYPES)

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 20mA)			Viewin g Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λp (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max			
3 ϕ	1L0341V22D0CA201	AlGaInP/Red	625	Water Clear	25	70	30	100	1.9	2.4	1600	25	L-001
	1L034FG42A0CA201	AlGaInP/Green	569		25	70	30	100	1.9	2.7	1200	30	
	1L034XG72E0CA201	AlGaInP/Green	525		30	110	30	100	3.2	3.8	15000	20	
	1L0341Y22C0CA201	AlGaInP/Yellow	590		25	80	30	100	2.0	2.7	2000	15	
	1L0341A21A0CA201	AlGaInP/Amber	605		25	80	30	100	2.0	2.7	2000	20	
	1L034FB12E0CA201	InGaN/Blue	466		30	110	30	100	3.2	3.8	2600	25	
5 ϕ	1L0534V22D0CA203	AlGaInP/Red	625		25	80	30	100	2.0	2.7	2600	15	L-002
	1L0532V24I0CR201	AlGaInP/Red	625		25	80	30	100	1.9	2.7	5000	30	
	1L0534G42A0CA202	AlGaInP/Green	567		30	80	30	100	2.1	2.7	2100	15	
	1L0545G72E0CA204	AlGaInP/Green	525		30	110	30	100	3.0	3.8	8200	45	
	1L0531A21A0CA201	AlGaInP/Amber	605		25	80	30	100	2.0	2.7	2300	15	
	1L0545B12E0CA201	InGaN/Blue	465		30	110	30	100	3.2	3.8	5200	15	

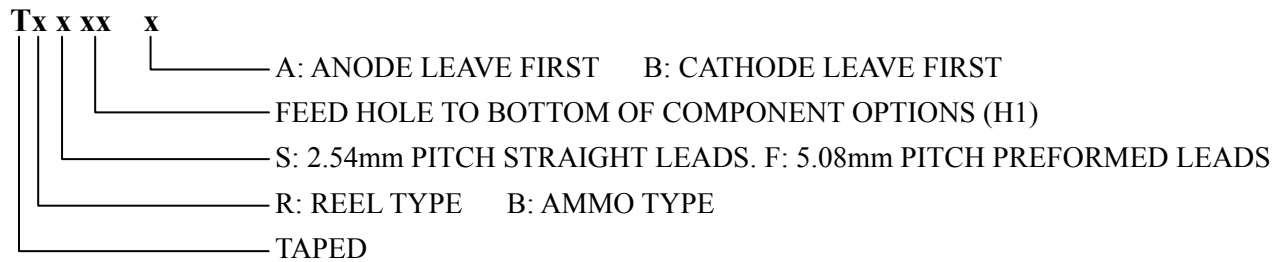
ULTRA BRIGHT LED LAMPS

L-001	3 ϕ	L-002	5 ϕ
 Technical drawing of L-001 3ϕ LED lamp. The drawing includes a front view, a side view, and a detail view of the anode. Dimensions are provided in millimeters (mm) and inches (in). The front view shows a total length of 3.85 (1.52) mm, a diameter of 3.0 (1.18) mm, and a height of 5.32 (2.09) mm. The side view shows a total length of 26 (1.04) mm, a diameter of 0.6 (0.024) mm, and a height of 1.0 (0.04) mm. The detail view shows a diameter of 0.4 (0.016) mm. The anode is labeled "ANODE" and "MIN". The nominal length is 2.54 (1) mm.		 Technical drawing of L-002 5ϕ LED lamp. The drawing includes a front view, a side view, and a detail view of the anode. Dimensions are provided in millimeters (mm) and inches (in). The front view shows a total length of 5.8 (2.28) mm, a diameter of 0.5 (0.02) mm, and a height of 4.98 mm. The side view shows a total length of 26 (1.04) mm, a diameter of 0.6 (0.024) mm, and a height of 1.0 (0.04) mm. The detail view shows a diameter of 0.5 (0.02) mm. The anode is labeled "ANODE". The nominal length is 2.54 (1.00) mm.	

- Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010)mm unless otherwise noted.
3. Protruded resin under flange is 1.0mm (.04) max.

TAPED LED LAMP

SELECTION GUIDE :



REEL TYPE :

ITEM	SYMBOL	SPECIFICATION			
		Minimum		Maximum	
		mm	inch	mm	inch
Reel Diameter	D	78.20	3.079	380.00	14.96
Core Diameter	D1	34.90	1.374	102.00	4.02
Hub Recess Inside Diameter	D2	28.60	1.126	88.00	3.47
Arbor Hole Diameter	D3	13.80	0.543	38.10	1.50
Overall Reel Thickness	T	—	—	57.20	2.25
Inside Reel Flange Thick	T1	30.00	1.181	50.00	1.97

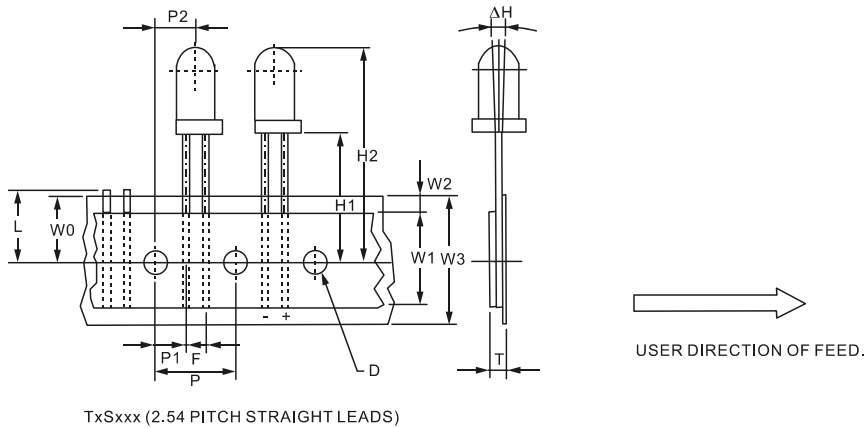
AMMO TYPE :

ITEM	SYMBOL	SPECIFICATION			
		Minimum		Maximum	
		mm	inch	mm	inch
Overall Length	L	325.00	12.80	340.00	13.40
Overall Width	W	245.00	9.65	276.00	10.87
Overall Thickness	H	50.00	1.97	60.00	2.36

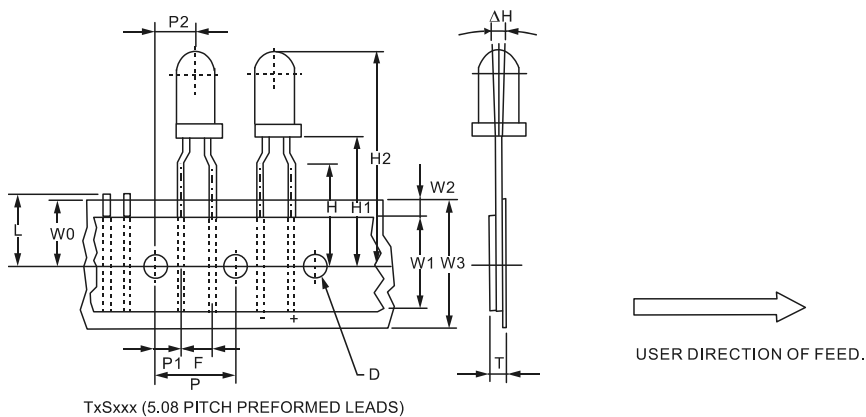
TAPED LED LAMP

ITEM			SYMBOL	SPECIFICATION			
				Minimum		Maximum	
				mm	inch	mm	inch
Tape Feed Hole Diameter			D	3.80	0.149	4.20	0.165
Component Lead Pitch	Straight Leads		F	2.30	0.091	3.00	0.118
	Preformed Lead			4.80	0.188	5.80	0.228
Front To Rear Deflection			ΔH	-	-	2.00	0.078
Feed Hole To Seating Plane			H	14.50	0.571	15.50	0.610
Feed Hole To Bottom Of Component	Straight Leads	TxS18x	H1	17.50	0.689	18.50	0.728
		TxS22x		21.50	0.846	22.50	0.886
		TxS26x		25.50	1.004	26.50	1.043
	Proformed Leads	TxF18x	H1	17.50	0.689	18.50	0.767
		TxF20x		19.50	0.748	20.50	0.826
		TxF23x		22.50	0.886	23.50	0.965
Feed Hole To Overall Component			H2	-	-	32.00	1.259
Lead Length After Component Height			L	W0		11.00	0.433
Feed Hole Pitch			P	12.40	0.488	13.00	0.511
Lead Location	Straight Leads		P1	4.40	0.173	5.80	0.228
	Preformed Leads			3.15	0.124	45.5	0.179
Center Component Location			P2	5.05	0.198	7.56	0.301
Overall Taped Package Thickness			T	-	-	1.42	0.056
Feed Hole Location			W0	8.50	0.334	9.75	0.384
Adhesive Tape Width			W1	14.50	0.571	15.50	0.610
Adhesive Tape Position			W2	0	0	4.00	0.157
Taped Width			W3	17.50	0.689	19.00	0.748

TxSxxx (2.54 PITCH STRAIGHT LEADS)



TxFxxx (5.08 PITCH PREFORMED LEADS)



- Notes: 1. The permission of fallen off is within continuous 3 pcs.
2. The edge of the tape has the space longer than at last 4 LEDS.

FLUX LED LAMPS

Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 30mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λd (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max	Typ.		
3 ϕ	1P03S1V23D0CJ301	AlGaInP/Red	622	Water Clear	25	120	50	100	2.25	2.7	1600	60	L-074
	1P03S1V22F0CJ001	AlGaInP/Red	622		25	120	50	100	2.45	2.7	1300	60	
	1P03S1G72E0CJ101	AlGaInP/Green	525		30	120	50	100	3.65	4.5	3200	50	
	1P03S1G73E0CA301	AlGaInP/Green	525		30	120	50	100	3.65	4.5	2400	70	
	1P03S1G62E0CC101	AlGaInP/Green	515		30	120	50	100	3.65	4.5	1300	85	
	1P03S1G62E0CA101	AlGaInP/Green	515		30	120	50	100	3.65	4.5	2500	70	
	1P03S1Y22G0CA301	AlGaInP/Yellow	590		25	120	50	100	2.45	2.6	1900	80	
	1P03S1Y22G0CJ101	AlGaInP/Yellow	590		25	120	50	100	2.45	2.6	3000	60	
	1P03S1Y23E0CJ101	AlGaInP/Yellow	590		25	120	50	100	2.45	2.6	2500	60	
	1P03S1A23D0CA302	AlGaInP/Amber	606		25	120	50	100	2.45	2.6	1200	70	
	1P03S1A23D0CJ301	AlGaInP/Amber	606		25	120	70	100	2.20	2.6	1900	60	
	1P03S1B22E0CC101	InGaN/Blue	475		30	120	50	100	3.65	4.5	800	85	
	1P03S1B14D0CA101	InGaN/Blue	466		30	120	50	100	3.65	4.5	500	70	
	1P03S1B12F0CA101	InGaN/Blue	466		30	120	50	100	3.65	4.5	1000	70	
5 ϕ	1P05S6V23D0CA101	AlGaInP/Red	622		25	120	70	100	2.25	2.7	650	60	L-075
	1P05S1V24H0CA101	AlGaInP/Red	623		25	120	50	100	2.40	2.7	2300	80	
	1P05S6V22G0CA101	AlGaInP/Red	625		25	120	70	100	2.25	2.7	1800	60	
	1P05S1G72E0CA001	InGaN/Green	525		30	120	50	100	3.65	4.5	2300	80	
	1P05S1Y23E0CA001	AlGaInP/Yellow	590		25	120	70	100	2.45	2.6	1000	80	
	1P05S1Y23E0CB102	AlGaInP/Yellow	590		25	120	70	100	2.45	2.6	4500	30	
	1P05S1Y24G0CB301	AlGaInP/Yellow	590		25	120	50	100	2.2	2.6	6800	30	
	1P05S6A23D0CA101	AlGaInP/Amber	605		25	120	70	100	2.25	2.6	900	60	
Package	Part No.	Chip		Lens Appearance	Absolute Maximum Ratings				Electro-optical Data (At 20mA)			Viewing Angle 2θ 1/2 (deg)	Drawing No.
		Material/Emitted Color	Peak Wave Length λp (nm)		Δλ (nm)	Pd (mw)	If (mA)	Peak (mA)	Vf (V)		Iv (mcd)		
									Typ	Max	Typ.		
5 ϕ	1P05S1B12E0CB101	InGaN/Blue	466	Water Clear	30	120	30	100	3.2	3.8	2500	30	L-075
	1P05S1B12C0CA101	InGaN/Blue	466		30	120	50	100	3.65	4.5	700	80	
	1P05S1B12E0CA001	InGaN/Blue	466		30	120	35	100	3.65	4.5	780	80	

L-074 PA Series	L-075 PB Series

- Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm (.010)mm unless otherwise noted.
3. Protruded resin under flange is 1.0mm (.04) max.

CHIP LED LAMPS GENERAL INFORMATION

QUALITY CONTROL AND ASSURANCE

Classification	Test Item	Reference Standard	Test Conditions	Result
Endurance Test	Operation Life	MIL-STD-750 : 1026 MIL-STD-883 : 1005 JIS C 7021 : B-1	Connect with a power $I_f = 20\text{mA}$ T_a = Under room temperature Test time = 1,000hrs	0/20
	High Temperature High Humidity Storage	MIL-STD-202 : 103B JIS C 7021 : B-11	$T_a = +85^\circ\text{C} \pm 5^\circ\text{C}$ $\text{RH} = 90\% - 95\%$ Test time = 240hrs	0/20
	High Temperature Storage	MIL-STD-883 : 1008 JIS C 7021 : B-10	High $T_a = +100^\circ\text{C} \pm 5^\circ\text{C}$ Test time = 1,000hrs	0/20
	Low Temperature Storage	JIS-C-7021 : B-12	Low $T_a = -40^\circ\text{C} \pm 5^\circ\text{C}$ Test time = 1,000hrs	0/20
Environmental Test	Temperature Cycling	MIL-STD-202 : 107D MIL-STD-750 : 1051 MIL-STD-883 : 1010 JIS C 7021 : A-4	$-40^\circ\text{C} \sim +25^\circ\text{C} \sim +85^\circ\text{C} \sim +25^\circ\text{C}$ 60min 20min 60min 20min Test Time = 5cycle	0/20
	Thermal Shock	MIL-STD-202 : 107D MIL-STD-750 : 1051 MIL-STD-883 : 1011	$-40^\circ\text{C} \pm 5^\circ\text{C} \sim +85^\circ\text{C} \pm 5^\circ\text{C}$ 20min 20min Test Time = 10cycle	0/20
	Solder Resistance	MIL-STD-202 : 201A MIL-STD-750 : 2031 JIS C 7021 : A-1	Preheating : $140^\circ\text{C} - 160^\circ\text{C}$, within 2 minutes. Operation heating: 260°C (Max.), within 10 seconds. (Max)	0/20

JUDGMENT CRITERIA OF FAILURE FOR THE RELIABILITY

Measuring items	Symbol	Measuring conditions	Judgement criteria for failure
Forward voltage	V_F (V)	$I_f = 20\text{mA}$	Over $U \times 1.2$
Reverse current	I_r (μA)	$V_r = 5\text{V}$	Over $U \times 2$
Luminous intensity	I_v (mcd)	$I_f = 20\text{mA}$	Below $S \times 0.5$

- Note:
1. U means the upper limit of specified characteristics. S means initial value.
 2. Measurement shall be taken between 2 hours and after the test pieces have been returned to normal ambient conditions after completion of each test.

CHIP LED LAMPS GENERAL INFORMATION

1. Soldering

- Manual Of Soldering

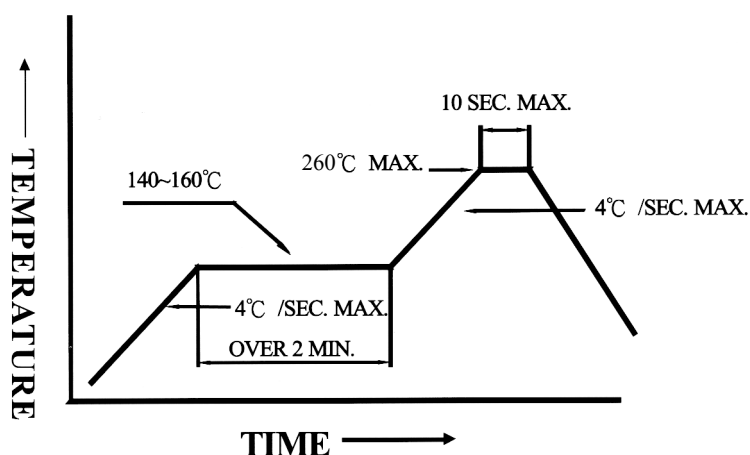
The temperature of the iron tip should not be higher than 300°C (572°F) and Soldering within 3 seconds per solder-land is to be observed.

- Reflow Soldering

Preheating: 140°C~160°C±5°C, within 2 minutes.

Operatin heating: 260°C (MAX.) within 10 seconds. (Max)

Gradual Cooling (Avoid quenching).

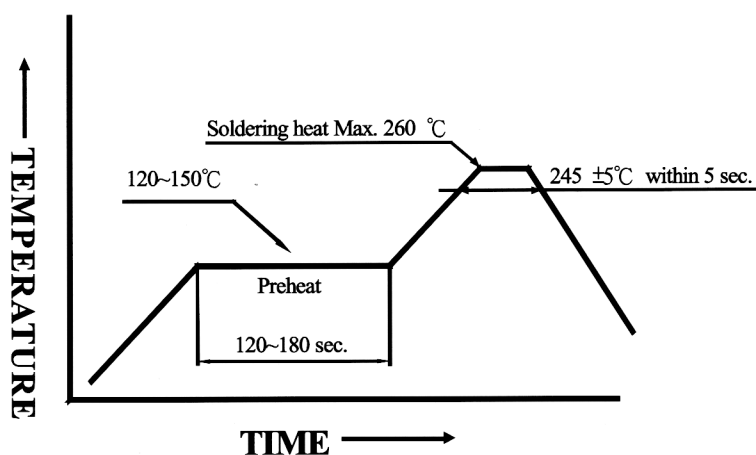


- DIP soldering (Wave Soldering)

Preheating : 120°C~150°C, within 120~180 sec.

Operation heating : 245°C±5°C within 5 sec. 260°C (Max)

Gradual Cooling (Avoid quenching).



2. Handling

Care must be taken not to cause to the epoxy resin portion of LEDs while it is exposed to high temperature.

Care must be taken not rub the epoxy resin portion of LEDs with hard or sharp article such as the sand blast and the metal hook.

CHIP LED LAMPS GENERAL INFORMATION

3. Notes for designing :

Care must be taken to provide the current limiting resistor in the circuit so as to drive the LEDs within the rated figures. Also, caution should be taken not to overload LEDs with instantaneous voltage at the turning ON and OFF of the circuit. When using the pulse drive care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as to be subjected to reverse voltage when turning off the LEDs.

4. Storage :

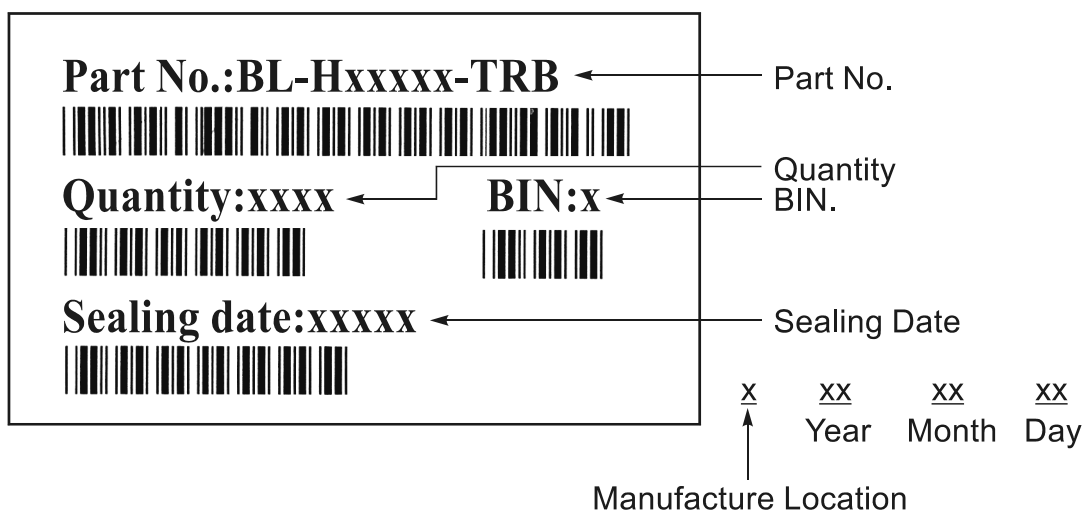
In order to avoid the absorption of moisture, it is recommended to solder LEDs as soon as possible after unpacking the sealed envelope.

If the envelope is still packed, to store it in the environment as following:

- (1) Temperature : 5°C-30°C (41°F) Humidity : RH 60% Max.
- (2) After this bag is opened, devices that will be applied to infrared reflow, vapor-phase reflow, or equivalent soldering process must be:
 - a. Completed within 168 hours.
 - b. Stored at less than 30% RH.
- (3) Devices require baking before mounting, if:
 - (2) a or (2) b is not met.
- (4) If baking is required, devices must be baked under below conditions:
48 hours at 60°C± 3°C

5. Package of Products :

- (1) Products are packed in one bag of 3000 pcs (one taping reel) and a label is attached on each bag.
- (2) Label:



CHIP LED LAMPS GENERAL INFORMATION

ABSOLUTE MAXIMUM RATINGS

1. Test Condition For Each Parameter:

Parameter	Symbol	Unit	Test Condition
Reverse Voltage	V_R	V	$I_R = 100\mu A$
Reverse Current	I_R	μA	$V_R = 5V$
Forward Voltage	V_F	V	$I_F = 20mA$
Luminous Intensity	I_V	mcd	$I_F = 20mA$
Viewing Angle	$2\theta_{1/2}$	Degree	$I_F = 20mA$
Spectral Line Half-Width	$\Delta\lambda$	nm	$I_F = 20mA$
Power Dissipation	P_D	mw	$I_F = 20mA$
Peak Forward Current	I_{FP}	mA	Duty 1/10, Pulse width = 0.1ms

2. Absolute Maximum Ratings :

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 ELECTIEICAL-OPTICAL CHARACTERISTICS CURVES

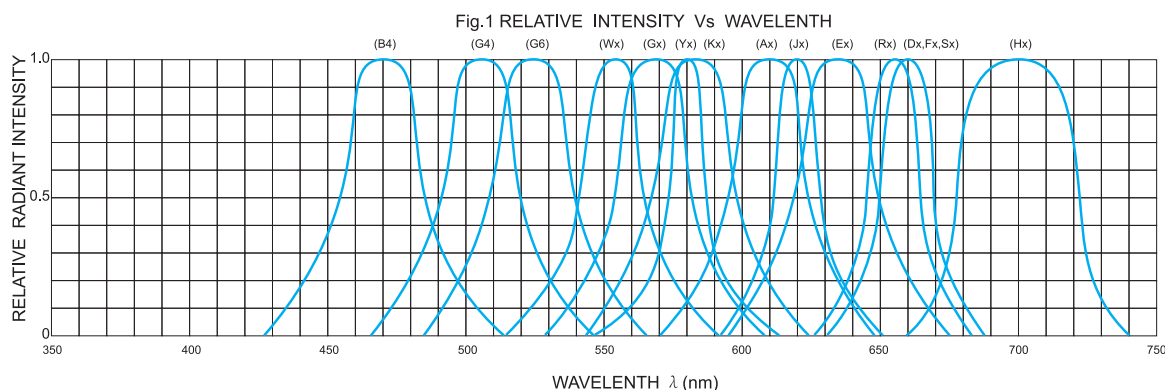


Fig.2 FORWARD CURRENT DERATING CURVE

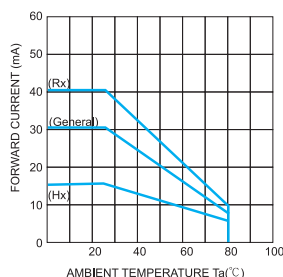


Fig.3 FORWARD CURRENT VS FORWARD VOLTAGE

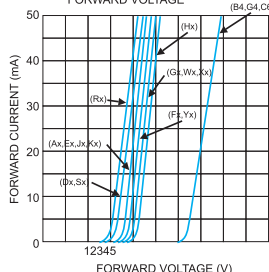


Fig.4 RELATIVE LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

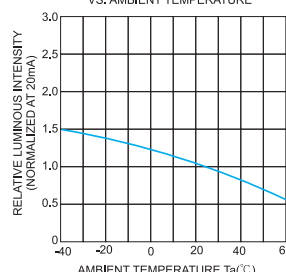


Fig.5 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

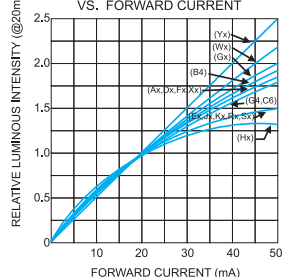


Fig.6 RADIATION DIAGRAM

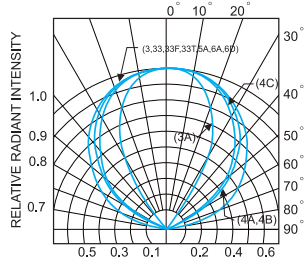


Fig.7 PULSE DURATION VS. PULSE FREQUENCY

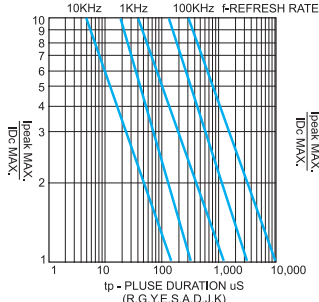
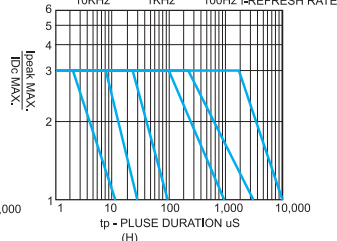
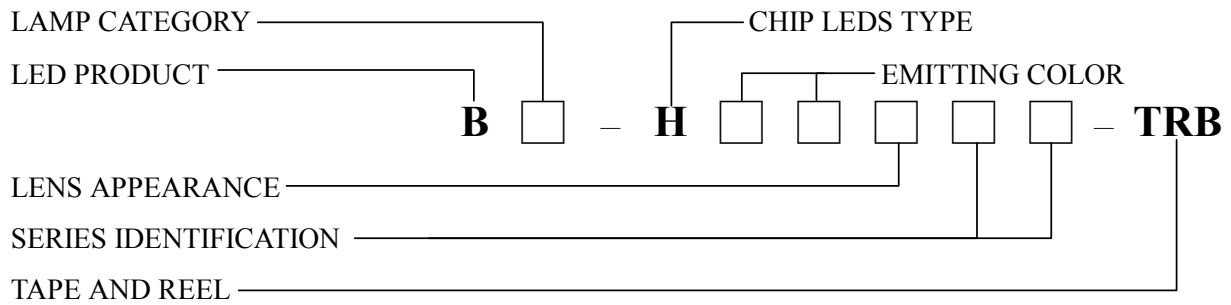


Fig.8 PULSE DURATION VS. PULSE FREQUENCY



SELECTION GUIDE TO CHIP LED LAMPS

PART NO. SYSTEM



LAMP CATEGORY:

L : Standard Lamp B : Blinking Lamp R : Resistor Lamp Z : Zener type

SERIES IDENTIFICATION:

3 : 1206 Super Wide(2.0mm) Type 3A : 1206 Inner Lens Type
 4A : Right Angle Lens Type/2.0mm Height 4C : Right Angle Lens Type/1.7mm Height
 4E : Right Angle Lens Type/1.0mm Height 5A : 0805 Flat Top Type
 6A : 0603 Super Thin(0.6mm) Type 6D : 0603 Flat Top Type
 6G : 0603 Super Thin(0.4mm) Type 3B : Bi-Color Type
 3 : 1206 Bi-Color Type 6H : 0605 Super Thin Bi-Color Type
 4B : Right Angle Lens Bi-Color Type 3F : Multi Color Type
 3T : Multi Color Type 4S : Multi Color Type
 6T : 0605 Super Thin Multi Color Type

LENS APPEARANCE:

1 : Color Diffused 2 : White Diffused 3 : Water Clear A : Black

PACKAGE TYPE:

H : CHIP LED X : Axial

EMITTING COLOR:

A_X : GaAsP/GaP 610nm/Amber (7) B5 : AlInGaN 470nm/Super Blue D_X : GaAlAs/GaAs 660nm/DH Red
 E_X : GaAsP/GaP 640nm/Orange (4) F_X : GaAlAs/GaAs 660nm/DDH Red G_X : GaP/GaP 568nm/Yellow Green(2)
 G4 : InGaN 505nm/Bluish Green G6 : InGaN 525nm/Green H_X : GaP/GaP 700nm/Bright Red(5)
 J_X : AlGaInP620nm/Super Orange K_X : AlGaInP595nm/Super Yellow R_X : GaAsP/GaAs 655nm/Red(1)
 S_X : GaAlAs/GaAs660nm/SH Red (6) W_X : GaP/GaP 555nm/Pure Green (9) X_X : GaP/GaP 568nm/Hi-Eff Green
 Y_X : GaAsP/GaP 583nm/Yellow (3)

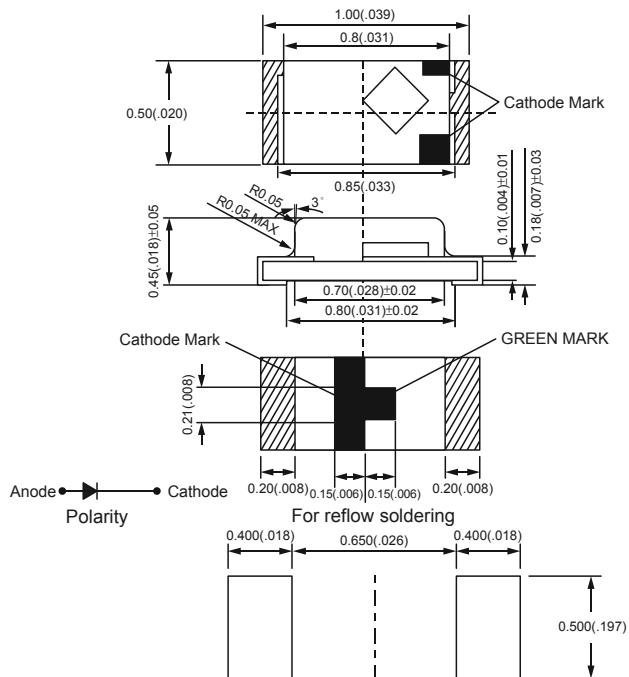
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxx7A (0402) Series



Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp(nm)	λd(nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HGE37A	AlGaInP	Super Yellow Green	570	570	Water Clear	2.0	2.6	18.5	35.0	120°
BL-HGK37A	AlGaInP	Green	525	525		3.5	4.0	63.0	160.0	
BL-HG437A	InGaN	Bluish Green	505	505		3.5	4.0	63.0	120.0	
BL-HG637A	InGaN	Green	525	525		3.5	4.0	63.0	160.0	
BL-HJC37A	AlGaInP	Super Amber	610	605		2.0	2.6	63.0	100.0	
BL-HJE37A	AlGaInP	Super Orange Red	630	620		2.0	2.6	63.0	100.0	
BL-HKC37A	AlGaInP	Super Yellow	590	589		2.0	2.6	63.0	120.0	
BL-HUB37A	AlGaInP	Super Red	645	632		2.1	2.6	28.0	50.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp(nm)	λd(nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB337A	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	8.2	15.0	120°
BL-HB537A	AlInGaN	Super Blue	470	470-475		2.8	3.2	8.2	20.0	

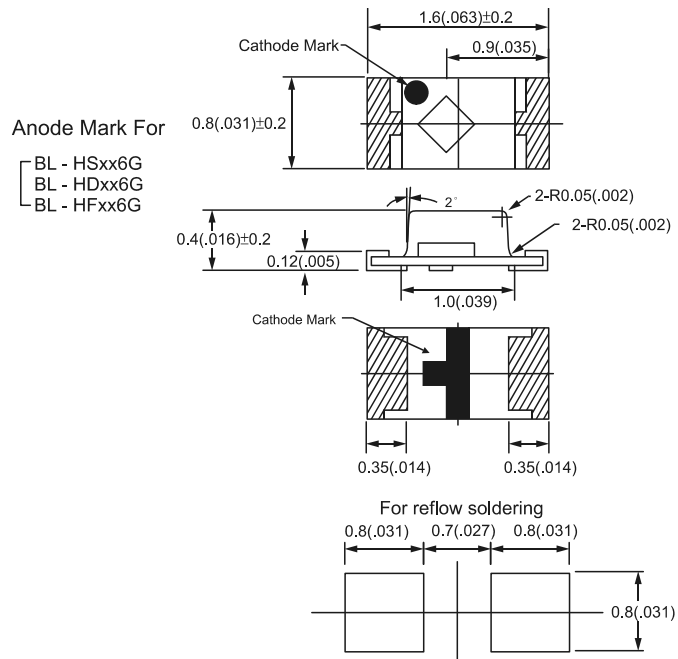
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxx6G (0603-0.4mm) Series

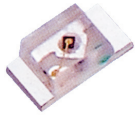


NOTE:
 1. All dimensions are in millimeters (inches).
 2. Tolerance is ± 0.10 (.004") unless otherwise specified.
 3. Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp(nm)	λd(nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HGE36G	AlGaInP	Super Yellow Green	570	570	Water Clear	2.0	2.6	18.5	35.0	120°
BL-HGK36G	AlGaInP	Green	525	525		3.5	4.0	63.0	160.0	
BL-HG436G	InGaN	Bluish Green	505	505		3.5	4.0	63.0	120.0	
BL-HG636G	InGaN	Green	525	525		3.5	4.0	63.0	160.0	
BL-HJC36G	AlGaInP	Super Amber	610	605		2.0	2.6	63.0	100.0	
BL-HJE36G	AlGaInP	Super Orange Red	630	620		2.0	2.6	63.0	100.0	
BL-HKC36G	AlGaInP	Super Yellow	590	589		2.0	2.6	63.0	120.0	
BL-HUB36G	AlGaInP	Super Red	645	632		2.1	2.6	28.0	50.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp(nm)	λd(nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB336G	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	8.2	15.0	120°
BL-HB536G	AlInGaN	Super Blue	470	470-475		2.8	3.2	8.2	20.0	

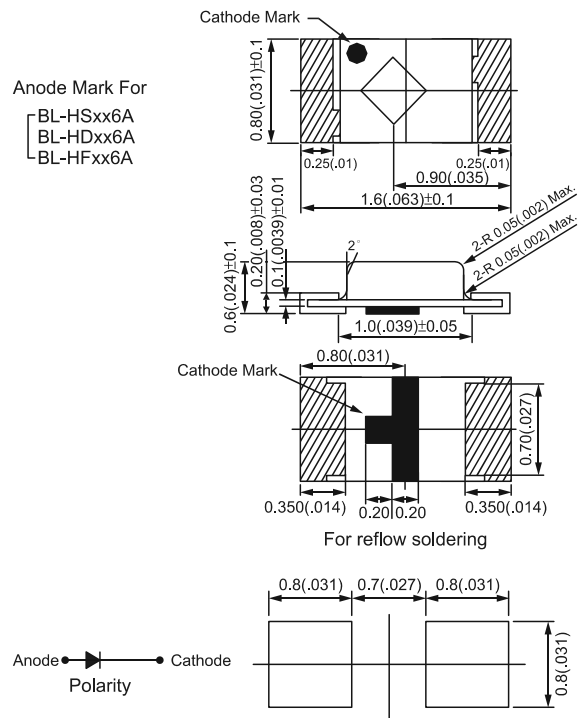
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

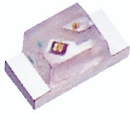
BL-Hxxx6A (0603-0.6mm) Series



Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HJD36A	AlGaInP	Super Orange Red	630	625	Water Clear	2.1	2.6	28.0	50.0	120°
BL-HJB36A	AlGaInP	Super Orange Red	620	615		2.0	2.6	28.0	50.0	
BL-HJE36A	AlGaInP	Super Orange Red	630	620		2.0	2.6	63.0	100.0	
BL-HJF36A	AlGaInP	Super Amber	610	605		2.0	2.6	28.0	50.0	
BL-HKB36A	AlGaInP	Super Yellow	590	587		2.1	2.6	28.0	45.0	
BL-HKC36A	AlGaInP	Super Yellow	590	589		2.0	2.6	63.0	120.0	
BL-HGE36A	AlGaInP	Super Yellow Green	570	570		2.0	2.6	28.0	50.0	
BL-HG436A	InGaN	Bluish Green	505	505		3.5	4.0	63.0	120.0	
BL-HG636A	InGaN	Green	525	525		3.5	4.0	63.0	160.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB336A	AlInGaIn	Super Blue	460	465-470	Water Clear	2.8	3.2	8.2	15.0	120°
BL-HB536A	AlInGaIn	Super Blue	470	470-475		2.8	3.2	8.2	20.0	

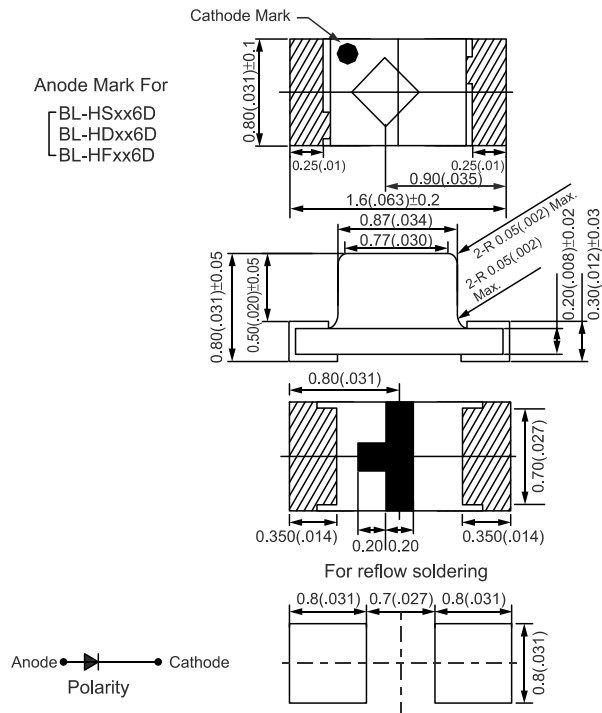
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxx6D (0603-0.8mm) Series



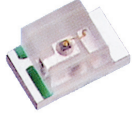
NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is $\pm 0.10(0.004)$ unless otherwise specified.
- 3.Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HS136D	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.7	2.6	5.5	15.0	120°
BL-HUB36D	AlGaInP	Super Red	645	632		2.1	2.6	28.0	50.0	
BL-HJB36D	AlGaInP	Super Orange Red	620	615		2.0	2.6	28.0	50.0	
BL-HJE36D	AlGaInP	Super Orange Red	630	625		2.0	2.6	63.0	100.0	
BL-HG036D	GaP/GaP	Yellow Green	568	571		2.1	2.6	3.7	12.0	
BL-HX136D	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	12.0	
BL-HGE36D	AlGaInP	Super Yellow Green	570	570		2.0	2.6	18.5	35.0	
BL-HG436D	InGaN	Bluish Green	505	505		3.5	4.0	63.0	120.0	
BL-HG636D	InGaN	Green	525	525		3.5	4.0	63.0	160.0	
BL-HY036D	GaAsP/GaP	Yellow	583	585		2.1	2.6	2.4	6.0	
BL-HKB36D	AlGaInP	Super Yellow	590	587		2.1	2.6	28.0	45.0	
BL-HKD36D	AlGaInP	Super Yellow	595	594		2.1	2.6	28.0	45.0	
BL-HA136D	GaAsP/GaP	Amber	610	610		2.2	2.6	2.4	5.0	
BL-HJF36D	AlGaInP	Super Amber	610	605		2.0	2.6	28.0	50.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB336D	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	8.2	15.0	120°
BL-HB536D	AlInGaN	Super Blue	470	470-475		2.8	3.2	8.2	20.0	

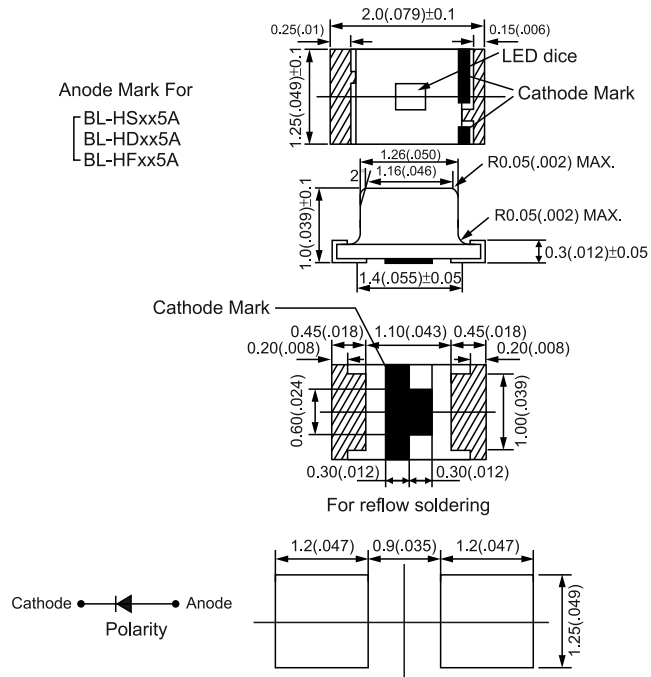
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxx5A (0805) Series



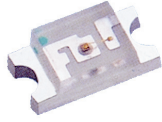
NOTE:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.10 (.004") unless otherwise specified.
3. Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λ_p (nm)	λ_d (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HS135A	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.7	2.6	5.5	15.0	120°
BL-HUB35A	AlGaInP	Super Red	645	632		2.1	2.6	28.0	50.0	
BL-HJB35A	AlGaInP	Super Orange Red	620	615		2.0	2.6	28.0	50.0	
BL-HJE35A	AlGaInP	Super Orange Red	630	625		2.0	2.6	63.0	120.0	
BL-HG035A	GaP/GaP	Yellow Green	568	571		2.1	2.6	3.7	12.0	
BL-HX135A	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	12.0	
BL-HGE35A	AlGaInP	Super Yellow Green	570	570		2.0	2.6	18.5	35.0	
BL-HG435A	InGaN	Bluish Green	505	505		3.5	4.0	63.0	120.0	
BL-HG635A	InGaN	Green	525	525		3.5	4.0	63.0	160.0	
BL-HY035A	GaAsP/GaP	Yellow	583	585		2.1	2.6	2.4	6.0	
BL-HKB35A	AlGaInP	Super Yellow	590	587		2.1	2.6	28.0	45.0	
BL-HKC35A	AlGaInP	Super Yellow	590	589		2.1	2.6	63	120.0	
BL-HA135A	GaAsP/GaP	Amber	610	610		2.2	2.6	2.4	5.0	
BL-HJF35A	AlGaInP	Super Amber	610	605		2.0	2.6	28.0	50.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 Θ1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB335A	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	8.2	15.0	120°
BL-HB535A	AlInGaN	Super Blue	470	470-475		2.8	3.2	8.2	20.0	

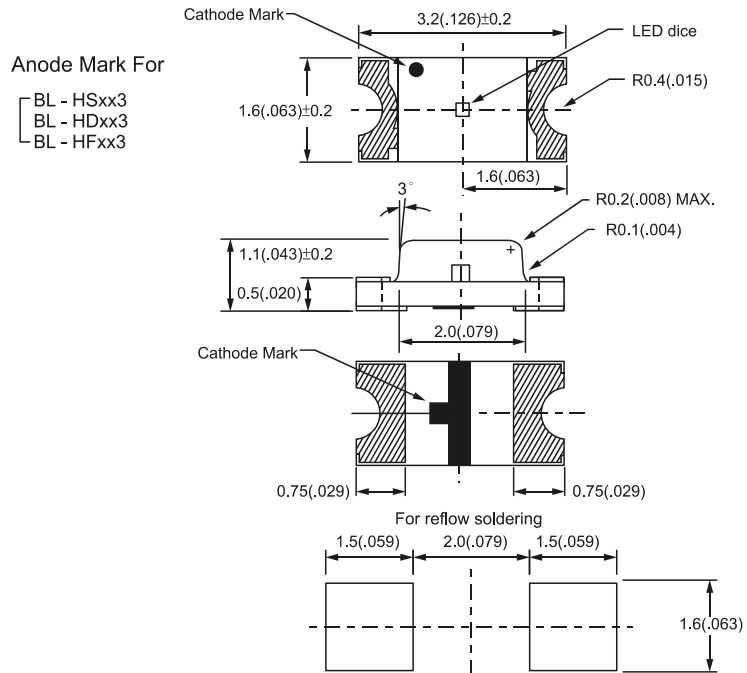
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxx3 (1206) Series



NOTE:
 1. All dimensions are in millimeters (inches).
 2. Tolerance is ± 0.10 (.004") unless otherwise specified.
 3. Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λ p (nm)	λ d (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HS133	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.7	2.6	5.5	15.0	120°
BL-HUB33	AlGaInP	Super Red	645	632		2.1	2.6	28.0	50.0	
BL-HJB33	AlGaInP	Super Orange Red	620	615		2.0	2.6	28.0	50.0	
BL-HJE33	AlGaInP	Super Orange Red	630	625		2.0	2.6	63.0	100.0	
BL-HG033	GaP/GaP	Yellow Green	568	571		2.1	2.6	3.7	12.0	
BL-HX133	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	12.0	
BL-HGE33	AlGaInP	Super Yellow Green	570	570		2.0	2.6	18.5	35.0	
BL-HG433	InGaN	Bluish Green	505	505		3.5	4.0	63.0	120.0	
BL-HG633	InGaN	Green	525	525		3.5	4.0	63.0	160.0	
BL-HY033	GaAsP/GaP	Yellow	583	585		2.1	2.6	2.4	6.0	
BL-HKB33	AlGaInP	Super Yellow	590	587		2.1	2.6	28.0	45.0	
BL-HKC33	AlGaInP	Super Yellow	590	586		2.1	2.6	63	120.0	
BL-HA133	GaAsP/GaP	Amber	610	610		2.2	2.6	2.4	5.0	
BL-HJF33	AlGaInP	Super Amber	610	605		2.0	2.6	28.0	50.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 Θ1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB333	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	8.2	15.0	120°
BL-HB533	AlInGaN	Super Blue	470	470-475		2.8	3.2	8.2	20.0	

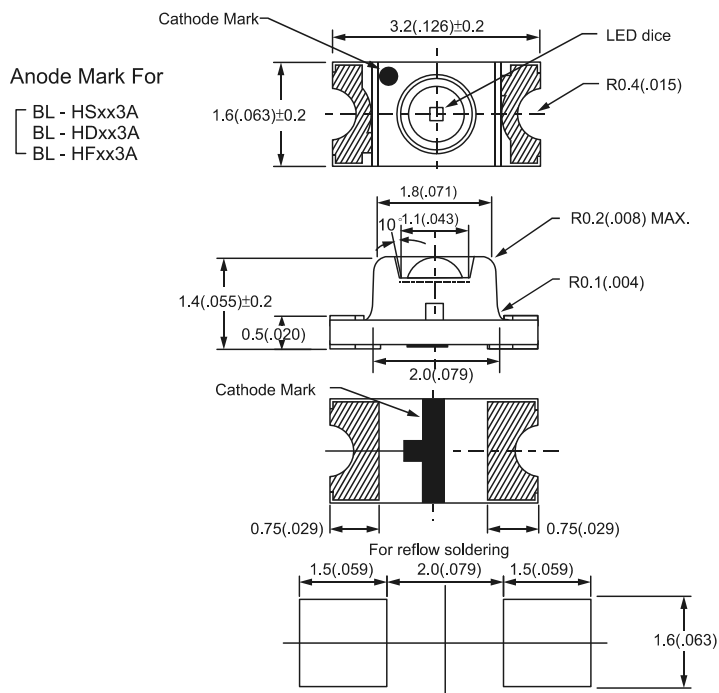
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

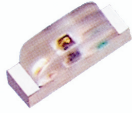
BL-Hxxx3A (1206) Series



Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HS133A	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.7	2.6	12.3	25.0	60°
BL-HUB33A	AlGaInP	Super Red	645	632		2.1	2.6	63.0	100.0	
BL-HJB33A	AlGaInP	Super Orange Red	620	615		2.0	2.6	63.0	100.0	
BL-HJE33A	AlGaInP	Super Orange Red	630	625		2.0	2.6	94.0	170.0	
BL-HG033A	GaP/GaP	Yellow Green	568	571		2.1	2.6	12.3	25.0	
BL-HX133A	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	12.3	40.0	
BL-HGE33A	AlGaInP	Super Yellow Green	570	570		2.0	2.6	42.0	75.0	
BL-HG433A	InGaN	Bluish Green	505	505		3.5	4.0	94.0	150.0	
BL-HG633A	InGaN	Green	525	525		3.5	4.0	140.0	300.0	
BL-HY033A	GaAsP/GaP	Yellow	583	585		2.1	2.6	5.5	15.0	
BL-HKB33A	AlGaInP	Super Yellow	590	587		2.1	2.6	63.0	130.0	
BL-HKD33A	AlGaInP	Super Yellow	595	594		2.1	2.6	94.0	200.0	
BL-HA133A	GaAsP/GaP	Amber	610	610		2.2	2.6	5.5	12.0	
BL-HJF33A	AlGaInP	Super Amber	610	605		2.0	2.6	94.0	160.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB333A	AlInGaIn	Super Blue	460	465-470	Water Clear	2.8	3.2	18.5	40.0	60°
BL-HB533A	AlInGaIn	Super Blue	470	470-475		2.8	3.2	18.5	45.0	

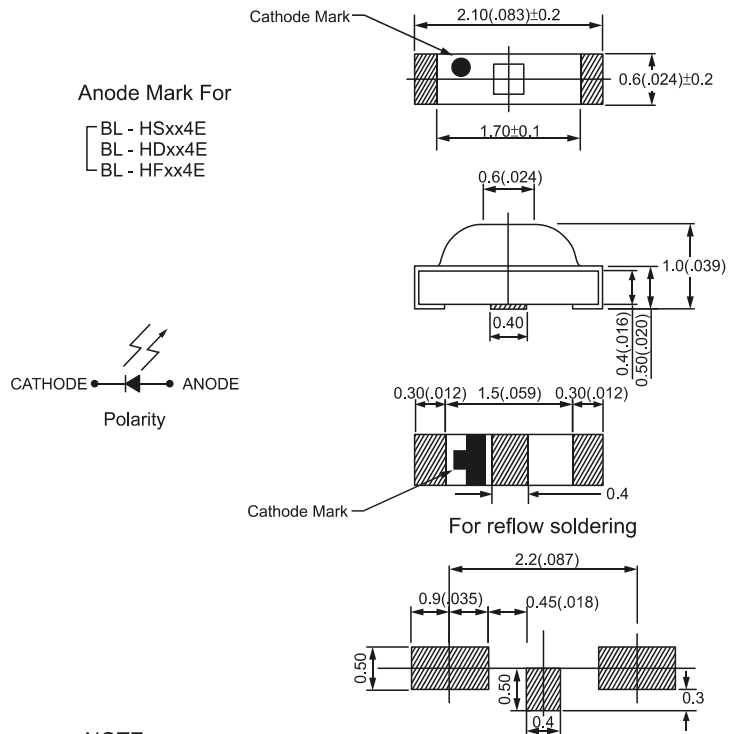
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxx4E (0802) Series



NOTE:
1.All dimensions are in millimeters(inches).
2.Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
3.Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λ p (nm)	λ d (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HS134E	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.7	2.6	5.5	10.0	130°
BL-HUB34E	AlGaInP	Super Red	645	632		2.1	2.6	28.0	40.0	
BL-HJB34E	AlGaInP	Super Orange Red	620	615		2.0	2.6	28.0	40.0	
BL-HJD34E	AlGaInP	Super Orange Red	630	625		2.1	2.6	28.0	40.0	
BL-HG034E	GaP/GaP	Yellow Green	568	571		2.1	2.6	2.4	5.0	
BL-HX134E	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	3.7	10.0	
BL-HGE34E	AlGaInP	Super Yellow Green	570	570		2.0	2.6	12.3	25.0	
BL-HG434E	InGaN	Bluish Green	505	505		3.5	4.0	63.0	120.0	
BL-HG634E	InGaN	Green	525	525		3.5	4.0	94.0	200.0	
BL-HY034E	GaAsP/GaP	Yellow	583	585		2.1	2.6	1.6	4.0	
BL-HKB34E	AlGaInP	Super Yellow	590	587		2.1	2.6	28.0	40.0	
BL-HKD34E	AlGaInP	Super Yellow	595	594		2.1	2.6	28.0	40.0	
BL-HA134E	GaAsP/GaP	Amber	610	610		2.2	2.6	1.6	4.0	
BL-HJF34E	AlGaInP	Super Amber	610	605		2.0	2.6	28.0	40.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB334E	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	5.5	10.0	130°
BL-HB534E	AlInGaN	Super Blue	470	470-475		2.8	3.2	5.5	15.0	

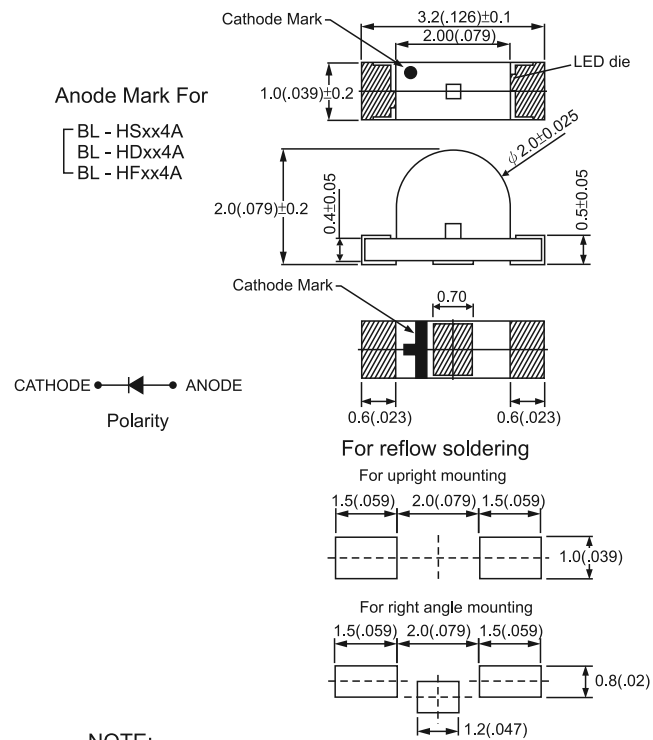
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxx4A (1204) Series



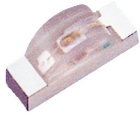
NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is $\pm 0.10(.004)$ " unless otherwise specified.
- 3.Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HS134A	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.7	2.6	8.2	20.0	100°
BL-HUB34A	AlGaInP	Super Red	645	632		2.1	2.6	42.0	70.0	
BL-HJB34A	AlGaInP	Super Orange Red	620	615		2.0	2.6	42.0	70.0	
BL-HJD34A	AlGaInP	Super Orange Red	630	625		2.1	2.6	42.0	70.0	
BL-HG034A	GaP/GaP	Yellow Green	568	571		2.1	2.6	5.5	15.0	
BL-HX134A	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	8.2	20.0	
BL-HGE34A	AlGaInP	Super Yellow Green	570	570		2.0	2.6	28.0	50.0	
BL-HG434A	InGaN	Bluish Green	505	505		3.5	4.0	63.0	130.0	
BL-HG634A	InGaN	Green	525	525		3.5	4.0	94.0	200.0	
BL-HY034A	GaAsP/GaP	Yellow	583	585		2.1	2.6	3.7	10.0	
BL-HKB34A	AlGaInP	Super Yellow	590	587		2.1	2.6	42.0	70.0	
BL-HKD34A	AlGaInP	Super Yellow	595	594		2.1	2.6	42.0	70.0	
BL-HA134A	GaAsP/GaP	Amber	610	610		2.2	2.6	2.4	6.0	
BL-HJF34A	AlGaInP	Super Amber	610	605		2.0	2.6	42.0	70.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB334A	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	12.3	25.0	100°
BL-HB534A	AlInGaN	Super Blue	470	470-475		2.8	3.2	12.3	30.0	

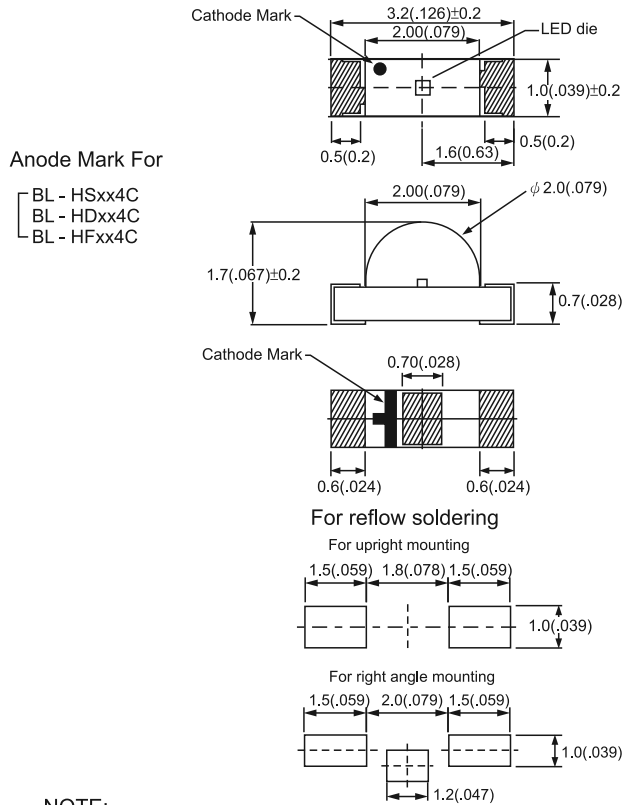
SURFACE MOUNT CHIP LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxx4C (1204) Series



NOTE:
 1.All dimensions are in millimeters(inches).
 2.Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
 3.Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HS134C	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.7	2.6	8.2	20.0	105°
BL-HUB34C	AlGaInP	Super Red	645	632		2.1	2.6	42.0	70.0	
BL-HJB34C	AlGaInP	Super Orange Red	620	615		2.0	2.6	42.0	70.0	
BL-HJE34C	AlGaInP	Super Orange Red	630	625		2.0	2.6	63.0	100.0	
BL-HG034C	GaP/GaP	Yellow Green	568	571		2.1	2.6	5.5	12.0	
BL-HX134C	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	8.2	20.0	
BL-HGE34C	AlGaInP	Super Yellow Green	570	570		2.0	2.6	28.0	40.0	
BL-HG434C	InGaN	Bluish Green	505	505		3.5	4.0	63.0	130.0	
BL-HG634C	InGaN	Green	525	525		3.5	4.0	94.0	200.0	
BL-HY034C	GaAsP/GaP	Yellow	583	585		2.1	2.6	3.7	10.0	
BL-HKB34C	AlGaInP	Super Yellow	590	587		2.1	2.6	42.0	70.0	
BL-HKC34C	AlGaInP	Super Yellow	590	595		2.0	2.6	55	130.0	
BL-HA134C	GaAsP/GaP	Amber	610	610		2.2	2.6	2.4	6.0	
BL-HJF34C	AlGaInP	Super Amber	610	605		2.0	2.6	42.0	70.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB334C	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	12.3	25.0	105°
BL-HB534C	AlInGaN	Super Blue	470	470-475		2.8	3.2	12.3	30.0	

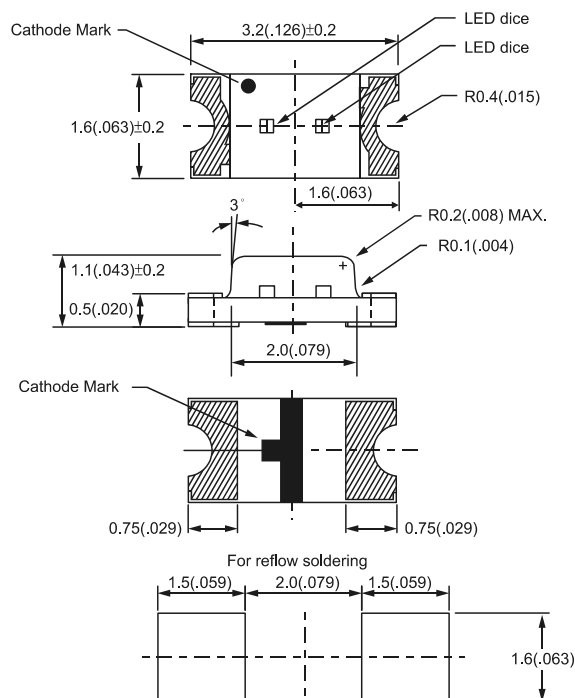
SURFACE MOUNT DUAL COLOR LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxxx33 (1206) Series



Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HD1X133	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.8	2.6	12.3	25.0	120°
	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	12.0	
BL-HE1G033	GaAsP/GaP	Hi-Eff Red	640	628		2.0	2.6	5.5	12.0	
	GaP/GaP	Yellow Green	568	571		2.2	2.6	2.4	10.0	
BL-HE1Y033	GaAsP/GaP	Hi-Eff Red	640	628		2.0	2.6	5.5	12.0	
	GaAsP/GaP	Yellow	583	585		2.1	2.6	2.4	10.0	
BL-HG0Y033	GaP/GaP	Yellow Green	568	571		2.2	2.6	2.4	10.0	
	GaAsP/GaP	Yellow	583	585		2.1	2.6	2.4	10.0	
BL-HJEGE33	AlGaInP	Super Orange Red	615	625		2.0	2.6	6.3	100	
	AlGaInP	Super Yellow Green	570	570		2.0	2.6	18.5	40	
BL-HUBB533	AlGaInP	Super Red	645	632		2.0	2.6	28	50	
	AlInGaN	Super Blue	460	465		3.2	3.6	28	50	

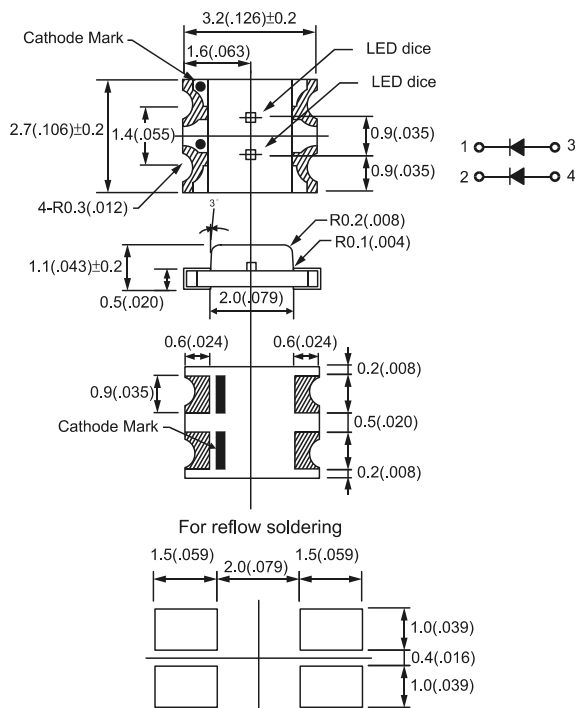
SURFACE MOUNT DUAL COLOR LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

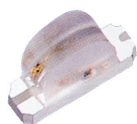
BL-Hxxxxx3B (1210) Series



NOTE:
 1.All dimensions are in millimeters(inches).
 2.Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
 3.Specifications are subject to change without notices.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HD1X133B	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.8	2.6	12.3	25.0	120°
	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	12.0	
BL-HE1G033B	GaAsP/GaP	Hi-Eff Red	640	628		2.0	2.6	5.5	12.0	
	GaP/GaP	Yellow Green	568	571		2.2	2.6	2.4	10.0	
BL-HE1Y033B	GaAsP/GaP	Hi-Eff Red	640	628		2.0	2.6	5.5	12.0	
	GaAsP/GaP	Yellow	583	585		2.1	2.6	2.4	10.0	
BL-HG0Y033B	GaP/GaP	Yellow Green	568	571		2.2	2.6	2.4	10.0	
	GaAsP/GaP	Yellow	583	585		2.1	2.6	2.4	10.0	
BL-HUBGE33B	AlGaInP	Supper Red	645	632		2.0	2.6	28	50	
	AlGaInP	Super Yellow Green	570	570		2.0	2.6	18.5	40	
BL-HB5UB33B	AlInGaN	Supper Blue	470	472		3.2	3.6	28	50	
	AlGaInP	Supper Red	645	632		2.0	2.6	28	50	

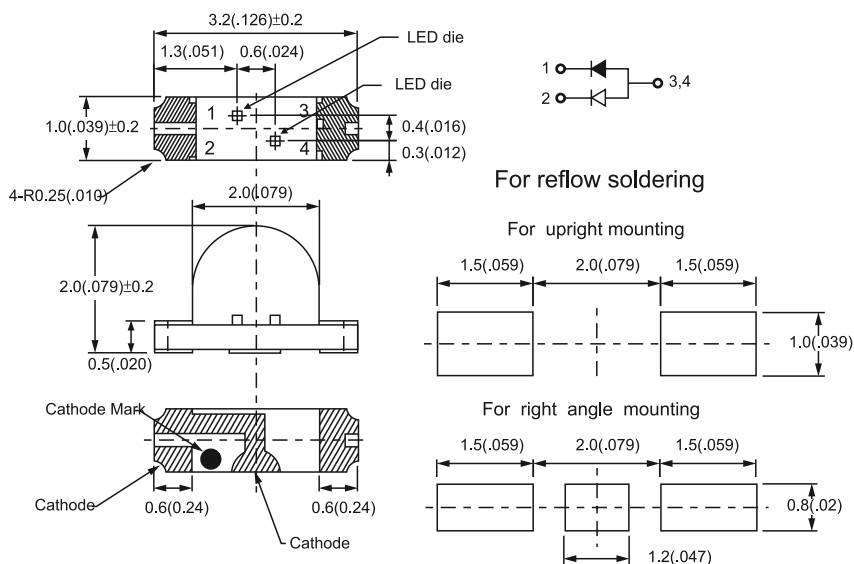
SURFACE MOUNT DUAL COLOR LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

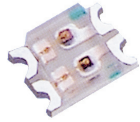
BL-Hxxxxx4B (1204) Series



NOTE:
 1. All dimensions are in millimeters (inches).
 2. Tolerance is ± 0.10 (± 0.004) unless otherwise specified.
 3. Specifications are subject to change without notices.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HB5KB34B	A1InGaN	Super Blue	470	470	Water Clear	3.2	3.6	42.0	70.0	100°
	A1GaInP	Super Yellow	590	587		2.1	2.6	42.0	70.0	
BL-HB5JF34B	A1InGaN	Super Blue	470	470		3.2	3.6	42.0	70.0	
	A1GaInP	Super Amber	610	605		2.0	2.6	42.0	70.0	
BL-HJFGE34B	A1GaInP	Super Amber	610	605		2.0	2.6	42.0	70.0	
	A1GaInP	Super Yellow Green	570	570		2.0	2.6	28.0	45.0	
BL-HD1X134B	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	8.2	25.0	
	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	20.0	
BL-HE1G034B	GaAsP/GaP	Hi-Eff Red	640	628		2.0	2.6	5.5	15.0	
	GaP/GaP	Yellow Green	568	571		2.2	2.6	3.7	12.0	
BL-HE1Y034B	GaAsP/GaP	Hi-Eff Red	640	628		2.0	2.6	5.5	15.0	
	GaAsP/GaP	Yellow	583	585		2.1	2.6	3.7	12.0	

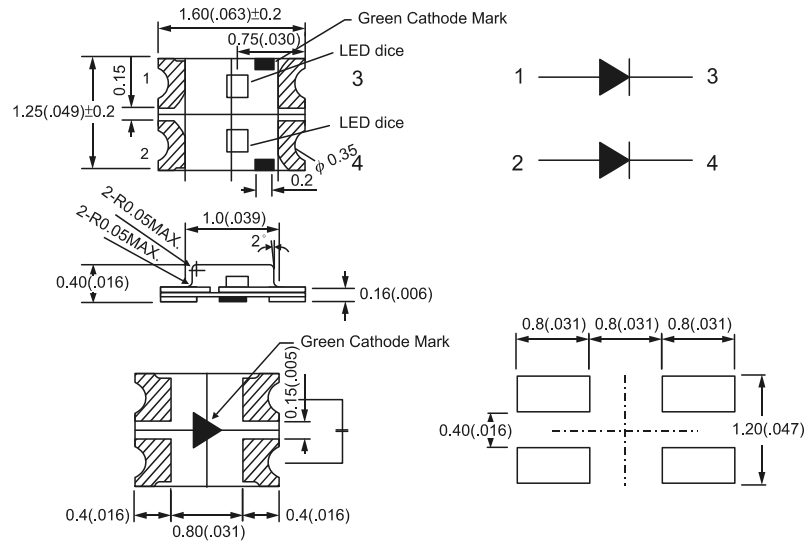
SURFACE MOUNT DUAL COLOR LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxxxx6H (0605) Series

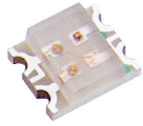


NOTE:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
3. Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HGEJE36H	AlGaInP	Super Yellow Green	570	570	Water Clear	1.8	2.4	3.7	8.0	120°
	AlGaInP	Super Orange Red	630	620		1.8	2.4	8.2	25.0	
BL-HGEUB36H	AlGaInP	Super Yellow Green	570	570		1.8	2.4	3.7	8.0	
	AlGaInP	Super Red	645	632		1.8	2.4	5.5	12.0	
BL-HGEKC36H	AlGaInP	Super Yellow Green	570	570		1.8	2.4	3.7	8.0	
	AlGaInP	Super Yellow	590	589		1.8	2.4	12.3	25.0	
BL-HB5JC36H	AlInGaIn	Super Blue	470	470-475		2.8	3.2	8.2	20.0	
	AlGaInP	Super Amber	610	605		1.8	2.4	12.3	25.0	
BL-HB5GE36H	AlInGaIn	Super Blue	470	470-475		2.8	3.2	8.2	20.0	
	AlGaInP	Super Yellow Green	570	570		1.8	2.4	3.7	8.0	
BL-HUBKC36H	AlGaInP	Super Red	645	632		1.8	2.4	5.5	12.0	
	AlGaInP	Super Yellow	590	589		1.8	2.4	12.3	25.0	

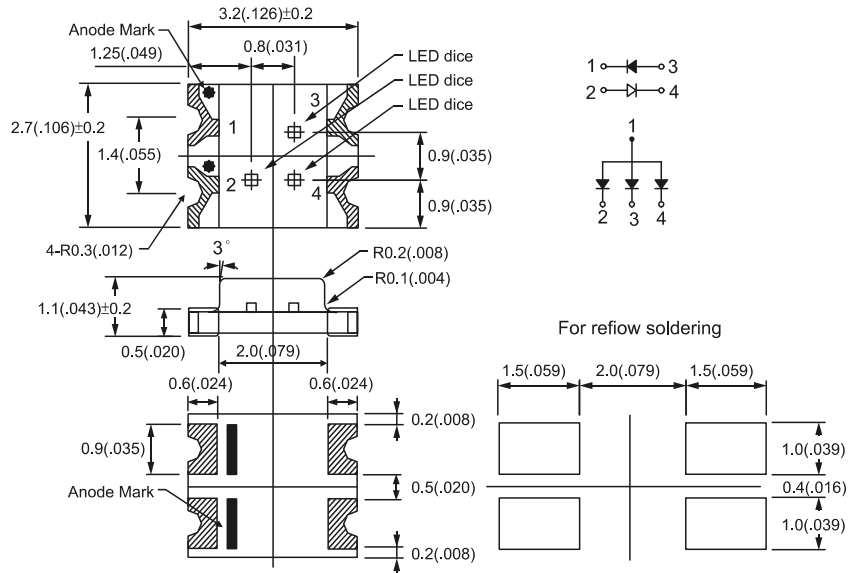
SURFACE MOUNT DUAL-TRI COLOR LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxxxxxx3F (1210) Series



NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
- 3.Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HD0G033F	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.8	2.6	8.2	20.0	120°
	GaP/GaP	Yellow Green	568	571		2.2	2.6	2.4	10.0	
BL-HS1X133F	GaAlAs/GaAs	Super Red	660	643		1.7	2.6	5.5	15.0	
	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	12.0	
BL-HF0G333F	GaAlAs/GaAlAs	Super Red	660	643		2.1	2.6	18.5	35.0	
	AlGaInP	Yellow Green	573	571		2.2	2.6	28.0	45.0	
BL-HD1G4B533F	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	12.3	25.0	
	InGaN	Bluish Green	505	505		3.5	4.0	63.0	120.0	
	AlInGaN	Super Blue	470	470		3.2	3.6	28.0	50.0	
BL-HD1X1B533F	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	12.3	25.0	
	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	12.0	
	AlInGaN	Super Blue	470	470		3.2	3.6	28.0	50.0	

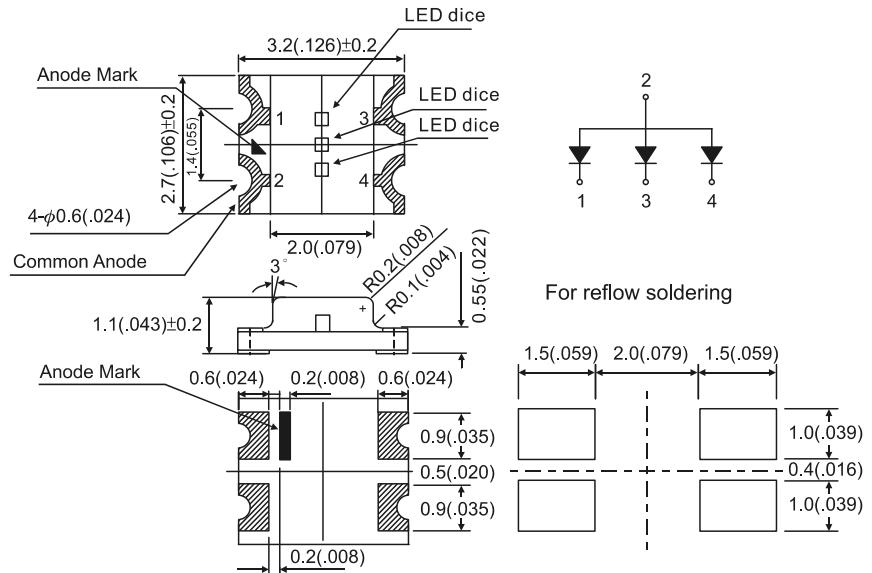
SURFACE MOUNT TRI COLOR LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxxxxxx3T (1210) Series



NOTE:
 1. All dimensions are in millimeters(inches).
 2. Tolerance is ±0.10(.004") unless otherwise specified.
 3. Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HD1G4B533T	GaAlAs/GaAs	Super Red	660	643	Water Clear	1.8	2.6	12.3	25.0	120°
	InGaN	Bluish Green	505	505		3.5	4.0	63.0	120.0	
	AlInGaN	Super Blue	470	470		3.2	3.6	28.0	50.0	
BL-HD1G6B533T	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	12.3	25.0	
	InGaN	Green	525	525		3.5	4.0	63.0	160.0	
	AlInGaN	Super Blue	470	470		3.2	3.6	28.0	50.0	
BL-HD1X1B533T	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	12.3	25.0	
	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	12.0	
	AlInGaN	Super Blue	470	470		3.2	3.6	28.0	50.0	
BL-HD1X1KB33T	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	12.3	25.0	
	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	5.5	12.0	
	AlGaInP	Super Yellow	590	587		2.1	2.6	28.0	45.0	
BL-HUBG6B533T	AlGaInP	Super Red	645	632		2.1	2.6	28.0	50.0	
	InGaN	Green	525	525		3.5	4.0	63.0	160.0	
	AlInGaN	Super Blue	470	470		3.2	3.6	28.0	50.0	

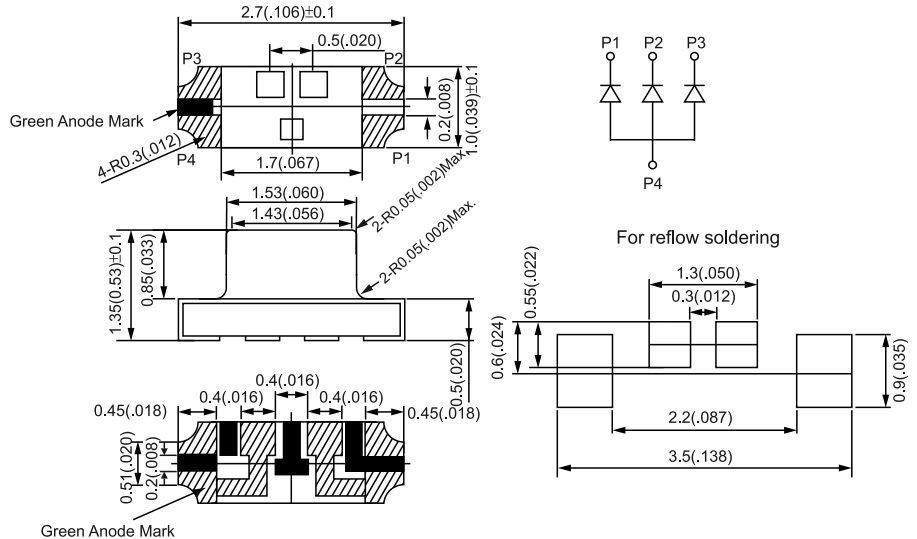
SURFACE MOUNT TRI COLOR LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxxxxxx4S(1004) Series

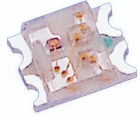


NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
- 3.Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HJEG6B534S	AlGaInP/GaAs	Super Orange Red	630	620	Water Clear	2.0	2.6	63	120	120°
	AlInGaN	Green	525	525		3.4	3.8	94	180	
	AlInGaN	Super Blue	470	470		3.2	3.6	28	50	
BL-HJFG6B534S	AlGaInP/GaAs	Super Amber	610	605		2.0	2.6	28	50	
	AlInGaN	Green	525	525		3.4	3.8	94	180	
	AlInGaN	Super Blue	470	470		3.2	3.6	28	50	
BL-HUEG6B534S	AlGaInP/GaAs	Super Red	645	630		2.0	2.6	63	140	
	AlInGaN	Green	525	525		3.4	3.8	94	180	
	AlInGaN	Super Blue	470	470		3.2	3.6	28	50	
BL-HJEGKB534S	AlGaInP/GaAs	Super Orange Red	630	620		2.0	2.6	63	120	
	AlInGaN	Green	525	525		3.2	3.6	94	180	
	AlInGaN	Super Blue	470	470		3.2	3.6	28	50	
BL-HGEB6UB34S	AlGaInP/GaAs	Super Yellow Green	570	570		2.0	2.6	18.5	40	
	AlInGaN	Super Blue	470	475		3.4	3.8	28	50	
	AlGaInP/GaAs	Super Red	645	630		2.1	2.6	28	50	

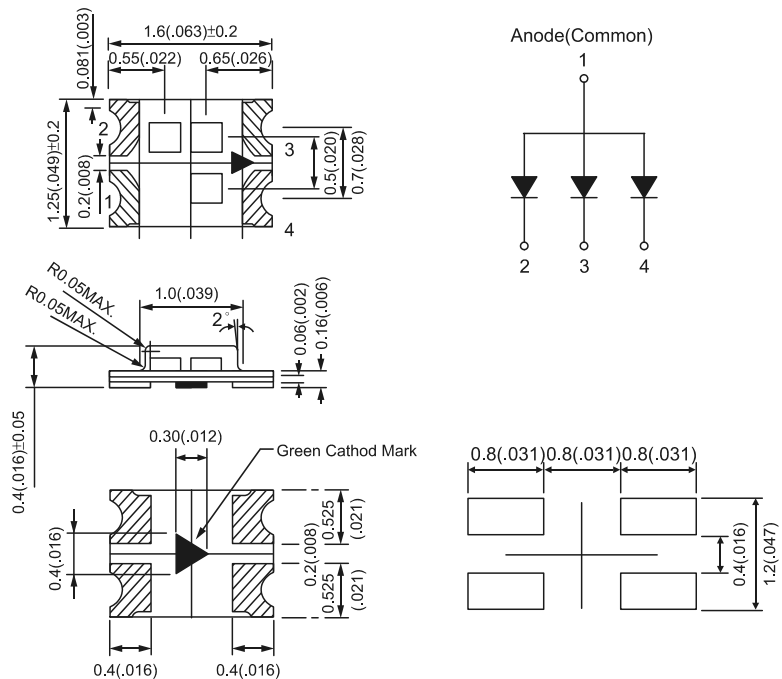
SURFACE MOUNT TRI COLOR LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Hxxxxxxx6T(0605) Series



NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
- 3.Specifications are subject to change without not notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-HJEGKBE36T	AlGaInP	Super Orange Red	630	620	Water Clear	1.8	2.4	12.3	25.0	120°
	AlGaInP	Green	525	525		2.8	3.2	18.5	40.0	
	AlInGaN	Super Blue	460	465		3.2	3.6	12.3	20.0	
BL-HJCGKBE36T	AlGaInP	Super Amber	610	605		1.8	2.4	18.5	25.0	
	INGaN	Green	525	525		2.8	3.2	18.5	40.0	
	AlInGaN	Super Blue	460	465		3.2	3.6	12.3	20.0	
BL-HJCGEB336T	AlGaInP	Super Amber	610	605		1.8	2.4	18.5	25.0	
	AlGaInP	Super Yellow Green	570	570		1.8	2.4	5.5	10.0	
	AlInGaN	Super Blue	460	465-470		2.8	3.2	8.2	15.0	
BL-HKCGEBE36T	AlGaInP	Super Yellow	590	589		1.8	2.4	12.3	30.0	
	AlGaInP	Super Yellow Green	570	570		1.8	2.4	5.5	10.0	
	AlInGaN	Super Blue	460	465		3.2	3.6	12.3	20.0	
BL-HUBGEBE36T	AlGaInP	Super Red	645	632		1.8	2.4	5.5	15.0	
	AlGaInP	Super Yellow Green	570	570		1.8	2.4	5.5	10.0	
	AlInGaN	Super Blue	460	465		3.2	3.6	12.3	20.0	

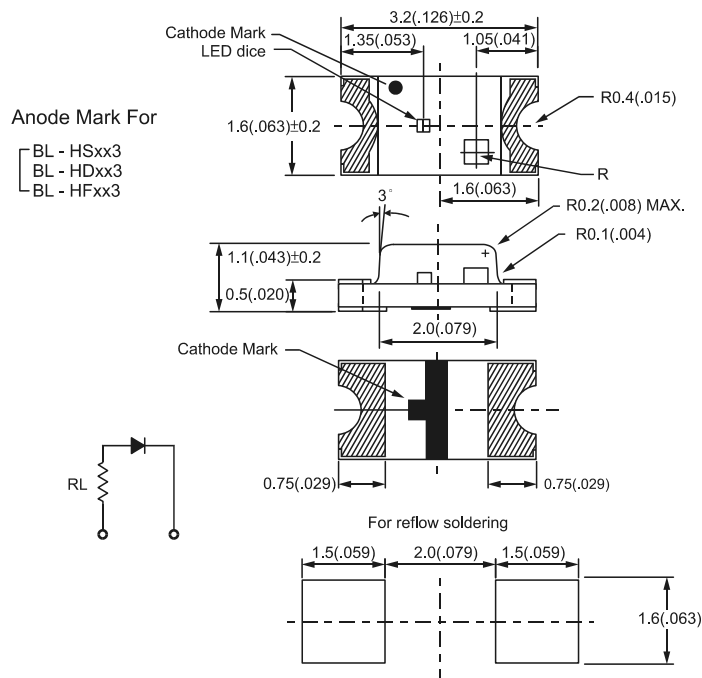
SURFACE MOUNT RESISTOR CHIP LED LAMPS



■ Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	12
IFp	mA	100
Topr	°C	-40~+85
Tstg	°C	-40~+85

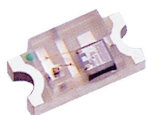
BR-Hxxx3-xx (1206) Series



NOTE:
 1. All dimensions are in millimeters (inches).
 2. Tolerance is ± 0.10 (.004") unless otherwise specified.
 3. Specifications are subject to change without notice.

Part No.	Chip			Lens Appearance	Electro-optical Data						Viewing Angle 2 θ 1/2 (deg)
					Operating Voltage		Forward Current		Iv (mcd)		
	Material	Emitted Color	λ_p (nm)		Typ.	Max.	Typ.	Max.	Min.	Typ.	
BR-HG033-05V	GaP/GaP	Yellow Green	568	Water Clear	—	5	7	12	5.5	15.0	120°
BR-HY033-05V	GaAsP/GaP	Yellow	583		—	5	7	12	3.7	12.0	
BR-HE133-05V	GaAsP/GaP	Hi-Eff Red	640		—	5	7	12	5.5	15.0	
BR-HD033-05V	GaAlAs/GaAs	Super Red	660		—	5	7	12	12.3	30.0	
BR-HUB33-05V	AlGaInP	Super Red	645		—	5	7	12	12.3	25.0	
BR-HUB33-09V	AlGaInP	Super Red	645		—	9	7	12	12.3	25.0	
BR-HG033-12V	GaP/GaP	Yellow Green	568		—	12	7	12	5.5	15.0	
BR-HY033-12V	GaAsP/GaP	Yellow	583		—	12	7	12	3.7	12.0	
BR-HE033-12V	GaAsP/GaP	Hi-Eff Red	640		—	12	7	12	5.5	15.0	
BR-HD033-12V	GaAlAs/GaAs	Super Red	660		—	12	7	12	12.3	30.0	
BR-HG033-15V	GaP/GaP	Yellow Green	568		—	15	7	12	5.5	15.0	
BR-HY033-15V	GaAsP/GaP	Yellow	583		—	15	7	12	3.7	12.0	
BR-HE133-15V	GaAsP/GaP	Hi-Eff Red	640		—	15	7	12	5.5	15.0	

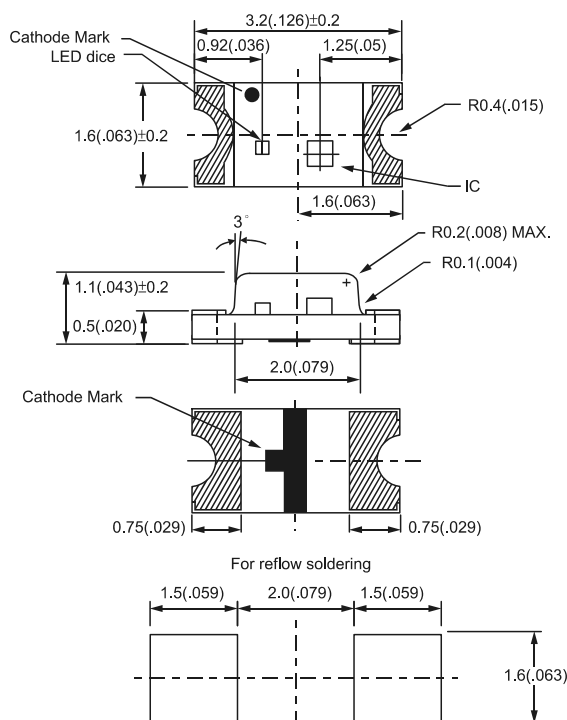
SURFACE MOUNT BLINKING CHIP LED LAMPS



■ Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	12
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BB-Hxxx3-C (1206) Series



NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is ±0.10(.004") unless otherwise specified.
- 3.Specifications are subject to change without notice.

Part No.	Chip			Lens Appearance	Forward Current		Pulse Rate (Hz) VDD = 5V			Iv (mcd)		Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)		Typ.	Max.	Min	Typ	Max.	Min.	Typ.	
BB-HH033-C	GaP/GaP	Bright Red	700	Water Clear	20	—	2.0	2.4	3.0	2.4	6.0	120°
BB-HG033-C	GaP/GaP	Yellow Green	568		20	—	2.0	2.4	3.0	8.2	25.0	
BB-HX133-C	GaP/GaP	Hi-Eff Green	568		20	—	2.0	2.4	3.0	5.5	12.0	
BB-HW133-C	GaP/GaP	Pure Green	557		20	—	2.0	2.4	3.0	1.6	3.0	
BB-HY033-C	GaAsP/GaP	Yellow	583		20	—	2.0	2.4	3.0	2.4	6.0	
BB-HE133-C	GaAsP/GaP	Hi-Eff Red	640		20	—	1.8	2.4	3.0	2.4	8.0	
BB-HD133-C	GaAlAs	Super Red	660		20	—	2.0	2.4	3.0	8.2	25.0	
BB-HJ033-C	AlGaInP	Super Orange	620		20	—	2.0	2.4	3.0	28.0	50.0	
BB-HK033-C	AlGaInP	Super Yellow	590		20	—	2.0	2.4	3.0	28.0	40.0	
BB-HJ333-C	AlGaInP	Soft Orange	630		20	—	2.0	2.4	3.0	42.0	70.0	
BB-HJF33-C	AlGaInP	Soft Orange	610		20	—	2.0	2.4	3.0	28.0	50.0	
BB-HUB33-C	AlGaInP	Super Red	645		20	—	2.0	2.4	3.0	28.0	50.0	

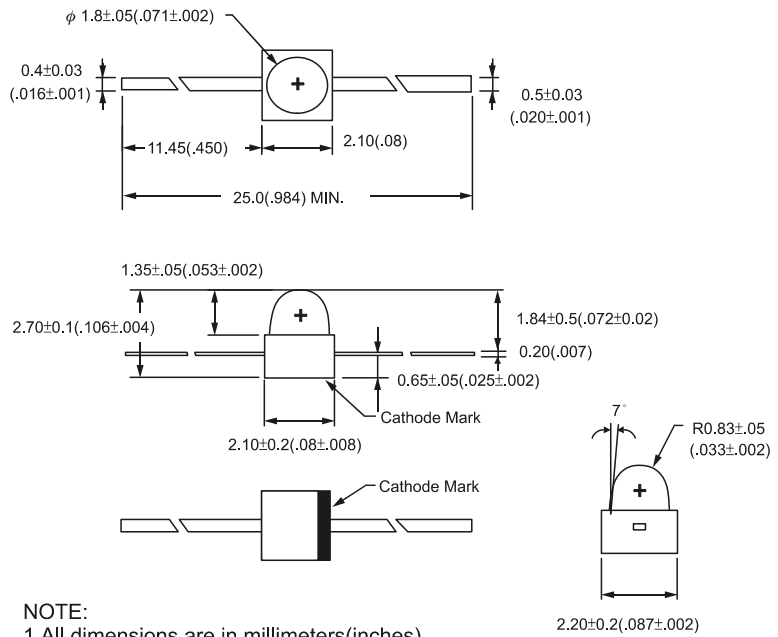
AXIAL LED LAMPS



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Xxx61 Series



Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-XE1361	GaAsP/GaP	Hi-Eff Red	640	628	Water Clear	2.0	2.6	18.5	40.0	35°
BL-XS1361	GaAlAs/GaAs	Super Red	660	643		1.7	2.6	28.0	60.0	
BL-XD0361	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	28.0	75.0	
BL-XF0361	GaAlAs	Super Red	660	643		2.1	2.6	42.0	100.0	
BL-XUB361	AlGaInP	Super Red	645	632		2.1	2.6	42.0	100.0	
BL-XJB361	AlGaInP	Super Orange Red	620	615		2.2	2.6	63.0	150.0	
BL-XJD361	AlGaInP	Super Orange Red	630	625		2.1	2.6	63.0	150.0	
BL-XG0361	GaP/GaP	Yellow Green	568	571		2.1	2.6	18.5	45.0	
BL-XX1361	GaP/GaP	Hi-Eff Green	568	570		2.0	2.6	28.0	55.0	
BL-XW1361	GaP/GaP	Pure Green	557	563		2.2	2.6	5.5	15.0	
BL-XGE361	AlGaInP	Super Yellow Green	570	570		2.0	2.6	42.0	80.0	
BL-XG4361	InGaN	Bluish Green	505	505		3.5	4.0	94.0	250.0	
BL-XG6361	InGaN	Green	525	525		3.5	4.0	94.0	300.0	
BL-XY0361	GaAsP/GaP	Yellow	583	585		2.1	2.6	12.3	30.0	
BL-XKB361	AlGaInP	Super Yellow	590	587		2.1	2.6	94.0	200.0	
BL-XKD361	AlGaInP	Super Yellow	595	594		2.1	2.6	94.0	200.0	
BL-XA1361	GaAsP/GaP	Amber	610	610		2.2	2.6	5.5	15.0	
BL-XJF361	AlGaInP	Super Amber	610	605		2.0	2.6	63.0	150.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-XB3361	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	28.0	60.0	35°
BL-XB5361	AlInGaN	Super Blue	470	470-475		2.8	3.2	28.0	70.0	

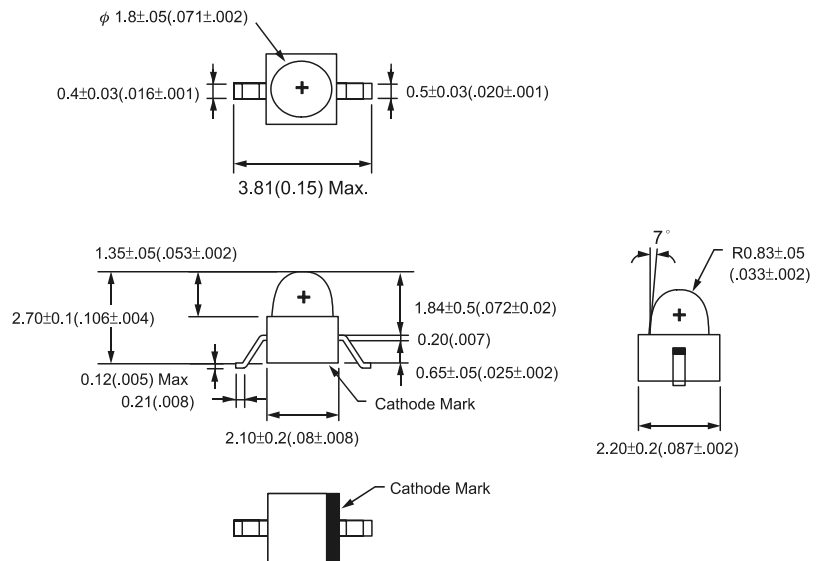
AXIAL LED LAMPS WITH “GULL WING” LEAD



■ Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Xxx61-F7 Series



NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is $\pm 0.10(0.004)$ unless otherwise specified.
- 3.Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-XE1361-F7	GaAsP/GaP	Hi-Eff Red	640	628	Water Clear	2.0	2.6	18.5	40.0	35°
BL-XS1361-F7	GaAlAs/GaAs	Super Red	660	643		1.7	2.6	28.0	60.0	
BL-XD0361-F7	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	28.0	75.0	
BL-XF0361-F7	GaAlAs	Super Red	660	643		2.1	2.6	42.0	100.0	
BL-XUB361-F7	AlGaInP	Super Red	645	632		2.1	2.6	42.0	100.0	
BL-XJB361-F7	AlGaInP	Super Orange Red	620	615		2.0	2.6	63.0	150.0	
BL-XJD361-F7	AlGaInP	Super Orange Red	630	625		2.1	2.6	63.0	150.0	
BL-XG0361-F7	GaP/GaP	Yellow Green	568	571		2.1	2.6	18.5	45.0	
BL-XX1361-F7	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	28.0	55.0	
BL-XW1361-F7	GaP/GaP	Pure Green	557	563		2.2	2.6	5.5	15.0	
BL-XGE361-F7	AlGaInP	Super Yellow Green	570	570		2.0	2.6	42.0	80.0	
BL-XG4361-F7	InGaN	Bluish Green	505	505		3.5	4.0	94.0	250.0	
BL-XG6361-F7	InGaN	Green	525	525		3.5	4.0	94.0	300.0	
BL-XY0361-F7	GaAsP/GaP	Yellow	583	585		2.1	2.6	12.3	30.0	
BL-XKB361-F7	AlGaInP	Super Yellow	590	587		2.1	2.6	94.0	200.0	
BL-XKD361-F7	AlGaInP	Super Yellow	595	594		2.1	2.6	94.0	200.0	
BL-XA1361-F7	GaAsP/GaP	Amber	610	610		2.2	2.6	5.5	15.0	
BL-XJF361-F7	AlGaInP	Super Amber	610	605		2.0	2.6	63.0	150.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-XB3361-F7	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	28.0	60.0	35°
BL-XB5361-F7	AlInGaN	Super Blue	470	470-475		2.8	3.2	28.0	70.0	

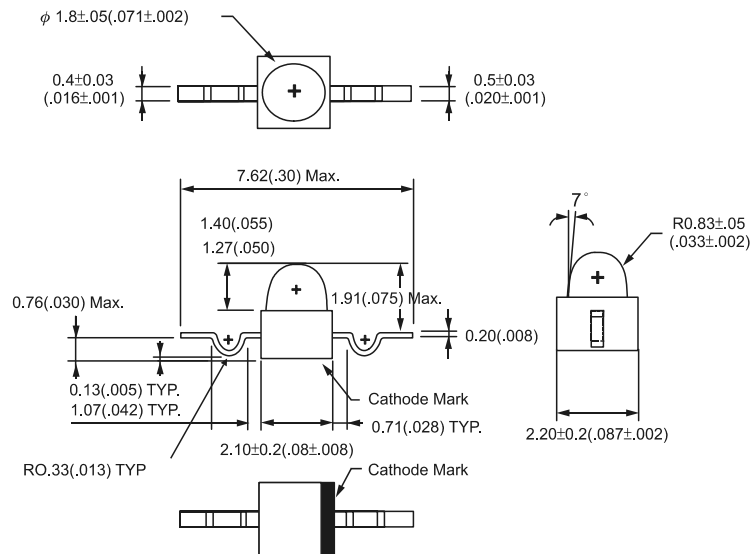
AXIAL LED LAMPS WITH “YOKE” LEAD



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Xxx61-F8 Series



NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
- 3.Specifications are subject to change without notice.

Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-XE1361-F8	GaAsP/GaP	Hi-Eff Red	640	628	Water Clear	2.0	2.6	18.5	40.0	35°
BL-XS1361-F8	GaAlAs/GaAs	Super Red	660	643		1.7	2.6	28.0	60.0	
BL-XD0361-F8	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	28.0	75.0	
BL-XF0361-F8	GaAlAs	Super Red	660	643		2.1	2.6	42.0	100.0	
BL-XUB361-F8	AlGaInP	Super Red	645	632		2.1	2.6	42.0	100.0	
BL-XJB361-F8	AlGaInP	Super Orange Red	620	615		2.0	2.6	63.0	150.0	
BL-XJD361-F8	AlGaInP	Super Orange Red	630	625		2.1	2.6	63.0	150.0	
BL-XG0361-F8	GaP/GaP	Yellow Green	568	571		2.1	2.6	18.5	45.0	
BL-XX1361-F8	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	28.0	55.0	
BL-XW1361-F8	GaP/GaP	Pure Green	557	563		2.2	2.6	5.5	15.0	
BL-XGE361-F8	AlGaInP	Super Yellow Green	570	570		2.0	2.6	42.0	80.0	
BL-XG4361-F8	InGaN	Bluish Green	505	505		3.5	4.0	94.0	250.0	
BL-XG6361-F8	InGaN	Green	525	525		3.5	4.0	94.0	300.0	
BL-XY0361-F8	GaAsP/GaP	Yellow	583	585		2.1	2.6	12.3	30.0	
BL-XKB361-F8	AlGaInP	Super Yellow	590	587		2.1	2.6	94.0	200.0	
BL-XKD361-F8	AlGaInP	Super Yellow	595	594		2.1	2.6	94.0	200.0	
BL-XA1361-F8	GaAsP/GaP	Amber	610	610		2.2	2.6	5.5	15.0	
BL-XJF361-F8	AlGaInP	Super Amber	610	605		2.0	2.6	63.0	150.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-XB3361-F8	AlInGaN	Super Blue	460	465-470	Water Clear	2.8	3.2	28.0	60.0	35°
BL-XB5361-F8	AlInGaN	Super Blue	470	470-475		2.8	3.2	28.0	70.0	

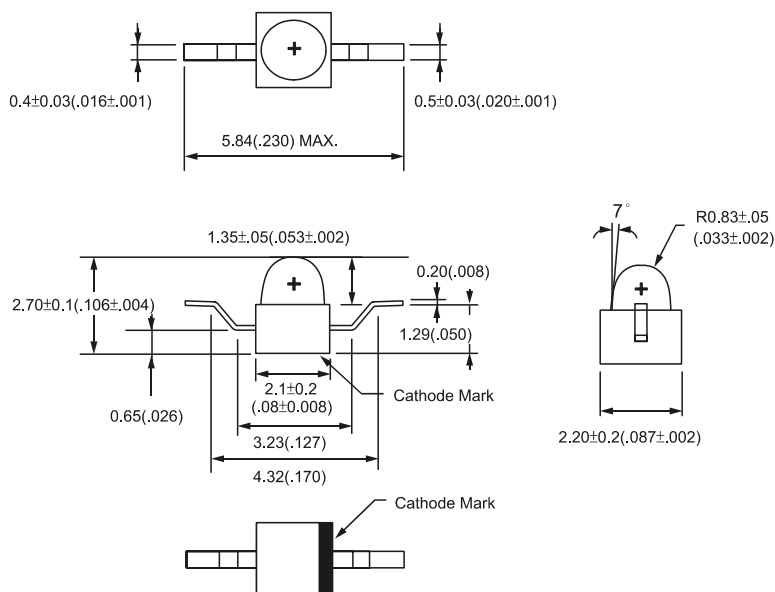
AXIAL LED LAMPS WITH “Z” BENT LEAD



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BL-Xxx61-F9 Series



NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is ±0.10(.004") unless otherwise specified.
- 3.Specifications are subject to change without notice.

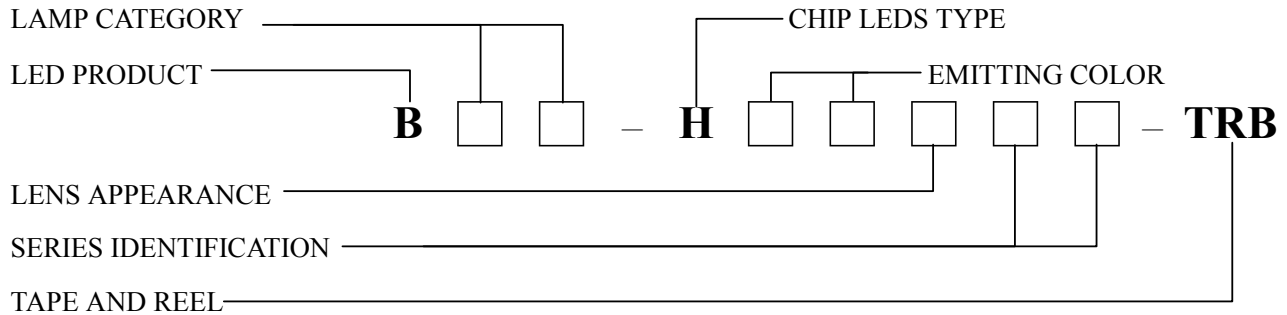
Part No.	Chip				Lens Appearance	Electro-optical Data (At 20mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-XE1361-F9	GaAsP/GaP	Hi-Eff Red	640	628	Water Clear	2.0	2.6	18.5	40.0	35°
BL-XS1361-F9	GaAlAs/GaAs	Super Red	660	643		1.7	2.6	28.0	60.0	
BL-XD0361-F9	GaAlAs/GaAs	Super Red	660	643		1.8	2.6	28.0	75.0	
BL-XF0361-F9	GaAlAs	Super Red	660	643		2.1	2.6	42.0	100.0	
BL-XUB361-F9	AlGaInP	Super Red	645	632		2.1	2.6	42.0	100.0	
BL-XJB361-F9	AlGaInP	Super Orange Red	620	615		2.0	2.6	63.0	150.0	
BL-XJD361-F9	AlGaInP	Super Orange Red	630	625		2.1	2.6	63.0	150.0	
BL-XG0361-F9	GaP/GaP	Yellow Green	568	571		2.1	2.6	18.5	45.0	
BL-XX1361-F9	GaP/GaP	Hi-Eff Green	568	570		2.2	2.6	28.0	55.0	
BL-XW1361-F9	GaP/GaP	Pure Green	557	563		2.2	2.6	5.5	15.0	
BL-XGE361-F9	AlGaInP	Super Yellow Green	570	570		2.0	2.6	42.0	80.0	
BL-XG4361-F9	InGaIn	Bluish Green	505	505		3.5	4.0	94.0	250.0	
BL-XG6361-F9	InGaIn	Green	525	525		3.5	4.0	94.0	300.0	
BL-XY0361-F9	GaAsP/GaP	Yellow	583	585		2.1	2.6	12.3	30.0	
BL-XKB361-F9	AlGaInP	Super Yellow	590	587		2.1	2.6	94.0	200.0	
BL-XKD361-F9	AlGaInP	Super Yellow	595	594		2.1	2.6	94.0	200.0	
BL-XA1361-F9	GaAsP/GaP	Amber	610	610		2.2	2.6	5.5	15.0	
BL-XJF361-F9	AlGaInP	Super Amber	610	605		2.0	2.6	63.0	150.0	

Part No.	Chip				Lens Appearance	Electro-optical Data (At 5mA)				Viewing Angle 2 θ 1/2 (deg)
	Material	Emitted Color	λp (nm)	λd (nm)		Vf (V)		Iv (mcd)		
						Typ.	Max.	Min.	Typ.	
BL-XB3361-F9	AlInGaIn	Super Blue	460	465-470	Water Clear	2.8	3.2	28.0	60.0	35°
BL-XB5361-F9	AlInGaIn	Super Blue	470	470-475		2.8	3.2	28.0	70.0	

SELECTION GUIDE TO INFRARED SERIES

PART NO. SYSTEM

- INFRARED EMITTING DIODES
- PHOTO TRANSISTORS
- PHOTO DIODES



LAMP CATEGORY:

IR : Infrared Emitting Diodes

PT : Phototransistors

PD : Photodiodes

SERIES IDENTIFICATION:

Lx : GaAs/GaAs940nm

Mx : GaAsAl/GaAs940nm

Nx : GaAlAs880nm

Ox : GaAlAs/GaAlAs850nm

Px : Silicon Phototransistors

Qx : Silicon Photodiodes

TYPICAL ELECTIEICAL-OPTICAL CHARACTERISTICS CURVES

Infrared Emitting Diodes Series :

Fig.3 FORWARD CURRENT VS. FORWARD VOLTAGE

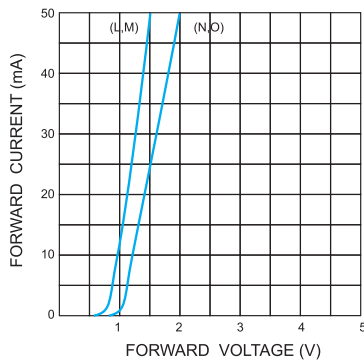


Fig.4 RELATIVE LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

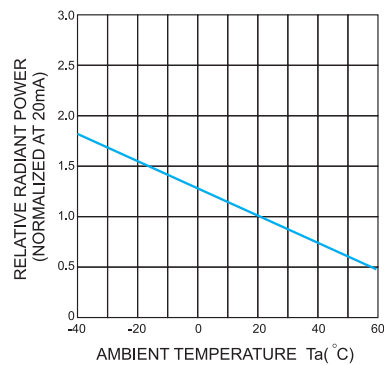


Fig.5 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

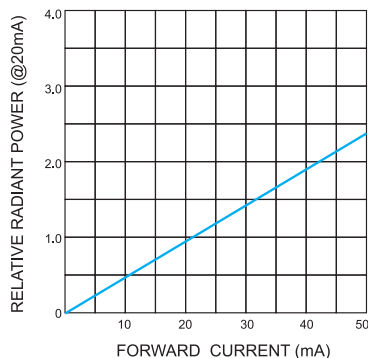
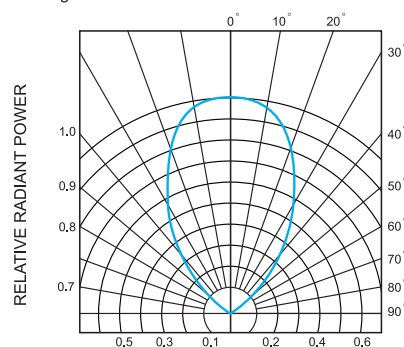


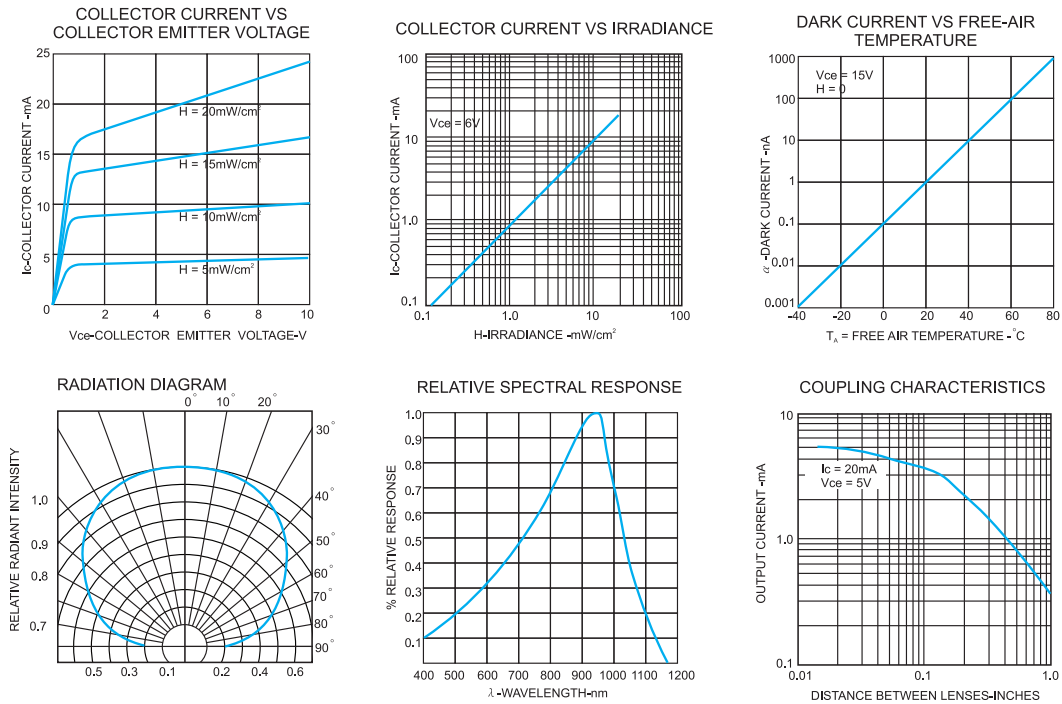
Fig.6 RADIATION DIAGRAM



SELECTION GUIDE TO INFRARED SERIES

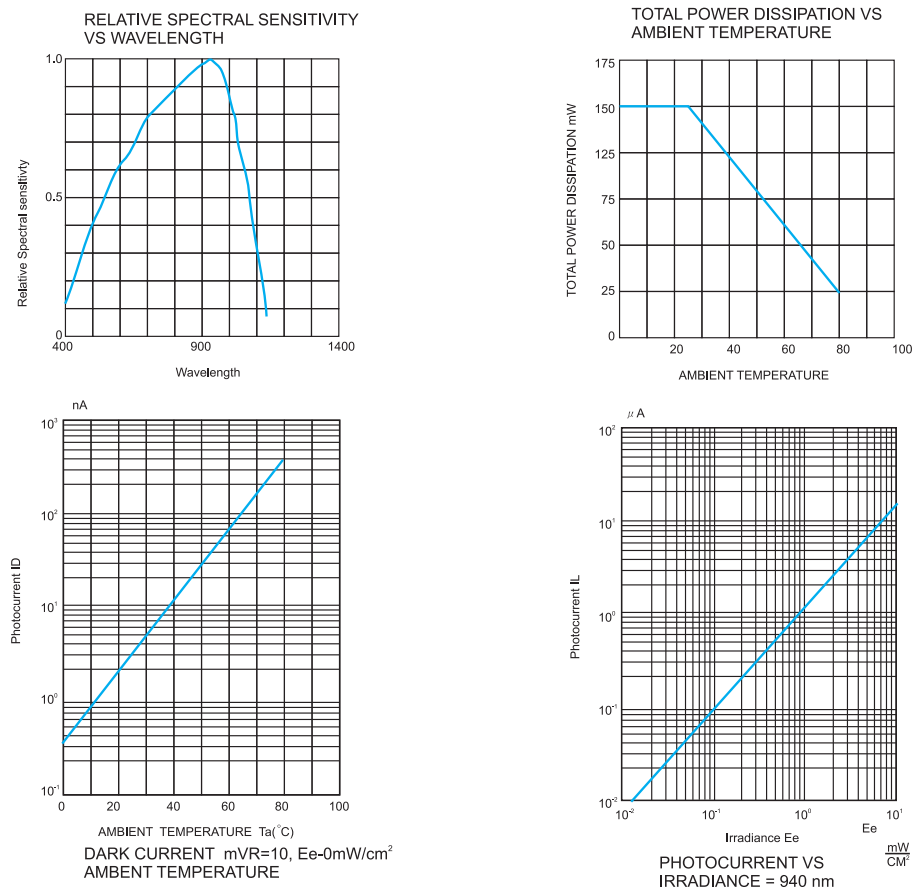
TYPICAL ELECTIEICAL-OPTICAL CHARACTERISTICS CURVES

Photo transistors Series:

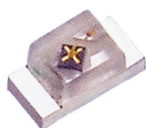


TYPICAL ELECTIEICAL-OPTICAL CHARACTERISTICS CURVES

Photo diodes Series



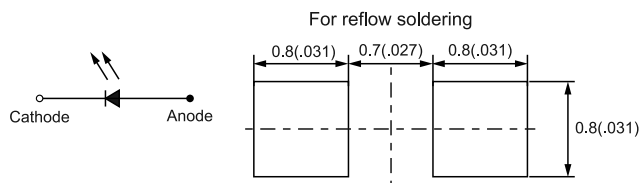
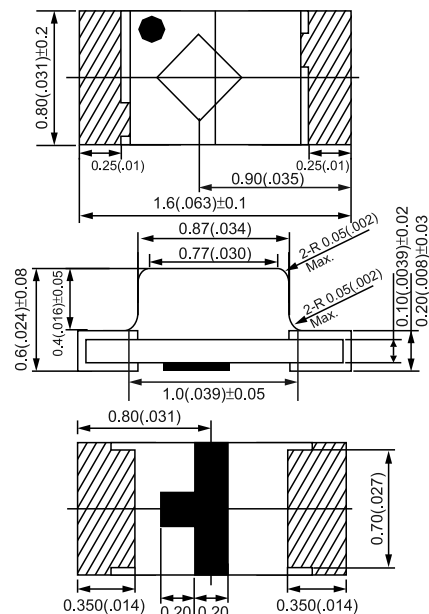
SURFACE MOUNT INFRARED EMITTING DIODES



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	A	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

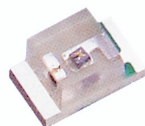
BIR-Hxx36A (0603) Series



NOTE:
 1. All dimension are in millimeters(inches).
 2. Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
 3. Specifications are subject to change without notices.

Part No.	Chip			Lens Appearance	Electro-optical Data (At 20mA)					Viewing Angle 2 θ 1/2 (deg)
	Material	λ p (nm)	$\Delta \lambda$ (nm)		V _f (V)		Ir (μ A)	Radiant Power Po (mw/sr)		
					Typ.	Max.		Min.	Typ.	
BIR-HM136A	AlGaAs/GaAs	940	50	Water Clear	1.2	1.7	50	1.00	4.00	120°
BIR-HN036A	AlGaAs/GaAs	880	50		1.4	2.0	50	0.71	1.20	
BIR-HO036A	AlGaAs/GaAs	850	50		1.4	2.0	50	1.98	4.00	
BIR-HO136A	AlGaAs/GaAs	850	50		1.4	2.0	50	1.41	3.00	

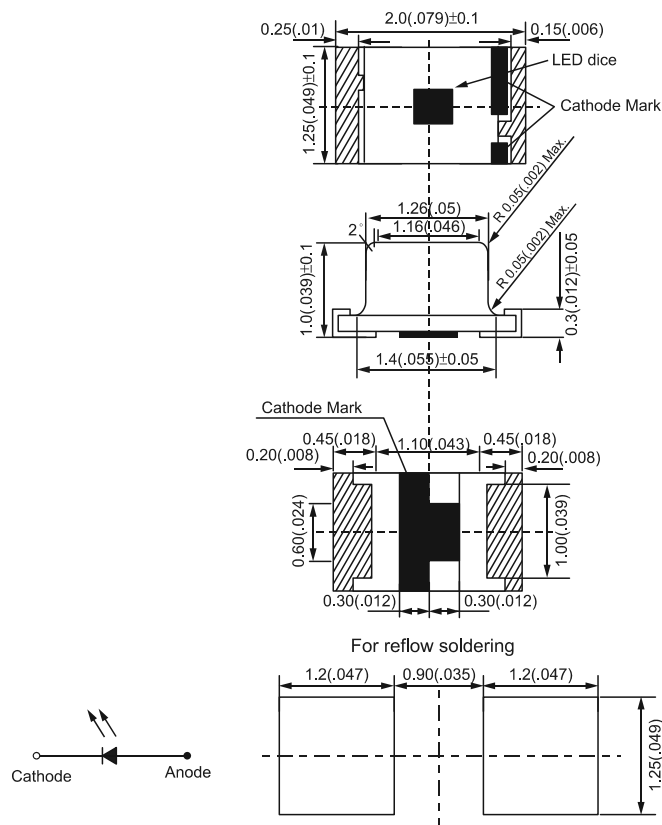
SURFACE MOUNT INFRARED EMITTING DIODES



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	A	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BIR-Hxx35A (0805) Series



NOTE:
 1. All dimension are in millimeters(inches).
 2. Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
 3. Specifications are subject to change without notices.

Part No.	Chip			Lens Appearance	Electro-optical Data (At 20mA)					Viewing Angle 2 θ 1/2 (deg)
	Material	λ p (nm)	$\Delta \lambda$ (nm)		V _f (V)		Ir (μ A)	Radiant Power Po (mw/sr)		
					Typ.	Max.		Min.	Typ.	
BIR-HM135A	AlGaAs/GaAs	940	50	Water Clear	1.2	1.7	50	1.00	4.00	120°
BIR-HN035A	AlGaAs/GaAs	880	50		1.4	2.0	50	0.71	1.20	
BIR-HO035A	AlGaAs/GaAs	850	50		1.4	2.0	50	1.98	4.00	
BIR-HO135A	AlGaAs/GaAs	850	50		1.4	2.0	50	1.41	3.00	

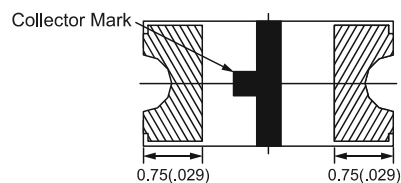
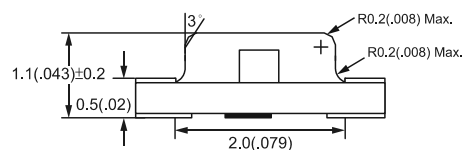
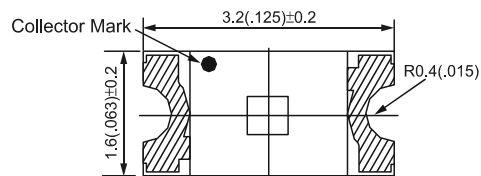
SURFACE MOUNT INFRARED EMITTING DIODES



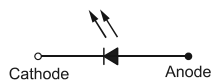
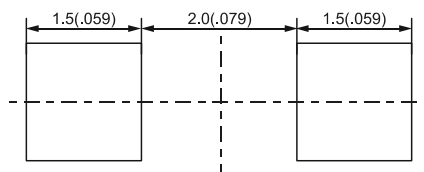
Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	mA	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

BIR-Hxx33 (1206) Series



For reflow soldering



NOTE:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.10 (.004") unless otherwise specified.
3. Specifications are subject to change without notices.

Part No.	Chip			Lens Appearance	Electro-optical Data (At 20mA)					Viewing Angle 2 θ 1/2 (deg)
	Material	λ_p (nm)	$\Delta \lambda$ (nm)		V _r (V)		I _r (μ A)	Radiant Power Po (mw/sr)		
					Typ.	Max.		Min.	Typ.	
BIR-HM133	AlGaAs/GaAs	940	50	Water Clear	1.2	1.7	50	1.00	4.00	120°
BIR-HN133	AlGaAs/GaAs	880	50		1.4	2.0	50	0.71	1.20	
BIR-HO033	AlGaAs/GaAs	850	50		1.4	2.0	50	1.98	4.00	
BIR-HO133	AlGaAs/GaAs	850	50		1.4	2.0	50	1.41	3.00	

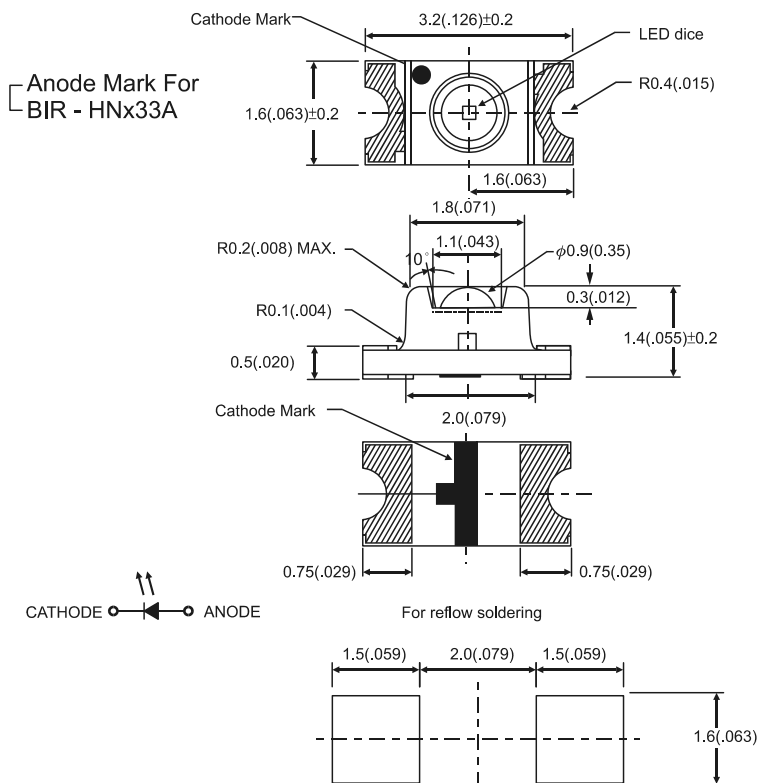
SURFACE MOUNT INFRARED EMITTING DIODES



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
IF	mA	20
IFp	A	100
VR	V	5
Topr	°C	-40~+85
Tstg	°C	-40~+85

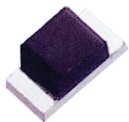
BIR-Hxx33A (1206) Series



NOTE:
 1. All dimensions are in millimeters (inches).
 2. Tolerance is ±0.10(.004") unless otherwise specified.
 3. Specifications are subject to change without notices.

Part No.	Chip			Lens Appearance	Electro-optical Data (At 20mA)					Ifp = 20mA PW = 10 μs DC = 1%		Viewing Angle 2 θ 1/2 (deg)
	Material	λp (nm)	Δ λ (nm)		V _f (V)		I _r (μA)	Radiant Power Po (mw/sr)		Tr (ns)	Tf (ns)	
					Typ.	Max.		Min.	Typ.			
BIR-HM133A	GaAlAs	940	50	Water Clear	1.2	1.7	50	1.00	4.00	500	200	60°
BIR-HN033A	GaAlAs	880	50		1.4	2.0	50	0.71	1.20	500	200	
BIR-HO033A	GaAlAs	850	50		1.4	2.0	50	1.98	4.00	500	200	
BIR-HO133A	GaAlAs	850	50		1.4	2.0	50	1.41	3.00	500	200	

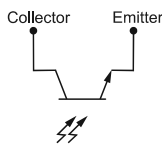
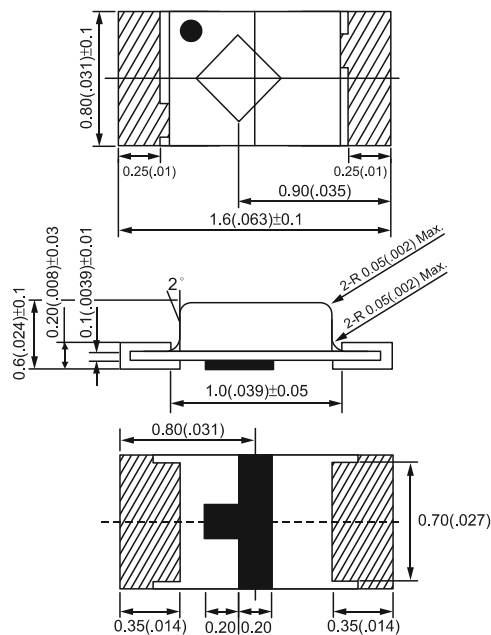
SURFACE MOUNT PHOTO TRANSISTORS



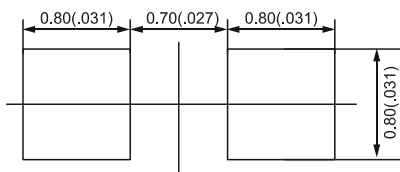
Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
Collector-Emitter Saturation Voltage Vce(sat)	V	0.5Ic =100μA
Emitter-Collector Breakdown Voltage Bveco	V	5Ie =100μA
Topr	°C	-40~+85
Tstg	°C	-40~+85
Power Dissipation	mW	100

BPT-HPx36A (0603) Series



For reflow soldering

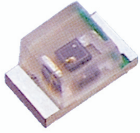


NOTE:

1. All dimension are in millimeters(inches).
2. Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
3. Specifications are subject to change without notices.

Part No.	Parameter						
	Spectrum Sensitivity	Peak Wavelength	Collector Light Current Vce=5V, H=1.0mw/cm ²		Collector Dark Current, Vce=20V, H ₂ =1.0mw/cm ²	Rise/Fall Time Vce=5V, Ic=1mA RL=1KΩ	Viewing Angle 2 θ 1/2 (deg)
	λ (nm)	λp (nm)	I _{C(on)} (mA)		I _C E _O (nA)	T _R /T _F (us)	
			Min.	Typ.	Max.	Typ.	
BPT-HPG036A	500-1000	940	1.156	3.00	100	15/15	120°

SURFACE MOUNT PHOTO TRANSISTORS

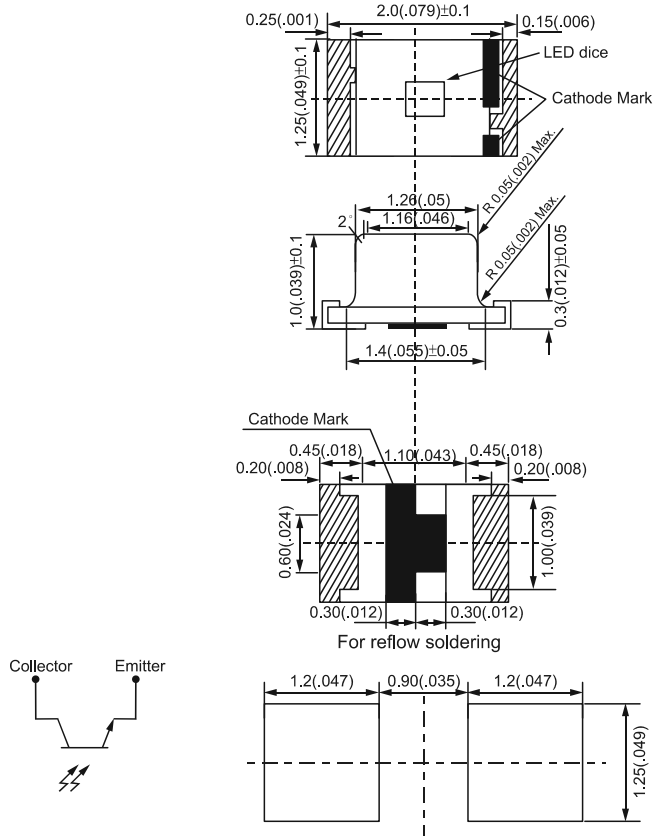


Absolute Maximum Ratings

(Ta=25°C)

	UNIT	SPEC.
Collector-Emitter Saturation Voltage Vce(sat)	V	0.5 Ic =100μA
Emitter-Collector Breakdown Voltage Bveco	V	5 Ic =100μA
Topr	°C	-40~+85
Tstg	°C	-40~+85
Power Dissipation	mW	100

BPT-HPx35A (0805) Series



NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
- 3.Specifications are subject to change without not notices.

Part No.	Parameter					
	Spectrum Sensitivity	Peak Wavelength	Collector Light Current Vce=5V, H=1.0mw/cm ²		Collector Dark Current, Vce=20V, H ₂ =1.0mw/cm ²	Rise/Fall Time Vce=5V, Ic=1mA RL=1KΩ
	λ (nm)	λp (nm)	I _{C(on)} (mA)		I _C E _O (nA)	T _R /T _F (us)
			Min.	Typ.	Max.	Typ.
BPT-HP035A	500-1000	940	0.67	1.50	100	15/15
BPT-HP135A	500-1000	940	2.00	3.00	100	15/15
BPT-HP235A	500-1000	940	2.00	4.00	100	15/15
BPT-HP835A	500-1000	940	2.00	5.00	100	15/15

120°

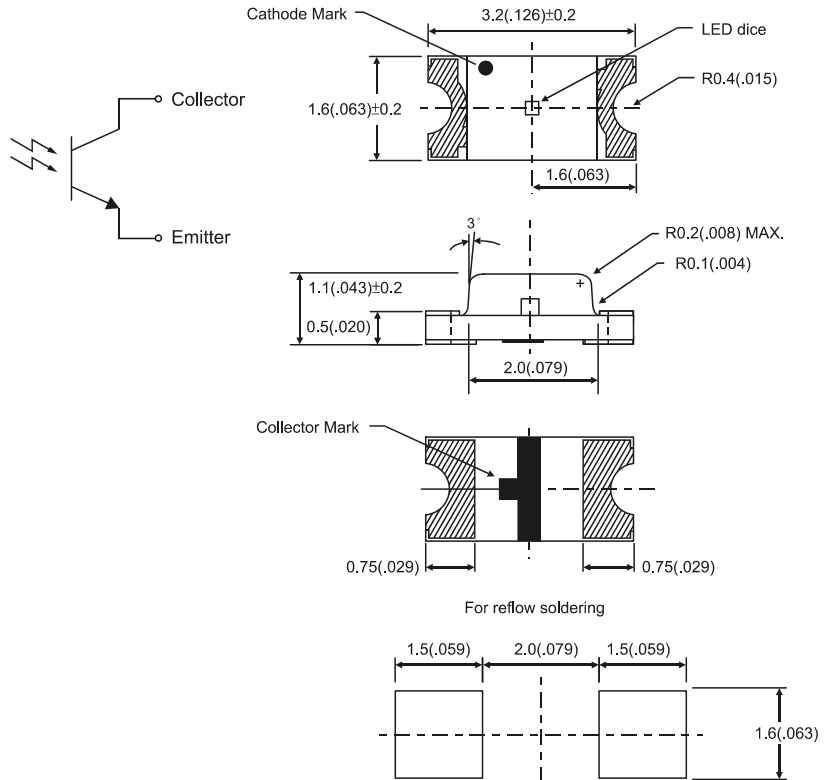
SURFACE MOUNT PHOTO TRANSISTORS



■ Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
Collector-Emitter Saturation Voltage Vce(sat)	V	0.5 Ic =100μA
Emitter-Collector Breakdown Voltage Bvco	V	5 Ic =100μA
Topr	°C	-40~+85
Tstg	°C	-40~+85
Power Dissipation	mW	100

BPT-HPx33 (1206) Series



NOTE:

- 1.All dimension are in millimeters(inches).
- 2.Tolerance is $\pm 0.10(.004)$ unless otherwise specified.
- 3.Specifications are subject to change without notices.

Part No.	Parameter						
	Spectrum Sensitivity	Peak Wavelength	Collector Light Current Vce=5V,H=1.0mw/cm ²		Collector Dark Current, Vce=20V, H ₂ =1.0mw/cm ²	Rise/Fall Time Vce=5V, Ic=1mA RL=1KΩ	Viewing Angle 2 θ 1/2 (deg)
			I _{C(on)} (mA)		I _C E _O (nA)	T _R /T _F (us)	
			Min.	Typ.	Max.	Typ.	
BPT-HP033	500-1000	940	0.67	1.50	100	15/15	120°
BPT-HP133	500-1000	940	2.00	3.00	100	15/15	
BPT-HP233	500-1000	940	2.00	4.00	100	15/15	
BPT-HP833	500-1000	940	2.00	5.00	100	15/15	

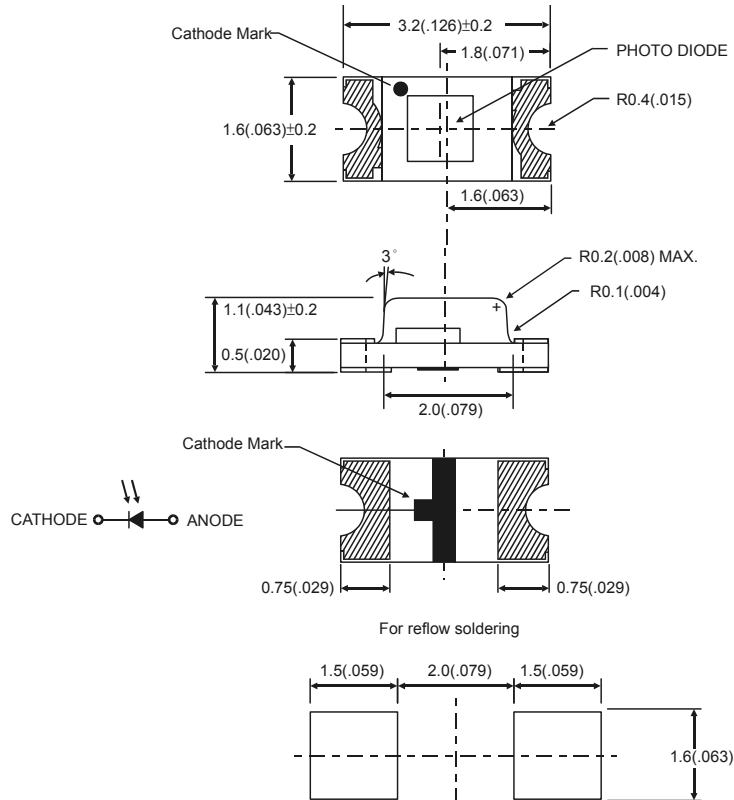
SURFACE MOUNT PHOTO DIODES



Absolute Maximum Ratings (Ta=25°C)

	UNIT	SPEC.
Topr	°C	-40~+85
Tstg	°C	-40~+85

BPD-HQx33 (1206) Series



NOTE:

- 1.All dimensions are in millimeters(inches).
- 2.Tolerance is ±0.10(.004") unless otherwise specified.
- 3.Specifications are subject to change without not notices.

Part No.	Open Circuit Voltage	Short Circuit Current	Reverse Dark Current	Reverse Light Current	Reverse Break Down Voltage	Rise/Fall Time	Peak Wave Length	Viewing Angle 2 θ 1/2 (deg)
	Voc H=5.0mw/cm ² Typ. (mV)	ISC H=5.0mw/cm ² Typ. (uA)	ID(R) VR=10V H=0mw/cm ² Max. (nA)	IL VR=5.0V H=5.0mw/cm ² Typ. (uA)	VBR IR=100uA H=0mw/cm ² Min. (V)	TR/TF VR=10V RL=1KΩ (ns)	λp (nm)	
BPD-HQA33	450	2.0	10	2.0	30	6/6	940	120°
BPD-HQB33	550	7.0	10	5.0	30	10/10	940	

LAMP WITH HOLDER ASSEMBLY

Package (mm)	Part No.	Chip			Lens Appearance	Electro-optical Data (At 10mA)			Viewing Angle 2 θ 1/2 (deg)	Drawing No.
		Material	Emitted Color	λ_p (nm)		V _f (V)		IV(mcd)		
						Typ.	Max.	Typ.		
3 ϕ 4.5x6.0x6.0	BL-31G-1	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-076
	BL-31Y-1	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	15.0	35	
	BL-31P-1	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	7.0	35	
3 ϕ 4.5x6.0x9.3	BL-32G-1	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-077
	BL-32Y-1	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	15.0	35	
	BL-32P-1	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	7.0	35	
3 ϕ 4.6x7.4 x6.5	BL-33G-1	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-078
	BL-33Y-1	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	15.0	35	
	BL-33P-1	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	7.0	35	
3 ϕ 4.5x5.08x6.0	BL-35G-1	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-079
	BL-35Y-1	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	15.0	35	
	BL-35P-1	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	7.0	35	
3 ϕ 4.5x8.84x6.0	BL-3D(G)-1	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-080
	BL-3D(Y)-1	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	15.0	35	
	BL-3D(P)-1	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	7.0	35	
3 ϕ 4.6x8.6x4.8	BL-3I(G)-1	GaP/GaP	Green	568	Green Diffused	2.1	2.5	30.0	45	L-081
	BL-3I(Y)-1	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	20.0	45	
	BL-3I(R)-1	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	3.0	45	
3 ϕ 7.2x6.0x9.3	BL-34YG-1	GaAsP/GaP	Yellow	585	White Diffused	2.0	2.5	15.0	40	L-082
		GaP/GaP	Green	568		2.1	2.5	18.0		
	BL-34EG-1	GaAsP/GaP	Hi-Eff Red	635		1.9	2.5	18.0		
		GaP/GaP	Green	568		2.1	2.5	18.0		
3 ϕ 7.0x7.3x6.35	BL-44(YGW)-1	GaAsP/GaP	Yellow	585	White Diffused	2.0	2.5	15.0	40	L-083
		GaP/GaP	Green	568		2.1	2.5	18.0		
	BL-44(EGW)-1	GaAsP/GaP	Hi-Eff Red	635		1.9	2.5	18.0		
		GaP/GaP	Green	568		2.1	2.5	18.0		

LAMP WITH HOLDER ASSEMBLY

L-076 BL-31x-1	L-077 BL-32x-1
L-078 BL-33x-1	L-079 BL-35x-1
L-080 BL-3D(x)-1	L-081 BL-3I(x)-1
L-082 BL-34xx-1 CENTER LEADS COMMON CATHODE	L-083 BL-44(XXX)-1 CENTER LEADS COMMON CATHODE

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

LAMP WITH HOLDER ASSEMBLY

Package (mm)	Part No.	Chip			Lens Appearance	Electro-optical Data (At 10mA)			Viewing Angle 2 θ 1/2 (deg)	Drawing No.
		Material	Emitted Color	λp (nm)		V _f (V)		IV(mcd)		
						Typ.	Max.	Typ.		
5 ϕ 6.1x6.1x9.15	BL-66G-1	GaP/GaP	Green	568	Green Diffused	2.1	2.5	40.0	40	L-084
	BL-66Y-1	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	30.0	40	
	BL-66R-1	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	8.0	40	
4.8 ϕ 6.05x6.05x9.15	BL-66G-1L	GaP/GaP	Green	568	Green Diffused	2.1	2.5	35.0	40	L-085
	BL-66Y-1L	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	30.0	40	
	BL-66R-1L	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	8.0	40	
5 ϕ 7.6x7.6 x9.5	BL-61YGW-1	GaAsP/GaP	Yellow	585	White Diffused	2.0	2.5	20.0	50	L-086
		GaP/GaP	Green	568		2.1	2.5	25.0		
	BL-61EGW-1	GaAsP/GaP	Hi-Eff Red	635		1.9	2.5	25.0		
		GaP/GaP	Green	568		2.1	2.5	25.0		
5 ϕ 7.22x7.22x8.5	BL-69YGW-1	GaAsP/GaP	Yellow	585		2.0	2.5	20.0	50	L-087
		GaP/GaP	Green	568		2.1	2.5	25.0		
	BL-69EGW-1	GaAsP/GaP	Hi-Eff Red	635		1.9	2.5	25.0		
		GaP/GaP	Green	568		2.1	2.5	25.0		
3 ϕ 4.3x9.6x8.2	BL-31GG-2	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-088
	BL-31YY-2	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	15.0		
	BL-31RR-2	GaP/GaP	Brigh t Red	700	Red Diffused	2.1	2.5	7.0		
3 ϕ 4.6x10.0x10.0	BL-33GG-2	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-089
	BL-33YY-2	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	15.0	35	
	BL-33RR-2	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	7.0	35	
3 ϕ 4.3x9.65x9.02	BL-39GG-2	GaP/GaP	Green	568	Green Diffused	2.1	2.5	30.0	45	L-090
	BL-39YY-2	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	20.0	45	
	BL-39RR-2	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	3.0	45	
4.8 ϕ 6.3x12.5x10.85	BL-66GG-2	GaP/GaP	Green	568	Green Diffused	2.1	2.5	35.0	40	L-091
	BL-66YY-2	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	30.0	40	
	BL-66RR-2	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	8.0	40	

LAMP WITH HOLDER ASSEMBLY

L-084 BL-66xx-1	L-85 BL-66xx-1L
L-086 BL-61xxx-1 CENTER LEADS COMMON CATHODE	L-087 BL-69xxx-1 CENTER LEADS COMMON CATHODE
L-088 BL-31xx-2	L-089 BL-33xx-2
L-090 BL-39xx-2	L-091 BL-66xx-2

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

LAMP WITH HOLDER ASSEMBLY

Package (mm)	Part No.	Chip			Lens Appearance	Electro-optical Data (At 10mA)			Viewing Angle 2 θ 1/2 (deg)	Drawing No.
		Material	Emitted Color	λp (nm)		V _f (V)		IV(mcd)		
						Typ.	Max.	Typ.		
3 ϕ 4.3×15.3×11.5	BL-51GGG-3	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-092
	BL-51YYY-3	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	15.0	35	
	BL-51RRR-3	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	7.0	35	
3 ϕ 15×4.6×5.8	BL-13GGG-3	GaP/GaP	Green	568	Green Diffused	2.1	2.5	30.0	45	L-093
3 ϕ 16.9×4.5×11.5	BL-38GGG-3	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-094
4.8 ϕ 19.1×6.2×9.2	BL-66GGG-3	GaP/GaP	Green	568	Green Diffused	2.1	2.5	40.0	40	L-095
	BL-66YYY-3	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	35.0	40	
	BL-66RRR-3	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	12.0	40	
3 ϕ 4.4×20.3×10.7	BL-34GGGG-4-1	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-096
	BL-34YYYY-4-1	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	15.0	35	
	BL-34RRRR-4-1	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	7.0	35	
5 ϕ 25.7×6.2×9.2	BL-66GGGG-4	GaP/GaP	Green	568	Green Diffused	2.1	2.5	35.0	40	L-097
	BL-66YYYY-4	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	30.0	40	
	BL-66RRRR-4	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	8.0	40	
3 ϕ 5.0×25.8×16.7	BL-35GGGGG-5	GaP/GaP	Green	568	Green Diffused	2.1	2.5	30.0	45	L-098
	BL-35YYYYY-5	GaAsP/GaP	Yellow	585	Yellow Diffused	2.0	2.5	20.0	45	
	BL-35RRRRR-5	GaP/GaP	Bright Red	700	Red Diffused	2.1	2.5	3.0	45	
3 ϕ 38.8×5.0×19.0	BL-3N05-5G	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-099

LAMP WITH HOLDER ASSEMBLY

L-092 BL-51xxx-3	L-93 BL-13xxx-3
L-094 BL-38xxx-3	L-095 BL-66xxx-3
L-096 BL-34xxxx-4-1	L-097 BL-66xxxx-4
L-098 BL-35xxxxx-5	L-099 BL-3N05-5x

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

LAMP WITH HOLDER ASSEMBLY

Package (mm)	Part No.	Chip			Lens Appearance	Electro-optical Data (At 10mA)			Viewing Angle 2 θ 1/2 (deg)	Drawing No.
		Material	Emitted Color	λ p (nm)		V_f (V)		IV(mcd)		
						Typ.	Max.	Typ.		
3 ϕ 19.3×9.5×8.15	BL-4208-2(GG)X4	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-100
3 ϕ 19.3×19.5×12.12	BL-4416-I(GGGG)X4	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-101
3 ϕ 27.2×3.2×11.6	BL-3D05G-11.6	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-102
3 ϕ 42.2×3.2×10.7	BL-3D08G-10.7	GaP/GaP	Green	568	Green Diffused	2.1	2.5	25.0	35	L-103
98.2×5.0×12.75	BL-2512-12G	GaP/GaP	Green	568	Green Diffused	2.1	2.5	2.5	125	L-104
74.4×5.0×12.85	BL-2512S-12G	GaP/GaP	Green	568	Green Diffused	2.1	2.5	2.5	125	L-105

L-100 BL-4208-2(xx)×4	L-101 BL-4416-I(xxxx)×4
L-102 BL-3D05x-11.6	L-103 BL-3D08x-10.7
L-104 BL-2512-12x	L-105 BL-2512S-12x

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

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GENERAL INFORMATION

HOW TO USE INVISIBLE PRODUCTS

● SOLDERING

1. Soldering Bath-- $260 \pm 5^{\circ}\text{C}$ Within 5 seconds. (Dip depth should under 1/16 inch below seating plane)
2. Soldering Iron Under 40W within 3 seconds. (Tip temperature: $380 \pm 5^{\circ}\text{C}$)
3. The neutrality flux be used before soldering.

● CLEANING

1. Do not use unspecified chemical liquid to clean invisible product. They could harm the invisible product. If cleaning is necessary, wipe the pin out with alcohol, Freon TE or Chlorosen at normal temperature for less Than 1 minute, or wipe the surface with alcohol. When other chemical solutions not specified is used. It may cause crack or haze on the surface of the Invisible product.

● PREVENTING OVER CURRENT

1. Be not overcurrent.
2. In order to cooperate INVISIBLE PRODUCTS under stable conditions. Put protective resistors in series. Resistor values can be determined by supplying voltage or current is in the invisible product. Recommended current is in the range of forward current 50mA.
3. Circuit must be designed so that over voltage (over current) is not applied to the invisible product during on/off switching. Transient or pulse current will damage the junction of invisible product die.

● BRIGHTNESS

1. For obtaining even brightness. Each segment should be at the same current, so the best circuit design is to supply constant current for each segment.
2. To increase brightness. Increase current. But do not over maximum rating.
3. To check the appearance defect of invisible product, the viewing distance should be 15cm minimum
4. For obtaining more uniform brightness on SIDE LOOK and INTERRUPTER. The supplying forward current should be over 20mA, but do not be over rating.

QUALITY CONTROL AND ASSURANCE

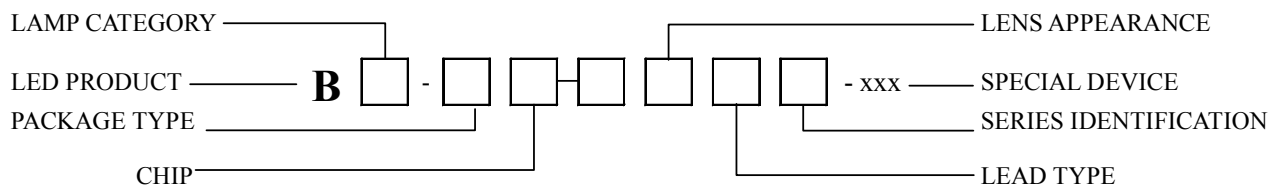
● RELIABILITY TESTS

CLASSIFICATION	TEST ITEM	DESCRIPTION AND TEST CONDITION	REFERENCE STANDARD
ENDURANCE TEST	OPERATION LIFE	Ta: $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Sidelook: IR: IF=20mA; Endlook: IR: IF=50mA; Vce=5V Time: 1000hrs	MIL-STD-883E:1016
	HIGH TEMPERATURE HIGH HUMIDITY STORAGE	Ta: $65^{\circ}\text{C} \pm 5^{\circ}\text{C}$ RH: 90%~95% Time: 240hrs	MIL-STD-883E:1004.7 MIL-STD-202F:103B
	HIGH TEMPERATURE STORAGE	Ta: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 240hrs	MIL-STD-883E:1008.2
	LOW TEMPERATURE STORAGE	Ta: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 240s $\pm$ 2hrs	JIS-C-7021:B-12
ENVIRONMENTAL TEST	TEMPERATURE CYCLING	Ta: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (30min)~ $25 \pm 5^{\circ}\text{C}$ (5min) ~ $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (30min)~ $25 \pm 5^{\circ}\text{C}$ (5min) 10cycle	MIL-STD-883E:1010.7
	THERMAL SHOCK	Ta: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (10min)~ $125 \pm 5^{\circ}\text{C}$ (10min) 15cycle	MIL-STD-883E:1011.9 MIL-STD-202F:107G
	SOLDER RESISTANCE	To evaluate resistance of thermal stress caused by soldering Ta: $260 \pm 5^{\circ}\text{C}$ Time: $10 \pm 2\text{sec}$	MIL-STD-202F:210B
	SOLDERABILITY	To evaluate solder ability on leads of device Ta: $245 \pm 5^{\circ}\text{C}$ Time: $5 \pm 0.5\text{sec}$	MIL-STD-883E:2003.7 MIL-STD-202F:208F1

INFRARED SERIES

PART NO. SYSTEM

- INFRARED EMITTING DIODE
- PHOTOTRANSISTORS
- PHOTODIODE



LAMP CATEGORY:

IR : Infrared Emitting Diode
PT : Phototransistors
PD : Photodiodes

CHIP:

M1 : GaAIAs/GaAs 940nm
M2 : GaAIAs/GaAs 940nm
N0 : GaAIAs/GaAIAs 880nm
O0 : GaAIAs/GaAIAs 850nm
O1 : GaAIAs/GaAIAs 850nm
Q0 : silicon photodiode
QA : silicon photodiode
QB : silicon photodiode
QD : silicon photodiode

P0 : silicon phototransistor
P1 : silicon phototransistor
P2 : silicon phototransistor
P4 : silicon phototransistor
P6 : silicon phototransistor
P7 : silicon phototransistor

SPECIAL DEVICE

-1 : Wider Viewing Angle
-S : Leads With Stand Off (Stopper)

PACKAGE TYPE:

B : Round
C : Cylindrical
R : Rectangular
N : Side Look

LEADS TYPE:

1 : 0.8" Long Stand-Off Type
2 : 0.5" Long, Non-Reflective Type
4 : 1.0" Long, Reflective Type
C : For Side Viewing Leads Type
D : For Photodiodes Leads Type
P : For Phototransistor Twin Chips Leads Type
M : 1.0" Long, Reflective Type
N : 1.0" Long, Reflective Type
R : 1.0" Long, Reflective Type

LENS APPEARANCE:

3 : Water Clear
7 : Blue Transparent
8 : Light Blue Transparent
9 : Black (cut off 750nm)
A : Black (cut off 820nm)

INFRARED EMITTING DIODE--END LOOK

Package	Part No.	Chip		Lens Color	V _F (V)@I _F =50mA		Ee(mW/sr) @I _F =50mA		Viewing Angle 2θ 1/2	Drawing No.
		Material	Wavelength λp		Typ	Max	Min	Typ		
3 ϕ	BIR-BM1341	GaAlAs/GaAs	940	Water clear	1.25	1.50	13.81	33.00	30	L-106
	BIR-BM1341-A	GaAlAs/GaAs	940		1.25	1.50	13.81	33.00		
	BIR-BO1341	GaAlAs/GaAlAs	850		1.50	1.80	16.50	53.00		
	BIR-BO0341	GaAlAs/GaAlAs	850		1.50	1.80	16.50	45.00		
	BIR-BM1741	GaAlAs/GaAs	940	Blue Transparent	1.25	1.50	9.90	33.00	35	
	BIR-BM1741-A	GaAlAs/GaAs	940		1.25	1.50	9.90	33.00		
	BIR-BO0741	GaAlAs/GaAlAs	850		1.50	1.80	16.50	65.50	30	
	BIR-BO1741	GaAlAs/GaAlAs	850		1.50	1.80	16.50	65.50		
	BIR-BM1341J	GaAlAs/GaAs	940	Water clear	1.25	1.50	6.00	18.00	50	L-107
	BIR-BO0341J	GaAlAs/GaAlAs	850		1.50	1.80	16.50	65.50	35	
	BIR-BO1341J	GaAlAs/GaAlAs	850		1.50	1.80	16.50	35.00		
	BIR-BM1341Q	GaAlAs/GaAs	940	Water clear	1.25	1.50	11.78	33.40	35	L-108
	BIR-BO0341Q	GaAlAs/GaAlAs	940		1.50	1.80	16.5	65.00		
	BIR-BO1341Q	GaAlAs/GaAlAs	850		1.50	1.80	16.50	65.00		
5 ϕ	BIR-BM13J4G	GaAlAs/GaAs	940	Water Clear	1.25	1.50	16.50	55.00	20	L-109
	BIR-BO13J4G	GaAlAs/GaAlAs	850		1.50	1.80	32.36	128.00		
	BIR-BO03J4G	GaAlAs/GaAlAs	850		1.50	1.80	27.20	89.00		
	BIR-BM17J4G	GaAlAs/GaAs	940	Blue Transparent	1.25	1.50	16.50	55.00	20	
	BIR-BO17J4G	GaAlAs/GaAlAs	850		1.50	1.80	27.20	128.50		
	BIR-BO07J4G	GaAlAs/GaAlAs	850		1.50	1.80	27.20	128.50		
	BIR-BM13J4G-1	GaAlAs/GaAs	940	Water Clear	1.25	1.50	11.78	45.31	25	
	BIR-BO03J4G-1	GaAlAs/GaAlAs	850		1.50	1.80	32.36	91.79		
	BIR-BO13J4G-1	GaAlAs/GaAlAs	850		1.50	1.80	32.36	91.79		
	BIR-BM13E4G-1	GaAlAs/GaAs	940	Water Clear	1.25	1.50	11.78	30.00	30	L-110
	BIR-BO03E4G-1	GaAlAs/GaAlAs	850		1.50	1.80	16.50	50.00		
	BIR-BO13E4G-1	GaAlAs/GaAlAs	850		1.50	1.80	23.20	60.00		
	BIR-BM13E4G-2	GaAlAs/GaAs	940	Water Clear	1.25	1.50	11.78	30.00	40	
	BIR-BO03E4G-2	GaAlAs/GaAlAs	850		1.50	1.80	16.50	65.00		
	BIR-BO13E4G-2	GaAlAs/GaAlAs	850		1.50	1.80	16.50	48.00		
	BIR-BM18E4G-2	GaAlAs/GaAs	940	Blue Transparent	1.25	1.50	11.78	30.00	40	
	BIR-BO08E4G-2	GaAlAs/GaAlAs	850		1.50	1.80	23.12	65.50		
	BIR-BO18E4G-2	GaAlAs/GaAlAs	850		1.50	1.80	19.42	55.40		
	BIR-BM13V4V-2	GaAlAs/GaAs	940	Water Clear	1.25	1.50	6.00	17.00	60	L-111
	BIR-BO03V4V-2	GaAlAs/GaAlAs	850		1.50	1.80	11.78	32.00	50	
	BIR-BO13V4V-2	GaAlAs/GaAlAs	850		1.50	1.80	11.78	30.00	60	

INFRARED EMITTING DIODE--END LOOK

L-106 BIR-Bxxxx1 Side view dimensions: 0.81 (.032), 1.5 (.059) MAX, 3.0 (.118), 5.3 (.208), 23.4 (.921) MIN, 1.0 (.040) MIN, 2.54 (.100) NOM, 0.5 (.020) SQ. TYP, Cathode. End view dimensions: 3.8 (.150), Anode, cathode.	L-107 BIR-Bxxxx1J Side view dimensions: 3.0 (.118), 5.10 (.201), 1.5 (.059) MAX, 0.5 (.020) SQ. TYP, 23.4 (.921) MIN, 1.0 (0.4) MIN, 2.54 (.100) NOM, Cathode. End view dimensions: 3.00 (.118), Anode, cathode.
L-108 BIR-Bxxxx1Q Side view dimensions: 3.10 (.122), 1.30 (.051), 1.5 (.059) MAX, 25.4 (1.00) MIN, 2.54 (.100) NOM, 1.00 (.040) MIN, Cathode. End view dimensions: 3.60 (.142), 3.80 (1.50), Anode, Cathode.	L-109 BIR-BxxxJ4G(-x) Side view dimensions: 5.0 (.197), 1.0 (.040), 1.5 (.059) MAX, 0.5 (.020) SQ. TYP, 23.4 (.921) MIN, 1.0 (.040) MIN, 2.54 (.100) NOM, Cathode. End view dimensions: 5.9 (.232), Anode, Cathode.
L-110 BIR-BxxxE4G-x Side view dimensions: 5.0 (.197), 1.0 (.040), 1.5 (.059) MAX, 23.4 (.921) MIN, 1.0 (.040) MIN, 2.54 (.100) NOM, 0.5 (.020) SQ. TYP, Cathode. End view dimensions: 5.9 (.232), Anode, Cathode.	L-111 BIR-Bxxxx4V-2 Side view dimensions: 7.7 (.303), 1.0 (.040), 23.4 (.921) MIN, 1.0 (.040) MIN, 2.54 (.100) NOM, 0.5 (0.197) SQ TYP, Cathode. End view dimensions: 4.98 (1.96), 5 (.197), 5.9 (232), Cathode, Anode.

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

INFRARED EMITTING DIODE--END & SIDE LOOK

Package	Part No.	Chip		Lens Color	V _F (V)@I _F =50mA		E _e (mW/sr) @I _F =50mA		Viewing Angle 2θ 1/2	Drawing No.
		Material	Wavelength λ _p		Typ	Max	Min	Typ		
5 φ	BIR-BM18V4V-2	GaAlAs/GaAs	940	Blue Transparent	1.25	1.50	4.29	15.00	20	L-112
	BIR-BO08V4V-2	GaAlAs/GaAlAs	850		1.50	1.80	16.50	46.83	60	
	BIR-BO18V4V-2	GaAlAs/GaAlAs	850		1.50	1.80	16.50	46.83		
	BIR-BM13K4Q	GaAlAs/GaAs	940	Water clear	1.25	1.50	4.29	12.00	45	L-113
	BIR-BO13K4Q-2	GaAlAs/GaAlAs	850		1.50	1.80	16.50	46.80		
	BIR-BO13K4Q	GaAlAs/GaAlAs	850		1.50	1.80	11.78	35.00	50	
	BIR-BM13J7M	GaAlAs/GaAs	940	Water clear	1.25	1.50	16.50	46.00	15	L-114
	BIR-BO03J7M	GaAlAs/GaAlAs	850		1.50	1.80	23.12	100.00		
	BIR-BO13J7M	GaAlAs/GaAlAs	850		1.50	1.80	27.20	128.00		
3 φ Flux	BIR-FO13F1	GaAlAs/GaAlAs	850	Water clear	1.50	1.80	6.00	12.18	80	L-115
	BIR-FO13F2	GaAlAs/GaAlAs	850	Water clear	1.50	1.80	8.41	17.06	60	L-116

Package	Part No.	Chip		Lens Color	V _F (V)@I _F =50mA		E _e (mW/sr) @I _F =100mA		Viewing Angle 2θ 1/2	Drawing No.
		Material	Wavelength λ _p		Typ	Max	Min	Typ		
8 φ	BIR-B2O13K9	GaAlAs/GaAlAs	850	Water clear	1.50	1.80	32.36	128.50	25	L-117

Package	Part No.	Chip		Lens Color	V _F (V)@I _F =50mA		E _e (mW/sr) @I _F =200mA		Viewing Angle 2θ 1/2	Drawing No.
		Material	Wavelength λ _p		Typ	Max	Min	Typ		
5 φ Flux	BIR-FO53F3	GaAlAs/GaAlAs	850	Water clear	1.50	1.70	16.50	65.50	60	L-118

SIDE LOOK INFRARED EMITING DIODE

Package	Part No.	Chip		Lens Color	V _F (V)@I _F =20mA		E _e (mW/cm ²) @I _F =4mA		Viewing Angle 2θ 1/2	Drawing No.
		Material	Wavelength λ _p		Typ	Max	Min	Typ		
1.5×4.5×5.7 mm	BIR-NM13C1	GaAlAs/GaAs	940	Water Clear	1.20	1.50	0.40	0.65	45	L-119
	BIR-NM23C1	GaAlAs/GaAs	940		1.20	1.50	0.40	0.60		

INFRARED EMITTING DIODE--END & SIDE LOOK

L-112 BIR-Bxxxx4V-2	L-113 BIR-Bxxxx4Q
L-114 BIR-Bxxxx7M	L-115 BIR-FO13F1
L-116 BIR-FO13F2	L-117 BIR-B2O13K9
L-118 BIR-FO53F3	L-119 BIR-NMxxC1

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

PHOTOTRANSISTORS--END & SIDE LOOK

Package	Part No.	Chip		Lens Color	Electrical & Optical Characteristics				Viewing Angle 2θ 1/2	Drawing No.
		Material	Wavelength λp(nm)		Light Current I _{c(on)} (mA) @V _{CE} =5V E _e =1.0mW/cm ²	Saturation Voltage V _{CE(Sat)} (V) @I _c =0.1mA E _e =1.0mW/cm ²	Breakdown Voltage V _{BR(CEO)} (V) @I _c =0.1mA E _e =0mW/cm ²	Dark Current I _D (nA) @V _{CE} =10V E _e =0mW/cm ²		
					Typ	Max	Min	Max		
3 ϕ	BPT-BP0341	Si-Phototransistor (NPN)	940(400-1100)	Water clear	4.50	0.50	30	100	30	L-120
	BPT-BP1341		940(400-1100)		12.50	0.50	30	100		
	BPT-BP2341		940(400-1100)		15.00	0.50	30	100		
	BPT-BP0941	Si-Phototransistor (NPN)	940(750-1100)	Black	3.50	0.50	30	100	30	
	BPT-BP1941		940(750-1100)		10.50	0.50	30	100		
	BPT-BP2941		940(750-1100)		12.50	0.50	30	100		
	BPT- BP0A41	Si-Phototransistor (NPN)	940(820-1100)	Black	3.50	0.50	30	100	30	
	BPT-BP1A41		940(820-1100)		10.50	0.50	30	100		
	BPT-BP2A41		940(820-1100)		12.50	0.50	30	100		
BPT-BP7341K	Si-Phototransistor (NPN)	940(400-1100)	Water clear	12.00	0.50	30	100	35	L-121	
5 ϕ	BPT-BP0334	Si-Phototransistor (NPN)	940(400-1100)	Water clear	5.50	0.50	30	100	35	L-122
	BPT-BP1334		940(400-1100)		16.00	0.50	30	100		
	BPT-BP2334		940(400-1100)		19.00	0.50	30	100		
	BPT-BP0934	Si-Phototransistor (NPN)	940(750-1100)	Black	4.70	0.50	30	100	35	
	BPT- BP1934		940(750-1100)		13.50	0.50	30	100		
	BPT-BP2934		940(750-1100)		16.00	0.50	30	100		
	BPT-BP0A34	Si-Phototransistor (NPN)	940(820-1100)	Black	4.70	0.50	30	100	35	
	BPT-BP1A34		940(820-1100)		13.50	0.50	30	100		
	BPT-BP2A34		940(820-1100)		16.00	0.50	30	100		
	BPT-BP0314	Si-Phototransistor (NPN)	940(400-1100)	Water Clear	5.50	0.50	30	100	35	L-123
	BPT-BP1314		940(400-1100)		16.00	0.50	30	100		
	BPT-BP2314		940(400-1100)		19.00	0.50	30	100		
SIDE LOOK PHOTOTRANSISTOR										
2.4×4.9×5.0 mm	BPT-RP4APK	Si-Phototransistor (NPN)	940(820-1100)	Black	0.40	0.50	30	100	-	L-124
	BPT-RP4APK		940(820-1100)		0.40	0.50	30	100		
	BPT-RP4APK-H	Si-Phototransistor (NPN)	940(820-1100)	Black	0.40	0.50	30	100	-	L-125
1.5×4.5×5.7 mm	BPT-NP03C1	Si-Phototransistor (NPN)	940(400-1100)	Water Clear	3.50	0.50	30	100	-	L-126
	BPT-NP13C1		940(400-1100)		10.00	0.50	30	100		
	BPT-NP23C1		940(400-1100)		12.00	0.50	30	100		
2.5×4.6×4.5 mm	BPT-NP03C2	Si-Phototransistor (NPN)	940(400-1100)	Water Clear	4.00	0.50	30	100	-	L-127
	BPT-NP13C2		940(400-1100)		11.00	0.50	30	100		
	BPT-NP23C2		940(400-1100)		13.00	0.50	30	100		

PHOTOTRANSISTORS--END & SIDE LOOK

L-120 BPT-BPxx41	L-121 BPT-BPxx41K
L-122 BPT-BPxx34	L-123 BPT-BPxx14
L-124 BPT-RP4APK ① Emitter (PTR A) 0.61 (.020) 1.27±0.01 (.050) ② Collector (COM) 0.61±0.01 (.02) ③ Emitter (PTR B)	L-125 BPT-RP4APK-H ① Emitter (PTR A) ② Collector (COM) ③ Emitter (PTR B)
L-126 BPT-NPxxC1 ① Emitter ② Collector	L-127 BPT-NPxxC2 ① Emitter ② Collector

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

PHOTODIODE--END & SIDE LOOK

Package	Part No.	Chip		Lens Color	Electrical & Optical Characteristics				Viewing Angle 2θ 1/2	Drawing No.
		Material	Wavelength λp(nm)		Light Current I _L (uA) @V _R =5V Ee=1mW/cm ²	Open Circuit Voltage Voc(mV)@ Ee=1mW/cm ²	Reverse Breakdown Voltage V _{BR} (V) @I _R =0.1mA Ee=0mW/cm ²	Reverse Dark Current I _D (nA) @V _R =10V Ee=0mW/cm ²		
					Typ	Max	Min	Max		
3 ϕ	BPD-BQA341	Si-Photodiode	940(400-1100)	Water clear	25	400	30	30	30	L-128
	BPD-BQB341	(PIN)	940(400-1100)		38	400	30	30		
5 ϕ	BPD-BQA334	Si-Photodiode (PIN)	940(400-1100)	Water clear	35	400	30	30	35	L-129
	BPD-BQB334		940(400-1100)		50	400	30	30		
	BPD-BQD334		940(400-1100)		80	400	30	30		
	BPD-BQA934	Si-Photodiode (PIN)	940(750-1100)	Black	30	400	30	30	35	
	BPD-BQB934		940(750-1100)		42	400	30	30		
	BPD-BQD934		940(750-1100)		70	400	30	30		
	BPD-BQAA34	Si-Photodiode (PIN)	940(820-1100)	Black	30	400	30	30	35	
	BPD-BQBA34		940(820-1100)		42	400	30	30		
	BPD-BQDA34		940(820-1100)		70	400	30	30		
SIDE LOOK PHOTODIODE										
3.8×5.0×6.5 mm	BPD-RQ03DY-A	Si-Photodiode (PIN)	940(400-1100)	Water clear	215	350	30	30	140	L-130
	BPD-RQ0ADY-A	Si-Photodiode	940(820-1100)	Black	180	350	30	30	140	L-131
	BPD-RQ09DY-A	(PIN)	940(750-1100)		180	350	30	30		
3.0×5.1×7.4 mm	BPD-RQ03DV-1	Si-Photodiode (PIN)	940(400-1100)	Water clear	150	350	30	30	140	L-132
	BPD-RQ09DV-1	Si-Photodiode	940(750-1100)	Black	125	350	30	30	140	L-133
	BPD-RQ0ADV-1	(PIN)	940(820-1100)		125	350	30	30	140	

PHOTODIODE--END & SIDE LOOK

L-128 BPD-Bxxx41	L-129 BPD-Bxxx34
L-130 BPD-RQ03DY-A	L-131 BPD-RQxxDY-A
L-132 BPD-RQ03DV-1	L-133 BPD-RQxxDV-1

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

PHOTO INTERRUPTERS-REFLECTIVE TYPE

PART NO. SYSTEM

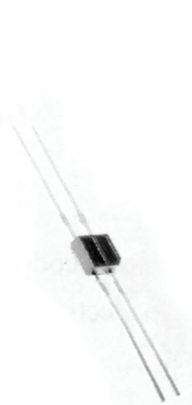
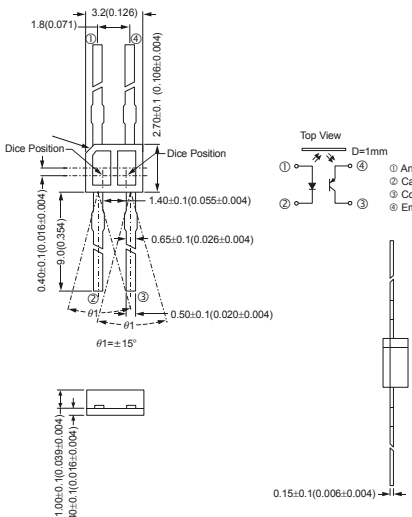
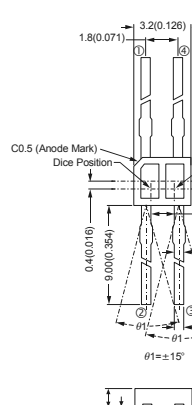
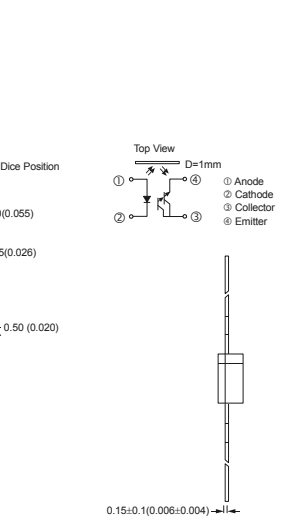
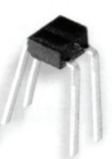
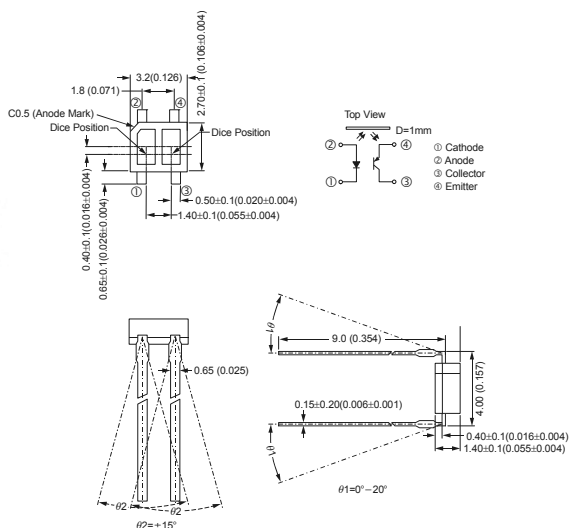
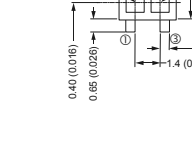
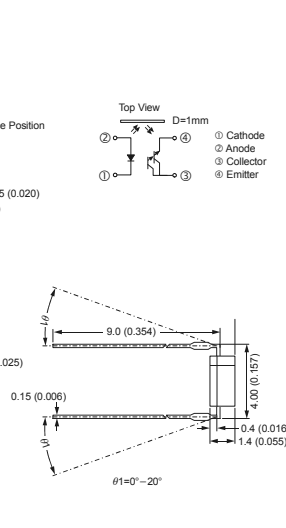
Bright Photo Interrupt reflect style **B P R** **1** **0 5** Lead forming type

Light Source No code for no forming

Miniature F=forming once like style F

S=forming twice like style S

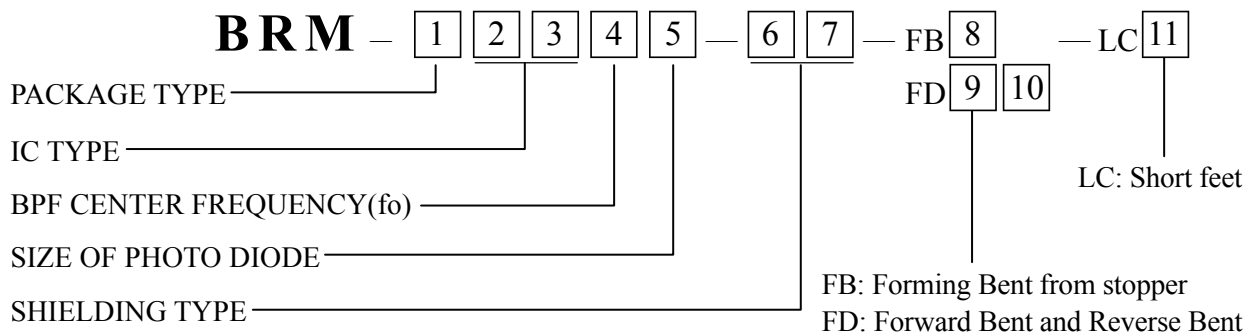
Part No.	Package (mm[Inch])	V _F @I _F =20mA	I _R @V _R =5V	I _D @V _{CE} =10V	V _{CE(sat)} @I _C =0.25mA I _F =20mA	I _L @V _{CE} =5V I _F =10mA D=1mm	Tr/Tf @I _{FP} =20mA V _{CE} =5V R _L =1K	Drawing NO.
BPR-105		Max. 1.5V	Max. 100uA	Max. 200nA	Max. 0.4V	Min. 80uA	Typ. 20/20	L-134
BPR-105F		Max. 1.5V	Max. 100uA	Max. 200nA	Max. 0.4V	Min. 80uA	Typ. 20/20	L-135
BPR-205		Max. 1.5V	Max. 100uA	Max. 1uA	I _c =0.9mA I _f =5.0mA Max:1.0V	Min. 160uA	Typ. 20/20	L-136
BPR-205F		Max. 1.5V	Max. 100uA	Max. 1uA	I _c =0.9mA I _f =5.0mA Max:1.0V	Min. 160uA	Typ. 20/20	L-137

L-134	BPR-105	L-136	BPR-205
 		 	
L-135	BPR-105F	L-137	BPR-205F
 		 	

Notes: 1. Tolerance is $\pm 0.25\text{mm}$ (.010")

RECEIVER MODULE SERIES

PART NO. SYSTEM



PACKAGE TYPE

- 1 : Molding Type
- 2 : Inside Shielding Molding Type
- 4 : Encap Type
- 5 : Large Encap Type
- 6 : Inside Shielding Encap Type
- 9 : Large Encap Type

IC TYPE

BPF CENTER FREQUENCY (f_o):

- 3 : $F_o = 33$ KHz
- 6 : $F_o = 36$ KHz
- 8 : $F_o = 38$ KHz
- 0 : $F_o = 40$ KHz
- H : $F_o = 56$ KHz

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SHIELDING TYPE

- 11-20 : Shielding for 1000 Series
- 41-45 : Shielding for 4000 Series
- 51 : Shielding for 5000 Series

FBxx: Forming Bent from stopper

FDxxxx: Forward Bent and Reverse Bent

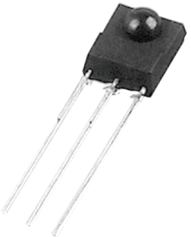
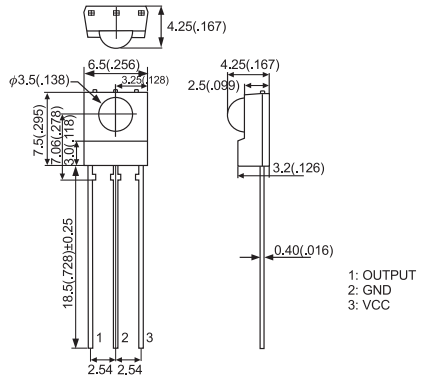
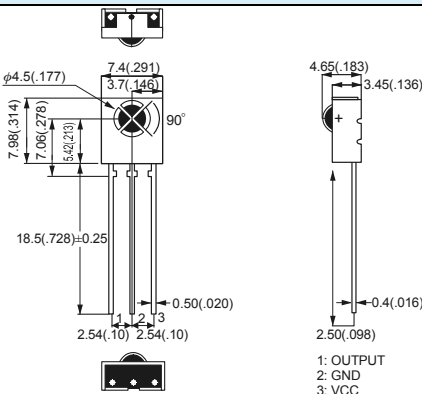
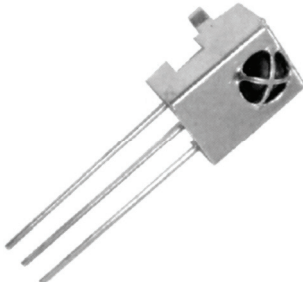
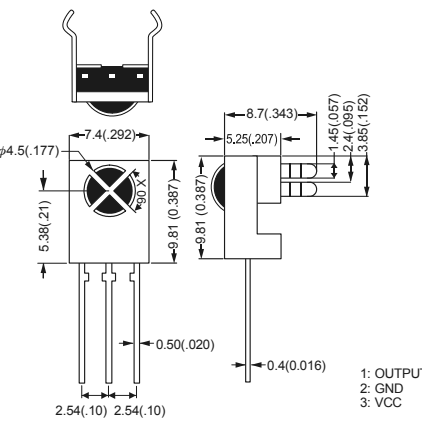
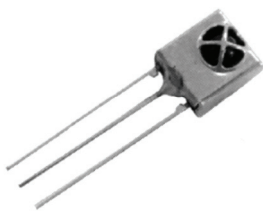
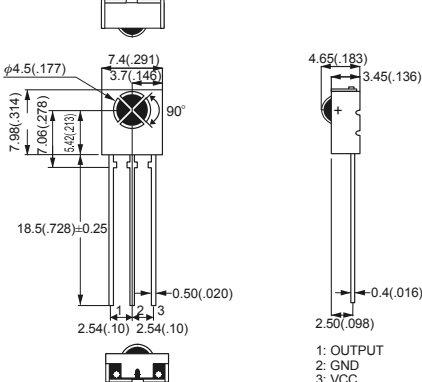
LCxx: Short Feet

NOTES : Fllow dimensions of FB, FD and LC could be changed by castomors requiement

RECEIVER MODULE

Part No.	B.P.F	Supply Voltage (V)		Supply Current Max(mA)	Receiving Distance Min (m)	Receiving Wavelength (nm)	Angle (θ)	Drawing No.
	Center Frequency (KHz)	Min.	Max.					
BRM-15B6	36.0	2.7	5.0	1.5	12	940	±45	L-138
BRM-15B8	38.0	2.4	5.0	1.5	12	940	±45	
BRM-15B0	40.0	4.5	5.0	1.5	12	940	±45	
BRM-15BH	56.0	4.5	5.0	1.5	12	940	±45	
BRM-13A8	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1458	38.0	2.7	5.0	1.2	12	940	±45	
BRM-1A18	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1538	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15S8	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1528	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15B6-11	36.0	2.7	5.0	1.5	12	940	±45	L-139
BRM-15B8-11	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15B0-11	40.0	2.7	5.0	1.5	12	940	±45	
BRM-15BH-11	56.0	2.7	5.0	1.5	12	940	±45	
BRM-13A8-11	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1458-11	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1A18-11	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1N16-11	36.0	2.7	5.0	1.5	12	940	±45	
BRM-1N18-11	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1N10-11	40.0	2.7	5.0	1.5	12	940	±45	
BRM-1N1H-11	56.0	2.7	5.0	1.5	12	940	±45	L-140
BRM-1538-11	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15S8-11	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1528-11	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15B8-13	38.0	2.7	5.0	1.5	12	940	±45	
BRM-13A8-13	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1458-13	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1A18-13	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1N18-13	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1538-13	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15S8-13	38.0	2.7	5.0	1.5	12	940	±45	L-141
BRM-1528-13	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15B8-14	38.0	2.7	5.0	1.5	12	940	±45	
BRM-13A8-14	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1458-14	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1A18-14	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1N18-14	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1538-14	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15S8-14	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1528-14	38.0	2.7	5.0	1.5	12	940	±45	

RECEIVER MODULE

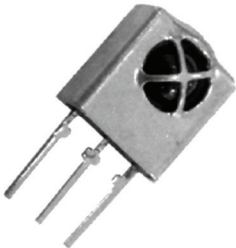
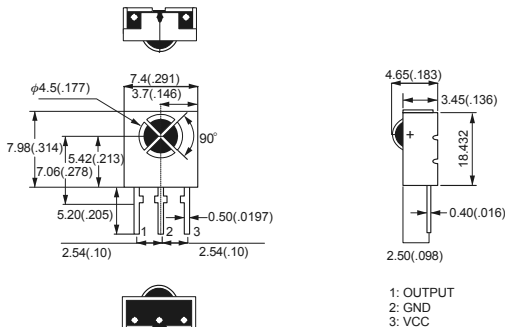
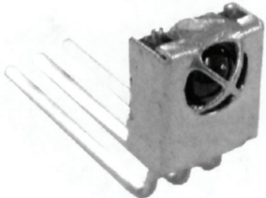
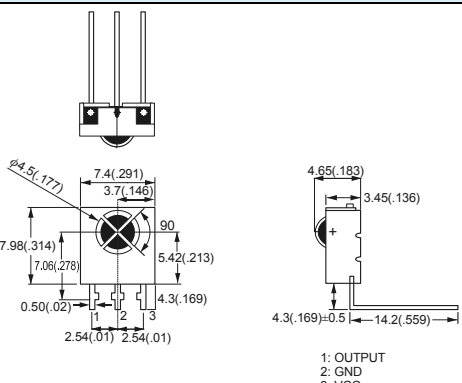
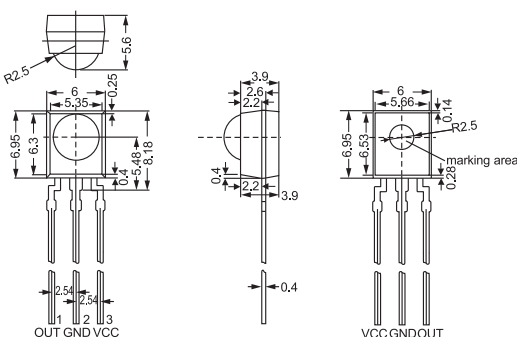
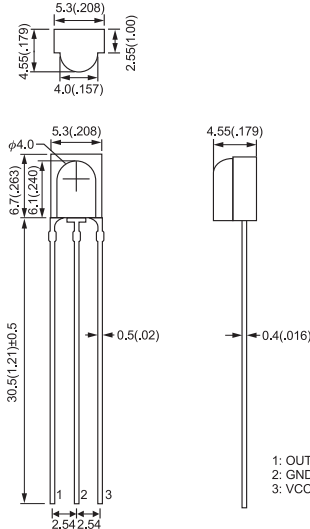
L-138	BRM-xxxx
	 1: OUTPUT 2: GND 3: VCC
L-139	BRM-xxxx-11
	 1: OUTPUT 2: GND 3: VCC
L-140	BRM-xxxx-13
	 1: OUTPUT 2: GND 3: VCC
L-141	BRM-xxxx-14
	 1: OUTPUT 2: GND 3: VCC

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

RECEIVER MODULE

Part No.	B.P.F	Supply Voltage (V)		Supply Current Max(mA)	Recepting Distance Min (m)	Receiving Wavelength (nm)	Angle (θ)	Drawing No.
	Center Frequency (KHz)	Min.	Max.					
BRM-15B8-11-LC5.2	38.0	2.7	5.0	1.5	12	940	±45	L-142
BRM-13A8-11-LC5.2	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1458-11-LC5.2	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1A18-11-LC5.2	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1N18-11-LC5.2	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1538-11-LC5.2	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15S8-11-LC5.2	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1528-11-LC5.2	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15B8-11-FB4.3	38.0	2.7	5.0	1.5	12	940	±45	L-143
BRM-13A8-11-FB4.3	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1458-11-FB4.3	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1A18-11-FB4.3	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1N18-11-FB4.3	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1538-11-FB4.3	38.0	2.7	5.0	1.5	12	940	±45	
BRM-15S8-11-FB4.3	38.0	2.7	5.0	1.5	12	940	±45	
BRM-1528-11-FB4.3	38.0	2.7	5.0	1.5	12	940	±45	
BRM-25B8	38.0	2.7	5.0	1.5	12	940	±45	L-144
BRM-23A8	38.0	2.7	5.0	1.5	12	940	±45	
BRM-2458	38.0	2.7	5.0	1.5	12	940	±45	
BRM-2A18	38.0	2.7	5.0	1.5	12	940	±45	
BRM-2N18	38.0	2.7	5.0	1.5	12	940	±45	
BRM-2538	38.0	2.7	5.0	1.5	12	940	±45	
BRM-25S8	38.0	2.7	5.0	1.5	12	940	±45	
BRM-2528	38.0	2.7	5.0	1.5	12	940	±45	
BRM-45B8	38.0	2.7	5.0	1.5	12	940	±45	L-145
BRM-43A8	38.0	2.7	5.0	1.5	12	940	±45	
BRM-4458	38.0	2.7	5.0	1.5	12	940	±45	
BRM-4A18	38.0	2.7	5.0	1.5	12	940	±45	
BRM-4N18	38.0	2.7	5.0	1.5	12	940	±45	
BRM-4538	38.0	2.7	5.0	1.5	12	940	±45	
BRM-45S8	38.0	2.7	5.0	1.5	12	940	±45	
BRM-4528	38.0	2.7	5.0	1.5	12	940	±45	

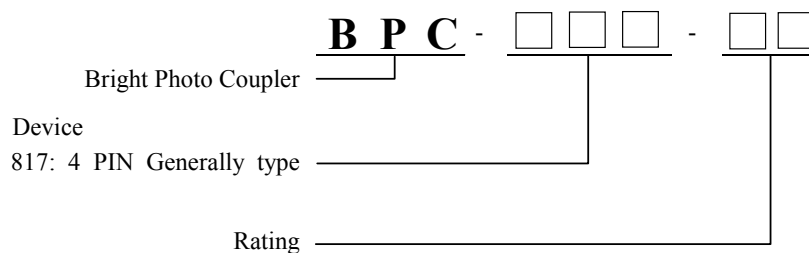
RECEIVER MODULE

L-142	BRM-xxxx-11-LC5.2
	 1: OUTPUT 2: GND 3: VCC
L-143	BRM-xxxx-11-FB4.3
	 1: OUTPUT 2: GND 3: VCC
L-144	BRM-xxxx
	 OUT GND VCC VCC GND OUT
L-145	BRM-xxxx
	 1: OUTPUT 2: GND 3: VCC

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

PHOTO COUPLER

PART NO. SYSTEM

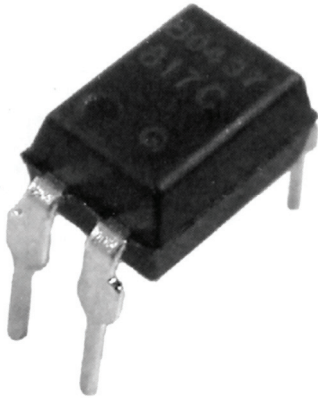
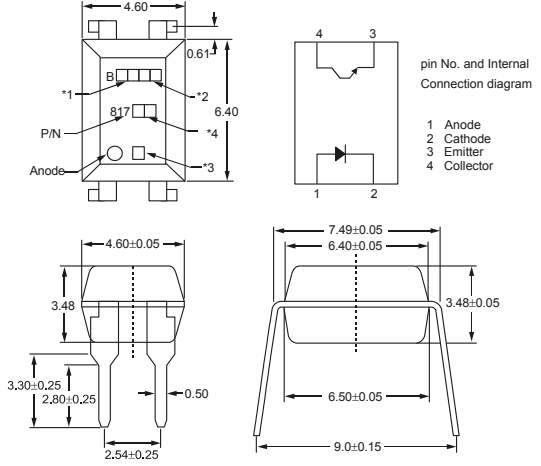
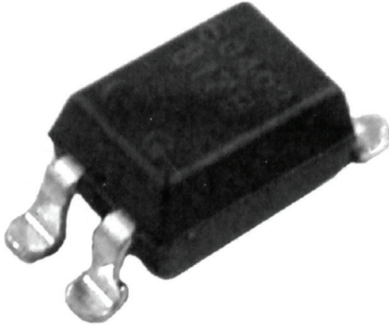
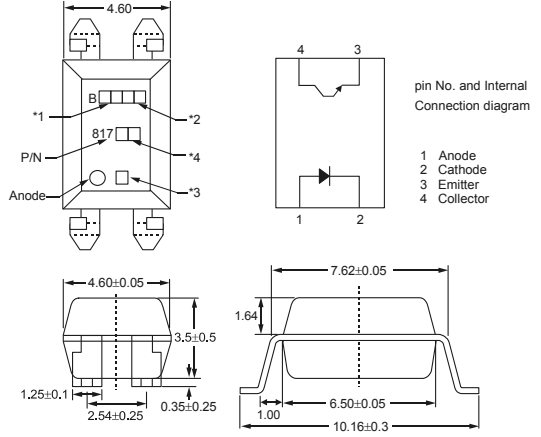
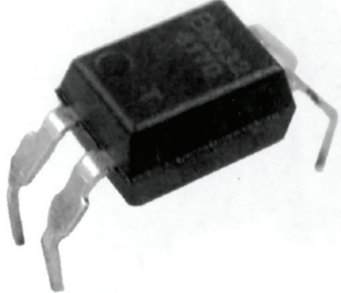
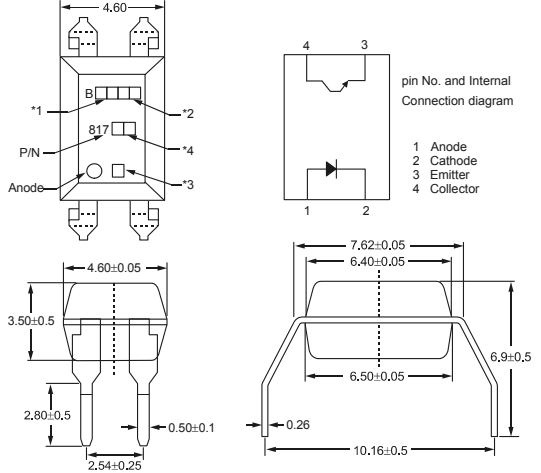


Rating :

- A : Generally A grade type
- B : Generally B grade type
- C : Generally C grade type
- D : Generally D grade type
- SA : SMD A grade type
- SB : SMD A grade type
- SC : SMD C grade type
- SD : SMD D grade type
- MA : broad Ditch A type
- MB : broad Ditch B type
- MC : broad Ditch C type
- MD : broad Ditch D type

PHOTO COUPLER

Part No.	Rated impulse isolation voltage (V)	Input	Output	Transfer Characteristics		Drawing No.
		Forward Voltage (V)	Collector-Emitter Voltage (V)	Current Transfer Ratio	Isolation Resistance	
BPC-817	6000	1.2	35	50~600	1×10^{11}	L-146
BPC-817S	6000	1.2	35	50~600	1×10^{11}	L-147
BPC-817M	6000	1.2	35	50~600	1×10^{11}	L-148

L-146		BPC-817		(mm)
		 pin No. and Internal Connection diagram 1 Anode 2 Cathode 3 Emitter 4 Collector		
L-147		BPC-817S		(mm)
		 pin No. and Internal Connection diagram 1 Anode 2 Cathode 3 Emitter 4 Collector		
L-148		BPC-817M		(mm)
		 pin No. and Internal Connection diagram 1 Anode 2 Cathode 3 Emitter 4 Collector		

Notes: 1. All dimensions are in millimeters (inches).

SINGLE DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length P(nm)	(nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.28" Single-Digit	BS-A285ND	BS-C285ND	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	SD-01
	BS-A282ND	BS-C282ND	GaP/Green	568	30	80	30	150	2.2	2.5	2.8	
	BS-A283ND	BS-C283ND	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.2	
	BS-A284ND	BS-C284ND	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	2.8	
	BS-A286ND	BS-C286ND	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	5.0	
	BS-A28DND	BS-C28DND	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	6.0	
0.3" Single-Digit	BS-A305RD	BS-C305RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	SD-02
	BS-A302RD	BS-C302RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BS-A303RD	BS-C303RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BS-A304RD	BS-C304RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BS-A306RD	BS-C306RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BS-A30DRD	BS-C30DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.31" Single-Digit	BS-A365RD	BS-C365RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	SD-03
	BS-A362RD	BS-C362RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BS-A363RD	BS-C363RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BS-A364RD	BS-C364RD	GaAsP/GaP/Hi-Eff.Red	635	45	100	30	150	2.0	2.5	3.0	
	BS-A366RD	BS-C366RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BS-A36DRD	BS-C36DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.36" Single-Digit	BS-A325RD	BS-C325RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	SD-04
	BS-A322RD	BS-C322RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BS-A323RD	BS-C323RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BS-A324RD	BS-C324RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BS-A326RD	BS-C326RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BS-A32DRD	BS-C32DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.39" Single-Digit	BS-A345RD	BS-C345RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	SD-05
	BS-A342RD	BS-C342RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BS-A343RD	BS-C343RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BS-A344RD	BS-C344RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BS-A346RD	BS-C346RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BS-A34DRD	BS-C34DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.40" Single-Digit	BS-A405RD	BS-C405RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	SD-06
	BS-A402RD	BS-C402RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BS-A403RD	BS-C403RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BS-A404RD	BS-C404RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BS-A406RD	BS-C406RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BS-A40DRD	BS-C40DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	

SINGLE DIGIT LED DISPLAYS

SD-01 BS-^A_C 28xND BS-A28xxx BS-C28xxx	SD-02 BS-^A_C C30xRD BS-A30xxx BS-C30xxx
SD-03 BS-^A_C 36xRD BS-A36xRD BS-C36xRD	SD-04 BS-^A_C 32xRD BS-A32xRD BS-C32xRD
SD-05 BS-^A_C 34xRD BS-A34xRD BS-C34xRD	SD-06 BS-^A_C 40xRD BS-A40xxx BS-C40xxx

Notes: 1. All dimensions are in millimeters (inches).

2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.

4. NP: No Pin.

5. NC: No Connect

SINGLE DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length P(nm)	(nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.43" Overflow Single-Digit	BS-A415RD	BS-C415ND	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	SD-07
	BS-A412RD	BS-C412RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.5	
	BS-A413RD	BS-C413RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.5	
	BS-A414RD	BS-C414RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.5	
	BS-A416RD	BS-C416RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.5	
	BS-A41DND	BS-C41DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.5	
0.50" Single-Digit	BS-A505RD	BS-C505RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	SD-08
	BS-A502RD	BS-C502RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BS-A503RD	BS-C503RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BS-A504RD	BS-C504RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BS-A506RD	BS-C506RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	7.0	
	BS-A50DRD	BS-C50DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	8.0	
0.50" Overflow Single-Digit	BF-A525RD	BF-C525RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	SD-09
	BF-A522RD	BF-C522RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.5	
	BF-A523RD	BF-C523RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.5	
	BF-A524RD	BF-C524RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.5	
	BF-A526RD	BF-C526RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.5	
	BF-A52DRD	BF-C52DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.5	
0.52" Single-Digit	BS-A535RD	BS-C535RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	SD-10
	BS-A532RD	BS-C532RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BS-A533RD	BS-C533RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BS-A534RD	BS-C534RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BS-A536RD	BS-C536RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	7.0	
	BS-A53DRD	BS-C53DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	8.0	
0.56" Single-Digit	BS-A515RD	BS-C515RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	SD-11
	BS-A512RD	BS-C512RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BS-A513RD	BS-C513RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BS-A514RD	BS-C514RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BS-A516RD	BS-C516RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	7.0	
	BS-A51DRD	BS-C51DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	8.0	
0.56" Single-Digit	BS-A555RD	BS-C555RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	SD-12
	BS-A552RD	BS-C552RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BS-A553RD	BS-C553RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BS-A554RD	BS-C554RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BS-A556RD	BS-C556RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	7.0	
	BS-A55DRD	BS-C55DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	8.0	

SINGLE DIGIT LED DISPLAYS

SD-07 BS-^A_C 41xRD BS-A41xRD BS-C41xRD NP: 4, 5, 12 NP: 4, 5, 12	SD-08 BS-^A_C 50xRD BS-A50xRD BS-C50xRD NP: 7, 6, 4, 2, 1, 9, 10, 5 NP: 7, 6, 4, 2, 1, 9, 10, 5
SD-09 BF-^A_C 52xRD BF-A52xRD BF-C52xRD NP: 2, 7 NP: 2, 7	SD-10 BS-^A_C 53xRD BS-A53xRD BS-C53xRD NP: 7, 6, 4, 2, 1, 9, 10, 5 NP: 7, 6, 4, 2, 1, 9, 10, 5
SD-11 BS-^A_C 51xRD BS-A51xRD BS-C51xRD NP: 7, 6, 4, 2, 1, 9, 10, 5 NP: 7, 6, 4, 2, 1, 9, 10, 5	SD-12 BS-^A_C 55xRD BS-A55xRD BS-C55xRD NP: 7, 6, 4, 2, 1, 9, 10, 5 NP: 7, 6, 4, 2, 1, 9, 10, 5

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin. 5. NC: No Connect

SINGLE DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length P(nm)	(nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.80" Alpha-Numeric Single-Digit	BS-A825RD	BS-C825ND	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.6	SD-13
	BS-A822RD	BS-C822RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.2	
	BS-A823RD	BS-C823RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.2	
	BS-A824RD	BS-C824RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.2	
	BS-A826RD	BS-C826RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	7.5	
	BS-A82DRD	BS-C82DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	9.0	
0.80" Single-Digit	BS-A855RD	BS-C855RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.6	SD-14
	BS-A852RD	BS-C852RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.2	
	BS-A853RD	BS-C853RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.2	
	BS-A854RD	BS-C854RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.2	
	BS-A856RD	BS-C856RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	7.5	
	BS-A85FRD	BS-C85FRD	GaAlAs/DDH Super Red	660	20	80	30	150	2.0	2.5	12.5	
1.00" Single-Digit	BS-AA05RD	BS-CA05RD	GaP/Bright Red	700	90	80	15	50	4.4	5.0	3.5	SD-15
	BS-AA02RD	BS-CA02RD	GaP/Green	568	30	160	30	150	4.4	5.0	5.0	
	BS-AA03RD	BS-CA03RD	GaAsP/GaP/Yellow	585	35	160	30	150	4.2	5.0	4.0	
	BS-AA04RD	BS-CA04RD	GaAsP/GaP/Hi-Eff.Red	635	45	160	30	150	4.0	5.0	5.0	
	BS-AA06RD	BS-CA06RD	GaAlAs/SH Super Red	660	20	160	30	150	3.4	5.0	10.0	
	BS-AA0FRD	BS-CA0FRD	GaAlAs/DDH Super Red	660	20	160	30	150	4.0	5.0	15.0	
1.20" Single-Digit	BS-AB15RD	BS-CB15RD	GaP/Bright Red	700	90	80	15	50	4.4	5.0	3.5	SD-16
	BS-AB12RD	BS-CB12RD	GaP/Green	568	30	160	30	150	4.4	5.0	5.0	
	BS-AB13RD	BS-CB13RD	GaAsP/GaP/Yellow	585	35	160	30	150	4.2	5.0	4.0	
	BS-AB14RD	BS-CB14RD	GaAsP/GaP/Hi-Eff.Red	635	45	160	30	150	4.0	5.0	5.0	
	BS-AB16RD	BS-CB16RD	GaAlAs/SH Super Red	660	20	160	30	150	3.4	5.0	10.0	
	BS-AB1FRD	BS-CB1FRD	GaAlAs/DDH Super Red	660	20	160	30	150	4.0	5.0	15.0	
1.50" Single-Digit	BS-AB35RD	BS-CB35RD	GaP/Bright Red	700	90	80	15	50	4.4	5.0	3.5	SD-17
	BS-AB32RD	BS-CB32RD	GaP/Green	568	30	160	30	150	4.4	5.0	5.0	
	BS-AB33RD	BS-CB33RD	GaAsP/GaP/Yellow	585	35	160	30	150	4.2	5.0	4.0	
	BS-AB34RD	BS-CB34RD	GaAsP/GaP/Hi-Eff.Red	635	45	160	30	150	4.0	5.0	5.0	
	BS-AB36RD	BS-CB36RD	GaAlAs/SH Super Red	660	20	160	30	150	3.4	5.0	10.0	
	BS-AB3FRD	BS-CB3FRD	GaAlAs/DDH Super Red	660	20	160	30	150	4.0	5.0	15.0	
1.80" Single-Digit	BS-AB05RD	BS-CB05RD	GaP/Bright Red	700	90	120	15	50	6.6	7.5	5.5	SD-18
	BS-AB02RD	BS-CB02RD	GaP/Green	568	30	240	30	150	6.6	7.5	7.0	
	BS-AB03RD	BS-CB03RD	GaAsP/GaP/Yellow	585	35	240	30	150	6.3	7.5	6.0	
	BS-AB04RD	BS-CB04RD	GaAsP/GaP/Hi-Eff.Red	635	45	240	30	150	6.0	7.5	7.0	
	BS-AB06RD	BS-CB06RD	GaAlAs/SH Super Red	660	20	240	30	150	5.1	7.5	12.0	
	BS-AB0FRD	BS-CB0FRD	GaAlAs/DDH Super Red	660	20	240	30	150	6.0	7.5	17.0	

SINGLE DIGIT LED DISPLAYS

SD-13 BS-^A_C 82xRD 11.00(.433) 20.32(.800) 27.70(1.091) 20.20(.795) 2.54x8=20.32(.80) 2.2(.087) 3.00(.118) MIN. 8.50(.335) 15.24(.600) φ0.50(.020) BS-A82xRD 11 A1 A2 B C D1 D2 E F G1 G2 DP 1 18 16 13 9 10 8 4 5 15 3 2 17 14 6 7 12	SD-14 BS-^A_C 85xRD 11.60(.457) 20.30(.800) 25.00(.984) 18.60(.732) 2.54(.100) 2.5(.098) 3.00(.118) MIN. 10.60(.417) 15.24(.600) φ0.50(.020) BS-A85xRD 4, 12, 17 A B C D E F G DP 2 15 13 9 11 5 7 3 14 10 NP: 1, 6, 8, 16, 18
SD-15 BS-^A_C A0xRD 13.00(.512) 26.00(1.02) 32.90(1.295) 22.50(.885) 2.54(.100) 2.6(.102) 3.00(.118) MIN. 8.50(.337) 15.24(.600) φ0.50(.020) BS-AA0xRD 3, 6, 14 A B C D E F G DP 1 13 10 8 7 2 11 9 NP: 4, 5, 12	SD-16 BS-^A_C B1xRD 17.30(.681) 30.40(1.20) 40.70(1.602) 28.80(1.134) 3.50(1.398) 3.0(.118) 3.00(.118) MIN. 9.00(.354) 2.54(.100) φ0.5(.020) BS-AB1xRD 1, 8 A B C D E F G DP 7 6 4 3 2 9 10 5 NP: 1, 6, 8, 16, 18
SD-17 BS-^A_C B3xRD 21.10(.831) 38.00(1.500) 44.10(1.736) 30.60(1.205) 4.064(1.600) 4.5(.177) 3.00(.118) MIN. 8.80(.346) 2.54(.100) φ0.50(.020) BS-AB3xRD 1, 5 A B C D E F G DP 7 6 4 3 2 9 10 8	SD-18 BS-^A_C B0xRD 26.00(1.024) 44.80(1.764) 55.80(2.197) 37.80(1.488) 4.80(1.890) 4.5(.177) 3.00(.118) MIN. 10.90(.429) 2.54(.100) φ0.50(.020) BS-AB0xRD 1, 5 A B C D E F G DP 7 6 4 3 2 9 10 8

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin. 5. NC: No Connect

SINGLE DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
1.80" Overflow Single-Digit	BF-AB05RD	BF-CB05RD	GaP/Bright Red	700	90	120	15	50	6.6	7.5	5.5	SD-19
	BF-AB02RD	BF-CB02RD	GaP/ Green	568	30	240	30	150	6.6	7.5	7.0	
	BF-AB03RD	BF-CB03RD	GaAsP/GaP/Yellow	585	35	240	30	150	6.3	7.5	6.0	
	BF-AB04RD	BF-CB04RD	GaAsP/GaP/Hi-Eff.Red	635	45	240	30	150	6.0	7.5	7.0	
	BF-AB06RD	BF-CB06RD	GaAlAs/SH Super Red	660	20	240	30	150	5.1	7.5	12.0	
	BF-AB0FRD	BF-CB0FRD	GaAlAs/DDH Super Red	660	20	240	30	150	6.0	7.5	17.0	
2.00" Alpha Numeric Single-Digit	BS-AD75RD	BS-CD75RD	GaP/Bright Red	700	90	130	15	50	8.8	8.4	8.0	SD-20
	BS-AD72RD	BS-CD72RD	GaP/Green	568	30	250	30	150	8.8	8.4	12.0	
	BS-AD73RD	BS-CD73RD	GaAsP/GaP/Yellow	585	35	250	30	150	8.4	8.4	10.0	
	BS-AD74RD	BS-CD74RD	GaAsP/GaP/Hi-Eff.Red	635	45	250	30	150	8.0	8.4	12.0	
	BS-AD76RD	BS-CD76RD	GaAlAs/SH Super Red	660	20	250	30	150	6.8	8.4	18.0	
	BS-AD7FRD	BS-CD7FRD	GaAlAs/DDH Super Red	660	20	250	30	150	8.0	8.4	25.0	
2.30" Single-Digit	BS-AD15RD	BS-CD15RD	GaP/Bright Red	700	90	160	15	50	8.8	10.0	8.0	SD-21
	BS-AD12RD	BS-CD12RD	GaP/Green	568	30	310	30	150	8.8	10.0	12.0	
	BS-AD13RD	BS-CD13RD	GaAsP/GaP/Yellow	585	35	310	30	150	8.4	10.0	10.0	
	BS-AD14RD	BS-CD14RD	GaAsP/GaP/Hi-Eff.Red	635	45	310	30	150	8.0	10.0	12.0	
	BS-AD16RD	BS-CD16RD	GaAlAs/SH Super Red	660	20	310	30	150	6.8	10.0	18.0	
	BS-AD1FRD	BS-CD1FRD	GaAlAs/DDH Super Red	660	20	310	30	150	8.0	10.0	25.0	
3.00" Single-Digit	BS-AF05RD	BS-CF05RD	GaP/Bright Red	700	90	230	15	50	12.6	15.0	10.0	SD-22
	BS-AF02RD	BS-CF02RD	GaP/Green	568	30	460	30	150	12.6	15.0	14.0	
	BS-AF03RD	BS-CF03RD	GaAsP/GaP/Yellow	585	35	460	30	150	12.0	15.0	12.0	
	BS-AF04RD	BS-CF04RD	GaAsP/GaP/Hi-Eff.Red	635	45	460	30	150	11.5	15.0	14.0	
	BS-AF06RD	BS-CF06RD	GaAlAs/SH Super Red	660	20	460	30	150	10.2	15.0	15.0	
	BS-AF0FRD	BS-CF0FRD	GaAlAs/DDH Super Red	660	20	460	30	150	12.0	15.0	25.0	
4.00" Single-Digit	BS-AE05RD	BS-CE05RD	GaP/Bright Red	700	90	200	15	50	11.0	12.5	9.0	SD-23
	BS-AE02RD	BS-CE02RD	GaP/Green	568	30	390	30	150	11.0	12.5	13.0	
	BS-AE03RD	BS-CE03RD	GaAsP/GaP/Yellow	585	35	390	30	150	11.0	12.5	10.0	
	BS-AE04RD	BS-CE04RD	GaAsP/GaP/Hi-Eff.Red	635	45	390	30	150	11.0	12.5	13.0	
	BS-AE06RD	BS-CE06RD	GaAlAs/SH Super Red	660	20	390	30	150	8.5	12.5	20.0	
	BS-AE0FRD	BS-CE0FRD	GaAlAs/DDH Super Red	660	20	390	30	150	10.0	12.5	25.0	
5.00" Single-Digit	BS-AG01RD	BS-CG01RD	GaAsP/Red	655	40	800	40	200	16.0	20.0	15.0	SD-24
	BS-AG05RD	BS-CG05RD	GaP/Bright Red	700	90	375	15	50	21.0	25.0	18.0	
	BS-AG02RD	BS-CG02RD	GaP/Green	568	30	750	30	150	21.0	25.0	25.0	
	BS-AG03RD	BS-CG03RD	GaAsP/GaP/Yellow	585	35	750	30	150	20.0	25.0	20.0	
	BS-AG04RD	BS-CG04RD	GaAsP/GaP/Hi-Eff.Red	635	45	750	30	150	19.0	25.0	22.0	
	BS-AG06RD	BS-CG06RD	GaAlAs/SH Super Red	660	20	750	30	150	17.0	25.0	30.0	
	BS-AG0FRD	BS-CG0FRD	GaAlAs/DDH Super Red	660	20	750	30	150	20.0	25.0	40.0	

SINGLE DIGIT LED DISPLAYS

SD-19 BF-^A_C B0xRD Technical drawing of SD-19 BF-^A_C B0xRD LED display showing dimensions and pinout.	SD-20 BS-^A_C D7xRD Technical drawing of SD-20 BS-^A_C D7xRD LED display showing dimensions and pinout.
SD-21 BS-^A_C D1xRD Technical drawing of SD-21 BS-^A_C D1xRD LED display showing dimensions and pinout.	SD-22 BS-^A_C F0xRD Technical drawing of SD-22 BS-^A_C F0xRD LED display showing dimensions and pinout.
SD-23 BS-^A_C E0xRD Technical drawing of SD-23 BS-^A_C E0xRD LED display showing dimensions and pinout.	SD-24 BS-^A_C G0xRD Technical drawing of SD-24 BS-^A_C G0xRD LED display showing dimensions and pinout.

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin. 5. NC: No Connect

DUAL DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.28" Dual-Digit	BD-E285RD	BD-F285RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.0	DD-01
	BD-E282RD	BD-F282RD	GaP/ Green	568	30	80	30	150	2.2	2.5	2.5	
	BD-E283RD	BD-F283RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BD-E284RD	BD-F284RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	2.5	
	BD-E286RD	BD-F286RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	5.0	
	BD-E28DRD	BD-F28DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	6.0	
0.30" Dual-Digit	BD-A305ND	BD-C305ND	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	DD-02
	BD-A302ND	BD-C302ND	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BD-A303ND	BD-C303ND	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BD-A304ND	BD-C304ND	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BD-A306ND	BD-C306ND	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BD-A30DND	BD-C30DND	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.30" Dual-Digit	BD-E305RD	BD-F305RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	DD-03
	BD-E302RD	BD-F302RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BD-E303RD	BD-F303RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BD-E304RD	BD-F304RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BD-E306RD	BD-F306RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BD-E30DRD	BD-F30DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.36" Dual-Digit	BD-E325RD	BD-F325RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	DD-04
	BD-E322RD	BD-F322RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.0	
	BD-E323RD	BD-F323RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BD-E324RD	BD-F324RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BD-E326RD	BD-F326RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BD-E32DRD	BD-F32DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.40" Dual-Digit	BD-A405ND	BD-C405ND	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	DD-05
	BD-A402ND	BD-C402ND	GaP/Green	568	30	80	30	150	2.2	2.5	3.5	
	BD-A403ND	BD-C403ND	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.5	
	BD-A404NE	BD-C404NE	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.5	
	BD-A406ND	BD-C406ND	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.5	
	BD-A40DND	BD-C40DND	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.5	
0.40" Dual-Digit	BD-E405RD	BD-F405RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	DD-06
	BD-E402RD	BD-F402RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.5	
	BD-E403RD	BD-F403RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.5	
	BD-E404RD	BD-F404RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.5	
	BD-E406RD	BD-F406RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.5	
	BD-E40DRD	BD-F40DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.5	

DUAL DIGIT LED DISPLAYS

DD-01 BD-^E_F 28xRD DD-01 BD-^E_F 28xRD	DD-02 BD-^A_C 30xND DD-02 BD-^A_C 30xND
DD-03 BD-^E_F 30xRD DD-03 BD-^E_F 30xRD	DD-04 BD-^E_F 32xRD DD-04 BD-^E_F 32xRD
DD-05 BD-^A_C 40xND DD-05 BD-^A_C 40xND	DD-06 BD-^E_F 40xRD DD-06 BD-^E_F 40xRD

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin.
5. NC: No Connect

DUAL DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length P(nm)	Δλ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.50" Dual-Digit	BD-A505RD	BD-C505RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	DD-07
	BD-A502RD	BD-C502RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.5	
	BD-A503RD	BD-C503RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.5	
	BD-A504RE	BD-C504RE	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.5	
	BD-A506RD	BD-C506RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.5	
	BD-A50DRD	BD-C50DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.5	
	BD-E505RD	BD-F505RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.6	DD-08
	BD-E505RE	BD-F505RE	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.6	
	BD-E502RD	BD-F502RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.8	
	BD-E503RD	BD-F503RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.8	
	BD-E504RE	BD-F504RE	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.6	
	BD-E506RD	BD-F506RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.8	
	BD-E50DRD	BD-F50DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.8	
	0.56" Dual-Digit	BD-A515RD	BD-C515RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5
BD-A512RD		BD-C512RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.5	
BD-A513RD		BD-C513RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.5	
BD-A514RE		BD-C514RE	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.5	
BD-A516RD		BD-C516RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.5	
BD-A51DRD		BD-C51DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.5	
BD-E545RD		BD-F545RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.6	DD-10
BD-E542RD		BD-F542RD	GaP/Green	568	30	80	30	150	2.2	2.5	3.8	
BD-E543RD		BD-F543RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.8	
BD-E544RE		BD-F544RE	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.6	
BD-E546RD		BD-F546RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.8	
BD-E54DRD		BD-F54DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.8	
0.80" Dual-Digit	BD-A815RD	BD-C815RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.6	DD-11
	BD-A812RD	BD-C812RD	GaP/Green	568	30	80	30	150	2.2	2.5	4.0	
	BD-A813RD	BD-C813RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	3.0	
	BD-A814RD	BD-C814RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	4.0	
	BD-A816RD	BD-C816RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	7.0	
	BD-A81FRD	BD-C81FRD	GaAlAs/DDH Super Red	660	20	80	30	150	2.0	2.5	12.0	
	BD-E815RD	BD-F815RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.6	DD-12
	BD-E812RD	BD-F812RD	GaP/Green	568	30	80	30	150	2.2	2.5	4.0	
	BD-E813RD	BD-F813RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	3.0	
	BD-E814RD	BD-F814RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	4.0	
	BD-E816RD	BD-F816RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	7.0	
	BD-E81FRD	BD-F81FRD	GaAlAs/DDH Super Red	660	20	80	30	150	2.0	2.5	12.0	

DUAL DIGIT LED DISPLAYS

DD-07 BD-^A_C 50xRD	DD-08 BD-^E_F 50xRD
DD-09 BD-^A_C 51xRD	DD-10 BD-^E_F 54xRD
DD-11 BD-^A_C 81xRD	DD-12 BD-^E_F 81xRD

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin.
5. NC: No Connect

THREE DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length λ P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.30" Three-Digit	BT-M305RD	BT-N305RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	TD-01
	BT-M302RD	BT-N302RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.0	
	BT-M303RD	BT-N303RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BT-M304RD	BT-N304RE	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BT-M306RD	BT-N306RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BT-M30DRD	BT-N30DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.36" Three-Digit	BT-M325RD	BT-N325RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	TD-02
	BT-M322RD	BT-N322RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.0	
	BT-M323RD	BT-N323RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BT-M324RD	BT-N324RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BT-M326RD	BT-N326RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BT-M32DRD	BT-N32DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	

TD-01	BT-N ^M 30xRD
TD-02	BT-N ^M 32xRD

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin. 5. NC: No Connect

THREE DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length λ P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.39" Three-Digit	BT-M345RD	BT-N345RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	TD-03
	BT-M342RD	BT-N342RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.0	
	BT-M343RD	BT-N343RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BT-M344RD	BT-N344RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BT-M346RD	BT-N346RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BT-M34DRD	BT-N34DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.40" Three-Digit	BT-M405RD	BT-N405RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	TD-04
	BT-M402RD	BT-N402RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.0	
	BT-M403RD	BT-N403RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BT-M404RD	BT-N404RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BT-M406RD	BT-N406RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BT-M40DRD	BT-N40DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	

TD-03 BT-M₃₄xRD												
TD-04 BT-M₄₀xRD												

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin. 5. NC: No Connect

THREE DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length λ P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.56" Three-Digit	BT-M515RD	BT-N515RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	TD-05
	BT-M512RD	BT-N512RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.0	
	BT-M513RD	BT-N513RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BT-M514RD	BT-N514RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BT-M516RD	BT-N516RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BT-M51DRD	BT-N51DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.80" Three-Digit	BT-M815RD	BT-N815RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.6	TD-06
	BT-M812RD	BT-N812RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.2	
	BT-M813RD	BT-N813RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.2	
	BT-M814RD	BT-N814RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.2	
	BT-M816RD	BT-N816RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	7.5	
	BT-M81DRD	BT-N81DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	12.5	

TD-05 BT-M_N51xRD												
TD-06 BT-M_N81xRD												

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin. 5. NC: No Connect

FOUR DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length λ P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.28" Four-Digit	BQ-M285RD	BQ-N285RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.0	FD-01
	BQ-M282RD	BQ-N282RD	GaP/ Green	568	30	80	30	150	2.2	2.5	2.5	
	BQ-M283RD	BQ-N283RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BQ-M284RD	BQ-N284RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	2.5	
	BQ-M286RD	BQ-N286RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	4.5	
	BQ-M28DRD	BQ-N28DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	5.5	
0.33" Four-Digit	BQ-M335RD	BQ-N335RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	FD-02
	BQ-M332RD	BQ-N332RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.0	
	BQ-M333RD	BQ-N333RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BQ-M334RD	BQ-N334RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BQ-M336RD	BQ-N336RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BQ-M33DRD	BQ-N33DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	

FD-01 BQ-M-N 28xRD												
FD-02 BQ-M-N 33xRD												

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

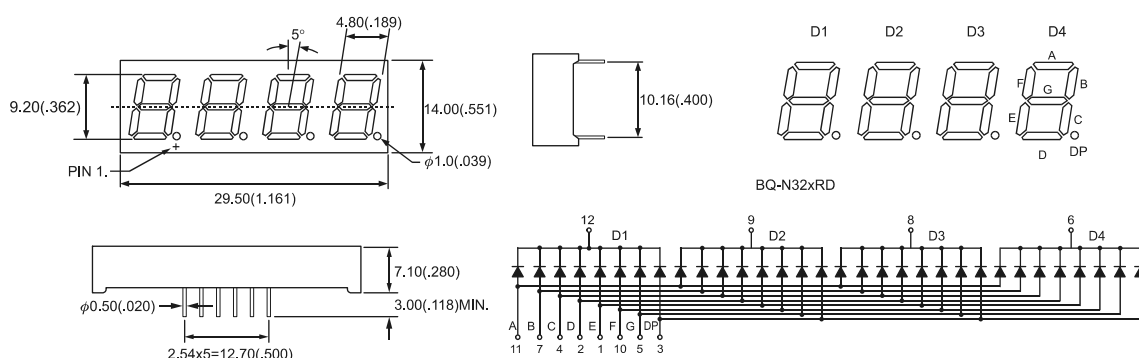
3. Specifications are subject to change without notice.
4. NP: No Pin. 5. NC: No Connect

FOUR DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length λ P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.36" Four-Digit	BQ-M325RD	BQ-N325RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	FD-03
	BQ-M322RD	BQ-N322RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.0	
	BQ-M323RD	BQ-N323RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BQ-M324RD	BQ-N324RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BQ-M326RD	BQ-N326RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BQ-M32DRD	BQ-N32DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	
0.40" Four-Digit	BQ-M405RD	BQ-N405RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.2	FD-04
	BQ-M402RD	BQ-N402RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.0	
	BQ-M403RD	BQ-N403RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.0	
	BQ-M404RD	BQ-N404RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.0	
	BQ-M406RD	BQ-N406RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.0	
	BQ-M40DRD	BQ-N40DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.0	

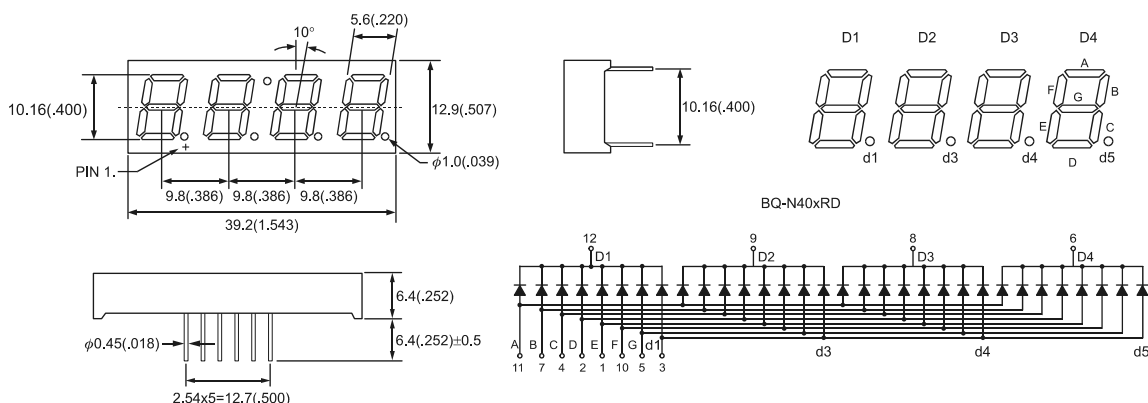
FD-03

BQ-M₃₂xRD



FD-04

BQ-M₄₀xRD



Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

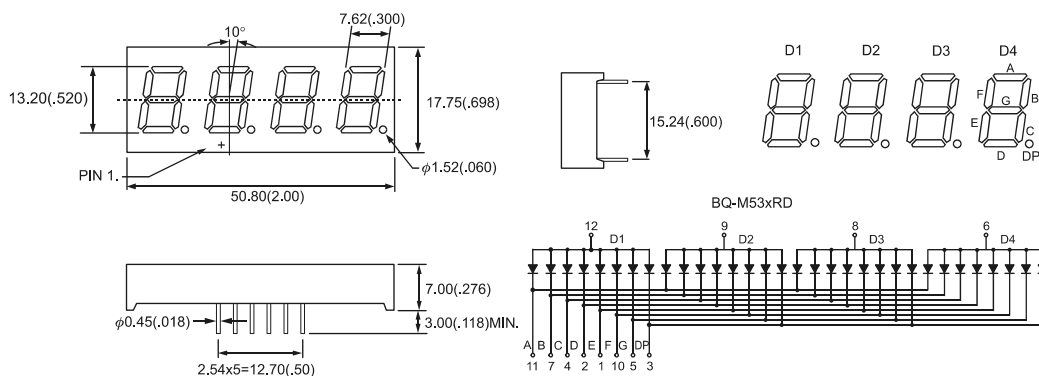
3. Specifications are subject to change without notice.
4. NP: No Pin. 5. NC: No Connect

FOUR DIGIT LED DISPLAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length λ P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
0.52" Four-Digit	BQ-M535RD	BQ-N535RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	FD-05
	BQ-M532RD	BQ-N532RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.5	
	BQ-M533RD	BQ-N533RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.5	
	BQ-M534RD	BQ-N534RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.5	
	BQ-M536RD	BQ-N536RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.5	
	BQ-M53DRD	BQ-N53DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.5	
0.56" Four-Digit	BQ-M515RD	BQ-N515RD	GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.5	FD-06
	BQ-M512RD	BQ-N512RD	GaP/ Green	568	30	80	30	150	2.2	2.5	3.5	
	BQ-M513RD	BQ-N513RD	GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	2.5	
	BQ-M514RD	BQ-N514RD	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	3.5	
	BQ-M516RD	BQ-N516RD	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	6.5	
	BQ-M51DRD	BQ-N51DRD	GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	7.5	

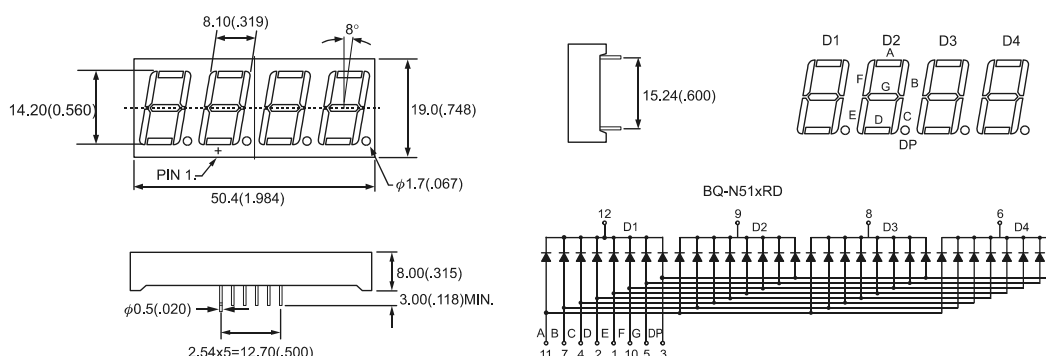
FD-05

^M
BQ-N 53xRD



FD-06

^M
BQ-N 51xRD



Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin. 5. NC: No Connect

LED LIGHT BAR & BAR GRAPH ARRAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
1.78*5.10mm 10Bar Graph-Array	BA-10H1UD		GaP/Bright Red	700	90	40	15	50	2.2	2.5	2.0	AD-01
	BA-10G1UD		GaP/ Green	568	30	80	30	150	2.2	2.5	5.0	
	BA-10Y1UD		GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	4.5	
	BA-10E1UD		GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	5.0	
	BA-10S1UD		GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	8.0	
	BA-10D1UD		GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	9.0	
1.70*5.00mm 5Bar Graph-Array	BA-5H5UD		GaP/Bright Red	700	90	40	15	50	2.2	2.5	2.0	AD-02
	BA-5G5UD		GaP/ Green	568	30	80	30	150	2.2	2.5	5.0	
	BA-5Y5UD		GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	4.5	
	BA-5E5UD		GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	5.0	
	BA-5S5UD		GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	8.0	
	BA-5D5UD		GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	9.0	
1.50*4.00mm 12Bar Graph-Array	BA-12H3UD		GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.8	AD-03
	BA-12G3UD		GaP/ Green	568	30	80	30	150	2.2	2.5	4.5	
	BA-12Y3UD		GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	3.5	
	BA-12E3UD		GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	4.5	
	BA-12S3UD		GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	10.0	
	BA-12D3UD		GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	12.0	
1.78*5.10mm 15Bar Graph-Array	BA-15H15UD		GaP/Bright Red	700	90	40	15	50	2.2	2.5	1.8	AD-04
	BA-15G15UD		GaP/Green	568	30	80	30	150	2.2	2.5	4.5	
	BA-15Y15UD		GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	3.5	
	BA-15E15UD		GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	4.5	
	BA-15S15UD		GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	10.0	
	BA-15D15UD		GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	12.0	
7.50*13.9mm Light-Bar	BA-2H2UW		GaP/Bright Red	700	90	40	15	50	2.2	2.5	4.0	AD-05
	BA-2G2UW		GaP/Green	568	30	80	30	150	2.2	2.5	9.0	
	BA-2Y2UW		GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	8.0	
	BA-2E2UW		GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	9.0	
	BA-2S2UW		GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	15.0	
	BA-2D2UW		GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	18.0	
10.0*20.2mm Light-Bar	BA-8H6UW		GaP/Bright Red	700	90	40	15	50	2.2	2.5	6.0	AD-06
	BA-8G6UW		GaP/Green	568	30	80	30	150	2.2	2.5	12.0	
	BA-8Y6UW		GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	10.0	
	BA-8E6UW		GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	12.0	
	BA-8S6UW		GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	16.0	
	BA-8D6UW		GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	20.0	

LED LIGHT BAR & BAR GRAPH ARRAYS

AD-01 BA-10x1UD Top view dimensions: 5.1(.200), 1.78(.070), 2.54(.100), 25.30(.996), 10.16(.400), 8.00(.315), 3.00(.118)MIN., 7.62(.300), $\phi 0.25(.010)$. Side view dimensions: 2.54(.100), 0.50(.020). Pin view: PIN 1, 1 2 3 4 5 6 7 8 9 10, A B C D E F G H I J.	AD-02 BA-5x5UD Top view dimensions: 2.54x4=10.16(.400), 1.70(.067), 5.0(.197), 12.70(.500), 10.10(.398), 7.90(.311), 3.00(.118)MIN., 2.54x4=10.16(.400), $\phi 0.5(.020)$. Side view dimensions: 7.62(.300). Pin view: PIN 1, 1 2 3 4 5, 6 7 8 9 10, A B C D E.
AD-03 BA-12x3UD Top view dimensions: 4.30x11=47.30(1.862), 4.00(.157), 56.00(2.205), 58.00(2.283), 1.50(.059), 5.00(.197), 1.60(.063), 7.00(.276), 0.50(.020), 8.00(.315), 3.00(.118)MIN., 2.54x20=50.80(2.00), PIN 1, A B C D E F G H I J K L. Side view dimensions: 0.50(.020), 8.00(.315), 3.00(.118)MIN. Pin view: PIN 1, 1 2 3 4 5 6 7 8 9 10 11 12, A B C D E F G H I J K L, NP: 12.	AD-04 BA-15x15UD Top view dimensions: 1.78(.070), 2.54(.100)TYP, 0.381(.015), 0.25(.010), 5.1(.200), 10.16(.400), 38.1(1.500)MAX., 6.223±0.127 (0.245±.005), 3.00(.118)MIN., 2.54(.100)x14=35.56(1.400), $\phi 0.50(.020)$, PIN 1, A B C D E F G H I J K L M N P Q R. Side view dimensions: 7.62(.300). Pin view: PIN 1, 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30, A B C D E F G H I J K L M N P Q R.
AD-05 BA-2x2UW Top view dimensions: 6.30(.248), 7.50(.295), 12.80(.504), 13.80(.543), 5.08(.200), 7.80(.307), 3.00(.118)MIN., 2.54x2=5.00(.197), $\phi 0.50(.020)$, PIN 1, 1 3, 4 6, NC: 5, NP: 2. Side view dimensions: 5.08(.200), 3.00(.118)MIN., 7.80(.307). Pin view: PIN 1, 1 3, 4 6, NC: 5, NP: 2.	AD-06 BA-8x6UW Top view dimensions: 8.90(.350), 10.00(.394), 19.06(.750), 20.16(.794), 6.15(.242), 3.00(.118)MIN., 2.54x7=17.78(.700), $\phi 0.50(.020)$, PIN 1, 1 2 3 4 5 6 7 8, 9 10 11 12 13 14 15 16, A B C D E F G H. Side view dimensions: 7.62(.300). Pin view: PIN 1, 1 2 3 4 5 6 7 8, 9 10 11 12 13 14 15 16, A B C D E F G H.

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin.
5. NC: No Connect

LED LIGHT BAR & BAR GRAPH ARRAYS

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.	
	Common Anode	Common Cathode	Material/Emitted Color	Peak Wave Length P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)		
									Typ.	Max.			
15.0*15.0mm Light-Bar	BA-4H7UW-B		GaP/Bright Red	700	90	80	15	50	4.4	5.0	6.0	AD-07	
	BA-4G7UW-B		GaP/ Green	568	30	160	30	150	4.4	5.0	8.0		
	BA-4Y7UW-B		GaAsP/GaP/Yellow	585	35	160	30	150	4.2	5.0	7.0		
	BA-4E7UW-B		GaAsP/GaP/Hi-Eff.Red	635	45	160	30	150	4.0	5.0	8.0		
	BA-4S7UW-B		GaAlAs/SH Super Red	660	20	160	30	150	3.4	5.0	12.0		
	BA-4D7UW-B		GaAlAs/DH Super Red	660	20	160	30	150	3.4	5.0	15.0		
		BA-4H7UW-C		GaP/Bright Red	700	90	40	15	50	2.2	2.5	12.0	AD-08
		BA-4G7UW-C		GaP/ Green	568	30	80	30	150	2.1	2.5	16.0	
		BA-4Y7UW-C		GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	14.0	
		BA-4E7UW-C		GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	16.0	
		BA-4S7UW-C		GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	20.0	
		BA-4D7UW-C		GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	24.0	
15.0*15.0mm Light-Bar	BA-8H7UW-2		GaP/Bright Red	700	90	80	15	50	4.4	5.0	8.0	AD-09	
	BA-8G7UW-2		GaP/ Green	568	30	160	30	150	4.4	5.0	16.0		
	BA-8Y7UW-2		GaAsP/GaP/Yellow	585	35	160	30	150	4.2	5.0	14.0		
	BA-8E7UW-2		GaAsP/GaP/Hi-Eff.Red	635	45	160	30	150	4.0	5.0	16.0		
	BA-8S7UW-2		GaAlAs/SH Super Red	660	20	160	30	150	3.4	5.0	20.0		
	BA-8D7UW-2		GaAlAs/DH Super Red	660	20	160	30	150	3.4	5.0	24.0		
33.0*22.0mm Light-Bar	BA-8H9UW		GaP/Bright Red	700	90	160	15	50	8.4	10.0	6.0	AD-10	
	BA-8G9UW		GaP/Green	568	30	310	30	150	8.4	10.0	8.0		
	BA-8Y9UW		GaAsP/GaP/Yellow	585	35	310	30	150	8.0	10.0	7.0		
	BA-8E9UW		GaAsP/GaP/Hi-Eff.Red	635	45	310	30	150	7.6	10.0	8.0		
	BA-8S9UW		GaAlAs/SH Super Red	660	20	310	30	150	6.8	10.0	12.0		
	BA-8D9UW		GaAlAs/DH Super Red	660	20	310	30	150	6.8	10.0	14.0		
32.0*32.0mm Light-Bar	BA-16H11UW		GaP/Bright Red	700	90	40	15	50	2.2	2.5	15.0	AD-11	
	BA-16G11UW		GaP/Green	568	30	80	30	150	2.2	2.5	20.0		
	BA-16Y11UW		GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	19.0		
	BA-16E11UW		GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	20.0		
	BA-16S11UW		GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	24.0		
	BA-16D11UW		GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	26.0		
6.80*19.8mm Light-Bar	BA-3H12UW		GaP/Bright Red	700	90	40	15	50	2.2	2.5	5.0	AD-12	
	BA-3G12UW		GaP/Green	568	30	80	30	150	2.2	2.5	9.0		
	BA-3Y12UW		GaAsP/GaP/Yellow	585	35	80	30	150	2.1	2.5	8.0		
	BA-3E12UW		GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	9.0		
	BA-3S12UW		GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	12.0		
	BA-3D12UW		GaAlAs/DH Super Red	660	20	80	30	150	1.7	2.5	14.0		

LED LIGHT BAR & BAR GRAPH ARRAYS

AD-07 BA-4x7UW-B	AD-08 BA-4x7UW-C
AD-09 BA-8x7UW-2	AD-10 BA-8x9UW
AD-11 BA-16x11UW	AD-12 BA-3x12UW

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin.
5. NC: No Connect

LED DOT MATRIX DISPLAY

Single Color 5x7 Dot Matrix Displays

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Column Common Anode	Column Common Cathode	Material/Emitted Color	Peak Wave Length λ P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
2.00" High ϕ 5.0	BM-20257MD	BM-20257ND	GaP/GaP/Yellow Green	568	30	80	30	150	2.1	2.5	12.0	DM-01
	BM-20457MD	BM-20457ND	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	12.0	
	BM-20457MA	BM-20457NA	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	20.0	
	BM-20657MD	BM-20657ND	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	16.0	
	BM-20657MA	BM-20657NA	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	24.0	
	BM-20F57MD	BM-20F57ND	GaAlAs/DDH Super Red	660	20	80	30	150	2.0	2.5	22.0	
	BM-20J57MD	BM-20J57ND	AlGaInP/GaAs/Ultra Orange	620	17	80	30	150	2.0	2.5	30.0	
	BM-20K57MD	BM-20K57ND	AlGaInP/GaAs/Ultra Yellow	592	15	80	30	150	2.1	2.5	32.0	
4.00" High ϕ 10.0	BM-40257MD	BM-40257ND	GaP/GaP/Yellow Green	568	30	160	30	150	4.2	5.0	15.0	DM-02
	BM-40457MD	BM-40457ND	GaAsP/GaP/Hi-Eff.Red	635	45	160	30	150	4.0	5.0	15.0	
	BM-40457MA	BM-40457NA	GaAsP/GaP/Hi-Eff.Red	635	45	160	30	150	4.0	5.0	18.0	
	BM-40657MD	BM-40657ND	GaAlAs/SH Super Red	660	20	160	30	150	3.4	5.0	18.0	
	BM-40657MA	BM-40657NA	GaAlAs/SH Super Red	660	20	160	30	150	3.4	5.0	25.0	
	BM-40F57MD	BM-40F57ND	GaAlAs/DDH/Super Red	660	20	160	30	150	4.0	5.0	20.0	
	BM-40J57MD	BM-40J57ND	AlGaInP/GaAs/Ultra Orange	620	17	160	30	150	4.0	5.0	32.0	
	BM-40K57MD	BM-40K57ND	AlGaInP/GaAs/Ultra Yellow	592	15	160	30	150	4.2	5.0	35.0	

DM-01	BM-20x57 ^M _N D	DM-02	BM-40x57 ^M _N D

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin.
5. NC: No Connect

LED DOT MATRIX DISPLAY

Single Color 5x8 Dot Matrix Displays

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Column Common Anode	Column Common Cathode	Material/Emitted Color	Peak Wave Length λ P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
1.50" High ϕ 3.0	BM-10258MD	BM-10258ND	GaP/GaP/Yellow Green	568	30	80	30	150	2.1	2.5	9.0	DM-03
	BM-10458MD	BM-10458ND	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	9.0	
	BM-10458MA	BM-10458NA	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	9.0	
	BM-10658MD	BM-10658ND	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	13.0	
	BM-10658MA	BM-10658NA	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	17.0	
	BM-10F58MD	BM-10F58ND	GaAlAs/DDH Super Red	660	20	80	30	150	2.0	2.5	20.0	
	BM-10J58MD	BM-10J58ND	AlGaInP/GaAs/Ultra Orange	620	17	80	30	150	2.0	2.5	22.0	
	BM-10K58MD	BM-10K58ND	AlGaInP/GaAs/Ultra Yellow	592	15	80	30	150	2.1	2.5	22.0	
2.30" High ϕ 5.0	BM-20258MD	BM-20258ND	GaP/GaP/Yellow Green	568	30	80	30	150	2.1	2.5	10.0	DM-04
	BM-20458MD	BM-20458ND	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	10.0	
	BM-20458MA	BM-20458NA	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	15.0	
	BM-20658MD	BM-20658ND	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	18.0	
	BM-20658MA	BM-20658NA	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	25.0	
	BM-20F58MD	BM-20F58ND	GaAlAs/DDH/Super Red	660	20	80	30	150	2.0	2.5	23.0	
	BM-20J58MD	BM-20J58ND	AlGaInP/GaAs/Ultra Orange	620	17	80	30	150	2.0	2.5	25.0	
	BM-20K58MD	BM-20K58ND	AlGaInP/GaAs/Ultra Yellow	592	15	80	30	150	2.1	2.5	25.0	

DM-03 BM-10x58 _N D	DM-04 BM-20x58 _N D
Diagram showing the physical dimensions and pin configurations for the BM-10x58MD and BM-10x58ND displays. The MD version has a height of 37.50(1.476)mm and a width of 23.40(.921)mm. The ND version has a height of 28.2(1.11)mm. Both have a dot pitch of $\phi 3.0(.118)$mm. The MD version has a pin pitch of 2.54x6=15.24(.600)mm and a pin diameter of $\phi 0.50(.050)$mm. The ND version has a pin pitch of 3.00(.118)mm. The MD version has a pin configuration of 13, 3, 4, 11, 10, 6. The ND version has a pin configuration of 13, 3, 4, 11, 10, 6.	Diagram showing the physical dimensions and pin configurations for the BM-20x58MD and BM-20x58ND displays. The MD version has a height of 60.80(2.394)mm and a width of 38.00(1.496)mm. The ND version has a height of 45.72(1.800)mm. Both have a dot pitch of $\phi 5.0(.197)$mm. The MD version has a pin pitch of 2.54x6=15.24(.600)mm and a pin diameter of $\phi 0.50(.020)$mm. The ND version has a pin pitch of 3.00(.118)mm. The MD version has a pin configuration of 13, 3, 4, 11, 10, 6. The ND version has a pin configuration of 13, 3, 4, 11, 10, 6.

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin.
5. NC: No Connect

LED DOT MATRIX DISPLAY

Single Color 8x8 Dot Matrix Displays

Digit Size	Part No.		Chip		Absolute Maximum Ratings				Electro-optical Data (At 10mA)			Drawing No.
	Column Common Anode	Column Common Cathode	Material/Emitted Color	Peak Wave Length λ P(nm)	$\Delta\lambda$ (nm)	Pd (mw)	If (mA)	Ifp (mA)	Vf (v)		Iv. Typ. Per. Seg. (mcd)	
									Typ.	Max.		
1.20" High ϕ 3.0	BM-10288MD-A	BM-10288ND-A	GaP/GaP/Yellow Green	568	30	80	30	150	2.1	2.5	9.0	DM-05
	BM-10488MD-A	BM-10488ND-A	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	9.0	
	BM-10488MA-A	BM-10488NA-A	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	14.0	
	BM-10688MD-A	BM-10688ND-A	GaAlAs/SH/Super Red	660	20	80	30	150	1.7	2.5	14.0	
	BM-10688MA-A	BM-10688NA-A	GaAlAs/SH/Super Red	660	20	80	30	150	1.7	2.5	18.0	
	BM-10F88MD-A	BM-10F88ND-A	GaAlAs/DDH/Super Red	660	20	80	30	150	2.0	2.5	20.0	
	BM-10J88MD-A	BM-10J88ND-A	AlGaInP/GaAs/Ultra Orange	620	17	80	30	150	2.0	2.5	22.0	
	BM-10K88MD-A	BM-10K88ND-A	AlGaInP/GaAs/Ultra Yellow	592	15	80	30	150	2.1	2.5	22.0	
2.30" High ϕ 5.0	BM-20288MD	BM-20288ND	GaP/GaP/Yellow Green	568	30	80	30	150	2.1	2.5	12.0	DM-06
	BM-20488MD	BM-20488ND	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	12.0	
	BM-20488MA	BM-20488NA	GaAsP/GaP/Hi-Eff.Red	635	45	80	30	150	2.0	2.5	17.0	
	BM-20688MD	BM-20688ND	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	17.0	
	BM-20688MA	BM-20688NA	GaAlAs/SH Super Red	660	20	80	30	150	1.7	2.5	21.0	
	BM-20F88MD	BM-20F88ND	GaAlAs/DDH/Super Red	660	20	80	30	150	2.0	2.5	23.0	
	BM-20J88MD	BM-20J88ND	AlGaInP/GaAs/Ultra Orange	620	17	80	30	150	2.0	2.5	25.0	
	BM-20K88MD	BM-20K88ND	AlGaInP/GaAs/Ultra Yellow	592	15	80	30	150	2.1	2.5	25.0	

DM-05	BM-10x88 ^M _N D-A	DM-06	BM-20x88 ^M _N D

Notes: 1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010")

3. Specifications are subject to change without notice.
4. NP: No Pin.
5. NC: No Connect

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This image shows a full page of primary-ruled paper. It features multiple sets of horizontal lines designed to guide handwriting. Each set consists of three lines: two dashed lines for ascenders and x-height, a solid middle line for the baseline, and another dashed line for descenders. These sets are repeated vertically down the entire page, providing ample space for practicing letter formation and alignment. The margins are consistent throughout.