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DATA SHEET

PART NO : EP20XX-150XX

V : A/3

CUSTOMER'S APPROVAL : _____ DCC : _____

DRAWING NO : DS-51-03-0045

DATE : 2003-12-17

Page : 1



EP20XX-150XX

V A/3

Enhanced Power LED Revolutionary Light Source Module

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http://www.para.com.tw

FEATURES

Conventional LED design : Simple to use

High Flux and Low Cost : More competitive advantages in the LED industry

Special body frame : Excellent transiting heat from LED chip operating under 150mA.

ADVANTAGES

Operating Current : 150mA .

Custom Design Light Sourcing Module for 0.6W·····.

Excellent Heat Dissipation.

TYPICAL APPLICATIONS

Reading Light / Flashlight / Track Lighting

Under Shelf / Task Lighting

Emergency Lighting / Traffic Signals

Bollards / Security / Garden Lighting

Full Color Sign Boards

ABSOLUTE MAXIMUM RATINGS T_J=25°C

Parameter	EP20XX-150XX	Units
DC Forward Current	150	mA
Pulsed Forward Current	300	mA
Power Dissipation	380/600	mW
Dark Current (V _R =5V)	100	uA
Electrostatic Discharge Threshold	12	V
Operating Temperature Range	-40 to 100	°C
Storage Temperature Range	-40 to 100	°C
Thermal Resistance R _{θJ-PCB-AIR} (°C/W)	85	°C /W
LED Junction Temperature	110	°C

Operating conditions:

1.Red,Amber,Blue,Cyan,Green operating condition under f=0.5 ~ 2 Hz and 1/2 duty factor .

2. 380mw 6 pins of E-Power LED must be mounted on PCB.

600mw (PCB:25.4 mm*25.4 mm1.6t/two layers / 2.0 oz .)

3.LED Operating required Anti-electrostatic devices in all equipment , machinery , and manual assembly.

4.Heat-sink required

5.Convective IR Reflow Soldering.



EP20XX-150XX

V A/3

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ELECTRICAL CHARACTERISTICS

$T_J=25^{\circ}\text{C}$ $I_F=150\text{mA}$

Device Type	Forward Voltage			Dark Current		Intensity		Total Flux (lm)	Wavelength λ_D (nm)		Viewing Angle $2\theta_{1/2}$ (Degrees)
	Min	Typ	Max	Min	Max	Min	Typ		or	$\Delta\lambda_{1/2}$ (nm)	
EP2012-150R1						21	50				10°
EP201C-150R1						2.6	4.0				60°
EP202S-150R1						0.53	1.2				PEAK INTENSITY $\theta_{PEAK} 90^{\circ}$
EP2032-150R1	2.0	2.4	2.8	10	100	16	30	3	620	20	10°
EP2034-150R1						12	24		Red Orange		20°
EP2036-150R1						8.5	15				30°
EP204K-150R1						1.3	3.0				100°
EP201C-150RD2	2.0	2.4	2.8	10	100	4.7	10	3	624±5	20	60°
EP204K-150RD2						3.5	7				100°
EP201C-150AD1	2.0	2.4	2.8	10	100	4.7	10	5	590	20	60°
EP204K-150AD1						3.5	7				100°
EP2012-150A1						21	50				10°
EP201C-150A1						2.6	4.0				60°
EP202S-150A1						0.53	1.2				PEAK INTENSITY $\theta_{PEAK} 90^{\circ}$
EP2032-150A1	2.0	2.4	2.8	10	100	16	30	5	590	20	10°
EP2034-150A1						12	24		Amber		20°
EP2036-150A1						8.5	15				30°
EP204K-150A1						1.3	3.0				100°

The specification is subject to change without notice.

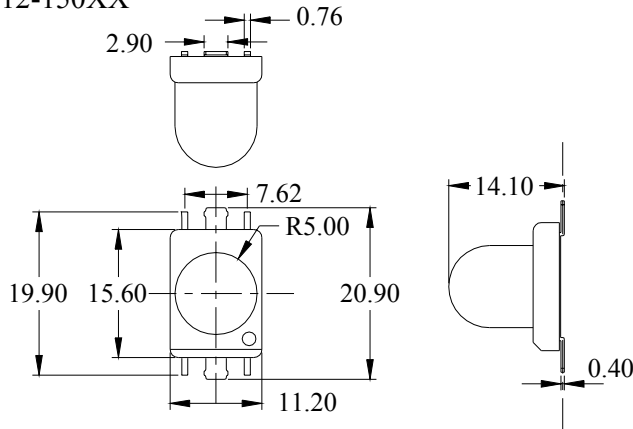
ELECTRICAL CHARACTERISTICS

 $T_J=25^{\circ}\text{C}$ $I_F=150\text{mA}$

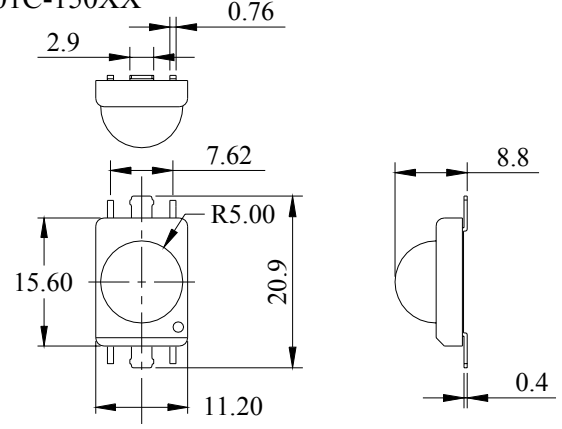
Device Type	Forward Voltage			Dark Current		Intensity		Total Flux (lm)	Wavelength λ_D (nm)		$\Delta\lambda_{1/2}$ (nm)	Viewing Angle $2\theta_{1/2}$ (Degrees)
	Min	Typ	Max	Min	Max	Min	Typ		or	Color Temperature(°K)		
EP2012-150C1						12	24					10°
EP201C-150C1						3.5	7.0					60°
EP202S-150C1						0.39	0.70					PEAK INTENSITY $\theta_{\text{PEAK } 90^{\circ}}$
EP2032-150C1	3.0	3.4	4.0	10	100	8.5	18	3.5	505		30	10°
EP2034-150C1						6.3	13		Cyan			20°
EP2036-150C1						4.7	10					30°
EP204K-150C1						2.6	5.0					100°
EP2012-150G1						28	60					10°
EP201C-150G1						6.3	10					60°
EP202S-150G1						0.73	1.5					PEAK INTENSITY $\theta_{\text{PEAK } 90^{\circ}}$
EP2032-150G1	3.0	3.4	4.0	10	100	21	40	3.5	525		30	10°
EP2034-150G1						16	24		Green			20°
EP2036-150G1						12	15					30°
EP204K-150G1						4.7	8.0					100°
EP2012-150B1						12	20					10°
EP201C-150B1						2.6	4.0					60°
EP202S-150B1						0.29	0.45					PEAK INTENSITY $\theta_{\text{PEAK } 90^{\circ}}$
EP2032-150B1	3.0	3.4	4.0	10	100	6.3	12	1.5	470		30	10°
EP2034-150B1						4.7	7.5		Blue			20°
EP2036-150B1						3.5	6.0					30°
EP204K-150B1						1.3	3.0					100°

The specification is subject to change without notice.

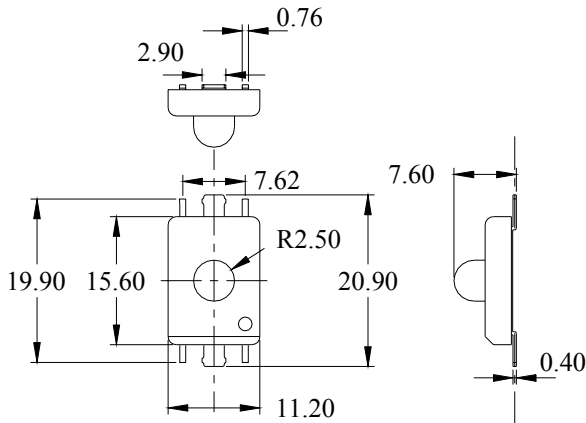
EP2012-150XX



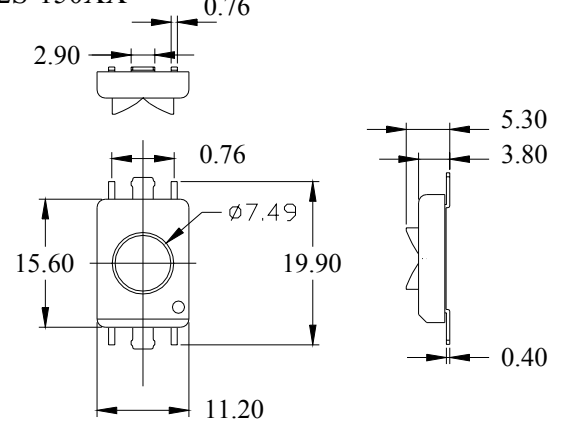
EP201C-150XX



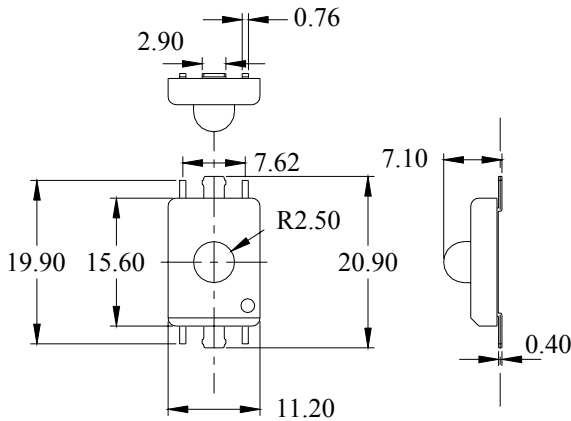
EP2032-150XX



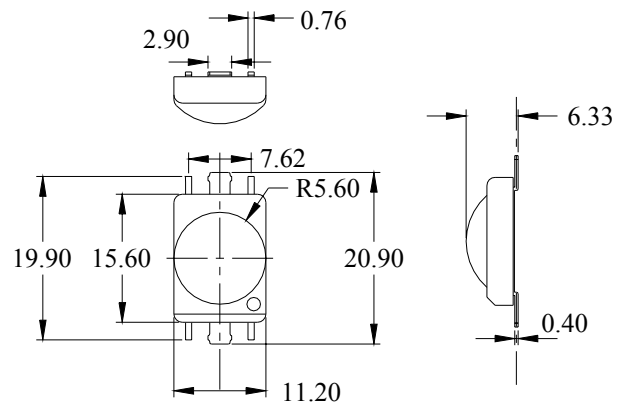
EP202S-150XX



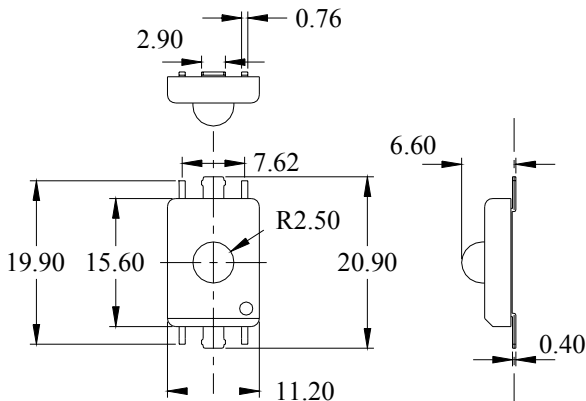
EP2034-150XX



EP204K-150XX



EP2036-150XX



NOTE

1. All dimensions are in millimeters.
2. Tolerance is 0.25mm unless otherwise specified.
3. This specification is subject to change without notice.

E-POWER VF BIN SELECTION (150mA)

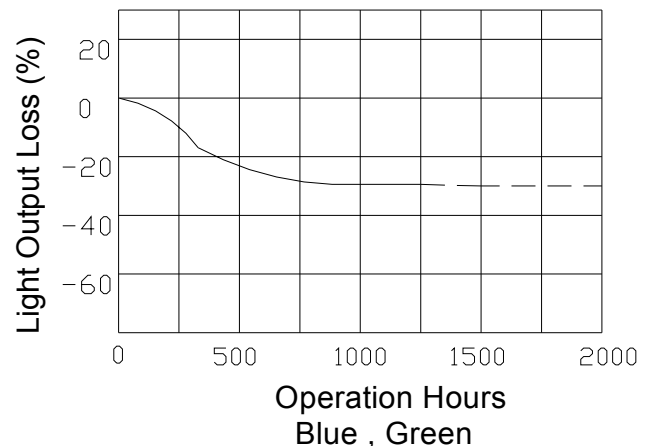
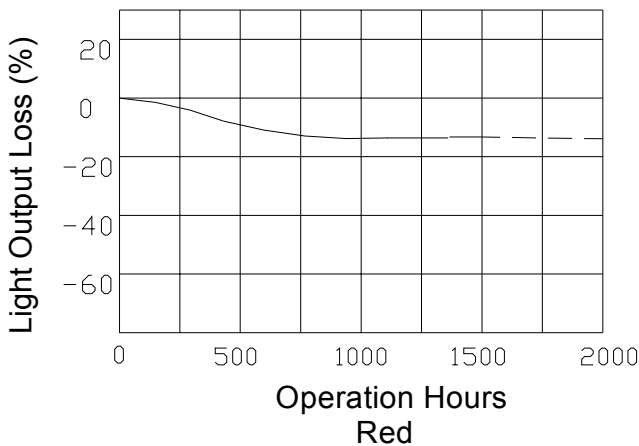
Red , Amber			Blue , Cyan , Green		
BIN	MIN(V)	MAX(V)	BIN	MIN(V)	MAX(V)
0D	1.00	1.20	F	2.8	3.0
0C	1.20	1.40	G	3.0	3.2
0B	1.40	1.60	H	3.2	3.4
0A	1.60	1.80	J	3.4	3.6
A	1.8	2.0	K	3.6	3.8
B	2.0	2.2	L	3.8	4.0
C	2.2	2.4	M	4.0	4.2
D	2.4	2.6	N	4.2	4.4
E	2.6	2.8	O	4.4	4.8

E-POWER IV BIN SELECTION (150mA)

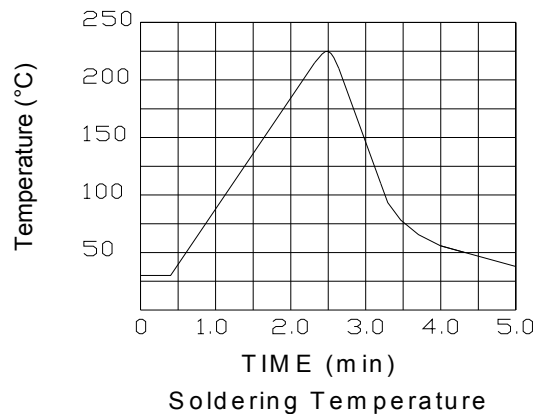
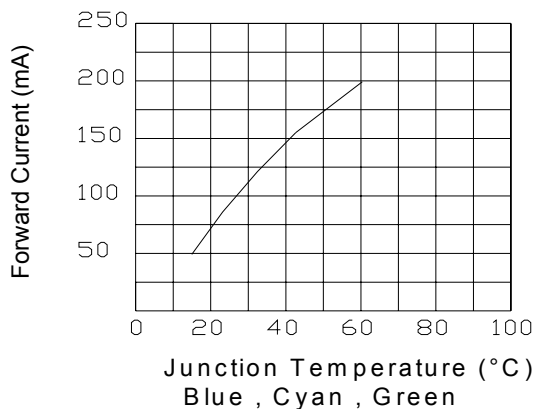
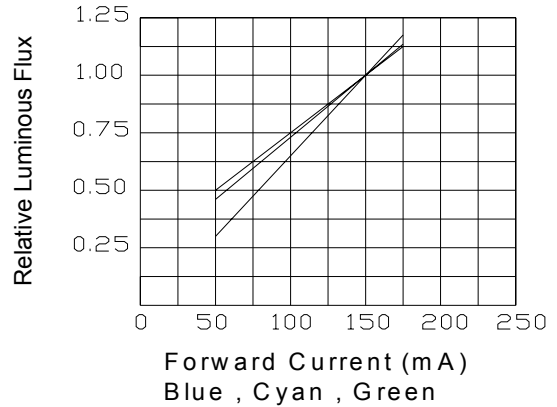
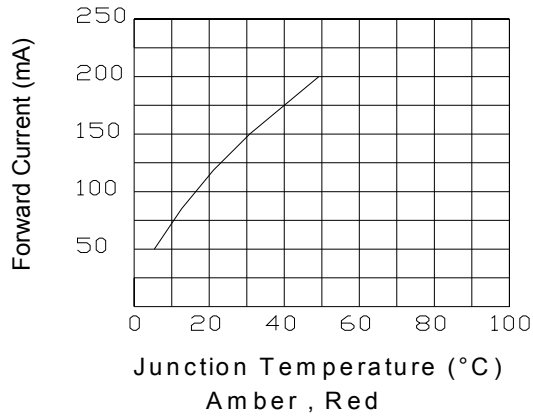
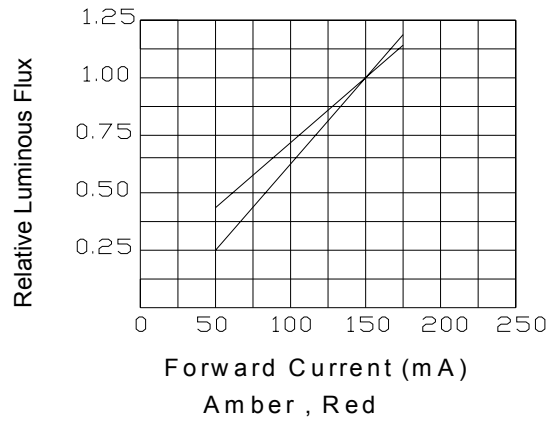
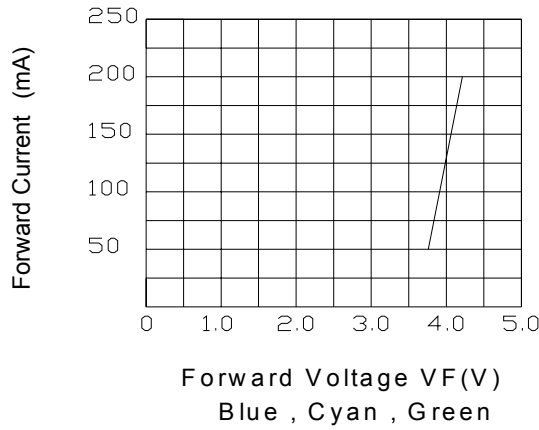
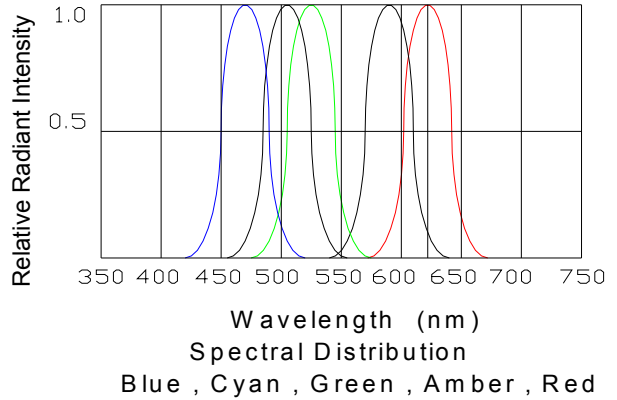
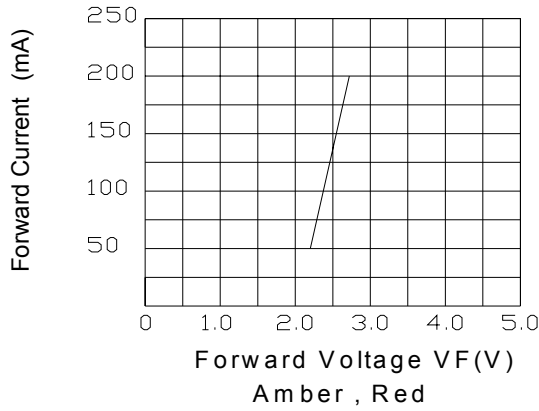
BIN	MIN(CD)	MAX(CD)	BIN	MIN(CD)	MAX(CD)
E0	0.29	0.53	H	16	28
D0	0.39	0.72	J	21	38
C0	0.53	0.98	K	28	52
B0	0.73	1.27	L	38	70
A0	0.94	1.73	M	52	94
A	1.3	3.5	N	70	127
B	2.6	4.7	P	94	171
C	3.5	6.3	Q	-	-
D	4.7	8.5	R	-	-
E	6.3	11.5	S	-	-
F	8.5	15.5	T	-	-
G	12	21	U	-	-

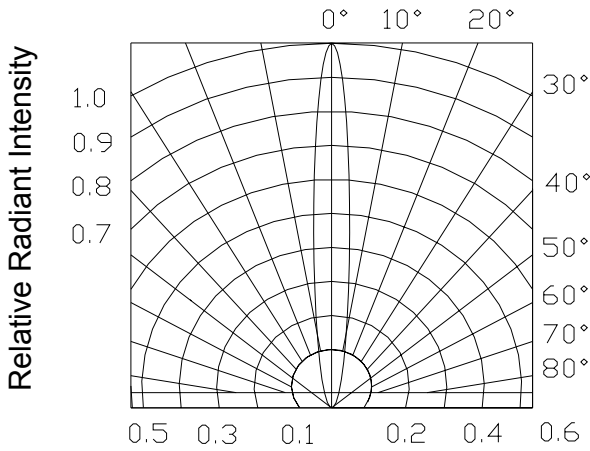
The specification is subject to change without notice.

Operation Life

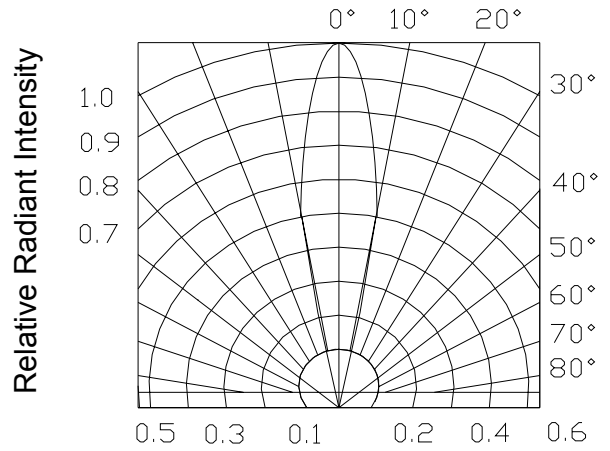


CHARACTERISTICS CURVE

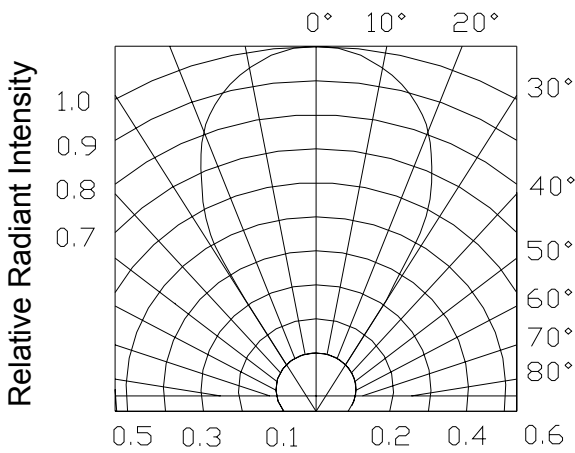




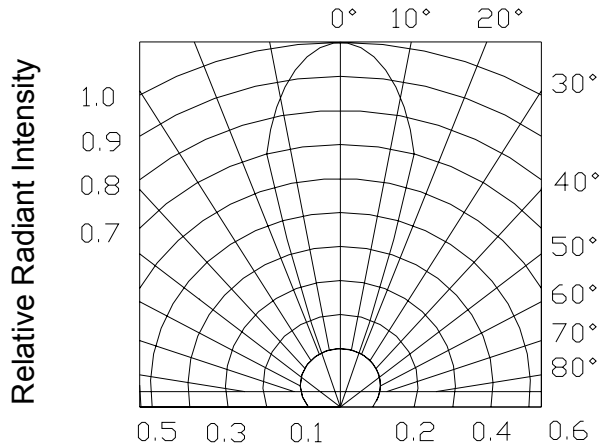
VIEW ANGLE
EP2012-150XX
EP2032-150XX



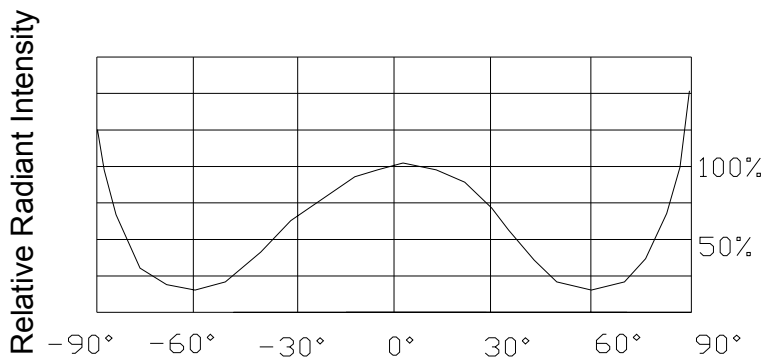
VIEW ANGLE
EP2034-150XX



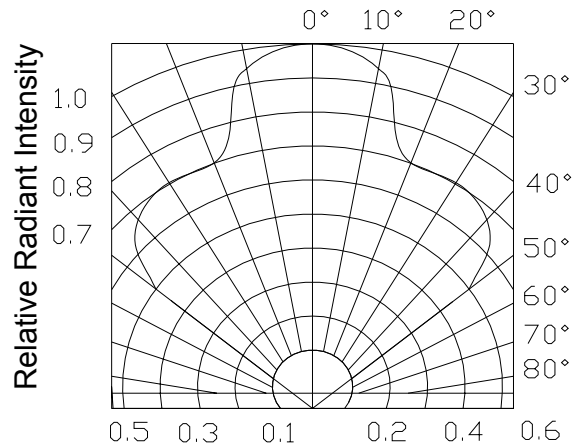
VIEW ANGLE
EP201C-150XX



VIEW ANGLE
EP2036-150XX



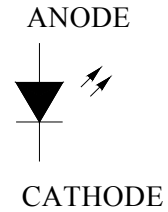
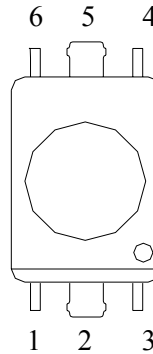
VIEW ANGLE
EP202S-150XX



VIEW ANGLE
EP204K-150XX

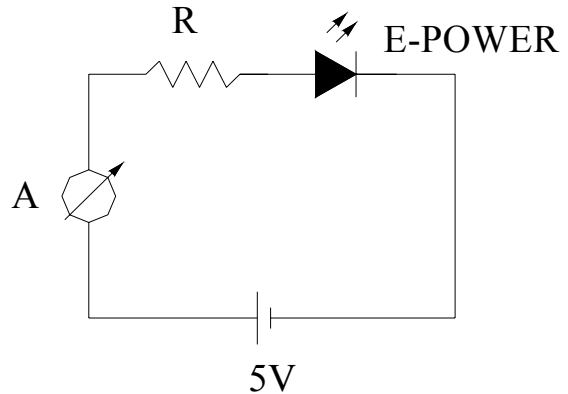
PIN CONNECTION

COLOR	R	G	B	C	A	RD	AD
ANODE	6	6	6	6	6	6	6
CATHODE	2 5	3	3	3	2 5	3	3

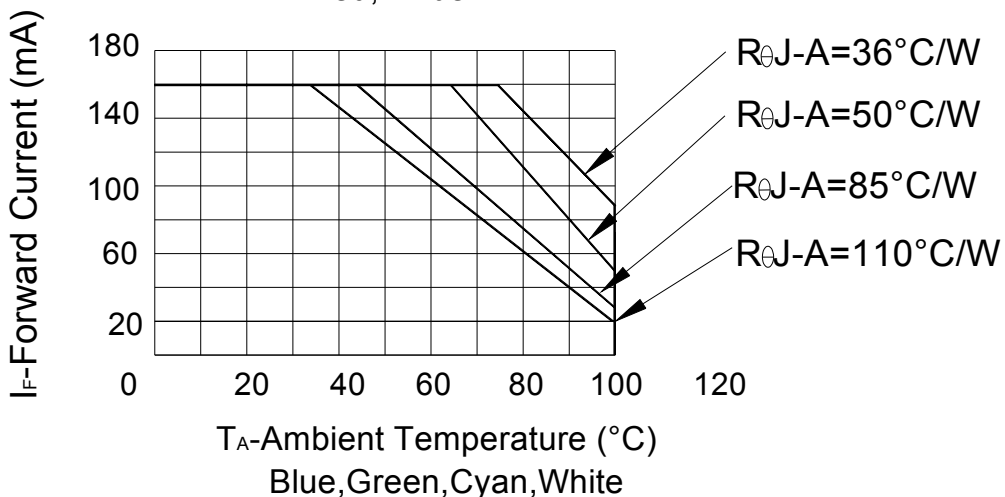
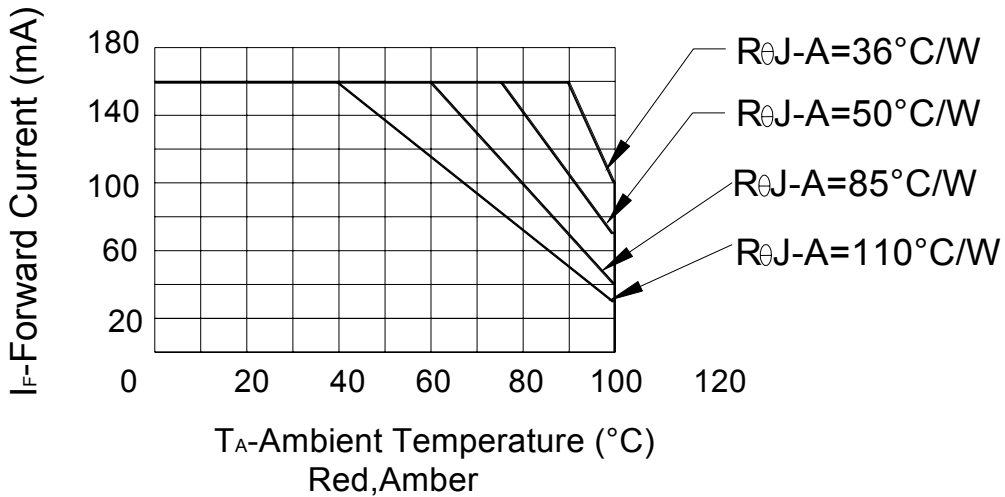


TEST CIRCUIT

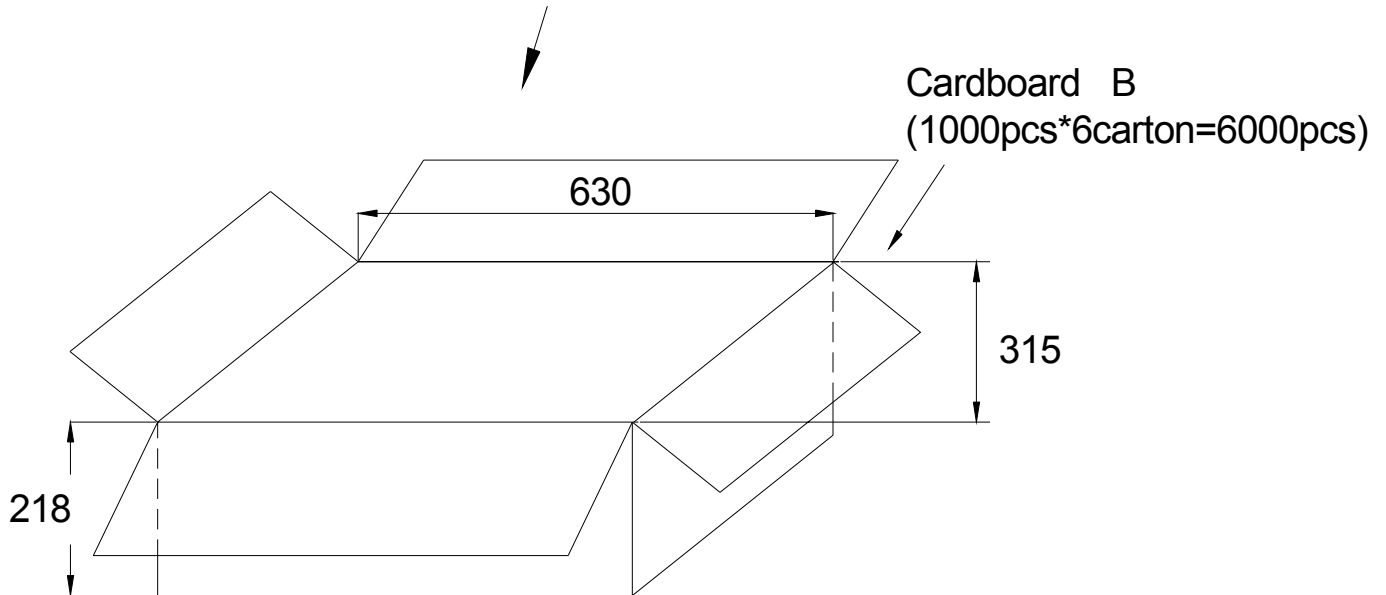
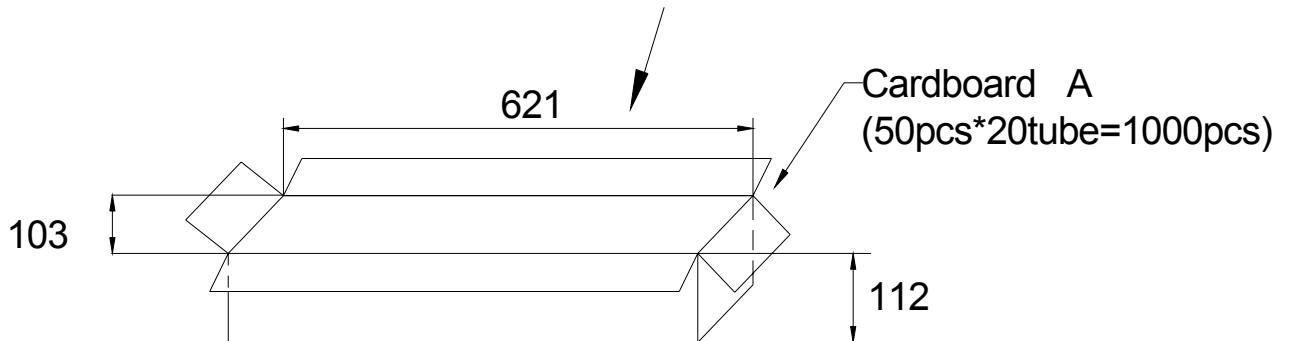
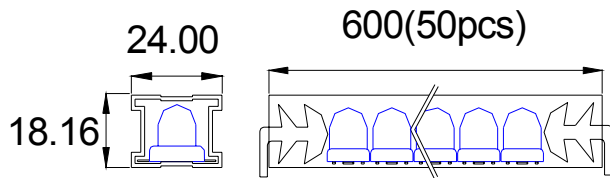
COLOR	Vf (min)	R(100mA)	R(150mA)
R	2V	30 Ω	20 Ω
A	2V	30 Ω	20 Ω
B	3.5V	15 Ω	10 Ω
C	3.5V	15 Ω	10 Ω
G	3.5V	15 Ω	10 Ω
RD	2V	30 Ω	20 Ω
AD	2V	30 Ω	20 Ω



MAXIMUM FORWARD CURRENT VS. AMBIENT TEMPERATURE



PACKING SPECIFICATIONS



Notes:

- 1.All dimensions are in millimeters.
- 2.Normal packing Quantity:1000pcs.
- 3.The carton B contains 6 carton A at maximum.

RELLINABILITY TEST FOR E-POWER LAMPS

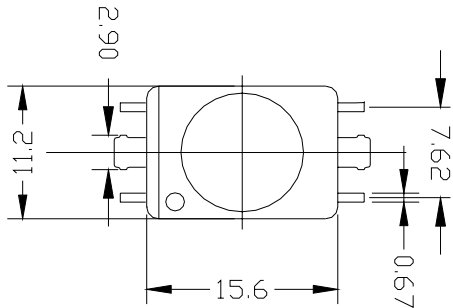
Classification	Test Item	Description and Test Condition	Reference Standard
Endurance Test	Operation Life	Evaluates resistance of the device when operated at electrical stress Ta=under room temperature IF=150mA Test Time=1000hrs(-24hrs,+72hrs)	
	High Temperature Storage	Evaluates device durability for long term storage in high temperature Ta=100±5°C Test Time=1000hrs(-24hrs,+72hrs)	
	Low Temperature Storage	Evaluates device durability for long term storage in low temperature Ta=-40±5°C Test Time=1000hrs(-24hrs,+72hrs)	
Environmental Test	Temperature Cycling	Evaluates resistance of device at thermal stresses or expansion and contraction 100°C~25°C~-40°C~25°C 30min 5min 30min 5min 10Cycles	
	Thermal Shock	Evaluates device's structure and mechanical resistance when suddenly exposed at severe changes 100±5°C~-40±5°C 30min 30min 10 Cycles	
	Solder Resistance	Evaluates resistance to thermal stress caused by soldering T.Sol=230±5°C Dwell Time=5±1sec	
	Solderability	Evaluates solderability on leads of device T.Sol=230±5°C Dwell Time=3±1sec.	

E-POWER OPERATING PROCEDURE

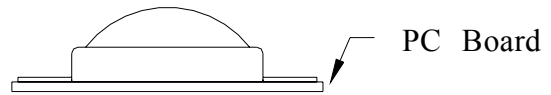
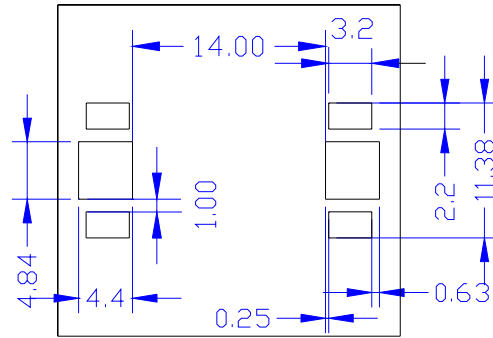
1. E-power 150 series should be operated at 150 mA for ideal performance, but not more than 160 mA.
2. E-power has been designed to be compatible with automated SMD production line. It can be soldered with solder paste using reflow process. The suggested heating curve for reflow is shown in the data sheet.
3. Blue, Cyan, Green and White colors must be used in conjunction with heat-sinking devices. Soldering on PCB with mid-connection point while keeping the layout pattern (25.4 mm X 25.4 mm) is another way to help heat dissipation.
4. Please be aware that the mid-connection point for Red and Amber is negative-polarity while it is non-polarity in Blue, Cyan, Green and White.
5. E-power products are sensitive to static, especially in Blue, Cyan, Green . Operators must wear static wristband (wireless static wristband is prohibited) and be well grounded while working in the environment with an ionizing air blower. Anti-static requirement should be under ESD 10V.
6. E-power products are fully tested and shipped in anti-static packaging.
7. A non-conductive heat-dissipating paste should be applied between E-power and heat-sinking device.
8. It is recommended to design circuit in series with protected IC to limit current flow. In a parallel connection, each IC should be protected individually.

HOW TO USE E-POWER LED

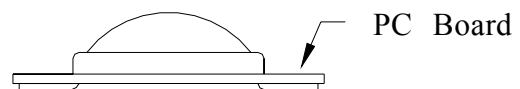
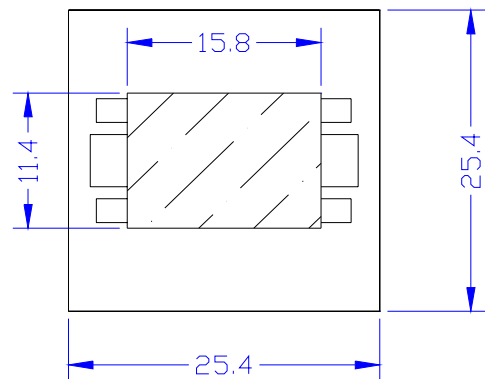
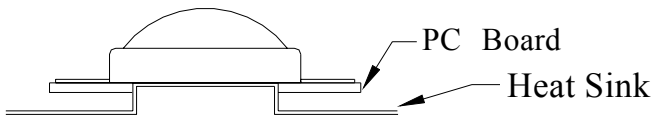
(1)E-Power LED dimensions



(3)Recommended layout pattern



(2)Accelerate heat dissipation



All dimensions are in millimeters.

PART NO. SYSTEM OF E-Power LED

EP 2 0X X-150 XX

1---2-3-4-5-----6-----7

1.E -Power LED

2.YEAR 2002

3.PACKAGE TYPE:01=10mm LENS;03=5mm LENS;04=11 mm LENS

4.VIEWING ANGLE: 2*5=10° ; 4*5=20 ; 6*5=30 ; C*5=60 ; K*5=100°

5.CURRENT:150mA

**6. λD: R1=620nm(Red), RD2=624nm(Red),A1=590nm(Amber),B1=470nm(Blue),
C1=505nm(Cyan),G1=525nm(Green)**