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DATA SHEET

PART NO. : EP204K-35G1R1B1-CA

V : A / 12

CUSTOMER'S APPROVAL: _____ DCC: _____

DRAWING NO. : DS-51-03-0037

DATE : 2006-08-24

Page : 1



EP204K-35G1R1B1-CA

A/12

Enhanced Power LED Revolutionary Light Source Module

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FEATURES

- Meet RoHS, Green Product
- Full color in one single LED
- Low thermal resistance
- Changeable color temperature

TYPICAL APPLICATIONS

- Reading Light / Flash Light / Track Lighting
- Under Shelf / Task Lighting
- Emergency Lighting / Traffic Signals
- Bollards / Security / Garden Lighting
- Full Color Sign Boards

ABSOLUTE MAXIMUM RATINGS, $T_a=25^{\circ}\text{C}$

Parameter	Symbol	Rating	Units
DC Forward Current	IF	20	mA
Pulsed Forward Current	I _{fp}	35	mA
Power Dissipation	P _d	176	mW
Electrostatic Discharge Threshold	ESD	400	V
Operating Temperature Range	Topr	-35 to 85	°C
Storage Temperature Range	Tstg	-35 to 85	°C
Thermal Resistance R _{θJ-BOARD} (°C / W)	R _{j-a}	36	°C / W
LED Junction Temperature	T _j	110	°C

OPERATING CONDITIONS:

- 35mA RGB operating condition under $f=1\text{K Hz}$ and 1/8 duty cycle.
- 176mW: 6pins of E-Power LED must be mounted on Aluminum PCB.
(PCB: 25.4mm × 25.4mm 1.6t / two layers / 2.0 oz)
- LED Operating required Anti-electrostatic devices in all equipment, machinery and manual assembly.
- Suggested operation current 20mA
- Heat-sink paste required

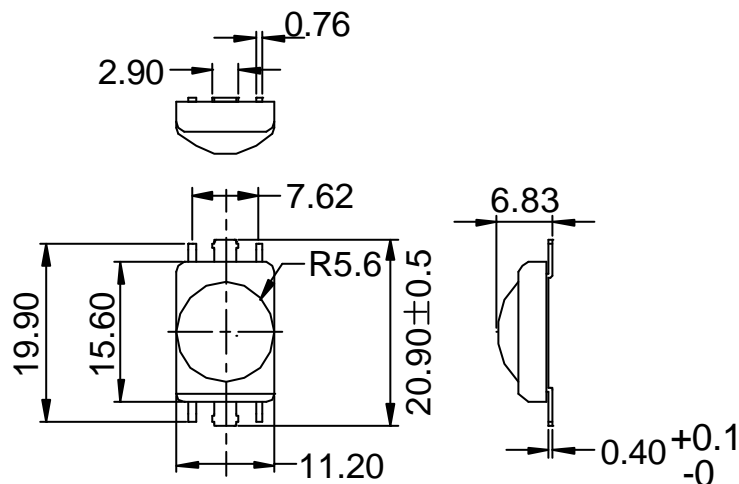
ELECTRICAL CHARACTERISTICS

Ta=25°C IF=20mA

Unit	Forward Voltage VF (Volts)		Reverse Current VR=5V IR=(uA)	Intensity IV (CD)	Total Flux (lm)	λ D(nm) or CCT(K)	Viewing Angle 2 θ 1/2 (Degrees)
	Typ	Max	Max	20mA Typ	20mA Typ	Typ	Typ
EP204K-35G1R1B1-CA	-	-	-	-	1.98	3000~11000	100°
Green	3.4	4.0	10	0.7	1.2	525	-
Blue	3.4	4.0	10	0.18	0.28	470	-
Red	2.0	2.6	10	0.29	0.5	625	-

The specification is subject to change without notice.

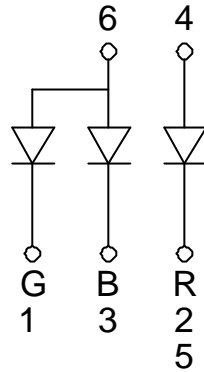
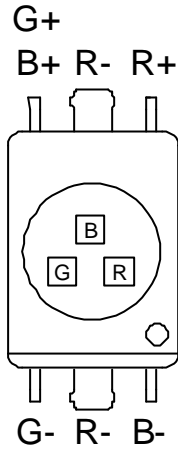
OUTLINE DRAWINGS



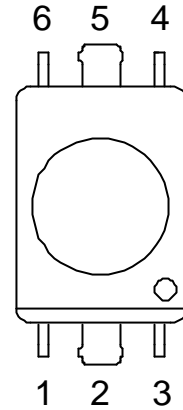
- NOTE:
1. All dimensions are in millimeters.
 2. Tolerance is ± 0.25 unless otherwise specified.
 3. The specification is subject to change without notice.

PIN CONNECTION

COMMON ANODE



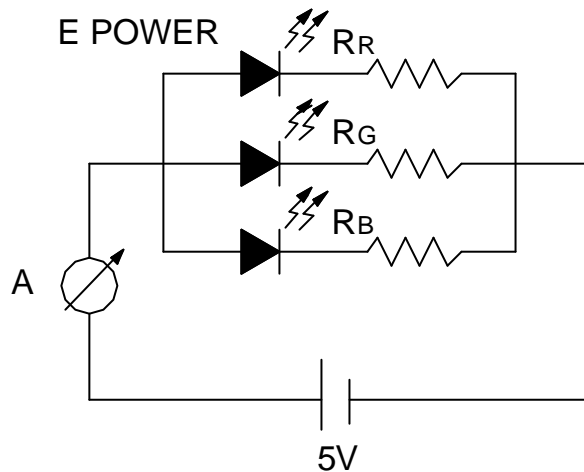
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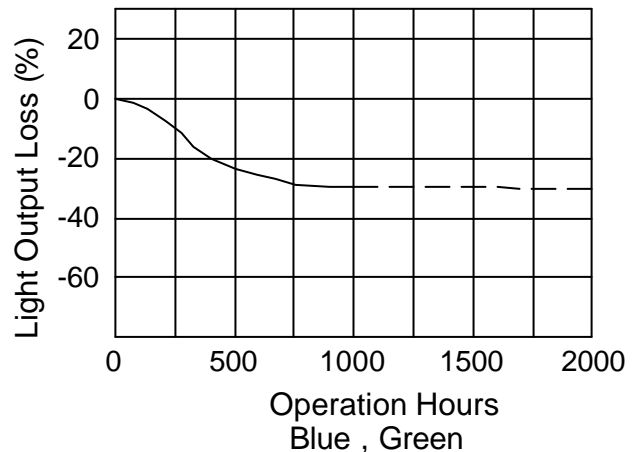
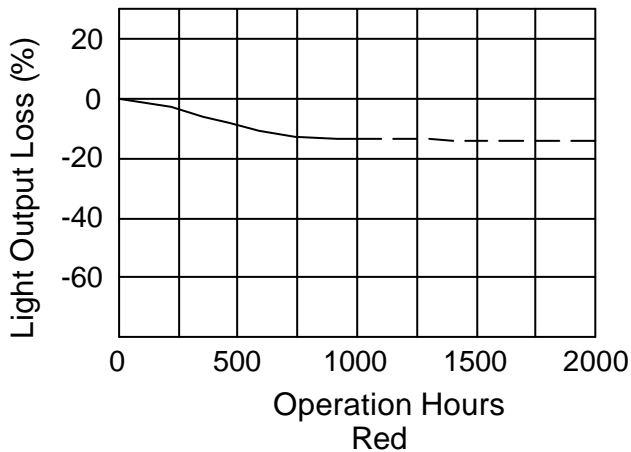
TEST CIRCUIT

EP204K-35G1R1B1-CA

COLOR	VF	R(20mA)
RR	2.0V	150 Ohm
RG	3.4V	80 Ohm
RB	3.4V	80 Ohm

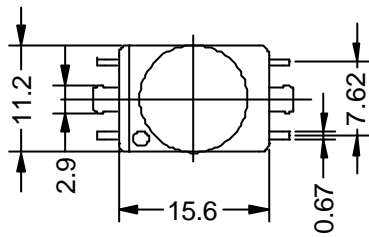


OPERATION LIFE



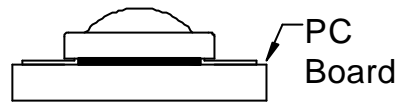
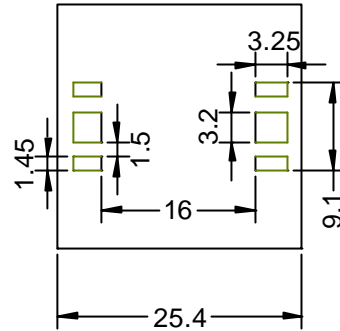
HOW TO USE E-POWER LED

(1) E-Power LED dimensions

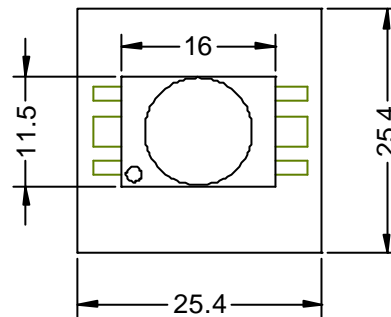
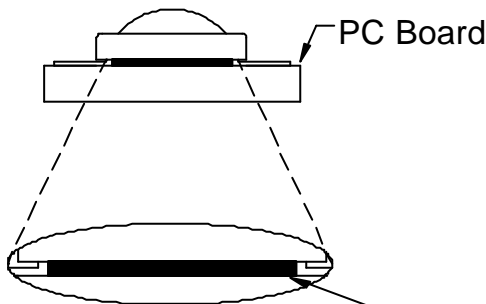


All dimensions are in millimeters.

(3) Recommended layout pattern



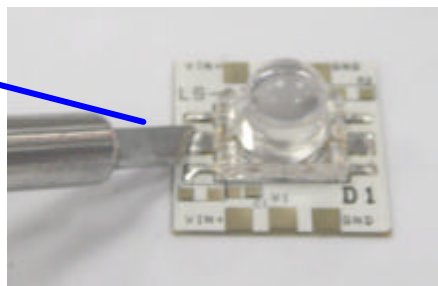
(2) Accelerate heat dissipation



* To fill up the heat sink paste.

- (4) Iron soldering only used constant temperature a soldering-iron 300°C/5sec by the iron with knife type head, the procedure as following (attached picture):
- 4-1 Put the iron head in PCB PAD area, then add the tin (0.8mm) thawed between the pin head and iron head.
 - 4-2 It can be soldered when the iron head is pressed to lead.

Soldering head





EP204K-35G1R1B1-CA

A12

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** E-POWER VF BIN DISTRIBUTION

Red , Amber			Blue , Cyan , Green		
BIN	MIN(V)	MAX(V)	BIN	MIN(V)	MAX(V)
V1	1.8	2.0	V1	3.0	3.2
V2	2.0	2.2	V2	3.2	3.4
V3	2.2	2.4	V3	3.4	3.6
V4	2.4	2.6	V4	3.6	3.8
			V5	3.8	4.0

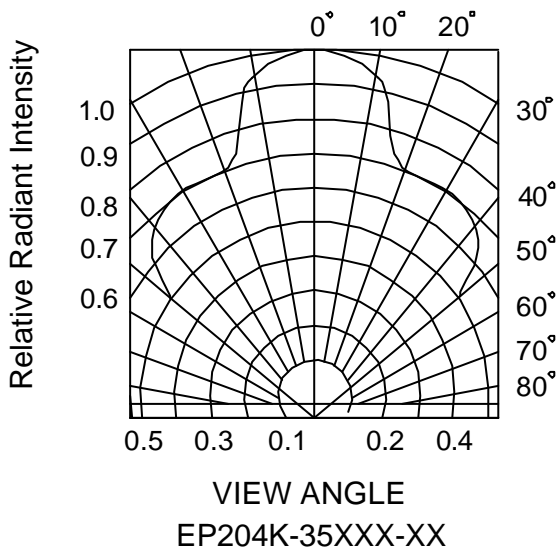
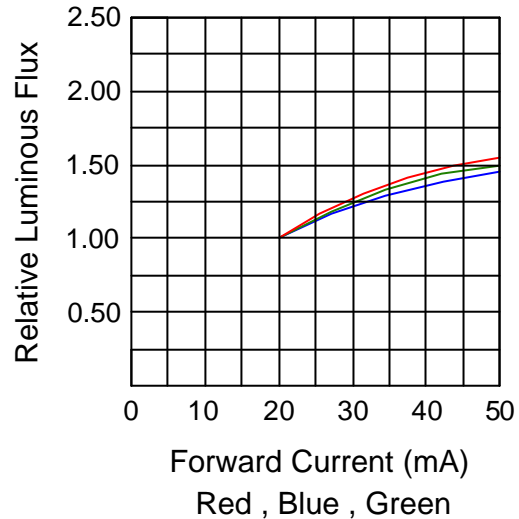
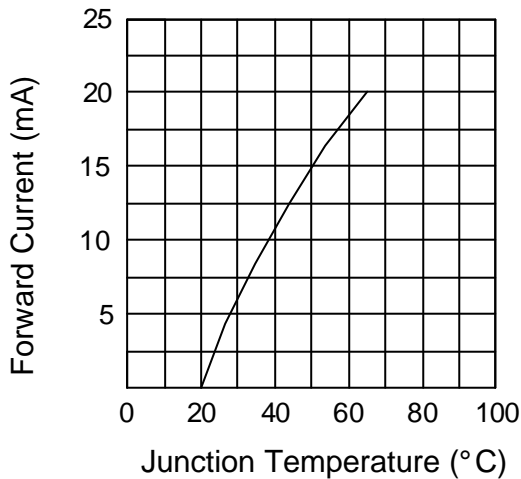
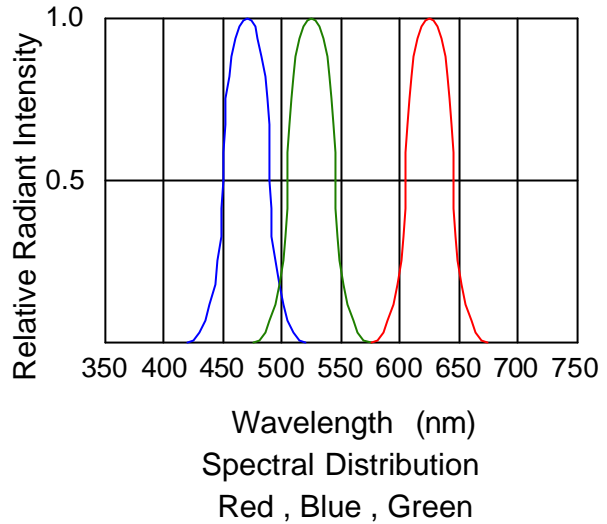
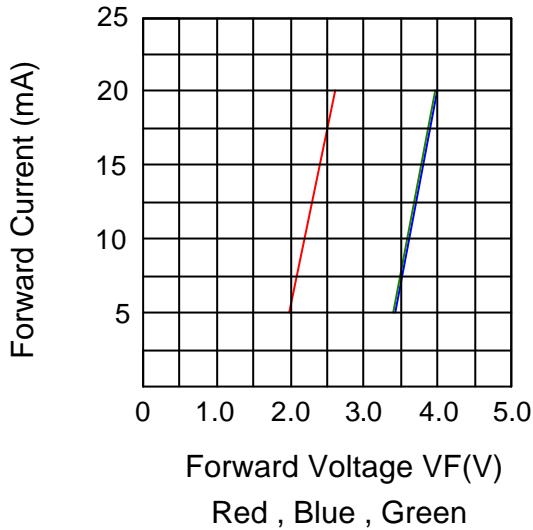
** E-POWER IV BIN DISTRIBUTION

Red			Green			Blue		
BIN	MIN(CD)	MAX(CD)	BIN	MIN(CD)	MAX(CD)	BIN	MIN(CD)	MAX(CD)
D	0.22	0.29	G	0.48	0.63	B	0.13	0.17
E	0.29	0.37	H	0.63	0.82	C	0.17	0.22
F	0.37	0.48	I	0.82	1.06	D	0.22	0.29

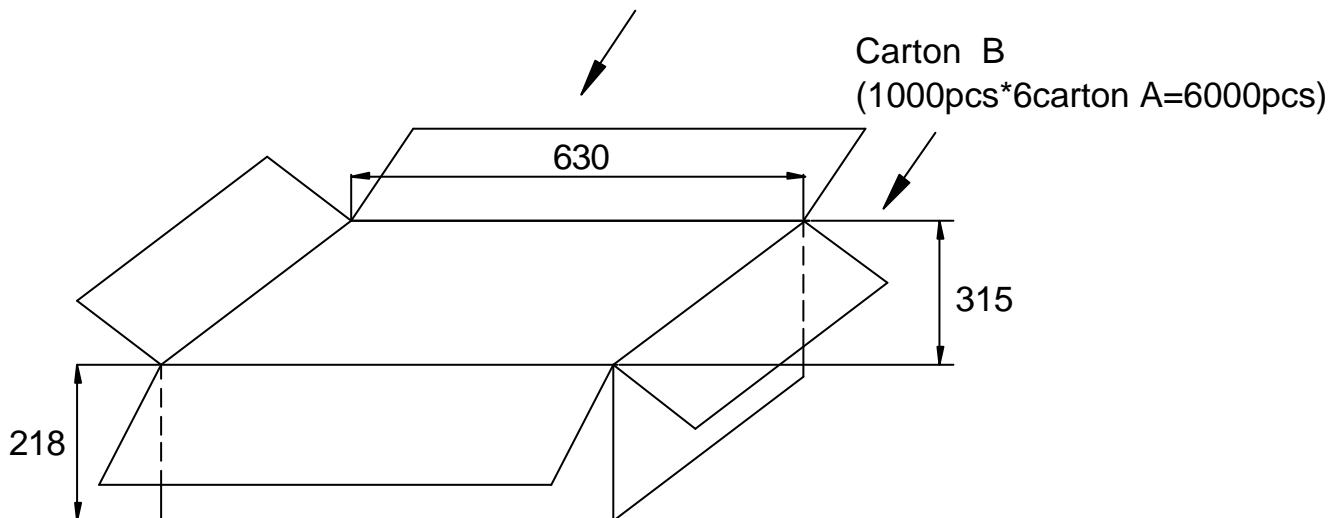
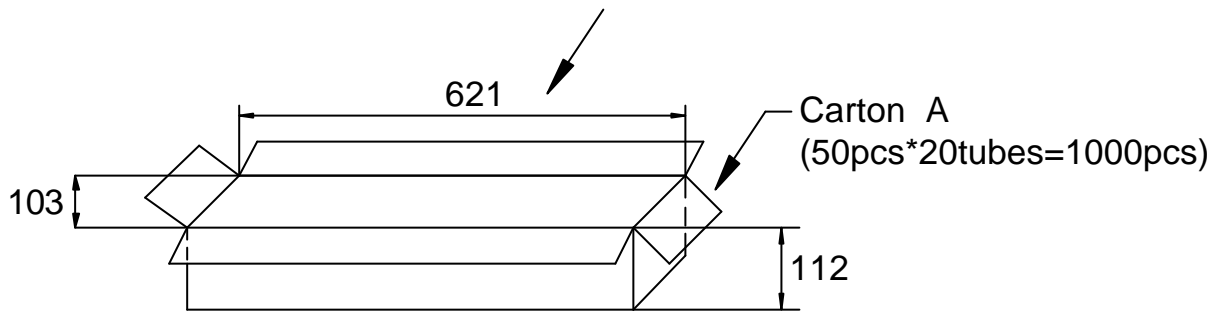
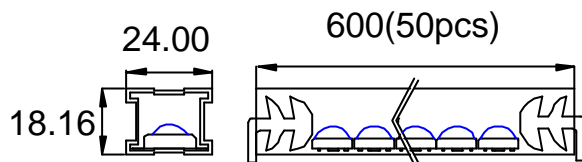
The Iv guarantee should be added $\pm 15\%$

*** Note: The specification is subject to change without notice.**

CHARACTERISTICS CURVE



PACKING SPECIFICATIONS



Notes:

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

RELIABILITY 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=20mA Test Time=1000hrs(-24hrs,+72hrs)	MIL-STD-750:1026 MIL-STD-883:1005 JIS C 7021:B-1
	High Temperature Storage	Evaluates device durability for long term storage in high temperature Ta=85±5°C Test Time=1000hrs(-24hrs,+72hrs)	MIL-STD-883:1008 JIS C 7021:B-10
	Low Temperature Storage	Evaluates device durability for long term storage in low temperature Ta=-35±5°C Test Time=1000hrs(-24hrs,+72hrs)	JIS C 7021:B-12
Environmental Test	Temperature Cycling	Evaluates resistance of device at thermal stresses or expansion and contraction 85°C ~ 25°C ~ -35°C ~ 25°C 30min 5min 30min 5min 10Cycles	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS C 7021:A-4
	Thermal Shock	Evaluates device' s structure and mechanical resistance when suddenly exposed at severe changes 85±5°C~-35±5°C 30min 30min 10 Cycles	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011
	Solder Resistance	Evaluates resistance to thermal stress caused by soldering T.Sol=245±5°C Dwell Time=6±1sec	MIL-STD-202:210A MIL-STD-750:2031 JIS C 7021:A-1
	Solderability	Evaluates solderability on leads of device T.Sol=230±5°C Dwell Time=3±1sec.	MIL-STD-202:208D MIL-STD-750:2026 MIL-STD-833:2003



EP204K-35G1R1B1-CA

A/12

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E-POWER OPERATING PROCEDURE

1. E-power 35 series should be operated at 20mA for ideal performance, but not more than 20mA.
2. 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 (25.4mm X 25.4mm) is another way to help heat dissipation.
3. 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.
4. All products are sensitive to ESD damage (+/-400 Volts by HBM condition).
5. E-power products are fully tested and shipped in anti-static packaging.
6. A non-conductive to fill up the heat sink paste should be applied between E-power and heat-sinking device.
7. 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.

* **Note: Iron soldering only used constant temperature a soldering-iron 300±5° C/5sec**

PART NO. SYSTEM OF E-POWER LED

EP 2 04 K - 35 G1R1B1 - CA

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: K = 100°
5. CURRENT: 20mA
6. λ D (Typ): R1 = 625nm (Red) , B1 = 470nm (Blue) , G1 = 525nm (Green)
7. CA (Common Anode) , CC (Common Cathode) , SE (Series Electrics)