

SHARP

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ELECTRONIC COMPONENTS GROUP

SHARP CORPORATION

SPECIFICATION

DEVICE SPECIFICATION FOR
LIGHT EMITTING DIODE

MODEL No.

GM5BW05340A

CUSTOMERS' APPROVAL

Date _____

By _____

PRESENTED

Date Mar-10-05

By T. Kotani

for

M.Katoh,
Chief of LED Business Center
LED Business Development Center
Electronic Components Group
SHARP CORPORATION

PRODUCT NAME Light Emitting Diode
MODEL No. GM5BW05340A

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2. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets, as well as the precautions mentioned below. Sharp assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets, and the precautions mentioned below.

(Precautions)

- (1) This product is designed for use in the following application areas;

* OA equipment * Audio visual equipment * Home appliance
* Telecommunication equipment (Terminal) * Measuring equipment
* Tooling machines * Computers

If the use of the product in the above application areas is for equipment listed in paragraphs (2) or (3), please be sure to observe the precautions given in those respective paragraphs.

- (2) Appropriate measures, such as fail-safe design and redundant design considering the safety design of the overall system and equipment, should be taken to ensure reliability and safety when this product is used for equipment which demands high reliability and safety in function and precision, such as ;

* Transportation control and safety equipment (aircraft, train, automobile etc.)
* Traffic signals * Gas leakage sensor breakers * Rescue and security equipment
* Other safety equipment

- (3) Please do not use this product for equipment which require extremely high reliability and safety in function and precision, such as ;

* Space equipment * Telecommunication equipment (for trunk lines)
* Nuclear power control equipment * Medical equipment

- (4) Please contact and consult with a Sharp sales representative if there are any questions regarding interpretation of the above three paragraphs.

3. Please contact and consult with a Sharp sales representative for any questions about this product.

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1. Application

This technical literature applies to the light emitting diode device Model No. GM5BW05340A
[White (from InGaN Blue LED chip + Yellow Phosphor) LED device]

2. Outline dimensions and terminal connections ----- Refer to the attached sheet Page 3.

3. Ratings and characteristics ----- Refer to the attached sheet Page 4 ~ 6.

3-1. Absolute maximum ratings

3-2. Electro-optical characteristics

3-3. Derating Curve

3-4. Characteristics Diagram

4. Precautions for use ----- Refer to the attached sheet Page 7 ~ 8.

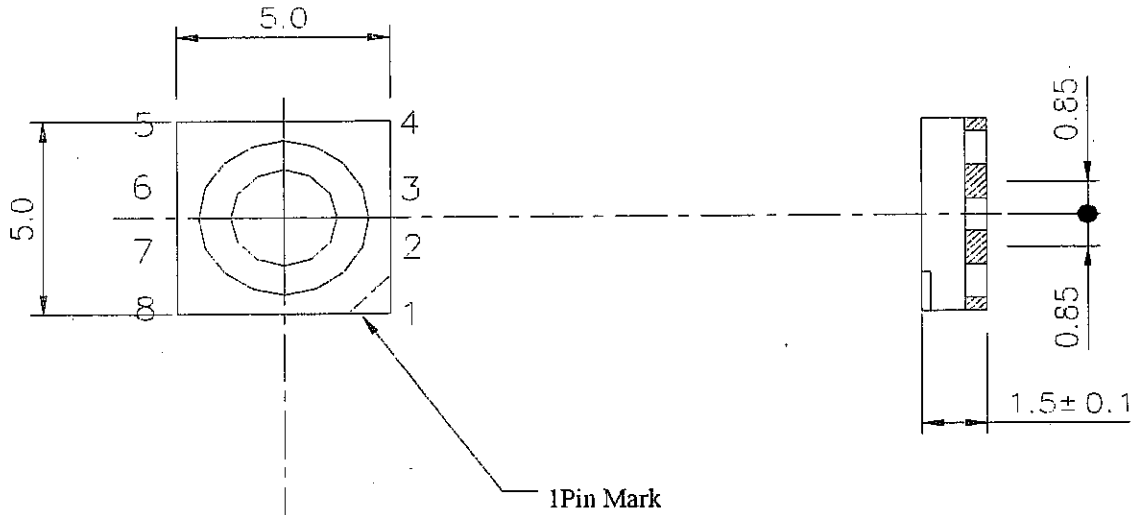
4-1. Precautions matters for designing circuit

4-2. Soldering

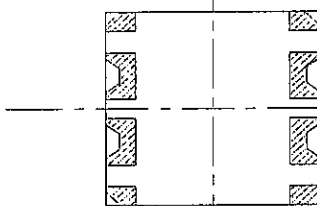
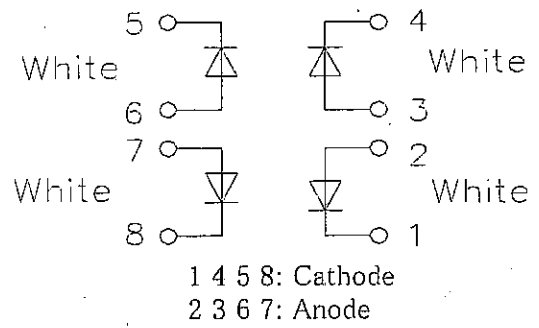
4-3. Cleaning method

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2. Outline dimensions and terminal connections



1.Pin Connection



2. Unspecified tolerance to be ± 0.3

3. Recommended soldering pattern

unit	Material	Finish	Drawing No.
mm	Substrate:BT-resin Reflector: PPA	Terminal:Au coat Reflector:Al evaporation	517020002

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3. Ratings and characteristics

3-1. Absolute maximum ratings

(Ta=25 °C)

Parameter	Symbol	Rating	Unit
Total Power dissipation	P	560	mW
Continuous forward current (*1)	I _F	35	mA
Peak forward current(*2)	I _{FM}	150	mA
Derating factor	DC	0.71	mA/°C
	Pulse	2.00	mA/°C
Reverse voltage	V _R	5	V
Operating temperature	T _a	-30 to +85	°C
Storage temperature	T _{stg}	-40 to +100	°C
Soldering temperature (*3)	T _{sol}	290	°C

(*1) Rating per one chip when four chips turns on simultaneously.

(*2) Duty ratio = 1/10, Pulse width = 400ms Rating per one chip when four chips turn on simultaneously.

(*3) Manual soldering Max. 3 seconds.

3-2. Electro-optical characteristics

(Ta=25 °C)

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Forward Voltage(*4)	V _F	I _F =20 mA turn on each chip	—	3.4	4.0	V
Luminous Intensity(*5)	I _V	I _F =20 mA turn on 4chip	8	10	—	cd
Chromaticity Coordinate(*6)	x y		— —	0.31 0.31	— —	— —
Reverse Current	I _R	V _R =4V	—	—	100	μA
Radiation Pattern	2θ _{1/2}	I _F =20 mA turn on 4chip	-	70	—	°

(*4) Rating of each chip.

(*5) This is Luminous Intensity, when four chips turns on simultaneously.

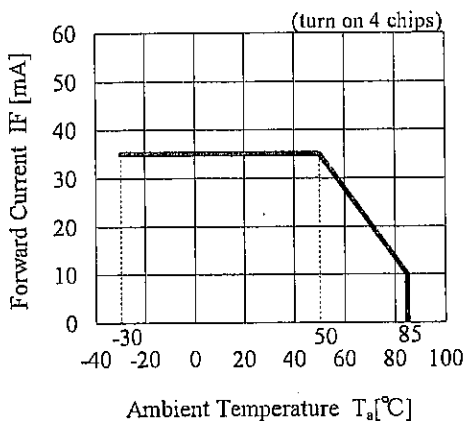
Measured by EG&G MODEL550(Radiometer/Photometersystem) after 20ms drive
(Tolerance : ±15%)

(*6) This is Chromaticity Coordinate, when four chips turns on simultaneously.

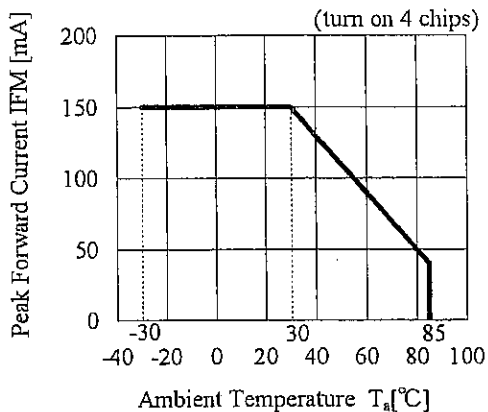
Measured by Ohtsuka electronics MODEL MCPD-2000 after 20ms drive
(Tolerance : x,y:±0.02)



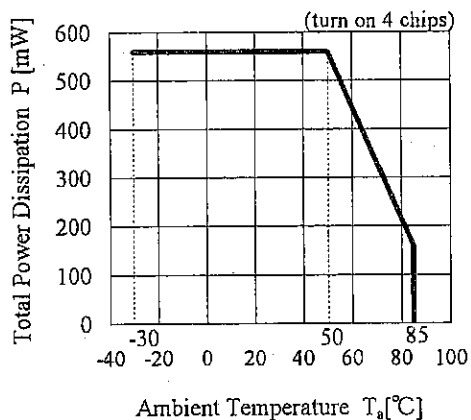
3-3. Derating Curve



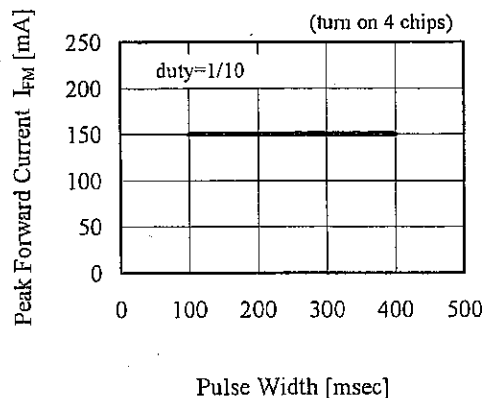
(*1)
Forward Current Derating Curve



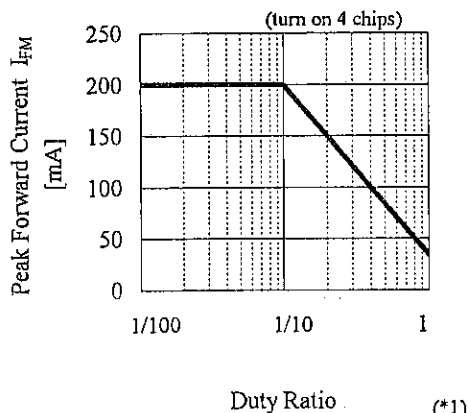
(*1)
Peak Forward Current Derating Curve



(*2)
Power Dissipation Curve



(*1)
Peak Forward Current vs. Pulse Width ($T_a=25^\circ\text{C}$)

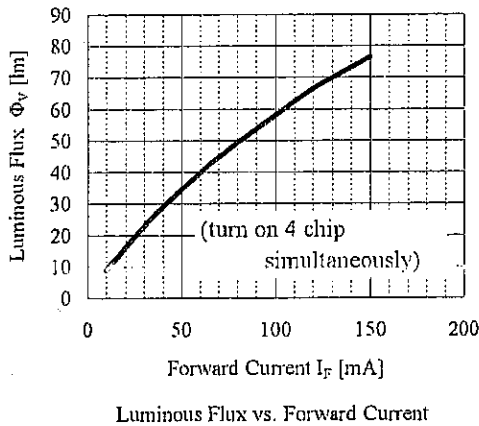
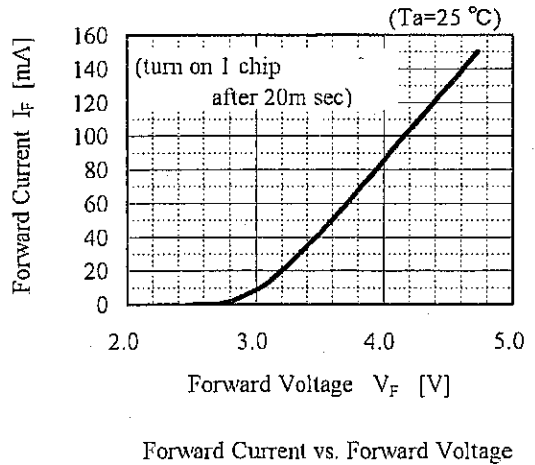
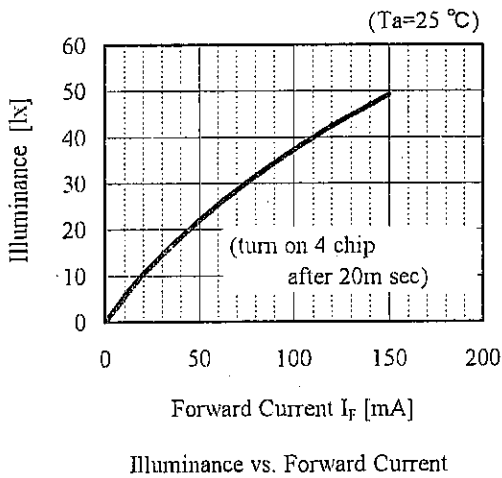
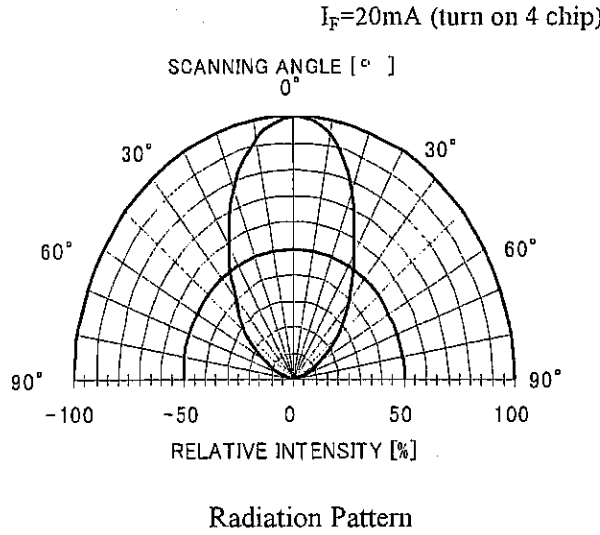
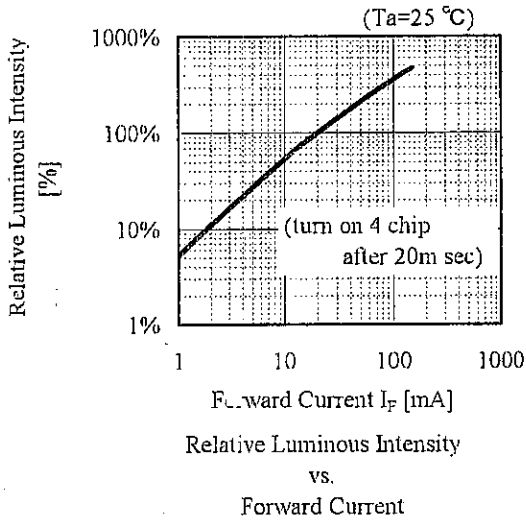


(*1)
Peak Forward Current vs. Duty Ratio
($T_a=25^\circ\text{C}$)

(*1) Rating per one chip
when four chips turns on simultaneously.
(*2) Rating when four chips turns on simultaneously.

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3-4. Characteristic chart (Note)



(Note) Above characteristic data are measurement data.

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4. Precautions for use

4-1. Precautions matters for designing circuit

- When designing a circuit, please make sure that not to give a reverse voltage to the LED.
- There is a case that LED to be damaged with external stresses since the devices very small. Please make sure that not to give any shock to the LED after assembling.
- Blue chip LED and fluorescent materials are used as luminescent materials. Please note there is possibility to have color change in some degree depended on applied current.
- Please note there is possibility to damage your eyes when person look LED in face for long time.
- During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound.
- When populating boards in SMT production, there are basically no restrictions regarding the form of the pick and place nozzle, except that mechanical pressure on the surface of the resin must be prevented.

This is assured by choosing a pick and place nozzle which is larger than the LED's reflector area.

4-2. Soldering

4-2-1. Reflow soldering

- (1) It is not recommended to exceed the soldering temperature and time shown below. Caused by substrate bend or the other mechanical stress during reflow soldering may happen gold wire disconnection etc. Therefore please check and study your solder reflow machine's best condition.
- (2) In case of 2 times reflow process, 2nd reflow process should be done within 3 days after opening package. (Storage condition ; at 30°C, RH less than 60%RH)
- (3) LED electrode and leadframe are comprised of a silver plated copper alloy. The silver surface may be attacked by environments which contain corrosive gases and so on. Please avoid conditions which may cause the LED to corrode, tarnish or discolor. This corrosion or discoloration might lower solderability or might affect on optical characteristics.
- (4) Reflow soldering temperature profile
Use the conditions shown to the under figure. ※After reflow soldering, rapid cooling should be avoided.

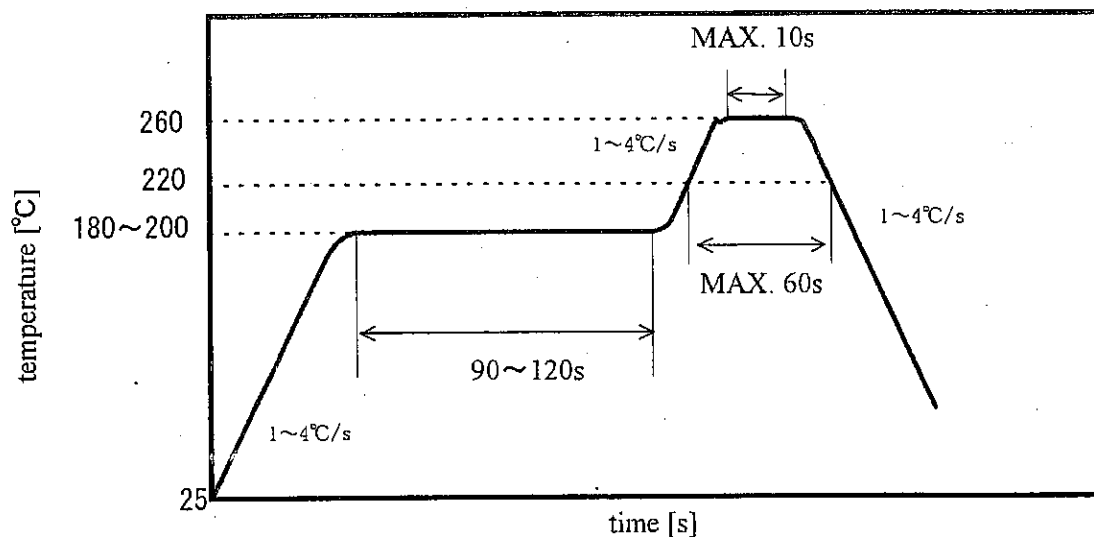


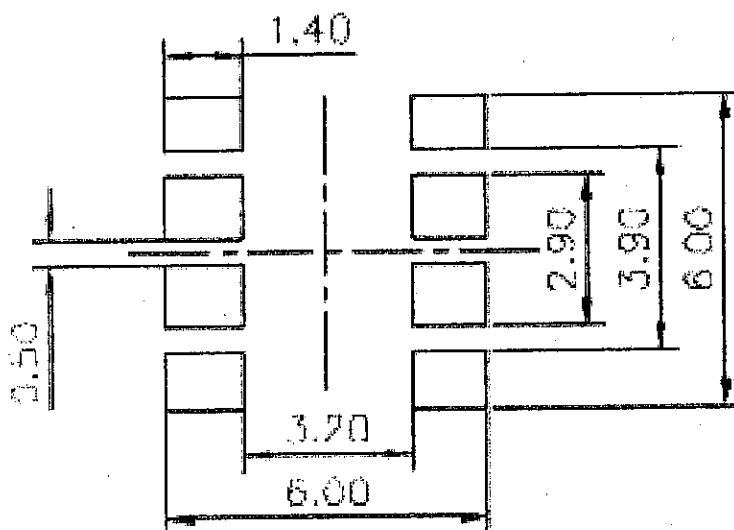
Fig. Reflow soldering temperature profile

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4-2-2. Precaution for use

- (1) Recommendable Metal Mask pattern for screen print
 Recommend 0.15mm thickness metal mask for screen print. Caused by solder reflow condition, solder paste, substrate and the other material etc., may change solderability.
 Please check and study actual solderability before usage.

Solder resist



Note

- 1) Please do not mount any heating unit (resistor etc) on the rear surface of LED.
- 2) Heating unit should be located far from LED as much as possible.
- 3) In order to have enough heat radiation, please make pattern thick as much as possible. (Especially, against the lead of NO. 2, 3, 6, 7 → attached page 3)

4-3. Cleaning method

Use no clean solder and do not clean the LED's. When cleaning is absolutely necessary, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not.
 Do not clean the LED's by the ultrasonic.