

< Specifications (Precautions and Prohibitions) >

● **Precaution for circuit design**

- 1) The products are designed and produced for application in ordinary electronic equipment (AV equipment, OA equipment, telecommunication equipment, home appliances, amusement equipment, etc.).
If the products are to be used in devices requiring extremely high reliability (medical equipment, transport equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or operational error may endanger human life and sufficient fail-safe measures, please consult with the ROHM sales staff in advance. If product malfunctions may result in serious damage, including that to human life, sufficient fail-safe measures must be taken, including the following:
 - [a] Installation of protection circuits or other protective devices to improve system safety
 - [b] Installation of redundant circuits in the case of single-circuit failure

- 2) The products are designed for use in a standard environment and not in any special environments. Application of the products in a special environment can deteriorate product performance. Accordingly, verification and confirmation of product performance, prior to use, is recommended if used under the following conditions:
 - [a] Use in various types of liquid, including water, oils, chemicals, and organic solvents
 - [b] Use outdoors where the products are exposed to direct sunlight, or in dusty places
 - [c] Use in places where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [d] Use in places where the products are exposed to static electricity or electromagnetic waves
 - [e] Use in proximity to heat-producing components, plastic cords, or other flammable items
 - [f] Use involving sealing or coating the products with resin or other coating materials
 - [g] Use involving unclean solder or use of water or water-soluble cleaning agents for cleaning after soldering
 - [h] Use of the products in places subject to dew condensation

- 3) The products are not radiation resistant.

- 4) The Company is not responsible for any problems resulting from use of the products under conditions not recommended herein.

- 5) The Company should be notified of any product safety issues. Moreover, product safety issues should be periodically monitored by the customer.

- 6) De-rate Power Dissipation (Pd) depending on Ambient temperature (Ta).
When used in sealed area, confirm the actual ambient temperature.

- 7) Confirm that operation temperature is within the specified range described in product specification.

- 8) Failure induced under deviant condition from what defined in the product specification can not be guaranteed.

- 9) When product safety related problems arises, please immediately inform to ROHM, and consider technical counter measure.

DESIGN	CHECK	APPROVAL	DATE:Nov./29/2012	SPECIFICATION No. : TENTATIVE (20121129)
<i>T.Nakagawa</i>	<i>M.Kobayakawa</i>	<i>S.Isokawa</i>	REV. 001	ROHM Co.,Ltd.

< Specifications (Precautions and Prohibitions) >

● **Precaution for Mounting / Circuit board design**

When a highly active halogenous (chlorine, bromine, etc.) flux is used, the remainder of flux may negatively affect product performance and reliability.

● **Precautions Regarding Application Examples and External Circuits**

- 1) If change is made to the constant of an external circuit, allow a sufficient margin due to variations of the characteristics of the products and external components, including transient characteristics, as well as static characteristics.
- 2) The application examples, their constants, and other types of information contained herein are applicable only when the products are used in accordance with standard methods. Therefore, if mass production is intended, sufficient consideration to external conditions must be made.

● **Precautions for Electrostatic**

This product is Electrostatic sensitive product, which may be damaged due to Electrostatic discharge. Please take proper caution during manufacturing and storing so that voltage exceeding product maximum rating won't be applied to products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of Ionizer, friction prevention and temperature / humidity control).

● **Precautions for product label**

QR code printed on ROHM product label is only for internal use, and please do not use at customer site. It might contain an internal part number that is inconsistent with a product part number.

● **Precautions for disposition**

When disposing products please dispose them properly with an industry waste company.

● **Precautions for Foreign exchange and Foreign trade act**

Since conceded goods have not been determined to be fallen under controlled goods prescribed by Foreign Exchange and Foreign Trade act or not, please consult with ROHM in case of export.

● **Prohibitions Regarding Industrial Property**

- 1) These Specifications contain information related to the ROHM industrial property. Any use of them other than pertaining to the usage of appropriate products is not permitted. Duplication of these specifications and its disclosure to a third party without the Company's permission are prohibited.
- 2) Information and data on products, including application examples, contained in these specifications are simply for reference; the company does not guarantee any industrial property rights, intellectual property rights, or any other rights of a third party regarding this information or data. Accordingly, the Company does not bear any responsibility for:
 - [a] infringement of the intellectual property rights of a third party
 - [b] any problems incurred by the use of the products listed herein
- 3) The Company prohibits the purchaser of its products to exercise or use the intellectual property rights, industrial property rights, or any other rights that either belong to or are controlled by the Company, other than the right to use, sell, or dispose of the products.

< Specifications (Precautions and Prohibitions) >

● **Precautions for Storage / Transportation**

- 1) Product performance and soldered connections may deteriorate if the products are stored in the following places:
 - [a] Where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [b] Where the temperature or humidity exceeds those recommended by the Company
 - [c] Storage in direct sunshine or condensation
 - [d] Storage in high Electrostatic

- 2) Storage temperature and humidity
 - [a] Package : Not to be opened before using
 - [b] After unpackaging : LEDs to be kept in our moisture proof package with some desiccant (SILICA GEL) LEDs to be baked in case the SILICAGEL indicator changed its color from either blue to clear or green to pink.
 - [c] Early use is recommended after unsealed.
Return the unused items into the moisture proof package and seal tightly.
Please refer to the individual specifications for the expiration terms of use.
 - [d] The baking condition may not be the same for very item.
Please refer the individual specifications for the detail.

- 3) Even under ROHM recommended storage condition, solderability of products over 1 year old may be degraded.

- 4) Store / transport cartons in the correct direction, which is indicated on a carton as a symbol.
Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.

● **Other Matters**

- 1) Please sign these Specifications and return one copy to the Company.
If a copy is not returned within three months after the issued date specified on the front page of these Specifications, the Company will consider the Specifications accepted.

- 2) If any matter related to these Specifications needs to be clarified, discussions shall be held promptly between the two parties concerned to determine the issue.

- 1. CONSTRUCTION White surface mount LEDs featuring InGaN packed with resin containing phosphor.
- 2. USAGE Light Source for display and back light unit.
- 3. DIMENSIONS See Figure.1
- 4. ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Power Dissipation	P D	.....	33mW	} ※
Forward Current	I F	.....	10mA	
Peak Forward Current	I F P	.....	50mA (Notes 1)	
Reverse Voltage	V R	.....	5V	
Operating Temperature	Topr	.....	-40°C ~ + 85°C	
Storage Temperature	Tstg	.....	-40°C ~ +100°C	
(Notes1 Duty 1/10 1kHz)				

※The value is based on the die destruction endurance; optical characteristics are NOT considered.

5. ELECTRO-CHARACTERISTICS (Ta=25°C)

DISCRIPTION	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNITS
Forward Voltage	VF	IF=5mA *1	—	2.9	3.3	V
Reverse Current	IR	VR=5V	—	—	100	μA
Luminous Intensity	IV	IF=5mA *2	90	150	(360)	mcd
Chromaticity Coordinates	x	IF=5mA *2	—	0.30	—	—
	y	IF=5mA *2	—	0.30	—	—

*1 Pulse duration : 1msec *2 Pulse duration : 10msec () : Reference

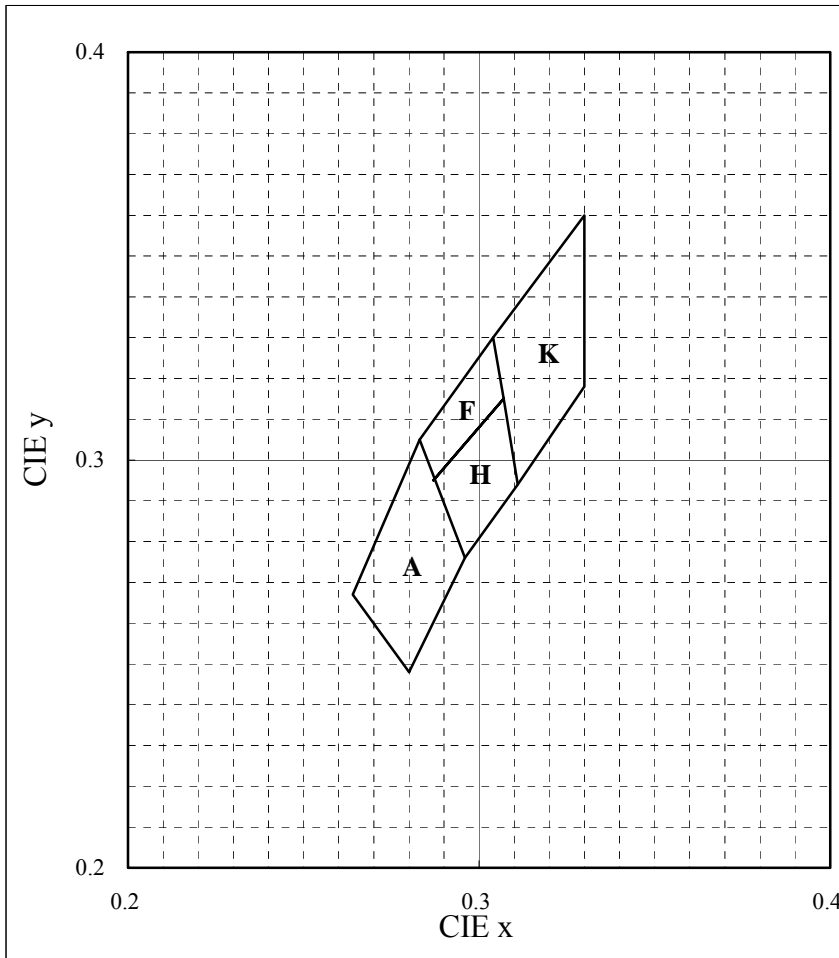
6. LUMINOUS CLASSIFICATION (Ta=25°C, IF=5mA)

SYMBOL	LUMINOUS CLASSIFICATION RANGE
“S”	90 ~ 140 mcd
“T”	140 ~ 220 mcd
“U”	220 ~ (360) mcd

If rank shift occur, we may ask for re-approval of new rank when necessary.

Measurement tolerance : ±10%, () : Reference

7. CHROMATICITY DIAGRAM



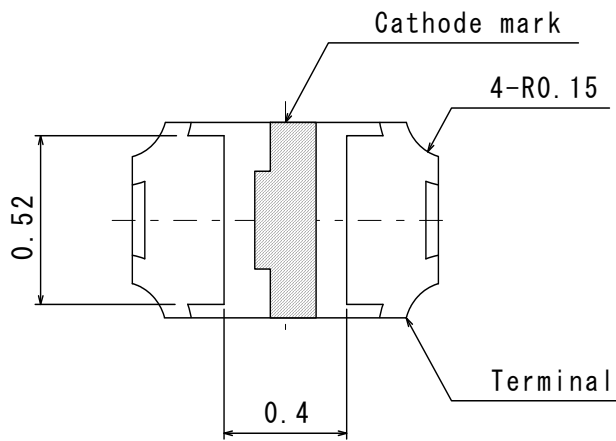
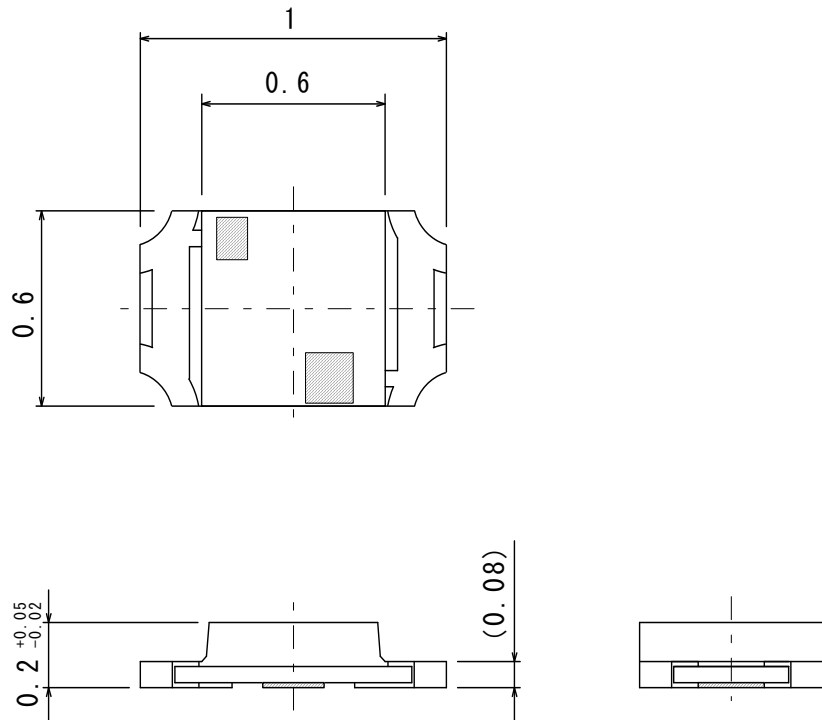
• CHROMATICITY COORDIMATES (Ta=25°C, IF=5mA)

A		F		H		K	
x	y	x	y	x	y	x	y
0.280	0.248	0.283	0.305	0.287	0.295	0.304	0.330
0.296	0.276	0.304	0.330	0.307	0.315	0.330	0.360
0.283	0.305	0.307	0.315	0.311	0.294	0.330	0.318
0.264	0.267	0.287	0.295	0.296	0.276	0.311	0.294

Measurement tolerance : ±0.02

8. PRODUCT WEIGHT Product weight per piece, approx 0.0002035gm.

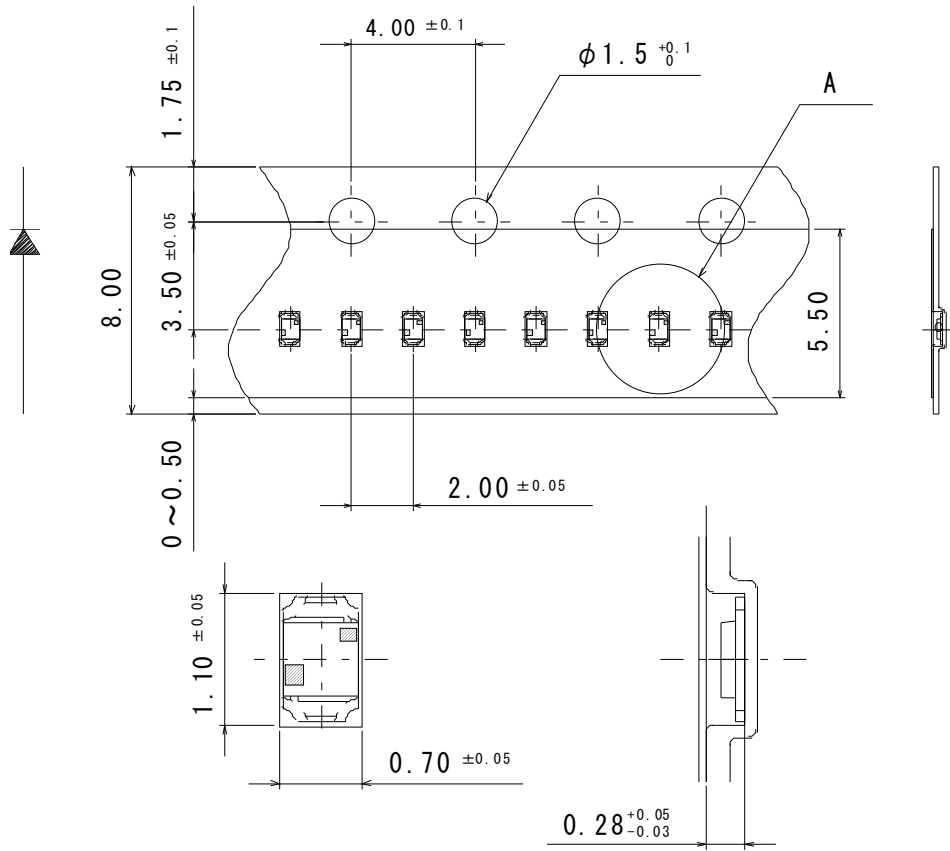
【Figure 1】



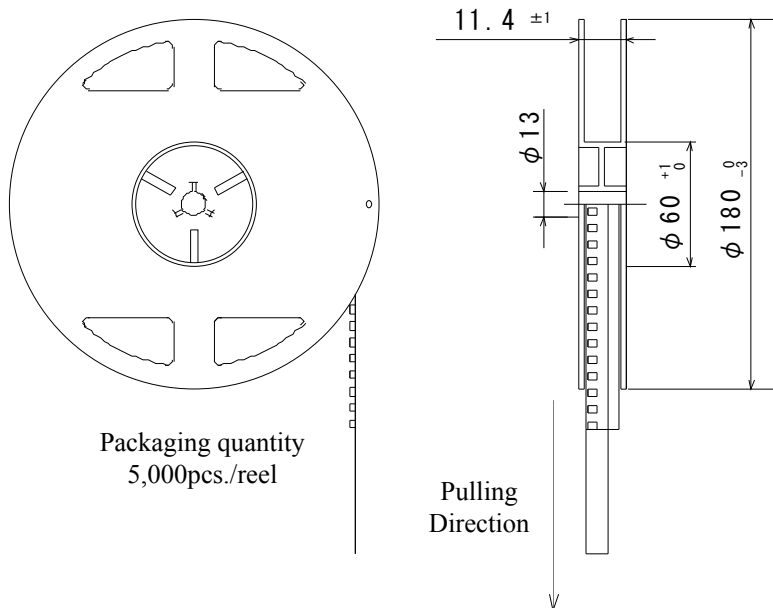
(Unit : mm)

(Note) Tolerance is $\pm 0.05\text{mm}$, unless otherwise specified.

【Taping : 1】



Enlarged drawing of "A"



Packaging quantity
5,000pcs./reel

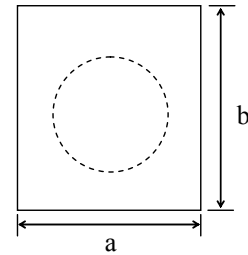
(Unit : mm)

(Note) Tolerance is ±0.1mm, unless otherwise specified.

【PACKAGING REQUIREMENTS】

1. PACKING

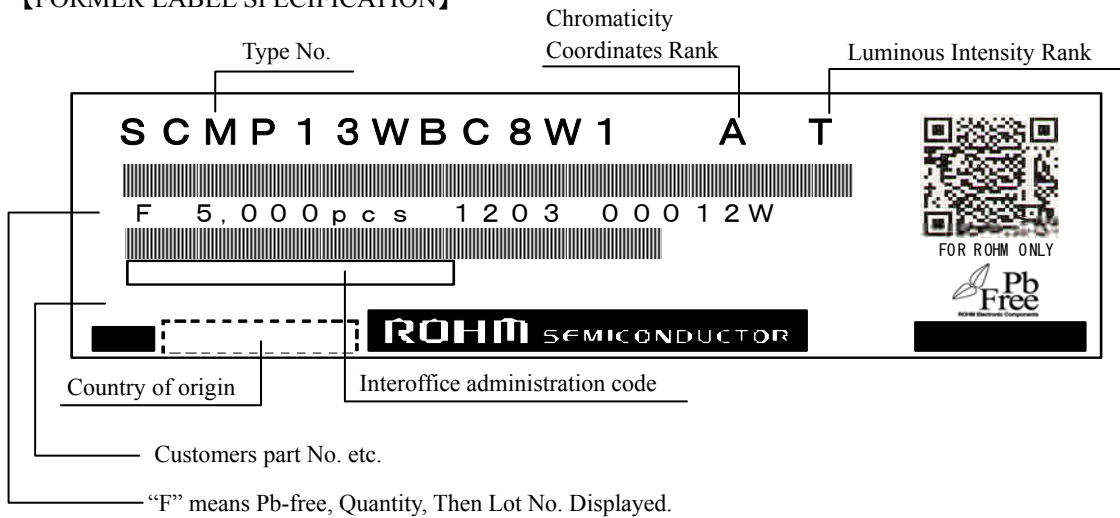
- (1) 5,000pcs are packed in one reel.
- (2) One reel is packed in aluminum bag.
The size of aluminum bag is 240(a)×250(b)mm.
- (3) Aluminum bag is sealed by pressured for all directions.



2. MARKING

The following information shall be described on a box label:
ROHM Type number, Packing quantity, Luminous intensity rank, Lot number etc.

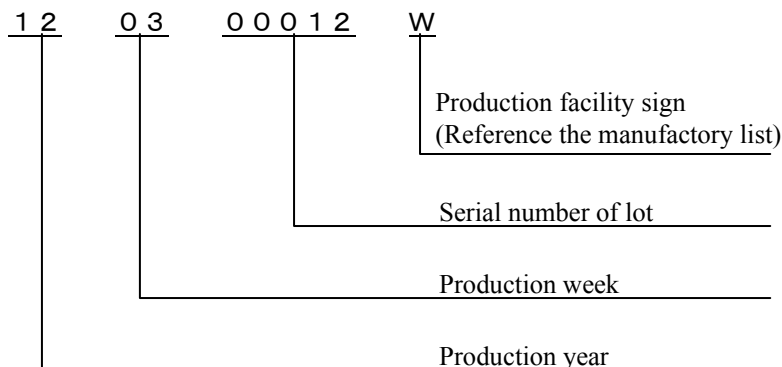
【FORMER LABEL SPECIFICATION】



Note) Indicates bar code expressed by code 39.

indicates Pb-free Products.

【EXAMPLE OF LOT NO. MARKING】



【ATTENTION POINTS IN HANDLING】

This product was developed as a surface mount LED especially suitable for reflow soldering. Please take care of following points when using this device.

Reference

Mask open area ratio : 80%
Mask thickness : 80~100μm

1. DESIGNING OF PCB

As for a recommendable solder pattern, Please refer to Fig-1.
The size and direction of the pad pattern depend on the condition of the PCB.
Thorough design review is recommended before the final designing.

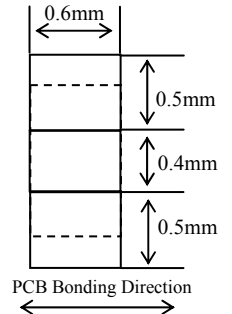
(This product of structured with rear/bottom electrode to be soldered.
The formation of solder fillet is not guaranteed due to its electrode shape.)

Additional notification of mounting :

We recommend additional facility of mounting Machine due to small size package which might be haven electrification, and product might be moved in the taping pocket.

And the mounting production efficiency will be decreased.

Ex) Magnet facility etc.



(Fig-1)

2. SOLDERING (Sn-Cu, Sn-Ag-Cu, Sn-Ag-Bi-Cu)

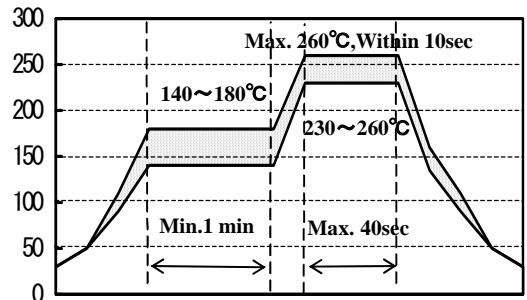
LED products do not contain reinforcement materials such as glass fillers.

Therefore, thermal stress by soldering greatly influences its reliability.

The temperature conditions for reflow soldering should therefore be set up according to the characteristic of this product. (See Fig-2)

Number of reflow process shall be max 2 times and these processes shall be performed in a row.

Cooling process to normal temperature shall be required between the first and the second soldering process.



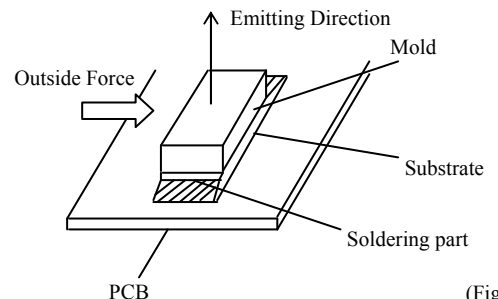
(Fig-2)

3. HANDLING AFTER MOUNTING (Fig.-3)

As shown in the drawing on the right, in case outside force of about 700g is given to the device, stress is concentrated to the jointed part between mold resin and substrate.

Therefore there is a possibility to breath the device or PCB.

Careful handling is needed as ROHM cannot guarantee the falling of the device by outside force after mounting.



(Fig-3)

4. WASHING

Please note the following points when washing is required after soldering.

4-1) WASHING SOLVENT

Isopropyl alcohol or other alcohol solvent is recommendable.

4-2) TEMPERATURE

Below 30°C, immersion time ; within 3 minutes.

4-3) ULTRA SONIC WASHING

Below 15W/1 litter of solvent tub or less.

4-4) COOLING

Below 100°C within 3 minutes.

5. EROSION GAS

Utilization in erosion gas atmosphere may degenerate the plating surface which might cause deterioration of solder strength, optical characteristics, or functions.

Please take precautions against occurrence of gas from the surrounding parts on the occasion of custody, and also after mounted on circuit board.

6. STORAGE

At reflow soldering, the reliability of this product is often influenced by moisture absorption so we apply the packaging with moisture proof for better condition is use, please also note that

6-1) Not to be opened before using.

6-2) To be kept in our moisture proof packaging with some desiccant (SILICA GEL) after opening it.

To be baked in case the SILICA GEL indicator its color from either blue to clear or green to pink.

6-3) Please use within 168 hours after the package was opened. (Condition at 30°C, max.70%Rh.)

In case it is not used within 168 hours, please put it back into our packaging.

6-4) BAKING

Please bake under reel condition at 60°C, 12~24 hours (max.20%Rh) after un-sealing.

While baking is done, the reel and emboss tape may be easily deformed.

Please be careful not to give any stress.

7. LIFE TIME

Blue led die used in this product will cause reduction of luminous intensity due to epoxy resin discoloration depending on the using conditions and environmental.

Please inquire our sales contact if long life time is required on your application.

【ATTENTION POINTS IN SOLDERING OPERATION】

This product was developed as a surface mount LED especially suitable for reflow soldering. So reflow soldering is recommended. In case of implementing manual soldering, please take care of following points.

1. SOLDERING OPERATION

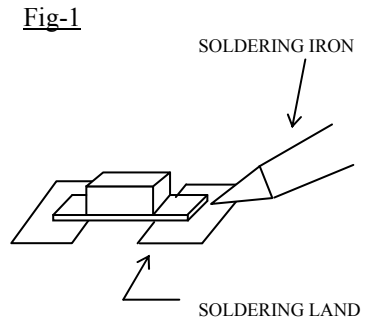
1) SOLDER USED

Sn-Cu, Sn-Ag-Cu, Sn-Ag-Bi-Cu

2) SOLDERING CONDITION

LED products do not contain reinforcement material such as a glass fillers. So thermal stress by soldering greatly influence its reliability. Please keep following points for manual soldering.

	ITEM	RECOMMENDED CONDITION
a)	Soldering iron	Less than 30W, top of iron less than 3mm.
b)	Heating method	Condition) Temp. of iron top less than 400°C within 3 sec. Heating on PCB pattern, not direct to the LED. (Fig-1)
c)	Handling after soldering	Please handle after the part temp. Goes down to room temp.



3) WASHING

Please note the following points when washing is required after soldering.

3-1) WASHING SOLVENT

Isopropyl alcohol or other alcohol solvent is recommendable.

3-2) TEMPERATURE

Below 30°C, immersion time : within 3 minutes.

3-3) ULTRA SONIC WASHING

Below 15W/1 litter of solvent tub.

3-4) CURING

Below 100°C within 3 minutes.

4) STORAGE

At manual soldering, the reliability of this product is often influenced by moisture absorption so we apply the packaging with moisture proof for better condition is use, please also note that

4-1) Not to be opened before using.

4-2) To be kept in our moisture proof packaging with some desiccant (SILICA GEL) after opening it.

To be baked in case the SILICA GEL indicator its color from either blue to clear or green to pink.

4-3) STRAGE CONDITION

Please use products in a sort time after opening the package. In case all parts are not used at the sometime, put the remaining back into ROHM package.

Storage condition : (Lower than 30°C, 70% Humidity max.168 hours.)

4-4) BAKING CONDITION

12~24 hours at 60°C, and humidity less than 20