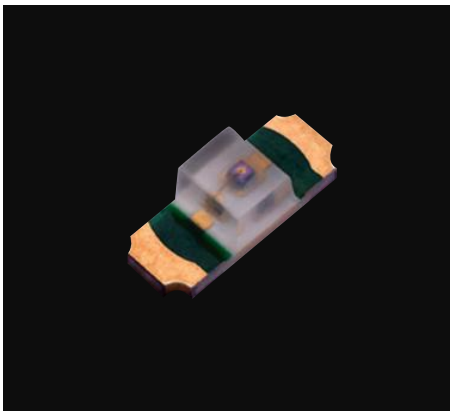
# SML-81 series

Datasheet

## ●Features

- Reverse-mount available type

## ●Outline

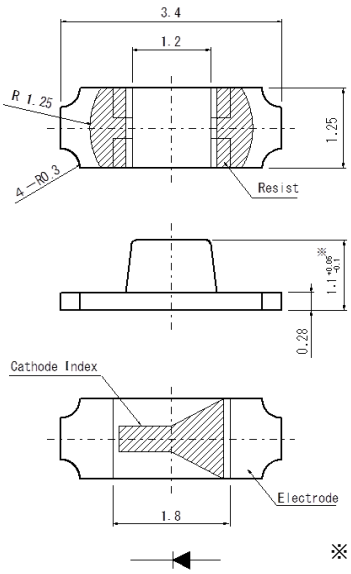


## ●Size

3412 (1305)
3.4 × 1.25mm (t=1.1mm)

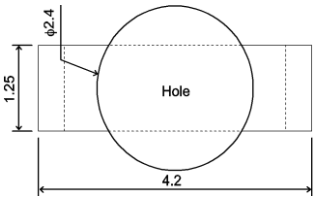
Color Type: V U D W M B WB

## ●Dimensions




(unit : mm)
(note) Tolerance is within ±0.1mm unless otherwise specified
※ Except burr on terminal from consideration.

## ●Recommended Solder Pattern




(unit : mm)

## ●Specifications

| Part No. | Chip Structure | Emitting Color | Absolute Maximum Ratings (Ta=25°C) | | | | | | Electrical and Optical Characteristics (Ta=25°C) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Power Dissipation $P_D$(mW) | Forward Current $I_F$(mA) | Peak Forward Current $I_{FP}$(mA) | Reverse Voltage $V_R$(V) | Operating Temp. Topr(°C) | Storage Temp. Tstg(°C) | Forward Voltag $V_F$ Typ. (V) | $I_F$ (mA) | Reverse Current $I_R$ Max. (μA) | $V_R$ (V) | Dominant Wavelength λD Min.*3 (nm) | Typ. (nm) | Max.*3 (nm) | $I_F$ (mA) | Luminous Intensity $I_V$ Min. (mcd) | Typ. (mcd) | $I_F$ (mA) |
| SML-811VT(A) | AlGaInP | Red | 62 | 25 | 100*2 | 5 | −40 to +85 | −40 to +100 | 1.95 | 10 | 100 | 5 | 625 | 630 | 636 | 10 | 11.2 | 22.4 | 10 |
| SML-811UT(A) | | | | | | | | | | | | | 615 | 620 | 625 | | | | |
| SML-811DT(A) | | Orange | | | | | | | | | | | 602 | 605 | 608 | | | | |
| SML-811WT(A) | | Yellow | | | | | | | | | | | 587 | 590 | 593 | | 14 | 28 | |
| SML-812MT | | Yellowish Green | 65 | | 60*1 | 4 | −30 to +85 | −40 to +85 | 2.1 | 20 | | 4 | 569 | 572 | 575 | 20 | 14 | 40 | 20 |
| SML812BCT | InGaN | Blue | 80 | 20 | 100*2 | 5 | −30 to +85 | −40 to +85 | 3.3 | | | 5 | 464 | 470 | 476 | | 22 | 56 | |
| SML813WBC8W | | White | 33 | 10 | 50*2 | | −40 to +100 | −40 to +100 | 2.9 | 5 | 10 | | (0.30, 0.30) | | | 5 | 22 | 45 | 5 |

*1:Duty1/5, 200Hz *2:Duty1/10, 1kHz *3:Reference


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## ●Electrical Characteristics Curves

Fig.1 Forward Current - Forward Voltages

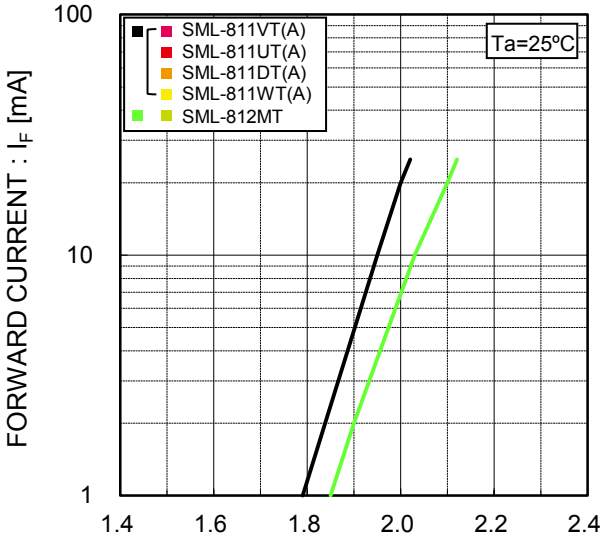



Fig.2 Luminous Intensity - Atmosphere Temperature

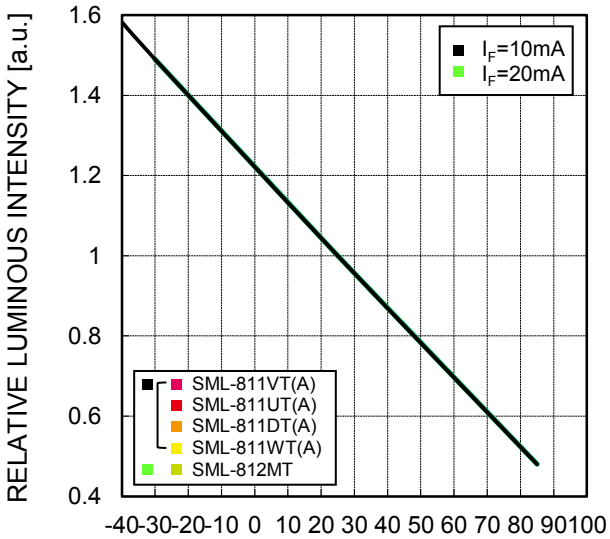



Fig.3 Luminous Intensity - Forward Current

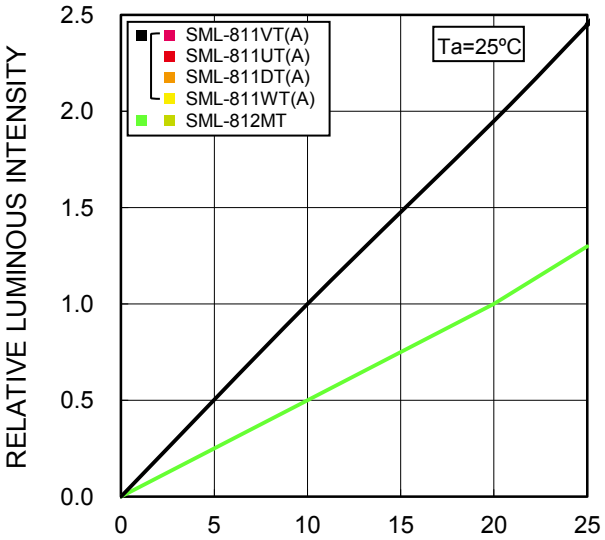
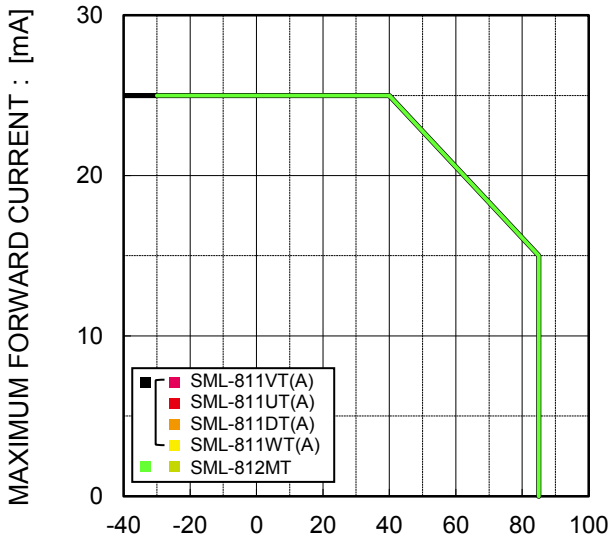



Fig.4 Derating





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## ●Electrical Characteristics Curves

Fig.1 Forward Current - Forward Voltages

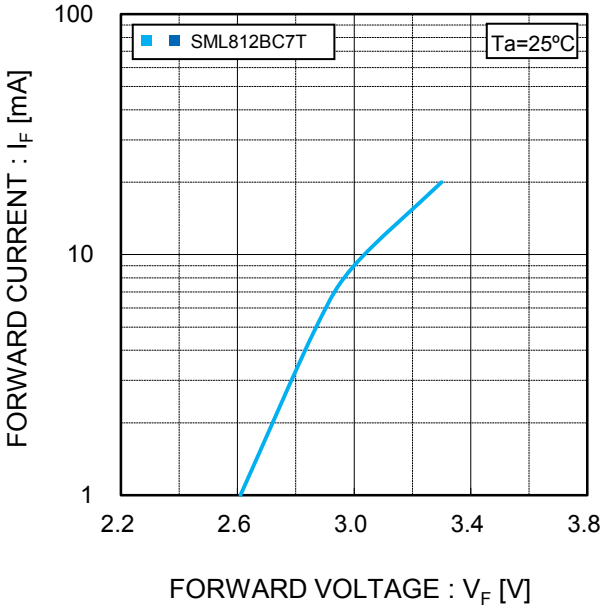



Fig.2 Luminous Intensity - Atmosphere Temperature

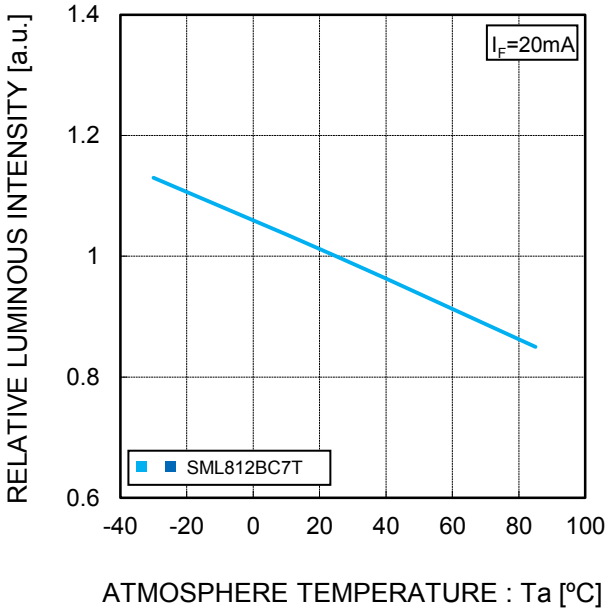



Fig.3 Luminous Intensity - Forward Current

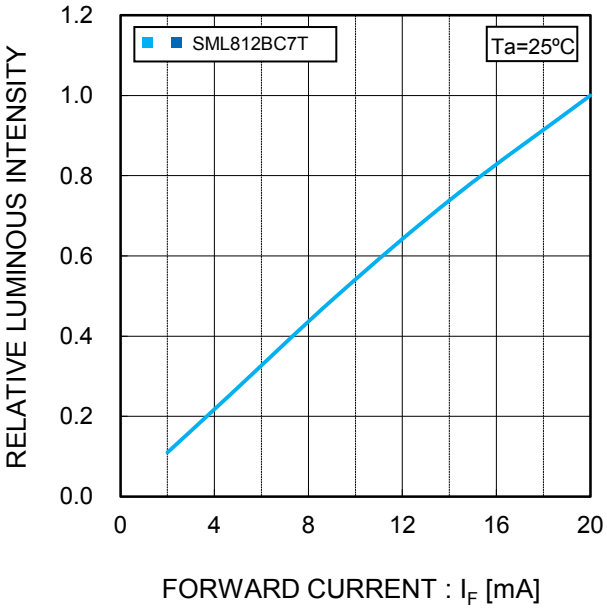
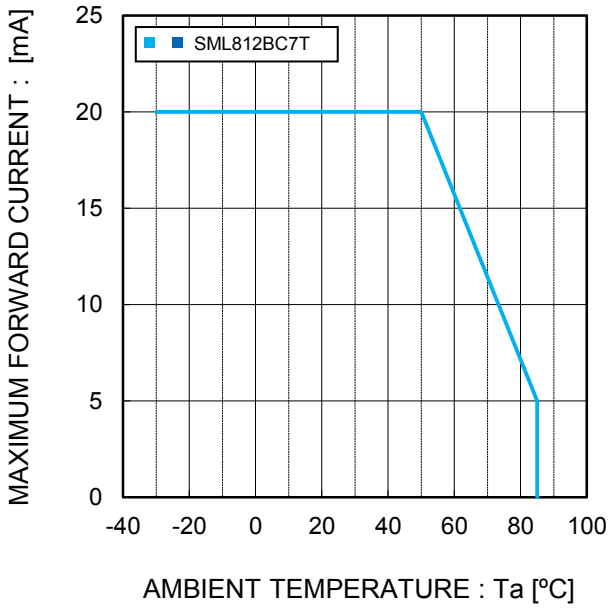



Fig.4 Derating




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


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## ●Electrical Characteristics Curves

Fig.1 Forward Current - Forward Voltages

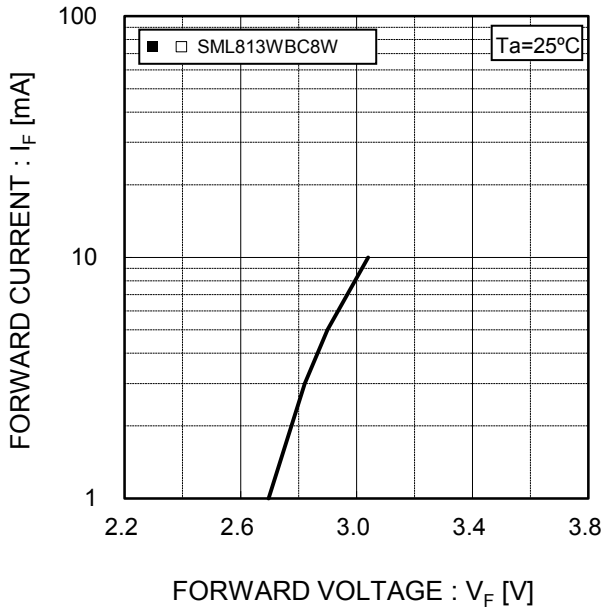



Fig.2 Luminous Intensity - Atmosphere Temperature

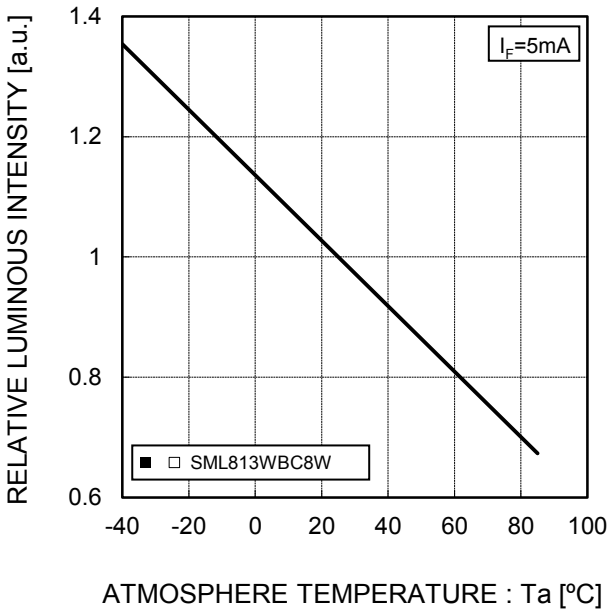



Fig.3 Luminous Intensity - Forward Current

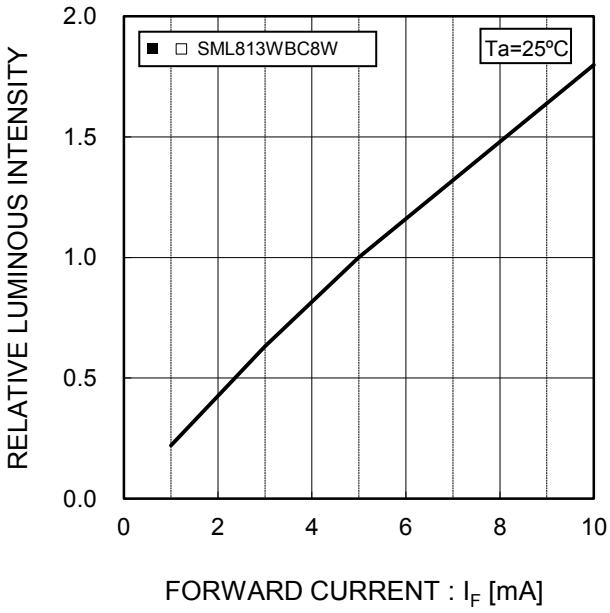
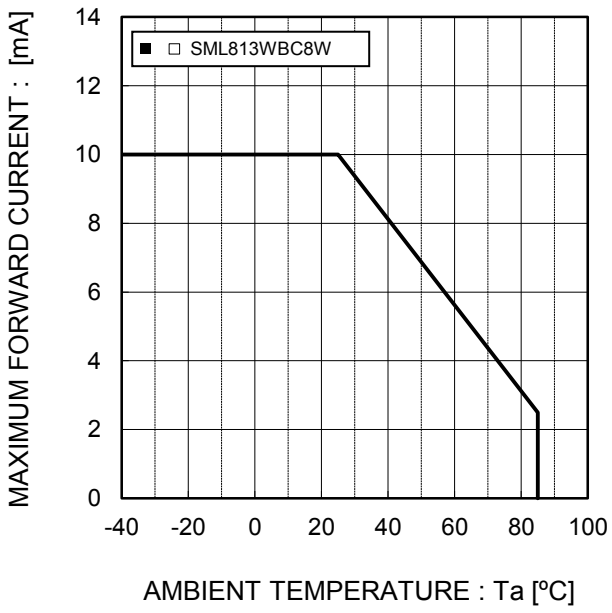


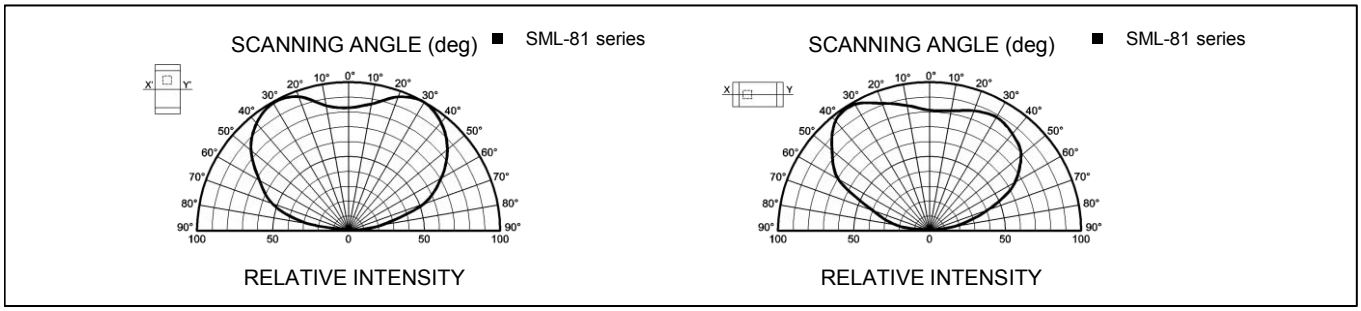

Fig.4 Derating

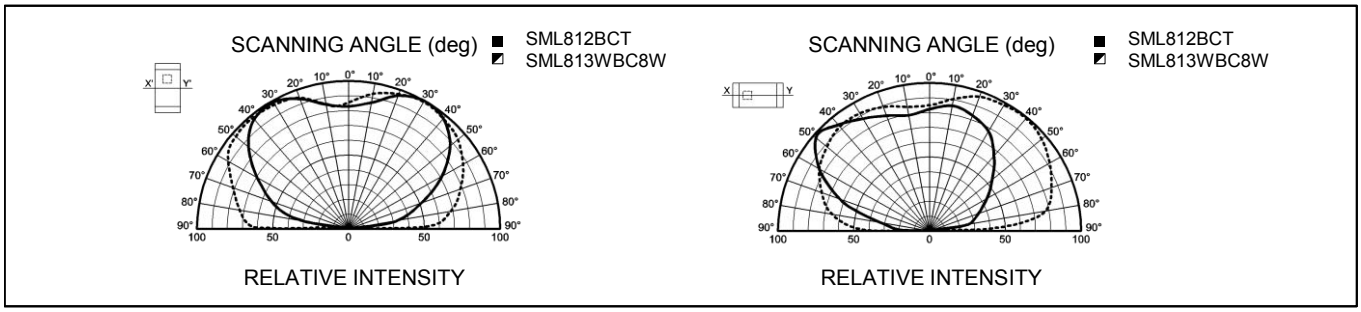



∗The value is based on the die destruction endurance; optical characteristics are NOT considered..


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## ●Viewing Angle




## ●Rank Reference of Brightness

### Red(V,U)

(Ta=25ºC, $I_F$=10mA)

| Rank | AG | AH | AJ | AK | AL | AM | AN | AP | AQ | AR | AS | AT | AU | AV | AW | AX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Iv (mcd) | 9.0 to 11.2 | 11.2 to 14 | 14 to 18 | 18 to 22.4 | 22.4 to 28 | 28 to 35.5 | 35.5 to 45 | 45 to 56 | 56 to 71 | 71 to 90 | 90 to 112 | 112 to 140 | 140 to 180 | 180 to 224 | 224 to 280 | 280 to 355 |
| SML-811VT(A)* | | | | | | | | | | | | | | | | |
| SML-811UT(A)* | | | | | | | | | | | | | | | | |

### Orange(D)

(Ta=25ºC, $I_F$=10mA)

| Rank | AG | AH | AJ | AK | AL | AM | AN | AP | AQ | AR | AS | AT | AU | AV | AW | AX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Iv (mcd) | 9.0 to 11.2 | 11.2 to 14 | 14 to 18 | 18 to 22.4 | 22.4 to 28 | 28 to 35.5 | 35.5 to 45 | 45 to 56 | 56 to 71 | 71 to 90 | 90 to 112 | 112 to 140 | 140 to 180 | 180 to 224 | 224 to 280 | 280 to 355 |
| SML-811DT(A)* | | | | | | | | | | | | | | | | |

### Yellow(Y)

(Ta=25ºC, $I_F$=10mA)

| Rank | AG | AH | AJ | AK | AL | AM | AN | AP | AQ | AR | AS | AT | AU | AV | AW | AX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Iv (mcd) | 9.0 to 11.2 | 11.2 to 14 | 14 to 18 | 18 to 22.4 | 22.4 to 28 | 28 to 35.5 | 35.5 to 45 | 45 to 56 | 56 to 71 | 71 to 90 | 90 to 112 | 112 to 140 | 140 to 180 | 180 to 224 | 224 to 280 | 280 to 355 |
| SML-811WT(A)* | | | | | | | | | | | | | | | | |

### Green(M)

(Ta=25ºC, $I_F$=20mA)

| Rank | G | H | J | K | L | M | N | P | Q | R | S | T | U | V | W | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Iv (mcd) | 1.0 to 1.6 | 1.6 to 2.5 | 2.5 to 4.0 | 4.0 to 6.3 | 6.3 to 10 | 10 to 16 | 16 to 25 | 25 to 40 | 40 to 63 | 63 to 100 | 100 to 160 | 160 to 250 | 250 to 400 | 400 to 630 | 630 to 1000 | 1000 to 1600 |
| SML-812MT※ | | | | | | | | | | | | | | | | |

### Blue(B)

(Ta=25ºC, $I_F$=20mA)

| Rank | G | H | J | K | L | M | N | P | Q | R | S | T | U | V | W | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Iv (mcd) | 0.9 to 1.4 | 1.4 to 2.2 | 2.2 to 3.6 | 3.6 to 5.6 | 5.6 to 9 | 9 to 14 | 14 to 22 | 22 to 36 | 36 to 56 | 56 to 90 | 90 to 140 | 140 to 220 | 220 to 360 | 360 to 560 | 560 to 900 | 900 to 1400 |
| SML812BCT | | | | | | | | | | | | | | | | |

### White(WB)

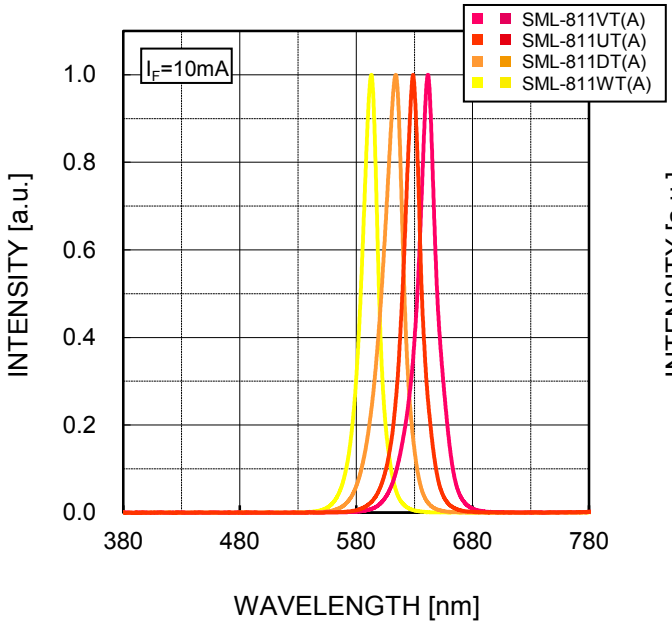
(Ta=25ºC, $I_F$=5mA)

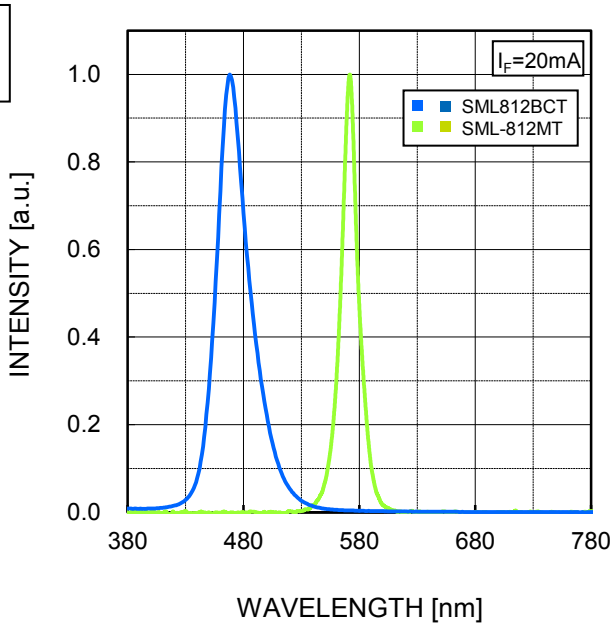
| Rank | G | H | J | K | L | M | N | P | Q | R | S | T | U | V | W | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Iv (mcd) | 0.9 to 1.4 | 1.4 to 2.2 | 2.2 to 3.6 | 3.6 to 5.6 | 5.6 to 9 | 9 to 14 | 14 to 22 | 22 to 36 | 36 to 56 | 56 to 90 | 90 to 140 | 140 to 220 | 220 to 360 | 360 to 560 | 560 to 900 | 900 to 1400 |
| SML813WBC8W | | | | | | | | | | | | | | | | |

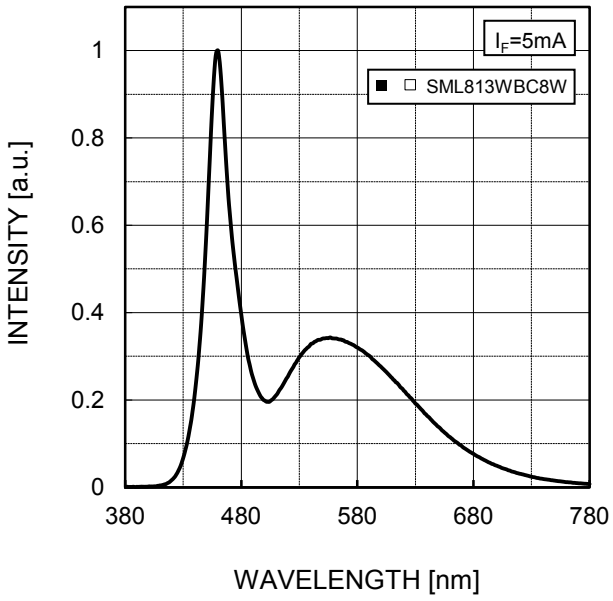
*Please note that the brightness of some products may fall between ranks (half rank).
※Brightness on specification sheet include tolerance of within ±10%.


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## ●Spectrum Data



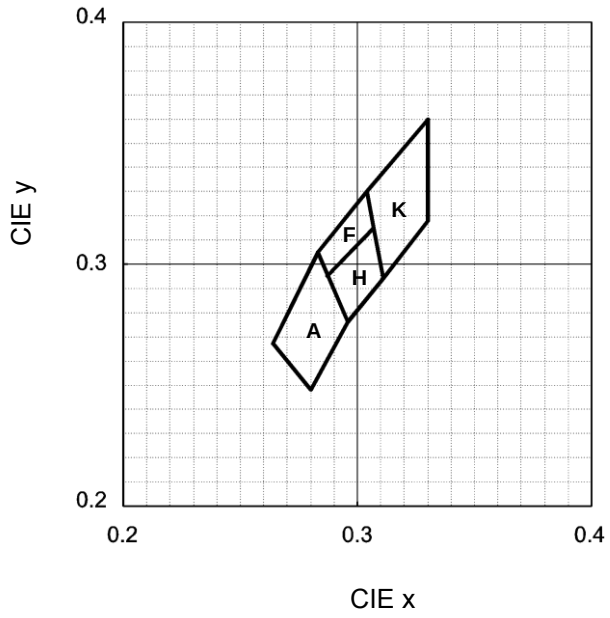




* Please take this data as a reference data for the samples are measured randomly.
* The data is relativized for each color. It is NOT to show the spectrum peaks are equal.


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## ●Chromaticity Diagram

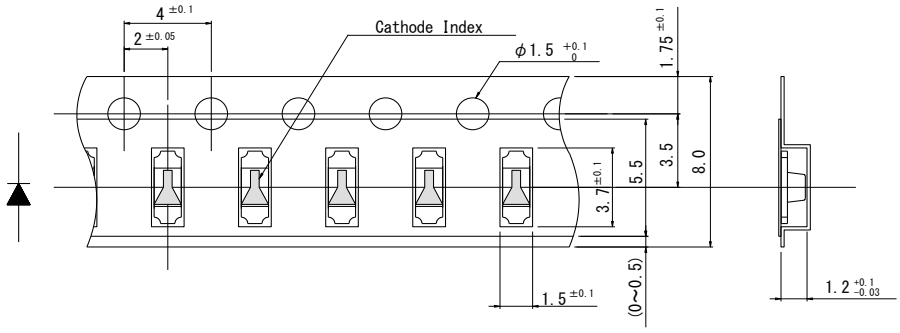


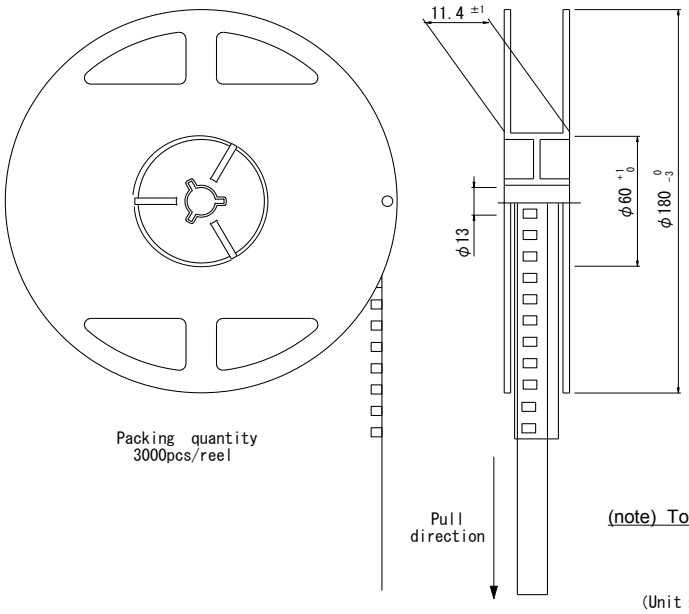

[Chromaticity Coordimates] (Ta=25ºC, $I_F$=5mA)

| 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

## ●**Taping** [T86 / 1(white)]



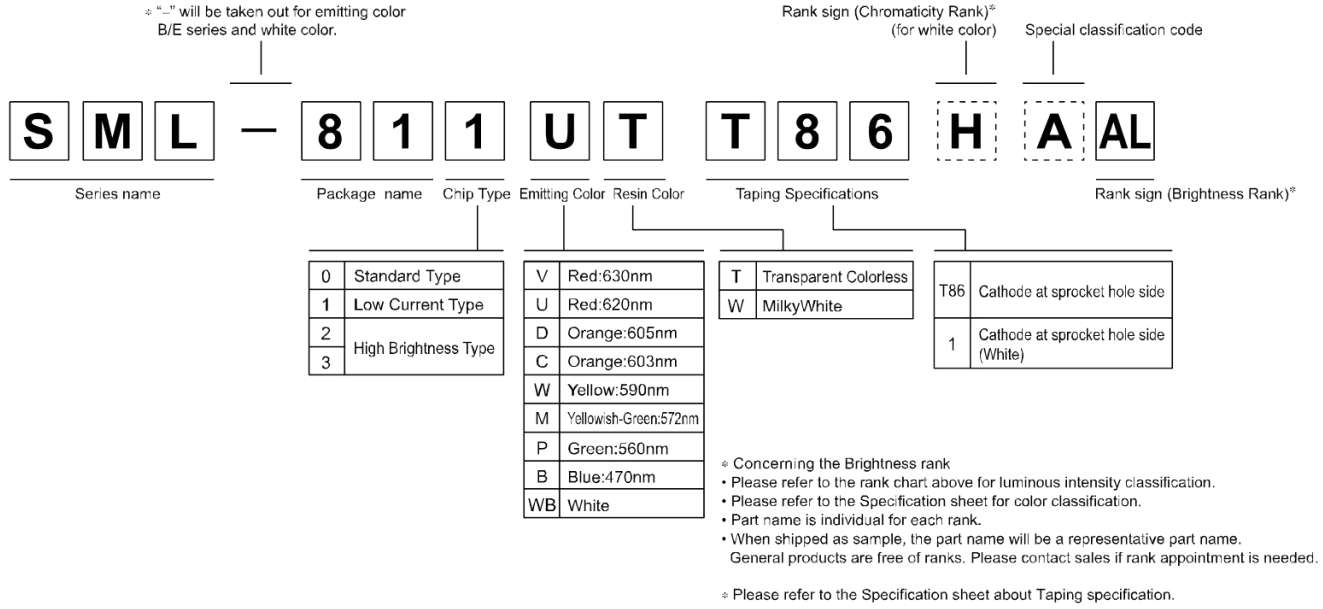




(note) Tolerance is within ±0.2mm unless otherwise specified

(Unit : mm)
( ):Reference


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## ●Part No. Construction




※ Concerning the Brightness rank
- Please refer to the rank chart above for luminous intensity classification.
- Please refer to the Specification sheet for color classification.
- Part name is individual for each rank.
- When shipped as sample, the part name will be a representative part name. General products are free of ranks. Please contact sales if rank appointment is needed.

※ Please refer to the Specification sheet about Taping specification.

## ●Packing Specification

ROHM LED products are being shipped with desiccant (silica gel) concluded in moisture-proof bags.

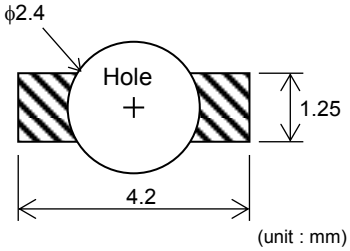
Pasting the moisture sensitive label on the outer surface of the moisture-proof bags or enclosing the humidity indication card inside the bag is available upon request.

Please contact the nearest sales office or distributer if necessary.


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## ●Attention Points In Handling

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




(Fig-1)

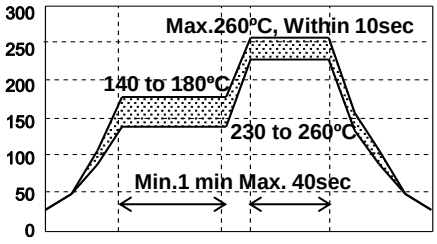
### 1.DESIGNING OF PCB

As for a recommendable solder pattern, Please refer to Fig-1.
The size and direction of the pad pattern depends 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 )

### 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 influence 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 first and second soldering process.




(Fig-2)

### 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 30ºC, immersion time ; within 3 minutes.

3-3) ULTRA SONIC WASHING

Below 15/1 litter of solvent tub.

3-4) COOLING

Below 100ºC within 3 minutes.

### 4.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.


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5.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

5-1) Not to be opened before using.

5-2) 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.

5-3) 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.

5-4) 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.

6.LIFE TIME

This product will cause reduction of luminous intensity depending on the using conditions and environmental.
Please inquire our sales contact if long life time is required on your application.


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## Notes

1) The information contained herein is subject to change without notice.

2) Before you use our Products, please contact our sales representative and verify the latest specifications :

3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors.
Therefore, in order to prevent personal injury or fire arising from failure, please take safety measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures. ROHM shall have no responsibility for any damages arising out of the use of our Poducts beyond the rating specified by ROHM.

4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

5) The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM or any other parties. ROHM shall have no responsibility whatsoever for any dispute arising out of the use of such technical information.

6) The Products are intended for use in general electronic equipment (i.e. AV/OA devices, communication, consumer systems, gaming/entertainment sets) as well as the applications indicated in this document.

7) The Products specified in this document are not designed to be radiation tolerant.

8) For use of our Products in applications requiring a high degree of reliability (as exemplified below), please contact and consult with a ROHM representative : transportation equipment (i.e. cars, ships, trains), primary communication equipment, traffic lights, fire/crime prevention, safety equipment, medical systems, servers, solar cells, and power transmission systems.

9) Do not use our Products in applications requiring extremely high reliability, such as aerospace equipment, nuclear power control systems, and submarine repeaters.

10) ROHM shall have no responsibility for any damages or injury arising from non-compliance with the recommended usage conditions and specifications contained herein.

11) ROHM has used reasonable care to ensur the accuracy of the information contained in this document. However, ROHM does not warrants that such information is error-free, and ROHM shall have no responsibility for any damages arising from any inaccuracy or misprint of such information.

12) Please use the Products in accordance with any applicable environmental laws and regulations, such as the RoHS Directive. For more details, including RoHS compatibility, please contact a ROHM sales office. ROHM shall have no responsibility for any damages or losses resulting non-compliance with any applicable laws or regulations.

13) When providing our Products and technologies contained in this document to other countries, you must abide by the procedures and provisions stipulated in all applicable export laws and regulations, including without limitation the US Export Administration Regulations and the Foreign Exchange and Foreign Trade Act.

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ROHM SEMICONDUCTOR

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More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

http://www.rohm.com/contact/


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