SMLV56RGB1W

SRGB2 Datasheet

●Features

- High Brightness Tri-Color LEDs
- Low height and improved color mixture made possible by flat frame structure.
- Epoxy Resin Type

●Outline

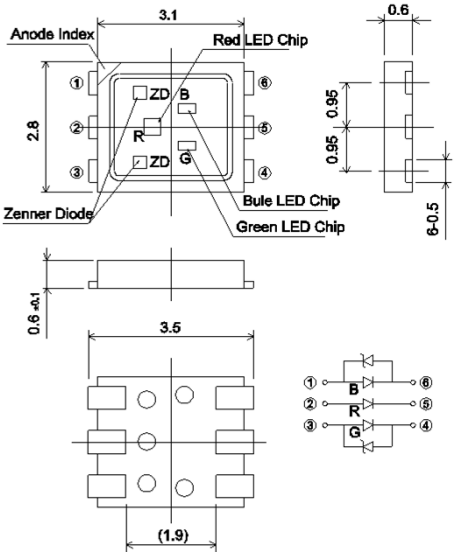


●Size

3528(1411)
3.5×2.8mm (t=0.6mm)

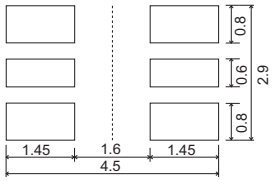
Color Type

●Dimensions



Tolerance : ±0.2
(unit : mm)

●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*1,2 Dissipation P_D(mW)	Forward*2 Current I_F(mA)	Peak Forward*3 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. (nm)	Typ. (nm)	Max. (nm)	I_F (mA)	Luminous Intensity I_V Min. (mcd)	Typ. (mcd)	I_F (mA)
SMLV56RGB1W	AlGaInP on Si	Red	400	50	100	5	−40 to +85	−40 to +100	2.1	20	10	5	619	624	629	20	450	700	20
	InGaN	Green		40					3.3		-	-	520	527	535		710	1200	
		Blue											465	470	475		220	400	

*1 : Total power dissipation in case of lighting several colors.
*2 : 50mm×50mm, substrate : FR4 : t=1.6mm, Cu foil : t=0.7mm
*3 : Pulse width ≦1ms, Duty ≦1/20

●When it as white

Electrical and Optical Characteristics (Ta=25°C)				
Chromaticity Coordinates (x, y)		Luminous Intensity I_V		
	I_F (mA)	Min. (mcd)	Typ. (mcd)	I_F (mA)
(0.30, 0.30)	(R)12	1100	1700	(R)12
	(G)15			(G)15
	(B)12			(B)12

●Thermal resistance

	Rθj-s	Rθj-a
R	70°C/W	170°C/W
G	171°C/W	311°C/W
B	160°C/W	260°C/W

Conditions

Circuit Board	Glass epoxy circuit board
Circuit Board Dimensions	25×20×1.6mmt
Cu foil thickness	70μm(Cathode polarity land pattern 4×4mm)

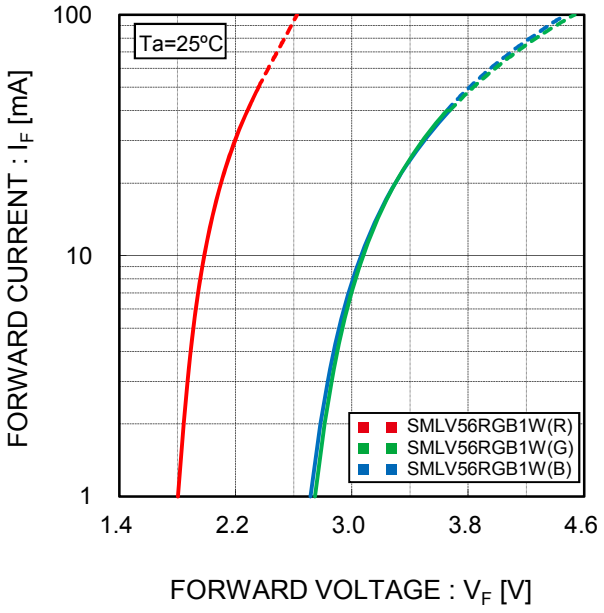
*The above value is a result of actual measurement performed on randomly selected product.
The value does not have any meanings of guarantee.

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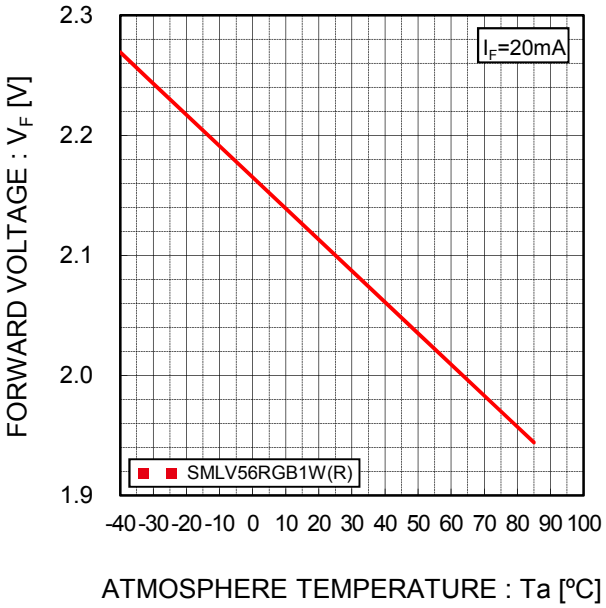
●Electrical Characteristics Curves

Fig.1 Forward Current - Forward Voltages



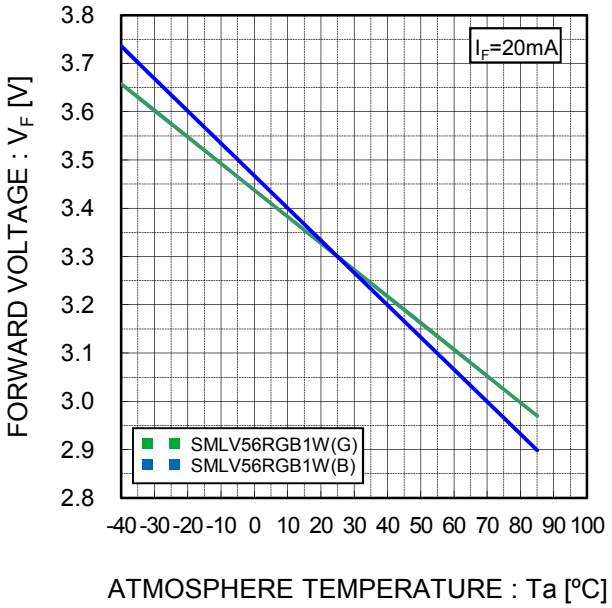
∗The dotted line is direct current driven, above absolute maximum rating.

Fig.2-1 Forward Voltage - Atmosphere Temperature (R)



* Please take this data as a reference data for the samples are measured randomly.

Fig.2-2 Forward Voltages - Atmosphere Temperature (G, B)



* Please take this data as a reference data for the samples are measured randomly.

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●Electrical Characteristics Curves

Fig.3 Luminous Intensity - Atmosphere Temperature

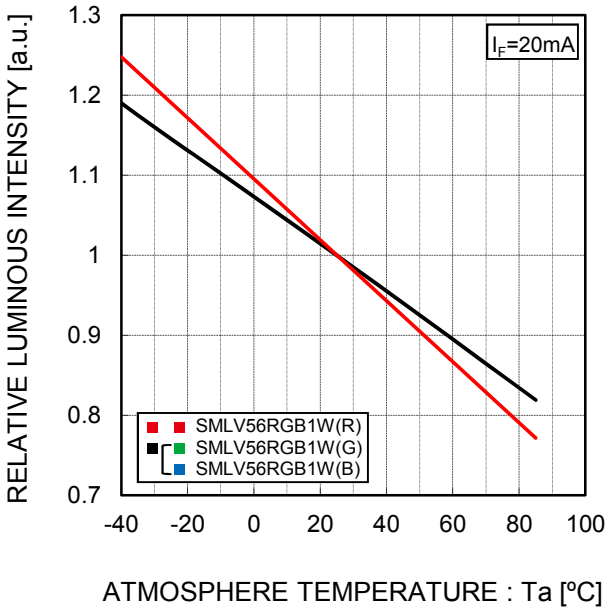


Fig.4 Luminous Intensity - Forward Current

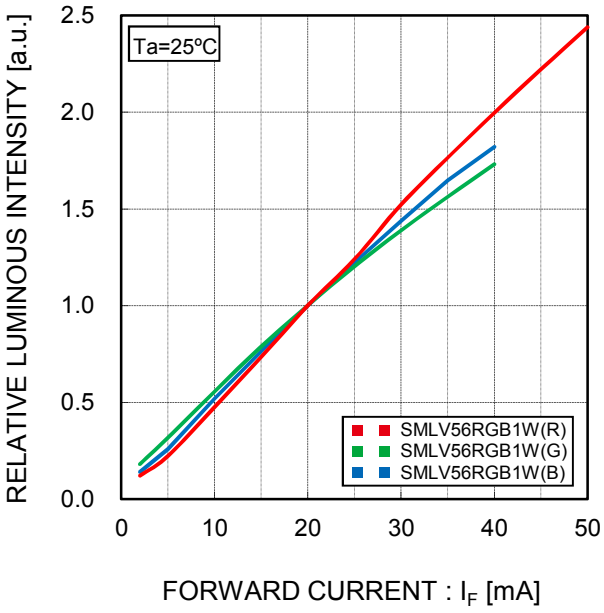
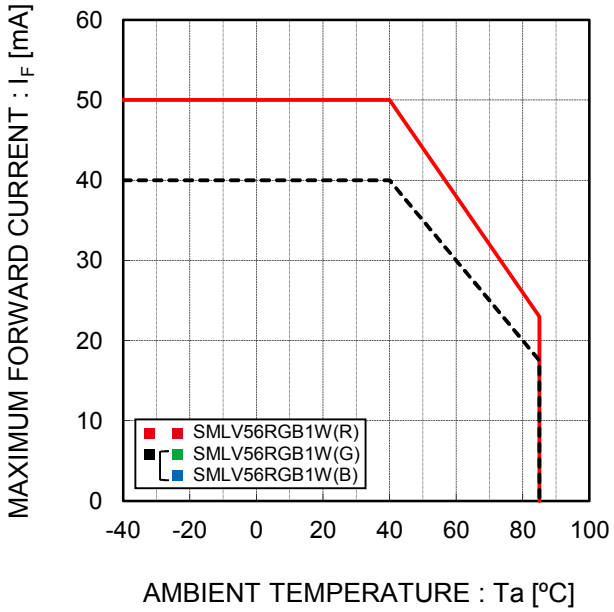


Fig.5 Derating

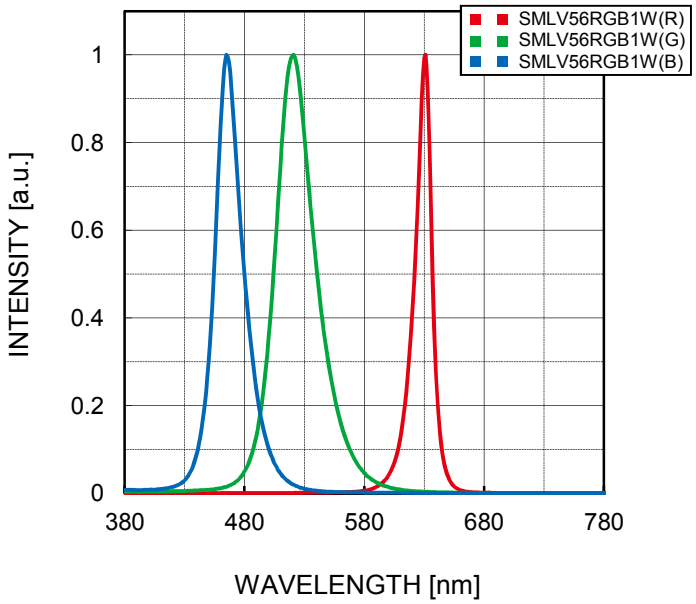


(Note) In case of lighting a single color.
∗50mm×50mm、Substrate FR4:t=1.6mm Cu foil:t=0.07mm

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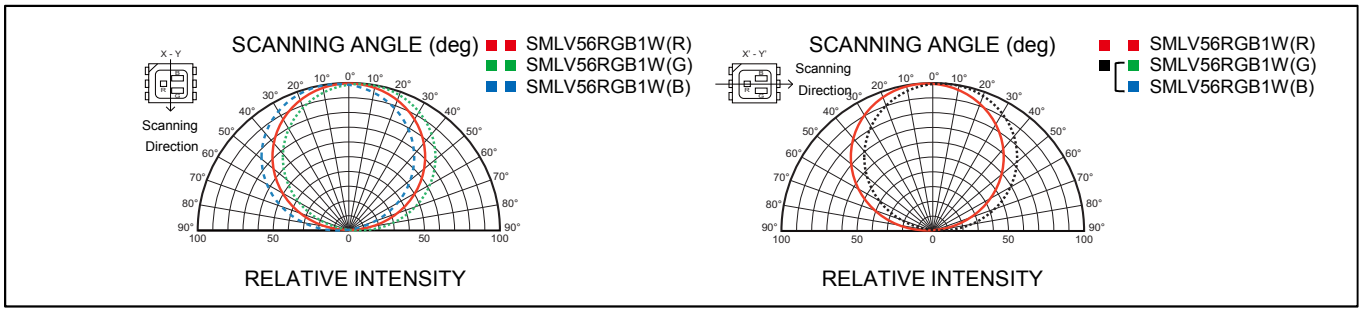
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●Spectrum Data



* 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.

●Viewing Angle

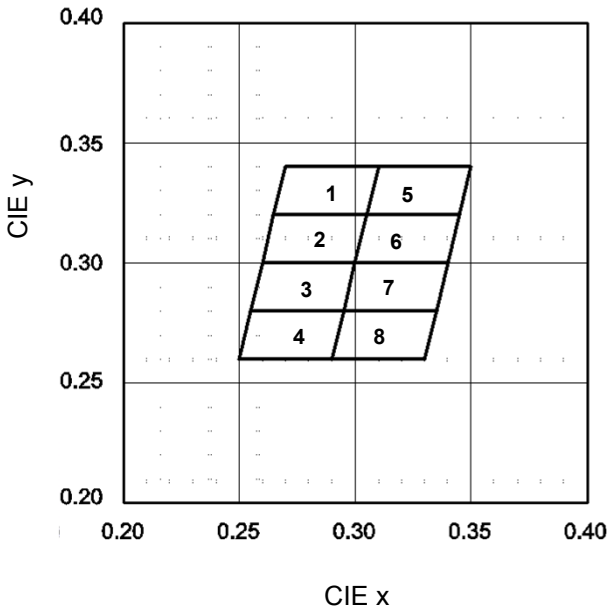


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●Chromaticity Diagram

SMLV56RGB1W



[Chromaticity Coordimates]

Ta=25ºC Lighting simultaneously
I_F=12mA (Red)
I_F=15mA (Green)
I_F=12mA (Blue)

1		2		3		4	
x	x	x	y	x	y	x	y
0.270	0.340	0.265	0.320	0.260	0.300	0.255	0.280
0.265	0.320	0.260	0.300	0.255	0.280	0.250	0.260
0.305	0.320	0.300	0.300	0.295	0.280	0.290	0.260
0.310	0.340	0.305	0.320	0.300	0.300	0.295	0.280

5		6		7		8	
x	y	x	y	x	y	x	y
0.310	0.340	0.305	0.320	0.300	0.300	0.295	0.280
0.305	0.320	0.300	0.300	0.295	0.280	0.290	0.260
0.345	0.320	0.340	0.300	0.335	0.280	0.330	0.260
0.350	0.340	0.345	0.320	0.340	0.300	0.335	0.280

Measurement tolerance : ±0.02

●Rank Reference of Brightness

Triple Color

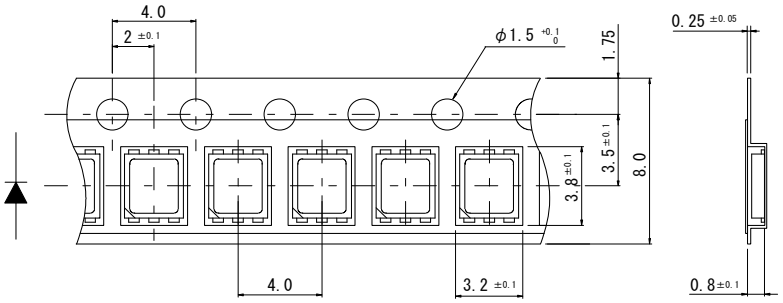
	Rank Iv (mcd) / Emitting Color	Y* 220 to 280	280 to 360	360 to 450	450 to 560	560 to 710	710 to 900	900 to 1100	1100 to 1400	1400 to 1800	1800 to 2200
SMLV56RGB1W	Red*1										
	Green*1										
	Blue*1										
	White*2										

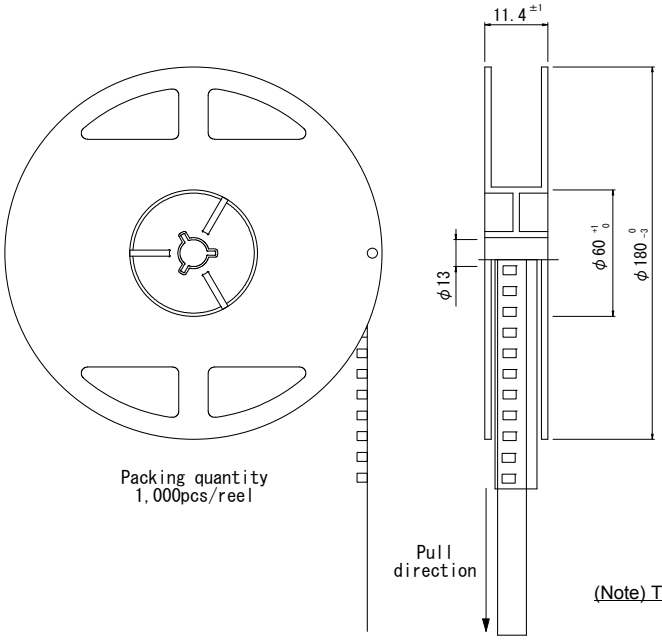
∗ : When lighting three colores simultaneously <to express white light>
Measure tolerance : ±10%
∗1 : Reference value of each colors
∗2 : Rank of Mixing white color
Y Rank (I_F=12mA (Red), I_F=15mA (Green), I_F=12mA (Blue))

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●Taping





(unit : mm)

(Note) Tolerance is ±0.2mm, unless otherwise specified.

●Part No. Construction

Chromaticity rank
(When lighting three colors simultaneously <to express white light>)

S	M	L	V	5	6	R	G	B	1	W	1	2	Y
Series name			Package name		Chip Type	Emitting Color			Special Code	Resin Color	Taping Specifications	Brightness rank* (When lighting three colors simultaneously <to express white light>)	

6	Ultra High Brightness Type

R	Red:624nm
G	Green:527nm
B	Blue:470nm

W	MilkyWhite(Epoxy resin)

1	Cathode at sprocket hole side

* Concerning the Brightness rank
- Please refer to the rank chart above for luminous intensity classification.
- Please refer to the Chromaticity diagram 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.

●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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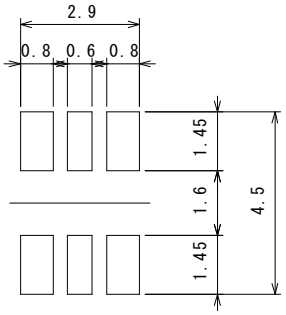
●Attention Points In Handling

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

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.
so, please investigate about the adjustment thoroughly before designing.

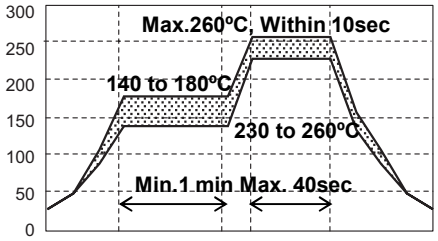
(n.b) Performance/characteristics of devise shall considerably differ depending on mounting conditions. That is to say, the optimized heat-radiation mounting will make best use of device's performance. Thus, it in recommended to design the land pattern with use of Cu for a great deal of heat-radiation as well as the use of metalmounting board.)



(Fig-1)

2.SOLDERING

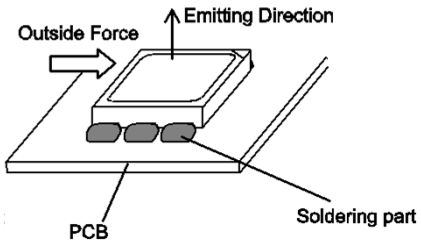
LED products do not contain reinforcement materials such as glass fillers.
Therefore, thermal stress by soldering greatly influence its reliability.
The temperature conditions for reflow soldering should therefore be set up according to the characteristic of this product. (See Fig-2)
Number of reflow 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.HANDLING AFTER MOUNTING

As shown right drawing, in case outside force 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 handing is needed as ROHM cannot guarantee the falling of the device by outside force after mounting.



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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 30ºC, immersion time ; within 3 minutes.

4-3) ULTRA SONIC WASHING

Below 15W/1 litter of solvent tub.

4-4) COOLING

Below 100ºC within 3 minutes.

5.HEAT–RADIATION DESIGN

Pleases of luminous intensity under continuous load varies depending on the ambient temperature.
Therefore, it is requested that enough heart – radiation designing be conducted for mounting.
Also, please consider derating features for the setting drive current.

6.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.

7.STORAGE

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

7-1) Not to be opened before using.

7-2) 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 changed its color from either blue to clear or green to pink.

7-3) 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.

7-4) BAKING

Please bake under reel condition at 60 °C, 12 to 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.

8.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.

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Notes

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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.

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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.

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