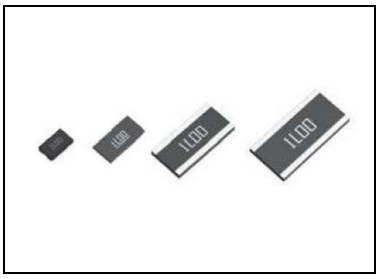
●Features

1) Ultra low-ohmic resistance range.
2) Wide terminal configuration for high joint reliability.
3) Improved current detection accuracy by trimming-less structure.
4) ROHM resistors have obtained ISO9001 / ISO / TS16949 certification.



●Products List

Part No.	Size (mm)	Size (inch)	Rated power (70℃) (W)	Temperature coefficient (ppm / ℃)	Resistance tolerance (%)	Resistance range (mΩ)	Operating temperature range (℃)
PML10	2012	0805	0.66	±200	G (±2%)	1.0,1.5,2.0,2.5	-55 ~ +155
					J (±5%)		
PML18	3216	1206	1	±150	G (±2%)	0.5,1.0,1.5,2.0,2.5	-55 ~ +155
					J (±5%)		
PML50	5025	2010	2	±150	J (±5%)	0.5	-55 ~ +155
				±100		2.2	
				☆±200		☆(1.0,1.5,2.0)	
PML100	6432	2512	2 (3W at 25℃)	±150	J (±5%)	0.5	-55 ~ +155
			2	±100		1.0,1.5,2.0,2.2	

☆:Under development

*Design and specifications are subject to change without notice.

Carefully check the specification sheet supplied with the product before using or ordering it.

●Part number description

P M L | 1 0 | E Z P | J | V | 1 L 0

Part No.

PML
(Ultra-low ohmic chip resistors for current detection / wide terminal type>)

Size (mm[inch])

10 (2012 [0805])
18 (3216 [1206])
50 (5025 [2010])
100 (6432 [2512])

Packaging specifications code

Part No.	Code	Packaging specifications	Quantity / Reel
PML10	EZP	Paper tape (4mm pitch)	5,000
PML18	EZP	Paper tape (4mm pitch)	5,000
PML50	HZP	Embossed tape (4mm pitch)	2,000
PML100	HZP	Embossed tape (4mm pitch)	2,000

Resistance tolerance

G (±2%)
J (±5%)

Special part code

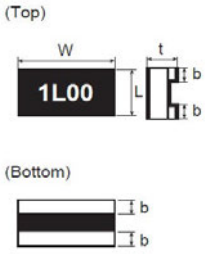
Nominal resistance

Resistance code, 3 or 4 digits.

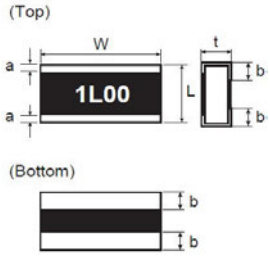
Resistance value(Ω)	Resistance tolerance	
	J	G
0.5mΩ	0L5	0L50
1mΩ	1L0	1L00
1.5mΩ	1L5	1L50
2mΩ	2L0	2L00
2.2mΩ	2L2	-
2.5mΩ	2L5	2L50

●Chip resistor dimensions and markings

■PML 10 / 18



■PML 50 / 100



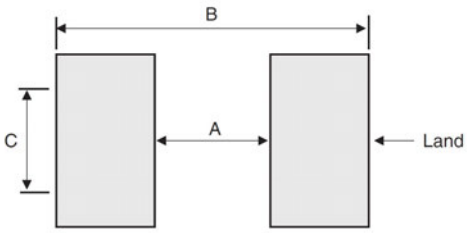
<Marking method>
There are four digits used for the calculation number "L" is used for the decimal point of m .
Ex.) 2mΩ = 2L00
10mΩ = 10L0

(Unit:mm)

Part No.	(mm)	(inch)	L	W	t	a	b	Marking existence
PML10	2012	0805	1.20±0.15	2.0±0.15	0.42 ~ 0.28*±0.15	-	0.45 ~ 0.35*±0.25	Yes
PML18	3216	1206	1.60±0.15	3.20±0.15	0.42 ~ 0.28*±0.15	-	0.55 ~ 0.35*±0.20	Yes
PML50	5025	2010	2.60±0.20	5.00±0.20	0.50 ~ 0.36*±0.15	0.40±0.20	0.75 ~ 0.70*±0.20	Yes
PML100	6432	2512	3.20±0.25	6.40±0.25	0.50 ~ 0.36*±0.15	0.45±0.25	0.90 ~ 0.70*±0.25	Yes

* : Each value range varies with the resisrance. Please contact a ROHM sales representative for futher details.

●Land pattern example



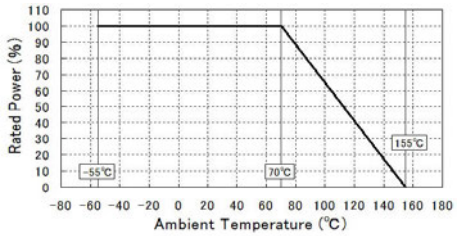
(Unit:mm)

Dimensions / Part No.	A	B	C	D
PML10	0.14	1.6	2.0	0.73
PML18	0.325	2.675	3.2	1.175
PML50	0.8	3.35	5.0	1.275
PML100	0.8	4.2	6.4	1.7

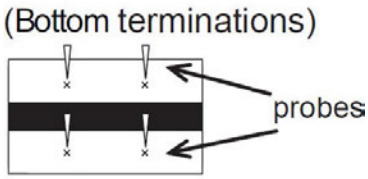
●Derating curve

When the ambient temperature exceeds 70°C, power dissipation must be adjusted according to the derating curves below.

■PML10/18/50/100



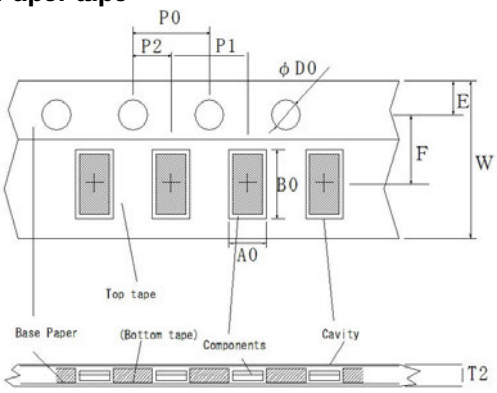
●Characteristics (PML10/18/50/100)

Test items	Guaranteed > Resistor type	Test conditions
Resistance	See P.1	20°C Measuring method : Measure Bottom termination by 4 proves. 
Variation of resistance with temperature	See P.1	Measurement: +25/-55, +25/+125°C
Overload	±(2.0%+0.0001Ω)	Rated power×2.5, 2s
Solderability	Anew uniform coating of minimum of 95% of the surface being immersed and no soldering damage.	Rosin-ethanol solution(25% weight) Soldering condition: 245±5°C Duration of immersion: 2.0±0.5s
Resistance to soldering heat	±(1.0%+0.0001Ω) No remarkable abnormality on the appearance.	Soldering condition: 260±5°C Duration of immersion: 10±1s
Rapid change of temperature	±(1.0%+0.0001Ω)	Test temp: -55°C～+125°C 5cycle
Damp heat, steady state	±(3.0%+0.0001Ω)	40°C, 93%(Relative humidity) Test time: 1,000h
Endurance at 70°C	±(3.0%+0.0001Ω)	70°C,Rated power 1.5h:ON－0.5h:OFF Test time: 1,000h
Endurance	±(3.0%+0.0001Ω)	155°C Test time: 1,000h
Resistance to solvent	±(0.5%+0.0001Ω)	23±5°C Immersion cleaning, 5±0.5min Solvent: 2-propanol
Bend strength of the end face plating	Whout open.	-

Compliance Standard(s) : IEC60115-8
JISC 5201-8

●Tape dimensions

■Paper tape

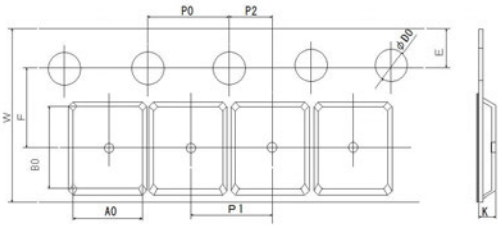


(Unit : mm)

Part No.	W	F	E	A0	B0
PML10	8.0±0.3	3.5±0.05	1.75±0.1	$1.65^{+0.2}_{-0.1}$	$2.4^{+0.2}_{-0.1}$
PML18	8.0±0.3	3.5±0.05	1.75±0.1	$1.95^{+0.1}_{-0.05}$	$3.5^{+0.15}_{-0.05}$

Part No.	D0	P0	P1	P2	T2
PML10	$\Phi1.5^{+0.1}_{0}$	4.0±0.1	4.0±0.1	2.0±0.05	MAX1.1
PML18	$\Phi1.5^{+0.1}_{0}$	4.0±0.1	4.0±0.1	2.0±0.05	MAX1.1

■Embossed tape

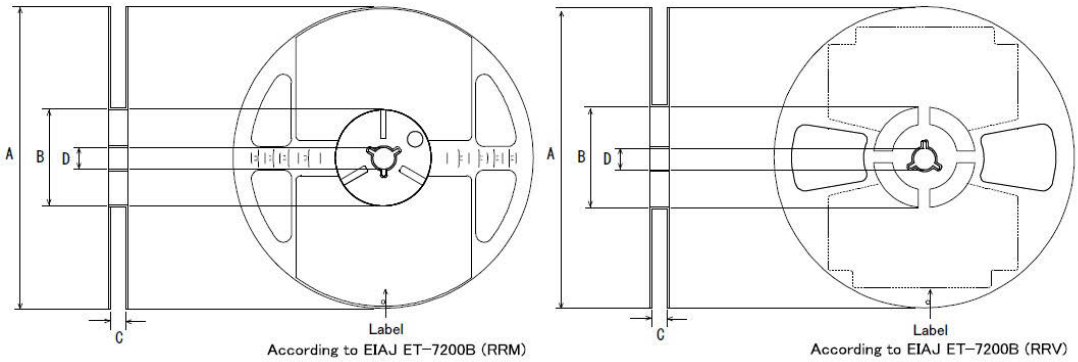


(Unit : mm)

Part No.	W	F	E	A0	B0
PML50	12.0±0.3	5.5±0.05	1.75±0.1	2.9±0.2	5.3±0.2
PML100	12.0±0.3	5.5±0.05	1.75±0.1	3.5±0.2	6.7±0.2

Part No.	D0	P0	P1	P2	K
PML50	$\Phi1.5^{+0.1}_{0}$	4.0±0.1	4.0±0.1	2.0±0.05	MAX1.1
PML100	$\Phi1.5^{+0.1}_{0}$	4.0±0.1	4.0±0.1	2.0±0.05	MAX1.1

●Reel dimensions



(Unit : mm)

Part No.	A	B	C	D
PML10	$\Phi180^{0}_{-1.5}$	$\Phi60^{+1.0}_{0}$	$9^{+1.0}_{0}$	Φ13±0.2
PML18				
PML50			$13^{+1.0}_{0}$	
PML100				

Notice

Precaution on using ROHM Products

1. Our Products are designed and manufactured for application in ordinary electronic equipment (such as AV equipment, OA equipment, telecommunication equipment, home electronic appliances, amusement equipment, etc.). If you intend to use our Products in devices requiring extremely high reliability (such as medical equipment (Note 1), transport equipment, traffic equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or failure may cause loss of human life, bodily injury or serious damage to property ("Specific Applications"), please consult with the ROHM sales representative in advance. Unless otherwise agreed in writing by ROHM in advance, ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of any ROHM's Products for Specific Applications.

(Note1) Medical Equipment Classification of the Specific Applications

JAPAN	USA	EU	CHINA
CLASSⅢ	CLASSⅢ	CLASSⅡb	CLASSⅢ
CLASSⅣ		CLASSⅢ	

2. ROHM designs and manufactures its Products subject to strict quality control system. However, semiconductor products can fail or malfunction at a certain rate. Please be sure to implement, at your own responsibilities, adequate safety measures including but not limited to fail-safe design against the physical injury, damage to any property, which a failure or malfunction of our Products may cause. The following are examples of safety measures:
   [a] Installation of protection circuits or other protective devices to improve system safety
   [b] Installation of redundant circuits to reduce the impact of single or multiple circuit failure

3. Our Products are designed and manufactured for use under standard conditions and not under any special or extraordinary environments or conditions, as exemplified below. Accordingly, ROHM shall not be in any way responsible or liable for any damages, expenses or losses arising from the use of any ROHM's Products under any special or extraordinary environments or conditions. If you intend to use our Products under any special or extraordinary environments or conditions (as exemplified below), your independent verification and confirmation of product performance, reliability, etc, prior to use, must be necessary:
   [a] Use of our Products in any types of liquid, including water, oils, chemicals, and organic solvents
   [b] Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
   [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl_2, H_2S, NH_3, SO_2, and NO_2
   [d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
   [e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
   [f] Sealing or coating our Products with resin or other coating materials
   [g] Use of our Products without cleaning residue of flux (Exclude cases where no-clean type fluxes is used. However, recommend sufficiently about the residue.) ; or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
   [h] Use of the Products in places subject to dew condensation

4. The Products are not subject to radiation-proof design.

5. Please verify and confirm characteristics of the final or mounted products in using the Products.

6. In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse, is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

7. De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.

8. Confirm that operation temperature is within the specified range described in the product specification.

9. ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

Precaution for Mounting / Circuit board design

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

2. In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

Precautions Regarding Application Examples and External Circuits

1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.

2. You agree that application notes, reference designs, and associated data and information contained in this document are presented only as guidance for Products use. Therefore, in case you use such information, you are solely responsible for it and you must exercise your own independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of such information.

Precaution for Electrostatic

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not 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).

Precaution for Storage / Transportation

1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
   [a] the Products are exposed to sea winds or corrosive gases, including Cl_2, H_2S, NH_3, SO_2, and NO_2
   [b] the temperature or humidity exceeds those recommended by ROHM
   [c] the Products are exposed to direct sunshine or condensation
   [d] the Products are exposed to high Electrostatic

2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.

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

4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

Precaution for Product Label

A two-dimensional barcode printed on ROHM Products label is for ROHM's internal use only.

Precaution for Disposition

When disposing Products please dispose them properly using an authorized industry waste company.

Precaution for Foreign Exchange and Foreign Trade act

Since concerned goods might be fallen under listed items of export control prescribed by Foreign exchange and Foreign trade act, please consult with ROHM in case of export.

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1. Before you use our Products, you are requested to carefully read this document and fully understand its contents. ROHM shall not be in any way responsible or liable for failure, malfunction or accident arising from the use of any ROHM's Products against warning, caution or note contained in this document.

2. All information contained in this document is current as of the issuing date and subject to change without any prior notice. Before purchasing or using ROHM's Products, please confirm the latest information with a ROHM sales representative.

3. The information contained in this document is provided on an "as is" basis and ROHM does not warrant that all information contained in this document is accurate and/or error-free. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties resulting from inaccuracy or errors of or concerning such information.

PML100HZPJV - Web Page

Buy

Distribution Inventory

Part Number	PML100HZPJV
Package	
Unit Quantity	2000
Minimum Package Quantity	2000
Packing Type	Taping
Constitution Materials List	inquiry
RoHS	Yes

MSL0201RGB Series

PICOLED™-RGB-side

Data Sheet

■Features

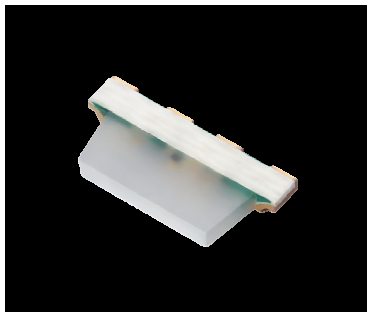
- Side view RGB LEDs
- Ultra compact, thin size

■Size

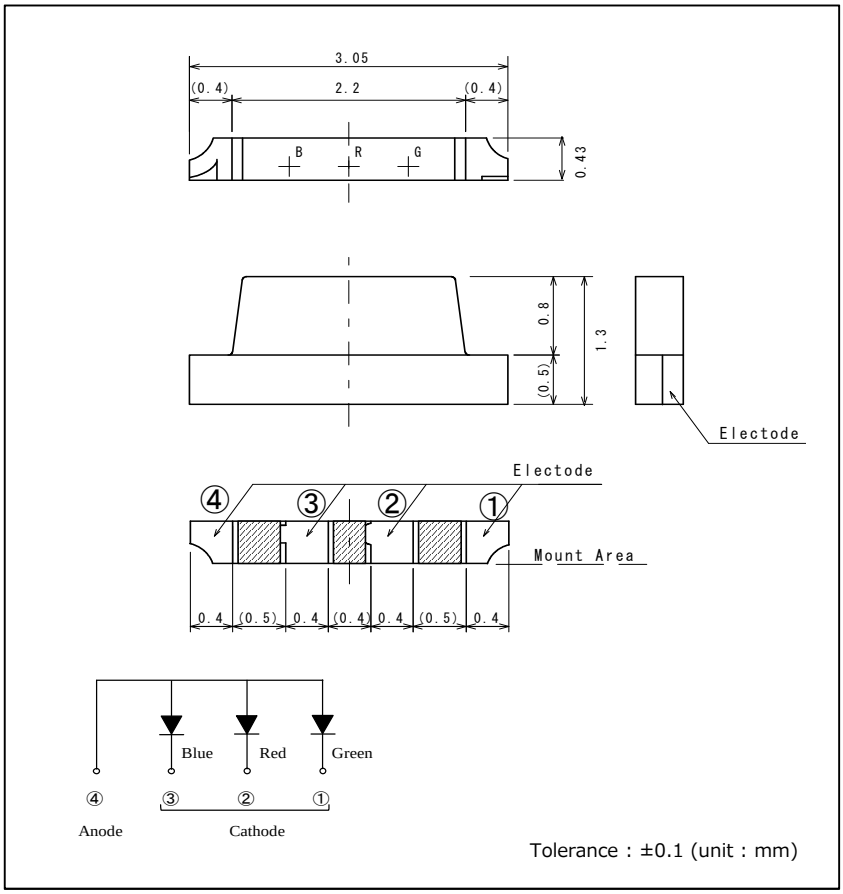
3013(1150)
3.05×1.3mm(t=0.43mm)

Color Type

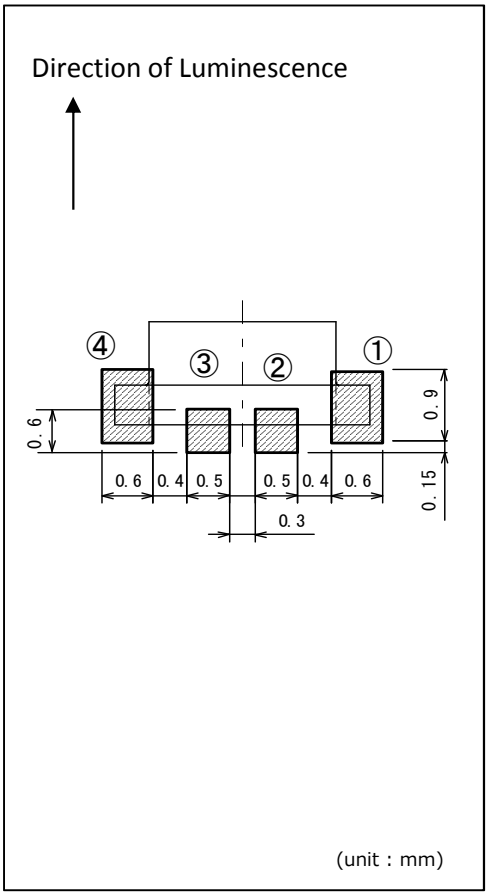
■Outline



■Dimensions



■Recommended Solder Pattern



■Specifications

Part No.	Chip Structure	Emitting Color	Absolute Maximum Ratings (Ta=25ºC)						Electrical and Optical Characteristics (Ta=25ºC)										
			Power Dissipation P_D(mW)	Forward Current I_F(mA)	Peak Forward Current I_{FP}(mA)	Reverse Voltage V_R(V)	Operating Temp. T_{opr}(ºC)	Storage Temp. T_{stg}(ºC)	Forward Voltage V_F Typ. (V)	I_F (mA)	Reverse Current I_R Max. (μA)	V_R (V)	Dominant Wavelength λ_D Min.*2 (nm)	Typ. (nm)	Max.*2 (nm)	I_F (mA)	Luminous Intensity I_V Min. (mcd)	Typ. (mcd)	I_F (mA)
MSL0201RGB	AlGaInP	Red	24	10	50*1	5	-40 ~ +85	-40 ~ +100	2.1	5	100	5	618	624	630	5	11	25	5
	InGaN	Green	33						3.0				519	527	536		56	90	
		Blue	32						2.9				464	470	476		11	22	

*1 : Duty ≦1/20, Pulse width≦ 1ms *2 : Measurement tolerance:±2nm

■ Electrical Characteristics Curves

Reference

Fig.1 Forward Current - Forward Voltages

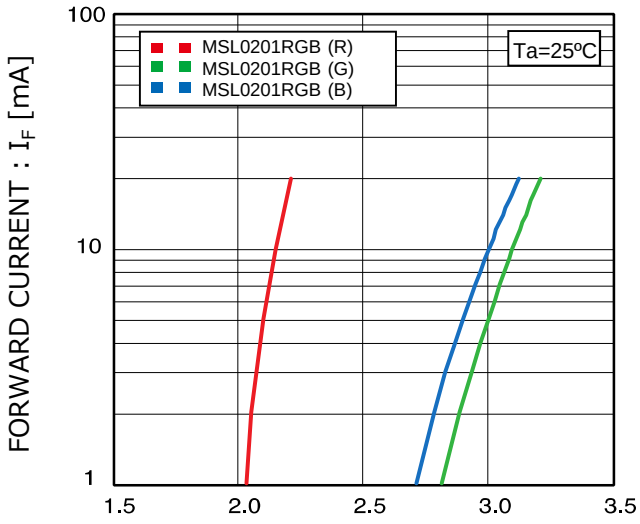


Fig.2 Luminous Intensity - Atmosphere Temperature

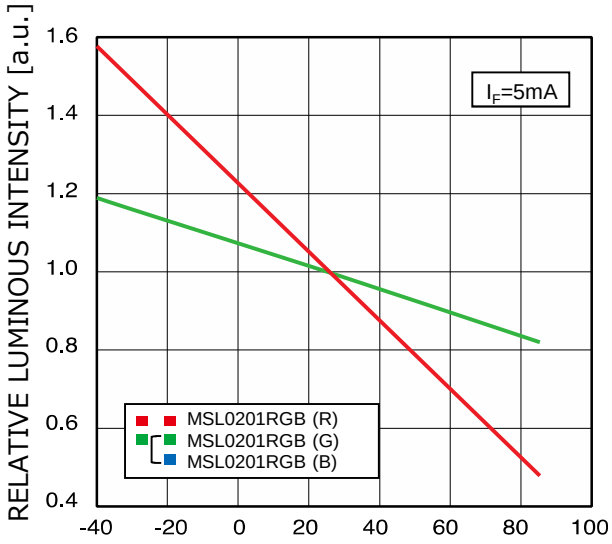


Fig.3 Luminous Intensity - Forward Current

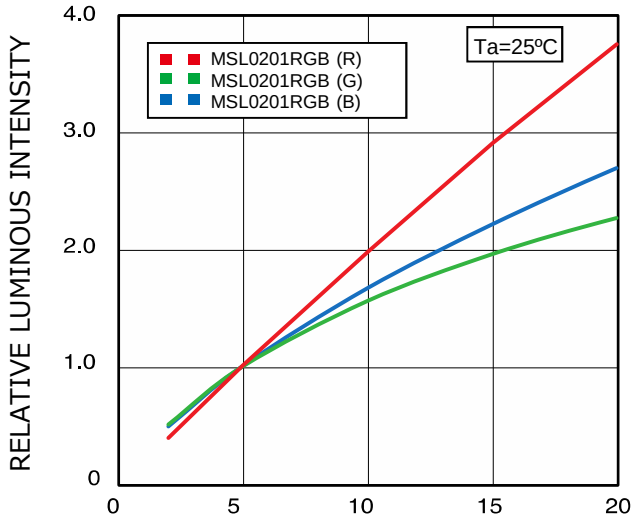
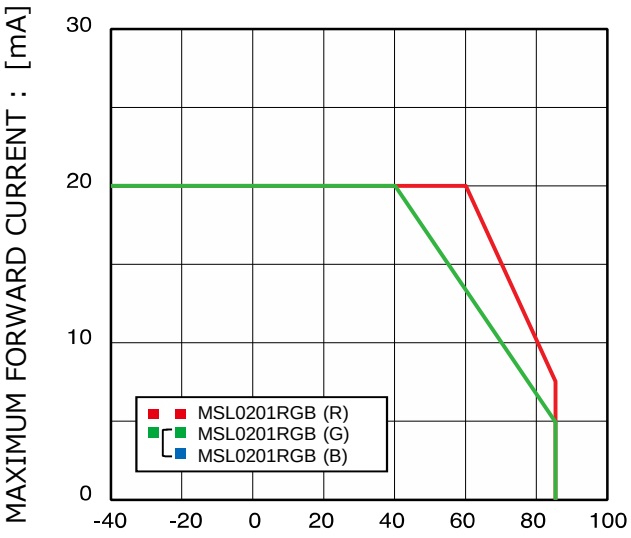
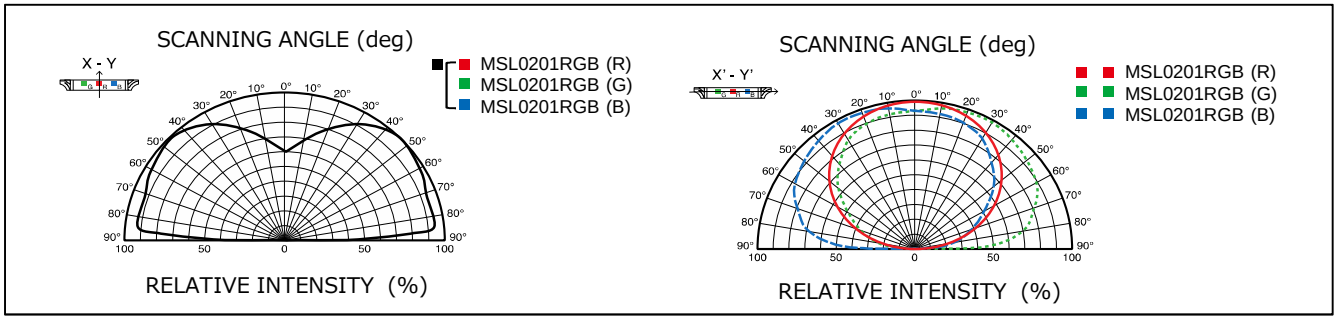


Fig.4 Derating



■Viewing Angle

Reference



■ Rank Reference of Brightness*

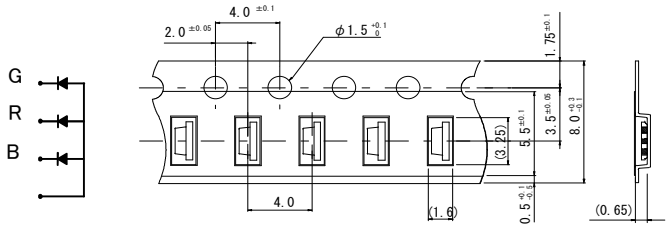
*Measurement tolerance:±10%

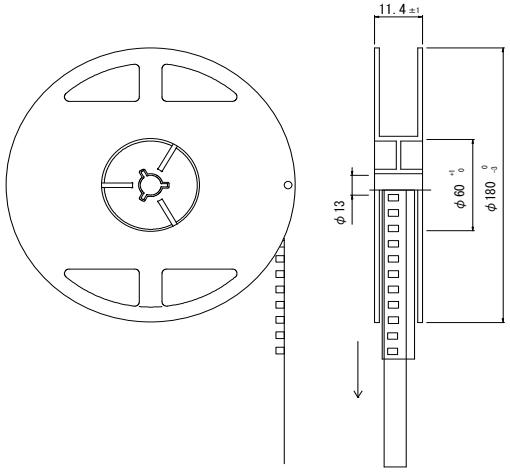
Triple Color

Unit (mcd) (Ta=25ºC, I_F=5mA)

	Emitting Color \ Rank sigh(mcd)	1	2	3	4	5	6	7	8
MSL0201RGB	Blue	11～22	22～45	11～22	22～45	11～22	22～45	11～22	22～45
	Green	56～90		90～140		56～90		90～140	
	Red	11～22				22～45			

■Taping(1)





Unit:mm

Note)Tolerance is within ±0.2mm unless otherwise specified.

■Part No. Construction

M	S	L	0	2	0	1	R	G	B	W	1		5	

Chromaticity rank (for white LED) / Rank sign (Brightness Rank)*

Series name / Package Type / Chip type / Emitting Color / Resin / Taping Specification

CSL	Chip LED
MSL	Multi color series

04	2.8x1.2 t=0.8mm
07	2.9x2.5 t=3.1mm
09	1.6x0.8 t=1.24mm
01	6.9x2.2 t=2.15mm
02	3.05x1.3 t=0.43mm
04	1.8x1.6 t=0.5mm

V	Red
U	Red
D	Orange
Y	Yellow
W	Yellow
M	Yellowish green
WB	White
RGB	RGB

U	Silicone
W	Epoxy

*Concerning the Brightness rank.
*Please refer to the rank chart above for luminous intensity 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) included 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.

■Precaution (Surface Mount Device)

1．Storage

If the product is heated during the reflow under the condition of hygroscopic state, it may vaporize and expand which will influence the performance of the product. Therefore, the package is waterproof. Please use the product following the conditions:

・Using Conditions

Classification	Temperature	Humidity	Expiration Date	Remark
①Before using	5～30℃	30～70%RH	Within 1 year from Receiving	Storage with waterproof package
②After opening package	5～30℃	Below 70%RH	Within 168h	Please storing in the airtight container with our desiccant (silica gel)

・Baking

Bake the product in case of below:
①The expiration date is passed.
②The color of indicator (silica gel) turned from blue to colorless or from green to pink.
(Even if the product is within the expiration date.)

・Baking Conditions

Temperature	Time	Humidity
60±3℃	12～24h	Below 20%RH
Remark	・Bake products in reel. ・Reel and embossed tape are easy to be deformed when baking, so please try not to apply stress on it. ・Recommend bake once.	

2．Application Methods

2－1．Precaution for Drive System and Off Mode

Design the circuit without the electric load exceeding the ABSOLUTE MAXIMUM RATING that applies on the products. If drive by constant voltage, it may cause current deviation of the LED and result in deviation of luminous intensity, so we recommend to drive by constant current. (Deviation of VF Value will cause deviation of current in LED.) Furthermore, for off mode, please do not apply voltage neither forward nor reverse. Especially, for the products with the Ag-paste used in the die bonding, there's high possibility to cause electro migration and result in function failure.

2－2．About Derating

It is considered that derating characteristics will not result in LED chip's electrical destruction. Even within the derating, the reliability and luminous life can be affected depending on operating conditions and ambient environment. So we would be appreciate it if you can confirm with your application again.

2－3．About product life

Depending on operating conditions and environment(applied current, ambient temperature and humidity, corrosive gas), decreasing of luminosity and change of chromaticity may occur even within the specification conditions.
Please contact our sales office if you use it for the following applications.
①It requires long luminosity life
②It is always lit

2－4．Applied Stress on Product

No resin hardening agent such as filler is used in the sealing resin of the product.
Therefore, please pay attention to the overstress on it which may influence its reliability.

2－5．Usage

The Product is LED. We are not responsible for the usage as the diode such as Protection Chip, Rectifier, Switching and so on.

3．Others

3－1．Surrounding Gas

Notice that if it is stored under the condition of acid gas (chlorine gas, sulfured gas) or alkali gas (ammonia), it may result in low soldering ability (caused by the change in quality of the plating surface) or optical characteristics changes (light intensity, chrominance) and change in quality of cause die bonding (Ag-paste) materials. All of the above will function failure of the products.
Therefore, please pay attention to the storage environment for mounted product (concern the generated gas of the surrounding parts of the products and the atmospheric environment).

3－2．Electrostatic Damage

The product is part of semiconductor and electrostatic sensitive, there's high possibility to be damaged by the electrostatic discharge. Please take appropriate measures to avoid the static electricity from human body and earthing of production equipment. The resistance values of electrostatic discharge (actual values) vary with products, therefore, please call our Sales staffs for inquiries.

3－3．Electromagnetic Wave

Applications with strong electromagnetic wave such as, IH cooker, will influence the reliability of LED, therefore please evaluate before using it.

4．Mounting

4－1．Soldering

・No resin hardening agent such as filler is used in the sealing resin of the product. Therefore, resin expansion and moisture absorption at humidity will cause heat stress during soldering process and finally has bad influence on the product's reliability.

・The product is not guaranteed for flow soldering.

・Do not expose the product in the environment of high temperature (over 100℃) or rapid temperature shift (within 3℃/sec. of temperature gradient) during the flow soldering of surrounding parts. In case of carrying out flow soldering of surrounding parts without recommended conditions, please contact us for inquiries.

・Please set appropriate reflow temperature based on our product usage conditions and specification.

・The max for reflowing is 2 times, please finish the second reflow soldering and flow soldering with other parts within the usage limitation after open the moistureproof package.

・Compare with N2 reflow, during air reflow, because of the heat and surrounding conditions, it may cause the discoloration of the resin.

・For our product that has no solder resist, because of its solder amount and soldering conditions, one of its specific characteristics is that solder will penetrate into LED. Thus, there's high possibility that will influence its reliability.Therefore, please be informed, concerning it before using it.

4－2．Automatic Mounting

4-2-1．Silicon Resin Sealing Product

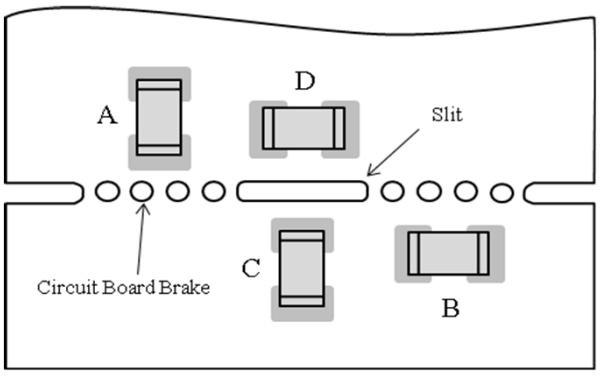
The sealing resin of LED is very soft, so please select adsorption nozzle that would not apply stress directly on the sealing section.

4-2-2．Mini Package (Smaller than 1608 size)

・Vibration may result in low mounting rate since it will cause the static electricity of product and adhere to top cover tape. Therefore, the magnet should be set on parts feeder cassette of the mounter to control the product stabilization. In addition, it is recommended to set ionizer to prevent electrostatic charge.

4－3．Mounting Location

The stress like bending stress of circuit board dividing after mounting, may cause LED package crack or damage of LED internal junction, therefore, please concern the mounting direction and position to avoid bending or screwing with great stress of the circuit board.



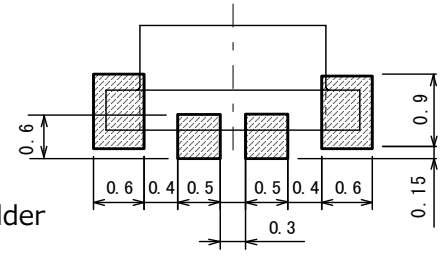
Stress strength according to he mounting position:
A＞B＞C＞D

4—4．Mechanical Stress after Mounting

The mechanical stress may damage the LED after Circuit Mounting, so please pay attention to the touch on product.

4－5．Soldering Pattern for Recommendation

We recommend the soldering pattern that shows on the right.
It will be different according to mounting situation of circuit board, therefore, please concern before designing.



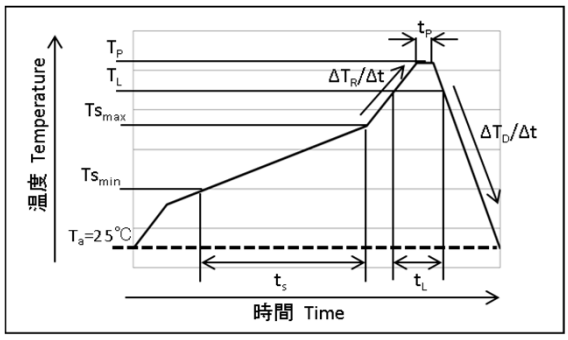
※The product has adopted the electrode structure that it should solder with back electrode of the product.
Thus, please be informed that the shape of electrode pin of solder fillet formation is not guaranteed.
The through hole on electrode surface is for conduction of front and rear electrodes but not for formation of solder fillet.

4 – 6. Reflow Profile

For reflow profile, please refer to the conditions below:(※)

■Meaning of marks, Conditions

Mark	Meanings	Conditions
Ts_{max}	Maximum of pre-heating temperature	180℃
Ts_{min}	Minimum of pre-heating temperature	140℃
t_s	Time from Tsmin to Tsmax	Over 60sec.
T_L	Reference temperature	210～260℃
t_L	Retention time for TL	Within 40sec.
T_P	Peak temperature	260℃(Max)
t_P	Time for peak temperature	Within 10sec.
$\Delta T_R/\Delta t$	Temperature rising rate	Under 3℃/sec.
$\Delta T_D/\Delta t$	Temperature decreasing rate	Over -3℃/sec.



※Above conditions are for reference. Therefore, evaluate by customer's own circuit boards and reflow furnaces before using, because stress from circuit boards and temperature variations of reflow furnaces vary by customer's own conditions.

4 – 7. 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.

①SOLDER USED

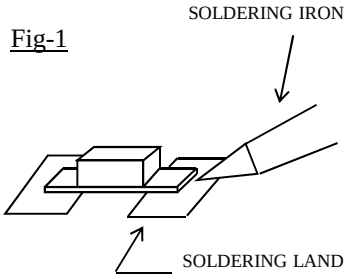
Sn-Cu, Sn-Ag-Cu, Sn-Ag-Bi-Cu

②HAND 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)	Heating method	Condition) Temp. of iron top less than 400℃ within 3 sec. Heating on PCB pattern, not direct to the LED. (Fig-1)
b)	Handling after soldering	Please handle after the part temp. goes down to room temp.

Fig-1



4 – 8. Cleaning after Soldering

Please follow the conditions below if the cleaning is necessary after soldering.

Solvent	We recommend to use alcohols solvent such as, isopropyl alcohols
Temperature	Under 30℃ within 3 minutes
Ultrasonic Cleaning	15W／Below 1 liter (capacity of tank)
Drying	Under 100℃ within 3 minutes

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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