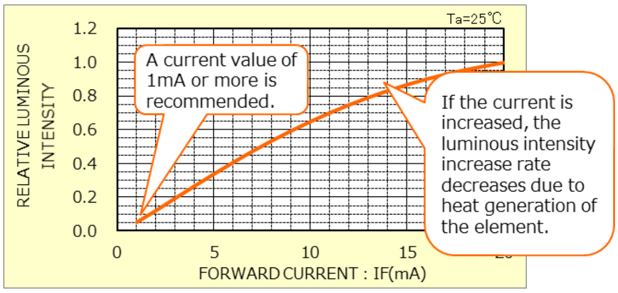
How to read LED characteristics data

When designing with LEDs, it is necessary to use the characteristic data provided with each product along with the LED product specifications. This section explains how to read typical characteristic data. This data is only an indication of how to read the characteristic data. For the actual data, please refer to the characteristic data attached to each product specification.

Relative Luminous Intensity - Current Characteristics

The brightness when a specified current is applied to the LED is expressed as a relative value when the luminous intensity of the luminous intensity measurement is set to 1.0 as described in the specifications.

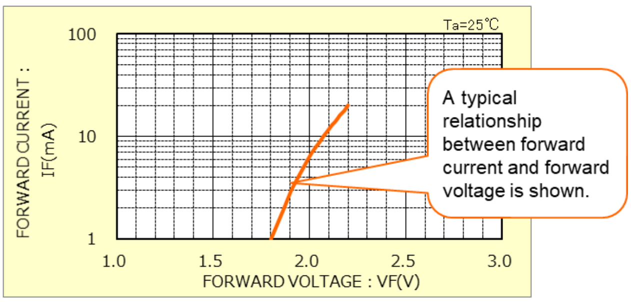
[Relative luminosity - forward current]



Forward Current - Forward Voltage

This figure shows the relationship between forward current and forward voltage.

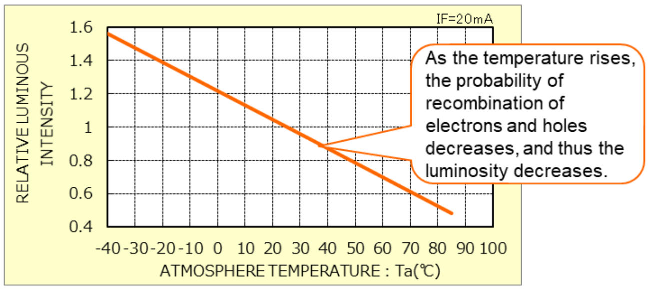
[Forward current - Forward voltage]



Luminous intensity vs. ambient temperature

The brightness at each ambient temperature is shown as the relative magnitude when the luminous intensity at 25°C is set to 1.0.

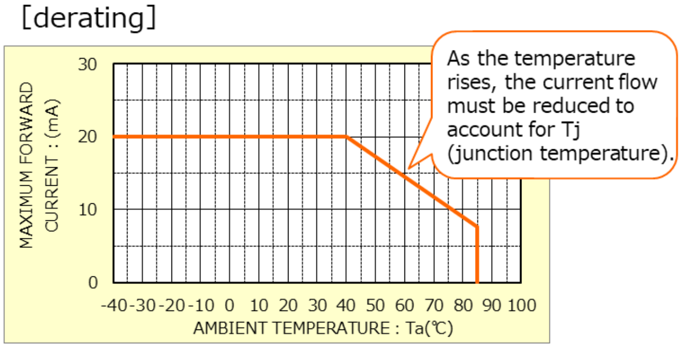
[Relative Luminous Intensity - Temperature]



Derating characteristics

The maximum rated current at each ambient temperature is shown.

[derating]

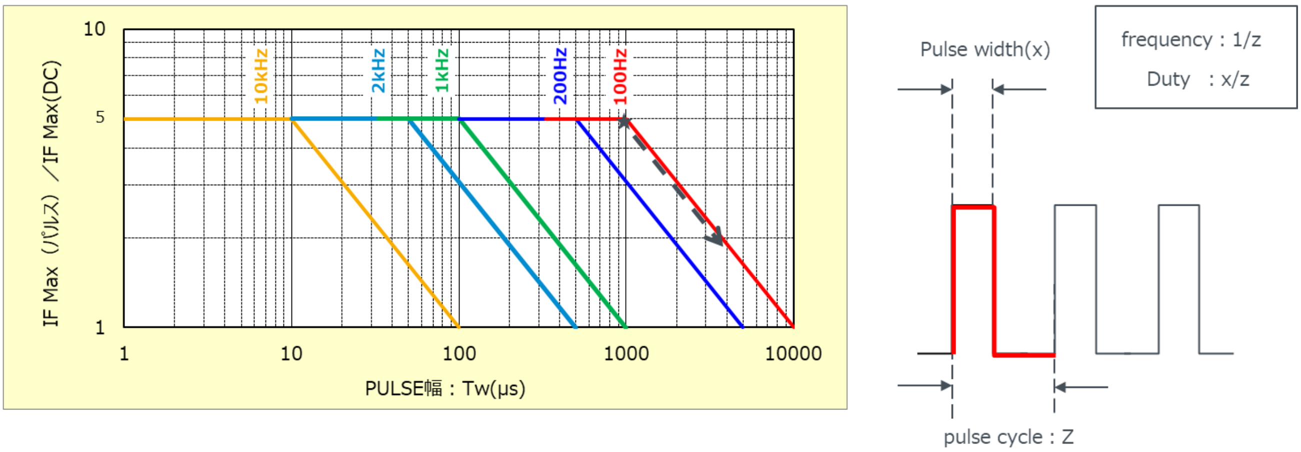


No. 63AN149E Rev.001
2020.10

Maximum peak allowable current vs. pulse width

The following table shows the maximum peak allowable current at each frequency and pulse width when the LEDs are pulsed.

[Maximum allowable peak current vs. pulse width]



LED lighting time (On time): x (seconds)
Frequency: y (Hz)
Pulse cycle: z (second)
If the pulse duty is A, then

The following relationship holds.
(1) 1÷y=z
(2) x / (1 / y) = A

(Example) LED lighting time: 1000μsec.
In the case of frequency: 100Hz.

→ Pulse Cycle = 1/100 = 0.01 sec.=10000μsec.
Pulse Duty = 1000/100 = 0.01sec. =10000μsec. (The above graph ★)
→ IF Max (pulse) will be 5 times greater than IF Max (DC).
If only the pulse width is increased without changing the duty, as shown by the arrows IF Max (pulse) approaches the same as IF Max (DC).

The maximum permissible peak current (pulse: 10% duty cycle) shown in the specification is five times the IF Max value (DC current).

The IF Max (DC current) varies depending on the pulse frequency and duty used, and we recommend using a frequency of 100Hz or higher to prevent flickering of the LED lights.

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 specified in this document are not designed to be radiation tolerant.

7) 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.

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

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

10) ROHM has used reasonable care to ensure 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.

11) 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.

12) 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.

13) This document, in part or in whole, may not be reprinted or reproduced without prior consent of ROHM.

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

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