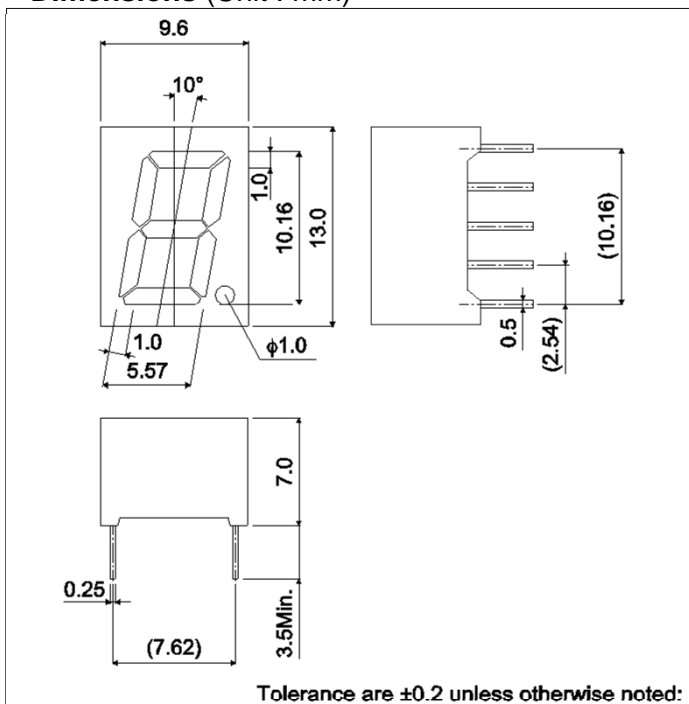


LAP-401 D / N series are the numerical display units featuring ROHM's in-house 4-element (AlGaInP) high-brightness LED dies. Their luminous intensity is top class in the industry while degradation is considerably slow, which helps to keep illumination vividness almost unchanged and the image of sets high over a long period of time.

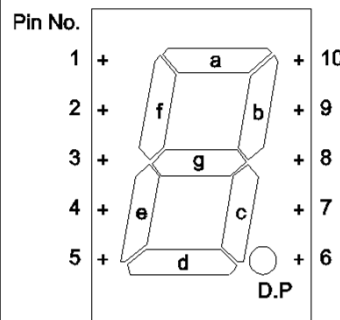
### ●Features

- 1) 10.16mm for letter height, single-line LED numerical displays.
- 2) About 10 times more luminous intensity than the conventional products by use of 4-element LED dies. (in case of orange color)
- 3) The same luminous intensity as the conventional products at their 1/10 of current, which contributes lots to energy-saving of sets.
- 4) Light-leakage from segments probable with the small display packages is very rare.
- 5) Both anode common type and cathode common type are available in lineup for each color.

### ●Dimensions (Unit : mm)

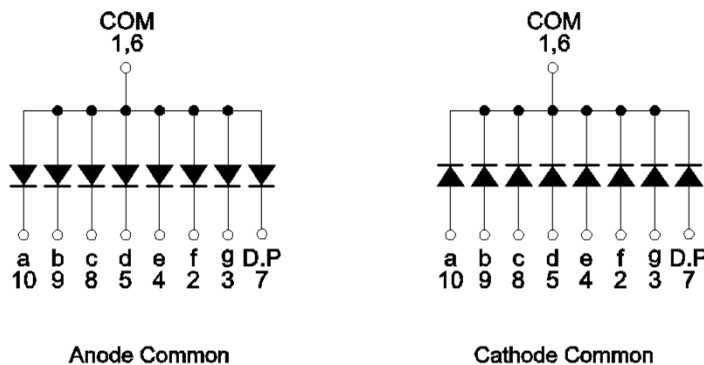


### ●Pin assignments



Pin No.	Function
1	Common
2	Segment "f"
3	Segment "g"
4	Segment "e"
5	Segment "d"
6	Common
7	D.P
8	Segment "c"
9	Segment "b"
10	Segment "a"

### ●Internal circuit schematic



### ●Selection guide

Emitting color	Emitting color			
	Red	Orange	Yellow (NRND)	Green
Common				
Anode	LAP-401VD	LAP-401DD	LAP-401YD	LAP-401MD
Cathode	LAP-401VN	LAP-401DN	LAP-401YN	LAP-401MN

● **Absolute maximum ratings** ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Red	Orange	Yellow (NRND)	Green	Unit
		LAP-401VD / VN	LAP-401DD / DN	LAP-401YD / YN	LAP-401MD / MN	
Power dissipation	$P_D$	448	448	448	448	mW
Power dissipation	$P_D / \text{seg}$	56	56	56	56	mW
Forward current	$I_F$	20	20	20	20	mA
Peak forward current	$I_{FP}$	60 * <sup>1</sup>	60 * <sup>1</sup>	60 * <sup>1</sup>	60 * <sup>1</sup>	mA
Reverse voltage	$V_R$	5	5	5	5	V
Operating temperature	$T_{opr}$	-25 to +75				$^\circ\text{C}$
Storage temperature	$T_{stg}$	-30 to +85				$^\circ\text{C}$

\*<sup>1</sup> Pulse width 1ms, duty 1 / 5

● **Electrical and optical characteristics** ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Red		Orange		Yellow (NRND)		Green		Unit
			Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	
Forward voltage	$V_F$	$I_F = 10\text{mA}$	1.9	2.6	1.9	2.6	1.9	2.6	1.9	2.6	V
Reverse current	$I_R$	$V_R = 3\text{V}$	-	100	-	100	-	100	-	100	$\mu\text{A}$
Peak wavelength	$\lambda_p$	$I_F = 10\text{mA}$	650	-	605	-	590	-	572	-	nm
Spectral line halfwidth	$\Delta\lambda$	$I_F = 10\text{mA}$	20	-	20	-	20	-	20	-	nm

© Not designed for radiation resistance.

## ●Luminous intensity

Parameter	$\lambda_p$	Type	Min.	Typ.	Max.	Unit
Red	650	LAP-401VD	14	36	-	mcd
		LAP-401VN				
Orange	605	LAP-401DD	56	250	-	mcd
		LAP-401DN				
Yellow (NRND)	590	LAP-401YD	90	450	-	mcd
		LAP-401YN				
Green	572	LAP-401MD	36	100	-	mcd
		LAP-401MN				

© Condition  $I_F=10\text{mA}$ 

## ●Iv classification

Parameter	Type	Item	Iv classification	Unit
Red	LAP-401VD LAP-401VN	“ N ”	14 to 28	mcd
		“ P ”	22 to 45	mcd
		“ Q ”	36 to 71	mcd
		“ R ”	56 to 110	mcd
		“ S ”	90 to (180)	mcd
Orange	LAP-401DD LAP-401DN	“ R ”	56 to 110	mcd
		“ S ”	90 to 180	mcd
		“ T ”	140 to 280	mcd
		“ U ”	220 to 450	mcd
		“ V ”	360 to (710)	mcd
Green	LAP-401MD LAP-401MN	“ Q ”	36 to 71	mcd
		“ R ”	56 to 110	mcd
		“ S ”	90 to 180	mcd
		“ T ”	140 to 280	mcd
		“ U ”	220 to (450)	mcd

© Condition  $I_F=10\text{mA}$

●Electrical and optical characteristics curves

Fig.1 Forward Current vs. Forward Voltage

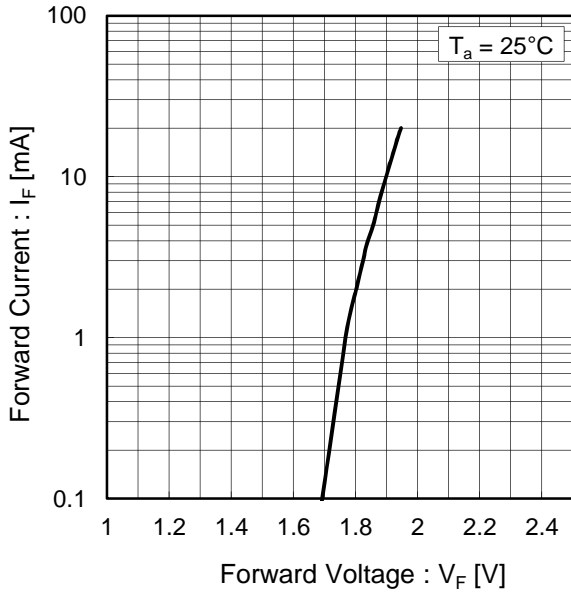


Fig.2 Relative Luminous Intensity vs. Forward Current

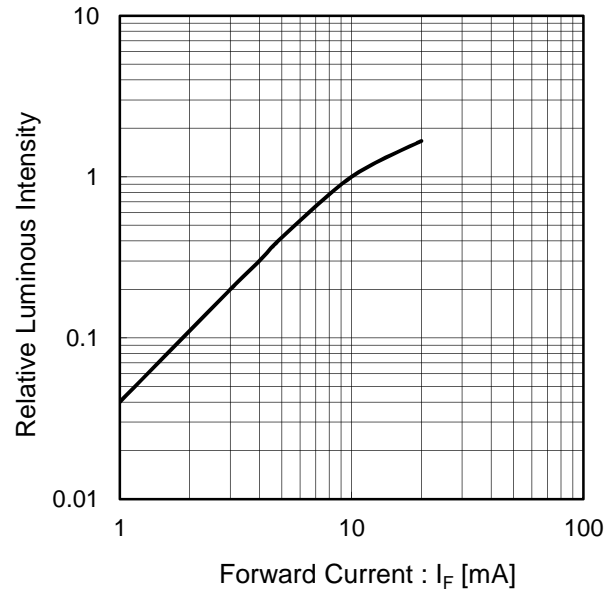


Fig.3 Relative Luminous Intensity vs. Case Temperature

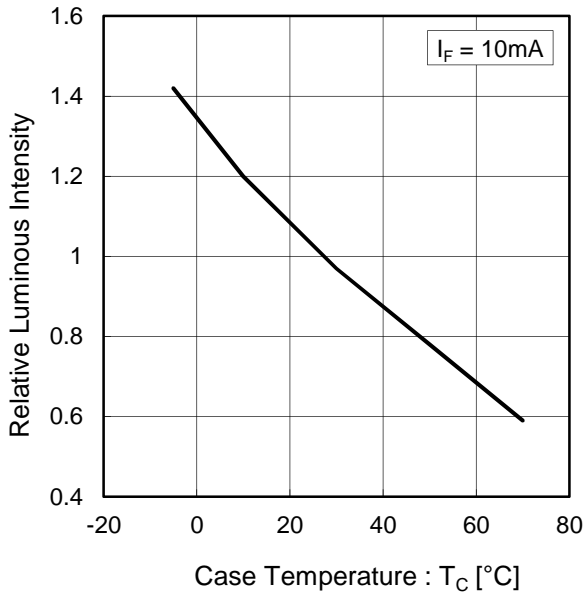
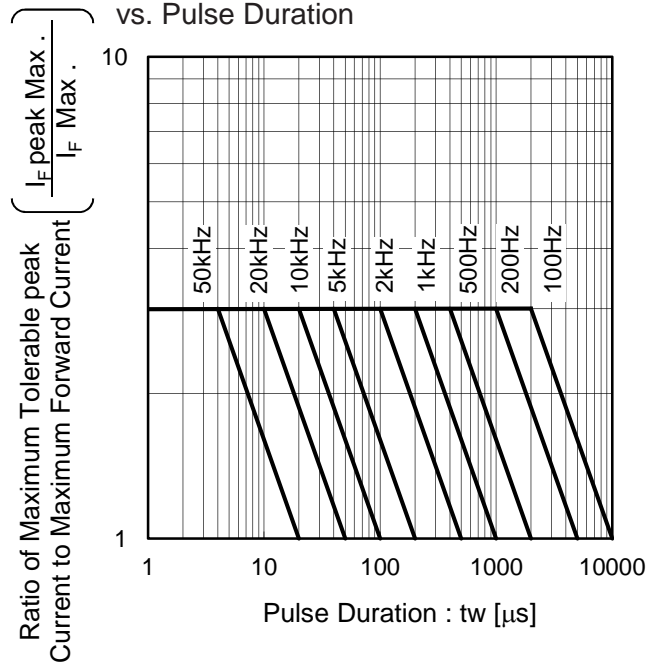
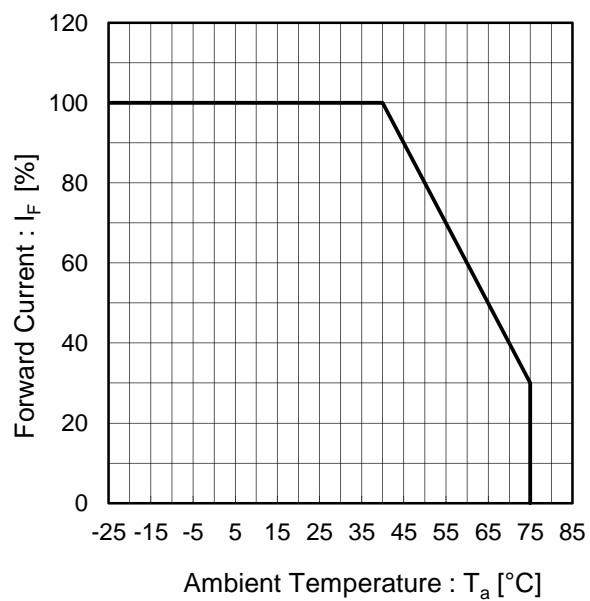


Fig.4 Ratio of Maximum Tolerable Peak Current vs. Pulse Duration



## ●Electrical and optical characteristics curves

Fig.5 Derating



## 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 Products 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 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.
- 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.
- 14) 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/>