Single Digit High Brightness LED Numeric Display

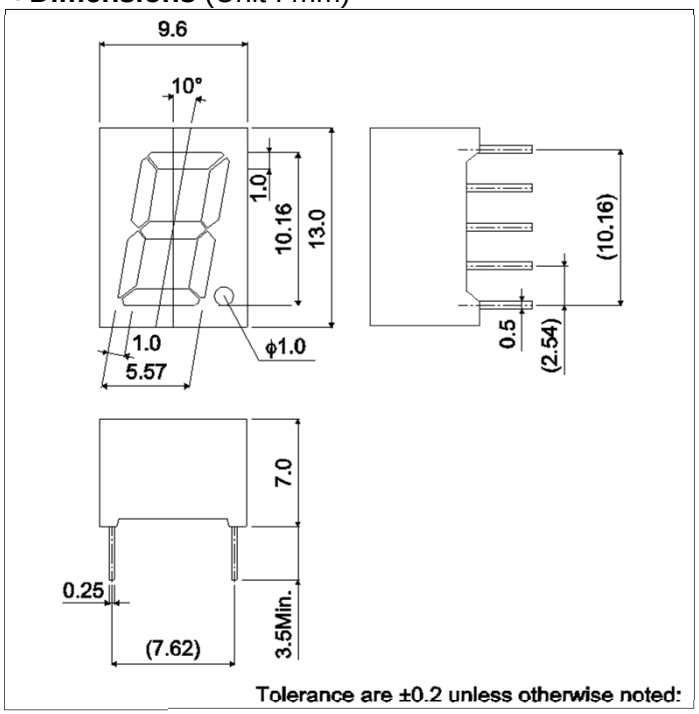
LAP-401 D / N Series Datasheet

LAP-401 D / N series are the numberical 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.

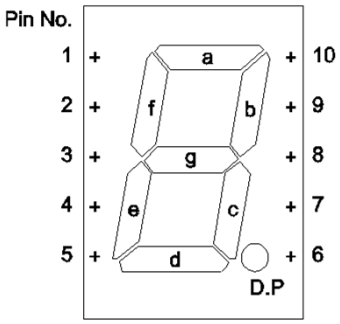
●Features

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)

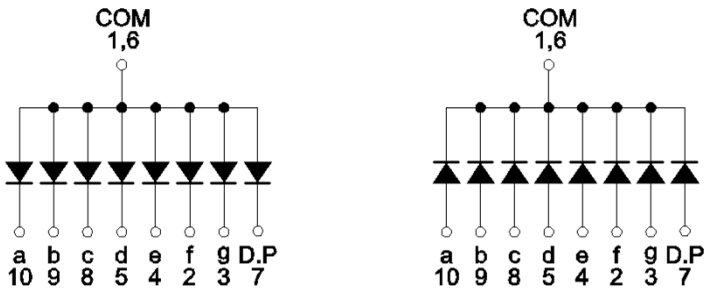


●Pin assignments



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

●**Absolute maximum ratings** (T_a = 25°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 / seg	56	56	56	56	mW
Forward current	I_F	20	20	20	20	mA
Peak forward current	I_{FP}	60 *1	60 *1	60 *1	60 *1	mA
Reverse voltage	V_R	5	5	5	5	V
Operating temperature	T_{opr}	−25 to +75				°C
Storage temperature	T_{stg}	−30 to +85				°C

*1 Pulse width 1ms, duty 1 / 5

●**Electrical and optical characteristics** (T_a = 25°C)

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

◎ Not designed for radiation resistance.

●Luminous intensity

Parameter	λ_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=10mA

●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=10mA

●Electrical and optical characteristics curves

Fig.1 Forward Current vs. Forward Voltage

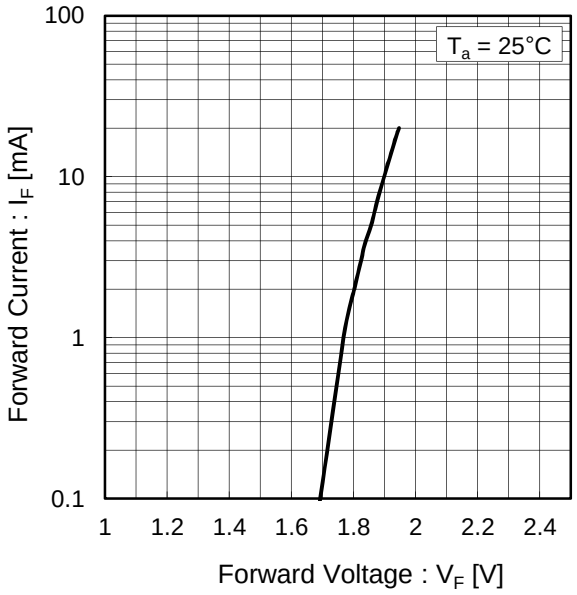


Fig.2 Relative Luminous Intensity vs. Forward Current

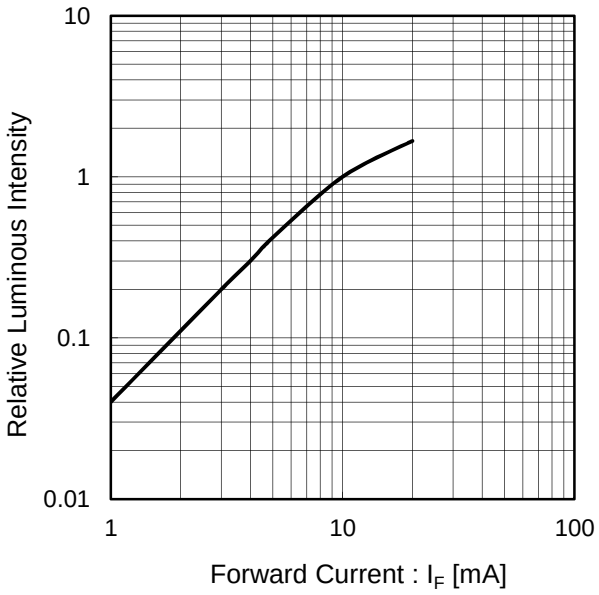


Fig.3 Relative Luminous Intensity vs. Case Temperature

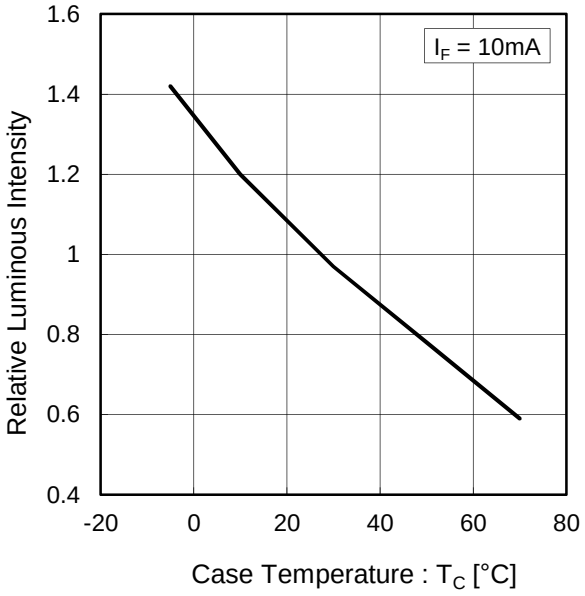
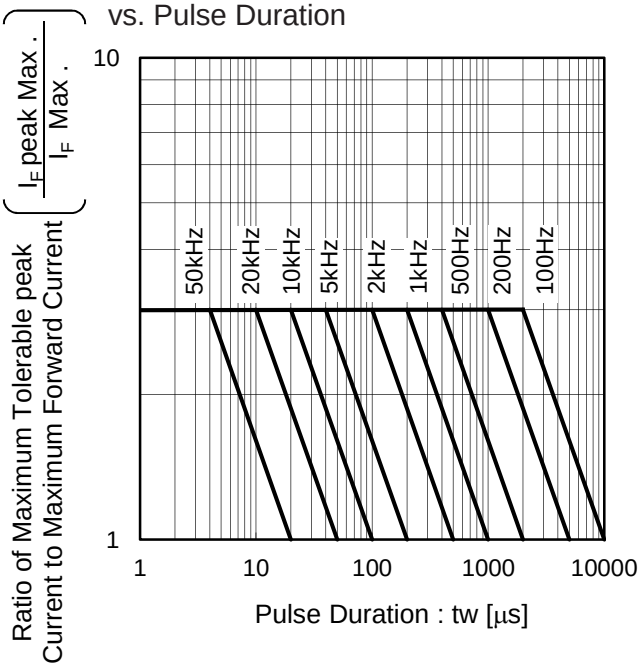
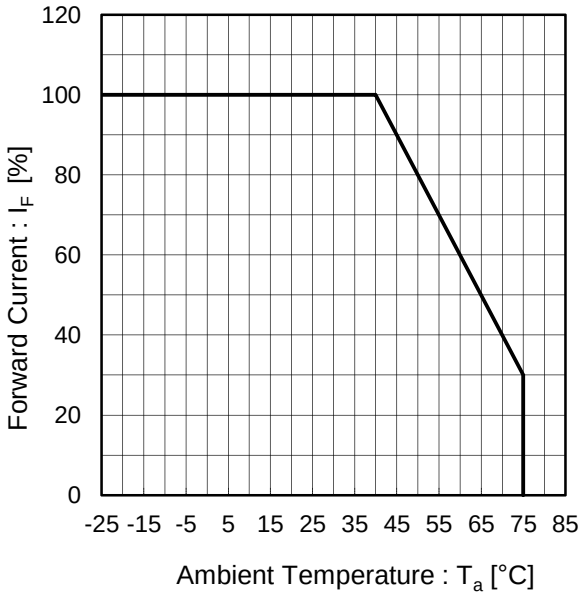


Fig.4 Ratio of Maximum Tolerable Peak Current vs. Pulse Duration



●Electrical and optical characteristics curves

Fig.5 Derating



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