

# High efficiency, two-digit numeric displays

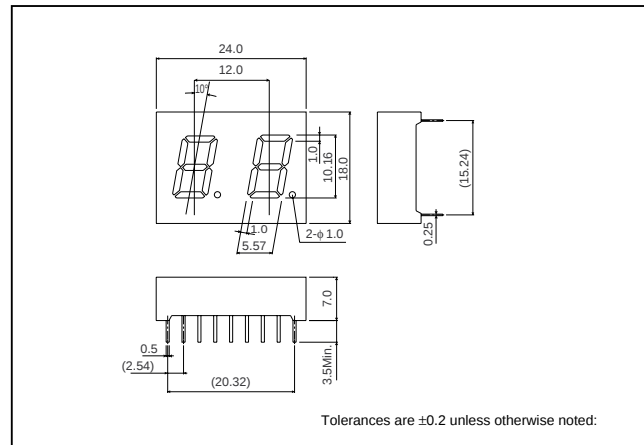
## LB-402DN Series

The LB-402 DN series were designed to meet the need for multi-digit numeric displays. These LED numeric displays use GaAsP on GaP for the emitting material (with the exception of green) and are housed in an epoxy resin package. They are two-digit displays with a character height of 10.16 mm.

### ●Features

- 1) Height of character : 10.16 mm
- 2) Common anode and common cathode configurations are available for each color.
- 3) The package surface is painted black and the segments are colored the display color.
- 4) High efficiency reflectors are used to achieve a bright, clear display.

### ●Dimensions (Unit : mm)

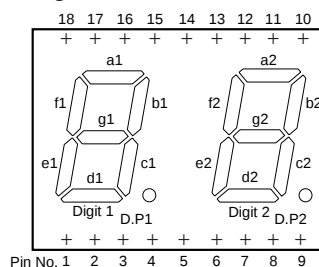


### ●Selection guide

| Emitting color | Red      | Orange    | Yellow    | Green    |
|----------------|----------|-----------|-----------|----------|
| Common         |          |           |           |          |
| Anode          | LB-402VD | LB-402DD* | LB-402YD* | LB-402MD |
| Cathode        | LB-402VN | LB-402DN* | LB-402YN* | LB-402MN |

\*Order-based production.

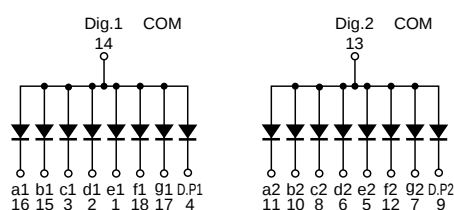
### ●Pin assignments



| Pin No. | Function     | Pin No. | Function       |
|---------|--------------|---------|----------------|
| 1       | Segment "e1" | 10      | Segment "b2"   |
| 2       | Segment "d1" | 11      | Segment "a2"   |
| 3       | Segment "c1" | 12      | Segment "f2"   |
| 4       | D.P1         | 13      | Digit 2 Common |
| 5       | Segment "e2" | 14      | Digit 1 Common |
| 6       | Segment "d2" | 15      | Segment "b1"   |
| 7       | Segment "g2" | 16      | Segment "a1"   |
| 8       | Segment "c2" | 17      | Segment "g1"   |
| 9       | D.P2         | 18      | Segment "f1"   |

## LED displays

## ● Internal circuit schematic (example of common anode)



## ● Absolute maximum ratings (Ta = 25°C)

| Parameter             | Symbol               | Red           | Orange        | Yellow        | Green         | Unit |
|-----------------------|----------------------|---------------|---------------|---------------|---------------|------|
|                       |                      | LB-402VD / VN | LB-402DD / DN | LB-402YD / YN | LB-402MD / MN |      |
| Power dissipation     | P <sub>D</sub>       | 640           | 640           | 640           | 960           | mW   |
| Power dissipation     | P <sub>D</sub> / seg | 40            | 40            | 40            | 60            | mW   |
| Forward current       | I <sub>F</sub>       | 15            | 15            | 15            | 20            | mA   |
| Peak forward current  | I <sub>FP</sub>      | 60*           | 60*           | 60*           | 60*           | mA   |
| Reverse voltage       | V <sub>R</sub>       | 3             | 3             | 3             | 3             | V    |
| Operating temperature | T <sub>opr</sub>     | -25~+75       |               |               |               | °C   |
| Storage temperature   | T <sub>stg</sub>     | -30~+85       |               |               |               | °C   |

\* Pulse width 1ms duty 1 / 5

## ● Electrical and optical characteristics (Ta = 25°C)

| Parameter                | Symbol         | Conditions            | Red  |      |      | Orange |      |      | Yellow |      |      | Green |      |      | Unit |
|--------------------------|----------------|-----------------------|------|------|------|--------|------|------|--------|------|------|-------|------|------|------|
|                          |                |                       | Min. | Typ. | Max. | Min.   | Typ. | Max. | Min.   | Typ. | Max. | Min.  | Typ. | Max. |      |
| Forward voltage          | V <sub>F</sub> | I <sub>F</sub> = 10mA | —    | 2.0  | 2.8  | —      | 2.0  | 2.8  | —      | 2.1  | 2.8  | —     | 2.1  | 2.8  | V    |
| Reverse current          | I <sub>R</sub> | V <sub>R</sub> = 3V   | —    | —    | 100  | —      | —    | 100  | —      | —    | 100  | —     | —    | 100  | μA   |
| Peak wavelength          | λ <sub>P</sub> | I <sub>F</sub> = 10mA | —    | 650  | —    | —      | 610  | —    | —      | 585  | —    | —     | 563  | —    | nm   |
| Spectral line half width | Δλ             | I <sub>F</sub> = 10mA | —    | 40   | —    | —      | 40   | —    | —      | 40   | —    | —     | 40   | —    | nm   |

©Not designed for radiation resistance.

## ● Luminous intensity

| Color  | λ <sub>P</sub> | Type     | Min. | Typ. | Max. | Unit |
|--------|----------------|----------|------|------|------|------|
| Red    | 650            | LB-402VD | 5.6  | 16   | —    | mcd  |
|        |                | LB-402VN |      |      |      |      |
| Orange | 610            | LB-402DD | 3.6  | 10   | —    | mcd  |
|        |                | LB-402DN |      |      |      |      |
| Yellow | 585            | LB-402YD | 3.6  | 10   | —    | mcd  |
|        |                | LB-402YN |      |      |      |      |
| Green  | 563            | LB-402MD | 9.0  | 25   | —    | mcd  |
|        |                | LB-402MN |      |      |      |      |

Note : Measured at I<sub>F</sub> = 10mA

## LED displays

## ● Electrical and optical characteristic curves

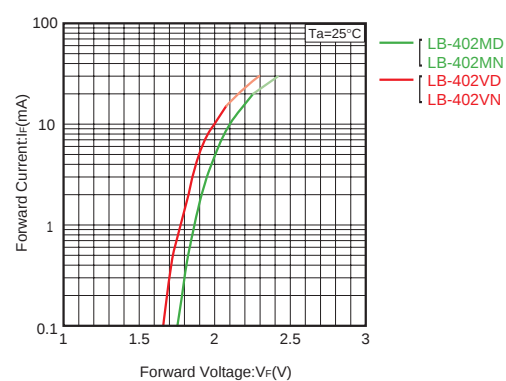


Fig.1 Forward Current - Forward Voltage

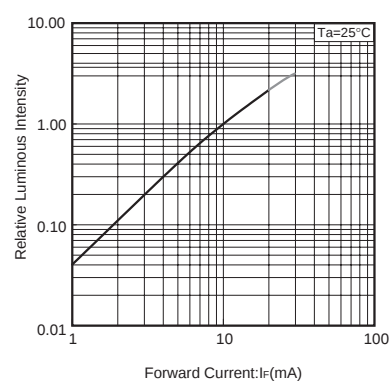


Fig.2 Relative Luminous Intensity - Forward Current

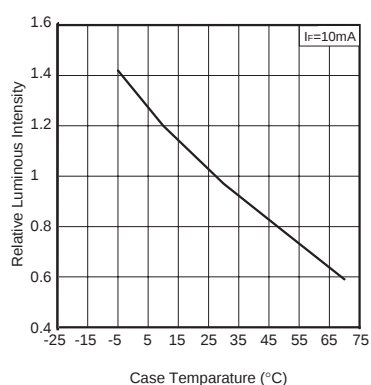


Fig.3 Relative Luminous Intensity - Case Temperature

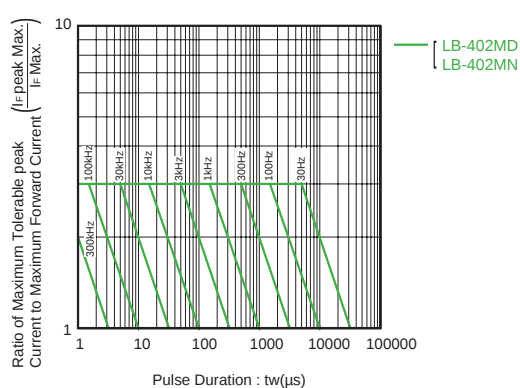


Fig.4 Ratio of Maximum Tolerable Peak Current - Pulse Duration ( I )

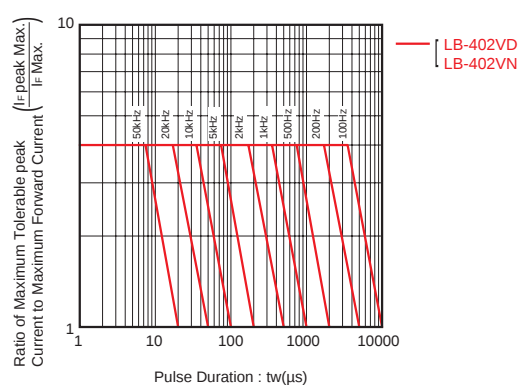


Fig.5 Ratio of Maximum Tolerable Peak Current - Pulse Duration ( II )

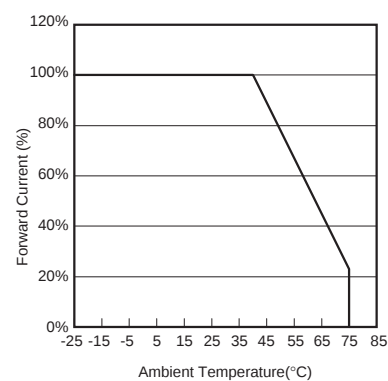


Fig.6 Derating

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