LED Display Module | 650 nm | AlInGaP

ELM-650-992-7

Prototype

Features
- FR4 PCB
- Radiation 650 nm (red)
- 7-segment chip (5-times)
- Optimized to avoid reflections

Pat. US 8847241 B2

Applications
- Rangefinder
### Maximum Ratings

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_F$</td>
<td>10 mA</td>
<td>mA</td>
</tr>
<tr>
<td>$T_{amb}$</td>
<td>-25 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>$T_J$</td>
<td>+100</td>
<td>°C</td>
</tr>
</tbody>
</table>

### Optical and Electrical Characteristics

<table>
<thead>
<tr>
<th>Test conditions</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_F = 5$ mA</td>
<td>$V_F$</td>
<td>1.85</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$I_F = 10$ µA</td>
<td>$V_R$</td>
<td>5</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$I_F = 5$ mA</td>
<td>$I_I$</td>
<td>12</td>
<td></td>
<td>1.75</td>
<td>mcd</td>
</tr>
<tr>
<td>$I_F = 5$ mA</td>
<td>$\lambda_p$</td>
<td>645</td>
<td></td>
<td>2.00</td>
<td>nm</td>
</tr>
<tr>
<td>$I_F = 5$ mA</td>
<td>$\lambda_c$</td>
<td>635</td>
<td>645</td>
<td>655</td>
<td>nm</td>
</tr>
<tr>
<td>$I_F = 5$ mA</td>
<td>$\Delta\lambda_{45}$</td>
<td>15</td>
<td></td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>$I_F = 5$ mA</td>
<td>$TC(V_F)$</td>
<td></td>
<td>-1.4</td>
<td></td>
<td>mV/K</td>
</tr>
<tr>
<td>$I_F = 5$ mA</td>
<td>$TC(I_F)$</td>
<td></td>
<td>-0.7</td>
<td></td>
<td>%/K</td>
</tr>
<tr>
<td>$I_F = 5$ mA</td>
<td>$TC(\lambda_c)$</td>
<td></td>
<td>0.11</td>
<td></td>
<td>nm/K</td>
</tr>
</tbody>
</table>

1. $T_{amb} = 25$°C, unless otherwise specified
2. measured on bare chip on TO-18 header with JENOPTIK Polymer Systems equipment
**Typical Characteristics**

**Segment of 7-Segment Chip**

- **Forward Voltage vs. Forward Current (typical)**
- **Luminous Intensity vs. Forward Current (typical)**

**Spectral Power** $I_F = 5 \text{ mA}$

- **Spectral Power Distribution (typical)**

**Current Reduction**

- **Ambient Temperature vs. Maximal Forward Current**

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JENOPTIK
Luminous Density

Typical current for a luminous density of approx. 100 000 cd/m² *

<table>
<thead>
<tr>
<th>7-Segment</th>
<th>Typ. Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per segment</td>
<td>0.29 mA</td>
</tr>
</tbody>
</table>

*Note: The typical current results by calculation on basis of the measurements of bare chips at 5 mA and room temperature. This value is for information only.
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Mechanical Dimensions

*module dimensions specified in mm*

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N.B. Si 281-1454 (14 pins)

Dimensions specified in mm
Chip

dimensions specified in µm

the relative tolerance in y direction between the 4 LED Chips is ± 0.025 mm

dimensions specified in mm
Pinout

front

1 14

back (optional)

1 14

front connector  back connector
1 - "b" anode     1 - not connected
2 - Chip E cathode  2 - Chip D cathode
3 - Chip B cathode  3 - "e" anode
4 - Chip A cathode  4 - "d" anode
5 - "g" anode     5 - "c" anode
6 - "a" anode     6 - "dp" anode
7 - "f" anode     7 - Chip C cathode
8 - Chip C cathode  8 - "f" anode
9 - "dp" anode     9 - "a" anode
10 - "c" anode    10 - "g" anode
11 - "d" anode    11 - Chip A cathode
12 - "e" anode    12 - Chip B cathode
13 - Chip D cathode  13 - Chip E cathode
14 - not connected  14 - "b" anode
ELM-650-992-7 | 650 nm | Prototype

Labeling

<table>
<thead>
<tr>
<th>Labeling</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>JENOPTIK Polymer System GmbH</td>
</tr>
<tr>
<td>Type</td>
<td>ELM-650-992-7</td>
</tr>
<tr>
<td>Order N°</td>
<td>626937</td>
</tr>
<tr>
<td>Quantity</td>
<td>XXX pcs</td>
</tr>
<tr>
<td>Charge</td>
<td>XXXXXXX</td>
</tr>
<tr>
<td>Purchase Order N°</td>
<td>1234567890</td>
</tr>
<tr>
<td>Patent</td>
<td>US 8847241 B2</td>
</tr>
</tbody>
</table>
Handling
Die surface and contact wires are very sensitive to mechanical stress. Lift and assemble the module carefully.
We accept no liability for errors during handling and resulting damage.

Modules have to be handled ESD sensitive.

Safety Advice*
The evaluation of eye safety occurs according to the standard CIE/IEC 62471:2006 (“Photobiological Safety of Lamps and Lamp Systems”). Within the risk grouping system of this CIE standard the LED module in this data sheet is assigned into the Group 1 – Low Risk.

*Note: Safety classification of an optical component mainly depends on the intended application and the way the component is being used. Furthermore, all statements made to classification are based on calculations and are only valid for this LED “as it is”, and at continuous operation, assuming direct view and maximum forward current. Using pulsed current or altering the light beam with additional optics may lead to different safety classifications. Therefore these remarks should be taken as recommendation and guideline only.