Low Current 7 mm 7-Segment Display

DESCRIPTION
The TDSL11.0 series are 7 mm character seven segment low current LED displays in a very compact package.

The displays are designed for a viewing distance up to 3 m and available in high efficiency red. The grey package surface and the evenly lighted untinted segments provide an optimum on-off contrast.

All displays are categorized in luminous intensity groups. That allows users to assemble displays with uniform appearance.

Typical applications include instruments, panel meters, point-of-sale terminals and household equipment.

FEATURES
• Low power consumption
• Suitable for DC and multiplex operation
• Evenly lighted segments
• Grey package surface
• Untinted segments
• Luminous intensity categorized
• Wide viewing angle
• Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS
• Panel meters
• Test- and measure-equipment
• Point-of-sale terminals
• Control units

PRODUCT GROUP AND PACKAGE DATA
• Product group: Display
• Package: 7 mm
• Product series: Low current
• Angle of half intensity: ± 50°

PARTS TABLE

<table>
<thead>
<tr>
<th>PART</th>
<th>COLOR</th>
<th>LUMINOUS INTENSITY (μcd) at IF (mA)</th>
<th>WAVELENGTH (nm) at IF (mA)</th>
<th>FORWARD VOLTAGE (V) at IF (mA)</th>
<th>CIRCUITRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDSL1150</td>
<td>Red</td>
<td>180 260 - 2 612 - 625 2 - 1.8 2.4 2</td>
<td>Common anode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TDSL1160</td>
<td>Red</td>
<td>180 260 - 2 612 - 625 2 - 1.8 2.4 2</td>
<td>Common cathode</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ABSOLUTE MAXIMUM RATINGS (Tamb = 25 °C, unless otherwise specified)
TDSL1150, TDSL1160

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITION</th>
<th>SYMBOL</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse voltage per segment</td>
<td></td>
<td>V_R</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>DC forward current per segment</td>
<td></td>
<td>I_F</td>
<td>15</td>
<td>mA</td>
</tr>
<tr>
<td>Peak forward current per segment</td>
<td></td>
<td>I_FM</td>
<td>45</td>
<td>mA</td>
</tr>
<tr>
<td>Surge forward current per segment</td>
<td>t_p ≤ 10 μs</td>
<td>I_FSM</td>
<td>106</td>
<td>mA</td>
</tr>
<tr>
<td>Power dissipation</td>
<td>Tamb ≤ 45 °C</td>
<td>P_V</td>
<td>320</td>
<td>mW</td>
</tr>
<tr>
<td>Junction temperature</td>
<td>Tamb</td>
<td>T_J</td>
<td>100</td>
<td>°C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>Tamb</td>
<td>T_amb</td>
<td>- 40 to + 85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>T_stg</td>
<td>- 40 to + 85</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Soldering temperature</td>
<td>t ≤ 3 s, below seating plane</td>
<td>T_σ</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Thermal resistance LED junction/ambient</td>
<td></td>
<td>R_JJA</td>
<td>180</td>
<td>K/W</td>
</tr>
</tbody>
</table>
**TDSL1150, TDSL1160**

**Vishay Semiconductors**

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**OPTICAL AND ELECTRICAL CHARACTERISTICS** *(T<sub>amb</sub> = 25 °C, unless otherwise specified)*

**TDSL1150, TDSL1160, RED**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITION</th>
<th>PART</th>
<th>SYMBOL</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luminous intensity per segment <em>(1)</em> (digit average)</td>
<td>If = 2 mA</td>
<td>TDSL1150</td>
<td>I&lt;sub&gt;V&lt;/sub&gt;</td>
<td>180</td>
<td>260</td>
<td>-</td>
<td>μcd</td>
</tr>
<tr>
<td></td>
<td>TDSL1160</td>
<td></td>
<td></td>
<td>180</td>
<td>260</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If = 5 mA</td>
<td>TDSL1150</td>
<td></td>
<td>-</td>
<td>1000</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TDSL1160</td>
<td></td>
<td></td>
<td>-</td>
<td>1000</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If = 20 mA, I&lt;sub&gt;p&lt;/sub&gt;/T = 0.25</td>
<td>TDSL1150</td>
<td></td>
<td>-</td>
<td>1300</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TDSL1160</td>
<td></td>
<td></td>
<td>-</td>
<td>1300</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Dominant wavelength</td>
<td>If = 2 mA</td>
<td>TDSL1150, TDSL1160</td>
<td>( \lambda_{D} )</td>
<td>612</td>
<td>-</td>
<td>625</td>
<td>nm</td>
</tr>
<tr>
<td>Peak wavelength</td>
<td>If = 2 mA</td>
<td>TDSL1150, TDSL1160</td>
<td>( \lambda_{P} )</td>
<td>-</td>
<td>635</td>
<td>-</td>
<td>nm</td>
</tr>
<tr>
<td>Angle of half intensity</td>
<td>If = 2 mA</td>
<td>TDSL1150, TDSL1160</td>
<td>( \phi )</td>
<td>-</td>
<td>± 50</td>
<td>-</td>
<td>deg</td>
</tr>
<tr>
<td>Forward voltage per segment</td>
<td>If = 2 mA</td>
<td>TDSL1150, TDSL1160</td>
<td>V&lt;sub&gt;F&lt;/sub&gt;</td>
<td>-</td>
<td>1.8</td>
<td>2.4</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>If = 20 mA</td>
<td>TDSL1150, TDSL1160</td>
<td>V&lt;sub&gt;F&lt;/sub&gt;</td>
<td>-</td>
<td>2.7</td>
<td>3</td>
<td>V</td>
</tr>
<tr>
<td>Reverse voltage per segment</td>
<td>If = 10 μA</td>
<td>TDSL1150, TDSL1160</td>
<td>V&lt;sub&gt;R&lt;/sub&gt;</td>
<td>6</td>
<td>20</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>Junction capacitance</td>
<td>V&lt;sub&gt;R&lt;/sub&gt; = 0 V, f = 1 MHz</td>
<td>TDSL1150, TDSL1160</td>
<td>C&lt;sub&gt;j&lt;/sub&gt;</td>
<td>-</td>
<td>30</td>
<td>-</td>
<td>pF</td>
</tr>
</tbody>
</table>

**Note** *(1)* I<sub>min</sub> and I<sub>V</sub> groups are mean values of all segments (a to g, D1 to D4), matching factor within segments is ≥ 0.5, excluding decimal points and colon.

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**LUMINOUS INTENSITY CLASSIFICATION**

<table>
<thead>
<tr>
<th>GROUP</th>
<th>LIGHT INTENSITY (μcd)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STANDARD</td>
</tr>
<tr>
<td>E</td>
<td>180</td>
</tr>
<tr>
<td>F</td>
<td>280</td>
</tr>
<tr>
<td>G</td>
<td>450</td>
</tr>
<tr>
<td>H</td>
<td>700</td>
</tr>
<tr>
<td>I</td>
<td>1100</td>
</tr>
<tr>
<td>K</td>
<td>1800</td>
</tr>
</tbody>
</table>

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**TYPICAL CHARACTERISTICS** *(T<sub>amb</sub> = 25 °C, unless otherwise specified)*

- **Fig. 1 - Forward Current vs. Ambient Temperature**
- **Fig. 2 - Relative Luminous Intensity vs. Angular Displacement**

For technical questions, contact: LED@Vishay.com

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**Fig. 3** - Forward Current vs. Forward Voltage

**Fig. 4** - Relative Luminous Intensity vs. Ambient Temperature

**Fig. 5** - Relative Luminous Intensity vs. Forward Current/Duty Cycle

**Fig. 6** - Relative Luminous Intensity vs. Forward Current

**Fig. 7** - Relative Intensity vs. Wavelength

**Fig. 8** - TDSL11...
PACKAGE DIMENSIONS in millimeters

Drawing-No.: 6.544-5083.01-4
Issue: 1; 21.11.95
95 11342
Display-7 mm

Package Dimensions in mm

[Diagram showing the dimensions in millimeters.
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   respectively
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Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423
Pin Connections 7 mm

Diagram showing pin connections for a 7-mm component.
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