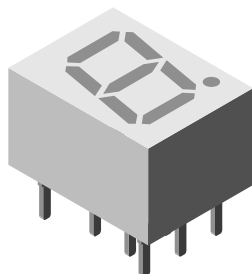


## Low Current 7 mm 7-Segment Display



19235

### 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 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](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### 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:  $\pm 50^\circ$

### PARTS TABLE

| PART     | COLOR | LUMINOUS INTENSITY ( $\mu\text{cd}$ ) |      |      | at $I_F$ (mA) | WAVELENGTH (nm) |      |      | at $I_F$ (mA) | FORWARD VOLTAGE (V) |      |      | at $I_F$ (mA) | CIRCUITRY      |
|----------|-------|---------------------------------------|------|------|---------------|-----------------|------|------|---------------|---------------------|------|------|---------------|----------------|
|          |       | MIN.                                  | TYP. | MAX. |               | MIN.            | TYP. | MAX. |               | MIN.                | TYP. | MAX. |               |                |
| TDSL1150 | Red   | 180                                   | 260  | -    | 2             | 612             | -    | 625  | 2             | -                   | 1.8  | 2.4  | 2             | Common anode   |
| TDSL1160 | Red   | 180                                   | 260  | -    | 2             | 612             | -    | 625  | 2             | -                   | 1.8  | 2.4  | 2             | Common cathode |

### ABSOLUTE MAXIMUM RATINGS ( $T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified) TDSL1150, TDSL1160

| PARAMETER                               | TEST CONDITION                                  | SYMBOL            | VALUE        | UNIT             |
|-----------------------------------------|-------------------------------------------------|-------------------|--------------|------------------|
| Reverse voltage per segment             |                                                 | $V_R$             | 6            | V                |
| DC forward current per segment          |                                                 | $I_F$             | 15           | mA               |
| Peak forward current per segment        |                                                 | $I_{FM}$          | 45           | mA               |
| Surge forward current per segment       | $t_p \leq 10 \mu\text{s}$ (non repetitive)      | $I_{FSM}$         | 106          | mA               |
| Power dissipation                       | $T_{\text{amb}} \leq 45^\circ\text{C}$          | $P_V$             | 320          | mW               |
| Junction temperature                    |                                                 | $T_j$             | 100          | $^\circ\text{C}$ |
| Operating temperature range             |                                                 | $T_{\text{amb}}$  | - 40 to + 85 | $^\circ\text{C}$ |
| Storage temperature range               |                                                 | $T_{\text{stg}}$  | - 40 to + 85 | $^\circ\text{C}$ |
| Soldering temperature                   | $t \leq 3 \text{ s}$ , 2 mm below seating plane | $T_{\text{sd}}$   | 260          | $^\circ\text{C}$ |
| Thermal resistance LED junction/ambient |                                                 | $R_{\text{thJA}}$ | 180          | K/W              |

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TDSL1150, TDSL1160, RED**

| PARAMETER                                                        | TEST CONDITION                       | PART                  | SYMBOL      | MIN. | TYP.     | MAX. | UNIT           |
|------------------------------------------------------------------|--------------------------------------|-----------------------|-------------|------|----------|------|----------------|
| Luminous intensity per segment <sup>(1)</sup><br>(digit average) | $I_F = 2\text{ mA}$                  | TDSL1150              | $I_V$       | 180  | 260      | -    | $\mu\text{cd}$ |
|                                                                  |                                      | TDSL1160              |             | 180  | 260      | -    |                |
|                                                                  | $I_F = 5\text{ mA}$                  | TDSL1150              |             | -    | 1000     | -    |                |
|                                                                  |                                      | TDSL1160              |             | -    | 1000     | -    |                |
|                                                                  | $I_F = 20\text{ mA}, t_p/T = 0.25$   | TDSL1150              |             | -    | 1300     | -    |                |
|                                                                  |                                      | TDSL1160              |             | -    | 1300     | -    |                |
| Dominant wavelength                                              | $I_F = 2\text{ mA}$                  | TDSL1150,<br>TDSL1160 | $\lambda_d$ | 612  | -        | 625  | nm             |
| Peak wavelength                                                  | $I_F = 2\text{ mA}$                  |                       | $\lambda_p$ | -    | 635      | -    | nm             |
| Angle of half intensity                                          | $I_F = 2\text{ mA}$                  |                       | $\phi$      | -    | $\pm 50$ | -    | deg            |
| Forward voltage per segment                                      | $I_F = 2\text{ mA}$                  |                       | $V_F$       | -    | 1.8      | 2.4  | V              |
|                                                                  | $I_F = 20\text{ mA}$                 |                       | $V_F$       | -    | 2.7      | 3    | V              |
| Reverse voltage per segment                                      | $I_F = 10\text{ }\mu\text{A}$        |                       | $V_R$       | 6    | 20       | -    | V              |
| Junction capacitance                                             | $V_R = 0\text{ V}, f = 1\text{ MHz}$ |                       | $C_j$       | -    | 30       | -    | pF             |

**Note**

<sup>(1)</sup>  $I_{Vmin.}$  and  $I_V$  groups are mean values of all segments (a to g, D1 to D4), matching factor within segments is  $\geq 0.5$ , excluding decimal points and colon.

**LUMINOUS INTENSITY CLASSIFICATION**

| GROUP    | LIGHT INTENSITY ( $\mu\text{cd}$ ) |      |
|----------|------------------------------------|------|
|          | MIN.                               | MAX. |
| STANDARD |                                    |      |
| E        | 180                                | 360  |
| F        | 280                                | 560  |
| G        | 450                                | 900  |
| H        | 700                                | 1400 |
| I        | 1100                               | 2200 |
| K        | 1800                               | 3600 |

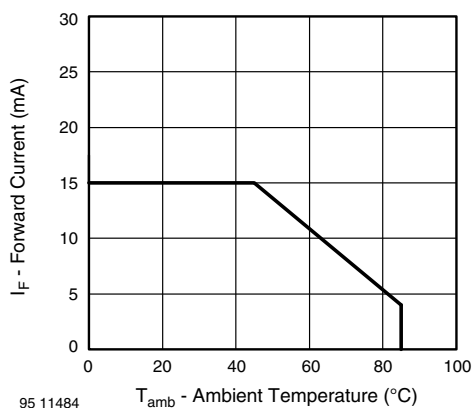
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

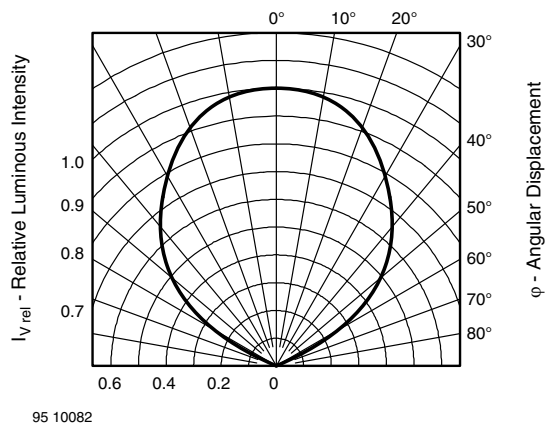


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

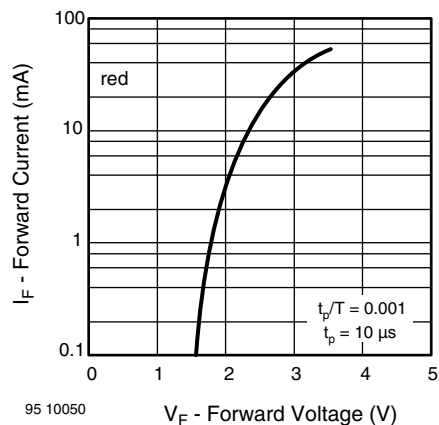


Fig. 3 - Forward Current vs. Forward Voltage

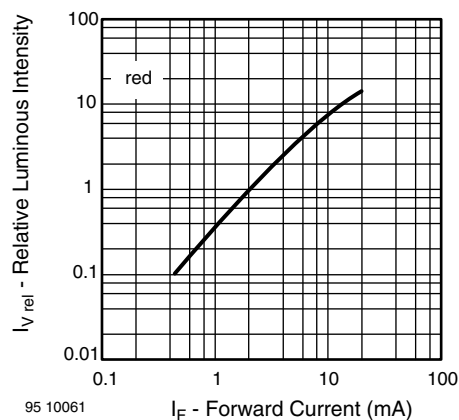


Fig. 6 - Relative Luminous Intensity vs. Forward Current

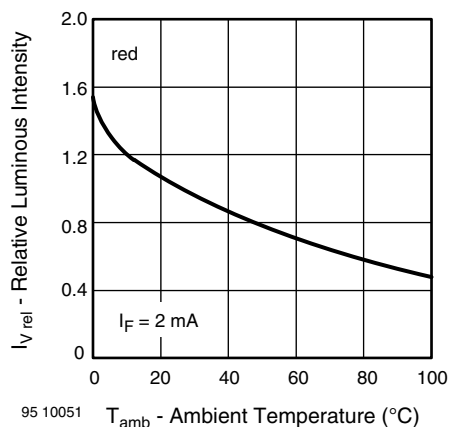


Fig. 4 - Relative Luminous Intensity vs. Ambient Temperature

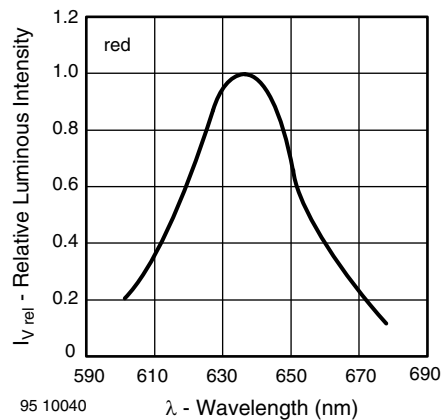


Fig. 7 - Relative Intensity vs. Wavelength

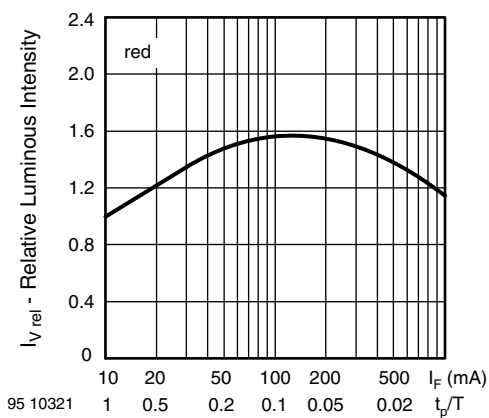


Fig. 5 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

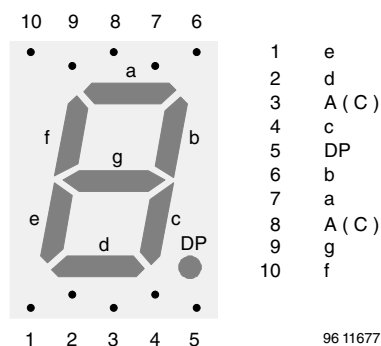
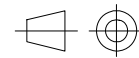
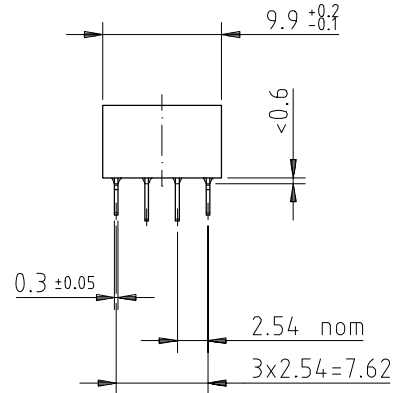
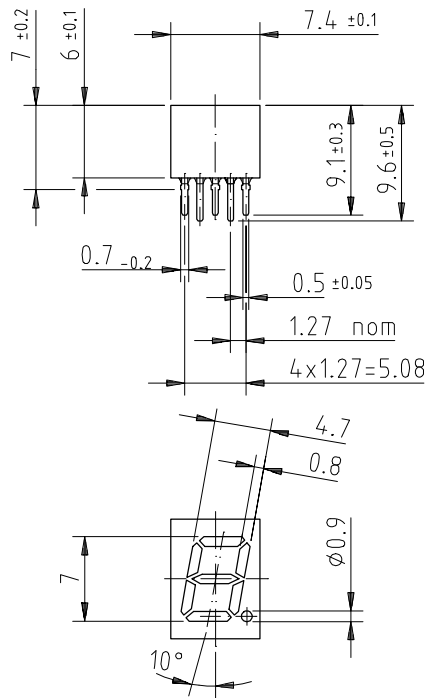


Fig. 8 - TDSL11..



**PACKAGE DIMENSIONS** in millimeters



technical drawings  
according to DIN  
specifications

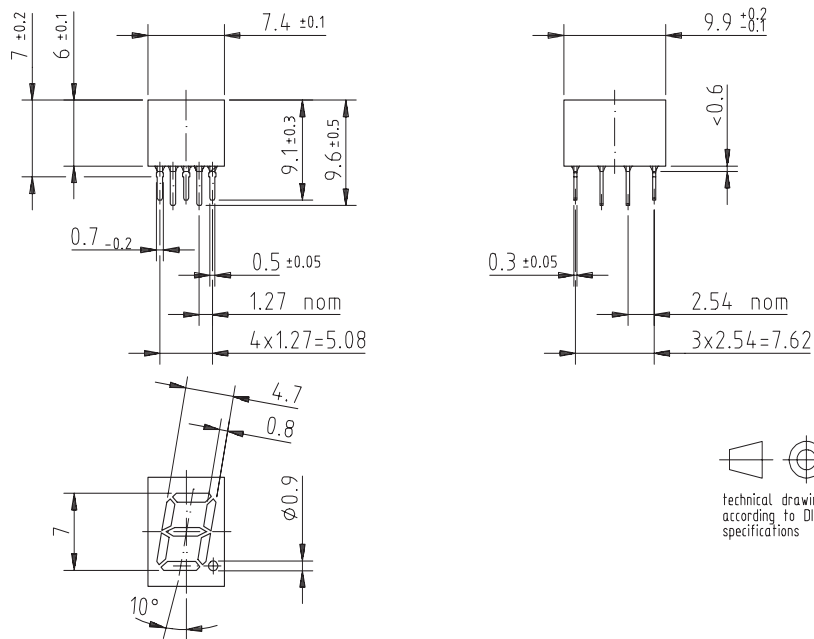
Drawing-No.: 6.544-5083.01-4

Issue: 1; 21.11.95

95 11342

## Display-7 mm

### Package Dimensions in mm



95 11342

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2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

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2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

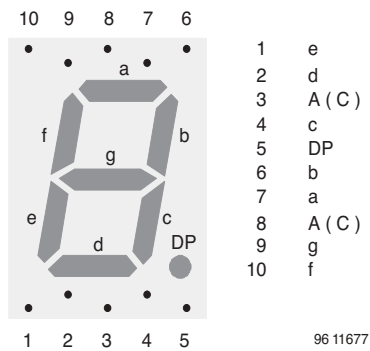
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Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

## Pin Connections 7 mm



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