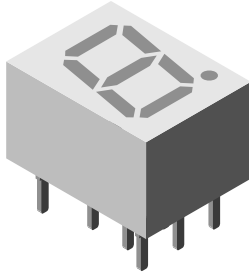


## Low Current 7 mm Seven Segment Display



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 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
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC


**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 at 2 mA	CIRCUITRY
TDSL1150	Red	$I_V = 260 \mu\text{cd (typ.)}$	Common anode
TDSL1160	Red	$I_V = 260 \mu\text{cd (typ.)}$	Common cathode

### ABSOLUTE MAXIMUM RATINGS <sup>(1)</sup> 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	$T_{amb} \leq 45^\circ\text{C}$	$P_V$	320	mW
Junction temperature		$T_j$	100	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	- 40 to + 85	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	- 40 to + 85	$^\circ\text{C}$
Soldering temperature	$t \leq 3 \text{ s}$ 2 mm below seating plane	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance LED junction/ambient		$R_{thJA}$	180	K/W

#### Note

<sup>(1)</sup>  $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified

OPTICAL AND ELECTRICAL CHARACTERISTICS <sup>(1)</sup> TDSL1150, TDSL1160, RED							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment <sup>(2)</sup> (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, 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	$I_F = 10 \mu\text{A}$		$V_R$	6	20	-	V
Junction capacitance	$V_R = 0 \text{ V}, f = 1 \text{ MHz}$		$C_j$	-	30	-	pF

### Notes

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

(2)  $I_{V\text{min}}$  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 ( $\mu\text{cd}$ )	
	STANDARD	MIN.
E	180	360
F	280	560
G	450	900
H	700	1400
I	1100	2200
K	1800	3600

### BASIC CHARACTERISTICS

$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified

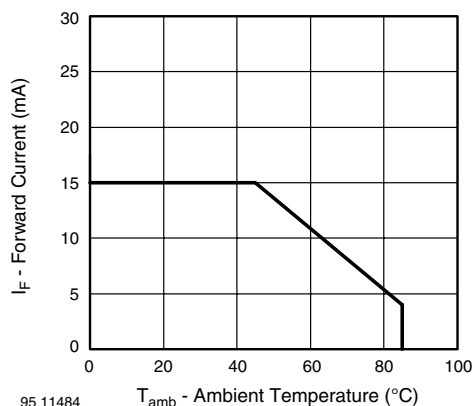


Fig. 1 - Forward Current vs. Ambient Temperature

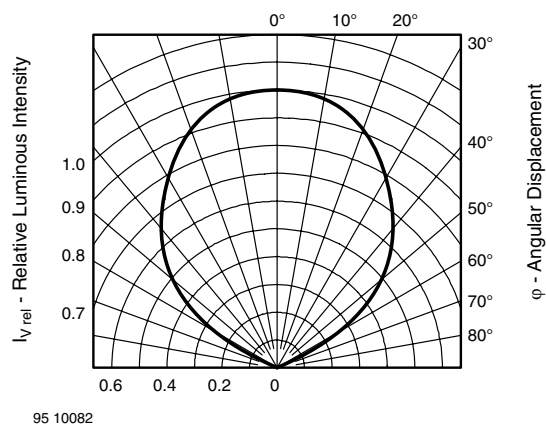


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

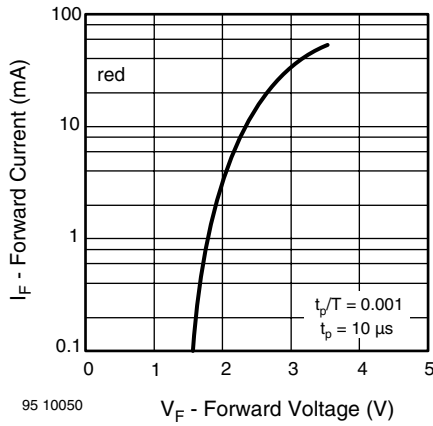


Fig. 3 - Forward Current vs. Forward Voltage

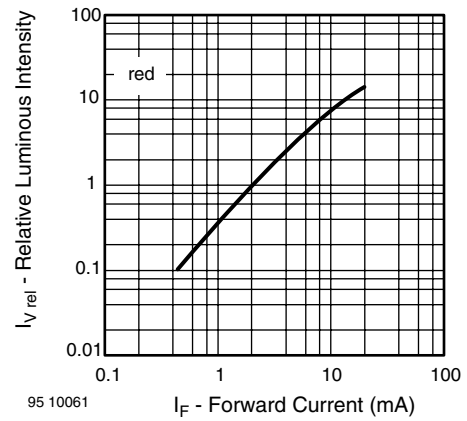


Fig. 6 - Relative Luminous Intensity vs. Forward Current

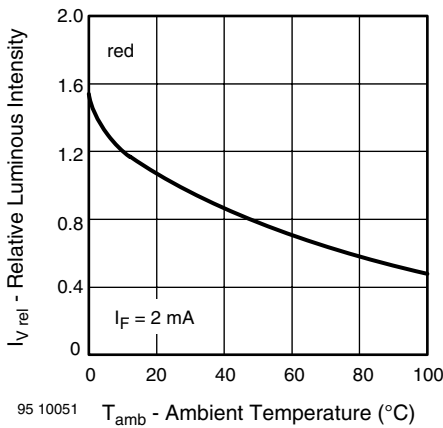


Fig. 4 - Rel. Luminous Intensity vs. Ambient Temperature

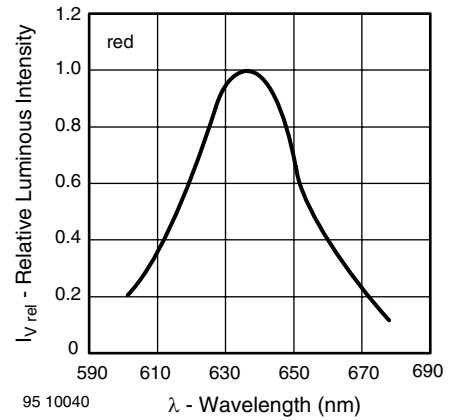


Fig. 7 - Relative Intensity vs. Wavelength

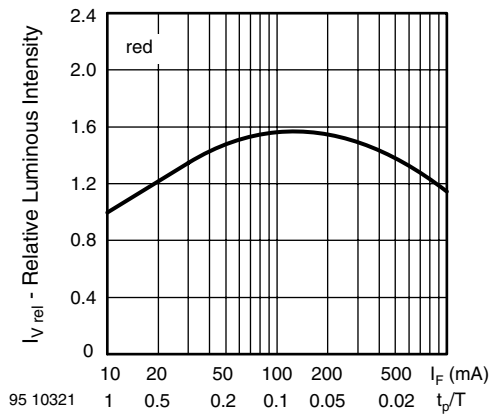
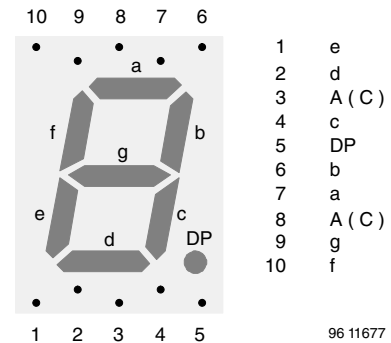


Fig. 5 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle



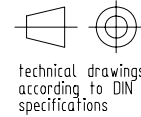
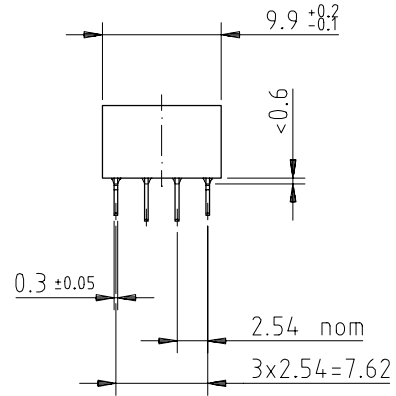
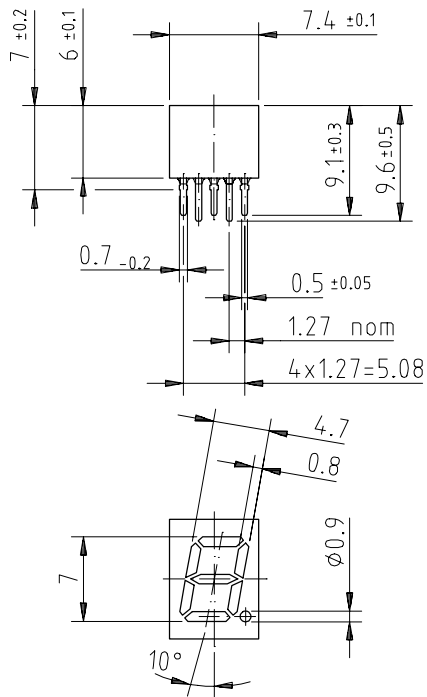
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# TDSL11..

Vishay Semiconductors Low Current 7 mm Seven Segment Display



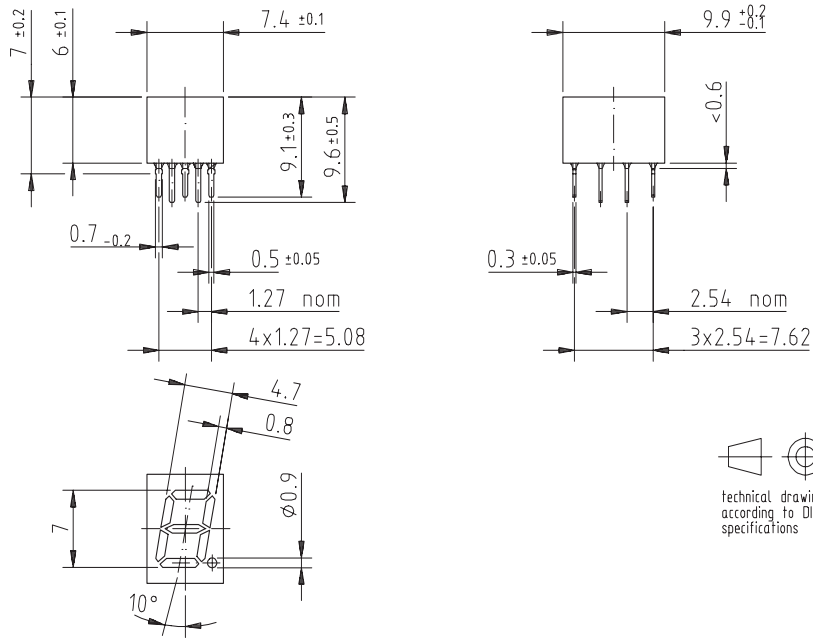
## PACKAGE DIMENSIONS in millimeters



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

## Display-7 mm

### Package Dimensions in mm



95 11342

### Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
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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**Vishay Semiconductor GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
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.

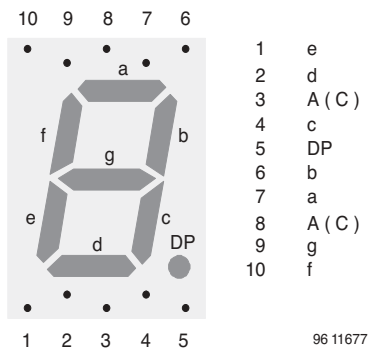
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**We reserve the right to make changes to improve technical design  
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Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany  
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

## Pin Connections 7 mm



### Ozone Depleting Substances Policy Statement

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