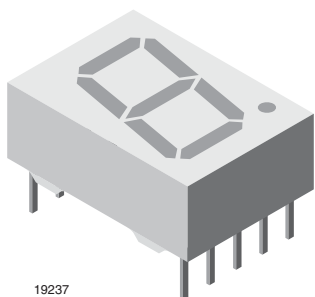


## Low Current 13 mm Seven-Segment Display



### 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

### DESCRIPTION

The TDSL51.0 series are 13 mm character seven segment low current LED displays in a very compact package.

The displays are designed for a viewing distance up to 7 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.

### APPLICATIONS

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

### PRODUCT GROUP AND PACKAGE DATA

- Product group: display
- Package: 13 mm
- Product series: low current
- Angle of half intensity:  $\pm 50^\circ$

### PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY at 2 mA	CIRCUITRY
TDSL5150	Red	$I_V = 400 \mu\text{cd}$ (typ.)	Common anode
TDSL5150-FG	Red	$I_V = (280 \text{ to } 900) \mu\text{cd}$	Common anode
TDSL5150-GH	Red	$I_V = (450 \text{ to } 1400) \mu\text{cd}$	Common anode
TDSL5160	Red	$I_V = 400 \mu\text{cd}$ (typ.)	Common cathode
TDSL5160-GH	Red	$I_V = (450 \text{ to } 1400) \mu\text{cd}$	Common cathode

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

#### TDSL5150, TDSL5150-FG, TDSL5150-GH, TDSL5160, TDSL5160-GH

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)	$I_{FSM}$	100	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)  
**TDSL5150, TDSL5150-GH, TDSL5160, TDSL5160-GH, RED**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment <sup>(1)</sup> (digit average)	$I_F = 2\text{ mA}$	TDSL5150	$I_V$	280	400	-	$\mu\text{cd}$
		TDSL5150-FG	$I_V$	280	-	900	
		TDSL5150-GH	$I_V$	450	-	1400	
		TDSL5160	$I_V$	280	400	-	
		TDSL5160-GH	$I_V$	450	-	1400	
	$I_F = 5\text{ mA}$	TDSL5150, TDSL5150-FG, TDSL5160, TDSL5160-GH	$I_V$	-	1600	-	
	$I_F = 20\text{ mA}, t_p/T = 0.25$		$I_V$	-	2000	-	
Dominant wavelength	$I_F = 2\text{ mA}$		$\lambda_d$	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

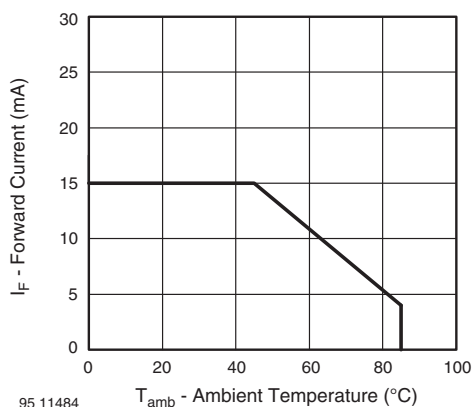
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

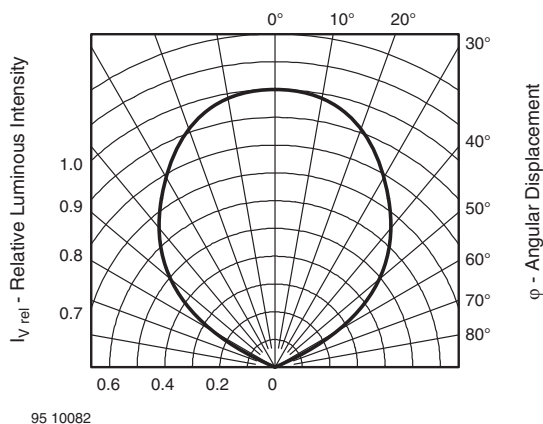


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

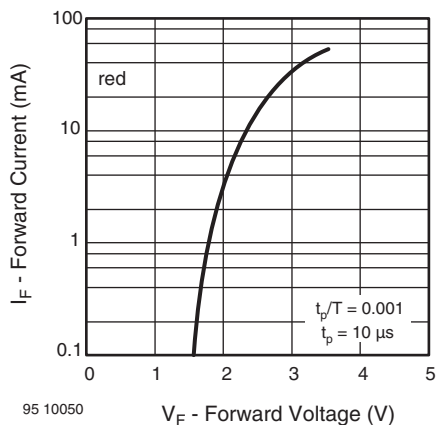


Fig. 3 - Forward Current vs. Forward Voltage

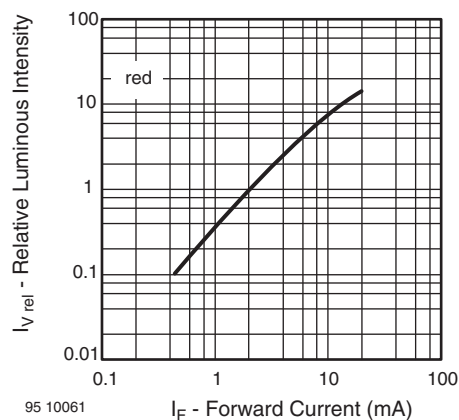


Fig. 6 - Relative Luminous Intensity vs. Forward Current

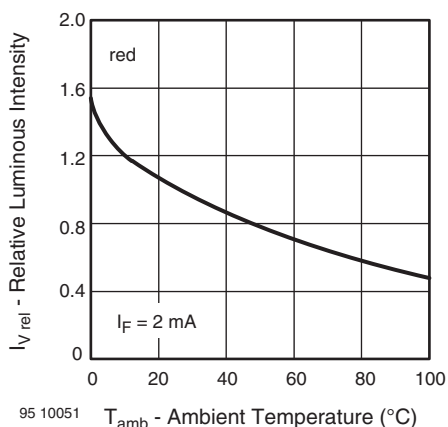


Fig. 4 - Rel. Luminous Intensity vs. Ambient Temperature

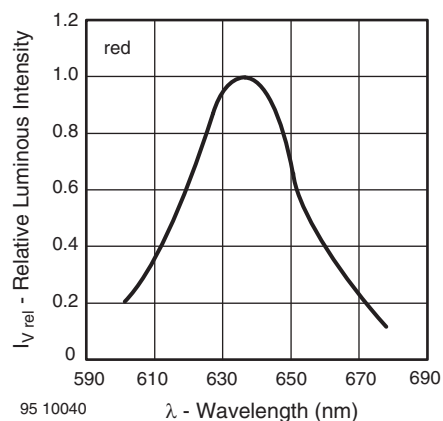


Fig. 7 - Relative Intensity vs. Wavelength

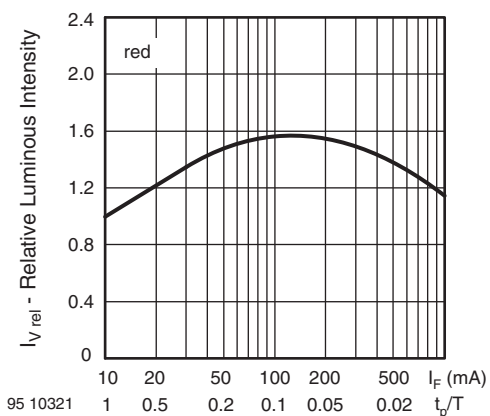
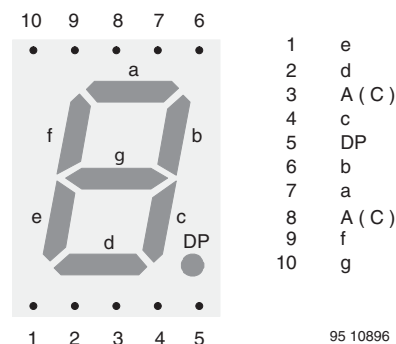
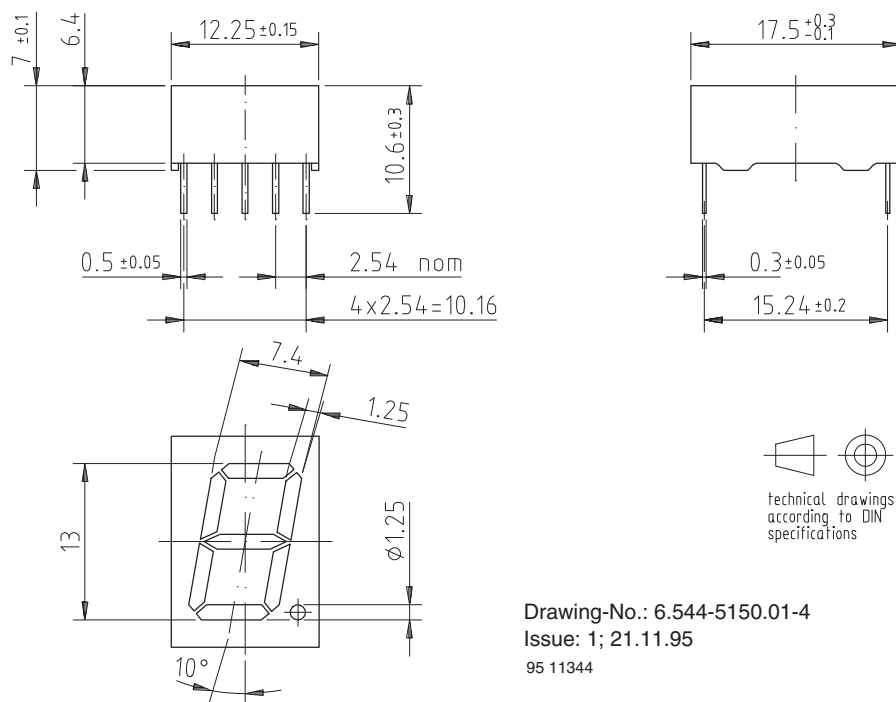


Fig. 5 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle



95 10896

**PACKAGE DIMENSIONS** in millimeters


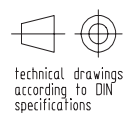
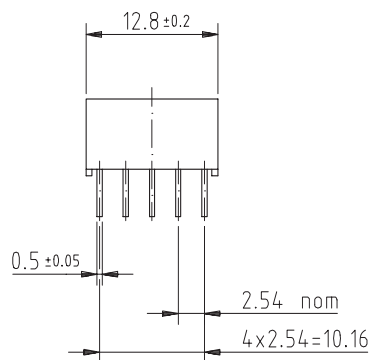
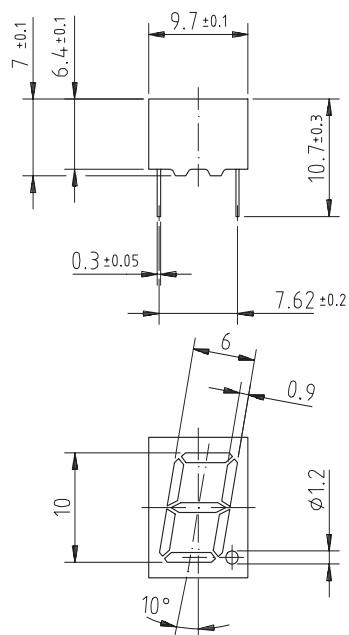
Drawing-No.: 6.544-5150.01-4

Issue: 1; 21.11.95

95 11344

# Display-10 mm

## Package Dimensions in mm



95 11343

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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.

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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.

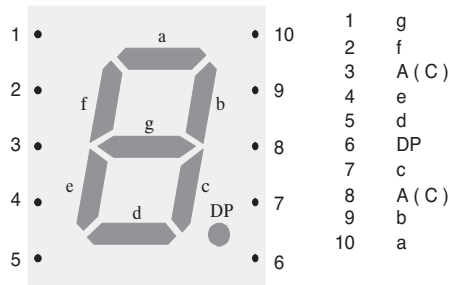
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Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany  
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

# Pin Connections 10 mm



96 11678

## **Ozone Depleting Substances Policy Statement**

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