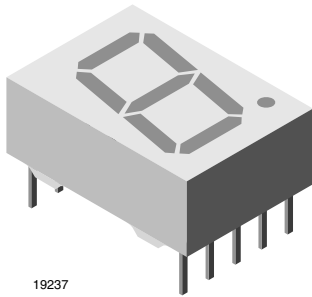


## Low Current 13 mm 7-Segment Display



### FEATURES

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


**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 gray 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.

Due to the design of 13 mm displays, a certain amount of cross-talk between segments is unavoidable. This light leakage becomes more noticeable as the brightness of the operated segments increases. However, higher environmental illumination, or a partially transparent cover, may reduce this effect. Therefore, it's important to consider this phenomenon during design-in and to validate suitability for the particular application and all its operation modes.

### 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 ( $\mu\text{cd}$ )			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.		
TDSL5150	Red	280	400	-	2	612	-	625	2	-	1.8	2.4	2	Common anode
TDSL5150-FG <sup>(1)</sup>	Red	280	-	900	2	612	-	625	2	-	1.8	2.4	2	Common anode
TDSL5160	Red	280	400	-	2	612	-	625	2	-	1.8	2.4	2	Common cathode

#### Note

<sup>(1)</sup> Not for new designs

### ABSOLUTE MAXIMUM RATINGS ( $T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified) TDSL5150, TDSL5150-FG, TDSL5160

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 to ambient		$R_{\text{thJA}}$	180	K/W



**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TDSL5150, TDSL5150-FG, TDSL5160, 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 <sup>(2)</sup>	$I_V$	280	-	900	
	$I_F = 5\text{ mA}$ $I_F = 20\text{ mA}, t_p/T = 0.25$	TDSL5160	$I_V$	280	400	-	
				$I_V$	-	1600	-
Dominant wavelength	$I_F = 2\text{ mA}$	TDSL5150, TDSL5150-FG <sup>(2)</sup> , TDSL5160	$\lambda_d$	612	-	625	nm
Peak wavelength	$I_F = 2\text{ mA}$		$\lambda_p$	-	635	-	nm
Angle of half intensity	$I_F = 2\text{ mA}$		$\phi$	-	$\pm 50$	-	$^{\circ}$
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

**Notes**

- (1)  $I_{Vmin.}$  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
- (2) Not for new designs

**LUMINOUS INTENSITY CLASSIFICATION**

GROUP STANDARD	LIGHT INTENSITY ( $\mu\text{cd}$ )	
	MIN.	MAX.
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)

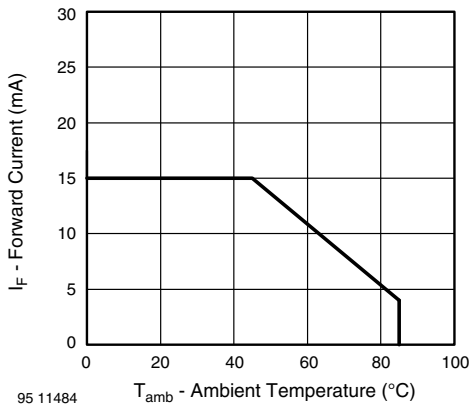


Fig. 1 - Forward Current vs. Ambient Temperature

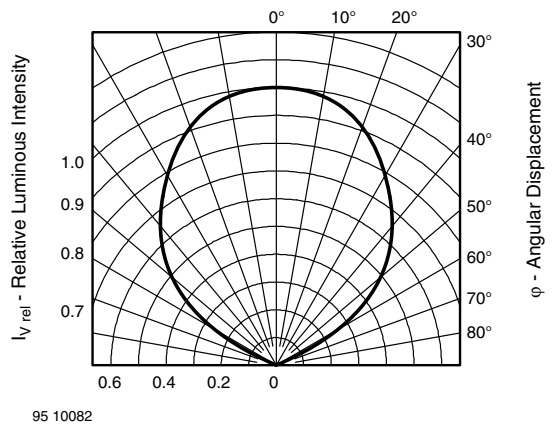


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

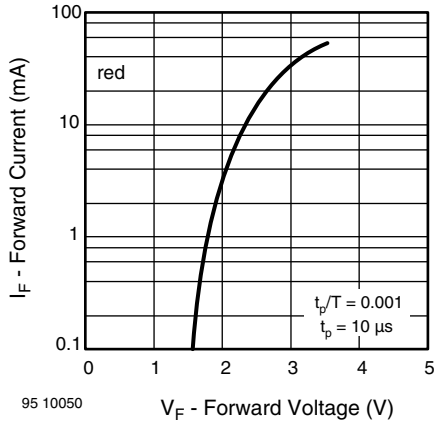


Fig. 3 - Forward Current vs. Forward Voltage

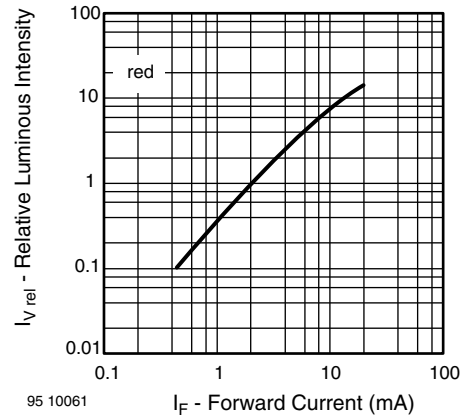


Fig. 6 - Relative Luminous Intensity vs. Forward Current

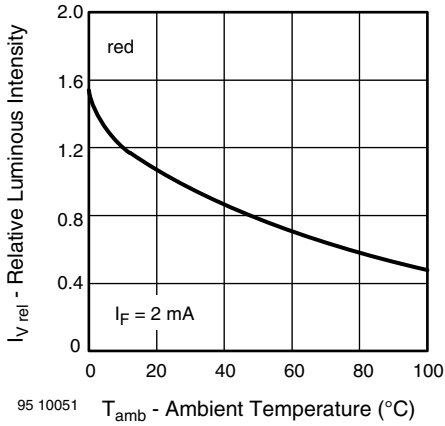


Fig. 4 - Relative Luminous Intensity vs. Ambient Temperature

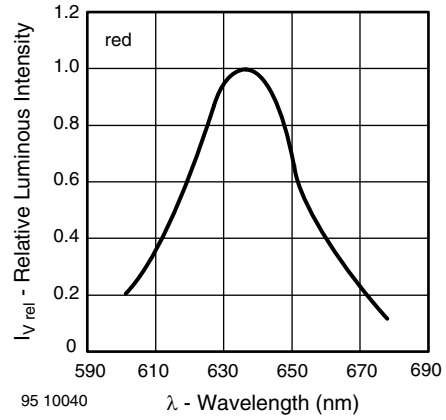


Fig. 7 - Relative Intensity vs. Wavelength

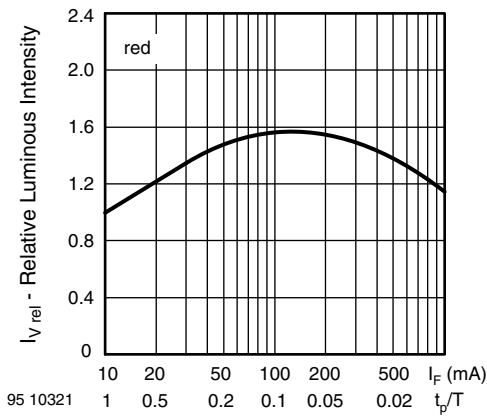


Fig. 5 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

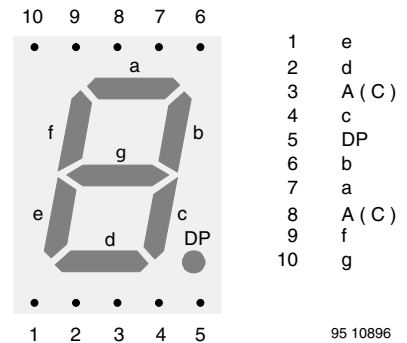
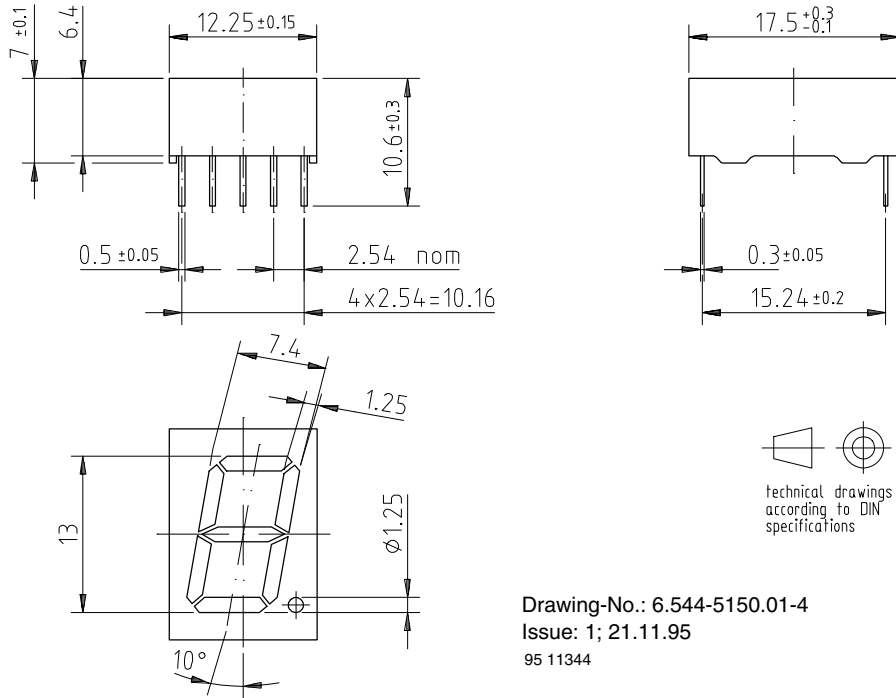


Fig. 8 - TDSL51..



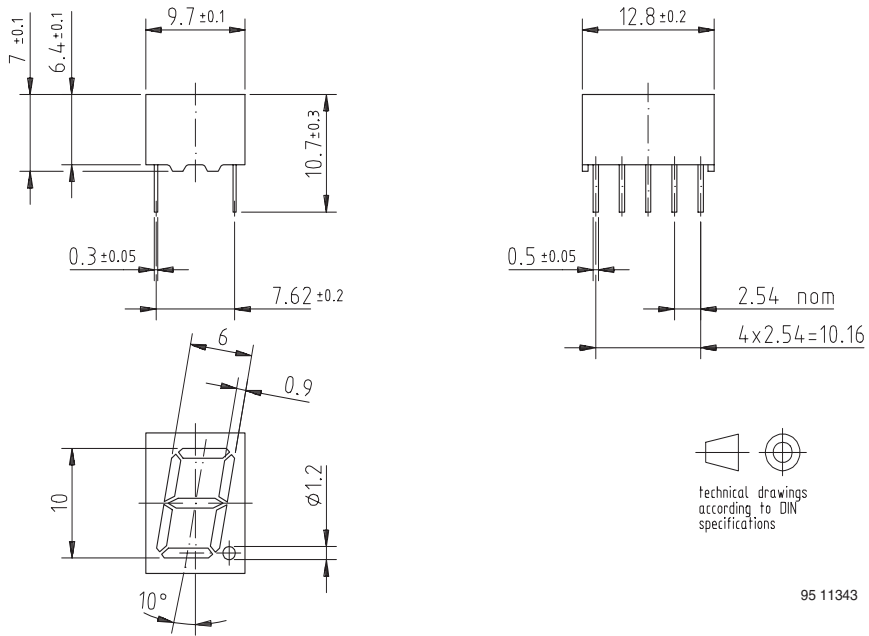
## PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5150.01-4  
Issue: 1; 21.11.95  
95 11344

## Display-10 mm

### Package Dimensions in mm



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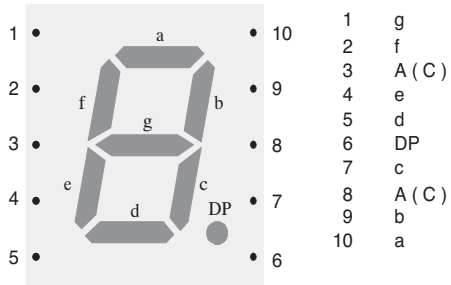
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Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423



## Pin Connections 10 mm



9611678

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