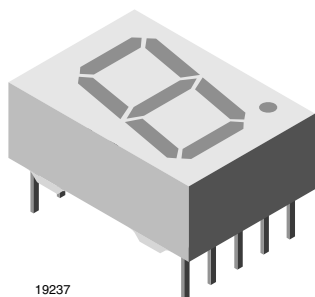


Low Current 13 mm 7-Segment Display



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


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 (μcd)			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 ⁽¹⁾	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

⁽¹⁾ 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_{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 to ambient		R_{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 ⁽¹⁾ (digit average)	$I_F = 2\text{ mA}$	TDSL5150	I_V	280	400	-	μcd
		TDSL5150-FG ⁽²⁾	I_V	280	-	900	
		TDSL5160	I_V	280	400	-	
	$I_F = 5\text{ mA}$ $I_F = 20\text{ mA}, t_p/T = 0.25$	TDSL5150, TDSL5150-FG ⁽²⁾ , TDSL5160	I_V	-	1600	-	
			I_V	-	2000	-	
Dominant wavelength	$I_F = 2\text{ mA}$		λ_d	612	-	625	
Peak wavelength	$I_F = 2\text{ mA}$		λ_p	-	635	-	
Angle of half intensity	$I_F = 2\text{ mA}$		ϕ	-	± 50	-	
Forward voltage per segment	$I_F = 2\text{ mA}$	TDSL5150, TDSL5150-FG ⁽²⁾ , TDSL5160	V_F	-	1.8	2.4	V
	$I_F = 20\text{ mA}$		V_F	-	2.7	3	
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 ≥ 0.5 , excluding decimal points and colon
- (2) Not for new designs

LUMINOUS INTENSITY CLASSIFICATION

GROUP STANDARD	LIGHT INTENSITY (μcd)	
	MIN.	MAX.
E	180	360
F	280	560
G	450	900
H	700	1400
I	1100	2200
K	1800	3600

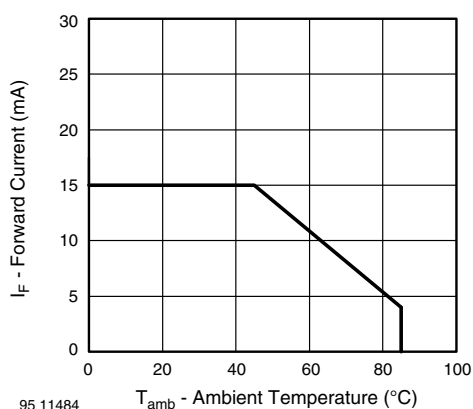
TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

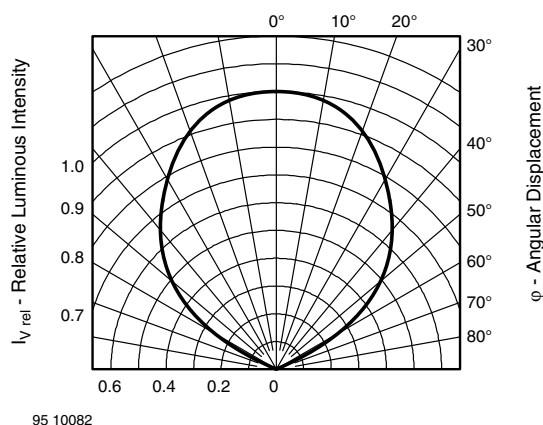


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

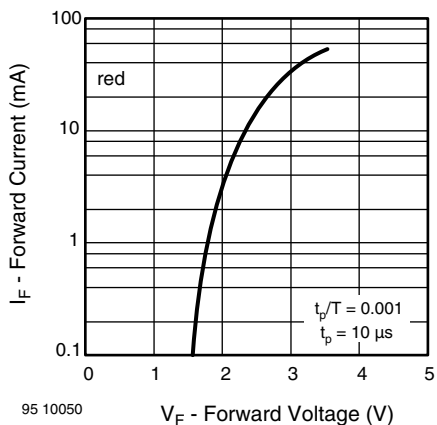


Fig. 3 - Forward Current vs. Forward Voltage

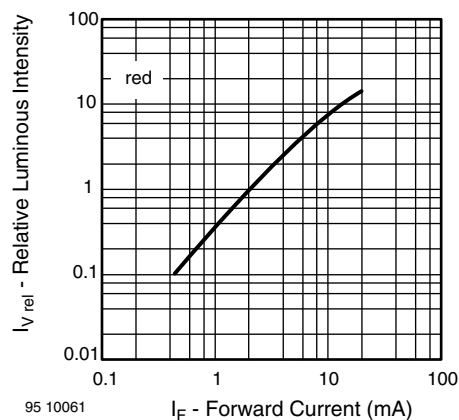


Fig. 6 - Relative Luminous Intensity vs. Forward Current

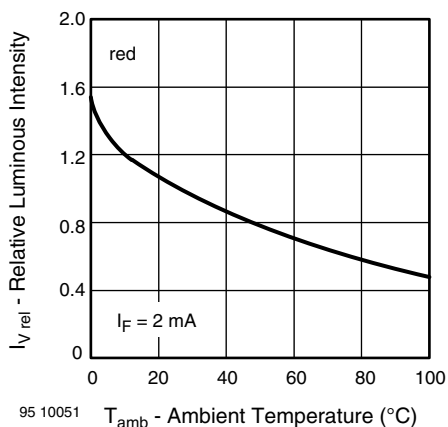


Fig. 4 - Relative Luminous Intensity vs. Ambient Temperature

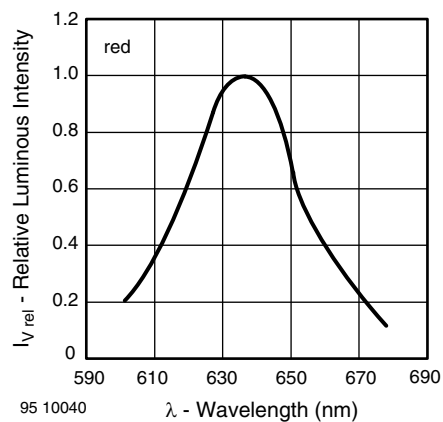


Fig. 7 - Relative Intensity vs. Wavelength

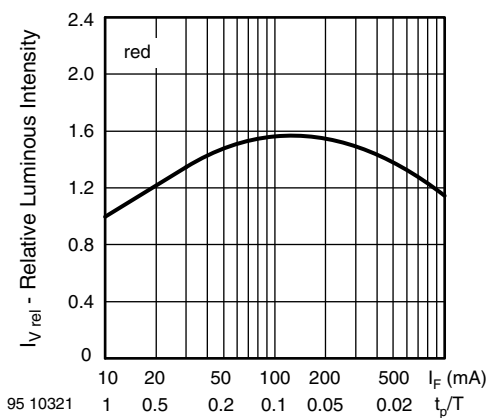


Fig. 5 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

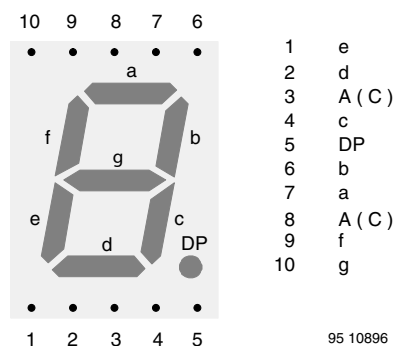
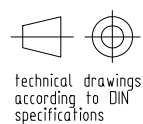
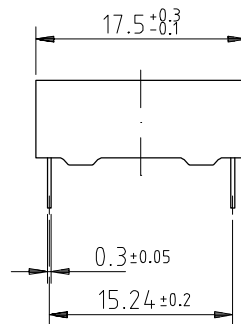
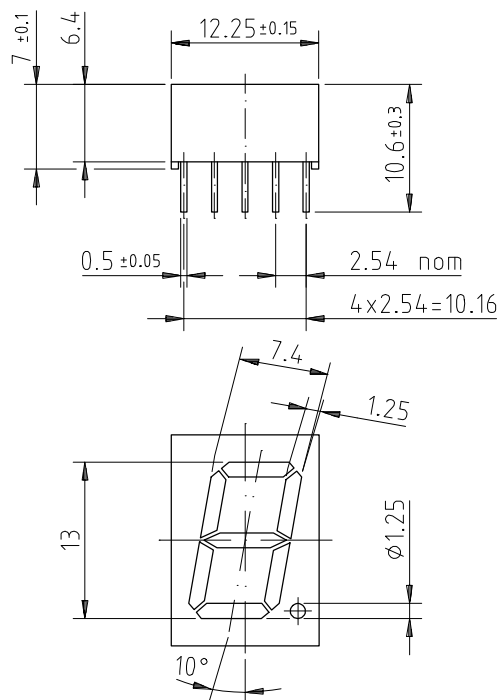


Fig. 8 - TDSL51..



PACKAGE DIMENSIONS in millimeters



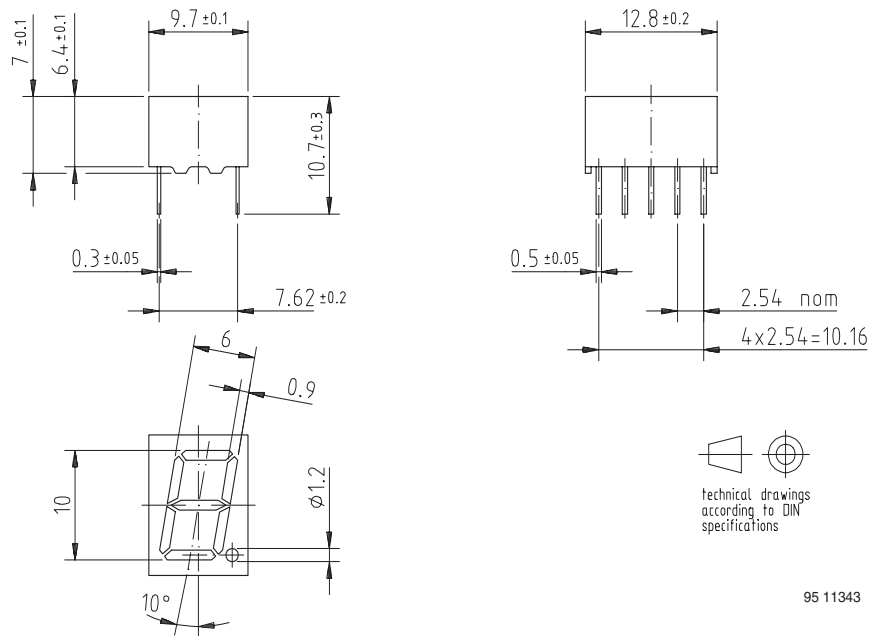
Drawing-No.: 6.544-5150.01-4

Issue: 1; 21.11.95

95 11344

Display-10 mm

Package Dimensions in mm



Ozone Depleting Substances Policy Statement

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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.

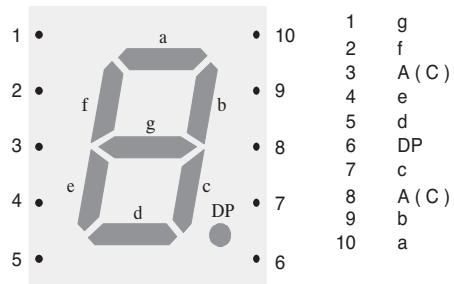
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Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

Pin Connections 10 mm



96 11678



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