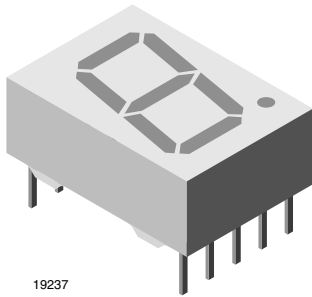


Low Current 13 mm 7-Segment Display



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	-	
	$I_F = 5\text{ mA}$	TDSL5150, TDSL5150-FG ⁽²⁾ , TDSL5160	I_V	-	1600	-	
	$I_F = 20\text{ mA}, t_p/T = 0.25$		I_V	-	2000	-	
Dominant wavelength	$I_F = 2\text{ mA}$	TDSL5150, TDSL5150-FG ⁽²⁾ , TDSL5160	λ_d	612	-	625	nm
Peak wavelength	$I_F = 2\text{ mA}$		λ_p	-	635	-	nm
Angle of half intensity	$I_F = 2\text{ mA}$		ϕ	-	± 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 ≥ 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)

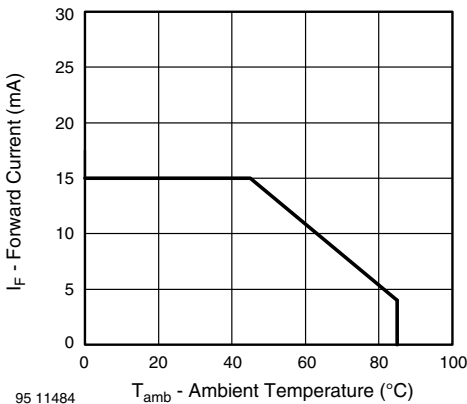


Fig. 1 - Forward Current vs. Ambient Temperature

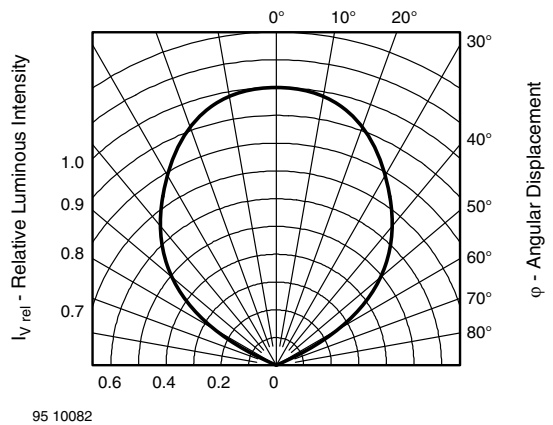


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

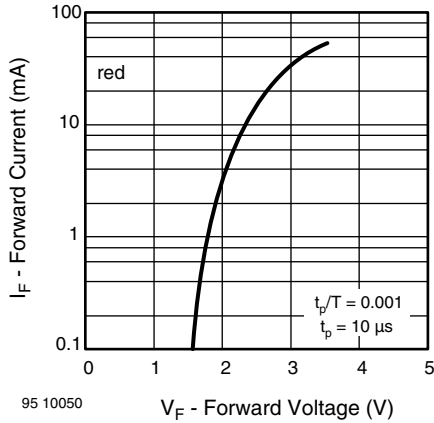


Fig. 3 - Forward Current vs. Forward Voltage

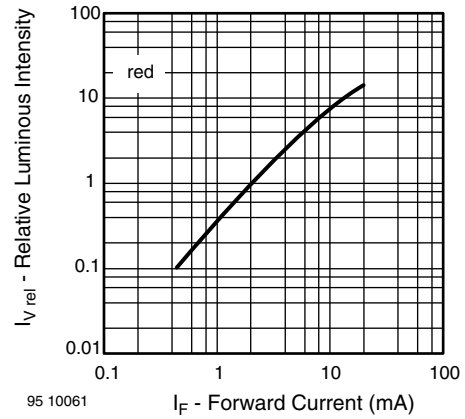


Fig. 6 - Relative Luminous Intensity vs. Forward Current

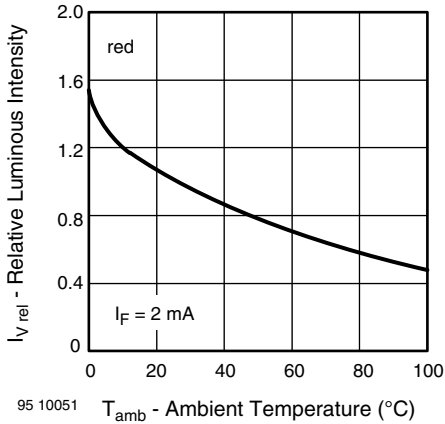


Fig. 4 - Relative Luminous Intensity vs. Ambient Temperature

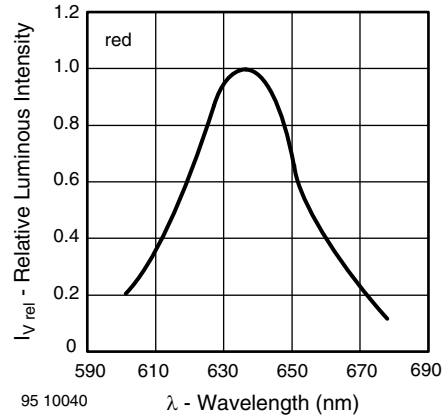


Fig. 7 - Relative Intensity vs. Wavelength

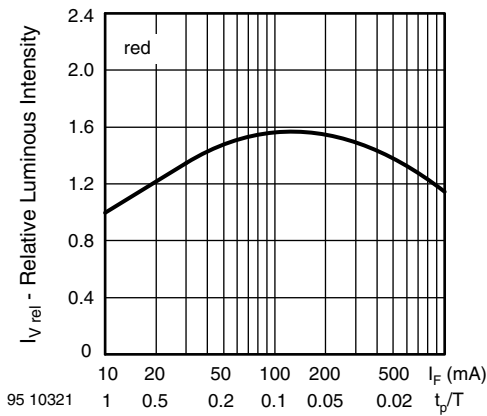


Fig. 5 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

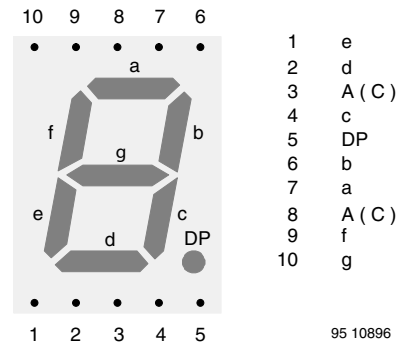
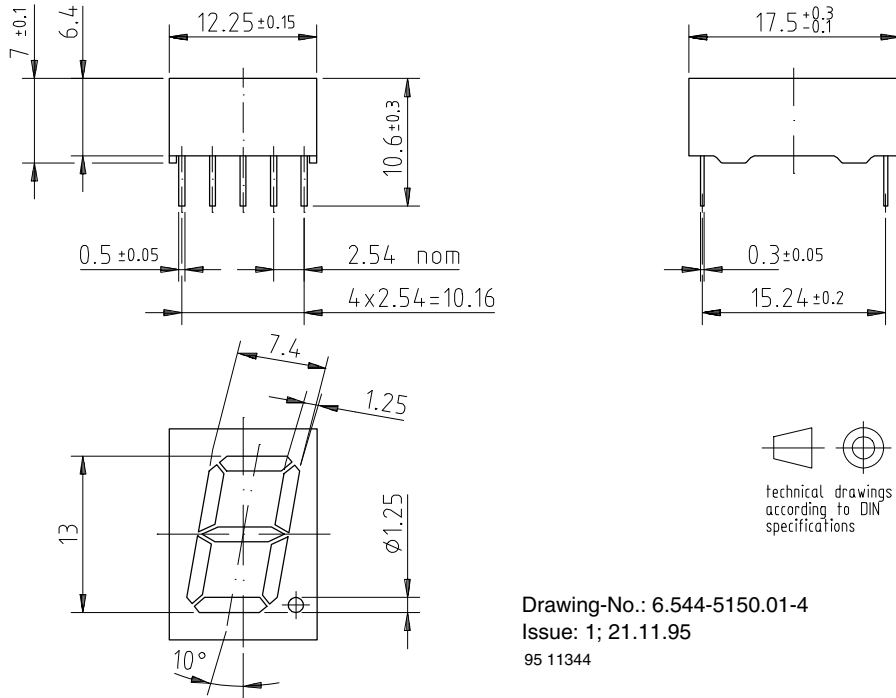


Fig. 8 - TDSL51..



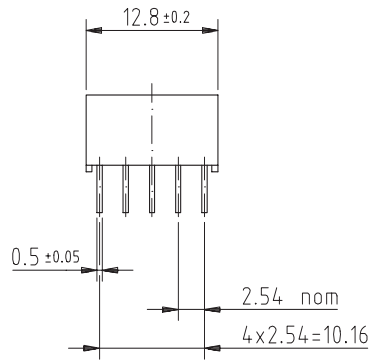
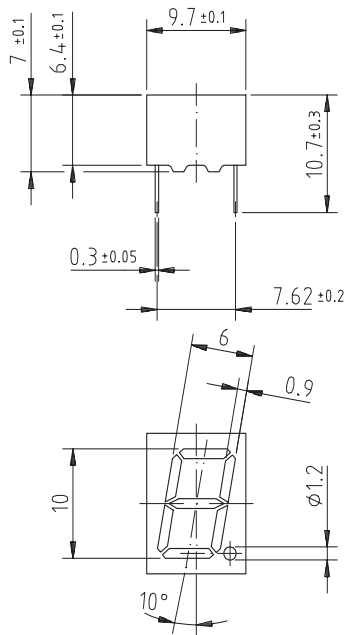
PACKAGE DIMENSIONS in millimeters



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

Display-10 mm

Package Dimensions in mm



technical drawings
according to DIN
specifications

95 11343

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3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

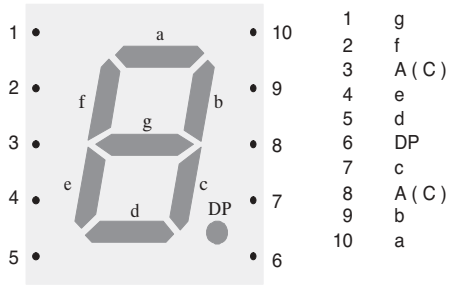
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Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

Pin Connections 10 mm



96 11678

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