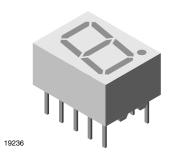


Low Current 10 mm 7-Segment Display



DESCRIPTION

The TDSL31.0 series are 10 mm character seven segment low current LED displays in a very compact package.

The displays are designed for a viewing distance up to 6 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 appearence.

Typical applications include instruments, panel meters, point-of-sale terminals and household equipment.

Due to the design of 10 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.

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



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

PRODUCT GROUP AND PACKAGE DATA

Product group: display

• Package: 10 mm

Product series: low current
Angle of half intensity: ± 50°

PARTS TABLE															
PART	COLOR	LUMINOUS INTENSITY (µcd)		at I _F	WAVELENGTH (nm)		at I _F	FORWARD VOLTAGE (V)		at I _F	CIRCUITRY				
		MIN.	TYP.	MAX.	(mA)	MIN.	TYP.	MAX.	(mA)	MIN.	TYP.	MAX.	(mA)		
TDSL3150	Red	180	260	-	2	612	-	625	2	-	1.8	2.4	2	Common anode	
TDSL3160	Red	180	260	-	2	612	-	625	2	-	1.8	2.4	2	Common cathode	

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25$ °C, unless otherwise specified) TDSL3150, TDSL3160						
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT		
Reverse voltage per segment		V _R	6	V		
DC forward current per segment		l _F	15	mA		
Peak forward current per segment		I _{FM}	45	mA		
Surge forward current per segment	$t_p \le 10 \ \mu s$ (non repetitive)	I _{FSM}	100	mA		
Power dissipation	T _{amb} ≤ 45 °C	P _V	320	mW		
Junction temperature		Tj	100	°C		
Operating temperature range		T _{amb}	-40 to +85	°C		
Storage temperature range		T _{stg}	-40 to +85	°C		
Soldering temperature	t ≤ 3 s, 2 mm below seating plane	T _{sd}	260	°C		
Thermal resistance LED junction to ambient		R_{thJA}	180	K/W		



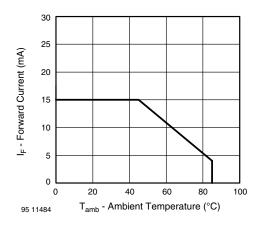
OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25$ °C, unless otherwise specified) TDSL3150, TDSL3160, RED							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment (1)	I _E = 2 mA	TDSL3150	- I _V	180	260	-	μcd
(digit average)	IF = 2 IIIA	TDSL3160		180	260	-	
Dominant wavelength	I _F = 2 mA		λ_{d}	612	-	625	nm
Peak wavelength	$I_F = 2 \text{ mA}$		λ_{p}	-	635	-	nm
Angle of half intensity	I _F = 2 mA		φ	-	± 50	-	٥
	I _F = 2 mA	TDSL3150, TDSL3160	V _F	-	1.8	2.4	V
Forward voltage per segment	I _F = 20 mA	12020100	V _F	-	2.7	3	V
Reverse voltage per segment	I _F = 10 μA		V _R	6	20	-	V
Junction capacitance	V _R = 0 V, f = 1 MHz		C _j	-	30	=	pF

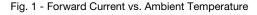
Note

⁽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

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

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)





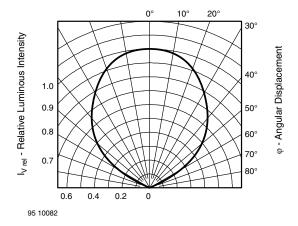


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

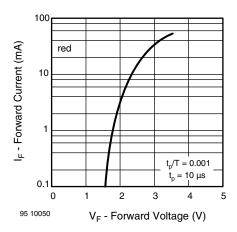


Fig. 3 - Forward Current vs. Forward Voltage

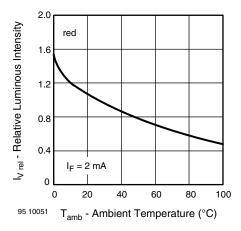


Fig. 4 - Relative Luminous Intensity vs. Ambient Temperature

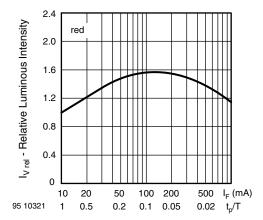


Fig. 5 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

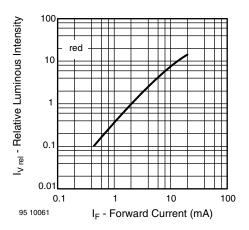


Fig. 6 - Relative Luminous Intensity vs. Forward Current

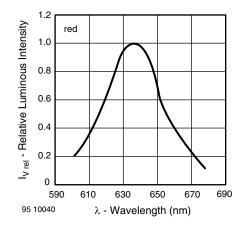


Fig. 7 - Relative Intensity vs. Wavelength

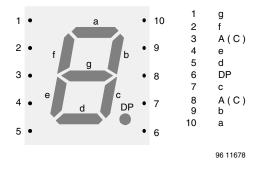
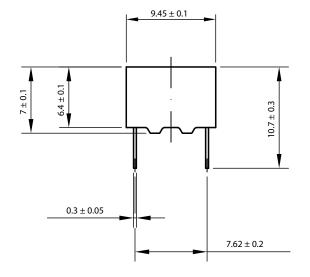
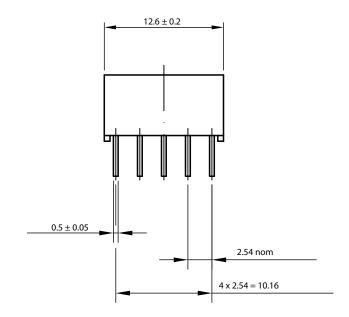


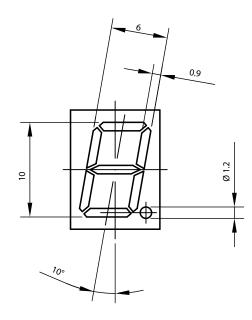
Fig. 8 - TDSL31..

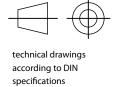


PACKAGE DIMENSIONS in millimeters





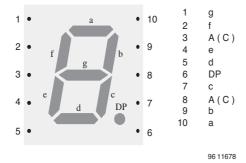




Drawing-No.: 6.544-5093.01-4 Issue: 2; 23.03.2012



Pin Connections 10 mm



Pin Connections 10 mm

Vishay Semiconductors



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 operatingsystems 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).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

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.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design and may do so without further notice.

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