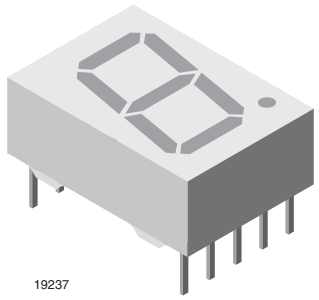
Low Current 13 mm Seven-Segment Display



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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

Pb-free

e4

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 appearence.

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: ± 50°

PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY at 2 mA	CIRCUITRY
TDSL5150	Red	I_V = 400 µcd (typ.)	Common anode
TDSL5150-FG	Red	I_V = (280 to 900) µcd	Common anode
TDSL5150-GH	Red	I_V = (450 to 1400) µcd	Common anode
TDSL5160	Red	I_V = 400 µcd (typ.)	Common cathode
TDSL5160-GH	Red	I_V = (450 to 1400) µcd	Common cathode

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °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	$t_p \leq 10$ µs (non repetitive)	I_{FSM}	100	mA
Power dissipation	$T_{amb} \leq 45$ °C	P_V	320	mW
Junction temperature		T_j	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/ambient		R_{thJA}	180	K/W

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) TDSL5150, TDSL5150-GH, TDSL5160, TDSL5160-GH, RED							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity per segment (1) (digit average)	I_F = 2 mA	TDSL5150	I_V	280	400	-	µcd
		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 mA	TDSL5150, TDSL5150-FG, TDSL5150-GH, TDSL5160, TDSL5160-GH	I_V	-	1600	-	
	I_F = 20 mA, t_p/T = 0.25		I_V	-	2000	-	
Dominant wavelength	I_F = 2 mA		λ_d	612	-	625	nm
Peak wavelength	I_F = 2 mA		λ_p	-	635	-	nm
Angle of half intensity	I_F = 2 mA		φ	-	± 50	-	deg
Forward voltage per segment	I_F = 2 mA		V_F	-	1.8	2.4	V
	I_F = 20 mA		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
H	700	1400
I	1100	2200
K	1800	3600

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

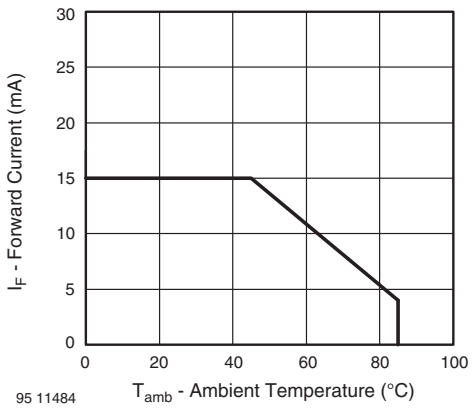


Fig. 1 - Forward Current vs. Ambient Temperature

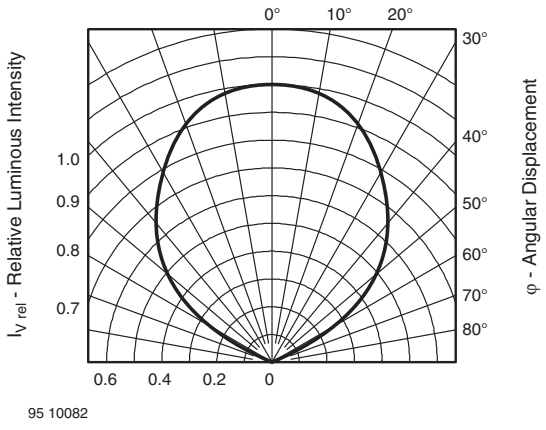


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

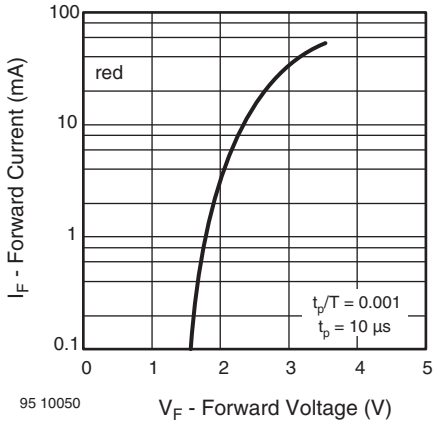


Fig. 3 - Forward Current vs. Forward Voltage

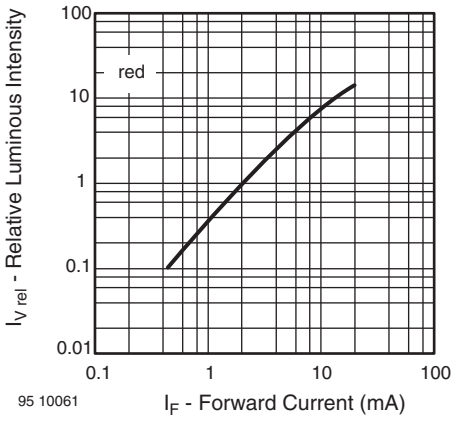


Fig. 6 - Relative Luminous Intensity vs. Forward Current

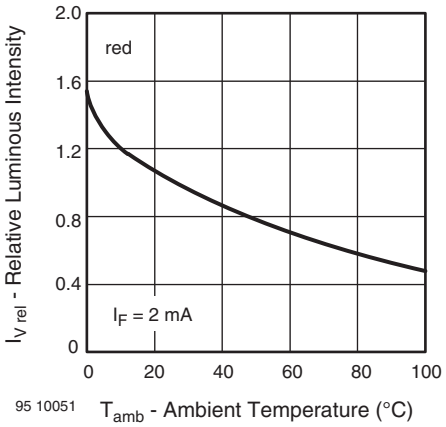


Fig. 4 - Rel. Luminous Intensity vs. Ambient Temperature

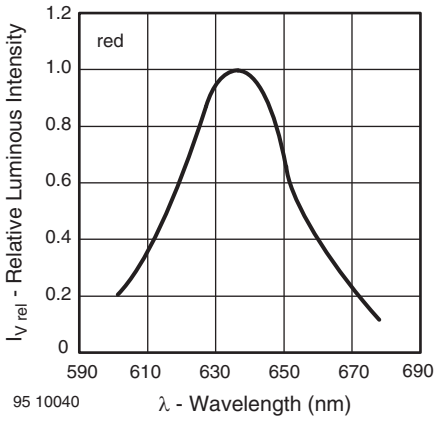


Fig. 7 - Relative Intensity vs. Wavelength

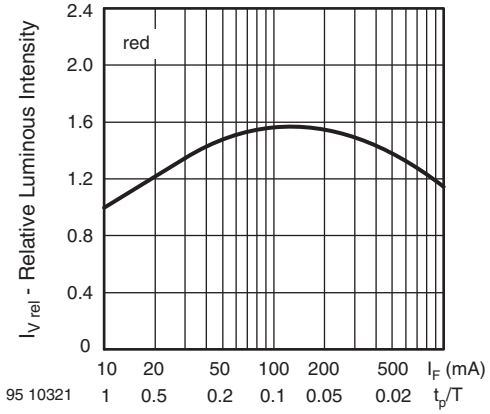
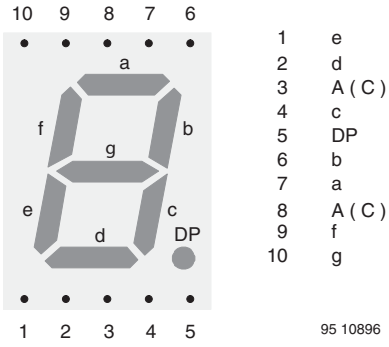
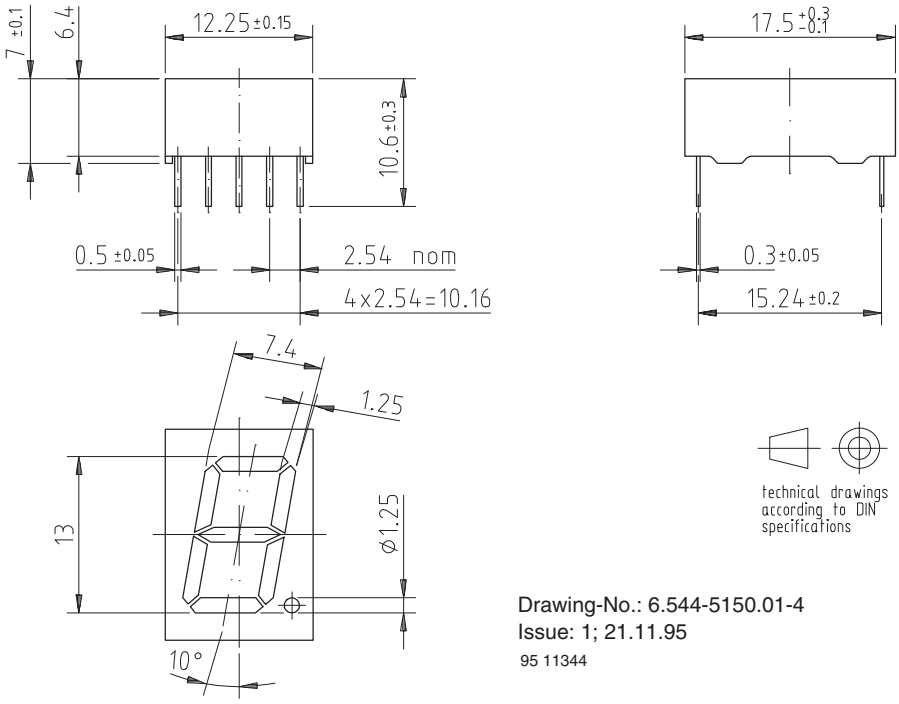


Fig. 5 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle



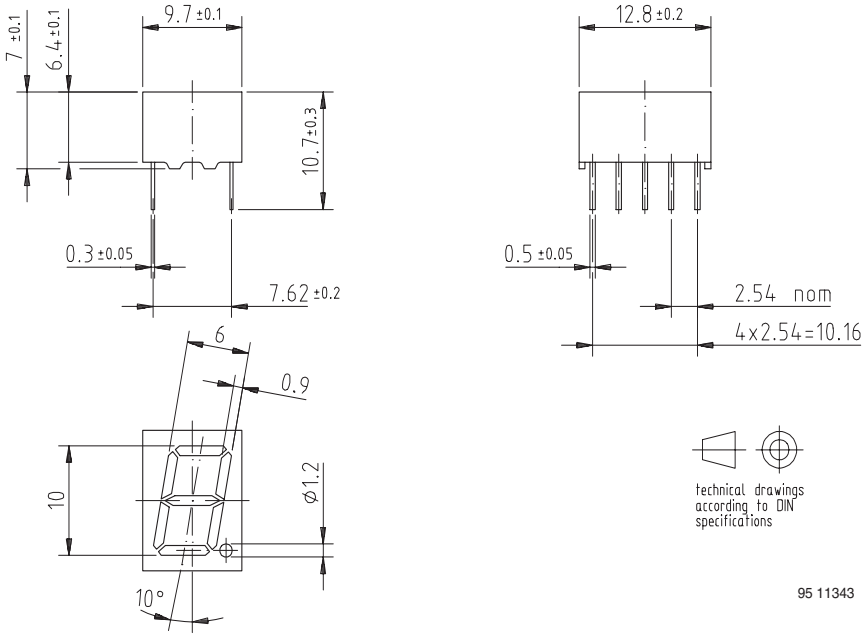
PACKAGE DIMENSIONS in millimeters



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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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.

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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.

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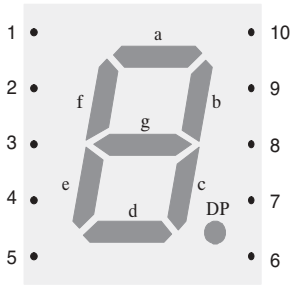
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

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

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



1	g
2	f
3	A (C)
4	e
5	d
6	DP
7	c
8	A (C)
9	b
10	a

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