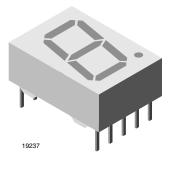


Vishay Semiconductors

Standard 7-Segment Display 13 mm



DESCRIPTION

The TDS.51.. series are 13 mm character seven segment LED displays in a very compact package.

The displays are designed for a viewing distance up to 7 m and available in two bright colors. 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 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.

FEATURES

- Evenly lighted segments
- Grey package surface
- Untinted segments
- · Luminous intensity categorized
- · Green categorized for color
- Wide viewing angle
- · Suitable for DC and high peak current
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

APPLICATIONS

- Panel meters
- Test- and measure-equipment
- · Point-of-sale terminals
- Control units
- TV sets

PRODUCT GROUP AND PACKAGE DATA

- Product group: Display
- Package: 13 mm
- Product series: Standard
- Angle of half intensity: ± 50°

PARTS TABLE														
PART	COLOR	LUMINOUS INTENSITY (µcd)			at I _F		VELENGTH (nm)		at I _F (mA)			LTAGE	at I _F (mA)	CIRCUITRY
		MIN.	TYP.	MAX.	(mA)	MIN.	TYP.	MAX.	(1174)	MIN.	TYP.	MAX.	(IIIA)	
TDSO5150	Orange red	700	5000	-	10	612	I	625	10	1	2	3	20	Common anode
TDSO5150-LM	Orange red	2800	-	9000	10	612	-	625	10	-	2	3	20	Common anode
TDSO5160	Orange red	700	5000	-	10	612	-	625	10	-	2	3	20	Common cathode
TDSO5160-LM	Orange red	2800	-	9000	10	612	-	625	10	-	2	3	20	Common cathode
TDSG5150	Green	700	9500	-	10	562	-	575	10	-	2.4	3	20	Common anode
TDSG5150-MN	Green	4500	-	14 000	10	562	-	575	10	-	2.4	3	20	Common anode
TDSG5150-N	Green	7000	-	14 000	10	562	-	575	10	-	2.4	3	20	Common anode
TDSG5160	Green	700	9500	-	10	562	-	575	10	-	2.4	3	20	Common cathode
TDSG5160-MN	Green	4500	-	14 000	10	562	-	575	10	-	2.4	3	20	Common cathode
TDSG5160-N	Green	7000	-	14 000	10	562	-	575	10	-	2.4	3	20	Common cathode



1 For technical questions, contact: <u>LED@Vishay.com</u> Document Number: 83126

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ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) TDS05150, TDS05160, TDSG5150, TDSG5160								
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT				
Reverse voltage per segment or DP		V _R	6	V				
DC forward current per segment or DP		I _F	25	mA				
Surge forward current per segment or DP	$t_p \le 10 \ \mu s$ (non repetitive)	I _{FSM}	0.15	A				
Power dissipation	T _{amb} ≤ 45 °C	Pv	550	mW				
Junction temperature		Тj	100	°C				
Operating temperature range		T _{amb}	-40 to +85	°C				
Storage temperature range		T _{stg}	-40 to +85	°C				
Soldering temperature	$t \le 3$ s, 2 mm below seating plane	T _{sd}	260	°C				
Thermal resistance LED junction to ambient		R _{thJA}	100	K/W				

OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25$ °C, unless otherwise specified) **TDSO51..., ORANGE RED**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
		TDSO5150	- I _V	700	5000	-	μcd
Luminous intensity per segment	1 10 1	TDSO5150-LM		2800	-	9000	
(digit average) ⁽¹⁾	I _F = 10 mA	TDSO5160		700	5000	-	
		TDSO5160-LM		2800	-	9000	
Dominant wavelength	I _F = 10 mA		λ _d	612	-	625	nm
Peak wavelength	I _F = 10 mA	TDSO5150, TDSO5150-LM, TDSO5160, TDSO5160-LM	λρ	-	630	-	nm
Angle of half intensity	I _F = 10 mA		j	-	± 50	-	0
Forward voltage per segment or DP	I _F = 20 mA		V _F	-	2	3	V
Reverse voltage per segment or DP	I _R = 10 μA		V _R	6	15	-	V

Note

(1) $I_{Vmin.}$ and I_V groups are mean values of all segments (a to g), matching factor within segments is \geq 0.5, excluding decimal points and colon

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified) **TDSG51..., GREEN**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
		TDSG5150		700	9500	-	μcd
		TDSG5150-MN		4500	-	14 000	
Luminous intensity per segment	1 10 m 1	TDSG5150-N		7000	-	14 000	
(digit average) ⁽¹⁾	I _F = 10 mA	TDSG5160	١V	700	9500	-	
		TDSG5160-MN		4500	-	14 000	
		TDSG5160-N		7000	-	14 000	
Dominant wavelength	I _F = 10 mA	TDSG5150,	λ_d	562	-	575	nm
Peak wavelength	I _F = 10 mA	TDSG5150-MN,	λρ	-	565	-	nm
Angle of half intensity	I _F = 10 mA	TDSG5150-N. TDSG5160.	j	-	± 50	-	0
Forward voltage per segment or DP	I _F = 20 mA	TDSG5160-MN, TDSG5160-N	V _F	-	2.4	3	V
Reverse voltage per segment or DP	I _R = 10 μA		V _R	6	15	-	V

Note

 $^{(2)}$ I_{Vmin.} and I_V groups are mean values of all segments (a to g), matching factor within segments is \geq 0.5, excluding decimal points and colon



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LUMINOUS INTENSITY CLASSIFICATION							
GROUP	P LIGHT INTENSITY (µcd)						
STANDARD	MIN.	MAX.					
E	180	360					
F	280	560					
G	450	900					
Н	700	1400					
I	1100	2200					
К	1800	3600					
L	2800	5600					
М	4500	9000					
Ν	7000	14 000					

Note

The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped in one tube (there will be no mixing of two groups in one tube).

In order to ensure availability, single brightness groups will not be orderable

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

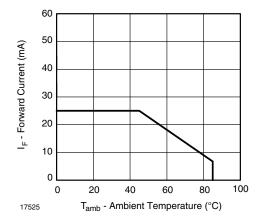
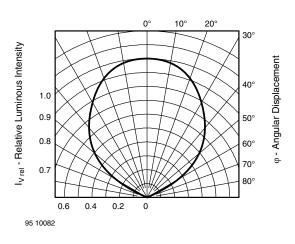
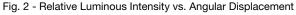


Fig. 1 - Forward Current vs. Ambient Temperature





COLOR CLASSIFICATION								
GROUP	ORANO	GE RED	GREEN					
GROUP	MIN.	MAX.	MIN.	MAX.				
1	612	617	-	-				
2	616	621	-	-				
3	620	625	562	565				
4	-	-	564	567				
5	-	-	566	569				
6	-	-	568	571				
7	-	-	570	573				
8	-	-	572	575				

Note

 Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm

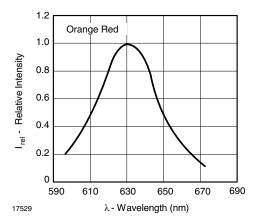


Fig. 3 - Relative Intensity vs. Wavelength

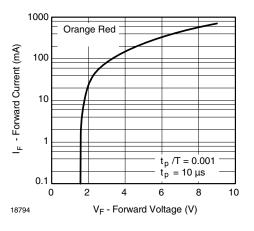


Fig. 4 - Forward Current vs. Forward Voltage

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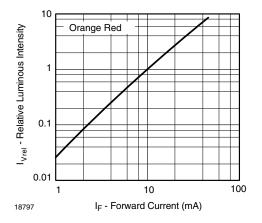


Fig. 5 - Relative Luminous Intensity vs. Forward Current

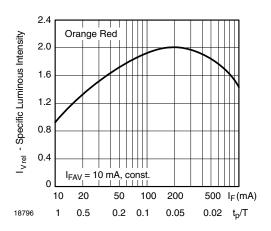


Fig. 6 - Relative Luminous Intensity vs. Forward Current/Duty Cycle

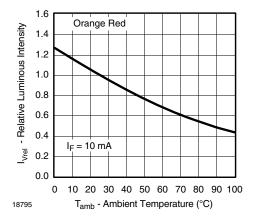


Fig. 7 - Relative Luminous Intensity vs. Ambient Temperature

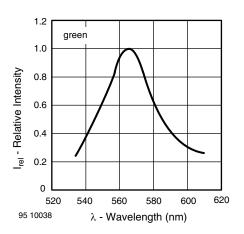


Fig. 8 - Relative Intensity vs. Wavelength

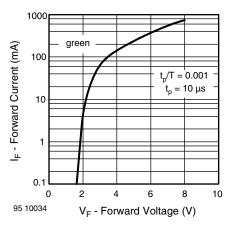


Fig. 9 - Forward Current vs. Forward Voltage

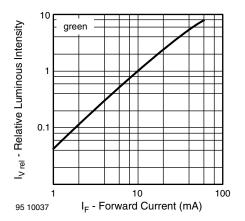


Fig. 10 - Relative Luminous Intensity vs. Forward Current

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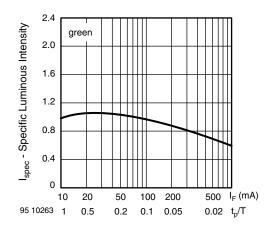


Fig. 11 - Specific Luminous Intensity vs. Forward Current

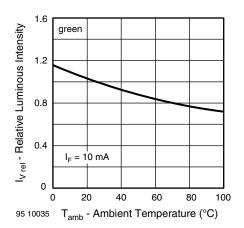
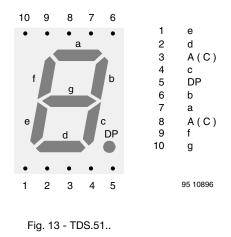


Fig. 12 - Relative Luminous Intensity vs. Ambient Temperature

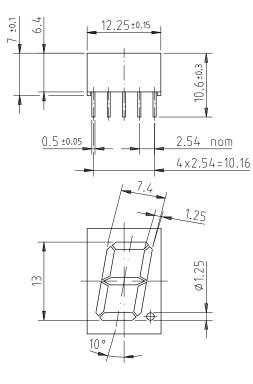


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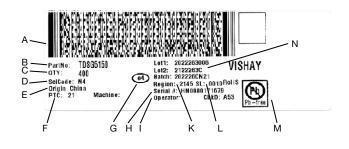


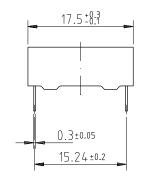
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PACKAGE DIMENSIONS FOR TDS.51.. in millimeters



LABEL OF FAN FOLD BOX (example)







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

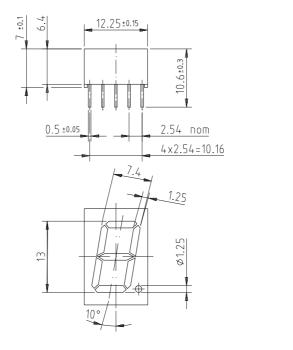
- A. 2D barcode
- B. Part No: Vishay part number
- C. QTY: quantity
- D. SelCode: selection bin code
- E. Country of origin
- F. PTC: production plant code
- G. Termination finish
- H. Region code
- I. Serial#: serial number
- K. Batch number: year, week, country code, plant code
- L. SL: storage location
- M. Environmental symbols: RoHS, lead (Pb)-free, halogen-free
- N. Lot numbers

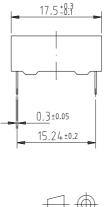


Display-13 mm **Vishay Semiconductors**

Display-13 mm

Package Dimensions in mm





technical drawings according to DIN specifications

95 11344

Display-13 mm

Vishay Semiconductors



Ozone Depleting Substances Policy Statement

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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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Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

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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
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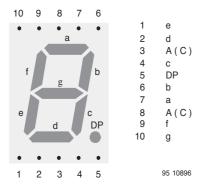
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Pin Connections 13 mm

Vishay Semiconductors

Pin Connections 13 mm



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