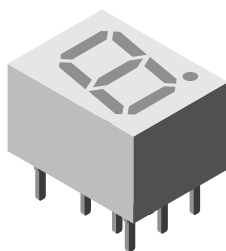


## Standard 7-Segment Display 7 mm



19235

### DESCRIPTION

The TDS.11.. series are 7 mm character seven segment LED displays in a very compact package.

The displays are designed for a viewing distance up to 3 m and available in four 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 appearance. Typical applications include instruments, panel meters, point-of-sale terminals and household equipment.

Due to the design of 7 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
- Yellow and green categorized for color
- Wide viewing angle
- Suitable for DC and high peak current
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### APPLICATIONS

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

### PRODUCT GROUP AND PACKAGE DATA

- Product group: display
- Package: 7 mm
- Product series: standard
- Angle of half intensity:  $\pm 50^\circ$

### PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY ( $\mu\text{cd}$ )			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.		
TDSO1150	Orange red	450	3000	-	10	612	-	625	10	-	2	3	20	Common anode
TDSO1150-K	Orange red	1800	-	3600	10	612	-	625	10	-	2	3	20	Common anode
TDSO1160	Orange red	450	3000	-	10	612	-	625	10	-	2	3	20	Common cathode
TDSO1160-KL	Orange red	1800	-	5600	10	612	-	625	10	-	2	3	20	Common cathode
TDSG1150	Green	450	6000	-	10	562	-	575	10	-	2.4	3	20	Common anode
TDSG1150-LM	Green	2800	-	9000	10	562	-	575	10	-	2.4	3	20	Common anode
TDSG1160	Green	450	6000	-	10	562	-	575	10	-	2.4	3	20	Common cathode
TDSG1160-LM	Green	2800	-	9000	10	562	-	575	10	-	2.4	3	20	Common cathode

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TDSO1150, TDSO1160, TDSG1150, TDSG1160**

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage per segment or DP		$V_R$	6	V
DC forward current per segment or DP		$I_F$	17	mA
Surge forward current per segment or DP	$t_p \leq 10\text{ }\mu\text{s}$ (non repetitive)	$I_{FSM}$	0.15	A
Power dissipation	$T_{amb} \leq 45\text{ }^{\circ}\text{C}$	$P_V$	400	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		$R_{thJA}$	140	K/W

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TDSO1150, TDSO1150-K, TDSO1160, TDSO1160-KL, ORANGE RED**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment (digit average) <sup>(1)</sup>	$I_F = 10\text{ mA}$	TDSO1150	$I_V$	450	3000	-	$\mu\text{cd}$
		TDSO1150-K		1800	-	3600	
		TDSO1160		450	3000	-	
		TDSO1160-KL		1800	-	5600	
Dominant wavelength	$I_F = 10\text{ mA}$	TDSO1150, TDSO1150-K, TDSO1160, TDSO1160-KL	$\lambda_d$	612	-	625	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$	-	630	-	nm
Angle of half intensity	$I_F = 10\text{ mA}$		$j$	-	$\pm 50$	-	$^{\circ}$
Forward voltage per segment or DP	$I_F = 20\text{ mA}$		$V_F$	-	2	3	V
Reverse voltage per segment or DP	$I_R = 10\text{ }\mu\text{A}$		$V_R$	6	15	-	V

**Notes**

<sup>(1)</sup>  $I_{Vmin.}$  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** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TDSG1150, TDSG1150-LM, TDSG1160, GREEN**

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment (digit average) <sup>(1)</sup>	$I_F = 10\text{ mA}$	TDSG1150	$I_V$	450	6000	-	$\mu\text{cd}$
		TDSG1150-LM		2800	-	9000	
		TDSG1160		450	6000	-	
		TDSG1160-LM		2800	-	9000	
Dominant wavelength	$I_F = 10\text{ mA}$	TDSG1150, TDSG1150-LM, TDSG1160, TDSG1160-LM	$\lambda_d$	562	-	575	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$	-	565	-	nm
Angle of half intensity	$I_F = 10\text{ mA}$		$j$	-	$\pm 50$	-	$^{\circ}$
Forward voltage per segment or DP	$I_F = 20\text{ mA}$		$V_F$	-	2.4	3	V
Reverse voltage per segment or DP	$I_R = 10\text{ }\mu\text{A}$		$V_R$	6	15	-	V

**Note**

<sup>(1)</sup>  $I_{Vmin.}$  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

LUMINOUS INTENSITY CLASSIFICATION		
GROUP	LIGHT INTENSITY ( $\mu\text{cd}$ )	
STANDARD	MIN.	MAX.
E	180	360
F	280	560
G	450	900
H	700	1400
I	1100	2200
K	1800	3600
L	2800	5600
M	4500	9000
N	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

COLOR CLASSIFICATION				
GROUP	ORANGE RED		GREEN	
	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  $\pm 1$  nm

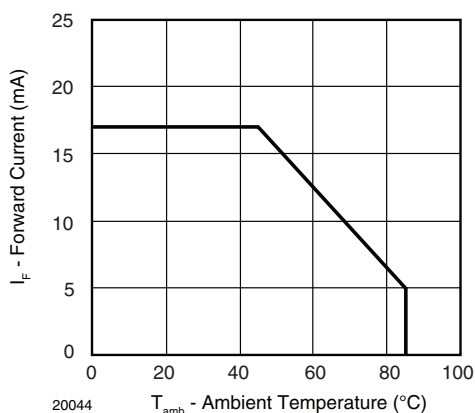
**TYPICAL CHARACTERISTICS** ( $T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified)


Fig. 1 - Forward Current vs. Ambient Temperature

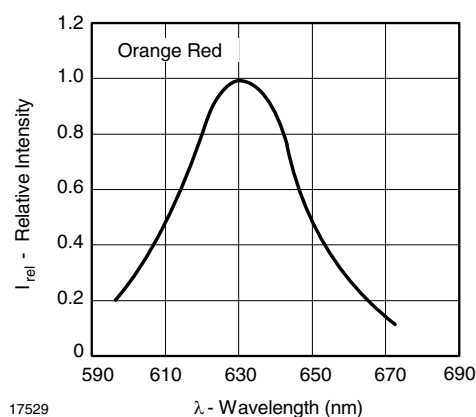


Fig. 3 - Relative Intensity vs. Wavelength

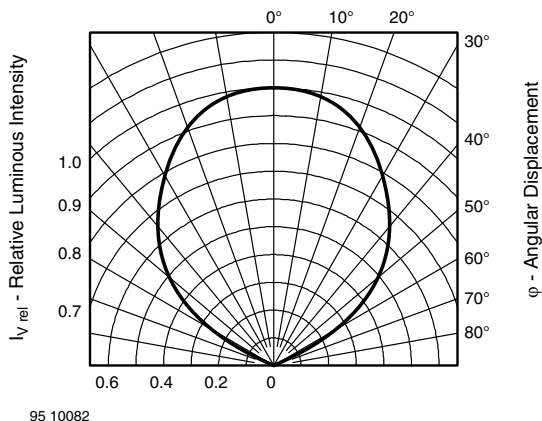


Fig. 2 - Relative Luminous Intensity vs. Angular Displacement

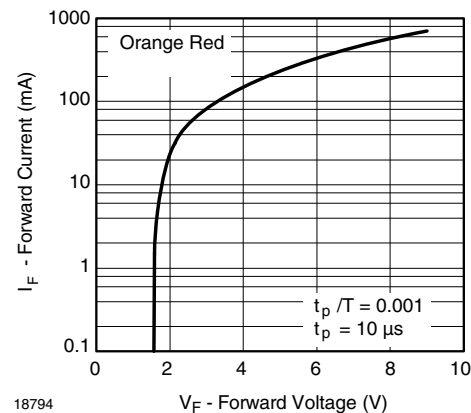


Fig. 4 - Forward Current vs. Forward Voltage

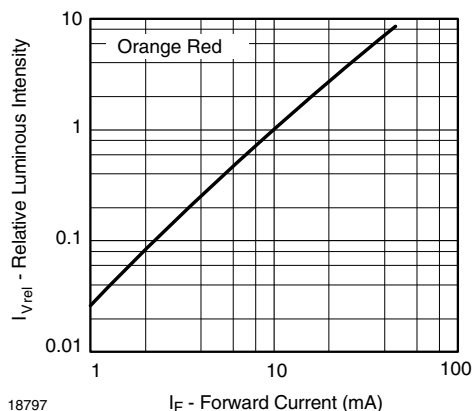


Fig. 5 - Relative Luminous Intensity vs. Forward Current

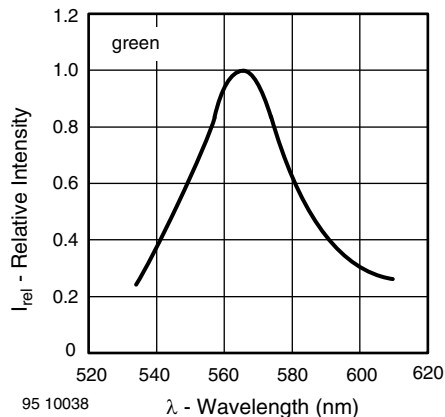


Fig. 8 - Relative Intensity vs. Wavelength

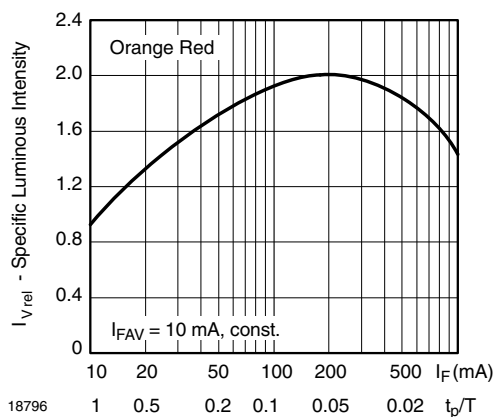


Fig. 6 - Relative Luminous Intensity vs. Forward Current / Duty Cycle

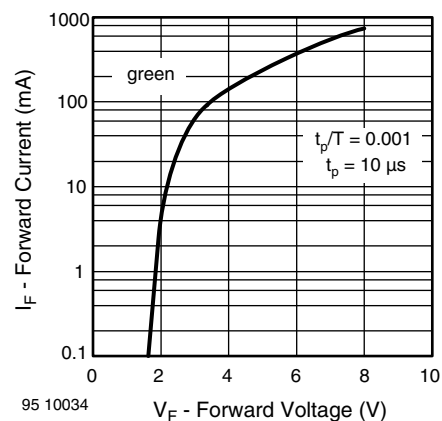


Fig. 9 - Forward Current vs. Forward Voltage

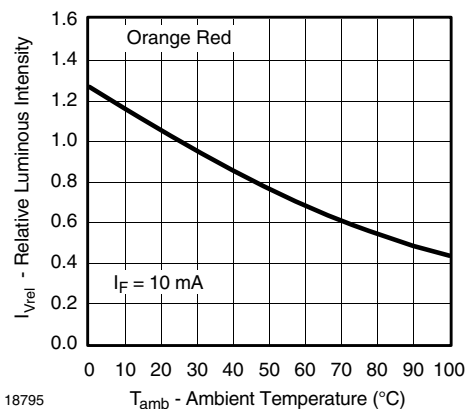


Fig. 7 - Relative Luminous Intensity vs. Ambient Temperature

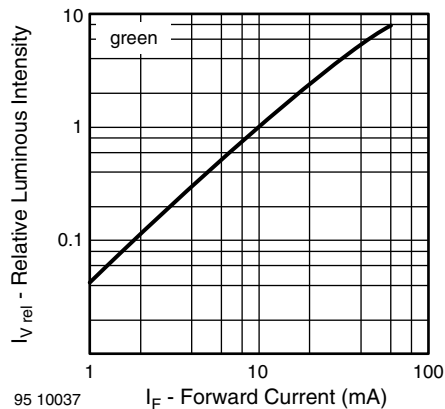


Fig. 10 - Relative Luminous Intensity vs. Forward Current

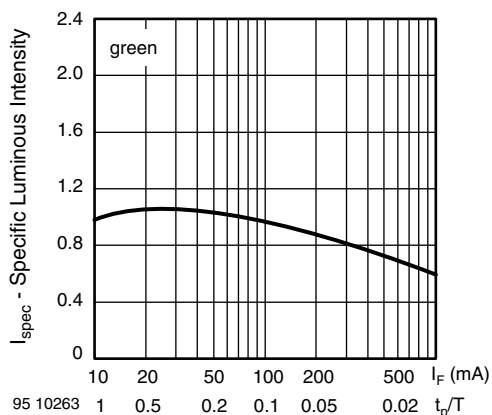


Fig. 11 - Specific Luminous Intensity vs. Forward Current

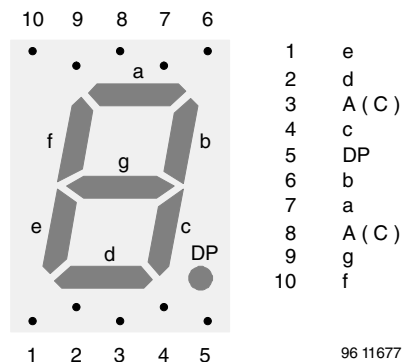


Fig. 13 - TDS.11..

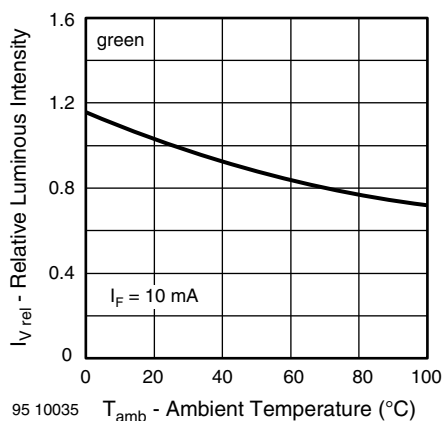
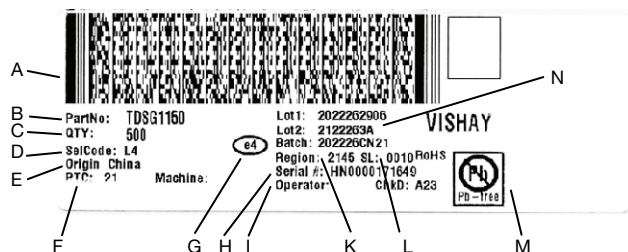


Fig. 12 - Relative Luminous Intensity vs. Ambient Temperature

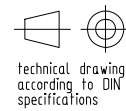
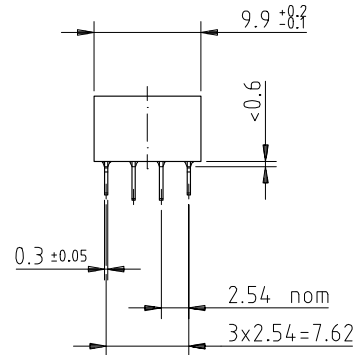
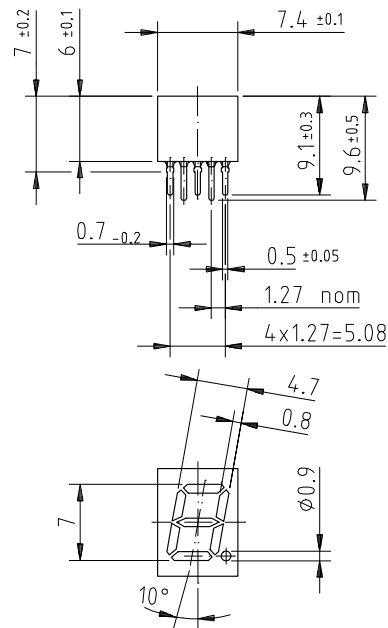
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- A. 2D barcode
- B. Part No: Vishay part number
- C. QTY: quantity
- D. SelCode: selection bin code
- E. Country of origin
- F. PTC: production plant code
- G. Termination finish
- H. Region code
- I. Serial#: serial number
- K. Batch number: year,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



## PACKAGE DIMENSIONS FOR TDS.11.. in millimeters



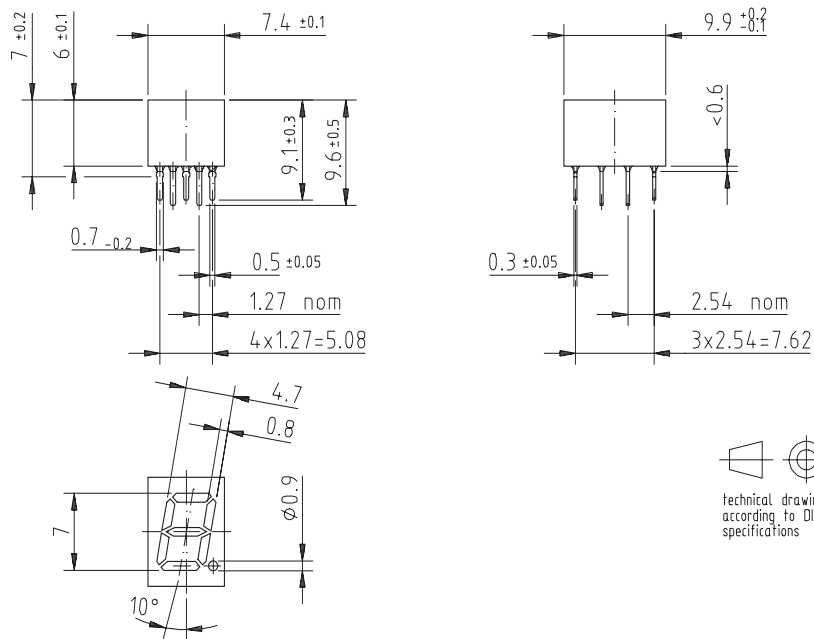
Drawing-No.: 6.544-5083.01-4

Issue: 1; 21.11.95

95 11342

## Display-7 mm

### Package Dimensions in mm



95 11342

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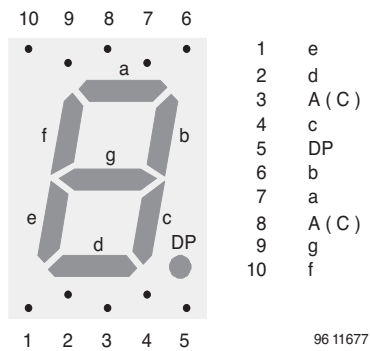
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Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423



## Pin Connections 7 mm





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