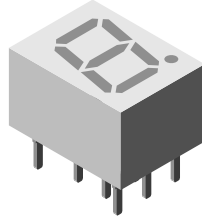


## Standard 7-Segment Display 7 mm



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.

### 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
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



**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 AT 10 mA	CIRCUITRY
TDSO1150	Orange red	$I_V = 3000 \mu\text{cd (typ.)}$	Common anode
TDSO1150-K	Orange red	$I_V = (1800 \text{ to } 3600) \mu\text{cd}$	Common anode
TDSO1160	Orange red	$I_V = 3000 \mu\text{cd (typ.)}$	Common cathode
TDSO1160-K	Orange red	$I_V = (1800 \text{ to } 3600) \mu\text{cd}$	Common cathode
TDSO1160-KL	Orange red	$I_V = (1800 \text{ to } 5600) \mu\text{cd}$	Common cathode
TDSY1150	Yellow	$I_V = 3000 \mu\text{cd (typ.)}$	Common anode
TDSY1150-K	Yellow	$I_V = (1800 \text{ to } 3600) \mu\text{cd}$	Common anode
TDSY1150-KL	Yellow	$I_V = (1800 \text{ to } 5600) \mu\text{cd}$	Common anode
TDSY1160	Yellow	$I_V = 3000 \mu\text{cd (typ.)}$	Common cathode
TDSG1150	Green	$I_V = 6000 \mu\text{cd (typ.)}$	Common anode
TDSG1150-LM	Green	$I_V = (2800 \text{ to } 9000) \mu\text{cd}$	Common anode
TDSG1160	Green	$I_V = 6000 \mu\text{cd (typ.)}$	Common cathode

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) <b>TDSO1150, TDSO1160, TDSY1150, TDSY1160, TDSG1150, TDSG1160</b>					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage per segment or DP		$V_R$	6	V	
DC forward current per segment or DP	TDSO1150	$I_F$	17	mA	
	TDSO1160		17		
	TDSY1150		17		
	TDSY1160		17		
	TDSG1150		17		
	TDSG1160		17		
Surge forward current per segment or DP	$t_p \leq 10\text{ }\mu\text{s}$ (non repetitive)	$I_{FSM}$	0.15	A	
	TDSO1150		0.15		
	TDSO1160		0.15		
	TDSY1150		0.15		
	TDSY1160		0.15		
	TDSG1150		0.15		
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/ambient		$R_{thJA}$	140	K/W	

<b>OPTICAL AND ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) <b>TDSO1150, TDSO1160, ORANGE RED</b>							
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-K		1800	-	3600	
		TDSO1160-KL		1800	-	5600	
Dominant wavelength	$I_F = 10\text{ mA}$	TDSO1150, TDSO1160	$\lambda_d$	612	-	625	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$	-	630	-	nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$	-	$\pm 50$	-	deg
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

**Note**

<sup>(1)</sup>  $I_{Vmin.}$  and  $I_V$  groups are mean values of all segments (a to g, D1 to D4), matching factor within segments is  $\geq 0.5$ , excluding decimal points and colon.



# TDSG1150, TDSG1160, TDSO1150, TDSO1160, TDSY1150, TDSY1160

Standard 7-Segment Display 7 mm Vishay Semiconductors

OPTICAL AND ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
TDSY1150, TDSY1160, YELLOW							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment (digit average) <sup>(1)</sup>	$I_F = 10\text{ mA}$	TDSY1150	$I_V$	450	3000	-	$\mu\text{cd}$
		TDSY1150-K		1800	-	3600	
		TDSY1150-KL		1800	-	5600	
		TDSY1160		450	3000	-	
Dominant wavelength	$I_F = 10\text{ mA}$	TDSY1150, TDSY1160	$\lambda_d$	581	-	594	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$	-	585	-	nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$	-	$\pm 50$	-	deg
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, D1 to D4), 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, TDSG1160, GREEN							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity per segment (digit average) <sup>(2)</sup>	$I_F = 10\text{ mA}$	TDSG1150	$I_V$	450	6000	-	$\mu\text{cd}$
		TDSG1150-LM		2800	-	9000	
		TDSG1160		450	6000	-	
Dominant wavelength	$I_F = 10\text{ mA}$	TDSG1150, TDSG1160	$\lambda_d$	562	-	575	nm
Peak wavelength	$I_F = 10\text{ mA}$		$\lambda_p$	-	565	-	nm
Angle of half intensity	$I_F = 10\text{ mA}$		$\phi$	-	$\pm 50$	-	deg
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, D1 to D4), matching factor within segments is  $\geq 0.5$ , excluding decimal points and colon.

LUMINOUS INTENSITY CLASSIFICATION		
GROUP	LIGHT INTENSITY ( $\mu\text{cd}$ )	
	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		YELLOW		GREEN	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
1	598	601	581	584		
2	600	603	583	586	562	565
3	602	605	585	588	564	567
4	604	607	587	590	566	569
5	606	609	589	592	568	571
6	608	611	591	594	570	573
7					570	575

**Note**

Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of  $\pm 1\text{ nm}$ .

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

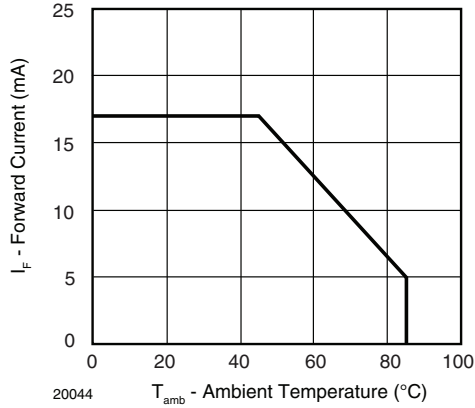


Fig. 1 - Forward Current vs. Ambient Temperature

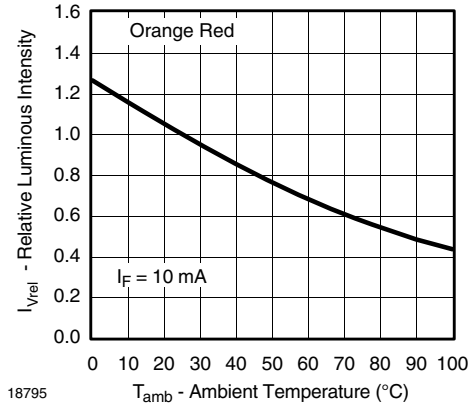


Fig. 4 - Rel. Luminous Intensity vs. Ambient Temperature

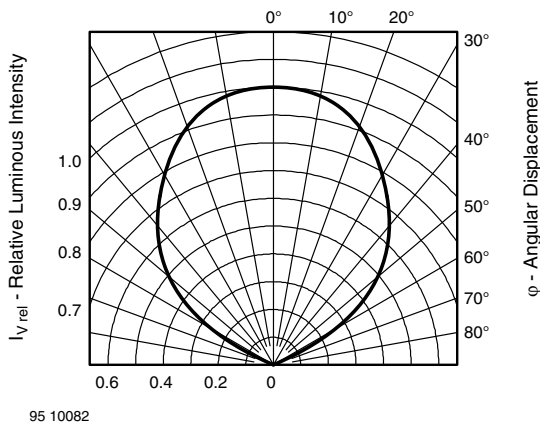


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

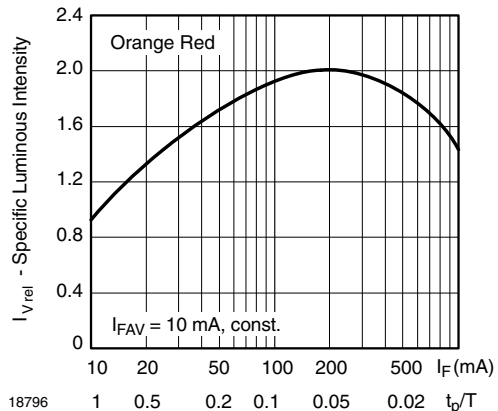


Fig. 5 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

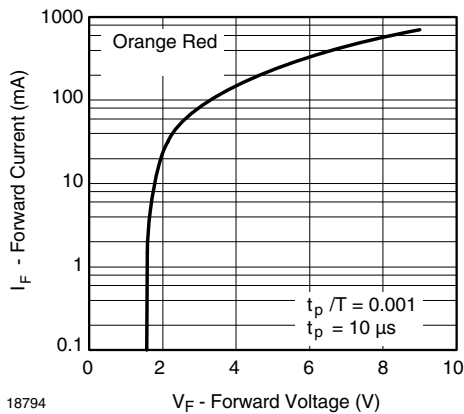


Fig. 3 - Forward Current vs. Forward Voltage

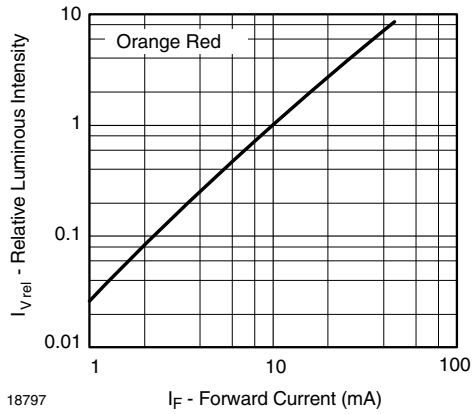


Fig. 6 - Relative Luminous Intensity vs. Forward Current

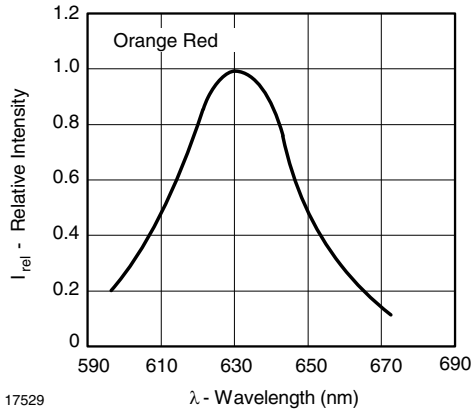


Fig. 7 - Relative Intensity vs. Wavelength

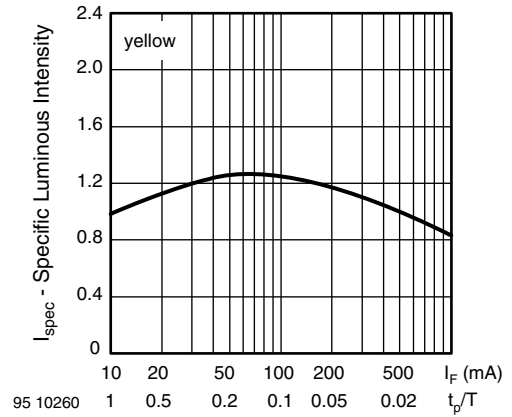


Fig. 10 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

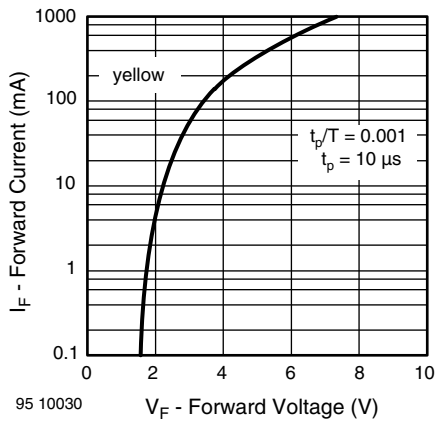


Fig. 8 - Forward Current vs. Forward Voltage

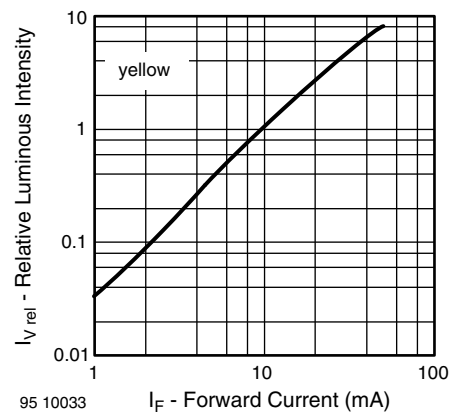


Fig. 11 - Relative Luminous Intensity vs. Forward Current

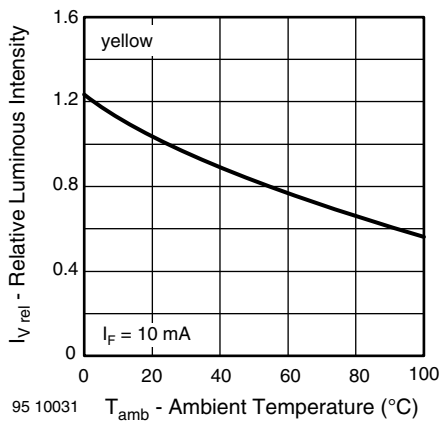


Fig. 9 - Rel. Luminous Intensity vs. Ambient Temperature

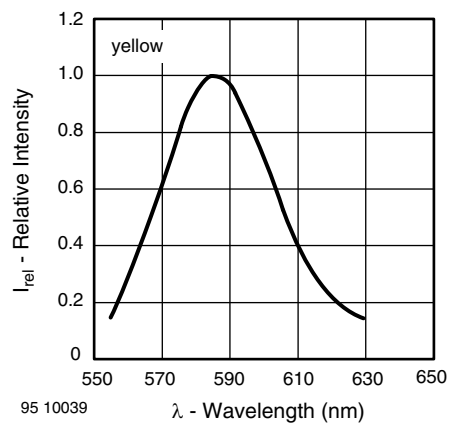


Fig. 12 - Relative Intensity vs. Wavelength

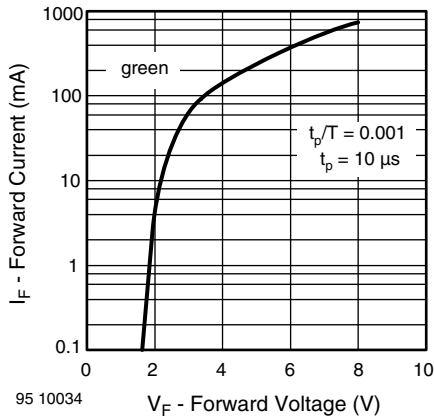


Fig. 13 - Forward Current vs. Forward Voltage

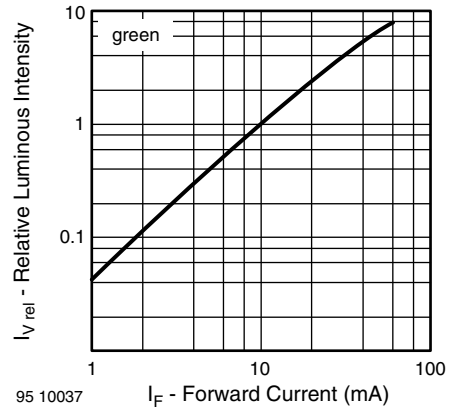


Fig. 16 - Relative Luminous Intensity vs. Forward Current

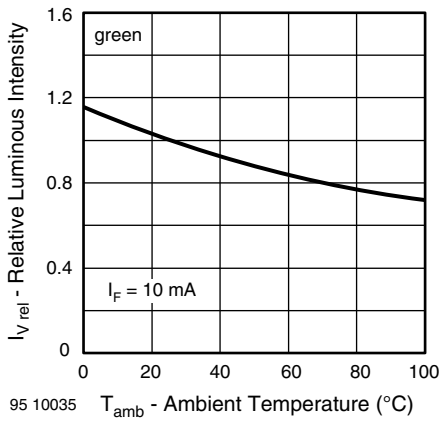


Fig. 14 - Rel. Luminous Intensity vs. Ambient Temperature

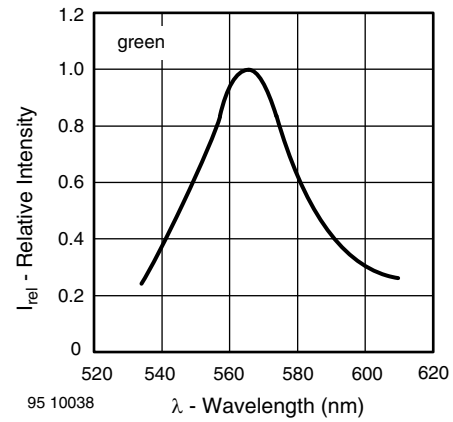


Fig. 17 - Relative Intensity vs. Wavelength

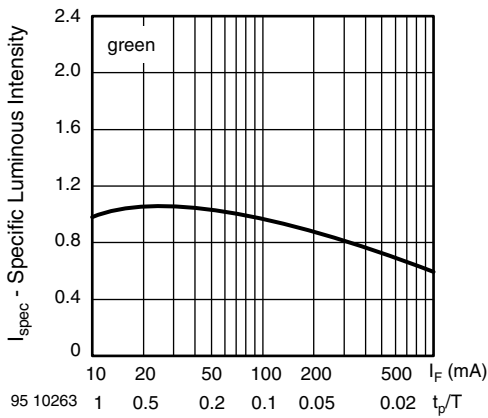


Fig. 15 - Specific Luminous Intensity vs. Forward Current

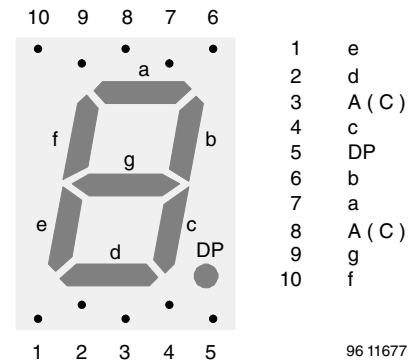


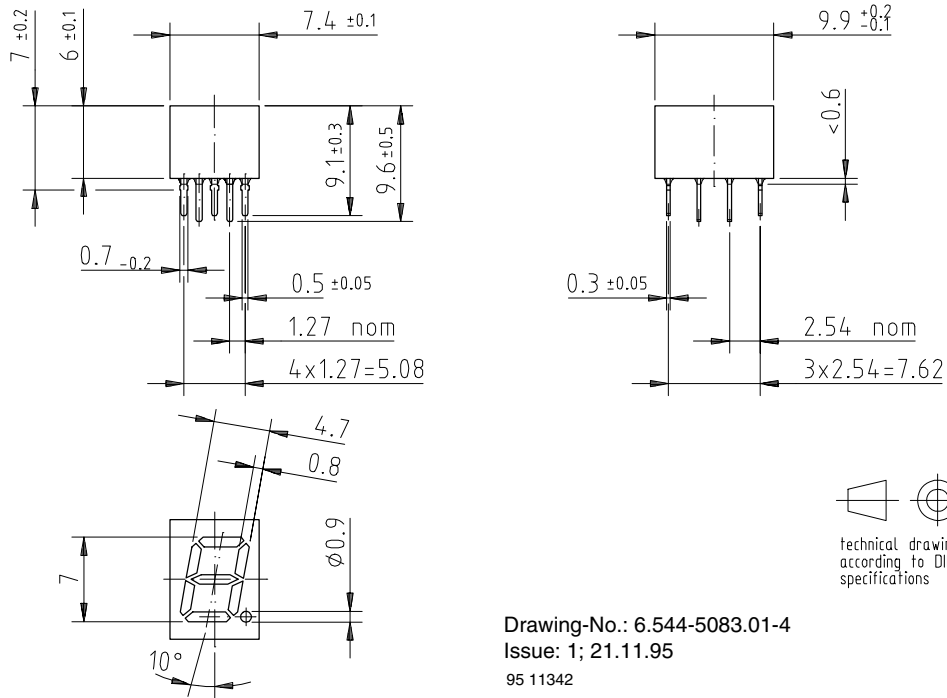
Fig. 18 - TDS.11..



# TDSG1150, TDSG1160, TDSO1150, TDSO1160, TDSY1150, TDSY1160

Standard 7-Segment Display 7 mm Vishay Semiconductors

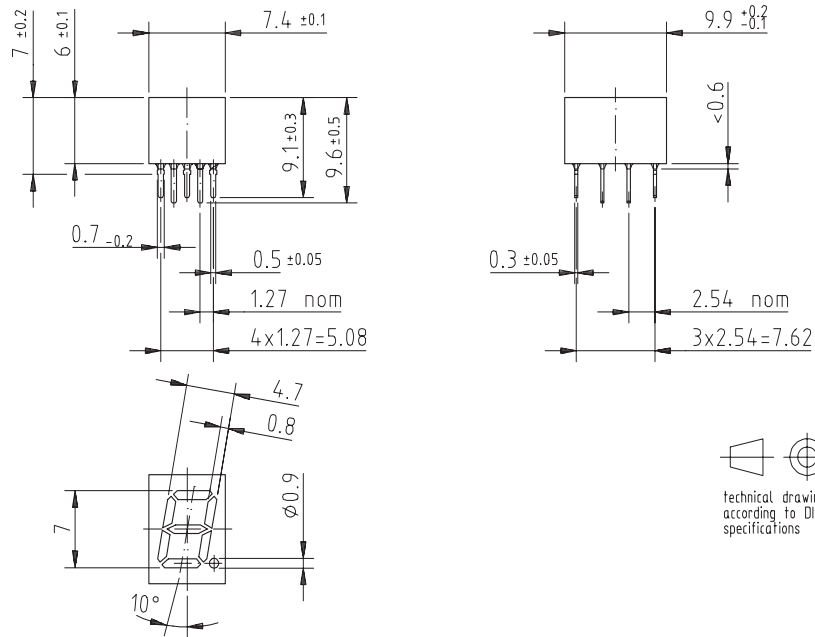
## PACKAGE DIMENSIONS FOR TDS.11.. in millimeters



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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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 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.

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.

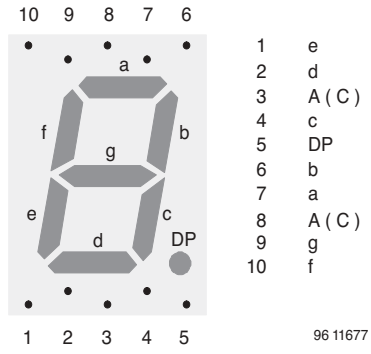
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Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany  
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

# Pin Connections 7 mm



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