

## High Intensity Red Low Current Seven Segment Display

### Description

This series defines a new standard for Low Current Displays. It is a single digit 7-Segment LED display utilizing AllnGaP technology in color red.

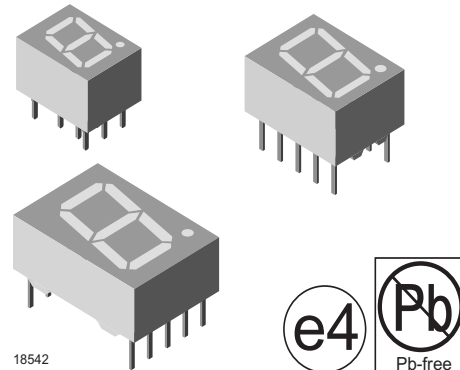
The supreme light intensity allows applications under direct sunlight or "black front" designs by using tinted filter glass in front of the display.

Typical 1500  $\mu$ cd at 1.0 mA is Best in Class Performance for applications with very limited power supply. The maximum forward current of 10 mA is allowed for an ambient temperature range of - 40° to +85° C without current derating.

Crosstalk between segments is possible at drive currents above 5 mA per segment. Therefore it is recommend to apply more than 5 mA only under direct sunlight or with tinted filter glass.

### Features

- 1500  $\mu$ cd typical at 1.0 mA
- Very low power consumption
- Wide viewing angle
- Grey package surface
- Light intensity categorized at  $I_F= 1.0\text{mA}$
- Lead-free device



### Applications

- Battery driven instruments
- Telecom devices
- Home appliances
- Instrumentation
- POS Terminals

### Parts Table

Part	Color, Luminous Intensity	Circuitry
TDSR0750	High intensity low current red	Common anode
TDSR0760	High intensity low current red	Common cathode
TDSR1050	High intensity low current red	Common anode
TDSR1060	High intensity low current red	Common cathode
TDSR1350	High intensity low current red	Common anode
TDSR1360	High intensity low current red	Common cathode

### Absolute Maximum Ratings

$T_{amb} = 25^\circ\text{C}$ , unless otherwise specified

**TDSR0750/0760 , TDSR1050/1060 , TDSR1350/1360**

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage per segment		$V_R$	5	V
DC Forward current per segment		$I_F$	10	mA
Peak forward current per segment	$t_p \leq 10 \mu\text{s}$ , duty cycle 1/10	$I_{FM}$	50	mA

Parameter	Test condition	Symbol	Value	Unit
Power dissipation	$T_{amb} \leq 85^{\circ}\text{C}$	$P_V$	185	mW
Junction temperature		$T_j$	105	$^{\circ}\text{C}$
Operating temperature range		$T_{amb}$	- 40 to + 85	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	- 40 to + 85	$^{\circ}\text{C}$
Soldering temperature	$t \leq 3$ sec, 2mm below seating plane	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal resistance LED junction/ambient		$R_{thJA}$	100	K/W

## Optical and Electrical Characteristics

$T_{amb} = 25^{\circ}\text{C}$ , unless otherwise specified

### Red

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
<b>TDSR0750, TDSR0760</b>						
Luminous intensity per segment (digit average)	$I_F = 1$ mA	$I_V$	180		2200	$\mu\text{cd}$
Dominant wavelength	$I_F = 1$ mA	$\lambda_d$		640		nm
Peak wavelength	$I_F = 1$ mA	$\lambda_p$		650		nm
Forward voltage per segment or DP	$I_F = 1$ mA	$V_F$		1.8	2.4	V
Reverse voltage per segment or DP	$V_R = 6$ V	$I_R$		10		$\mu\text{A}$
<b>TDSR1050, TDSR1060</b>						
Luminous intensity per segment (digit average)	$I_F = 1$ mA	$I_V$	280		3600	$\mu\text{cd}$
Dominant wavelength	$I_F = 1$ mA	$\lambda_d$		640		nm
Peak wavelength	$I_F = 1$ mA	$\lambda_p$		650		nm
Forward voltage per segment or DP	$I_F = 1$ mA	$V_F$		1.8	2.4	V
Reverse voltage per segment or DP	$V_R = 6$ V	$I_R$		10		$\mu\text{A}$
<b>TDSR1350, TDSR1360</b>						
Luminous intensity per segment (digit average)	$I_F = 1$ mA	$I_V$	280		3600	$\mu\text{cd}$
Dominant wavelength	$I_F = 1$ mA	$\lambda_d$		640		nm
Peak wavelength	$I_F = 1$ mA	$\lambda_p$		650		nm
Forward voltage per segment or DP	$I_F = 1$ mA	$V_F$		1.8	2.4	V
Reverse voltage per segment or DP	$V_R = 6$ V	$I_R$		10		$\mu\text{A}$

## Typical Characteristics ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

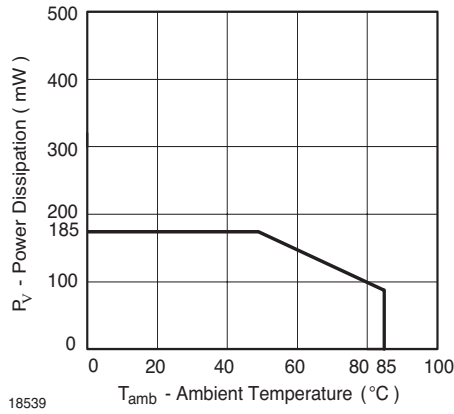


Figure 1. Power Dissipation vs. Ambient Temperature

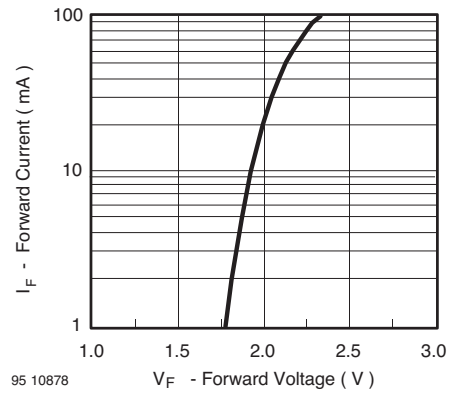


Figure 4. Forward Current vs. Forward Voltage

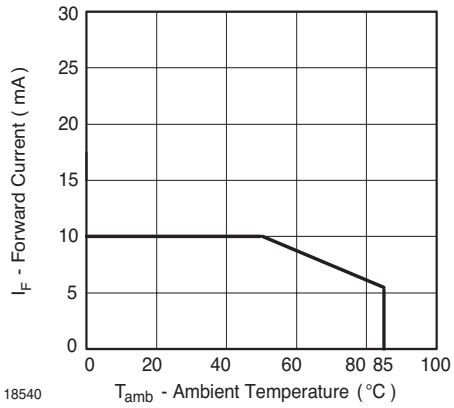


Figure 2. Forward Current vs. Ambient Temperature

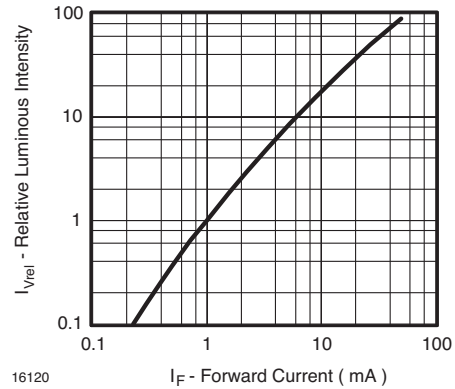


Figure 5. Relative Luminous Intensity vs. Forward Current

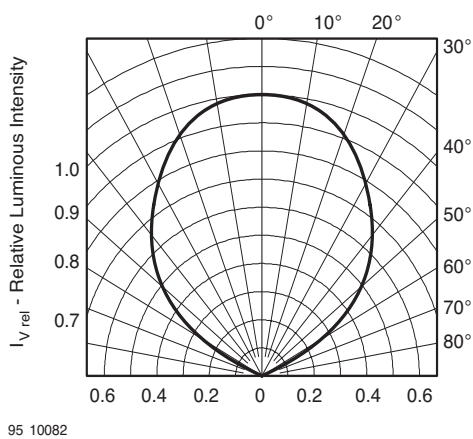


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

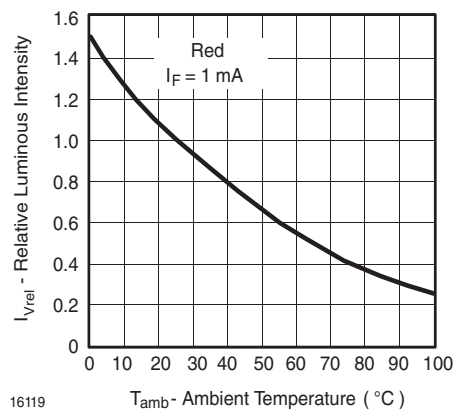
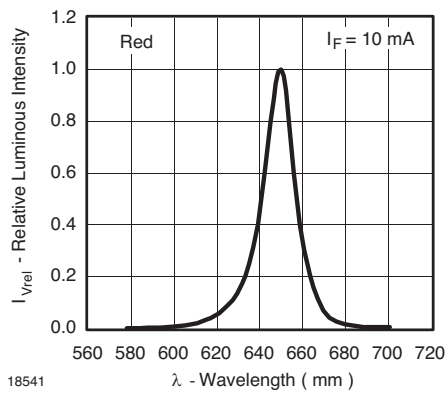
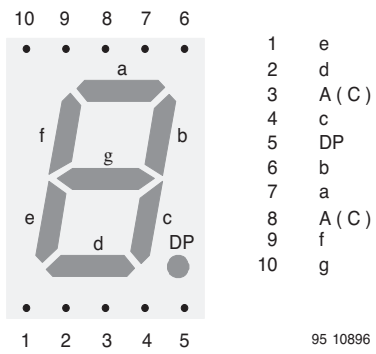
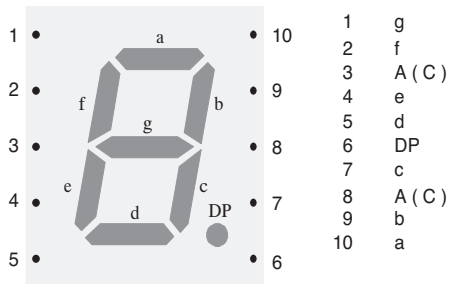
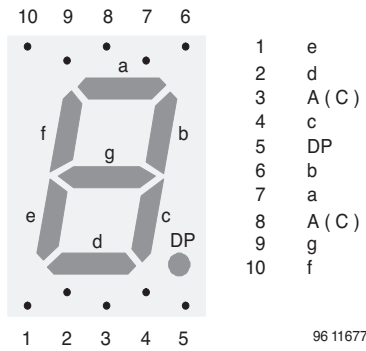


Figure 6. Rel. Luminous Intensity vs. Ambient Temperature

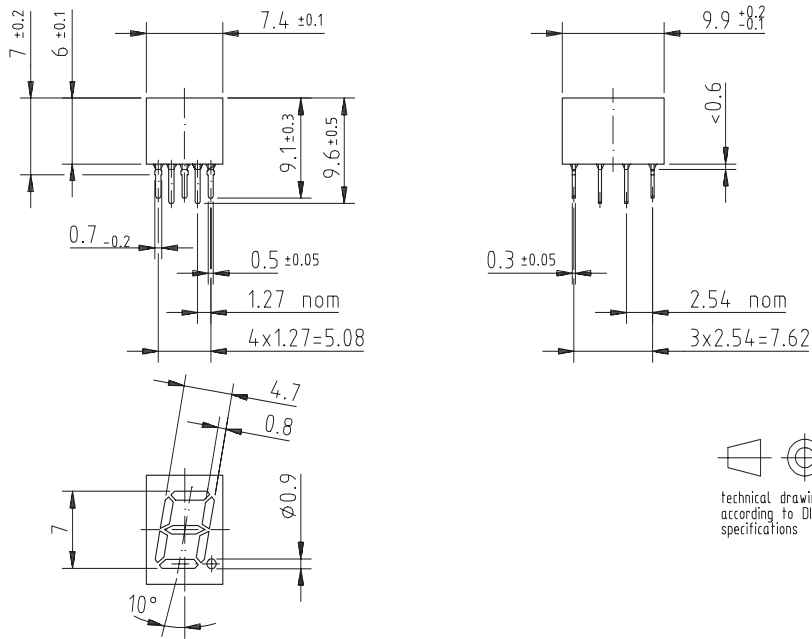


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Figure 7. Rel. Luminous Intensity vs. Ambient Temperature

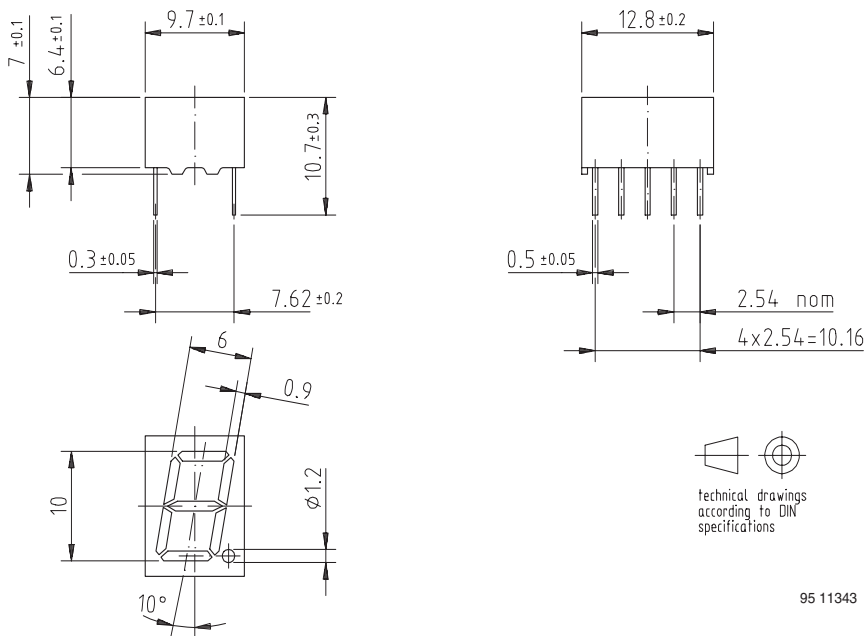


## Package Dimensions in mm



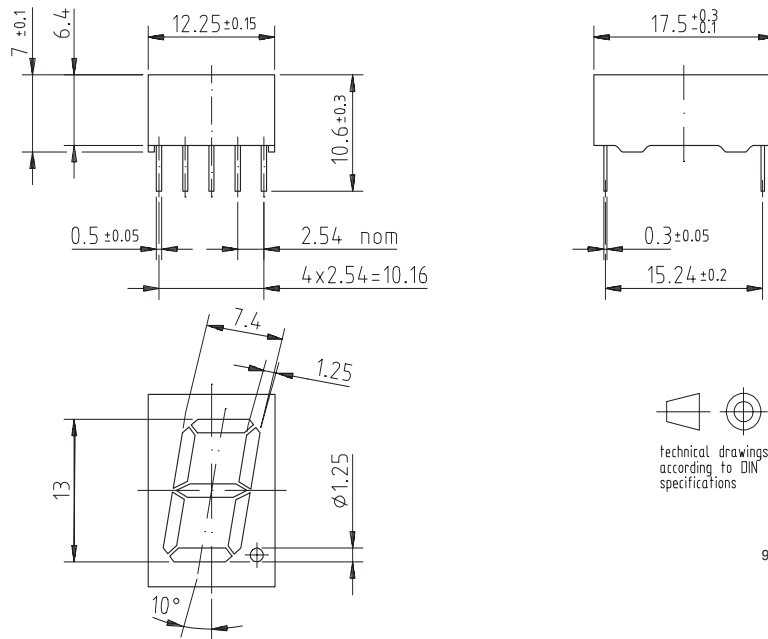
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## Package Dimensions in mm



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## Package Dimensions in mm



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### 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 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.

**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.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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