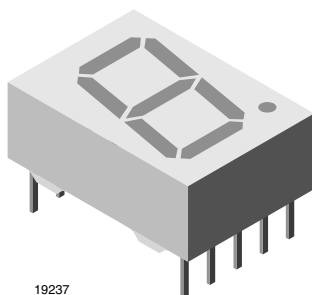


## Standard 7-Segment Display 13 mm



19237

### 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 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
- TV sets

### PRODUCT GROUP AND PACKAGE DATA

- Product group: display
- Package: 13 mm
- Product series: standard
- Angle of half intensity:  $\pm 50^\circ$

### PARTS TABLE

| PART        | COLOR      | LUMINOUS INTENSITY AT 10 mA                     | CIRCUITRY      |
|-------------|------------|-------------------------------------------------|----------------|
| TDSO5150    | Orange red | $I_V > 700 \mu\text{cd}$                        | Common anode   |
|             |            | $I_V = 5000 \mu\text{cd (typ.)}$                | Common anode   |
| TDSO5150-LM | Orange red | $I_V = (2800 \text{ to } 9000) \mu\text{cd}$    | Common anode   |
| TDSO5150-M  | Orange red | $I_V = (4500 \text{ to } 9000) \mu\text{cd}$    | Common anode   |
| TDSO5160    | Orange red | $I_V > 700 \mu\text{cd}$                        | Common cathode |
|             |            | $I_V = 5000 \mu\text{cd (typ.)}$                | Common cathode |
| TDSO5160-LM | Orange red | $I_V = (2800 \text{ to } 9000) \mu\text{cd}$    | Common cathode |
| TDSY5150    | Yellow     | $I_V > 700 \mu\text{cd}$                        | Common anode   |
|             |            | $I_V = 4200 \mu\text{cd (typ.)}$                | Common anode   |
| TDSY5160    | Yellow     | $I_V > 700 \mu\text{cd}$                        | Common cathode |
|             |            | $I_V = 4200 \mu\text{cd (typ.)}$                | Common cathode |
| TDSG5150    | Green      | $I_V > 700 \mu\text{cd}$                        | Common anode   |
|             |            | $I_V = 9500 \mu\text{cd (typ.)}$                | Common anode   |
| TDSG5150-MN | Green      | $I_V = (4500 \text{ to } 14\,000) \mu\text{cd}$ | Common anode   |
| TDSG5150-N  | Green      | $I_V = (7000 \text{ to } 14\,000) \mu\text{cd}$ | Common anode   |
| TDSG5160    | Green      | $I_V > 700 \mu\text{cd}$                        | Common cathode |
|             |            | $I_V = 9500 \mu\text{cd (typ.)}$                | Common cathode |
| TDSG5160-MN | Green      | $I_V = (4500 \text{ to } 14\,000) \mu\text{cd}$ | Common cathode |
| TDSG5160-N  | Green      | $I_V = (7000 \text{ to } 14\,000) \mu\text{cd}$ | Common cathode |

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TDSO5150, TDSO5160, TDSY5150, TDSY5160, 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    | TDSO5150                                          | $I_F$      | 25           | mA                 |
|                                         | TDSO5160                                          |            | 25           |                    |
|                                         | TDSY5150                                          |            | 25           |                    |
|                                         | TDSY5160                                          |            | 25           |                    |
|                                         | TDSG5150                                          |            | 25           |                    |
|                                         | TDSG5160                                          |            | 25           |                    |
| Surge forward current per segment or DP | $t_p \leq 10\text{ }\mu\text{s}$ (non repetitive) | $I_{FSM}$  | 0.15         | A                  |
|                                         |                                                   |            | 0.15         |                    |
|                                         |                                                   |            | 0.15         |                    |
|                                         |                                                   |            | 0.15         |                    |
|                                         |                                                   |            | 0.15         |                    |
|                                         |                                                   |            | 0.15         |                    |
| Power dissipation                       | $T_{amb} \leq 45\text{ }^{\circ}\text{C}$         | $P_V$      | 550          | 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                   | $t \leq 3\text{ s}$ ,<br>2 mm below seating plane | $T_{sd}$   | 260          | $^{\circ}\text{C}$ |
| Thermal resistance LED junction/ambient |                                                   | $R_{thJA}$ | 100          | K/W                |

**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TDSO5150, TDSO5160, ORANGE RED**

| PARAMETER                                                     | TEST CONDITION                | PART                  | SYMBOL      | MIN. | TYP.     | MAX. | UNIT           |
|---------------------------------------------------------------|-------------------------------|-----------------------|-------------|------|----------|------|----------------|
| Luminous intensity per segment (digit average) <sup>(1)</sup> | $I_F = 10\text{ mA}$          | TDSO5150              | $I_V$       | 700  | 5000     | -    | $\mu\text{cd}$ |
|                                                               |                               | TDSO5150-LM           |             | 2800 | -        | 9000 |                |
|                                                               |                               | TDSO5150-M            |             | 4500 | -        | 9000 |                |
|                                                               |                               | TDSO5160              |             | 700  | 5000     | -    |                |
|                                                               |                               | TDSO5160-LM           |             | 2800 | -        | 9000 |                |
| Dominant wavelength                                           | $I_F = 10\text{ mA}$          | TDSO5150,<br>TDSO5160 | $\lambda_d$ | 612  | -        | 625  | nm             |
| Peak wavelength                                               | $I_F = 10\text{ mA}$          |                       | $\lambda_p$ | -    | 630      | -    | nm             |
| Angle of half intensity                                       | $I_F = 10\text{ mA}$          |                       | $\varphi$   | -    | $\pm 50$ | -    | 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.



# TDSG5150, TDSG5160, TDSO5150, TDSO5160, TDSY5150, TDSY5160

Standard 7-Segment Display 13 mm Vishay Semiconductors

## OPTICAL AND ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) TDSY5150, TDSY5160, YELLOW

| PARAMETER                                                     | TEST CONDITION                | PART                  | SYMBOL      | MIN. | TYP.     | MAX. | UNIT           |
|---------------------------------------------------------------|-------------------------------|-----------------------|-------------|------|----------|------|----------------|
| Luminous intensity per segment (digit average) <sup>(1)</sup> | $I_F = 10\text{ mA}$          | TDSY5150              | $I_V$       | 700  | 4200     | -    | $\mu\text{cd}$ |
|                                                               |                               | TDSY5160              |             | 700  | 4200     | -    |                |
| Dominant wavelength                                           | $I_F = 10\text{ mA}$          | TDSY5150,<br>TDSY5160 | $\lambda_d$ | 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  $\leq 0.5$ , excluding decimal points and colon.

## OPTICAL AND ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) TDSG5150, TDSG5160, GREEN

| PARAMETER                                                     | TEST CONDITION                | PART                  | SYMBOL      | MIN. | TYP.     | MAX.   | UNIT           |
|---------------------------------------------------------------|-------------------------------|-----------------------|-------------|------|----------|--------|----------------|
| Luminous intensity per segment (digit average) <sup>(1)</sup> | $I_F = 10\text{ mA}$          | TDSG5150              | $I_V$       | 700  | 9500     | -      | $\mu\text{cd}$ |
|                                                               |                               | TDSG5150-MN           |             | 4500 | -        | 14 000 |                |
|                                                               |                               | TDSG5150-N            |             | 7000 | -        | 14 000 |                |
|                                                               |                               | TDSG5160              |             | 700  | 9500     | -      |                |
|                                                               |                               | TDSG5160-MN           |             | 4500 | -        | 14 000 |                |
|                                                               |                               | TDSG5160-N            |             | 7000 | -        | 14 000 |                |
| Dominant wavelength                                           | $I_F = 10\text{ mA}$          | TDSG5150,<br>TDSG5160 | $\lambda_d$ | 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)

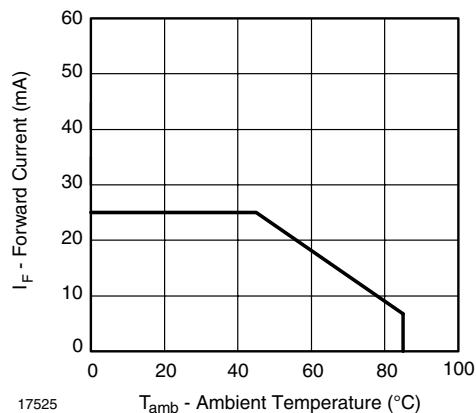


Fig. 1 - Forward Current vs. Ambient Temperature

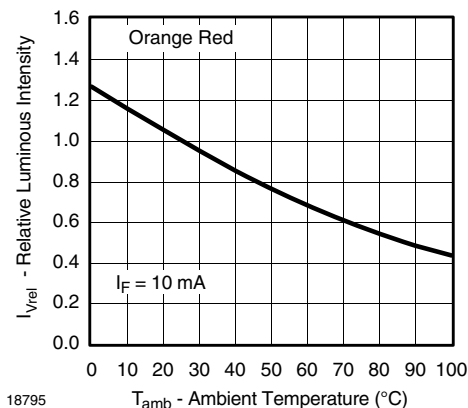


Fig. 4 - Rel. Luminous Intensity vs. Ambient Temperature

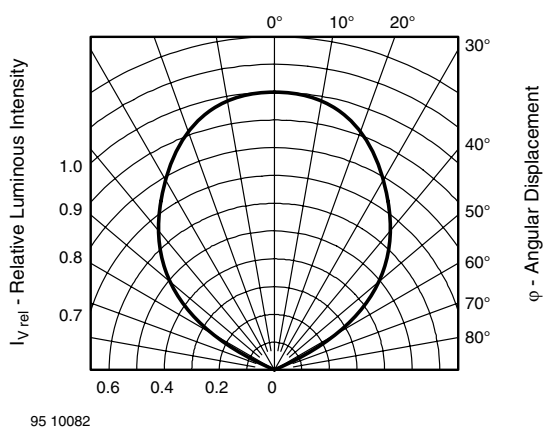


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

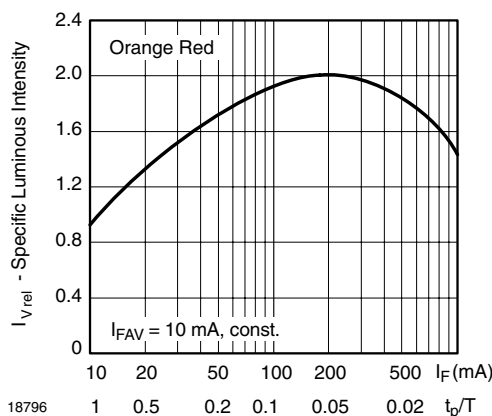


Fig. 5 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

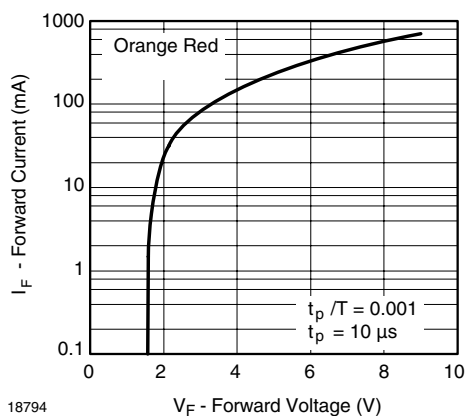


Fig. 3 - Forward Current vs. Forward Voltage

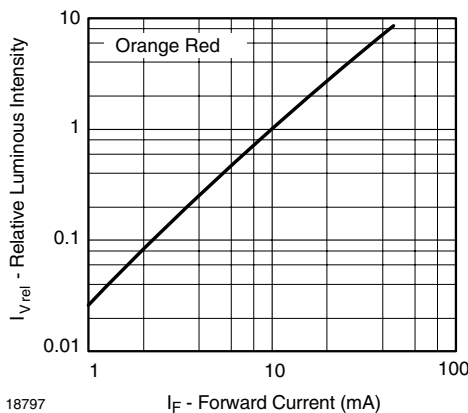


Fig. 6 - Relative Luminous Intensity vs. Forward Current

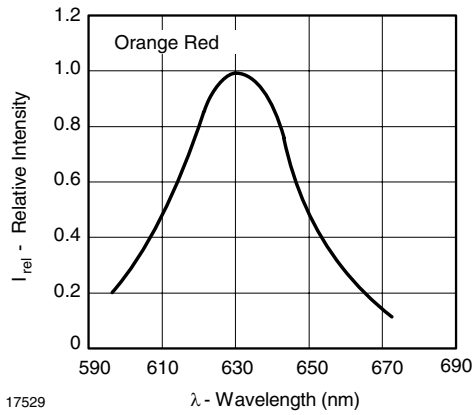


Fig. 7 - Relative Intensity vs. Wavelength

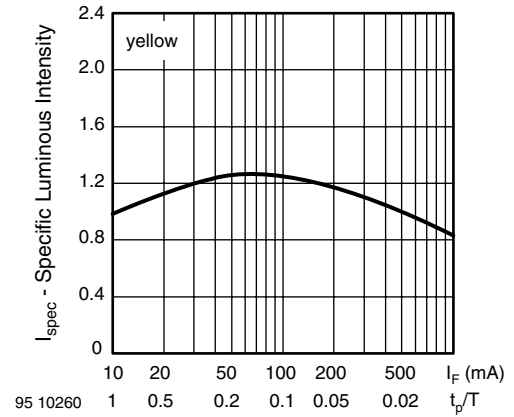


Fig. 10 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

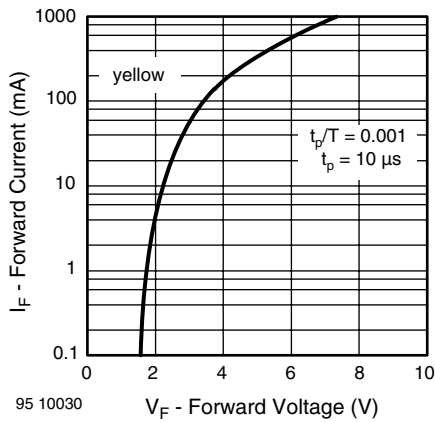


Fig. 8 - Forward Current vs. Forward Voltage

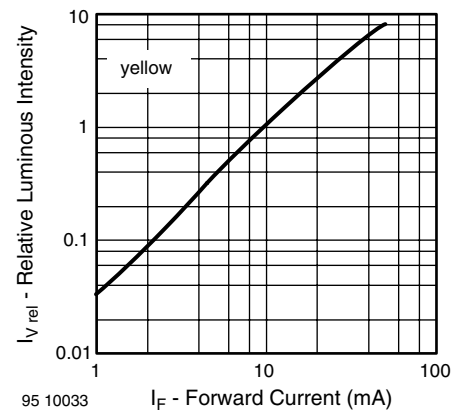


Fig. 11 - Relative Luminous Intensity vs. Forward Current

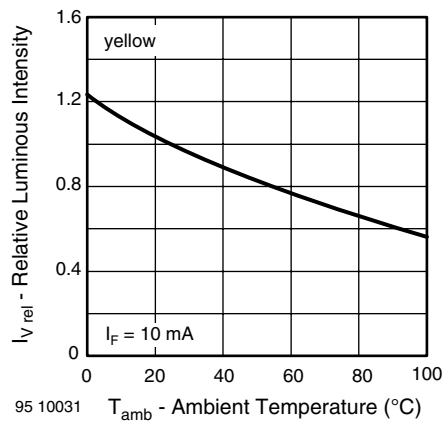


Fig. 9 - Rel. Luminous Intensity vs. Ambient Temperature

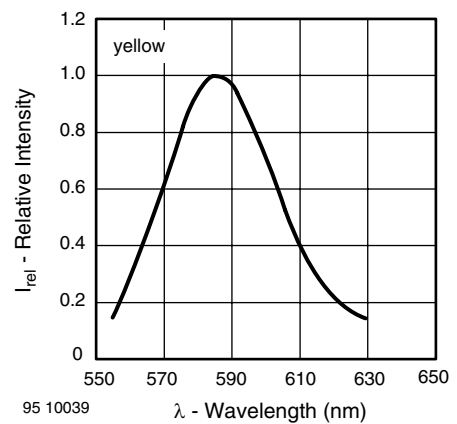
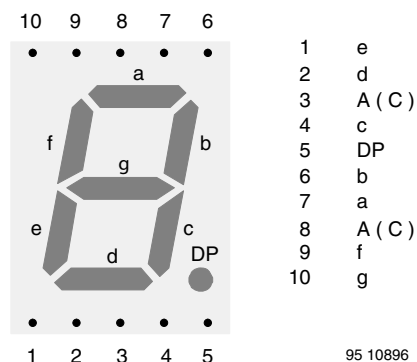
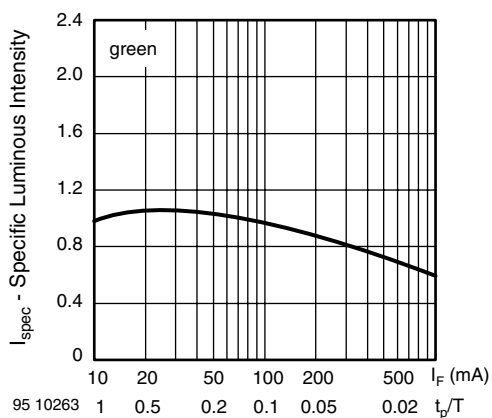
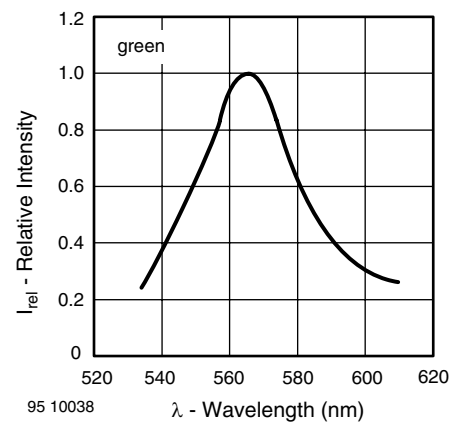
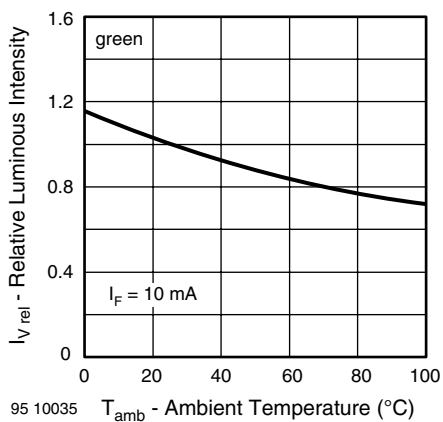
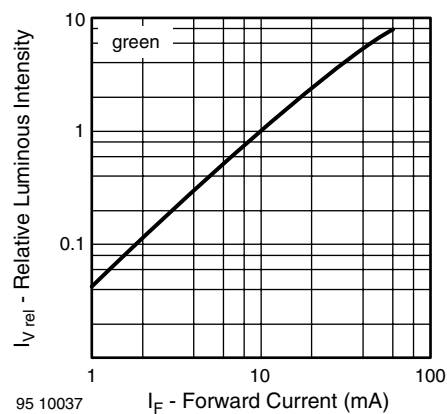
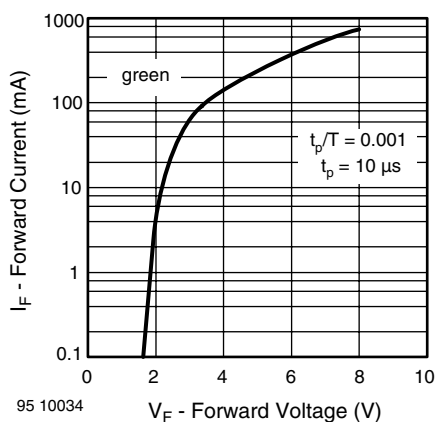


Fig. 12 - Relative Intensity vs. Wavelength

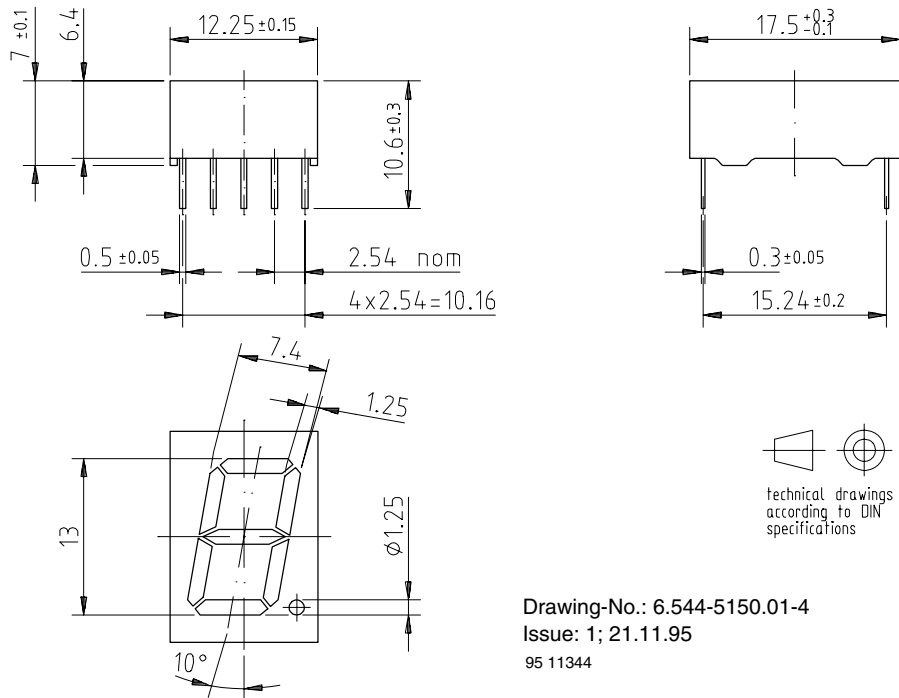




# TDSG5150, TDSG5160, TDSO5150, TDSO5160, TDSY5150, TDSY5160

Standard 7-Segment Display 13 mm Vishay Semiconductors

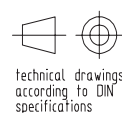
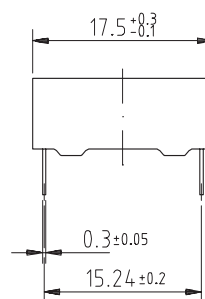
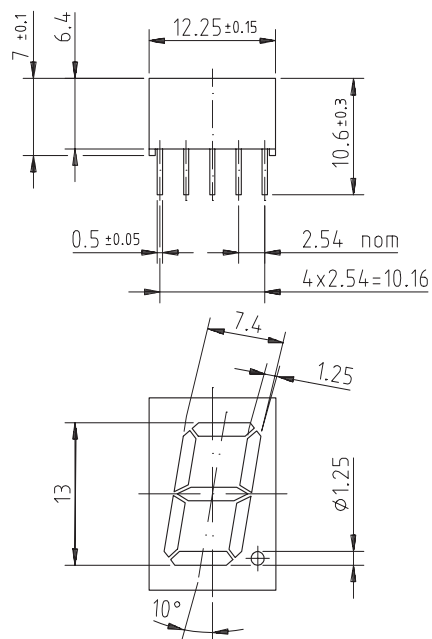
## PACKAGE DIMENSIONS FOR TDS.51.. in millimeters



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

# Display-13 mm

## Package Dimensions in mm



95 11344

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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.

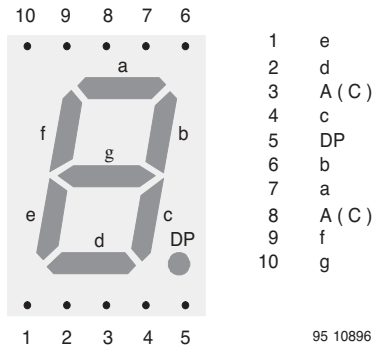
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Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany  
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

# Pin Connections 13 mm



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



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Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

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