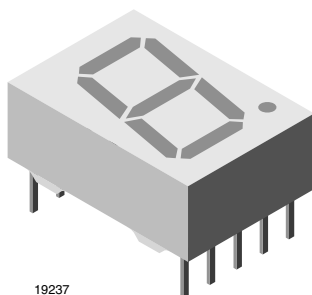


Standard 7-Segment Display 13 mm



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 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 | TDSO5150 | I_{FSM} | 0.15 | A |
| | TDSO5160 | | 0.15 | |
| | TDSY5150 | | 0.15 | |
| | TDSY5160 | | 0.15 | |
| | TDSG5150 | | 0.15 | |
| | TDSG5160 | | 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 | $t \leq 3\text{ s}$, 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) ⁽¹⁾ | $I_F = 10\text{ mA}$ | TDSO5150 | I_V | 700 | 5000 | - | μcd |
| | | TDSO5150-LM | | 2800 | - | 9000 | |
| | | TDSO5150-M | | 4500 | - | 9000 | |
| | | TDSO5160 | | 700 | 5000 | - | |
| | | TDSO5160-LM | | 2800 | - | 9000 | |
| Dominant wavelength | $I_F = 10\text{ mA}$ | TDSO5150, TDSO5160 | λ_d | 612 | - | 625 | nm |
| Peak wavelength | $I_F = 10\text{ mA}$ | | λ_p | - | 630 | - | nm |
| Angle of half intensity | $I_F = 10\text{ mA}$ | | φ | - | ± 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

⁽¹⁾ $I_{Vmin.}$ and I_V groups are mean values of all segments (a to g, D1 to D4), matching factor within segments is ≥ 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 ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified) TDSY5150, TDSY5160, YELLOW

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|-------------------------------|-----------------------|-------------|------|----------|------|----------------|
| Luminous intensity per segment (digit average) ⁽¹⁾ | $I_F = 10\text{ mA}$ | TDSY5150 | I_V | 700 | 4200 | - | μcd |
| | | TDSY5160 | | 700 | 4200 | - | |
| Dominant wavelength | $I_F = 10\text{ mA}$ | TDSY5150, TDSY5160 | λ_d | 581 | - | 594 | nm |
| Peak wavelength | $I_F = 10\text{ mA}$ | | λ_p | - | 585 | - | nm |
| Angle of half intensity | $I_F = 10\text{ mA}$ | | ϕ | - | ± 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

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

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

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|-------------------------------|-----------------------|-------------|------|----------|--------|----------------|
| Luminous intensity per segment (digit average) ⁽¹⁾ | $I_F = 10\text{ mA}$ | TDSG5150 | I_V | 700 | 9500 | - | μcd |
| | | 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, TDSG5160 | λ_d | 562 | - | 575 | nm |
| Peak wavelength | $I_F = 10\text{ mA}$ | | λ_p | - | 565 | - | nm |
| Angle of half intensity | $I_F = 10\text{ mA}$ | | ϕ | - | ± 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

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

LUMINOUS INTENSITY CLASSIFICATION

| GROUP | LIGHT INTENSITY (μcd) | |
|-------|------------------------------------|--------|
| | 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)

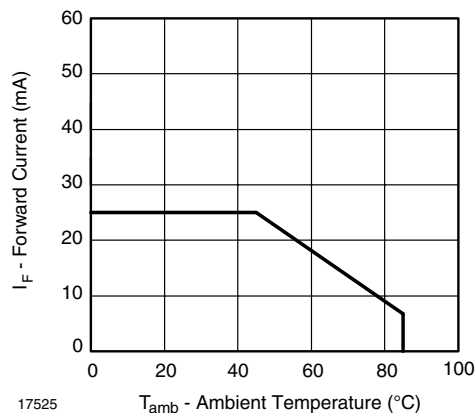


Fig. 1 - Forward Current vs. Ambient Temperature

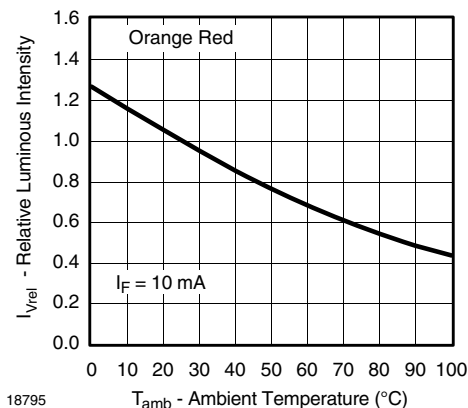


Fig. 4 - Rel. Luminous Intensity vs. Ambient Temperature

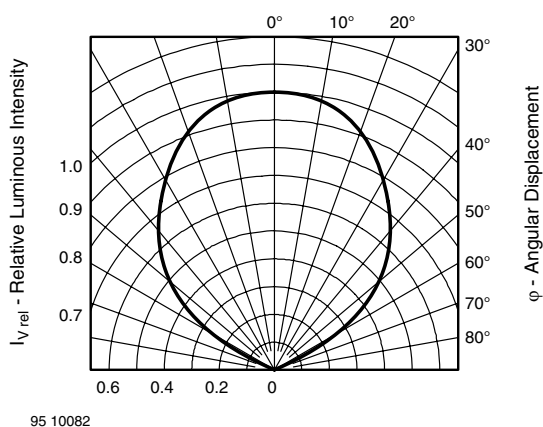


Fig. 2 - Rel. Luminous Intensity vs. Angular Displacement

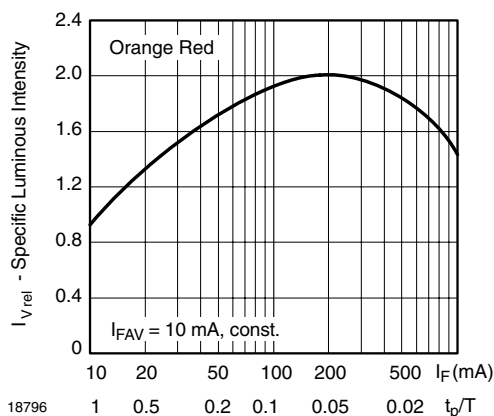


Fig. 5 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

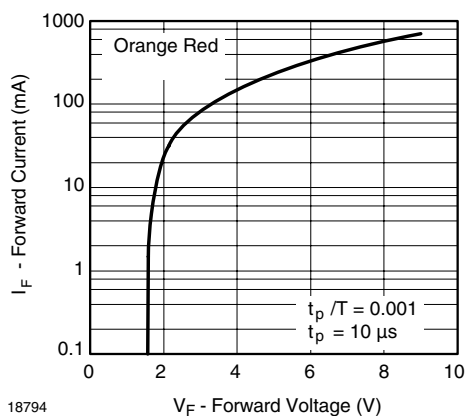


Fig. 3 - Forward Current vs. Forward Voltage

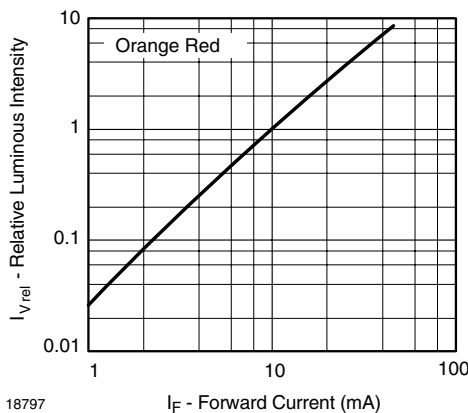


Fig. 6 - Relative Luminous Intensity vs. Forward Current

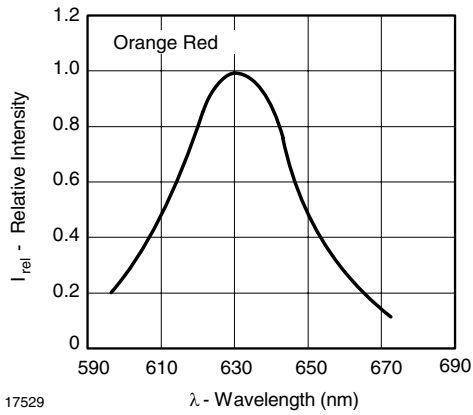


Fig. 7 - Relative Intensity vs. Wavelength

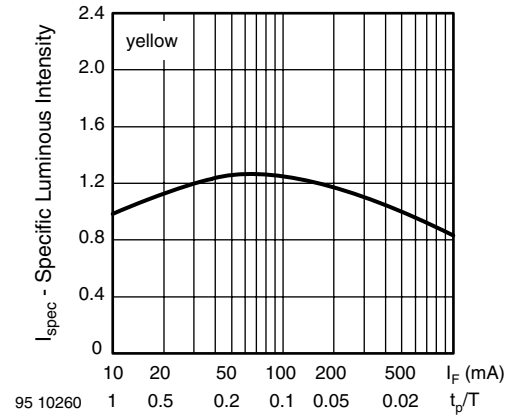


Fig. 10 - Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

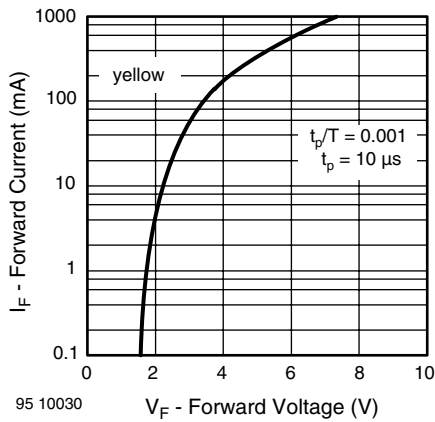


Fig. 8 - Forward Current vs. Forward Voltage

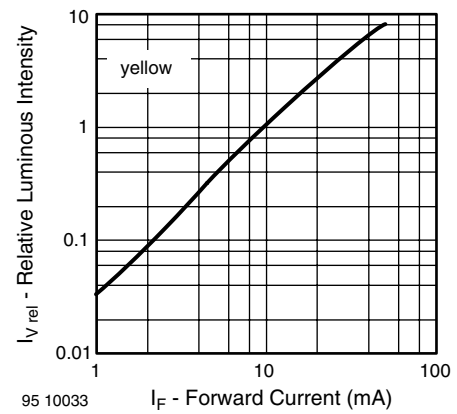


Fig. 11 - Relative Luminous Intensity vs. Forward Current

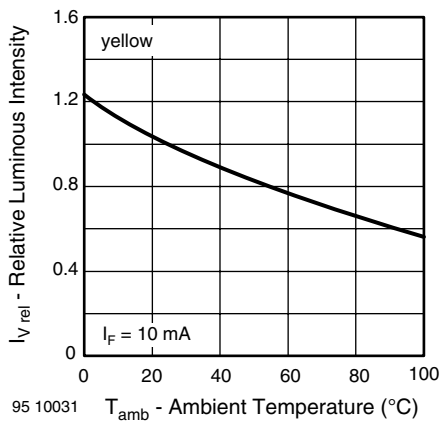


Fig. 9 - Rel. Luminous Intensity vs. Ambient Temperature

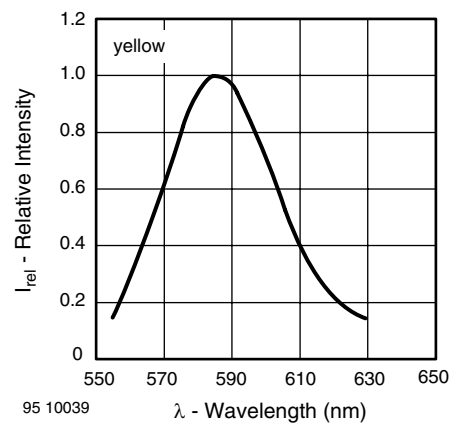
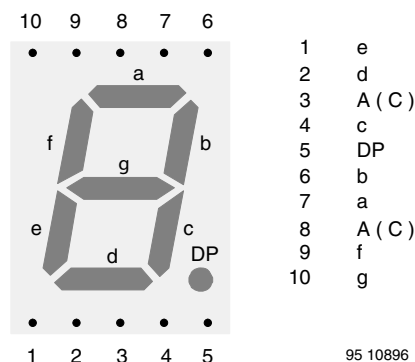
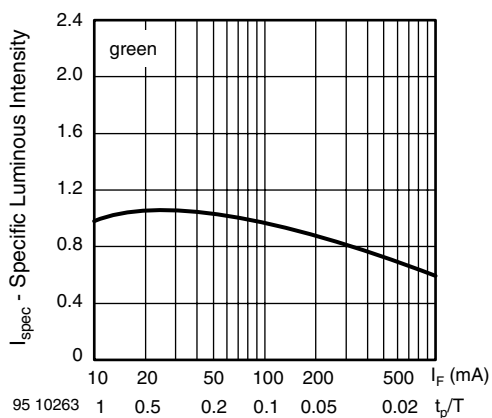
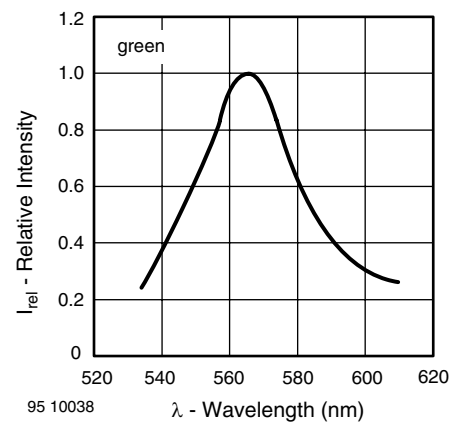
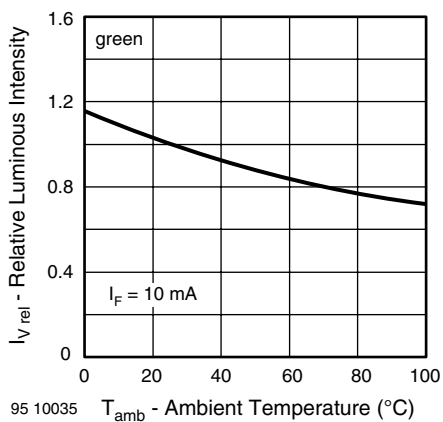
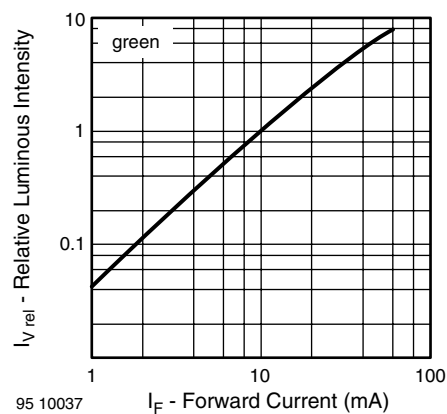
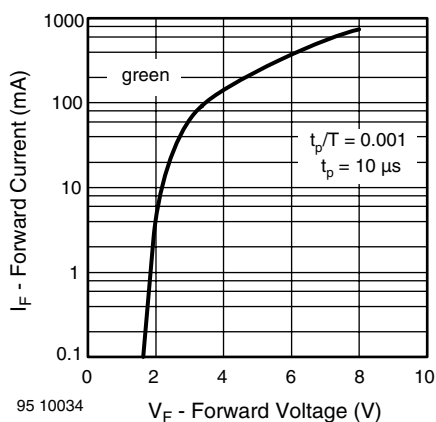


Fig. 12 - Relative Intensity vs. Wavelength

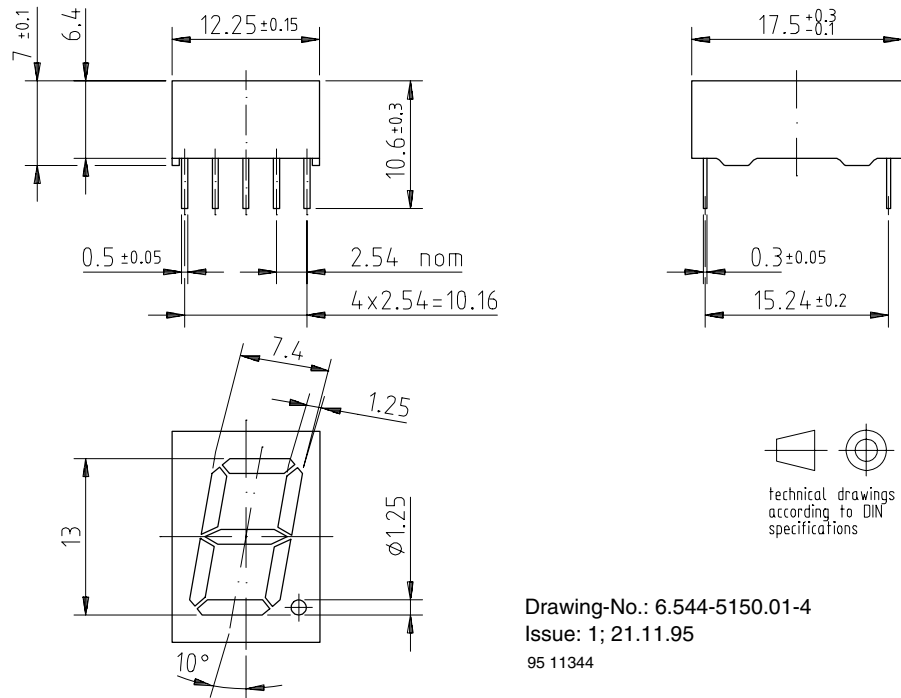




TDSG5150, TDSG5160, TDSO5150, TDSO5160, TDSY5150, TDSY5160

Standard 7-Segment Display 13 mm Vishay Semiconductors

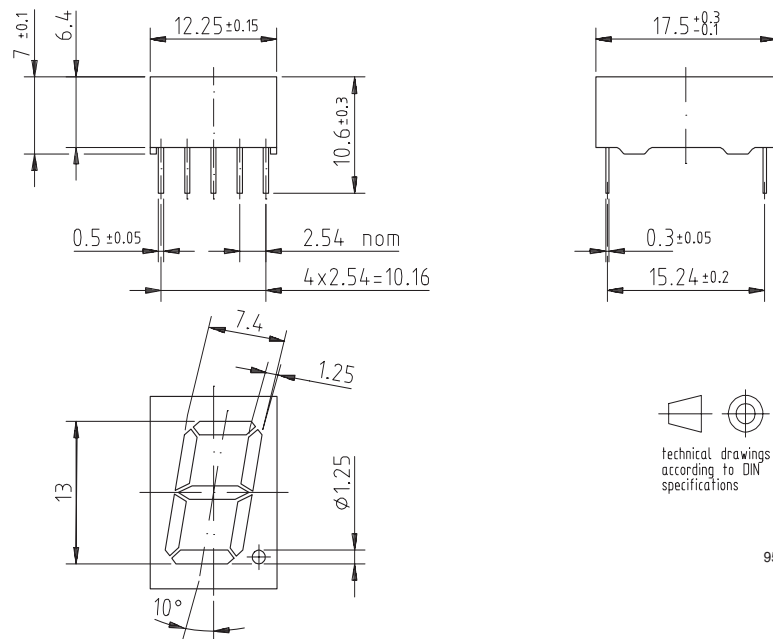
PACKAGE DIMENSIONS FOR TDS.51.. in millimeters



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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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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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.

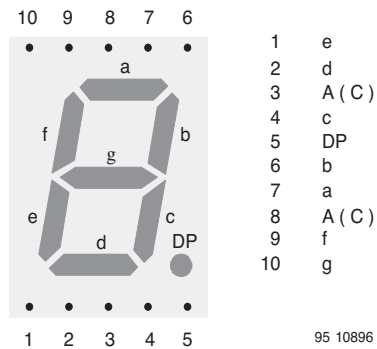
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Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

Pin Connections 13 mm





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