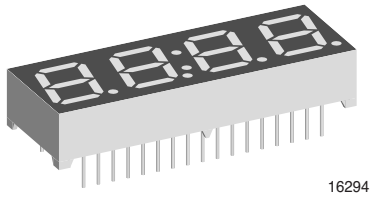
# Clock Display

## Description

Four digit Display, with 10 mm digit charactersize. Designed as clock Display with active colon between digit two and three.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## Features

- High efficient AlInGAP technology
- Dark surface, white segments
- Common anode
  (TDCG1050, TDCR1050, TDCY1050)
- Common cathode
  (TDCG1060, TDCR1060, TDCY1060)
- Recommended viewing distance up to 7 meter
- Lead-free device

## Applications

Clock modules for Video/Audioequipment, Instrumentation, Set Top Boxes

## Parts Table

| Part | Color, Luminous Intensity | Circuitry |
|---|---|---|
| TDCG1050 | Green, $I_V$ = (2.8 to 4.0) mcd | Common anode |
| TDCG1060 | Green, $I_V$ = (2.8 to 4.0) mcd | Common cathode |
| TDCR1050 | Red, $I_V$ = (4.0 to 6.0) mcd | Common anode |
| TDCR1060 | Red, $I_V$ = (4.0 to 6.0) mcd | Common cathode |
| TDCY1050 | Super Yellow, $I_V$ = (4.0 to 6.0) mcd | Common anode |
| TDCY1060 | Super Yellow, $I_V$ = (4.0 to 6.0) mcd | Common cathode |

## Absolute Maximum Ratings

$T_{amb}$ = 25 °C, unless otherwise specified

**TDCG1050/ TDCG1060, TDCR1050/ TDCR1060, TDCY1050/ TDCY1060,**

| Parameter | Test condition | Symbol | Value | Unit |
|---|---|---|---|---|
| Reverse voltage | | $V_R$ | 5 | V |
| Forward current | | $I_F$ | 25 | mA |
| Operating temperature range | | $T_{amb}$ | -40 to + 85 | °C |
| Storage temperature range | | $T_{stg}$ | -40 to + 100 | °C |
| Soldering temperature | | $T_{sd}$ | 260 ± 5 | °C |
| Electrostatic discharge | | ESD | 2000 | V |
| Power dissipation | | $P_V$ | 60 | mW |
| Peak forward current | (Duty 1/10 @ 1kHz) | $I_F$(Peak) | 160 | mA |

## Optical and Electrical Characteristics

$T_{amb}$ = 25 °C, unless otherwise specified

### Red

**TDCR1050/TDCR1060**

| Parameter | Test condition | Part | Symbol | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Luminous intensity per segment [1] | $I_F$ = 2 mA | TDCR1050 | $I_V$ | | 1.5 | | mcd |
| | | TDCR1060 | $I_V$ | | 1.5 | | mcd |
| | $I_F$ = 10 mA | TDCR1050 | $I_V$ | 4.0 | 6.0 | | mcd |
| | | TDCR1060 | $I_V$ | 4.0 | 6.0 | | mcd |
| Luminous intensity of colon | $I_F$ = 2 mA | TDCR1050 | $I_V$ | | 0.4 | | mcd |
| | | TDCR1060 | $I_V$ | | 0.4 | | mcd |
| | $I_F$ = 10 mA | TDCR1050 | $I_V$ | 0.5 | 0.8 | | mcd |
| | | TDCR1060 | $I_V$ | 0.5 | 0.8 | | mcd |
| Dominant wavelength | $I_F$ = 20 mA | | $\lambda_d$ | | 631 | | nm |
| Peak wavelength | $I_F$ = 20 mA | | $\lambda_p$ | | 639 | | nm |
| Spectral bandwidth | $I_F$ = 20 mA | | $\Delta\lambda$ | | 20 | | nm |
| Forward voltage | $I_F$ = 20 mA | | $V_F$ | | 2.0 | 2.4 | V |
| Reverse current | $V_R$ = 5 V | | $I_R$ | | | 10 | µA |

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.

### Yellow

**TDCY1050/TDCY1060**

| Parameter | Test condition | Part | Symbol | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Luminous intensity per segment [1] | $I_F$ = 2 mA | TDCY1050 | $I_V$ | | 1.5 | | mcd |
| | | TDCY1060 | $I_V$ | | 1.5 | | mcd |
| | $I_F$ = 10 mA | TDCY1050 | $I_V$ | 4.0 | 6.0 | | mcd |
| | | TDCY1060 | $I_V$ | 4.0 | 6.0 | | mcd |
| Luminous intensity of colon | $I_F$ = 2 mA | TDCY1050 | $I_V$ | | 0.4 | | mcd |
| | | TDCY1060 | $I_V$ | | 0.4 | | mcd |
| | $I_F$ = 10 mA | TDCY1050 | $I_V$ | 0.5 | 0.8 | | mcd |
| | | TDCY1060 | $I_V$ | 0.5 | 0.8 | | mcd |
| Dominant wavelength | $I_F$ = 20 mA | | $\lambda_d$ | | 589 | | nm |
| Peak wavelength | $I_F$ = 20 mA | | $\lambda_p$ | | 591 | | nm |
| Spectral bandwidth | $I_F$ = 20 mA | | $\Delta\lambda$ | | 15 | | nm |
| Forward voltage | $I_F$ = 20 mA | | $V_F$ | | 2.0 | 2.4 | V |
| Reverse current | $V_R$ = 5 V | | $I_R$ | | | 10 | µA |

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.

## Green

**TDCG1050/TDCG1060**

| Parameter | Test condition | Part | Symbol | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Luminous intensity per segment [1)] | $I_F$ = 2 mA | TDCG1050 | $I_V$ | | 1.0 | | mcd |
| | | TDCG1060 | $I_V$ | | 1.0 | | mcd |
| | $I_F$ = 10 mA | TDCG1050 | $I_V$ | 2.8 | 4.0 | | mcd |
| | | TDCG1060 | $I_V$ | 2.8 | 4.0 | | mcd |
| Luminous intensity of colon | $I_F$ = 2 mA | TDCG1050 | $I_V$ | | 0.2 | | mcd |
| | | TDCG1060 | $I_V$ | | 0.2 | | mcd |
| | $I_F$ = 10 mA | TDCG1050 | $I_V$ | 0.5 | 1.2 | | mcd |
| | | TDCG1060 | $I_V$ | 0.5 | 1.2 | | mcd |
| Dominant wavelength | $I_F$ = 20 mA | | $\lambda_d$ | | 573 | | nm |
| Peak wavelength | $I_F$ = 20 mA | | $\lambda_p$ | | 575 | | nm |
| Spectral bandwidth | $I_F$ = 20 mA | | $\Delta\lambda$ | | 20 | | nm |
| Forward voltage | $I_F$ = 20 mA | | $V_F$ | | 2.0 | 2.4 | V |
| Reverse current | $V_R$ = 5 V | | $I_R$ | | | 10 | µA |

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.

## Typical Characteristics ($T_{amb}$ = 25 °C unless otherwise specified)

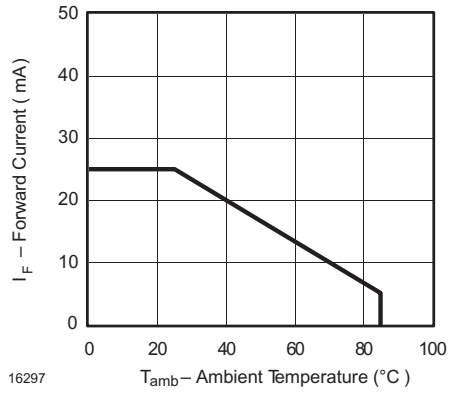



Figure 1. Forward Current vs. Ambient Temperature

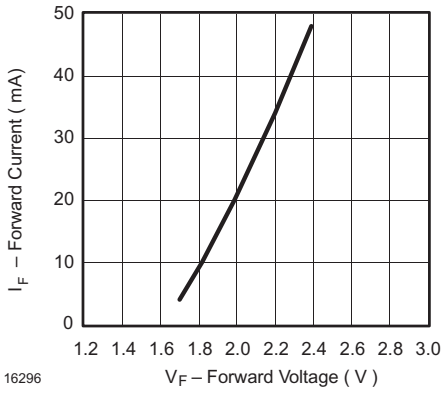



Figure 2. Forward Current vs. Forward Voltage

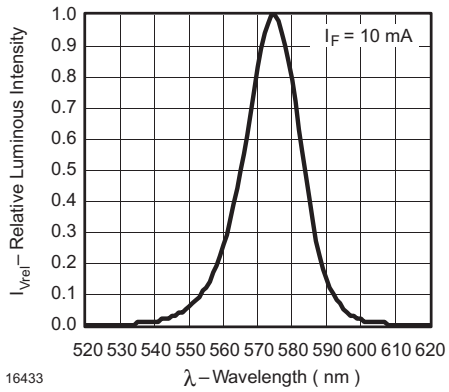



Figure 3. Relative Intensity vs. Wavelength

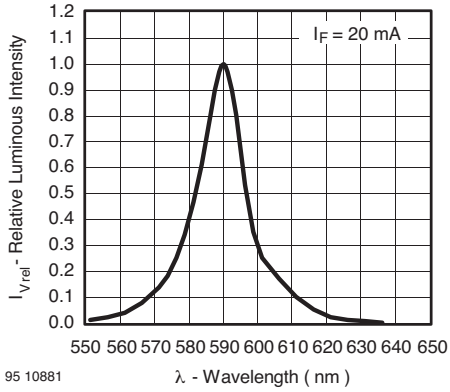



Figure 4. Relative Intensity vs. Wavelength

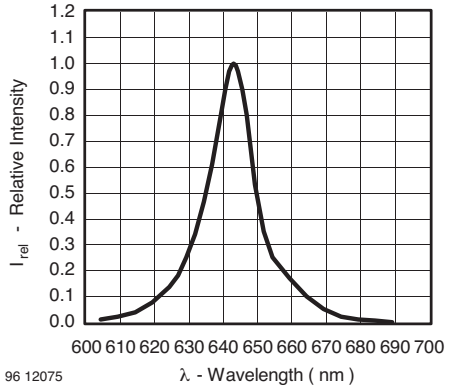
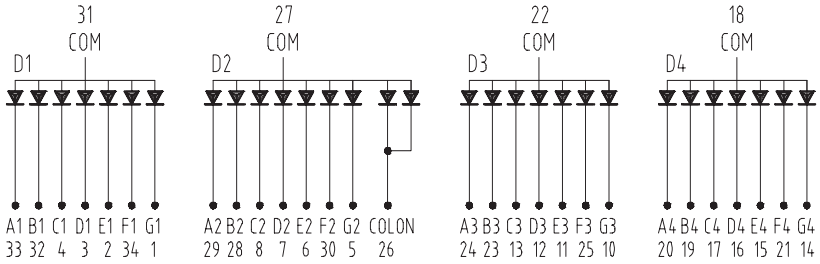
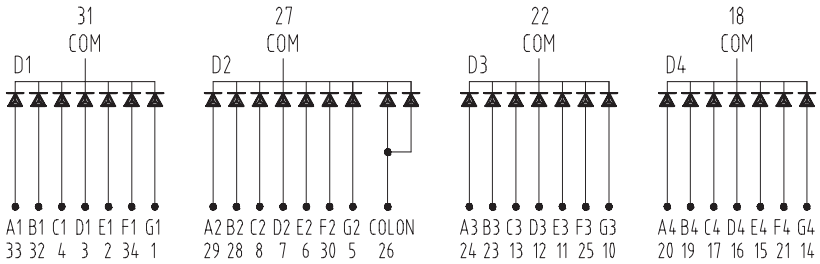



Figure 5. Relative Intensity vs. Wavelength




Common Anode

1 Cathode D1 G
2 Cathode D1 E
3 Cathode D1 D
4 Cathode D1 C
5 Cathode D2 G
6 Cathode D2 E
7 Cathode D2 D
8 Cathode D2 C
9 no Pin
10 Cathode D3 G
11 Cathode D3 E
12 Cathode D3 D
13 Cathode D3 C
14 Cathode D4 G
15 Cathode D4 E
16 Cathode D4 D
17 Cathode D4 C
18 Common Anode D4
19 Cathode D4 B
20 Cathode D4 A
21 Cathode D4 F
22 Common Anode D3
23 Cathode D3 B
24 Cathode D3 A
25 Cathode D3 F
26 Cathode D2 Colon
27 Common Anode D2
28 Cathode D2 B
29 Cathode D2 A
30 Cathode D2 F
31 Common Anode D1
32 Cathode D1 B
33 Cathode D1 A
34 Cathode D1 F




Common Cathode

1 Anode D1 G
2 Anode D1 E
3 Anode D1 D
4 Anode D1 C
5 Anode D2 G
6 Anode D2 E
7 Anode D2 D
8 Anode D2 C
9 no Pin
10 Anode D3 G
11 Anode D3 E
12 Anode D3 D
13 Anode D3 C
14 Anode D4 G
15 Anode D4 E
16 Anode D4 D
17 Anode D4 C
18 Common Cathode D4
19 Anode D4 B
20 Anode D4 A
21 Anode D4 F
22 Common Cathode D3
23 Anode D3 B
24 Anode D3 A
25 Anode D3 F
26 Anode D2 Colon
27 Common Cathode D2
28 Anode D2 B
29 Anode D2 A
30 Anode D2 F
31 Common Cathode D1
32 Anode D1 B
33 Anode D1 A
34 Anode D1 F

Drawing-No.: 6.544-5334.01-4 Bl. 2
Issue: 1; 20.02.02

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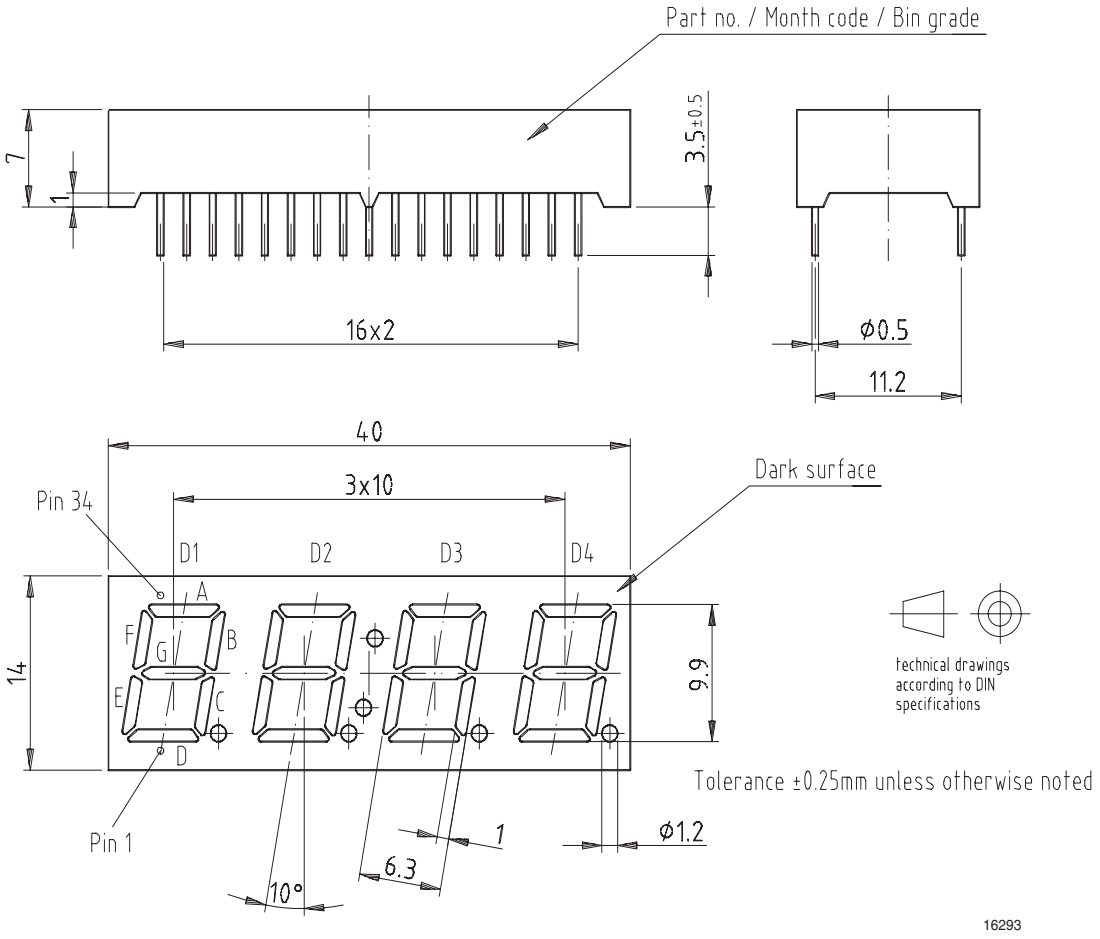
## Package Dimensions in mm




Drawing-No.: 6.544-5334.01-4 Bl. 1
Issue: 4; 27.02.02

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2. Regularly and continuously improve the performance of our products, processes, distribution and operatingsystems 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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**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.



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

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