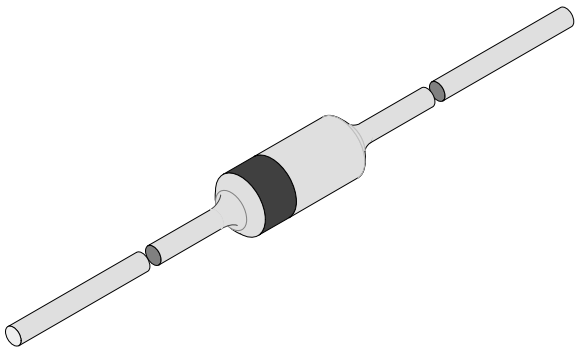
# Silicon Epitaxial Planar Z–Diodes

## Features

- Very sharp reverse characteristic
- Low reverse current level
- Low noise
- Very high stability
- Available with tighter tolerances
- $V_Z$–tolerance ± 2%



94 9367

## Applications

Voltage stabilization

## Absolute Maximum Ratings

$T_j$ = 25°C

| Parameter | Test Conditions | Type | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Power dissipation | l=4mm, $T_L$=25˚C | | $P_V$ | 500 | mW |
| Z–current | | | $I_Z$ | $P_V/V_Z$ | mA |
| Junction temperature | | | $T_j$ | 175 | ˚C |
| Storage temperature range | | | $T_{stg}$ | –65...+175 | ˚C |

## Maximum Thermal Resistance

$T_j$ = 25°C

| Parameter | Test Conditions | Symbol | Value | Unit |
|---|---|---|---|---|
| Junction ambient | l=4mm, $T_L$=constant | $R_{thJA}$ | 300 | K/W |

## Characteristics

$T_j$ = 25°C

| Parameter | Test Conditions | Type | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Forward voltage | $I_F$=100mA | | $V_F$ | | | 1 | V |

| Type | $V_{Znorm}$ | $I_{ZT}$ for | $V_{ZT}$ and $r_{zjT}$ | | $r_{zjk}$ at $I_{ZK}$ | | $I_R$ and $I_R$ 2) at $V_R$ | | | $TK_{VZ}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| BZX55/B... | V | mA | V | Ω | Ω | mA | µA | µA | V | %/K |
| 2V4 | 2.4 | 5 | 2.35 to 2.45 | < 85 | < 600 | 1 | < 50 | < 100 | 1 | –0.09 to –0.06 |
| 2V7 | 2.7 | 5 | 2.64 to 2.76 | < 85 | < 600 | 1 | < 10 | < 50 | 1 | –0.09 to –0.06 |
| 3V0 | 3.0 | 5 | 2.94 to 3.06 | < 90 | < 600 | 1 | < 4 | < 40 | 1 | –0.08 to –0.05 |
| 3V3 | 3.3 | 5 | 3.24 to 3.36 | < 90 | < 600 | 1 | < 2 | < 40 | 1 | –0.08 to –0.05 |
| 3V6 | 3.6 | 5 | 3.52 to 3.68 | < 90 | < 600 | 1 | < 2 | < 40 | 1 | –0.08 to –0.05 |
| 3V9 | 3.9 | 5 | 3.82 to 3.98 | < 90 | < 600 | 1 | < 2 | < 40 | 1 | –0.08 to –0.05 |
| 4V3 | 4.3 | 5 | 4.22 to 4.38 | < 90 | < 600 | 1 | < 1 | < 20 | 1 | –0.06 to –0.03 |
| 4V7 | 4.7 | 5 | 4.60 to 4.80 | < 80 | < 600 | 1 | < 0.5 | < 10 | 1 | –0.05 to +0.02 |
| 5V1 | 5.1 | 5 | 5.00 to 5.20 | < 60 | < 550 | 1 | < 0.1 | < 2 | 1 | –0.02 to +0.02 |
| 5V6 | 5.6 | 5 | 5.48 to 5.72 | < 40 | < 450 | 1 | < 0.1 | < 2 | 1 | –0.05 to +0.05 |
| 6V2 | 6.2 | 5 | 6.08 to 6.32 | < 10 | < 200 | 1 | < 0.1 | < 2 | 2 | 0.03 to 0.06 |
| 6V8 | 6.8 | 5 | 6.66 to 6.94 | < 8 | < 150 | 1 | < 0.1 | < 2 | 3 | 0.03 to 0.07 |
| 7V5 | 7.5 | 5 | 7.35 to 7.65 | < 7 | < 50 | 1 | < 0.1 | < 2 | 5 | 0.03 to 0.07 |
| 8V2 | 8.2 | 5 | 8.04 to 8.36 | < 7 | < 50 | 1 | < 0.1 | < 2 | 6.2 | 0.03 to 0.08 |
| 9V1 | 9.1 | 5 | 8.92 to 9.28 | < 10 | < 50 | 1 | < 0.1 | < 2 | 6.8 | 0.03 to 0.09 |
| 10 | 10 | 5 | 9.80 to 10.20 | < 15 | < 70 | 1 | < 0.1 | < 2 | 7.5 | 0.03 to 0.1 |
| 11 | 11 | 5 | 10.78 to 11.22 | < 20 | < 70 | 1 | < 0.1 | < 2 | 8.2 | 0.03 to 0.11 |
| 12 | 12 | 5 | 11.76 to 12.24 | < 20 | < 90 | 1 | < 0.1 | < 2 | 9.1 | 0.03 to 0.11 |
| 13 | 13 | 5 | 12.74 to 13.26 | < 26 | < 110 | 1 | < 0.1 | < 2 | 10 | 0.03 to 0.11 |
| 15 | 15 | 5 | 14.70 to 15.30 | < 30 | < 110 | 1 | < 0.1 | < 2 | 11 | 0.03 to 0.11 |
| 16 | 16 | 5 | 15.70 to 16.30 | < 40 | < 170 | 1 | < 0.1 | < 2 | 12 | 0.03 to 0.11 |
| 18 | 18 | 5 | 17.64 to 18.36 | < 50 | < 170 | 1 | < 0.1 | < 2 | 13 | 0.03 to 0.11 |
| 20 | 20 | 5 | 19.60 to 20.40 | < 55 | < 220 | 1 | < 0.1 | < 2 | 15 | 0.03 to 0.11 |
| 22 | 22 | 5 | 21.55 to 22.45 | < 55 | < 220 | 1 | < 0.1 | < 2 | 16 | 0.04 to 0.12 |
| 24 | 24 | 5 | 23.5 to 24.5 | < 80 | < 220 | 1 | < 0.1 | < 2 | 18 | 0.04 to 0,12 |
| 27 | 27 | 5 | 26.4 to 27.6 | < 80 | < 220 | 1 | < 0.1 | < 2 | 20 | 0.04 to 0.12 |
| 30 | 30 | 5 | 29.4 to 30.6 | < 80 | < 220 | 1 | < 0.1 | < 2 | 22 | 0.04 to 0.12 |
| 33 | 33 | 5 | 32.4 to 33.6 | < 80 | < 220 | 1 | < 0.1 | < 2 | 24 | 0.04 to 0.12 |
| 36 | 36 | 5 | 35.3 to 36.7 | < 80 | < 220 | 1 | < 0.1 | < 2 | 27 | 0.04 to 0.12 |
| 39 | 39 | 2.5 | 38.2 to 39.8 | < 90 | < 500 | 0.5 | < 0.1 | < 5 | 30 | 0.04 to 0.12 |
| 43 | 43 | 2.5 | 42.1 to 43.9 | < 90 | < 600 | 0.5 | < 0.1 | < 5 | 33 | 0.04 to 0.12 |
| 47 | 47 | 2.5 | 46.1 to 47.9 | < 110 | < 700 | 0.5 | < 0.1 | < 5 | 36 | 0.04 to 0.12 |
| 51 | 51 | 2.5 | 50.0 to 52.0 | < 125 | < 700 | 0.5 | < 0.1 | < 10 | 39 | 0.04 to 0.12 |
| 56 | 56 | 2.5 | 54.9 to 57.1 | < 135 | < 1000 | 0.5 | < 0.1 | < 10 | 43 | 0.04 to 0.12 |
| 62 | 62 | 2.5 | 60.8 to 63.2 | < 150 | < 1000 | 0.5 | < 0.1 | < 10 | 47 | 0.04 to 0.12 |
| 68 | 68 | 2.5 | 66.6 to 69.4 | < 200 | < 1000 | 0.5 | < 0.1 | < 10 | 51 | 0.04 to 0.12 |
| 75 | 75 | 2.5 | 73.5 to 76.5 | < 250 | < 1500 | 0.5 | < 0.1 | < 10 | 56 | 0.04 to 0.12 |

## Typical Characteristics ($T_j$ = 25°C unless otherwise specified)

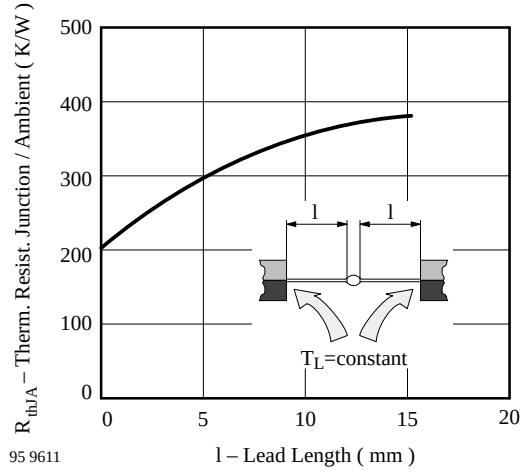



Figure 1. Thermal Resistance vs. Lead Length

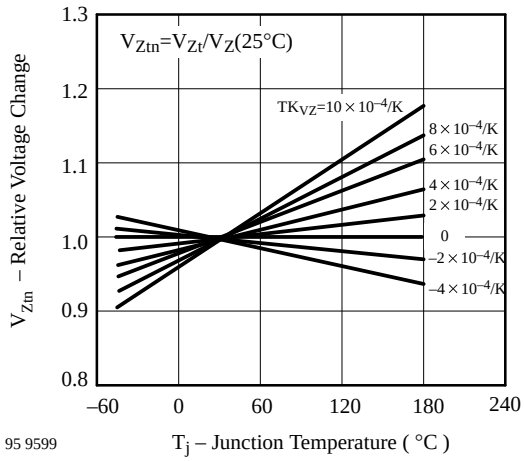



Figure 4. Typical Change of Working Voltage vs. Junction Temperature

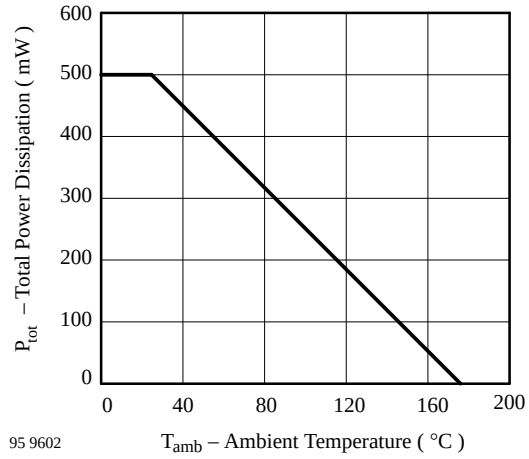



Figure 2. Total Power Dissipation vs. Ambient Temperature

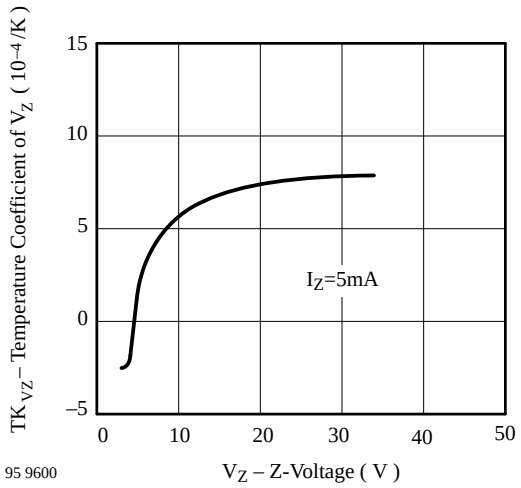



Figure 5. Temperature Coefficient of Vz vs. Z–Voltage

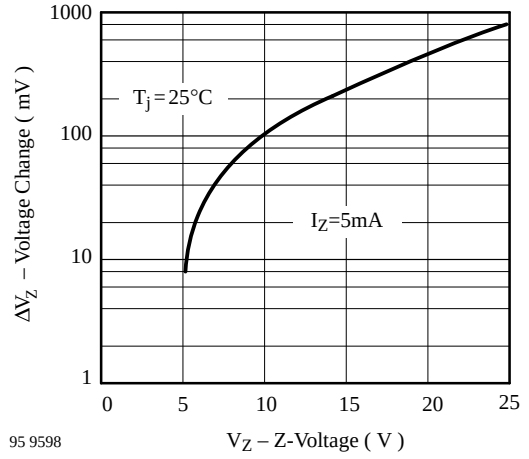



Figure 3. Typical Change of Working Voltage under Operating Conditions at $T_{amb}$=25˚C

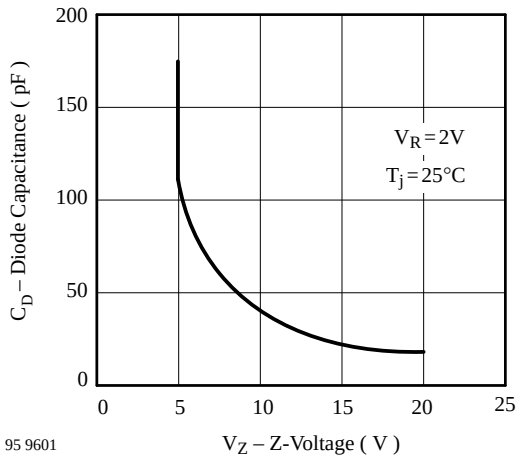



Figure 6. Diode Capacitance vs. Z–Voltage

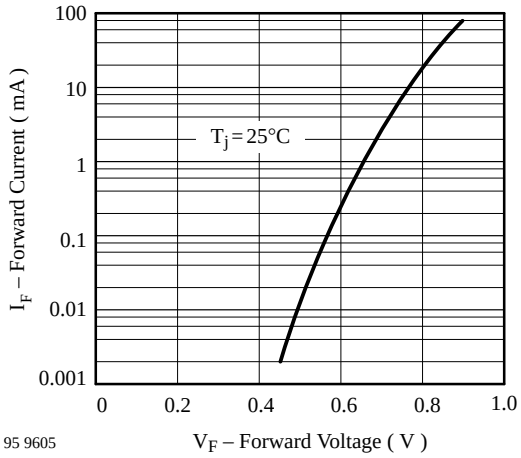



Figure 7. Forward Current vs. Forward Voltage

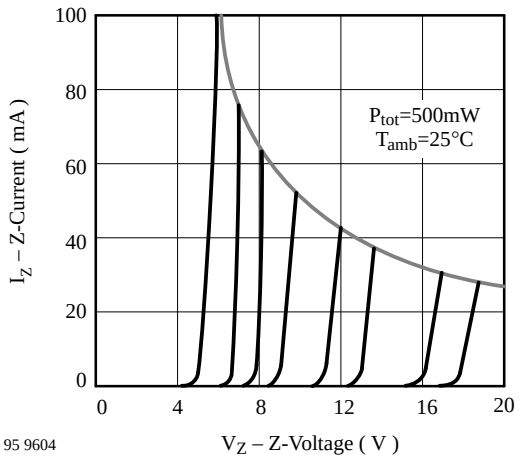



Figure 8. Z–Current vs. Z–Voltage

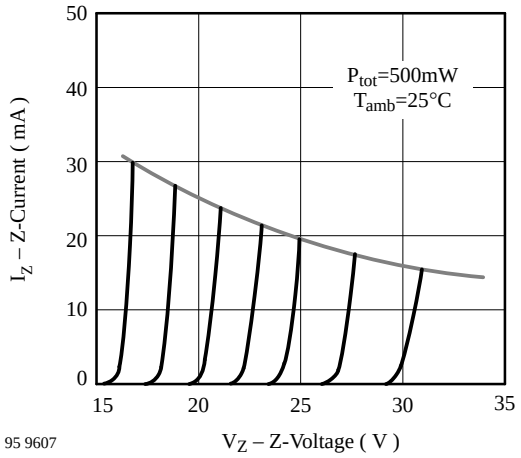



Figure 9. Z–Current vs. Z–Voltage

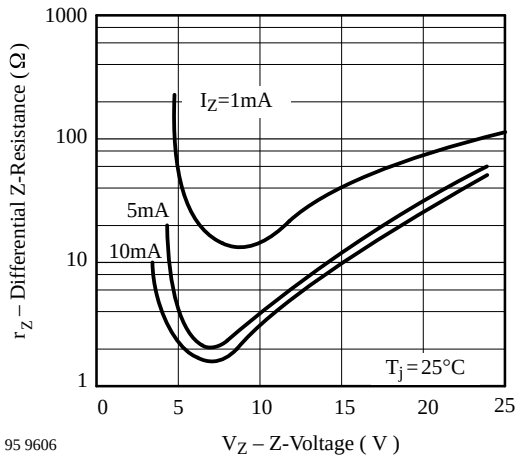



Figure 10. Differential Z–Resistance vs. Z–Voltage

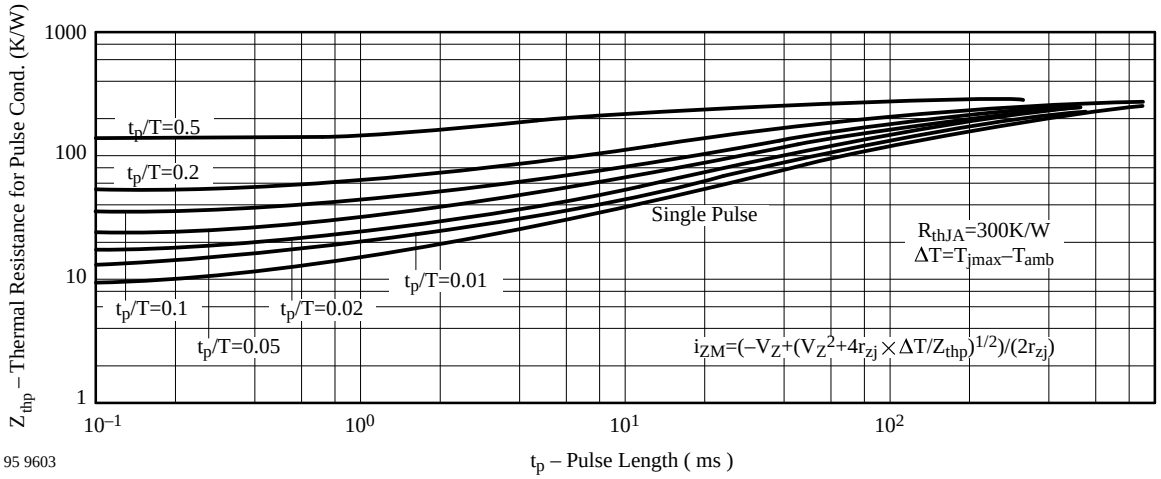


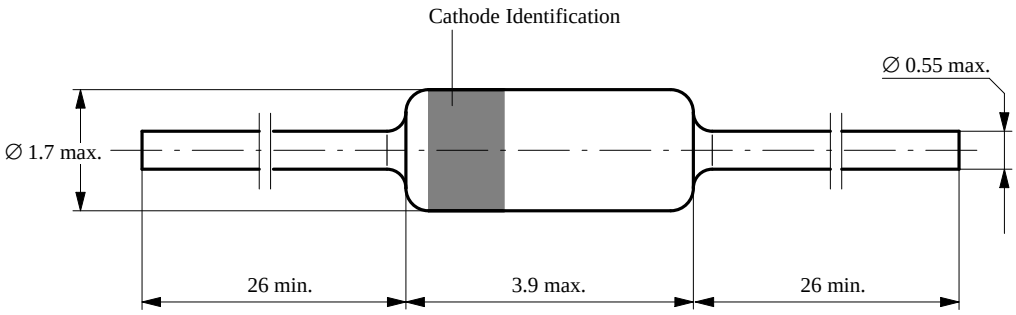

Figure 11. Thermal Response

## Dimensions in mm

technical drawings
according to DIN
specifications

94 9366

Standard Glass Case
54 A 2 DIN 41880
JEDEC DO 35
Weight max. 0.3 g



## Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic 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.

**TEMIC TELEFUNKEN microelectronic GmbH** semiconductor division 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.

**TEMIC** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.



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