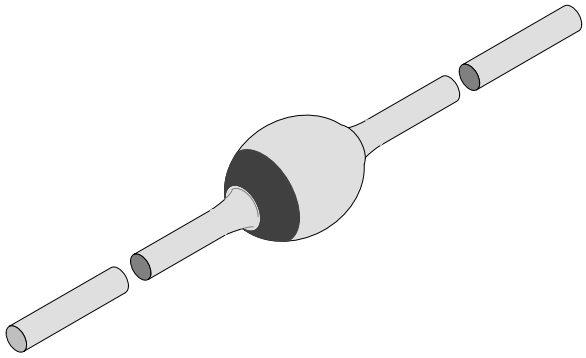
# Silicon Z–Diodes

## Features

- Glass passivated junction
- Hermetically sealed package
- Clamping time in picoseconds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## Applications

Medium power voltage regulators and medium power transient suppression circuits

## Absolute Maximum Ratings

$T_j$ = 25°C

| Parameter | Test Conditions | Type | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Power dissipation | l=10mm, $T_L$=25˚C | | $P_V$ | 3.25 | W |
| | $T_{amb}$=25˚C | | $P_V$ | 1.3 | W |
| Repetitive peak reverse power dissipation | | | $P_{ZRM}$ | 10 | W |
| Non repetitive peak surge power dissipation | $t_p$=100µs, $T_j$=25˚C | | $P_{ZSM}$ | 600 | W |
| 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=10mm, $T_L$=constant | $R_{thJA}$ | 46 | K/W |
| | on PC board with spacing 25mm | $R_{thJA}$ | 100 | K/W |

## Characteristics

$T_j$ = 25°C

| Parameter | Test Conditions | Type | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Forward voltage | $I_F$=0.5A | | $V_F$ | | | 1.2 | V |

## Characteristics when used as voltage regultor diodes, $T_j$ = 25°C

| Type | $V_Z$ | | | $r_{zj}$ and | | $TK_{UZ}$ at | | $I_Z$ | $I_R$ at | $V_R$ |
|---|---|---|---|---|---|---|---|---|---|---|
| BZT03D... | V | | | Ω | | %/K | | mA | µA | |
| | Min. | Typ. | Max. | Typ. | Max. | Min. | Max. | | Max. | |
| 6V2 | 5.6 | 6.2 | 6.8 | 1 | 2 | 0 | 0.07 | 100 | 1500 | 4.4 |
| 6V8 | 6.1 | 6.8 | 7.5 | 1 | 2 | 0 | 0.07 | 100 | 1000 | 4.8 |
| 7V5 | 6.75 | 7.5 | 8.25 | 1 | 2 | 0 | 0.07 | 100 | 750 | 5.3 |
| 8V2 | 7.4 | 8.2 | 9.0 | 1 | 2 | 0.03 | 0.08 | 100 | 600 | 5.9 |
| 9V1 | 8.2 | 9.1 | 10.0 | 2 | 4 | 0.03 | 0.08 | 50 | 20 | 6.5 |
| 10 | 9.0 | 10 | 11.0 | 2 | 4 | 0.05 | 0.09 | 50 | 10 | 7.1 |
| 11 | 9.9 | 11 | 12.1 | 4 | 7 | 0.05 | 0.10 | 50 | 4 | 7.9 |
| 12 | 10.8 | 12 | 13.2 | 4 | 7 | 0.05 | 0.10 | 50 | 3 | 8.6 |
| 13 | 11.7 | 13 | 14.3 | 5 | 10 | 0.05 | 0.10 | 50 | 2 | 9.3 |
| 15 | 13.5 | 15 | 16.5 | 5 | 10 | 0.05 | 0.10 | 50 | 1 | 10.6 |
| 16 | 14.4 | 16 | 17.6 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 11.6 |
| 18 | 16.2 | 18 | 19.8 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 12.6 |
| 20 | 18.0 | 20 | 22.0 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 14.4 |
| 22 | 29.8 | 22 | 24.2 | 6 | 15 | 0.06 | 0.11 | 25 | 1 | 15.8 |
| 24 | 21.6 | 24 | 26.4 | 7 | 15 | 0.06 | 0.11 | 25 | 1 | 17.2 |
| 27 | 24.3 | 27 | 29.7 | 7 | 15 | 0.06 | 0.11 | 25 | 1 | 19.4 |
| 30 | 27 | 30 | 33 | 8 | 15 | 0.06 | 0.11 | 25 | 1 | 21.5 |
| 33 | 29.7 | 33 | 36.3 | 8 | 15 | 0.06 | 0.11 | 25 | 1 | 23.5 |
| 36 | 32.4 | 36 | 39.6 | 21 | 40 | 0.06 | 0.11 | 10 | 1 | 25.8 |
| 39 | 35.1 | 39 | 42.9 | 21 | 40 | 0.06 | 0.11 | 10 | 1 | 28 |
| 43 | 38.7 | 43 | 47.3 | 24 | 45 | 0.07 | 0.12 | 10 | 1 | 31 |
| 47 | 42.3 | 47 | 51.7 | 24 | 45 | 0.07 | 0.12 | 10 | 1 | 33.5 |
| 51 | 45.9 | 51 | 56.1 | 25 | 60 | 0.07 | 0.12 | 10 | 1 | 36.5 |
| 56 | 50.4 | 56 | 61.6 | 25 | 60 | 0.07 | 0.12 | 10 | 1 | 40 |
| 62 | 55.8 | 62 | 68.2 | 25 | 80 | 0.08 | 0.13 | 10 | 1 | 44.5 |
| 68 | 61.2 | 68 | 74.8 | 25 | 80 | 0.08 | 0.13 | 10 | 1 | 49 |
| 75 | 67.5 | 75 | 82.5 | 30 | 100 | 0.08 | 0.13 | 10 | 1 | 54 |
| 82 | 73.8 | 82 | 90.2 | 30 | 100 | 0.08 | 0.13 | 10 | 1 | 59 |
| 91 | 81.9 | 91 | 100 | 60 | 200 | 0.09 | 0.13 | 5 | 1 | 65 |
| 100 | 90 | 100 | 110 | 60 | 200 | 0.09 | 0.13 | 5 | 1 | 71 |
| 110 | 99 | 110 | 121 | 80 | 250 | 0.09 | 0.13 | 5 | 1 | 79 |
| 120 | 108 | 120 | 132 | 80 | 250 | 0.09 | 0.13 | 5 | 1 | 86 |
| 130 | 117 | 130 | 143 | 110 | 300 | 0.09 | 0.13 | 5 | 1 | 93 |
| 150 | 135 | 150 | 165 | 130 | 300 | 0.09 | 0.13 | 5 | 1 | 106 |

## Characteristics when used as transient suppressor diodes, $T_j$ = 25°C

| Type BZT03D... | $V_Z$ V | | | $r_{zj}$ and $TK_{UZ}$ at $I_Z$ Ω %/K mA | | | | | $I_R$ at $V_R$ µA | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Typ. | Max. | Min. | Max. | | Max. | |
| 160 | 144 | 160 | 176 | 150 | 350 | 0.09 | 0.13 | 5 | 1 | 116 |
| 180 | 162 | 180 | 198 | 180 | 400 | 0.09 | 0.13 | 5 | 1 | 126 |
| 200 | 180 | 200 | 220 | 200 | 500 | 0.09 | 0.13 | 5 | 1 | 144 |
| 220 | 198 | 220 | 242 | 350 | 750 | 0.09 | 0.13 | 2 | 1 | 158 |
| 240 | 216 | 240 | 264 | 400 | 850 | 0.09 | 0.13 | 2 | 1 | 172 |
| 270 | 243 | 270 | 297 | 450 | 1000 | 0.09 | 0.13 | 2 | 1 | 194 |

## Characteristics when used as transient suppressor diodes, $T_j$ = 25°C

| Type | Clamping | | Stand-off | |
|---|---|---|---|---|
| | $V_{(CL)R}$ [1] at | $I_{RSM}$ | $I_R$ at | $V_R$ [2] |
| BZT03D... | V | A | µA | V |
| | Max. | | Max. | |
| 6V2 | 9.5 | 34.0 | 3000 | 4.8 |
| 6V8 | 10.5 | 31.0 | 2000 | 5.3 |
| 7V5 | 11.6 | 26.5 | 1500 | 5.9 |
| 8V2 | 12.6 | 24.4 | 1200 | 6.5 |
| 9V1 | 13.7 | 22.7 | 50 | 7.1 |
| 10 | 15.2 | 20.3 | 20 | 7.9 |
| 11 | 16.2 | 19.1 | 5 | 8.6 |
| 12 | 17.5 | 17.7 | 5 | 9.3 |
| 13 | 19.1 | 15.9 | 5 | 10.6 |
| 15 | 21.8 | 14.4 | 5 | 11.6 |
| 16 | 23.4 | 13.1 | 5 | 12.6 |
| 18 | 26.3 | 11.7 | 5 | 14.4 |
| 20 | 29.2 | 10.6 | 5 | 15.8 |
| 22 | 31.9 | 9.7 | 5 | 17.2 |
| 24 | 34.6 | 8.9 | 5 | 19.4 |
| 27 | 39 | 7.9 | 5 | 21.5 |
| 30 | 43.5 | 7.1 | 5 | 23.5 |
| 33 | 47.5 | 6.5 | 5 | 25.8 |
| 36 | 51.5 | 6.0 | 5 | 28 |
| 39 | 56 | 5.5 | 5 | 31 |
| 43 | 62 | 4.9 | 5 | 33.5 |
| 47 | 67.5 | 4.6 | 5 | 36.5 |
| 51 | 73 | 4.2 | 5 | 40 |
| 56 | 81 | 3.8 | 5 | 44.5 |
| 62 | 89 | 3.5 | 5 | 49 |
| 68 | 97 | 3.2 | 5 | 54 |
| 75 | 107 | 2.9 | 5 | 59 |
| 82 | 117 | 2.6 | 5 | 65 |
| 91 | 130 | 2.4 | 5 | 71 |
| 100 | 143 | 2.2 | 5 | 79 |
| 110 | 157 | 2.0 | 5 | 86 |
| 120 | 172 | 1.8 | 5 | 93 |
| 130 | 187 | 1.6 | 5 | 106 |
| 150 | 213 | 1.5 | 5 | 116 |
| 160 | 229 | 1.3 | 5 | 126 |

| Type | Clamping | | Stand-off | |
|---|---|---|---|---|
| BZT03D... | $V_{(CL)R}$ [1] at $I_{RSM}$ | | $I_R$ at $V_R$ [2] | |
| | V | A | µA | V |
| | Max. | | Max. | |
| 180 | 256 | 1.2 | 5 | 144 |
| 200 | 284 | 1.1 | 5 | 158 |
| 220 | 314 | 1.0 | 5 | 172 |
| 240 | 364 | 0.9 | 5 | 194 |
| 270 | 388 | 0.8 | 5 | 215 |

[1] 10/1000 exp. falling pulse $t_p$ = 1000 µs down to 50%  [2] Stand-off voltage = recommended supply voltage

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

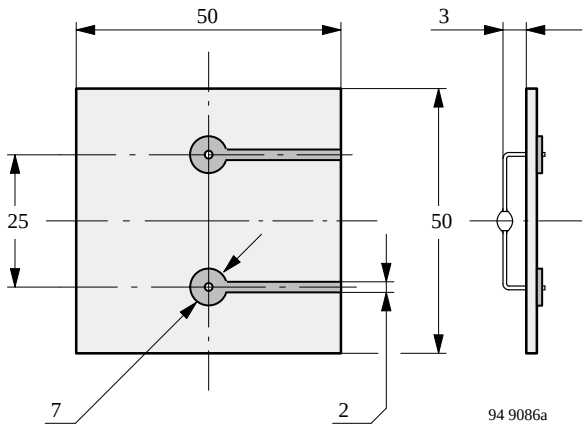



**Figure 1 : Epoxy glass hard tissue, board thickness 1.5 mm, $R_{thJA} \leqq 100$ K/W**

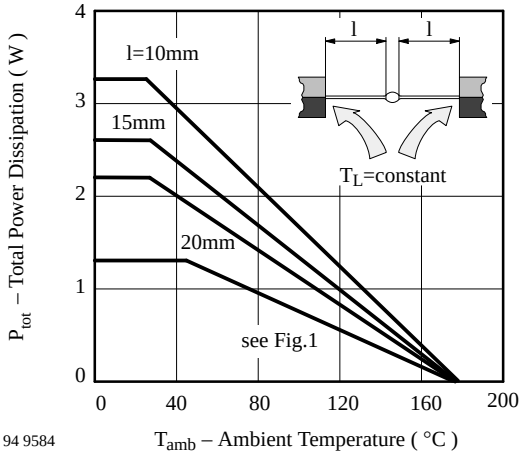



**Figure 2 : Total Power Dissipation vs. Ambient Temperature**

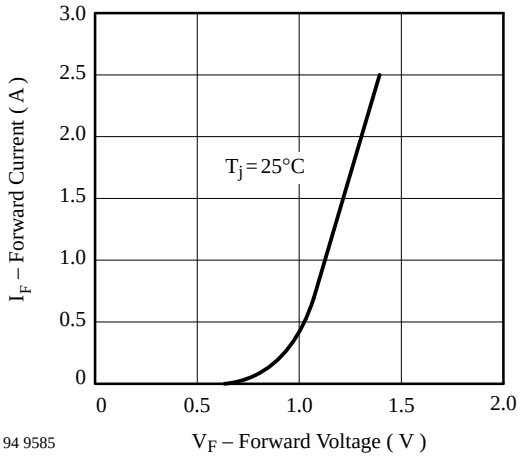



**Figure 3 : Forward Current vs. Forward Voltage**

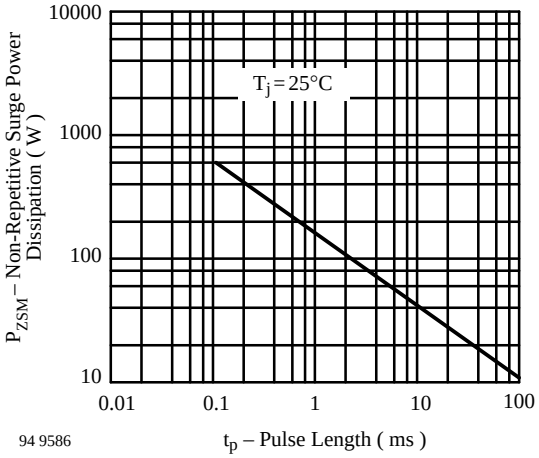
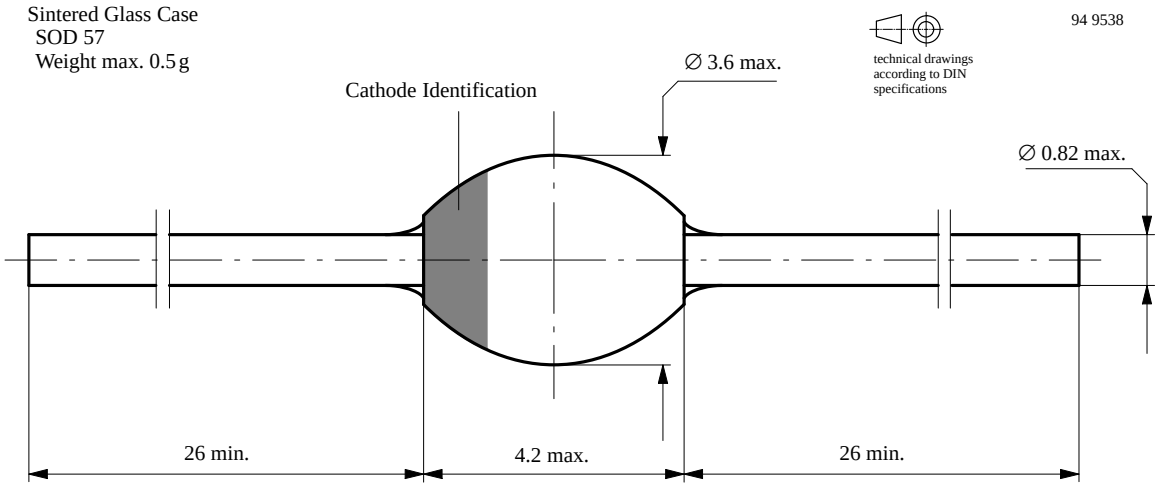



**Figure 4 : Non Repetitive Surge Power Dissipation vs. Pulse Length**

## Dimensions in mm



# 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 and

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.

Of particular concern is the control or elimination of releases into the atmosphere of those substances which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) will soon 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 any 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 and

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 and do not contain ozone depleting substances.



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