



# DZD2.0 to 24

Silicon Planar Type

## 0.2W Zener Diodes

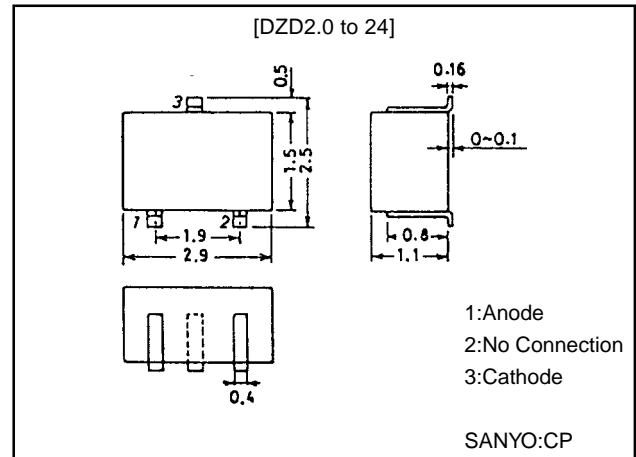
### Features

- Reference voltage use.
- Voltage regulators use.
- Power dissipation : P=200mW.
- Voltage range :  $\pm 2.5\%$  subdivided.
- High reliability due to planar type.
- Ideally suited for use in hybrid ICs because of ultra small package.

### Package Dimensions

unit:mm

1148A



### Specifications

#### Absolute Maximum Ratings at Ta = 25°C

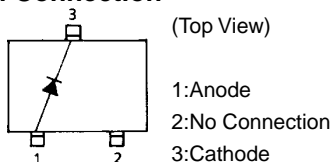
| Parameter            | Symbol | Conditions | Ratings     | Unit |
|----------------------|--------|------------|-------------|------|
| Power Dissipation    | P      |            | 200         | mW   |
| Junction Temperature | Tj     |            | 150         | °C   |
| Storage Temperature  | Tstg   |            | -55 to +150 | °C   |

#### Electrical Characteristics at Ta = 25°C

Zener voltage VZ will be subdivided into X, Y, Z at your request.

| Type No. | Zener Characteristics             |      |              |      |      |   |     |              | Reverse Current |                             |
|----------|-----------------------------------|------|--------------|------|------|---|-----|--------------|-----------------|-----------------------------|
|          | Zener Voltage V <sub>Z</sub> [V]* |      |              |      |      | Dynamic Resistance r <sub>d</sub> [Ω]<br>f=1kHz |     | Test Current | I <sub>R</sub>  | Test Voltage V <sub>R</sub> |
|          | min                               | max  | Sub-division | min  | max  | typ   | max | [mA]         |                 |                             |
| DZD2.0   | 1.85                              | 2.15 | X            | 1.85 | 2.05 | 60  | 100 | 5            | 120             | 1.0                         |
|          |                                   |      | Z            | 1.95 | 2.15 | 60  | 100 | 5            |                 |                             |
| DZD2.2   | 2.05                              | 2.38 | X            | 2.05 | 2.26 | 65  | 100 | 5            | 120             | 1.0                         |
|          |                                   |      | Z            | 2.16 | 2.38 | 65  | 100 | 5            |                 |                             |
| DZD2.4   | 2.28                              | 2.60 | X            | 2.28 | 2.50 | 70  | 100 | 5            | 120             | 1.0                         |
|          |                                   |      | Z            | 2.40 | 2.60 | 70  | 100 | 5            |                 |                             |
| DZD2.7   | 2.50                              | 2.90 | X            | 2.50 | 2.75 | 80  | 110 | 5            | 120             | 1.0                         |
|          |                                   |      | Z            | 2.65 | 2.90 | 80  | 110 | 5            |                 |                             |
| DZD3.0   | 2.80                              | 3.20 | X            | 2.80 | 3.05 | 85  | 120 | 5            | 50              | 1.0                         |
|          |                                   |      | Z            | 2.95 | 3.20 | 85  | 120 | 5            |                 |                             |
| DZD3.3   | 3.10                              | 3.50 | X            | 3.10 | 3.35 | 90  | 130 | 5            | 20              | 1.0                         |
|          |                                   |      | Z            | 3.25 | 3.50 | 90  | 130 | 5            |                 |                             |

#### Electrical Connection



Continued on next page.

\* : t=30ms

## DZD2.0 to 24

Continued from preceding page.

### Electrical Characteristics at Ta = 25°C

Zener voltage VZ will be subdivided into X, Y, Z at your request.

| Type No. | Zener Characteristics             |       |                  |       |       |  |     | Reverse Current |                |                                   |
|----------|-----------------------------------|-------|------------------|-------|-------|--|-----|-----------------|----------------|-----------------------------------|
|          | Zener Voltage V <sub>Z</sub> [V]* |       |                  |       |       | Dynamic Resistance<br>r <sub>d</sub> [Ω]<br>f=1kHz |     | Test<br>Current | I <sub>R</sub> | Test<br>Voltage<br>V <sub>R</sub> |
|          | min                               | max   | Sub-<br>division | min   | max   | typ  | max |                 |                |                                   |
|          |                                   |       |                  |       |       |  |     | [mA]            | [μA]           | [V]                               |
| DZD3.6   | 3.40                              | 3.80  | X                | 3.40  | 3.65  | 90   | 130 | 5               | 10             | 1.0                               |
|          |                                   |       | Z                | 3.55  | 3.80  | 90   | 130 | 5               | 10             | 1.0                               |
| DZD3.9   | 3.70                              | 4.10  | X                | 3.70  | 3.97  | 85   | 130 | 5               | 10             | 1.0                               |
|          |                                   |       | Z                | 3.87  | 4.10  | 85   | 130 | 5               | 10             | 1.0                               |
| DZD4.3   | 4.00                              | 4.50  | X                | 4.00  | 4.23  | 80   | 130 | 5               | 5              | 1.0                               |
|          |                                   |       | Y                | 4.13  | 4.35  | 80   | 130 | 5               | 5              | 1.0                               |
|          |                                   |       | Z                | 4.25  | 4.50  | 80   | 130 | 5               | 5              | 1.0                               |
| DZD4.7   | 4.40                              | 4.90  | X                | 4.40  | 4.63  | 60   | 120 | 5               | 5              | 1.0                               |
|          |                                   |       | Y                | 4.53  | 4.76  | 60   | 120 | 5               | 5              | 1.0                               |
|          |                                   |       | Z                | 4.66  | 4.90  | 60   | 120 | 5               | 5              | 1.0                               |
| DZD5.1   | 4.80                              | 5.40  | X                | 4.80  | 5.07  | 35   | 70  | 5               | 1.0            | 1.5                               |
|          |                                   |       | Y                | 4.97  | 5.24  | 35   | 70  | 5               | 1.0            | 1.5                               |
|          |                                   |       | Z                | 5.14  | 5.40  | 35   | 70  | 5               | 1.0            | 1.5                               |
| DZD5.6   | 5.30                              | 6.00  | X                | 5.30  | 5.63  | 15   | 40  | 5               | 1.0            | 2.5                               |
|          |                                   |       | Y                | 5.43  | 5.81  | 15   | 40  | 5               | 1.0            | 2.5                               |
|          |                                   |       | Z                | 5.61  | 6.00  | 15   | 40  | 5               | 1.0            | 2.5                               |
| DZD6.2   | 5.80                              | 6.60  | X                | 5.80  | 6.20  | 8.0  | 30  | 5               | 1.0            | 3.0                               |
|          |                                   |       | Y                | 6.00  | 6.39  | 8.0  | 30  | 5               | 1.0            | 3.0                               |
|          |                                   |       | Z                | 6.19  | 6.60  | 8.0  | 30  | 5               | 1.0            | 3.0                               |
| DZD6.8   | 6.40                              | 7.20  | X                | 6.40  | 6.80  | 7.0  | 25  | 5               | 0.5            | 5.0                               |
|          |                                   |       | Y                | 6.60  | 7.02  | 7.0  | 25  | 5               | 0.5            | 5.0                               |
|          |                                   |       | Z                | 6.82  | 7.20  | 7.0  | 25  | 5               | 0.5            | 5.0                               |
| DZD7.5   | 7.00                              | 7.90  | X                | 7.00  | 7.43  | 6.8  | 23  | 5               | 0.5            | 6.0                               |
|          |                                   |       | Y                | 7.23  | 7.66  | 6.8  | 23  | 5               | 0.5            | 6.0                               |
|          |                                   |       | Z                | 7.46  | 7.90  | 6.8  | 23  | 5               | 0.5            | 6.0                               |
| DZD8.2   | 7.70                              | 8.70  | X                | 7.70  | 8.16  | 5.0  | 20  | 5               | 0.5            | 6.5                               |
|          |                                   |       | Y                | 7.96  | 8.43  | 5.0  | 20  | 5               | 0.5            | 6.5                               |
|          |                                   |       | Z                | 8.23  | 8.70  | 5.0  | 20  | 5               | 0.5            | 6.5                               |
| DZD9.1   | 8.50                              | 9.60  | X                | 8.50  | 9.00  | 4.0  | 18  | 5               | 0.5            | 7.0                               |
|          |                                   |       | Y                | 8.80  | 9.30  | 4.0  | 18  | 5               | 0.5            | 7.0                               |
|          |                                   |       | Z                | 9.10  | 9.60  | 4.0  | 18  | 5               | 0.5            | 7.0                               |
| DZD10    | 9.40                              | 10.60 | X                | 9.40  | 9.93  | 4.0  | 15  | 5               | 0.5            | 8.0                               |
|          |                                   |       | Y                | 9.73  | 10.26 | 4.0  | 15  | 5               | 0.5            | 8.0                               |
|          |                                   |       | Z                | 10.06 | 11.60 | 4.0  | 15  | 5               | 0.5            | 8.0                               |
| DZD11    | 10.40                             | 11.60 | X                | 10.40 | 10.98 | 4.0  | 15  | 5               | 0.5            | 8.5                               |
|          |                                   |       | Y                | 10.73 | 11.26 | 4.0  | 15  | 5               | 0.5            | 8.5                               |
|          |                                   |       | Z                | 11.06 | 11.60 | 4.0  | 15  | 5               | 0.5            | 8.5                               |
| DZD12    | 11.40                             | 12.60 | X                | 11.40 | 11.93 | 3.0  | 15  | 5               | 0.5            | 9.0                               |
|          |                                   |       | Y                | 11.73 | 12.26 | 3.0  | 15  | 5               | 0.5            | 9.0                               |
|          |                                   |       | Z                | 12.06 | 12.60 | 3.0  | 15  | 5               | 0.5            | 9.0                               |
| DZD13    | 12.40                             | 14.10 | X                | 12.40 | 13.08 | 3.0  | 15  | 5               | 0.5            | 10.0                              |
|          |                                   |       | Y                | 12.88 | 13.57 | 3.0  | 15  | 5               | 0.5            | 10.0                              |
|          |                                   |       | Z                | 13.37 | 14.10 | 3.0  | 15  | 5               | 0.5            | 10.0                              |
| DZD15    | 13.80                             | 15.60 | X                | 13.80 | 14.63 | 3.0  | 15  | 5               | 0.5            | 11.0                              |
|          |                                   |       | Y                | 14.33 | 15.11 | 3.0  | 15  | 5               | 0.5            | 11.0                              |
|          |                                   |       | Z                | 14.81 | 15.60 | 3.0  | 15  | 5               | 0.5            | 11.0                              |
| DZD16    | 15.30                             | 17.10 | X                | 15.30 | 16.10 | 3.0  | 18  | 5               | 0.5            | 12.0                              |
|          |                                   |       | Y                | 15.80 | 16.60 | 3.0  | 18  | 5               | 0.5            | 12.0                              |
|          |                                   |       | Z                | 16.30 | 17.10 | 3.0  | 18  | 5               | 0.5            | 12.0                              |

\* : t=30ms

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# DZD2.0 to 24

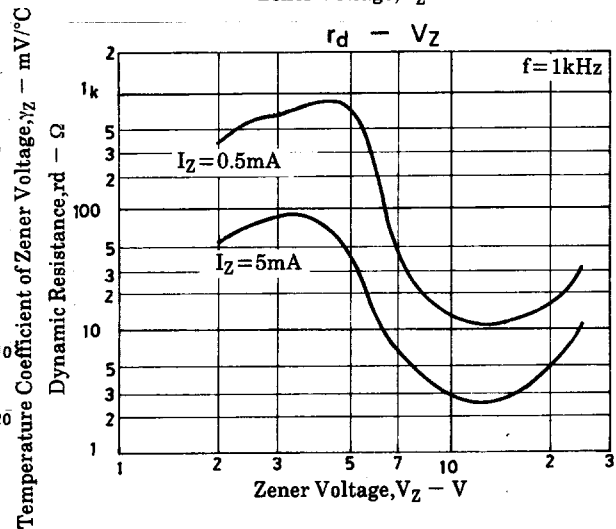
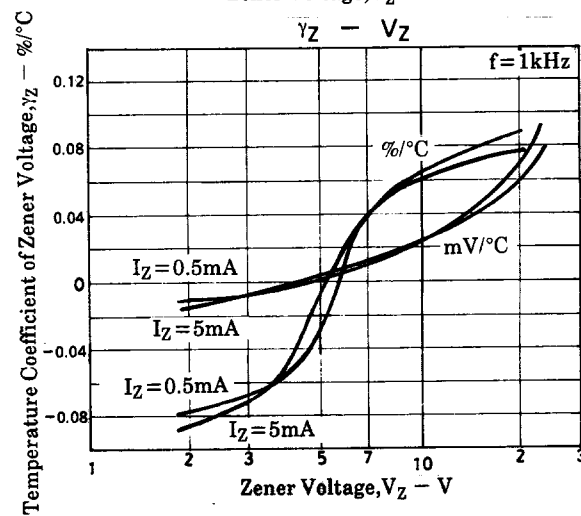
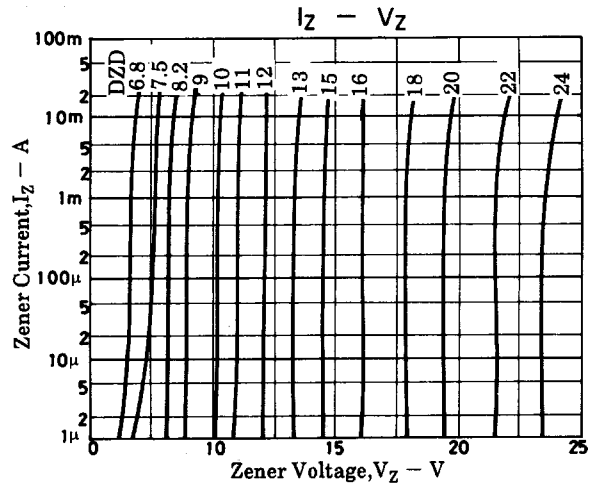
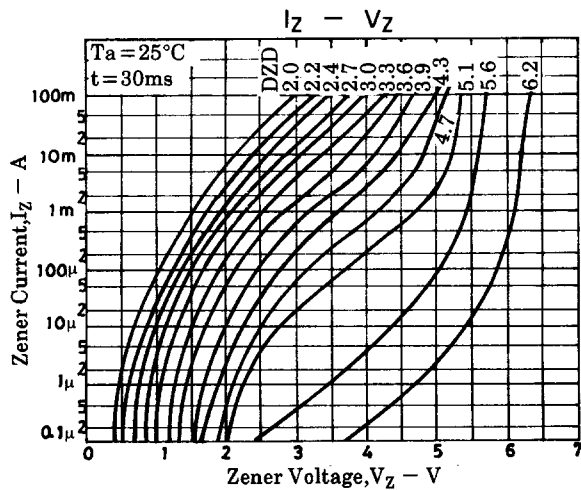
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## Electrical Characteristics at Ta = 25°C

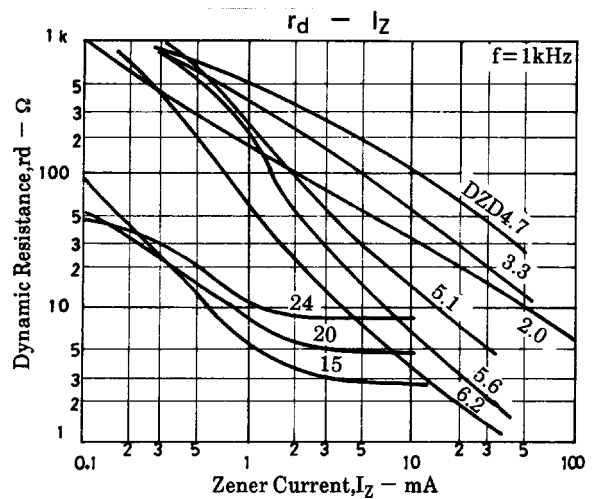
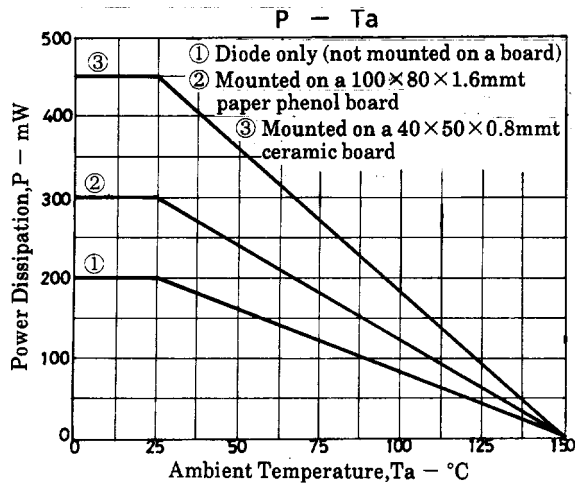
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| Type No. | Zener Characteristics             |       |              |       |       |  |     |              | Reverse Current |                                |
|----------|-----------------------------------|-------|--------------|-------|-------|--|-----|--------------|-----------------|--------------------------------|
|          | Zener Voltage V <sub>Z</sub> [V]* |       |              |       |       | Dynamic Resistance<br>r <sub>d</sub> [Ω]<br>f=1kHz |     | Test Current | I <sub>R</sub>  | Test Voltage<br>V <sub>R</sub> |
|          | min                               | max   | Sub-division | min   | max   | typ  | max | [mA]         |                 |                                |
|          |                                   |       |              |       |       |  |     |              | μA              | [V]                            |
| DZD18    | 16.80                             | 19.10 | X            | 16.80 | 17.76 | 4.0  | 20  | 5            | 0.5             | 14.0                           |
|          |                                   |       | Y            | 17.46 | 18.43 | 4.0  | 20  | 5            | 0.5             | 14.0                           |
|          |                                   |       | Z            | 18.13 | 19.10 | 4.0  | 20  | 5            | 0.5             | 14.0                           |
| DZD20    | 18.80                             | 21.20 | X            | 18.80 | 19.78 | 5.0  | 25  | 5            | 0.5             | 15.0                           |
|          |                                   |       | Y            | 19.48 | 20.46 | 5.0  | 25  | 5            | 0.5             | 15.0                           |
|          |                                   |       | Z            | 20.16 | 21.20 | 5.0  | 25  | 5            | 0.5             | 15.0                           |
| DZD22    | 20.80                             | 23.30 | X            | 20.80 | 21.88 | 6.0  | 30  | 5            | 0.5             | 17.0                           |
|          |                                   |       | Y            | 21.48 | 22.56 | 6.0  | 30  | 5            | 0.5             | 17.0                           |
|          |                                   |       | Z            | 22.16 | 23.30 | 6.0  | 30  | 5            | 0.5             | 17.0                           |
| DZD24    | 22.80                             | 25.60 | X            | 22.80 | 24.11 | 8.0  | 40  | 5            | 0.5             | 19.0                           |
|          |                                   |       | Y            | 23.61 | 24.92 | 8.0  | 40  | 5            | 0.5             | 19.0                           |
|          |                                   |       | Z            | 24.42 | 25.60 | 8.0  | 40  | 5            | 0.5             | 19.0                           |

\*: t=30ms



## DZD2.0 to 24



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