# HZM-N Series

## Silicon Epitaxial Planar Zener Diode for Stabilizer

REJ03G0483-0500
(Previous: ADE-208-130D)
Rev.5.00
Dec 14, 2004

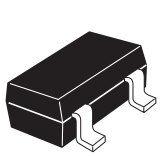
### Features

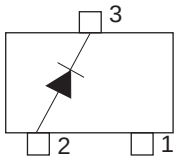
- Wide spectrum from 1.9 V through 38 V of zener voltage provide flexible application.
- MPAK Package is suitable for high density surface mounting and high speed assembly.

### Ordering Information

| Type No. | Laser Mark | Package Code |
|---|---|---|
| HZM-N Series | Let to Mark Code | MPAK |

### Pin Arrangement






(Top View)

1. NC
2. Anode
3. Cathode

## Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Value | Unit |
|---|---|---|---|
| Power dissipation | Pd *[1] | 200 | mW |
| Junction temperature | Tj | 150 | °C |
| Storage temperature | Tstg | −55 to +150 | °C |

Note: 1. See Fig. 3.

## Electrical Characteristics

(Ta = 25°C)

| Type | Grade | Zener Voltage | | | Reverse Current | | Dynamic Resistance | |
|---|---|---|---|---|---|---|---|---|
| | | $V_Z$ (V)*[1] | | Test Condition | $I_R$ (μA) | Test Condition | $r_d$ (Ω) | Test Condition |
| | | Min | Max | $I_Z$ (mA) | Max | $V_R$ (V) | Max | $I_Z$ (mA) |
| HZM2.0N | B | 1.90 | 2.20 | 5 | 120 | 0.5 | 100 | 5 |
| HZM2.2N | B | 2.10 | 2.40 | 5 | 120 | 0.7 | 100 | 5 |
| HZM2.4N | B | 2.30 | 2.60 | 5 | 120 | 1.0 | 100 | 5 |
| HZM2.7N | B | 2.50 | 2.90 | 5 | 120 | 1.0 | 110 | 5 |
| | B1 | 2.50 | 2.75 | | | | | |
| | B2 | 2.65 | 2.90 | | | | | |
| HZM3.0N | B | 2.80 | 3.20 | 5 | 50 | 1.0 | 120 | 5 |
| | B1 | 2.80 | 3.05 | | | | | |
| | B2 | 2.95 | 3.20 | | | | | |
| HZM3.3N | B | 3.10 | 3.50 | 5 | 20 | 1.0 | 130 | 5 |
| | B1 | 3.10 | 3.35 | | | | | |
| | B2 | 3.25 | 3.50 | | | | | |
| HZM3.6N | B | 3.40 | 3.80 | 5 | 10 | 1.0 | 130 | 5 |
| | B1 | 3.40 | 3.65 | | | | | |
| | B2 | 3.55 | 3.80 | | | | | |
| HZM3.9N | B | 3.70 | 4.10 | 5 | 10 | 1.0 | 130 | 5 |
| | B1 | 3.70 | 3.97 | | | | | |
| | B2 | 3.87 | 4.10 | | | | | |
| HZM4.3N | B | 4.01 | 4.48 | 5 | 10 | 1.0 | 130 | 5 |
| | B1 | 4.01 | 4.21 | | | | | |
| | B2 | 4.15 | 4.34 | | | | | |
| | B3 | 4.28 | 4.48 | | | | | |
| HZM4.7N | B | 4.42 | 4.90 | 5 | 10 | 1.0 | 130 | 5 |
| | B1 | 4.42 | 4.61 | | | | | |
| | B2 | 4.55 | 4.75 | | | | | |
| | B3 | 4.69 | 4.90 | | | | | |
| HZM5.1N | B | 4.84 | 5.37 | 5 | 5 | 1.5 | 130 | 5 |
| | B1 | 4.84 | 5.04 | | | | | |
| | B2 | 4.98 | 5.20 | | | | | |
| | B3 | 5.14 | 5.37 | | | | | |
| HZM5.6N | B | 5.31 | 5.92 | 5 | 5 | 2.5 | 80 | 5 |
| | B1 | 5.31 | 5.55 | | | | | |
| | B2 | 5.49 | 5.73 | | | | | |
| | B3 | 5.67 | 5.92 | | | | | |

Note: 1. Tested with pulse ($P_W$ = 40 ms)

| Type | Grade | Zener Voltage | | | Reverse Current | | Dynamic Resistance | |
|---|---|---|---|---|---|---|---|---|
| | | $V_Z$ (V)*[1] | | Test Condition | $I_R$ (μA) | Test Condition | $r_d$ (Ω) | Test Condition |
| | | Min | Max | $I_Z$ (mA) | Max | $V_R$ (V) | Max | $I_Z$ (mA) |
| HZM6.2N | B | 5.86 | 6.53 | 5 | 2 | 3.0 | 50 | 5 |
| | B1 | 5.86 | 6.12 | | | | | |
| | B2 | 6.06 | 6.33 | | | | | |
| | B3 | 6.26 | 6.53 | | | | | |
| HZM6.8N | B | 6.47 | 7.14 | 5 | 2 | 3.5 | 30 | 5 |
| | B1 | 6.47 | 6.73 | | | | | |
| | B2 | 6.65 | 6.93 | | | | | |
| | B3 | 6.86 | 7.14 | | | | | |
| HZM7.5N | B | 7.06 | 7.84 | 5 | 2 | 4.0 | 30 | 5 |
| | B1 | 7.06 | 7.36 | | | | | |
| | B2 | 7.28 | 7.60 | | | | | |
| | B3 | 7.52 | 7.84 | | | | | |
| HZM8.2N | B | 7.76 | 8.64 | 5 | 2 | 5.0 | 30 | 5 |
| | B1 | 7.76 | 8.10 | | | | | |
| | B2 | 8.02 | 8.36 | | | | | |
| | B3 | 8.28 | 8.64 | | | | | |
| HZM9.1N | B | 8.56 | 9.55 | 5 | 2 | 6.0 | 30 | 5 |
| | B1 | 8.56 | 8.93 | | | | | |
| | B2 | 8.85 | 9.23 | | | | | |
| | B3 | 9.15 | 9.55 | | | | | |
| HZM10N | B | 9.45 | 10.55 | 5 | 2 | 7.0 | 30 | 5 |
| | B1 | 9.45 | 9.87 | | | | | |
| | B2 | 9.77 | 10.21 | | | | | |
| | B3 | 10.11 | 10.55 | | | | | |
| HZM11N | B | 10.44 | 11.56 | 5 | 2 | 8.0 | 30 | 5 |
| | B1 | 10.44 | 10.88 | | | | | |
| | B2 | 10.76 | 11.22 | | | | | |
| | B3 | 11.10 | 11.56 | | | | | |
| HZM12N | B | 11.42 | 12.60 | 5 | 2 | 9.0 | 35 | 5 |
| | B1 | 11.42 | 11.90 | | | | | |
| | B2 | 11.74 | 12.24 | | | | | |
| | B3 | 12.08 | 12.60 | | | | | |
| HZM13N | B | 12.47 | 13.96 | 5 | 2 | 10.0 | 35 | 5 |
| | B1 | 12.47 | 13.03 | | | | | |
| | B2 | 12.91 | 13.49 | | | | | |
| | B3 | 13.37 | 13.96 | | | | | |
| 5M15N | B | 13.84 | 15.52 | 5 | 2 | 11.0 | 40 | 5 |
| | B1 | 13.84 | 14.46 | | | | | |
| | B2 | 14.34 | 14.98 | | | | | |
| | B3 | 14.85 | 15.52 | | | | | |
| HZM16N | B | 15.37 | 17.09 | 5 | 2 | 12.0 | 40 | 5 |
| | B1 | 15.37 | 16.01 | | | | | |
| | B2 | 15.85 | 16.51 | | | | | |
| | B3 | 16.35 | 17.09 | | | | | |
| HZM18N | B | 16.94 | 19.03 | 5 | 2 | 13.0 | 45 | 5 |
| | B1 | 16.94 | 17.70 | | | | | |
| | B2 | 17.56 | 18.35 | | | | | |
| | B3 | 18.21 | 19.03 | | | | | |

Note: 1. Tested with pulse ($P_W$ = 40 ms)

| Type | Grade | Zener Voltage | | | Reverse Current | | Dynamic Resistance | |
|---|---|---|---|---|---|---|---|---|
| | | $V_Z$ (V)*[1] | | Test Condition | $I_R$ (μA) | Test Condition | $r_d$ (Ω) | Test Condition |
| | | Min | Max | $I_Z$ (mA) | Max | $V_R$ (V) | Max | $I_Z$ (mA) |
| HZM20N | B | 18.86 | 21.08 | 5 | 2 | 15.0 | 50 | 5 |
| | B1 | 18.86 | 19.70 | | | | | |
| | B2 | 19.52 | 20.39 | | | | | |
| | B3 | 20.21 | 21.08 | | | | | |
| HZM22N | B | 20.88 | 23.17 | 5 | 2 | 17.0 | 55 | 5 |
| | B1 | 20.88 | 21.77 | | | | | |
| | B2 | 21.54 | 22.47 | | | | | |
| | B3 | 22.23 | 23.17 | | | | | |
| HZM24N | B | 22.93 | 25.57 | 5 | 2 | 19.0 | 60 | 5 |
| | B1 | 22.93 | 23.96 | | | | | |
| | B2 | 23.72 | 24.78 | | | | | |
| | B3 | 24.54 | 25.57 | | | | | |
| HZM27N | B | 25.10 | 28.90 | 2 | 2 | 21.0 | 70 | 2 |
| HZM30N | B | 28.00 | 32.00 | 2 | 2 | 23.0 | 80 | 2 |
| HZM33N | B | 31.00 | 35.00 | 2 | 2 | 25.0 | 80 | 2 |
| HZM36N | B | 34.00 | 38.00 | 2 | 2 | 27.0 | 90 | 2 |

Note: 1. Tested with pulse ($P_W$ = 40 ms)

## Mark Code

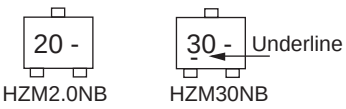
| Type | Grade | Mark No. |
|---|---|---|
| HZM2.0N | B | 2 0 – |
| HZM2.2N | B | 2 2 – |
| HZM2.4N | B | 2 4 – |
| HZM2.7N | B1 | 2 7 1 |
| | B2 | 2 7 2 |
| HZM3.0N | B1 | 3 0 1 |
| | B2 | 3 0 2 |
| HZM3.3N | B1 | 3 3 1 |
| | B2 | 3 3 2 |
| HZM3.6N | B1 | 3 6 1 |
| | B2 | 3 6 2 |
| HZM3.9N | B1 | 3 9 1 |
| | B2 | 3 9 2 |
| HZM4.3N | B1 | 4 3 1 |
| | B2 | 4 3 2 |
| | B3 | 4 3 3 |
| HZM4.7N | B1 | 4 7 1 |
| | B2 | 4 7 2 |
| | B3 | 4 7 3 |
| HZM5.1N | B1 | 5 1 1 |
| | B2 | 5 1 2 |
| | B3 | 5 1 3 |
| HZM5.6N | B1 | 5 6 1 |
| | B2 | 5 6 2 |
| | B3 | 5 6 3 |

| Type | Grade | Mark No. |
|---|---|---|
| HZM6.2N | B1 | 6 2 1 |
| | B2 | 6 2 2 |
| | B3 | 6 2 3 |
| HZM6.8N | B1 | 6 8 1 |
| | B2 | 6 8 2 |
| | B3 | 6 8 3 |
| HZM7.5N | B1 | 7 5 1 |
| | B2 | 7 5 2 |
| | B3 | 7 5 3 |
| HZM8.2N | B1 | 8 2 1 |
| | B2 | 8 2 2 |
| | B3 | 8 2 3 |
| HZM9.1N | B1 | 9 1 1 |
| | B2 | 9 1 2 |
| | B3 | 9 1 3 |
| HZM10N | B1 | 1 0 1 |
| | B2 | 1 0 2 |
| | B3 | 1 0 3 |
| HZM11N | B1 | 1 1 1 |
| | B2 | 1 1 2 |
| | B3 | 1 1 3 |
| HZM12N | B1 | 1 2 1 |
| | B2 | 1 2 2 |
| | B3 | 1 2 3 |

| Type | Grade | Mark No. |
|---|---|---|
| HZM13N | B1 | 1 3 1 |
| | B2 | 1 3 2 |
| | B3 | 1 3 3 |
| HZM15N | B1 | 1 5 1 |
| | B2 | 1 5 2 |
| | B3 | 1 5 3 |
| HZM16N | B1 | 1 6 1 |
| | B2 | 1 6 2 |
| | B3 | 1 6 3 |
| HZM18N | B1 | 1 8 1 |
| | B2 | 1 8 2 |
| | B3 | 1 8 3 |
| HZM20N | B1 | 2 0 1 |
| | B2 | 2 0 2 |
| | B3 | 2 0 3 |
| HZM22N | B1 | 2 2 1 |
| | B2 | 2 2 2 |
| | B3 | 2 2 3 |
| HZM24N | B1 | 2 4 1 |
| | B2 | 2 4 2 |
| | B3 | 2 4 3 |
| HZM27N | B | 2 7 – |
| HZM30N | B | 3 0 – |
| HZM33N | B | 3 3 – |
| HZM36N | B | 3 6 – |

## Example of Marking

1. One grade type (grade type B)




HZM2.0NB HZM30NB

2. Two grade type (B1, B2)


HZM3.0NB1 HZM3.0NB2

3. Three grade type (B1, B2, B3)


HZM4.3NB1 HZM4.3NB2 HZM4.3NB3

Notes: 1. The grade B type includes from B1 min. to B3 (or B2) max.
2. B grade is standard and has better delivery, These are marked one of B1, B2, B3.
3. Ordering P/N HZM-N series are delivered taped (TL/TR).
Choose one taping code and adhere to parts No.
Example: HZM2.0NBTL (or TR), HZM2.2NBTL (or TR), HZM36NBTL (or TR).
(Grade B type)
HZM2.7NB1TL (or TR), HZM2.7NB2TL (or TR), HZM24NB3TL (or TR).
(Grade B1, B2, B3 type)

## Main Characteristic

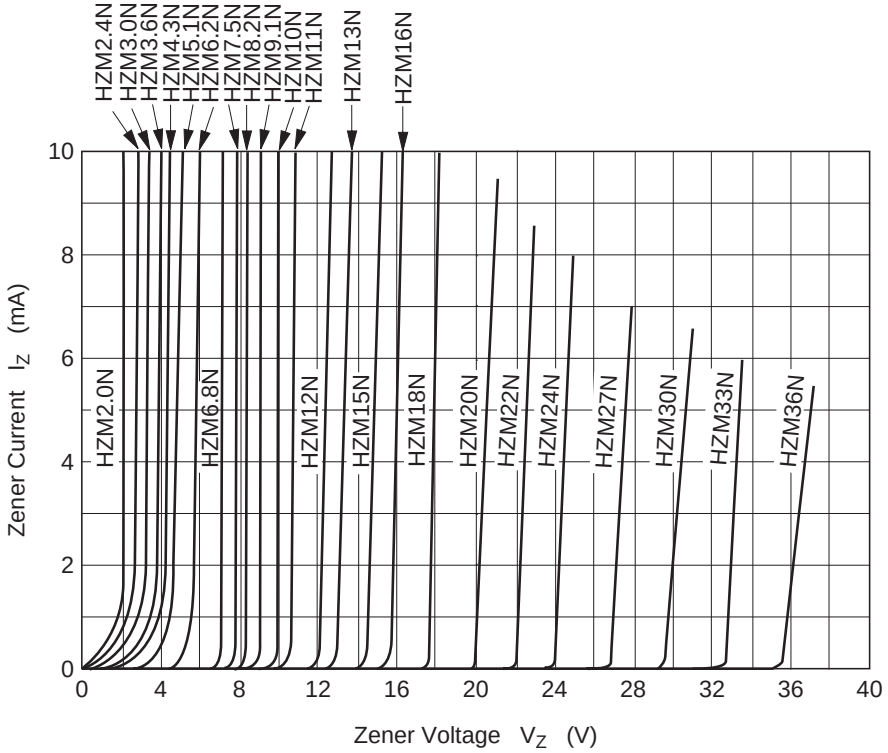



Fig.1 Zener current vs. Zener voltage

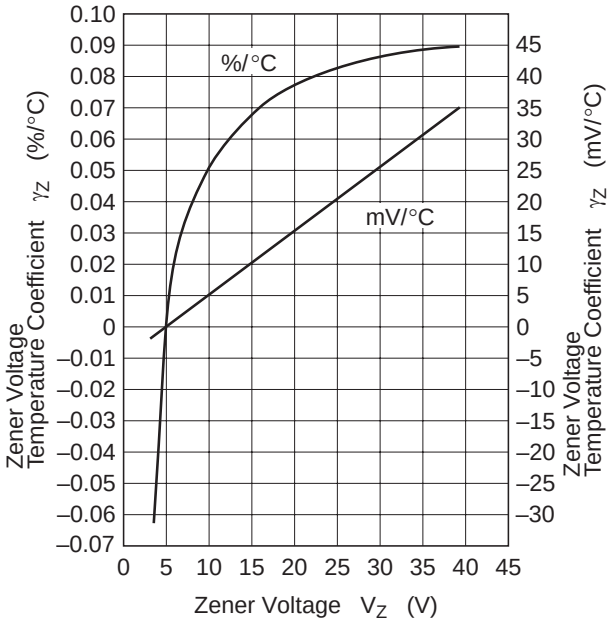



Fig.2 Temperature Coefficient vs. Zener voltage

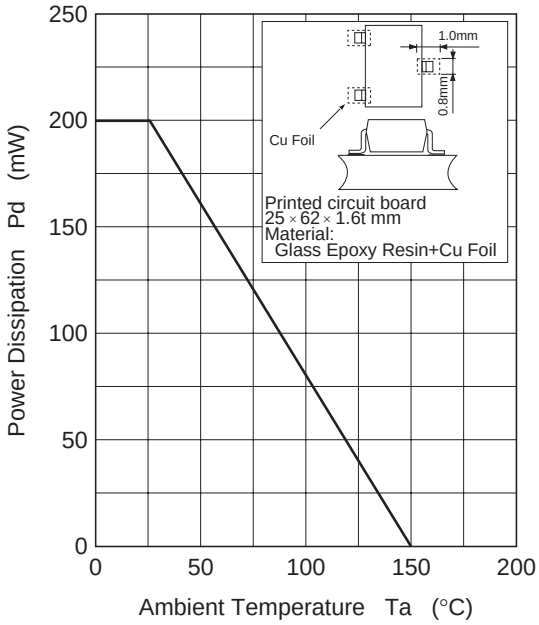
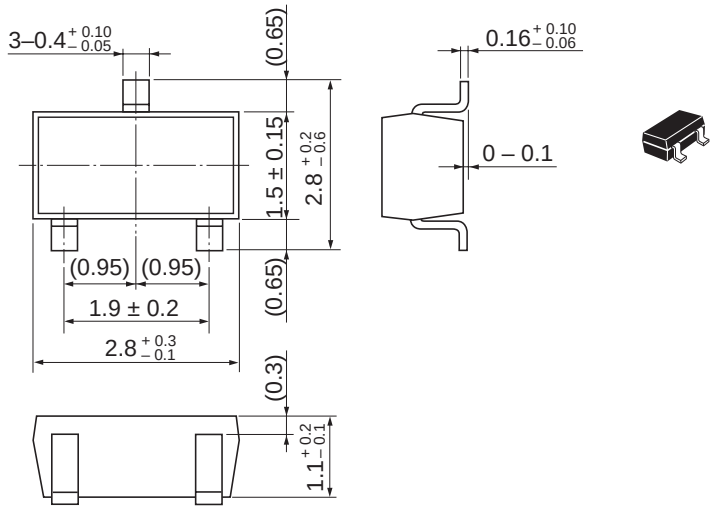



Fig.3 Power Dissipation vs. Ambient Temperature

## Package Dimensions

As of January, 2003

Unit: mm




| | |
|---|---|
| Package Code | MPAK |
| JEDEC | — |
| JEITA | Conforms |
| Mass (reference value) | 0.011 g |

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