

# 1N5223B through 1N5258B

## Silicon Epitaxial Planar Zener Diodes for Voltage Regulation

REJ03G1222-0300  
(Previous: ADE-208-137B)  
Rev.3.00  
Aug 22, 2005

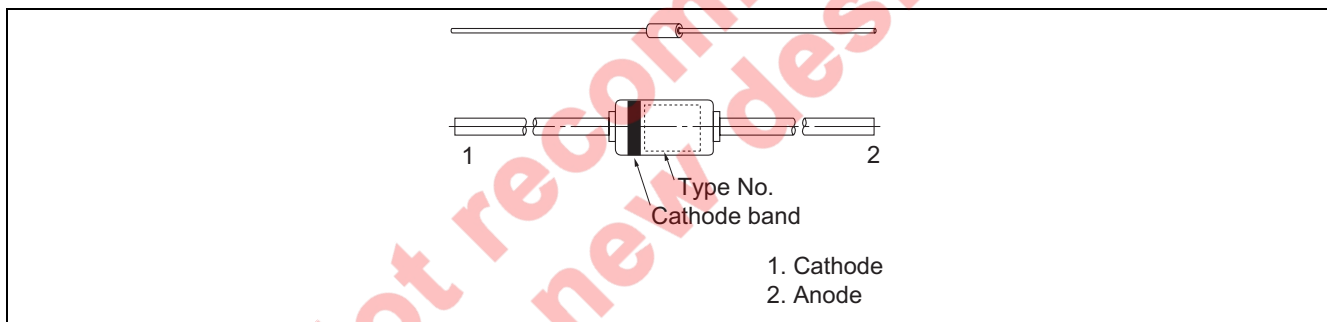
### Features

- Glass package DO-35 structure ensures high reliability.
- Wide spectrum from 2.7 V through 36 V of zener voltage provide flexible application.

### Ordering Information

| Type No.                | Cathode Band | Mark     | Package Name | Package Code (Previous Code) |
|-------------------------|--------------|----------|--------------|------------------------------|
| 1N5223B through 1N5258B | Black        | Type No. | DO-35        | GRZZ0002ZB-A (DO-35)         |

### Pin Arrangement



## Absolute Maximum Ratings

(Ta = 25°C)

| Item                    | Symbol                        | Ratings     | Unit |
|-------------------------|-------------------------------|-------------|------|
| Power dissipation       | Pd                            | 500         | mW   |
| Surge power dissipation | Pd (surge) * <sup>1</sup>     | 10          | W    |
| Lead temperature        | T <sub>L</sub> * <sup>2</sup> | 230         | °C   |
| Junction temperature    | T <sub>j</sub> * <sup>3</sup> | 200         | °C   |
| Storage temperature     | Tstg                          | -65 to +200 | °C   |

Notes: 1. Non-recurrent square wave, pw = 8.3 ms, Tj = 55°C, Tj is prior to surge.

2. Less than 1/16" from the case for 10 seconds.

3. By standard printed board, see fig 2.

## Electrical Characteristics

(Ta = 25°C)

| Type No. | Zener Voltage      |                     | Reverse Current     |                    | Dynamic Resistance  |                      |                     |                      | $\gamma_z$ (%/°C) * <sup>1</sup> | V <sub>F</sub> * <sup>2</sup> (V) |
|----------|--------------------|---------------------|---------------------|--------------------|---------------------|----------------------|---------------------|----------------------|----------------------------------|-----------------------------------|
|          | V <sub>z</sub> (V) | Test Condition      | I <sub>R</sub> (μA) | Test Condition     | Z <sub>zT</sub> (Ω) | Test Condition       | Z <sub>zK</sub> (Ω) | Test Condition       |                                  |                                   |
|          |                    | I <sub>z</sub> (mA) | Max                 | V <sub>R</sub> (V) | Max                 | I <sub>zT</sub> (mA) | Max                 | I <sub>zK</sub> (mA) | Max                              | Max                               |
| 1N5223B  | 2.7 ± 5 (%)        | 20                  | 75                  | 1.0                | 30                  | 20                   | 1300                | 0.25                 | -0.08                            | 1.1                               |
| 1N5224B  | 2.8 ± 5 (%)        | 20                  | 75                  | 1.0                | 30                  | 20                   | 1400                | 0.25                 | -0.08                            | 1.1                               |
| 1N5225B  | 3.0 ± 5 (%)        | 20                  | 50                  | 1.0                | 29                  | 20                   | 1600                | 0.25                 | -0.075                           | 1.1                               |
| 1N5226B  | 3.3 ± 5 (%)        | 20                  | 25                  | 1.0                | 28                  | 20                   | 1600                | 0.25                 | -0.07                            | 1.1                               |
| 1N5227B  | 3.6 ± 5 (%)        | 20                  | 15                  | 1.0                | 24                  | 20                   | 1700                | 0.25                 | -0.065                           | 1.1                               |
| 1N5228B  | 3.9 ± 5 (%)        | 20                  | 10                  | 1.0                | 23                  | 20                   | 1900                | 0.25                 | -0.06                            | 1.1                               |
| 1N5229B  | 4.3 ± 5 (%)        | 20                  | 5                   | 1.0                | 22                  | 20                   | 2000                | 0.25                 | ±0.055                           | 1.1                               |
| 1N5230B  | 4.7 ± 5 (%)        | 20                  | 5                   | 2.0                | 19                  | 20                   | 1900                | 0.25                 | ±0.03                            | 1.1                               |
| 1N5231B  | 5.1 ± 5 (%)        | 20                  | 5                   | 2.0                | 17                  | 20                   | 1600                | 0.25                 | ±0.03                            | 1.1                               |
| 1N5232B  | 5.6 ± 5 (%)        | 20                  | 5                   | 3.0                | 11                  | 20                   | 1600                | 0.25                 | +0.038                           | 1.1                               |
| 1N5233B  | 6.0 ± 5 (%)        | 20                  | 5                   | 3.5                | 7                   | 20                   | 1600                | 0.25                 | +0.038                           | 1.1                               |
| 1N5234B  | 6.2 ± 5 (%)        | 20                  | 5                   | 4.0                | 7                   | 20                   | 1000                | 0.25                 | +0.045                           | 1.1                               |
| 1N5235B  | 6.8 ± 5 (%)        | 20                  | 3                   | 5.0                | 5                   | 20                   | 750                 | 0.25                 | +0.05                            | 1.1                               |
| 1N5236B  | 7.5 ± 5 (%)        | 20                  | 3                   | 6.0                | 6                   | 20                   | 500                 | 0.25                 | +0.058                           | 1.1                               |
| 1N5237B  | 8.2 ± 5 (%)        | 20                  | 3                   | 6.5                | 8                   | 20                   | 500                 | 0.25                 | +0.062                           | 1.1                               |
| 1N5238B  | 8.7 ± 5 (%)        | 20                  | 3                   | 6.5                | 8                   | 20                   | 600                 | 0.25                 | +0.065                           | 1.1                               |
| 1N5239B  | 9.1 ± 5 (%)        | 20                  | 3                   | 7.5                | 10                  | 20                   | 600                 | 0.25                 | +0.068                           | 1.1                               |
| 1N5240B  | 10 ± 5 (%)         | 20                  | 3                   | 8.0                | 17                  | 20                   | 600                 | 0.25                 | +0.075                           | 1.1                               |
| 1N5241B  | 11 ± 5 (%)         | 20                  | 2                   | 8.4                | 22                  | 20                   | 600                 | 0.25                 | +0.076                           | 1.1                               |
| 1N5242B  | 12 ± 5 (%)         | 20                  | 1                   | 9.1                | 30                  | 20                   | 600                 | 0.25                 | +0.077                           | 1.1                               |
| 1N5243B  | 13 ± 5 (%)         | 9.5                 | 0.5                 | 9.9                | 13                  | 9.5                  | 600                 | 0.25                 | +0.079                           | 1.1                               |
| 1N5244B  | 14 ± 5 (%)         | 9.0                 | 0.1                 | 10                 | 15                  | 9.0                  | 600                 | 0.25                 | +0.082                           | 1.1                               |
| 1N5245B  | 15 ± 5 (%)         | 8.5                 | 0.1                 | 11                 | 16                  | 8.5                  | 600                 | 0.25                 | +0.082                           | 1.1                               |
| 1N5246B  | 16 ± 5 (%)         | 7.8                 | 0.1                 | 12                 | 17                  | 7.8                  | 600                 | 0.25                 | +0.083                           | 1.1                               |
| 1N5247B  | 17 ± 5 (%)         | 7.4                 | 0.1                 | 13                 | 19                  | 7.4                  | 600                 | 0.25                 | +0.084                           | 1.1                               |
| 1N5248B  | 18 ± 5 (%)         | 7.0                 | 0.1                 | 14                 | 21                  | 7.0                  | 600                 | 0.25                 | +0.085                           | 1.1                               |
| 1N5249B  | 19 ± 5 (%)         | 6.6                 | 0.1                 | 14                 | 23                  | 6.6                  | 600                 | 0.25                 | +0.086                           | 1.1                               |
| 1N5250B  | 20 ± 5 (%)         | 6.2                 | 0.1                 | 15                 | 25                  | 6.2                  | 600                 | 0.25                 | +0.086                           | 1.1                               |

Notes: 1. 1N5223 to 1N5242: I<sub>z</sub> = 7.5 mA, 1N5243 to 1N5258: I<sub>z</sub> = I<sub>z</sub>, Ta = 25°C to 125°C2. Tested with DC, I<sub>F</sub> = 200 mA

## Electrical Characteristics (cont.)

(Ta = 25°C)

| Type No. | Zener Voltage |                | Reverse Current |                | Dynamic Resistance |                |              |                | $\gamma_z$ (%/°C) *1 | $V_F^{*2}$ (V) |
|----------|---------------|----------------|-----------------|----------------|--------------------|----------------|--------------|----------------|----------------------|----------------|
|          | $V_z$ (V)     | Test Condition | $I_R$ (μA)      | Test Condition | $Z_{ZT}$ (Ω)       | Test Condition | $Z_{ZK}$ (Ω) | Test Condition |                      |                |
|          |               | $I_z$ (mA)     | Max             | $V_R$ (V)      | Max                | $I_{ZT}$ (mA)  | Max          | $I_{ZK}$ (mA)  | Max                  | Max            |
| 1N5251B  | 22 ± 5 (%)    | 5.6            | 0.1             | 17             | 29                 | 5.6            | 600          | 0.25           | +0.087               | 1.1            |
| 1N5252B  | 24 ± 5 (%)    | 5.2            | 0.1             | 18             | 33                 | 5.2            | 600          | 0.25           | +0.088               | 1.1            |
| 1N5253B  | 25 ± 5 (%)    | 5.0            | 0.1             | 19             | 35                 | 5.0            | 600          | 0.25           | +0.089               | 1.1            |
| 1N5254B  | 27 ± 5 (%)    | 4.6            | 0.1             | 21             | 41                 | 4.6            | 600          | 0.25           | +0.090               | 1.1            |
| 1N5255B  | 28 ± 5 (%)    | 4.5            | 0.1             | 21             | 44                 | 4.5            | 600          | 0.25           | +0.091               | 1.1            |
| 1N5256B  | 30 ± 5 (%)    | 4.2            | 0.1             | 23             | 49                 | 4.2            | 600          | 0.25           | +0.091               | 1.1            |
| 1N5257B  | 33 ± 5 (%)    | 3.8            | 0.1             | 25             | 58                 | 3.8            | 700          | 0.25           | +0.092               | 1.1            |
| 1N5258B  | 36 ± 5 (%)    | 3.4            | 0.1             | 27             | 70                 | 3.4            | 700          | 0.25           | +0.093               | 1.1            |

Notes: 1. 1N5223 to 1N5242:  $I_z = 7.5$  mA, 1N5243 to 1N5258:  $I_z = I_{ZT}$ , Ta = 25°C to 125°C2. Tested with DC,  $I_F = 200$  mANot recommend  
for new design

## Main Characteristic

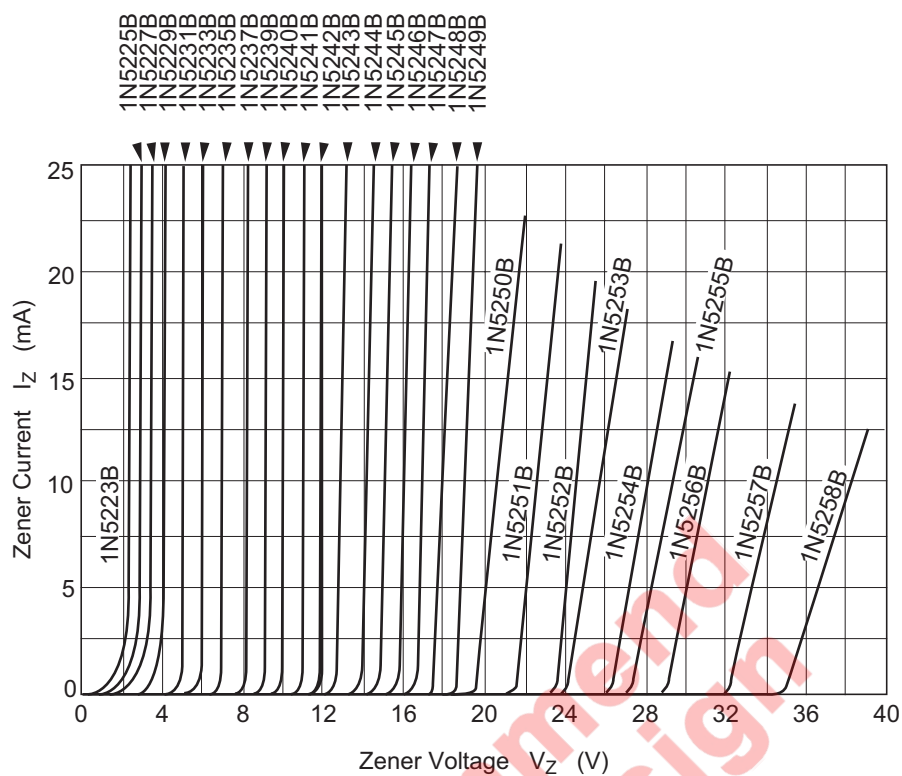


Fig.1 Zener current vs. Zener voltage

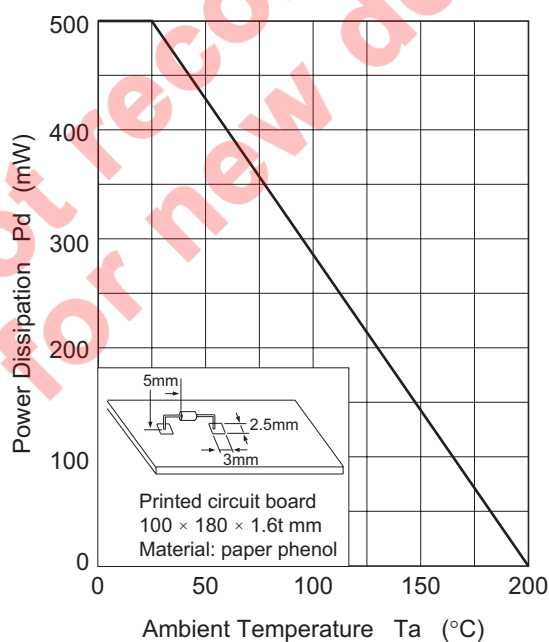
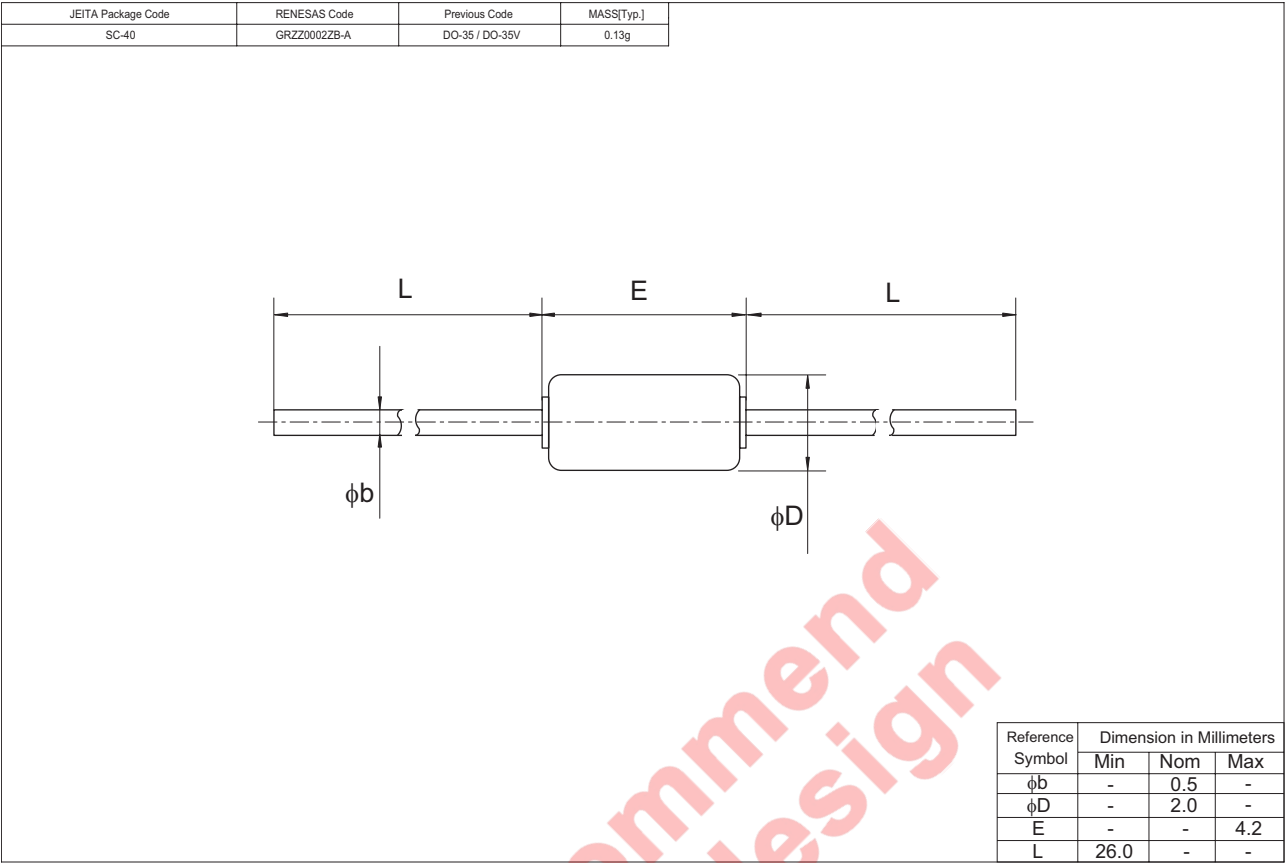


Fig.2 Power Dissipation vs. Ambient Temperature

Package Dimensions



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