

# MAZ4000N Series (MA4000(N) Series)

## Silicon planar type

For stabilization of power supply

### ■ Features

- Extremely low noise voltage caused from diode (1/3 to 1/10 of our conventional MAZ4000 series)
- Extremely good rising performance (in the low-current range)
- Easy-to-identify the zener-voltage rank by the color bands
- Easy-to-select the optimum diode because of their finely divided zener-voltage ranks
- Easy-to-mount through the adoption of the small glass-sealed DHD package (DO-34-A2)

### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| Parameter                       | Symbol      | Rating      | Unit             |
|---------------------------------|-------------|-------------|------------------|
| Average forward current         | $I_{F(AV)}$ | 250         | mA               |
| Repetitive peak forward current | $I_{FRM}$   | 250         | mA               |
| Total power dissipation *       | $P_{tot}$   | 400         | mW               |
| Junction temperature            | $T_j$       | 200         | $^\circ\text{C}$ |
| Storage temperature             | $T_{stg}$   | -65 to +200 | $^\circ\text{C}$ |

Note) \*: With a printed circuit board

### ■ Common Electrical Characteristics $T_a = 25^\circ\text{C}$ \*1

| Parameter                                   | Symbol   | Conditions            | Min | Typ  | Max | Unit                 |
|---|----------|-----------------------|-----|------|-----|----------------------|
| Forward voltage                             | $V_F$    | $I_F = 10\text{ mA}$  |     | 0.83 | 0.9 | V                    |
| Zener voltage *2                            | $V_Z$    | $I_Z$ Specified value |     |      |     | V                    |
| Zener knee operating resistance             | $R_{ZK}$ | $I_Z$ Specified value |     |      |     | $\Omega$             |
| Zener operating resistance                  | $R_Z$    | $I_Z$ Specified value |     |      |     | $\Omega$             |
| Reverse current                             | $I_R$    | $V_R$ Specified value |     |      |     | $\mu\text{A}$        |
| Temperature coefficient of zener voltage *3 | $S_Z$    | $I_Z$ Specified value |     |      |     | mV/ $^\circ\text{C}$ |

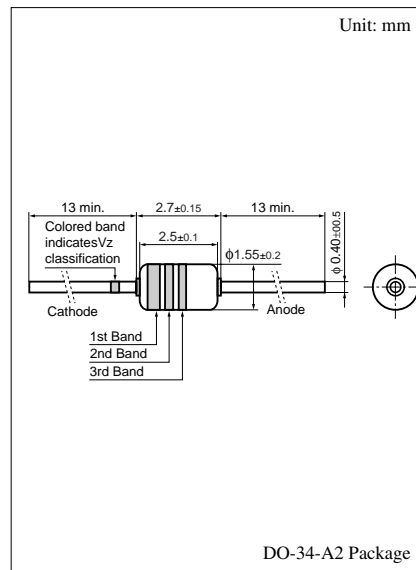
Refer to the list of the electrical characteristics within part numbers

Note) 1. Rated input/output frequency: 5 MHz

2. \*1 : The  $V_Z$  value is for the temperature of  $25^\circ\text{C}$ . In other cases, carry out the temperature compensation.

\*2 : Guaranteed at 20 ms after power application.

\*3 :  $T_j = 25^\circ\text{C}$  to  $150^\circ\text{C}$



### • Color indication of $V_Z$ rank classification

| Rank  | L     | M    | H   |
|-------|-------|------|-----|
| Color | Black | Blue | Red |

Note) The part number in the parenthesis shows conventional part number.

■ Electrical characteristics within part numbers  $T_a = 25^\circ\text{C}$

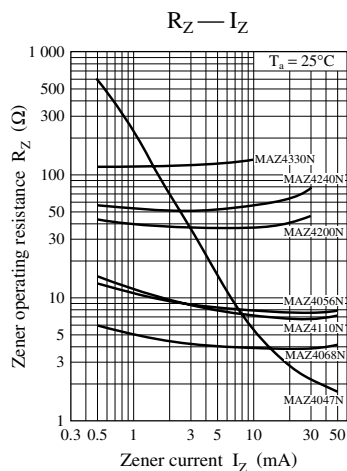
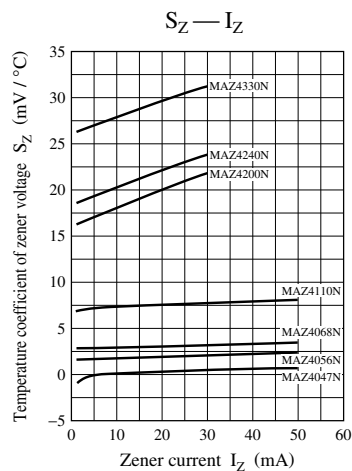
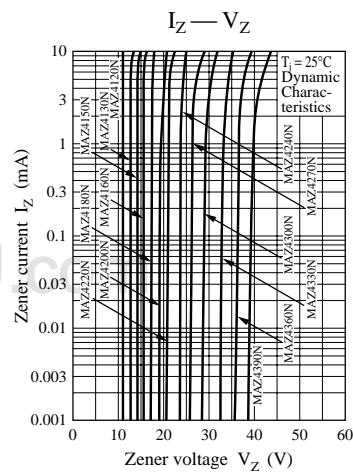
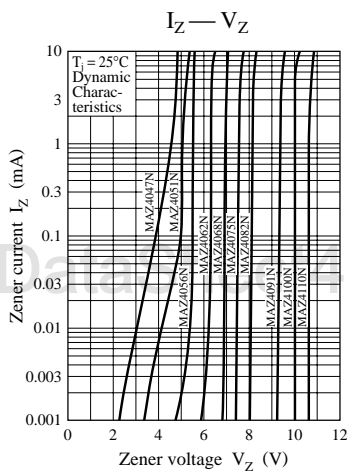
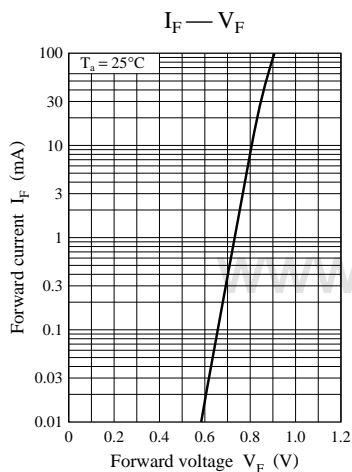
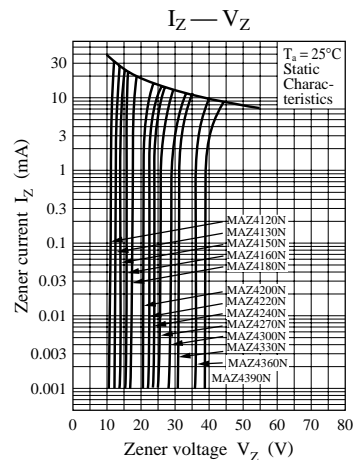
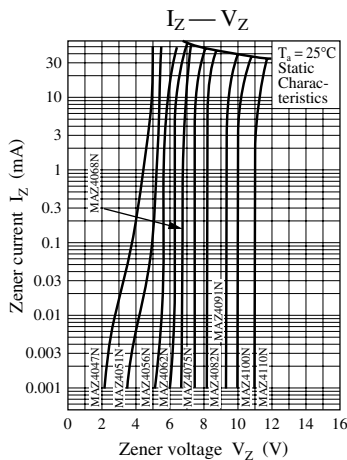
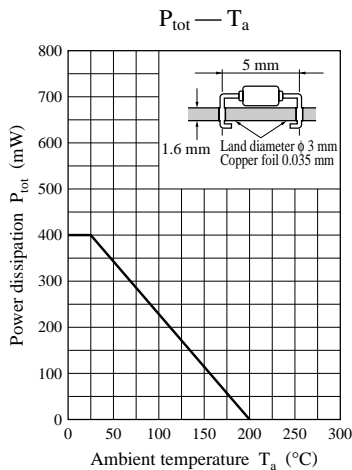
| Part number | Zener voltage             |       |       | Reverse current                   |              | Zener operating resistance |               |                       |               | Temperature coefficient of zener voltage |               | Marking symbol<br>(Color indication)<br>Main body:<br>light purple |        |        |
|-------------|---------------------------|-------|-------|-----------------------------------|--------------|----------------------------|---------------|-----------------------|---------------|--|---------------|--|--------|--------|
|             | $V_Z$ (V)<br>$I_Z = 5$ mA |       |       | $I_R$<br>( $\mu\text{A}$ )<br>Max | $V_R$<br>(V) | $R_Z$ ( $\Omega$ )         |               | $R_{ZK}$ ( $\Omega$ ) |               | $S_Z$<br>(mV/ $^\circ\text{C}$ )<br>Typ  | $I_Z$<br>(mA) | 1st.   | 2nd.   | 3rd.   |
|             | Min                       | Nom   | Max   |                                   |              | Max                        | $I_Z$<br>(mA) | Max                   | $I_Z$<br>(mA) |  |               |  |        |        |
| MAZ4047N    | 4.42                      | 4.66  | 4.90  | 2.0                               | 1.0          | 80                         | 5             | 800                   | 0.5           | -1.4                                     | 5             | Yellow   | Purple | Purple |
| MAZ4047N0L  | 4.42                      | 4.52  | 4.61  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4047N0M  | 4.55                      | 4.65  | 4.75  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4047N0H  | 4.69                      | 4.80  | 4.90  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4051N    | 4.84                      | 5.11  | 5.38  | 1.0                               | 2.0          | 60                         | 5             | 500                   | 0.5           | -0.8                                     | 5             | Green  | Brown  | Brown  |
| MAZ4051N0L  | 4.84                      | 4.94  | 5.04  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4051N0M  | 4.98                      | 5.10  | 5.21  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4051N0H  | 5.15                      | 5.27  | 5.38  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4056N    | 5.32                      | 5.62  | 5.92  | 0.5                               | 2.5          | 40                         | 5             | 200                   | 0.5           | 1.2                                      | 5             | Green  | Blue   | Blue   |
| MAZ4056N0L  | 5.32                      | 5.44  | 5.55  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4056N0M  | 5.49                      | 5.61  | 5.73  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4056N0H  | 5.67                      | 5.80  | 5.92  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4062N    | 5.86                      | 6.20  | 6.53  | 0.2                               | 4.0          | 30                         | 5             | 100                   | 0.5           | 2.3                                      | 5             | Blue   | Red    | Red    |
| MAZ4062N0L  | 5.86                      | 5.99  | 6.12  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4062N0M  | 6.06                      | 6.20  | 6.33  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4062N0H  | 6.26                      | 6.40  | 6.53  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4068N    | 6.47                      | 6.81  | 7.14  | 0.1                               | 4.0          | 20                         | 5             | 60                    | 0.5           | 3.0                                      | 5             | Blue   | Gray   | Gray   |
| MAZ4068N0L  | 6.47                      | 6.60  | 6.73  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4068N0M  | 6.65                      | 6.79  | 6.93  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4068N0H  | 6.86                      | 7.00  | 7.14  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4075N    | 7.07                      | 7.45  | 7.83  | 0.1                               | 5.0          | 20                         | 5             | 60                    | 0.5           | 4.0                                      | 5             | Purple   | Green  | Green  |
| MAZ4075N0L  | 7.07                      | 7.21  | 7.35  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4075N0M  | 7.29                      | 7.44  | 7.59  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4075N0H  | 7.53                      | 7.68  | 7.83  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4082N    | 7.77                      | 8.20  | 8.63  | 0.1                               | 5.0          | 20                         | 5             | 60                    | 0.5           | 4.6                                      | 5             | Gray   | Red    | Red    |
| MAZ4082N0L  | 7.77                      | 7.93  | 8.09  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4082N0M  | 8.03                      | 8.19  | 8.35  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4082N0H  | 8.29                      | 8.46  | 8.63  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4091N    | 8.57                      | 9.05  | 9.53  | 0.1                               | 6.0          | 20                         | 5             | 60                    | 0.5           | 5.5                                      | 5             | White  | Brown  | Brown  |
| MAZ4091N0L  | 8.57                      | 8.75  | 8.93  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4091N0M  | 8.86                      | 9.04  | 9.22  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4091N0H  | 9.15                      | 9.34  | 9.53  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4100N    | 9.47                      | 10.01 | 10.54 | 0.05                              | 7.0          | 30                         | 5             | 60                    | 0.5           | 6.4                                      | 5             | Brown  | Black  | —      |
| MAZ4100N0L  | 9.47                      | 9.66  | 9.85  |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4100N0M  | 9.79                      | 9.99  | 10.19 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4100N0H  | 10.12                     | 10.33 | 10.54 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4110N    | 10.45                     | 11.01 | 11.56 | 0.05                              | 8.0          | 30                         | 5             | 60                    | 0.5           | 7.4                                      | 5             | Brown  | Brown  | —      |
| MAZ4110N0L  | 10.45                     | 10.66 | 10.87 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4110N0M  | 10.77                     | 10.99 | 11.21 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4110N0H  | 11.10                     | 11.33 | 11.56 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4120N    | 11.43                     | 12.01 | 12.58 | 0.05                              | 9.0          | 30                         | 5             | 80                    | 0.5           | 8.4                                      | 5             | Brown  | Red    | —      |
| MAZ4120N0L  | 11.43                     | 11.66 | 11.89 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4120N0M  | 11.75                     | 11.99 | 12.23 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4120N0H  | 12.08                     | 12.33 | 12.58 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4130N    | 12.46                     | 13.21 | 13.96 | 0.05                              | 10.0         | 35                         | 5             | 80                    | 0.5           | 9.4                                      | 5             | Brown  | Orange | —      |
| MAZ4130N0L  | 12.46                     | 12.74 | 13.02 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4130N0M  | 12.90                     | 13.19 | 13.48 |                                   |              |                            |               |                       |               |  |               |  |        |        |
| MAZ4130N0H  | 13.36                     | 13.66 | 13.96 |                                   |              |                            |               |                       |               |  |               |  |        |        |

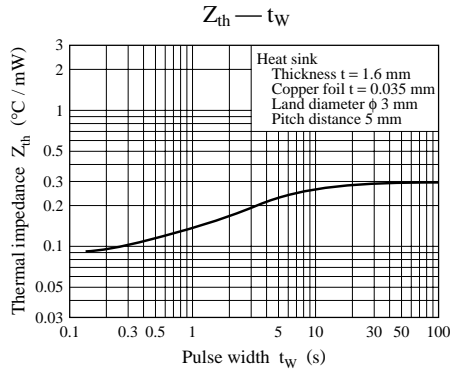
■ Electrical characteristics within part numbers (continued)  $T_a = 25^\circ\text{C}$

| Part number | Zener voltage                     |       |       | Reverse current                   |              | Zener operating resistance   |               |                                 |               | Temperature coefficient of zener voltage |               | Marking symbol<br>(Color indication)<br>Main body:<br>light purple |        |      |
|-------------|-----------------------------------|-------|-------|-----------------------------------|--------------|------------------------------|---------------|---------------------------------|---------------|--|---------------|--|--------|------|
|             | $V_Z$ (V)<br>$I_Z = 5 \text{ mA}$ |       |       | $I_R$<br>( $\mu\text{A}$ )<br>Max | $V_R$<br>(V) | $R_Z$<br>( $\Omega$ )<br>Max | $I_Z$<br>(mA) | $R_{ZK}$<br>( $\Omega$ )<br>Max | $I_Z$<br>(mA) | $S_Z$<br>(mV/ $^\circ\text{C}$ )<br>Typ  | $I_Z$<br>(mA) |  |        |      |
|             | Min                               | Nom   | Max   |                                   |              |                              |               |                                 |               |  |               | 1st.   | 2nd.   | 3rd. |
| MAZ4150N    | 13.84                             | 14.68 | 15.51 | 0.05                              | 11.0         | 40                           | 5             | 80                              | 0.5           | 11.4                                     | 5             | Brown  | Green  | —    |
| MAZ4150N0L  | 13.84                             | 14.15 | 14.46 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4150N0M  | 14.34                             | 14.66 | 14.98 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4150N0H  | 14.86                             | 15.19 | 15.51 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4160N    | 15.38                             | 16.23 | 17.08 | 0.05                              | 12.0         | 50                           | 5             | 80                              | 0.5           | 12.4                                     | 5             | Brown  | Blue   | —    |
| MAZ4160N0L  | 15.38                             | 15.69 | 16.00 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4160N0M  | 15.86                             | 16.18 | 16.50 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4160N0H  | 16.36                             | 16.72 | 17.08 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4180N    | 16.94                             | 17.98 | 19.02 | 0.05                              | 13.0         | 60                           | 5             | 80                              | 0.5           | 14.4                                     | 5             | Brown  | Gray   | —    |
| MAZ4180N0L  | 16.94                             | 17.32 | 17.70 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4180N0M  | 17.56                             | 17.96 | 18.35 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4180N0H  | 18.21                             | 18.62 | 19.02 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4200N    | 18.88                             | 19.98 | 21.08 | 0.05                              | 15.0         | 80                           | 5             | 100                             | 0.5           | 16.4                                     | 5             | Red  | Black  | —    |
| MAZ4200N0L  | 18.88                             | 19.28 | 19.68 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4200N0M  | 19.53                             | 19.95 | 20.37 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4200N0H  | 20.22                             | 20.65 | 21.08 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4220N    | 20.89                             | 22.02 | 23.15 | 0.05                              | 17.0         | 80                           | 5             | 100                             | 0.5           | 18.4                                     | 5             | Red  | Red    | —    |
| MAZ4220N0L  | 20.89                             | 21.33 | 21.76 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4220N0M  | 21.56                             | 22.01 | 22.45 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4220N0H  | 22.25                             | 22.70 | 23.15 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4240N    | 22.93                             | 24.25 | 25.57 | 0.05                              | 19.0         | 100                          | 5             | 120                             | 0.5           | 20.4                                     | 5             | Red  | Yellow | —    |
| MAZ4240N0L  | 22.93                             | 23.45 | 23.96 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4240N0M  | 23.76                             | 24.27 | 24.78 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4240N0H  | 24.56                             | 25.07 | 25.57 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4270N    | 25.20                             | 26.91 | 28.61 | 0.05                              | 21.0         | 120                          | 5             | 120                             | 0.5           | 23.4                                     | 5             | Red  | Purple | —    |
| MAZ4270N0L  | 25.20                             | 25.85 | 26.50 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4270N0M  | 26.19                             | 26.86 | 27.53 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4270N0H  | 27.21                             | 27.91 | 28.61 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4300N    | 28.22                             | 29.98 | 31.74 | 0.05                              | 23.0         | 160                          | 5             | 160                             | 0.5           | 26.6                                     | 5             | Orange   | Black  | —    |
| MAZ4300N0L  | 28.22                             | 28.94 | 29.66 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4300N0M  | 29.19                             | 29.94 | 30.69 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4300N0H  | 30.20                             | 30.97 | 31.74 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4330N    | 31.18                             | 33.01 | 34.83 | 0.05                              | 25.0         | 200                          | 5             | 200                             | 0.5           | 29.7                                     | 5             | Orange   | Orange | —    |
| MAZ4330N0L  | 31.18                             | 31.98 | 32.78 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4330N0M  | 32.15                             | 32.97 | 33.79 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4330N0H  | 33.13                             | 33.98 | 34.83 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4360N    | 34.12                             | 36.02 | 37.91 | 0.05                              | 27.0         | 250                          | 5             | 250                             | 0.5           | 33.0                                     | 5             | Orange   | Blue   | —    |
| MAZ4360N0L  | 34.12                             | 34.99 | 35.86 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4360N0M  | 35.07                             | 35.97 | 36.87 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4360N0H  | 36.07                             | 36.99 | 37.91 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4390N    | 37.04                             | 39.02 | 40.99 | 0.05                              | 30.0         | 300                          | 5             | 300                             | 0.5           | 35.6                                     | 5             | Orange   | White  | —    |
| MAZ4390N0L  | 37.04                             | 37.99 | 38.94 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4390N0M  | 38.00                             | 38.97 | 39.94 |                                   |              |                              |               |                                 |               |  |               |  |        |      |
| MAZ4390N0H  | 38.99                             | 39.99 | 40.99 |                                   |              |                              |               |                                 |               |  |               |  |        |      |

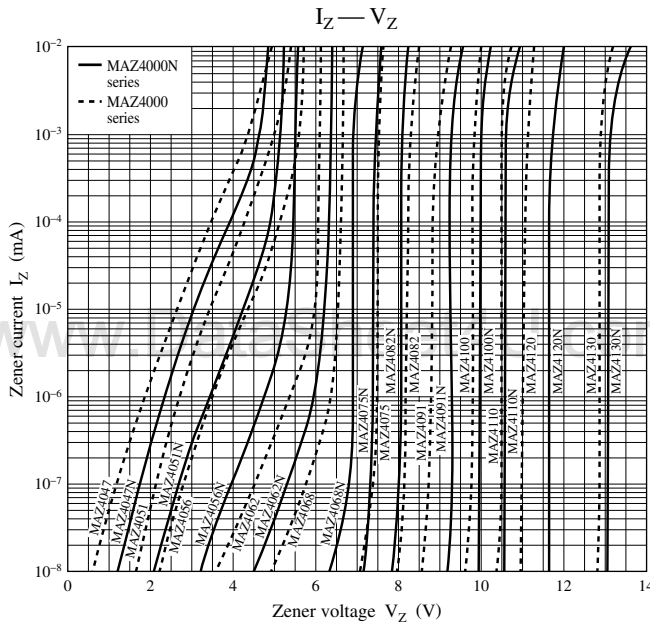
Note) 1. The  $V_Z$  value is the one after power application for 20 ms at  $T_a = 25^\circ\text{C}$ .

2. The zener voltage temperature coefficient is the one for  $T_j = 25^\circ\text{C}$  to  $150^\circ\text{C}$ .

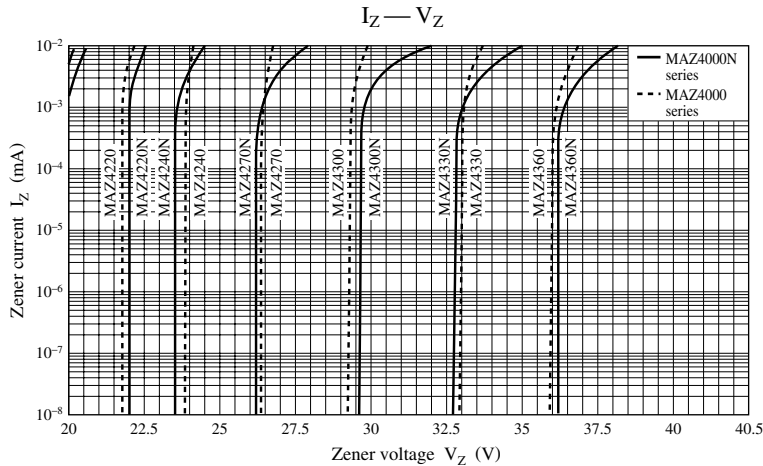




- Comparison (1) of rise performance between MAZ4000N and MAZ4000 series



- Comparison (2) of rise performance between MAZ4000N and MAZ4000 series



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  - Any applications other than the standard applications intended.
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- (5) When designing your equipment, comply with the guaranteed values, in particular those of maximum rating, the range of operating power supply voltage and heat radiation characteristics. Otherwise, we will not be liable for any defect which may arise later in your equipment.  
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- (6) When using products for which dry packing is required, observe the conditions (including shelf life and after-unpacking standby time) agreed upon when specification sheets are individually exchanged.
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