

# MAZ4000N 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)

### ■ 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 $T_a = 25^\circ\text{C}^{*1}$

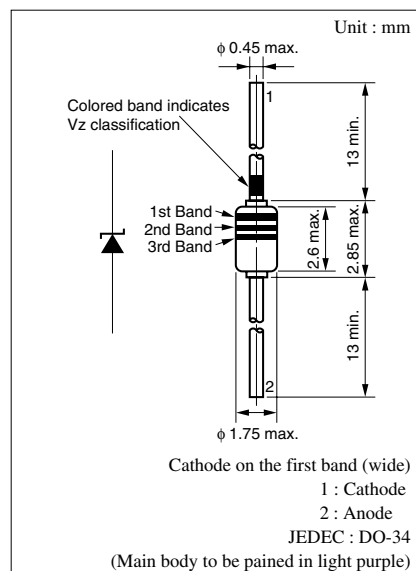
| Parameter                                              | Symbol   | Conditions                  | Min                                                                     | Typ  | Max | Unit                 |
|--------------------------------------------------------|----------|-----------------------------|-------------------------------------------------------------------------|------|-----|----------------------|
| Forward voltage                                        | $V_F$    | $I_F = 10 \text{ mA}$       |                                                                         | 0.83 | 0.9 | V                    |
| Zener voltage <sup>*2</sup>                            | $V_Z$    | $I_Z$ ..... Specified value |                                                                         |      |     | V                    |
| Operating resistance                                   | $R_{ZK}$ | $I_Z$ ..... Specified value | Refer to the list of the electrical characteristics within part numbers |      |     | $\Omega$             |
|                                                        | $R_Z$    | $I_Z$ ..... Specified value |                                                                         |      |     | $\Omega$             |
| Reverse current                                        | $I_R$    | $V_R$ ..... Specified value |                                                                         |      |     | $\mu\text{A}$        |
| Temperature coefficient of zener voltage <sup>*3</sup> | $S_Z$    | $I_Z$ ..... Specified value |                                                                         |      |     | mV/ $^\circ\text{C}$ |

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

| L rank | M rank | H rank |
|--------|--------|--------|
| Black  | Blue   | Red    |

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

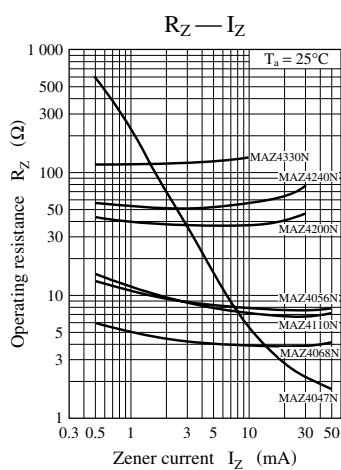
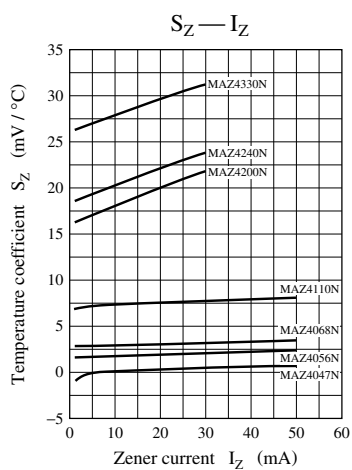
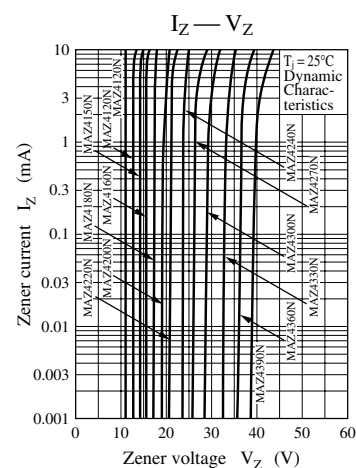
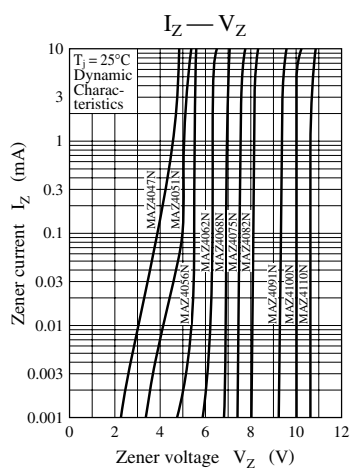
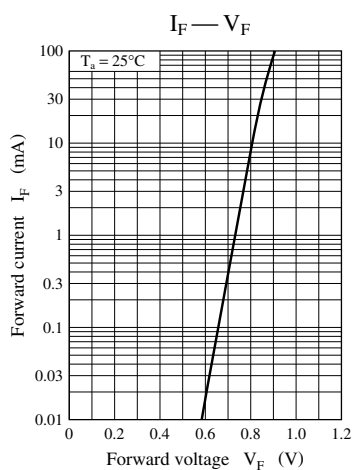
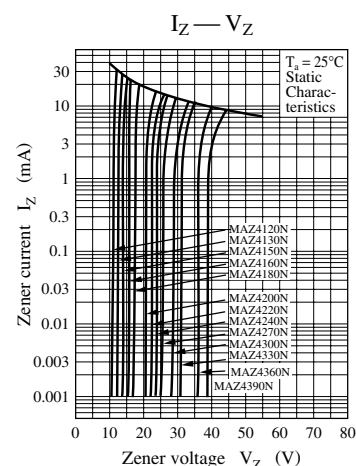
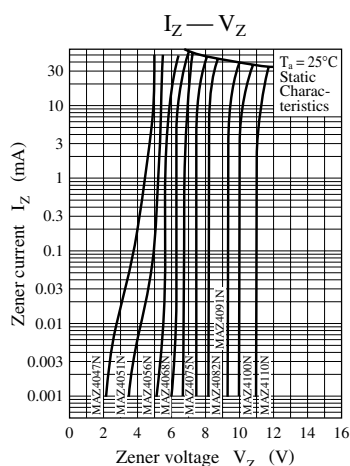
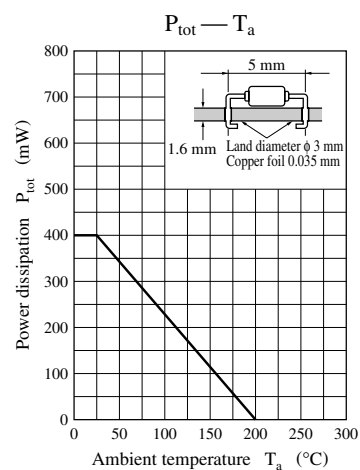
| Part Number  | Zener voltage                               |       |       | Reverse current        |                       | Operating resistance  |                        |                        |                        | Temperature coefficient of zener voltage |                        | Marking<br>(Color indication)<br>Main body:<br>light purple |        |        |
|--------------|---------------------------------------------|-------|-------|------------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------------------------|------------------------|-------------------------------------------------------------|--------|--------|
|              | V <sub>Z</sub> (V)<br>I <sub>Z</sub> = 5 mA |       |       | I <sub>R</sub><br>(μA) | V <sub>R</sub><br>(V) | R <sub>Z</sub><br>(Ω) | I <sub>Z</sub><br>(mA) | R <sub>ZK</sub><br>(Ω) | I <sub>Z</sub><br>(mA) | S <sub>Z</sub><br>(mV/°C)                | I <sub>Z</sub><br>(mA) |                                                             |        |        |
|              | Min                                         | Nom   | Max   | Max                    |                       | Max                   |                        | Max                    |                        | Max                                      |                        | Typ                                                         | Max    |        |
|              |                                             |       |       |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             | 1st.   | 2nd.   |
| MAZ4047(N)   | 4.42                                        | 4.66  | 4.90  | 2.0                    | 1.0                   | 80                    | 5                      | 800                    | 0.5                    | −1.4                                     | 5                      | Yellow                                                      | Purple | Purple |
| MAZ4047(N)-L | 4.42                                        | 4.52  | 4.61  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4047(N)-M | 4.55                                        | 4.65  | 4.75  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4047(N)-H | 4.69                                        | 4.80  | 4.90  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4051(N)   | 4.84                                        | 5.11  | 5.38  | 1.0                    | 2.0                   | 60                    | 5                      | 500                    | 0.5                    | −0.8                                     | 5                      | Green                                                       | Brown  | Brown  |
| MAZ4051(N)-L | 4.84                                        | 4.94  | 5.04  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4051(N)-M | 4.98                                        | 5.10  | 5.21  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4051(N)-H | 5.15                                        | 5.27  | 5.38  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4056(N)   | 5.32                                        | 5.62  | 5.92  | 0.5                    | 2.5                   | 40                    | 5                      | 200                    | 0.5                    | 1.2                                      | 5                      | Green                                                       | Blue   | Blue   |
| MAZ4056(N)-L | 5.32                                        | 5.44  | 5.55  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4056(N)-M | 5.49                                        | 5.61  | 5.73  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4056(N)-H | 5.67                                        | 5.80  | 5.92  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4062(N)   | 5.86                                        | 6.20  | 6.53  | 0.2                    | 4.0                   | 30                    | 5                      | 100                    | 0.5                    | 2.3                                      | 5                      | Blue                                                        | Red    | Red    |
| MAZ4062(N)-L | 5.86                                        | 5.99  | 6.12  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4062(N)-M | 6.06                                        | 6.20  | 6.33  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4062(N)-H | 6.26                                        | 6.40  | 6.53  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4068(N)   | 6.47                                        | 6.81  | 7.14  | 0.1                    | 4.0                   | 20                    | 5                      | 60                     | 0.5                    | 3.0                                      | 5                      | Blue                                                        | Gray   | Gray   |
| MAZ4068(N)-L | 6.47                                        | 6.60  | 6.73  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4068(N)-M | 6.65                                        | 6.79  | 6.93  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4068(N)-H | 6.86                                        | 7.00  | 7.14  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4075(N)   | 7.07                                        | 7.45  | 7.83  | 0.1                    | 5.0                   | 20                    | 5                      | 60                     | 0.5                    | 4.0                                      | 5                      | Purple                                                      | Green  | Green  |
| MAZ4075(N)-L | 7.07                                        | 7.21  | 7.35  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4075(N)-M | 7.29                                        | 7.44  | 7.59  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4075(N)-H | 7.53                                        | 7.68  | 7.83  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4082(N)   | 7.77                                        | 8.20  | 8.63  | 0.1                    | 5.0                   | 20                    | 5                      | 60                     | 0.5                    | 4.6                                      | 5                      | Gray                                                        | Red    | Red    |
| MAZ4082(N)-L | 7.77                                        | 7.93  | 8.09  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4082(N)-M | 8.03                                        | 8.19  | 8.35  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4082(N)-H | 8.29                                        | 8.46  | 8.63  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4091(N)   | 8.57                                        | 9.05  | 9.53  | 0.1                    | 6.0                   | 20                    | 5                      | 60                     | 0.5                    | 5.5                                      | 5                      | White                                                       | Brown  | Brown  |
| MAZ4091(N)-L | 8.57                                        | 8.75  | 8.93  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4091(N)-M | 8.86                                        | 9.04  | 9.22  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4091(N)-H | 9.15                                        | 9.34  | 9.53  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4100(N)   | 9.47                                        | 10.01 | 10.54 | 0.05                   | 7.0                   | 30                    | 5                      | 60                     | 0.5                    | 6.4                                      | 5                      | Brown                                                       | Black  | —      |
| MAZ4100(N)-L | 9.47                                        | 9.66  | 9.85  |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4100(N)-M | 9.79                                        | 9.99  | 10.19 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4100(N)-H | 10.12                                       | 10.33 | 10.54 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4110(N)   | 10.45                                       | 11.01 | 11.56 | 0.05                   | 8.0                   | 30                    | 5                      | 60                     | 0.5                    | 7.4                                      | 5                      | Brown                                                       | Brown  | —      |
| MAZ4110(N)-L | 10.45                                       | 10.66 | 10.87 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4110(N)-M | 10.77                                       | 10.99 | 11.21 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4110(N)-H | 11.10                                       | 11.33 | 11.56 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4120(N)   | 11.43                                       | 12.01 | 12.58 | 0.05                   | 9.0                   | 30                    | 5                      | 80                     | 0.5                    | 8.4                                      | 5                      | Brown                                                       | Red    | —      |
| MAZ4120(N)-L | 11.43                                       | 11.66 | 11.89 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4120(N)-M | 11.75                                       | 11.99 | 12.23 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4120(N)-H | 12.08                                       | 12.33 | 12.58 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4130(N)   | 12.46                                       | 13.21 | 13.96 | 0.05                   | 10.0                  | 35                    | 5                      | 80                     | 0.5                    | 9.4                                      | 5                      | Brown                                                       | Orange | —      |
| MAZ4130(N)-L | 12.46                                       | 12.74 | 13.02 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4130(N)-M | 12.90                                       | 13.19 | 13.48 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |
| MAZ4130(N)-H | 13.36                                       | 13.66 | 13.96 |                        |                       |                       |                        |                        |                        |                                          |                        |                                                             |        |        |

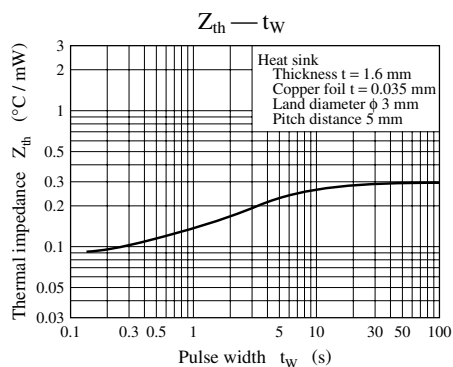
■ Electrical characteristics within part numbers (continued)  $T_a = 25^\circ\text{C}$

| Part Number  | Zener voltage                               |       |       | Reverse current        |                       | Operating resistance  |                        |                        |                        | Temperature coefficient of zener voltage |                        | Marking<br>(Color indication) |        |      |
|--------------|---------------------------------------------|-------|-------|------------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------------------------|------------------------|-------------------------------|--------|------|
|              | V <sub>Z</sub> (V)<br>I <sub>Z</sub> = 5 mA |       |       | I <sub>R</sub><br>(μA) | V <sub>R</sub><br>(V) | R <sub>Z</sub><br>(Ω) | I <sub>Z</sub><br>(mA) | R <sub>ZK</sub><br>(Ω) | I <sub>Z</sub><br>(mA) | S <sub>Z</sub><br>(mV/°C)                | I <sub>Z</sub><br>(mA) | Main body:<br>light purple    |        |      |
|              | Min                                         | Nom   | Max   | Max                    |                       | Max                   |                        | Max                    |                        | Typ                                      |                        |                               |        |      |
|              |                                             |       |       |                        |                       |                       |                        |                        |                        |                                          |                        | 1st.                          | 2nd.   | 3rd. |
| MAZ4150N     | 13.84                                       | 14.68 | 15.51 | 0.05                   | 11.0                  | 40                    | 5                      | 80                     | 0.5                    | 11.4                                     | 5                      | Brown                         | Green  | —    |
| MAZ4150(N)-L | 13.84                                       | 14.15 | 14.46 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4150(N)-M | 14.34                                       | 14.66 | 14.98 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4150(N)-H | 14.86                                       | 15.19 | 15.51 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4160(N)   | 15.38                                       | 16.23 | 17.08 | 0.05                   | 12.0                  | 50                    | 5                      | 80                     | 0.5                    | 12.4                                     | 5                      | Brown                         | Blue   | —    |
| MAZ4160(N)-L | 15.38                                       | 15.69 | 16.00 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4160(N)-M | 15.86                                       | 16.18 | 16.50 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4160(N)-H | 16.36                                       | 16.72 | 17.08 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4180(N)   | 16.94                                       | 17.98 | 19.02 | 0.05                   | 13.0                  | 60                    | 5                      | 80                     | 0.5                    | 14.4                                     | 5                      | Brown                         | Gray   | —    |
| MAZ4180(N)-L | 16.94                                       | 17.32 | 17.70 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4180(N)-M | 17.56                                       | 17.96 | 18.35 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4180(N)-H | 18.21                                       | 18.62 | 19.02 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4200(N)   | 18.88                                       | 19.98 | 21.08 | 0.05                   | 15.0                  | 80                    | 5                      | 100                    | 0.5                    | 16.4                                     | 5                      | Red                           | Black  | —    |
| MAZ4200(N)-L | 18.88                                       | 19.28 | 19.68 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4200(N)-M | 19.53                                       | 19.95 | 20.37 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4200(N)-H | 20.22                                       | 20.65 | 21.08 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4220(N)   | 20.89                                       | 22.02 | 23.15 | 0.05                   | 17.0                  | 80                    | 5                      | 100                    | 0.5                    | 18.4                                     | 5                      | Red                           | Red    | —    |
| MAZ4220(N)-L | 20.89                                       | 21.33 | 21.76 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4220(N)-M | 21.56                                       | 22.01 | 22.45 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4220(N)-H | 22.25                                       | 22.70 | 23.15 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4240(N)   | 22.93                                       | 24.25 | 25.57 | 0.05                   | 19.0                  | 100                   | 5                      | 120                    | 0.5                    | 20.4                                     | 5                      | Red                           | Yellow | —    |
| MAZ4240(N)-L | 22.93                                       | 23.45 | 23.96 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4240(N)-M | 23.76                                       | 24.27 | 24.78 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4240(N)-H | 24.56                                       | 25.07 | 25.57 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4270(N)   | 25.20                                       | 26.91 | 28.61 | 0.05                   | 21.0                  | 120                   | 5                      | 120                    | 0.5                    | 23.4                                     | 5                      | Red                           | Purple | —    |
| MAZ4270(N)-L | 25.20                                       | 25.85 | 26.50 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4270(N)-M | 26.19                                       | 26.86 | 27.53 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4270(N)-H | 27.21                                       | 27.91 | 28.61 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4300(N)   | 28.22                                       | 29.98 | 31.74 | 0.05                   | 23.0                  | 160                   | 5                      | 160                    | 0.5                    | 26.6                                     | 5                      | Orange                        | Black  | —    |
| MAZ4300(N)-L | 28.22                                       | 28.94 | 29.66 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4300(N)-M | 29.19                                       | 29.94 | 30.69 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4300(N)-H | 30.20                                       | 30.97 | 31.74 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4330(N)   | 31.18                                       | 33.01 | 34.83 | 0.05                   | 25.0                  | 200                   | 5                      | 200                    | 0.5                    | 29.7                                     | 5                      | Orange                        | Orange | —    |
| MAZ4330(N)-L | 31.18                                       | 31.98 | 32.78 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4330(N)-M | 32.15                                       | 32.97 | 33.79 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4330(N)-H | 33.13                                       | 33.98 | 34.83 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4360(N)   | 34.12                                       | 36.02 | 37.91 | 0.05                   | 27.0                  | 250                   | 5                      | 250                    | 0.5                    | 33.0                                     | 5                      | Orange                        | Blue   | —    |
| MAZ4360(N)-L | 34.12                                       | 34.99 | 35.86 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4360(N)-M | 35.07                                       | 35.97 | 36.87 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4360(N)-H | 36.07                                       | 36.99 | 37.91 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4390(N)   | 37.04                                       | 39.02 | 40.99 | 0.05                   | 30.0                  | 300                   | 5                      | 300                    | 0.5                    | 35.6                                     | 5                      | Orange                        | White  | —    |
| MAZ4390(N)-L | 37.04                                       | 37.99 | 38.94 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4390(N)-M | 38.00                                       | 38.97 | 39.94 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |
| MAZ4390(N)-H | 38.99                                       | 39.99 | 40.99 |                        |                       |                       |                        |                        |                        |                                          |                        |                               |        |      |

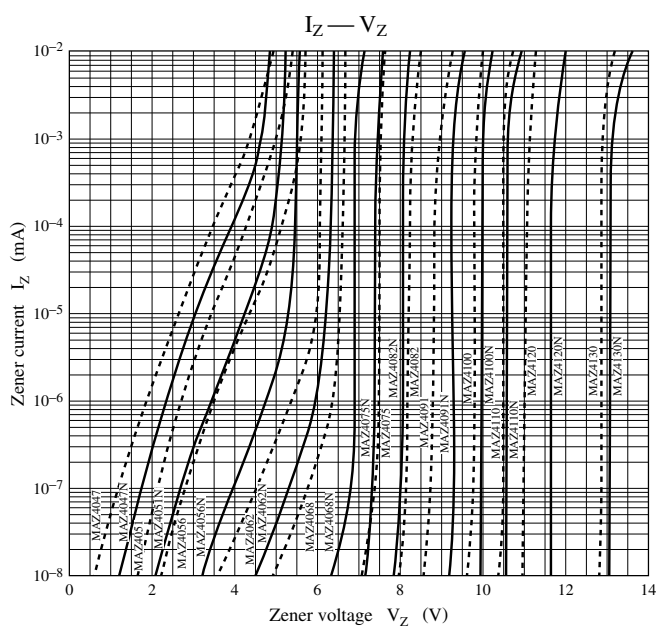
Note) 1. The  $V_Z$  value is the one after power application for 20 ms at  $T_a = 25^\circ\text{C}$ .

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

