

# 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 $T_a = 25^\circ\text{C}^{*1}$

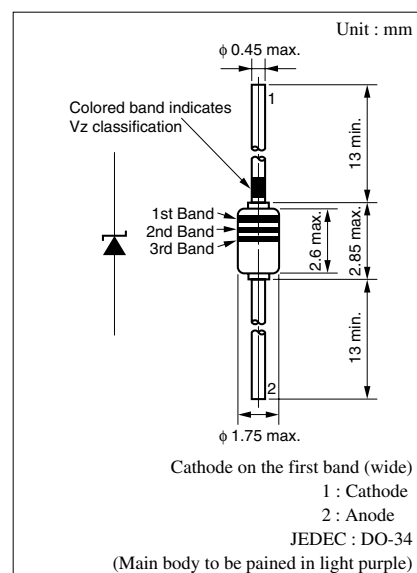
| Parameter                                              | Symbol   | Conditions                  | Min                                                                     | Typ  | Max | Unit                 |
|--------------------------------------------------------|----------|-----------------------------|-------------------------------------------------------------------------|------|-----|----------------------|
| 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  $T_a = 25^\circ\text{C}$

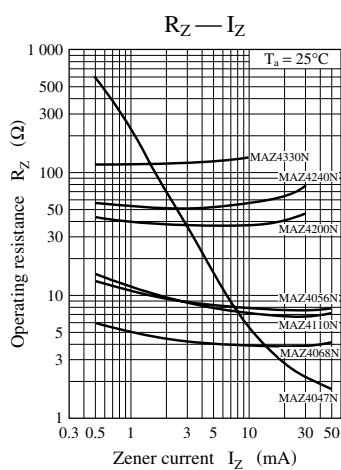
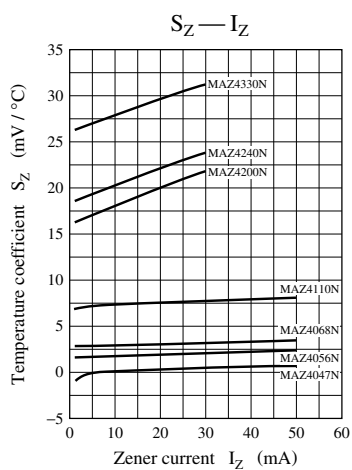
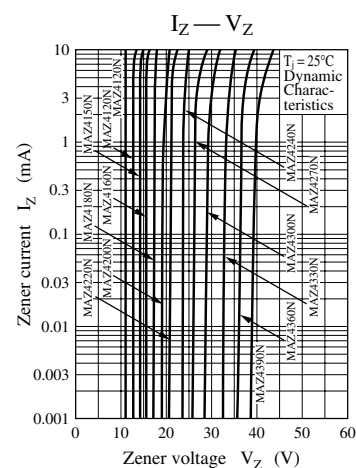
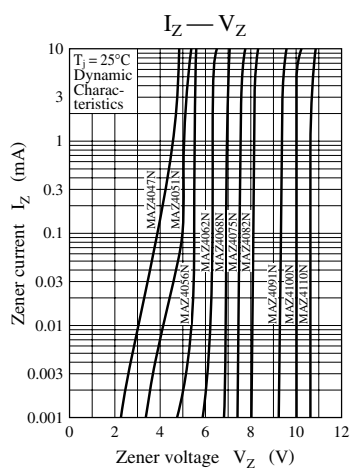
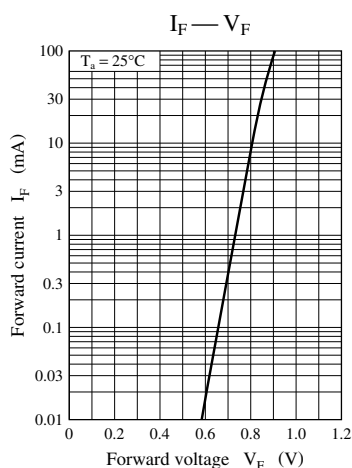
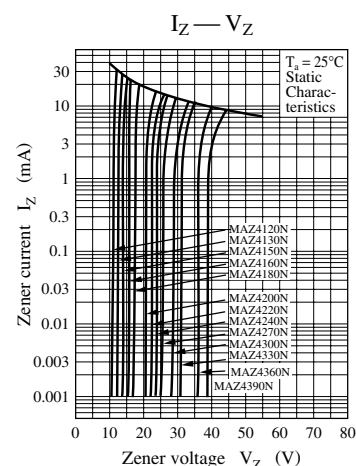
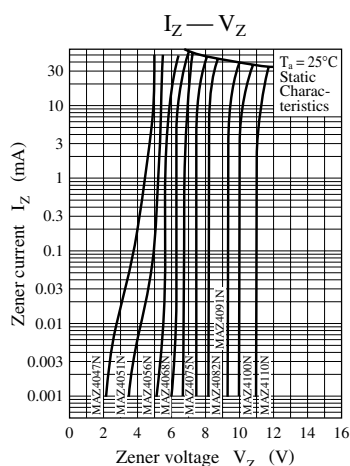
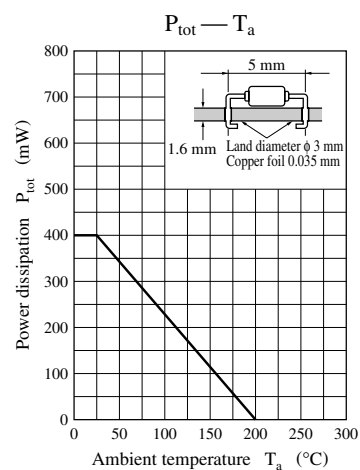
| Part Number  | Zener voltage                     |       |       | Reverse current            |              | Operating resistance  |               |                          |               | Temperature coefficient of zener voltage |               | Marking<br>(Color indication)<br>Main body:<br>light purple |        |        |
|--------------|-----------------------------------|-------|-------|----------------------------|--------------|-----------------------|---------------|--------------------------|---------------|------------------------------------------|---------------|-------------------------------------------------------------|--------|--------|
|              | $V_Z$ (V)<br>$I_Z = 5 \text{ mA}$ |       |       | $I_R$<br>( $\mu\text{A}$ ) | $V_R$<br>(V) | $R_Z$<br>( $\Omega$ ) | $I_Z$<br>(mA) | $R_{ZK}$<br>( $\Omega$ ) | $I_Z$<br>(mA) | $S_Z$<br>(mV/ $^\circ\text{C}$ )         | $I_Z$<br>(mA) |                                                             |        |        |
|              | Min                               | Nom   | Max   | Max                        |              | Max                   |               | Max                      |               | Typ                                      |               | 1st.                                                        | 2nd.   | 3rd.   |
|              |                                   |       |       |                            |              |                       |               |                          |               |                                          |               |                                                             |        |        |
| 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 |                            |              |                       |               |                          |               |                                          |               |                                                             |        |        |

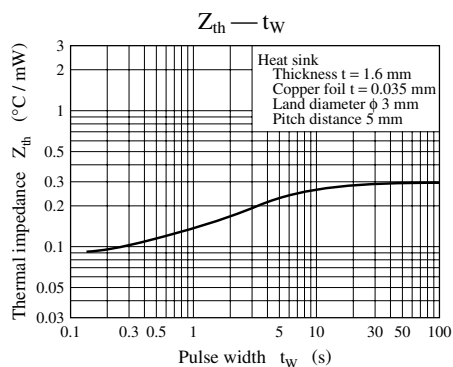
■ Electrical characteristics within part numbers (continued)  $T_a = 25^\circ\text{C}$

| Part Number  | Zener voltage         |       |       | Reverse current     |                    | Operating resistance |                     |                     | Temperature coefficient of zener voltage |                        | Marking |                                                |        |      |
|--------------|-----------------------|-------|-------|---------------------|--------------------|----------------------|---------------------|---------------------|------------------------------------------|------------------------|---------|------------------------------------------------|--------|------|
|              | V <sub>Z</sub> (V)    |       |       | I <sub>R</sub> (μA) | V <sub>R</sub> (V) | R <sub>Z</sub> (Ω)   |                     | R <sub>ZK</sub> (Ω) |                                          | S <sub>Z</sub> (mV/°C) |         | Color indication<br>Main body:<br>light purple |        |      |
|              | I <sub>Z</sub> = 5 mA |       |       |                     |                    | I <sub>Z</sub> (mA)  | I <sub>Z</sub> (mA) | (mV/°C)             | I <sub>Z</sub> (mA)                      |                        |         |                                                |        |      |
|              | Min                   | Nom   | Max   | Max                 | Max                |                      |                     |                     |                                          | Max                    | Typ     |                                                | 1st.   | 2nd. |
| 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 |                     |                    |                      |                     |                     |                                          |                        |         |                                                |        |      |

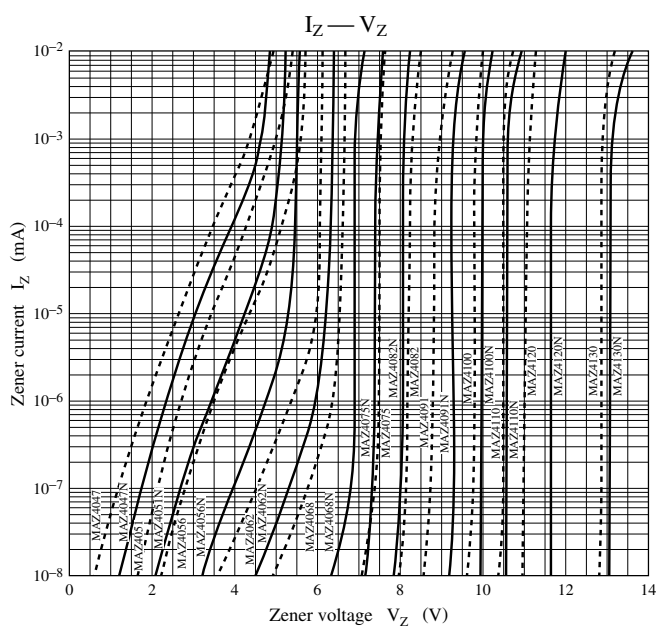
Note) 1. The  $V_Z$  value is the one after power application for 20 ms at  $T_a = 25^\circ\text{C}$ .

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

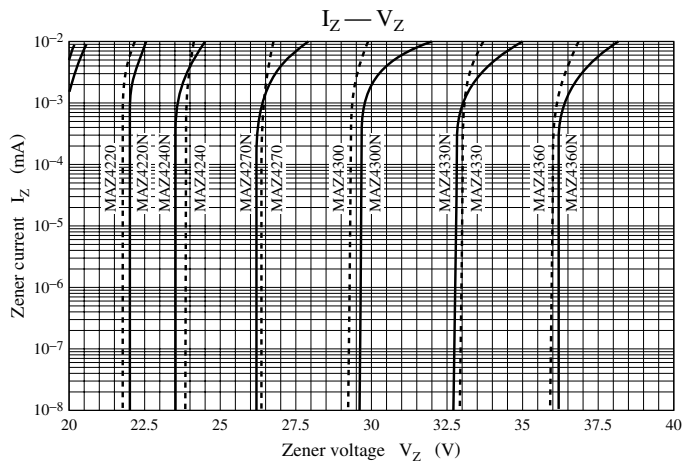




- Comparison (1) of rise performance between MAZ4000N and MAZ4000 series



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



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