

MAZ2000 Series (MA2000 Series)

Silicon planar type

For stabilization of power supply

■ Features

- High reliability, achieved by the combination the planar type and the glass seal
- Large power dissipation: $P_D = 1$ W
- Wide voltage range: $V_Z = 5.1$ V to 56.0 V
- Easy-to-use because of the finely divided zener voltage ranks, such as A and B ranks

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

| Parameter | Symbol | Rating | Unit |
|---------------------------------------------------|-----------|-------------|------------------|
| Repetitive peak forward current | I_{FRM} | 400 | mA |
| Total power dissipation *1 | P_{tot} | 1 | W |
| Non-repetitive reverse surge power dissipation *2 | P_{ZSM} | 75 | W |
| Junction temperature | T_j | 200 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +200 | $^\circ\text{C}$ |

Note) *1: With a printed circuit board

*2: $t = 100 \mu\text{s}$, $T_j = 150^\circ\text{C}$

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

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---------------------------------------------|--------|-----------------------|-----|-----|-----|----------------------|
| Forward voltage | V_F | $I_F = 200$ mA | | | 1 | V |
| Zener voltage *2 | V_Z | I_Z Specified value | | | | V |
| Zener operating resistance | R_Z | I_Z Specified value | | | | Ω |
| Reverse current | I_R | V_R Specified value | | | | μA |
| Temperature coefficient of zener voltage *3 | S_Z | I_Z Specified value | | | | mV/ $^\circ\text{C}$ |
| Terminal capacitance | C_t | V_R Specified value | | | | pF |

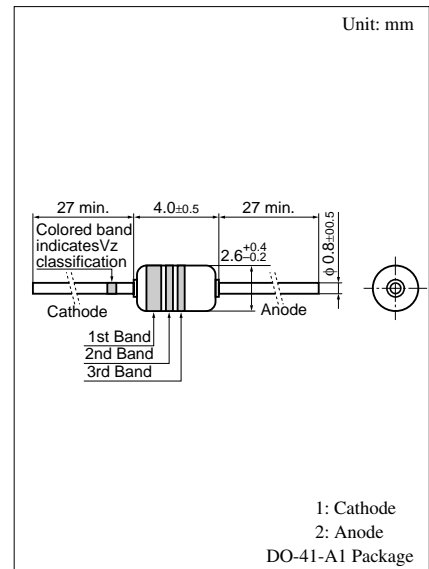
Refer to the list of the electrical characteristics within part numbers

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

2 *1: The V_Z value is for the temperature of 25°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°C



• Color indication of V_Z rank classification

| Rank | A | B |
|-------|------|-----|
| Color | Blue | Red |

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

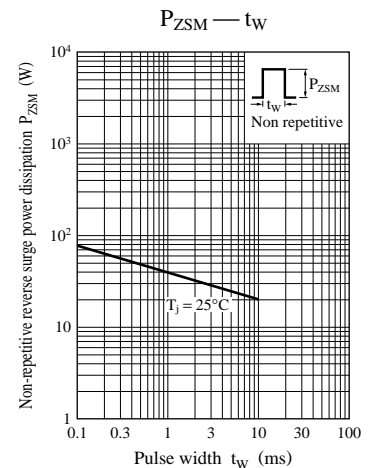
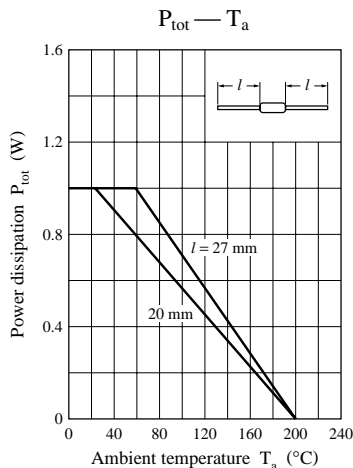
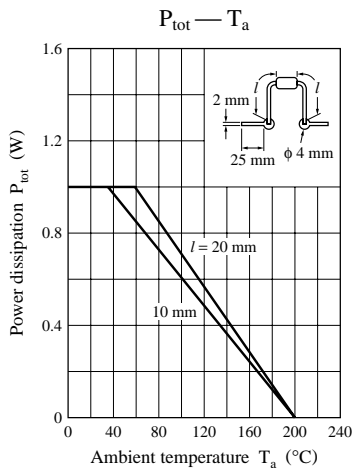
■ Electrical characteristics within part numbers $T_a = 25^\circ\text{C}$

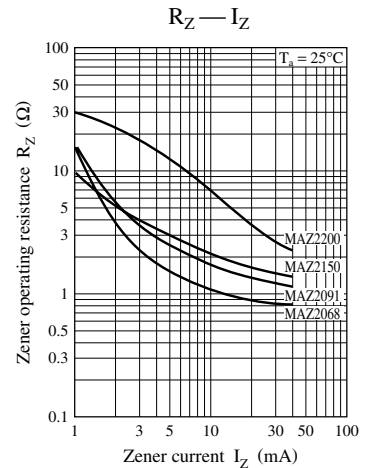
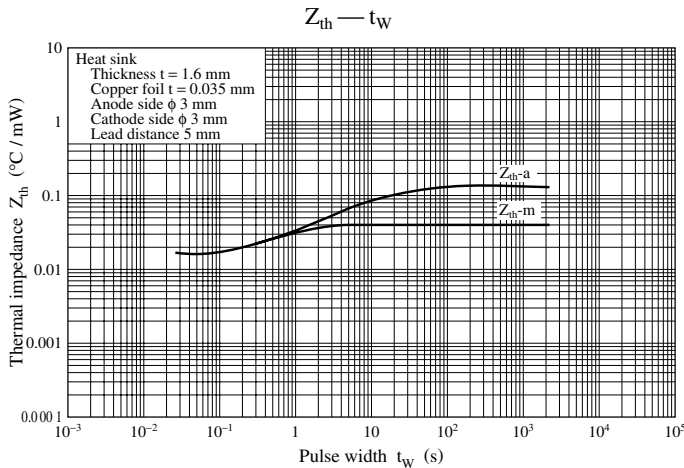
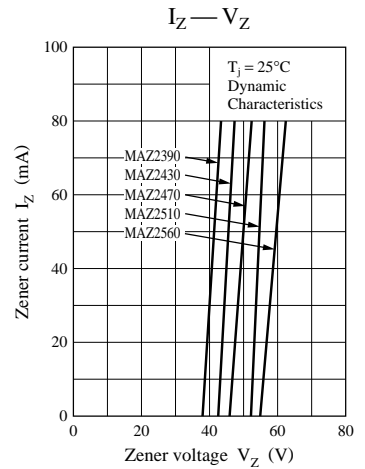
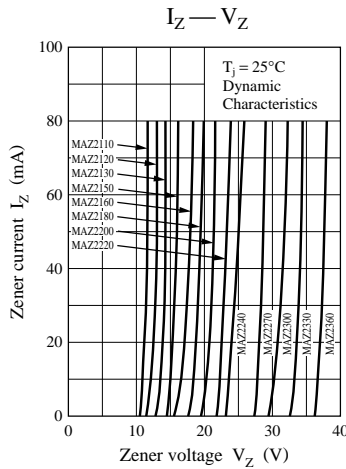
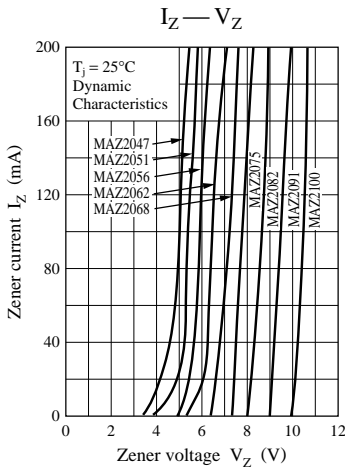
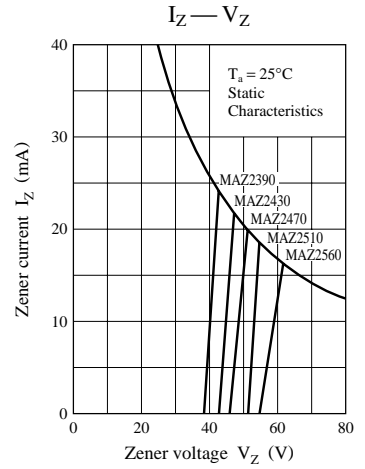
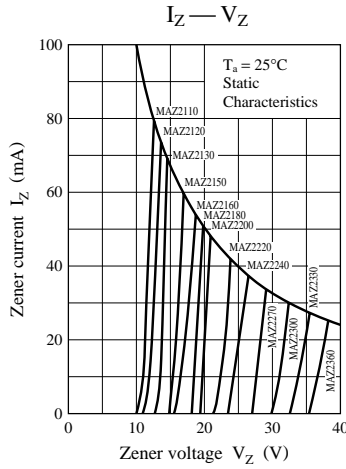
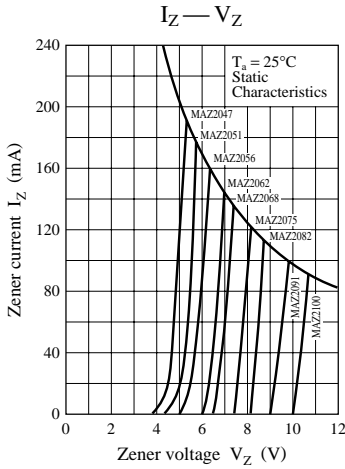
| Part Number | Zener voltage | | | Reverse current | | Zener operating resistance | | Temperature coefficient of zener voltage | | Terminal capacitance | Marking symbol (Color indication) | | | |
|-------------|---------------|-------|------|-------------------------|-----------|----------------------------|------------|------------------------------------------|------------|----------------------------------------------------|-----------------------------------|--------|--------|-------|
| | V_Z (V) | | | I_R (μA) | | R_Z (Ω) | | S_Z (mV/ $^\circ\text{C}$) | | C_T (pF) ($V_R = 0$ V) $f = 1$ MHz Typ | 1st. | 2nd. | 3rd. | |
| | I_Z (mA) | Min | Nom | Max | V_R (V) | Max | I_Z (mA) | Max | I_Z (mA) | | | | | Typ |
| MAZ2051 | 40 | 4.8 | 5.1 | 5.4 | 1 | 20 | 40 | 10 | 40 | 0 | 200 | Green | Brown | Brown |
| MAZ20510A | | 4.8 | — | 5.15 | | | | | | | | | | |
| MAZ20510B | | 5.05 | — | 5.4 | | | | | | | | | | |
| MAZ2056 | 40 | 5.2 | 5.6 | 6.0 | 2 | 20 | 40 | 8 | 40 | 1.5 | 180 | Green | Blue | Blue |
| MAZ20560A | | 5.3 | — | 5.7 | | | | | | | | | | |
| MAZ20560B | | 5.6 | — | 6.0 | | | | | | | | | | |
| MAZ2062 | 40 | 5.8 | 6.2 | 6.6 | 3 | 20 | 40 | 6 | 40 | 2.4 | 330 | Blue | Red | Red |
| MAZ20620A | | 5.8 | — | 6.2 | | | | | | | | | | |
| MAZ20620B | | 6.1 | — | 6.5 | | | | | | | | | | |
| MAZ2068 | 40 | 6.4 | 6.8 | 7.2 | 3 | 10 | 40 | 6 | 40 | 3.1 | 280 | Blue | Gray | Gray |
| MAZ20680A | | 6.4 | — | 6.8 | | | | | | | | | | |
| MAZ20680B | | 6.7 | — | 7.1 | | | | | | | | | | |
| MAZ2075 | 40 | 7.0 | 7.5 | 7.9 | 3 | 10 | 40 | 5 | 40 | 3.8 | 250 | Purple | Green | Green |
| MAZ20750A | | 7.0 | — | 7.45 | | | | | | | | | | |
| MAZ20750B | | 7.35 | — | 7.8 | | | | | | | | | | |
| MAZ2082 | 40 | 7.7 | 8.2 | 8.7 | 4 | 10 | 40 | 5 | 40 | 4.5 | 230 | Gray | Red | Red |
| MAZ20820A | | 7.7 | — | 8.2 | | | | | | | | | | |
| MAZ20820B | | 8.1 | — | 8.6 | | | | | | | | | | |
| MAZ2091 | 40 | 8.5 | 9.1 | 9.6 | 5 | 10 | 40 | 6 | 40 | 5.4 | 220 | White | Brown | Brown |
| MAZ20910A | | 8.5 | — | 9.05 | | | | | | | | | | |
| MAZ20910B | | 8.95 | — | 9.5 | | | | | | | | | | |
| MAZ2100 | 40 | 9.4 | 10.0 | 10.6 | 7 | 10 | 40 | 6 | 40 | 6.3 | 200 | Brown | Black | — |
| MAZ21000A | | 9.4 | — | 10 | | | | | | | | | | |
| MAZ21000B | | 9.9 | — | 10.5 | | | | | | | | | | |
| MAZ2110 | 20 | 10.4 | 11.0 | 11.6 | 7 | 5 | 20 | 8 | 20 | 7.4 | 160 | Brown | Brown | — |
| MAZ21100A | | 10.4 | — | 11.05 | | | | | | | | | | |
| MAZ21100B | | 10.85 | — | 11.5 | | | | | | | | | | |
| MAZ2120 | 20 | 11.4 | 12.0 | 12.7 | 8 | 5 | 20 | 8 | 20 | 8.4 | 160 | Brown | Red | — |
| MAZ21200A | | 11.4 | — | 12.1 | | | | | | | | | | |
| MAZ21200B | | 11.9 | — | 12.6 | | | | | | | | | | |
| MAZ2130 | 20 | 12.4 | 13.0 | 14.1 | 9 | 5 | 20 | 10 | 20 | 9.4 | 155 | Brown | Orange | — |
| MAZ21300A | | 12.4 | — | 13.25 | | | | | | | | | | |
| MAZ21300B | | 13.15 | — | 14.0 | | | | | | | | | | |
| MAZ2150 | 20 | 13.8 | 15.0 | 15.6 | 10 | 5 | 20 | 12 | 20 | 11.4 | 150 | Brown | Green | — |
| MAZ21500A | | 13.8 | — | 14.7 | | | | | | | | | | |
| MAZ21500B | | 14.5 | — | 15.4 | | | | | | | | | | |
| MAZ2160 | 20 | 15.3 | 16.0 | 17.1 | 11 | 5 | 20 | 12 | 20 | 12.5 | 135 | Brown | Blue | — |
| MAZ21600A | | 15.3 | — | 16.3 | | | | | | | | | | |
| MAZ21600B | | 16.1 | — | 17.1 | | | | | | | | | | |
| MAZ2180 | 20 | 16.8 | 18.0 | 19.1 | 12 | 5 | 20 | 15 | 20 | 14.5 | 110 | Brown | Gray | — |
| MAZ21800A | | 16.8 | — | 18.0 | | | | | | | | | | |
| MAZ21800B | | 17.8 | — | 19.0 | | | | | | | | | | |
| MAZ2200 | 20 | 18.8 | 20.0 | 21.2 | 14 | 5 | 20 | 15 | 20 | 16.6 | 100 | Red | Black | — |
| MAZ22000A | | 18.8 | — | 20.0 | | | | | | | | | | |
| MAZ22000B | | 19.8 | — | 21.0 | | | | | | | | | | |

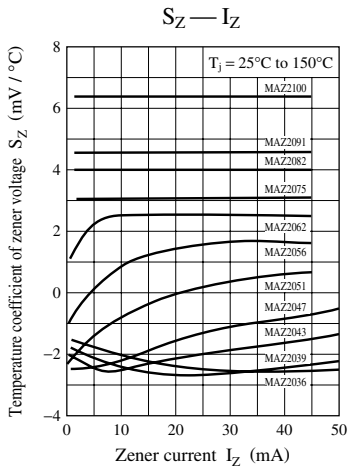
■ Electrical characteristics within part numbers (continued) $T_a = 25^\circ\text{C}$

| Part number | Zener voltage | | | Reverse current | | Zener operating resistance | | Temperature coefficient of zener voltage | | Terminal capacitance C_t (pF) ($V_R = 0$ V) $f = 1$ MHz Typ | Marking symbol (Color indication) | | | |
|-------------|---------------|-------|------|-------------------------|-----------|----------------------------|------------|------------------------------------------|------------|----------------------------------------------------------------------------|--------------------------------------|--------|--------|---|
| | V_Z (V) | | | I_R (μA) | | R_Z (Ω) | | S_Z (mV/ $^\circ\text{C}$) | | | 1st. | 2nd. | 3rd. | |
| | I_Z (mA) | Min | Nom | Max | V_R (V) | Max | I_Z (mA) | Max | I_Z (mA) | Typ | | | | |
| MAZ2220 | 10 | 20.8 | 22.0 | 23.3 | 15 | 5 | 10 | 20 | 10 | 18.6 | 95 | Red | Red | — |
| MAZ22200A | | 20.8 | — | 22.15 | | | | | | | | | | |
| MAZ22200B | | 21.85 | — | 23.2 | | | | | | | | | | |
| MAZ2240 | 10 | 22.8 | 24.0 | 25.6 | 16 | 5 | 10 | 20 | 10 | 20.7 | 90 | Red | Yellow | — |
| MAZ22400A | | 22.8 | — | 24.35 | | | | | | | | | | |
| MAZ22400B | | 24.15 | — | 25.6 | | | | | | | | | | |
| MAZ2270 | 10 | 25.1 | 27.0 | 28.9 | 18 | 2 | 10 | 25 | 10 | 23.8 | 85 | Red | Purple | — |
| MAZ22700A | | 25.1 | — | 27.0 | | | | | | | | | | |
| MAZ22700B | | 26.9 | — | 28.9 | | | | | | | | | | |
| MAZ2300 | 10 | 28.0 | 30.0 | 32.0 | 20 | 2 | 10 | 25 | 10 | 26.9 | 80 | Orange | Black | — |
| MAZ23000A | | 28.0 | — | 30.1 | | | | | | | | | | |
| MAZ23000B | | 29.9 | — | 32.0 | | | | | | | | | | |
| MAZ2330 | 10 | 31.0 | 33.0 | 35.0 | 22 | 2 | 10 | 30 | 10 | 30.0 | 75 | Orange | Orange | — |
| MAZ23300A | | 31.0 | — | 33.14 | | | | | | | | | | |
| MAZ23300B | | 32.86 | — | 35.0 | | | | | | | | | | |
| MAZ2360 | 10 | 34.0 | 36.0 | 38.0 | 24 | 2 | 10 | 30 | 10 | 33.4 | 70 | Orange | Blue | — |
| MAZ23600A | | 34.0 | — | 36.16 | | | | | | | | | | |
| MAZ23600B | | 35.84 | — | 38.0 | | | | | | | | | | |
| MAZ2390 | 10 | 37.0 | 39.0 | 41.0 | 26 | 5 | 10 | 50 | 10 | 36.3 | 65 | Orange | White | — |
| MAZ2430 | 10 | 40.0 | 43.0 | 46.0 | 29 | 5 | 10 | 50 | 10 | 41.1 | 60 | Yellow | Orange | — |
| MAZ2470 | 10 | 44.0 | 47.0 | 50.0 | 31 | 5 | 10 | 50 | 10 | 44.9 | 55 | Yellow | Purple | — |
| MAZ2510 | 10 | 48.0 | 51.0 | 54.0 | 33 | 5 | 10 | 50 | 10 | 48.6 | 50 | Green | Brown | — |
| MAZ2560 | 10 | 52.0 | 56.0 | 60.0 | 35 | 5 | 10 | 50 | 10 | 54.9 | 45 | Green | Blue | — |

- 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°C .







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