

MAZ3000 Series (MA3000 Series)

Silicon planar type

For stabilization of power supply

■ Features

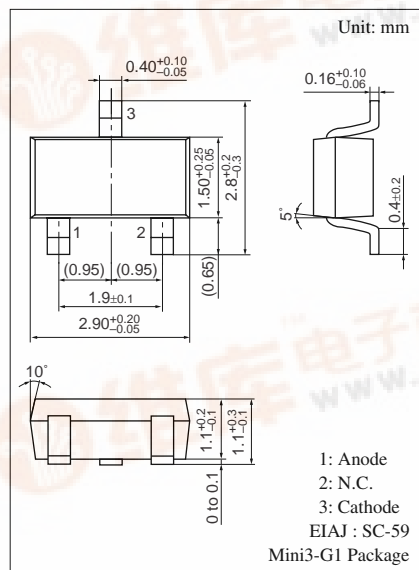
- Mini type 3-pin package (Mini3-G1)
- Allowing to achieve a high-density set
- Sharp rising performance
- Wide voltage range: $V_Z = 2.0\text{ V}$ to 36 V

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

| Parameter | Symbol | Rating | Unit |
|---|-------------|-------------|------------------|
| Average forward current | $I_{F(AV)}$ | 100 | mA |
| Repetitive peak forward current | I_{FRM} | 200 | mA |
| Total power dissipation *1 | P_{tot} | 200 | mW |
| Non-repetitive reverse surge power dissipation *2 | P_{ZSM} | 15 | W |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

Note) *1: With a printed circuit board

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

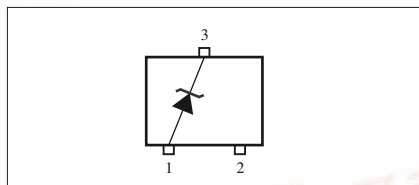


Marking Symbol

Refer to the list of the electrical characteristics within part numbers
(Example) MAZ3020: 2.0
MAZ30820H: 8.2H

Note) L/M/H marked products will be supplied unless other wise specified

Internal Connection



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

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|----------|-----------------------|---|-----|-----|----------------------------|
| Forward voltage | V_F | $I_F = 10\text{ mA}$ | | 0.8 | 0.9 | V |
| Zener voltage *2 | V_Z | I_Z Specified value | | | | V |
| Zener knee operating resistance | R_{ZK} | I_Z Specified value | | | | Ω |
| Zener operating resistance | R_Z | I_Z Specified value | | | | Ω |
| Reverse current | I_{R1} | V_R Specified value | Refer to the list of the electrical characteristics within part numbers | | | μA |
| | I_{R2} | V_R Specified value | | | | μA |
| Temperature coefficient of zener voltage *3 | S_Z | I_Z Specified value | | | | $\text{mV}/^\circ\text{C}$ |
| Terminal capacitance | C_t | V_R Specified value | | | | pF |

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

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



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

• $V_Z = 9.1\text{ V to }24.0\text{ V}$ ($I_Z = 5\text{ mA}$)

| Part number | Zener voltage | | | Reverse current | | | | Zener operating resistance | | | | Temperature coefficient of zener voltage | | | Terminal capacitance | | Marking symbol |
|-------------|---------------------|------|-------|----------------------------|------|----------------------------|------|----------------------------|-----|-----------------------|-----|--|------|-----|--|-----|----------------------|
| | V_Z (V) | | | I_{R1} (μA) | | I_{R2} (μA) | | R_Z (Ω) | | R_{ZK} (Ω) | | S_Z (mV/ $^\circ\text{C}$) | | | C_t (pF) | | |
| | $I_Z = 5\text{ mA}$ | | | V_R | Max | V_R | Max | $I_Z = 5\text{ mA}$ | | I_Z | | $I_Z = 5\text{ mA}$ | | | $(V_R = 0\text{ V})$ $f = 1\text{ MHz}$ | | |
| | Min | Nom | Max | (V) | Max | (V) | Max | Typ | Max | (mA) | Max | Min | Typ | Max | Typ | Max | |
| MA3091 | 8.5 | 9.1 | 9.6 | | | 8 | | | | | | | | | | | 9.1L or 9.1M or 9.1H |
| MAZ30910L | 8.58 | 8.8 | 9.02 | 6 | 0.2 | 8 | 60 | 6 | 15 | 0.5 | 130 | 3.8 | 5.5 | 7 | 70 | 90 | 9.1L |
| MAZ30910M | 8.87 | 9.1 | 9.33 | | | 8.3 | | | | | | | | | | | 9.1M |
| MAZ30910H | 9.14 | 9.4 | 9.6 | | | 8.6 | | | | | | | | | | | 9.1H |
| MAZ3100 | 9.4 | 10 | 10.6 | 7 | 0.2 | 8.9 | 60 | 8 | 20 | 0.5 | 130 | 4.5 | 6.4 | 8 | 70 | 90 | 10L or 10M or 10H |
| MAZ31000L | 9.44 | 9.7 | 9.92 | | | 8.9 | | | | | | | | | | | 10L |
| MAZ31000M | 9.75 | 10 | 10.25 | | | 9.2 | | | | | | | | | | | 10M |
| MAZ31000H | 10.07 | 10.3 | 10.59 | | | 9.5 | | | | | | | | | | | 10H |
| MAZ3110 | 10.4 | 11 | 11.6 | 7 | 0.1 | 9.9 | 60 | 10 | 20 | 0.5 | 170 | 5.4 | 7.4 | 9 | 65 | 85 | 11L or 11M or 11H |
| MAZ31100L | 10.4 | 10.7 | 10.94 | | | 9.9 | | | | | | | | | | | 11L |
| MAZ31100M | 10.73 | 11 | 11.28 | | | 10.2 | | | | | | | | | | | 11M |
| MAZ31100H | 11.05 | 11.3 | 11.6 | | | 10.5 | | | | | | | | | | | 11H |
| MAZ3120 | 11.4 | 12 | 12.7 | | | 8 | | | | | | | | | | | 0.1 |
| MAZ31200L | 11.4 | 11.7 | 11.96 | 10.9 | 12L | | | | | | | | | | | | |
| MAZ31200M | 11.73 | 12 | 12.33 | 11.2 | 12M | | | | | | | | | | | | |
| MAZ31200H | 12.06 | 12.3 | 12.68 | 11.5 | 12H | | | | | | | | | | | | |
| MAZ3130 | 12.4 | 13 | 14.1 | 9 | 0.1 | | 11.9 | 60 | 10 | 30 | 0.5 | 170 | 7 | 9.4 | 11 | 60 | |
| MAZ31300L | 12.4 | 12.7 | 12.99 | | | 11.9 | 13L | | | | | | | | | | |
| MAZ31300M | 12.73 | 13 | 13.4 | | | 12.2 | 13M | | | | | | | | | | |
| MAZ31300H | 13.25 | 13.7 | 14.08 | | | 12.7 | 13H | | | | | | | | | | |
| MAZ31400M | 13.65 | 14 | 14.35 | 9 | 0.1 | 13.1 | 60 | 10 | 30 | 0.5 | 170 | 7 | 10 | 13 | 60 | 80 | 14M |
| MAZ3150 | 13.9 | 15 | 15.6 | 10 | 0.05 | 13.4 | 60 | 10 | 30 | 0.5 | 170 | 9.2 | 11.4 | 13 | 55 | 75 | 15L or 15M or 15H |
| MAZ31500L | 13.9 | 14.3 | 14.76 | | | 13.4 | | | | | | | | | | | 15L |
| MAZ31500M | 14.6 | 15 | 15.35 | | | 14.1 | | | | | | | | | | | 15M |
| MAZ31500H | 14.95 | 15.3 | 15.6 | | | 14.4 | | | | | | | | | | | 15H |
| MAZ3160 | 15.3 | 16 | 17.1 | 11 | 0.05 | 14.8 | 60 | 10 | 40 | 0.5 | 170 | 10.4 | 12.4 | 14 | 52 | 75 | 16L or 16M or 16H |
| MAZ31600L | 15.3 | 15.7 | 16.09 | | | 14.8 | | | | | | | | | | | 16L |
| MAZ31600M | 15.7 | 16 | 16.5 | | | 15.2 | | | | | | | | | | | 16M |
| MAZ31600H | 16.26 | 16.7 | 17.1 | | | 15.7 | | | | | | | | | | | 16H |
| MAZ3180 | 16.9 | 18 | 19.1 | | | 13 | | | | | | | | | | | 0.05 |
| MAZ31800L | 16.9 | 17.3 | 17.76 | 16.4 | 18L | | | | | | | | | | | | |
| MAZ31800M | 17.55 | 18 | 18.45 | 17 | 18M | | | | | | | | | | | | |
| MAZ31800H | 18.2 | 18.7 | 19.1 | 17.7 | 18H | | | | | | | | | | | | |
| MAZ3200 | 18.8 | 20 | 21.2 | 14 | 0.05 | 18.3 | 60 | 15 | 55 | 0.5 | 180 | 14.4 | 16.4 | 18 | 36 | 60 | 20L or 20M or 20H |
| MAZ32000L | 18.85 | 19.3 | 19.81 | | | 18.3 | | | | | | | | | | | 20L |
| MAZ32000M | 19.50 | 20 | 20.5 | | | 19 | | | | | | | | | | | 20M |
| MAZ32000H | 20.15 | 20.7 | 21.19 | | | 19.6 | | | | | | | | | | | 20H |
| MAZ3220 | 20.8 | 22 | 23.3 | | | 15 | | | | | | | | | | | 0.05 |
| MAZ32200L | 20.8 | 21.3 | 21.86 | 20.3 | 22L | | | | | | | | | | | | |
| MAZ32200M | 21.45 | 22 | 22.55 | 20.9 | 22M | | | | | | | | | | | | |
| MAZ32200H | 22.1 | 22.7 | 23.24 | 21.6 | 22H | | | | | | | | | | | | |
| MAZ3240 | 22.8 | 24 | 25.6 | 17 | 0.05 | 22.3 | 60 | 25 | 70 | 0.5 | 180 | 18.4 | 20.4 | 22 | 33 | 55 | 24L or 24M or 24H |
| MAZ32400L | 22.8 | 23.3 | 23.97 | | | 22.3 | | | | | | | | | | | 24L |
| MAZ32400M | 23.5 | 24 | 24.7 | | | 23 | | | | | | | | | | | 24M |
| MAZ32400H | 24.35 | 25 | 25.6 | | | 23.8 | | | | | | | | | | | 24H |

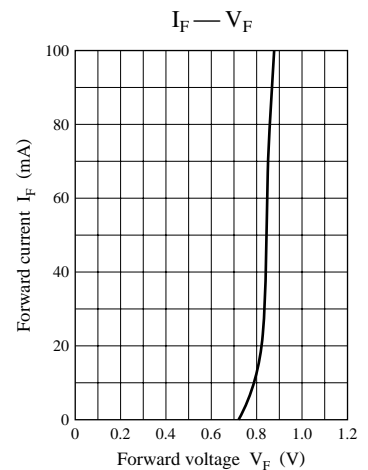
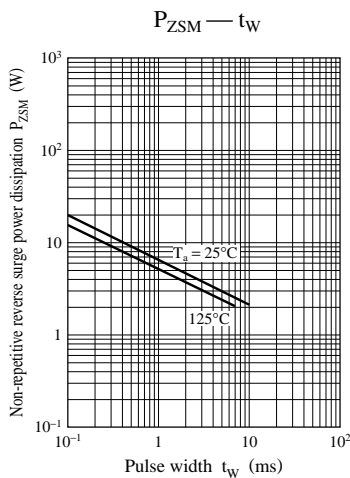
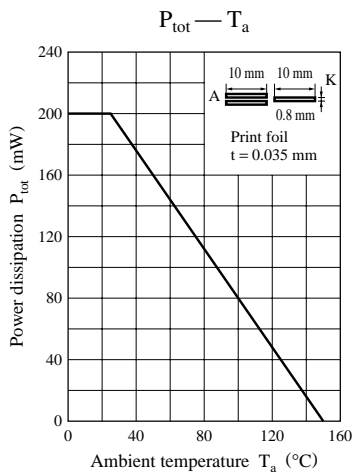
■ Electrical characteristics within part numbers (continued) $T_a = 25^\circ\text{C}$

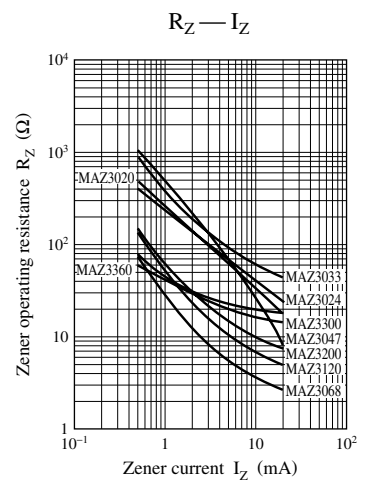
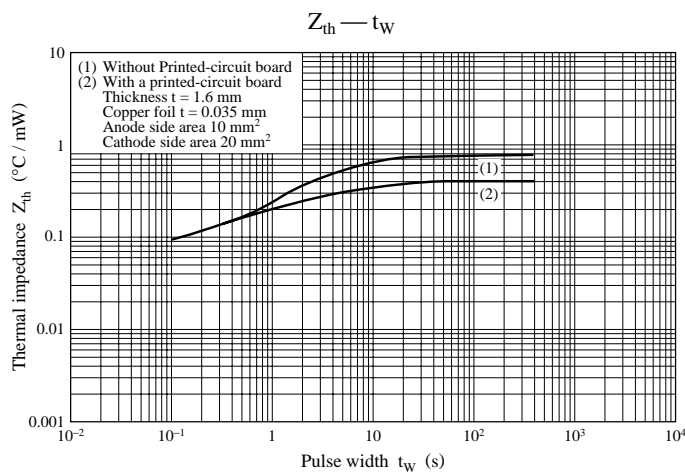
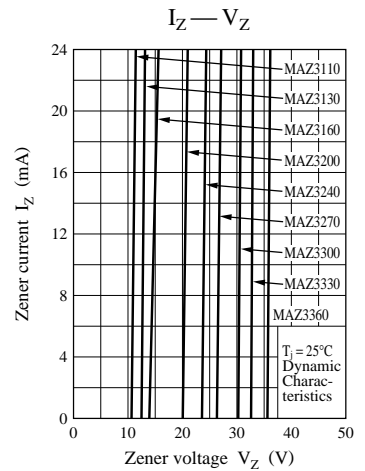
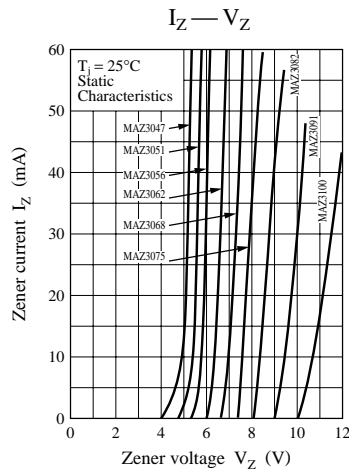
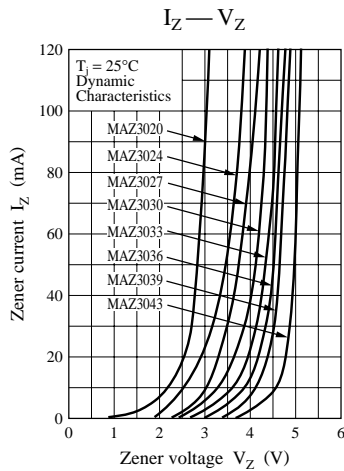
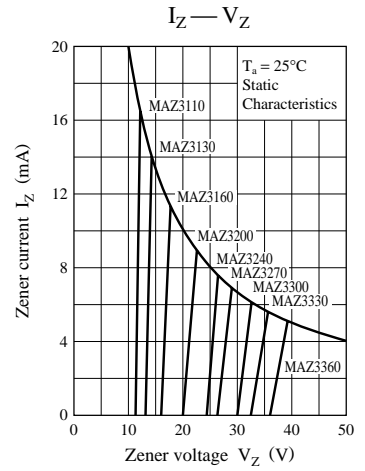
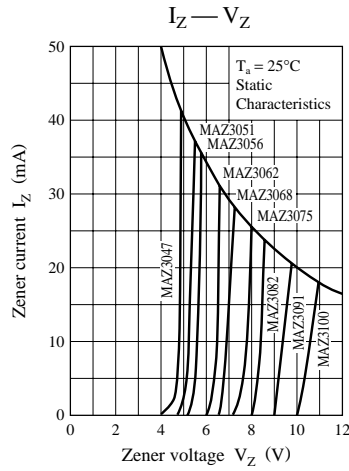
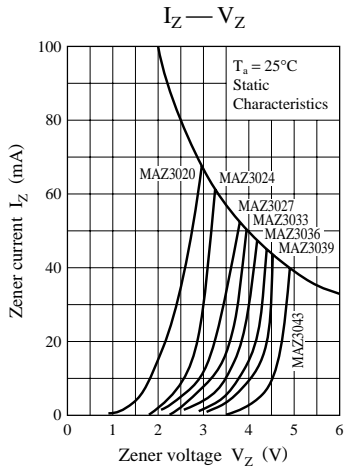
• $V_Z = 27.0\text{ V to } 36.0\text{ V}$ ($I_Z = 2\text{ mA}$)

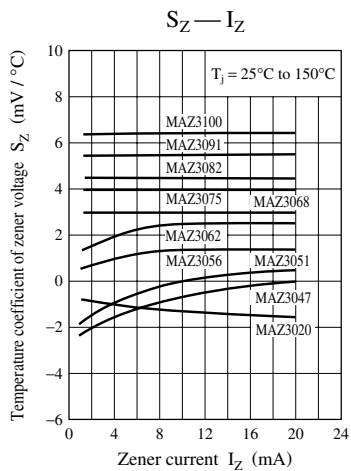
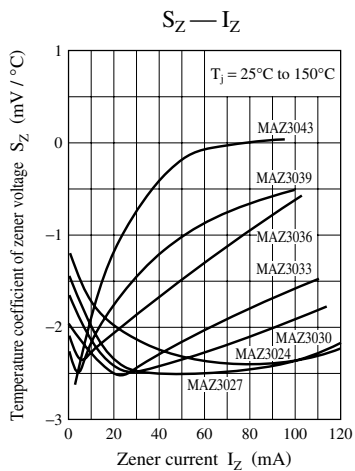
| Part number | Zener voltage | | | Reverse current | | | | Zener operating resistance | | | | Temperature coefficient of zener voltage | | | Terminal capacitance | | Marking symbol |
|-------------|----------------------------------|-----|------|----------------------------|------|----------------------------|-----|----------------------------|-----|-----------------------|-----|--|------|------|--|-----|-------------------|
| | V_Z (V) $I_Z = 2\text{ mA}$ | | | I_{R1} (μA) | | I_{R2} (μA) | | R_Z (Ω) | | R_{ZK} (Ω) | | S_Z (mV/ $^\circ\text{C}$) $I_Z = 2\text{ mA}$ | | | C_t (pF) ($V_R = 0\text{ V}$) $f = 1\text{ MHz}$ | | |
| | Min | Nom | Max | V_R (V) | Max | V_R (V) | Max | Typ | Max | I_Z (mA) | Max | Min | Typ | Max | Typ | Max | |
| MAZ3270 | 25.1 | 27 | 28.9 | 19 | 0.05 | 24.8 | 60 | 25 | 80 | 0.5 | 200 | 21.4 | 23.4 | 25.3 | 30 | 50 | 27L or 27M or 27H |
| MAZ32700L | 25.3 | 26 | 26.7 | | | 24.8 | | | | | | | | | | | 27L |
| MAZ32700M | 26.3 | 27 | 27.7 | | | 25.8 | | | | | | | | | | | 27M |
| MAZ32700H | 27.3 | 28 | 28.7 | | | 26.8 | | | | | | | | | | | 27H |
| MAZ3300 | 28 | 30 | 32 | 21 | 0.05 | 27.8 | 60 | 30 | 80 | 0.5 | 200 | 24.4 | 26.6 | 29.4 | 27 | 50 | 30L or 30M or 30H |
| MAZ33000L | 28.3 | 29 | 29.7 | | | 27.8 | | | | | | | | | | | 30L |
| MAZ33000M | 29.3 | 30 | 30.8 | | | 28.8 | | | | | | | | | | | 30M |
| MAZ33000H | 30.2 | 31 | 31.8 | | | 29.7 | | | | | | | | | | | 30H |
| MAZ3330 | 31 | 33 | 35 | 23 | 0.05 | 30.7 | 60 | 35 | 80 | 0.5 | 200 | 27.4 | 29.7 | 33.4 | 25 | 45 | 33L or 33M or 33H |
| MAZ33300L | 31.2 | 32 | 32.8 | | | 30.7 | | | | | | | | | | | 33L |
| MAZ33300M | 32.2 | 33 | 33.8 | | | 31.7 | | | | | | | | | | | 33M |
| MAZ33300H | 33.2 | 34 | 34.9 | | | 32.7 | | | | | | | | | | | 33H |
| MAZ3360 | 34 | 36 | 38 | 25 | 0.05 | 33.6 | 60 | 35 | 90 | 0.5 | 200 | 30.4 | 33 | 37.4 | 23 | 45 | 36L or 36M or 36H |
| MAZ33600L | 34.1 | 35 | 35.9 | | | 33.6 | | | | | | | | | | | 36L |
| MAZ33600M | 35.1 | 36 | 36.9 | | | 34.6 | | | | | | | | | | | 36M |
| MAZ33600H | 36.1 | 37 | 37.9 | | | 35.6 | | | | | | | | | | | 36H |

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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