

MAZ3000 Series (MA3000 Series)

Silicon planar type

For stabilization of power supply

■ Features

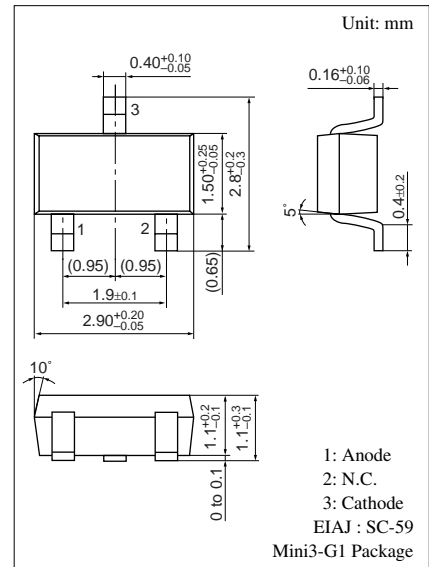
- Mini type 3-pin package (Mini3-G1)
- Allowing to achieve a high-density set
- Sharp rising performance
- Wide voltage range: $V_Z = 2.0\text{ V}$ to 36 V

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



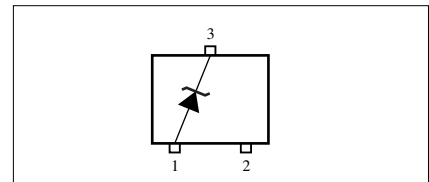
Marking Symbol

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 | | | | μA |
| | I_{R2} | 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 |

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 $T_a = 25^\circ\text{C}$

• $V_Z = 2.0\text{ V to } 8.2\text{ V}$ ($I_Z = 5\text{ mA}$)

| 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 | Max | I_Z | Max | $I_Z = 5\text{ mA}$ | | | $(V_R = 0\text{ V})$ $f = 1\text{ MHz}$ | | |
| | Min | Nom | Max | (V) | Max | (V) | Max | Typ | Max | Typ | Max | Min | Typ | Max | Typ | Max | |
| MAZ3020 | 1.88 | 2.0 | 2.12 | 0.5 | 120 | — | — | 5 | 100 | — | — | -3.5 | -1.5 | 0 | — | — | 2.0 |
| MAZ3022 | 2.08 | 2.2 | 2.32 | 0.7 | 120 | — | — | 5 | 100 | — | — | -3.5 | -1.5 | 0 | — | — | 2.2 |
| MAZ3024 | 2.28 | 2.4 | 2.60 | 1 | 120 | — | — | 5 | 100 | — | — | -3.5 | -1.6 | 0 | — | — | 2.4 |
| MAZ3027 | 2.50 | 2.7 | 2.90 | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.7L or 2.7H |
| MAZ30270L | 2.50 | 2.6 | 2.75 | 1 | 120 | — | — | 5 | 110 | — | — | -3.5 | -2.0 | 0 | — | — | 2.7L |
| MAZ30270H | 2.65 | 2.8 | 2.90 | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.7H |
| MAZ3030 | 2.80 | 3.0 | 3.20 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.0L or 3.0H |
| MAZ30300L | 2.80 | 2.9 | 3.05 | 1 | 50 | — | — | 5 | 120 | — | — | -3.5 | -2.1 | 0 | — | — | 3.0L |
| MAZ30300H | 2.95 | 3.1 | 3.20 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.0H |
| MAZ3033 | 3.10 | 3.3 | 3.50 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.3L or 3.3H |
| MAZ30330L | 3.10 | 3.2 | 3.35 | 1 | 20 | — | — | 5 | 130 | — | — | -3.5 | -2.4 | 0 | — | — | 3.3L |
| MAZ30330H | 3.25 | 3.4 | 3.50 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.3H |
| MAZ3036 | 3.40 | 3.6 | 3.80 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.6L or 3.6H |
| MAZ30360L | 3.40 | 3.5 | 3.65 | 1 | 10 | — | — | 5 | 130 | — | — | -3.5 | -2.4 | 0 | — | — | 3.6L |
| MAZ30360H | 3.55 | 3.7 | 3.80 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.6H |
| MAZ3039 | 3.70 | 3.9 | 4.10 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.9L or 3.9H |
| MAZ30390L | 3.70 | 3.8 | 3.97 | 1 | 10 | — | — | 5 | 130 | — | — | -3.5 | -2.5 | 0 | — | — | 3.9L |
| MAZ30390H | 3.87 | 4.0 | 4.10 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.9H |
| MAZ3043 | 4.00 | 4.3 | 4.60 | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.3L or 4.3M or 4.3H |
| MAZ30430L | 4.03 | 4.1 | 4.26 | 1 | 10 | — | — | 5 | 130 | — | — | -3.5 | -2.5 | 0 | — | — | 4.3L |
| MAZ30430M | 4.17 | 4.3 | 4.40 | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.3M |
| MAZ30430H | 4.31 | 4.4 | 4.54 | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.3H |
| MAZ3047 | 4.4 | 4.7 | 5.0 | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.7L or 4.7M or 4.7H |
| MAZ30470L | 4.45 | 4.6 | 4.69 | 1 | 3 | — | — | 50 | 80 | 1 | 900 | -3.5 | -1.4 | 0.2 | 130 | 180 | 4.7L |
| MAZ30470M | 4.59 | 4.7 | 4.83 | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.7M |
| MAZ30470H | 4.74 | 4.9 | 4.99 | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.7H |
| MAZ3051 | 4.8 | 5.1 | 5.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.1L or 5.1M or 5.1H |
| MAZ30510L | 4.87 | 5.0 | 5.12 | 2 | 2 | — | — | 40 | 60 | 1 | 800 | -2.7 | -0.8 | 1.2 | 110 | 160 | 5.1L |
| MAZ30510M | 5.0 | 5.1 | 5.26 | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.1M |
| MAZ30510H | 5.14 | 5.3 | 5.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.1H |
| MAZ3056 | 5.3 | 5.6 | 6.0 | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.6L or 5.6M or 5.6H |
| MAZ30560L | 5.3 | 5.4 | 5.58 | 2 | 1 | — | — | 15 | 40 | 1 | 500 | -2 | 1.2 | 2.5 | 95 | 140 | 5.6L |
| MAZ30560M | 5.48 | 5.6 | 5.76 | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.6M |
| MAZ30560H | 5.66 | 5.8 | 5.95 | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.6H |
| MAZ3062 | 5.8 | 6.2 | 6.6 | — | — | — | — | — | — | — | — | — | — | — | — | — | 6.2L or 6.2M or 6.2H |
| MAZ30620L | 5.85 | 6.0 | 6.15 | 4 | 3 | 5.3 | 60 | 6 | 20 | 0.5 | 300 | 0.4 | 2.3 | 3.7 | 90 | 130 | 6.2L |
| MAZ30620M | 6.05 | 6.2 | 6.36 | — | — | 5.5 | — | — | — | — | — | — | — | — | — | — | 6.2M |
| MAZ30620H | 6.24 | 6.4 | 6.56 | — | — | 5.7 | — | — | — | — | — | — | — | — | — | — | 6.2H |
| MAZ3068 | 6.4 | 6.8 | 7.2 | — | — | — | — | — | — | — | — | — | — | — | — | — | 6.8L or 6.8M or 6.8H |
| MAZ30680L | 6.44 | 6.6 | 6.77 | 4 | 2 | 5.9 | 60 | 6 | 15 | 0.5 | 140 | 1.2 | 3 | 4.5 | 85 | 110 | 6.8L |
| MAZ30680M | 6.64 | 6.8 | 6.98 | — | — | 6.1 | — | — | — | — | — | — | — | — | — | — | 6.8M |
| MAZ30680H | 6.85 | 7.0 | 7.2 | — | — | 6.3 | — | — | — | — | — | — | — | — | — | — | 6.8H |
| MAZ3075 | 7.0 | 7.5 | 7.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.5L or 7.5M or 7.5H |
| MAZ30750L | 7.07 | 7.3 | 7.43 | 5 | 1 | 6.5 | 60 | 6 | 15 | 0.5 | 120 | 2.5 | 4 | 5.3 | 80 | 100 | 7.5L |
| MAZ30750M | 7.29 | 7.5 | 7.67 | — | — | 6.7 | — | — | — | — | — | — | — | — | — | — | 7.5M |
| MAZ30750H | 7.51 | 7.7 | 7.89 | — | — | 7.0 | — | — | — | — | — | — | — | — | — | — | 7.5H |
| MAZ3082 | 7.7 | 8.2 | 8.7 | — | — | — | — | — | — | — | — | — | — | — | — | — | 8.2L or 8.2M or 8.2H |
| MAZ30820L | 7.77 | 7.9 | 8.17 | 5 | 0.5 | 7.2 | 60 | 6 | 15 | 0.5 | 120 | 3.2 | 4.6 | 6.2 | 75 | 95 | 8.2L |
| MAZ30820M | 8.03 | 8.2 | 8.43 | — | — | 7.5 | — | — | — | — | — | — | — | — | — | — | 8.2M |
| MAZ30820H | 8.29 | 8.5 | 8.7 | — | — | 7.7 | — | — | — | — | — | — | — | — | — | — | 8.2H |

■ 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 | | $I_Z = 5\text{ mA}$ | | | $(V_R = 0\text{ V})$ | | |
| | Min | Nom | Max | (V) | Max | (V) | Max | Typ | Max | (mA) | Max | Min | Typ | Max | Typ | Max | |
| MA3091 | 8.5 | 9.1 | 9.6 | 6 | 0.2 | 8 | 60 | 6 | 15 | 0.5 | 130 | 3.8 | 5.5 | 7 | 70 | 90 | 9.1L or 9.1M or 9.1H |
| MAZ30910L | 8.58 | 8.8 | 9.02 | | | 8 | | | | | | | | | | | 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 | 10.9 | 60 | 10 | 25 | 0.5 | 170 | 6 | 8.4 | 10 | 65 | 85 | 12L or 12M or 12H |
| 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 | 80 | 13L or 13M or 13H |
| 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 | 16.4 | 60 | 10 | 45 | 0.5 | 170 | 12.4 | 14.4 | 16 | 47 | 70 | 18L or 18M or 18H |
| 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 | 20.3 | 60 | 20 | 55 | 0.5 | 180 | 16.4 | 18.4 | 20 | 34 | 60 | 22L or 22M or 22H |
| 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) $T_a = 25^\circ\text{C}$

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

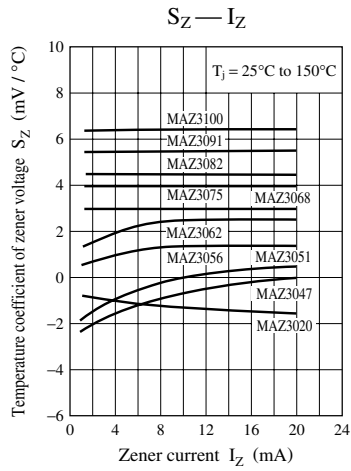
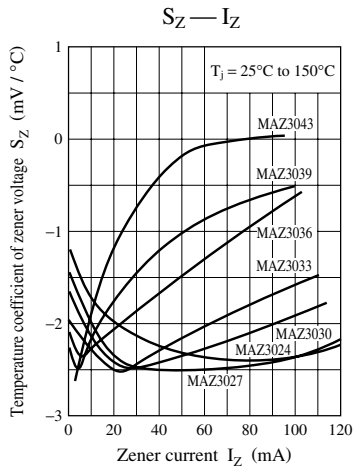
| Part number | Zener voltage | | | Reverse current | | | | Zener operating resistance | | | | Temperature coefficient of zener voltage | | | Terminal capacitance | | Marking symbol |
|-------------|---------------------|-----|------|----------------------------|------|----------------------------|-----|----------------------------|-----|-----------------------|-----|------------------------------------------|------|------|--------------------------------------------|-----|-------------------|
| | V_Z (V) | | | I_{R1} (μA) | | I_{R2} (μA) | | R_Z (Ω) | | R_{ZK} (Ω) | | S_Z (mV/ $^\circ\text{C}$) | | | C_t (pF) | | |
| | $I_Z = 2\text{ mA}$ | | | V_R | Max | V_R | Max | $I_Z = 2\text{ mA}$ | | I_Z | Max | $I_Z = 2\text{ mA}$ | | | $(V_R = 0\text{ V})$ $f = 1\text{ MHz}$ | | |
| | Min | Nom | Max | (V) | Max | (V) | Max | Typ | Max | (mA) | Max | Min | Typ | Max | Typ | Max | |
| 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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