

Zener Diodes



MAZ3000 Series (MA3000 Series)

Silicon planar type

For stabilization of power supply

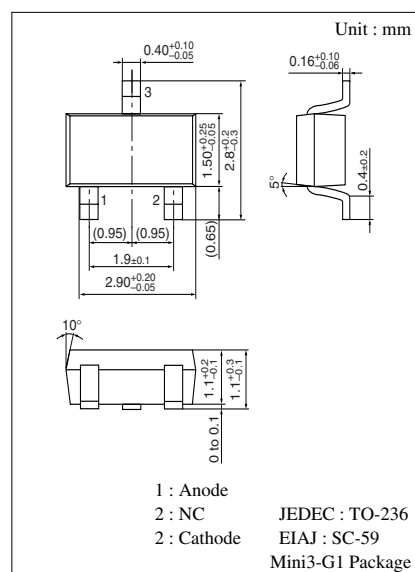
■ Features

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

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

Parameter	Symbol	Rating	Unit
Average forward current	$I_{F(AV)}$	100	mA
Instantaneous 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 : $t = 100 \mu\text{s}$, $T_j = 150^\circ\text{C}$

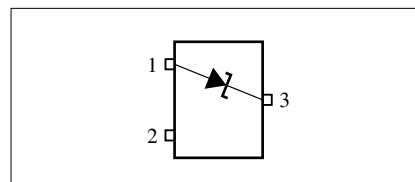


Marking Symbol

Refer to the list of the electrical characteristics within part numbers
 (Example) MAZ3020: 2.0
 MAZ3082-H: 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
Operating resistance	R_{ZK}	I_Z Specified value				Ω
	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 : $T_j = 25^\circ\text{C to } 150^\circ\text{C}$

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

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■ 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				Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking Symbol
	V_Z (V) $I_Z = 5\text{ mA}$			I_{R1} (μA) V_R (V)		I_{R2} (μA) V_R (V)		R_Z (Ω) $I_Z = 5\text{ mA}$		R_{ZK} (Ω) I_Z (mA)		S_Z (mV/ $^\circ\text{C}$) $I_Z = 5\text{ mA}$			C_t (pF) ($V_R = 0\text{ V}$) $f = 1\text{ MHz}$		
	Min	Nom	Max	Max	Max	Max	Typ	Max	Max	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	1	120	—	—	5	110	—	—	-3.5	-2.0	0	—	—	2.7L or 2.7H
MAZ3027-L	2.50	2.6	2.75														2.7L
MAZ3027-H	2.65	2.8	2.90														2.7H
MAZ3030	2.80	3.0	3.20	1	50	—	—	5	120	—	—	-3.5	-2.1	0	—	—	3.0L or 3.0H
MAZ3030-L	2.80	2.9	3.05														3.0L
MAZ3030-H	2.95	3.1	3.20														3.0H
MAZ3033	3.10	3.3	3.50	1	20	—	—	5	130	—	—	-3.5	-2.4	0	—	—	3.3L or 3.3H
MAZ3033-L	3.10	3.2	3.35														3.3L
MAZ3033-H	3.25	3.4	3.50														3.3H
MAZ3036	3.40	3.6	3.80	1	10	—	—	5	130	—	—	-3.5	-2.4	0	—	—	3.6L or 3.6H
MAZ3036-L	3.40	3.5	3.65														3.6L
MAZ3036-H	3.55	3.7	3.80														3.6H
MAZ3039	3.70	3.9	4.10	1	10	—	—	5	130	—	—	-3.5	-2.5	0	—	—	3.9L or 3.9H
MAZ3039-L	3.70	3.8	3.97														3.9L
MAZ3039-H	3.87	4.0	4.10														3.9H
MAZ3043	4.00	4.3	4.60	1	10	—	—	5	130	—	—	-3.5	-2.5	0	—	—	4.3L or 4.3M or 4.3H
MAZ3043-L	4.03	4.1	4.26														4.3L
MAZ3043-M	4.17	4.3	4.40														4.3M
MAZ3043-H	4.31	4.4	4.54														4.3H
MAZ3047	4.4	4.7	5.0	1	3	—	—	50	80	1	900	-3.5	-1.4	0.2	130	180	4.7L or 4.7M or 4.7H
MAZ3047-L	4.45	4.6	4.69														4.7L
MAZ3047-M	4.59	4.7	4.83														4.7M
MAZ3047-H	4.74	4.9	4.99														4.7H
MAZ3051	4.8	5.1	5.4	2	2	—	—	40	60	1	800	-2.7	-0.8	1.2	110	160	5.1L or 5.1M or 5.1H
MAZ3051-L	4.87	5.0	5.12														5.1L
MAZ3051-M	5.0	5.1	5.26														5.1M
MAZ3051-H	5.14	5.3	5.4														5.1H
MAZ3056	5.3	5.6	6.0	2	1	—	—	15	40	1	500	-2	1.2	2.5	95	140	5.6L or 5.6M or 5.6H
MAZ3056-L	5.3	5.4	5.58														5.6L
MAZ3056-M	5.48	5.6	5.76														5.6M
MAZ3056-H	5.66	5.8	5.95														5.6H
MAZ3062	5.8	6.2	6.6	4	3	5.3	60	6	20	0.5	300	0.4	2.3	3.7	90	130	6.2L or 6.2M or 6.2H
MAZ3062-L	5.85	6.0	6.15														6.2L
MAZ3062-M	6.05	6.2	6.36														6.2M
MAZ3062-H	6.24	6.4	6.56														6.2H
MAZ3068	6.4	6.8	7.2	4	2	5.9	60	6	15	0.5	140	1.2	3	4.5	85	110	6.8L or 6.8M or 6.8H
MAZ3068-L	6.44	6.6	6.77														6.8L
MAZ3068-M	6.64	6.8	6.98														6.8M
MAZ3068-H	6.85	7.0	7.2														6.8H
MAZ3075	7.0	7.5	7.9	5	1	6.5	60	6	15	0.5	120	2.5	4	5.3	80	100	7.5L or 7.5M or 7.5H
MAZ3075-L	7.07	7.3	7.43														7.5L
MAZ3075-M	7.29	7.5	7.67														7.5M
MAZ3075-H	7.51	7.7	7.89														7.5H
MAZ3082	7.7	8.2	8.7	5	0.5	7.2	60	6	15	0.5	120	3.2	4.6	6.2	75	95	8.2L or 8.2M or 8.2H
MAZ3082-L	7.77	7.9	8.17														8.2L
MAZ3082-M	8.03	8.2	8.43														8.2M
MAZ3082-H	8.29	8.5	8.7														8.2H

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Zener Diodes

■ Electrical characteristics within part numbers (continued) $T_a = 25^\circ\text{C}$ • $V_Z = 9.1\text{ V to } 24\text{ V}$ ($I_Z = 5\text{ mA}$)

Part Number	Zener voltage			Reverse current			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)			
	Min	Nom	Max	V_R (V)	Max	V_R (V)	Max	$I_Z = 5\text{ mA}$	Max	I_Z (mA)	Max	Min	Typ	Max	Typ		Max	
MAZ3091	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	
MAZ3091-L	8.58	8.8	9.02														8	9.1L
MAZ3091-M	8.87	9.1	9.33														8.3	9.1M
MAZ3091-H	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	
MAZ3100-L	9.44	9.7	9.92														8.9	10L
MAZ3100-M	9.75	10	10.25														9.2	10M
MAZ3100-H	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	
MAZ3110-L	10.4	10.7	10.94														9.9	11L
MAZ3110-M	10.73	11	11.28														10.2	11M
MAZ3110-H	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	
MAZ3120-L	11.4	11.7	11.96														10.9	12L
MAZ3120-M	11.73	12	12.33														11.2	12M
MAZ3120-H	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	
MAZ3130-L	12.4	12.7	12.99														11.9	13L
MAZ3130-M	12.73	13	13.4														12.2	13M
MAZ3130-H	13.25	13.7	14.08														12.7	13H
MAZ3140-M	13.65	14	14.35	10	0.05	13.1	60	10	30	0.5	170	7	10	13	60	80	14M	
MAZ3150	13.9	15	15.6														13.4	15L or 15M or 15H
MAZ3150-L	13.9	14.3	14.76														13.4	15L
MAZ3150-M	14.6	15	15.35														14.1	15M
MAZ3150-H	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	
MAZ3160-L	15.3	15.7	16.09														14.8	16L
MAZ3160-M	15.7	16	16.5														15.2	16M
MAZ3160-H	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	
MAZ3180-L	16.9	17.3	17.76														16.4	18L
MAZ3180-M	17.55	18	18.45														17	18M
MAZ3180-H	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	
MAZ3200-L	18.85	19.3	19.81														18.3	20L or 20M or 20H
MAZ3200-M	19.50	20	20.5														19	20M
MAZ3200-H	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	
MAZ3220-L	20.8	21.3	21.86														20.3	22L
MAZ3220-M	21.45	22	22.55														20.9	22M
MAZ3220-H	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	
MAZ3240-L	22.8	23.3	23.97														22.3	24L
MAZ3240-M	23.5	24	24.7														23	24M
MAZ3240-H	24.35	25	25.6														23.8	24H

Zener Diodes

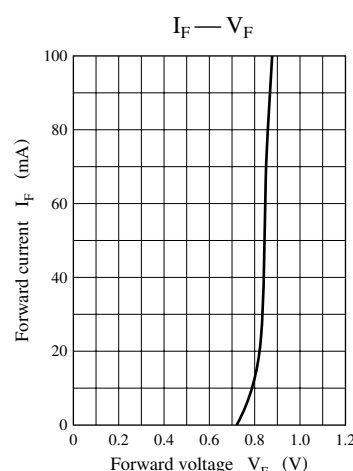
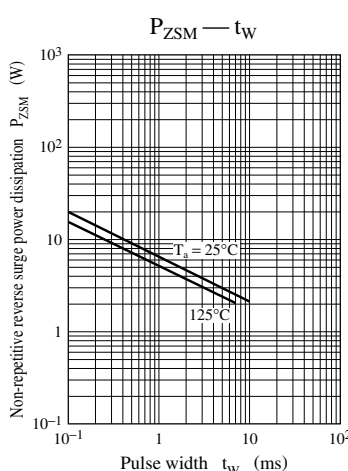
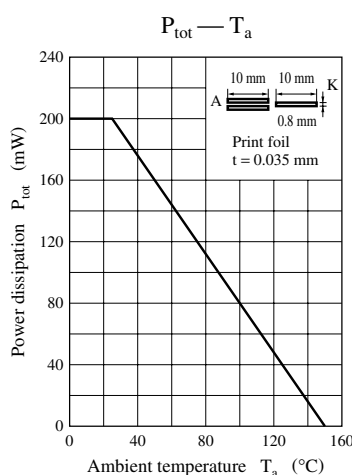
MAZ3000 Series

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

• $V_Z = 27\text{ V to } 36\text{ V}$ ($I_Z = 2\text{ mA}$)

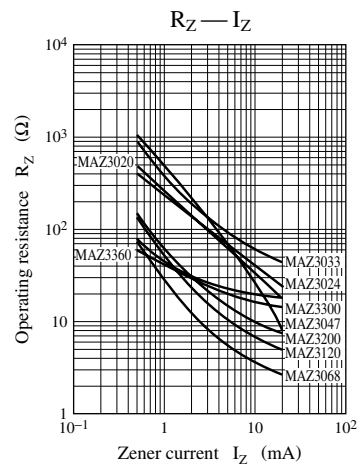
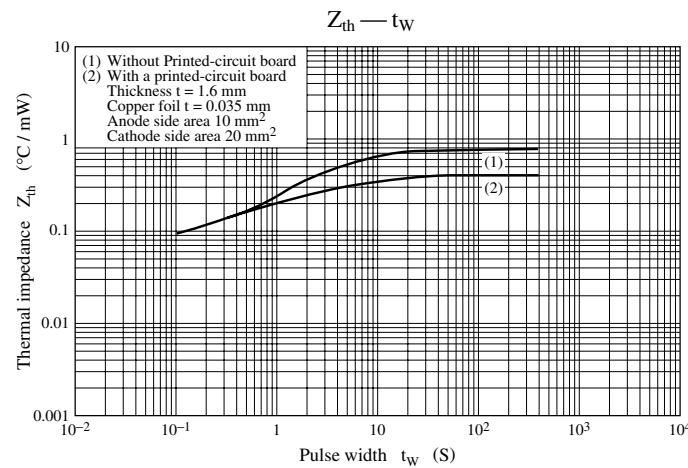
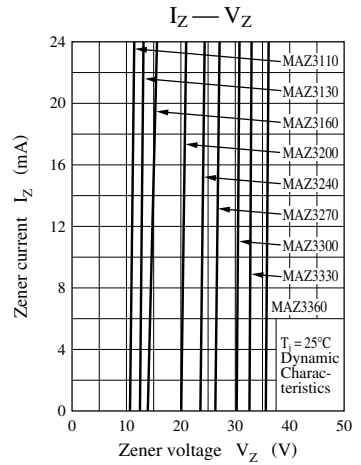
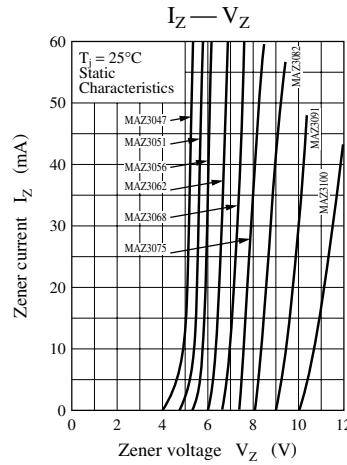
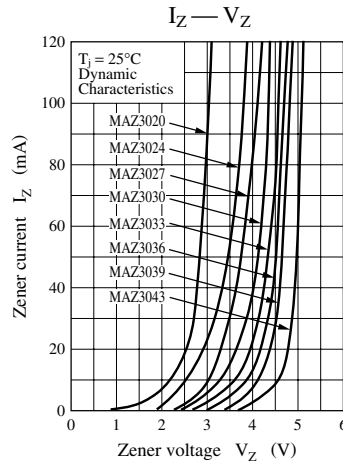
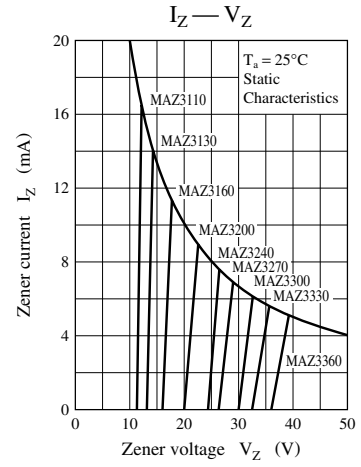
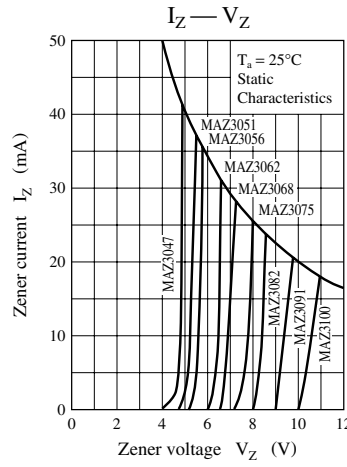
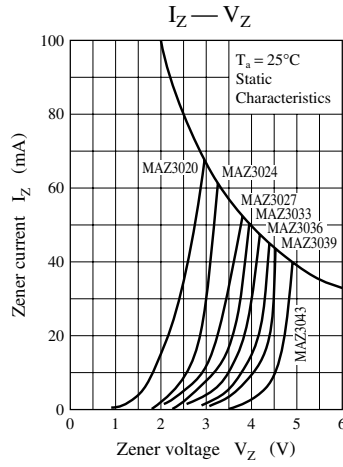
Part Number	Zener voltage			Reverse current			Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking Symbol	
	V_Z (V)			I_{R1} (μA)		I_{R2} (μA)		R_Z (Ω)		R_{ZK} (Ω)		S_Z (mV/ $^\circ\text{C}$)			C_t (pF)		
	Min	Nom	Max	V_R	Max	V_R	Max	$I_Z = 2\text{ mA}$	Max	I_Z	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
MAZ3270-L	25.3	26	26.7			24.8											27L
MAZ3270-M	26.3	27	27.7			25.8											27M
MAZ3270-H	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
MAZ3300-L	28.3	29	29.7			27.8											30L
MAZ3300-M	29.3	30	30.8			28.8											30M
MAZ3300-H	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
MAZ3300-L	31.2	32	32.8			30.7											33L
MAZ3330-M	32.2	33	33.8			31.7											33M
MAZ3300-H	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
MAZ3360-L	34.1	35	35.9			33.6											36L
MAZ3360-M	35.1	36	36.9			34.6											36M
MAZ3360-H	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 .



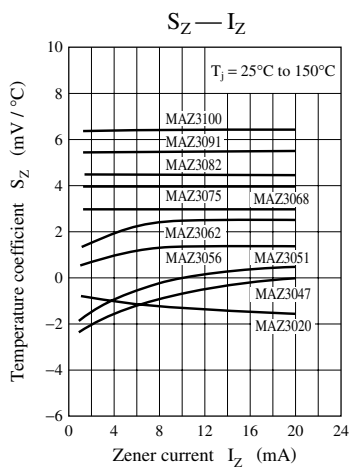
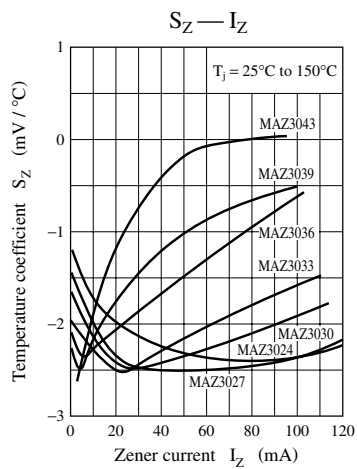
MAZ3000 Series

Zener Diodes



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