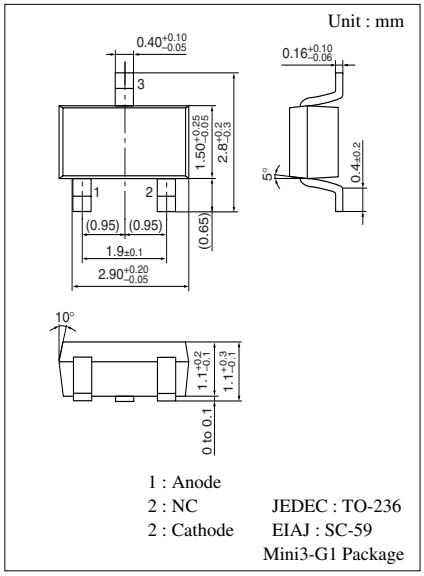
MAZ3000 Series (MA3000 Series)

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 V to 36 V



■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Average forward current	$I_{F(AV)}$	100	mA
Instanious 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	°C
Storage temperature	T_{stg}	−55 to +150	°C

Note) *1 : With a printed-circuit board
*2 : t = 100 µs, T_j = 150°C

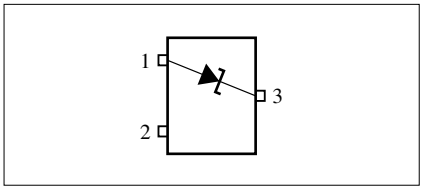
Marking Symbol

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°C*1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Forward voltage	V_F	I_F = 10 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/°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°C to 150°C

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

■ Electrical characteristics within part numbers $T_a = 25°C$

•V_Z = 2.0 V to 8.2 V (I_Z = 5 mA)

Part Number	Zener voltage			Reverse current				Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking Symbol
	V_Z (V) I_Z = 5 mA			I_{R1} (μA) V_R		I_{R2} (μA) V_R		R_Z (Ω) I_Z = 5 mA		R_{ZK} (Ω) I_Z		S_Z (mV/°C) I_Z = 5 mA			C_t (pF) (V_R = 0 V) f = 1 MHz		
	Min	Nom	Max	(V)	Max	(V)	Max	Typ	Max	(mA)	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
MAZ3027-L	2.50	2.6	2.75	1	120	—	—	5	110	—	—	–3.5	–2.0	0	—	—	2.7L
MAZ3027-H	2.65	2.8	2.90														2.7H
MAZ3030	2.80	3.0	3.20														3.0L or 3.0H
MAZ3030-L	2.80	2.9	3.05	1	50	—	—	5	120	—	—	–3.5	–2.1	0	—	—	3.0L
MAZ3030-H	2.95	3.1	3.20														3.0H
MAZ3033	3.10	3.3	3.50														3.3L or 3.3H
MAZ3033-L	3.10	3.2	3.35	1	20	—	—	5	130	—	—	–3.5	–2.4	0	—	—	3.3L
MAZ3033-H	3.25	3.4	3.50														3.3H
MAZ3036	3.40	3.6	3.80														3.6L or 3.6H
MAZ3036-L	3.40	3.5	3.65	1	10	—	—	5	130	—	—	–3.5	–2.4	0	—	—	3.6L
MAZ3036-H	3.55	3.7	3.80														3.6H
MAZ3039	3.70	3.9	4.10														3.9L or 3.9H
MAZ3039-L	3.70	3.8	3.97	1	10	—	—	5	130	—	—	–3.5	–2.5	0	—	—	3.9L
MAZ3039-H	3.87	4.0	4.10														3.9H
MAZ3043	4.00	4.3	4.60														4.3L or 4.3M or 4.3H
MAZ3043-L	4.03	4.1	4.26	1	10	—	—	5	130	—	—	–3.5	–2.5	0	—	—	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														4.7L or 4.7M or 4.7H
MAZ3047-L	4.45	4.6	4.69	1	3	—	—	50	80	1	900	–3.5	–1.4	0.2	130	180	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														5.1L or 5.1M or 5.1H
MAZ3051-L	4.87	5.0	5.12	2	2	—	—	40	60	1	800	–2.7	–0.8	1.2	110	160	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														5.6L or 5.6M or 5.6H
MAZ3056-L	5.3	5.4	5.58	2	1	—	—	15	40	1	500	–2	1.2	2.5	95	140	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			5.3											6.2L or 6.2M or 6.2H
MAZ3062-L	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
MAZ3062-M	6.05	6.2	6.36			5.5											6.2M
MAZ3062-H	6.24	6.4	6.56			5.7											6.2H
MAZ3068	6.4	6.8	7.2			5.9											6.8L or 6.8M or 6.8H
MAZ3068-L	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
MAZ3068-M	6.64	6.8	6.98			6.1											6.8M
MAZ3068-H	6.85	7.0	7.2			6.3											6.8H
MAZ3075	7.0	7.5	7.9			6.5											7.5L or 7.5M or 7.5H
MAZ3075-L	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
MAZ3075-M	7.29	7.5	7.67			6.7											7.5M
MAZ3075-H	7.51	7.7	7.89			7.0											7.5H
MAZ3082	7.7	8.2	8.7			7.2											8.2L or 8.2M or 8.2H
MAZ3082-L	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
MAZ3082-M	8.03	8.2	8.43			7.5											8.2M
MAZ3082-H	8.29	8.5	8.7			7.7											8.2H

■ Electrical characteristics within part numbers (continued) T_a = 25°C

•V_Z = 9.1 V to 24 V (I_Z = 5 mA)

Part Number	Zener voltage			Reverse current				Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking Symbol
	V_Z (V) I_Z = 5 mA			I_{R1} (μA) V_R		I_{R2} (μA) V_R		R_Z (Ω) I_Z = 5 mA		R_{ZK} (Ω) I_Z		S_Z (mV/°C) I_Z = 5 mA			C_t (pF) (V_R = 0 V) f = 1 MHz		
	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
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	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
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

■ Electrical characteristics within part numbers (continued) $T_a = 25°C$

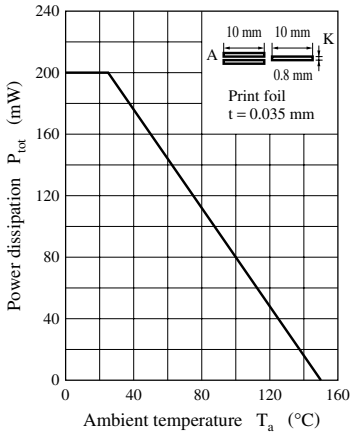
•V_Z = 27 V to 36 V (I_Z = 2 mA)

Part Number	Zener voltage			Reverse current				Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking Symbol
	V_Z (V) I_Z = 2 mA			I_{R1} (μA) V_R		I_{R2} (μA) V_R		R_Z (Ω) I_Z = 2 mA		R_{ZK} (Ω) I_Z		S_Z (mV/°C) I_Z = 2 mA			C_t (pF) (V_R = 0 V) f = 1 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
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

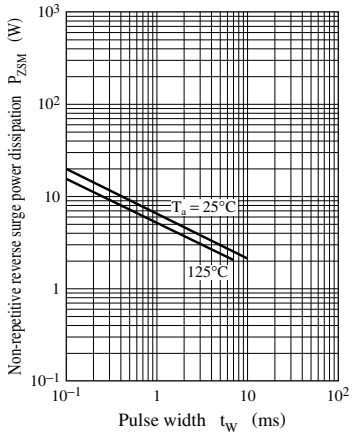
Note) 1. The V_Z value is the one after power application for 20 ms at T_a = 25°C.

2. The zener voltage temperature coefficient is the one for T_j = 25°C to 150°C.

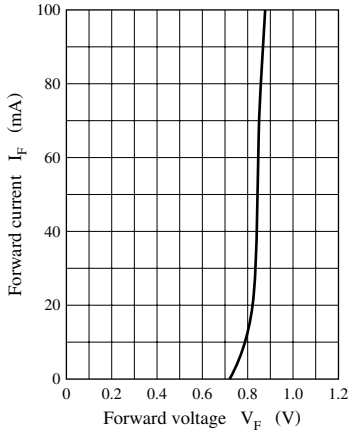
P_{tot} — T_a



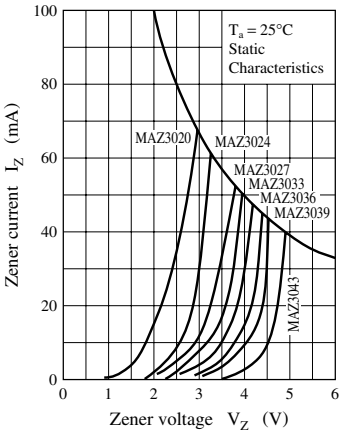
P_{ZSM} — t_W



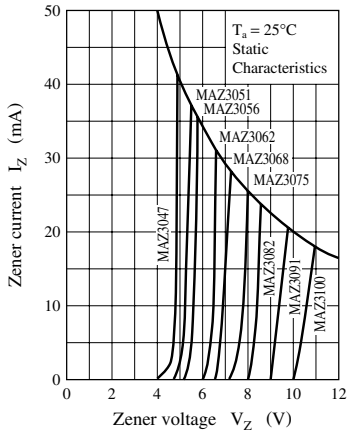
I_F — V_F



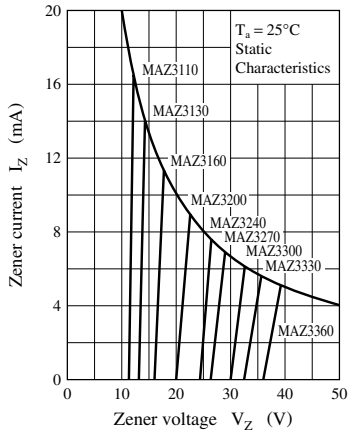
I_Z — V_Z



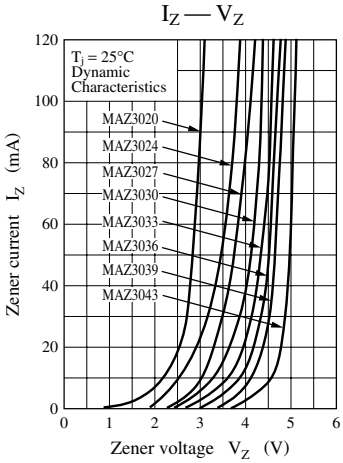
I_Z — V_Z



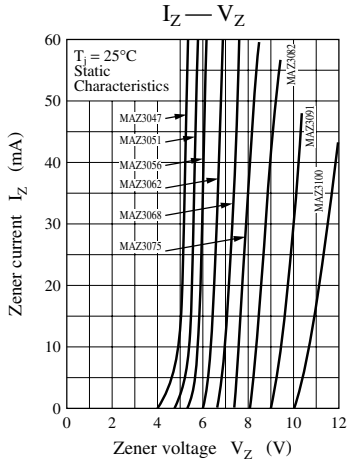
I_Z — V_Z



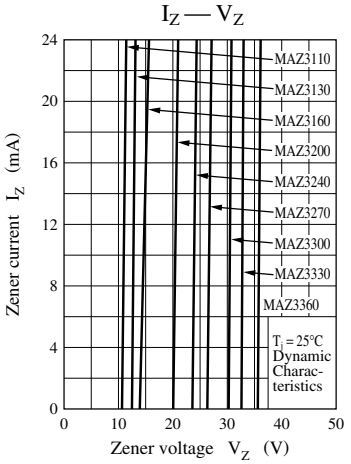
I_Z — V_Z



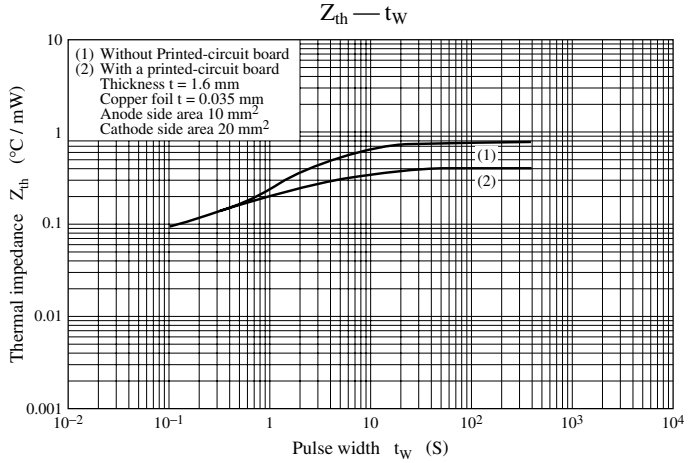
I_Z — V_Z



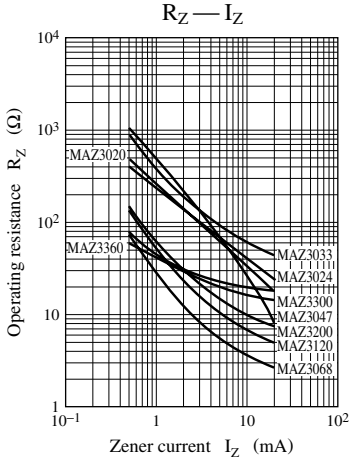
I_Z — V_Z



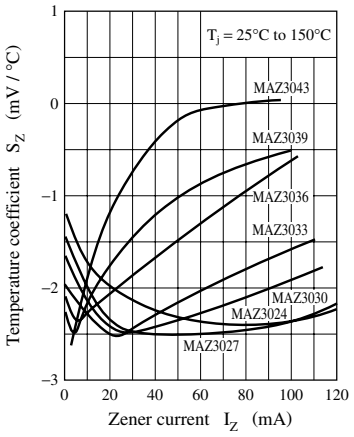
Z_{th} — t_W



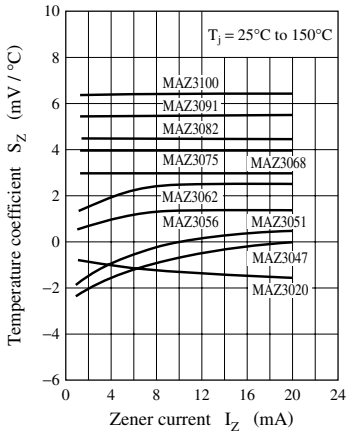
R_Z — I_Z



S_Z — I_Z


Tj = 25°C to 150°C
MAZ3043
MAZ3039
MAZ3036
MAZ3033
MAZ3030
MAZ3024
MAZ3027
Temperature coefficient SZ (mV / °C)
Zener current IZ (mA)
1
0
−1
−2
−3
0
20
40
60
80
100
120

S_Z — I_Z


Tj = 25°C to 150°C
MAZ3100
MAZ3091
MAZ3082
MAZ3075
MAZ3068
MAZ3062
MAZ3056
MAZ3051
MAZ3047
MAZ3020
Temperature coefficient SZ (mV / °C)
Zener current IZ (mA)
10
8
6
4
2
0
−2
−4
−6
0
4
8
12
16
20
24

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(2) The technical information described in this material is limited to showing representative characteristics and applied circuit examples of the products. It does not constitute the warranting of industrial property, the granting of relative rights, or the granting of any license.

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