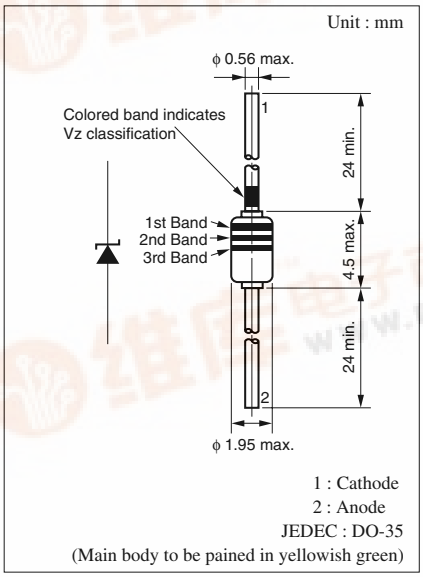
MAZ1000 Series

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 = 500 mW (With a printed-circuit board)
- Wide voltage range: V_Z = 2.0 V to 39 V
- Easy-to-use because of the finely divided zener voltage ranks, such as L, M, and H ranks
- Sharp rising performance

■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Average forward current	$I_{F(AV)}$	250	mA
Repetitive peak forward current	I_{FRM}	250	mA
Total power dissipation*1	P_{tot}	500	mW
Non-repetitive reverse surge power dissipation*2	P_{ZSM}	30	W
Junction temperature	T_j	200	°C
Storage temperature	T_{stg}	−65 to +200	°C

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

•Color indication of V_Z rank classification

L rank	M rank	H rank
Black	Blue	Red

■ Common Electrical Characteristics T_a = 25°C*1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Forward voltage (DC)	V_F	I_F = 10 mA		0.8	0.9	V
Zener voltage*2	V_Z	I_Z ..... Specified value	Refer to the list of the electrical characteristics within part numbers			V
Operating resistance	R_{ZK}	I_Z ..... Specified value				Ω
	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/°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°C to 150°C

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

•V_Z = 2.0 V to 6.8 V (I_Z = 5 mA)

Part Number	Zener voltage			Reverse current				Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking (Color indication Main body: Yellowish green)		
	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	1st.	2nd.	3rd.
MAZ1020	1.88	—	2.24	0.5	120	—	—	5	100	1	2000	−3.5	−1.5	0	375	450	Red	Black	Black
MAZ1020-L	1.88	—	2.12																
MAZ1020-H	2.01	—	2.24																
MAZ1022	2.08	—	2.45	0.7	120	—	—	5	100	1	2000	−3.5	−1.5	0	375	450	Red	Red	Red
MAZ1022-L	2.08	—	2.33																
MAZ1022-H	2.20	—	2.45																
MAZ1024	2.28	2.4	2.7	1	120	—	—	—	100	1	2000	−3.5	−1.6	0	375	450	Red	Yellow	Yellow
MAZ1024-L	2.28	—	2.56																
MAZ1024-H	2.4	—	2.7																
MAZ1027	2.5	2.7	2.9	1	100	—	—	—	100	1	1000	−3.5	−2	0	350	450	Red	Purple	Purple
MAZ1027-L	2.5	2.6	2.75																
MAZ1027-H	2.65	2.8	2.9																
MAZ1030	2.8	3.0	3.2	1	50	—	—	85	100	1	1000	−3.5	−2.1	0	350	450	Orange	Black	Black
MAZ1030-L	2.83	2.9	2.97																
MAZ1030-M	2.93	3.0	3.08																
MAZ1030-H	3.02	3.1	3.18																
MAZ1033	3.1	3.3	3.5	1	20	—	—	83	100	1	1000	−3.5	−2.4	0	325	450	Orange	Orange	Orange
MAZ1033-L	3.12	3.2	3.28																
MAZ1033-M	3.22	3.3	3.38																
MAZ1033-H	3.32	3.4	3.49																
MAZ1036	3.4	3.6	3.8	1	10	—	—	81	100	1	1000	−3.5	−2.4	0	300	450	Orange	Blue	Blue
MAZ1036-L	3.41	3.5	3.59																
MAZ1036-M	3.51	3.6	3.69																
MAZ1036-H	3.61	3.7	3.79																
MAZ1039	3.7	3.9	4.1	1	10	—	—	79	100	1	1000	−3.5	−2.5	0	300	450	Orange	White	White
MAZ1039-L	3.71	3.8	3.9																
MAZ1039-M	3.8	3.9	4.0																
MAZ1039-H	3.9	4.0	4.1																
MAZ1043	4.0	4.3	4.6	1	10	—	—	75	100	1	1000	−3.5	−2.5	0	275	450	Yellow	Orange	Orange
MAZ1043-L	4.03	4.1	4.26																
MAZ1043-M	4.17	4.3	4.4																
MAZ1043-H	4.31	4.4	4.54																
MAZ1047	4.4	4.7	5.0	1	3	—	—	50	80	1	900	−3.5	−1.4	0.2	130	180	Yellow	Purple	Purple
MAZ1047-L	4.45	4.6	4.69																
MAZ1047-M	4.59	4.7	4.83																
MAZ1047-H	4.74	4.9	4.99																
MAZ1051	4.8	5.1	5.4	2	2	—	—	40	60	1	800	−2.7	−0.8	1.2	110	160	Green	Brown	Brown
MAZ1051-L	4.87	5.0	5.12																
MAZ1051-M	5.0	5.1	5.26																
MAZ1051-H	5.14	5.3	5.4																
MAZ1056	5.3	5.6	6.0	2	1	—	—	15	40	1	500	−2	1.2	2.5	95	140	Green	Blue	Blue
MAZ1056-L	5.3	5.4	5.58																
MAZ1056-M	5.48	5.6	5.76																
MAZ1056-H	5.66	5.8	5.95																
MAZ1062	5.8	6.2	6.6	4	3	5.3	60	6	20	0.5	300	0.4	2.3	3.7	90	130	Blue	Red	Red
MAZ1062-L	5.85	6.0	6.15			5.3													
MAZ1062-M	6.05	6.2	6.36			5.5													
MAZ1062-H	6.24	6.4	6.56			5.7													
MAZ1068	6.4	6.8	7.2	4	2	5.9	60	6	15	0.5	140	1.2	3	4.5	85	110	Blue	Gray	Gray
MAZ1068-L	6.44	6.6	6.77			5.9													
MAZ1068-M	6.64	6.8	6.98			6.1													
MAZ1068-H	6.85	7.0	7.2			6.3													

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

•V_Z = 7.5 V to 22 V (I_Z = 5 mA)

Part Number	Zener voltage			Reverse current				Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking (Color indication Main body: Yellowish green)		
	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	Mom	Max	(V)	Max	(V)	Max	Typ	Max	(mA)	Max	Min	Typ	Max	Typ	Max	1st.	2nd.	3rd.
MAZ1075	7.0	7.5	7.9	5	1	6.5	60	6	15	0.5	120	2.5	4	5.3	80	100	Purple	Green	Green
MAZ1075-L	7.07	7.3	7.43			6.5													
MAZ1075-M	7.29	7.5	7.67			6.7													
MAZ1075-H	7.51	7.7	7.89			7.0													
MAZ1082	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	Gray	Red	Red
MAZ1082-L	7.77	7.9	8.17			7.2													
MAZ1082-M	8.03	8.2	8.43			7.5													
MAZ1082-H	8.29	8.5	8.7			7.7													
MAZ1091	8.5	9.1	9.6	6	0.2	8	60	6	15	0.5	130	3.8	5.5	7	70	90	White	Brown	Brown
MAZ1091-L	8.58	8.8	9.02			8													
MAZ1091-M	8.87	9.1	9.33			8.3													
MAZ1091-H	9.14	9.4	9.6			8.6													
MAZ1100	9.4	10	10.6	7	0.2	8.9	60	8	20	0.5	130	4.5	6.4	8	70	90	Brown	Black	—
MAZ1100-L	9.44	9.7	9.92			8.9													
MAZ1100-M	9.75	10	10.25			9.2													
MAZ1100-H	10.07	10.3	10.59			9.5													
MAZ1110	10.4	11	11.6	7	0.1	9.9	60	10	20	0.5	170	5.4	7.4	9	65	85	Brown	Brown	—
MAZ1110-L	10.4	10.7	10.94			9.9													
MAZ1110-M	10.73	11	11.28			10.2													
MAZ1110-H	11.05	11.3	11.6			10.5													
MAZ1120	11.4	12	12.7	8	0.1	10.9	60	10	25	0.5	170	6	8.4	10	65	85	Brown	Red	—
MAZ1120-L	11.4	11.7	11.96			10.9													
MAZ1120-M	11.73	12	12.33			11.2													
MAZ1120-H	12.06	12.3	12.68			11.5													
MAZ1130	12.4	13	14.1	9	0.1	11.9	60	10	30	0.5	170	7	9.4	11	60	80	Brown	Orange	—
MAZ1130-L	12.4	12.7	12.99			11.9													
MAZ1130-M	12.73	13	13.4			12.2													
MAZ1130-H	13.25	13.7	14.08			12.7													
MAZ1140-M	13.65	14	14.35	9	0.1	13.1	60	10	30	0.5	170	7	10	13	60	80	Brown	Yellow	—
MAZ1150	13.9	15	15.6	10	0.05	13.4	60	10	30	0.5	170	9.2	11.4	13	55	75	Brown	Green	—
MAZ1150-L	13.9	14.3	14.76			13.4													
MAZ1150-M	14.6	15	15.35			14.1													
MAZ1150-H	14.95	15.3	15.6			14.4													
MAZ1160	15.3	16	17.1	11	0.05	14.8	60	10	40	0.5	170	10.4	12.4	14	52	75	Brown	Blue	—
MAZ1160-L	15.3	15.7	16.09			14.8													
MAZ1160-M	15.7	16	16.5			15.2													
MAZ1160-H	16.26	16.7	17.1			15.7													
MAZ1180	16.9	18	19.1	13	0.05	16.4	60	10	45	0.5	170	12.4	14.4	16	47	70	Brown	Gray	—
MAZ1180-L	16.9	17.3	17.76			16.4													
MAZ1180-M	17.55	18	18.45			17													
MAZ1180-H	18.2	18.7	19.1			17.7													
MAZ1200	18.8	20	21.2	14	0.05	18.3	60	15	55	0.5	180	14.4	16.4	18	36	60	Red	Black	—
MAZ1200-L	18.85	19.3	19.81			18.3													
MAZ1200-M	19.50	20	20.5			19													
MAZ1200-H	20.15	20.7	21.19			19.6													
MAZ1220	20.8	22	23.3	15	0.05	20.3	60	20	55	0.5	180	16.4	18.4	20	34	60	Red	Red	—
MAZ1220-L	20.8	21.3	21.86			20.3													
MAZ1220-M	21.45	22	22.55			20.9													
MAZ1220-H	22.1	22.7	23.24			21.6													

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

•V_Z = 24 V (I_Z = 5 mA)

Part Number	Zener voltage			Reverse current				Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking (Color indication Main body: Yellowish green)		
	V_Z (V) I_Z = 5 mA			I_{R1} (μA)		I_{R2} (μA)		R_Z (Ω) I_Z = 5 mA		R_{ZK} (Ω)		S_Z (mV/°C) I_Z = 5 mA			C_t (pF) (V_R = 0 V) f = 1 MHz				
	Min	Nom	Max	V_R (V)	Max	V_R (V)	Max	Typ	Max	I_Z (mA)	Max	Min	Typ	Max	Typ	Max	1st.	2nd.	3rd.
MAZ1240	22.8	24	25.6	17	0.05	22.3	60	25	70	0.5	180	18.4	20.4	22	33	55	Red	Yellow	—
MAZ1240-L	22.8	23.3	23.97			22.3													
MAZ1240-M	23.5	24	24.7			23.8													
MAZ1240-H	24.35	25	25.6			23.8													

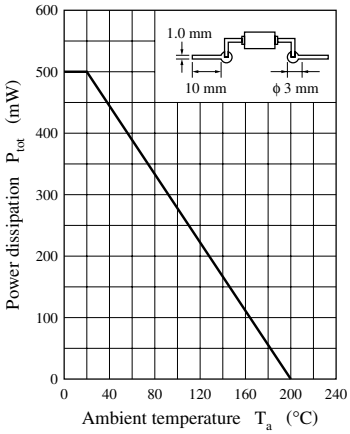
•V_Z = 27 V to 39 V (I_Z = 2 mA)

Part Number	Zener voltage			Reverse current				Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking (Color indication Main body: Yellowish green)		
	V_Z (V) I_Z = 2 mA			I_{R1} (μA)		I_{R2} (μA)		R_Z (Ω) I_Z = 2 mA		R_{ZK} (Ω)		S_Z (mV/°C) I_Z = 2 mA			C_t (pF) (V_R = 0 V) f = 1 MHz				
	Min	Nom	Max	V_R (V)	Max	V_R (V)	Max	Typ	Max	I_Z (mA)	Max	Min	Typ	Max	Typ	Max	1st.	2nd.	3rd.
MAZ1270	25.1	27	28.9	19	0.05	24.8	60	25	80	0.5	200	21.4	23.4	25.3	30	50	Red	Purple	—
MAZ1270-L	25.3	26	26.7			24.8													
MAZ1270-M	26.3	27	27.7			25.8													
MAZ1270-H	27.3	28	28.7			26.8													
MAZ1300	28	30	32	21	0.05	27.8	60	30	80	0.5	200	24.4	26.6	29.4	27	50	Orange	Black	—
MAZ1300-L	28.3	29	29.7			27.8													
MAZ1300-M	29.3	30	30.8			28.8													
MAZ1300-H	30.2	31	31.8			29.7													
MAZ1330	31	33	35	23	0.05	30.7	60	35	80	0.5	200	27.4	29.7	33.4	25	45	Orange	Orange	—
MAZ1330-L	31.2	32	32.8			30.7													
MAZ1330-M	32.2	33	33.8			31.7													
MAZ1330-H	33.2	34	34.9			32.7													
MAZ1360	34	36	38	25	0.05	33.6	60	35	90	0.5	200	30.4	33	37.4	23	45	Orange	Blue	—
MAZ1360-L	34.1	35	35.9			33.6													
MAZ1360-M	35.1	36	36.9			34.6													
MAZ1360-H	36.1	37	37.9			35.6													
MAZ1390	37	—	41	27	0.05	36	60	—	130	0.5	250	33.4	36.4	41.2	21	45	Orange	White	—
MAZ1390-L	37.1	—	39			36													
MAZ1390-M	38	—	40			36													
MAZ1390-H	39	—	41			36													

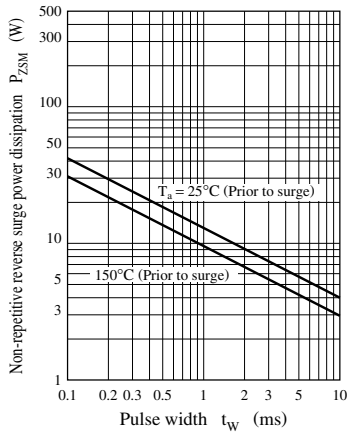
Note) 1. The V_Z value is the one after power application for 20 ms at T_a = 25°C.

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

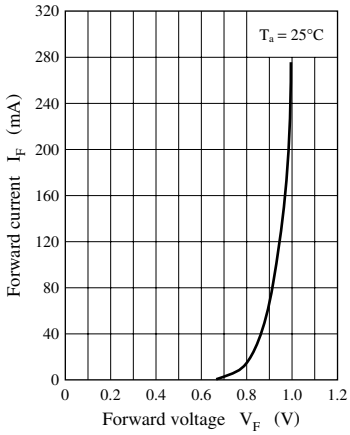
P_{tot} — T_a



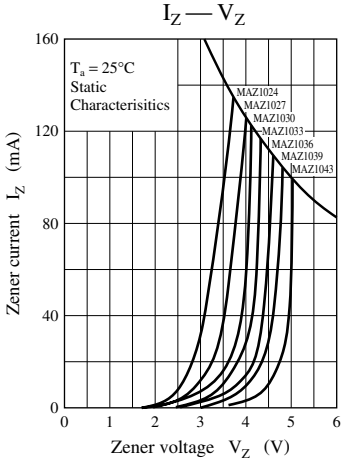
P_{ZSM} — t_W



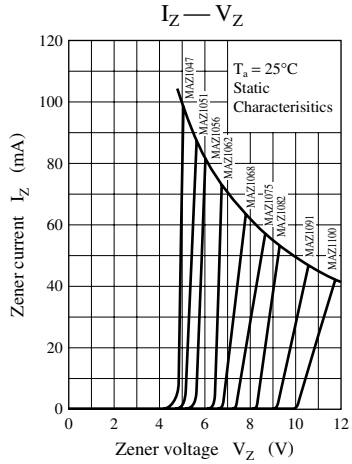
I_F — V_F



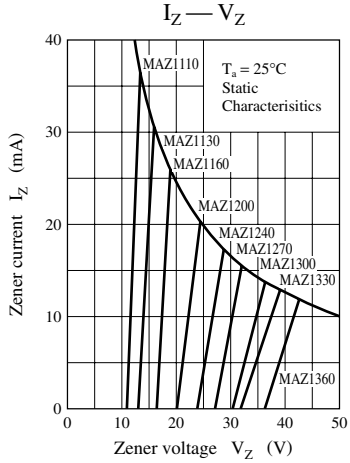
I_Z — V_Z



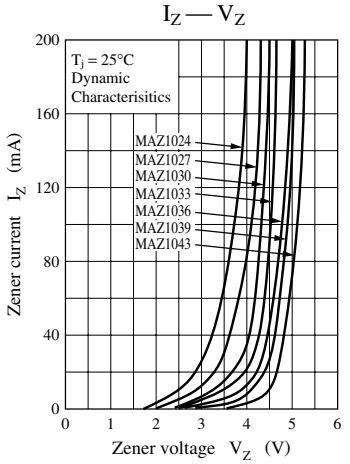
I_Z — V_Z



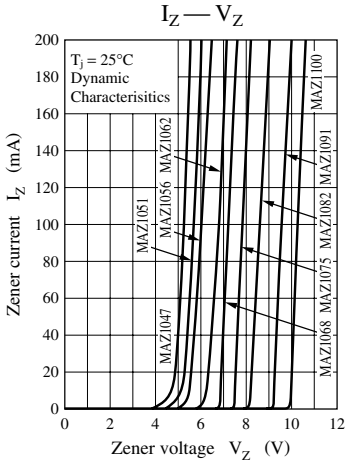
I_Z — V_Z



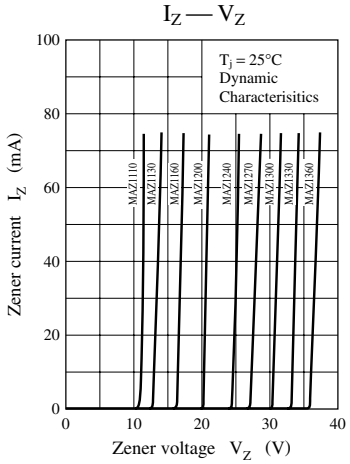
I_Z — V_Z



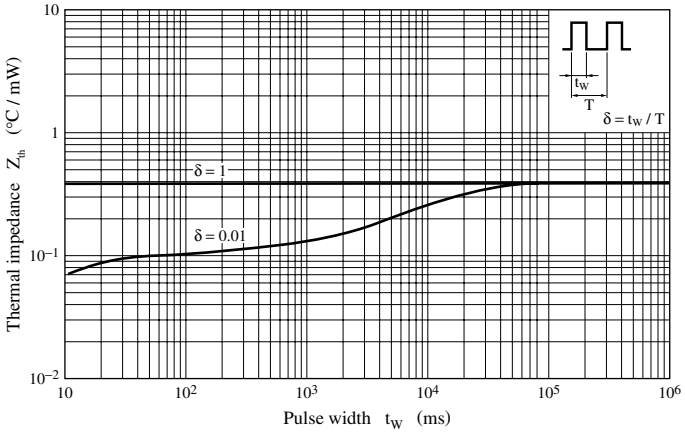
I_Z — V_Z



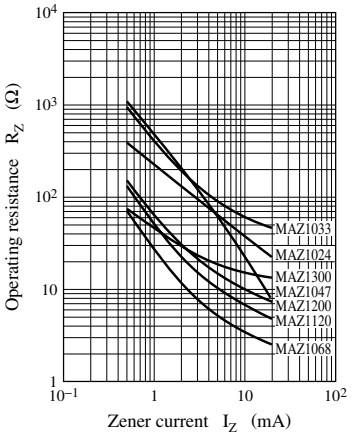
I_Z — V_Z



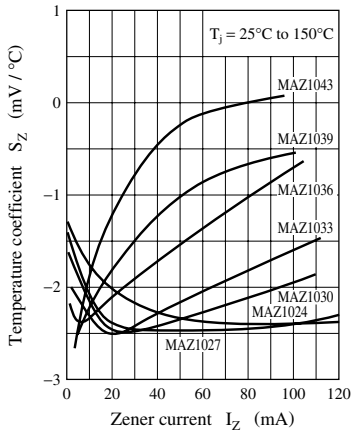
Z_{th} — t_W



R_Z — I_Z



S_Z — I_Z



S_Z — I_Z