

MAZ3000 Series (MA3000 Series)

Silicon planar type

For stabilization of power supply

■ Features

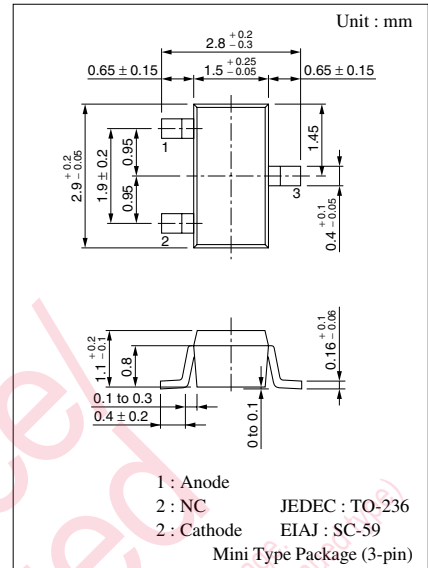
- Mini type package (3-pin)
- Allowing to achieve a high-density set
- Sharp rising performance
- Wide voltage range: $V_Z = 2.0 \text{ V}$ to 36 V

■ 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

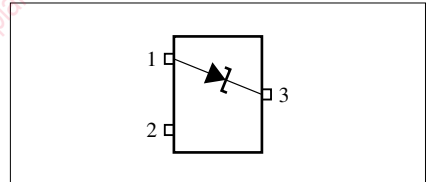
Refer to the list of the electrical characteristics within part numbers

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

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

Part Number	Zener voltage			Reverse current			Operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking Symbol		
	V_Z (V)			I_{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 (V)	Max	V_R (V)	Max	$I_Z = 5\text{ mA}$	Typ	Max	I_Z (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	—	—	—	—	—	—	—	—	—	—	—	—	—	6.2L or 6.2M or 6.2H	
MAZ3062-L	5.85	6.0	6.15	4	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	—	—	—	—	—	—	—	—	—	—	—	—	—	6.2M	
MAZ3062-H	6.24	6.4	6.56	—	—	—	—	—	—	—	—	—	—	—	—	—	6.2H	
MAZ3068	6.4	6.8	7.2	—	—	—	—	—	—	—	—	—	—	—	—	—	6.8L or 6.8M or 6.8H	
MAZ3068-L	6.44	6.6	6.77	4	2	—	—	60	6	15	0.5	140	1.2	3	4.5	85	110	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	—	—	—	—	—	—	—	—	—	—	—	—	—	7.5L or 7.5M or 7.5H	
MAZ3075-L	7.07	7.3	7.43	5	1	—	—	60	6	15	0.5	120	2.5	4	5.3	80	100	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	—	—	—	—	—	—	—	—	—	—	—	—	—	8.2L or 8.2M or 8.2H	
MAZ3082-L	7.77	7.9	8.17	5	0.5	—	—	60	6	15	0.5	120	3.2	4.6	6.2	75	95	8.2L
MAZ3082-M	8.03	8.2	8.43	—	—	—	—	—	—	—	—	—	—	—	—	—	8.2M	
MAZ3082-H	8.29	8.5	8.7	—	—	—	—	—	—	—	—	—	—	—	—	—	8.2H	

■ 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)					
	$I_Z = 5\text{ mA}$			V_R (V)	V_R (V)		$I_Z = 5\text{ mA}$	I_Z (mA)	$I_Z = 5\text{ mA}$			$(V_R = 0\text{ V})$ $f = 1\text{ MHz}$					
Min	Nom	Max	Max	Max	Typ	Max	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	7	0.2	8.6	60	8	20	0.5	130	4.5	6.4	8	70	90	9.1H
MAZ3100	9.4	10	10.6			8.9											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			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												

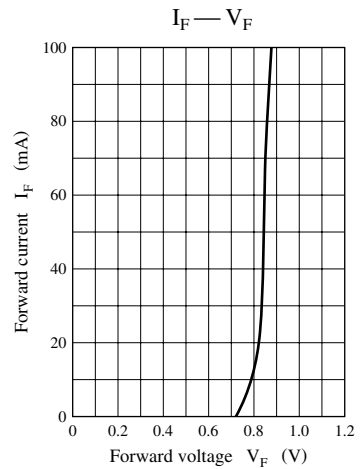
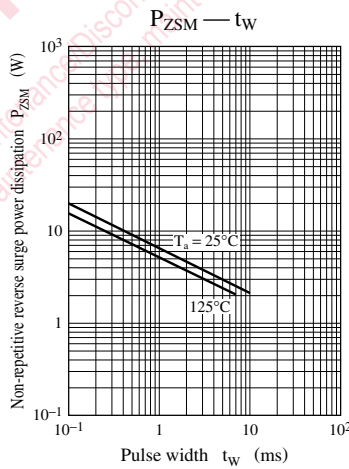
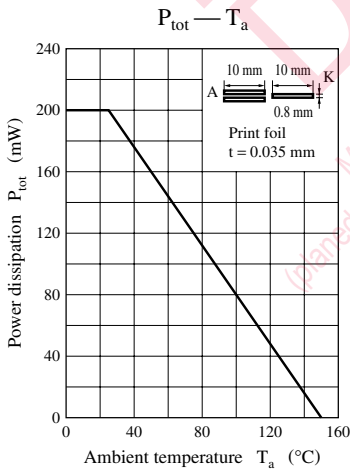
■ Electrical characteristics within part numbers (continued) $T_a = 25^\circ\text{C}$

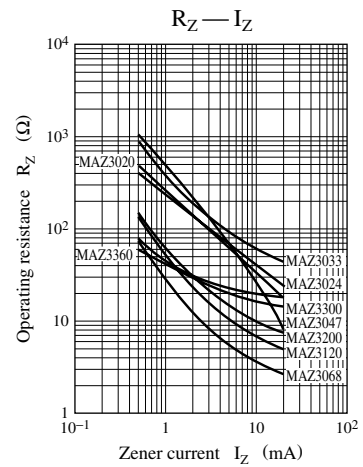
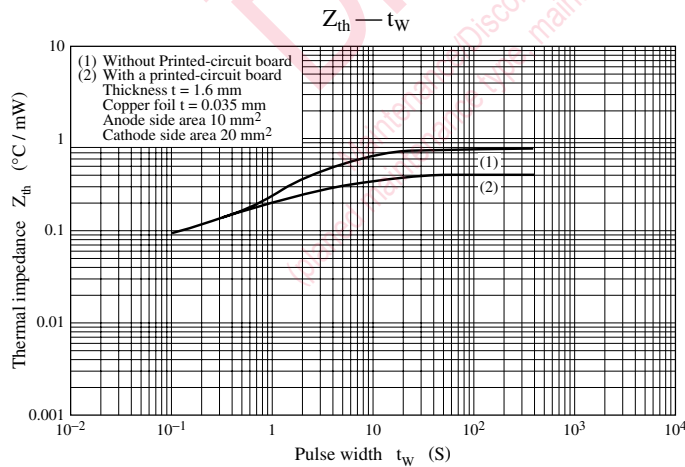
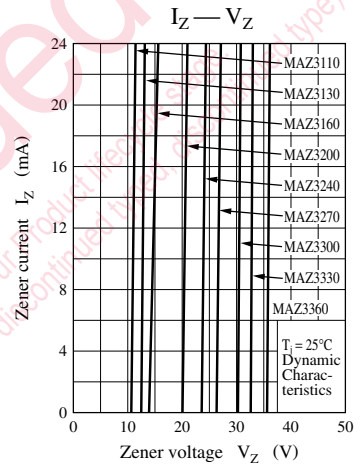
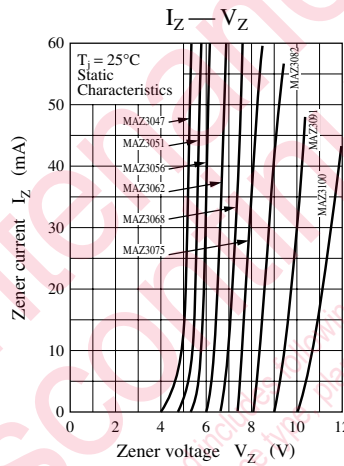
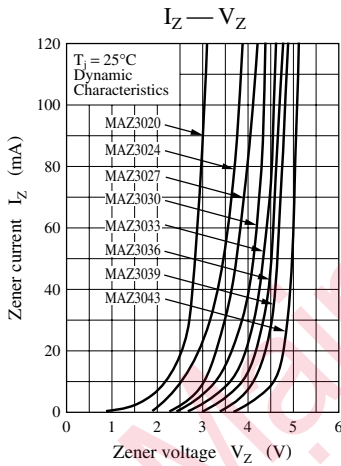
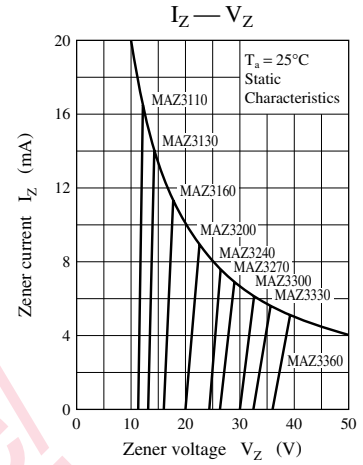
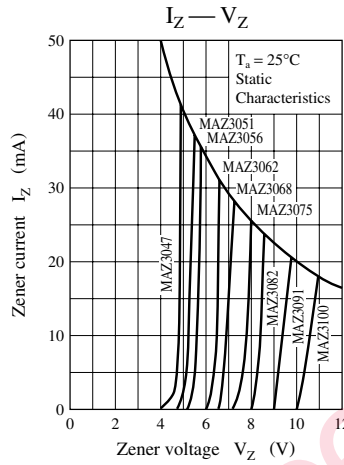
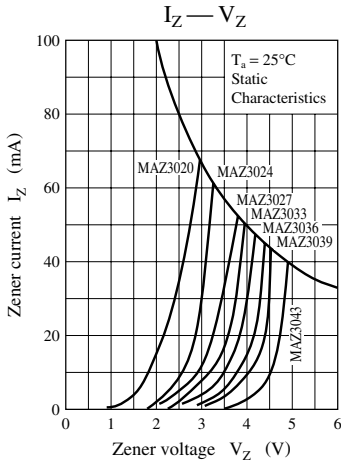
• $V_Z = 27\text{ V to } 36\text{ V}$ ($I_Z = 2\text{ mA}$)

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)				
	$I_Z = 2\text{ mA}$			V_R	V_R	$I_Z = 2\text{ mA}$		I_Z		$I_Z = 2\text{ mA}$			$(V_R = 0\text{ V})$				
	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

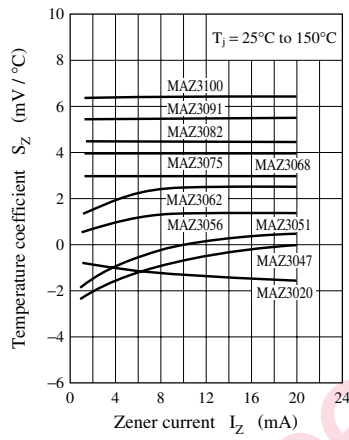
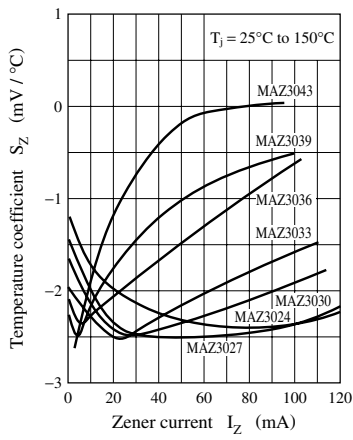
Note) 1. The V_Z value is the one after power application for 20 ms at $T_a = 25^\circ\text{C}$.

2. The zener voltage temperature coefficient is the one for $T_j = 25^\circ\text{C}$ to 150°C .





Zener Diodes



Maintenance/Discontinued

Maintenance/Discontinued includes following four Product lifecycle stage.
(planned maintenance type, maintenance type, planned discontinued type, discontinued type)

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 - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
 - Any applications other than the standard applications intended.
- (4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.
- (5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
 - Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.
- (6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.
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