

MAZ4000N Series (MA4000(N) Series)

Silicon planar type

For stabilization of power supply

■ Features

- Extremely low noise voltage caused from diode (1/3 to 1/10 of our conventional MAZ4000 series)
- Extremely good rising performance (in the low-current range)
- Easy-to-identify the zener-voltage rank by the color bands
- Easy-to-select the optimum diode because of their finely divided zener-voltage ranks
- Easy-to-mount through the adoption of the small glass-sealed DHD package (DO-34-A2)

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

Parameter	Symbol	Rating	Unit
Average forward current	$I_{F(AV)}$	250	mA
Repetitive peak forward current	I_{FRM}	250	mA
Total power dissipation *	P_{tot}	400	mW
Junction temperature	T_j	200	$^\circ\text{C}$
Storage temperature	T_{stg}	-65 to +200	$^\circ\text{C}$

Note) *: With a printed circuit board

■ Common Electrical Characteristics $T_a = 25^\circ\text{C}$ *1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Forward voltage	V_F	$I_F = 10\text{ mA}$		0.83	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_R	V_R Specified value				μA
Temperature coefficient of zener voltage *3	S_Z	I_Z Specified value				$\text{mV}/^\circ\text{C}$

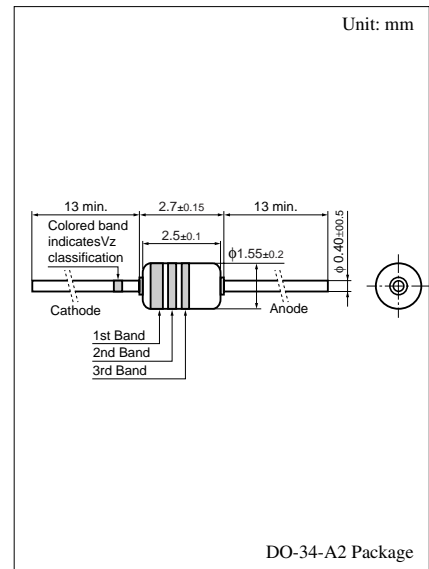
Refer to the list of the electrical characteristics within part numbers

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 : $T_j = 25^\circ\text{C}$ to 150°C



• Color indication of V_Z rank classification

Rank	L	M	H
Color	Black	Blue	Red

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

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

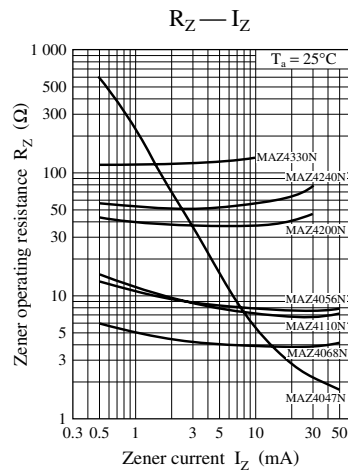
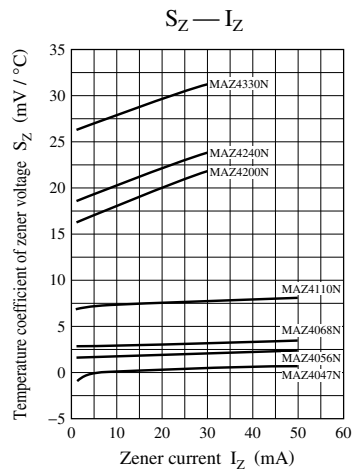
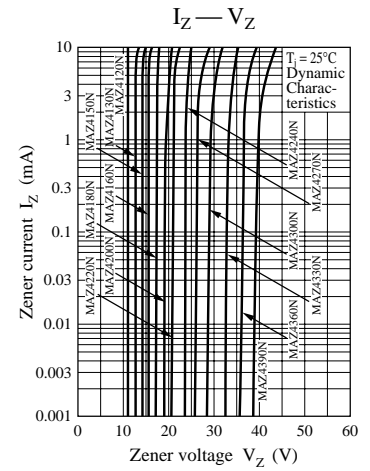
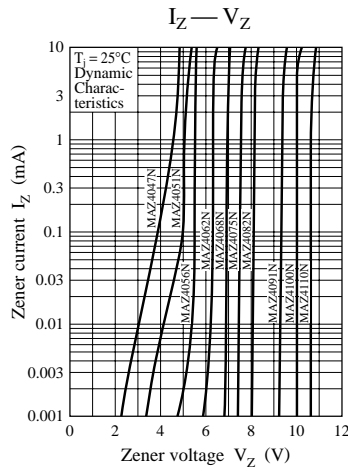
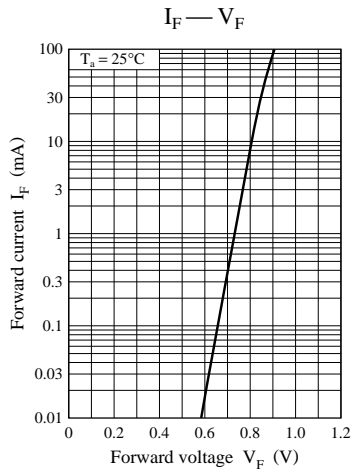
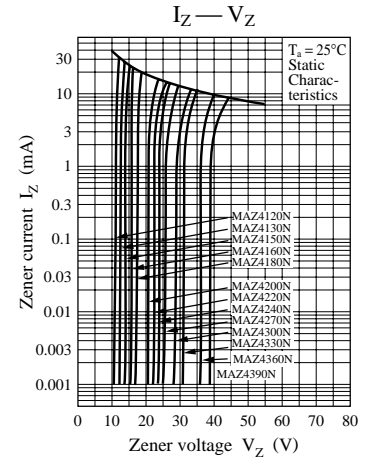
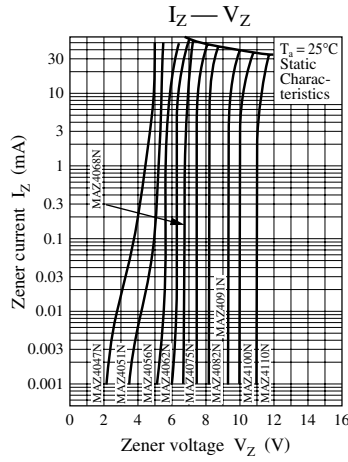
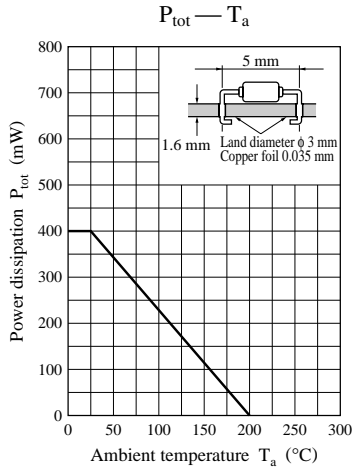
Part number	Zener voltage			Reverse current		Zener operating resistance				Temperature coefficient of zener voltage		Marking symbol (Color indication) Main body: light purple		
	V_Z (V) $I_Z = 5$ mA			I_R (μA) Max	V_R (V)	R_Z (Ω) Max	I_Z (mA)	R_{ZK} (Ω) Max	I_Z (mA)	S_Z (mV/ $^\circ\text{C}$) Typ	I_Z (mA)	1st.	2nd.	3rd.
	Min	Nom	Max											
MAZ4047N	4.42	4.66	4.90	2.0	1.0	80	5	800	0.5	-1.4	5	Yellow	Purple	Purple
MAZ4047N0L	4.42	4.52	4.61											
MAZ4047N0M	4.55	4.65	4.75											
MAZ4047N0H	4.69	4.80	4.90											
MAZ4051N	4.84	5.11	5.38	1.0	2.0	60	5	500	0.5	-0.8	5	Green	Brown	Brown
MAZ4051N0L	4.84	4.94	5.04											
MAZ4051N0M	4.98	5.10	5.21											
MAZ4051N0H	5.15	5.27	5.38											
MAZ4056N	5.32	5.62	5.92	0.5	2.5	40	5	200	0.5	1.2	5	Green	Blue	Blue
MAZ4056N0L	5.32	5.44	5.55											
MAZ4056N0M	5.49	5.61	5.73											
MAZ4056N0H	5.67	5.80	5.92											
MAZ4062N	5.86	6.20	6.53	0.2	4.0	30	5	100	0.5	2.3	5	Blue	Red	Red
MAZ4062N0L	5.86	5.99	6.12											
MAZ4062N0M	6.06	6.20	6.33											
MAZ4062N0H	6.26	6.40	6.53											
MAZ4068N	6.47	6.81	7.14	0.1	4.0	20	5	60	0.5	3.0	5	Blue	Gray	Gray
MAZ4068N0L	6.47	6.60	6.73											
MAZ4068N0M	6.65	6.79	6.93											
MAZ4068N0H	6.86	7.00	7.14											
MAZ4075N	7.07	7.45	7.83	0.1	5.0	20	5	60	0.5	4.0	5	Purple	Green	Green
MAZ4075N0L	7.07	7.21	7.35											
MAZ4075N0M	7.29	7.44	7.59											
MAZ4075N0H	7.53	7.68	7.83											
MAZ4082N	7.77	8.20	8.63	0.1	5.0	20	5	60	0.5	4.6	5	Gray	Red	Red
MAZ4082N0L	7.77	7.93	8.09											
MAZ4082N0M	8.03	8.19	8.35											
MAZ4082N0H	8.29	8.46	8.63											
MAZ4091N	8.57	9.05	9.53	0.1	6.0	20	5	60	0.5	5.5	5	White	Brown	Brown
MAZ4091N0L	8.57	8.75	8.93											
MAZ4091N0M	8.86	9.04	9.22											
MAZ4091N0H	9.15	9.34	9.53											
MAZ4100N	9.47	10.01	10.54	0.05	7.0	30	5	60	0.5	6.4	5	Brown	Black	—
MAZ4100N0L	9.47	9.66	9.85											
MAZ4100N0M	9.79	9.99	10.19											
MAZ4100N0H	10.12	10.33	10.54											
MAZ4110N	10.45	11.01	11.56	0.05	8.0	30	5	60	0.5	7.4	5	Brown	Brown	—
MAZ4110N0L	10.45	10.66	10.87											
MAZ4110N0M	10.77	10.99	11.21											
MAZ4110N0H	11.10	11.33	11.56											
MAZ4120N	11.43	12.01	12.58	0.05	9.0	30	5	80	0.5	8.4	5	Brown	Red	—
MAZ4120N0L	11.43	11.66	11.89											
MAZ4120N0M	11.75	11.99	12.23											
MAZ4120N0H	12.08	12.33	12.58											
MAZ4130N	12.46	13.21	13.96	0.05	10.0	35	5	80	0.5	9.4	5	Brown	Orange	—
MAZ4130N0L	12.46	12.74	13.02											
MAZ4130N0M	12.90	13.19	13.48											
MAZ4130N0H	13.36	13.66	13.96											

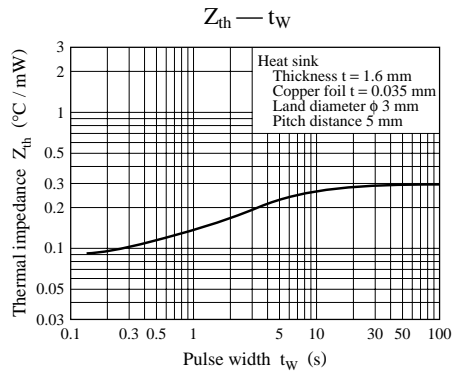
■ Electrical characteristics within part numbers (continued) $T_a = 25^\circ\text{C}$

Part number	Zener voltage			Reverse current		Zener operating resistance				Temperature coefficient of zener voltage		Marking symbol (Color indication) Main body: light purple		
	V_Z (V) $I_Z = 5 \text{ mA}$			I_R (μA) Max	V_R (V)	R_Z (Ω) Max	I_Z (mA)	R_{ZK} (Ω) Max	I_Z (mA)	S_Z (mV/ $^\circ\text{C}$) Typ	I_Z (mA)			
	Min	Nom	Max									1st.	2nd.	3rd.
MAZ4150N	13.84	14.68	15.51	0.05	11.0	40	5	80	0.5	11.4	5	Brown	Green	—
MAZ4150N0L	13.84	14.15	14.46											
MAZ4150N0M	14.34	14.66	14.98											
MAZ4150N0H	14.86	15.19	15.51											
MAZ4160N	15.38	16.23	17.08	0.05	12.0	50	5	80	0.5	12.4	5	Brown	Blue	—
MAZ4160N0L	15.38	15.69	16.00											
MAZ4160N0M	15.86	16.18	16.50											
MAZ4160N0H	16.36	16.72	17.08											
MAZ4180N	16.94	17.98	19.02	0.05	13.0	60	5	80	0.5	14.4	5	Brown	Gray	—
MAZ4180N0L	16.94	17.32	17.70											
MAZ4180N0M	17.56	17.96	18.35											
MAZ4180N0H	18.21	18.62	19.02											
MAZ4200N	18.88	19.98	21.08	0.05	15.0	80	5	100	0.5	16.4	5	Red	Black	—
MAZ4200N0L	18.88	19.28	19.68											
MAZ4200N0M	19.53	19.95	20.37											
MAZ4200N0H	20.22	20.65	21.08											
MAZ4220N	20.89	22.02	23.15	0.05	17.0	80	5	100	0.5	18.4	5	Red	Red	—
MAZ4220N0L	20.89	21.33	21.76											
MAZ4220N0M	21.56	22.01	22.45											
MAZ4220N0H	22.25	22.70	23.15											
MAZ4240N	22.93	24.25	25.57	0.05	19.0	100	5	120	0.5	20.4	5	Red	Yellow	—
MAZ4240N0L	22.93	23.45	23.96											
MAZ4240N0M	23.76	24.27	24.78											
MAZ4240N0H	24.56	25.07	25.57											
MAZ4270N	25.20	26.91	28.61	0.05	21.0	120	5	120	0.5	23.4	5	Red	Purple	—
MAZ4270N0L	25.20	25.85	26.50											
MAZ4270N0M	26.19	26.86	27.53											
MAZ4270N0H	27.21	27.91	28.61											
MAZ4300N	28.22	29.98	31.74	0.05	23.0	160	5	160	0.5	26.6	5	Orange	Black	—
MAZ4300N0L	28.22	28.94	29.66											
MAZ4300N0M	29.19	29.94	30.69											
MAZ4300N0H	30.20	30.97	31.74											
MAZ4330N	31.18	33.01	34.83	0.05	25.0	200	5	200	0.5	29.7	5	Orange	Orange	—
MAZ4330N0L	31.18	31.98	32.78											
MAZ4330N0M	32.15	32.97	33.79											
MAZ4330N0H	33.13	33.98	34.83											
MAZ4360N	34.12	36.02	37.91	0.05	27.0	250	5	250	0.5	33.0	5	Orange	Blue	—
MAZ4360N0L	34.12	34.99	35.86											
MAZ4360N0M	35.07	35.97	36.87											
MAZ4360N0H	36.07	36.99	37.91											
MAZ4390N	37.04	39.02	40.99	0.05	30.0	300	5	300	0.5	35.6	5	Orange	White	—
MAZ4390N0L	37.04	37.99	38.94											
MAZ4390N0M	38.00	38.97	39.94											
MAZ4390N0H	38.99	39.99	40.99											

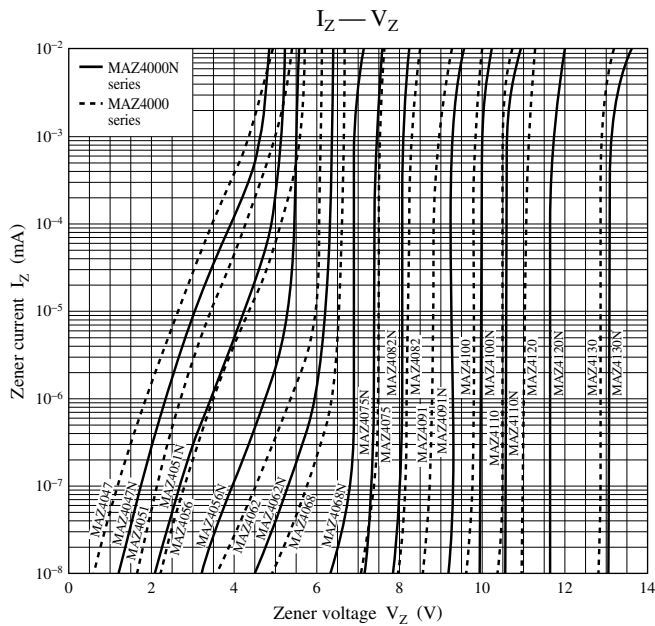
Note) 1. The V_Z value is the one after power application for 20 ms at $T_a = 25^\circ\text{C}$.

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

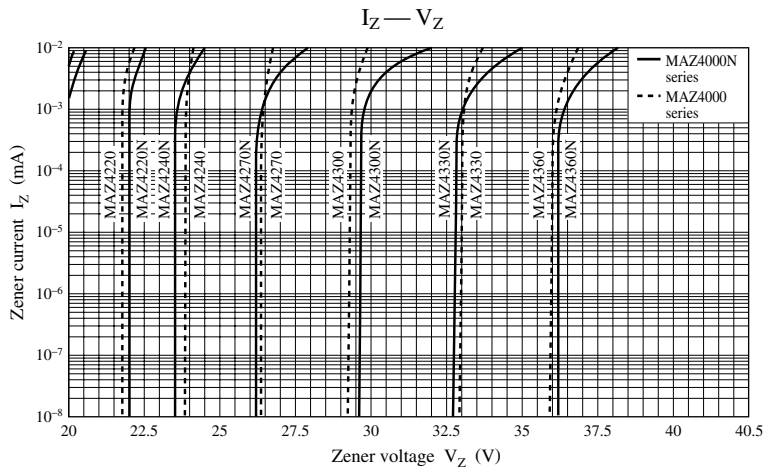




- Comparison (1) of rise performance between MAZ4000N and MAZ4000 series



- Comparison (2) of rise performance between MAZ4000N and MAZ4000 series



Request for your special attention and precautions in using the technical information and semiconductors described in this material

- (1) An export permit needs to be obtained from the competent authorities of the Japanese Government if any of the products or technologies described in this material and controlled under the "Foreign Exchange and Foreign Trade Law" is to be exported or taken out of Japan.
- (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.
- (3) The products described in this material are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
 - 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 material are subject to change without notice for reasons of 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 guaranteed values, in particular those of maximum rating, the range of operating power supply voltage and heat radiation characteristics. 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, redundant design is recommended, so that such equipment may not violate relevant laws or regulations because of the function of our products.
- (6) When using products for which dry packing is required, observe the conditions (including shelf life and after-unpacking standby time) agreed upon when specification sheets are individually exchanged.
- (7) No part of this material may be reprinted or reproduced by any means without written permission from our company.

Please read the following notes before using the datasheets

- A. These materials are intended as a reference to assist customers with the selection of Panasonic semiconductor products best suited to their applications.
Due to modification or other reasons, any information contained in this material, such as available product types, technical data, and so on, is subject to change without notice.
Customers are advised to contact our semiconductor sales office and obtain the latest information before starting precise technical research and/or purchasing activities.
- B. Panasonic is endeavoring to continually improve the quality and reliability of these materials but there is always the possibility that further rectifications will be required in the future. Therefore, Panasonic will not assume any liability for any damages arising from any errors etc. that may appear in this material.
- C. These materials are solely intended for a customer's individual use.
Therefore, without the prior written approval of Panasonic, any other use such as reproducing, selling, or distributing this material to a third party, via the Internet or in any other way, is prohibited.