NEC

ZENER DIODES

RD2.0S to RD120S

ZENER DIODES
200 mW 2 PINS SUPER MINI MOLD

DESCRIPTION

Type RD2.0S to RD120S Series are 2 PIN Super Mini Mold Package zener diodes possessing an allowable power dissipation of 200 mW.

FEATURES

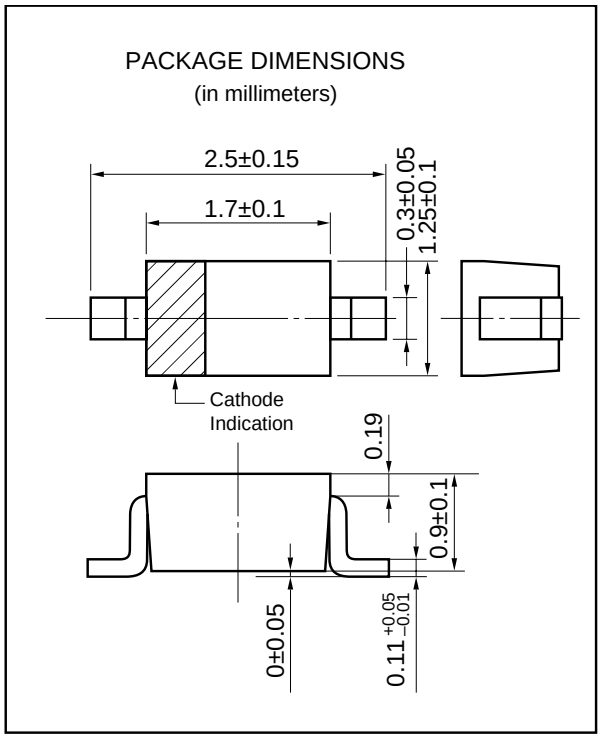
- Sharp Breakdown characteristic.
- Vz: Applied E24 standard.

APPLICATIONS

Circuit for Constant Voltage, Constant Current, Wave form Clipper, Surge absorber, etc.

PACKAGE DIMENSIONS

(in millimeter)



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

Power Dissipation	P	200 mW
Forward Current	I_F	100 mA
Reverse Surge Power	P_{RSM}	85 W (at t=10 μs/1 pulse) Show Fig. 12
Junction Temperature	T_j	150 °C
Storage Temperature	T_{stg}	–55 to +150 °C

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

Document No. D11444EJ3V0DS00 (3rd edition)
Date Published March 1999 N CP(K)
Printed in Japan

© NEC Corporation 1995

ELECTRICAL CHARACTERISTICS (T_A = 25 ± 2 °C)

Type Number	Class	Zener Voltage Vz (V)[Note 1]			Dynamic Impedance Zz (Ω)[Note 2]		Reverse Current I_R (μA)	
		MIN.	MAX.	Iz (mA)	MAX.	Iz (mA)	MAX.	V_R (V)
RD2.0S	B	1.90	2.20	5	100	5	120	0.5
RD2.2S	B	2.10	2.40	5	100	5	120	0.7
RD2.4S	B	2.30	2.60	5	100	5	120	1.0
RD2.7S	B	2.50	2.90	5	110	5	120	1.0
	B1	2.50	2.75					
	B2	2.65	2.90					
RD3.0S	B	2.80	3.20	5	120	5	50	1.0
	B1	2.80	3.05					
	B2	2.95	3.20					
RD3.3S	B	3.10	3.50	5	130	5	20	1.0
	B1	3.10	3.35					
	B2	3.25	3.50					
RD3.6S	B	3.40	3.80	5	130	5	10	1.0
	B1	3.40	3.65					
	B2	3.55	3.80					
RD3.9S	B	3.70	4.10	5	130	5	10	1.0
	B1	3.70	3.97					
	B2	3.87	4.10					
RD4.3S	B	4.00	4.49	5	130	5	10	1.0
	B1	4.00	4.22					
	B2	4.14	4.35					
	B3	4.27	4.49					
RD4.7S	B	4.40	4.92	5	130	5	10	1.0
	B1	4.40	4.63					
	B2	4.53	4.77					
	B3	4.67	4.92					
RD5.1S	B	4.82	5.39	5	130	5	5	1.5
	B1	4.82	5.06					
	B2	4.96	5.22					
	B3	5.12	5.39					
RD5.6S	B	5.29	5.94	5	80	5	5	2.5
	B1	5.29	5.57					
	B2	5.47	5.75					
	B3	5.65	5.94					
RD6.2S	B	5.84	6.55	5	50	5	2	3.0
	B1	5.84	6.14					
	B2	6.04	6.35					
	B3	6.24	6.55					

ELECTRICAL CHARACTERISTICS (T_A = 25 ± 2 °C)

Type Number	Class	Zener Voltage Vz (V)[Note 1]			Dynamic Impedance Zz (Ω)[Note 2]		Reverse Current I_R (μA)	
		MIN.	MAX.	Iz (mA)	MAX.	Iz (mA)	MAX.	V_R (V)
RD6.8S	B	6.44	7.17	5	30	5	2	3.5
	B1	6.44	6.76					
	B2	6.62	6.96					
	B3	6.83	7.17					
RD7.5S	B	7.03	7.87	5	30	5	2	4.0
	B1	7.03	7.39					
	B2	7.25	7.63					
	B3	7.49	7.87					
RD8.2S	B	7.73	8.67	5	30	5	2	5.0
	B1	7.73	8.13					
	B2	7.98	8.39					
	B3	8.25	8.67					
RD9.1S	B	8.53	9.58	5	30	5	2	6.0
	B1	8.53	8.96					
	B2	8.81	9.26					
	B3	9.12	9.58					
RD10S	B	9.42	10.58	5	30	5	2	7.0
	B1	9.42	9.90					
	B2	9.74	10.24					
	B3	10.08	10.58					
RD11S	B	10.40	11.60	5	30	5	2	8.0
	B1	10.40	10.92					
	B2	10.72	11.26					
	B3	11.06	11.60					
RD12S	B	11.38	12.64	5	35	5	2	9.0
	B1	11.38	11.94					
	B2	11.69	12.28					
	B3	12.04	12.64					
RD13S	B	12.43	14.00	5	35	5	2	10
RD15S	B	13.80	15.56	5	40	5	2	11
RD16S	B	15.31	17.14	5	40	5	2	12
RD18S	B	16.89	19.08	5	45	5	2	13
RD20S	B	18.80	21.14	5	50	5	2	15
RD22S	B	20.81	23.25	5	55	5	2	17
RD24S	B	22.86	25.66	5	60	5	2	19
RD27S	B	25.10	28.90	2	70	2	2	21
RD30S	B	28.00	32.00	2	80	2	2	23
RD33S	B	31.00	35.00	2	80	2	2	25
RD36S	B	34.00	38.00	2	90	2	2	27

ELECTRICAL CHARACTERISTICS (T_A = 25 ± 2 °C)

Type Number	Class	Zener Voltage Vz (V)[Note 1]			Dynamic Impedance Zz (Ω)[Note 2]		Reverse Current I_R (μA)	
		MIN.	MAX.	Iz (mA)	MAX.	Iz (mA)	MAX.	V_R (V)
RD39S	B	37.00	41.00	2	100	2	2	30
RD43S	B	40.00	45.00	2	130	2	2	33
RD47S	B	44.00	49.00	2	150	2	2	36
RD51S	B	48.00	54.00	2	180	2	1	39
RD56S	B	53.00	60.00	2	180	2	1	43
RD62S	B	58.00	66.00	2	200	2	0.2	47
RD68S	B	64.00	72.00	2	250	2	0.2	52
RD75S	B	70.00	79.00	2	300	2	0.2	57
RD82S	B	77.00	87.00	2	300	2	0.2	63
RD91S	B	85.00	96.00	1	700	1	0.2	69
RD100S	B	94.00	106.0	1	700	1	0.2	76
RD110S	B	104.0	116.0	1	800	1	0.2	84
RD120S	B	114.0	126.0	1	900	1	0.2	91

Note 1. Vz is tested with pulsed (40 ms).

2. Zz is measured at Iz by given a very small A.C. current signal.

TYPICAL CHARACTERISTICS (T_A = 25 °C)

Fig. 1 POWER DISSIPATION vs. AMBIENT TEMPERATURE

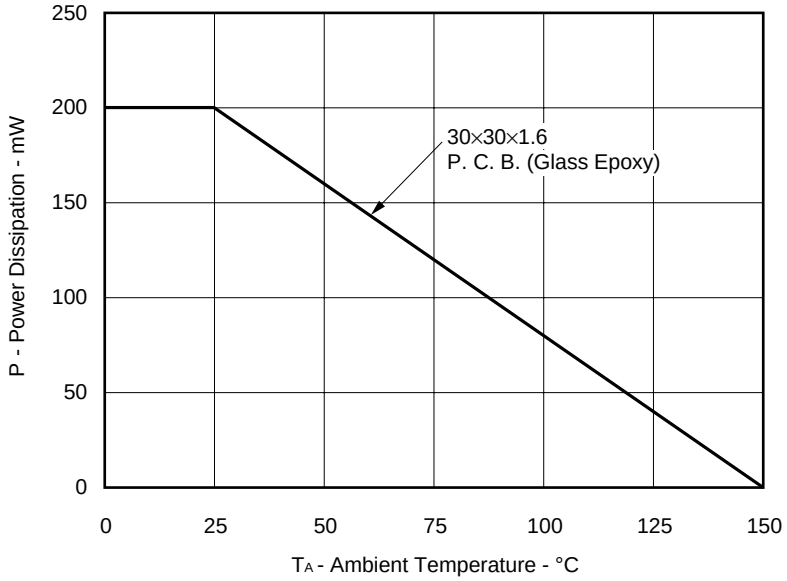


Fig. 2 ZENER CURRENT vs. ZENER VOLTAGE

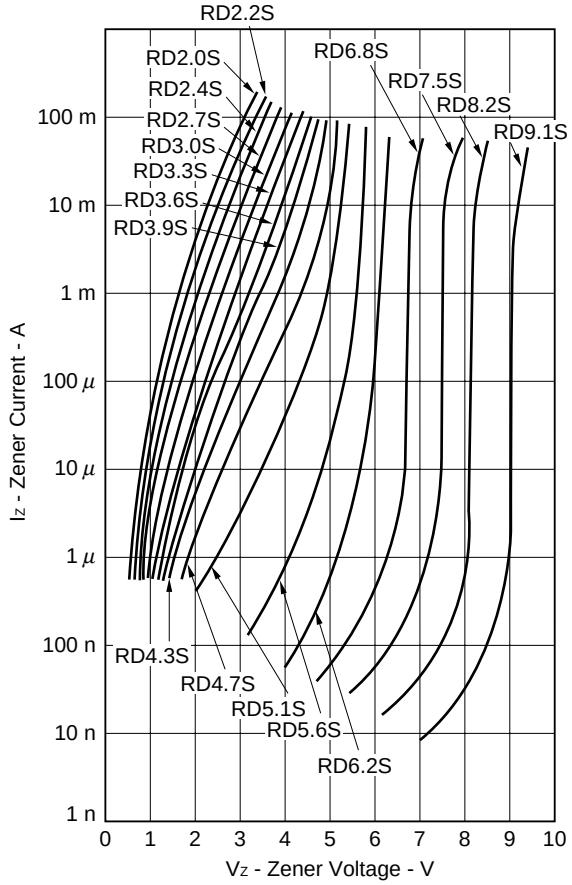


Fig. 3 ZENER CURRENT vs. ZENER VOLTAGE

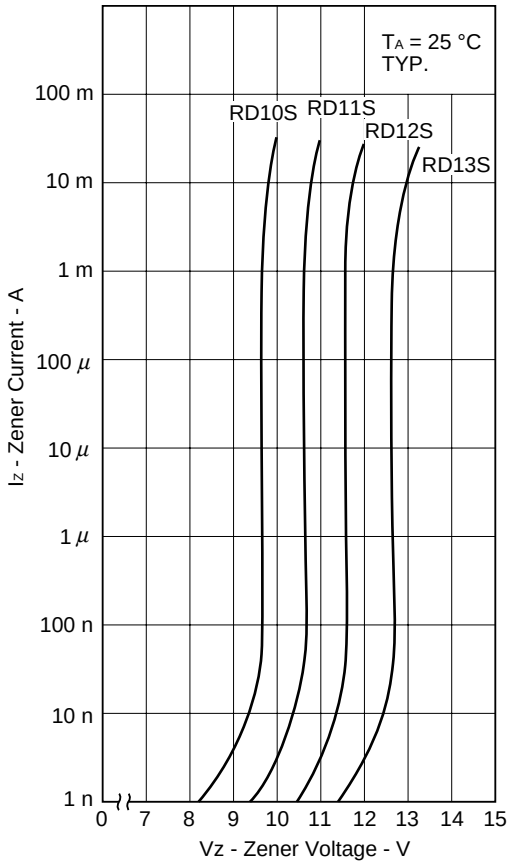


Fig. 4 ZENER CURRENT vs. ZENER VOLTAGE

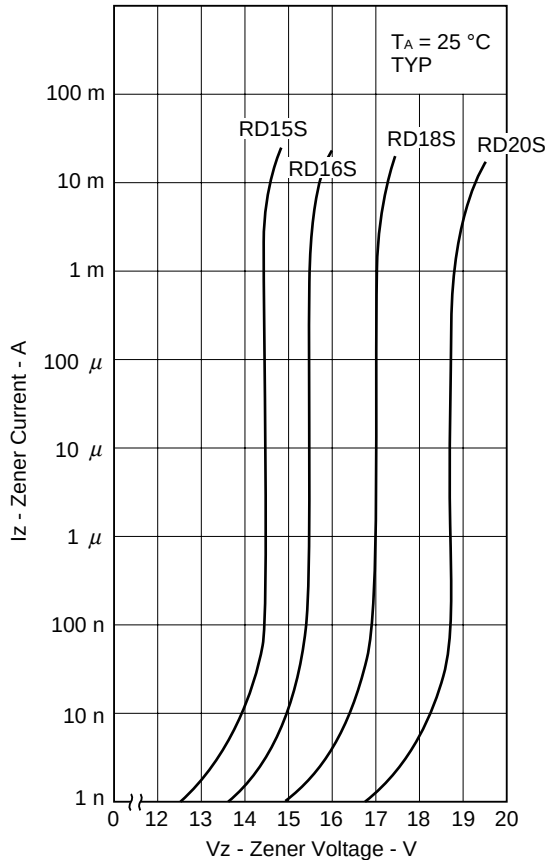


Fig. 5 ZENER CURRENT vs. ZENER VOLTAGE

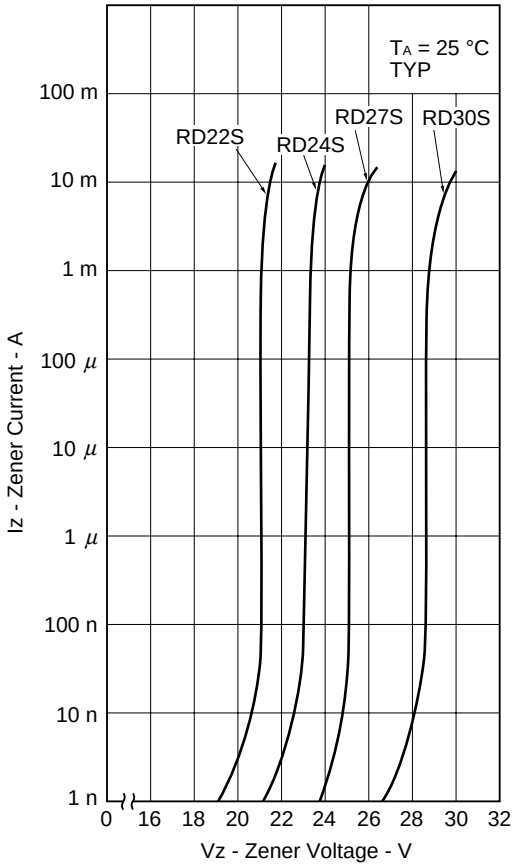


Fig. 6 ZENER CURRENT vs. ZENER VOLTAGE

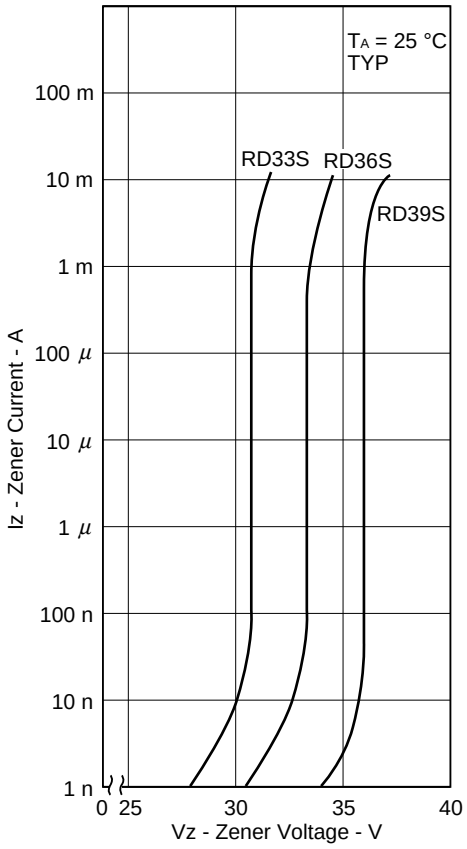


Fig. 7 ZENER CURRENT vs. ZENER VOLTAGE

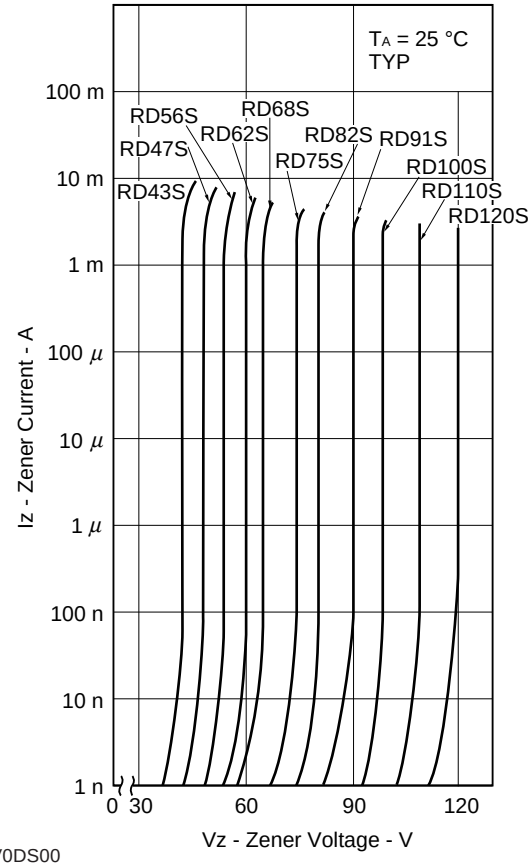


Fig. 8 DYNAMIC IMPEDANCE vs. ZENER CURRENT

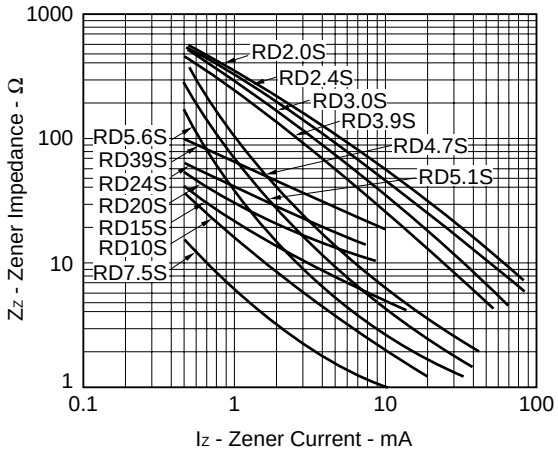


Fig. 9 ZENER VOLTAGE TEMPERATURE COEFFICIENT vs. ZENER VOLTAGE

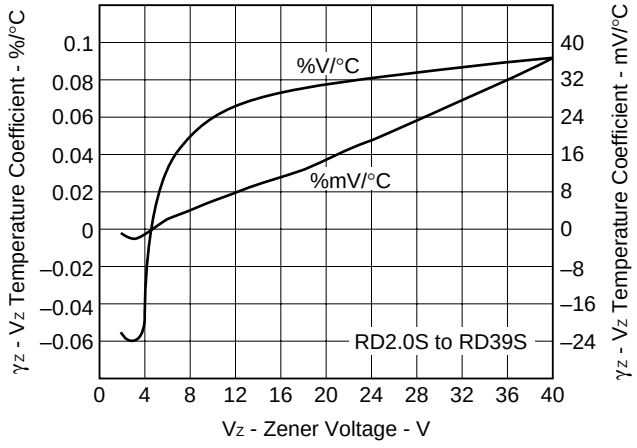


Fig. 10 ZENER VOLTAGE TEMPERATURE COEFFICIENT vs. ZENER VOLTAGE

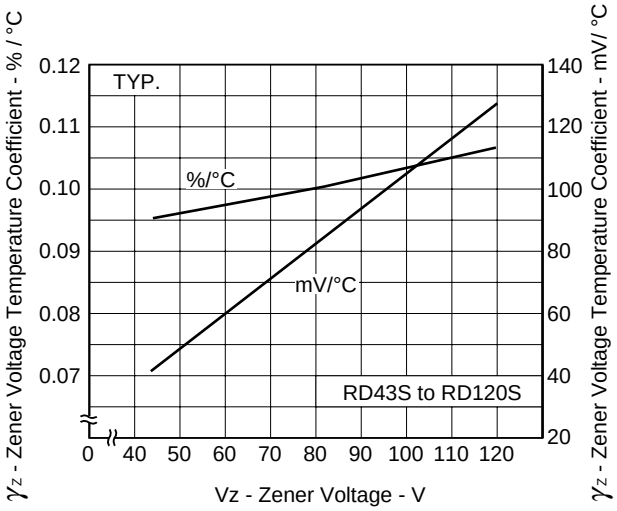


Fig. 11 TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

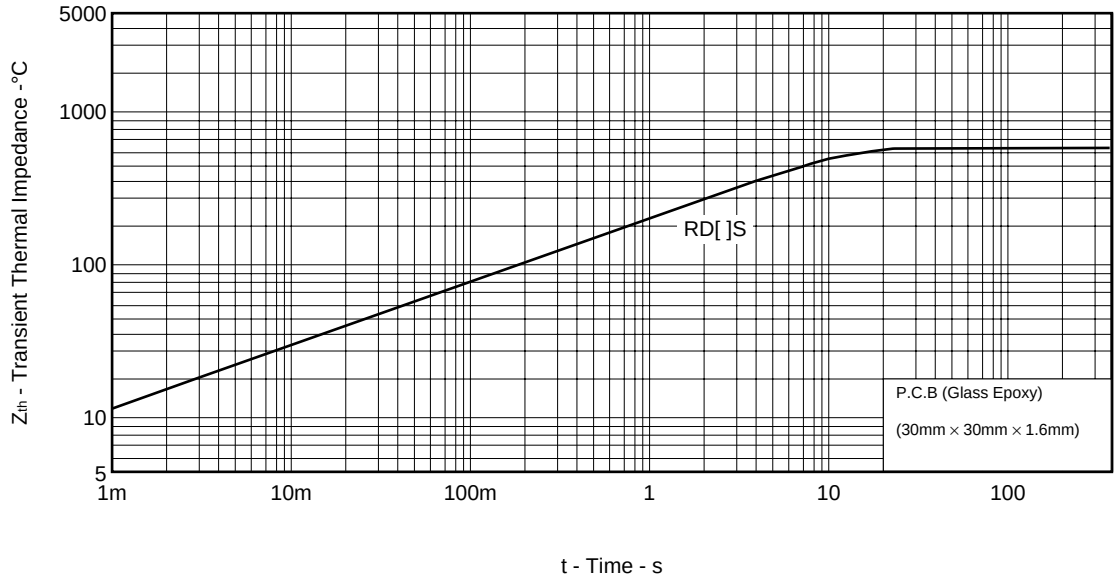
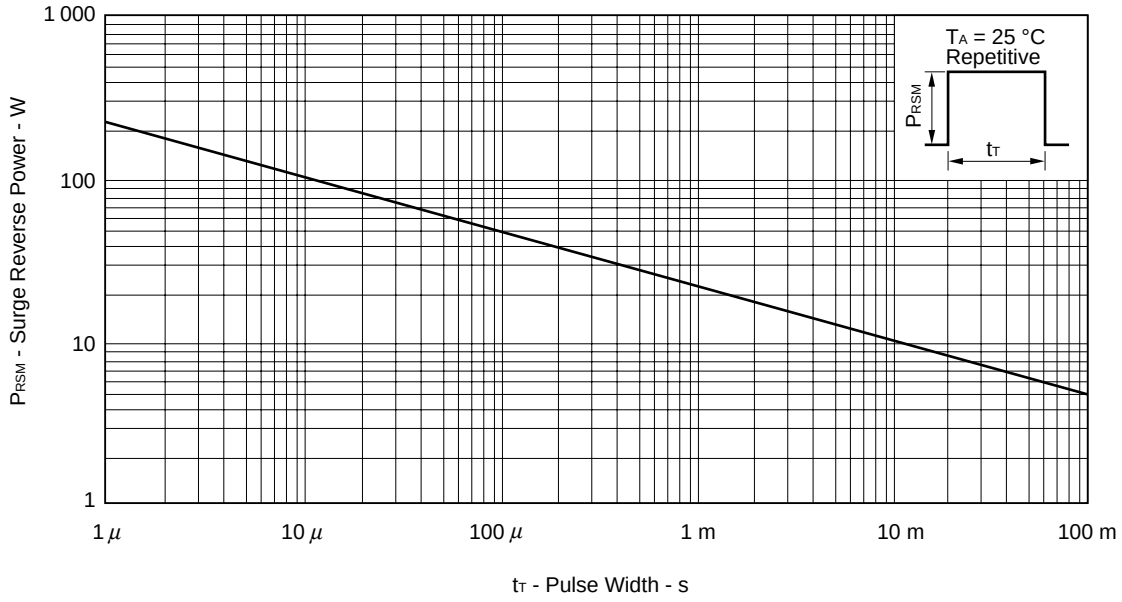


Fig. 12 SURGE REVERSE POWER RATINGS



[MEMO]

[MEMO]

[MEMO]

[MEMO]

- **The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.**
- No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Corporation. NEC Corporation assumes no responsibility for any errors which may appear in this document.
- NEC Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Corporation or others.
- Descriptions of circuits, software, and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software, and information in the design of the customer's equipment shall be done under the full responsibility of the customer. NEC Corporation assumes no responsibility for any losses incurred by the customer or third parties arising from the use of these circuits, software, and information.
- While NEC Corporation has been making continuous effort to enhance the reliability of its semiconductor devices, the possibility of defects cannot be eliminated entirely. To minimize risks of damage or injury to persons or property arising from a defect in an NEC semiconductor device, customers must incorporate sufficient safety measures in its design, such as redundancy, fire-containment, and anti-failure features.
- NEC devices are classified into the following three quality grades:
  "Standard", "Special", and "Specific". The Specific quality grade applies only to devices developed based on a customer designated “quality assurance program“ for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.

  Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

  Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

  Specific: Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

  The quality grade of NEC devices is "Standard" unless otherwise specified in NEC's Data Sheets or Data Books. If customers intend to use NEC devices for applications other than those specified for Standard quality grade, they should contact an NEC sales representative in advance.

M7 98.8