DATA SHEET

NEC

ZENER DIODES

RD2.0ES to RD39ES

400 mW DHD ZENER DIODE

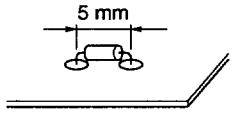
(DO-34)

DESCRIPTION

NEC Type RD2.0ES to RD39ES Series are planar type diodes into DO-34 Package (Body length 2.4 mm MAX.) with DHD (Double Heatsink Diode) construction having allowable power dissipation of 400 mW.

FEATURES

- DO-34 Glass sealed package
  This diode can be inserted into a PC board with a shorter pitch (5 mm)

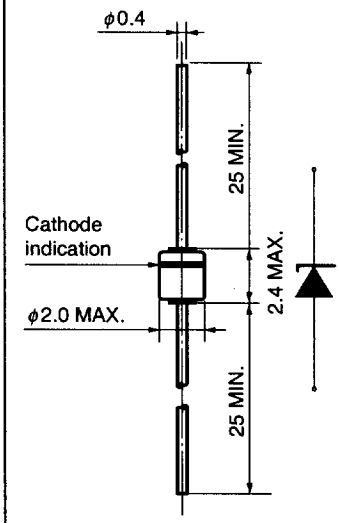


- Planar process
- DHD (Double Heatsink Diode) construction
- Vz Applied E24 standard

ORDERING INFORMATION

RD2.0ES to RD39ES with suffix "AB1", "AB2", or "AB3" should be applied for orders for suffix "AB".

PACKAGE DIMENSIONS
(in millimeters)



DO-34 (JEDEC)
Marking color: Black

APPLICATIONS

Circuits for Constant Voltage, Constant Current, Waveform clipper, Surge absorber, etc.

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

Forward Current	I_F	150 mA	
Power Dissipation	P	400 mW	to see Fig. 6
Surge Reverse Power	P_{RSM}	100 W (t = 10 μs)	to see Fig. 10
Junction Temperature	T_j	175 °C	
Storage Temperature	T_{stg}	−65 to +175 °C	

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

Type Number	Suffix	Zener Voltage V_Z (V) Note 1			Dynamic Impedance Z_Z (Ω) Note 2		Knee Dynamic Impedance Z_{ZK} (Ω) Note 2		Reverse Current I_R (μA)	
		MIN.	MAX.	I_Z(mA)	MAX.	I_Z(mA)	MAX.	I_Z(mA)	MAX.	V_R(V)
RD2.0ES	AB	1.88	2.24	5	100	5	1000	0.5	120	0.5
	AB1	1.88	2.12							
	AB2	2.01	2.24							
RD2.2ES	AB	2.11	2.44	5	100	5	1000	0.5	120	0.7
	AB1	2.11	2.34							
	AB2	2.22	2.44							
RD2.4ES	AB	2.32	2.65	5	100	5	1000	0.5	120	1.0
	AB1	2.32	2.54							
	AB2	2.41	2.65							
RD2.7ES	AB	2.52	2.93	5	110	5	1000	0.5	100	1.0
	AB1	2.52	2.77							
	AB2	2.68	2.93							
RD3.0ES	AB	2.84	3.24	5	120	5	1000	0.5	50	1.0
	AB1	2.84	3.08							
	AB2	2.99	3.24							
RD3.3ES	AB	3.15	3.54	5	120	5	1000	0.5	20	1.0
	AB1	3.15	3.39							
	AB2	3.31	3.54							
RD3.6ES	AB	3.46	3.84	5	120	5	1100	0.5	10	1.0
	AB1	3.46	3.69							
	AB2	3.60	3.84							
RD3.9ES	AB	3.74	4.16	5	120	5	1200	0.5	5	1.0
	AB1	3.74	4.01							
	AB2	3.89	4.16							
RD4.3ES	AB	4.04	4.57	5	120	5	1200	0.5	5	1.0
	AB1	4.04	4.29							
	AB2	4.17	4.43							
	AB3	4.30	4.57							
RD4.7ES	AB	4.44	4.93	5	100	5	1200	0.5	5	1.0
	AB1	4.44	4.68							
	AB2	4.55	4.80							
	AB3	4.68	4.93							
RD5.1ES	AB	4.81	5.37	5	70	5	1200	0.5	5	1.5
	AB1	4.81	5.07							
	AB2	4.94	5.20							
	AB3	5.09	5.37							
RD5.6ES	AB	5.28	5.91	5	40	5	900	0.5	5	2.5
	AB1	5.28	5.55							
	AB2	5.45	5.73							
	AB3	5.61	5.91							
RD6.2ES	AB	5.78	6.44	5	30	5	500	0.5	5	3.0
	AB1	5.78	6.09							
	AB2	5.96	6.27							
	AB3	6.12	6.44							
RD6.8ES	AB	6.29	7.01	5	25	5	150	0.5	2	3.5
	AB1	6.29	6.63							
	AB2	6.49	6.83							
	AB3	6.66	7.01							
RD7.5ES	AB	6.85	7.67	5	25	5	120	0.5	0.5	4.0
	AB1	6.85	7.22							
	AB2	7.07	7.45							
	AB3	7.29	7.67							
RD8.2ES	AB	7.53	8.45	5	20	5	120	0.5	0.5	5.0
	AB1	7.53	7.92							
	AB2	7.78	8.19							
	AB3	8.03	8.45							
RD9.1ES	AB	8.29	9.30	5	20	5	120	0.5	0.5	6.0
	AB1	8.29	8.73							
	AB2	8.57	9.01							
	AB3	8.83	9.30							
RD10ES	AB	9.12	10.39	5	20	5	120	0.5	0.2	7.0
	AB1	9.12	9.65							
	AB2	9.46	10.02							
	AB3	9.82	10.39							

Type Number	Suffix	Zener Voltage V_Z (V)[Note 1]			Dynamic Impedance Z_Z (Ω)[Note 2]		Knee Dynamic Impedance Z_{ZK} (Ω)[Note 2]		Reverse Current I_R (μA)	
		MIN.	MAX.	I_Z(mA)	MAX.	I_Z(mA)	MAX.	I_Z(mA)	MAX.	V_R(V)
RD11ES	AB	10.18	11.38	5	20	5	120	0.5	0.2	8.0
	AB1	10.18	10.71							
	AB2	10.50	11.05							
	AB3	10.82	11.38							
RD12ES	AB	11.13	12.35	5	25	5	110	0.5	0.2	9.0
	AB1	11.13	11.71							
	AB2	11.44	12.03							
	AB3	11.74	12.35							
RD13ES	AB	12.11	13.66	5	25	5	110	0.5	0.2	10
	AB1	12.11	12.75							
	AB2	12.55	13.21							
	AB3	12.99	13.66							
RD15ES	AB	13.44	15.09	5	25	5	110	0.5	0.2	11
	AB1	13.44	14.13							
	AB2	13.89	14.62							
	AB3	14.35	15.09							
RD16ES	AB	14.80	16.51	5	25	5	150	0.5	0.2	12
	AB1	14.80	15.57							
	AB2	15.25	16.04							
	AB3	15.69	16.51							
RD18ES	AB	16.22	18.33	5	30	5	150	0.5	0.2	13
	AB1	16.22	17.06							
	AB2	16.82	17.70							
	AB3	17.42	18.33							
RD20ES	AB	18.14	20.45	5	30	5	200	0.5	0.2	15
	AB1	18.14	19.07							
	AB2	18.80	19.76							
	AB3	19.45	20.45							
RD22ES	AB	20.15	22.63	5	30	5	200	0.5	0.2	17
	AB1	20.15	21.20							
	AB2	20.64	21.71							
	AB3	21.08	22.17							
	AB4	21.52	22.63							
RD24ES	AB	22.05	24.85	5	35	5	200	0.5	0.2	19
	AB1	22.05	23.18							
	AB2	22.61	23.77							
	AB3	23.12	24.31							
	AB4	23.63	24.85							
RD27ES	AB	24.26	27.64	5	45	5	250	0.5	0.2	21
	AB1	24.26	25.52							
	AB2	24.97	26.26							
	AB3	25.63	26.95							
	AB4	26.29	27.64							
RD30ES	AB	26.99	30.51	5	55	5	250	0.5	0.2	23
	AB1	26.99	28.39							
	AB2	27.70	29.13							
	AB3	28.36	29.82							
	AB4	29.02	30.51							
RD33ES	AB	29.68	33.11	5	65	5	250	0.5	0.2	25
	AB1	29.68	31.22							
	AB2	30.32	31.88							
	AB3	30.90	32.50							
	AB4	31.49	33.11							
RD36ES	AB	32.14	35.77	5	75	5	250	0.5	0.2	27
	AB1	32.14	33.79							
	AB2	32.79	34.49							
	AB3	33.40	35.13							
	AB4	34.01	35.77							
RD39ES	AB	34.68	38.52	5	85	5	250	0.5	0.2	30
	AB1	34.68	36.47							
	AB2	35.36	37.19							
	AB3	36.00	37.85							
	AB4	36.63	38.52							

Notes 1. tested with pulse (40 ms)

2. Z_Z and Z_{ZK} are measured at I_Z by given a very small A.C. current signal.

3. Suffix AB is Suffix AB1, AB2, AB3 or AB4.

TYPICAL CHARACTERISTICS (T_A = 25 °C)

Fig. 1 ZENER CURRENT vs. ZENER VOLTAGE

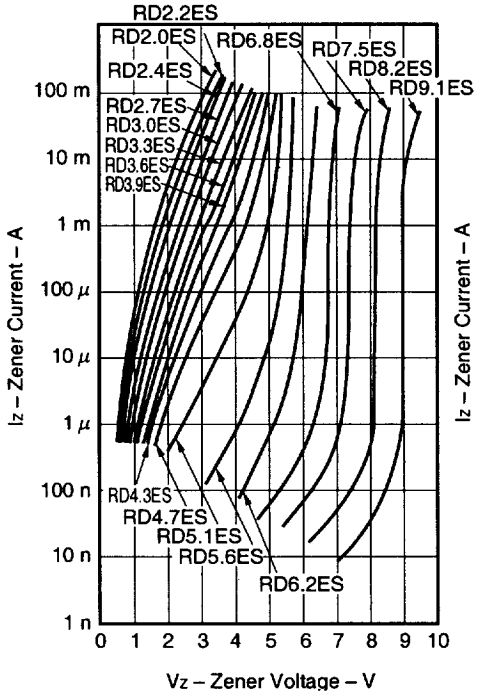


Fig. 2 ZENER CURRENT vs. ZENER VOLTAGE

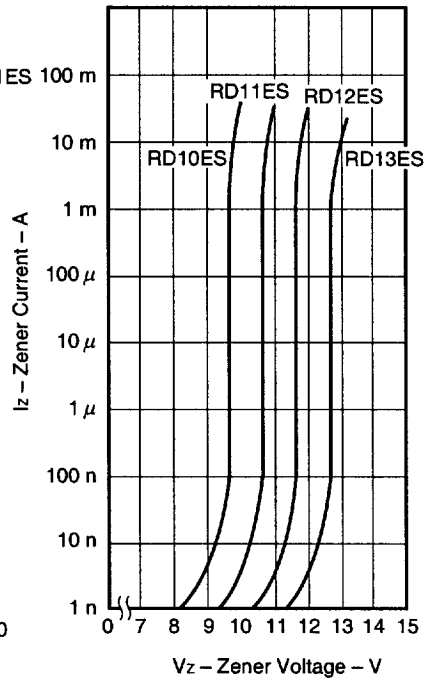


Fig. 3 ZENER CURRENT vs. ZENER VOLTAGE

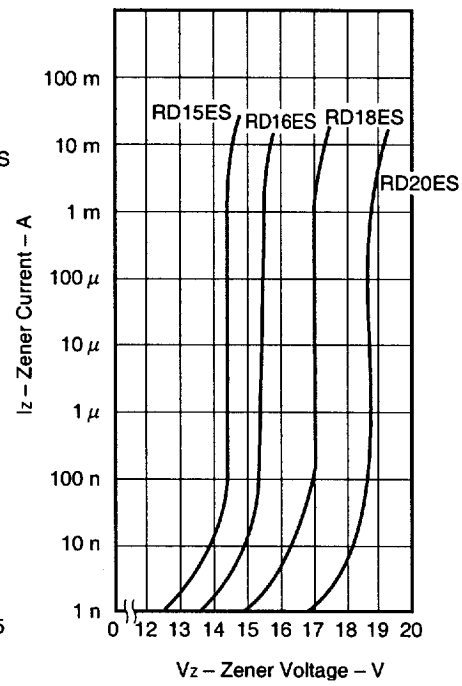


Fig. 4 ZENER CURRENT vs. ZENER VOLTAGE

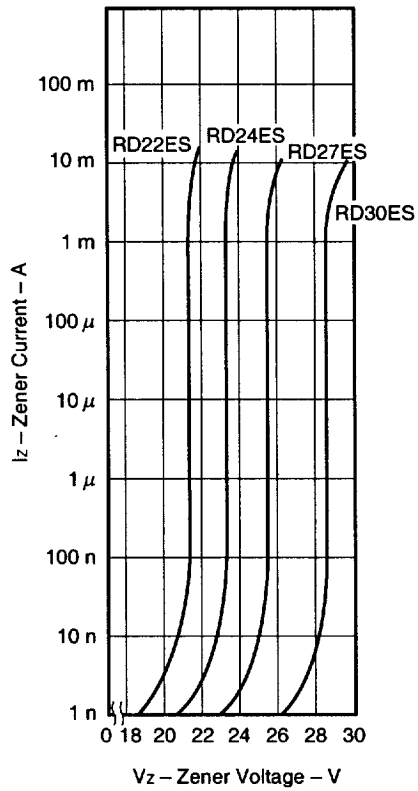


Fig. 5 ZENER CURRENT vs. ZENER VOLTAGE

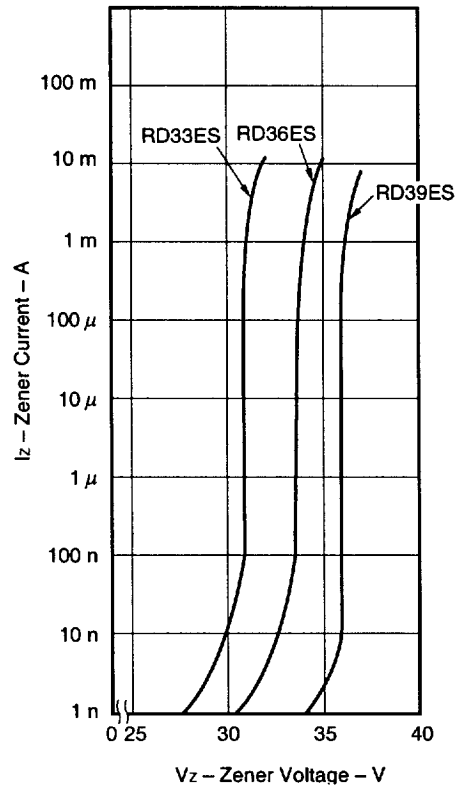


Fig. 6 POWER DISSIPATION vs. AMBIENT TEMPERATURE

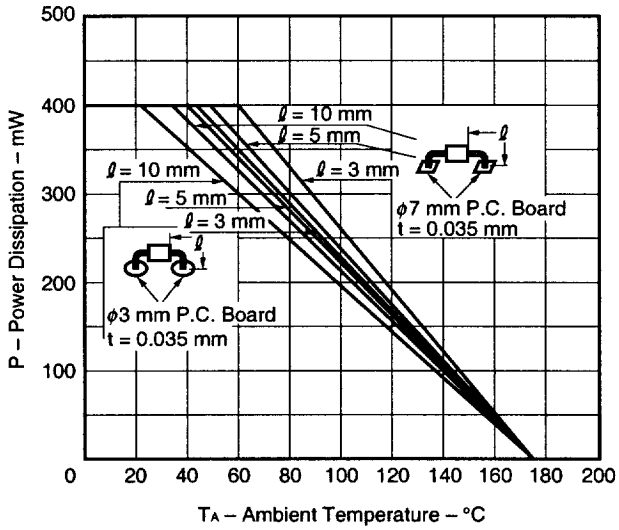


Fig. 7 THERMAL RESISTANCE vs. SIZE OF P.C BOARD

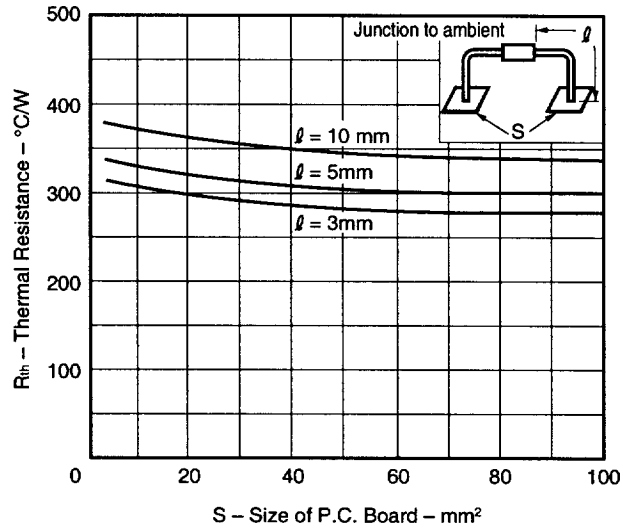


Fig. 8 DYNAMIC IMPEDANCE vs. ZENER CURRENT

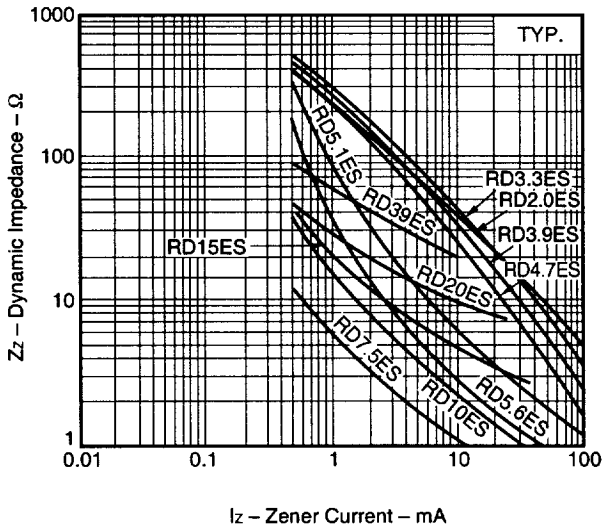


Fig. 9 ZENER VOLTAGE TEMPERATURE COEFFICIENT vs. ZENER VOLTAGE

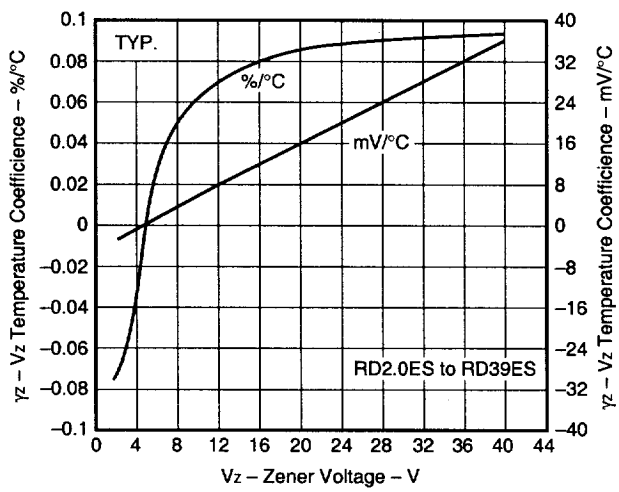


Fig. 10 SURGE REVERSE POWER RATINGS

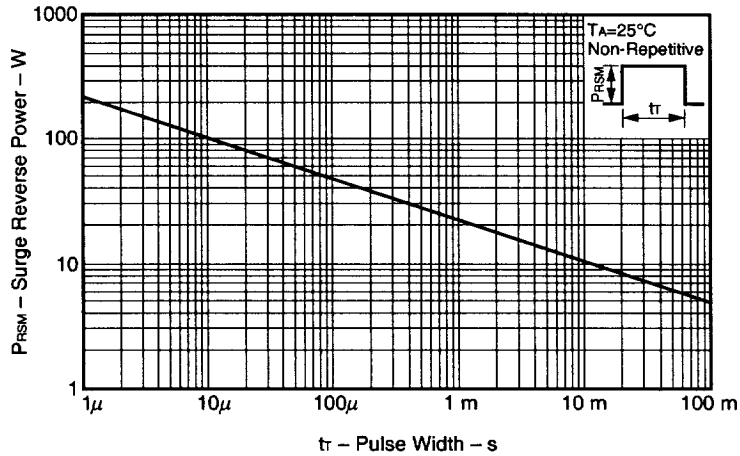
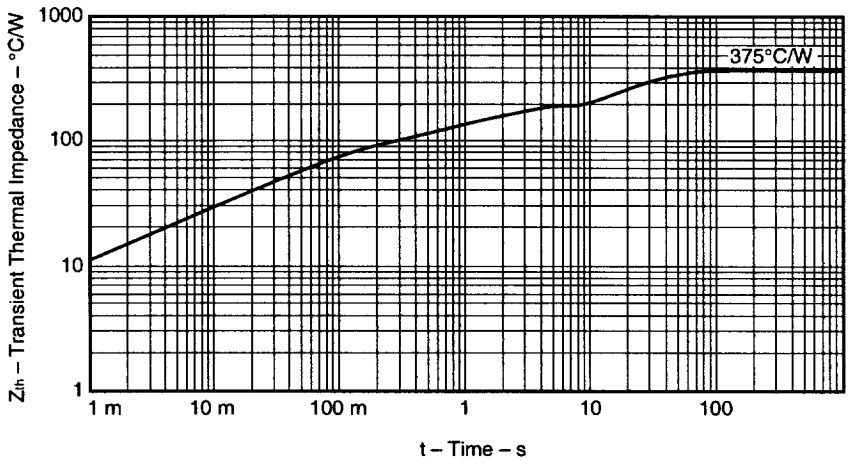


Fig. 11 TRANSIENT THERMAL IMPEDANCE CHARACTERISTIC



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M7 98.8

[NEC Corporation]

Discrete

What's

FET

Bipolar

Diode

Japanese

Taping Specification

SC-76 (SSP)

There are two types (-T1, -T2) of taping depending on the direction of the device.

-T1, -T2

Devices are taped in the direction as shown in the figure above, 3000 devices are w
one reel, as shown below.

Figure of Reel

You can get information about the dimensions of the taping and the reel by downlo
the PDF files below.

- Taping drawing
- Reel drawing

Caution

The part number consists of a device name and a taping specification.
For example, if you want to buy a RD6.2S in -T1 taping, the part number is: **RD6.2**

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