

# Zener diode

## Features

1. DO-34 Glass sealed package  
This diode can be inserted into a PC board with a shorter pitch (5mm)
2. Planar process
3. Vz applied E24 standard

## Applications

Circuits for constant voltage, constant current, waveform clipper, surge absorber, etc.



## Absolute Maximum Ratings

$T_j=25^{\circ}\text{C}$

Parameter	Symbol	Value	Unit
Forward Current	$I_f$	150	mA
Power Dissipation	$P_V$	400	mW
Surge Reverse Power	$P_{RSM}$	100	W
Junction Temperature	$T_j$	175	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-65~+175	$^{\circ}\text{C}$

## Electrical Characteristics

T<sub>j</sub>=25°C

Type Number	Suffix	Zener voltage			Dynamic Impedance		Knee Dynamic Impedance		Reverse current	
		V <sub>z</sub> (V)			Z <sub>zt</sub> (Ω)		Z <sub>zk</sub> (Ω)		I <sub>R</sub> (μA)	
		Min.	Max.	I <sub>z</sub> (mA)	Max.			Min.	Max.	I <sub>z</sub> (mA)
RD 2.0ES	-	1.88	2.24	5	100	5	1000	0.5	120	0.5
	A	1.88	2.12							
	B	2.01	2.24							
RD 2.2 ES	-	2.11	2.44	5	100	5	1000	0.5	120	0.7
	A	2.11	2.34							
	B	2.22	2.44							
RD 2.4 ES	-	2.32	2.65	5	100	5	1000	0.5	120	1.0
	A	2.32	2.54							
	B	2.41	2.65							
RD 2.7 ES	-	2.52	2.93	5	110	5	1000	0.5	100	1.0
	A	2.52	2.77							
	B	2.68	2.93							
RD 3.0 ES	-	2.84	3.24	5	120	5	1000	0.5	50	1.0
	A	2.84	3.08							
	B	2.99	3.24							
RD 3.3 ES	-	3.15	3.54	5	120	5	1000	0.5	20	1.0
	A	3.15	3.39							
	B	3.31	3.54							
RD 3.6 ES	-	3.46	3.84	5	120	5	1100	0.5	10	1.0
	A	3.46	3.69							
	B	3.60	3.84							
RD 3.9 ES	-	3.74	4.16	5	120	5	1200	0.5	5	1.0
	A	3.74	4.01							
	B	3.89	4.16							
RD 4.3 ES	-	4.04	4.57	5	120	5	1200	0.5	5	1.0
	A	4.04	4.29							
	B	4.17	4.43							
	C	4.30	4.57							
RD 4.7 ES	-	4.44	4.93	5	100	5	1200	0.5	5	1.0
	A	4.44	4.68							
	B	4.55	4.80							
	C	4.68	4.93							
RD 5.1 ES	-	4.81	5.37	5	70	5	1200	0.5	5	1.5
	A	4.81	5.07							
	B	4.94	5.20							
	C	5.09	5.37							
RD 5.6 ES	-	5.28	5.91	5	40	5	900	0.5	5	2.5
	A	5.28	5.55							
	B	5.45	5.73							
	C	5.61	5.91							
RD 6.2 ES	-	5.78	6.44	5	30	5	500	0.5	5	3.0
	A	5.78	6.09							
	B	5.96	6.27							
	C	6.12	6.44							

Type Number	Suffix	Zener voltage			Dynamic Impedance		Knee Dynamic Impedance		Reverse current	
		Vz (V)		Iz (mA)	Zzt (Ω)		Zzk (Ω)		IR (μA)	
		Min.	Max.		Max.		Min.	Max.	Iz (mA)	
RD 6.8 ES	-	6.29	7.01	5	25	5	150	0.5	2	3.5
	A	6.29	6.63							
	B	6.49	6.83							
	C	6.66	7.01							
RD 7.5 ES	-	6.85	7.67	5	25	5	120	0.5	0.5	4.0
	A	6.85	7.22							
	B	7.07	7.45							
	C	7.29	7.67							
RD 8.2 ES	-	7.53	8.45	5	20	5	120	0.5	0.5	5.0
	A	7.53	7.92							
	B	7.78	8.19							
	C	8.03	8.45							
RD 9.1 ES	-	8.29	9.30	5	20	5	120	0.5	0.5	6.0
	A	8.29	8.73							
	B	8.57	9.01							
	C	8.83	9.30							
RD 10 ES	-	9.12	10.39	5	20	5	120	0.5	0.2	7.0
	A	9.12	9.65							
	B	9.46	10.02							
	C	9.82	10.39							
RD 11 ES	-	10.18	11.38	5	20	5	120	0.5	0.2	8.0
	A	10.18	10.71							
	B	10.50	11.05							
	C	10.82	11.38							
RD 12 ES	-	11.13	12.35	5	25	5	110	0.5	0.2	9.0
	A	11.13	11.71							
	B	11.44	12.03							
	C	11.74	12.35							
RD 13 ES	-	12.11	13.66	5	25	5	110	0.5	0.2	10
	A	12.11	12.75							
	B	12.55	13.21							
	C	12.99	13.66							
RD 15 ES	-	13.44	15.09	5	25	5	110	0.5	0.2	11
	A	13.44	14.13							
	B	13.89	14.62							
	C	14.35	15.09							
RD 16 ES	-	14.80	16.51	5	25	5	150	0.5	0.2	12
	A	14.80	15.57							
	B	15.25	16.04							
	C	15.69	16.51							
RD 18 ES	-	16.22	18.33	5	30	5	150	0.5	0.2	13
	A	16.22	17.06							
	B	16.82	17.70							
	C	17.42	18.33							

Type Number	Suffix	Zener voltage			Dynamic Impedance		Knee Dynamic Impedance		Reverse current	
		Vz (V)		Iz (mA)	Max.		Zzk (Ω)	Min.	Max.	I <sub>R</sub> (μA)
		Min.	Max.							Iz (mA)
RD 20 ES	-	18.14	20.45	5	30	5	200	0.5	0.2	15
	A	18.14	19.07							
	B	18.80	19.76							
	C	19.45	20.45							
RD 22 ES	-	20.15	22.63	5	30	5	200	0.5	0.2	17
	A	20.15	21.20							
	B	20.64	21.71							
	C	21.08	22.17							
RD 24 ES	-	22.05	24.85	5	35	5	200	0.5	0.2	19
	A	22.05	23.18							
	B	22.61	23.77							
	C	23.12	24.13							
RD 27 ES	-	24.26	27.64	5	45	5	250	0.5	0.2	21
	A	24.26	25.52							
	B	24.97	26.26							
	C	25.63	26.95							
RD 30 ES	-	26.99	30.51	5	55	5	250	0.5	0.2	23
	A	26.99	28.39							
	B	27.70	29.13							
	C	28.36	29.82							
RD 33 ES	-	29.68	33.11	5	65	5	250	0.5	0.2	25
	A	29.68	31.22							
	B	30.32	31.88							
	C	30.90	32.50							
RD 36 ES	-	32.14	35.77	5	75	5	250	0.5	0.2	27
	A	32.14	33.79							
	B	32.79	34.49							
	C	33.40	35.13							
RD 39 ES	-	34.68	38.52	5	85	5	250	0.5	0.2	30
	A	34.68	36.47							
	B	35.36	37.19							
	C	36.00	37.85							
	D	36.63	38.52							

## Characteristics

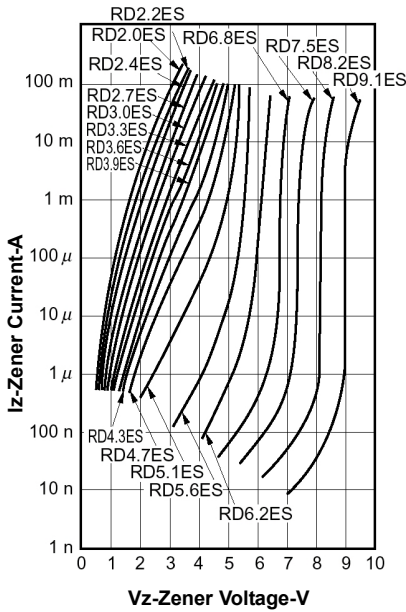


Figure 1. Zener current vs. zener voltage

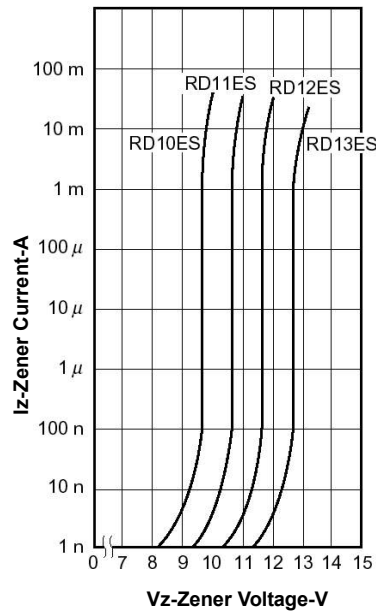


Figure 2. Zener current vs. zener voltage

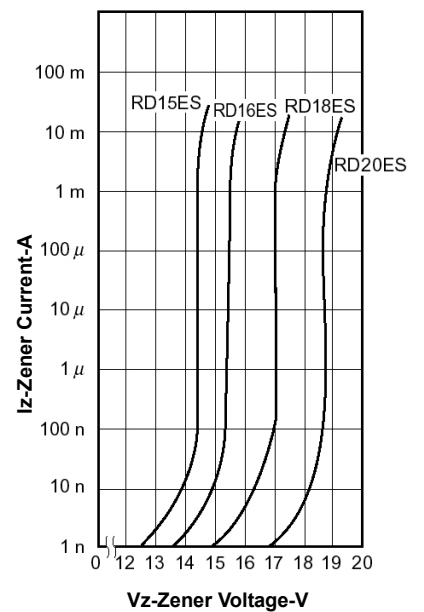


Figure 3. Zener current vs. zener voltage

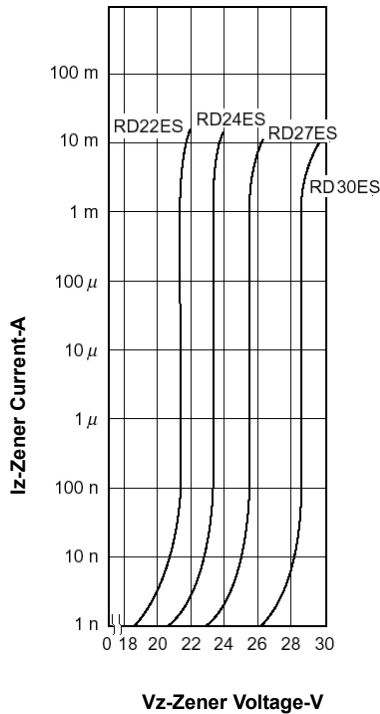


Figure 4. Zener current vs. zener voltage

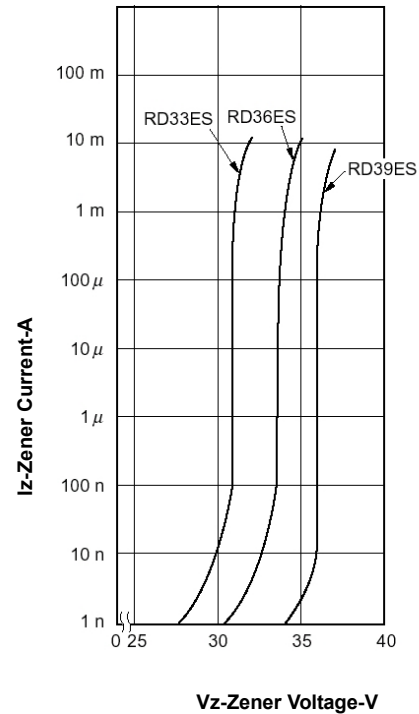
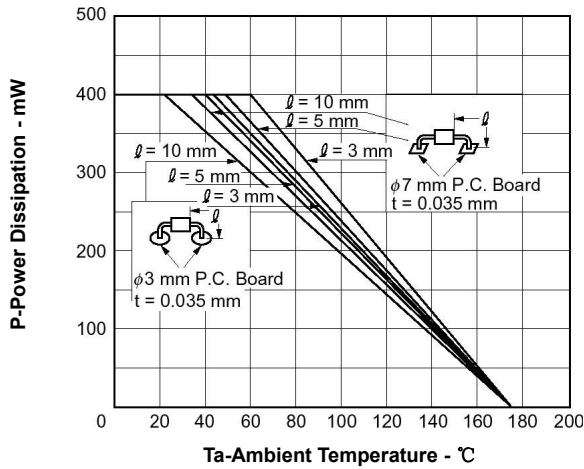
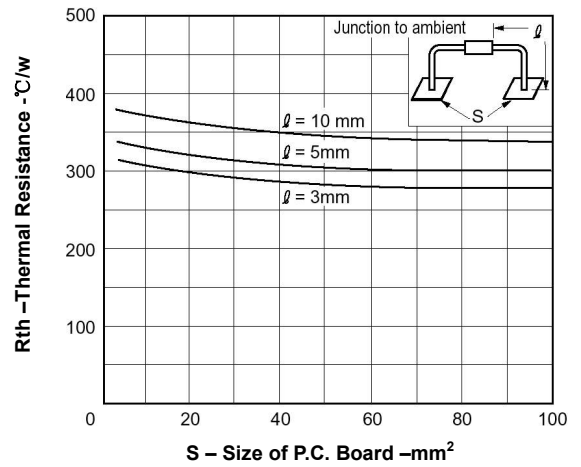


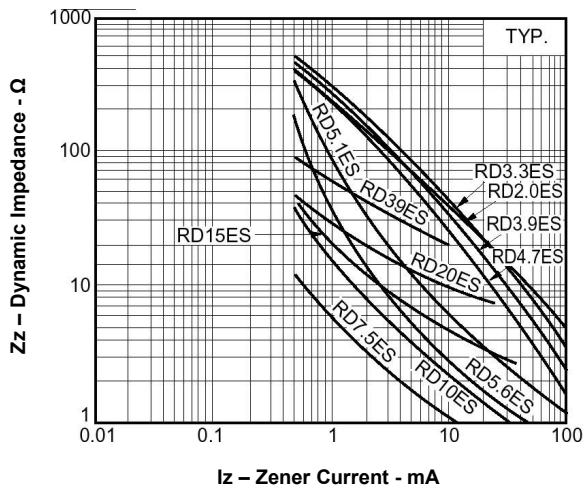
Figure 5. Zener current vs. zener voltage



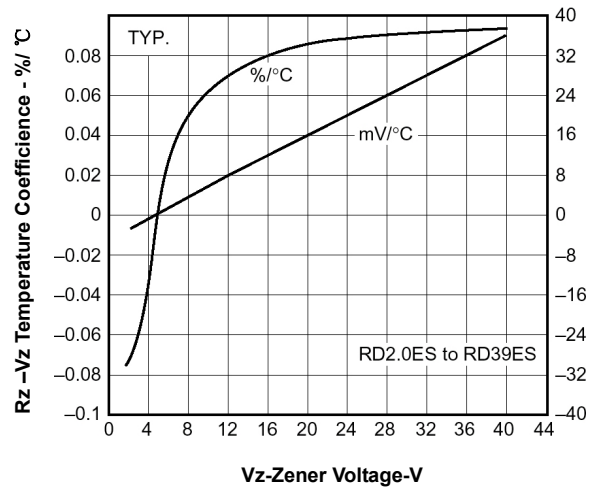
**Figure 6. Power dissipation vs. ambient temperature**



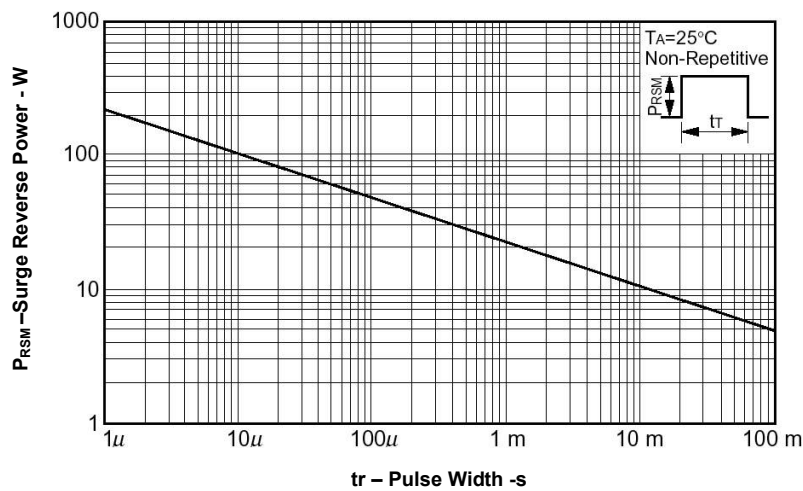
**Figure 7. Thermal resistance vs. size of P.C BOARD**



**Figure 8. Dynamic impedance vs. zener current**



**Figure 9. Zener voltage temperature coefficient vs. zener voltage**



**Figure 10. Surge reverse power ratings**

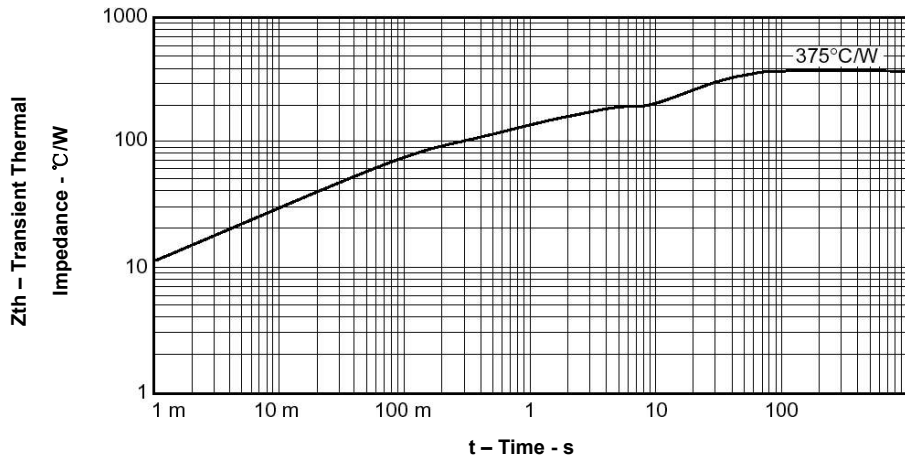
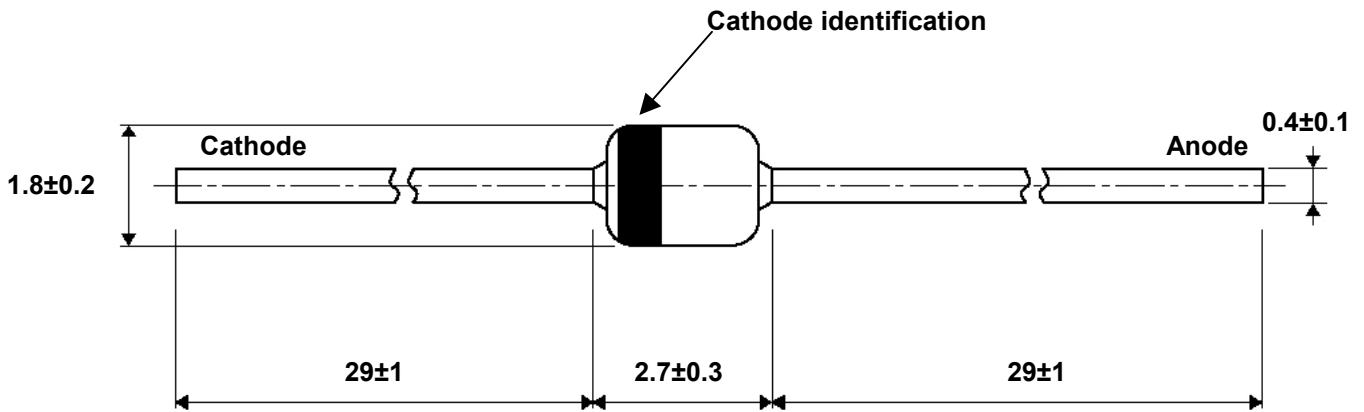


Figure 11. Transient thermal impedance characteristic

## Dimensions in mm



Standard Glass Case  
JEDEC DO 34