



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	$^{\circ}\text{C}$

Stresses exceeding maximum ratings may damage the device. Maximum ratings are stress ratings only. Functional operation above the recommended operating conditions is not implied. Extended exposure to stresses above the recommended operating conditions may affect device reliability.



Electrical Characteristics

T_j=25°C

Type Number	Suffix	Zener voltage			Dynamic Impedance		Knee Dynamic Impedance		Reverse current	
		V _z (V)			Z _{zt} (Ω)		Z _{zk} (Ω)		I _R (μA)	
		Min.	Max.	I _z (mA)	Max.	I _z (mA)	Max.	I _z (mA)	Max.	V _R (V)
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							

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Type Number	Suffix	Zener voltage			Dynamic Impedance		Knee Dynamic Impedance		Reverse current	
		Vz (V)		Iz (mA)	Zzt (Ω)		Zzk (Ω)		IR (μA)	
		Min.	Max.	Iz (mA)	Max.	Iz (mA)	Max.	Iz (mA)	Max.	VR (V)
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)	Zzt (Ω)		Zzk (Ω)		IR (μA)	
		Min.	Max.	Iz (mA)	Max.	Iz (mA)	Max.	Iz (mA)	Max.	VR (V)
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

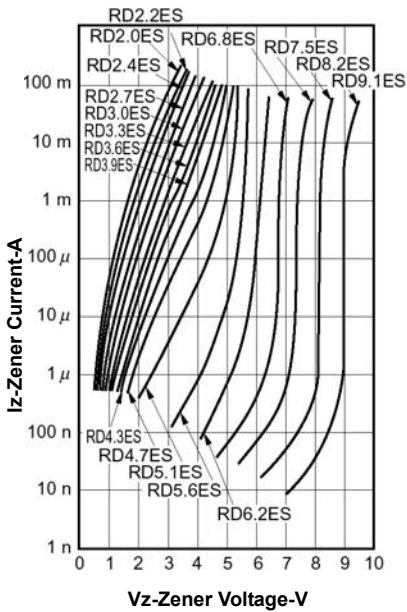


Figure 1. Zener current vs. zener voltage

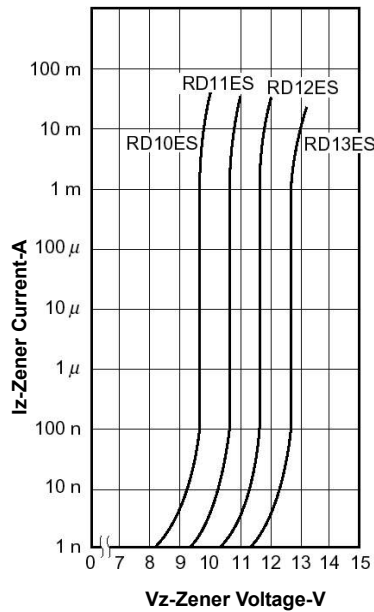


Figure 2. Zener current vs. zener voltage

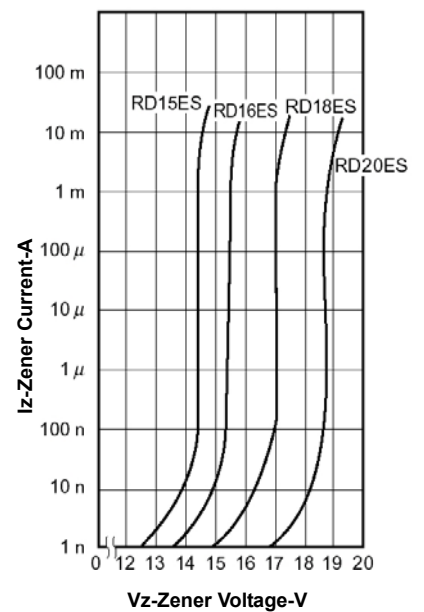


Figure 3. Zener current vs. zener voltage

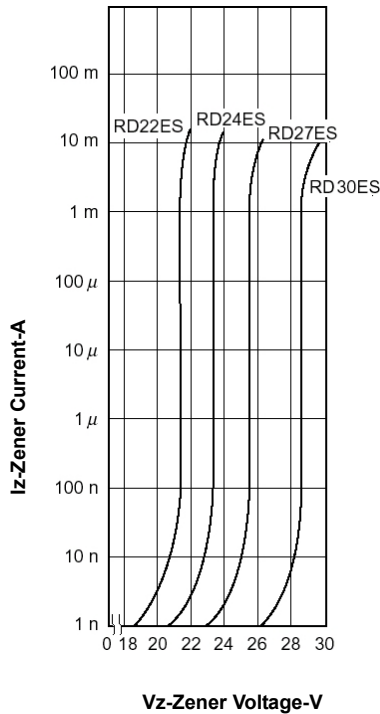


Figure 4. Zener current vs. zener voltage

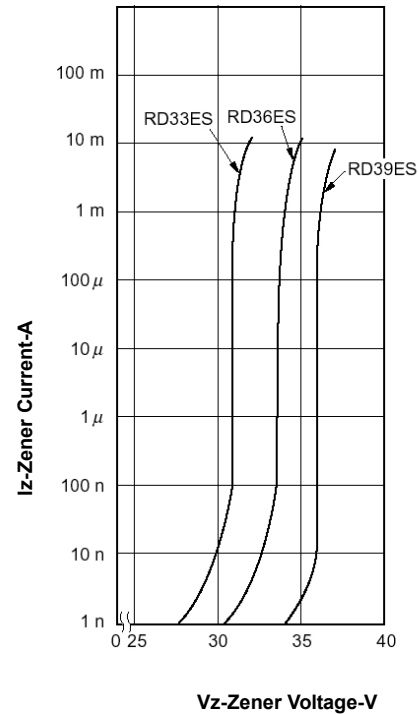


Figure 5. Zener current vs. zener voltage

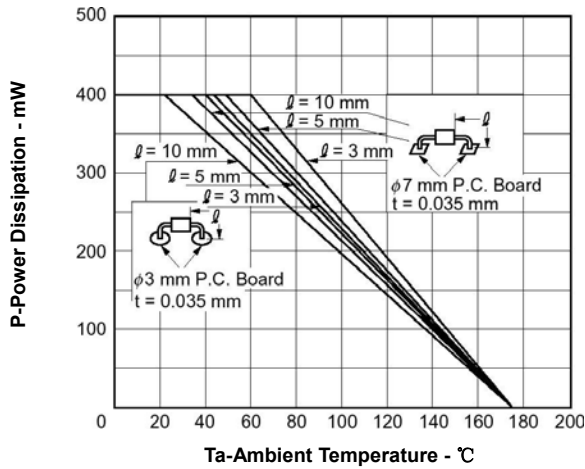


Figure 6. Power dissipation vs. ambient temperature

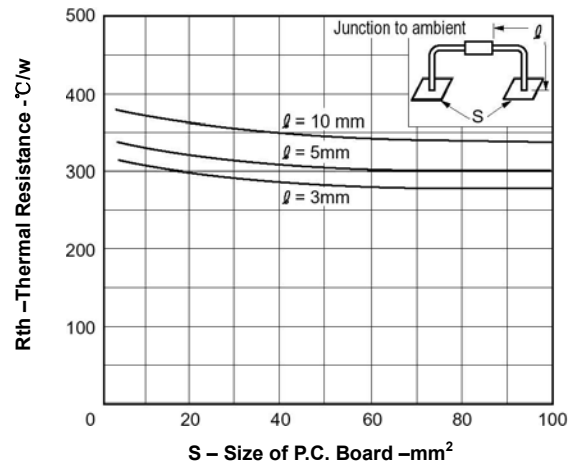


Figure 7. Thermal resistance vs. size of P.C BOARD

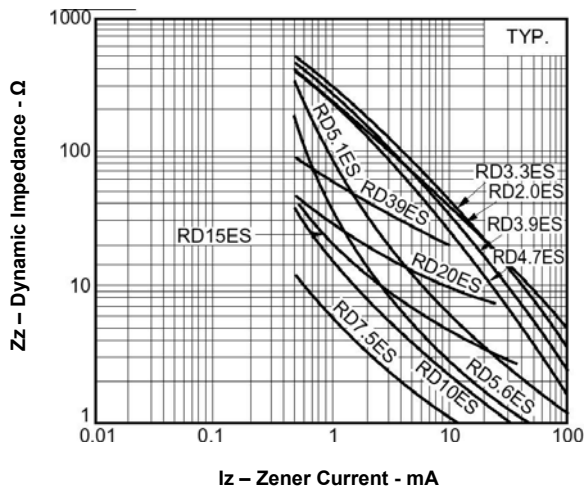


Figure 8. Dynamic impedance vs. zener current

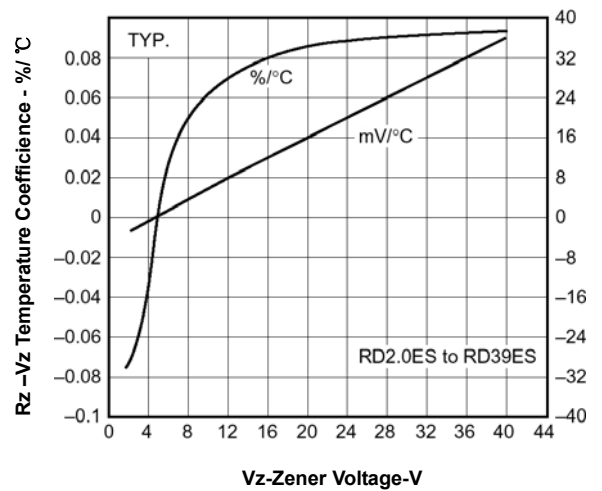


Figure 9. Zener voltage temperature coefficient vs. zener voltage

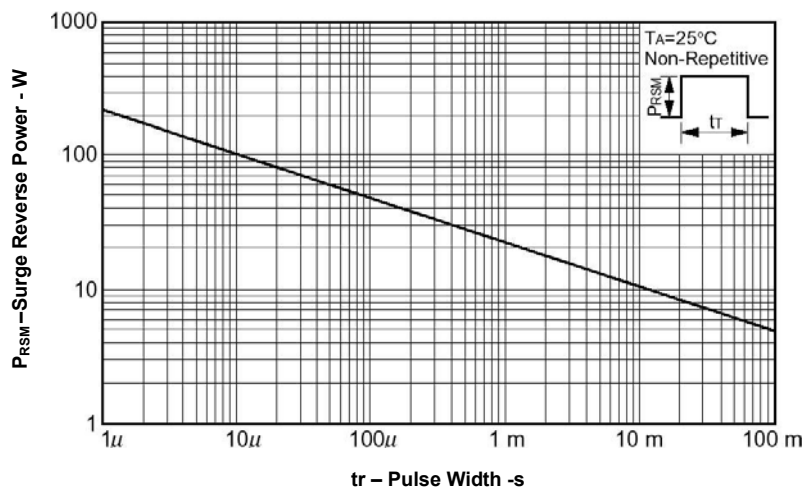


Figure 10. Surge reverse power ratings

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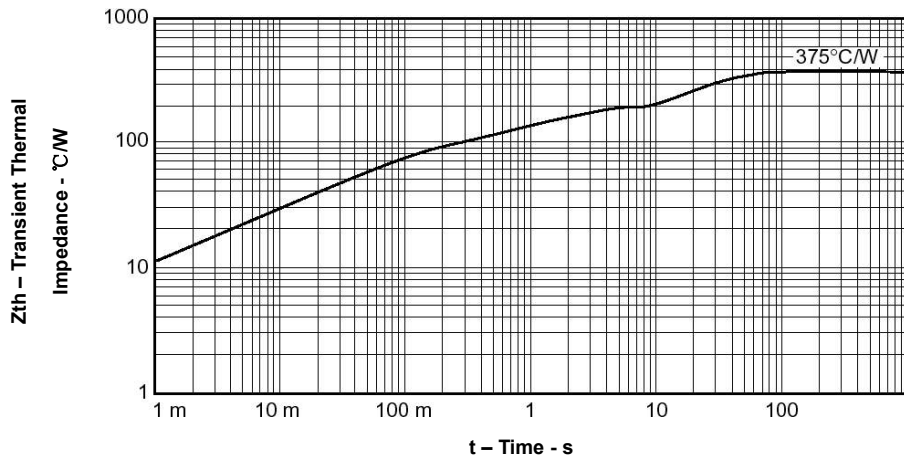
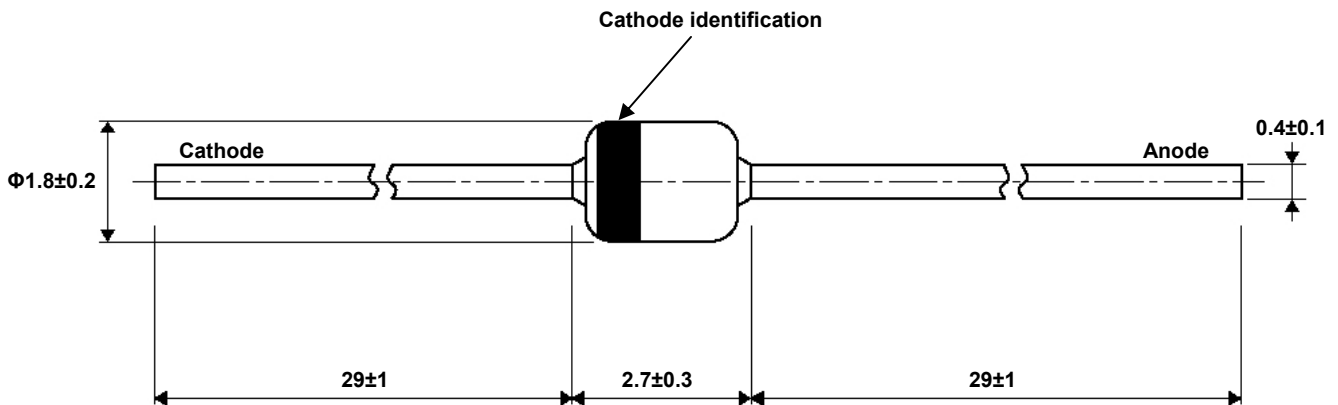


Figure 11. Transient thermal impedance characteristic

Dimensions in mm



Standard Glass Case
JEDEC DO-34