

VRD TRANSIENT VOLTAGE SUPPRESSORS



Stetron's VRD suppressors cover a wide range of stand-off voltages and peak pulse currents for the transient overload protection of electronic circuitry. They feature an exceptionally fast response time, low clamping voltage (Stetron's MNRs typically cover the higher voltage transients) and high surge capacity. The wide range covers many industry standard parts for these small-sized transient absorbers.

The Z1 class consists of an avalanche P-N junction and has bipolar characteristics and a steady state dissipation of 500 mW (peak dissipation to 3.03 kW). Class Z1 is also available in a low capacitance version (ZD series).

The Z2 class is available in bipolar or unipolar characteristic. Steady state dissipation is 1 watt (peak dissipation to 7.28 kW).

The Z6 class is also bipolar. Steady state dissipation 2 watts (peak dissipation to 18.2 kW).

FEATURES

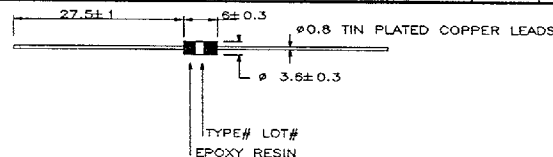
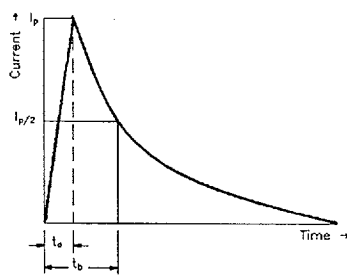
- Superior surge suppression characteristics
- Very short response time
- High surge capacity
- Very low clamping voltage
- Characteristics do not change with surge variations

Z1 VRD ... Bipolar ... 500mW Steady state

Bi-polar type	Stand-off Voltage V_s V	Max. leakage current I_L	Breakdown voltage V_B	Test current I_T mA	Maximum clamping voltage & Maximum peak pulse current				Max. temp. coef. of V_B %/°C
					10/1000 μ sec		8/20 μ sec		
					V_C V	I_P A	V_C V	I_P A	
Z1015	12.1	5	13.5-16.5	1	22.0	11.4	28.5	106	0.076
Z1018	14.5	5	16.2-19.8	1	26.5	9.43	34.4	88.0	0.079
Z1022	17.8	5	19.8-24.2	1	31.9	7.84	41.4	73.1	0.082
Z1027	21.8	5	24.3-29.7	1	39.1	6.39	50.7	59.7	0.085
Z1033	26.8	5	29.7-36.3	1	47.7	5.24	61.8	49.0	0.087
Z1039	31.6	5	35.1-42.9	1	56.4	4.43	73.1	41.4	0.090
Z1047	38.1	5	42.3-51.7	1	67.8	3.69	88.1	34.4	0.092
Z1056	45.4	5	50.4-61.6	1	80.5	3.11	10.4	29.1	0.094
Z1068	55.1	5	61.2-74.8	1	98.0	2.55	127	23.8	0.096
Z1082	66.4	5	73.8-90.2	1	118	2.12	153	19.8	0.099
Z1100	81.0	5	90.0-11.0	1	144	1.74	187	16.2	0.101
Z1120	97.0	5	108-132	1	173	1.45	224	13.5	0.103
Z1150	121	5	135-165	1	215	1.16	279	10.8	0.105

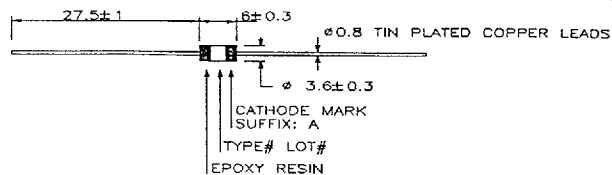
Surge waveforms

For the VRD surge suppression characteristics test the exponential waveform is shown below. Time t_a/t_b depends on the time width. Either 10 pulses of 1000 us or 8 pulses of 20 us are used. See data.

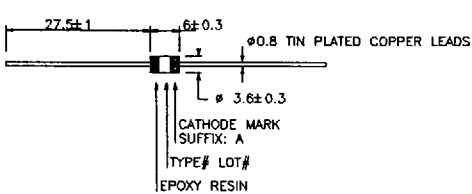


ZD VRD ... Bipolar; low capacitance - 500 mW Steady state

VRD type No.	Stand-off Voltage V_s V	Max. leakage current I_L	Breakdown voltage V_B V	Test current I_T mA	Maximum clamping voltage & Maximum peak pulse current				Max. temp. coef. of V_B %/°C
					10/1000 μ sec		8/20 μ sec		
					V_C V	I_P A	V_C V	I_P A	
ZD015	12.1	5	13.5-16.5	1	22.0	11.4	28.5	106	0.076
ZD018	14.5	5	16.2-19.8	1	26.5	9.43	34.4	88.0	0.079
ZD022	17.8	5	19.8-24.2	1	31.9	7.84	41.4	73.1	0.082
ZD027	21.8	5	24.3-29.7	1	39.1	6.39	50.7	59.7	0.085
ZD033	26.8	5	29.7-36.3	1	47.7	5.24	61.8	49.0	0.087
ZD039	31.6	5	35.1-42.9	1	56.4	4.43	73.1	41.4	0.090
ZD047	38.1	5	42.3-51.7	1	67.8	3.69	88.1	34.4	0.092
ZD056	45.4	5	50.4-61.6	1	80.5	3.11	104	29.1	0.094
ZD068	55.1	5	61.2-74.8	1	98.0	2.55	127	23.8	0.096

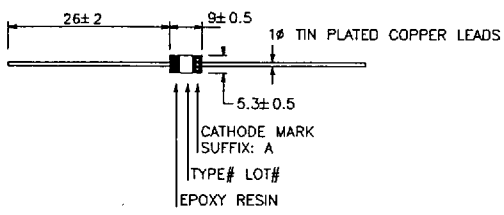


**Z2 VRD ... Bipolar or Unipolar type
1 W Steady state**



Bi-polar type	Uni-polar type	Stand-off voltage V _s V	Maximum leakage current I _L μA	Breakdown voltage V _B V	Test current I _T mA	Maximum clamping voltage & Maximum peak pulse current			
						10/1000μsec		8/20μsec	
						V _c V	I _p A	V _c V	I _p A
Z2010	Z2008U	6.63	500	7.38-9.02	10	12.5	48.0	16.2	449
	Z2008UA	7.02	500	7.79-8.61	10	12.1	49.5	15.7	463
	Z2010U	8.10	10	9.00-11.0	1	15.0	40.0	19.4	375
Z2012	Z2010UA	8.55	10	9.50-10.5	1	14.5	41.3	18.8	387
	Z2012U	9.72	5	10.8-13.2	1	17.3	34.6	22.4	325
Z2015	Z2012UA	10.2	5	11.4-12.6	1	16.7	35.9	21.6	337
	Z2015U	12.1	5	13.5-16.5	1	22.0	27.2	28.5	255
Z2018	Z2015UA	12.8	5	14.3-15.8	1	21.2	28.3	27.5	264
	Z2018U	14.5	5	16.2-19.8	1	26.5	22.6	34.4	298
Z2022	Z2018UA	15.3	5	17.1-18.0	1	25.2	23.8	32.7	222
	Z2022U	17.8	5	19.8-24.2	1	31.9	18.8	41.4	175
Z2027	Z2022UA	18.8	5	20.9-23.1	1	30.6	19.6	39.7	183
	Z2027U	21.8	5	24.3-29.7	1	39.1	15.3	50.7	143
Z2033	Z2027UA	23.1	5	25.7-28.4	1	37.5	16.0	48.6	149
	Z2033U	26.8	5	29.7-36.3	1	47.7	12.5	61.8	117
Z2039	Z2033UA	28.2	5	31.4-34.7	1	45.2	13.2	58.6	124
	Z2039U	31.6	5	35.1-42.9	1	56.4	10.6	73.1	99.5
Z2047	Z2039UA	33.3	5	37.1-41.0	1	53.9	11.1	69.9	104
	Z2047U	38.1	5	42.3-51.7	1	67.8	8.84	78.9	92.2
Z2056	Z2047UA	40.2	5	44.7-49.4	1	64.8	9.25	74.0	98.3
	Z2056U	45.4	5	50.4-61.6	1	80.5	7.45	104	70.0
Z2068	Z2056UA	47.8	5	53.2-58.8	1	77.0	7.79	99.8	72.9
	Z2068U	55.1	5	61.2-74.8	1	98.0	6.12	127	60.6
Z2082	Z2068UA	58.1	5	64.6-71.4	1	92.0	6.52	119	61.1
	Z2082U	66.4	5	73.8-90.2	1	118	5.08	153	47.5
Z2100	Z2082UA	70.1	5	77.9-86.1	1	113	5.30	146	49.8
	Z2100U	81.0	5	90.0-110	1	144	4.16	187	38.9
Z2120	Z2100UA	85.5	5	95.0-105	1	137	4.37	178	40.8
	Z2120U	97.2	5	108-132	1	173	3.46	224	32.5
Z2150	Z2120UA	102	5	114-126	1	165	3.63	214	34.0
	Z2150U	121	5	135-165	1	215	2.79	279	26.0
Z2180	Z2180U	146	5	162-198	1	258	2.32	335	21.7
	Z2200	162	5	180-220	1	287	2.09	372	22.2

**Z6 VRD...Bipolar or Unipolar style
2 W Steady state**



Bi-polar type	Uni-polar type	Stand-off voltage V _s V	Maximum leakage current I _L μA	Breakdown voltage V _B V	Test current I _T mA	Maximum clamping voltage & Maximum peak pulse current			
						10/1000μsec		8/20μsec	
						V _c V	I _p A	V _c V	I _p A
Z6010	Z6008U	6.63	500	7.38-9.02	10	12.5	120	16.2	1124
	Z6008UA	7.02	500	7.79-8.61	10	12.1	124	15.7	1160
	Z6010U	8.10	10	9.00-11.0	1	15.0	100	19.4	938
Z6012	Z6010UA	8.55	10	9.50-10.5	1	14.5	103	18.8	968
	Z6012U	9.72	5	10.8-13.2	1	17.3	87	22.4	813
Z6015	Z2012UA	10.2	5	11.4-12.6	1	16.7	90	21.6	843
	Z6015U	12.1	5	13.5-16.5	1	22.0	68	28.5	639
Z6018	Z6015UA	12.8	5	14.3-15.8	1	21.2	71	27.5	662
	Z6018U	14.5	5	16.2-19.8	1	26.5	56	34.4	529
Z6022	Z6018UA	15.3	5	17.1-18.0	1	25.2	59	32.7	557
	Z6022U	17.8	5	19.8-24.2	1	31.9	47	41.4	440
Z6027	Z6022UA	18.8	5	20.9-23.1	1	30.6	49	39.7	459
	Z6027U	21.8	5	24.3-29.7	1	39.1	38	50.7	359
Z6033	Z6027UA	23.1	5	25.7-28.4	1	37.5	40	48.6	375
	Z6033U	26.8	5	29.7-36.3	1	47.7	31	61.8	295
Z6039	Z6033UA	28.2	5	31.4-34.7	1	45.2	33	58.6	311
	Z6039U	31.6	5	35.1-42.9	1	56.4	26	73.1	249
Z6047	Z6039UA	33.3	5	37.1-41.0	1	53.9	28	69.9	260
	Z6047U	38.1	5	42.3-51.7	1	67.8	22.2	78.9	231
Z6056	Z6047UA	40.2	5	44.7-49.4	1	64.8	21.2	74.0	246
	Z6056U	45.4	5	50.4-61.6	1	80.5	18.6	104	175
Z6068	Z6056UA	47.8	5	53.2-58.8	1	77.0	19.5	99.8	182
	Z6068U	55.1	5	61.2-74.8	1	98.0	15.3	127	143
Z6082	Z6068UA	58.1	5	64.6-71.4	1	92.0	16.3	119	153
	Z6082U	66.4	5	73.8-90.2	1	118	12.7	153	119
Z6100	Z6100U	81.0	5	90.0-110	1	144	10.4	187	97.4
	Z6120	97.2	5	108-132	1	173	8.7	224	81.3
Z6150	Z6150U	121	5	135-165	1	215	7.0	279	65.2
	Z6180	146	5	162-198	1	258	5.81	335	54.3
Z6200	Z6200U	162	5	180-220	1	287	5.22	372	48.9

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