

MZD3.9 thru MZD200

Designers [▲] Data Sheet

1.3 WATT SURMETIC[▲] 30 SILICON ZENER DIODES

... a complete series of 1.3 Watt Zener Diodes with limits and operating characteristics that reflect the superior capabilities of silicon-oxide-passivated junctions. All this in an axial-lead, transfer-molded plastic package offering protection in all common environmental conditions.

- To 80 Watts Surge Rating @ 1.0 ms
- Maximum Limits Guaranteed on Six Electrical Parameters
- Package No Larger Than the Conventional 400 mW Package

Designer's Data for "Worst Case" Conditions

The Designers[▲] Data sheets permit the design of most circuits entirely from the information presented. Limit curves - representing boundaries on device characteristics - are given to facilitate "worst case" design.

MAXIMUM RATINGS (Note 1)

Rating	Symbol	Value	Unit
DC Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.3	Watt
		7.4	mW/ $^\circ\text{C}$
DC Power Dissipation @ $T_L = 75^\circ\text{C}$ Lead Length = 10 mm Derate above 75°C	P_D	3.0	Watts
		24	mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

MECHANICAL CHARACTERISTICS

CASE: Void-free, transfer-molded, thermosetting plastic

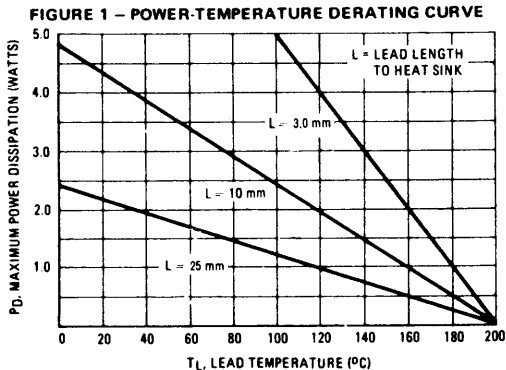
FINISH: All external surfaces are corrosion resistant and leads are readily solderable and weldable

POLARITY: Cathode indicated by polarity band. When operated in zener mode, cathode will be positive with respect to anode

MOUNTING POSITION: Any

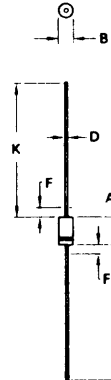
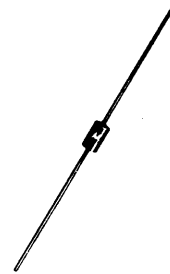
WEIGHT: 0.4 gram (approx)

Note 1: Lead Temperature not less than 2.0 mm from case for 10 seconds: 230°C .



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1.3 WATT, 5%
ZENER REGULATOR DIODES
3.9-200 VOLTS



NOTE:
1. POLARITY DENOTED BY CATHODE BAND

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.07	5.20	0.160	0.205
B	2.04	2.71	0.080	0.107
D	0.71	0.86	0.028	0.034
F	-	1.27	-	0.050
K	27.94	-	1.100	-

All JEDEC dimensions and notes apply.

CASE 59-03
DO-41
"SURMETIC"

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.) $V_F = 1.5\text{ V max.}$ $I_F = 200\text{ mA}$ for all types.

Type No. (Note 1)	Zener Voltage (Note 2)		Test Current I_{ZT} mA	Zener Impedance at I_{ZT} $f = 1000\text{ Hz}$		Blocking Voltage $I_R = 1.0\ \mu\text{A}$	Typical T_C %/°C	Surge Current @ $T_L = 25^\circ\text{C}$ $i_R - \text{mA}$ (Note 3)
	Min	Max		Typ	Max			
MZD3.9	3.7	4.1	100	3.8	7.0	—	-0.060	1380
MZD4.3	4.0	4.6	100	3.8	7.0	—	± 0.055	1260
MZD4.7	4.4	5.0	100	3.8	7.0	—	± 0.030	1190
MZD5.1	4.8	5.4	100	2.0	5.0	—	± 0.030	1070
MZD5.6	5.2	6.0	100	1.0	2.0	1.5	+0.038	970
MZD6.2	5.8	6.6	100	1.0	2.0	1.5	+0.045	890
MZD6.8	6.4	7.2	100	1.0	2.0	2.0	+0.050	810
MZD7.5	7.0	7.9	100	1.0	2.0	2.0	+0.058	730
MZD8.2	7.7	8.7	100	1.0	2.0	3.5	+0.062	660
MZD9.1	8.5	9.6	50	2.0	4.0	3.5	+0.068	605
MZD10	9.4	10.6	50	2.0	4.0	5.0	+0.075	550
MZD11	10.4	11.6	50	4.0	7.0	5.0	+0.076	500
MZD12	11.4	12.7	50	4.0	7.0	7.0	+0.077	454
MZD13	12.4	14.1	50	5.0	10	7.0	+0.079	414
MZD15	13.8	15.8	50	5.0	10	10	+0.082	380
MZD16	15.3	17.1	25	6.0	15	10	+0.083	344
MZD18	16.8	19.1	25	6.0	15	10	+0.085	304
MZD20	18.8	21.2	25	6.0	15	10	+0.086	285
MZD22	20.8	23.3	25	6.0	15	12	+0.087	250
MZD24	22.8	25.6	25	7.0	15	12	+0.088	225
MZD27	25.1	28.9	25	7.0	15	14	+0.090	205
MZD30	28.0	32	25	8.0	15	14	+0.091	190
MZD33	31	35	25	8.0	15	17	+0.092	170
MZD36	34	38	10	21	40	17	+0.093	150
MZD39	37	41	10	21	40	20	+0.094	135
MZD43	40	46	10	24	45	20	+0.095	125
MZD47	44	50	10	24	45	24	+0.095	115
MZD51	48	54	10	25	60	24	+0.096	110
MZD56	52	60	10	25	60	28	+0.096	95
MZD62	58	66	10	25	80	28	+0.097	90
MZD68	64	72	10	25	80	34	+0.097	80
MZD75	70	79	10	30	100	34	+0.098	70
MZD82	77	88	10	30	100	41	+0.098	65
MZD91	85	96	5.0	60	200	41	+0.099	60
MZD100	94	106	5.0	60	200	50	+0.110	55
MZD110	104	116	5.0	80	250	50	+0.110	50
MZD120	114	127	5.0	80	250	60	+0.110	45
MZD130	124	141	5.0	110	300	60	+0.110	—
MZD150	138	156	5.0	110	300	75	+0.110	—
MZD160	153	171	5.0	150	350	75	+0.110	—
MZD180	168	191	5.0	150	350	90	+0.110	—
MZD200	188	212	5.0	150	350	90	+0.110	—

NOTE 1 – TOLERANCE AND TYPE NUMBER DESIGNATION

The type numbers listed have a standard tolerance on the nominal zener voltage of $\pm 5\%$.

A suffix "C" indicates a $\pm 2\%$ tolerance; suffix "D" indicates a $\pm 1\%$ tolerance.

NOTE 2 – ZENER VOLTAGE (V_Z) MEASUREMENT

The zener voltage is measured after the test current (I_{ZT}) has been applied for 40 ± 10 milliseconds, while maintaining a lead temperature (T_L) of 30°C at a point of 10 mm from the diode body.

NOTE 3 – (I_R) NON-REPETITIVE SURGE CURRENT

Maximum peak, non-repetitive reverse surge current of half square wave or equivalent sine wave pulse of 50 ms duration, superimposed on the test current (I_{ZT}).

FIGURE 2 – TYPICAL THERMAL RESPONSE L, LEAD LENGTH = 10 mm

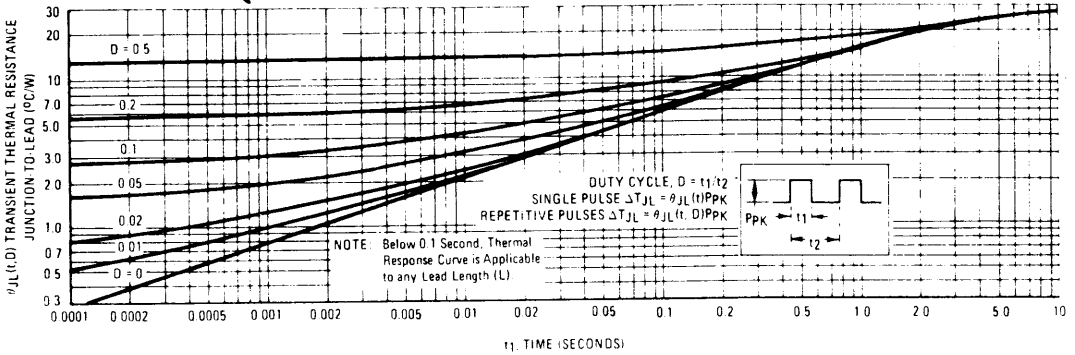


FIGURE 3 – TYPICAL THERMAL RESISTANCE

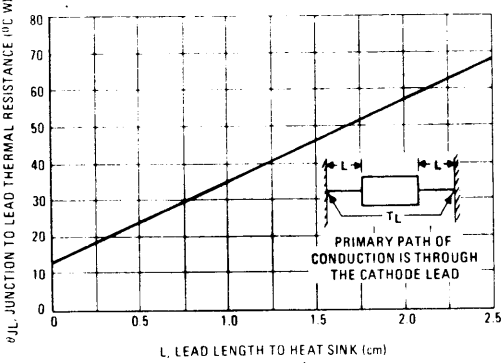


FIGURE 4 – MAXIMUM NON-REPETITIVE SURGE POWER

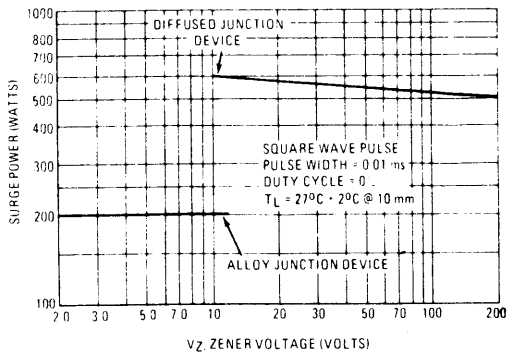
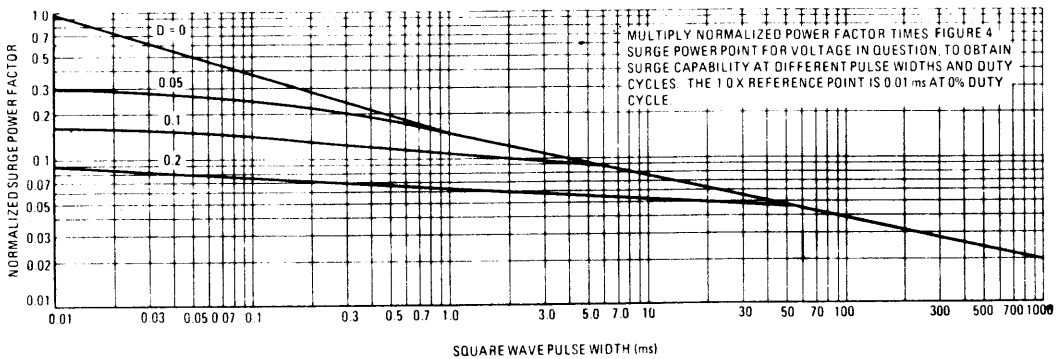


FIGURE 5 – SURGE POWER FACTOR



TEMPERATURE COEFFICIENTS AND VOLTAGE REGULATION

(90% OF THE UNITS ARE IN THE RANGES INDICATED)

FIGURE 6 – TEMPERATURE COEFFICIENT-RANGE FOR UNITS TO 12 VOLTS

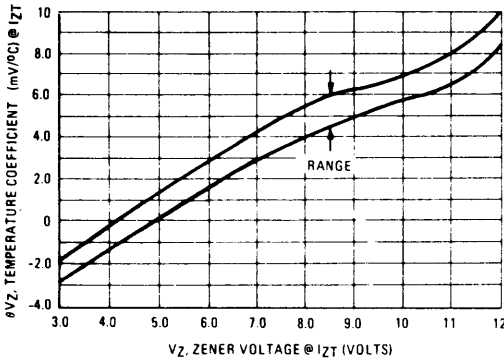


FIGURE 7 – TEMPERATURE COEFFICIENT-RANGE FOR UNITS 10 TO 200 VOLTS

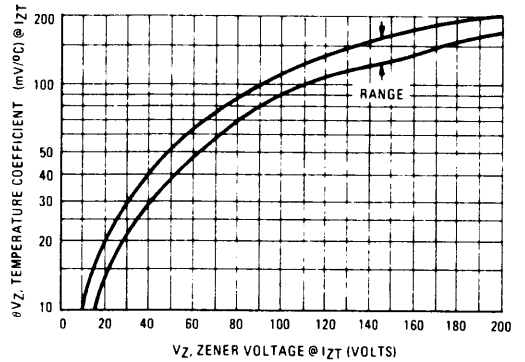


FIGURE 8 – VOLTAGE REGULATION

