

# MZ92-2.4,A,B thru MZ92-200,A,B

## 500 mW UNIBLOC<sup>▲</sup> SILICON OXIDE PASSIVATED ZENER REGULATOR DIODES

Highly reliable silicon regulators utilizing an oxide-passivated junction for long-term voltage stability. Supplied in the popular TO-92 plastic package for the high volume requirements of the consumer industry.

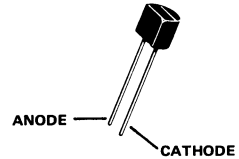
- In-Line Leads for Easy Insertion
- Lower Cost in High Volume
- Electrically Similar to Our Popular Surmetic<sup>▲</sup> 20 Series "1N5221 - 1N5281"
- Wide Voltage Selection - 2.4-200 V

## UNIBLOC<sup>▲</sup> ZENER REGULATOR DIODES

500 MILLIWATTS  
2.4 thru 200 VOLTS

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Power Dissipation @ $T_L = 55^\circ\text{C}$ Lead Length = 6.35 mm Derate above $55^\circ\text{C}$ (Figure 1)	$P_D$	500 5.26	mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$



### MECHANICAL CHARACTERISTICS

CASE: Void free, transfer molded, thermosetting plastic

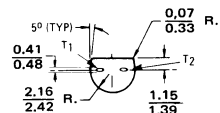
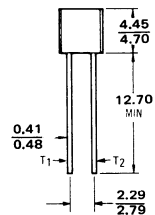
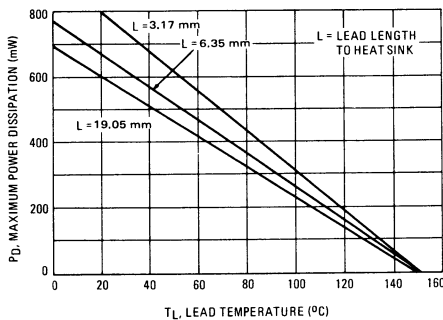
FINISH: All external surfaces are corrosion resistant. Leads are readily solderable and weldable

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

MOUNTING POSITION: Any

WEIGHT: 0.18 gram (approx)

FIGURE 1 - POWER-TEMPERATURE DERATING CURVE



STYLE 1

T1 - ANODE  
T2 - CATHODE

CASE 182 (1)

Dimensions in millimeters

<sup>▲</sup>Trademark of Motorola Inc.

# MZ 92-2.4, A, B, thru MZ 92-200, A, B (continued)

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise noted. Based on dc measurements at thermal equilibrium; lead length = 6.35 mm thermal resistance of heat sink  $\approx 30^\circ\text{C/W}$ ,  $V_F = 1.5 \text{ Max}$  @  $I_F = 200 \text{ mA}$  for all types.)

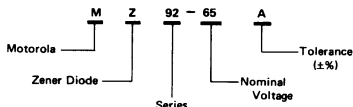
Motorola Type Number (Note 1)	Nominal Zener Voltage $V_Z$ @ $I_Z T$ Volts (Note 2)	Test Current $I_Z T$ mA	Max Zener Impedance A & B Suffix Only		Max Reverse Leakage Current				Typical Zener Voltage Temp. Coeff. $\theta_{VZ}$ (%/°C) (Note 3)
			$Z_{ZT}$ @ $I_Z T$ Ohms	$Z_{ZK}$ @ $I_{ZK} = 0.25 \text{ mA}$ Ohms	A & B Suffix Only		Non-Suffix		
					$I_R$ $\mu\text{A}$	$\theta$	$V_R$ Volts	$I_R$ @ $V_R$ Used For Suffix A $\mu\text{A}$	
A	B								
MZ92-2.4	2.4	20	50	2100	100	0.95	1.0	200	-1.03
MZ92-2.5	2.5	20	50	2100	100	0.95	1.0	200	-1.03
MZ92-2.7	2.7	20	50	2200	75	0.95	1.0	150	-1.01
MZ92-2.8	2.8	20	50	2200	75	0.95	1.0	100	-1.00
MZ92-3.0	3.0	20	50	2300	50	0.95	1.0	100	-0.99
MZ92-3.3	3.3	20	50	2500	25	0.95	1.0	100	-0.988
MZ92-3.6	3.6	20	48	2700	15	0.95	1.0	100	-0.951
MZ92-3.9	3.9	20	40	2800	10	0.95	1.0	75	-0.934
MZ92-4.3	4.3	20	25	2900	5.0	0.95	1.0	50	-0.910
MZ92-4.7	4.7	20	19	2600	5.0	1.9	2.0	50	+0.912
MZ92-5.1	5.1	20	17	2400	5.0	1.9	2.0	50	+0.925
MZ92-5.6	5.6	20	15	2100	5.0	2.9	3.0	50	+0.935
MZ92-6.0	6.0	20	13	1900	5.0	3.3	3.5	50	+0.941
MZ92-6.2	6.2	20	14	1500	5.0	3.8	4.0	50	+0.943
MZ92-6.8	6.8	20	17	780	3.0	4.8	5.0	30	+0.950
MZ92-7.5	7.5	20	23	700	3.0	5.7	6.0	30	+0.955
MZ92-8.2	8.2	20	34	700	3.0	6.2	6.5	30	+0.959
MZ92-8.7	8.7	20	44	700	3.0	6.2	6.5	30	+0.961
MZ92-9.1	9.1	20	62	700	3.0	6.7	7.0	30	+0.962
MZ92-10	10	20	62	700	3.0	7.6	8.0	30	+0.966
MZ92-11	11	20	68	700	2.0	8.0	8.4	30	+0.968
MZ92-12	12	20	70	700	1.0	8.7	9.1	10	+0.970
MZ92-13	13	9.5	70	700	0.5	9.4	9.9	10	+0.972
MZ92-14	14	9.0	70	700	0.1	9.5	10	10	+0.974
MZ92-15	15	8.5	34	700	0.1	10.5	11	10	+0.976
MZ92-16	16	7.8	38	700	0.1	11.4	12	10	+0.977
MZ92-17	17	7.4	42	700	0.1	12.4	13	10	+0.978
MZ92-18	18	7.0	48	700	0.1	13.3	14	10	+0.979
MZ92-19	19	6.6	52	700	0.1	13.3	14	10	+0.980
MZ92-20	20	6.2	57	700	0.1	14.3	15	10	+0.980
MZ92-22	22	5.6	68	700	0.1	16.2	17	10	+0.982
MZ92-24	24	5.2	78	700	0.1	17.1	18	10	+0.983
MZ92-25	25	5.0	85	700	0.1	18.1	19	10	+0.983
MZ92-27	27	4.6	98	700	0.1	20	21	10	+0.984
MZ92-28	28	4.5	105	700	0.1	20	21	10	+0.984
MZ92-30	30	4.2	117	700	0.1	22	23	10	+0.985
MZ92-33	33	3.8	140	700	0.1	24	25	10	+0.986
MZ92-36	36	3.4	160	700	0.1	26	27	10	+0.987
MZ92-39	39	3.2	190	800	0.1	29	30	10	+0.987
MZ92-43	43	3.0	225	900	0.1	31	33	10	+0.988
MZ92-47	47	2.7	260	1000	0.1	34	36	10	+0.988
MZ92-51	51	2.5	300	1100	0.1	37	38	10	+0.989
MZ92-56	56	2.2	360	1300	0.1	41	43	10	+0.989
MZ92-60	60	2.1	410	1500	0.1	44	46	10	+0.990
MZ92-62	62	2.0	430	1600	0.1	45	47	10	+0.990
MZ92-68	68	1.8	520	1900	0.1	49	52	10	+0.990
MZ92-75	75	1.7	600	2300	0.1	53	56	10	+0.990
MZ92-82	82	1.5	700	2700	0.1	59	62	10	+0.990
MZ92-87	87	1.4	780	3100	0.1	65	68	10	+0.991
MZ92-91	91	1.4	840	3400	0.1	66	69	10	+0.991
MZ92-100	100	1.3	1000	4000	0.1	72	76	10	+0.991
MZ92-110	110	1.1	1200	5000	0.1	80	84	10	+0.991
MZ92-120	120	1.0	1400	5100	0.1	86	91	10	+0.992
MZ92-130	130	0.95	1600	5200	0.1	94	99	10	+0.992
MZ92-140	140	0.90	1800	5300	0.1	101	106	10	+0.992
MZ92-150	150	0.85	2100	5400	0.1	108	114	10	+0.992
MZ92-160	160	0.80	2300	5500	0.1	116	122	10	+0.992
MZ92-170	170	0.74	2600	5600	0.1	123	129	10	+0.992
MZ92-180	180	0.68	2900	5900	0.1	130	137	10	+0.992
MZ92-190	190	0.66	3200	6500	0.1	137	144	10	+0.993
MZ92-200	200	0.65	3500	7000	0.1	144	152	10	+0.993

### NOTE 1 - TOLERANCE AND VOLTAGE DESIGNATION

Tolerance designation - The type numbers listed indicate a tolerance of  $\pm 20\%$  with guaranteed limits on  $V_Z$ ,  $I_R$  and  $V_F$ . In addition, zener impedance ( $Z_{ZT}$ ,  $Z_{ZK}$ ) limits are guaranteed on devices indicated by suffix "A" for  $\pm 10\%$  tolerance, "B" for  $\pm 5.0\%$ , "C" for  $\pm 2.0\%$  and "D" for  $\pm 1.0\%$  tolerance.

Non-Standard voltage designation - To designate units with zener voltages other than those assigned the Motorola type number should be used.

### EXAMPLE:



### NOTE 2 - SPECIAL SELECTIONS AVAILABLE INCLUDE:

- Nominal zener voltages between those shown.
- Matched sets: (Standard Tolerances are  $\pm 5.0\%$ ,  $\pm 2.0\%$ ,  $\pm 1.0\%$ )
  - Two or more units for series connection with specified tolerance on total voltage. Series matched sets make zener voltages in excess of 200 volts possible as well as providing lower temperature coefficients, lower dynamic impedance and greater power handling ability.
  - Two or more units matched to one another with any specified tolerance.
- Tight voltage tolerances: 1.0%, 2.0%

### NOTE 3 - TYPICAL TEMPERATURE COEFFICIENT ( $\theta_{VZ}$ )

Test conditions for temperature coefficient are as follows:

- $I_Z T = 7.5 \text{ mA}$ ,  $T_1 = 25^\circ\text{C}$ ,  $T_2 = 125^\circ\text{C}$  (MZ92-2.4A,B thru MZ92-12A,B).
- $I_Z T = \text{Rated } I_Z T$ ,  $T_1 = 25^\circ\text{C}$ ,  $T_2 = 125^\circ\text{C}$  (MZ92-13A,B thru MZ92-200A,B).

Device to be temperature stabilized with current applied prior to reading breakdown voltage at the specified ambient temperature.