

1N5837A
thru
1N5897A

500 mW UNIBLOC 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 the Popular Surmetic 20 Series
"1N5221 - 1N5281"
- Wide Voltage Selection - 2.4-200 V

*MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Power Dissipation @ $T_L = 55^\circ\text{C}$ Lead Length = 1/4"	P_D	500	mW
Derate above 55°C (Figure 1)		5.26	mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150	$^\circ\text{C}$

*Indicates JEDEC Registered Data.

MECHANICAL CHARACTERISTICS

CASE: Void free, transfer molded, thermosetting plastic

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

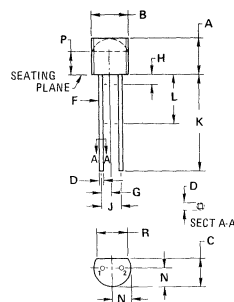
POLARITY: Cathode indicated by color dot. (When operated in zener mode, cathode will be positive with respect to anode.)

MOUNTING POSITION: Any

WEIGHT: 0.18 gram (approx)

UNIBLOC ZENER REGULATOR DIODES

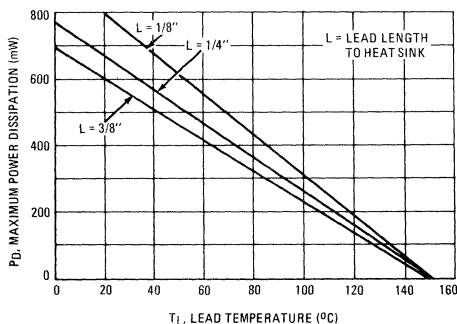
500 MILLIWATTS
2.4 thru 200 VOLTS



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.32	5.33	0.170	0.210
B	4.45	5.21	0.175	0.205
C	3.18	4.19	0.125	0.165
D	0.385	0.531	0.014	0.021
E	0.407	0.482	0.016	0.019
F	1.27	BSC	0.050	BSC
G	1.27	0.050	0.050	0.050
H	2.54	BSC	0.100	BSC
J	12.70	0.500	0.500	0.500
K	6.35	0.250	0.250	0.250
L	2.03	2.66	0.080	0.105
M	2.93	0.115	0.115	0.115
N	3.43	0.135	0.135	0.135

CASE 182-02

FIGURE 1 - POWER-DERATING



1N5837A thru 1N5897A (continued)

ELECTRICAL CHARACTERISTICS Guaranteed when measured at 90 seconds while maintaining the lead temperature $T_L = 30 \pm 1^\circ\text{C}$, 3/8" from the diode body ($V_F = 1.5$ Volts Max at $I_F = 200$ mA dc for all types.)

Motorola Type Number (Note 1)	Nominal Zener Voltage* V_Z @ I_{ZT} Volts (Note 2)	Test Current* I_{ZT} mA	Max. Zener Impedance *		Max. Reverse * Leakage Current			Maximum DC Zener Current I_{ZM} * mA dc	Maximum Surge Current I_{ZS} (surge)* mA dc (Note 4)	Typical Zener Voltage Temp. Coeff. θ_{VZ} (%/°C) (Note 3)
			Z_{ZT} @ I_{ZT} Ohms	Z_{ZK} @ $I_{ZK} = 0.25$ mA Ohms	I_R μA	at	V_R volts			
1N5837A	2.4	20	50	2100	100	1.0	210	1041.7	-1.03	
1N5838A	2.5	20	50	2100	100	1.0	200	1000.0	-1.03	
1N5839A	2.7	20	50	2200	75	1.0	185	925.9	-1.01	
1N5840A	2.8	20	50	2200	75	1.0	179	892.9	-1.00	
1N5841A	3.0	20	50	2300	50	1.0	167	833.3	-0.09	
1N5842A	3.3	20	50	2500	25	1.0	151	757.6	-0.068	
1N5843A	3.6	20	48	2700	15	1.0	139	694.4	-0.051	
1N5844A	3.9	20	40	2800	10	1.0	129	641.0	-0.034	
1N5845A	4.3	20	25	2900	5.0	1.0	116	581.4	-0.010	
1N5846A	4.7	20	19	2600	5.0	2.0	106	531.9	+0.012	
1N5847A	5.1	20	17	2400	5.0	2.0	98	490.2	+0.025	
1N5848A	5.6	20	15	2100	5.0	3.0	89	446.4	+0.035	
1N5849A	6.0	20	13	1900	5.0	3.5	83	416.7	+0.041	
1N5850A	6.2	20	14	1500	5.0	4.0	80	403.2	+0.043	
1N5851A	6.8	20	17	780	3.0	5.0	74	367.6	+0.050	
1N5852A	7.5	20	23	700	3.0	6.0	67	333.3	+0.055	
1N5853A	8.2	20	34	700	3.0	6.5	61	304.9	+0.059	
1N5854A	8.7	20	44	700	3.0	6.5	57	287.4	+0.061	
1N5855A	9.1	20	50	700	3.0	7.0	55	274.7	+0.062	
1N5856A	10	20	62	700	3.0	8.0	50	250.0	+0.066	
1N5857A	11	20	68	700	2.0	8.4	45	227.3	+0.068	
1N5858A	12	20	70	700	1.0	9.1	41.5	208.3	+0.070	
1N5859A	13	20	70	700	0.5	9.9	38.5	538.5	+0.072	
1N5860A	14	9.0	70	700	0.1	10	35.5	500.0	+0.074	
1N5861A	15	8.5	34	700	0.1	11	33	466.7	+0.076	
1N5862A	16	7.8	38	700	0.1	12	31	437.5	+0.077	
1N5863A	17	7.4	42	700	0.1	13	29	411.8	+0.078	
1N5864A	18	7.0	48	700	0.1	14	28	388.9	+0.079	
1N5865A	19	6.6	52	700	0.1	14	26	368.4	+0.080	
1N5866A	20	6.2	57	700	0.1	15	25	350.0	+0.080	
1N5867A	22	5.6	68	700	0.1	17	22.6	318.2	+0.082	
1N5868A	24	5.2	78	700	0.1	18	21.7	291.7	+0.083	
1N5869A	25	5.0	85	700	0.1	19	20	280.0	+0.083	
1N5870A	27	4.6	98	700	0.1	21	18.5	259.3	+0.084	
1N5871A	28	4.5	105	700	0.1	21	17.9	250.0	+0.084	
1N5872A	30	4.2	117	700	0.1	23	16.7	233.3	+0.085	
1N5873A	33	3.8	140	700	0.1	25	15.1	212.1	+0.086	
1N5874A	36	3.4	160	700	0.1	27	13.9	194.4	+0.087	
1N5875A	39	3.2	190	800	0.1	30	12.9	179.5	+0.087	
1N5876A	43	3.0	225	900	0.1	33	11.6	162.8	+0.088	
1N5877A	47	2.7	260	1000	0.1	36	10.6	148.9	+0.088	
1N5878A	51	2.5	300	1100	0.1	39	9.8	137.3	+0.089	
1N5879A	56	2.2	360	1300	0.1	43	8.9	125.0	+0.089	
1N5880A	60	2.1	410	1500	0.1	46	8.3	116.7	+0.090	
1N5881A	62	2.0	430	1600	0.1	47	8.0	112.9	+0.090	
1N5882A	68	1.8	520	1900	0.1	52	7.4	102.9	+0.090	
1N5883A	75	1.7	600	2300	0.1	56	6.7	93.3	+0.090	
1N5884A	82	1.5	700	2700	0.1	62	6.1	85.4	+0.090	
1N5885A	87	1.4	780	3100	0.1	68	5.7	80.5	+0.091	
1N5886A	91	1.4	840	3400	0.1	69	5.5	76.9	+0.091	
1N5887A	100	1.3	1000	4000	0.1	76	5.0	50.0	+0.091	
1N5888A	110	1.1	1200	5000	0.1	84	4.5	45.5	+0.091	
1N5889A	120	1.0	1400	5100	0.1	91	4.1	41.7	+0.092	
1N5890A	130	0.95	1600	5200	0.1	99	3.8	38.5	+0.092	
1N5891A	140	0.90	1800	5300	0.1	106	3.5	35.7	+0.092	
1N5892A	150	0.85	2100	5400	0.1	114	3.3	33.3	+0.092	
1N5893A	160	0.80	2300	5500	0.1	122	3.1	31.2	+0.092	
1N5894A	170	0.74	2600	5600	0.1	129	2.9	29.4	+0.092	
1N5895A	180	0.68	2900	6000	0.1	137	2.8	27.8	+0.092	
1N5896A	190	0.66	3200	6500	0.1	144	2.6	26.3	+0.093	
1N5897A	200	0.65	3500	7000	0.1	152	2.5	25.0	+0.093	

* Indicates JEDEC Registered Data.

NOTE 1 – TOLERANCE AND VOLTAGE DESIGNATION

Tolerance designation — The type numbers listed indicate a tolerance of $\pm 10\%$. Device tolerances of $\pm 5\%$ are indicated by a "B" suffix; $\pm 2\%$ by a "C" suffix; $\pm 1\%$ by a "D" suffix. $\pm 20\%$ tolerance should be designated as below with no suffix.

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

EXAMPLE:

$\frac{M}{\text{Motorola}}$ $\frac{Z}{\text{Zener Diode}}$ $\frac{92}{\text{Series}}$ $\frac{65}{\text{Nominal Voltage}}$ $\frac{A}{\text{Tolerance } (\pm\%)}$

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.

NOTE 3 – TYPICAL TEMPERATURE COEFFICIENT (θ_{VZ})

Test conditions for temperature coefficient are as follows:

- $I_{ZT} = 7.5$ mA, $T_1 = 25^\circ\text{C}$
 $T_2 = 125^\circ\text{C}$ (MZ92-2,4A,B thru MZ92-12A,B).
- $I_{ZT} = \text{Rated } I_{ZT}$, $T_1 = 25^\circ\text{C}$
 $T_2 = 125^\circ\text{C}$ (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.

NOTE 4 – I_Z (surge) NON-REPETITIVE

The rating listed in the electrical characteristics table is maximum peak, non-repetitive, reverse surge current of 1/2 square wave or equivalent sine wave pulse of 1/120 second duration superimposed on the test current, I_{ZT} , per JEDEC registration.