

T-11-17

**MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA**

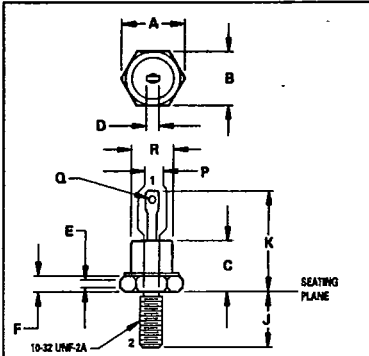
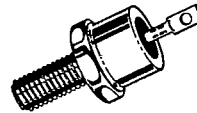
**1N2970A
thru
1N3015A**

ZENER DIODES

Diffused-junction zener diodes for both military and high-reliability industrial applications. Available with anode-to-case and cathode-to-case connections (standard and reverse polarity), i.e., 1N2970 and 1N2970R. Supplied with mounting hardware.

The type numbers shown have a standard tolerance of $\pm 10\%$ on the nominal zener voltage. Add suffix "B" for $\pm 5\%$ units. (2% and 1% tolerance also available.)

**10 WATTS
ZENER DIODES**



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	—	12.82	—	0.505
B	10.77	11.09	0.424	0.437
C	—	10.28	—	0.405
D	—	6.35	—	0.250
E	1.53	—	0.060	—
F	1.91	4.44	0.075	0.175
J	10.72	11.50	0.422	0.453
K	15.24	20.32	0.600	0.800
P	4.14	4.80	0.163	0.189
Q	1.53	2.41	0.060	0.095
R	6.74	10.76	0.265	0.424

STYLE 1:
TERM. 1. CATHODE
2. ANODE

STYLE 2:
TERM. 1. ANODE
2. CATHODE

**CASE 56-03
DO-203AA
METAL**

MAXIMUM RATINGS

Junction and Storage Temperature: -85°C to $+175^{\circ}\text{C}$.
DC Power Dissipation: 10 Watts. (Derate 83.3 mW/ $^{\circ}\text{C}$ above 55°C .)

ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$ unless otherwise noted, $V_F = 1.5\text{ V max @ } I_F = 2\text{ amp on all types.}$)

Type No.	Nominal Zener Voltage $V_Z @ I_{ZT}$ Volts	Test Current I_{ZT} mA	Max Zener Impedance			Max DC Zener Current I_{ZM} mA	Max. Reverse Current*		
			$Z_{ZT} @ I_{ZT}$ Ohms	$Z_{ZK} @ I_{ZK}$ Ohms	I_{ZK} mA		I_R Max (μA)	V_{R1}	V_{R2}
1N2970A	6.8	370	1.2	500	1.0	1,320	150	5.2	4.9
1N2971A	7.5	335	1.3	250	1.0	1,180	75	5.7	5.4
1N2972A	8.2	305	1.5	250	1.0	1,040	50	6.2	5.9
1N2973A	9.1	275	2.0	250	1.0	960	25	6.9	6.6
1N2974A	10	250	3	250	1.0	880	10	7.6	7.2
1N2975A	11	230	3	250	1.0	780	5	8.4	8.0
1N2976A	12	210	3	250	1.0	720	5	9.1	8.6
1N2977A	13	190	3	250	1.0	660	5	9.9	9.4
1N2978A	14	180	3	250	1.0	600	5	10.6	10.1
1N2979A	15	170	3	250	1.0	560	5	11.4	10.8

* V_{R1} — Test Voltage for 5% Tolerance Device. V_{R2} — Test Voltage for 10% Tolerance Device. No Leakage Specified as 20% Tolerance Device.

1N2970A thru 1N3015A

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted, V_F = 1.5 V max @ I_F = 2 amp on all types.)

Type No.	Nominal Zener Voltage V _Z @ I _{ZT} Volts	Test Current I _{ZT} mA	Max Zener Impedance			Max DC Zener Current I _{ZM} mA	Max. Reverse Current*		
			Z _{ZT} @ I _{ZT} Ohms	Z _{ZK} @ I _{ZK} Ohms	I _{ZK} mA		I _R Max (μA)	V _{R1}	V _{R2}
1N2980A	16	155	4	250	1.0	530	5	12.2	11.5
1N2982A	18	140	4	250	1.0	460	5	13.7	13.0
1N2983A	19	130	4	250	1.0	440	5	14.4	13.7
1N2984A	20	125	4	250	1.0	420	5	15.2	14.4
1N2985A	22	115	5	250	1.0	380	5	16.7	15.8
1N2986A	24	105	5	250	1.0	350	5	18.2	17.3
1N2988A	27	95	7	250	1.0	300	5	20.6	19.4
1N2989A	30	85	8	300	1.0	280	5	22.8	21.6
1N2990A	33	75	9	300	1.0	260	5	25.1	23.8
1N2991A	36	70	10	300	1.0	230	5	27.4	25.9
1N2992A	39	65	11	300	1.0	210	5	29.7	28.1
1N2993A	43	60	12	400	1.0	195	5	32.7	31.0
1N2995A	47	55	14	400	1.0	175	5	35.8	33.8
1N2996A	50	50	15	500	1.0	165	5	38.0	36.0
1N2997A	51	50	15	500	1.0	163	5	38.8	36.7
1N2998A	52	50	15	500	1.0	160	5	39.5	37.4
1N2999A	56	45	16	500	1.0	150	5	42.6	40.3
1N3000A	62	40	17	600	1.0	130	5	47.1	44.6
1N3001A	68	37	18	600	1.0	120	5	51.7	49.0
1N3002A	75	33	22	600	1.0	110	5	56.0	54.0
1N3003A	82	30	25	700	1.0	100	5	62.2	59.0
1N3004A	91	28	35	800	1.0	85	5	69.2	65.5
1N3005A	100	25	40	900	1.0	80	5	76.0	72.0
1N3006A	105	25	45	1,000	1.0	75	5	79.8	75.6
1N3007A	110	23	55	1,100	1.0	72	5	83.6	79.2
1N3008A	120	20	75	1,200	1.0	67	5	91.2	86.4
1N3009A	130	19	100	1,300	1.0	62	5	98.8	93.6
1N3010A	140	18	125	1,400	1.0	58	5	106.4	100.8
1N3011A	150	17	175	1,500	1.0	54	5	114.0	108.0
1N3012A	160	16	200	1,600	1.0	50	5	121.6	115.2
1N3014A	180	14	260	1,850	1.0	45	5	136.8	129.6
1N3015A	200	12	300	2,000	1.0	40	5	152.0	144.0

*V_{R1} — Test Voltage for 5% Tolerance Device. V_{R2} — Test Voltage for 10 % Tolerance Device. No Leakage Specified as 20% Tolerance Device.

4