

# 10 WATT ZENER DIODES (DO-4) CASE

## FEATURES:

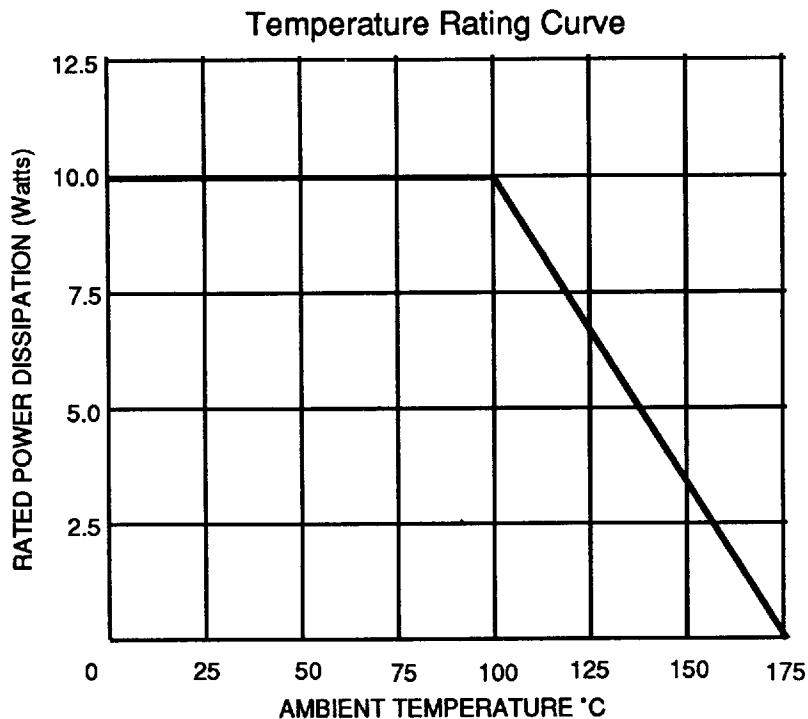
- Hermetic Seal
- High Temperature Operation
- Metallurgically Bonded
- Complete Characteristic Listing

## DESCRIPTION

This series of high grade voltage regulator diodes is designed to meet the electrical and environmental requirements of the commercial, military, industrial computer, and home instrument electronics markets.

## ABSOLUTE MAXIMUM RATINGS:

- 10W @ 100°C Case Temp
- Derate .133w/°C from 100°C
- Storage -65°C to 175°C
- Operation -65°C to 175°C
- Thermal Imp 2.5°C/w



# ZENER DIODES 10 WATT RATING (DO-4)

TYPE NUMBER	NOMINAL ZENER VOLTAGE (V <sub>Z</sub> ) VOLTS	MAX. ZENER IMPEDANCE				MAX. REVERSE LEAKAGE			MAX. ZENER CURRENT mA
		Z <sub>ZT</sub> @	I <sub>ZT</sub>	Z <sub>ZK</sub> @	I <sub>ZK</sub>	I <sub>R</sub> @	V <sub>R1</sub> *	V <sub>R2</sub> **	
		OHMS	mA	OHMS	mA	μA	VOLTS	VOLTS	
1N2970	6.8	1.2	370	500	1.0	150	5.2	4.0	1320
1N2971	7.5	1.3	335	250	1.0	75	5.7	5.4	1180
1N2972	8.2	1.5	305	250	1.0	50	6.2	5.0	1040
1N2973	9.1	2.0	275	250	1.0	25	6.0	6.6	960
1N2974	10	3	250	250	1.0	10	7.6	7.2	860
1N2975	11	3	230	250	1.0	5	8.4	8.0	780
1N2976	12	3	210	250	1.0	5	9.1	8.6	720
1N2977	13	3	190	250	1.0	5	9.9	9.4	660
1N2978	14	3	180	250	1.0	5	10.6	10.1	600
1N2979	15	3	170	250	1.0	5	11.4	10.8	560
1N2980	16	4	155	250	1.0	5	12.2	11.5	530
1N2982	18	4	150	250	1.0	5	13.7	13.0	460
1N2983	19	4	130	250	1.0	5	14.4	13.7	440
1N2984	20	4	125	250	1.0	5	15.2	14.4	420
1N2985	22	5	115	250	1.0	5	16.7	15.8	380
1N2986	24	5	105	250	1.0	5	18.2	17.3	350
1N2988	27	7	95	250	1.0	5	20.6	19.4	300
1N2989	30	8	85	300	1.0	5	22.8	21.6	280
1N2990	33	9	75	300	1.0	5	25.1	23.8	260
1N2991	36	10	70	300	1.0	5	27.4	25.9	230
1N2992	39	11	65	300	1.0	5	29.7	28.1	210
1N2993	43	12	60	400	1.0	5	32.7	31.0	195
1N2995	47	14	55	400	1.0	5	35.8	33.8	175
1N2996	50	15	50	500	1.0	5	38.0	36.0	165
1N2997	51	15	50	500	1.0	5	38.8	36.7	163
1N2998	52	15	50	500	1.0	5	39.5	37.4	160
1N2999	56	16	45	500	1.0	5	42.6	40.3	150
1N3000	62	17	40	600	1.0	5	47.1	44.6	130
1N3001	68	18	37	600	1.0	5	51.7	49.0	120
1N3002	75	22	33	600	1.0	5	56.0	54.0	110
1N3003	82	25	30	700	1.0	5	62.2	59.0	100
1N3004	91	35	28	800	1.0	5	69.2	65.5	85
1N3005	100	40	25	900	1.0	5	76.0	72.0	80
1N3006	105	45	25	1000	1.0	5	79.8	75.6	75
1N3007	110	55	23	1100	1.0	5	83.6	79.2	72
1N3008	120	75	20	1200	1.0	5	91.2	86.4	67
1N3009	130	100	19	1300	1.0	5	98.8	93.6	62
1N3010	140	125	18	1400	1.0	5	106.4	100.8	58
1N3011	150	175	17	1500	1.0	5	114.0	108.0	54
1N3012	160	200	16	1600	1.0	5	121.6	115.2	50
1N3014	180	260	14	1850	1.0	5	136.8	129.6	45
1N3015	200	300	12	2000	1.0	5	152.0	144.0	40
1N3993†	3.9	2.0	640	400	1.0	100	.5		2380
1N3994†	4.3	1.5	580	400	1.0	100	.5		2170
1N3995†	4.7	1.2	530	500	1.0	50	1		1940
1N3996†	5.1	1.1	490	550	1.0	10	1		1780
1N3997†	5.6	1.0	445	600	1.0	10	1		1620
1N3998†	6.2	1.1	405	750	1.0	10	2		1460
1N3999†	6.8	1.2	370	500	1.0	10	2		1330
1N4000†	7.5	1.3	335	250	1.0	10	3		1221

NON SUFFIX TYPES V<sub>Z</sub> = ± 20%, "A" SUFFIX ± 10%  
"B" SUFFIX ± 5%

\* V<sub>R1</sub> TEST VOLTAGE FOR "B" ± 5% TOLERANCE DEVICE

STANDARD POLARITY - ANODE TO CASE

\*\* V<sub>R2</sub> TEST VOLTAGE FOR "A" ± 10% TOLERANCE DEVICE

† NON-SUFFIX TYPES V<sub>Z</sub> ± 10%, "A" SUFFIX ± 5%  
STANDARD POLARITY - CATHODE TO CASE

ALL TYPES ADD SUFFIX LTR "R" FOR REVERSE POLARITY

# ZENER DIODES 10.0 WATT RATING (DO-4)

TYPE NUMBER	NOMINAL ZENER VOLTAGE (V <sub>Z</sub> ) VOLTS	TEST CURRENT I <sub>ZT</sub> mA	MAX. ZENER IMPEDANCE Z <sub>ZT</sub>	MAX. ZENER CURRENT I <sub>ZM</sub> mA
1N1351	10	500	2.0	910
1N1352	11	500	2.0	830
1N1353	12	500	2.0	780
1N1354	13	500	2.0	700
1N1355	15	500	2.0	610
1N1356	16	500	3.0	570
1N1357	18	150	3.0	500
1N1358	20	150	3.0	450
1N1359	22	150	3.0	410
1N1360	24	150	3.0	380
1N1361	27	150	3.0	340
1N1362	30	150	4.0	300
1N1363	33	150	4.0	275
1N1364	36	150	5.0	252
1N1365	39	150	5.0	233
1N1366	43	150	6.0	212
1N1367	47	150	7.0	193
1N1368	51	150	8.0	178
1N1369	56	150	9.0	162
1N1370	62	50	12	147
1N1371	68	50	14	134
1N1372	75	50	20	121
1N1373	82	50	22	111
1N1374	91	50	35	100
1N1375	100	50	40	91
1N1588	3.9	150	4.5	850
1N1589	4.7	125	4.0	700
1N1590	5.6	110	3.0	625
1N1591	6.8	100	0.9	525
1N1592	8.2	80	1.5	425
1N1593	10	70	2.5	350
1N1594	12	50	3.0	275
1N1595	15	40	5.5	225
1N1596	18	35	9.0	200
1N1597	22	30	14	160
1N1598	27	25	24	125
1N1599	3.9	500	1.5	2500
1N1600	4.7	400	0.9	2000
1N1601	5.6	350	0.6	1750
1N1602	6.8	300	0.4	1500
1N1603	8.2	250	0.6	1200
1N1604	10	200	1.0	1000
1N1605	12	170	2.0	850
1N1606	15	140	1.9	650
1N1607	18	110	4.0	550
1N1608	22	90	6.0	450
1N1609	27	70	10	350
1N1803	5.6	1000	1.0	
1N1804	6.2	1000	1.0	
1N1805	6.8	1000	1.0	1340
1N1806	7.5	1000	1.0	1210
1N1807	8.2	1000	1.0	1110
1N1808	9.1	500	1.0	1000
1N1809	110	50	47	83
1N1810	120	50	56	78
1N1811	130	50	65	70
1N1812	150	50	82	61
1N1813	160	50	93	57
1N1814	180	50	115	50
1N1815	200	50	140	45
1N1816	13	500	2.0	700
1N1817	15	500	2.0	610
1N1818	16	500	3.0	570
1N1819	18	500	3.0	500
1N1820	20	250	3.0	450

TYPE NUMBER	NOMINAL ZENER VOLTAGE (V <sub>Z</sub> ) VOLTS	TEST CURRENT I <sub>ZT</sub> mA	MAX. ZENER IMPEDANCE Z <sub>ZT</sub>	MAX. ZENER CURRENT I <sub>ZM</sub> mA
1N1821	22	250	910	410
1N1822	24	250	3.0	380
1N1823	27	250	3.0	340
1N1824	30	250	4.0	300
1N1825	33	150	4.0	275
1N1826	36	150	5.0	252
1N1827	39	150	5.0	233
1N1828	43	150	6.0	212
1N1829	47	150	7.0	193
1N1830	51	150	8.0	178
1N1831	56	150	9.0	162
1N1832	62	50	12	147
1N1833	68	50	12	134
1N1834	75	50	20	121
1N1835	82	50	22	111
1N1836	91	50	35	100
1N2008	100	50	40	91
1N2009	110	50	47	83
1N2010	120	50	56	76
1N2011	130	50	65	70
1N2012	150	50	82	61
1N2041	4.3-5.4	†1.0	1.0	740
1N2041-1	4.5	†1.0	1.0	740
1N2041-2	5.0	†1.0	1.0	740
1N2042	5.2-6.4	†1.0	0.7	675
1N2042-1	5.5	†1.0	0.7	675
1N2042-2	6.0	†1.0	0.7	675
1N2043	6.2-8.0	†1.0	0.8	500
1N2043-1	6.5	†1.0	0.8	500
1N2043-2	7.0	†1.0	0.8	500
1N2043-3	7.5	†1.0	0.8	500
1N2044	7.5-10.0	†1.0	0.8	400
1N2044-1	8.0	†1.0	0.8	400
1N2044-2	8.5	†1.0	0.8	400
1N2044-3	9.0	†1.0	0.8	400
1N2044-4	9.5	†1.0	0.8	400
1N2045	9.0-12.0	†1.0	1.5	330
1N2045-1	10	†1.0	1.5	330
1N2045-2	11	†1.0	1.5	330
1N2046	11.0-14.5	†1.0	2.0	275
1N2046-1	12	†0.5	2.0	275
1N2046-2	13	†0.5	2.0	275
1N2046-3	14	†0.5	2.0	275
1N2047	13.5-18.0	†0.5	3.0	220
1N2047-1	15	†0.5	3.0	220
1N2047-2	16	†0.5	3.0	220
1N2047-3	17	†0.5	3.0	220
1N2048	17.0-21.0	†0.5	3.0	190
1N2048-1	18	†0.5	3.0	190
1N2048-2	19	†0.5	3.0	190
1N2048-3	20	†0.5	3.0	190
1N2049	20.0-27.0	†0.15	8.0	150
1N2049-1	22	†0.15	8.0	150
1N2049-2	24	†0.15	8.0	150
1N2049-3	26	†0.15	8.0	150
1N2498	10	500	2.0	910
1N2499	11	500	2.0	830
1N2500	12	500	2.0	760

STANDARD POLARITY 1N1351 - 1N1375 - ANODE TO CASE  
 STANDARD POLARITY 1N1588 - 1N1609 - CATHODE TO CASE  
 STANDARD POLARITY 1N1803 - 1N2012 - ANODE TO CASE  
 STANDARD POLARITY 1N2041 - 1N2049 - CATHODE TO CASE  
 STANDARD POLARITY 1N2498 - 1N2500 - ANODE TO CASE

NO SUFFIX LTR V<sub>Z</sub> = ± 10% TOLERANCE  
 \*A\* SUFFIX LTR V<sub>Z</sub> = ± 5% TOLERANCE  
 1N2041 -1, -2, -3 THRU 1N2049 -1, -2, -3 V<sub>Z</sub> = ± 5%  
 † I<sub>ZT</sub> IN AMPERES