MOTOROLA

1N5985A thru 1N6025A

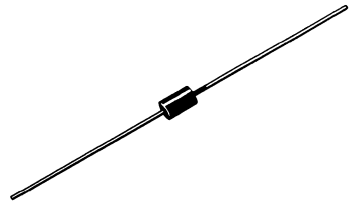
500 MILLIWATT HERMETICALLY SEALED GLASS SILICON ZENER DIODES

. . . A complete line of 500 mW Zener Diodes offering the following advantages:

- Complete Voltage Range – 2.4 to 110 Volts
- DO-35 Package – Smaller than Conventional DO-7 Package
- Double Slug Type Construction
- Metallurgically Bonded Construction
- JEDEC Registered
- Oxide Passivated Die

500 MILLIWATT GLASS ZENER DIODES

2.4–110 VOLTS



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*MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Power Dissipation @ $T_L \leq 50^oC$, Lead Length = 3/8"	P_D	500	mW
Derate above 50^oC		3.33	$mW/^oC$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +200	^oC

*Indicates JEDEC Registered Data.

MECHANICAL CHARACTERISTICS

CASE: Double slug type, hermetically sealed glass

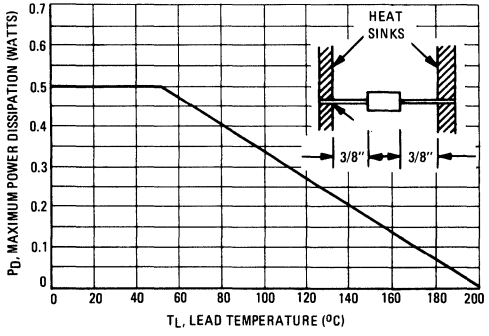
MAXIMUM LEAD TEMPERATURE FOR SOLDERING PURPOSES: 230^oC, 1/16" from case for 10 seconds

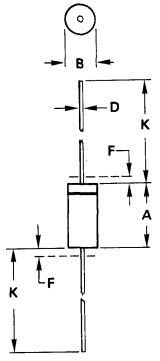
FINISH: All external surfaces are corrosion resistant with readily solderable leads.

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

MOUNTING POSITION: Any

FIGURE 1 – STEADY STATE POWER DERATING





NOTES:
1. PACKAGE CONTOUR OPTIONAL WITHIN A AND B. HEAT SLUGS, IF ANY, SHALL BE INCLUDED WITHIN THIS CYLINDER, BUT NOT SUBJECT TO THE MINIMUM LIMIT OF B.
2. LEAD DIAMETER NOT CONTROLLED IN ZONE F TO ALLOW FOR FLASH, LEAD FINISH BUILDUP AND MINOR IRREGULARITIES OTHER THAN HEAT SLUGS.
3. POLARITY DENOTED BY CATHODE BAND.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	3.05	5.08	0.120	0.200
B	1.52	2.29	0.060	0.090
D	0.46	0.56	0.018	0.022
F	–	1.27	–	0.050
K	25.40	38.10	1.000	1.500

All JEDEC dimensions and notes apply.

CASE 299-02
DO-204AH
(DO-35)

***ELECTRICAL CHARACTERISTICS** (T_L = 30°C unless otherwise noted.) (V_F = 1.5 Volts Max @ I_F = 100 mAdc 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 (Note 4) Z_{ZT} @ I_{ZT} Ohms		Z_{ZK} @ I_{ZK} = 0.25 mA Ohms		Max. Reverse Leakage Current I_R μA @ V_R volts				Max. DC Zener Current I_{ZM} (Note 3)
			B Suffix	A, Non-Suffix	B Suffix	A, Non-Suffix	B Suffix	A, Non-Suffix	B Suffix	A, Non-Suffix	
1N5985A	2.4	5.0	100	110	1800	2000	100	100	1.0	0.5	208
1N5986A	2.7	5.0	100	110	1900	2200	75	100	1.0	0.5	185
1N5987A	3.0	5.0	95	100	2000	2300	50	100	1.0	0.5	167
1N5988A	3.3	5.0	95	100	2200	2400	25	75	1.0	0.5	152
1N5989A	3.6	5.0	90	95	2300	2500	15	50	1.0	0.5	139
1N5990A	3.9	5.0	90	95	2400	2500	10	25	1.0	1.0	128
1N5991A	4.3	5.0	88	90	2500	2500	5.0	15	1.0	1.0	116
1N5992A	4.7	5.0	70	90	2200	2500	3.0	10	1.5	1.0	106
1N5993A	5.1	5.0	50	88	2050	2500	2.0	5.0	2.0	1.0	98
1N5994A	5.6	5.0	25	70	1800	2200	2.0	3.0	3.0	1.5	89
1N5995A	6.2	5.0	10	50	1300	2050	1.0	2.0	4.0	2.0	81
1N5996A	6.8	5.0	8.0	25	750	1800	1.0	2.0	5.2	3.0	74
1N5997A	7.5	5.0	7.0	10	600	1300	0.5	1.0	6.0	4.0	67
1N5998A	8.2	5.0	7.0	15	600	750	0.5	1.0	6.5	5.2	61
1N5999A	9.1	5.0	10	18	600	600	0.1	0.5	7.0	6.0	55
1N6000A	10	5.0	15	22	600	600	0.1	0.5	8.0	6.5	50
1N6001A	11	5.0	18	25	600	600	0.1	0.1	8.4	7.0	45
1N6002A	12	5.0	22	32	600	600	0.1	0.1	9.1	8.0	42
1N6003A	13	5.0	25	36	600	600	0.1	0.1	9.9	8.4	38
1N6004A	15	5.0	32	42	600	600	0.1	0.1	11	9.1	33
1N6005A	16	5.0	36	48	600	600	0.1	0.1	12	9.9	31
1N6006A	18	5.0	42	55	600	600	0.1	0.1	14	11	28
1N6007A	20	5.0	48	62	600	600	0.1	0.1	15	12	25
1N6008A	22	5.0	55	70	600	600	0.1	0.1	17	14	23
1N6009A	24	5.0	62	78	600	600	0.1	0.1	18	15	21
1N6010A	27	5.0	70	88	600	700	0.1	0.1	21	17	19
1N6011A	30	5.0	78	95	600	700	0.1	0.1	23	18	17
1N6012A	33	5.0	88	110	700	800	0.1	0.1	25	21	15
1N6013A	36	5.0	95	130	700	900	0.1	0.1	27	23	14
1N6014A	39	2.0	130	170	800	1000	0.1	0.1	30	25	13
1N6015A	43	2.0	150	180	900	1100	0.1	0.1	33	27	12
1N6016A	47	2.0	170	200	1000	1300	0.1	0.1	36	30	11
1N6017A	51	2.0	180	225	1300	1400	0.1	0.1	39	33	9.8
1N6018A	56	2.0	200	240	1400	1600	0.1	0.1	43	36	8.9
1N6019A	62	2.0	225	265	1400	1700	0.1	0.1	47	39	8.0
1N6020A	68	2.0	240	280	1600	2000	0.1	0.1	52	43	7.4
1N6021A	75	2.0	265	300	1700	2300	0.1	0.1	56	47	6.7
1N6022A	82	2.0	280	350	2000	2600	0.1	0.1	62	52	6.1
1N6023A	91	2.0	300	400	2300	3000	0.1	0.1	69	56	5.5
1N6024A	100	1.0	500	800	2600	4000	0.1	0.1	76	62	5.0
1N6025A	110	1.0	650	950	3000	4500	0.1	0.1	84	69	4.5

*Indicates JEDEC Registered Data.

NOTE 1 – TOLERANCE AND VOLTAGE DESIGNATION

Tolerance designation – Device tolerances of ±10% are indicated by an "A" suffix, ±5% by a "B" suffix, ±2% by a "C" suffix, ±1% by a "D" suffix.

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

EXAMPLE: M Z G 35 – 6.0 A

Motorola Zener Glass Series Nominal Voltage Tolerance (±%)

NOTE 2 – SPECIAL SELECTIONS AVAILABLE INCLUDE:

(a) Nominal Zener voltages between those shown.

(b) Matched sets: (Standard Tolerances are ±5.0%, ±2.0%, ±1.0%)

a. 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

b. Two or more units matched to one another with any specified tolerance.

NOTE 3:

This data was calculated using nominal voltages. In order to determine the maximum current handling capability on a worst case basis the following formula must be used:

$$I_{zm}(\text{worst case}) = \frac{500\ \text{mW}}{V_z(\text{nom}) + \text{tolerance}}$$

NOTE 4:

Z_{ZT} and Z_{ZK} are measured by dividing the ac voltage drop across the device by the ac current applied. The specified limits are for $I_Z(ac) = 0.1\ I_Z(dc)$ with the ac frequency = 1.0 kHz.

TYPICAL CHARACTERISTICS

TEMPERATURE COEFFICIENTS (-55°C to +150°C temperature range)

FIGURE 2A – ZENER VOLTAGE 2.4 to 12 VOLTS

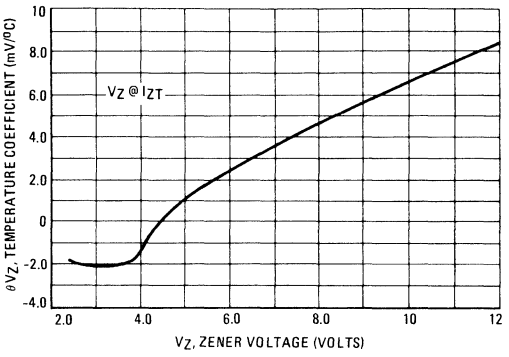


FIGURE 2B – ZENER VOLTAGE 12 to 200 VOLTS

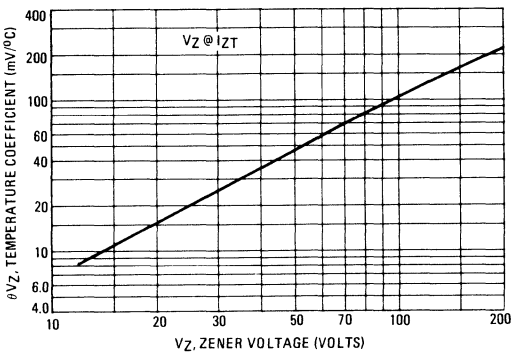


FIGURE 3 – EFFECT OF ZENER CURRENT ON ZENER IMPEDANCE

FIGURE 3A

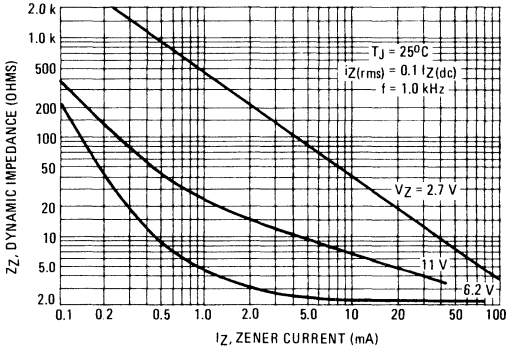


FIGURE 3B

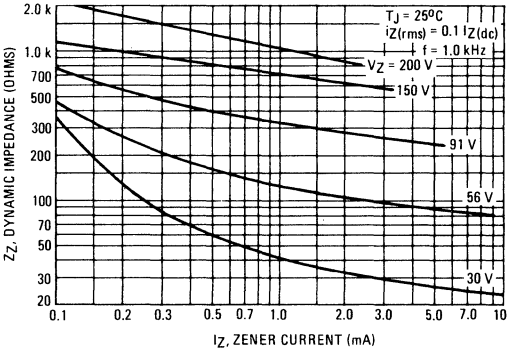


FIGURE 4 – EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE