


**International
Semiconductor, Inc.**

1N5518B-1N5546B

T-11-09

Standard tolerances are 5%
20%, 10%, 2% & 1% are available

400 mW low noise silicon zener diodes

FEATURES

- Zener voltage 3.3 to 33 V
- Low noise
- Low zener impedance
- Hermetically sealed glass package

MAXIMUM RATINGS

- Junction Temperature: -65°C to +200°C
- Storage Temperature: -65°C to +200°C
- DC Power Dissipation: 400mW @ $T_A = 50^\circ\text{C}$
- Derate above 50°C: 3.2 mW/°C
- Forward Voltage @ 200 mA: 1.1 Volts max.

ELECTRICAL CHARACTERISTICS @ 25°C

JEDEC Type No. (Note 1)	Nominal Zener Voltage V_Z @ I_{ZT} Volts (Note 2)	Test Current I_{ZT} mA	Max Zener Impedance B-C D Suffix Z_{ZT} @ I_{ZT} Ohms (Note 3)	Max Reverse Leakage Current			B-C D Suffix Maximum DC Zener Current I_{ZM} mA (Note 5)	B-C D Suffix Max Noise Density at $I_Z = 250 \mu\text{A}$ N_D (Figure 1) (microvolts per square root cycle)	Regulation Factor ΔV_Z Volts (Note 6)	Low V_Z Current I_{ZL} mA
				I_R μA (Note 4)	V_R - Volts Non & A- Suffix	B-C D Suffix				
1N5518A	3.3	20	26	5.0	0.90	1.0	115	0.5	0.90	2.0
1N5519A	3.6	20	24	3.0	0.90	1.0	105	0.5	0.90	2.0
1N5520A	3.9	20	22	1.0	0.90	1.0	98	0.5	0.85	2.0
1N5521A	4.3	20	18	3.0	1.0	1.5	88	0.5	0.75	2.0
1N5522A	4.7	10	22	2.0	1.5	2.0	81	0.5	0.60	1.0
1N5523A	5.1	5.0	26	2.0	2.0	2.5	75	0.5	0.65	0.25
1N5524A	5.6	3.0	30	2.0	3.0	3.5	68	1.0	0.30	0.25
1N5525A	6.2	1.0	30	1.0	4.5	5.0	61	1.0	0.20	0.01
1N5526A	6.8	1.0	30	1.0	5.5	6.2	56	1.0	0.10	0.01
1N5527A	7.5	1.0	35	0.5	6.0	6.8	51	2.0	0.05	0.01
1N5528A	8.2	1.0	40	0.5	6.5	7.5	46	4.0	0.05	0.01
1N5529A	9.1	1.0	45	0.1	7.0	8.2	42	4.0	0.05	0.01
1N5530A	10.0	1.0	50	0.05	8.0	9.1	38	4.0	0.10	0.01
1N5531A	11.0	1.0	60	0.05	9.0	9.9	35	5.0	0.20	0.01
1N5532A	12.0	1.0	90	0.05	9.5	10.8	32	10	0.20	0.01
1N5533A	13.0	1.0	90	0.01	10.5	11.7	29	15	0.20	0.01
1N5534A	14.0	1.0	100	0.01	11.5	12.6	27	20	0.20	0.01
1N5535A	15.0	1.0	100	0.01	12.5	13.5	25	20	0.20	0.01
1N5536A	16.0	1.0	100	0.01	13.0	14.4	24	20	0.20	0.01
1N5537A	17.0	1.0	100	0.01	14.0	15.3	22	20	0.20	0.01
1N5538A	18.0	1.0	100	0.01	16.0	16.2	21	20	0.20	0.01
1N5539A	19.0	1.0	100	0.01	16.0	17.1	20	20	0.20	0.01
1N5540A	20.0	1.0	100	0.01	17.0	18.0	19	20	0.20	0.01
1N5541A	22.0	1.0	100	0.01	18.0	19.8	17	20	0.25	0.01
1N5542A	24.0	1.0	100	0.01	20.0	21.6	16	20	0.30	0.01
1N5543A	25.0	1.0	100	0.01	21.0	22.4	15	20	0.35	0.01
1N5544A	28.0	1.0	100	0.01	23.0	25.2	14	20	0.40	0.01
1N5545A	30.0	1.0	100	0.01	24.0	27.0	13	20	0.45	0.01
1N5546A	33.0	1.0	100	0.01	28.0	29.7	12	20	0.50	0.01

Note 1 The JEDEC type numbers shown with no suffix are $\pm 20\%$ with guaranteed limits for only V_Z , I_R , and V_F . A suffix are $\pm 10\%$ with guaranteed limits for only V_Z , I_R , and V_F . Units with guaranteed limits for all six parameters are indicated by a B suffix for $\pm 5\%$ units, suffix C for $\pm 2\%$ units and suffix D indicates a $\pm 1\%$ units.

Note 2 Voltage measurement performed with the device junction in thermal equilibrium with ambient temperature at 25°C.

Note 3 The zener impedance is derived from the 60 Hz ac voltage, which results when an ac current having an rms value equal to 10% of the DC zener current (I_{ZT}) is superimposed on I_{ZT} .

Note 4 Reverse leakage currents are guaranteed and are measured at V_R as shown.

Note 5 The maximum current shown is based on the maximum voltage of a 5.0% type unit. The actual I_{ZM} for any device may not exceed the value of 400 mW divided by the actual V_Z of the device.

Note 6 ΔV_Z is the maximum difference between V_Z at I_{ZT} and V_Z at I_{ZL} measured with the device junction in thermal equilibrium.

MECHANICAL CHARACTERISTICS

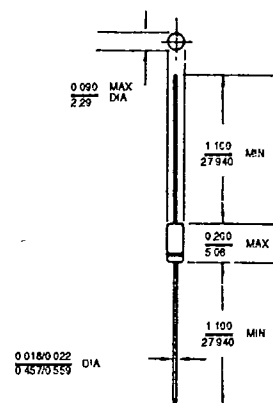


FIGURE 1 all dimensions in INCH
mm

CASE: Hermetically sealed
glass package (DO-35)
FINISH: Corrosion resistant.

Leads are tin plated
THERMAL RESISTANCE:
200°C/W junction to lead at
0.375-inches from body
POLARITY: Cathode banded
WEIGHT: 0.2 grams (typ)

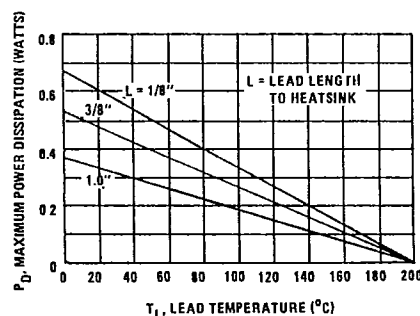


Figure 2 POWER DERATING

Corporate Offices:

727 Raritan Road, Suite 203
Clark, NJ 07066

Phone (908) 396-0322 FAX (908) 396-0410

Sales Office:

574 E. Alamo, #40
Chandler, AZ 85225

Phone (602) 497-8172 FAX (602) 497-8173



**International
Semiconductor, Inc.**

1N5518B-1N5546B

T-11-09

Noise Density

A zener diode produces noise when biased in the reverse mode. The most significant portion of the noise is caused by the zener breakdown and is referred to as microplasma -- or white -- noise. The higher frequencies can be eliminated by the use of a shunt capacitor. However the lower frequencies can not be removed without a serious degradation in zener performance.

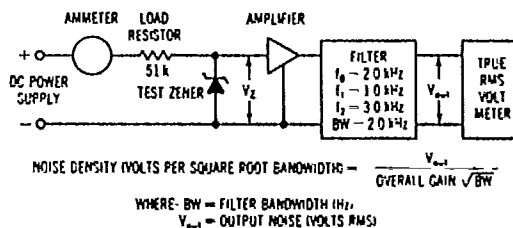


Figure 3 NOISE DENSITY MEASUREMENT CIRCUIT

Noise density (ND) in microvolts-rms per square-root-hertz decreases as zener current increases. The measurement of ND can be made with a circuit as shown in Figure 3. Measurement is performed using a 1 KHz to 3 KHz frequency bandpass filter at a constant zener test current (I_{ZT}) at 25°C ambient temperature.

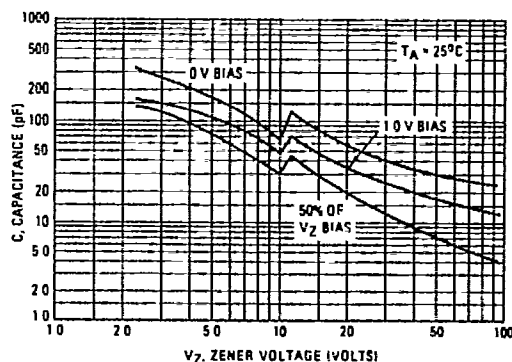


Figure 4 TYPICAL CAPACITANCE VS FORWARD VOLTAGE

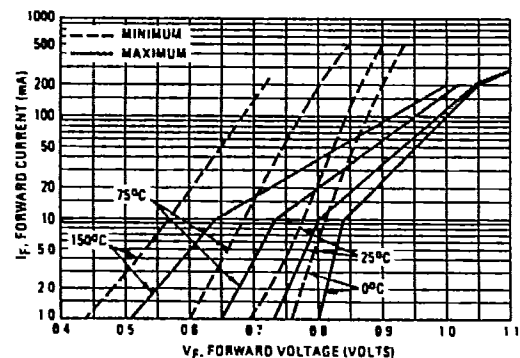


Figure 5 TYPICAL FORWARD CHARACTERISTICS

Corporate Offices:

727 Raritan Road, Suite 203
Clark, NJ 07066

Phone (908) 396-0322 FAX (908) 396-0410

Sales Office:

574 E. Alamo, #40
Chandler, AZ 85225

Phone (602) 497-8172 FAX (602) 497-8173