american power devices, inc.

1N5518B-1N5546B

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

400 mW low noise silicon zener diodes

FEATURES

- Zener voltage 3.3 to 33 V
- Low noise
- Low zener impedance
- Available in JAN, JANTX and JANTXV qualified to MIL-S-19500/437 in 1N5518B - 1N5532B versions
- 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_L = 50°C
- Derate above 50°C: 3.2mW/°C
- Forward Voltage @ 200 mA: 1.1 Volts max.

Note 1 The JEDEC type numbers shown with no suffix are ±20% with guaranteed limits for only V_Z, I_R and V_F. A suffix are ±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 ±5% units, suffix C for ±2% units and suffix D indicates ±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 man not exceed the value of 400 mW divided by the actual V_Z of the device.

Note 6 Δ_{VZ} 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

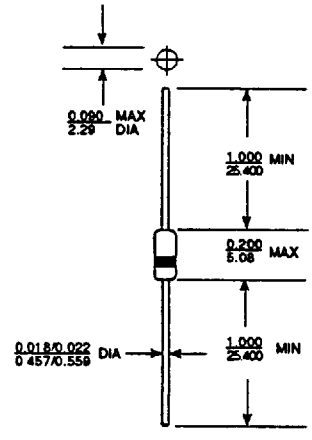

FIGURE 1 all dimensions in INCH mm

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).

This series also offered in DO-7 package up to 12 V. Consult factory for availability.

ELECTRICAL CHARACTERISTICS @ 25°C

JEDEC Type No. (Note 1)	Nominal Zener Voltage V_Z @ I_{ZT} Volts (Note 2)	Test Current I_{ZT} mAdc	Max Zener Impedance B-C-D Suffix Z_{ZT} @ I_{ZT} Ohms (Note 3)	Max Reverse Leakage Current I_R µAdc (Note 4)	V_R – Volts Non & A-Suffix	V_R – Volts B-C-D Suffix	B-C-D Suffix Maximum DC Zener Current I_{ZM} mAdc (Note 5)	B-C-D Suffix Max Noise Density at I_Z = 250 µA N_D (Figure 1) (micro-volts per square root cycle)	Regulation Factor ΔV_Z Volts (Note 6)	Low V_Z Current I_{ZL} mAdc
1N5518B	3.3	20	26	5.0	0.90	1.0	115	0.5	0.90	2.0
1N5519B	3.6	20	24	3.0	0.90	1.0	105	0.5	0.90	2.0
1N5520B	3.9	20	22	1.0	0.90	1.0	98	0.5	0.85	2.0
1N5521B	4.3	20	18	3.0	1.0	1.5	88	0.5	0.75	2.0
1N5522B	4.7	10	22	2.0	1.5	2.0	81	0.5	0.60	1.0
1N5523B	5.1	5.0	26	2.0	2.0	2.5	75	0.5	0.65	0.25
1N5524B	5.6	3.0	30	2.0	3.0	3.5	68	1.0	0.30	0.25
1N5525B	6.2	1.0	30	1.0	4.5	5.0	61	1.0	0.20	0.01
1N5526B	6.8	1.0	30	1.0	5.5	6.2	56	1.0	0.10	0.01
1N5527B	7.5	1.0	35	0.5	6.0	6.8	51	2.0	0.05	0.01
1N5528B	8.2	1.0	40	0.5	6.5	7.5	46	4.0	0.05	0.01
1N5529B	9.1	1.0	45	0.1	7.0	8.2	42	4.0	0.05	0.01
1N5530B	10.0	1.0	60	0.05	8.0	9.1	38	4.0	0.10	0.01
1N5531B	11.0	1.0	80	0.05	9.0	9.9	35	5.0	0.20	0.01
1N5532B	12.0	1.0	90	0.05	9.5	10.8	32	10	0.20	0.01
1N5533B	13.0	1.0	90	0.01	10.5	11.7	29	15	0.20	0.01
1N5534B	14.0	1.0	100	0.01	11.5	12.6	27	20	0.20	0.01
1N5535B	15.0	1.0	100	0.01	12.5	13.5	25	20	0.20	0.01
1N5536B	16.0	1.0	100	0.01	13.0	14.4	24	20	0.20	0.01
1N5537B	17.0	1.0	100	0.01	14.0	15.3	22	20	0.20	0.01
1N5538B	18.0	1.0	100	0.01	15.0	16.2	21	20	0.20	0.01
1N5539B	19.0	1.0	100	0.01	16.0	17.1	20	20	0.20	0.01
1N5540B	20.0	1.0	100	0.01	17.0	18.0	19	20	0.20	0.01
1N5541B	22.0	1.0	100	0.01	18.0	19.8	17	20	0.25	0.01
1N5542B	24.0	1.0	100	0.01	20.0	21.6	16	20	0.30	0.01
1M5543B	25.0	1.0	100	0.01	21.0	22.4	15	20	0.35	0.01
1N5544B	28.0	1.0	100	0.01	23.0	25.2	14	20	0.40	0.01
1N5545B	30.0	1.0	100	0.01	24.0	27.0	13	20	0.45	0.01
1N5546B	33.0	1.0	100	0.01	28.0	29.7	12	20	0.50	0.01

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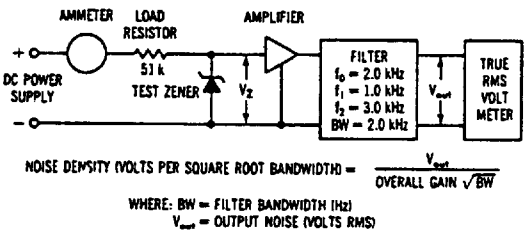

Figure 2 NOISE DENSITY MEASUREMENT CIRCUIT

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.

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 2. 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.

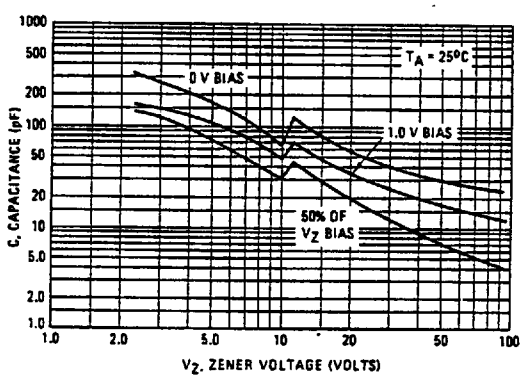

Figure 3 TYPICAL CAPACITANCE VS FORWARD VOLTAGE

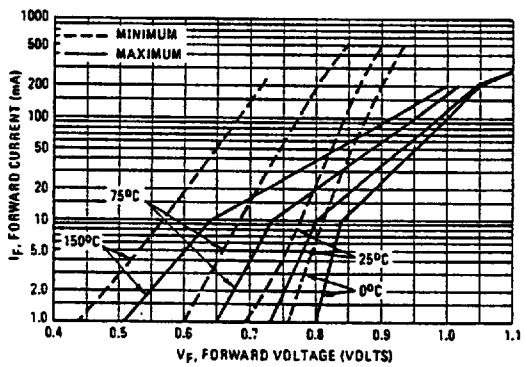

Figure 3 TYPICAL FORWARD CHARACTERISTCS

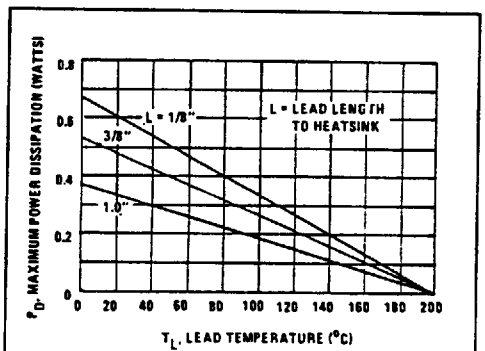

Figure 5 POWER DERATING

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