DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

1N6309-1N6355

500mW GLASS ZENER DIODES

FEATURES

- Available as “HR” (high reliability) screened per MIL-PRF-19500, JANTX level. Add “HR” suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding “-PBF” suffix.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Junction and storage temperature range	T_J, T_{stg}	-65 to +175	°C
Thermal resistance, junction to lead(1) 1N6309-1N6320 1N6321-1N6355	$R_{\Theta JL}$	 150 95.5	°C/W
Thermal resistance, junction to ambient (2)	$R_{\Theta JA}$	240	°C/W
Steady state power dissipation @ T_L = 75°C	P_D	0.5	W
Forward voltage @ 1.0A	V_F	1.4	V
Solder temperature @ 10s	T_{SP}	260	°C

Note 1: At 3/8” from body.
Note 2: T_A = +55°C before derating on printed circuit board, PCB = FR4 0.0625” 1 layer 1oz. Cu, horizontal, still air, pads = 0.092” diameter, strip = 0.030” x 1” long, axial lead length L ≤ 0.187”. $R_{\Theta JA}$ with a defined thermal resistance condition included is measured at IZ = as defined in the characteristics and ratings table herin.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Part number(1)	V_{Z2} Nom. +/-5% @ I_{Z2}	V_{Z1} Min. @ L_{z1} 250µA	Test Current I_{Z2}	Dynamic impedance Z_Z @ I_{Z2}	Dynamic impedance Z_{ZK} @ 250µA	Max. current I_{ZM}	Voltage reg. V_Z (reg) ΔV_Z(2)	Surge current I_{ZSM} 8.3ms square wave	Reverse voltage V_R	Max. reverse current I_{R1} @ 25°C	Max. reverse current I_{R2} @ 150°C	Max. noise density ND @ 250µA 1-3kHz	Max. temperature coefficient aV_Z
	Volts	Volts	mA	Ohms	Ohms	mA	Volts	Amps	Volts	µA	µA	µV/√Hz	%/°C
1N6309	2.4	1.1	20	30	1200	177	1.5	2.5	1.0	100	200	1	-0.085
1N6310	2.7	1.2	20	30	1300	157	1.5	2.2	1.0	60	150	1	-0.080
1N6311	3.0	1.3	20	29	1400	141	1.5	2.0	1.0	30	100	1	-0.075
1N6312	3.3	1.5	20	27	1400	158	1.6	1.8	1.0	5	20	1	-0.070
1N6313	3.6	1.8	20	25	1400	117	1.6	1.65	1.0	3	12	1	-0.065
1N6314	3.9	2.0	20	23	1700	108	1.6	1.5	1.0	2	12	1	-0.060
1N6315	4.3	2.4	20	20	1700	99	0.9	1.4	1.0	2	12	1	-0.045 +0.020
1N6316	4.7	2.8	20	17	1500	90	0.5	1.27	1.5	5	12	1	-0.028 +0.032
1N6317	5.1	3.3	20	14	1300	83	0.4	1.17	2.0	5	12	1	-0.020 +0.035
1N6318	5.6	4.3	20	8	1200	76	0.4	1.10	2.5	5	10	2	+0.050
1N6319	6.2	5.2	20	3	800	68	0.3	0.97	3.5	5	10	5	+0.060
1N6320	6.8	6.0	20	3	400	63	0.35	1.23	4.0	2	50	5	+0.062
1N6321	7.5	6.6	20	4	400	57	0.4	1.16	5.0	2	30	5	+0.068
1N6322	8.2	7.5	20	5	400	52	0.4	1.07	6.0	1	10	20	+0.075
1N6323	9.1	8.4	20	6	500	47	0.5	0.97	7.0	1	10	40	+0.076
1N6324	10.0	9.1	20	6	500	43	0.5	0.89	8.0	1	10	80	+0.079
1N6325	11.0	10.0	20	7	550	35	0.55	0.77	9.0	1	10	100	+0.083
1N6326	12.0	11.0	20	7	550	35	0.55	0.77	9.0	10	10	100	+0.083
1N6327	13.0	11.9	9.5	8	550	33	0.55	0.71	9.9	0.05	10	100	+0.083
1N6328	15.0	13.8	8.5	10	600	28	0.70	0.62	11.0	0.05	10	100	+0.084
1N6329	16.0	14.7	7.8	12	600	27	0.75	0.58	12.0	0.05	10	100	+0.084

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Part number[1]	V_{Z2} Nom. +/-5% @ I_{Z2}	V_{Z1} Min. @ L_{z1} 250µA	Test Current I_{Z2}	Dynamic impedance Z_z @ I_{Z2}	Dynamic impedance Z_{ZK} @ 250µA	Max. current I_{ZM}	Voltage reg. V_Z (reg) ΔV_Z[2]	Surge current I_{ZSM} 8.3ms square wave	Reverse voltage V_R	Max. reverse current I_{R1} @ 25°C	Max. reverse current I_{R2} @ 150°C	Max. noise density ND @ 250µA 1-3kHz	Max. temperature coefficient aV_z
	Volts	Volts	mA	Ohms	Ohms	mA	Volts	Amps	Volts	µA	µA	µV/√Hz	%/°C
1N6330	18.0	16.6	7.0	14	600	24	0.85	0.52	14.0	0.05	10	00	+0.085
1N6331	20.0	18.5	6.2	18	500	21	0.95	0.47	15.0	0.05	10	100	+0.086
1N6332	22.0	20.4	5.6	20	500	19	1.05	0.43	17.0	0.05	10	100	+0.087
1N6333	24.0	22.33	5.2	24	500	18	1.15	0.39	18.0	0.05	10	100	+0.088
1N6334	27.0	25.2	4.6	27	500	16	1.30	0.35	21.0	0.05	10	100	+0.009
1N6335	30.0	28.0	4.2	32	500	14	1.45	0.31	23.0	0.05	10	100	+0.091
1N6336	33.0	30.9	3.8	40	600	13	1.60	0.28	25.0	0.05	10	100	+0.092
1N6337	36.0	33.7	3.4	50	600	12	1.75	0.260	27.0	0.05	10	100	+0.093
1N6338	39.0	36.6	3.2	55	700	11	1.90	0.240	30	0.05	10	100	+0.094
1N6339	43.0	40.4	3.0	65	800	9.9	2.10	0.220	33	0.05	10	80	+0.095
1N6340	47.0	44.2	2.7	75	900	9.0	2.25	0.200	36	0.05	10	80	+0.095
1N6341	51.0	48.0	2.5	85	1000	8.3	2.5	0.180	39	0.05	10	80	+0.096
1N6342	56.0	52.7	2.2	100	1200	7.6	2.7	0.170	43	0.05	10	80	+0.097
1N6343	62.0	58.4	2.0	125	1300	6.8	2.9	0.150	47	0.05	10	80	+0.099
1N6344	68.0	64.1	1.8	155	1500	6.3	3.2	0.13	52	0.05	10	80	+0.101
1N6345	75.0	70.8	1.7	180	1600	5.7	3.4	0.125	56	0.05	10	80	+0.103
1N6346	82.0	77.4	1.5	220	1800	5.2	3.8	0.115	62	0.05	10	80	+0.105
1N6347	91.0	86.0	1.4	270	2100	4.7	4.2	0.100	69	0.05	10	80	+0.108
1N6348	100.0	94.5	1.3	340	2400	4.3	4.4	0.095	76	0.05	10	80	+0.110
1N6349	110.0	104.0	1.1	500	2800	3.9	4.80	0.085	84	0.05	10	80	+0.110
1N6350	120.0	113.0	1.0	600	3200	3.5	5.2	0.080	91	0.05	10	80	+0.110
1N6351	130.0	122.0	0.95	850	4100	3.3	5.60	0.070	99	0.05	10	800	+0.110
1N6352	150.0	141	0.85	1000	4500	2.8	7.00	0.065	114	0.05	10	80	+0.110
1N6353	160.0	151	0.80	1200	5000	2.7	7.5	0.060	122	0.05	10	80	+0.110
1N6354	180.0	170	0.68	1500	5600	2.4	9.00	0.050	137	0.05	10	80	+0.110
1N6355	200.0	189	0.65	1800	6500	2.1	12.00	0.045	152	0.05	10	80	+0.110

Note 1: Standard tolerance is 5%. "C" suffix is 2% tolerance and "D" suffix is 1% tolerance.
Note 2: Voltage regulation $V_{Z(reg)}$ is the measured voltage change at thermal equilibrium between the current of 10% and 50% of maximum zener current (I_{ZM}) when the lead temperature is maintained at 25°C = +8°C, -2°C.

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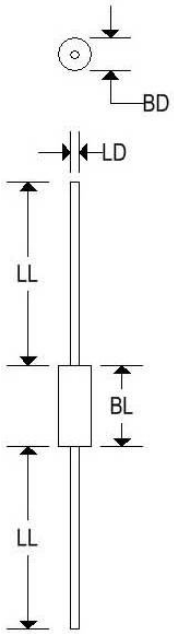
MECHANICAL CHARACTERISTICS

Case	DO-35
Marking	Body painted, alpha-numeric
Polarity	Cathode band



	DO-35			
	Inches		Millimeters	
	Min	Max	Min	Max
BD	0.055	0.090	1.400	2.290
BL	0.120	0.200	3.050	5.080
LD	0.018	0.022	0.460	0.560
LL	1.000	1.500	25.400	38.100

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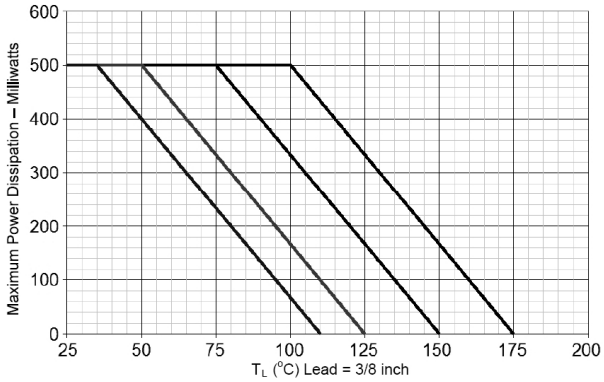

FIGURE 1 - (1N6309 – 1N6320)
T_L Temperature-Power Derating Curve
$R_{\theta JL}$ 3/8 inch = 150 °C/W (dc operation)

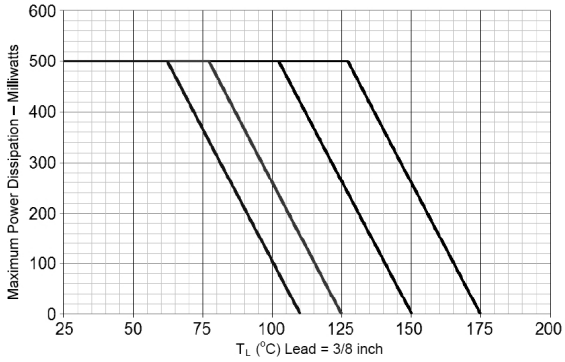

FIGURE 2 - (1N6321 – 1N6355)
T_L Temperature-Power Derating Curve
$R_{\theta JL}$ 3/8 inch = 95.5 °C/W (dc operation)

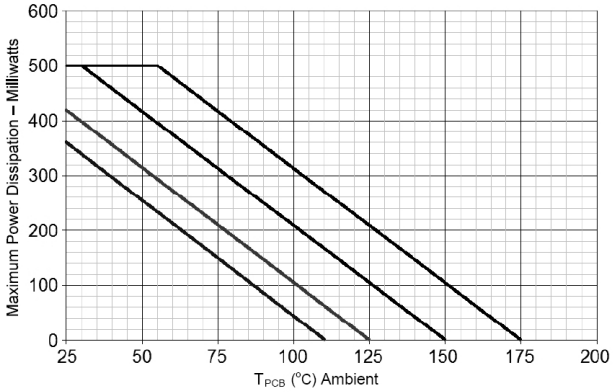

FIGURE 3
Temperature-Power Derating Curve
$R_{\theta JA}$ = 240 °C/W (dc operation)