Zener Diode Datasheet Information:

For a zener series: 1N4728A-1N4764A.

1N4728A - 1N4764A Zeners



Absolute Maximum Ratings * T_a = 25°C unless otherwise noted

Symbol	Parameter	Value	Units	
PD	Power Dissipation @ TL ≤ 50°C, Lead Length = 3/8"	1.0	W	
	Derate above 50℃	6.67	mW/°C	
T _J , T _{STG}	Operating and Storage Temperature Range	-65 to +200	°C	

* These ratings are limiting values above which the serviceability of the diode may be impaired.

Absolute Maximum Ratings in Datasheet

- The maximum power dissipation, $P_{\rm D}$, is specified as 1.0 W up to 50C.
- The power dissipation is **derated** as shown on the datasheet at **6.67 mW** for each degree above.
- **Example**: maximum power dissipation at 60C:

$$P_{\rm D} = 1 \,\text{W} - 10^{\circ}\text{C}(6.67 \,\text{mW}/^{\circ}\text{C}) = 1 \,\text{W} - 66.7 \,\text{mW} = 0.9933 \,\text{W}$$

• Maximum reverse current can be determined from the maximum power dissipation: **Example**: at 50 C, the max zener current for Vz = 3.3:

$$I_{\rm ZM} = \frac{P_{\rm D}}{V_Z} = \frac{1 \,\rm W}{3.3 \,\rm V} = 303 \,\rm mA$$

Electrical Characteristics in Datasheet:

• Zener voltage, V_Z , and zener test current, I_Z

Vz is measured at the specified zener test current Iz. For example, the zener voltage for a 1N4728A can range from 3.315 V to 3.465 V with a typical value of 3.3 V at a test current of 76 mA.

• Maximum zener impedance

(Zz) at the specified test current Iz.

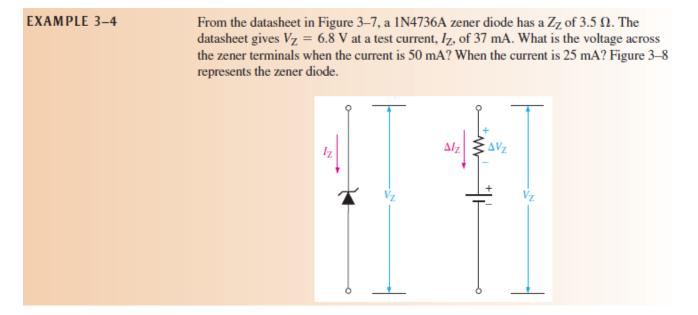
The maximum zener impedance $(\mathbf{Z}_{\mathbf{ZK}})$, at the knee of the characteristic curve is specified at $(\mathbf{I}_{\mathbf{ZK}})$ which is the current at the knee of the curve

Leakage current: Reverse leakage current is specified for a reverse voltage that is less than • the knee voltage. This means that the zener is not in reverse breakdown for these measurements.

Device Min. Typ. Max. Iz (mA) Zz @ Iz (i) Zz @ Iz (i) Imax (mA) (mA) (mA) Imax (mA) (mA) 1N4728A 3.345 3.3 3.485 76 10 400 1 100 1 1N4728A 3.42 3.6 3.78 69 10 400 1 50 1 1N4730A 3.705 3.9 4.095 64 9 400 1 50 1 1N4730A 3.705 3.9 4.095 64 9 400 1 50 1 10 1 1N4733A 4.865 5.1 5.355 49 7 550 1 10 1 1N4735A 5.89 6.2 6.51 41 2 700 1 10 3 1N4738A 7.79 8.2 8.61 31 4.5 700 0.5 10 7 1N4738A 7.79 8.2 8.61 11 1.55			V _Z (V) @ I _Z (Note 1)		Test Comment	Max. Zener Impedance			Leakage Current		
Ex.3.4 1N4729A 1N4730A 3.42 3.76 3.8 4.095 64 4.95 9 4.00 1 4.00 1 1.00		Device	Min.	Тур.	Max.	Test Current I _Z (mA)		Z _{ZK} @ I _{ZK} (Ω)			V _R (V)
Ex.3.4 1N4730A 3.705 3.9 4.095 64 9 400 1 50 1 1N4731A 4.085 4.3 4.515 53 9 400 1 100 1 1N4732A 4.465 5.1 5.355 49 7 550 1 100 1 1N4733A 4.845 5.1 5.355 49 7 550 1 100 1 1N4733A 5.89 6.2 6.861 41 2 700 1 10 3 1N4738A 6.46 6.8 7.14 37 3.5 700 1 10 4 1N4738A 7.79 8.2 8.61 31 4.5 700 0.5 10 75 1N4738A 7.79 8.2 8.61 31 4.5 700 0.25 5 84 1N474A 10.45 11 11.55 23 8 700 0.25		1N4728A	3.315	3.3	3.465	76	10	400	1	100	1
Ex.3.4 1N4731A 4.085 4.3 4.515 58 9 400 1 100 1 1N4732A 4.465 4.7 4.935 53 8 500 1 100 1 1N4733A 4.845 5.1 5.355 49 7 550 1 100 1 1N4735A 5.89 6.2 6.51 41 2 700 1 100 42 1N4738A 6.46 6.8 7.125 7.5 7.875 34 4 700 0.5 10 6 1N4738A 7.79 8.2 8.61 31 4.5 700 0.5 10 7 1N4738A 7.79 8.2 8.61 31 4.5 700 0.25 5 9.5 1N4740A 9.5 10 10.5 23 8 700 0.25 5 9.5 1N4740A 12.35 13 13.65 19 10		1N4729A	3.42	3.6	3.78	69	10	400	1	100	1
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		1N4763A 1N4764A	86.45 95	91 100	95.55 105	2.8 2.5	250 350	3000 3000	0.25	5 5	69.2 76

Electrical Characteristics T_a = 25°C unless otherwise noted

Can ar Voltage (V₂) The zener voltage is measured with the device junction in the thermal equilibrium at the lead temperature (T₁) at 30°C ± 1°C and 3′8* lead length.



For Iz = 50 mA which is above the test current (Iz = 37 mA)

$$\begin{split} \Delta Iz &= Iz - 37 \text{mA} = 50 \text{ mA} - 37 \text{ mA} = +13 \text{ mA} \\ Vz &= 6.8 + \Delta Iz \cdot Zz \\ &= 6.8 + 13 \text{mA} \times 3.5 \\ &= 6.85 \text{ V} \end{split}$$

For Iz = 25 mA which is below the test current (Iz = 37 mA)

 $\Delta Iz = Iz - 37mA = 25 mA - 37 mA = -42 mA$ Vz = 6.8 + ΔIz . Zz = 6.8 - 13mA x 3.5 = **6.85 V**