

**DESCRIPTION**

The popular 1N4728AG thru 1N4764AG glass body series of 1.0 watt Zeners provides voltage regulation in a selection from 3.3 to 100 volts in 5% tolerances with other tighter tolerances also available as identified by different suffix letters on the part number. These glass encapsulated Zeners with a G suffix provide hermetic-sealed qualities and higher rated temperature when required beyond that optionally provided in the same size DO-41 plastic-body (P suffix) for these JEDEC part numbers. Both of these package options are available by Microsemi including RoHS Compliant devices with an "e3" suffix. A variety of other Zener product offerings and packages are available by Microsemi to meet higher and lower power or test current applications.

**APPEARANCE**

**DO-41 or  
DO-204AL  
(Glass)**



**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

**FEATURES**

- JEDEC registered 1N4728A to 1N4764A
- Options for screening in accordance with MIL-PRF-19500 for JAN, JANTX, JANTXV, and JANS are available by adding MQ, MX, MV, or MSP prefixes respectively to part numbers.
- Surface mount equivalents available as SMAJ4728A to SMAJ4764A and MLL4728A to MLL4764A (consult factory for others)
- Plastic body axial-leaded Zener equivalents are also available as 1N4728AP to 1N4764AP
- RoHS Compliant devices available by adding "e3" suffix

**APPLICATIONS / BENEFITS**

- Regulates voltage over a broad operating current and temperature range
- Extensive voltage selection from 3.3 to 100 V
- Flexible axial-lead mounting terminals
- Standard voltage tolerances are plus/minus 5% with A suffix and 10 % with no suffix identification
- Tight tolerances available in plus or minus 2% or 1% with C or D suffix respectively
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Hermetically sealed glass body construction

**MAXIMUM RATINGS**

- Power dissipation at 25°C: 1.0 watts (also see derating in Figure 1).
- Operating and Storage temperature: -65°C to +175°C
- Thermal Resistance: 80 °C/W junction to lead at 3/8 (10 mm) lead length from body, or 140°C/W junction to ambient when mounted on FR4 PC board (1 oz Cu) with 4 mm<sup>2</sup> copper pads and track width 1 mm, length 25 mm
- Steady-State Power: 1.0 watts at T<sub>L</sub> ≤ 95°C 3/8 inch (10 mm) from body or 1.00 watt at T<sub>A</sub> ≤ 35°C when mounted on FR4 PC board as described for thermal resistance above (also see Figure 1)
- Forward voltage @200 mA: 1.2 volts (maximum)
- Solder Temperatures: 260 °C for 10 s (max)

**MECHANICAL AND PACKAGING**

- CASE: Hermetically sealed axial-lead glass package
- TERMINALS: Tin-Lead (Sn/Pb) or RoHS Compliant annealed matte-Tin plated solderable per MIL-STD-750, method 2026
- POLARITY: Cathode indicated by band. Diode to be operated with the banded end positive with respect to the opposite end for Zener regulation
- MARKING: Part number
- TAPE & REEL option: Standard per EIA-296 (add "TR" suffix to part number)
- WEIGHT: 0.4 grams
- See package dimensions on last page

**ELECTRICAL CHARACTERISTICS\***

JEDEC TYPE NUMBER (Note 1)	ZENER VOLTAGE (Note 4)	TEST CURRENT	MAXIMUM DYNAMIC IMPEDANCE (Note 2)	MAXIMUM REVERSE CURRENT	TEST VOLTAGE	MAXIMUM REGULATOR CURRENT T <sub>A</sub> = 50°C	MAXIMUM KNEE IMPEDANCE (Note 2)	TEST CURRENT	MAXIMUM (SURGE) CURRENT (Note 3)
	(V <sub>Z</sub> )	(I <sub>ZT</sub> )	(Z <sub>ZT</sub> @ I <sub>ZT</sub> )	(I <sub>R</sub> @ V <sub>R</sub> )	(V <sub>R</sub> )	(I <sub>ZM</sub> )	(Z <sub>ZK</sub> @ I <sub>ZK</sub> )	(I <sub>ZK</sub> )	(I <sub>S</sub> )
	VOLTS	mA	OHMS	μA	VOLTS	mA	OHMS	mA	mA
1N4728A	3.3	76	10	100	1	276	400	1.0	1380
1N4729A	3.6	69	10	100	1	252	400	1.0	1260
1N4730A	3.9	64	9	50	1	234	400	1.0	1190
1N4731A	4.3	58	9	10	1	217	400	1.0	1070
1N4732A	4.7	53	8	10	1	193	500	1.0	970
1N4733A	5.1	49	7	10	1	178	550	1.0	890
1N4734A	5.6	45	5	10	2	162	600	1.0	810
1N4735A	6.2	41	2	10	3	146	700	1.0	730
1N4736A	6.8	37	3.5	10	4	133	700	1.0	660
1N4737A	7.5	34	4.0	10	5	121	700	0.5	605
1N4738A	8.2	31	4.5	10	6	110	700	0.5	550
1N4739A	9.1	28	5.0	10	7	100	700	0.5	500
1N4740A	10	25	7	10	7.6	91	700	0.25	454
1N4741A	11	23	8	5	8.4	83	700	0.25	414
1N4742A	12	21	9	5	9.1	76	700	0.25	380
1N4743A	13	19	10	5	9.9	69	700	0.25	344
1N4744A	15	17	14	5	11.4	61	700	0.25	304
1N4745A	16	15.5	16	5	12.2	57	700	0.25	285
1N4746A	18	14	20	5	13.7	50	750	0.25	250
1N4747A	20	12.5	22	5	15.2	45	750	0.25	225
1N4748A	22	11.5	23	5	16.7	41	750	0.25	205
1N4749A	24	10.5	25	5	18.2	38	750	0.25	190
1N4750A	27	9.5	35	5	20.6	34	750	0.25	170
1N4751A	30	8.5	40	5	22.8	30	1000	0.25	150
1N4752A	33	7.5	45	5	25.1	27	1000	0.25	135
1N4753A	36	7.0	50	5	27.4	25	1000	0.25	125
1N4754A	39	6.5	60	5	29.7	23	1000	0.25	115
1N4755A	43	6.0	70	5	32.7	22	1500	0.25	110
1N4756A	47	5.5	80	5	35.8	19	1500	0.25	95
1N4757A	51	5.0	95	5	38.8	18	1500	0.25	90
1N4758A	56	4.5	110	5	42.6	16	2000	0.25	80
1N4759A	62	4.0	125	5	47.1	14	2000	0.25	70
1N4760A	68	3.7	150	5	51.7	13	2000	0.25	65
1N4761A	75	3.3	175	5	56.0	12	2000	0.25	60
1N4762A	82	3.0	200	5	62.2	11	3000	0.25	55
1N4763A	91	2.8	250	5	69.2	10	3000	0.25	50
1N4764A	100	2.5	350	5	76.0	9	3000	0.25	45

\*JEDEC Registered Data

**NOTES:**

- The JEDEC type numbers shown with an A suffix have a 5% tolerance on nominal zener voltage. No suffix signifies a 10% tolerance, C signifies 2%, and D signifies 1% tolerance. Also add a G suffix for designating glass construction (P suffix designates plastic body options described by separate data sheet).
- The Zener impedance is derived from the 60 Hz ac voltage that results when an ac current having an rms value equal to 10% of the dc Zener current (I<sub>ZT</sub> or I<sub>ZK</sub>) is superimposed on I<sub>ZT</sub> or I<sub>ZK</sub>. Zener impedance is measured at two points to ensure a sharp knee on the breakdown curve and eliminate unstable units. See MicroNote 202 for zener impedance variation with different operating currents.
- The reverse surge current is measured at 25°C ambient using a ½ square wave or equivalent sine wave pulse 1/120 second duration superimposed on I<sub>ZT</sub>.
- Zener voltage (V<sub>Z</sub>) is measured at T<sub>L</sub> = 25°C (+8, -2°C) and 90 seconds after application of dc current.

GRAPHS



$T_L$ , LEAD TEMP. ( $^{\circ}$ C) 3/8" from body  
or  $T_A$  on FR4 PC Board

**FIGURE 1**  
Power Derating Curve



NOMINAL ZENER VOLTAGE (VOLTS)

**FIGURE 2**  
Temp. Coeff. vs. Zener Voltage



**FIGURE 3**  
Capacitance vs. Voltage  
for Representative Types

PACKAGE DIMENSIONS (DO-41 or DO-204AL)



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[1N4757A G](#) [1N4760A G](#) [1N4728 G](#) [1N4735 G](#) [1N4764A G](#) [1N4744 G](#) [1N4736A G](#) [1N4763 G](#) [1N4759A G](#)  
[1N4732A G](#) [1N4741A G](#) [1N4748A G](#) [1N4761A G](#) [1N4731A G](#) [1N4742 G](#) [1N4735A G](#) [1N4744A G](#) [1N4763A G](#)  
[1N4750A G](#) [1N4740 G](#) [1N4760 G](#) [1N4745 G](#) [1N4756A G](#) [1N4729A G](#) [1N4741 G](#) [1N4739A G](#) [1N4743 G](#)  
[1N4752A G](#) [1N4730A G](#) [1N4731 G](#) [1N4761 G](#) [1N4747A G](#) [1N4738A G](#) [1N4729 G](#) [1N4745A G](#) [1N4739 G](#)  
[1N4764 G](#) [1N4732 G](#) [1N4762A G](#) [1N4728A G](#) [1N4743A G](#) [1N4740A G](#) [1N4754A G](#) [1N4749A G](#) [1N4751A G](#)  
[1N4733 G](#) [1N4758A G](#) [1N4742A G](#) [1N4734A G](#) [1N4753A G](#) [1N4746A G](#) [1N4762 G](#) [1N4733A G](#) [1N4734 G](#)  
[1N4737 G](#) [1N4737A G](#) [1N4755A G](#) [1N4736 G](#) [1N4730 G](#) [1N4738 G](#) [1N4749 G](#) [1N4750 G](#) [1N4735Ae3/TR13](#)  
[1N4749AP/TR12](#) [1N4736Ae3/TR13](#) [1N4740Ae3/TR13](#) [1N4749Ae3/TR13](#) [1N4750AP/TR12](#) [1N4748Ae3/TR13](#)  
[1N4746AP/TR12](#) [1N4741Ae3/TR13](#) [1N4746Ae3/TR13](#) [1N4738Ae3/TR13](#) [1N4739Ae3/TR13](#) [1N4750Ae3/TR13](#)  
[1N4736AP/TR12](#) [1N4735AP/TR12](#) [1N4748AP/TR12](#) [1N4761AP/TR12](#) [1N4763AP/TR12](#) [1N4762AP/TR12](#)  
[1N4753Ae3/TR13](#) [1N4757AP/TR12](#) [1N4752Ae3/TR13](#) [1N4751Ae3/TR13](#) [1N4756Ae3/TR13](#) [1N4756AP/TR12](#)  
[1N4758AP/TR12](#) [1N4755Ae3/TR13](#) [1N4751AP/TR12](#) [1N4754Ae3/TR13](#) [1N4754AP/TR12](#) [1N4752AP/TR12](#)  
[1N4763Ae3/TR13](#) [1N4760Ae3/TR13](#) [1N4764Ae3/TR13](#) [1N4757Ae3/TR13](#) [1N4762Ae3/TR13](#) [1N4755AP/TR12](#)  
[1N4759Ae3/TR13](#)