

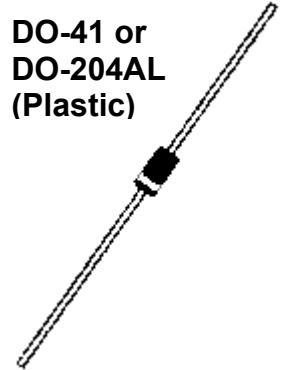
ALSC  
AVAILABLE IN  
SURFACE  
MOUNT

### DESCRIPTION

The 1N5913-5956B series of 1.5 watt Zeners provides voltage regulation in a selection from 3.3 to 200 volts with different tolerances as identified by suffix letter on the part. These plastic encapsulated Zeners have moisture classification of Level 1 with no dry pack required. They are also available in various military screening levels by adding a prefix identifier as described in the Features below. The plastic molded Zeners with a P suffix provide a lower thermal resistance (junction to lead) compared to the optional glass body (G suffix) for these same JEDEC part numbers. Both package options are available by Microsemi. Microsemi also offers numerous other Zener products to meet higher or lower power and test-current applications.

### APPEARANCE

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



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

### FEATURES

- JEDEC registered 1N5913 to 1N5956B
- Zener voltage available 3.3V to 200V
- Standard voltage tolerances are plus/minus 5% with B suffix and 10 % with A suffix identification
- Tight tolerances available in plus or minus 2% or 1% with C or D suffix respectively
- 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 SMBJ5913 to SMBJ5956B or SMBG5913 to SMBG5956B
- Optional glass body axial-leaded Zeners available as 1N5913BG to 1N5956BG (see separate data sheet)

### APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range
- Wide selection from 3.3 to 200 V
- Flexible axial-lead mounting terminals
- Nonsensitive to ESD
- Moisture classification is Level 1 per IPC/JEDEC J-STD-020B with no dry pack required
- Specified capacitance (see Figure 3)

### MAXIMUM RATINGS

- Power dissipation at 25°C: 1.5 watts (also see derating in Figure 1).
- Operating and Storage temperature: -65°C to +150°C
- Thermal Resistance: 45°C/W junction to lead at 3/8 (10 mm) lead length from body, or 105°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: 1.5 watts at T<sub>L</sub> ≤ 82.5°C 3/8 inch (10 mm) from body, or 1.19 watts at T<sub>A</sub> = 25°C when mounted on FR4 PC board as described for thermal resistance (also see Figure 1)
- Forward voltage @200 mA: 1.2 volts (maximum)
- Solder Temperatures: 260°C for 10 s (max)

### MECHANICAL AND PACKAGING

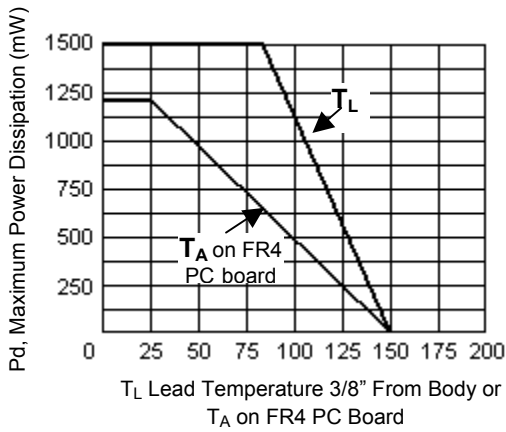
- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0
- TERMINALS: Leads, tin-lead plated solderable per MIL-STD-750, method 2026
- POLARITY: Cathode indicated by band. Diode to be operated with the banded end positive with respect to the opposite end for Zener regulation
- MARKING: Part number
- TAPE & REEL optional: Standard per EIA-296 (add "TR" suffix to part number)
- WEIGHT: 0.7 grams
- See package dimensions on last page

**ELECTRICAL CHARACTERISTICS @  $T_L = 30^\circ\text{C}$**

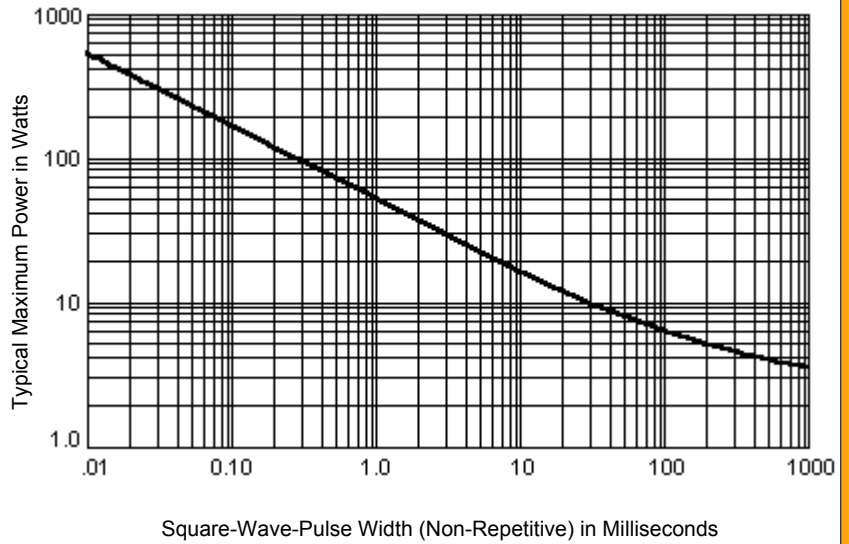
JEDEC TYPE NUMBER (note 1)	ZENER VOLTAGE $V_Z$	TEST CURRENT $I_{ZT}$	MAXIMUM DYNAMIC IMPEDANCE $Z_{ZT}$	KNEE CURRENT $I_{ZK}$	MAXIMUM KNEE IMPEDANCE $Z_{ZK}$	MAXIMUM REVERSE CURRENT $I_R @ V_R$	REVERSE VOLTAGE $V_R$	MAX. DC CURRENT $I_{ZM}$
	Volts	mA	Ohms	mA	Ohms	$\mu\text{A}$ dc	Volts	mA
1N5913B	3.3	113.6	10	1.0	500	100	1.0	454
1N5914B	3.6	104.2	9.0	1.0	500	75	1.0	416
1N5915B	3.9	96.1	7.5	1.0	500	25	1.0	384
1N5916B	4.3	87.2	6.0	1.0	500	5.0	1.0	348
1N5917B	4.7	79.8	5.0	1.0	500	5.0	1.5	319
1N5918B	5.1	73.5	4.0	1.0	350	5.0	2.0	294
1N5919B	5.6	66.9	2.0	1.0	250	5.0	3.0	267
1N5920B	6.2	60.5	2.0	1.0	200	5.0	4.0	241
1N5921B	6.8	55.1	2.5	1.0	200	5.0	5.2	220
1N5922B	7.5	50	3.0	0.5	400	5.0	6.0	200
1N5923B	8.2	45.7	3.5	0.5	400	5.0	6.5	182
1N5924B	9.1	41.2	4.0	0.5	500	5.0	7.0	164
1N5925B	10	37.5	4.5	0.25	500	5.0	8.0	150
1N5926B	11	34.1	5.5	0.25	550	1.0	8.4	136
1N5927B	12	31.2	6.5	0.25	550	1.0	9.1	125
1N5928B	13	28.8	7.0	0.25	550	1.0	9.9	115
1N5929B	15	25	9.0	0.25	600	1.0	11.4	100
1N5930B	16	23.4	10	0.25	600	1.0	12.2	93
1N5931B	18	20.8	12	0.25	650	1.0	13.7	83
1N5932B	20	18.7	14	0.25	650	1.0	15.2	75
1N5933B	22	17	17.5	0.25	650	1.0	16.7	68
1N5934B	24	15.6	19	0.25	700	1.0	18.2	62
1N5935B	27	13.9	23	0.25	700	1.0	20.6	55
1N5936B	30	12.5	28	0.25	750	1.0	22.8	50
1N5937B	33	11.4	33	0.25	800	1.0	25.1	45
1N5938B	36	10.4	38	0.25	850	1.0	27.4	41
1N5939B	39	9.6	45	0.25	900	1.0	29.7	38
1N5940B	43	8.7	53	0.25	950	1.0	32.7	34
1N5941B	47	8.0	67	0.25	1000	1.0	35.8	31
1N5942B	51	7.3	70	0.25	1100	1.0	38.8	29
1N5943B	56	6.7	86	0.25	1300	1.0	42.6	26
1N5944B	62	6.0	100	0.25	1500	1.0	47.1	24
1N5945B	68	5.5	120	0.25	1700	1.0	51.2	22
1N5946B	75	5.0	140	0.25	2000	1.0	56	20
1N5947B	82	4.6	160	0.25	2500	1.0	62.2	18
1N5948B	91	4.1	200	0.25	3000	1.0	69.2	16
1N5949B	100	3.7	250	0.25	3100	1.0	76	15
1N5950B	110	3.4	300	0.25	4000	1.0	83.6	13
1N5951B	120	3.1	380	0.25	4500	1.0	91.2	12
1N5952B	130	2.9	450	0.25	5000	1.0	98.8	11
1N5953B	150	2.5	600	0.25	6000	1.0	114	10
1N5954B	160	2.3	700	0.25	6500	1.0	121.6	9.0
1N5955B	180	2.1	900	0.25	7000	1.0	136.8	8.0
1N5956B	200	1.9	1200	0.25	8000	1.0	152	7.0

**NOTES:**

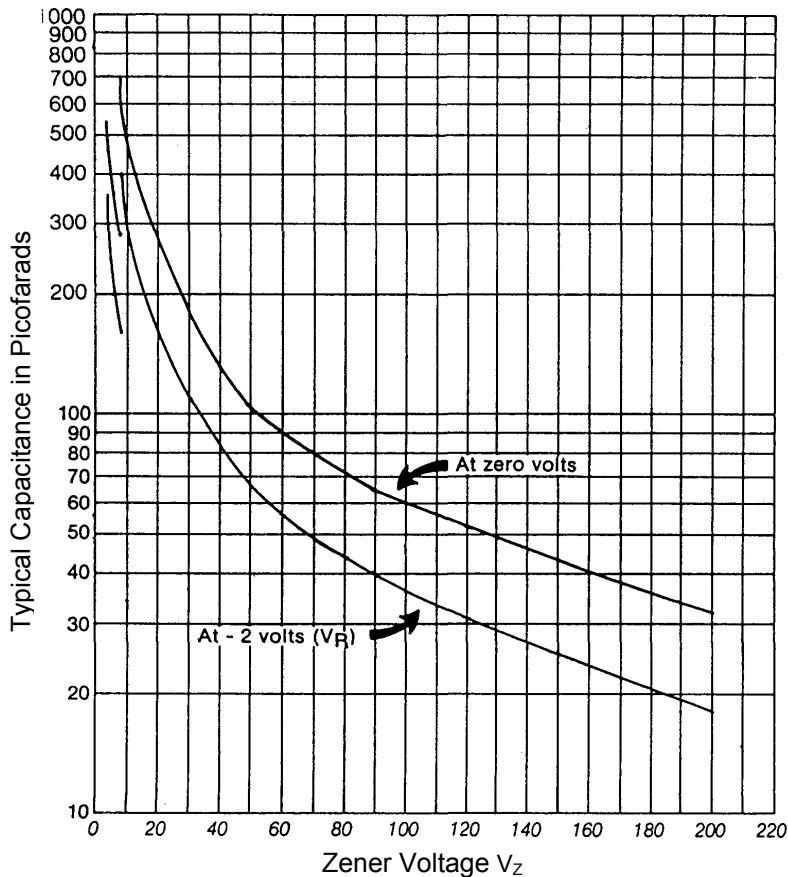
- No suffix indicates a +/-20% tolerance on nominal  $V_Z$ . Suffix A denotes a +/-10% tolerance, B denotes a +/-5% tolerance, C denotes a 2% tolerance, and D denotes a +/-1% tolerance. Also add a P suffix for plastic construction, e.g. 1N5956BP (G suffix designates glass body options described by separate data sheet).
- Zener voltage ( $V_Z$ ) is measured at  $T_L = 30^\circ\text{C}$  and 90 seconds after application of dc current.
- 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 ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed on  $I_{ZT}$  or  $I_{ZK}$ . See MicroNote 202 for zener impedance variation with different operating currents.



**FIGURE 1**  
POWER DERATING CURVE



**FIGURE 2**  
TRANSIENT SURGE CAPABILITY



**FIGURE 3 - CAPACITANCE vs.  $V_Z$  CURVE**

**PACKAGE DIMENSIONS**  
**DO-41 or DO-204AL**

