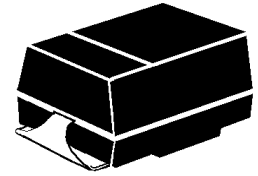


**DESCRIPTION**

The HSMBJ5913-5956B series of surface mount 3.0 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 number. It is equivalent to the JEDEC registered 1N5913 thru 1N5956B with identical electrical characteristics except it is rated at 3.0 W instead of 1.5 W with the lower thermal resistance features of this surface mount packaging. These plastic encapsulated Zeners have a moisture classification of Level 1 with no dry pack required and are also available in military equivalent screening levels by adding a prefix identifier as further described in the Features section. Microsemi also offers numerous other Zener products to meet higher and lower power applications.

**PACKAGE**



**DO-214AA**  
(see package notes)

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

**FEATURES**

- Surface mount equivalent to 1N5913 to 1N5956B
- Ideal for high-density and low-profile mounting
- 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
- RoHS Compliant devices available by adding "e3" suffix
- 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.

**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 per MIL-STD-750 Method 1020
- High specified maximum current ( $I_{ZM}$ ) when adequately heat sinking
- Moisture classification is Level 1 with no dry pack required per IPC/JEDEC J-STD-020B

**MAXIMUM RATINGS**

- Power dissipation at 25°C: 3.0 watts (also see derating in Figure 1).
- Operating and Storage temperature: -65°C to +150°C
- Thermal Resistance: 15°C/W junction to lead, or 80°C/W junction to ambient when mounted on FR4 PC board (1oz Cu) with recommended footprint (see last page)
- Steady-State Power: 3 watts at  $T_L \leq 105^\circ\text{C}$ , or 1.56 watts at  $T_A = 25^\circ\text{C}$  when mounted on FR4 PC board with recommended footprint (also see Figure1)
- Forward voltage @200 mA: 1.2 volts (maximum)
- Solder Temperatures: 260°C for 10 s (maximum)

**MECHANICAL AND PACKAGING**

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0
- TERMINALS: C-bend (modified J-bend) leads, Tin-Lead or RoHS Compliant annealed matte-Tin plating 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: Includes part number without prefix (e.g. 5913B, 5926C, 5951D, etc.)
- TAPE & REEL option: Standard per EIA-481-1-A with 12 mm tape 750 per 7 inch reel or 2500 per 13 inch reel (add "TR" suffix to part number)
- WEIGHT: 0.1 grams
- See package dimensions on last page

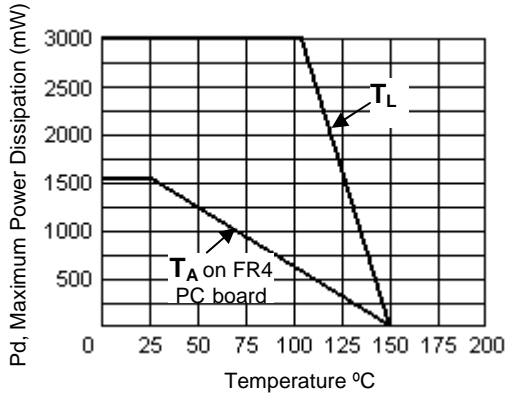
**ELECTRICAL CHARACTERISTICS @  $T_L = 30^\circ\text{C}$**

JEDEC TYPE NUMBER	ZENER VOLTAGE	TEST CURRENT	DYNAMIC IMPEDANCE	KNEE CURRENT	KNEE IMPEDANCE	REVERSE CURRENT	REVERSE VOLTAGE	MAX. DC CURRENT
	$V_Z$	$I_{ZT}$	$Z_{ZT}$	$I_{ZK}$	$Z_{ZK}$	$I_R$ (MAX.)	$V_R$	$I_{ZM}$
	Volts	mA	Ohms	mA	Ohms	$\mu\text{A}$ dc	Volts	mA
HSMBJ5913	3.3	113.6	10	1.0	500	100	1.0	908
HSMBJ5914	3.6	104.2	9.0	1.0	500	75	1.0	832
HSMBJ5915	3.9	96.1	7.5	1.0	500	25	1.0	768
HSMBJ5916	4.3	87.2	6.0	1.0	500	5.0	1.0	696
HSMBJ5917	4.7	79.8	5.0	1.0	500	5.0	1.5	638
HSMBJ5918	5.1	73.5	4.0	1.0	350	5.0	2.0	588
HSMBJ5919	5.6	66.9	2.0	1.0	250	5.0	3.0	534
HSMBJ5920	6.2	60.5	2.0	1.0	200	5.0	4.0	482
HSMBJ5921	6.8	55.1	2.5	1.0	200	5.0	5.2	440
HSMBJ5922	7.5	50	3.0	0.5	400	5.0	6.0	400
HSMBJ5923	8.2	45.7	3.5	0.5	400	5.0	6.5	364
HSMBJ5924	9.1	41.2	4.0	0.5	500	5.0	7.0	328
HSMBJ5925	10	37.5	4.5	0.25	500	5.0	8.0	300
HSMBJ5926	11	34.1	5.5	0.25	550	1.0	8.4	272
HSMBJ5927	12	31.2	6.5	0.25	550	1.0	9.1	250
HSMBJ5928	13	28.8	7.0	0.25	550	1.0	9.9	230
HSMBJ5929	15	25	9.0	0.25	600	1.0	11.4	200
HSMBJ5930	16	23.4	10	0.25	600	1.0	12.2	183
HSMBJ5931	18	20.8	12	0.25	650	1.0	13.7	166
HSMBJ5932	20	18.7	14	0.25	650	1.0	15.2	150
HSMBJ5933	22	17	17.5	0.25	650	1.0	16.7	136
HSMBJ5934	24	15.6	19	0.25	700	1.0	18.2	124
HSMBJ5935	27	13.9	23	0.25	700	1.0	20.6	110
HSMBJ5936	30	12.5	28	0.25	750	1.0	22.8	100
HSMBJ5937	33	11.4	33	0.25	800	1.0	25.1	90
HSMBJ5938	36	10.4	38	0.25	850	1.0	27.4	82
HSMBJ5939	39	9.6	45	0.25	900	1.0	29.7	76
HSMBJ5940	43	8.7	53	0.25	950	1.0	32.7	68
HSMBJ5941	47	8.0	67	0.25	1000	1.0	35.8	62
HSMBJ5942	51	7.3	70	0.25	1100	1.0	38.8	58
HSMBJ5943	56	6.7	86	0.25	1300	1.0	42.6	52
HSMBJ5944	62	6.0	100	0.25	1500	1.0	47.1	48
HSMBJ5945	68	5.5	120	0.25	1700	1.0	51.2	44
HSMBJ5946	75	5.0	140	0.25	2000	1.0	56	40
HSMBJ5947	82	4.6	160	0.25	2500	1.0	62.2	36
HSMBJ5948	91	4.1	200	0.25	3000	1.0	69.2	32
HSMBJ5949	100	3.7	250	0.25	3100	1.0	76	30
HSMBJ5950	110	3.4	300	0.25	4000	1.0	83.6	26
HSMBJ5951	120	3.1	380	0.25	4500	1.0	91.2	24
HSMBJ5952	130	2.9	450	0.25	5000	1.0	98.8	22
HSMBJ5953	150	2.5	600	0.25	6000	1.0	114	20
HSMBJ5954	160	2.3	700	0.25	6500	1.0	121.6	18
HSMBJ5955	180	2.1	900	0.25	7000	1.0	136.8	18
HSMBJ5956	200	1.9	1200	0.25	8000	1.0	152	14

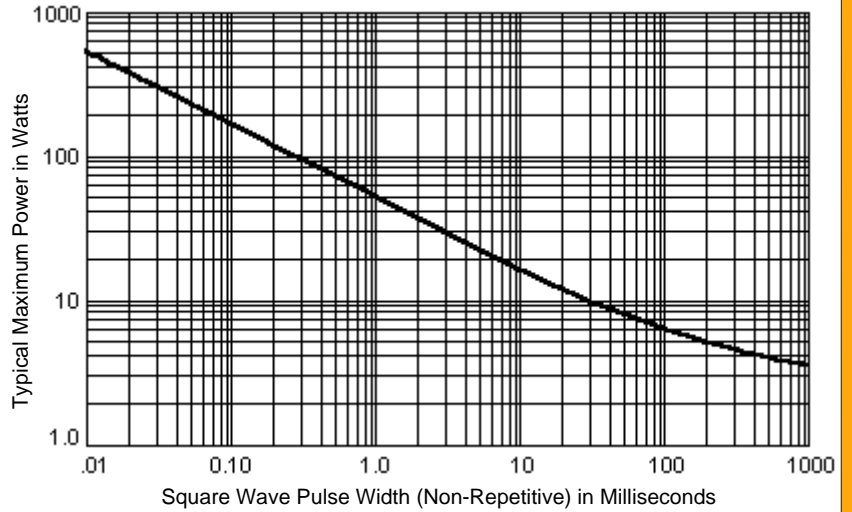
**NOTES:**

1. 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.
2. Zener voltage ( $V_Z$ ) is measured at  $T_L = 30^\circ\text{C}$  and 90 seconds after application of dc current.
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 ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed on  $I_{ZT}$  or  $I_{ZK}$ .

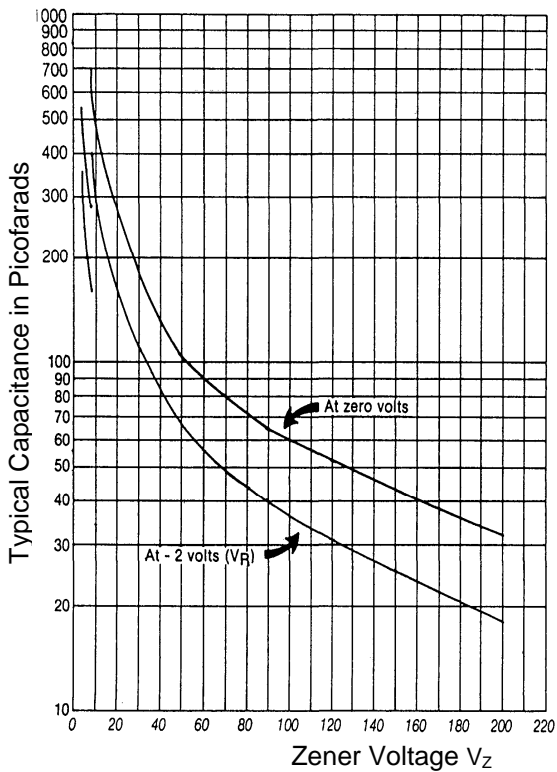
**GRAPHS**



**FIGURE 1**  
**POWER DERATING CURVE**

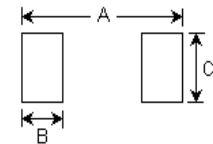
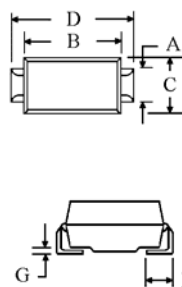


**FIGURE 2**  
**TRANSIENT SURGE CAPABILITY**



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

**PACKAGE DIMENSIONS & PAD LAYOUT**



	INCHES	mm
A	.260	6.60
B	.085	2.16
C	.110	2.79

DIM	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.052	.103	1.32	2.62
B	.160	.180	4.06	4.57
C	.130	.155	3.30	3.94
D	.205	.220	5.21	5.59
E	.075	.130	1.91	3.30
F	.030	.060	.76	1.52
G	.006	.016	.15	.41

NOTE: Dimension E exceeds the JEDEC outline in height as shown