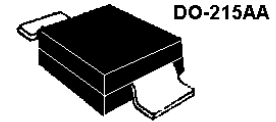


### DESCRIPTION

The SMBJ5913-5956B or SMBG5913-5956B 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. This series 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 the surface mount packaging. It is available in J-bend design (SMBJ) with the DO-214AA package for greater PC board mounting density or in Gull-wing design (SMBG) in the DO-215AA for visible solder connections. Microsemi also offers numerous other Zener products to meet higher and lower power applications.

### APPEARANCE



NOTE: All SMB series are equivalent to prior SMS package identifications.

**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
- 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
- Popular DO-214AA or DO-215AA packages and footprints for either high density J-bend or Gull-wing designs for visible solder joints
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Withstands high surge stresses (see Figure 2)
- Moisture classification: Level 1 per IPC/JEDEC J-STD-020B with no dry pack required

### 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: 25°C/W junction to lead, or 90°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  $T_L \leq 75^\circ\text{C}$ , or 1.38 watts at  $T_A = 25^\circ\text{C}$  when mounted on FR4 PC board with recommended footprint (also see Figure 1)
- 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: Gull-wing or C-bend (modified J-bend) leads, tin-lead plated solderable per MIL-STD-750, method 2026
- POLARITY: Cathode indicated by band. Diode to be operated with banded end positive with respect to opposite end for Zener regulation
- MARKING: Includes part number without prefix (e.g. 5913B, 5948C, 5956D, etc.)
- TAPE & REEL option: Standard per EIA-481-2 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 @  $T_L = 30^\circ\text{C}$**

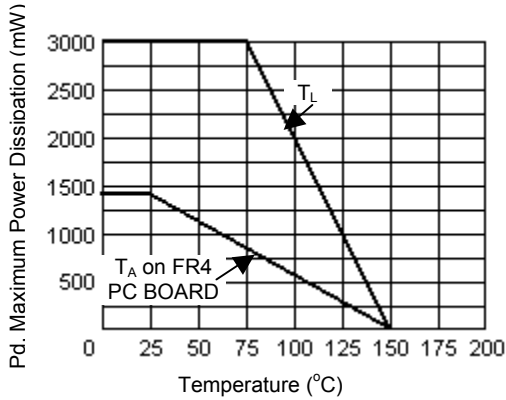
MICROSEMI PART NUMBER		ZENER VOLTAGE	TEST CURRENT	DYNAMIC IMPEDANCE	KNEE CURRENT	KNEE IMPEDANCE	REVERSE CURRENT	REVERSE VOLTAGE	MAX. DC CURRENT
GULL-WING LEAD	C-BEND (MOD. "J")	$V_Z$	$I_{ZT}$	$Z_{ZT}$	$I_{ZK}$	$Z_{ZK}$	$I_R$	$V_R$	$I_{ZM}$
		Volts	mA	Ohms	mA	Ohms	$\mu\text{adc}$	Volts	mA
SMBG5913	SMBJ5913	3.3	113.6	10.0	1.0	500	100.0	1.0	908
SMBG5914	SMBJ5914	3.6	104.2	9.0	1.0	500	75.0	1.0	832
SMBG5915	SMBJ5915	3.9	96.1	7.5	1.0	500	25.0	1.0	768
SMBG5916	SMBJ5916	4.3	87.2	6.0	1.0	500	5.0	1.0	696
SMBG5917	SMBJ5917	4.7	79.8	5.0	1.0	500	5.0	1.5	638
SMBG5918	SMBJ5918	5.1	73.5	4.0	1.0	350	5.0	2.0	588
SMBG5919	SMBJ5919	5.6	66.9	2.0	1.0	250	5.0	3.0	534
SMBG5920	SMBJ5920	6.2	60.5	2.0	1.0	200	5.0	4.0	482
SMBG5921	SMBJ5921	6.8	55.1	2.5	1.0	200	5.0	5.2	440
SMBG5922	SMBJ5922	7.5	50.0	3.0	0.5	400	5.0	6.0	400
SMBG5923	SMBJ5923	8.2	45.7	3.5	0.5	400	5.0	6.5	364
SMBG5924	SMBJ5924	9.1	41.2	4.0	0.5	500	5.0	7.0	328
SMBG5925	SMBJ5925	10	37.5	4.5	0.25	500	5.0	8.0	300
SMBG5926	SMBJ5926	11	34.1	5.5	0.25	550	1.0	8.4	272
SMBG5927	SMBJ5927	12	31.2	6.5	0.25	550	1.0	9.1	250
SMBG5928	SMBJ5928	13	28.8	7.0	0.25	550	1.0	9.9	230
SMBG5929	SMBJ5929	15	25.0	9.0	0.25	600	1.0	11.4	200
SMBG5930	SMBJ5930	16	23.4	10.0	0.25	600	1.0	12.2	183
SMBG5931	SMBJ5931	18	20.8	12.0	0.25	650	1.0	13.7	166
SMBG5932	SMBJ5932	20	18.7	14.0	0.25	650	1.0	15.2	150
SMBG5933	SMBJ5933	22	17.0	17.5	0.25	650	1.0	16.7	136
SMBG5934	SMBJ5934	24	15.6	19.0	0.25	700	1.0	18.2	124
SMBG5935	SMBJ5935	27	13.9	23.0	0.25	700	1.0	20.6	110
SMBG5936	SMBJ5936	30	12.5	28.0	0.25	750	1.0	22.8	100
SMBG5937	SMBJ5937	33	11.4	33.0	0.25	800	1.0	25.1	90
SMBG5938	SMBJ5938	36	10.4	38.0	0.25	850	1.0	27.4	82
SMBG5939	SMBJ5939	39	9.6	45.0	0.25	900	1.0	29.7	76
SMBG5940	SMBJ5940	43	8.7	53.0	0.25	950	1.0	32.7	68
SMBG5941	SMBJ5941	47	8.0	67.0	0.25	1000	1.0	35.8	62
SMBG5942	SMBJ5942	51	7.3	70.0	0.25	1100	1.0	38.8	58
SMBG5943	SMBJ5943	56	6.7	86.0	0.25	1300	1.0	42.6	52
SMBG5944	SMBJ5944	62	6.0	100.0	0.25	1500	1.0	47.1	48
SMBG5945	SMBJ5945	68	5.5	120.0	0.25	1700	1.0	51.2	44
SMBG5946	SMBJ5946	75	5.0	140.0	0.25	2000	1.0	56.0	40
SMBG5947	SMBJ5947	82	4.6	160.0	0.25	2500	1.0	62.2	36
SMBG5948	SMBJ5948	91	4.1	200.0	0.25	3000	1.0	69.2	32
SMBG5949	SMBJ5949	100	3.7	250.0	0.25	3100	1.0	76.0	30
SMBG5950	SMBJ5950	110	3.4	300.0	0.25	4000	1.0	83.6	26
SMBG5951	SMBJ5951	120	3.1	380.0	0.25	4500	1.0	91.2	24
SMBG5952	SMBJ5952	130	2.9	450.0	0.25	5000	1.0	98.8	22
SMBG5953	SMBJ5953	150	2.5	600.0	0.25	6000	1.0	114.0	20
SMBG5954	SMBJ5954	160	2.3	700.0	0.25	6500	1.0	121.6	18
SMBG5955	SMBJ5955	180	2.1	900.0	0.25	7000	1.0	136.8	16
SMBG5956	SMBJ5956	200	1.9	1200.0	0.25	8000	1.0	152.0	14

**NOTE 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.

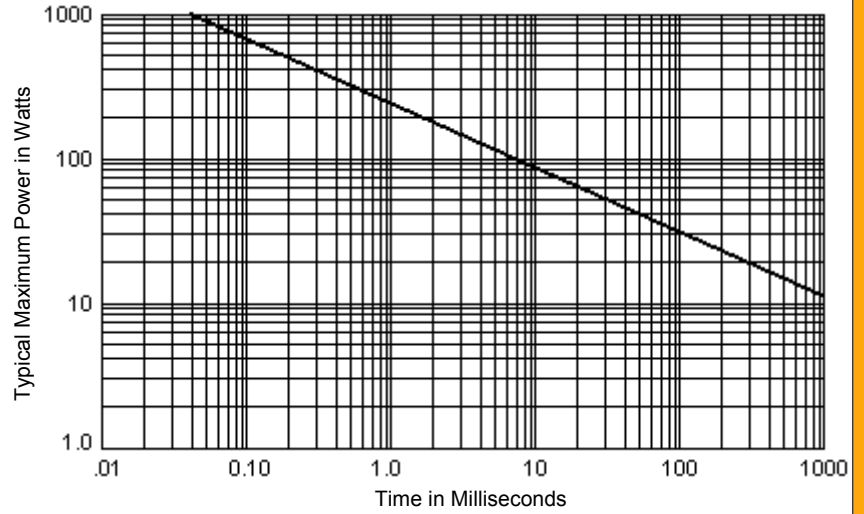
**NOTE 2:** Zener voltage ( $V_Z$ ) is measured at  $T_L = 30^\circ\text{C}$  and 20 seconds after application of dc current.

**NOTE 3:** The zener impedance is derived from 1 kHz ac voltage resulting from an ac current modulation having an rms value equal to 10% of the dc zener current ( $I_{ZT}$  or  $I_{ZK}$ ) superimposed on  $I_{ZT}$  or  $I_{ZK}$ . See Micro Note 202 for zener impedance variation with different operating currents.

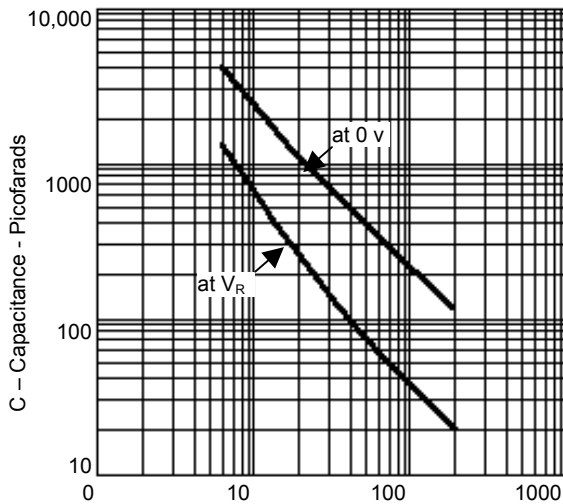
**GRAPHS**



**FIGURE 1 – Power Derating Curve**

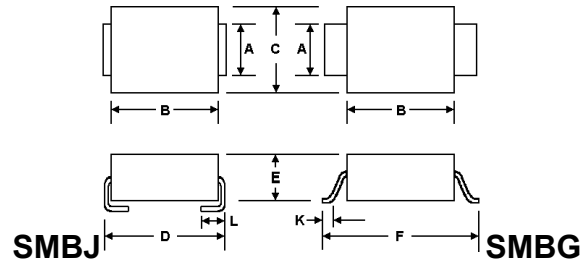


**FIGURE 2 – Transient Surge Capability Square-Wave Pulse Width (non-Repetitive) in Milliseconds**



**FIGURE 3 – Capacitance vs Zener Voltage**

**PACKAGE DIMENSIONS & PAD LAYOUT**



	A	B	C	D	E	F	K	L
<b>MIN</b>	.077	.160	.130	.205	.075	.235	.015	.030
<b>MAX</b>	.083	.180	.155	.220	.095	.255	.030	.060
<b>DIMENSIONS IN MILLIMETERS</b>								
<b>MIN</b>	1.96	4.06	3.30	5.21	1.90	5.97	.381	.760
<b>MAX</b>	2.10	4.57	3.94	5.59	2.41	6.48	.762	1.520

	INCHES	mm	
<b>A</b>	0.320	8.13	<b>SMBG</b>
<b>B</b>	0.085	2.16	
<b>C</b>	0.110	2.79	
<b>INCHES mm</b>			
<b>A</b>	.260	6.60	<b>SMBJ</b>
<b>B</b>	.085	2.16	
<b>C</b>	.110	2.79	