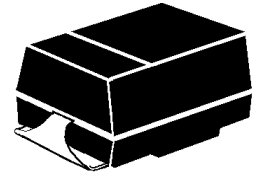


DESCRIPTION

The SMAJ5913-5956B 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-214AC or BA
(SMAJ)**

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
- 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: 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 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 V_Z	TEST CURRENT I_{ZT}	DYNAMIC IMPEDANCE Z_{ZT}	KNEE CURRENT I_{ZK}	KNEE IMPEDANCE Z_{ZK}	REVERSE CURRENT I_R (MAX.)	REVERSE VOLTAGE V_R	MAX. DC CURRENT I_{ZM}
	Volts	mA	Ohms	mA	Ohms	μA dc	Volts	mA
1N5913	3.3	113.6	10	1.0	500	100	1.0	454
1N5914	3.6	104.2	9.0	1.0	500	75	1.0	416
1N5915	3.9	96.1	7.5	1.0	500	25	1.0	384
1N5916	4.3	87.2	6.0	1.0	500	5.0	1.0	348
1N5917	4.7	79.8	5.0	1.0	500	5.0	1.5	319
1N5918	5.1	73.5	4.0	1.0	350	5.0	2.0	294
1N5919	5.6	66.9	2.0	1.0	250	5.0	3.0	267
1N5920	6.2	60.5	2.0	1.0	200	5.0	4.0	241
1N5921	6.8	55.1	2.5	1.0	200	5.0	5.2	220
1N5922	7.5	50	3.0	0.5	400	5.0	6.0	200
1N5923	8.2	45.7	3.5	0.5	400	5.0	6.5	182
1N5924	9.1	41.2	4.0	0.5	500	5.0	7.0	164
1N5925	10	37.5	4.5	0.25	500	5.0	8.0	150
1N5926	11	34.1	5.5	0.25	550	1.0	8.4	136
1N5927	12	31.2	6.5	0.25	550	1.0	9.1	125
1N5928	13	28.8	7.0	0.25	550	1.0	9.9	115
1N5929	15	25	9.0	0.25	600	1.0	11.4	100
1N5930	16	23.4	10	0.25	600	1.0	12.2	93
1N5931	18	20.8	12	0.25	650	1.0	13.7	83
1N5932	20	18.7	14	0.25	650	1.0	15.2	75
1N5933	22	17	17.5	0.25	650	1.0	16.7	68
1N5934	24	15.6	19	0.25	700	1.0	18.2	62
1N5935	27	13.9	23	0.25	700	1.0	20.6	55
1N5936	30	12.5	28	0.25	750	1.0	22.8	50
1N5937	33	11.4	33	0.25	800	1.0	25.1	45
1N5938	36	10.4	38	0.25	850	1.0	27.4	41
1N5939	39	9.6	45	0.25	900	1.0	29.7	38
1N5940	43	8.7	53	0.25	950	1.0	32.7	34
1N5941	47	8.0	67	0.25	1000	1.0	35.8	31
1N5942	51	7.3	70	0.25	1100	1.0	38.8	29
1N5943	56	6.7	86	0.25	1300	1.0	42.6	26
1N5944	62	6.0	100	0.25	1500	1.0	47.1	24
1N5945	68	5.5	120	0.25	1700	1.0	51.2	22
1N5946	75	5.0	140	0.25	2000	1.0	56	20
1N5947	82	4.6	160	0.25	2500	1.0	62.2	18
1N5948	91	4.1	200	0.25	3000	1.0	69.2	16
1N5949	100	3.7	250	0.25	3100	1.0	76	15
1N5950	110	3.4	300	0.25	4000	1.0	83.6	13
1N5951	120	3.1	380	0.25	4500	1.0	91.2	12
1N5952	130	2.9	450	0.25	5000	1.0	98.8	11
1N5953	150	2.5	600	0.25	6000	1.0	114	10
1N5954	160	2.3	700	0.25	6500	1.0	121.6	9.0
1N5955	180	2.1	900	0.25	7000	1.0	136.8	8.0
1N5956	200	1.9	1200	0.25	8000	1.0	152	7.0

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

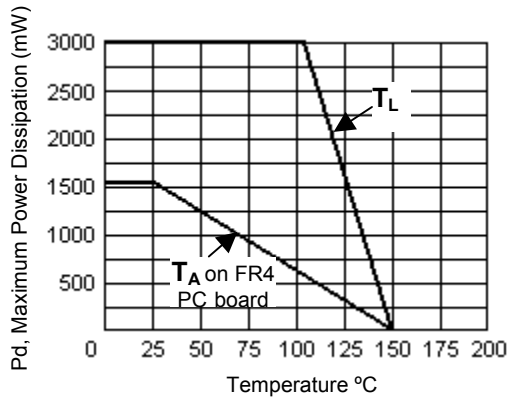


FIGURE 1
POWER DERATING CURVE

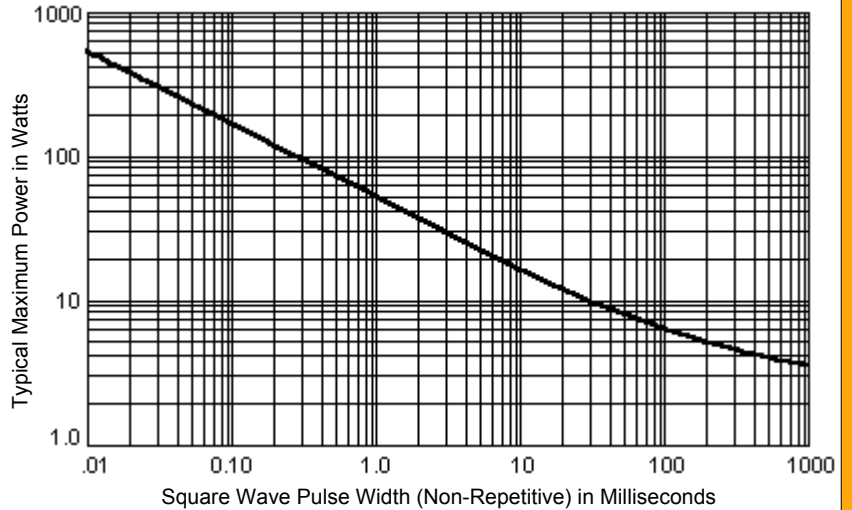


FIGURE 2
TRANSIENT SURGE CAPABILITY

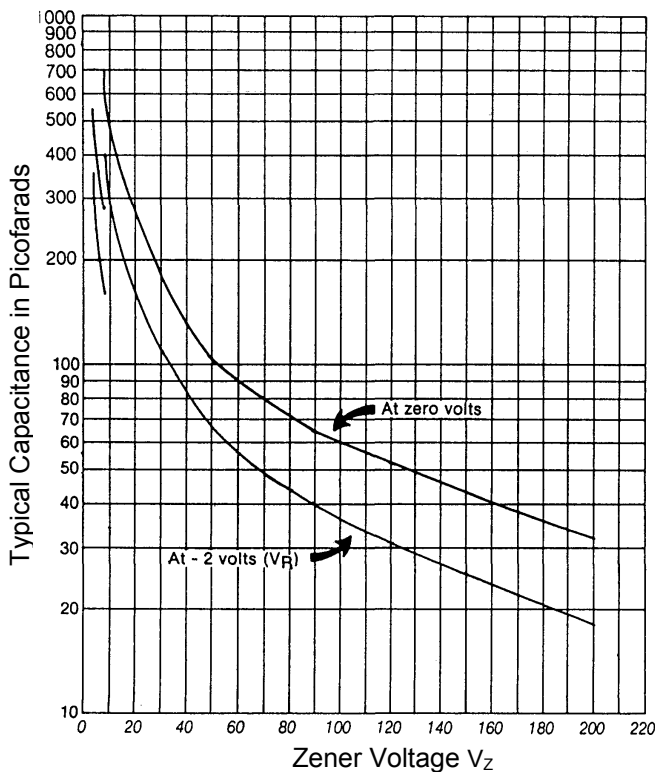
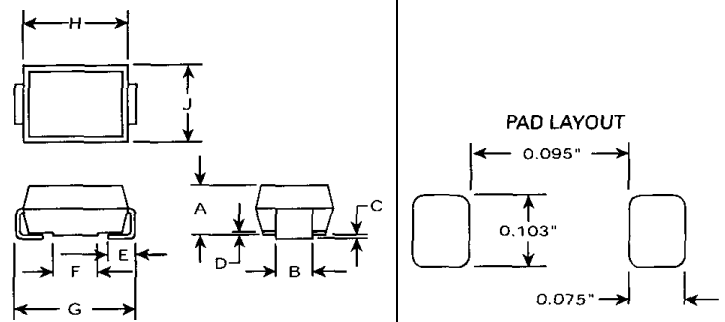


FIGURE 3 - CAPACITANCE vs. V_Z CURVE

DIMENSIONS & LAYOUT



DIM	INCHES	MILLIMETERS	NOTE
	MIN / MAX	MIN / MAX	
A	.078 / .115	1.98 / 2.92	1
B	.052 / .103	1.32 / 2.61	1
C	- / .005	- / .127	
D	- / .02	- / .51	
E	.030 / .060	.76 / 1.52	
F	.055 / .075	1.65 / 2.13	
G	.194 / .216	4.93 / 5.48	
H	.160 / .180	3.99 / 4.50	
J	.100 / .110	2.57 / 2.79	

NOTE 1: DIMENSION A IS WITHIN DO-214BA BUT HIGHER THAN DO-214AC STANDARD JEDEC OUTLINES. DIMENSION B IS WIDER THAN BOTH JEDEC OUTLINES FOR LOWER THERMAL RESISTANCE.