RoHS Compliant

Axial-Leaded 1.5 Watt Plastic Zener Diodes

DESCRIPTION

The 1N5913BPe3 – 5956BPe3 series of 1.5 watt Zeners provides voltage regulation in a selection from 3.3 to 200 volts with different tolerances available. These plastic encapsulated Zeners have moisture classification of Level 1 with no dry pack required. They are also available in various military equivalent screening levels for high reliability. 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.

Important: For the latest information, visit our website http://www.microsemi.com.

FEATURES

- JEDEC registered 1N5913B – 1N5956B number series.
- Zener voltage available 3.3 V to 200 V.
- Tolerances of 10%, 5%, and 2% are available.
- RoHS compliant.
- Optional glass body axial-leaded Zeners available as 1N5913BG – 1N5956BG (see separate data sheet).

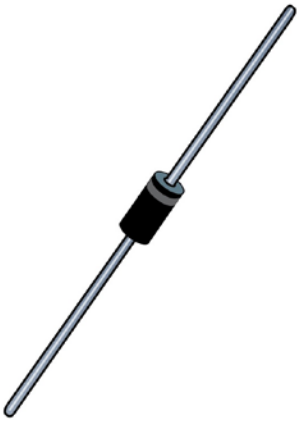
APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range.
- Flexible axial-lead mounting terminals.
- Non-sensitive to ESD per MIL-STD-750 method 1020.
- Moisture classification is Level 1 per IPC/JEDEC J-STD-020B with no dry pack required.

MAXIMUM RATINGS @ T_A= 25 °C unless otherwise specified

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T_J & T_{STG}	-65 to +150	°C
Thermal Resistance Junction-to-Lead @ 3/8 inch (10 mm) lead length from body	$R_{\Theta JL}$	45	°C/W
Thermal Resistance Junction-to-Ambient (1)	$R_{\Theta JA}$	105	°C/W
Steady State Power Dissipation @ $T_L \leq 82.5$ °C (2) @ T_A = 25 °C (1)	P_D	1.5 1.19	W
Rated Average Power Dissipation (also see Figure 1)	$P_{M(AV)}$	1.5	W
Forward Voltage @ 200 mA	V_F	1.2	V
Solder Temperature @ 10 s		260	°C

Notes: 1. When mounted on FR4 PC board (1 oz Cu) with 4 mm^2 copper pads and track width 1 mm, length 25 mm.
2. At 3/8 inch (10 mm) lead length from body.



DO-41 (DO-204AL) Plastic Package

Also available in:

SMB package
(tabbed surface mount)
SMBG(J)5913B – SMBG(J)5956B

SMAJ package
(tabbed surface mount)
SMAJ5913B – SMAJ5956B

Powermite package
(tabbed surface mount)
1PMT5913B – 1PMT5956B

MSC – Lawrence
6 Lake Street,
Lawrence, MA 01841
Tel: 1-800-446-1158 or
(978) 620-2600
Fax: (978) 689-0803

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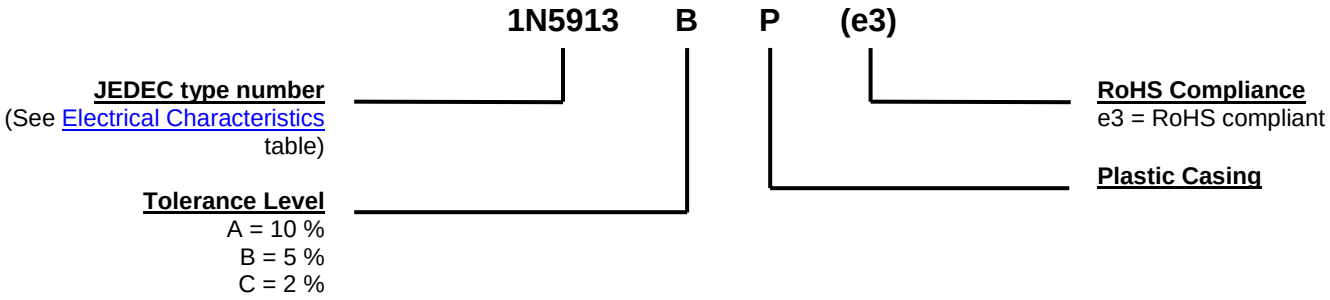
Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

Website:
www.microsemi.com

MECHANICAL and PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0.
- TERMINALS: RoHS compliant matte/tin over copper. Solderable per MIL-STD-750, method 2026.
- MARKING: Part number.
- POLARITY: Cathode indicated by band. Diode to be operated with the banded end positive with respect to the opposite end for Zener regulation.
- TAPE & REEL option: Standard per EIA-296 (add TR suffix to part number). Consult factory for quantities.
- WEIGHT: Approximately 0.7 grams.
- See Package Dimensions on last page.

PART NOMENCLATURE



SYMBOLS & DEFINITIONS

Symbol	Definition
V_Z	Zener Voltage: The Zener voltage the device will exhibit at a specified current (I_Z) in its breakdown region.
I_Z, I_{ZT}, I_{ZK}	Regulator Current: The dc regulator current (I_Z), at a specified test point (I_{ZT}), near breakdown knee (I_{ZK}).
Z_{ZT} or Z_{ZK}	Dynamic Impedance: The small signal impedance of the diode when biased to operate in its breakdown region at a specified rms current modulation (typically 10% of I_{ZT} or I_{ZK}) and superimposed on I_{ZT} or I_{ZK} respectively.
V_F	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
I_R	Maximum Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
I_{ZM}	Maximum Regulator (Zener) Current: The maximum rated dc current for the specified power rating.

ELECTRICAL CHARACTERISTICS @ T_L = 30 ºC

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	µA	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:

1. Zener voltage (V_Z) is measured at T_L = 30 °C and 90 seconds after application of dc current.
2. 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.

GRAPHS

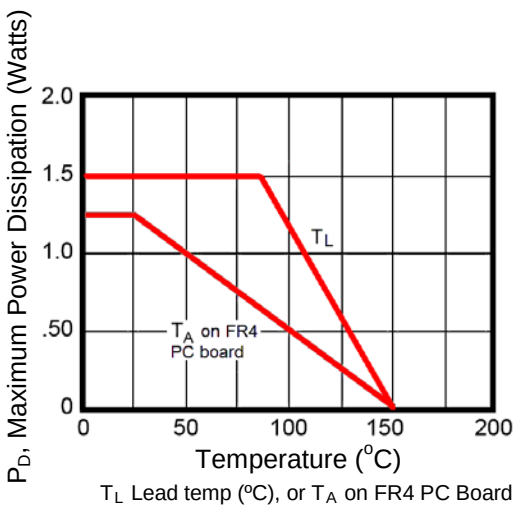


FIGURE 1 – Power Derating Curve

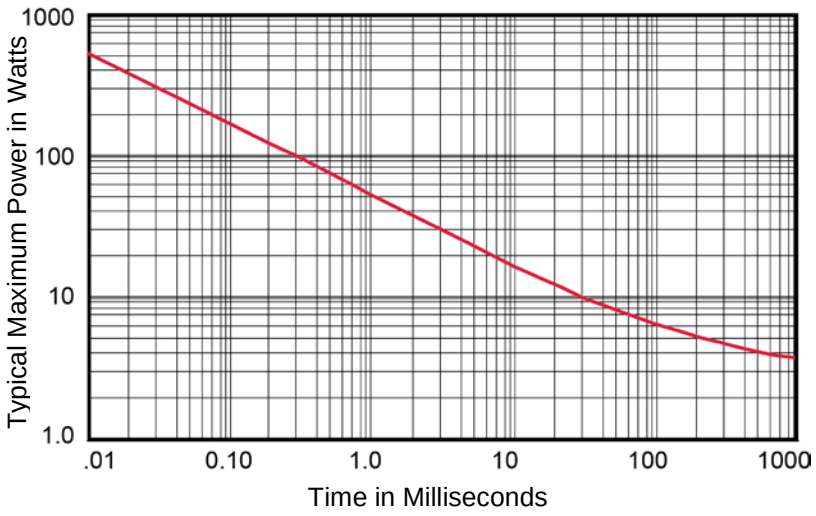


FIGURE 2 – Transient Surge Capability Square-Wave Pulse Width (non-Repetitive) in Milliseconds

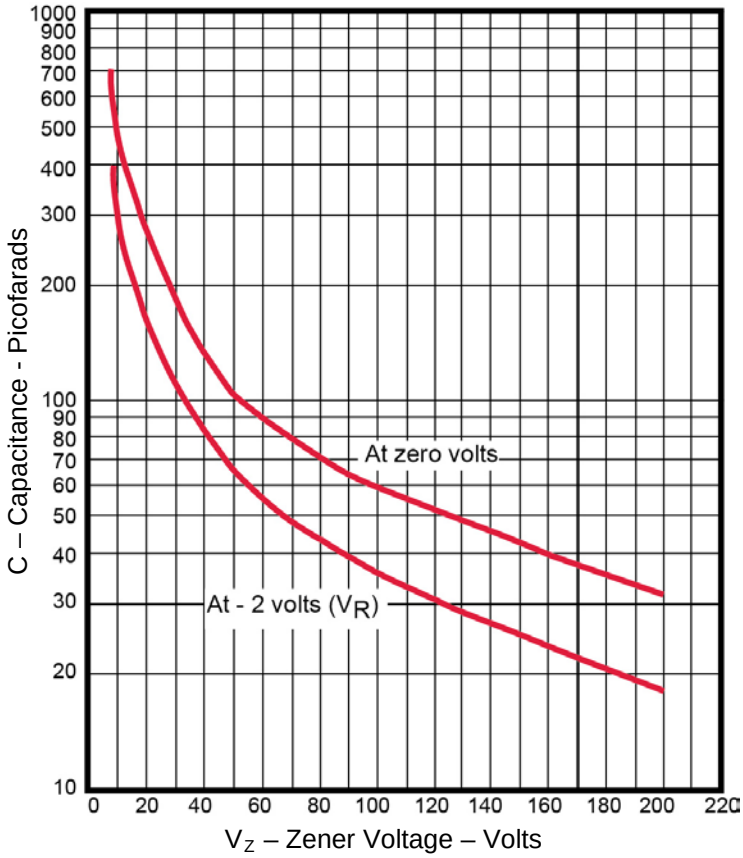
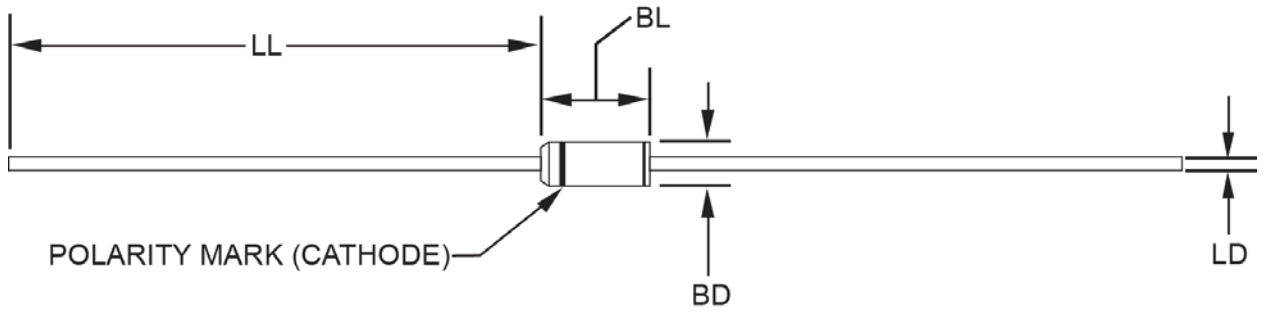


FIGURE 3 – Capacitance vs Zener Voltage

PACKAGE DIMENSIONS



NOTES:

1. Dimensions are in inches.
2. Millimeters are given for information only.
3. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.

Ltr	DIMENSIONS			
	INCH		MILLIMETERS	
	Min	Max	Min	Max
BD	-	0.107	-	2.718
BL	-	0.205	-	5.207
LD	0.030	0.034	0.762	0.864
LL	1.10	-	27.940	-

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