



## Silicon 5 Watt Zener Diodes

### DESCRIPTION

The 1N5334Be3 through 1N5388Be3 JEDEC registered series of axial-leaded 5.0 watt Zeners provides a voltage selection of 3.6 V to 200 V with different tolerances as identified by a suffix letter on a part number. These plastic encapsulated Zeners have a moisture classification of level 1 with no dry pack required. They may be operated at high maximum dc currents with adequate heat sinking due to their comparatively low thermal resistance design. D0-201AE comes in tape and reel only, TR7 and TR13.

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

### FEATURES

- JEDEC registered 1N5336 through 1N5388 numbers
- Zener voltage available 3.6 volts to 200 volts
- Plus/minus 10%, 5% and 2% voltage tolerances available.  
(See [Part Nomenclature](#) for all available options.)
- Low inductance
- RoHS compliant
- Plastic package classification 94V-0

### APPLICATIONS / BENEFITS

- Built-in strain relief
- Flexible axial lead mounting terminals
- Minimal changes of voltage vs current
- Regulates voltage over broad operating current and temperature ranges

### MAXIMUM RATINGS @ 25 °C unless otherwise stated

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	$T_J$ and $T_{STG}$	-65 to +150	°C
Thermal Resistance Junction-to-Lead <sup>(1)</sup>	$R_{\theta JL}$	25	°C/W
Thermal Resistance Junction-to-Ambient <sup>(2)</sup>	$R_{\theta JA}$	85	°C/W
DC Power Dissipation @ $T_L=75$ °C, measured at zero lead length. Derate above 75 °C <sup>(3)</sup>	$P_D$	5	W
Solder Temperature @ 10 s	$T_{SP}$	260	°C

- Notes:**
1. At 3/8" (10 mm) lead length from body.
  2. Mounted on 100 mm<sup>2</sup> copper pads to each terminal.



**DO-201AE Package**

Also available in:

**T-18 Package**

(leaded alternative)



[1N5333B – 1N5388B](#)

#### MSC – Lawrence

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

#### MSC – Ireland

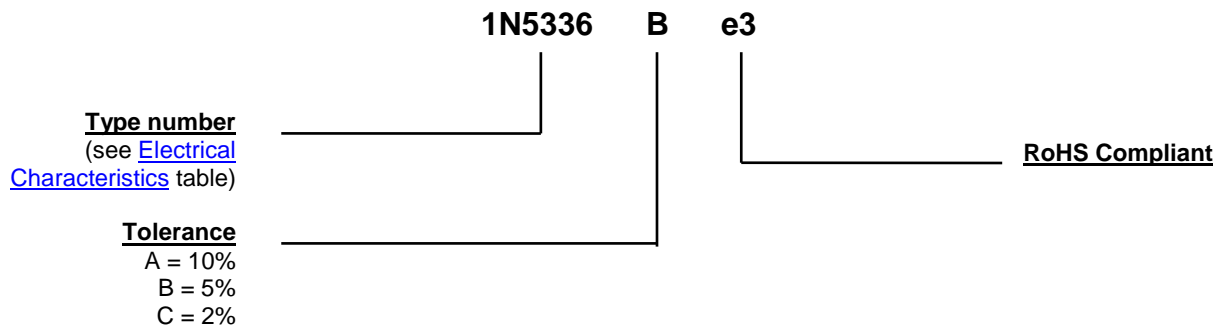
Gort Road Business Park,  
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**Website:**

[www.microsemi.com](http://www.microsemi.com)

**MECHANICAL and PACKAGING**

- CASE: JEDEC DO-201AE molded plastic body in compliance with specification 94V-0
- TERMINALS: RoHS compliant matte/tin plated axial leads. 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.)
- TAPE & REEL option: Seven and thirteen inch reel sizes (add "TR" suffix to part number, TR7 or TR13, e.g. 1N5352Be3/TR13). Consult factory for quantities.
- WEIGHT: Approximately 1.122 grams
- See [Package Dimensions](#) on last page.

**PART NOMENCLATURE**

**SYMBOLS & DEFINITIONS**

Symbol	Definition
$\alpha_{VZ}$	Temperature Coefficient of Regulator Voltage: The change in regulator voltage divided by the change in temperature that caused it expressed in %/C or mV/°C.
$I_R$	Reverse Current: The dc current flowing from the external circuit into the cathode terminal at the specified voltage $V_R$ .
$I_Z, I_{ZT}, I_{ZK}$	Regulator Current: The dc regulator current ( $I_Z$ ), at a specified test point ( $I_{ZT}$ ), near breakdown knee ( $I_{ZK}$ ).
$I_{ZSM}$	Reverse Surge Current, Nonrepetitive Peak: The peak reverse current in the breakdown region including all nonrepetitive transient currents but excluding all repetitive transients (also known as maximum Zener surge current).
$P_D$	Steady-State Power Dissipation: The dc power resulting from the product of $V_Z \times I_Z$ .
$V_R$	Reverse Voltage: A positive dc cathode-anode voltage below the breakdown region.
$V_Z$	Zener Voltage: The Zener voltage the device will exhibit at a specified current ( $I_Z$ ) in its breakdown region.
$Z_Z$ or $Z_{ZK}$	Regulator Impedance: The small signal impedance of the diode when biased to operate in its breakdown region with $I_{ZT}$ applied at $I_Z$ or $I_{ZK}$ respectively. This has also been known as Zener or dynamic impedance ( $Z_{ZT}$ or $Z_{ZK}$ ).

**ELECTRICAL CHARACTERISTICS @ T<sub>A</sub> = 25 °C unless otherwise noted**

PART NUMBER	Nominal Zener Voltage			Maximum Zener Test Current	Maximum Zener Impedance			Maximum Leakage Current	
	V <sub>Z</sub> @ I <sub>ZT</sub>			I <sub>ZT</sub>	Z <sub>ZT</sub> @ I <sub>ZT</sub>	Z <sub>ZK</sub> @ I <sub>ZK</sub>		I <sub>R</sub> @ V <sub>R</sub>	
	Nom V	Min V	Max V	mA	Ω	Ω	mA	μA	V
1N5334Be3	3.6	3.42	3.79	350	2.5	500	1	150	1
1N5335Be3	3.9	3.70	4.09	320	2	500	1	50	1
1N5336Be3	4.3	4.08	4.52	290	2	500	1	10	1
1N5337Be3	4.7	4.47	4.94	260	2	450	1	5	1
1N5338Be3	5.1	4.84	5.35	240	1.5	400	1	1	1
1N5339Be3	5.6	5.32	5.88	220	1	400	1	1	2
1N5340Be3	6	5.70	6.31	200	1	300	1	1	3
1N5341Be3	6.2	5.89	6.51	200	1	200	1	1	3
1N5342Be3	6.8	6.46	7.14	175	1	200	1	10	5.2
1N5343Be3	7.5	7.12	7.89	175	1.5	200	1	10	5.7
1N5344Be3	8.2	7.79	8.61	150	1.5	200	1	10	6.2
1N5345Be3	8.7	8.26	9.14	150	2	200	1	10	6.6
1N5346Be3	9.1	8.64	9.56	150	2	150	1	7.5	6.9
1N5347Be3	10	9.50	10.50	125	2	125	1	5	7.6
1N5348Be3	11	10.45	11.55	125	2.5	125	1	5	8.4
1N5349Be3	12	11.40	12.60	100	2.5	125	1	2	9.1
1N5350Be3	13	12.35	13.65	100	2.5	100	1	1	9.9
1N5351Be3	14	13.30	14.70	100	2.5	75	1	1	10.6
1N5352Be3	15	14.25	15.75	75	2.5	75	1	1	11.5
1N5353Be3	16	15.20	16.80	75	2.5	75	1	1	12.2
1N5354Be3	17	16.15	17.85	70	2.5	75	1	0.5	12.9
1N5355Be3	18	17.10	18.90	65	2.5	75	1	0.5	13.7
1N5356Be3	19	18.05	19.95	65	3	75	1	0.5	14.4
1N5357Be3	20	19.00	21.00	65	3	75	1	0.5	15.2
1N5358Be3	22	20.90	23.10	50	3.5	75	1	0.5	16.7
1N5359Be3	24	22.80	25.20	50	3.5	100	1	0.5	18.2
1N5360Be3	25	23.75	26.25	50	4	110	1	0.5	19
1N5361Be3	27	25.65	28.35	50	5	120	1	0.5	20.6
1N5362Be3	28	26.60	29.40	50	6	130	1	0.5	21.2
1N5363Be3	30	28.50	31.50	40	8	140	1	0.5	22.8
1N5364Be3	33	31.35	34.65	40	10	150	1	0.5	25.1
1N5365Be3	36	34.20	37.80	30	11	160	1	0.5	27.4
1N5366Be3	39	37.05	40.65	30	14	170	1	0.5	29.7
1N5367Be3	43	40.85	45.15	30	20	190	1	0.5	32.7
1N5368Be3	47	44.65	49.35	25	25	210	1	0.5	35.8
1N5369Be3	51	48.45	53.55	25	27	230	1	0.5	38.8
1N5370Be3	56	53.20	58.80	25	35	280	1	0.5	42.6
1N5371Be3	60	57.00	63.00	20	40	350	1	0.5	45.5
1N5372Be3	62	58.90	65.10	20	42	400	1	0.5	47.1
1N5373Be3	68	64.60	71.40	20	44	500	1	0.5	51.7
1N5374Be3	75	71.25	78.75	20	45	620	1	0.5	56
1N5375Be3	82	77.90	86.10	15	65	720	1	0.5	62.2
1N5376Be3	87	82.65	91.35	15	75	760	1	0.5	66
1N5377Be3	91	86.45	95.55	15	75	760	1	0.5	69.2
1N5378Be3	100	95.00	105.0	12	90	800	1	0.5	76
1N5379Be3	110	104.5	115.5	12	125	1000	1	0.5	83.6
1N5380Be3	120	114.0	126.0	10	170	1150	1	0.5	91.2
1N5381Be3	130	123.5	136.5	10	190	1250	1	0.5	98.8
1N5382Be3	140	133.0	147.0	8	230	1500	1	0.5	106
1N5383Be3	150	142.5	157.5	8	330	1500	1	0.5	114
1N5384Be3	160	152.0	168.0	8	350	1650	1	0.5	122
1N5385Be3	170	161.5	178.5	8	380	1750	1	0.5	129
1N5386Be3	180	171.0	189.0	5	430	1750	1	0.5	137
1N5387Be3	190	180.5	199.5	5	450	1850	1	0.5	144
1N5388Be3	200	190.0	210.0	5	480	1850	1	0.5	152

GRAPHS

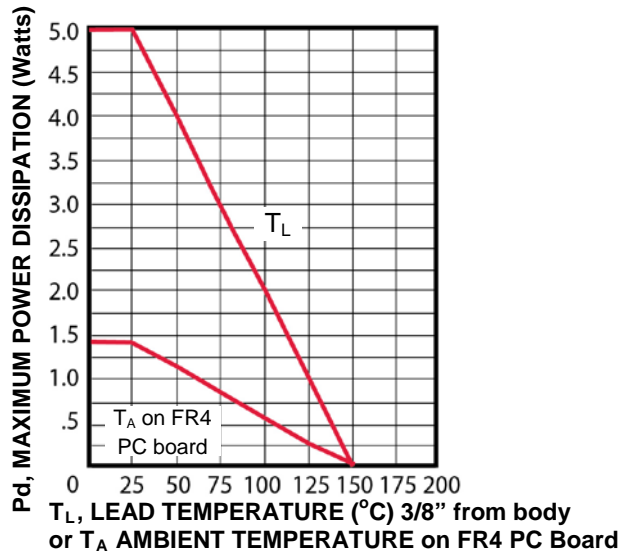


Figure 1 – Power temperature Derating Curve

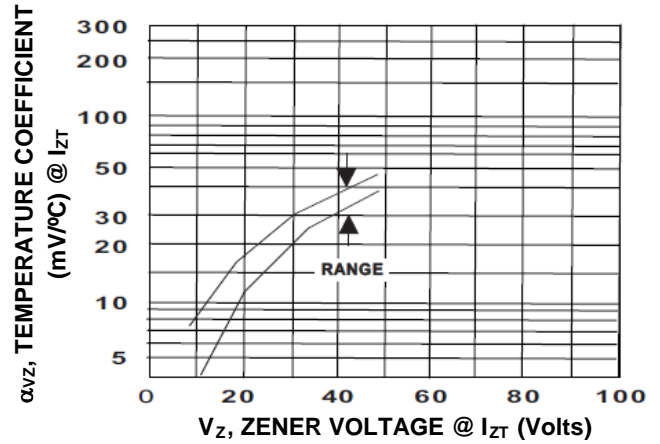


Figure 2 –  $V_z$  Temperature Coefficient

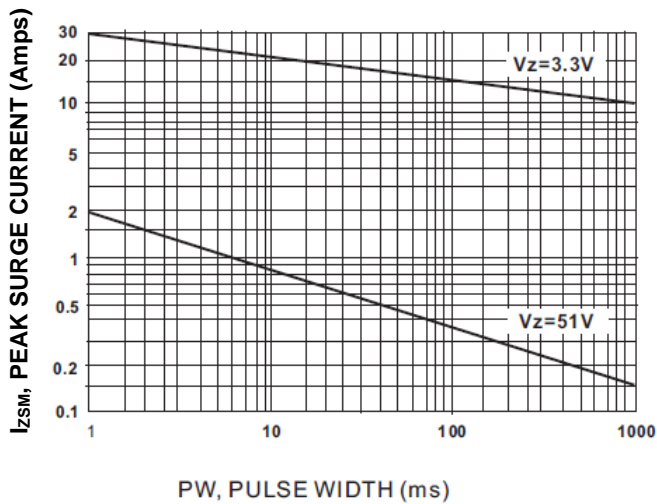


Figure 3 – Peak Surge Current vs. Pulse Width

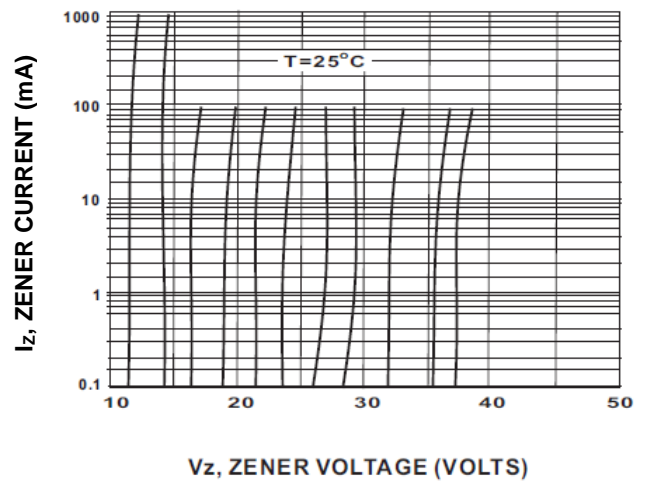
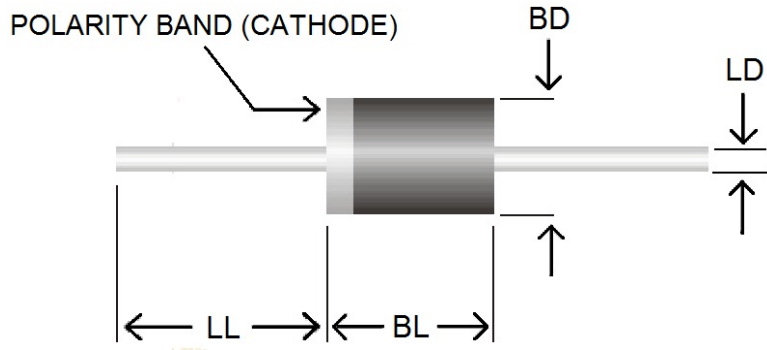


Figure 4 – Zener Voltage vs Zener Current  
 $V_z = 11$  through 39 Volts

**PACKAGE DIMENSIONS**


Ltr	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
<b>LL</b>	1.00	-	25.4	-
<b>BL</b>	0.285	0.375	7.2	9.5
<b>BD</b>	0.188	0.210	4.8	5.3
<b>LD</b>	0.037	0.042	0.94	1.07