3.0W SURFACE MOUNT POWER ZENER DIODE

Features

- 3.0W Power Dissipation
- Ideally Suited for Automated Assembly
- 6.2V - 200V Nominal Zener Voltage Range
- Standard V_Z Tolerance is ±5%
- ESD Rating of Class 3 (>16kV) per Human Body Model
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: SMB
- Case Material: Molded Plastic.
  UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Copper Alloy Leadframe with Lead-Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208 e3
- Polarity: Cathode Band
- Weight: 0.096 grams (Approximate)

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Top View

Bottom View

Ordering Information (Note 4)

Device*	Packaging	Shipping
1SMB59xxB-13	SMB	3000/Tape & Reel

*x = Device Voltage, e.g., 1SMB5920B-13.

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at http"//www.diodes.com/products/packages.html.

Marking Information

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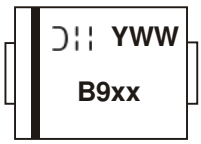

B9xx = Product Type Marking Code
(See Electric Characteristics Table)
= Manufacturers' Code Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 4 for 2014)
WW = Week Code (01 - 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Forward Voltage @ I_F = 200mA	V_F	1.5	V
Zener Current (See Page 3)	I_{ZM}	P_D / V_Z	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @T_L = +75°C Derate Above +75°C (Note 5)	P_D	3.0 40	W mW/°C
Thermal Resistance - Junction to Terminal (Note 5)	$R_{\Theta JT}$	25	°C/W
Power Dissipation @T_A = +25°C Derate Above +25°C (Note 5)	P_D	550 4.4	mW mW/°C
Thermal Resistance - Junction to Ambient (Note 5)	$R_{\Theta JA}$	226	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

Note: 5. Device mounted on FR-4 PCB; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Type Number	Marking Code	Zener Voltage Range (Note 6)			Test Current	Maximum Zener Impedance (Note 7)			Maximum Reverse Current (Note 6)		$I_{ZM\ Max}$
		V_Z @ I_{ZT}			I_{ZT}	Z_{ZT} @ I_{ZT}	Z_{ZK} @ I_{ZK}		I_R @ V_R		
		Min (V)	Typ (V)	Max (V)	mA	Ω	Ω	mA	µA	V	mA
1SMB5920B	B920	5.89	6.2	6.51	60.5	2	200	1	5	4	241
1SMB5921B	B921	6.46	6.8	7.14	55.1	2.5	200	1	5	5.2	220
1SMB5922B	B922	7.12	7.5	7.88	50	3	400	0.5	5	6	200
1SMB5923B	B923	7.79	8.2	8.61	45.7	3.5	400	0.5	5	6.5	182
1SMB5924B	B924	8.64	9.1	9.56	41.2	4	500	0.5	5	7	164
1SMB5925B	B925	9.5	10	10.5	37.5	4.5	500	0.25	5	8	150
1SMB5926B	B926	10.45	11	11.55	34.1	5.5	550	0.25	1	8.4	136
1SMB5927B	B927	11.4	12	12.6	31.2	6.5	550	0.25	1	9.1	125
1SMB5928B	B928	12.35	13	13.65	28.8	7	550	0.25	1	9.9	115
1SMB5929B	B929	14.25	15	15.75	25	9	600	0.25	1	11.4	100
1SMB5930B	B930	15.2	16	16.8	23.4	10	600	0.25	1	12.2	93
1SMB5931B	B931	17.1	18	18.9	20.8	12	650	0.25	1	13.7	83
1SMB5932B	B932	19	20	21	18.7	14	650	0.25	1	15.2	75
1SMB5933B	B933	20.9	22	23.1	17	17.5	650	0.25	1	16.7	68
1SMB5934B	B934	22.8	24	25.2	15.6	19	700	0.25	1	18.2	62
1SMB5935B	B935	25.65	27	28.35	13.9	23	700	0.25	1	20.6	55
1SMB5936B	B936	28.5	30	31.5	12.5	28	750	0.25	1	22.8	50
1SMB5937B	B937	31.35	33	34.65	11.4	33	800	0.25	1	25.1	45
1SMB5938B	B938	34.2	36	37.8	10.4	38	850	0.25	1	27.4	41
1SMB5939B	B939	37.05	39	40.95	9.6	45	900	0.25	1	29.7	38
1SMB5940B	B940	40.85	43	45.15	8.7	53	950	0.25	1	32.7	34
1SMB5941B	B941	44.65	47	49.35	8	67	1000	0.25	1	35.8	31
1SMB5942B	B942	48.45	51	53.55	7.3	70	1100	0.25	1	38.8	29
1SMB5943B	B943	53.2	56	58.8	6.7	86	1300	0.25	1	42.6	26
1SMB5944B	B944	58.9	62	65.1	6	100	1500	0.25	1	47.1	24
1SMB5945B	B945	64.6	68	71.4	5.5	120	1700	0.25	1	51.7	22
1SMB5946B	B946	71.25	75	78.75	5	140	2000	0.25	1	56	20
1SMB5947B	B947	77.9	82	86.1	4.6	160	2500	0.25	1	62.2	18
1SMB5948B	B948	86.45	91	95.55	4.1	200	3000	0.25	1	69.2	16
1SMB5949B	B949	95	100	105	3.7	250	3100	0.25	1	76	15
1SMB5950B	B950	104.5	110	115.5	3.4	300	4000	0.25	1	83.6	13
1SMB5951B	B951	114	120	128	3.1	380	4500	0.25	1	91.2	12
1SMB5952B	B952	123.5	130	136.5	2.9	450	5000	0.25	1	98.8	11
1SMB5953B	B953	142.5	150	157.5	2.5	600	6000	0.25	1	114	10
1SMB5954B	B954	152	160	168	2.3	700	6500	0.25	1	121.6	9
1SMB5955B	B955	171	180	189	2.1	900	7000	0.25	1	136.8	8
1SMB5956B	B956	190	200	210	1.9	1200	8000	0.25	1	152	7

Notes: 6. Short duration pulse test used to minimize self-heating effect.

7. ZENER IMPEDANCE (Z_Z) DERIVATION Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the AC current applied. The specified limits are for $I_{Z(AC)}$ = 0.1 $I_{Z(DC)}$ with the AC frequency = 60 Hz.

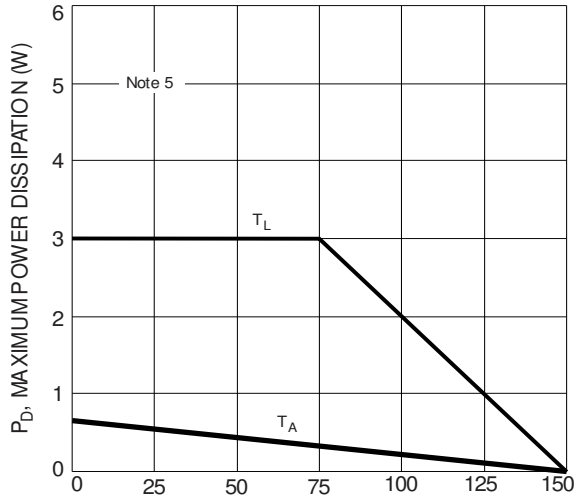

Figure Power Dissipation vs. Ambient Temperature

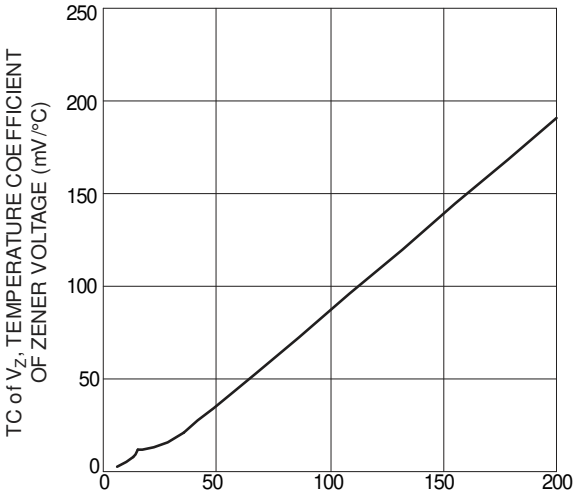

Figure 2 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage

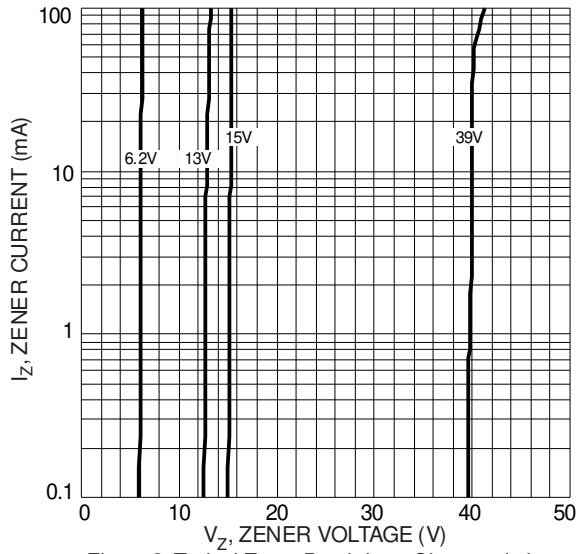

Figure 3 Typical Zener Breakdown Characteristics

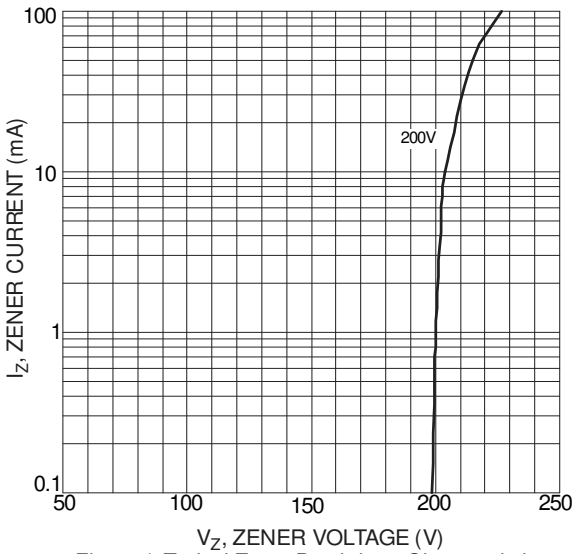

Figure 4 Typical Zener Breakdown Characteristics

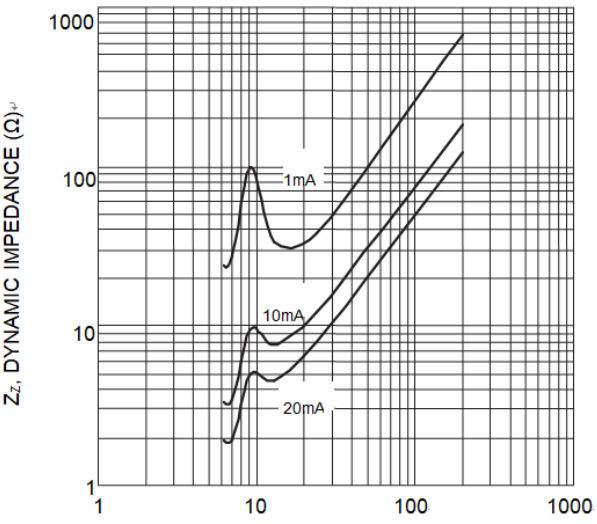

Figure 5 Effect of Zener Voltage

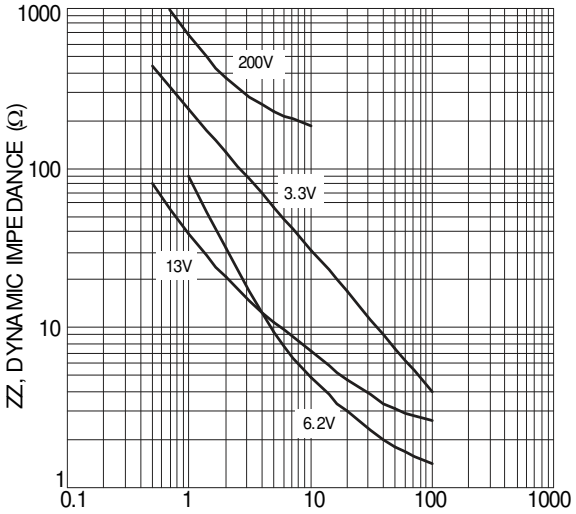

Figure 6 Effect of Zener Current

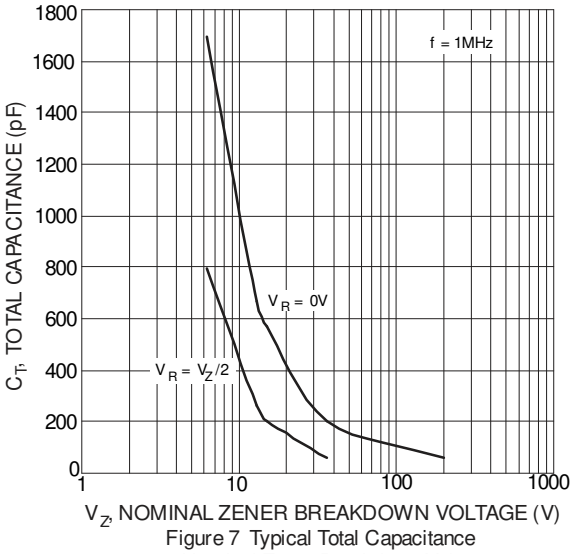

Figure 7 Typical Total Capacitance vs. Nominal Zener Breakdown Voltage

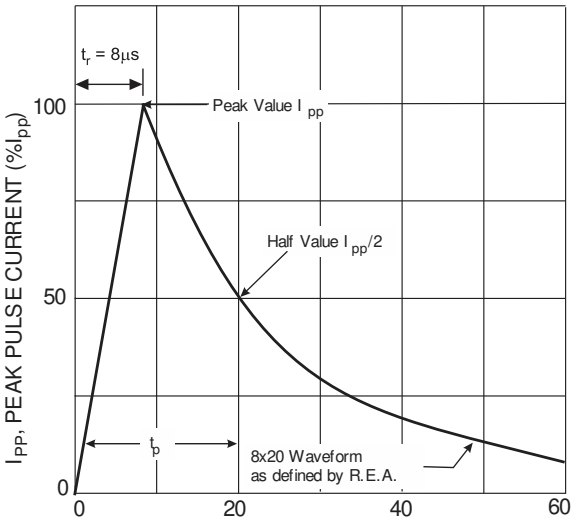

Figure 8 Pulse Waveform

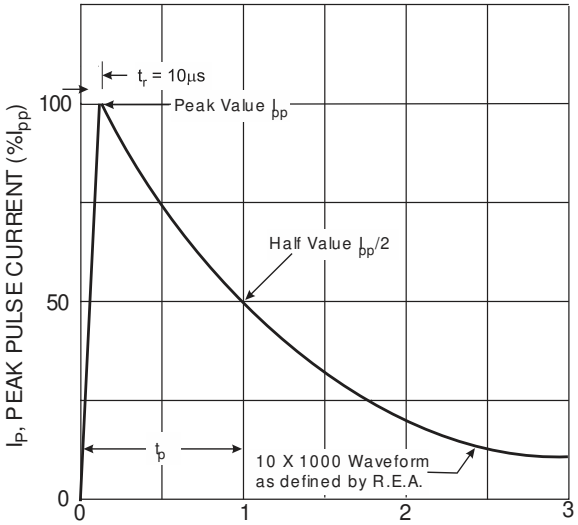

Figure 9 Pulse Waveform

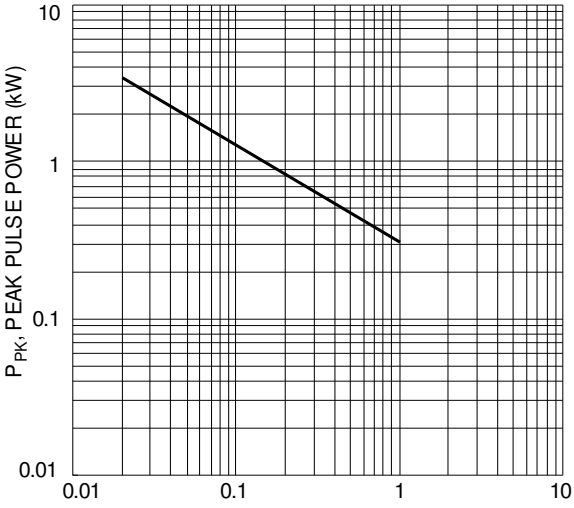

Figure 10 Max. Peak Pulse Power vs. Pulse Duration

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

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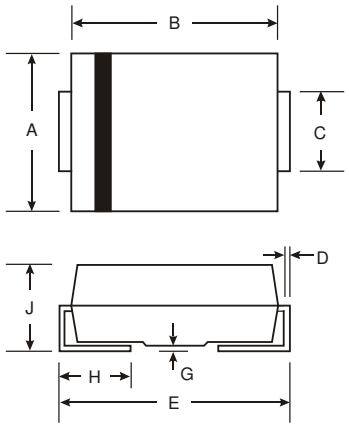

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Dim	**Min**	**Max**
A	3.30	3.94
B	4.06	4.57
C	1.96	2.21
D	0.15	0.31
E	5.00	5.59
G	0.05	0.20
H	0.76	1.52
J	2.00	2.50
All Dimensions in mm		

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

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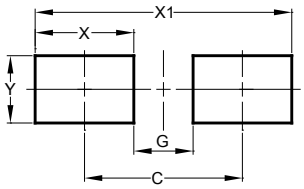

Dimensions	Value (in mm)
C	4.30
G	1.80
X	2.50
X1	6.80
Y	2.30

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