

## 1W, 11V - 220V Zener Diode

### FEATURES

- Silicon zener diode
- Low profile surface-mount package
- Zener and surge current specification
- Low leakage current
- Excellent stability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- Voltage regulating
- Reference voltage
- Protection circuit

### MECHANICAL DATA

- Case: SOD-123W
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.016g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$V_Z$	11 - 220	V
Test current $I_{ZT}$	5 - 50	mA
$P_{tot}$	1.0	W
$T_{JMAX}$	175	°C
Package	SOD-123W	
Configuration	Single die	



SOD-123W



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Forward voltage @ $I_F = 0.2\text{A}$	$V_F$	1.0	V
Power dissipation	$P_{tot}$	$T_L = 80^\circ\text{C}$	2.3
		$T_A = 25^\circ\text{C}^{(1)}$	1.0
Non-repetitive peak pulse power dissipation 100 $\mu\text{s}$ square pulse <sup>(2)</sup>	$P_{ZSM}$	300	W
Non-repetitive peak pulse power dissipation 10/1000 $\mu\text{s}$ waveform (BZD27C11PW to BZD27C100PW)	$P_{RSM}$	150	W
Non-repetitive peak pulse power dissipation 10/1000 $\mu\text{s}$ waveform (BZD27C110PW to BZD27C220PW)	$P_{RSM}$	100	W
Junction temperature	$T_J$	- 55 to +175	°C
Storage temperature	$T_{STG}$	- 55 to +175	°C

#### Notes:

1. Mounted on Cu-Pad size 5mm x 5mm
2.  $T_J = 25^\circ\text{C}$  prior to surge

<b>THERMAL PERFORMANCE</b>			
<b>PARAMETER</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>UNIT</b>
Junction-to-lead thermal resistance	$R_{\theta JL}$	22	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	85	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	24	°C/W

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE<sup>(1)</sup></b>	<b>PACKAGE</b>	<b>PACKING</b>
BZD27CxPW	SOD-123W	10,000 / Tape & Reel

**Notes:**

1. “x” defines voltage from 11V (BZD27C11PW) to 220V (BZD27C220PW)

ELECTRICAL SPECIFICATIONS (T <sub>A</sub> = 25°C unless otherwise noted)								
Part number	Marking code	Zener voltage			Test current	Regulator impedance		Test current
		V <sub>Z</sub> @ I <sub>ZT</sub> <sup>(1)</sup>			I <sub>ZT</sub>	Z <sub>ZT</sub> @ I <sub>ZT</sub>	Z <sub>ZK</sub> @ I <sub>ZK</sub>	I <sub>ZK</sub>
		V			mA	Ω	Ω	mA
		Min	Nom	Max		Max	Max	
BZD27C11PW	N2	10.5	11	11.6	50	7	700	0.25
BZD27C12PW	N3	11.4	12	12.6	50	7	700	0.25
BZD27C13PW	N4	12.4	13	13.7	50	10	700	0.25
BZD27C15PW	N5	14.3	15	15.8	50	10	700	0.25
BZD27C16PW	N6	15.2	16	16.8	25	15	700	0.25
BZD27C18PW	N7	17.1	18	18.9	25	15	750	0.25
BZD27C20PW	P0	19	20	21	25	15	750	0.25
BZD27C22PW	P1	20.9	22	23.1	25	15	750	0.25
BZD27C24PW	P3	22.8	24	25.2	25	15	750	0.25
BZD27C27PW	P4	25.7	27	28.4	25	15	1000	0.25
BZD27C30PW	P5	28.5	30	31.5	25	15	1000	0.25
BZD27C33PW	P6	31.4	33	34.7	25	15	1000	0.25
BZD27C36PW	P7	34.2	36	37.8	10	40	1000	0.25
BZD27C39PW	P8	37.1	39	41	10	40	1000	0.25
BZD27C43PW	Q0	40.9	43	45.2	10	45	1500	0.25
BZD27C47PW	Q1	44.7	47	49.4	10	45	1500	0.25
BZD27C51PW	Q2	48.5	51	53.6	10	60	1500	0.25
BZD27C56PW	Q5	53.2	56	58.8	10	60	2000	0.25
BZD27C62PW	Q7	58.9	62	65.1	10	80	2000	0.25
BZD27C68PW	R1	64.6	68	71.4	10	80	2000	0.25
BZD27C75PW	R2	71.3	75	78.8	10	100	2000	0.25
BZD27C82PW	R3	77.9	82	86.1	10	200	3000	0.25
BZD27C91PW	R4	86.5	91	95.6	5	200	3000	0.25
BZD27C100PW	R5	95	100	105	5	200	3000	0.25
BZD27C110PW	R6	104.5	110	115.5	5	250	4000	0.25
BZD27C120PW	R7	114	120	126	5	300	4500	0.25
BZD27C130PW	R8	123.5	130	136.5	5	300	5000	0.25
BZD27C150PW	R9	142.5	150	157.5	5	300	6000	0.25
BZD27C160PW	R10	152	160	168	5	350	6500	0.25
BZD27C180PW	R11	171	180	189	5	450	7000	0.25
BZD27C200PW	R12	190	200	210	5	750	8000	0.25
BZD27C220PW	R13	209	220	231	5	900	8500	0.25

**Notes:**

1. Pulse test with PW = 30ms

**ELECTRICAL SPECIFICATIONS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Part number	Marking code	Zener voltage			Test current	Clamping Voltage		Leakage current		Temperature coefficient of Zener voltage	
		$V_Z @ I_{ZT}^{(1)}$			$I_{ZT}$	$V_C$	@ $I_{RSM}^{(2)}$	$I_R @ V_R^{(1)}$		$\alpha V_Z @ I_{ZT}$	
		V			mA	V	A	$\mu\text{A}$	V	% / $^\circ\text{C}$	
		Min	Nom	Max		Max		Max		Min	Max
BZD27C11PW	N2	10.5	11	11.6	50	15.7	9.6	4.0	8.2	0.05	0.10
BZD27C12PW	N3	11.4	12	12.6	50	17.0	8.8	3.0	9.1	0.05	0.10
BZD27C13PW	N4	12.4	13	13.7	50	18.9	7.9	2.0	10	0.05	0.10
BZD27C15PW	N5	14.3	15	15.8	50	20.9	7.2	1.0	11	0.05	0.10
BZD27C16PW	N6	15.2	16	16.8	25	22.9	6.6	1.0	12	0.06	0.11
BZD27C18PW	N7	17.1	18	18.9	25	25.6	5.9	1.0	13	0.06	0.11
BZD27C20PW	P0	19	20	21	25	28.4	5.3	1.0	15	0.06	0.11
BZD27C22PW	P1	20.9	22	23.1	25	31.0	4.8	1.0	16	0.06	0.11
BZD27C24PW	P3	22.8	24	25.2	25	33.8	4.4	1.0	18	0.06	0.11
BZD27C27PW	P4	25.7	27	28.4	25	38.1	3.9	1.0	20	0.06	0.11
BZD27C30PW	P5	28.5	30	31.5	25	42.2	3.6	1.0	22	0.06	0.11
BZD27C33PW	P6	31.4	33	34.7	25	46.2	3.2	1.0	24	0.07	0.12
BZD27C36PW	P7	34.2	36	37.8	10	50.1	3.0	1.0	27	0.07	0.12
BZD27C39PW	P8	37.1	39	41	10	54.1	2.8	1.0	30	0.07	0.12
BZD27C43PW	Q0	40.9	43	45.2	10	60.7	2.5	1.0	33	0.08	0.13
BZD27C47PW	Q1	44.7	47	49.4	10	65.5	2.3	1.0	36	0.08	0.13
BZD27C51PW	Q2	48.5	51	53.6	10	70.8	2.1	1.0	39	0.08	0.13
BZD27C56PW	Q5	53.2	56	58.8	10	78.6	1.9	1.0	43	0.09	0.13
BZD27C62PW	Q7	58.9	62	65.1	10	86.5	1.7	1.0	47	0.09	0.13
BZD27C68PW	R1	64.6	68	71.4	10	94.4	1.6	1.0	51	0.09	0.13
BZD27C75PW	R2	71.3	75	78.8	10	103.5	1.5	1.0	56	0.09	0.13
BZD27C82PW	R3	77.9	82	86.1	10	114	1.3	1.0	62	0.09	0.13
BZD27C91PW	R4	86.5	91	95.6	5	126	1.2	1.0	68	0.09	0.13
BZD27C100PW	R5	95	100	105	5	139	1.1	1.0	75	0.09	0.13
BZD27C110PW	R6	104.5	110	115.5	5	150	1.0	1.0	82	0.09	0.13
BZD27C120PW	R7	114	120	126	5	152	0.65	1.0	91	0.09	0.13
BZD27C130PW	R8	123.5	130	136.5	5	185	0.81	1.0	100	0.09	0.13
BZD27C150PW	R9	142.5	150	157.5	5	205	0.73	1.0	110	0.09	0.13
BZD27C160PW	R10	152	160	168	5	224	0.67	1.0	120	0.09	0.13
BZD27C180PW	R11	171	180	189	5	229	0.43	1.0	130	0.09	0.13
BZD27C200PW	R12	190	200	210	5	254	0.39	1.0	150	0.09	0.13
BZD27C220PW	R13	209	220	231	5	279	0.35	1.0	160	0.09	0.13

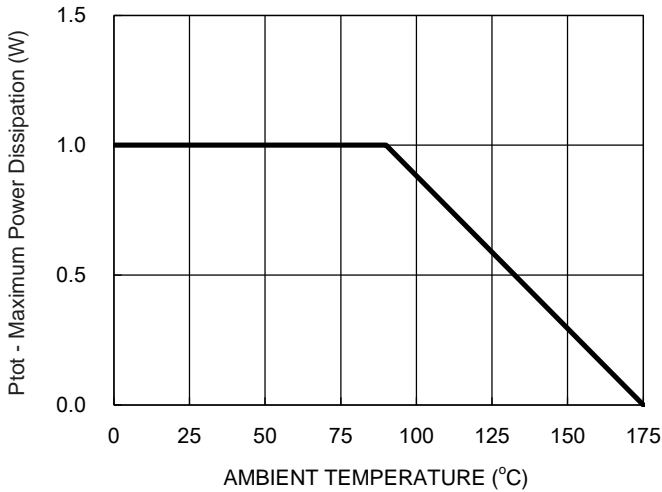
**Notes :**

1. Pulse test with  $PW = 30\text{ms}$
2. 10/1000 $\mu\text{s}$  waveform

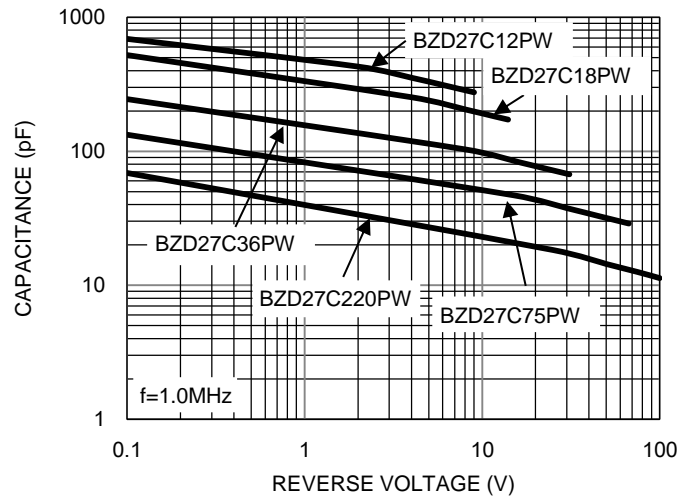
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

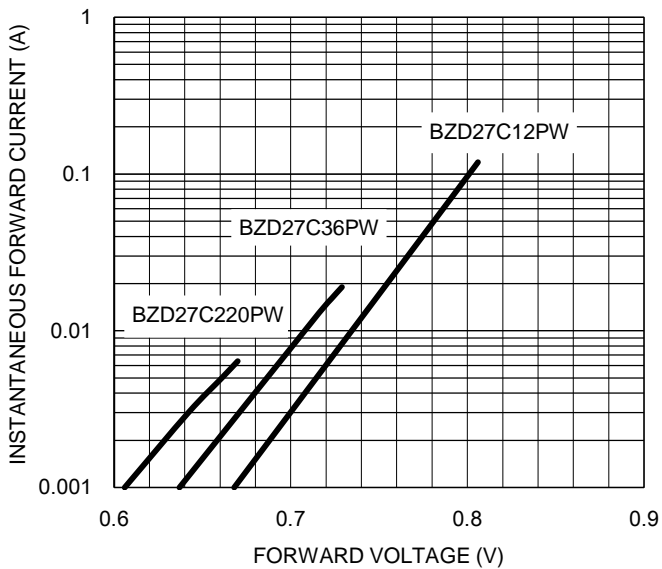
**Fig.1 Steady State Power Derating Curve**



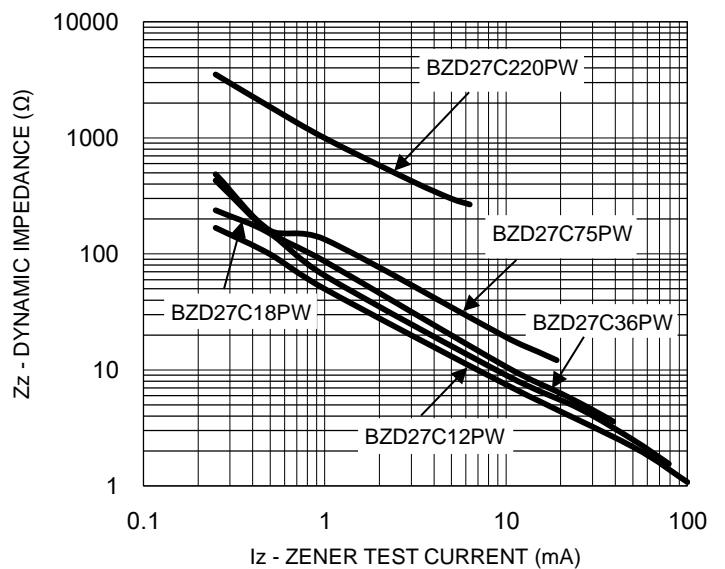
**Fig.2 Typical Junction Capacitance**



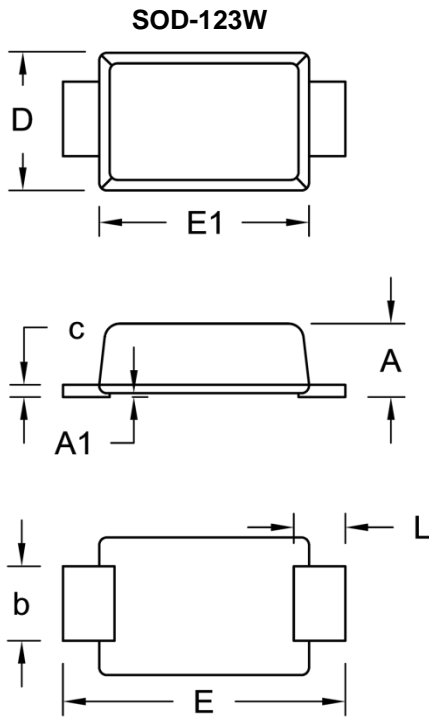
**Fig.3 Typical Forward Characteristics**



**Fig.4 Typical Zener Impedance**

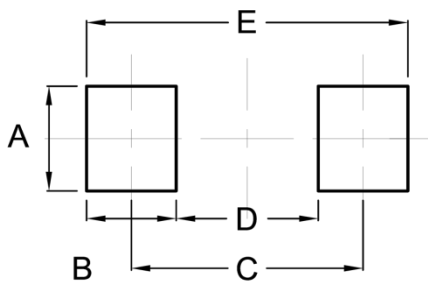


**PACKAGE OUTLINE DIMENSIONS**



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	0.90	1.02	0.035	0.040
A1	0.00	0.10	0.000	0.004
b	0.90	1.05	0.035	0.041
c	0.10	0.22	0.004	0.009
D	1.70	1.90	0.067	0.075
E	3.60	3.80	0.142	0.150
E1	2.60	2.90	0.102	0.114
L	0.50	0.85	0.020	0.033

**SUGGESTED PAD LAYOUT**



Symbol	Unit (mm)	Unit (inch)
A	1.40	0.055
B	1.20	0.047
C	3.10	0.122
D	1.90	0.075
E	4.30	0.169

**MARKING DIAGRAM**



P/N = Marking Code  
 YW = Date Code  
 F = Factory Code

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