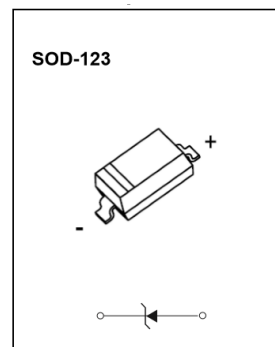


**Features**


- 500mW Rating on FR-4 or FR-5 Board
- Wide Zener Reverse Voltage Range – 2.4 V to 75V
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications
- General Purpose, Medium Current
- ESD Rating of Class 3 (>16 kV) per Human Body Model
- Tolerance approximately:  $\pm 5\%$
- Device meets MSL 1 requirements

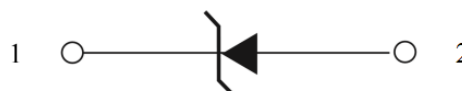
**Exterior**

**Application Information**

- Cellular handsets
- Tablets
- Other portable devices

**Package (top view)**

**Agency Approvals**

Icon	Description
<b>RoHS</b>	Compliance with 2011/65/EU
<b>HF</b>	Compliance with IEC61249-2-21:2003
	Mean lead free

**Schematic(top view)**

**Maximum Ratings(Ta=25°C unless otherwise specified)**

Parameters	Symbol	MAX	Unit
Forward Voltage @IF=10mA	VF	0.9	V
Power Dissipation	Pd	500	mW
Thermal Resistance, Junction-to-Ambient (Note 2)	R <sub>θJA</sub>	340	°C/W
Thermal Resistance, Junction-to-Lead (Note 2)	R <sub>θJA</sub>	150	°C/W
Junction and Storage Temperature Range	Tj, Tstg	-65 to +150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

**Notes: 1. FR-5 = 3.5 X 1.5 inches, using the minimum recommended footprint.**

**2. Thermal Resistance measurement obtained via infrared Scan Method**

**Planar Plastic Zener Diode**

Version: A3 2021-10-20

## Part Number and Electrical Parameter

Part Number	Device Marking	Zener Voltage(Note3 and 4)				Zener Impedance(Note 5)			Maximum Reverse Current	
		VZ@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>ZK</sub>	I <sub>R</sub>	V <sub>R</sub>
		Nom(V)	Min(V)	Max(V)	(mA)	(Ω)		(mA)	(μA)	(V)
BW-D1G2V4T1G-5	C1	2.4	2.28	2.52	20	30	1200	0.25	100	1.0
BW-D1G2V5T1G-5	C2	2.5	2.38	2.63	20	30	1250	0.25	100	1.0
BW-D1G2V7T1G-5	C3	2.7	2.57	2.84	20	30	1300	0.25	75	1.0
BW-D1G2V8T1G-5	C4	2.8	2.66	2.94	20	30	1400	0.25	75	1.0
BW-D1G3V0T1G-5	C5	3.0	2.85	3.15	20	30	1600	0.25	50	1.0
BW-D1G3V3T1G-5	G1	3.3	3.14	3.47	20	28	1600	0.25	25	1.0
BW-D1G3V6T1G-5	G2	3.6	3.42	3.78	20	24	1700	0.25	15	1.0
BW-D1G3V9T1G-5	G3	3.9	3.71	4.10	20	23	1900	0.25	10	1.0
BW-D1G4V3T1G-5	G4	4.3	4.09	4.52	20	22	2000	0.25	5	1.0
BW-D1G4V7T1G-5	G5	4.7	4.47	4.94	20	19	1900	0.25	5	2.0
BW-D1G5V1T1G-5	E1	5.1	4.85	5.36	20	17	1600	0.25	5	2.0
BW-D1G5V6T1G-5	E2	5.6	5.32	5.88	20	11	1600	0.25	5	3.0
BW-D1G6V0T1G-5	E3	6.0	5.70	6.30	20	7	1600	0.25	5	3.5
BW-D1G6V2T1G-5	E4	6.2	5.89	6.51	20	7	1000	0.25	5	4.0
BW-D1G6V8T1G-5	E5	6.8	6.46	7.14	20	5	750	0.25	3	5.0
BW-D1G7V5T1G-5	F1	7.5	7.13	7.88	20	6	500	0.25	3	6.0
BW-D1G8V2T1G-5	F2	8.2	7.79	8.61	20	8	500	0.25	3	6.5
BW-D1G8V7T1G-5	F3	8.7	8.27	9.14	20	8	600	0.25	3	6.5
BW-D1G9V1T1G-5	F4	9.1	8.65	9.56	20	10	600	0.25	3	7.0
BW-D1G10VT1G-5	F5	10	9.50	10.50	20	17	600	0.25	3	8.0
BW-D1G11VT1G-5	H1	11	10.45	11.55	20	22	600	0.25	2.0	8.4
BW-D1G12VT1G-5	H2	12	11.40	12.60	20	30	600	0.25	1.0	9.1
BW-D1G13VT1G-5	H3	13	12.35	13.65	9.5	13	600	0.25	0.5	9.9
BW-D1G14VT1G-5	H4	14	13.30	14.70	9.0	15	600	0.25	0.1	10
BW-D1G15VT1G-5	H5	15	14.25	15.75	8.5	16	600	0.25	0.1	11
BW-D1G16VT1G-5	J1	16	15.20	16.80	7.8	17	600	0.25	0.1	12
BW-D1G17VT1G-5	J2	17	16.15	17.85	7.5	19	600	0.25	0.1	13
BW-D1G18VT1G-5	J3	18	17.10	18.90	7.0	21	600	0.25	0.1	14
BW-D1G20VT1G-5	J5	20	19.00	21.00	6.2	25	600	0.25	0.1	15
BW-D1G22VT1G-5	K1	22	20.90	23.10	5.6	29	600	0.25	0.1	17
BW-D1G24VT1G-5	K2	24	22.80	25.20	5.2	33	600	0.25	0.1	18
BW-D1G25VT1G-5	K3	25	23.75	26.25	5.0	35	600	0.25	0.1	19
BW-D1G27VT1G-5	K4	27	25.65	28.35	5.0	41	600	0.25	0.1	21
BW-D1G28VT1G-5	K5	28	26.60	29.40	4.5	44	600	0.25	0.1	21
BW-D1G30VT1G-5	M1	30	28.50	31.50	4.2	49	600	0.25	0.1	23
BW-D1G33VT1G-5	M2	33	31.35	34.65	3.8	58	700	0.25	0.1	25
BW-D1G36VT1G-5	M3	36	34.20	37.80	3.4	70	700	0.25	0.1	27

BW-D1G39VT1G-5	M4	39	37.05	40.95	3.2	80	800	0.25	0.1	30
BW-D1G43VT1G-5	M5	43	40.85	45.15	3.0	93	900	0.25	0.1	33
BW-D1G47VT1G-5	N1	47	44.65	49.35	2.7	105	1000	0.25	0.1	36
BW-D1G51VT1G-5	N2	51	48.45	53.55	2.5	125	1100	0.25	0.1	39
BW-D1G56VT1G-5	N3	56	53.20	58.80	2.2	150	1300	0.25	0.1	43
BW-D1G60VT1G-5	N4	60	57.00	63.00	2.1	170	1400	0.25	0.1	46
BW-D1G62VT1G-5	N5	62	58.90	65.10	2.0	185	1400	0.25	0.1	47
BW-D1G68VT1G-5	P1	68	64.60	71.40	1.8	230	1600	0.25	0.1	52
BW-D1G75VT1G-5	P2	75	71.25	78.75	1.7	270	1700	0.25	0.1	56

### Notes:

- The type numbers shown have a standard tolerance of  $\pm 5\%$  on the nominal Zener voltage.
- Nominal Zener voltage is measured with the device junction in thermal equilibrium at  $T_L = 30^\circ\text{C} \pm 1^\circ\text{C}$ .
- ZZT and ZZK are measured by dividing the AC voltage drop across the device by the ac current applied. The specified limits are for  $I_Z(\text{AC}) = 0.1 I_Z(\text{dc})$  with the AC frequency = 1 KHz.

### Part Numbering System

### Mark

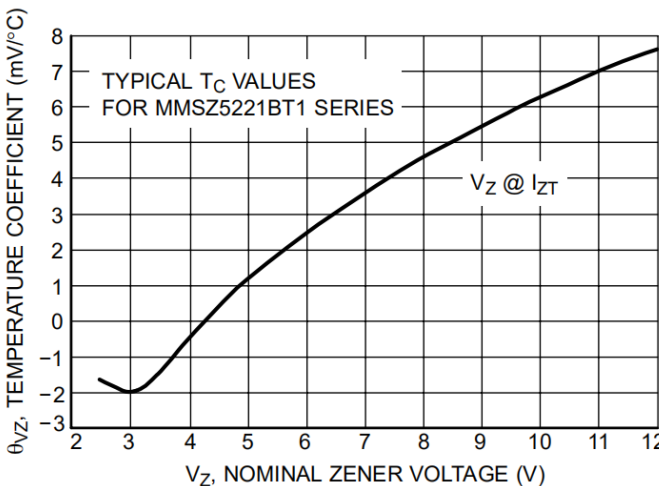
BW D1 G XXX T1 G 5  
 (1) (2) (3) (4) (5) (6) (7)

- (1) Bencent Zener Diode
- (2) Package: SOD-123
- (3) Power Dissipation: 500mW
- (4) Work Voltage: 2.4V-75V
- (5) Package type: Taping, 3K/R
- (6) Green
- (7) Tolerance of accuracy:  $\pm 5\%$

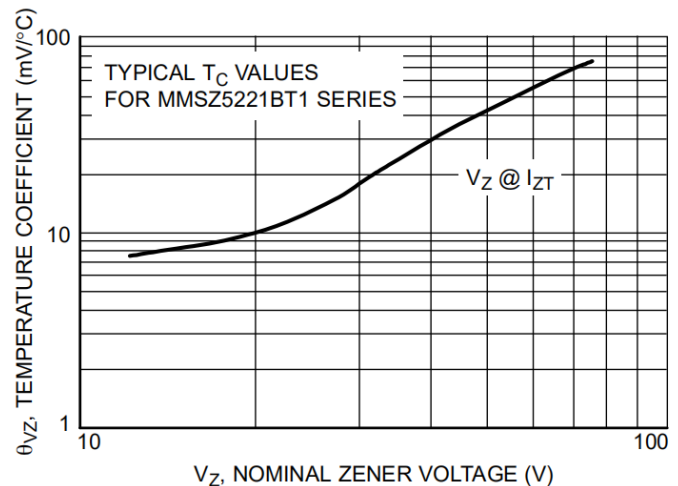


XX = Device Code  
 M = Data Code

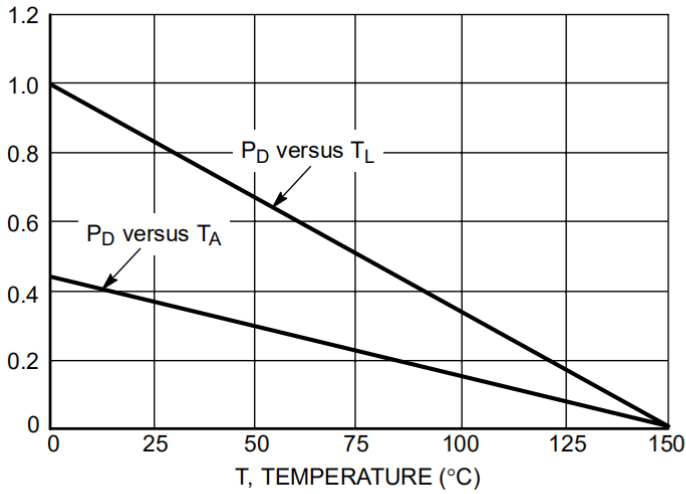
### Typical Characteristics



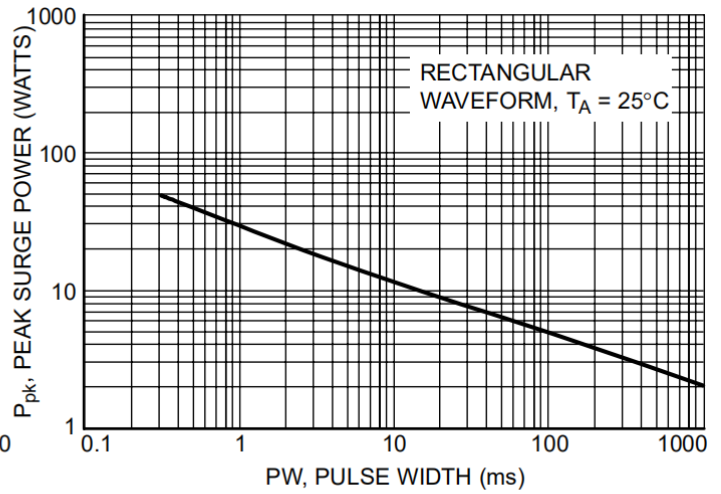
**Figure 1. Temperature Coefficients**  
 (Temperature Range  $-55^\circ\text{C}$  to  $+150^\circ\text{C}$ )



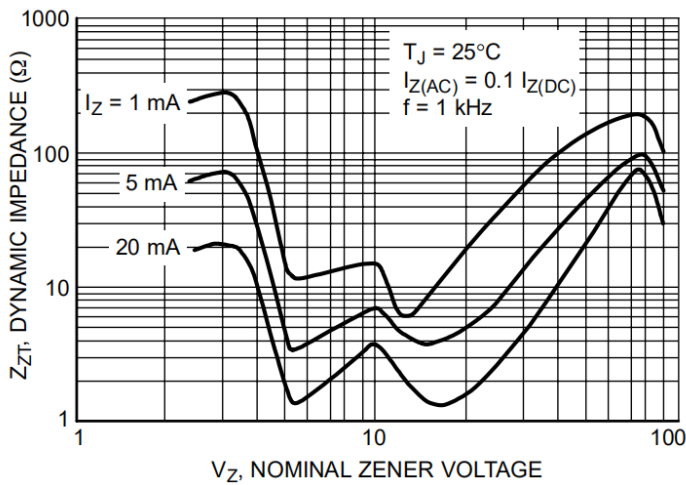
**Figure 2. Temperature Coefficients**  
 (Temperature Range  $-55^\circ\text{C}$  to  $+150^\circ\text{C}$ )



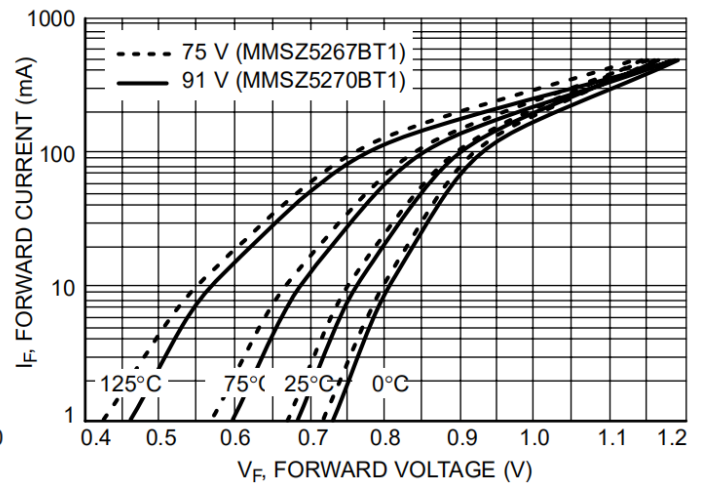
**Figure 3. Steady State Power Derating**



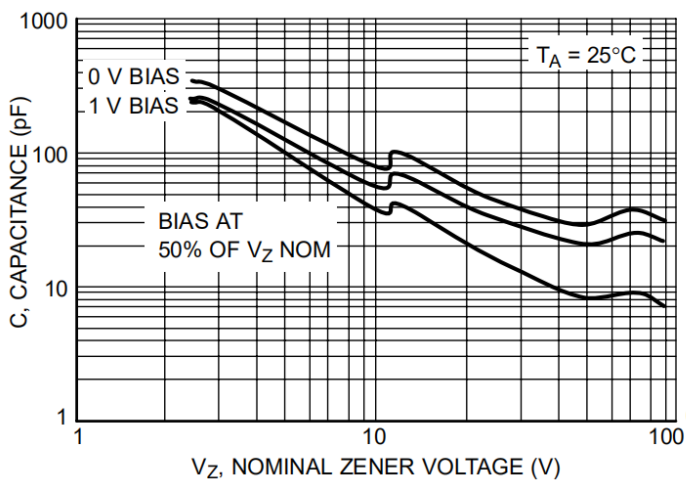
**Figure 4. Maximum Nonrepetitive Surge Power**



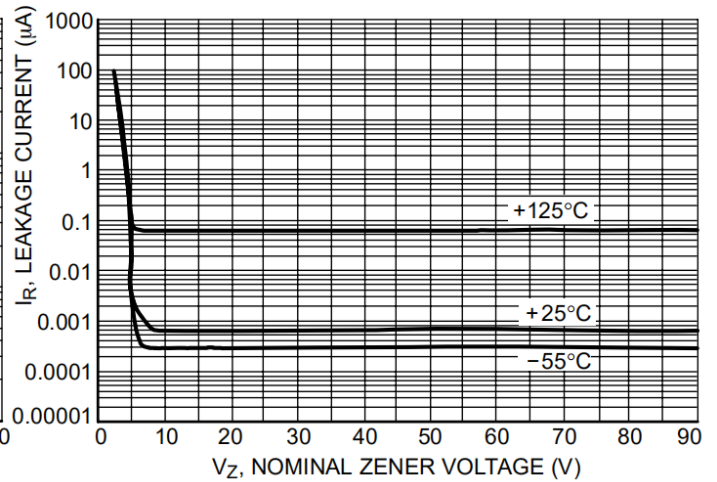
**Figure 5. Effect of Zener Voltage on Zener Impedance**



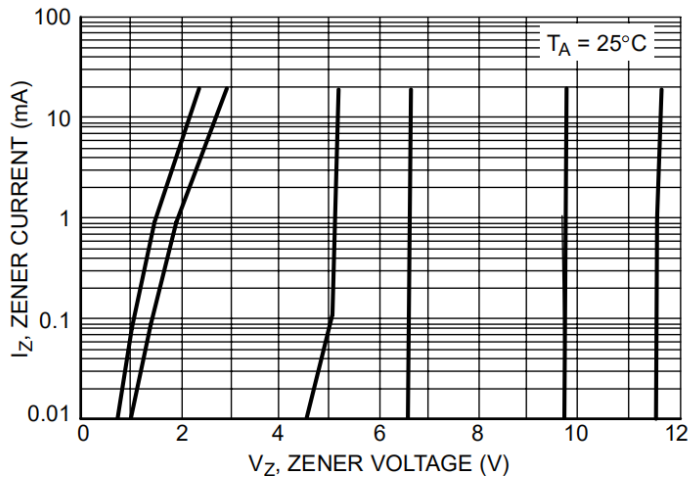
**Figure 6. Typical Forward Voltage**



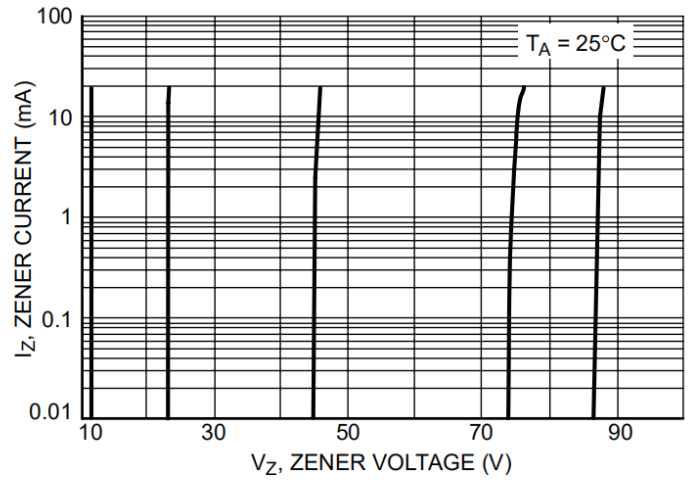
**Figure 7. Typical Capacitance**



**Figure 8. Typical Leakage Current**

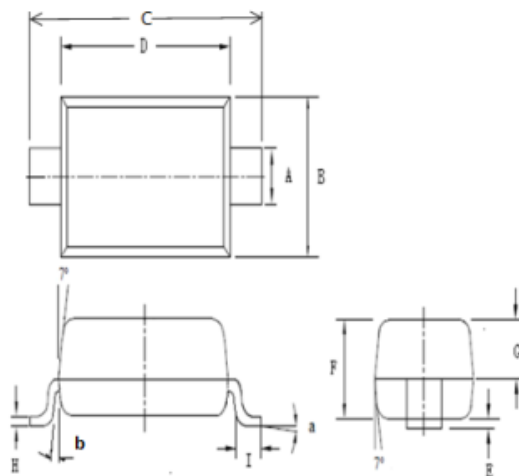


**Figure 9. Zener Voltage versus Zener Current (V<sub>Z</sub> Up to 12 V)**



**Figure 10. Zener Voltage versus Zener Current (12 V to 91 V)**

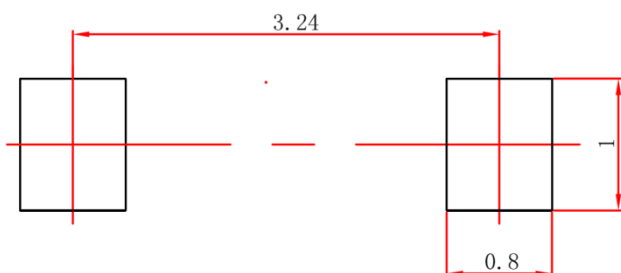
### Product Dimensions



**SOD123**

REF	mm	inch
A	0.45~0.65	0.018~0.026
B	1.40~1.70	0.055~0.067
C	3.55~3.85	0.140~0.152
D	2.55~2.85	0.100~0.112
E	0.00~0.10	0.000~0.004
F	1.20max	0.047max
G	0.60~0.70	0.024~0.028
H	0.075~0.125	0.003~0.005
I	0.25~0.45	0.010~0.018
a	0°~6°	
b	0.4°~0.8°	

### SOD-123 Suggested Pad Layout



#### Notes:

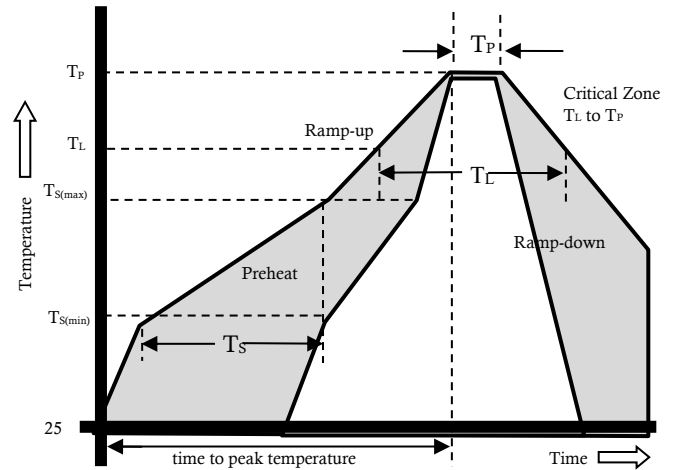
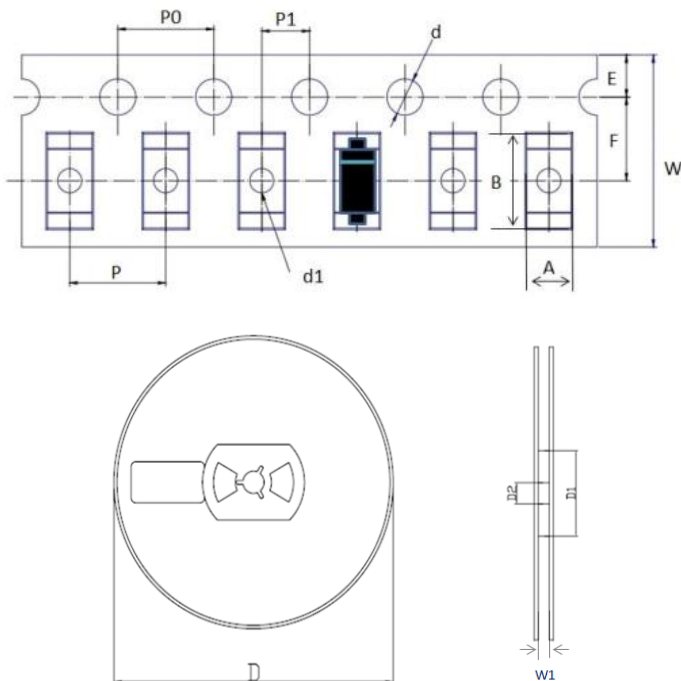
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$ mm.
3. The pad layout is for reference purpose only.

**Planar Plastic Zener Diode**

Version: A3 2021-10-20

**Reflow Profile**

Reflow Condition		Pb-Free assembly
Pre Heat	Temperature Min	150°C
	Temperature Max	200°C
	Time (min to max)	60 – 180 secs
Average ramp up rate (Liquid) Tamp (T <sub>L</sub> ) to peal		3°C/s max
T <sub>S</sub> (max) to T <sub>L</sub> - Ramp-up Rate		3°C/s max
Reflow	- Temperature (T <sub>L</sub> ) (Liquid)	217°C
	- Temperature (T <sub>L</sub> )	60 – 150 secs
Peak Temperature (T <sub>P</sub> )		260±0/-5 °C
Time within 5°C of actual peak Temperature (T <sub>P</sub> )		30secs
Ramp-down Rate		6°C/s max
Time 25°C to peak Temperature (T <sub>P</sub> )		8 mins max.
Do not exceed		260°C


**Package Reel Information**


REF	mm	inch
A	1.90±0.20	0.075±0.008
B	4.10±0.20	0.161±0.008
d	1.50±0.1/-0	0.059±0.004/-0
d1	1.10±0.10	0.043±0.004
D	178.00±2.00	7.008±0.079
D1	55.00±3.00	2.165±0.118
D2	13.00±0.50	0.512±0.020
E	1.75±0.10	0.069±0.004
F	3.50±0.20	0.138±0.008
P	4.00±0.20	0.157±0.008
P0	4.00±0.20	0.157±0.008
P1	2.00±0.20	0.079±0.008
W	8.00±0.20	0.315±0.008
W1	9.50±1.00	0.374±0.039

OUTLINE	REEL (PCS)	PER CARTON (PCS)	REEL DIAMETERS (mm)	CARTON SIZE(mm)		
				L	W	H
TAPING	3,000	90,000	178	390	370	220

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