

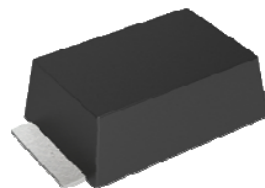
Transient Voltage Suppressor

Version: A4 2020-07-30

Features

- IEC 61000-4-2(ESD) $\pm 30\text{KV}(\text{air})$, $\pm 30\text{KV}(\text{contact})$
- IEC61000-4-5(Lightning) 170A (8/20 μS)
- IEC61000-4-4(EFT) 40A (5/50nS)
- 4420 Watts peak pulse power ($t_p=8/20\mu\text{S}$)
- Low clamping voltage
- Weight 15mg (Approximate)
- Moisture sensitivity level: Level 1
- Small package: SOD123-F

Exterior



SOD123-F

Application information

- DC power port
- DC High-Side Proximity Switches
- Industrial Controls

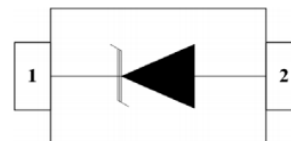
Package (top view)



Agency Approvals

Icon	Description
RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

Schematic



Part Number and Electrical Parameter

Part Number	$I_{\text{DRM}}@V_{\text{DRM}}$		$V_{\text{BR}}^{①}@I_{\text{R}}$			$V_{\text{c}}@I_{\text{pp}}^{②}$			$V_{\text{c}}@I_{\text{pp}}^{②}$			$\text{Co}^{③}$
	μA	V	V	V	mA	V	V	A	V	V	A	pF
	MAX		MIN	MAX		TYP	MAX		TYP	MAX		MAX
BV-D112ZB	1	12	13.3	14.7	1	20	23	100	23	26	170	1500

Absolute maximum ratings measured at $T = 25^{\circ}\text{C}$ RH = 45%-75% (unless otherwise noted).

① V_{BR} is measured at $I_{\text{R}}=1\text{mA}$, pin 1 to 2

② Surge Waveform: 8/20 μS , pin 1 to 2

③ Off-state capacitance is measured in $V_{\text{DC}}=0\text{V}$, $V_{\text{RMS}}=0.3\text{V}$, $f=1\text{MHz}$

Part Numbering System

BV D1 12 Z B
(1) (2) (3) (4) (5)

- (1) Bencent Transient Voltage Suppressor
- (2) Package:SOD123-F
- (3) Off-state Voltage: 12V
- (4) Normal Capacitance
- (5) Bencent internal code

Mark



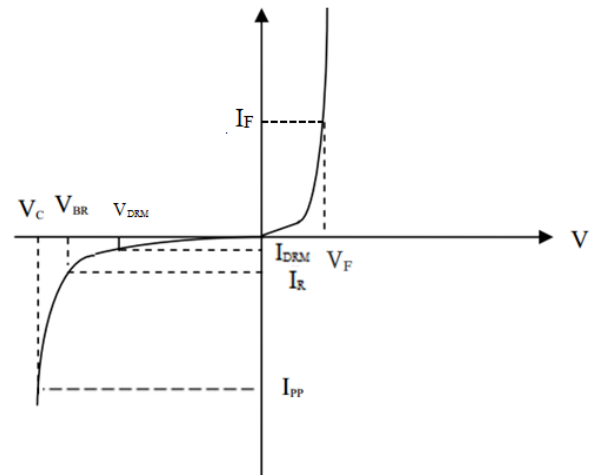
BE: Part Number

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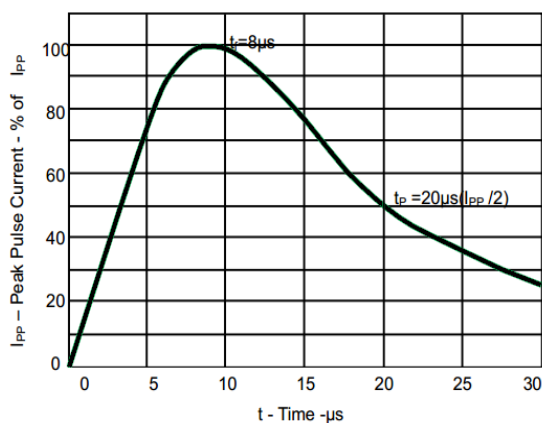
V-I Curve

Parameters	Definition
V_C	Clamping Voltage
I_{pp}	Surge Waveform 8/20 μ s
V_{DRM}	Stand-off Voltage
I_{DRM}	Reverse Leakage Current
V_{BR}	Breakdown Voltage
I_R	Test Current
V_F	Forward Voltage
I_F	Test Current
P_{pp}	Peak Pulse Power Dissipation

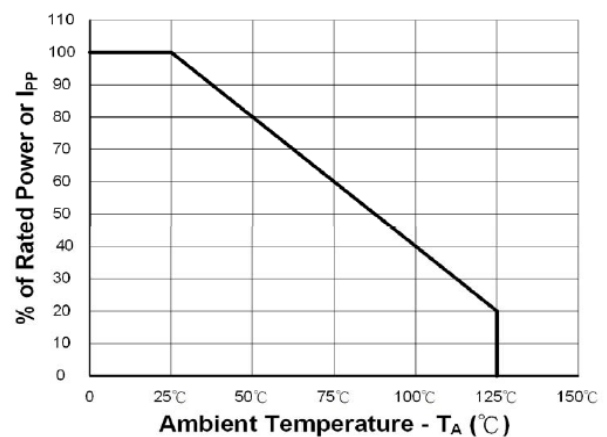


Typical Characteristics

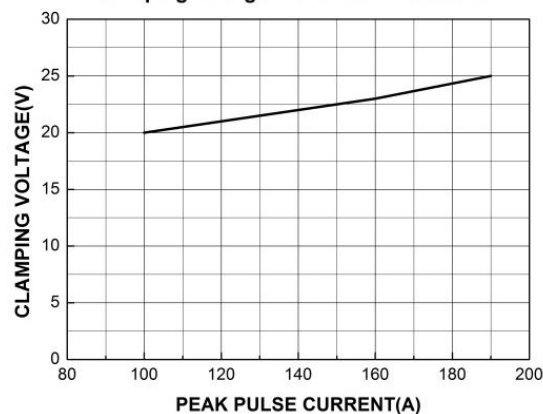
Pulse Waveform



Power Derating



Clamping Voltage Vs. Peak Pulse Current



Thermal Considerations

symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-40 to +125	°C
T_S	Storage Temperature Range	-55 to +150	°C

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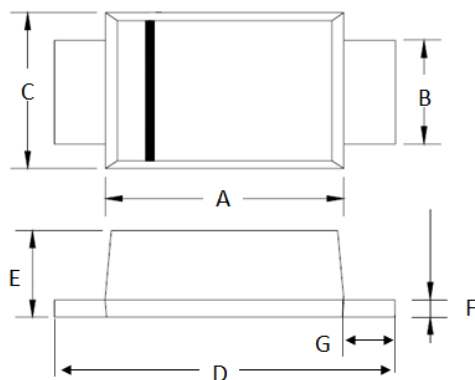
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Environmental Characteristics

Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: $125\pm 3^{\circ}\text{C}$ Bias= $80\%V_{\text{DRM}}$ Time:168H
High Temperature Life Test	Temperature: 150°C Time:168H
High-low Temperature Cycle test	Temperature: From -40°C to 125°C Dwell time : 30min,10~100cycles
High Temperature &High Humidity Test	Temperature: 85°C Humidity:85% Time:168H
Pressure cooker Test	Temperature: 121°C , 2atm. Humidity:100% Time:24H
Resistance of soldering heat	Temperature: $260\pm 5^{\circ}\text{C}$ Time of dip soldering: 10s, 3times

Note: The above testing items can be specified by customer's special request

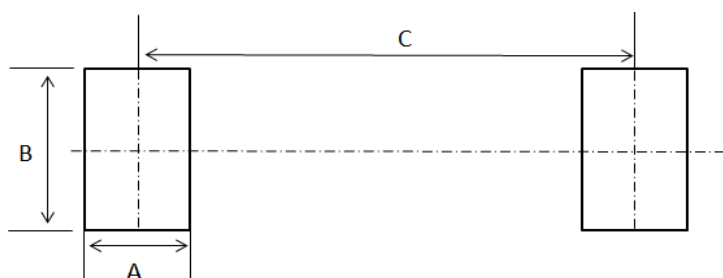
Product Dimensions



REF	mm	inch
A	2.50~2.90	0.098~0.114
B	0.80~1.20	0.031~0.047
C	1.70~1.90	0.067~0.075
D	3.50~3.90	0.138~0.154
E	0.80~1.20	0.031~0.047
F	0.10~0.30	0.004~0.012
G	0.50TYP	0.020TYP

SOD123-F

Recommended Soldering Pad



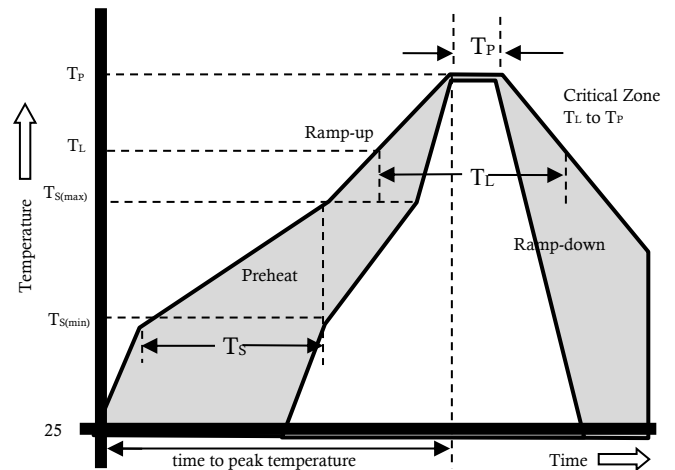
REF	mm	inch
A	1	0.039
B	1.6	0.063
C	3	0.118

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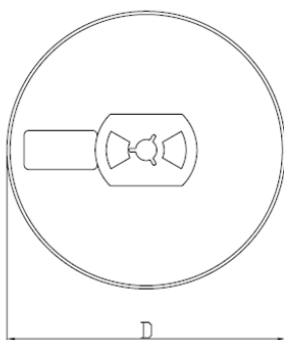
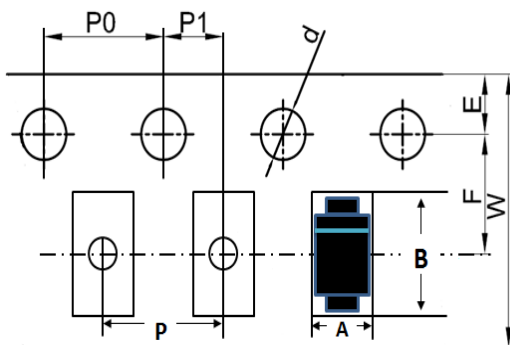
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Reflow Profile

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)		3°C/s max
Tamp (T _L) to peal		
T _S (max) to T _L - Ramp-up Rate		3°C/s max
Reflow	- Temperature (T _L) (Liquid)	217°C
	- Temperature (T _L)	60 – 150 secs
Peak Temperature (T _P)		260+0/-5 °C
Time within 5°C of actual peak Temperature (T _P)		30secs
Ramp-down Rate		6°C/s max
Time 25°C to peak Temperature (T _P)		8 mins max.
Do not exceed		260°C



Package Reel Information



REF	mm	inch
A	2.10+/-0.30	0.083+/-0.012
B	4.10+/-0.30	0.161+/-0.012
d	1.50+0.1/-0	0.059+0.004/-0
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