

Transient Voltage Suppressor

Version: A3 2023-07-25

Features

- IEC 61000-4-2(ESD) $\pm 25\text{KV}$ (air), $\pm 25\text{KV}$ (contact)
- IEC61000-4-5(Lightning) 6A (8/20 μS)
- 174Watts peak pulse power per Line(tp=8/20 μS)
- Low operating voltage and low clamping
- Moisture sensitivity level: Level 1
- Small package:SOD523

Exterior



SOD523

Application information

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Personal Digital Assistants (PDA's)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Peripherals
- Pagers

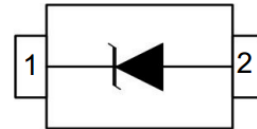
Package (top view)



Agency Approvals

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

Schematic Symbol



Part Number and Electrical Parameter

Part Number	$I_{\text{DRM}}@V_{\text{DRM}}$		$V_{\text{BR}}^{\text{①}}@I_{\text{R}}$		$V_{\text{C}}@I_{\text{pp}}^{\text{②}}$		$V_{\text{C}}@I_{\text{pp}}^{\text{②}}$		$R_{\text{DYN}}@ \text{TLP}^{\text{③}}$	$V_{\text{C}}@I_{\text{pp}} \text{TLP}^{\text{③}}$		$\text{Co}^{\text{④}}$
	μA	V	V	mA	V	A	V	A	Ω	V	A	pF
	MAX		MIN		MAX		MAX		TYP	TYP		MAX
BV-D512ZA	0.1	12	14.1	1	23	3	29	6	0.2	19.2	16	100

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

① V_{BR} is measured at $I_{\text{R}}=1\text{mA}$

② Surge Waveform: 8/20 μS .

③ TLP parameter: $Z_0 = 50\Omega$, $t_p = 100\text{ns}$, $t_r = 1\text{ns}$, R_{DYN} is calculated from 4A to 16A

④ Off-state capacitance is measured in $V_{\text{DC}}=0\text{V}$, $f=1\text{MHz}$

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Part Numbering System

Mark

BV D5 12 Z A
(1) (2) (3) (4) (5)

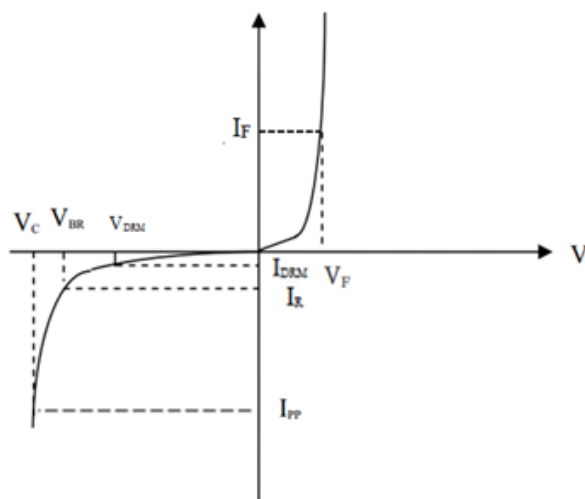
- (1) Bencent Transient Voltage Suppressor
- (2) Package: SOD523
- (3) Stand-off Voltage:12V
- (4) Normal Capacitance
- (5) Bencent internal code



ZM: Part Number

V-I Curve

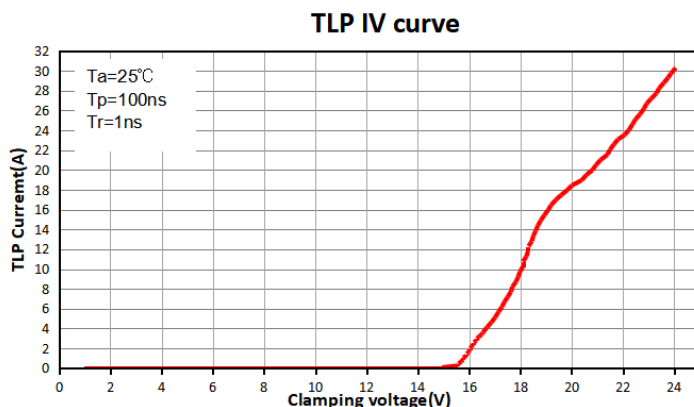
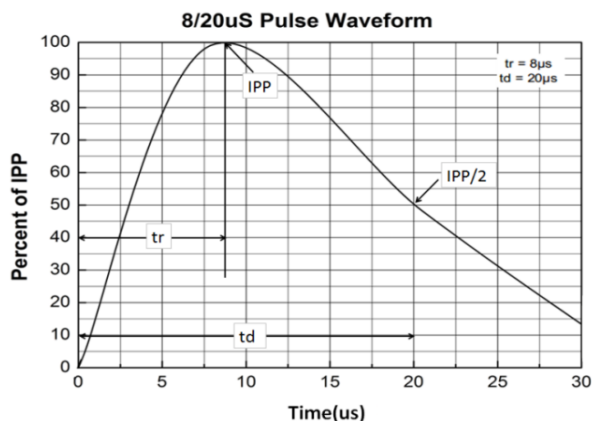
Parameters	Definition
V_C	Clamping voltage
I_{PP}	Peak pulse current
V_{DRM}	Stand-off Voltage
V_{BR}	Breakdown Voltage
I_{DRM}	Reverse Leakage Current
I_R	Test current
P_{pp}	Peak Pulse Power Dissipation
V_F	Forward on-state voltage
I_F	Forward current



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

Typical Characteristics



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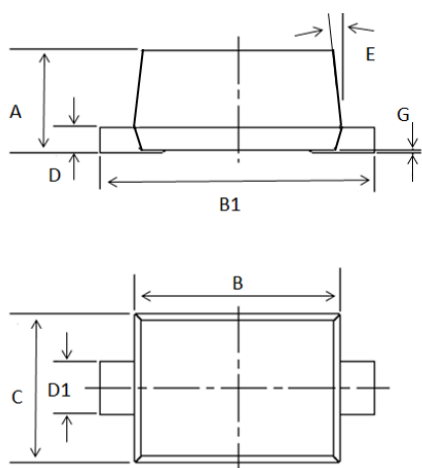
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Environmental Characteristics

Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: $125\pm3^{\circ}\text{C}$ 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,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: $260\pm5^{\circ}\text{C}$ Time of dip soldering: 10s, 3times

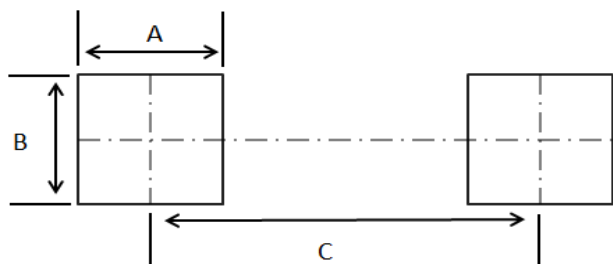
Note: The above testing items can be specified by customer's special request

Product Dimensions



REF	mm	inch
A	0.50~0.77	0.020~0.030
B	1.10~1.30	0.043~0.051
B1	1.50~1.70	0.059~0.067
C	0.70~0.90	0.028~0.035
D	0.08~0.15	0.003~0.006
D1	0.25~0.35	0.010~0.014
E	8°REF	
F	8°REF	
G	0.00~0.07	0.000~0.003

Recommended Soldering Pad



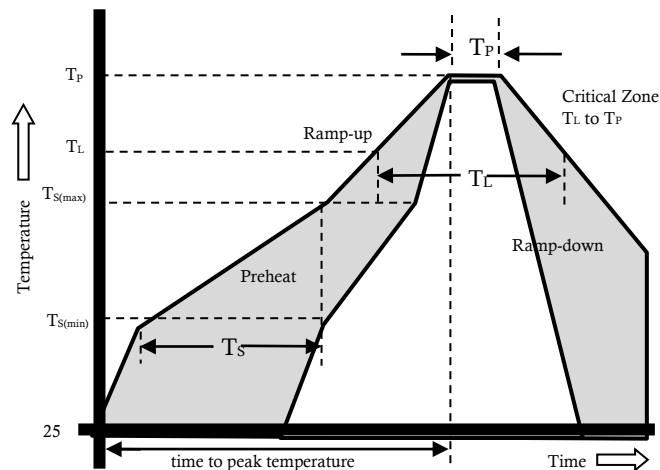
REF	mm	inch
A	0.5	0.020
B	0.6	0.024
C	1.42	0.056

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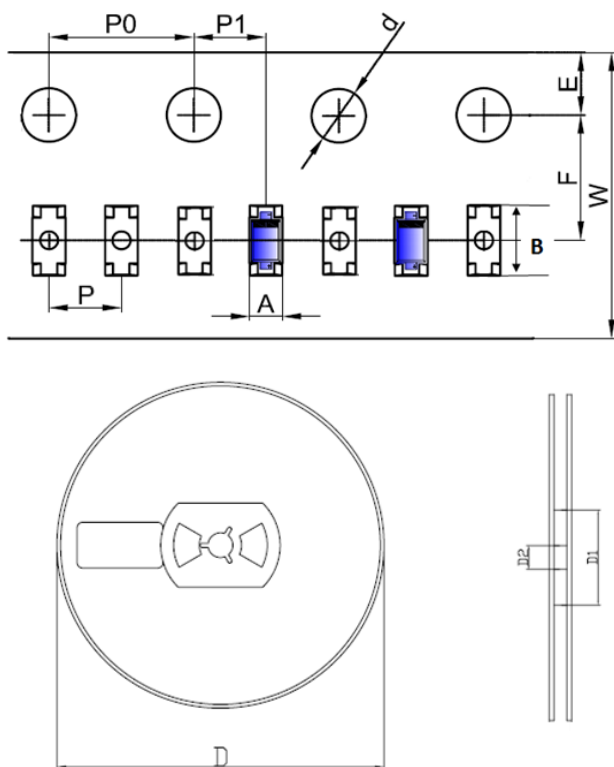
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Reflow Profile

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) T _{amp} (T _L) to peak		3°C/s Max
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	0.95+/-0.10	0.037+/-0.004
B	1.95+/-0.10	0.077+/-0.004
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	2.00+/-0.20	0.079+/-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	8.60+/-1.00	0.339+/-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