

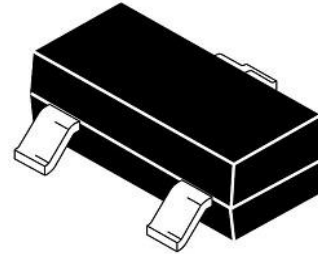
Transient Voltage Suppressor

Version: A1 2023-03-23

Features

- IEC61000-4-2(ESD level 4) $\pm 15\text{KV}$ (air), $\pm 8\text{KV}$ (Contact)
- IEC61000-4-2(ESD MAX) $\pm 20\text{KV}$ (air), $\pm 20\text{KV}$ (Contact)
- IEC 61000-4-4 (EFT) 40A (5/50 ns)
- IEC61000-4-5(Surge) 4A (8/20uS)
- 60 Watts peak pulse power per Line(tp=8/20μS)
- Working Voltage: 5V
- V_{SB} min value 5.5V
- Moisture sensitivity level: Level 1
- Weight approx. 3 mg

Exterior

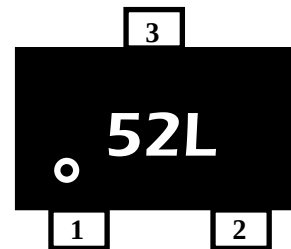


SOT-523

Application Information

- Serial ATA
- Desktops, Servers and Notebooks
- PCI Express
- MDDI Ports
- USB Data Line Protection
- Digital Visual Interfaces

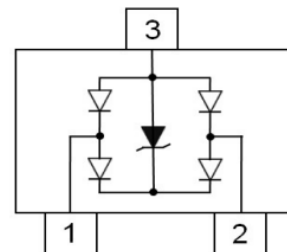
Package (top view)



Agency Approvals

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

Schematic



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-E505U2B	0.1	5	6	1	12	1	15	4	0.8	22	16	0.8

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

① I_{DRM} is measured at $V_{\text{DRM}}=5\text{V}$, V_{BR} is measured at $I_{\text{R}}=1\text{mA}$, pin1 to pin3 and pin2 to pin3;

② Surge Waveform: 8/20μS, pin1 to pin3 and pin2 to pin3

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, IO to GND

④ Off-state capacitance is measured in $V_{\text{DC}}=0\text{V}$, $V_{\text{RMS}}=0.3\text{V}$, $f=1\text{MHz}$, between pin1 and pin3, pin2 and pin3

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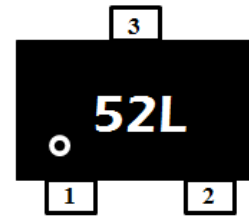
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Part Numbering System

BV E5 05 U 2 B
(1) (2) (3) (4) (5) (6)

- (1) Bencent Transient Voltage Suppressor
- (2) Package:SOT523
- (3) Working Voltage:5V
- (4) Low Capacitance
- (5) 2 Lines Protection
- (6) Bencent internal code

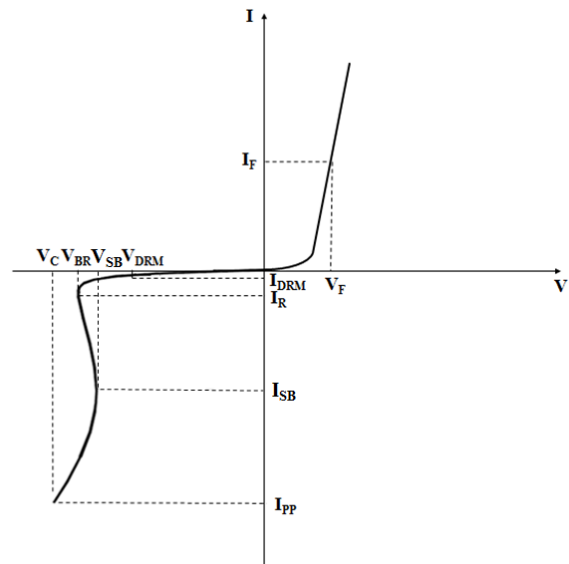
Mark



52L: Part Number

V-I Curve

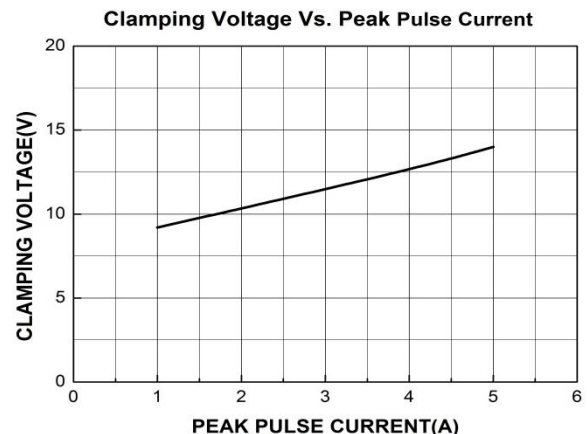
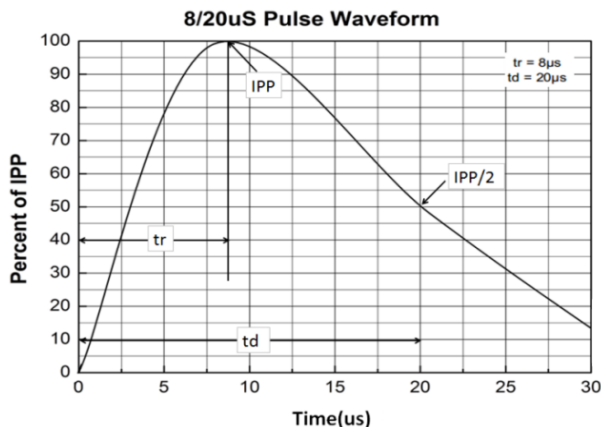
Parameters	Definition
V_C	Clamping Voltage
I_{PP}	Surge Waveform 8/20 μ s
V_{DRM}	Stand-off Voltage
V_{BR}	Breakdown Voltage
V_F	Forward Voltage
V_{SB}	Snapback voltage
I_{DRM}	Reverse Leakage Current
I_R	Test Current
I_F	Test Current
I_{SB}	Test current
P_{pp}	Peak Pulse Power Dissipation



Thermal Consideration

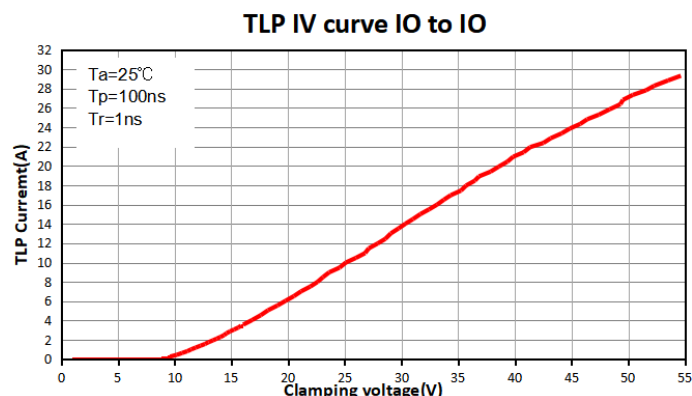
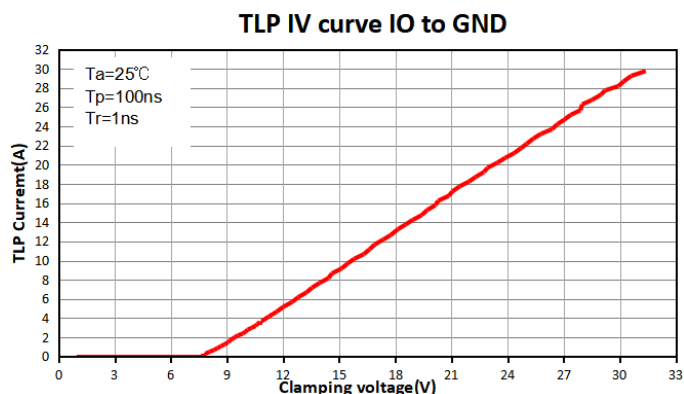
symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-55 to +125	°C
T_S	Storage Temperature Range	-55 to +125	°C

Typical Characteristics



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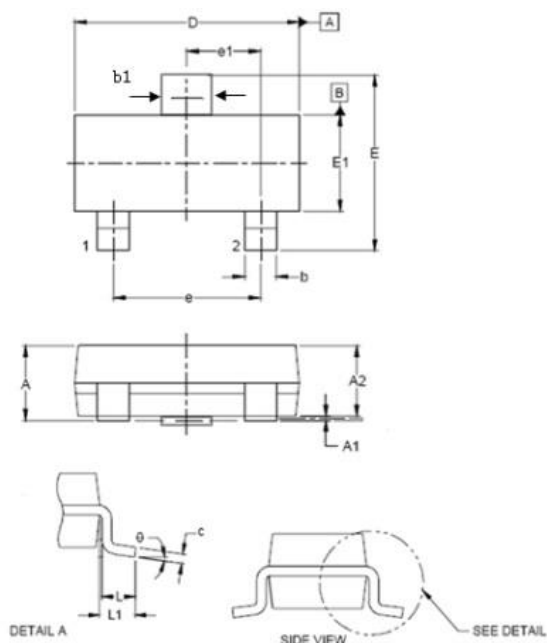


Environmental Characteristics

Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: 150±3℃ Bias=80%V _{DRM} Time:168H
High Temperature Life Test	Temperature: 150℃ Time:168H
High-low Temperature Cycle test	Temperature: From -55℃ to 125℃ Dwell time : 30min,10cycles
High Temperature &High Humidity Test	Temperature: 85℃Humidity:85% Time:168H
Pressure cooker Test	Temperature: 121℃, 2atm. Humidity:100% Time:24H
Resistance of soldering heat	Temperature: 260±5℃ Time of dip soldering: 10s, 3times

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

Product Dimensions

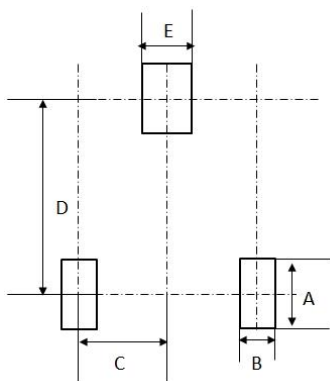


REF	mm	inch
A	0.60~0.90	0.024~0.035
A1	0.10MAX	0.004MAX
A2	0.70~0.80	0.028~0.031
b	0.10~0.30	0.004~0.012
b1	0.20~0.40	0.008~0.016
c	0.10~0.20	0.004~0.008
D	1.50~1.70	0.059~0.067
E	1.45~1.75	0.057~0.069
E1	0.70~0.90	0.028~0.035
L	0.20~0.45	0.008~0.018
L1	0.40REF	0.016REF
e	0.90~1.10	0.035~0.043
e1	0.5BSC	0.020BSC
θ	0° ~8°	

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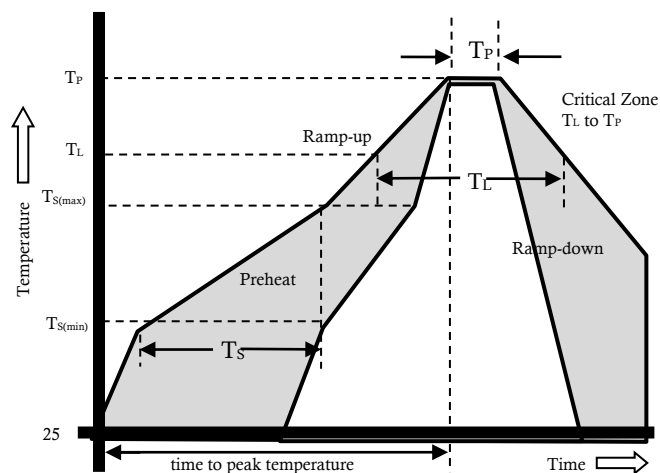
Recommended Soldering Pad



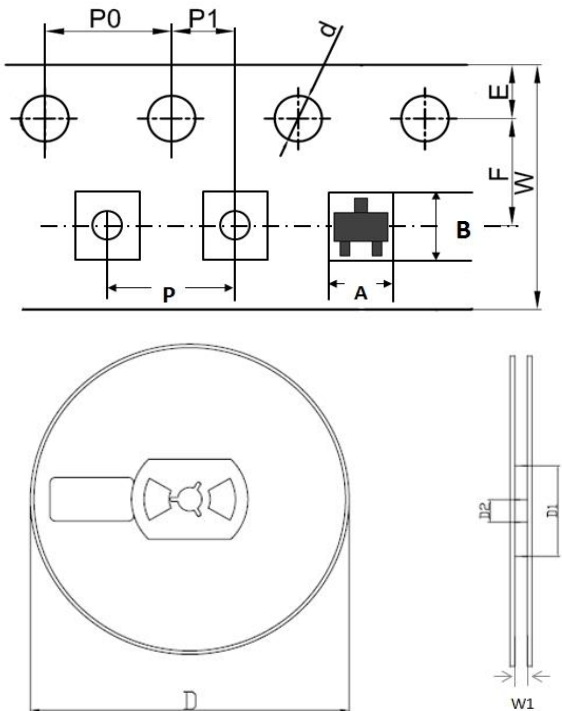
REF	mm	inch
A	0.8	0.031
B	0.4	0.016
C	0.5	0.020
D	1.4	0.055
E	0.5	0.020

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
T _{amp} (T _L) to peak		
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)		25secs
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	1.80+/-0.10	0.071+/-0.004
B	1.80+/-0.10	0.071+/-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	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	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