

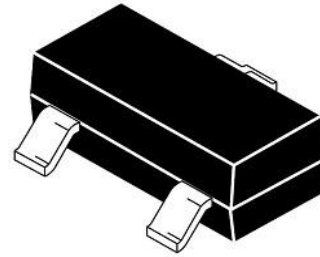
Transient Voltage Suppressor

Draft Version: A1 2023-03-22

Features

- IEC61000-4-2(ESD) $\pm 15\text{KV}$ (air), $\pm 8\text{KV}$ (Contact)
- IEC61000-4-4(EFT) 40A (5/50ns)
- IEC61000-4-5(Surge) 4A (8/20uS)
- 100 Watts peak pulse power per Line (tp=8/20 uS)
- Working Voltage: 5V
- 2 Lines Protection
- Low leakage current
- Moisture sensitivity level: Level 1
- Weight 3 mg

Exterior

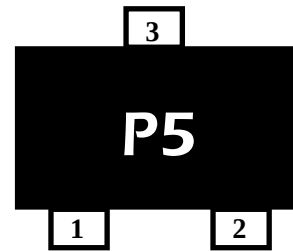


SOT-523

Application Information

- Cellular Handset & Accessories
- Battery, Power Lines
- Notebooks & Desktop Computers
- Keypads, Side keys, LCD Displays

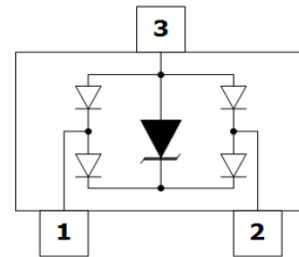
Package (top view)



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	$I_{\text{DRM}}@ V_{\text{DRM}}$		$V_{\text{BR}}^{①}@ I_{\text{R}}$		$V_{\text{c}}@I_{\text{pp}}^{②}$		$V_{\text{c}}@I_{\text{pp}}^{②}$		$R_{\text{DYN}}@ \text{TLP}^{③}$	$V_{\text{c}}@I_{\text{pp}} \text{TLP}^{③}$		$\text{CO}^{④}$
	μA	V	V	mA	V	A	V	A	Ω	V	A	pF
	MAX		MIN		MAX		MAX		TYP	TYP		MAX
BV-E505U2A	1	5	6	1	12	1	25	4	1.15	29	16	0.8

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

① V_{BR} is measured at $I_{\text{R}}=1\text{mA}$, Pin 1, 2 to 3

② Surge Waveform: 8/20 μS .

③ TLP parameter: $Z_0 = 50\Omega$, $t_{\text{p}} = 100\text{ns}$, $t_{\text{r}} = 1\text{ns}$, R_{DYN} is calculated from 4A to 16A, IO to GND

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

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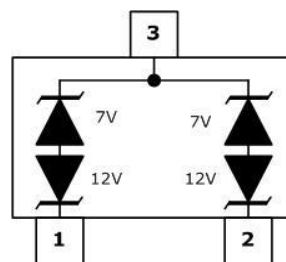
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Part Numbering System

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

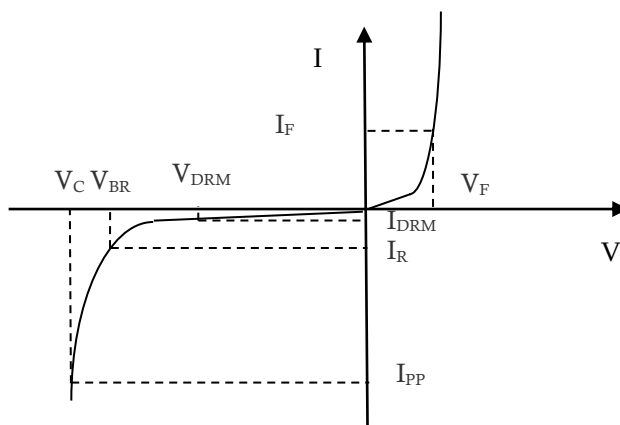
- (1) Bencent Transient Voltage Suppressor
- (2) Package:SOT523
- (3) Working Voltage:5V
- (4) Low Capacitance
- (5) 2 Lines Protection
- (6) Bencent internal code

Mark



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
V_F	Forward on-state voltage
I_F	Forward current
P_{pp}	Peak Pulse Power Dissipation

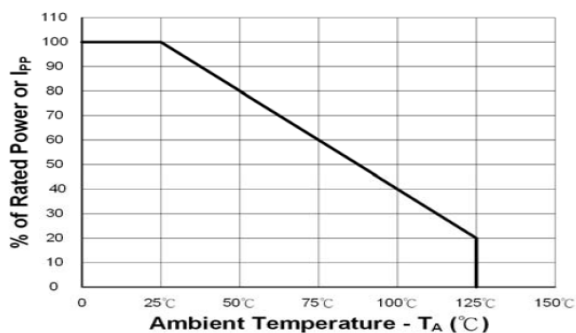


Thermal Consideration

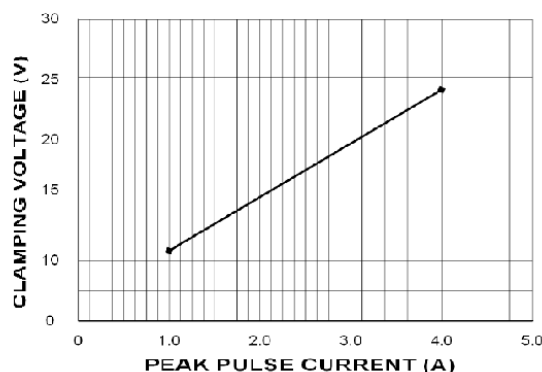
symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-40 to +125	°C
T_S	Storage Temperature Range	-55 to +150	°C

Typical Characteristics

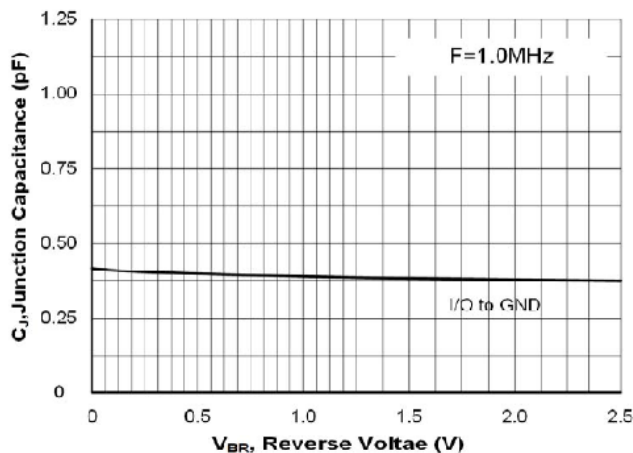
Power Derating Curve



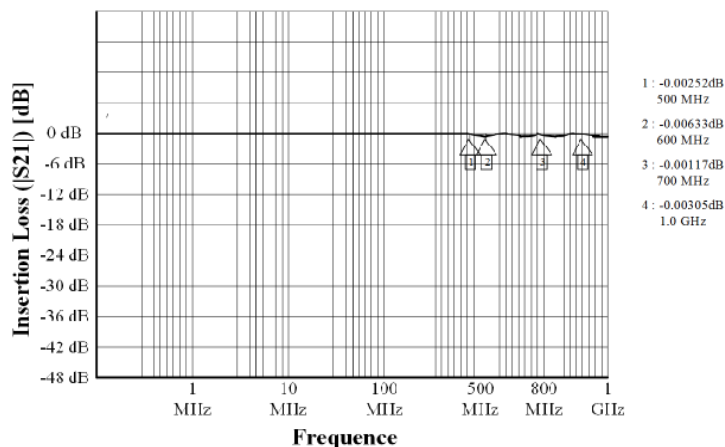
Clamping Voltage vs. Peak Pulse Current (tp=8/20us)



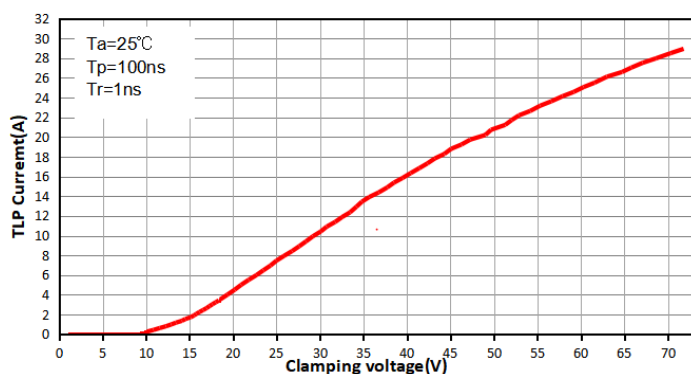
Typic Capacitance vs. Reverse Voltage



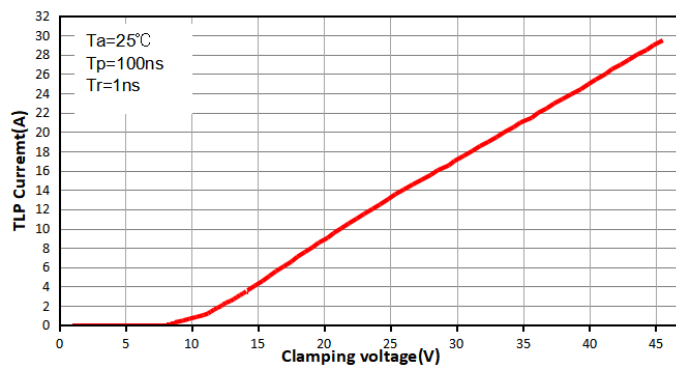
Insertion Loss (S21)



TLP IV curve IO to IO



TLP IV curve IO to GND



Environmental Characteristics

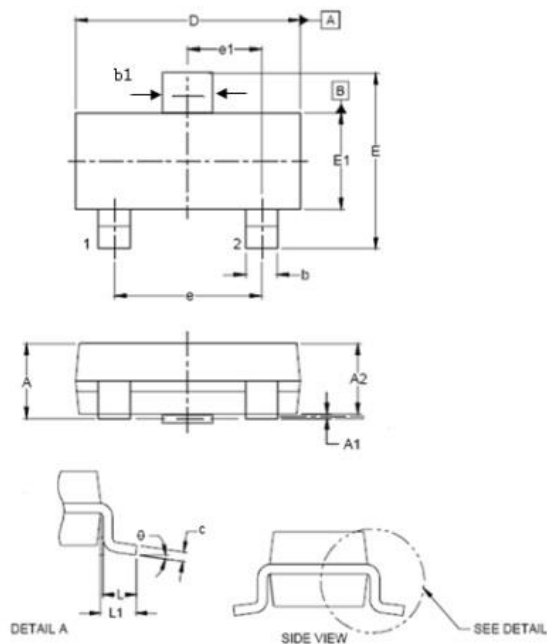
Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: 150±3℃ Bias=80%V _{DRM} Time:168H
High Temperature Life Test	Temperature: 150℃ Time:168H
High-low Temperature Cycle test	Temperature: From -40℃ to125℃ Dwell time: 30min,10cycles
High Temperature &High Humidity Test	Temperature: 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

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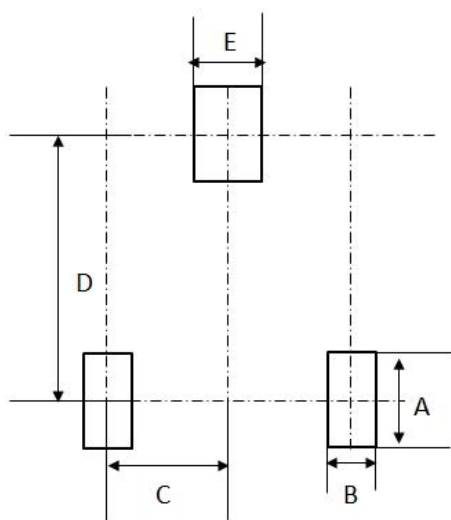
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Product Dimensions



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°	

Recommended Soldering



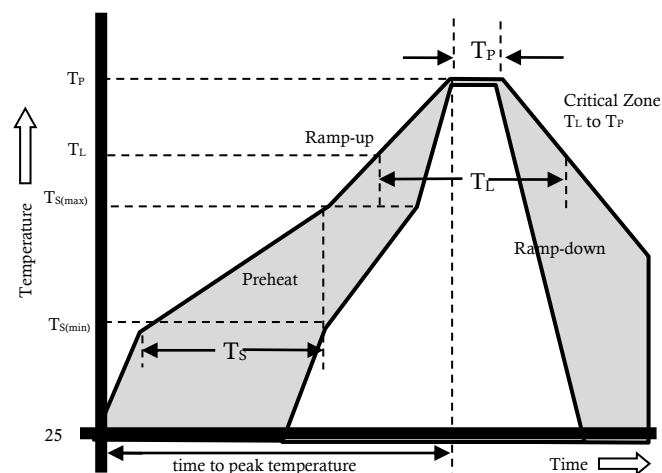
REF	mm	inch
A	0.8	0.031
B	0.4	0.016
C	0.5	0.020
D	1.4	0.055
E	0.5	0.020

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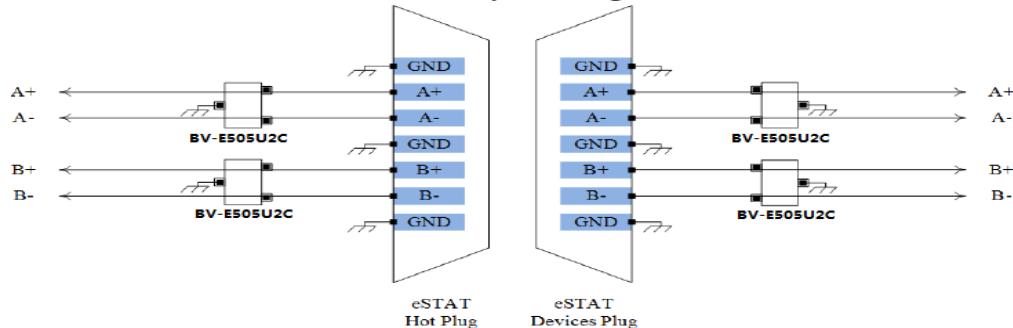
Reflow Profile

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)		25secs
Ramp-down Rate		6°C/s max
Time 25°C to peak Temperature (T _P)		8 mins Max.
Do not exceed		260°C

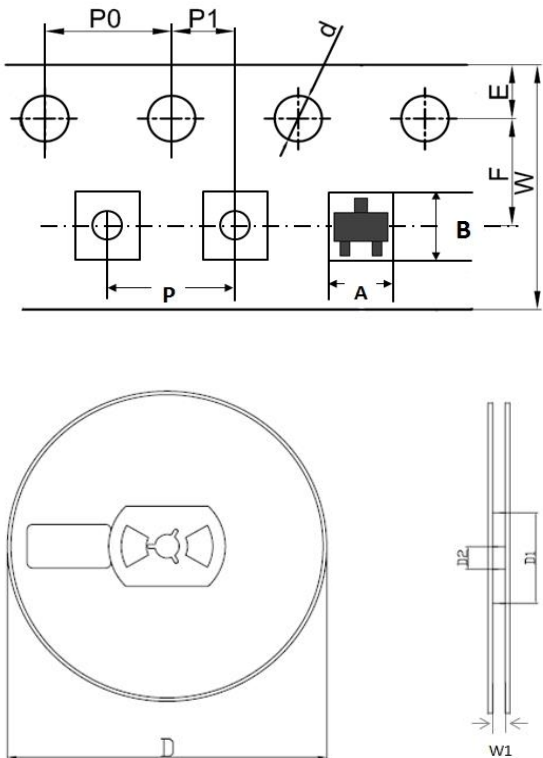


Layout Diagram

eSTAT Layout Diagram



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