

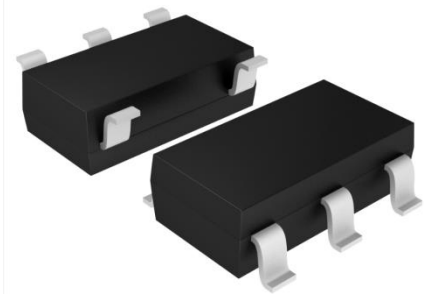
## Thyristor Surge Suppressor

Version: A1 2024-3-11

### Features

- Small package (SOT23-5)
- Low Capacitance (<10pF)
- Excellent capability of absorbing transient surge
- Weight:15mg
- Non degenerative
- Bi-directional
- 

### Exterior

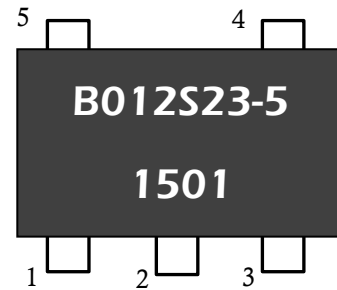


SOT23-5

### Application Information

- xDSL

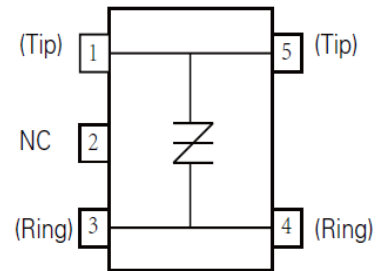
### Package (top view)



### Agency Approvals

Icon	Description
<b>RoHS</b>	Compliance with 2011/65/EU

### Schematic Symbol



### Part Number and Electrical Parameter

Part Number	IDRM@VDRM		VS <sup>①</sup> @ Is		VT@ IT		IH	Co <sup>②</sup>
	μA	V	V	mA	V	A	mA	pF
	MAX		MAX		MAX		MIN	MAX
BS0120S23-5	5	12	20	500	4	2.2	20	10

Absolute maximum ratings measured at TA= 25°C RH = 45%-75% (unless otherwise noted).

①Vs is measured at 100KV/S

② Off-state Capacitance is measured at VDC=2V, VRMS=1V, f=1MHz

## Thyristor Surge Suppressor

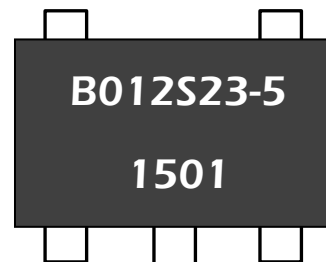
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### Part Numbering System

BS 0120 S23-5  
(1) (2) (3)

- (1)Bencent Semiconductor Surge Arrester  
(2)Off-state Voltage,e.g.0120=12×10<sup>0</sup>=12V  
(3) Package: SOT23-5

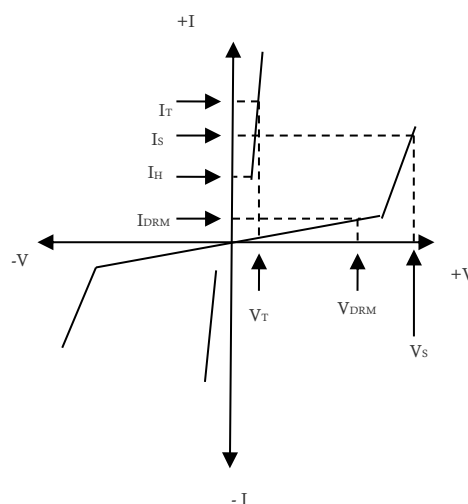
### Mark



B012S23-5: Part Number  
1501: January, 2015

### V-I Curve

Parameters	Definition
V <sub>DRM</sub>	Peak Off-state Voltage
I <sub>DRM</sub>	Off-state Current
V <sub>S</sub>	Switching Voltage
I <sub>S</sub>	Switching Current
I <sub>H</sub>	Holding Current
V <sub>T</sub>	On-state Voltage
I <sub>T</sub>	On-state Current
C <sub>o</sub>	Off-state Capacitance



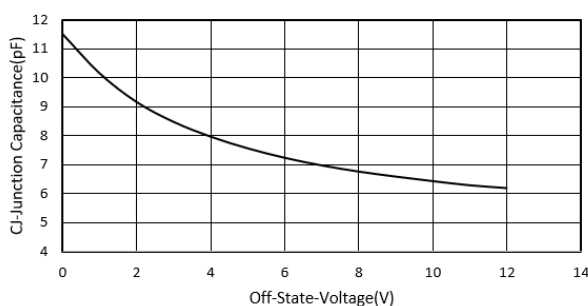
### Surge Ratings

Current Waveform	8/20μs
Voltage Waveform	1.2/50μs
I <sub>pp</sub>	50A

- Peak pulse current rating (I<sub>PP</sub>)is repetitive and guaranteed for the life of the product;
- Bencent only makes the test for 8/20μs @50A(1.2/50μs 2Ω100V).

### Typical Characteristics

Capacitance VS Off-State-Voltage



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### Thermal Considerations

Symbol	Parameter	Value	Unit
$T_J$	Operating Junction Temperature Range	-40 to +125	°C
$T_S$	Storage Temperature Range	-60 to +125	°C

### Physical Characteristics

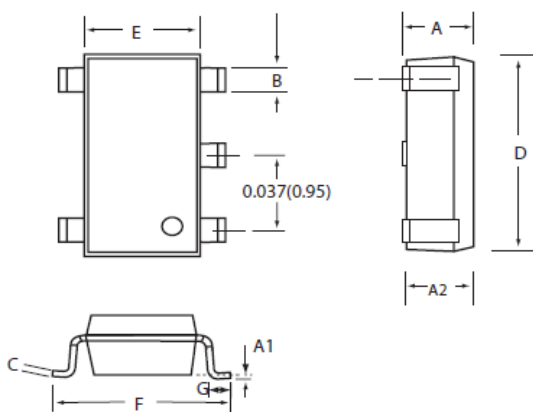
Lead Material	Copper Alloy
Body Material	UL recognized epoxy meeting flammability classification 94V-0
Terminal Finish	100% Matte-Tin Plated

### Environmental Characteristics

Testing Items	Technical Standards
High Temperature Reverse Bias Test	Temperature: $150 \pm 3^\circ\text{C}$ , Bias= $80\%V_{\text{DRM}}$ Time:168H
High Temperature Life Test	Temperature: $150^\circ\text{C}$ Time:168H
High-low Temperature Cycle Test	Temperature:From $-40^\circ\text{C}$ to $125^\circ\text{C}$ Dwell time: 30min, 10-100 cycles
High Temperature &High Humidity Test	Temperature: $85^\circ\text{C}$ Humidity:60% Test time:168H
Pressure Cooker Test	Temperature: $121^\circ\text{C}$ , 2atm. Humidity:100% Test time: 24H to 168H
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 customers by contacting Bencent service

### Product Dimensions



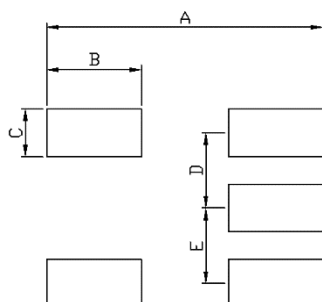
SOT23-5

REF.	mm	inch
A	0.90-1.45	0.035-0.057
B	0.35-0.50	0.014-0.020
C	0.09-0.20	0.004-0.008
D	2.80-3.20	0.110-0.126
E	1.50-1.75	0.059-0.069
F	2.60-3.00	0.102-0.118
G	0.10-0.60	0.004-0.024
A1	0.00-0.10	0.000-0.004
A2	0.90-1.30	0.035-0.051

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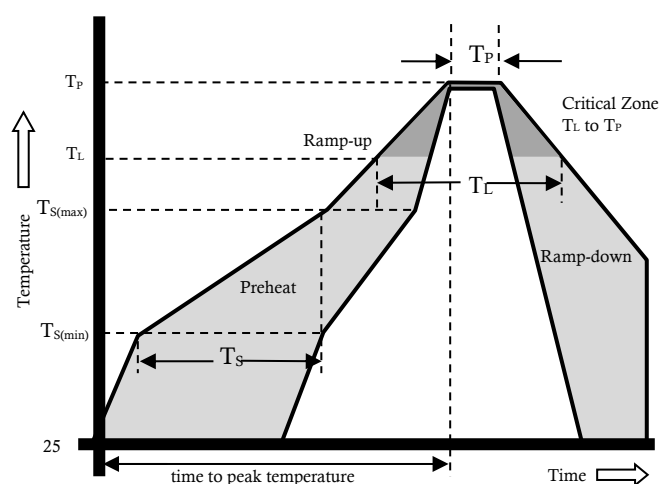
### Recommended Soldering Pad



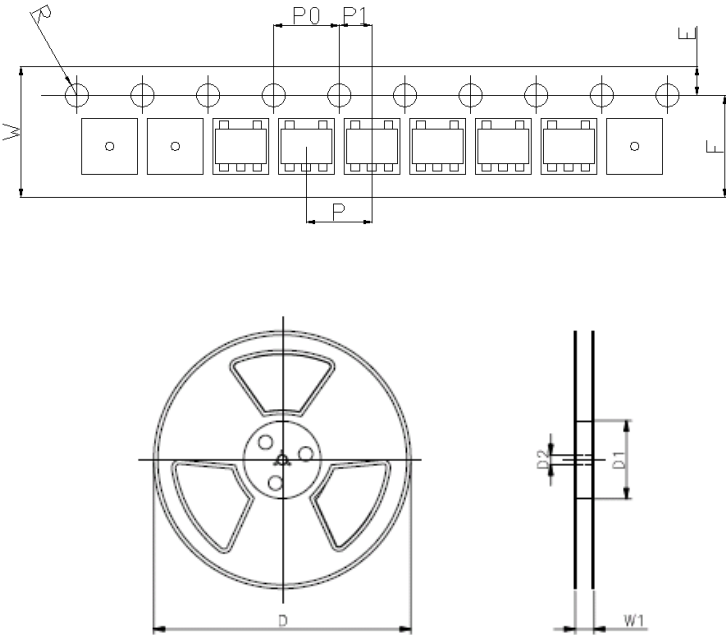
REF	mm	inch
A	3.50	0.138
B	1.20	0.047
C	0.60	0.024
D	0.95	0.037
E	0.95	0.037

### 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(Liquidus Temp( $T_L$ ) to peak)		3°C/sec. Max.
$T_{S(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max.
Reflow	- Temperature ( $T_L$ ) (Liquidus)	+217°C
	- Temperature ( $T_L$ )	60 – 150 secs.
Peak Temp ( $T_P$ )		+(260+0/-5)°C
Time within 5°C of actual Peak Temp ( $T_P$ )		30secs.
Ramp-down Rate		6°C/sec. Max.
Time 25°C to peak Temp ( $T_P$ )		8 min. Max.
Do not exceed		+260°C



Package Reel Information



REF	mm	inch
R	0.75+/-0.05	0.029+/-0.002
D	178.0	7.0
D1	60+/-3	2.362+/-0.118
D2	13+/-0.3	0.512+/-0.012
E	1.75+/-0.2	0.069+/-0.008
F	6.25+/-0.2	0.246+/-0.008
P	4.0+/-0.2	0.157+/-0.008
P0	4.0+/-0.2	0.157+/-0.008
P1	2.0+/-0.2	0.079+/-0.008
W	8.0+/-0.2	0.315+/-0.008
W1	8.4+/-0.5	0.331+/-0.020

Outline	Reel (pcs)	Per Carton (pcs)	Reel Diameters (mm)	Carton Size(mm)		
				L	W	H
Taping	3000	90,000	177	380	220	205