

Thyristor Surge Suppressor

Version: A2 2021-05-26

Features

- High surge level, 10/1000uS 200A
- Quick response to surge voltage (nS Level)
- Eliminates overvoltage caused by fast rising transients
- Moisture sensitivity level: level 1
- Weight: 104mg
- Non degenerative
- Bi-directional

Exterior



SMB-F

Application Information

- Ethernet

Package (top view)



Agency Approvals

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

Schematic Symbol



Part Number and Electrical Parameter

Part Number	IDRM@VDRM		Vs ^① @ Is		VT@ IT		IH	Co ^②
	μA	V	V	mA	V	A	mA	pF
	MAX		MAX		MAX		MIN	MAX
BS3100N-E-F	5	275	350	800	4	2.2	50	100

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

① Vs is measured at 100KV/S

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

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Part Numbering System

BS 3100 N E -F
(1) (2) (3) (4) (5)

- (1) Bencent Semiconductor Surge Arrester
- (2) Off-state Voltage, e.g. $3100=310 \times 100=310V$
- (3) Package: SMB-F
- (4) Rating Surge Voltage: 200A (10/1000 μ s)
- (5) Flat feet

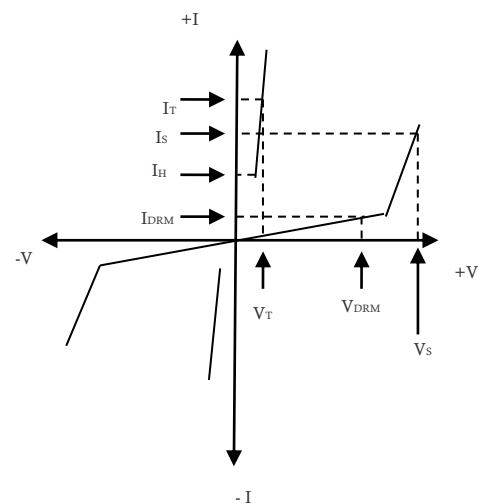
Mark



B31NE: Part Number
1312: December, 2013

V-I Curve

Parameters	Definition
V_{DRM}	Peak Off-state Voltage
I_{DRM}	Off-state Current
V_S	Switching Voltage
I_S	Switching Current
I_H	Holding Current
V_T	On-state Voltage
I_T	On-state Current
C_o	Off-state Capacitance



Surge Ratings

Current Waveform	8/20 μ s	5/320 μ s	10/1000 μ s
Voltage Waveform	1.2/50 μ s	10/700 μ s	10/1000 μ s
I_{pp}	800A	350A	200A

-Peak pulse current rating (I_{PP}) is repetitive and guaranteed for the life of the product;

-Bencent makes the test for 10/1000 μ s@200A, but for other IPP value derived from experience is just for reference only. Bencent will not take any obligation for these parameters, so before applying our parts, please make sure to verify the parameters listed in the above table.

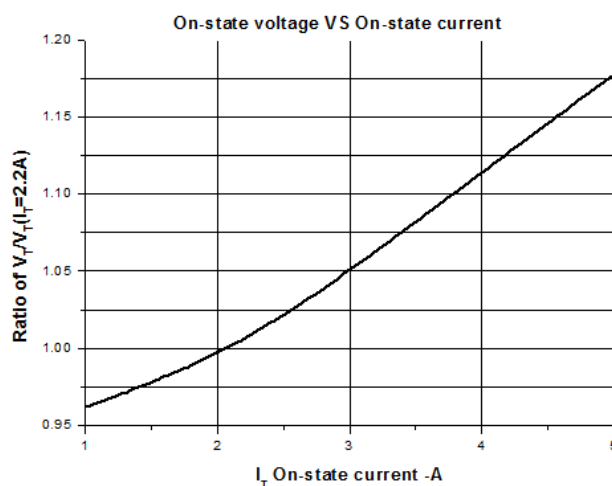
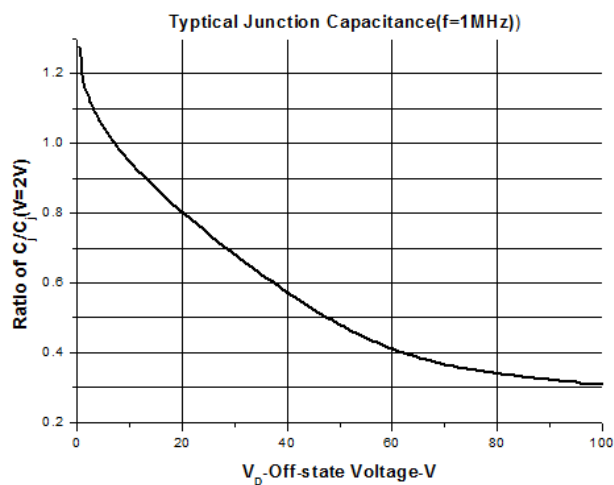
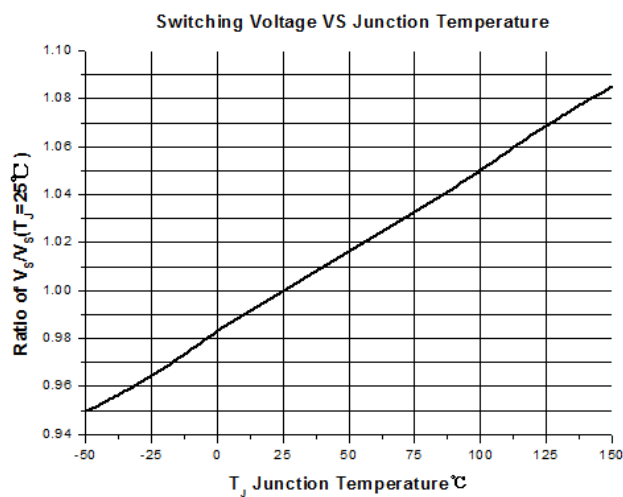
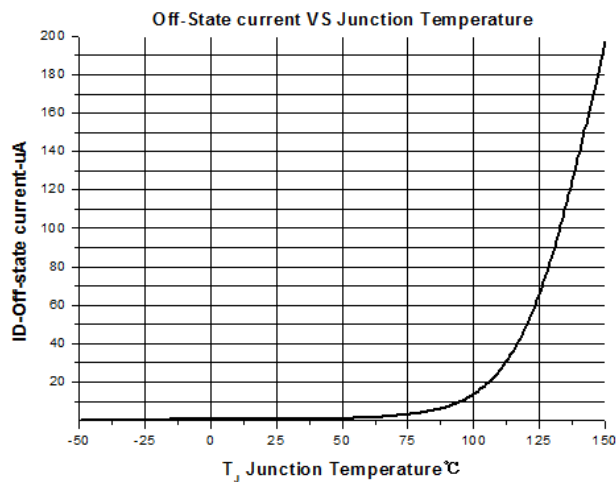
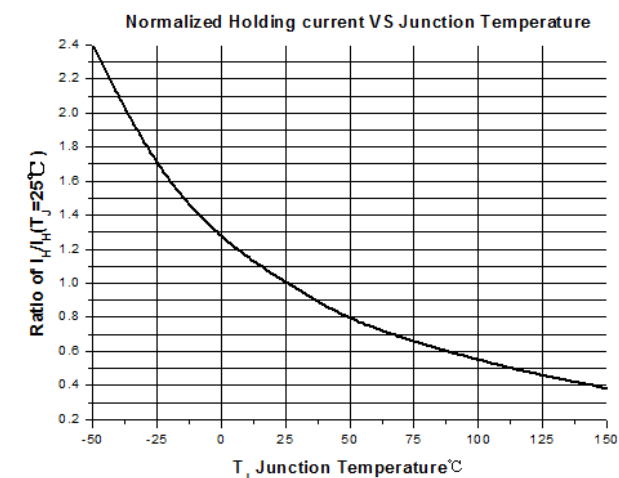
Thermal Considerations

Symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-40 to +150	$^{\circ}C$
T_S	Storage Temperature Range	-60 to +150	$^{\circ}C$

Physical Characteristics

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

Typical Characteristics



Thyristor Surge Suppressor

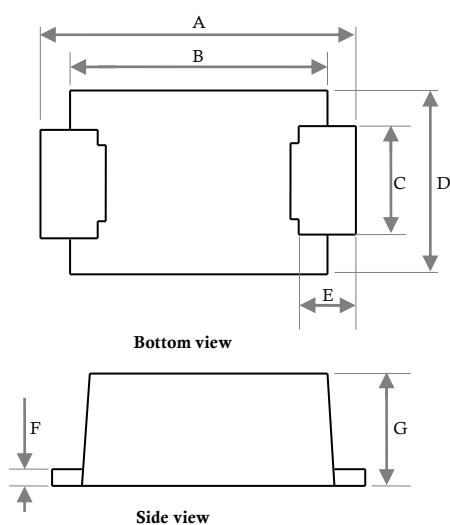
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Environmental Characteristics

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, 10-100 cycles
High Temperature & High Humidity Test	Temperature: 85°C Humidity: 85% Test time: 168H
HAST	Temperature: 130°C (dry bulb), 124.7°C (wet bulb), 2atm. Humidity: 85% Test time: 96H
Resistance of Soldering Heat	Temperature: $260\pm 5^{\circ}\text{C}$ Time of dip soldering: 10s, 3times

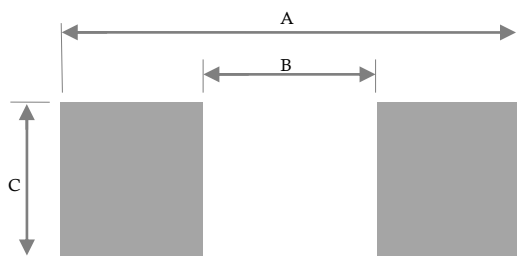
Note: The above testing items can be specified by customers by contacting Bencent service

Product Dimensions



REF	mm	inch
A	5.4 ± 0.3	0.213 ± 0.012
B	4.4 ± 0.2	0.173 ± 0.008
C	2.0 ± 0.1	0.079 ± 0.004
D	3.3 ± 0.3	0.130 ± 0.012
E	0.8 ± 0.3	0.032 ± 0.012
F	0.25 ± 0.05	0.010 ± 0.002
G	2 ± 0.3	0.079 ± 0.012

Recommended Soldering Pad



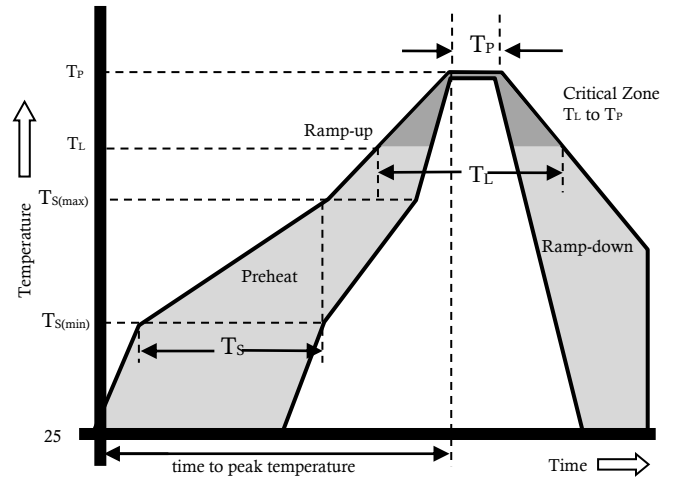
REF	mm	inch
A	6.58	0.252
B	3.40	0.134
C	2.75	0.108

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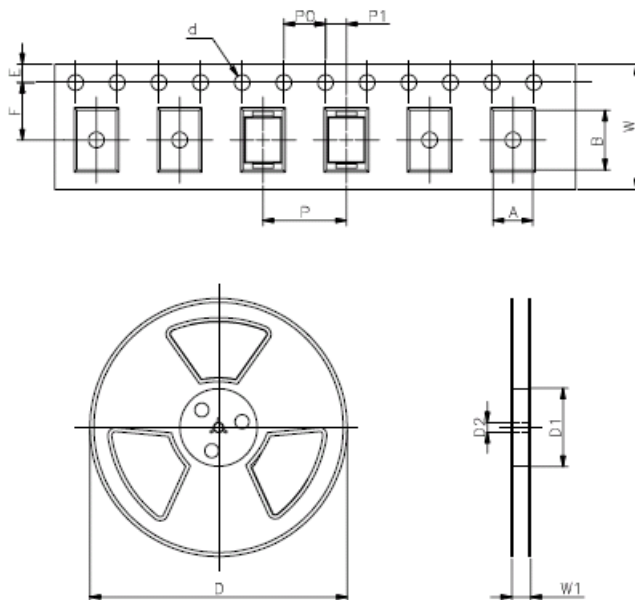
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Reflow Profile

Reflow Condition		Pb-Free Assembly
Pre Heat	Temperature Min.	+150°C
	Temperature Max.	+200°C
	Time (Min to Max)	60 – 180 sec.
Average ramp up rate (Liquid) T _{amp} (T _L) to peak		3°C/sec. Max.
Ts(max) to T _L - Ramp-up Rate		3°C/sec. Max.
Reflow	- Temperature (T _L) (Liquid)	+217°C
	- Temperature (T _L)	60 – 150 sec.
Peak Temp (T _P)		+(260+0/-5) °C
Time within 5°C of actual Peak Temp (T _P)		30 sec.
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
A	3.65+/-0.3	0.144+/-0.012
B	5.69+/-0.3	0.244+/-0.012
d	1.5+/-0.1	0.059+/-0.004
D	330.0	13.0
D1	100+/-3	3.937+/-0.118
D2	13+/-0.3	0.512+/-0.012
E	1.5+/-0.2	0.059+/-0.008
F	5.65+/-0.2	0.222+/-0.008
P	8.0+/-0.2	0.315+/-0.008
P0	4.0+/-0.2	0.157+/-0.008
P1	2.0+/-0.2	0.079+/-0.008
W	12.0+/-0.2	0.472+/-0.008
W1	16.8+/-2.0	0.661+/-0.079

Outline	Reel (pcs)	Per Carton (pcs)	Reel Diameters (mm)	Carton Size(mm)		
				L	W	H
Taping	3,000	48,000	330	360	360	385