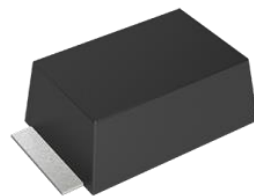


Thyristor Surge Suppressor

Features

- Excellent capability of absorbing transient surge
- Quick response to surge voltage (nS Level)
- Eliminates overvoltage caused by fast rising transients
- Moisture sensitivity level: level 1
- Weight: 87mg
- Non degenerative
- Bi-directional

Exterior



SMB-F

Application Information

- SLIC
- 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 |
| BS1300N-C-F | 5 | 120 | 160 | 800 | 4 | 2.2 | 120 | 85 |

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

① Vs is measured at 100KV/S.

② Off-state Capacitance is measured at V_{DC}=2V, V_{RMS}=1V, f=1MHz.

Thyristor Surge Suppressor

Part Numbering System

| | | | | |
|-----|------|-----|-----|-----|
| BS | 1300 | N | C | F |
| (1) | (2) | (3) | (4) | (5) |

- (1) Bencent Semiconductor Surge Arrester
- (2) Off-state Voltage, e.g.: 1300=130×10⁰=130V
- (3) Package: SMB-F
- (4) Rating Surge Voltage: 6KV (10/700μs)
- (5) Flat Feet

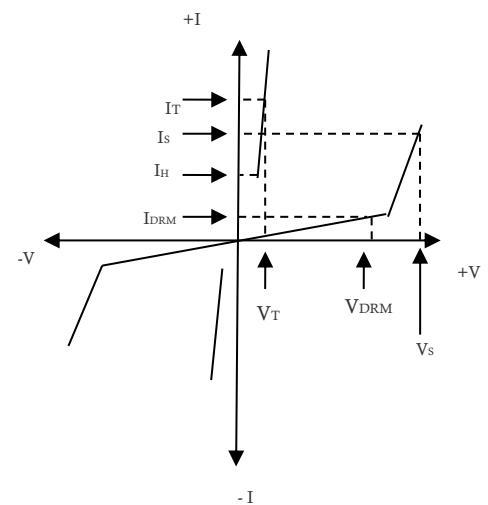
Mark



B13NC: Part Number
1704: April, 2017

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 | 8/20μs | 5/320μs |
| Voltage Waveform | 1.2/50μs | 10/700μs |
| I _{pp} | 400 | 150 |

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

-Bencent only makes the test for 5/320μs @150A (10/700μs@6KV), 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

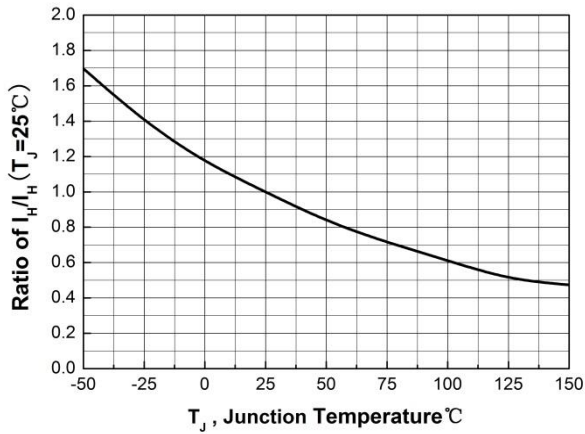
| symbol | Parameter | Value | Unit |
|----------------|--------------------------------------|-------------|------|
| T _J | Operating Junction Temperature Range | -40 to +150 | °C |
| T _S | Storage Temperature Range | -60 to +150 | °C |

Physical Characteristics

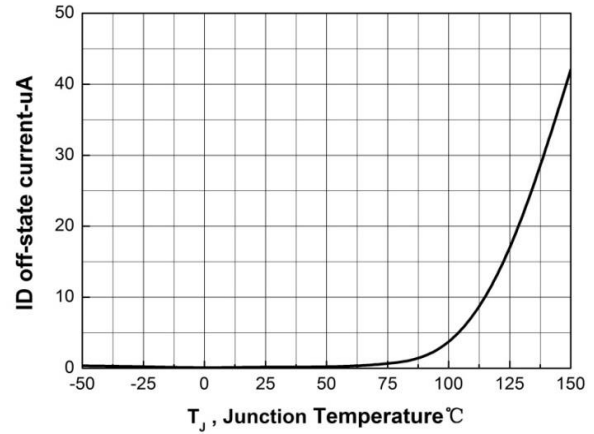
| | |
|-----------------|---|
| Lead Material | Copper Alloy |
| Body Material | UL recognized epoxy meeting flammability classification 94V-0 |
| Terminal Finish | 100% Matte-Tin Plated |

Typical Characteristics

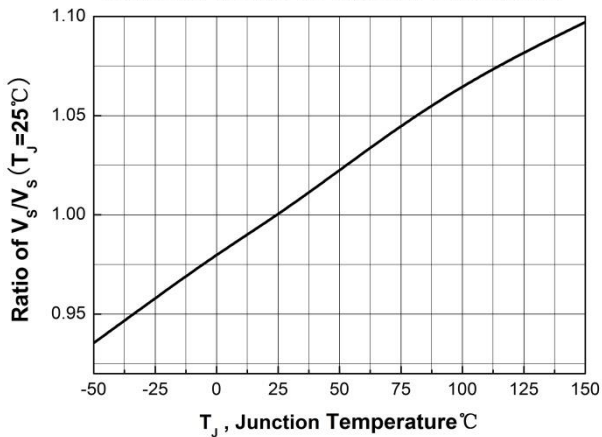
Normalized holding current VS Junction Temperature



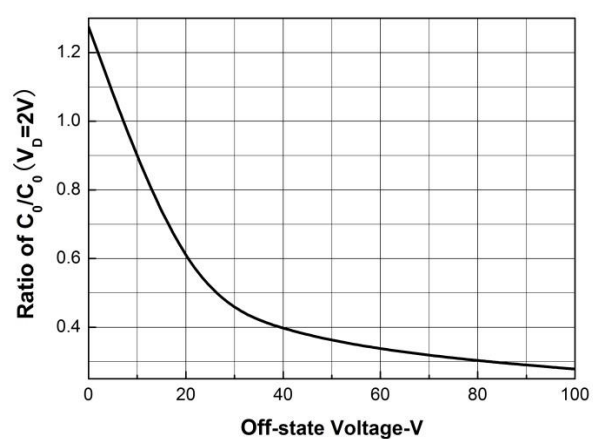
Off-state current VS Junction Temperature



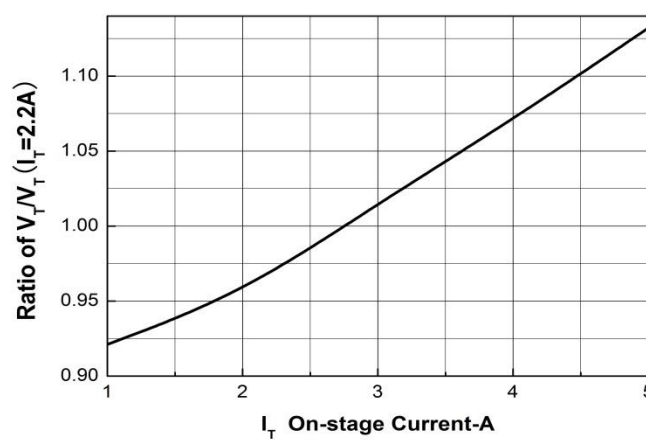
Switching Voltage VS Junction Temperature



Capacitance Normalized VS Off-stage Voltage(f=1MHZ)



On-state Voltage VS On-stage current

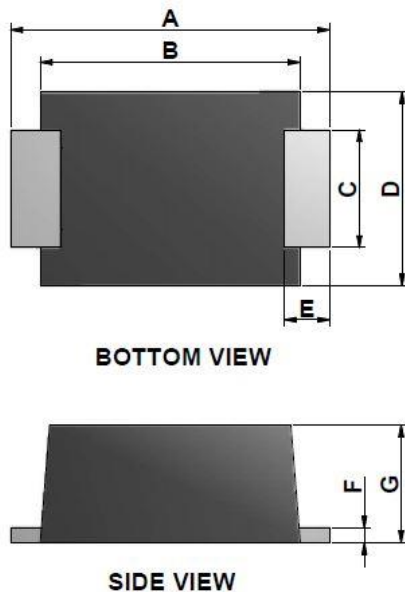


Environmental Characteristics

| 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 |
| Pressure Cooker Test | Temperature: 121°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 |

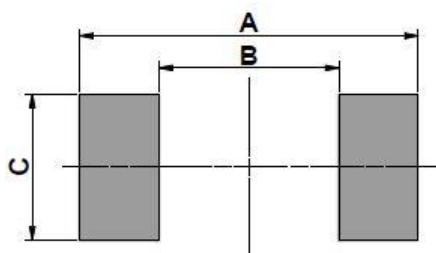
Note: The above testing items can be specified by customers by contacting Bencent service

Product Dimensions



| 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 | 0.031 ± 0.012 |
| F | 0.25 ± 0.05 | 0.010 ± 0.002 |
| G | 2 ± 0.3 | 0.079 ± 0.012 |

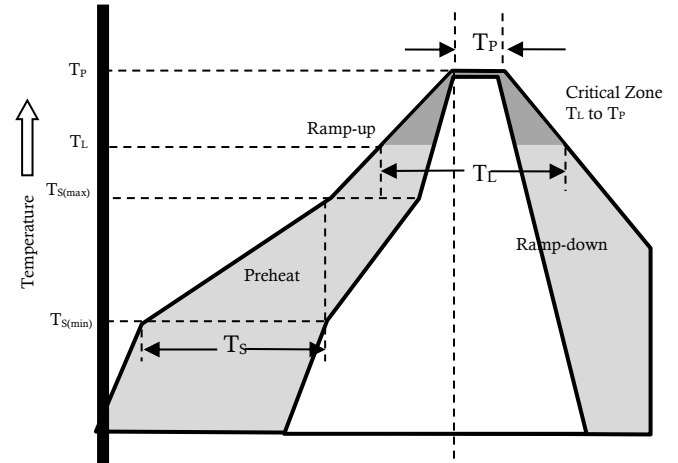
Recommended Soldering Pad



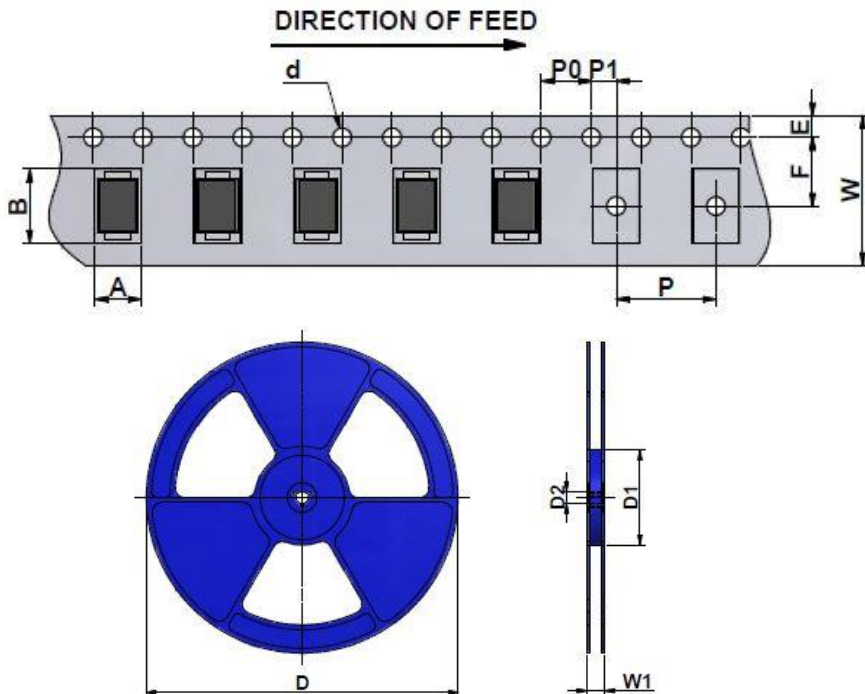
| REF | mm | inch |
|-----|------|-------|
| A | 6.4 | 0.252 |
| B | 3.4 | 0.134 |
| C | 2.75 | 0.108 |

Reflow Profile

| Reflow Condition | | Pb-Free assembly |
|---|----------------------------------|------------------|
| Pre Heat | Temperature Min | 150°C |
| | Temperature Max | 200°C |
| | Time (min to max) | 60 – 180 seconds |
| Average ramp up rate (Liquid) T_{amp} (T_L) to peak | | 3°C/second max |
| TS (max) to TL - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature (T_L) (Liquid) | 217°C |
| | - Temperature (T_L) | 60 – 150 seconds |
| Peak Temperature (T_P) | | 260 +0/-5 °C |
| Time within 5°C of actual peak Temperature (T_P) | | 8-15 seconds |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature (T_P) | | 8 minutes Max. |
| Do not exceed | | 260°C |



Package Reel Information



| REF | mm | inch |
|-----|----------|-------------|
| A | 3.9±0.2 | 0.154±0.008 |
| B | 5.8±0.2 | 0.228±0.008 |
| 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 | 1.75±0.2 | 0.069±0.008 |
| F | 5.5±0.25 | 0.217±0.010 |
| 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 |

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