Thyristor Surge Suppresser

Version: A0 2019/5/27

## 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
- Non degenerative
- Bi-directional
- Surge rating:4KV@10/700us

## Exterior


SMA

## 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 | $I_{DRM}$@ $V_{DRM}$ | | $V_S$①@ $I_S$ | | $V_T$@ $I_T$ | | $I_H$ | $C_O$② |
|---|---|---|---|---|---|---|---|---|
| | μA | V | V | mA | V | A | mA | pF |
| | MAX | | MAX | | MAX | | MIN | MAX |
| BS4000M | 5 | 400 | 520 | 800 | 4 | 2.2 | 15 | 50 |

Absolute maximum ratings measured at $T_A$= 25ºC 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

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## Part Numbering System

| BS | 4000 | M |
|---|---|---|
| (1) | (2) | (3) |

(1) Bencent Semiconductor Surge Arrester

(2) Product code

(3) Package: SMA

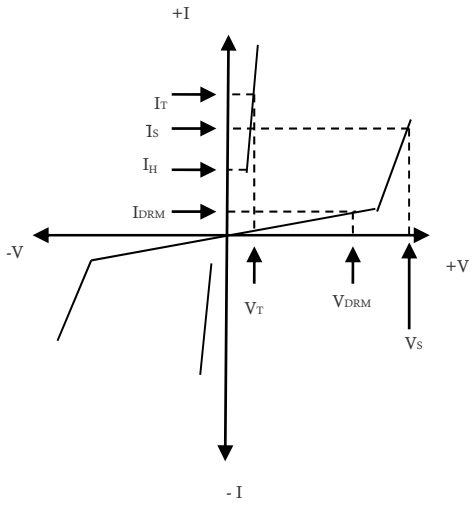
## Mark


B40NB: Part Number

1904: April, 2019

## 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 | 5/320μs* |
|---|---|
| Voltage Waveform | 10/700μs* |
| Ipp | 100A |

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

-Bencent only makes the test for 5/320μs@100A* (10/700μs@4KV).

## Thermal Considerations

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $T_J$ | Operating Junction Temperature Range | -40 to +125 | ℃ |
| $T_S$ | Storage Temperature Range | -40 to +150 | ℃ |

## Physical Characteristics

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

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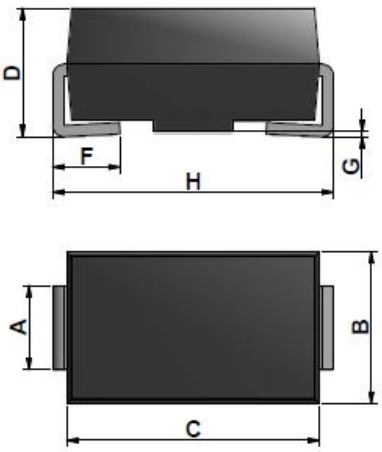
## Environmental Characteristics

| Testing Items | Technical Standards |
|---|---|
| High Temperature Reverse Bias Test | Temperature: 125±3℃, Bias=80%$V_{DRM}$<br>Time: 168H |
| High Temperature Life Test | Temperature: 150℃<br>Time: 168H |
| High-low Temperature Cycle Test | Temperature: From -40℃ to125℃<br>Dwell time: 30min, 100 cycles |
| High Temperature &High Humidity Test | Temperature: 85℃ Humidity: 85%<br>Test time: 168H |
| Pressure Cooker Test | Temperature: 121℃, 2atm. Humidity: 100%<br>Test time: 24H |
| Resistance of Soldering Heat | Temperature: 260±5℃<br>Time of dip soldering: 10s, 3times |

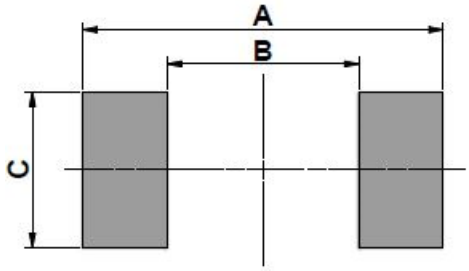
Note: The above testing items can be specified by customers by contacting Bencent service

## Product Dimensions




| REF. | mm | inch |
|---|---|---|
| A | 1.5±0.2 | 0.059±0.008 |
| B | 2.7±0.4 | 0.106±0.016 |
| C | 4.4±0.4 | 0.173±0.016 |
| D | 2~2.50 | 0.079~0.098 |
| F | 1.2±0.5 | 0.047±0.020 |
| G | 0~0.5 | 0~0.020 |
| H | 5±0.4 | 0.197±0.016 |

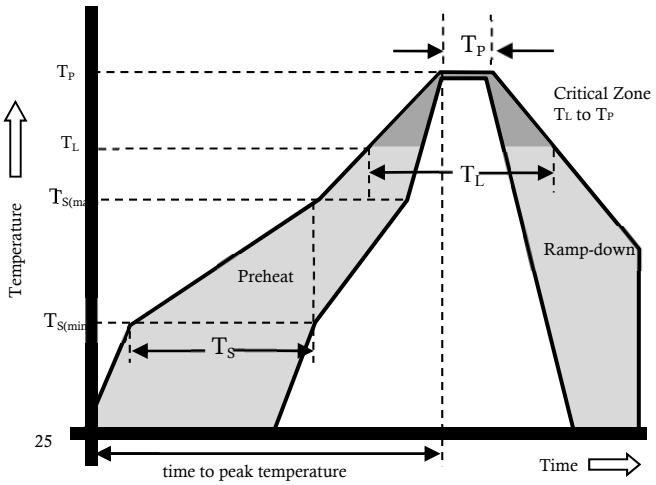
## Recommended Soldering Pad



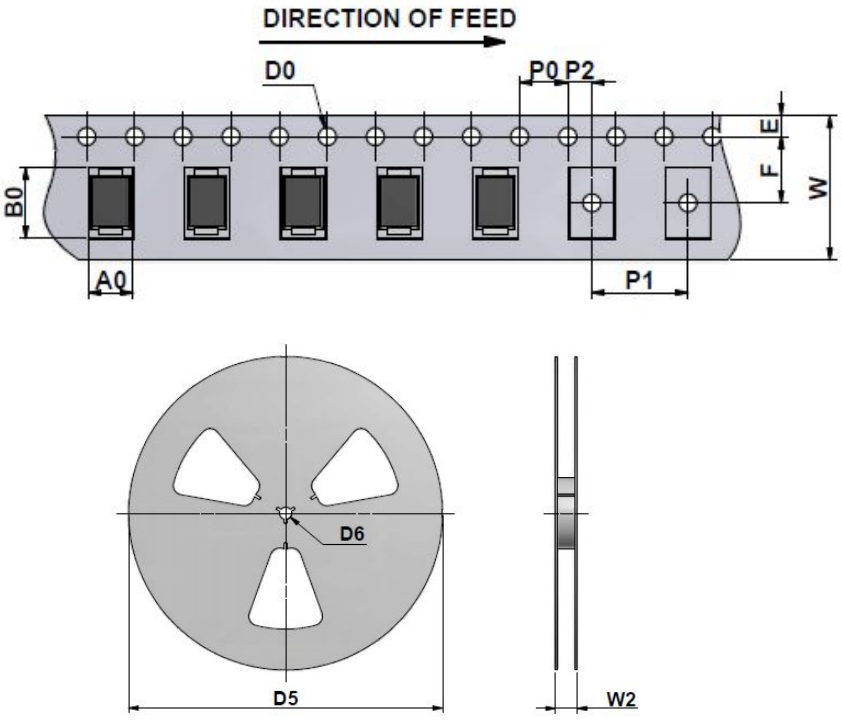

| REF | mm | inch |
|---|---|---|
| A | 6 | 0.236 |
| B | 2 | 0.079 |
| C | 2 | 0.079 |

## 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 (Liquidus Temp ($T_L$) to peak) | | 3°C/second max |
| $T_{S(max)}$ to $T_L$ - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature ($T_L$) (Liquidus) | 217°C |
| | - Temperature ($T_L$) | 60 – 150 seconds |
| Peak Temp ($T_P$) | | 260+0/-5 °C |
| Time within 5°C of actual Peak Temp ($T_P$) | | 8-15 seconds |
| Ramp-down Rate | | 6°C/s max |
| Time 25°C to peak Temp ($T_P$) | | 8 min max. |
| Do not exceed | | 260°C |




## Package Reel Information




| REF. | mm | inch |
|---|---|---|
| W | 12±1 | 0.472±0.039 |
| E | 1.75±0.4 | 0.069±0.016 |
| F | 5.5±0.4 | 0.217±0.016 |
| D0 | 1.5±0.2 | 0.059±0.008 |
| P0 | 4.0±0.3 | 0.157±0.012 |
| P1 | 4.0±0.3 | 0.157±0.012 |
| P2 | 2.0±0.3 | 0.079±0.012 |
| A0 | 2.85±0.4 | 0.112±0.016 |
| B0 | 5.4±0.4 | 0.213±0.016 |
| D5 | Ø330 | Ø13 |
| D6 | Ø13.5±1.0 | Ø0.531±0.039 |
| W2 | 18±2.0 | 0.709±0.079 |

| Outline | Reel (pcs) | Per Carton (pcs) | Reel Diameters (mm) | Carton Size(mm) | | |
|---|---|---|---|---|---|---|
| | | | | L | W | H |
| Taping | 5,000 | 80,000 | 330 | 360 | 360 | 385 |