

## Transient Voltage Suppressor

### Features

- IEC 61000-4-2(ESD)±20KV(air), ±15KV(contact)
- IEC61000-4-5(Lightning) 3.5A (8/20μS)
- 175 Watts peak pulse power (tp=8/20μS)
- Low operating voltage and low clamping
- Moisture sensitivity level: Level 1
- Small package: SOD523

### Exterior



SOD523

### Application information

- Signal: VGA, Audio, Reset
- Control signal port

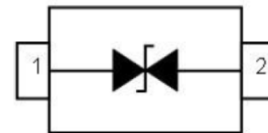
### Package (top view)



### Agency Approvals

| Icon                                                                                | Description                        |
|-------------------------------------------------------------------------------------|------------------------------------|
| <b>RoHS</b>                                                                         | Compliance with 2011/65/EU         |
| <b>HF</b>                                                                           | Compliance with IEC61249-2-21:2003 |
|  | Mean lead free                     |

### Schematic Symbol



### Part Number and Electrical Parameter

| Part Number | IDRM@VDRM |    | VBR <sup>①</sup> @IR |    | Vc@Ipp <sup>②</sup> |     |     | RDYN@<br>TLP <sup>③</sup> | Vc@Ipp<br>TLP <sup>③</sup> |    | Co <sup>④</sup> |     |
|-------------|-----------|----|----------------------|----|---------------------|-----|-----|---------------------------|----------------------------|----|-----------------|-----|
|             | μA        | V  | V                    | mA | V                   | V   | A   | Ω                         | V                          | A  | pF              | pF  |
|             | MAX       |    | MIN                  |    | TYP                 | MAX |     | TYP                       | TYP                        |    | TYP             | MAX |
| BV-D524ZCA  | 1         | 24 | 26                   | 1  | 35                  | 50  | 3.5 | 0.06                      | 33                         | 16 | 10              | 20  |

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

①VBR is measured at IR=1mA

②Surge Waveform: 8/20μS.

③TLP parameter: Z0 = 50Ω, tp = 100ns, tr = 1ns, RDYN is calculated from 4A to16A

④Off-state capacitance is measured in VDC=0V ,VRMS=0.3V ,f=1MHz

## Transient Voltage Suppressor

Part Numbering System

Mark

BV D5 24 Z C A  
(1) (2) (3) (4) (5) (6)

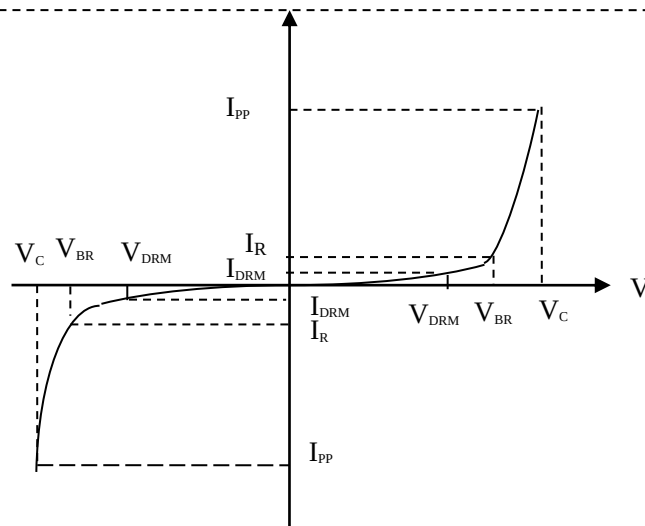
- (1) Bencent Transient Voltage Suppressor
- (2) Package: SOD523
- (3) Stand-off Voltage: 24V
- (4) Normal Capacitance
- (5) Bidirectional
- (6) Bencent internal code



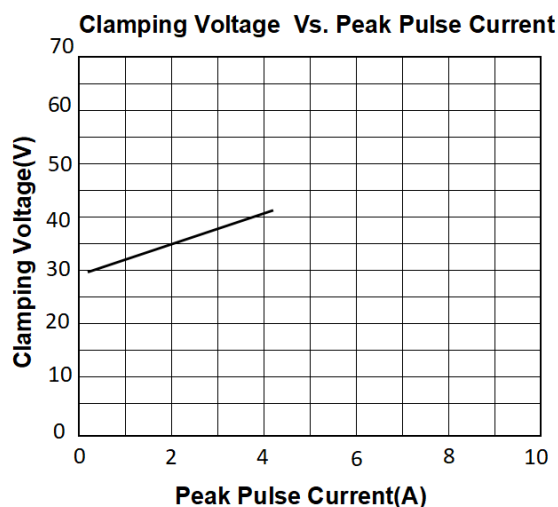
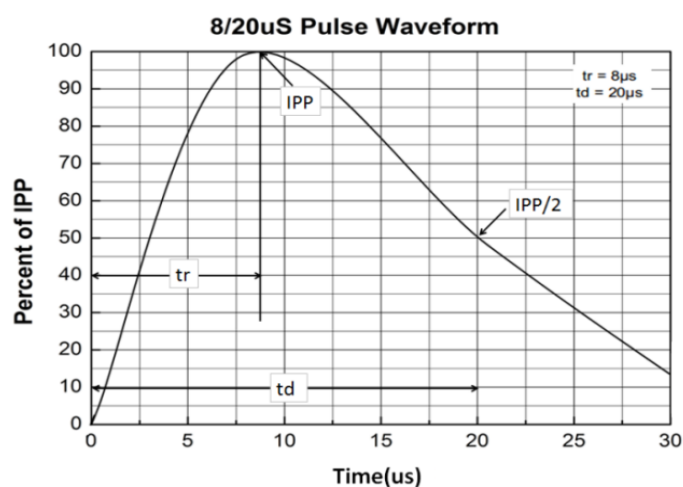
Part Number: 5S

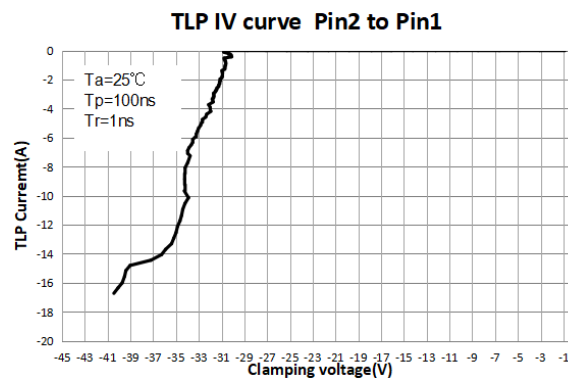
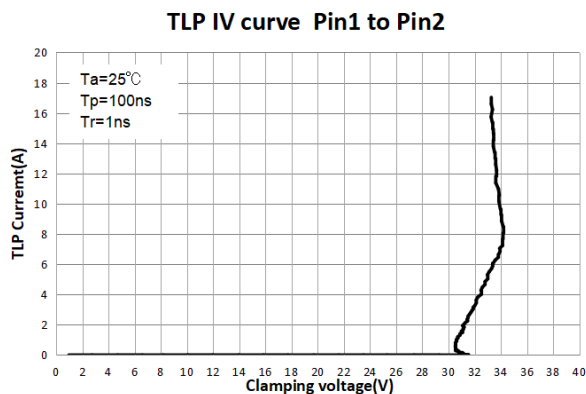
### V-I Curve

| 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                 |
| $P_{pp}$   | Peak Pulse Power Dissipation |



### Typical Characteristics





### Thermal Considerations

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

### Environmental Characteristics

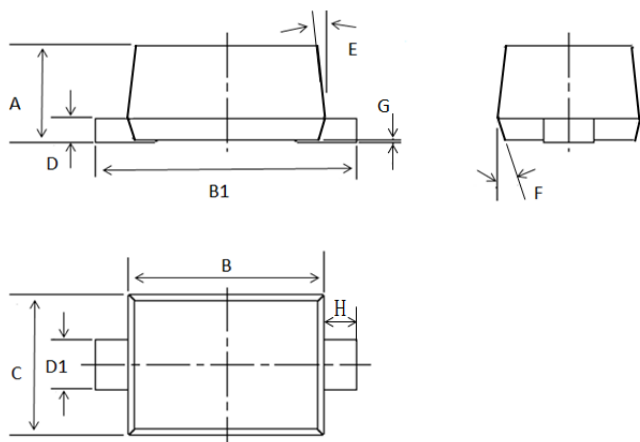
| Testing items                        | Technical standards                                                |
|--------------------------------------|--------------------------------------------------------------------|
| High temperature Reverse Bias Test   | Temperature: 125±3°C Bias=80%V <sub>DRM</sub><br>Time:168H         |
| High Temperature Life Test           | Temperature: 150°C<br>Time:168H                                    |
| High-low Temperature Cycle test      | Temperature: From -40°C to125°C<br>Dwell time : 30min,10~100cycles |
| High Temperature &High Humidity Test | Temperature: 85°C Humidity:85%<br>Time:168H                        |
| Pressure cooker Test                 | Temperature: 121°C , 2atm. Humidity:100%<br>Time:24H               |
| Resistance of soldering heat         | Temperature: 260±5°C<br>Time of dip soldering: 10s, 3times         |

Note: The above testing items can be specified by customer's special request

## Transient Voltage Suppressor

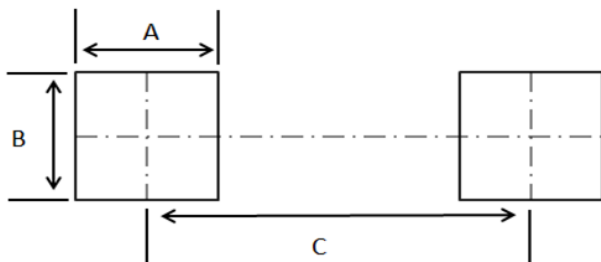
Version: A0 2022-08-31

### Product Dimensions



| REF | mm        | inch        |
|-----|-----------|-------------|
| A   | 0.50~0.77 | 0.020~0.030 |
| B   | 1.10~1.30 | 0.043~0.051 |
| B1  | 1.50~1.70 | 0.059~0.067 |
| C   | 0.70~0.90 | 0.028~0.035 |
| D   | 0.08~0.15 | 0.003~0.006 |
| D1  | 0.25~0.35 | 0.010~0.014 |
| E   | 8° REF    |             |
| F   | 8° REF    |             |
| G   | 0.00~0.07 | 0.000~0.003 |
| H   | 0.20REF   | 0.008REF    |

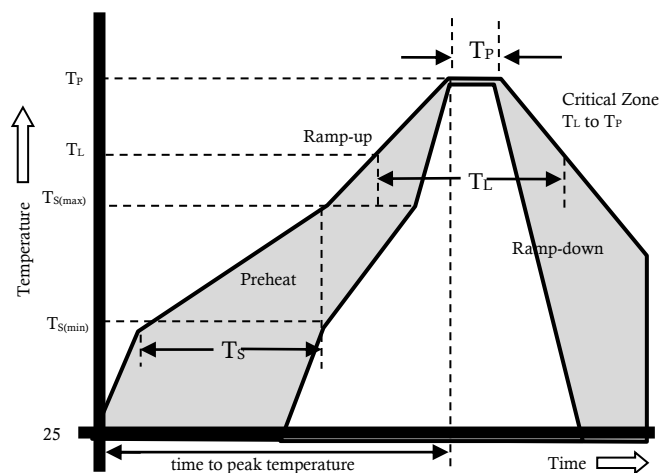
### Recommended Soldering Pad



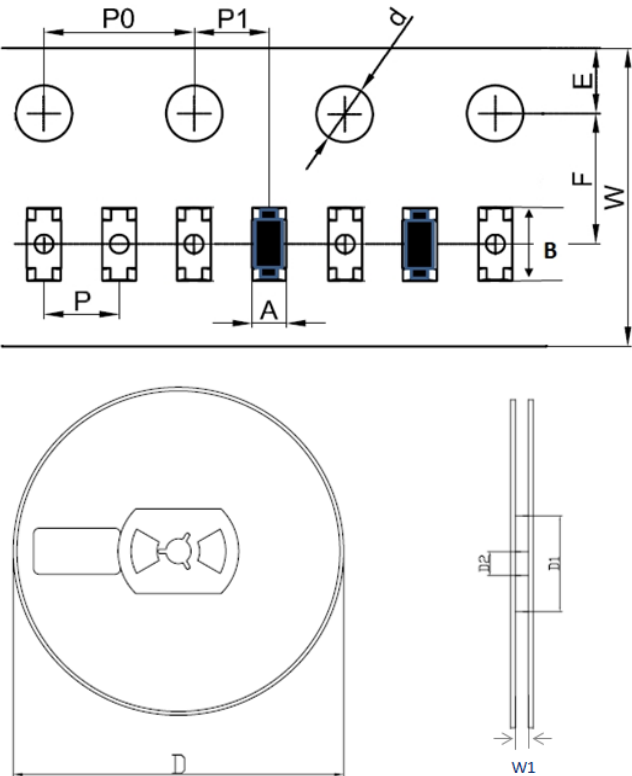
| REF | mm   | inch  |
|-----|------|-------|
| A   | 0.5  | 0.020 |
| B   | 0.6  | 0.024 |
| C   | 1.42 | 0.056 |

### 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)<br>Tamp (T <sub>L</sub> ) to peal |                                          | 3°C/s Max        |
| Ts(max) to T <sub>L</sub> - Ramp-up Rate                        |                                          | 3°C/s Max        |
| Reflow                                                          | - Temperature (T <sub>L</sub> ) (Liquid) | 217°C            |
|                                                                 | - Temperature (T <sub>L</sub> )          | 60 – 150 secs    |
| Peak Temperature (T <sub>P</sub> )                              |                                          | 260±0/-5 °C      |
| Time within 5°C of actual peak Temperature (T <sub>P</sub> )    |                                          | 30secs           |
| Ramp-down Rate                                                  |                                          | 6°C/s Max        |
| Time 25°C to peak Temperature (T <sub>P</sub> )                 |                                          | 8 mins Max.      |
| Do not exceed                                                   |                                          | 260°C            |



Package Reel Information



| REF | mm            | inch           |
|-----|---------------|----------------|
| A   | 0.95+/-0.10   | 0.037+/-0.004  |
| B   | 1.95+/-0.10   | 0.077+/-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   | 2.00+/-0.20   | 0.079+/-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<br>(PCS) | PER CARTON<br>(PCS) | REEL<br>DIAMETERS<br>(mm) | CARTON SIZE(mm) |     |     |
|---------|---------------|---------------------|---------------------------|-----------------|-----|-----|
|         |               |                     |                           | L               | W   | H   |
| TAPING  | 3,000         | 90,000              | 178                       | 380             | 220 | 205 |