

## Features

- Ideally Suited for ESD Protection
- Ultra-Small Surface Mount Package
- Excellent Clamping Capability, Fast Response Time
- Low Capacitance
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

## Mechanical Data

- Case: SOD-523
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: Cathode Band
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminals: Finish - Matte Tin annealed over Alloy 42 leadframe.  
Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 2
- Ordering Information: See Page 2
- Weight: 0.001 grams (approximate)



Top View

## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                          |                                | Symbol         | Value | Unit |
|-----------------------------------------|--------------------------------|----------------|-------|------|
| Forward Voltage @ I <sub>F</sub> = 10mA |                                | V <sub>F</sub> | 0.9   | V    |
| ESD Rating                              | Human Body Model               | ESD            | 8     | kV   |
|                                         | Machine Model                  |                | 400   | V    |
|                                         | IEC61000-4-2 Air Discharge     |                | 30    | kV   |
|                                         | IEC61000-4-2 Contact Discharge |                | 30    | kV   |

## Thermal Characteristics

| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 3) (See figure 2)            | P <sub>D</sub>                    | 150         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 3) | R <sub>θJA</sub>                  | 833         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

## Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

| Part Number | Reverse Standoff Voltage | Min. Breakdown Voltage<br>V <sub>BR</sub> @ I <sub>T</sub> | Test Current        | Max. Reverse Leakage @<br>V <sub>RWM</sub><br>(Note 4) | Typ. Clamping Voltage<br>@ I <sub>PP</sub> =5A<br>(t <sub>p</sub> = 8 x 20 μs)<br>(See figure 1) | Max. Clamping Voltage V <sub>C</sub><br>@ I <sub>PP</sub><br>(t <sub>p</sub> = 8 x 20 μs)<br>(See Figure 1) |                     | Max. Clamping Voltage V <sub>C</sub><br>@ I <sub>PP</sub><br>(t <sub>p</sub> = 8 x 20 μs)<br>(See Figure 1) |                     | Peak Power Dissipation<br>(See Figure 1) | Typical Total Capacitance<br>V <sub>R</sub> = 0V<br>f = 1MHz | Marking Code |
|-------------|--------------------------|------------------------------------------------------------|---------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------|--------------------------------------------------------------|--------------|
|             | V <sub>RWM</sub> (V)     | Min (V)                                                    | I <sub>T</sub> (mA) | I <sub>R</sub> (μA)                                    | V <sub>C</sub> (V)                                                                               | V <sub>C</sub> (V)                                                                                          | I <sub>PP</sub> (A) | V <sub>C</sub> (V)                                                                                          | I <sub>PP</sub> (A) | P <sub>PK</sub> (W)                      | C <sub>T</sub> (pF)                                          |              |
| T3V3S5      | 3.3                      | 5.0                                                        | 1.0                 | 1                                                      | 8.4                                                                                              | 14.1                                                                                                        | 11.2                | 16                                                                                                          | 16                  | 220                                      | 85                                                           | ED           |
| T5V0S5      | 5.0                      | 6.2                                                        | 1.0                 | 0.05                                                   | 15                                                                                               | 22                                                                                                          | 9.4                 | 27                                                                                                          | 15                  | 260                                      | 60                                                           | EJ           |
| T6V0S5      | 6.0                      | 6.8                                                        | 1.0                 | 0.05                                                   | 11.2                                                                                             | 17                                                                                                          | 8.8                 | 23                                                                                                          | 15                  | 260                                      | 90                                                           | EL           |
| T12S5       | 12                       | 14.1                                                       | 1.0                 | 0.01                                                   | 19.7                                                                                             | 25                                                                                                          | 9.6                 | 28                                                                                                          | 12                  | 300                                      | 60                                                           | ES           |

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Part mounted on FR-4 board with recommended pad layout, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  4. Short duration pulse test used to minimize self-heating effect.

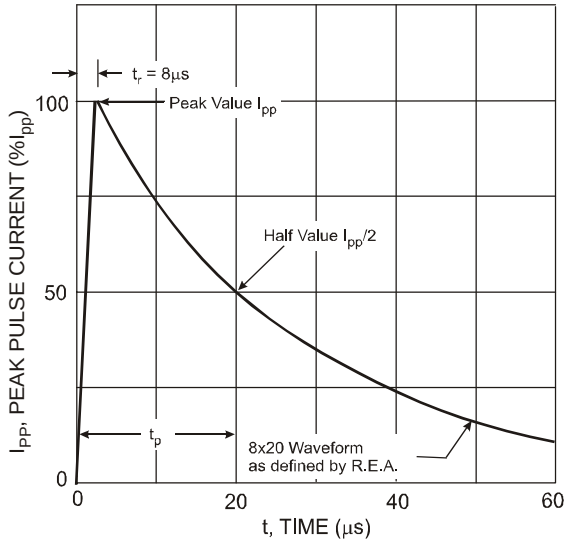


Fig. 1 Pulse Waveform

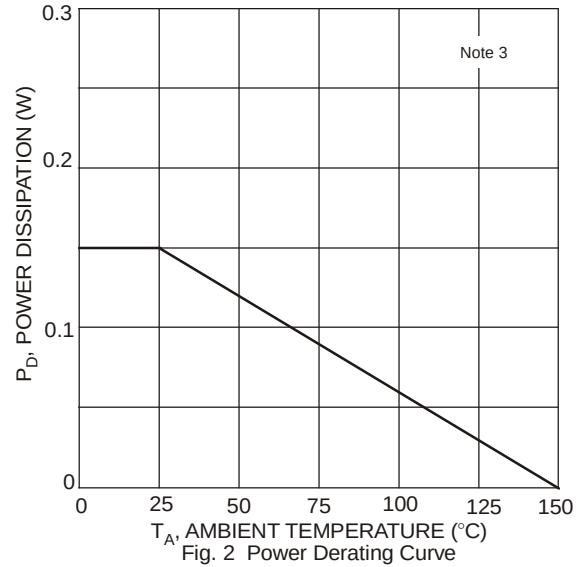


Fig. 2 Power Derating Curve

## Ordering Information (Note 5)

| Part Number               | Case    | Packaging        |
|---------------------------|---------|------------------|
| (Type Number)-7* (Note 6) | SOD-523 | 3000/Tape & Reel |

\* Add "-7" to the appropriate type number in Electrical Characteristics Table on page 1 example: 2.5V TVS = T2V5S5-7.

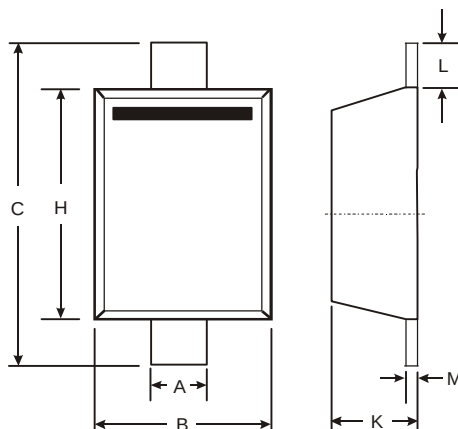
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.  
6. Dispensed in every other cavity of the tape.

## Marking Information



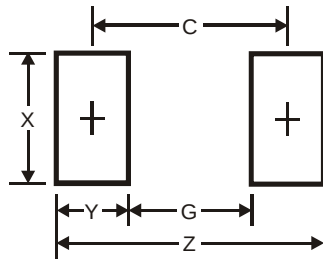
xx = Product Type Marking Code  
(See Electrical Characteristics Table)

## Package Outline Dimensions



| SOD-523              |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 0.25 | 0.35 |
| B                    | 0.70 | 0.90 |
| C                    | 1.50 | 1.70 |
| H                    | 1.10 | 1.30 |
| K                    | 0.55 | 0.65 |
| L                    | 0.10 | 0.30 |
| M                    | 0.10 | 0.12 |
| All Dimensions in mm |      |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.3           |
| G          | 1.1           |
| X          | 0.8           |
| Y          | 0.6           |
| C          | 1.7           |

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