

## 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 @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic                        | Symbol | Value                          | Unit  |
|---------------------------------------|--------|--------------------------------|-------|
| Forward Voltage @ $I_F = 10\text{mA}$ | $V_F$  | 0.9                            | V     |
| ESD Rating                            | ESD    | Human Body Model               | 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)            | $P_D$           | 150         | mW                        |
| Thermal Resistance, Junction to Ambient Air (Note 3) | $R_{\theta JA}$ | 833         | $^\circ\text{C}/\text{W}$ |
| Operating and Storage Temperature Range              | $T_J, T_{STG}$  | -65 to +150 | $^\circ\text{C}$          |

## Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Part Number | Reverse Standoff Voltage | Min. Breakdown Voltage $V_{BR}$ @ $I_T$ | Test Current | Max. Reverse Leakage @ $V_{RWM}$ (Note 4) | Typ. Clamping Voltage @ $I_{PP} = 5\text{A}$ ( $t_p = 8 \times 20 \mu\text{s}$ ) (See figure 1) | Max. Clamping Voltage $V_C$ @ $I_{PP}$ ( $t_p = 8 \times 20 \mu\text{s}$ ) (See Figure 1) | Max. Clamping Voltage $V_C$ @ $I_{PP}$ ( $t_p = 8 \times 20 \mu\text{s}$ ) (See Figure 1) | Peak Power Dissipation (See Figure 1) | Typical Total Capacitance $V_R = 0\text{V}$ $f = 1\text{MHz}$ | Marking Code |
|-------------|--------------------------|---|--------------|---|---|---|---|---------------------------------------|---|--------------|
|             | $V_{RWM}$ (V)            | Min (V)                                 | $I_T$ (mA)   | $I_R$ ( $\mu\text{A}$ )                   | $V_C$ (V)   | $V_C$ (V)   $I_{PP}$ (A)  | $V_C$ (V)   $I_{PP}$ (A)  | $P_{PK}$ (W)                          | $C_T$ (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.

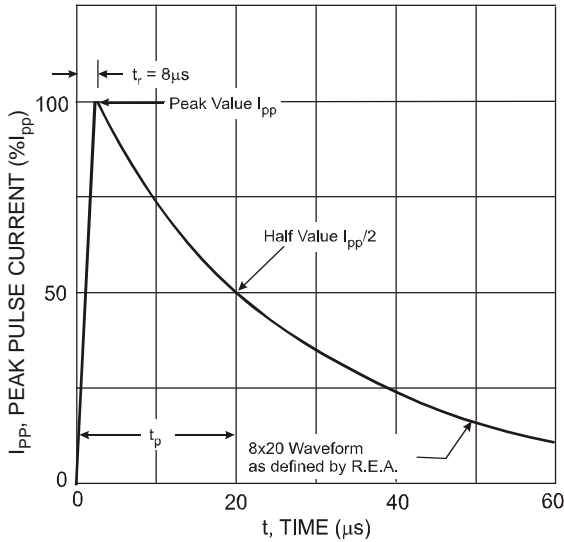


Fig. 1 Pulse Waveform

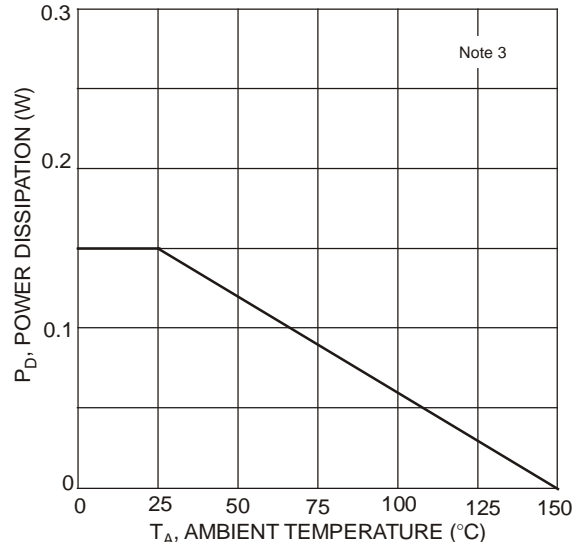


Fig. 2 Power Derating Curve

**Ordering Information** (Note 5)

| Part Number<br>(Type Number)-7* | Case<br>SOD-523 | Packaging<br>3000/Tape & Reel |
|---------------------------------|-----------------|-------------------------------|
|---------------------------------|-----------------|-------------------------------|

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

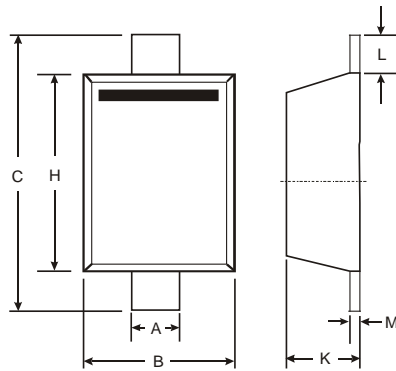
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



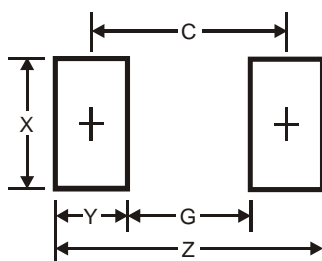
xx = Product Type Marking Code  
(See Electrical Characteristics Table)

**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 | 0.70 |
| L                           | 0.10 | 0.30 |
| M                           | 0.10 | 0.20 |
| <b>All Dimensions in mm</b> |      |      |

**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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