## Features

- Ultra-Small Surface Mount Package
- Fast Switching Speed
- For General Purpose Switching Applications
- High Conductance
- Lead Free/RoHS Compliant (Note 1)
- "Green" Device (Note 3 and 4)


## Mechanical Data

- Case: SOT-523
- Case Material - Molded Plastic. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-O20D
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish)
- Polarity: See Diagrams Below
- Marking Information: See Diagrams Below \& Page 2
- Ordering Information: See Page 2
- Weight: 0.002 grams (approximate)


## SOT-523



TOP VIEW



Maximum Ratings $@ T_{A}=25^{\circ} \mathrm{C}$ unless otherwise specified

| Characteristic |  | Symbol | Value | Unit |
| :---: | :---: | :---: | :---: | :---: |
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage |  | $V_{\text {RRM }}$ <br> $V_{\text {RWM }}$ <br> $V_{R}$ | 85 | V |
| RMS Reverse Voltage Forward Continuous Current (Note 2) |  | $\mathrm{V}_{\mathrm{R} \text { (RMS) }}$ | 60 | V |
|  | Single Diode Double Diode | Ifm | $\begin{gathered} \hline 155 \\ 75 \end{gathered}$ | mA |
| Repetitive Peak Forward Current |  | IFRM | 500 | mA |
| Non-Repetitive Peak Forward Surge Current | @ t=1.0 s <br> @ $\mathrm{t}=1.0 \mathrm{~ms}$ <br> @ t = 1.0s | IFSM | $\begin{aligned} & 4.0 \\ & 1.0 \\ & 0.5 \\ & \hline \end{aligned}$ | A |

## Thermal Characteristics

| Characteristic | Symbol | Value |  |
| :--- | :---: | :---: | :---: |
| Power Dissipation (Note 2) | $\mathrm{P}_{\mathrm{D}}$ | 150 | Unit |
| Thermal Resistance Junction to Ambient (Note 2) | $\mathrm{R}_{\theta \mathrm{JA}}$ | mW |  |
| Operating and Storage Temperature Range | $\mathrm{T}_{\mathrm{J}}, \mathrm{T}_{\text {STG }}$ | 833 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |

## Electrical Characteristics $@ T_{A}=25^{\circ} \mathrm{C}$ unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Reverse Breakdown Voltage (Note 5) | $\mathrm{V}_{(\mathrm{BR}) \mathrm{R}}$ | 85 | - | - | V | $\mathrm{I}_{\mathrm{R}}=100 \mu \mathrm{~A}$ |
| Forward Voltage | $V_{F}$ | - | - | $\begin{gathered} \hline 0.715 \\ 0.855 \\ 1.0 \\ 1.25 \end{gathered}$ | V | $\begin{aligned} & I_{F}=1.0 \mathrm{~mA} \\ & I_{F}=10 \mathrm{~mA} \\ & I_{F}=50 \mathrm{~mA} \\ & I_{F}=150 \mathrm{~mA} \end{aligned}$ |
| Leakage Current (Note 5) | IR | - | - | $\begin{gathered} 2.0 \\ 100 \\ 60 \\ 30 \end{gathered}$ | $\begin{aligned} & \mu \mathrm{A} \\ & \mu \mathrm{~A} \\ & \mu \mathrm{~A} \\ & \mathrm{nA} \end{aligned}$ | $\begin{aligned} & V_{R}=75 \mathrm{~V} \\ & V_{R}=75 \mathrm{~V}, \mathrm{~T}_{J}=150^{\circ} \mathrm{C} \\ & \mathrm{~V}_{\mathrm{R}}=25 \mathrm{~V}, \mathrm{~T}_{J}=150^{\circ} \mathrm{C} \\ & \mathrm{~V}_{\mathrm{R}}=25 \mathrm{~V} \\ & \hline \end{aligned}$ |
| Total Capacitance | $\mathrm{C}_{\text {T }}$ | - | 1.5 | - | pF | $\mathrm{V}_{\mathrm{R}}=0, \mathrm{f}=1.0 \mathrm{MHz}$ |
| Reverse Recovery Time | $\mathrm{trr}_{\text {r }}$ | - | - | 4.0 | ns | $\begin{aligned} & I_{F}=I_{R}=10 \mathrm{~mA}, \\ & \mathrm{Irf}^{2}=0.1 \times \mathrm{I}_{\mathrm{R}}, \mathrm{R}_{\mathrm{L}}=100 \Omega \end{aligned}$ |

Notes: 1. No purposefully added lead.
2. Device mounted on FR-4 PC board with recommended pad layout, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or $\mathrm{Sb}_{2} \mathrm{O}_{3}$ Fire Retardants.
5. Short duration pulse test used to minimize self-heating effect.


Fig. 1 Typical Forward Characteristics, Per Element

$\mathrm{V}_{\mathrm{R}}$, DC REVERSE VOLTAGE (V)
Fig. 3 Total Capacitance vs. Reverse Voltage, Per Element


BAS16T, BAW56T, BAV70T, BAV99T


Fig. 2 Typical Reverse Characteristics, Per Element

$\mathrm{T}_{\mathrm{s}}$, SOLDERING POINT TEMPERATURE
Fig. 4 Current Derating Curve, Total Package

## Ordering Information (Note 6)

| Part Number | Case | Packaging |
| :---: | :---: | :---: |
| BAS16T-7-F | SOT-523 | $3000 /$ Tape \& Reel |
| BAW56T-7-F | SOT-523 | $300 /$ Tape \& Reel |
| BAV70T-7-F | SOT-523 | $3000 /$ Tape \& Reel |
| BAV99T-7-F | SOT-523 | $3000 /$ Tape \& Reel |

Notes: 6. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

## Marking Information



## Package Outline Dimensions



| SOT-523 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Dim | Min | Max | Typ |  |
| A | 0.15 | 0.30 | 0.22 |  |
| B | 0.75 | 0.85 | 0.80 |  |
| C | 1.45 | 1.75 | 1.60 |  |
| D | - | - | 0.50 |  |
| G | 0.90 | 1.10 | 1.00 |  |
| $\mathbf{H}$ | 1.50 | 1.70 | 1.60 |  |
| $\mathbf{J}$ | 0.00 | 0.10 | 0.05 |  |
| K | 0.60 | 0.80 | 0.75 |  |
| $\mathbf{L}$ | 0.10 | 0.30 | 0.22 |  |
| $\mathbf{M}$ | 0.10 | 0.20 | 0.12 |  |
| $\mathbf{N}$ | 0.45 | 0.65 | 0.50 |  |
| $\mathbf{\alpha}$ | $0^{\circ}$ | $8^{\circ}$ | - |  |
| All Dimensions in $\mathbf{~ D m}$ |  |  |  |  |
|  |  |  |  |  |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
| :---: | :---: |
| $\mathbf{Z}$ | 1.8 |
| $\mathbf{X}$ | 0.4 |
| $\mathbf{Y}$ | 0.51 |
| $\mathbf{C}$ | 1.3 |
| $\mathbf{E}$ | 0.7 |

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