# BAV199TQ

## SURFACE MOUNT LOW LEAKAGE DIODE

## Features

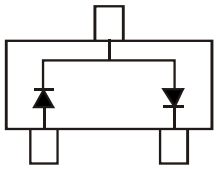
- Ultra-Small Surface Mount Package
- Very Low Leakage Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The BAV199TQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  **https://www.diodes.com/quality/product-definitions/**

## Mechanical Data

- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208
  Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Lead-Frame). (e3)
- Polarity: See Diagrams Below
- Weight: 0.002 grams (Approximate)

Top View

SOT523



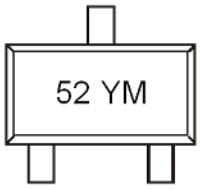
## Ordering Information (Note 4)

| Part Number | Compliance | Case | Packaging |
|---|---|---|---|
| BAV199TQ-7-F | Automotive | SOT523 | 3000/Tape & Reel |

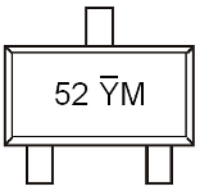
Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

## Marking Information

SAT site




CAT site




52 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: H = 2020)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | H | I | J | K | L | M | N | O | P | R | S | T |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

## Maximum Ratings (@ $T_A$ = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 85 | V |
| Forward Continuous Current (Note 5) | Single Diode<br>Double Diode | $I_{FM}$ | 215<br>125 | mA |
| Repetitive Peak Forward Current | | $I_{FRM}$ | 500 | mA |
| Non-Repetitive Peak Forward Surge Current | @ t = 1.0μs<br>@ t = 1.0ms<br>@ t = 1.0s | $I_{FSM}$ | 4.0<br>1.0<br>0.5 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation (Note 5) | $P_D$ | 150 | mW |
| Thermal Resistance Junction to Ambient Air (Note 5) | $R_{\theta JA}$ | 833 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics (@ $T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Breakdown Voltage (Note 6) | $V_{(BR)R}$ | 85 | — | — | V | $I_R$ = 100μA |
| Forward Voltage | $V_F$ | — | — | 0.90<br>1.0<br>1.1<br>1.25 | V | $I_F$ = 1.0mA<br>$I_F$ = 10mA<br>$I_F$ = 50mA<br>$I_F$ = 150mA |
| Leakage Current (Note 6) | $I_R$ | — | — | 5.0<br>80 | nA<br>nA | $V_R$ = 75V<br>$V_R$ = 75V, $T_J$ = +150°C |
| Total Capacitance | $C_T$ | — | 2 | — | pF | $V_R$ = 0, f = 1.0MHz |
| Reverse Recovery Time | $t_{RR}$ | — | — | 3.0 | μs | $I_F$ = $I_R$ = 10mA,<br>$I_{RR}$= 0.1 x $I_R$, $R_L$ = 100Ω |

Notes: 5. Device mounted on FR-4 PC board with recommended pad layout, which can be found on our website at http://www.diodes.com/package-outlines.html.
6. Short duration pulse test used to minimize self-heating effect.

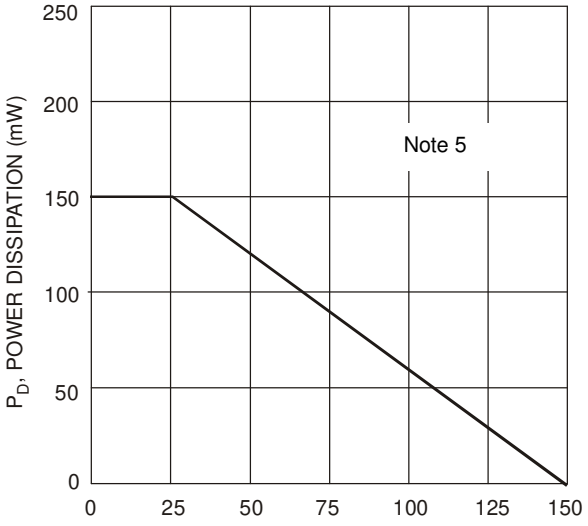



Fig. 1 Power Derating Curve

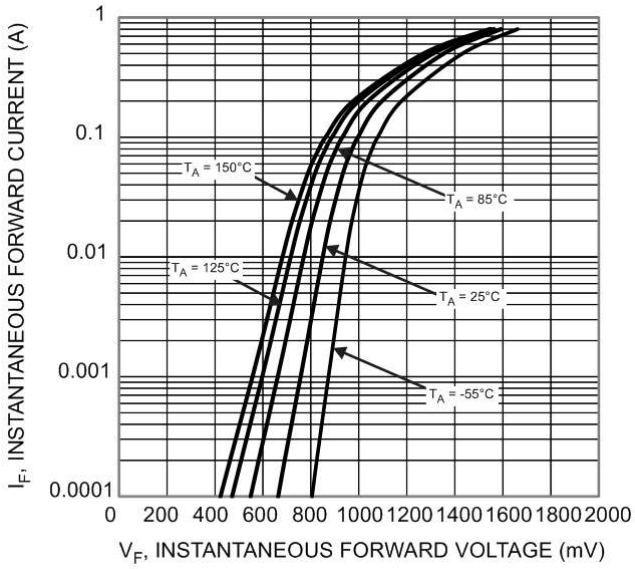



Fig. 2 Typical Forward Characteristics

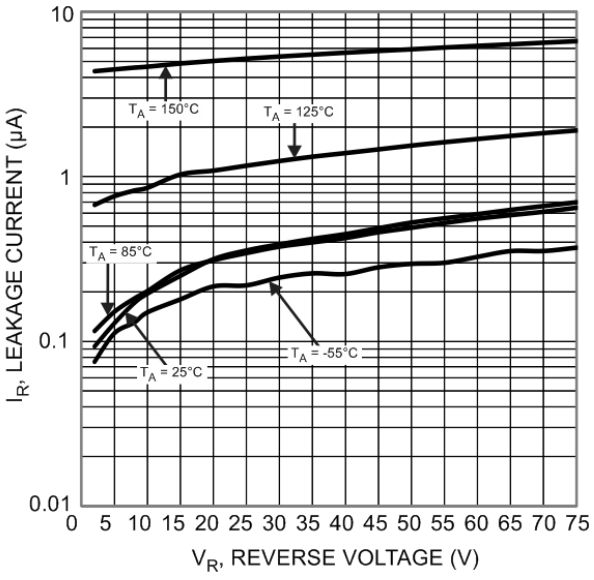



Fig. 3 Typical Reverse Characteristics

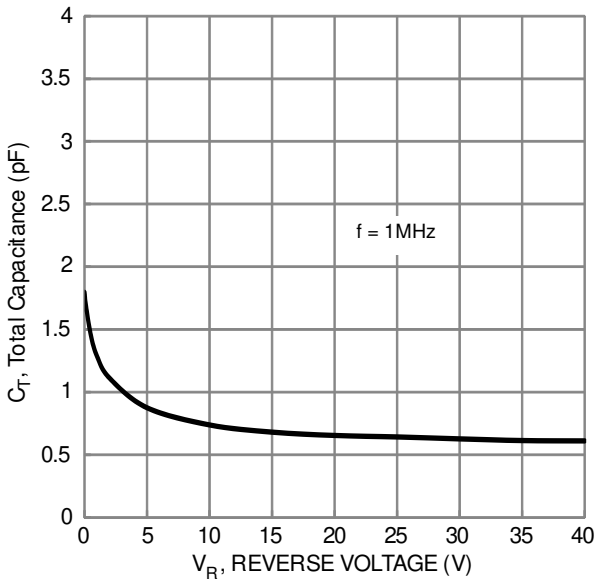
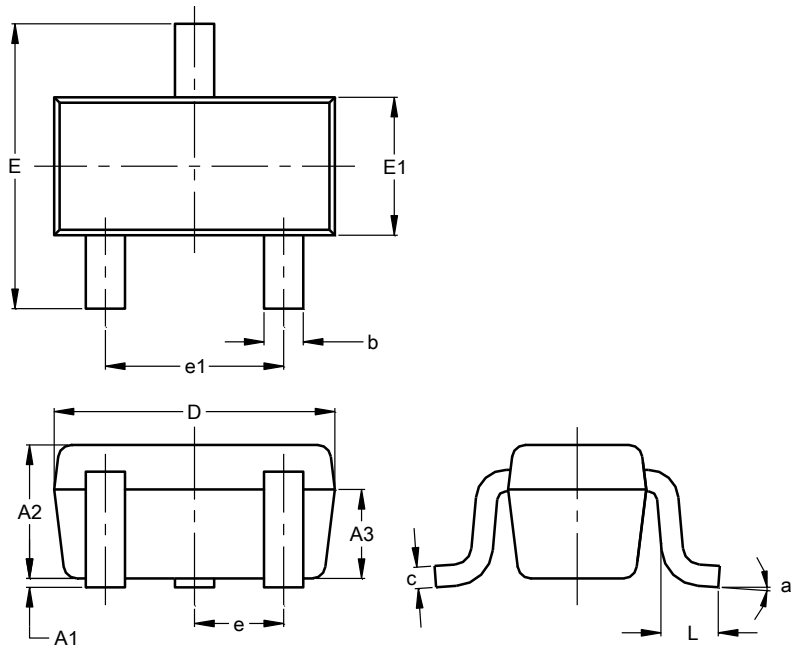



Fig. 4 Typical Total Capacitance, per Element

## Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

**SOT523**

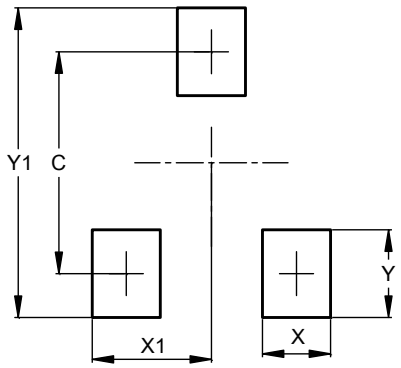



| SOT523 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A1** | 0.00 | 0.10 | 0.05 |
| **A2** | 0.60 | 0.80 | 0.75 |
| **A3** | 0.45 | 0.65 | 0.50 |
| **b** | 0.15 | 0.30 | 0.22 |
| **c** | 0.10 | 0.20 | 0.12 |
| **D** | 1.50 | 1.70 | 1.60 |
| **E** | 1.45 | 1.75 | 1.60 |
| **E1** | 0.75 | 0.85 | 0.80 |
| **e** | 0.50 BSC | | |
| **e1** | 0.90 | 1.10 | 1.00 |
| **L** | 0.20 | 0.40 | 0.33 |
| **a** | 0° | -- | 8° |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

**SOT523**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 1.29 |
| **X** | 0.40 |
| **X1** | 0.70 |
| **Y** | 0.51 |
| **Y1** | 1.80 |

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