

# Dual Series Switching Diode

## BAV199L, SBAV199L

### Features

- Low Leakage Current Applications
- Medium Speed Switching Times
- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### MAXIMUM RATINGS

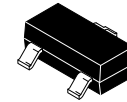
| Rating                                                                                | Symbol          | Value             | Unit |
|---------------------------------------------------------------------------------------|-----------------|-------------------|------|
| Reverse Voltage                                                                       | $V_R$           | 70                | V    |
| Forward Current                                                                       | $I_F$           | 215               | mA   |
| Peak Forward Surge Current                                                            | $I_{FM(surge)}$ | 500               | mA   |
| Repetitive Peak Reverse Voltage                                                       | $V_{RRM}$       | 70                | V    |
| Average Rectified Forward Current<br>(Note 1)<br>(Averaged Over Any 20 ms Period)     | $I_{F(AV)}$     | 715               | mA   |
| Repetitive Peak Forward Current                                                       | $I_{FRM}$       | 450               | mA   |
| Non-Repetitive Peak Forward Current<br>$t = 1.0 \mu s$<br>$t = 1.0 ms$<br>$t = 1.0 s$ | $I_{FSM}$       | 2.0<br>1.0<br>0.5 | A    |
| Human Body Model (HBM)<br>Charged Device Model (CDM)                                  | ESD             | 750<br>2000       | V    |

### THERMAL CHARACTERISTICS

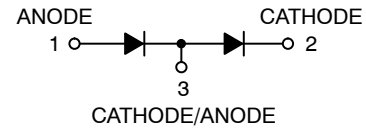
| Characteristic                                                                                          | Symbol          | Max         | Unit                 |
|---------------------------------------------------------------------------------------------------------|-----------------|-------------|----------------------|
| Total Device Dissipation<br>FR-5 Board (Note 1), $T_A = 25^\circ C$<br>Derate above $25^\circ C$        | $P_D$           | 225<br>1.8  | mW<br>mW/ $^\circ C$ |
| Thermal Resistance, Junction-to-Ambient                                                                 | $R_{\theta JA}$ | 556         | $^\circ C/W$         |
| Total Device Dissipation<br>Alumina Substrate (Note 2), $T_A = 25^\circ C$<br>Derate above $25^\circ C$ | $P_D$           | 300<br>2.4  | mW<br>mW/ $^\circ C$ |
| Thermal Resistance, Junction-to-Ambient                                                                 | $R_{\theta JA}$ | 417         | $^\circ C/W$         |
| Junction and Storage Temperature                                                                        | $T_J, T_{stg}$  | -65 to +150 | $^\circ C$           |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

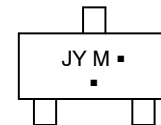
1. FR-5 =  $1.0 \times 0.75 \times 0.062$  in.
2. Alumina =  $0.4 \times 0.3 \times 0.024$  in. 99.5% alumina.



CASE 318  
SOT-23  
STYLE 11



### MARKING DIAGRAM



JY = Specific Device Code  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation and/or overbar may vary depending upon manufacturing location.

### ORDERING INFORMATION

| Device      | Package             | Shipping†               |
|-------------|---------------------|-------------------------|
| BAV199LT1G  | SOT-23<br>(Pb-Free) | 3,000 /<br>Tape & Reel  |
| SBAV199LT1G | SOT-23<br>(Pb-Free) | 3,000 /<br>Tape & Reel  |
| SBAV199LT3G | SOT-23<br>(Pb-Free) | 10,000 /<br>Tape & Reel |

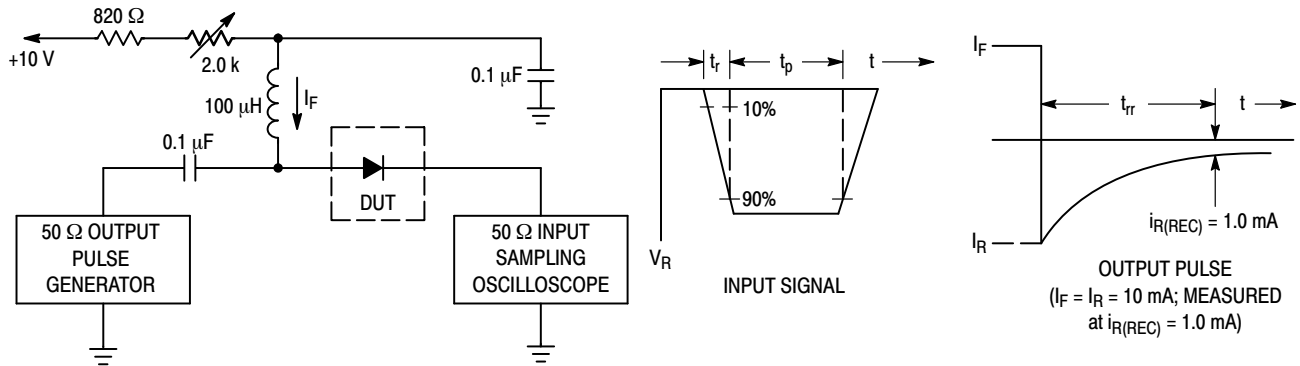
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# BAV199L, SBAV199L

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) (EACH DIODE)

| Characteristic                                                                                                                                | Symbol     | Min              | Max                         | Unit          |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|-----------------------------|---------------|
| <b>OFF CHARACTERISTICS</b>                                                                                                                    |            |                  |                             |               |
| Reverse Breakdown Voltage<br>( $I_{(BR)} = 100 \mu\text{Adc}$ )                                                                               | $V_{(BR)}$ | 70               | –                           | Vdc           |
| Reverse Voltage Leakage Current<br>( $V_R = 70 \text{ Vdc}$ )<br>( $V_R = 70 \text{ Vdc}$ , $T_J = 150^\circ\text{C}$ )                       | $I_R$      | –<br>–           | 5.0<br>80                   | nAdc          |
| Diode Capacitance<br>( $V_R = 0 \text{ V}$ , $f = 1.0 \text{ MHz}$ )                                                                          | $C_D$      | –                | 2.0                         | pF            |
| Forward Voltage<br>( $I_F = 1.0 \text{ mAdc}$ )<br>( $I_F = 10 \text{ mAdc}$ )<br>( $I_F = 50 \text{ mAdc}$ )<br>( $I_F = 150 \text{ mAdc}$ ) | $V_F$      | –<br>–<br>–<br>– | 900<br>1000<br>1100<br>1250 | mVdc          |
| Reverse Recovery Time<br>( $I_F = I_R = 10 \text{ mAdc}$ ) (Figure 1)                                                                         | $t_{rr}$   | –                | 3.0                         | $\mu\text{s}$ |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



**Figure 1. Recovery Time Equivalent Test Circuit**

# BAV199L, SBAV199L

## TYPICAL CHARACTERISTICS

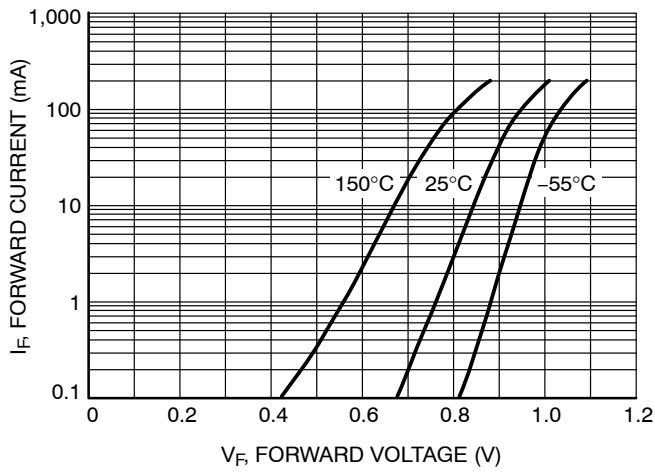


Figure 2. Forward Voltage

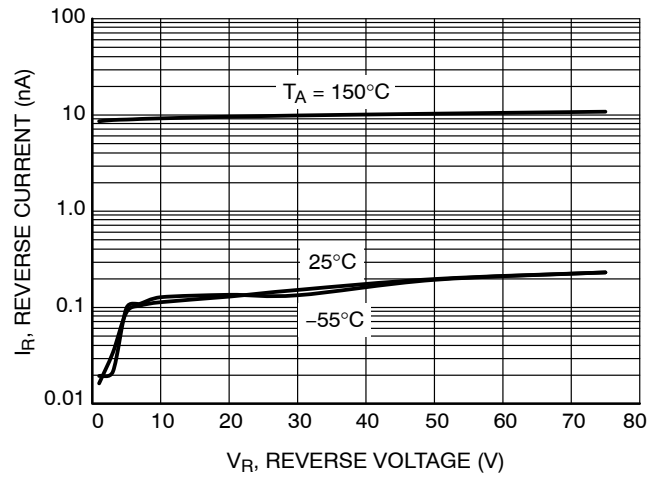


Figure 4. Leakage Current

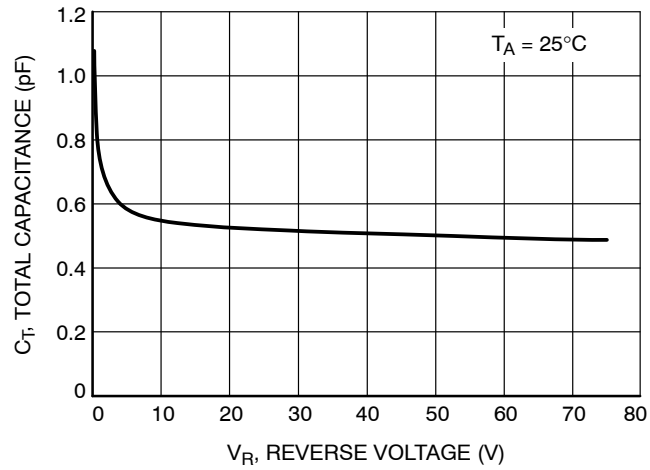


Figure 3. Capacitance



SCALE 4:1

SOT-23 (TO-236) 2.90x1.30x1.00 1.90P  
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| MILLIMETERS |      |      |      |
|-------------|------|------|------|
| DIM         | MIN  | NOM  | MAX  |
| A           | 0.89 | 1.00 | 1.11 |
| A1          | 0.01 | 0.06 | 0.10 |
| b           | 0.37 | 0.44 | 0.50 |
| c           | 0.08 | 0.14 | 0.20 |
| D           | 2.80 | 2.90 | 3.04 |
| E           | 1.20 | 1.30 | 1.40 |
| e           | 1.78 | 1.90 | 2.04 |
| L           | 0.30 | 0.43 | 0.55 |
| L1          | 0.35 | 0.54 | 0.69 |
| HE          | 2.10 | 2.40 | 2.64 |
| T           | 0°   | ---  | 10°  |

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

GENERIC  
MARKING DIAGRAM\*



XXX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.



RECOMMENDED  
MOUNTING FOOTPRINT

\* For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERM/D.

STYLES ON PAGE 2

|                  |                                      |                                                                                                                                                                                     |
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|                                                         |                                                       |                                                             |                                                             |                                                             |                                                             |
|---------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| STYLE 1 THRU 5:<br>CANCELLED                            | STYLE 6:<br>PIN 1. BASE<br>2. EMITTER<br>3. COLLECTOR | STYLE 7:<br>PIN 1. EMITTER<br>2. BASE<br>3. COLLECTOR       | STYLE 8:<br>PIN 1. ANODE<br>2. NO CONNECTION<br>3. CATHODE  |                                                             |                                                             |
| STYLE 9:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE      | STYLE 10:<br>PIN 1. DRAIN<br>2. SOURCE<br>3. GATE     | STYLE 11:<br>PIN 1. ANODE<br>2. CATHODE<br>3. CATHODE-ANODE | STYLE 12:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. ANODE       | STYLE 13:<br>PIN 1. SOURCE<br>2. DRAIN<br>3. GATE           | STYLE 14:<br>PIN 1. CATHODE<br>2. GATE<br>3. ANODE          |
| STYLE 15:<br>PIN 1. GATE<br>2. CATHODE<br>3. ANODE      | STYLE 16:<br>PIN 1. ANODE<br>2. CATHODE<br>3. CATHODE | STYLE 17:<br>PIN 1. NO CONNECTION<br>2. ANODE<br>3. CATHODE | STYLE 18:<br>PIN 1. NO CONNECTION<br>2. CATHODE<br>3. ANODE | STYLE 19:<br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE-ANODE | STYLE 20:<br>PIN 1. CATHODE<br>2. ANODE<br>3. GATE          |
| STYLE 21:<br>PIN 1. GATE<br>2. SOURCE<br>3. DRAIN       | STYLE 22:<br>PIN 1. RETURN<br>2. OUTPUT<br>3. INPUT   | STYLE 23:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE         | STYLE 24:<br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE           | STYLE 25:<br>PIN 1. ANODE<br>2. CATHODE<br>3. GATE          | STYLE 26:<br>PIN 1. CATHODE<br>2. ANODE<br>3. NO CONNECTION |
| STYLE 27:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. CATHODE | STYLE 28:<br>PIN 1. ANODE<br>2. ANODE<br>3. ANODE     |                                                             |                                                             |                                                             |                                                             |

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