

# Switching Diode, Dual, High Voltage, Common Cathode

## BAV23CL, NSVBAV23CL

### Features

- Moisture Sensitivity Level: 1
- ESD Rating – Human Body Model: Class 2  
– Machine Model: Class C
- Fast Switching Speed
- Switching Application
- NSV 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

### Typical Applications

- LCD TV
- Power Supply
- Industrial

### MAXIMUM RATINGS

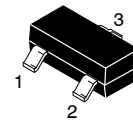
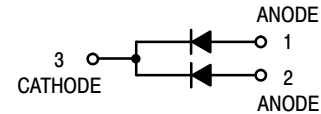
| Rating                                    | Symbol          | Value             | Unit  |
|---|-----------------|-------------------|---|
| Continuous Reverse Voltage                | $V_R$           | 250               | V   |
| Repetitive Peak Reverse Voltage           | $V_{RRM}$       | 250               | V   |
| Peak Forward Current                      | $I_F$           | 400               | mA  |
| Non-Repetitive Peak Forward Surge Current | $I_{FSM}$       | 9.0<br>3.0<br>1.7 | A   |
|   |                 |                   | @ $t = 1.0 \mu s$<br>@ $t = 100 \mu s$<br>@ $t = 10 ms$ |
| Peak Forward Surge Current                | $I_{FM(surge)}$ | 625               | mAdc  |
| Non-Repetitive Peak Per Human Body Model  | HBM             | 4.0               | kV  |
| Per Machine Model                         | MM              | 400               | V   |

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.



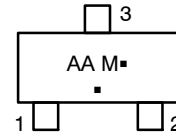
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SOT-23  
CASE 318  
STYLE 9

### MARKING DIAGRAM



AA = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device        | Package          | Shipping†           |
|---------------|------------------|---------------------|
| BAV23CLT1G    | SOT-23 (Pb-Free) | 3000 / Tape & Reel  |
| BAV23CLT3G    | SOT-23 (Pb-Free) | 10000 / Tape & Reel |
| NSVBAV23CLT1G | SOT-23 (Pb-Free) | 3000 / 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.

# BAV23CL, NSVBAV23CL

## THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|----------------|--------|-----|------|
|----------------|--------|-----|------|

### SINGLE HEATED

|   |                 |            |                            |
|---|-----------------|------------|----------------------------|
| Total Device Dissipation (Note 1) $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 265<br>2.1 | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient (Note 1)  | $R_{\theta JA}$ | 472        | $^\circ\text{C/W}$         |
| Thermal Reference, Junction-to-Anode Lead (Note 1)  | $R_{\psi JL}$   | 263        | $^\circ\text{C/W}$         |
| Thermal Reference, Junction-to-Case (Note 1)  | $R_{\psi JC}$   | 289        | $^\circ\text{C/W}$         |
| Total Device Dissipation (Note 2) $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 345<br>2.7 | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient (Note 2)  | $R_{\theta JA}$ | 362        | $^\circ\text{C/W}$         |
| Thermal Reference, Junction-to-Anode Lead (Note 2)  | $R_{\psi JL}$   | 251        | $^\circ\text{C/W}$         |
| Thermal Reference, Junction-to-Case (Note 2)  | $R_{\psi JC}$   | 250        | $^\circ\text{C/W}$         |

### DUAL HEATED (Note 3)

|   |                 |             |                            |
|---|-----------------|-------------|----------------------------|
| Total Device Dissipation (Note 1) $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 390<br>3.1  | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient (Note 1)  | $R_{\theta JA}$ | 321         | $^\circ\text{C/W}$         |
| Thermal Reference, Junction-to-Anode Lead (Note 1)  | $R_{\psi JL}$   | 159         | $^\circ\text{C/W}$         |
| Thermal Reference, Junction-to-Case (Note 1)  | $R_{\psi JC}$   | 138         | $^\circ\text{C/W}$         |
| Total Device Dissipation (Note 2) $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 540<br>4.3  | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient (Note 2)  | $R_{\theta JA}$ | 231         | $^\circ\text{C/W}$         |
| Thermal Reference, Junction-to-Anode Lead (Note 2)  | $R_{\psi JL}$   | 148         | $^\circ\text{C/W}$         |
| Thermal Reference, Junction-to-Case (Note 2)  | $R_{\psi JC}$   | 119         | $^\circ\text{C/W}$         |
| Junction and Storage Temperature Range  | $T_J, T_{stg}$  | -55 to +150 | $^\circ\text{C}$           |

1. FR-4 @ 100 mm<sup>2</sup>, 1 oz. copper traces, still air.
2. FR-4 @ 500 mm<sup>2</sup>, 2 oz. copper traces, still air.
3. Dual heated values assume total power is sum of two equally powered channels

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

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

### OFF CHARACTERISTICS

|  |            |        |              |                 |
|--|------------|--------|--------------|-----------------|
| Reverse Voltage Leakage Current<br>( $V_R = 200\text{ Vdc}$ )<br>( $V_R = 200\text{ Vdc}, T_J = 150^\circ\text{C}$ ) | $I_R$      | -<br>- | 0.1<br>100   | $\mu\text{Adc}$ |
| Reverse Breakdown Voltage<br>( $I_{BR} = 100\ \mu\text{Adc}$ )   | $V_{(BR)}$ | 250    | -            | Vdc             |
| Forward Voltage<br>( $I_F = 100\ \text{mAdc}$ )<br>( $I_F = 200\ \text{mAdc}$ )                                      | $V_F$      | -<br>- | 1000<br>1250 | mV              |
| Diode Capacitance<br>( $V_R = 0, f = 1.0\ \text{MHz}$ )  | $C_T$      | -      | 5.0          | pF              |
| Reverse Recovery Time<br>( $I_F = I_R = 30\ \text{mAdc}, R_L = 100\ \Omega$ )  | $t_{rr}$   | -      | 150          | ns              |

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.

# BAV23CL, NSVBAV23CL

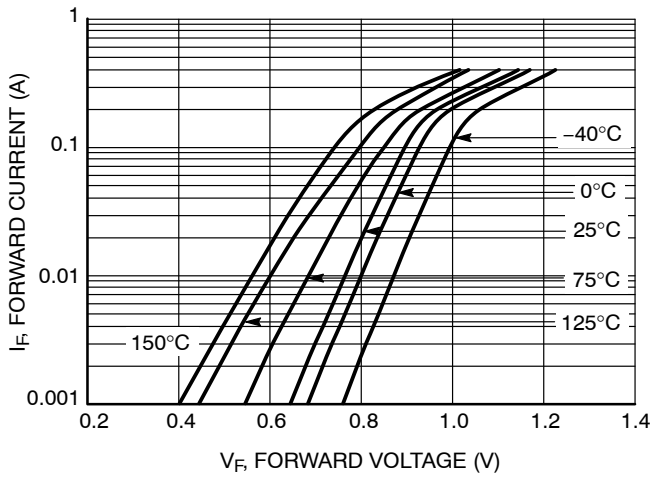


Figure 1. Forward Voltage

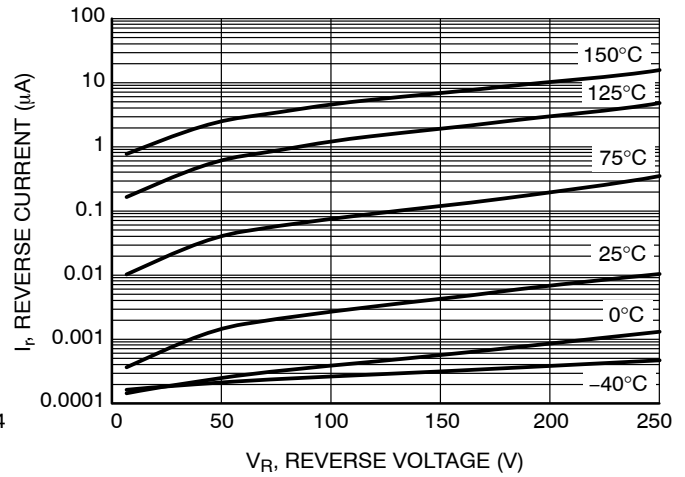


Figure 2. Reverse Current

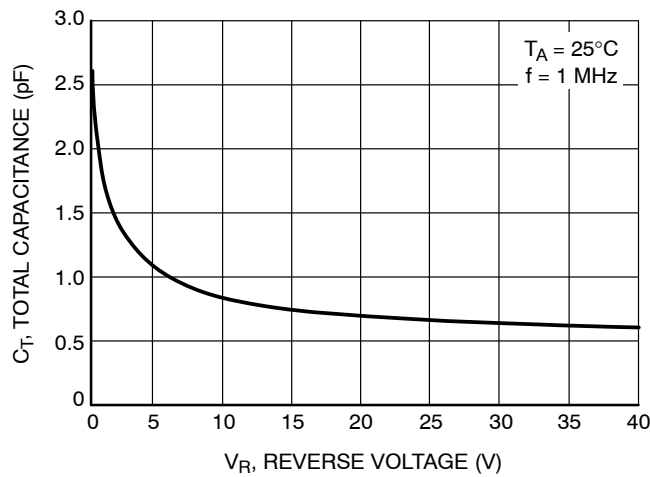
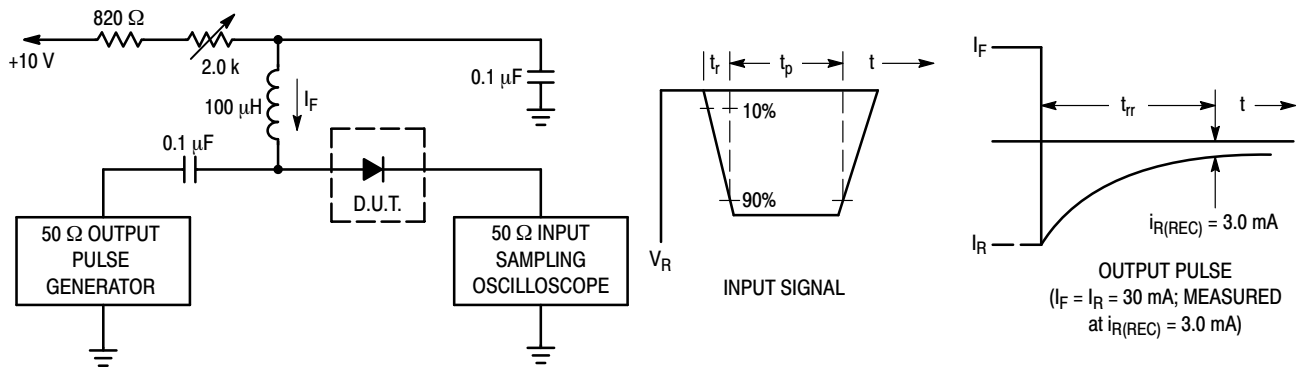


Figure 3. Total Capacitance



- Notes: 1. A 2.0 kΩ variable resistor adjusted for a Forward Current ( $I_F$ ) of 30 mA.  
 2. Input pulse is adjusted so  $I_{R(peak)}$  is equal to 30 mA.  
 3.  $t_p \gg t_{rr}$

Figure 4. Recovery Time Equivalent Test Circuit

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



### SOT-23 (TO-236) CASE 318-08 ISSUE AS

DATE 30 JAN 2018

SCALE 4:1



**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: 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.

| DIM | MILLIMETERS |      |      | INCHES |       |       |
|-----|-------------|------|------|--------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A   | 0.89        | 1.00 | 1.11 | 0.035  | 0.039 | 0.044 |
| A1  | 0.01        | 0.06 | 0.10 | 0.000  | 0.002 | 0.004 |
| b   | 0.37        | 0.44 | 0.50 | 0.015  | 0.017 | 0.020 |
| c   | 0.08        | 0.14 | 0.20 | 0.003  | 0.006 | 0.008 |
| D   | 2.80        | 2.90 | 3.04 | 0.110  | 0.114 | 0.120 |
| E   | 1.20        | 1.30 | 1.40 | 0.047  | 0.051 | 0.055 |
| e   | 1.78        | 1.90 | 2.04 | 0.070  | 0.075 | 0.080 |
| L   | 0.30        | 0.43 | 0.55 | 0.012  | 0.017 | 0.022 |
| L1  | 0.35        | 0.54 | 0.69 | 0.014  | 0.021 | 0.027 |
| HE  | 2.10        | 2.40 | 2.64 | 0.083  | 0.094 | 0.104 |
| T   | 0°          | ---  | 10°  | 0°     | ---   | 10°   |

### RECOMMENDED SOLDERING FOOTPRINT



### 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.

STYLE 1 THRU 5:  
CANCELLED

STYLE 6:  
PIN 1. BASE  
2. EMITTER  
3. COLLECTOR

STYLE 7:  
PIN 1. EMITTER  
2. BASE  
3. COLLECTOR

STYLE 8:  
PIN 1. ANODE  
2. NO CONNECTION  
3. CATHODE

STYLE 9:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 10:  
PIN 1. DRAIN  
2. SOURCE  
3. GATE

STYLE 11:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE-ANODE

STYLE 12:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

STYLE 13:  
PIN 1. SOURCE  
2. DRAIN  
3. GATE

STYLE 14:  
PIN 1. CATHODE  
2. GATE  
3. ANODE

STYLE 15:  
PIN 1. GATE  
2. CATHODE  
3. ANODE

STYLE 16:  
PIN 1. ANODE  
2. CATHODE  
3. CATHODE

STYLE 17:  
PIN 1. NO CONNECTION  
2. ANODE  
3. CATHODE

STYLE 18:  
PIN 1. NO CONNECTION  
2. CATHODE  
3. ANODE

STYLE 19:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE-ANODE

STYLE 20:  
PIN 1. CATHODE  
2. ANODE  
3. GATE

STYLE 21:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN

STYLE 22:  
PIN 1. RETURN  
2. OUTPUT  
3. INPUT

STYLE 23:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE

STYLE 24:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE

STYLE 25:  
PIN 1. ANODE  
2. CATHODE  
3. GATE

STYLE 26:  
PIN 1. CATHODE  
2. ANODE  
3. NO CONNECTION

STYLE 27:  
PIN 1. CATHODE  
2. CATHODE  
3. CATHODE

STYLE 28:  
PIN 1. ANODE  
2. ANODE  
3. ANODE

|                         |                        |  |
|-------------------------|------------------------|--|
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