

# 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

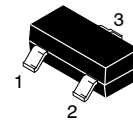
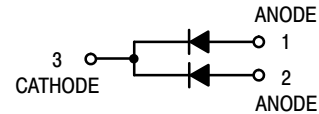
Rating	Symbol	Value	Unit
Continuous Reverse Voltage	$V_R$	250	V
Repetitive Peak Reverse Voltage	$V_{RRM}$	250	V
Peak Forward Current	$I_F$	400	mA
Non-Repetitive Peak Forward Surge Current	$I_{FSM}$	9.0 3.0 1.7	A
		@ $t = 1.0 \mu s$	
		@ $t = 100 \mu s$	
		@ $t = 10 ms$	
Peak Forward Surge Current	$I_{FM(surge)}$	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.



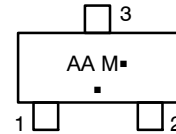
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SOT-23  
CASE 318  
STYLE 9

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

## DUAL HEATED (Note 3)

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

- FR-4 @ 100 mm<sup>2</sup>, 1 oz. copper traces, still air.
- FR-4 @ 500 mm<sup>2</sup>, 2 oz. copper traces, still air.
- 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
<b>OFF CHARACTERISTICS</b>				
Reverse Voltage Leakage Current ( $V_R = 200 \text{ Vdc}$ ) ( $V_R = 200 \text{ Vdc}, T_J = 150^\circ\text{C}$ )	$I_R$	- -	0.1 100	$\mu\text{Adc}$
Reverse Breakdown Voltage ( $I_{BR} = 100 \mu\text{Adc}$ )	$V_{(BR)}$	250	-	Vdc
Forward Voltage ( $I_F = 100 \text{ mAdc}$ ) ( $I_F = 200 \text{ mAdc}$ )	$V_F$	- -	1000 1250	mV
Diode Capacitance ( $V_R = 0, f = 1.0 \text{ MHz}$ )	$C_T$	-	5.0	pF
Reverse Recovery Time ( $I_F = I_R = 30 \text{ mAdc}, R_L = 100 \Omega$ )	$t_{rr}$	-	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

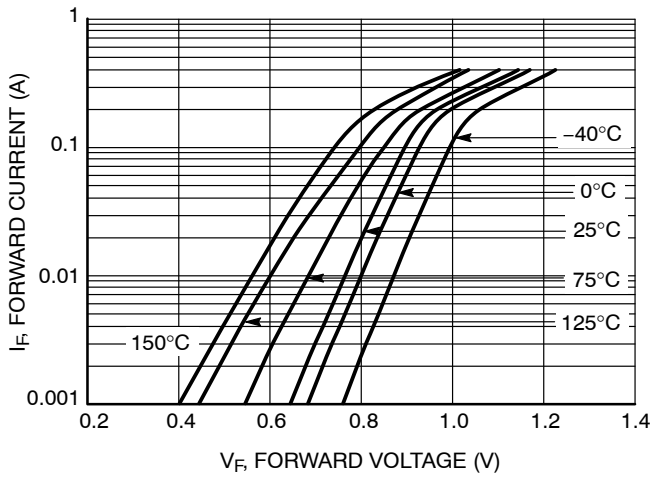


Figure 1. Forward Voltage

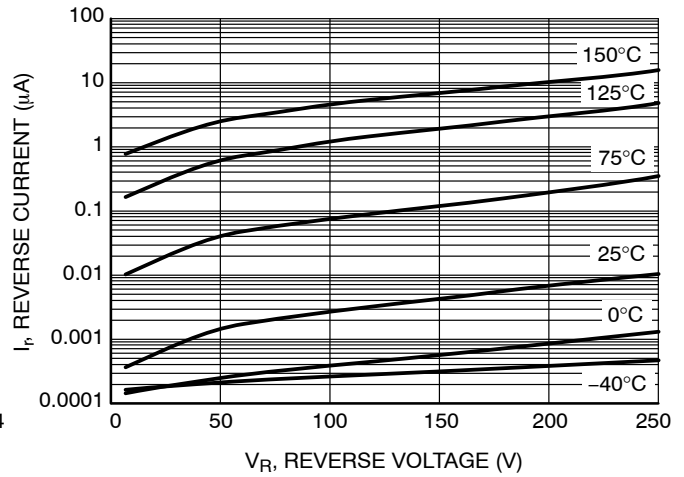


Figure 2. Reverse Current

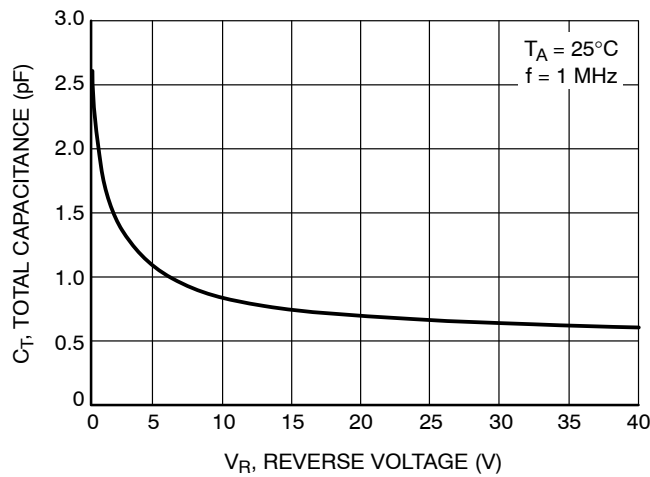
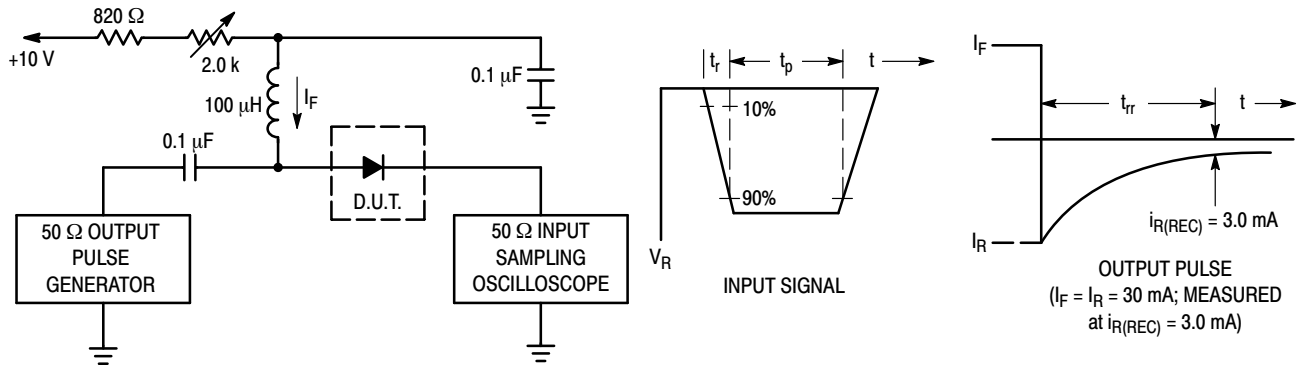


Figure 3. Total Capacitance



- 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

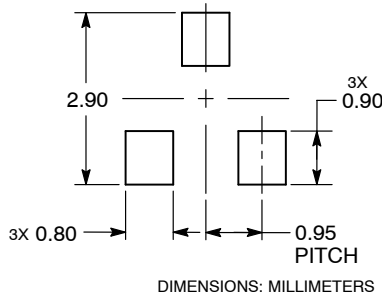


**NOTES:**

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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