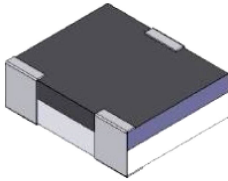




**Small Signal Switching Diode**

➤ **CDBAV99/CDBAV70/CDBAW56/CDMMBD4148**



**FEATURES**

- Silicon epitaxial planar diode
- SMD chip pattern, dual diode with anode to cathode
- Leadfree and RoHS compliance components

**MECHANICAL CHARACTERISTICS**

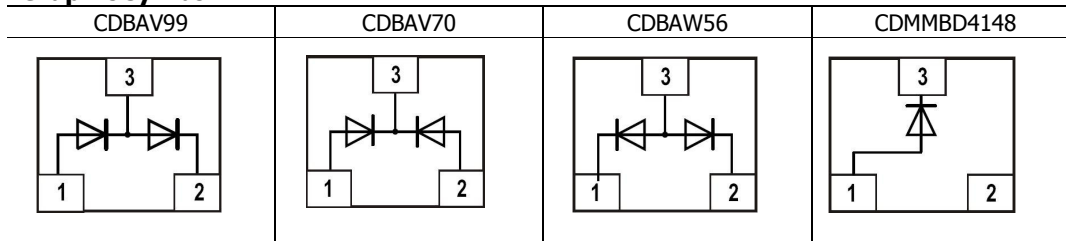
- Size: SOT-23 case
- Weight: approx. 21mg
- Marking: BAV99 as anode to cathode series dual switching diode

BAV70 as common cathode dual switching diode

BAW56 as common anode dual switching diode

BD4148 as SOT-23 case single switching diode

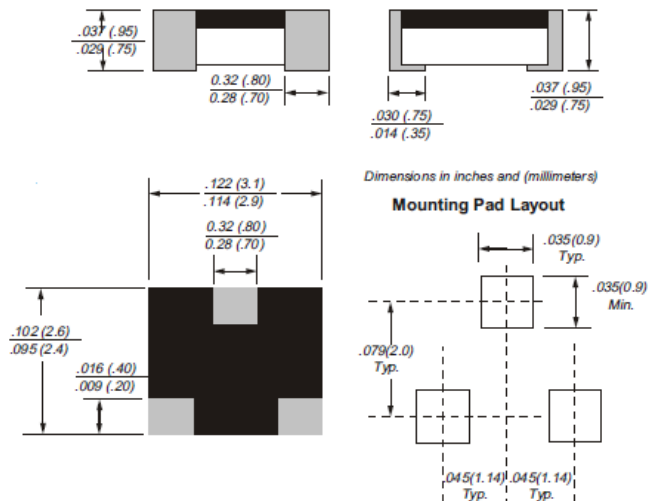
**Graphic symbol**



**DIMENSIONS**

Dimension/mm	SOT-23CD
L	3.0±0.1
W	2.5±0.1
T	0.85±0.1
C	0.55±0.2

**SOT-23CD**



**THERMAL CHARACTERISTICS<sup>1)</sup>**

Parameter at $T_{amb}=25^{\circ}\text{C}^{1)}$	Symbol	Value	Unit
Forward Power Dissipation Power derating above 25°C	$P_{tot}$	300	mW
		2.4	mW/°C
Junction Temperature	$T_j$	150	°C
Thermal Resistance Junction to Ambient air	$R_{\theta JA}$	430	°C/W
Operating & Storage Temperature range	$T_{sto}$	-55 to 150	°C

1) Valid provided that electrodes are kept at ambient temperature.

**MAXIMUM RATING<sup>1)</sup>**

Parameter at $T_{amb}=25^{\circ}\text{C}^{1)}$	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	$V_{RRM}$	70	V
Non-Repetitive Peak Reverse Voltage	$V_{RSM}$	100	V
Average rectified current sin half wave rectification with resistive load	$I_{F(AV)}$	150 <sup>2)</sup>	mA
		130 <sup>3)</sup>	mA
Repetitive Peak Forward Current at $T_{amb}=25^{\circ}\text{C}$	$I_{FRM}$	200	mA
Non-Repetitive Surge Forward Current at $t < 1\text{s}$ and $T_j=25^{\circ}\text{C}$ at $t \leq 8.3\text{ms}$ and $T_j=25^{\circ}\text{C}$	$I_{FSM}$	500	mA
		1000	mA

1) Valid provided that electrodes are kept at ambient temperature.

2) Single diode loader

3) Double diode loader

**ELECTRICAL CHARACTERISTICS<sup>1)</sup>**

Parameter at $T_{amb}=25^{\circ}\text{C}^{1)}$	Symbol	Value	Unit
Forward Voltage at $I_F=10\text{mA}$ at $I_F=100\text{mA}$	$V_F$	0.855 <sub>MAX</sub>	V
		1.0 <sub>MAX</sub>	V
Leakage Current at $V_R=70\text{V}$	$I_R$	2.5 <sub>MAX</sub>	uA
Capacitance at $V_R=6\text{V}, f=1\text{MHz}$	$C_{tot}$	4 <sub>MAX</sub>	pF
Reverse Recovery Time at $V_R=6\text{V}$ $I_F$ $=I_R=10\text{mA}, R_L=50\Omega$	$t_{rr}$	4 <sub>MAX</sub>	ns

1) Valid provided that electrodes are kept at ambient temperature.



**TYPICAL CHARACTERISTICS**

Figure 1. Forward Characteristic

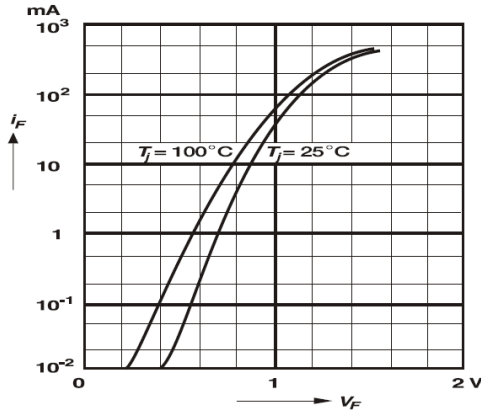


Figure 2. Power De-rating

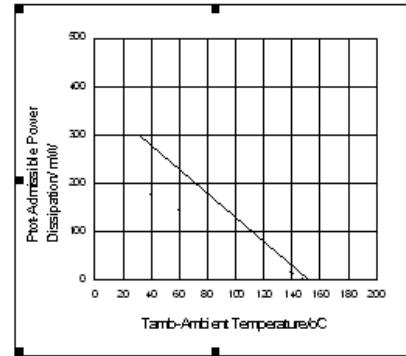


Figure 3. Forward Current De-rating

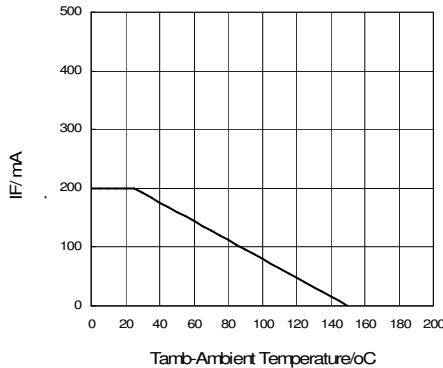
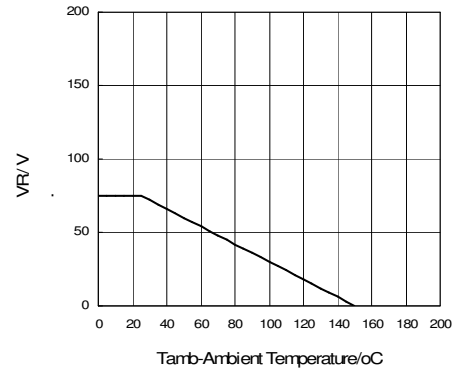


Figure 4. Reverse Voltage De-rating



**TEST CHARACTERISTICS**

Test Item	Test Condition	Requirement
Solderability	Sn bath at $245 \pm 5^\circ\text{C}$ for $2 \pm 0.5\text{s}$	>95% area tin covered
Resistance to Soldering Heat	Sn bath at $260 \pm 5^\circ\text{C}$ for $10 \pm 2\text{s}$	$V_F, V_Z$ & $I_R$ within spec; no mechanical damage
Humidity Steady State	At $85^\circ\text{C}$ 85%RH for 168hrs	$V_F, V_Z$ & $I_R$ within spec
Continue Forward Operating Life	At $25^\circ\text{C}$ $I_F = 1.1 I_{F\text{max}}$ for 1000hrs	$V_F, V_Z$ & $I_R$ within spec
Thermal Shock	$-55 \pm 5^\circ\text{C}/5\text{min}$ to $150 \pm 5^\circ\text{C}/5\text{min}$ for 10cycles	$V_F, V_Z$ & $I_R$ within spec



Bending Strength	Bending up to 2mm for 1cycle	$V_F, V_Z$ & $I_R$ within spec; no mechanical damage
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## APPLICATIONS

- Function: Fast switching
- Soldering Condition:

### Soldering Condition & Caution

- Recommended Soldering Condition  
(Refer to IPC/JEDEC J-STD-020D 4-1&5.2)

Recommended Profile Condition	Sn-Pb Soldering	Leadfree Soldering	Wave Soldering
Ramp-up rate (from pre-heat stage)	<3°C/s	<3°C/s	$\Delta T < 150^\circ\text{C}$
Pre-heat Temperature & Time	100-150 °C 60-120s	150-200 °C 60-120s	100-150 °C 60-120s
Soldering Temperature & Time	183 °C 60-150s	217 °C 60-150s	260±5°C 5±2s
Peak Temperature	230±5°C <260°C	245±5°C <260°C	260±5°C
Time within 5°C of peak temperature	10-20s	20-30s	-
Ramp-down rate	<6°C/s	<6°C/s	<6°C/s
Time 25°C to peak temperature	<6min	<8min	-

Manual Soldering: Approx. 350°C for 3s, avoid solder iron tip direct touch the components body

### Recommended Soldering Profile

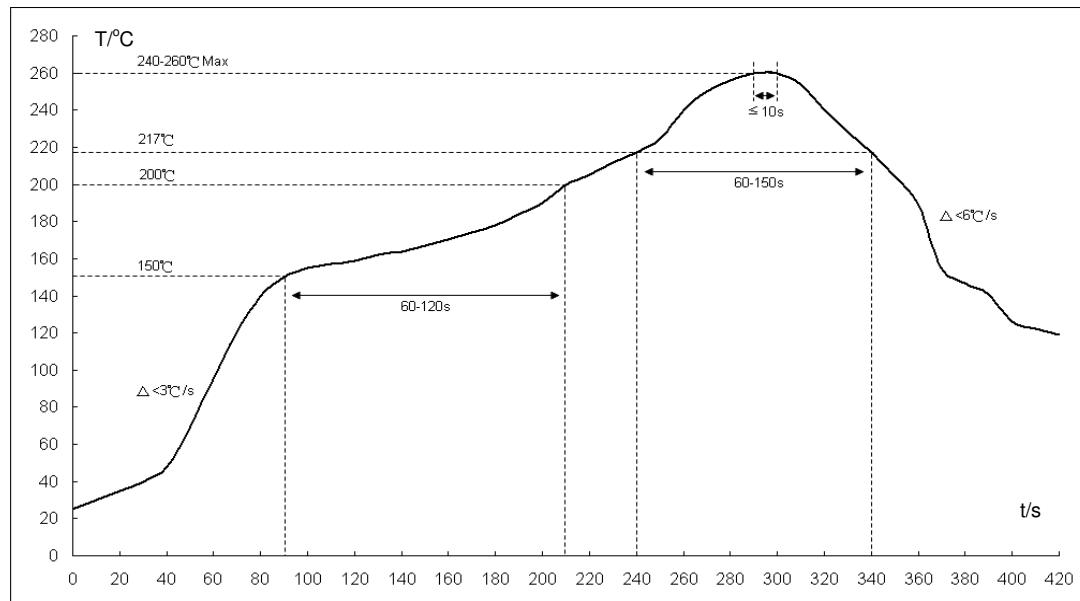


Fig1: Reflow soldering profile for lead-free solder (SnAgCu)

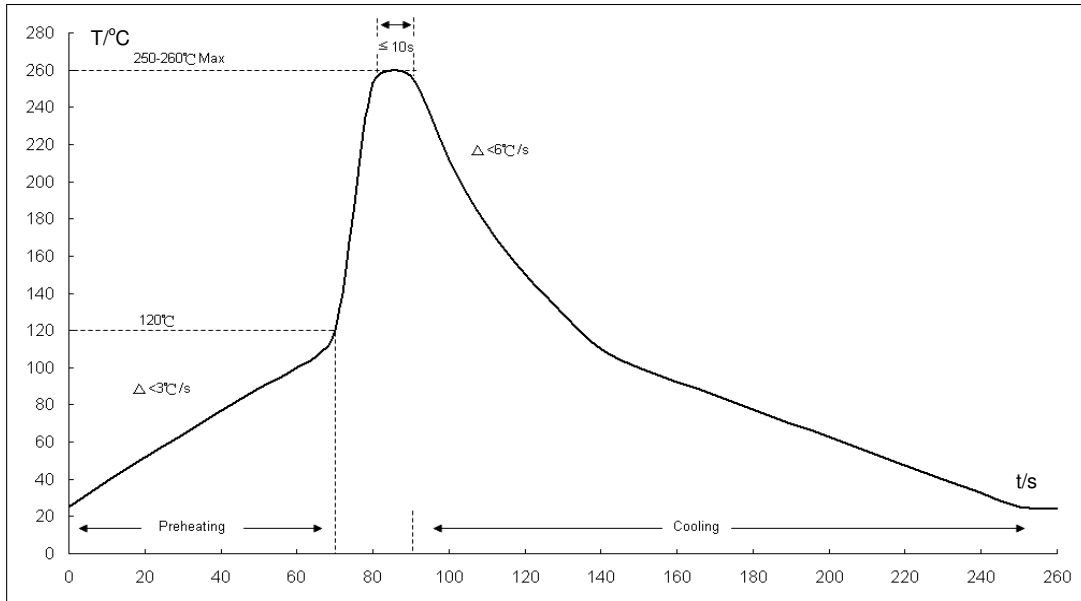


Fig2: Wave soldering profile

- \*1. The recommended profiles are referring to IPC/JEDEC J-STD-020D & IEC-60068-2-58
- \*2. Chip diodes are able to stand maximum soldering temperature up to 260°C max for 10s, and the soldering cycles with max 3 times, referring to IEC-60068-2-58

- Storage Condition: Product termination solderability can degrade due to high temperature and humidity or chemical environment. Storage condition must be in an ambient temperature of <40°C and ambient humidity of <75%RH, and free from chemical.

**ENVIRONMENTAL CHARACTERISTICS**

Product	Hazardous Substance or Element/ppm					
	Pb	Cd	Hg	Cr <sup>6+</sup>	PBB	PBDE
	<1000	<100	<1000	<1000	<1000	<1000

Product	Halogen Substance/ ppm				
	F	Cl	Br	I	Total
	<900	<900	<900	<900	<1500

**PACKING METHOD**



## SOT-23CD SERIES

Crownpo Technology

Product	Quality/Reel	Reel Size	Tape
	5,000pcs	7"	Embossed tape

### DISCLAIMERS

These products are not designed for use in applications where any failure or malfunction may result in personal injury, death or severe property or environmental damage such as medical, military, aircraft,



## **SOT-23CD SERIES**

Crownpo Technology

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space or life support equipments.