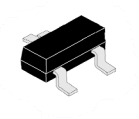
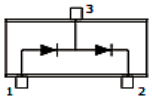
SILICON PLANAR HIGH SPEED SWITCHING DUAL DIODE

BAV99



SOT-23



SOT-23
Surface Mount
Plastic Package
RoHS compliant

FEATURES:

1. Marking **BAV99 = A7**
2. This product is available in AEC-Q101 Qualified and PPAP Capable also.

Note: For AEC-Q101 qualified products, please use suffix -AQ in the part number while ordering.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Parameter		SYMBOL	VALUE	UNIT
Repetitive Peak Reverse Voltage		V_{RRM}	100	V
Reverse Voltage		V_R	100	V
Forward Current (DC)		I_F	215	mA
Repetitive Peak Forward Current		I_{FRM}	500	mA
Non Repetitive Peak Forward Current (per crystal)	t=1µs	I_{FSM}	4.0	A
	t=1ms		1.0	A
	t=1s		0.5	A
Power Dissipation up to Ta=25ºC		P_D	250	mW
Junction Temperature		T_j	150	°C
Ambient Temperature		T_{amb}	-65 to +150	°C
Storage Temperature Range		T_{stg}	-65 to +150	°C

Thermal Resistance

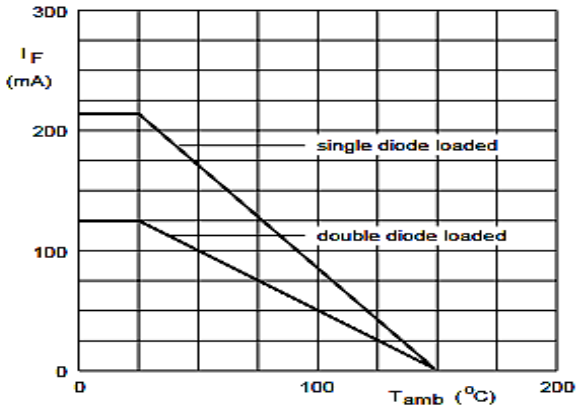
Junction to Ambient in free air	$R_{th\ (j\text{-}a)}$	500	K/W
Junction to Solder Point	$R_{th\ (j\text{-}sp)}$	360	K/W

ELECTRICAL CHARACTERISTICS at T_a = 25 °C

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	I_F = 1mA	--	--	0.715	V
		I_F = 10mA	--	--	0.855	V
		I_F = 50mA	--	--	1.0	V
		I_F = 150mA	--	--	1.25	V
Reverse Current	I_R	V_R=25V	--	--	30	nA
		V_R=25V, T_J=150ºC	--	--	30	µA
		V_R=80V	--	--	0.5	µA
		V_R=80V, T_J=150ºC	--	--	50	µA
Diode Capacitance	C_d	V_R=0V, f=1MHz	--	--	1.5	pF
Forward Recovery Voltage	V_{FR}	I_F=10mA, t_r=20ns	--	--	1.75	V
Reverse Recovery Time	t_{rr}	I_F=10mA, to I_R=10mA, measured at I_R=1.0mA, R_L=100W	--	--	4.0	ns
Reverse Charge When Switched Time	Q_S	I_F=10mA to V_R=5V, R_L=100W	--	--	45	pC

Typical Characteristic Curves

Fig 1: Maximum permissible continuous forward current as a function of ambient temperature



Device mounted on an FR4 printed-circuit board.

Fig 2: Reverse current as a function of junction temperature.

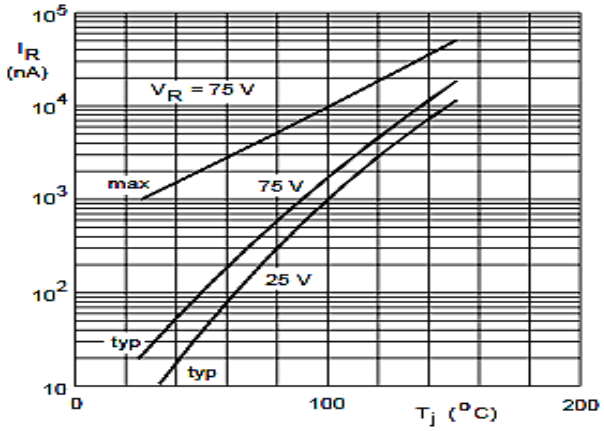
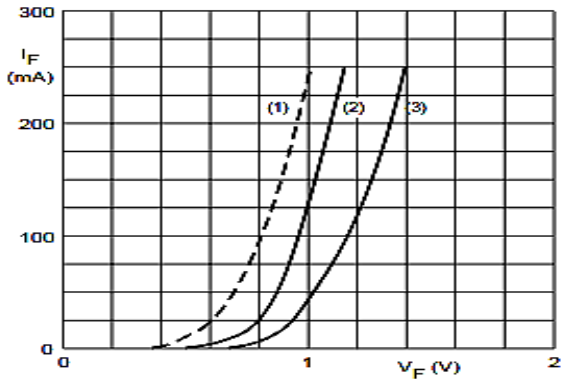
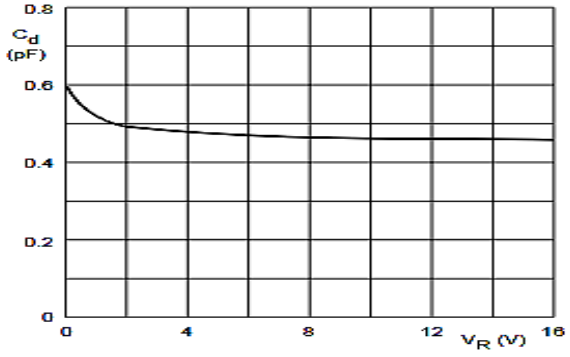


Fig 3: Forward current as a function of forward voltage.



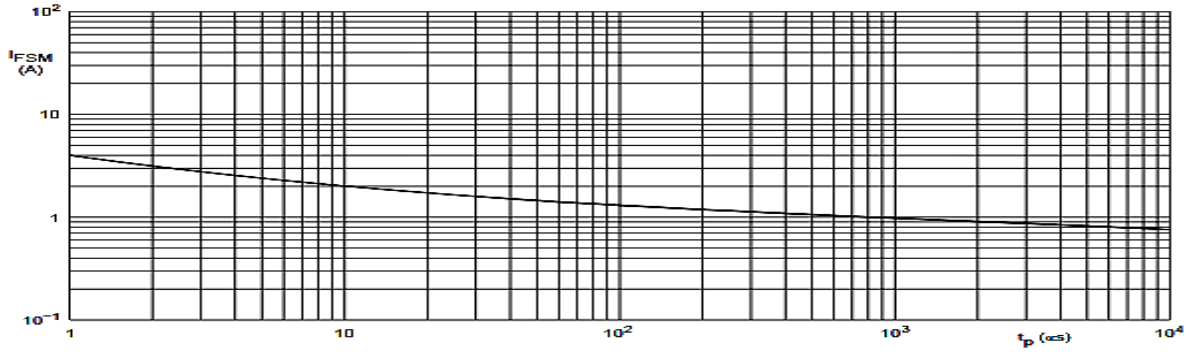
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig 4: Diode capacitance as a function of reverse voltage; typical values.



f = 1 MHz; T_j = 25 °C.

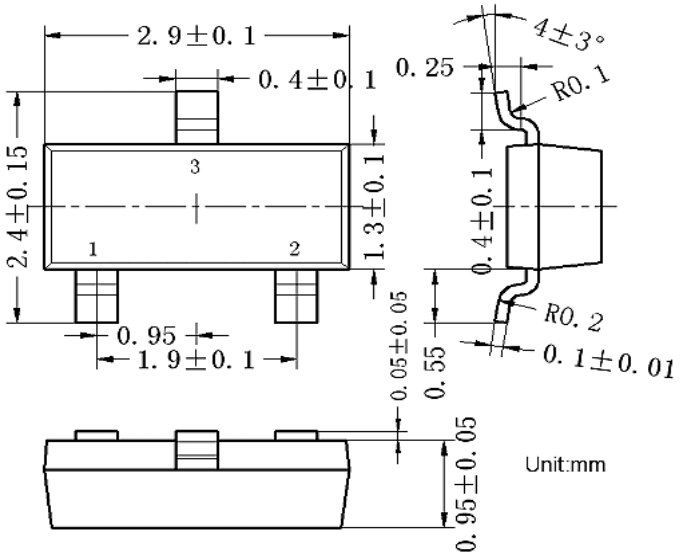
Fig 5: Maximum permissible non-repetitive peak forward current as a function of pulse duration.



Based on square wave currents.
T_j = 25 °C prior to surge.

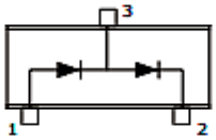
PACKAGE DETAILS

SOT-23 SMD Package

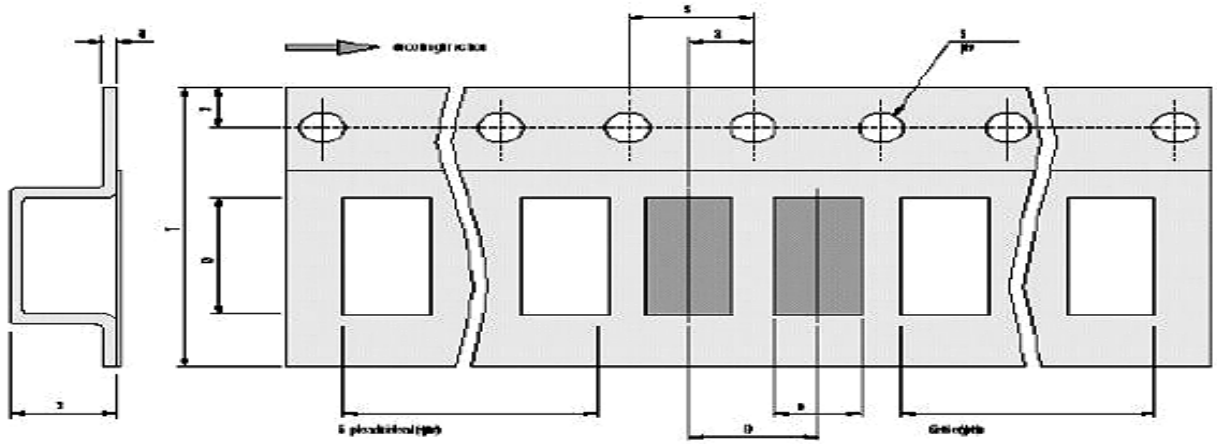


Pin Configuration

1. ANODE
2. CATHODE
3. ANODE/CATHODE



Packaging Tape Specification For SMD Packages



SMD Tape Specifications (8-12mm)

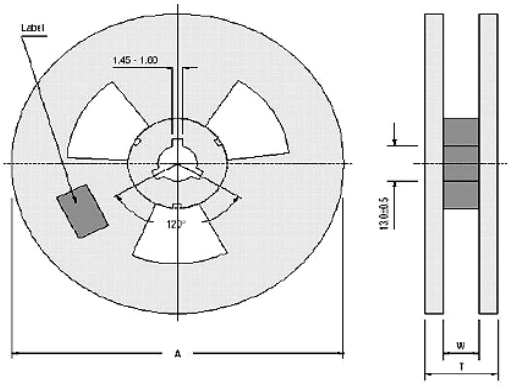
Device	D1	D2	D3	T1	T2	T3	T4	S1	S2	S3
						Max	Max			Dia
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
SOT-23	3.2±0.1	2.0±0.1	4.0±0.1	1.0±0.2	1.75±0.1	1.60	0.35	4.0±0.1	2.0±0.1	1.5±0.1

Packaging Specifications

T & A: Tape and Ammo Pack; T & R: Tape and Reel Bulk: Loose in Poly bags; Tube: Tube and Carton; K: 1,000

Package / Case Type	Packaging Type	Std. Packing	Inner Carton			Outer Carton		
		Qty	Qty	Size L x W x H (cm)	Gross Weight (Kg)	Qty	Size L x W x H (cm)	Gross Weight (Kg)
SOT-23	T & R	3,000	15K	19 x 19 x 8	0.6	51K	23 x 13 x 23	2.2
	T & R	3,000	15K	19 x 19 x 8	0.6	408K	48 x 48 x 51	20.2
	T & R	10,000	50K	35.5 x 35.5 x 8.9	2.4	350K	48 x 48 x 51	19.2

Reel Specification For SMD Packages



Reel Specifications

Package	Tape Width	Reel Dia.	Devices per Reel and MOQ	Inside Thickness	Reel Thickness
		A - Max		W	T - Max
SOT-23	8	180	3,000	8.4±2	14.4
	8	330	10,000	8.4±2	14.4

Recommended Reflow Solder Profiles

The recommended reflow solder profiles for Pb and Pb-free devices are shown below.

Figure 1 shows the recommended solder profile for devices that have Pb-free terminal plating, and where a Pb-free solder is used.

Figure 2 shows the recommended solder profile for devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with a leaded solder.

Figure 1

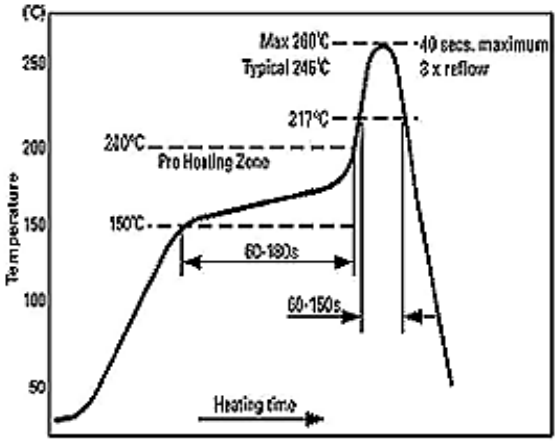
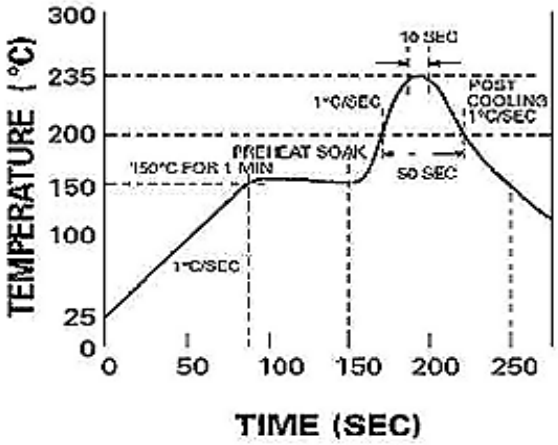


Figure 2

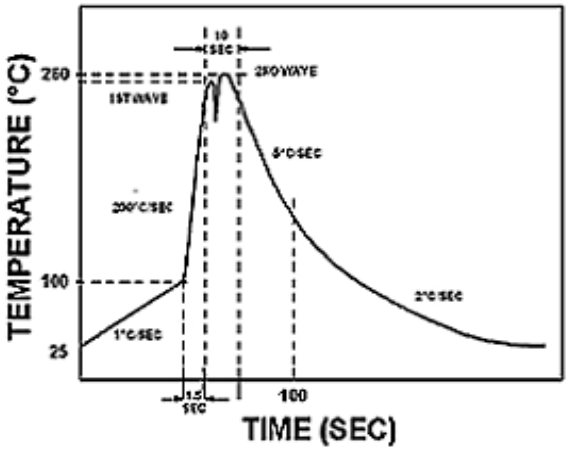


Reflow profiles in tabular form

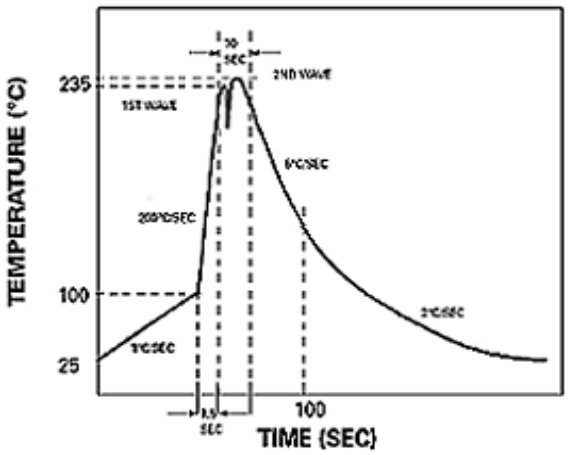
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	 150-170°C 60-180 seconds	 150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	 200°C 30-50 seconds	 217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	40 seconds
Ramp-Down Rate	3°C/second max.	6°C/second max.

Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free terminal plating where a Pb-free solder is used



The Recommended solder Profile For Devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with leaded solder



Wave Profiles in Tabular Form

Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~200°C/second	~200°C/second
Heating rate during preheat	Typical 1-2, Max 4°C/sec	Typical 1-2, Max 4°C/Sec
Final preheat Temperature	Within 125°C of Solder Temp	Within 125°C of Solder Temp
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	10 seconds
Ramp-Down Rate	5°C/second max.	5°C/second max

Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.
If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.
The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.
For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	**Time**	**Condition**
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH

Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).
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