

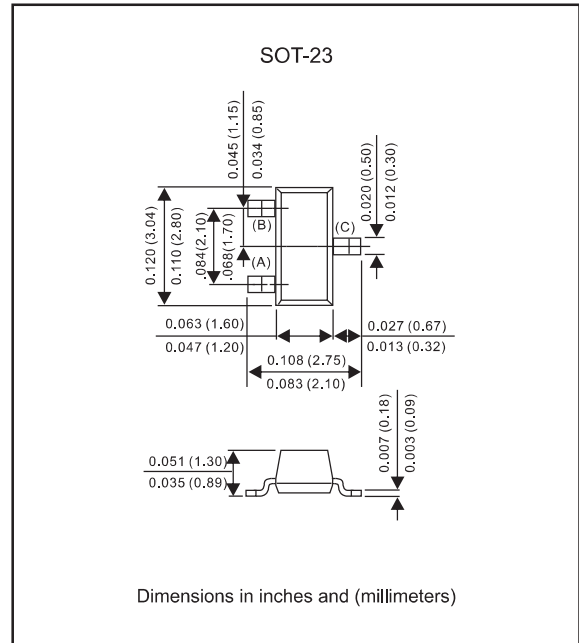
## Features

- Fast speed switching.
- For general purpose switching application.
- High conductance.
- Silicon epitaxial planar chip.
- Lead-free parts meet RoHS requirements.
- Compliant to Halogen-free
- Suffix "-Q1" for AEC-Q101

## Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any

## Package outline



## Maximum ratings (AT $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	BAL99-Q1	BAV99-Q1	BAW56-Q1	BAV70-Q1	UNIT
Reverse Voltage	$V_R$	70				V
Forward Current	$I_F$	100	215	200		mA
Peak Forward Surge Current	$I_{FM}$	500				mA
Non-Repetitive Peak Forward Surge Current @ $t=1.0\mu\text{s}$ @ $t=1.0\text{s}$	$I_{FSM}$	2.0 1.0				A

## Thermal Characteristics

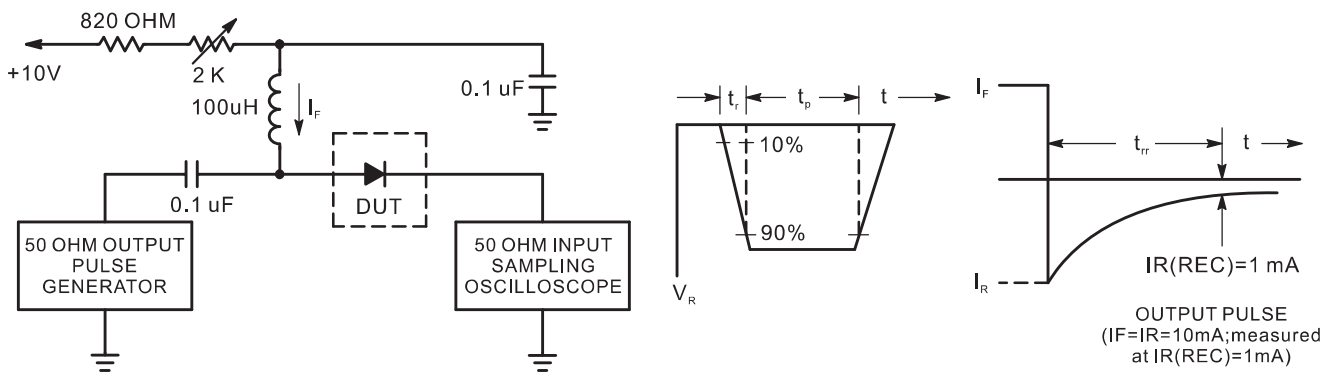
PARAMETER	SYMBOL	MAX.	UNIT
Total Device Dissipation FR-5 Board* <sup>1</sup> , $T_A = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate* <sup>2</sup> , $T_A = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Operating Temperature Range	$T_J$	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65 ~ +150	$^\circ\text{C}$

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

### Electrical Characteristics (AT $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Reverse Breakdown Voltage( $I_{BR}=100\mu\text{Adc}$ )	$V_{BR}$	70		V
Reverse Voltage Leakage Current (at $V_R = 70\text{V}$ , $T_J=25^\circ\text{C}$ ) BAL99-Q1/BAV99-Q1/BAW56-Q1/BAV70-Q1 (at $V_R = 25\text{V}$ , $T_J=150^\circ\text{C}$ )BAL99-Q1/BAV99-Q1/BAW56-Q1 (at $V_R = 25\text{V}$ , $T_J=150^\circ\text{C}$ )BAV70-Q1 (at $V_R = 70\text{V}$ , $T_J=150^\circ\text{C}$ )BAL99-Q1/BAV99-Q1/BAW56-Q1 (at $V_R = 70\text{V}$ , $T_J=150^\circ\text{C}$ )BAV70-Q1	$I_R$		2.5 30 60 50 100	$\mu\text{A}$
Diode Capacitance( $V_R = 0\text{V}$ , $f = 1.0\text{MHz}$ ) BAL99-Q1/BAV99-Q1/BAV70-Q1 BAW56-Q1	$C_D$		1.5 2.0	pF
Reverse Recovery Time( $I_F = I_R = 10\text{mA}$ , $V_R = 5.0\text{Vdc}$ , $I_R(\text{REC}) = 1.0\text{mA}$ , $R_L = 100_{\text{OHM}}$ )	$t_{rr}$		6.0	ns
Forward Voltage (at $I_F = 1.0\text{mA}$ ) (at $I_F = 10\text{mA}$ ) (at $I_F = 50\text{mA}$ ) (at $I_F = 150\text{mA}$ )	$V_F$		715 855 1000 1250	mV

Recovery Time Equivalent Test Circuit



- Notes : 1. A2.0 Kohm variable resistor adjusted for a forward Current ( $I_F$ ) of 10mA.  
 2. Input pulse is adjusted so  $I_R(\text{peak})$  is equal to 10 mA.  
 3.  $t_p \gg t_{rr}$ .

## Rating and characteristic curves for each diode

FIG.1-TYPICAL FORWARD CHARACTERISTICS

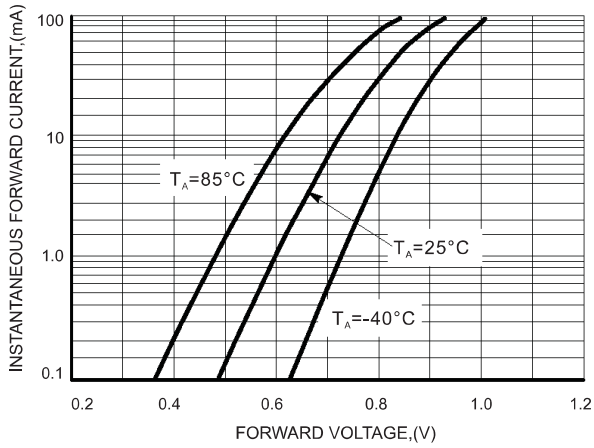


FIG.2 - TYPICAL REVERSE CHARACTERISTICS

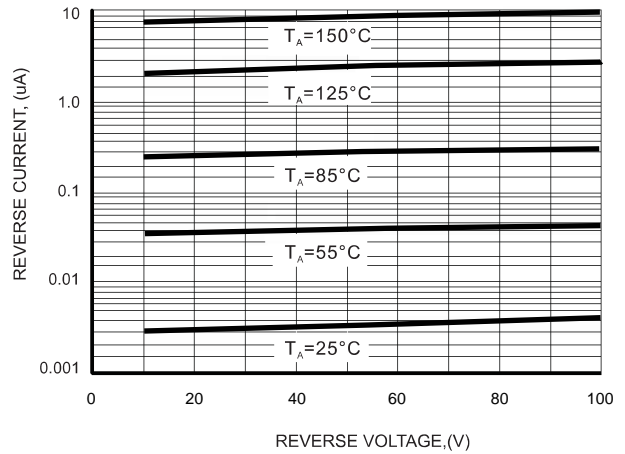


FIG.3a - TYPICAL DIODE CAPACITANCE  
BAL99/BAV99/BAV70

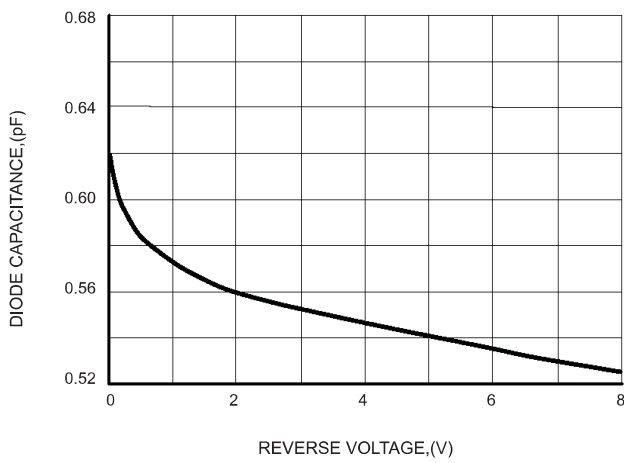
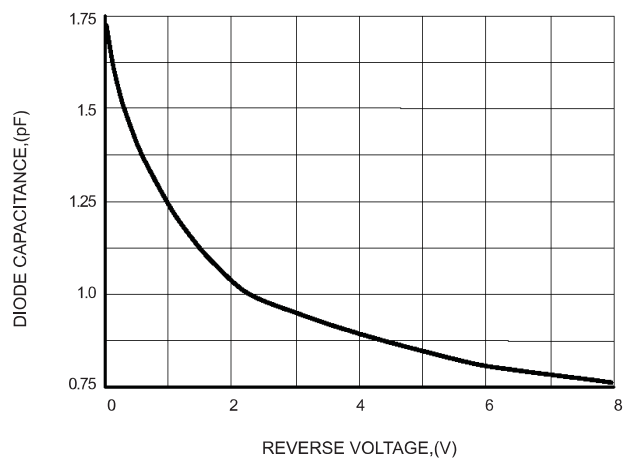
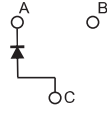
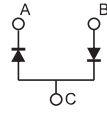
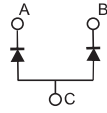
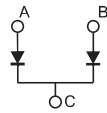
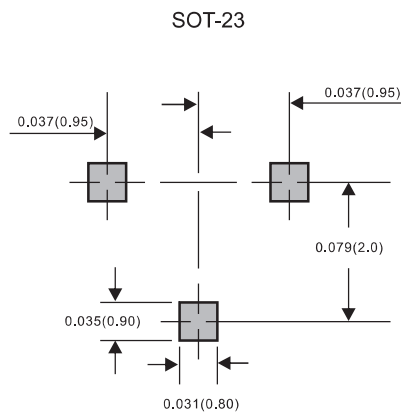


FIG.3b - TYPICAL DIODE CAPACITANCE  
BAW56



**Pinning information**

Type number	Marking code	Symbol
BAL99-Q1	L4, A6, JF	
BAV99-Q1	JG, A7	
BAW56-Q1	JC, A1	
BAV70-Q1	JA, A4	

**Suggested solder pad layout**


Dimensions in inches and (millimeters)