

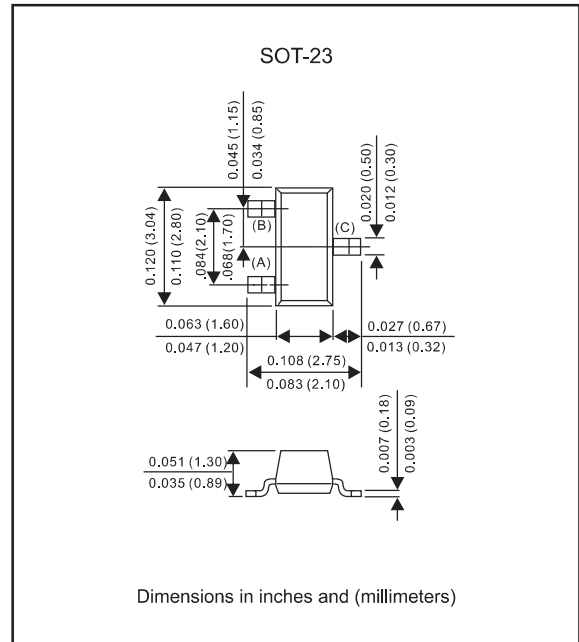
### Features

- 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=1.0us @ t=1.0s	$I_{FSM}$	2.0 1.0				A

### Thermal Characteristics

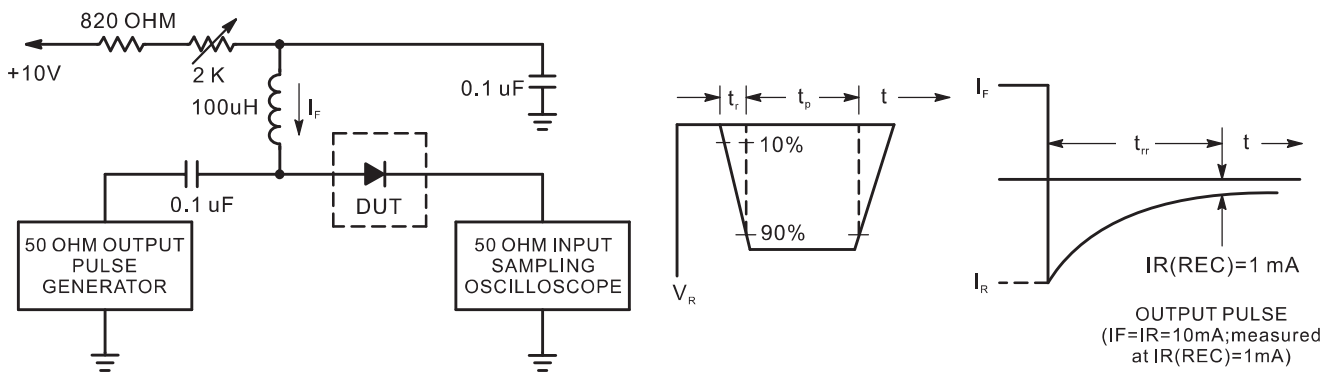
PARAMETER	SYMBOL	MAX.	UNIT
Total Device Dissipation FR-5 Board* <sup>1</sup> , $T_A = 25^{\circ}\text{C}$ Derate Above $25^{\circ}\text{C}$	$P_D$	225 1.8	mW mW/ $^{\circ}\text{C}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	556	$^{\circ}\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate* <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( $I_{BR}=100\mu\text{A}$ )	$V_{BR}$	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

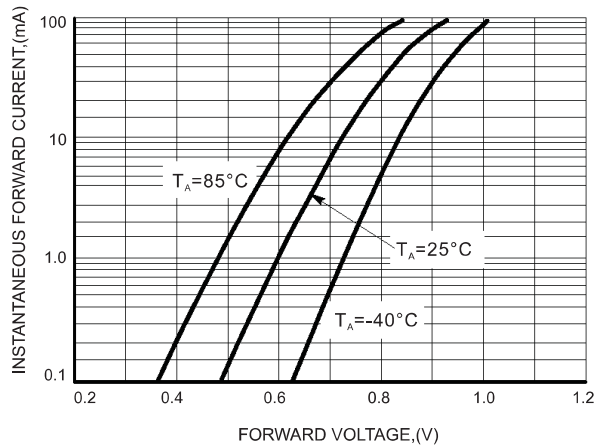
Recovery Time Equivalent Test Circuit



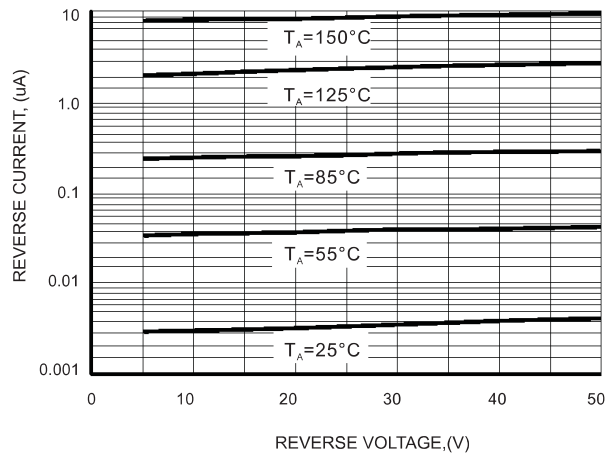
- Notes : 1. A2.0 Kohm variable resistor adjusted for a forward Current ( $I_F$ ) of 10mA.  
2. Input pulse is adjusted so  $I_R(\text{peak})$  is equal to 10 mA.  
3.  $t_p \gg t_{rr}$ .

**Rating and characteristic curves for each diode**

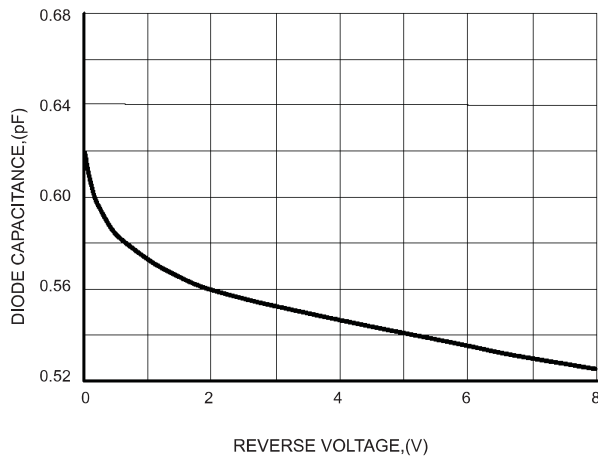
**FIG.1-TYPICAL FORWARD CHARACTERISTICS**



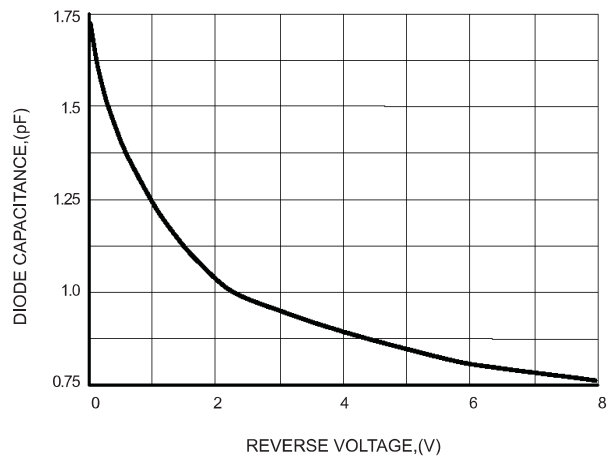
**FIG.2 - TYPICAL REVERSE CHARACTERISTICS**



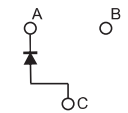
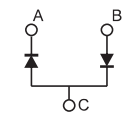
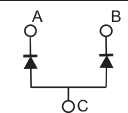
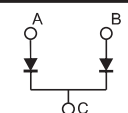
**FIG.3a - TYPICAL DIODE CAPACITANCE BAL99-Q1/BAV99-Q1/BAV70-Q1**



**FIG.3b - TYPICAL DIODE CAPACITANCE BAW56-Q1**

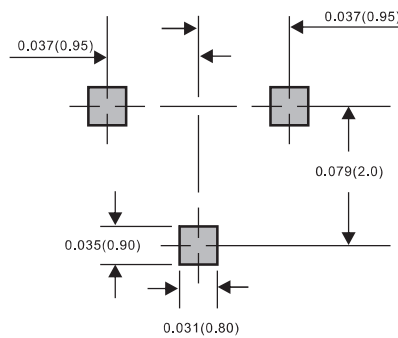


### Pinning information

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

SOT-23



Dimensions in inches and (millimeters)