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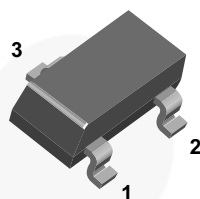
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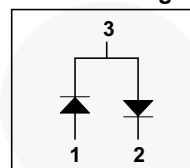
## BAS31 Small Signal Diode



SOT-23



Connection Diagram



### Ordering Information

Part Number	Top Mark	Package	Packing Method
BAS31	L21	SOT-23 3L	Tape and Reel, 7 inch Reel, 3000 pcs
BAS31_D87Z	L21	SOT-23 3L	Tape and Reel, 13 inch Reel, 10000 pcs

### Absolute Maximum Ratings<sup>(1), (2)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter		Value	Unit
$V_{RRM}$	Maximum Repetitive Reverse Voltage		120	V
$I_{F(AV)}$	Average Rectified Forward Current		200	mA
$I_{FSM}$	Non-Repetitive Peak Forward Surge Current	Pulse Width = 1.0 second	1.0	A
		Pulse Width = 1.0 microsecond	2.0	
$T_{STG}$	Storage Temperature Range		-55 to +150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature		150	$^\circ\text{C}$

#### Notes:

1. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

## Thermal Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

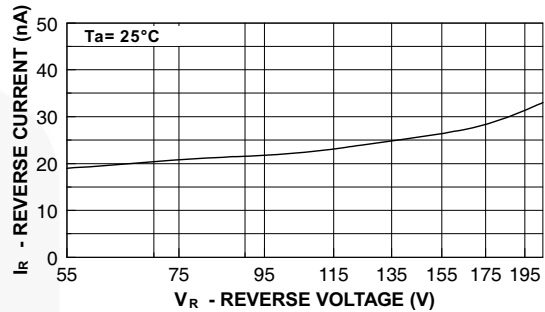
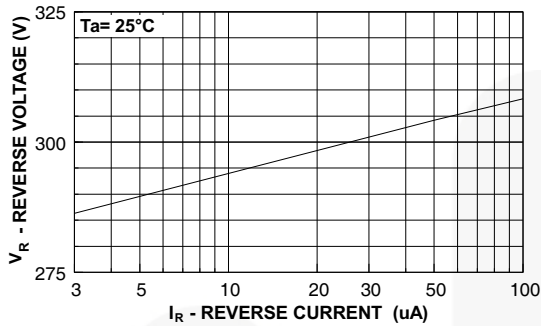
Symbol	Parameter	Value	Unit
$P_D$	Power Dissipation	350	mW
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	357	$^\circ\text{C/W}$

## Electrical Characteristics

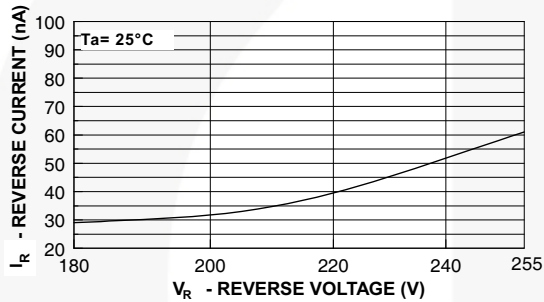
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_R$	Breakdown Voltage	$I_R = 1.0\text{ mA}$	120		V
$V_F$	Forward Voltage	$I_F = 10\text{ mA}$		750	mV
		$I_F = 50\text{ mA}$		840	mV
		$I_F = 100\text{ mA}$		900	mV
		$I_F = 200\text{ mA}$		1.00	V
		$I_F = 400\text{ mA}$		1.25	V
$I_R$	Reverse Current	$V_R = 90\text{ V}$		100	nA
		$V_R = 90\text{ V}, T_A = 150^\circ\text{C}$		100	$\mu\text{A}$
$C_T$	Total Capacitance	$V_R = 0, f = 1.0\text{ MHz}$		35	pF
$t_{rr}$	Reverse Recovery Time	$I_F = I_R = 30\text{ mA}, I_{RR} = 3.0\text{ mA}, R_L = 100\ \Omega$		50	ns

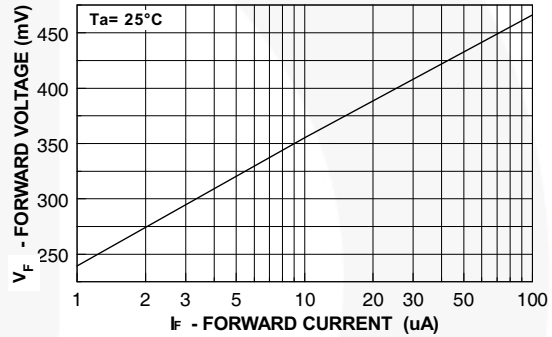
## Typical Performance Characteristics



GENERAL RULE: The Reverse Current of a diode will approximately double for every ten (10) Degree C increase in Temperature

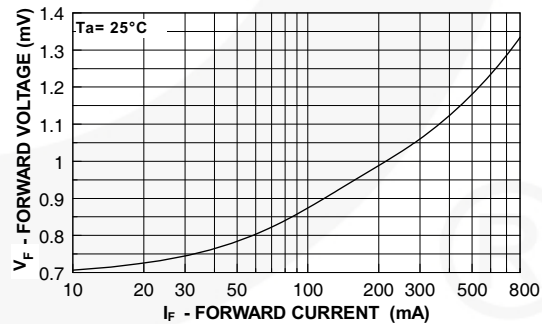
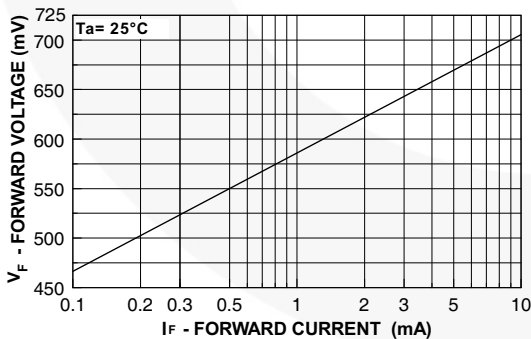


GENERAL RULE: The Reverse Current of a diode will approximately double for every ten Degree C increase in Temperature



**Figure 3. Reverse Current vs. Reverse Voltage**  
 $I_R$  - 180 to 255 V

**Figure 4. Forward Voltage vs. Forward Current**  
 $V_F$  - 1.0 to 100  $\mu A$



# Typical Performance Characteristics (Continued)

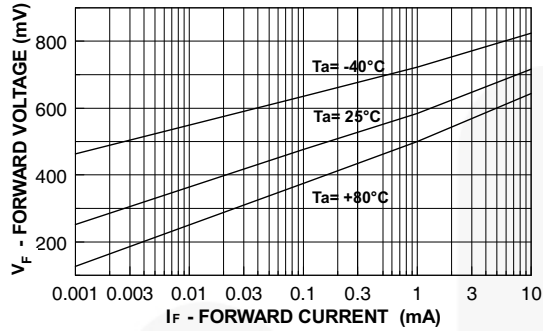


Figure 7. Forward Voltage vs. Ambient Temperature  
 $V_F$  - 1.0  $\mu$ A - 10 mA (- 40 to +80°C)

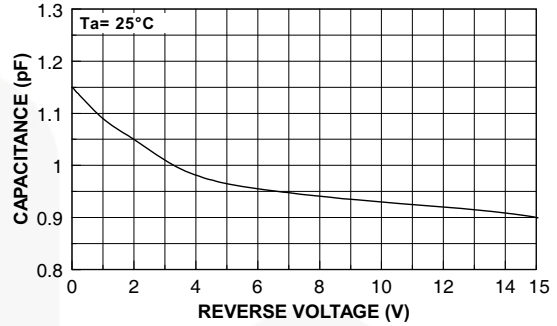


Figure 8. Capacitance vs. Reverse Voltage

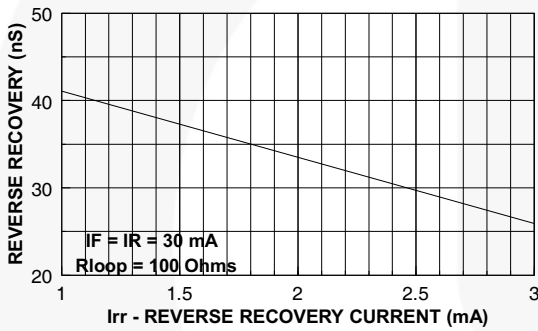


Figure 9. Reverse Recovery Time vs. Reverse Recovery Current ( $I_{rr}$ )

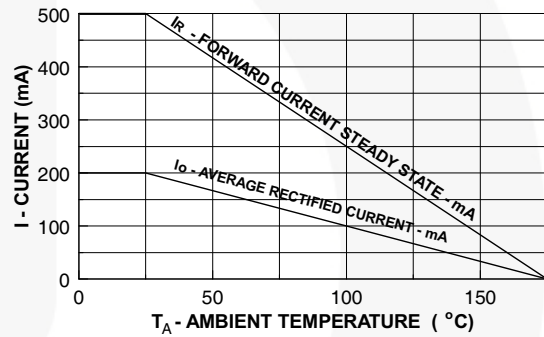


Figure 10. Average Rectified Current( $I_O$ ) and Forward Current ( $I_F$ ) vs. Ambient Temperature( $T_A$ )

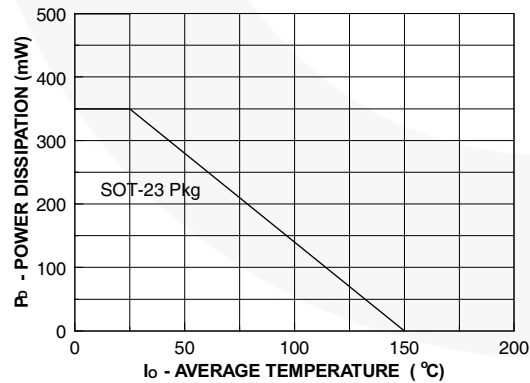


Figure 11. Power Derating Curve





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