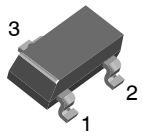
Small Signal Diode

BAS31



SOT−23
CASE 318BM

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted) (Note 1, 2)

Symbol	Parameter		Ratings	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	°C
T_J	Operating Junction Temperature		150	°C

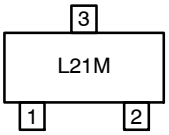
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady−state limits. **onsemi** should be consulted on applications involving pulsed or low− duty−cycle operations.

THERMAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

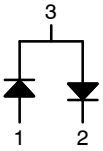
Symbol	Parameter	Ratings	Unit
P_D	Power Dissipation	350	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction−to−Ambient	357	

MARKING DIAGRAM



L21 = Specific Device Code
M = Date Code

CONNECTION DIAGRAM



ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 4 of this data sheet.

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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TYPICAL PERFORMANCE CHARACTERISTICS

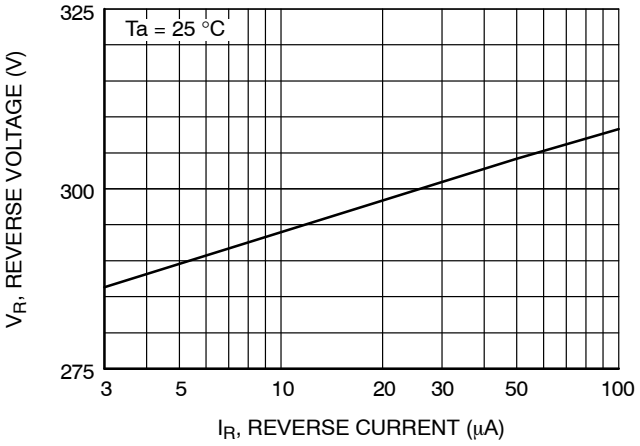
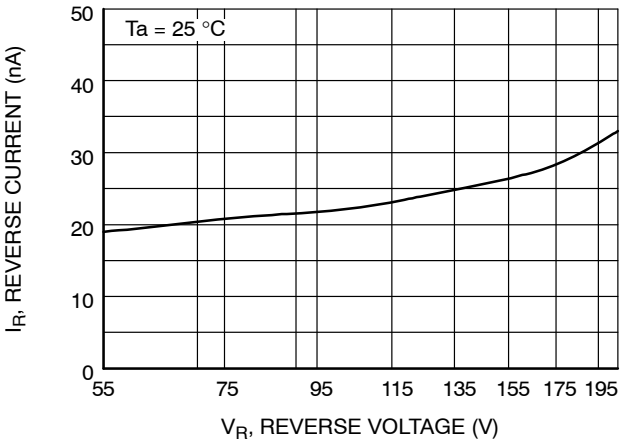
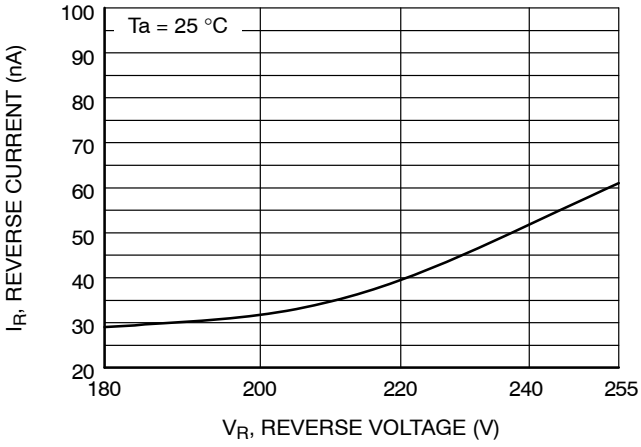


Figure 1. Reverse Voltage vs. Reverse Current BV – 1.0 to 100 μA



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

Figure 2. Reverse Current vs. Reverse Voltage I_R – 55 to 205 V



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

Figure 3. Reverse Current vs. Reverse Voltage I_R – 180 to 255 V

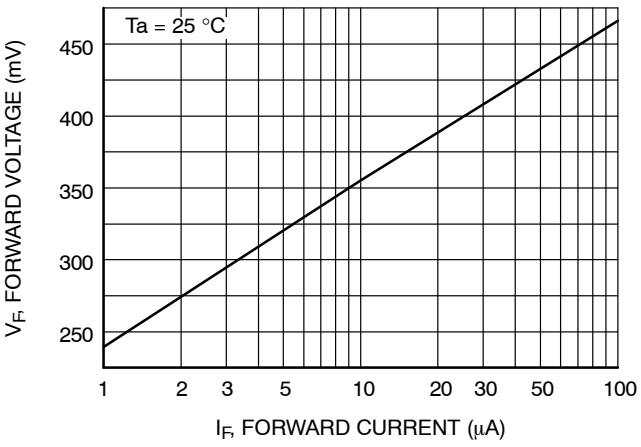


Figure 4. Forward Voltage vs. Forward Current V_F – 1.0 to 100 μA

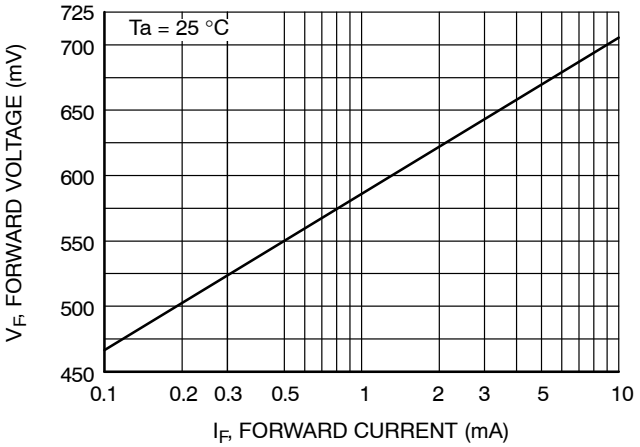


Figure 5. Forward Voltage vs. Forward Current V_F – 0.1 to 10 mA

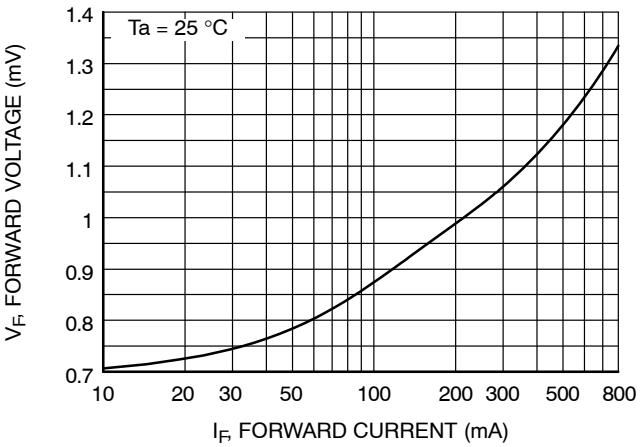


Figure 6. Forward Voltage vs. Forward Current V_F – 10 to 800 mA

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TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

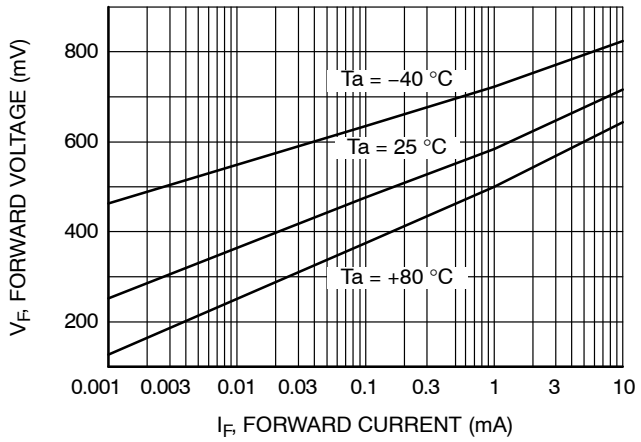


Figure 7. Forward Voltage vs. Ambient Temperature VF – 1.0 μA – 10 mA (– 40 to +80°C)

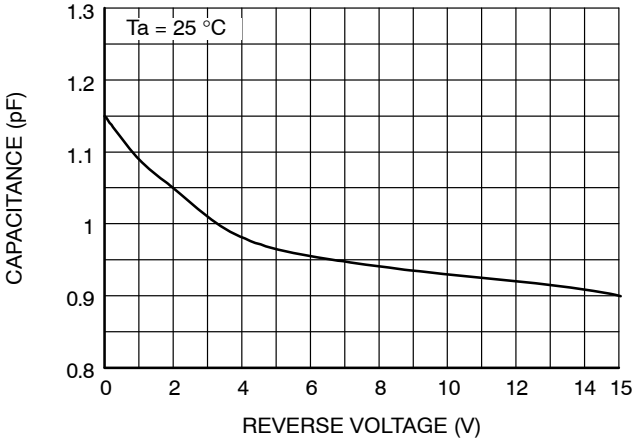


Figure 8. Capacitance vs. Reverse Voltage

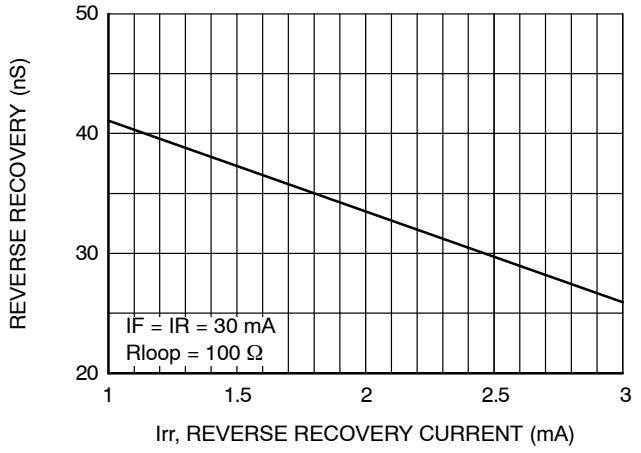


Figure 9. Reverse Recovery Time vs. Reverse Recovery Current (Irr)

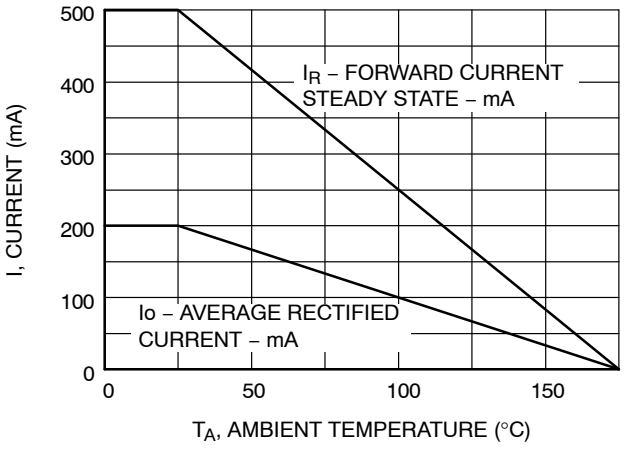


Figure 10. Average Rectified Current (I_O) and Forward Current (I_F) vs. Ambient Temperature (T_A)

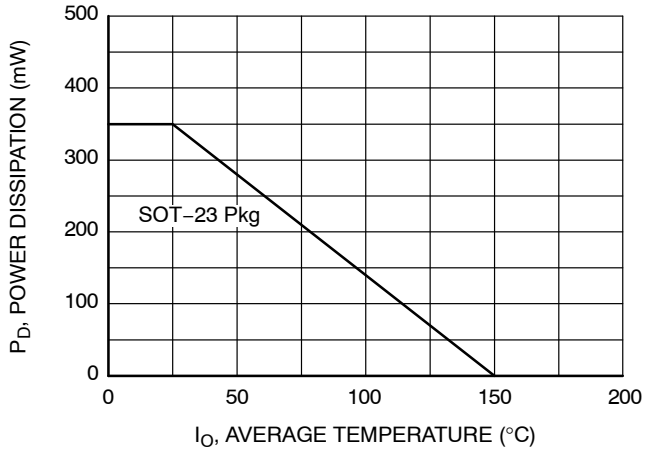


Figure 11. Power Derating Curve

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ORDERING INFORMATION

Device	Specific Marking Code	Package	Shipping†
BAS31 BAS31-NC	L21	SOT-23 3L (Pb-Free)	3,000 / Tape & Reel
BAS31−D87Z BAS31−D87Z-NC			10,000 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

* S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

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REVISION HISTORY

Revision	Description of Changes	Date
4	Added “-NC” OPNs to order table.	9/24/2026

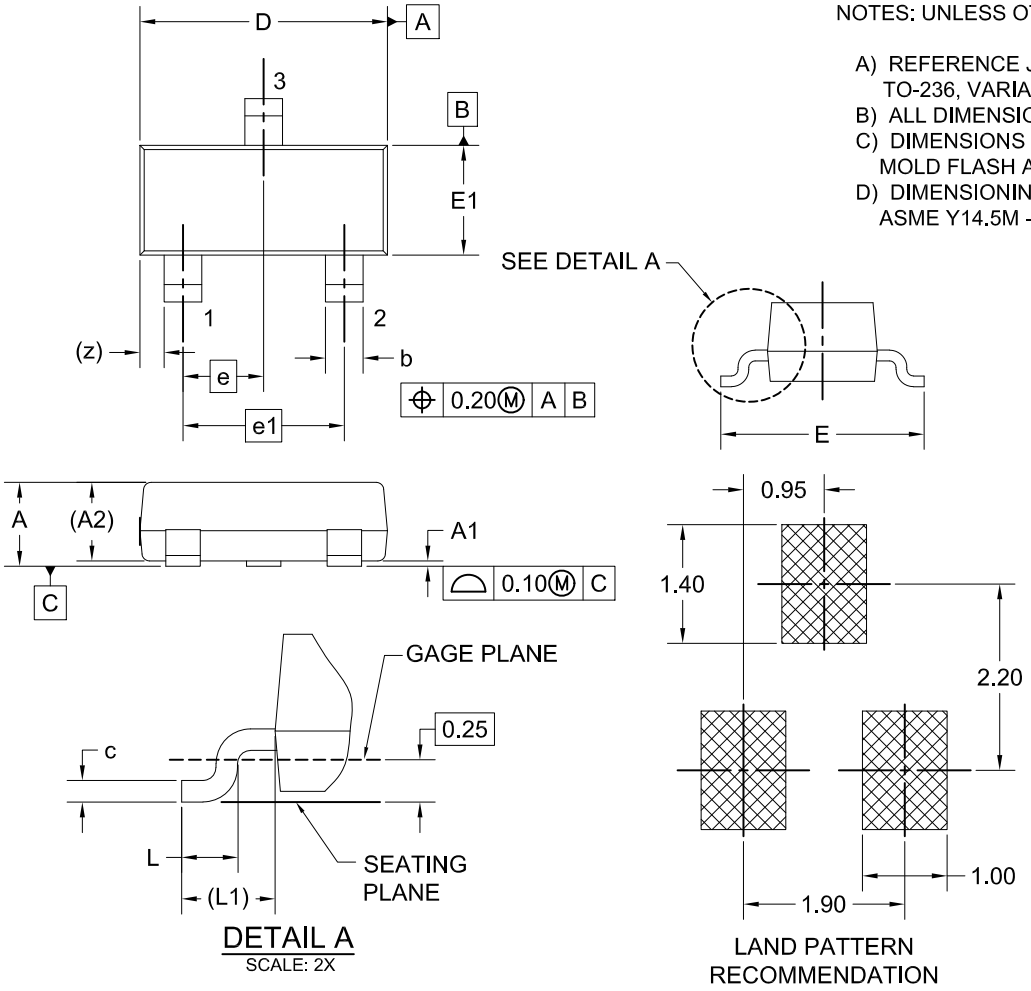
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

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SOT−23
CASE 318BM
ISSUE A

DATE 01 SEP 2021



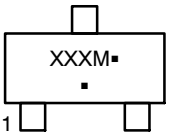
NOTES: UNLESS OTHERWISE SPECIFIED

A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 2009.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	---	---	1.20
A1	0.00	0.05	0.10
A2		0.93 REF	
b	0.37	0.44	0.60
c	0.08	0.15	0.23
D	2.72	2.92	3.12
E	2.10	2.40	2.70
E1	1.15	1.30	1.50
e		0.95 BSC	
e1		1.90 BSC	
L	0.20	---	---
L1		0.55 REF	
z		0.29 REF	

*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

GENERIC MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

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