National Semiconductor™

Discrete POWER & Signal Technologies

BAV19 / 20 / 21

DO-35

High Voltage General Purpose Diode

Sourced from Process 1J. NSC alternate for BAV19 & BAV20: FDH400.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter		Value	Units
W_{IV}	Working Inverse Voltage	**BAV19**	100	V
		BAV20	150	V
		BAV21	200	V
I_O	Average Rectified Current		200	mA
I_F	DC Forward Current		500	mA
i_f	Recurrent Peak Forward Current		600	mA
$i_{f(surge)}$	Peak Forward Surge Current			
	Pulse width = 1.0 second		1.0	A
	Pulse width = 1.0 microsecond		4.0	A
T_{stg}	Storage Temperature Range		-65 to +200	°C
T_J	Operating Junction Temperature		175	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:
1) These ratings are based on a maximum junction temperature of 200 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		BAV19 / 20 / 21	
P_D	Total Device Dissipation	500	mW
	Derate above 25°C	3.33	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	300	°C/W

High Voltage General Purpose Diode

(continued)

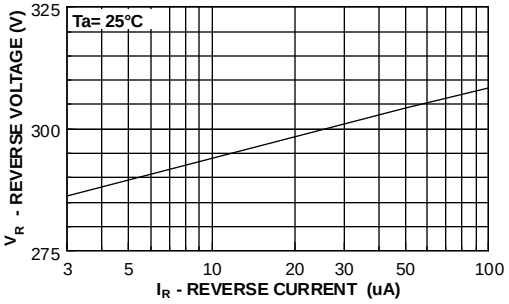
Electrical Characteristics

TA = 25°C unless otherwise noted

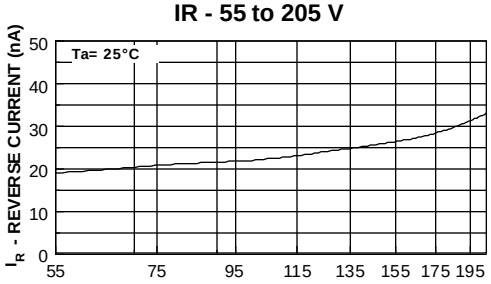
Symbol	Parameter		Test Conditions	Min	Max	Units
B_V	Breakdown Voltage	**BAV19**	I_R = 100 µA	120		V
		BAV20	I_R = 100 µA	200		V
		BAV21	I_R = 100 µA	250		V
I_R	Reverse Current	**BAV19**	V_R = 100 V		100	nA
			V_R = 100 V, T_A = 150°C		100	µA
		BAV20	V_R = 150 V		100	nA
			V_R = 150 V, T_A = 150°C		100	µA
		BAV21	V_R = 200 V		100	nA
			V_R = 200 V, T_A = 150°C		100	µA
V_F	Forward Voltage		I_F = 100 mA		1.0	V
			I_F = 200 mA		1.25	V
C_O	Diode Capacitance		V_R = 0, f = 1.0 MHz		5.0	pF
T_{RR}	Reverse Recovery Time		I_F = I_R = 30 mA, I_{RR} = 3.0 mA, R_L = 100Ω		50	nS

Typical Characteristics

REVERSE VOLTAGE vs REVERSE CURRENT
BV - 1.0 to 100 uA

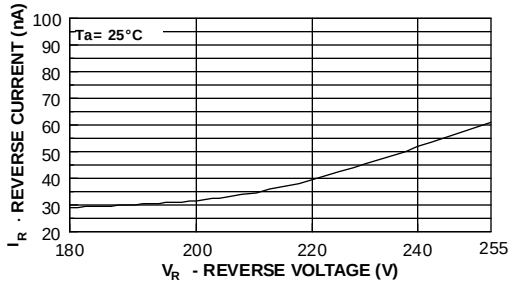


REVERSE CURRENT vs REVERSE VOLTAGE
IR - 55 to 205 V



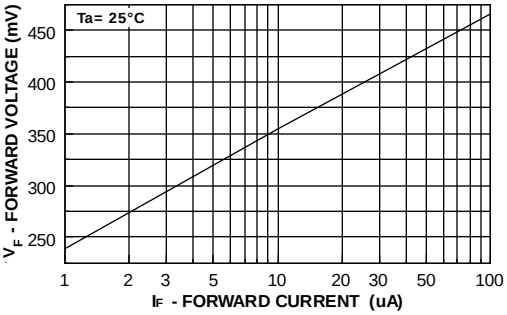
GENERAL RULE: The Reverse Current of a diode will approximately double for every ten (10) Degree C increase in Temperature

REVERSE CURRENT vs REVERSE VOLTAGE
IR - 180 to 255 V



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

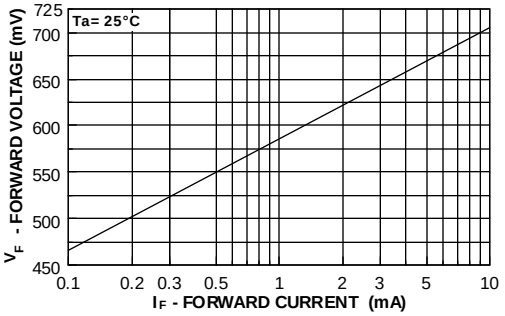
FORWARD VOLTAGE vs FORWARD CURRENT
VF - 1.0 to 100 uA



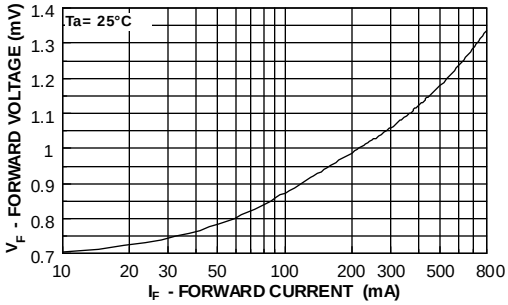
High Voltage General Purpose Diode
(continued)

Typical Characteristics (continued)

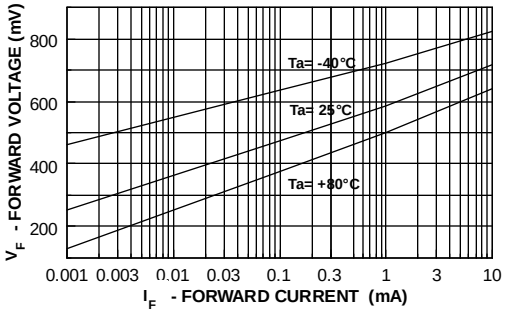
FORWARD VOLTAGE vs FORWARD CURRENT
VF - 0.1 to 10 mA



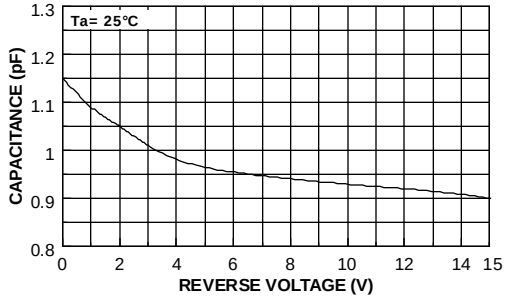
FORWARD VOLTAGE vs FORWARD CURRENT
VF - 10 to 800 mA



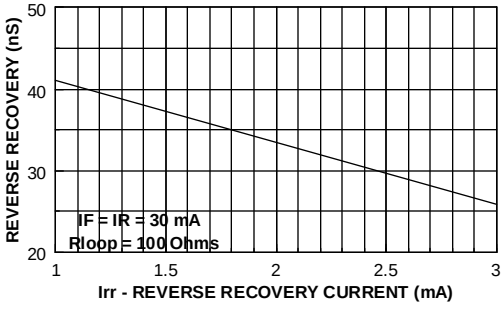
Forward Voltage vs Ambient Temperature
VF - 1.0 uA - 10 mA (-40 to + 80 Deg C)



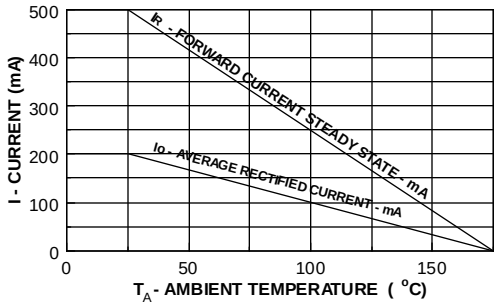
CAPACITANCE vs REVERSE VOLTAGE
VR - 0 to 15 V



REVERSE RECOVERY TIME vs
REVERSE RECOVERY CURRENT (Irr)



Average Rectified Current (Io) &
Forward Current (I_F) versus
Ambient Temperature (T_A)



High Voltage General Purpose Diode
(continued)

Typical Characteristics (continued)

POWER DERATING CURVE