BAS19 / BAS20 / BAS21

SURFACE-MOUNT FAST SWITCHING DIODE

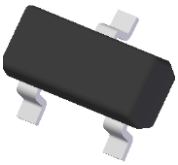
Features

- Fast Switching Speed
- Surface-Mount Package Ideally Suited for Automated Insertion
- For General-Purpose Switching Applications
- High Conductance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The BAS20Q and BAS21Q are suitable for automotive applications requiring specific change control; these parts are AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

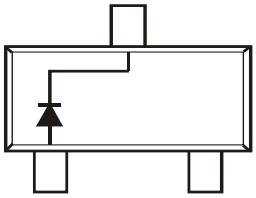
Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic.
  UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208.
  Lead-Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe)(e3)
- Polarity: See Diagram
- Weight: 0.008 grams (Approximate)

SOT23



Top View



Top View
Internal Schematic

Ordering Information (Note 4)

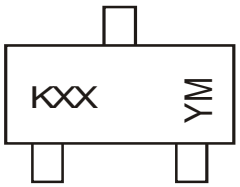
Orderable Part Number*	Package	Packing	
		Qty.	Carrier
BAS19-7-F	SOT23	3,000	Tape & Reel
BAS19-7-F-N	SOT23	3,000	Tape & Reel
BAS20-7-F	SOT23	3,000	Tape & Reel
BAS20-7-F-N	SOT23	3,000	Tape & Reel
BAS20-13-F	SOT23	10,000	Tape & Reel
BAS20Q-13-F	SOT23	10,000	Tape & Reel
BAS20Q-13-F-N	SOT23	10,000	Tape & Reel
BAS21-7-F	SOT23	3,000	Tape & Reel
BAS21-7-F-N	SOT23	3,000	Tape & Reel
BAS21Q-7-F	SOT23	3,000	Tape & Reel
BAS21Q-7-F-N	SOT23	3,000	Tape & Reel
BAS21-13-F	SOT23	10,000	Tape & Reel
BAS21-13-F-N	SOT23	10,000	Tape & Reel
BAS21Q-13-F	SOT23	10,000	Tape & Reel
BAS21Q-13-F-N	SOT23	10,000	Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen, Antimony and Beryllium-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl), <1000ppm antimony compounds and <1000ppm Beryllium.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

* If products manufactured in a specific region are required, select part numbers with the -N, -V, or -W suffix. These suffixes identify the wafer fabrication and assembly/test locations as defined in our Supply Resiliency information.

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Marking Information



KXX = Product Type Marking Code
BAS19 Marking: KA8, KT3; T3, KT2
BAS20 Marking: KT2, KT3, T3
BAS21 Marking: KT3, T3
YM = Date Code Marking
Y = Year (ex: L = 2024)
M = Month (ex: 9 = September)
A bar or underline around the date code or product type marking code denotes assembly site if marked.

Date Code Key

Year	2000	-	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	L	-	L	M	N	P	R	S	T	U	V	W

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	BAS19	BAS20	BAS21	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	120	200	250	V
Working Peak Reverse Voltage DC Blocking Voltage	V_{RWM} V_R	100	150	200	V
RMS Reverse Voltage	$V_{R(RMS)}$	71	106	141	V
Forward Continuous Current (Note 5)	I_{FM}	400			mA
Average Rectified Output Current (Note 5)	I_O	200			mA
Non-Repetitive Peak Forward Surge Current @ t = 1.0µs @ t = 1.0s	I_{FSM}	2.5 0.5			A
Repetitive Peak Forward Surge Current (Note 5)	I_{FRM}	625			mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	250	mW
Thermal Resistance Junction to Ambient Air (Note 5)	$R_{\theta JA}$	500	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 6) BAS19 BAS20 BAS21	$V_{(BR)R}$	120 200 250	—	V	I_R = 100µA
Forward Voltage	V_F	— —	1.0 1.25	V	I_F = 100mA I_F = 200mA
Reverse Current @ Rated DC Blocking Voltage (Note 6)	I_R	— —	100 15	nA µA	T_J = +25°C T_J = +100°C
Total Capacitance	C_T	—	5.0	pF	V_R = 0, f = 1.0MHz
Reverse Recovery Time	t_{rr}	—	50	ns	I_F = I_R = 30mA, I_{rr} = 0.1 x I_R, R_L = 100Ω

Notes: 5. Part mounted on FR-4 board with one inch square, 2oz copper pad layout. I_{FM}, I_O are valid provided that terminals are kept at ambient temperature.
6. Short duration pulse test used to minimize self-heating effect.

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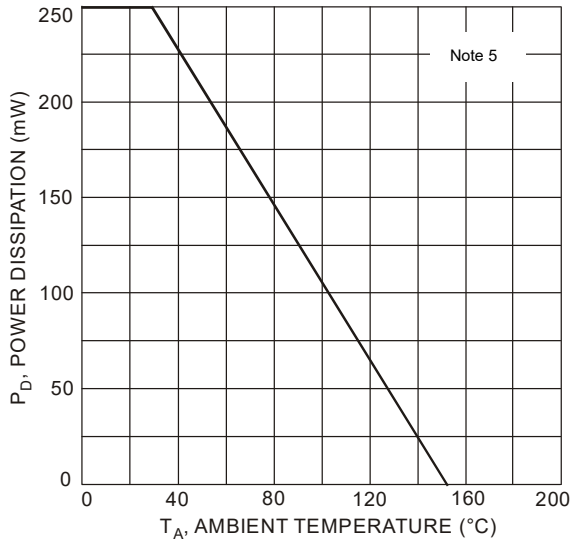


Fig. 1 Power Derating Curve

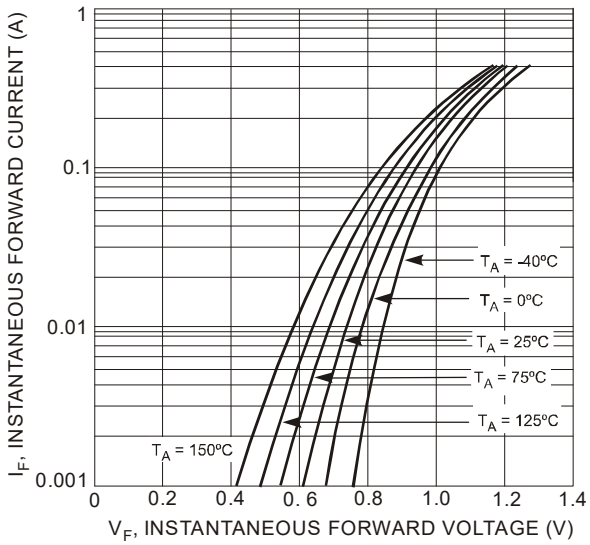


Fig. 2 Typical Forward Characteristics

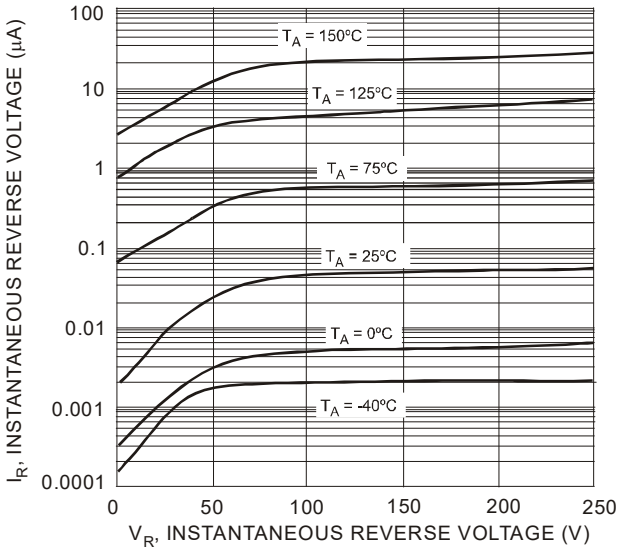


Fig. 3 Typical Reverse Characteristics

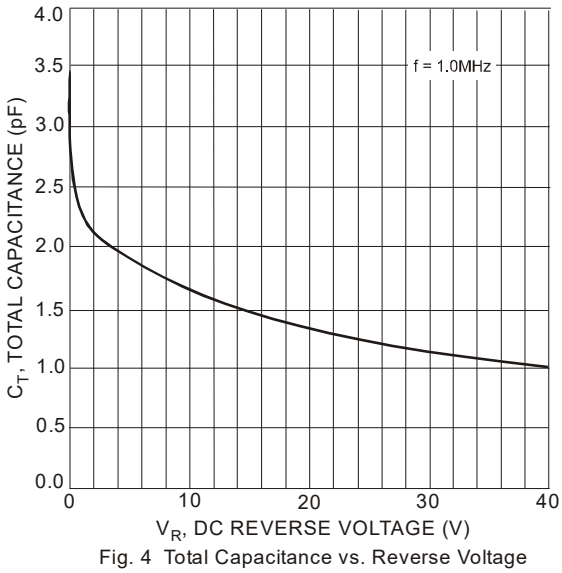


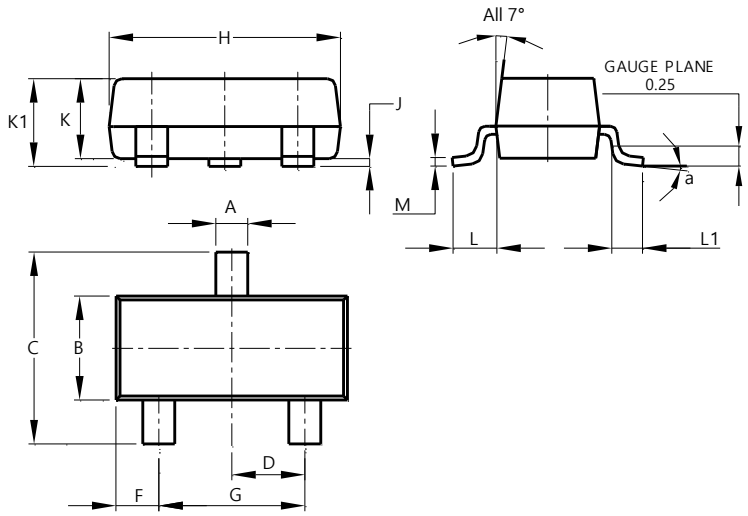
Fig. 4 Total Capacitance vs. Reverse Voltage

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Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23

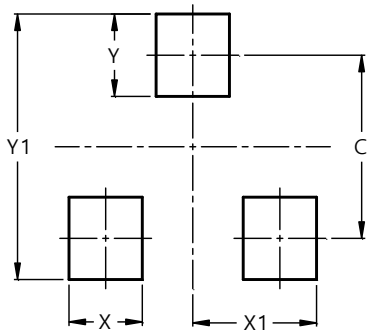


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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