

BAS21-Q1/BAS21A-Q1/BAS21C-Q1/BAS21S-Q1**List**

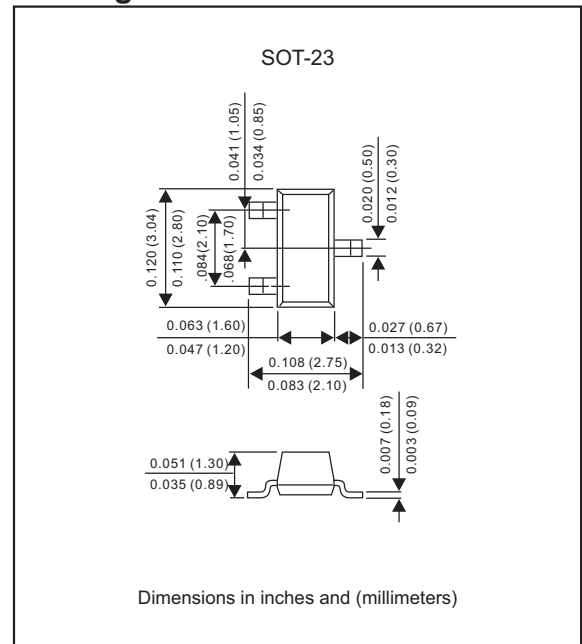
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BAS21-Q1/BAS21A-Q1/BAS21C-Q1/BAS21S-Q1**225mW Surface Mount
Switching Diode 250V****Features**

- Fast switching speed
- Surface mount package ideally suited for automatic insertion
- High conductance
- Lead-free parts meet RoHS requirements
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen-free part, ex.BAS21-Q1-H

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
- Weight : Approximated 0.008 gram

Package outline**Maximum ratings** (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	BAS21-Q1	BAS21A-Q1	BAS21C-Q1	BAS21S-Q1	Unit
Continuous reverse voltage	V_R	250				V
Average rectified current	I_O	200				mA
Continuous forward current	I_{FM}	400				mA
Non-repetitive peak forward surge current @ $t=1.0\mu\text{s}$ @ $t=1.0\text{s}$	I_{FSM}	2.5 0.5				A

Thermal characteristics

Parameter	Symbol	Limits	Unit
Total device dissipation FR-5 Board* ¹ , $T_A = 25^{\circ}\text{C}$ Derate Above 25°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* ² , $T_A = 25^{\circ}\text{C}$ Derate Above 25°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 junction temperature range	T_J	-55 to +150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

1. FR-5 = 1.0 x 0.75 x 0.062 in.

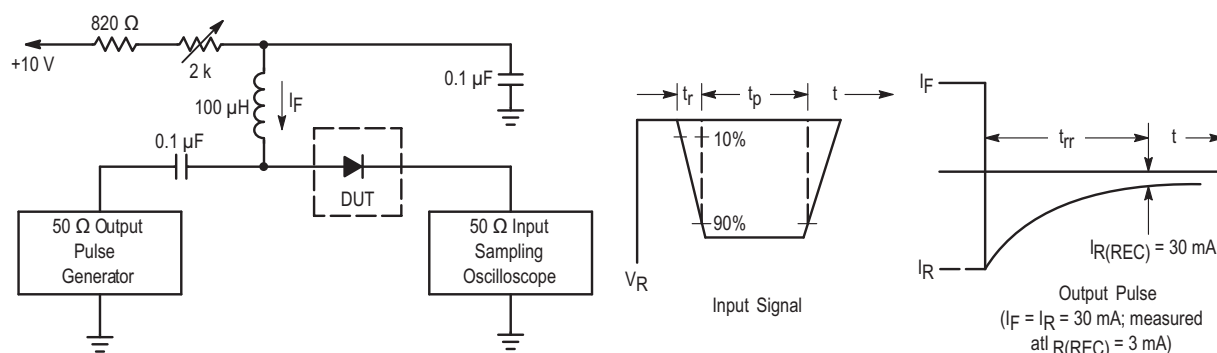
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

BAS21-Q1/BAS21A-Q1/BAS21C-Q1/BAS21S-Q1

Electrical characteristics (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Min	Max	Unit
Reverse breakdown voltage $I_R=100\mu\text{A}$	$V_{(BR)}$	250		V
Forward voltage $I_F=100\text{mA}$ $I_F=200\text{mA}$	V_F		1.00 1.25	V
Reverse leakage $V_R=200\text{V}$ $V_R=200\text{V}, T_J=150^{\circ}\text{C}$	I_R		0.1 100	μA
Total capacitance $V_R=0\text{V}, f=1.0\text{MHz}$	C_J		5.0	pF
Reverse recovery time $I_F=I_R=30\text{mA}, I_{RR}=0.1 \cdot I_R, R_L=100\Omega$	t_{rr}		50	ns

Recovery Time Equivalent Test Circuit



- Notes: 1. A 2.0 kΩ variable resistor adjusted for a Forward Current (I_F) of 30 mA.
 2. Input pulse is adjusted so $I_{R(\text{peak})}$ is equal to 30 mA.
 3. $t_p \gg t_{rr}$

Rating and characteristic curves(BAS21-Q1/BAS21A-Q1/BAS21C-Q1/BAS21S-Q1)

Figure 1. Forward Voltage

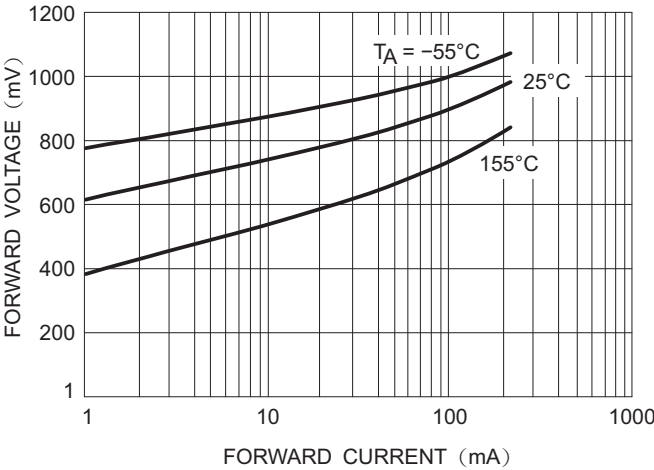
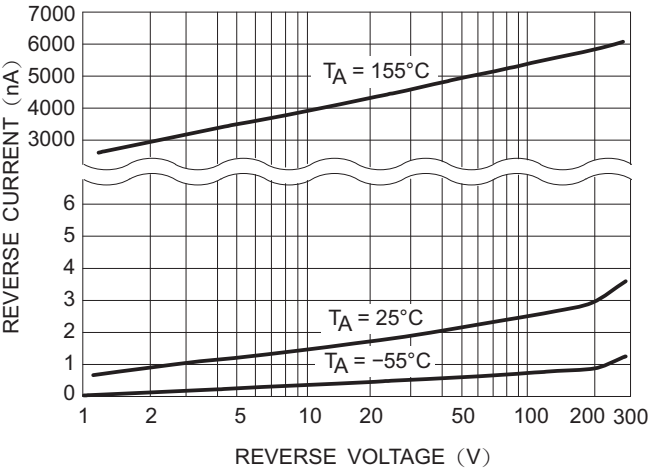
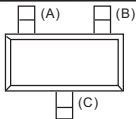
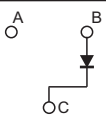
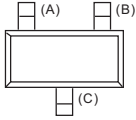
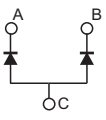
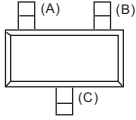
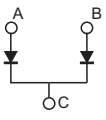
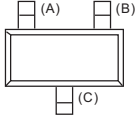
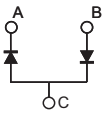


Figure 2. Reverse Leakage

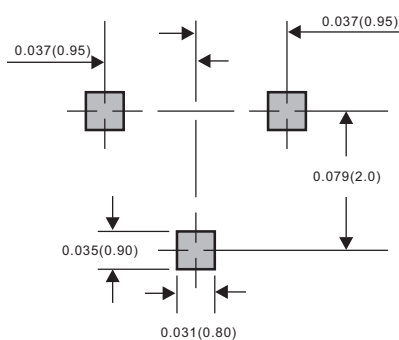


BAS21-Q1/BAS21A-Q1/BAS21C-Q1/BAS21S-Q1**Pinning information**

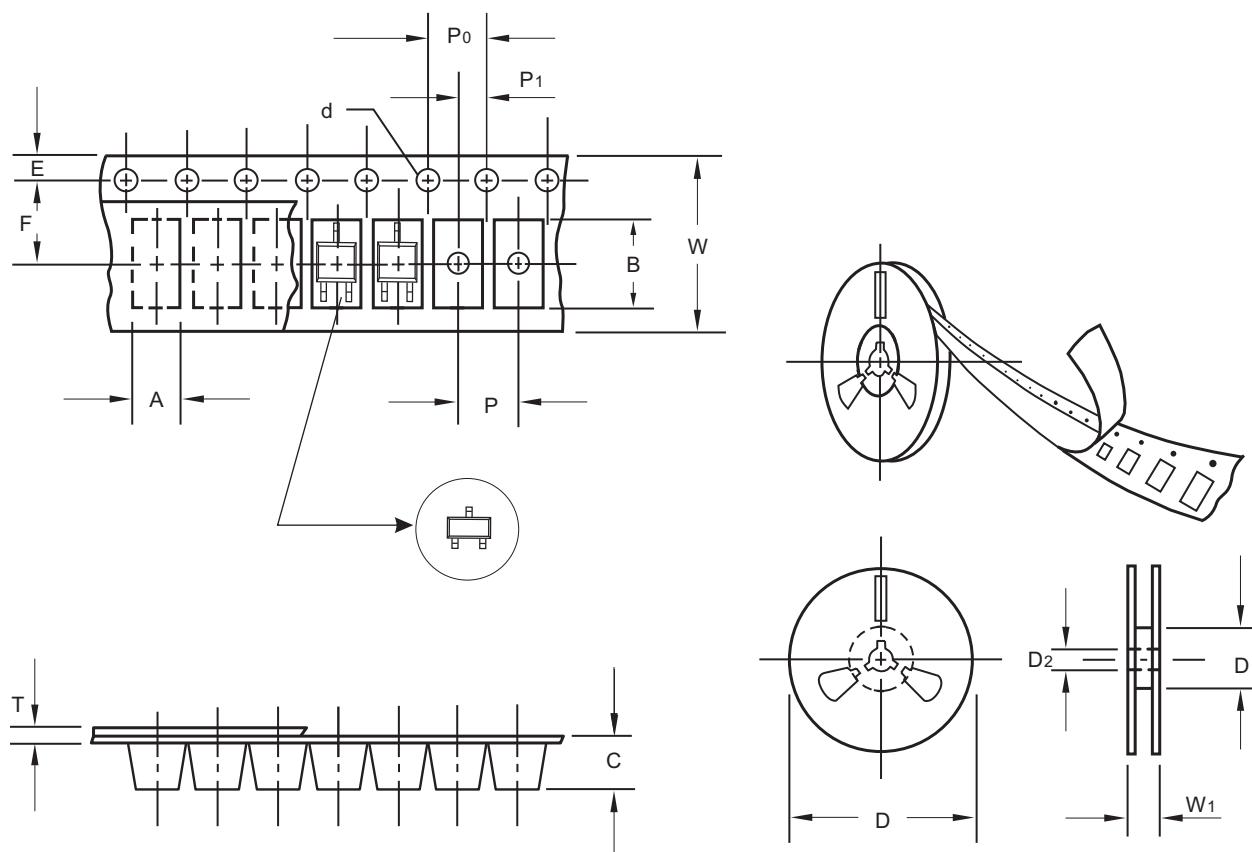
Type number	Marking code	Simplified outline	Symbol
BAS21-Q1	JS		
BAS21A-Q1	JS2		
BAS21C-Q1	JU, JS3		
BAS21S-Q1	JT, JS4		

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

BAS21-Q1/BAS21A-Q1/BAS21C-Q1/BAS21S-Q1**Packing information**

unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	62.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	11.40

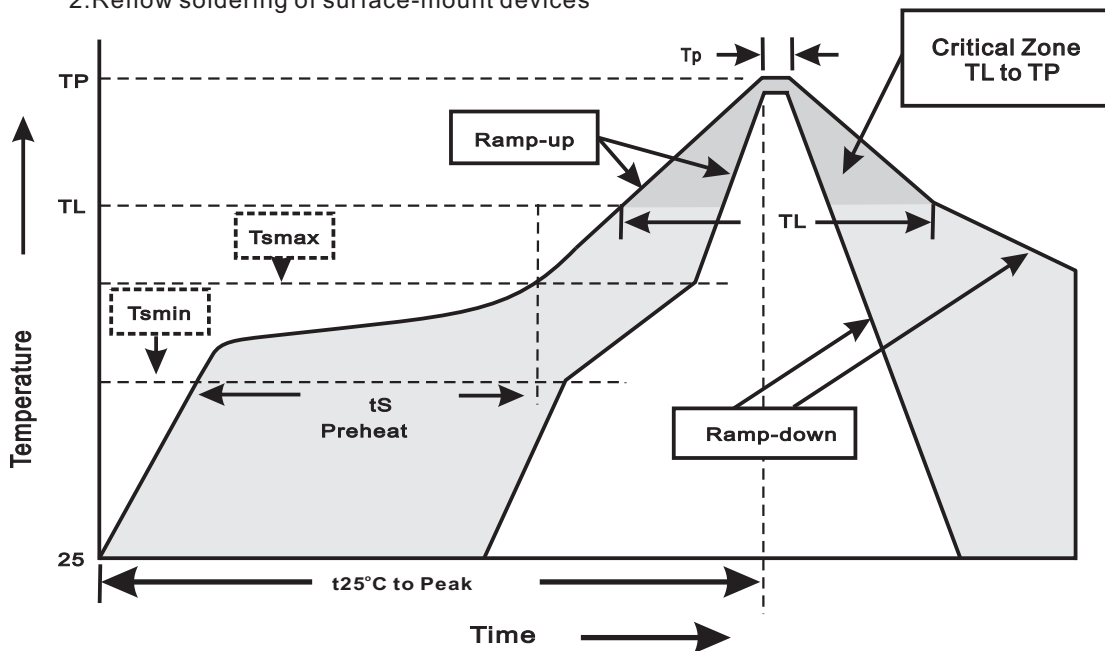
Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

BAS21-Q1/BAS21A-Q1/BAS21C-Q1/BAS21S-Q1**Reel packing**

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices

**3.Reflow soldering**

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

BAS21-Q1/BAS21A-Q1/BAS21C-Q1/BAS21S-Q1**High reliability test capabilities**

Item Test	Conditions	Reference
1. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. Operation Life	Ta=25°C, Rated Current (Io=Io max.) Test Duration: 1000hrs	MIL-STD-750E METHOD 1027.3
3. High Temperature Reverse Bias	80% Rated VR (Tj=Tj max.) Test Duration: 1000hrs	JESD22-A108
4. High Temperature Storage Life	Ta=125°C Test Duration: 1000hrs	JESD22 A-103
5. Temperature Cycle	-55°C(15min) to 150°C(15min) Test Cycles: 1000cycles	JESD22 A-104
6. Autoclave	P=2atm Ta=121°C RH=100% Test Duration: 96hrs	JESD22 A-102
7. Intermittent Operational Life	Ta=25°C, On/Io Max. 2min, Off/2min, Test Cycles: 15000cycles	MIL-STD-750E METHOD 1037
8. Solderability	245±5°C for 5sec	J-STD-002
9. Moisture Resistance	Ta=85°C/85% Relative humidity Test Duration: 1000hrs	MIL-STD-750E METHOD 1021.2
10. Resistance To Solder Heat	260±5°C for 10sec	JESD22 B-106
11. High Temperature High Humidity Reverse Bias	Ta=85°C, 85%RH, with device reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber Test Duration: 1000hrs	JESD22-A101