

BAS16-Q1**List**

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BAS16-Q1

225mW Surface Mount Switching Diode 75V

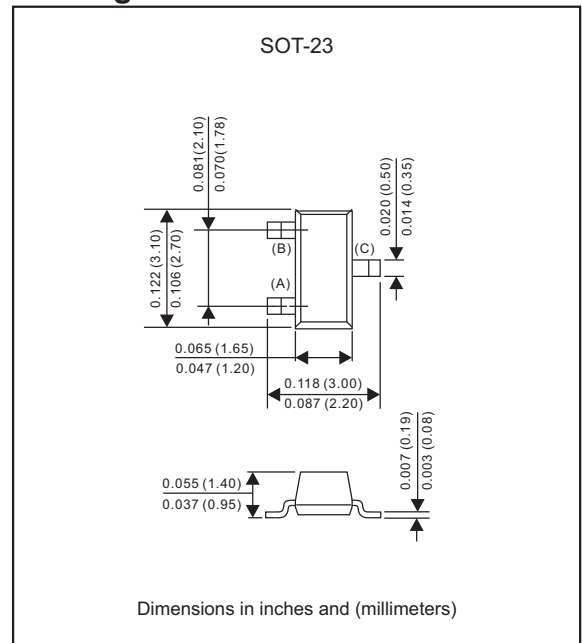
Features

- Fast speed switching.
- For general purpose switching application.
- High conductance.
- Silicon epitaxial planar chip
- Lead-free parts meet RoHS requirements.
- Qualified to AEC-Q101 standards for high reliability.
- Suffix "-H" indicates Halogen-free part, ex. BAS16-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	BAS16-Q1	UNIT
Reverse Voltage	V_R	75	V
Forward Current	I_F	200	mA
Peak Forward Surge Current	I_{FM}	500	mA
Non-Repetitive Peak Forward Surge Current	I_{FSM}	2.0	A
		1.0	

Thermal Characteristics

PARAMETER	SYMBOL	MAX.	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	$^{\circ}\text{C/W}$
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	$^{\circ}\text{C/W}$
Operating Junction Temperature Range	T_J	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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

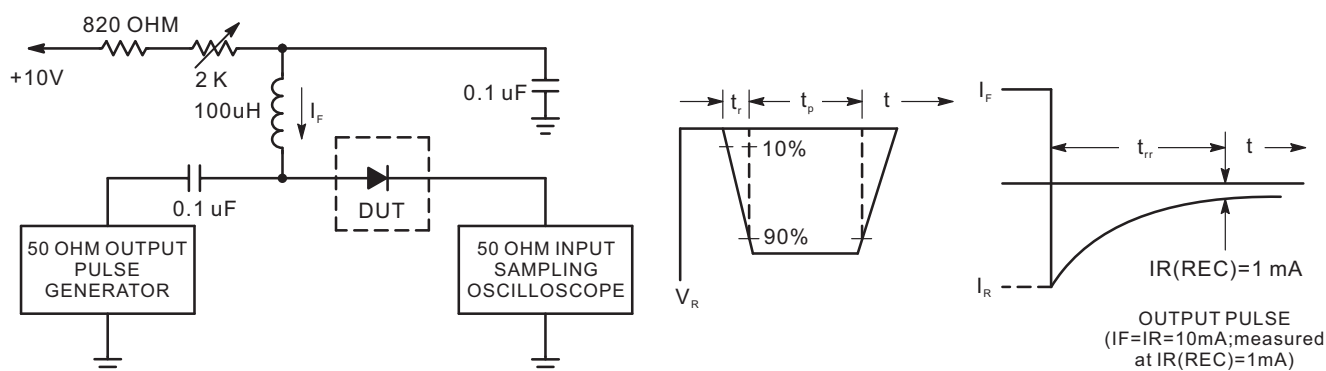
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

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

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Reverse Breakdown Voltage($I_{BR}=100\mu\text{Adc}$)	V_{BR}	75		V
Reverse Voltage Leakage Current (at $V_R = 75\text{V}$, $T_J = 25^{\circ}\text{C}$) (at $V_R = 25\text{V}$, $T_J = 150^{\circ}\text{C}$) (at $V_R = 75\text{V}$, $T_J = 150^{\circ}\text{C}$)	I_R		1.0 30 50	μA
Diode Capacitance($V_R = 0\text{V}$, $f = 1.0\text{MHz}$)	C_D		2.0	pF
Reverse Recovery Time ($I_F = I_R = 10\text{mA}$, $V_R = 5.0\text{Vdc}$, $I_{R(REC)} = 1.0\text{mAdc}$, $R_L = 100\Omega$)	t_{rr}		6.0	ns
Forward Voltage (at $I_F = 1.0\text{mAdc}$) (at $I_F = 10\text{mAdc}$) (at $I_F = 50\text{mAdc}$) (at $I_F = 150\text{mAdc}$)	V_F		715 855 1000 1250	mV

Recovery Time Equivalent Test Circuit



- Notes : 1. A 2.0 Kohm variable resistor adjusted for a forward Current (I_F) of 10mA.
 2. Input pulse is adjusted so $I_R(\text{peak})$ is equal to 10 mA.
 3. $t_p \gg t_{rr}$.

Rating and characteristic curves(BAS16-Q1)

FIG.1-TYPICAL FORWARD CHARACTERISTICS

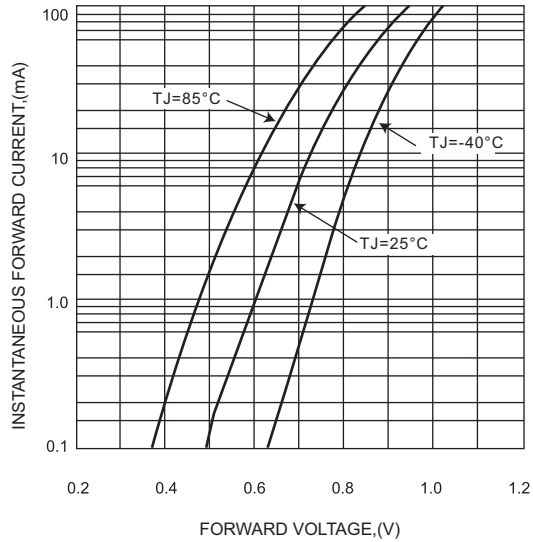


FIG.3 - TYPICAL REVERSE CHARACTERISTICS

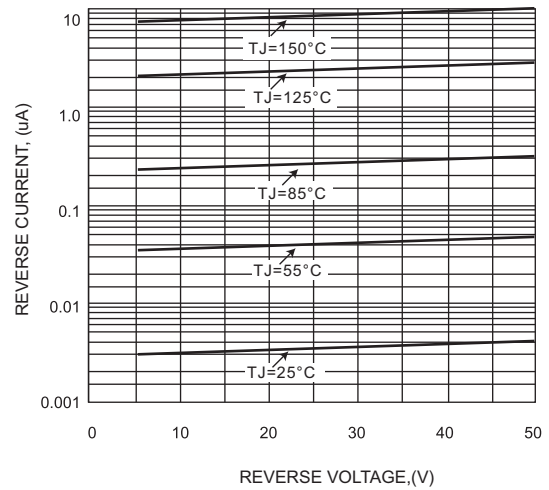
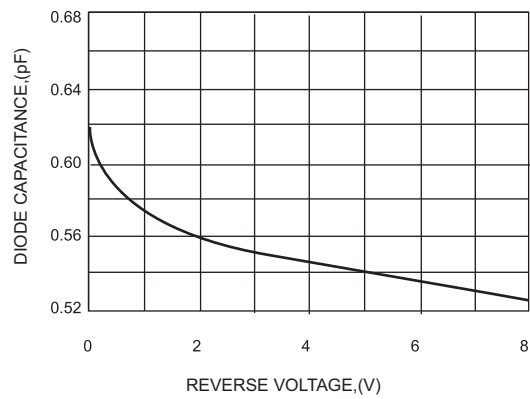
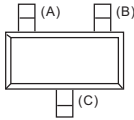
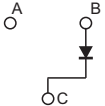


FIG.2 - TYPICAL DIODE CAPACITANCE



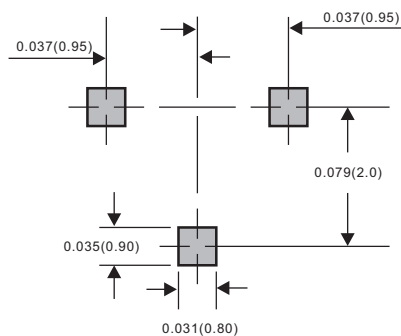
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Pinning information

Type number	Marking code	Simplified outline	Symbol
BAS16-Q1	A6,5D		

Suggested solder pad layout

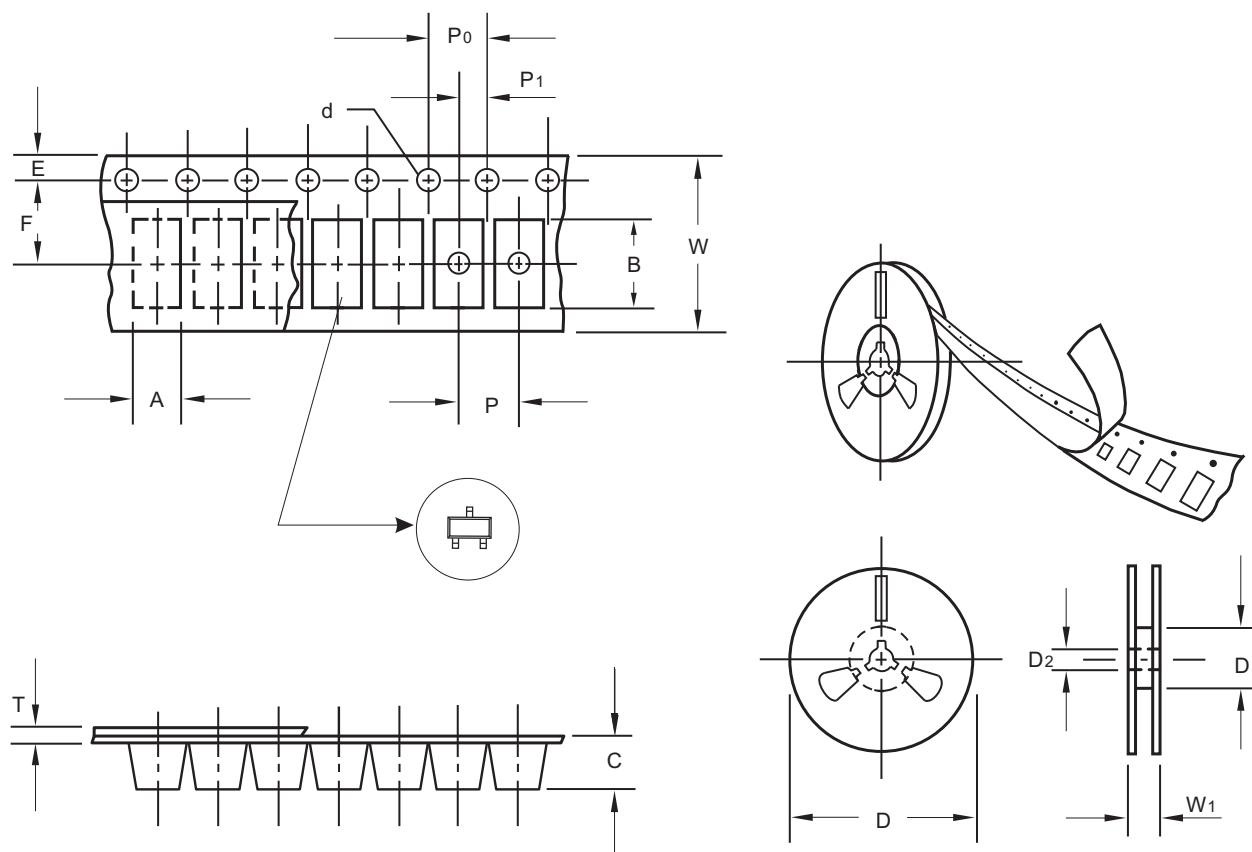
SOT-23



Dimensions in inches and (millimeters)

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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.

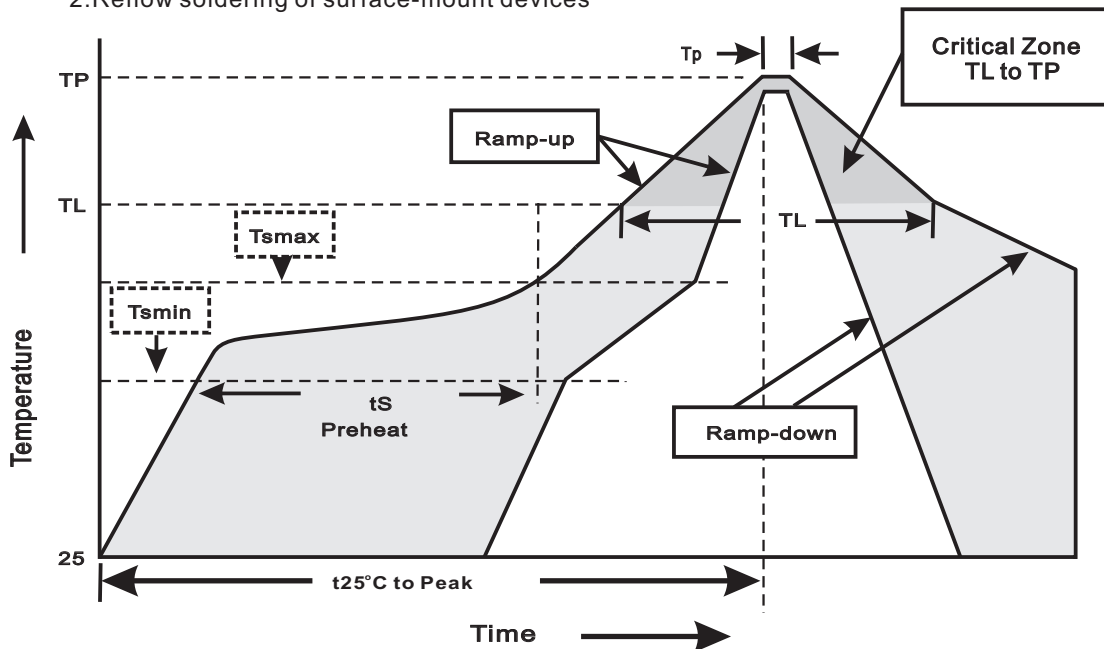
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Reel packing

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*183*123	178	382*262*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

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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. High Temperature Reverse Bias	$V_{BR}=V_{BR\ Nom}*80\%$ ($T_j=150^{\circ}C$) Test Duration:1000hrs	JESD22-A108
3. High Temperature Storage Life	$T_a=125^{\circ}C$ Test Duration: 1000hrs	JESD22 A-103
4. Temperature Cycle	$-55^{\circ}C$ (15min) to $150^{\circ}C$ (15min) Test Cycles: 1000cycles	JESD22 A-104
5. Autoclave	$P=2atm$ $T_a=121^{\circ}C$ RH=100% Test Duration:96hrs	JESD22 A-102
6. Solderability	$245\pm5^{\circ}C$ for 5sec	J-STD-002
7. Moisture Resistance	$T_a=85^{\circ}C$ /85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
8. Resistance To Solder Heat	$260\pm5^{\circ}C$ for 10sec	JESD22 B-106
9. High Temperature High Humidity Reverse Bias	$T_a=85^{\circ}C$, 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