

BAS116-Q1/BAV170-Q1/BAV199-Q1**List**

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BAS116-Q1/BAV170-Q1/BAV199-Q1

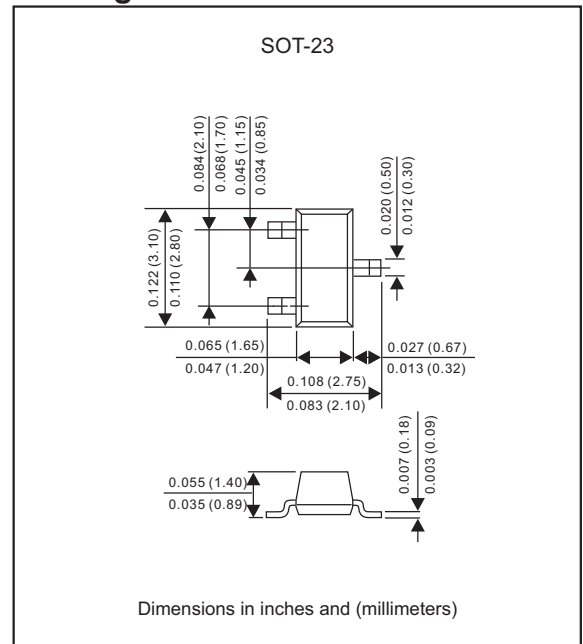
**250mW Surface Mount
Low Leakage Current
Switching Diode: 85V**

Features

- High switching speed
- Low leakage current applications
- Lead-free parts meet RoHS requirements
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen-free part, ex.BAS116-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	Limit	Unit
Power dissipation	P_D	250	mW
Repetitive peak reverse voltage	V_{RRM}	85	V
Continuous reverse voltage	V_R	75	V
Average rectified output current (Single Diode)	BAS116-Q1 BAV170-Q1 BAV199-Q1	215 215 160	mA
Average rectified output current (Double Diode)	BAV170-Q1 BAV199-Q1	125 140	
Non-repetitive peak forward surge current	$t = 1\mu\text{s}$ $t = 1\text{ms}$ $t = 1\text{s}$	4.0 1.0 0.5	A
Thermal resistance junction to ambient	$R_{\theta JA}$	500	
Operating junction temperature range	T_J	+150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-65 to +150	$^{\circ}\text{C}$

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

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Reverse breakdown voltage	$I_R = 100\mu\text{A}$	V_{BR}	85			V
Reverse leakage current	$V_R = 75\text{V}$ $V_R = 75\text{V}, T_J = 150^{\circ}\text{C}$	I_R			5 80	nA
Forward voltage	$I_F = 1.0\text{mA}$ $I_F = 10\text{mA}$ $I_F = 50\text{mA}$ $I_F = 150\text{mA}$	V_F			0.9 1.0 1.1 1.25	V
Total capacitance	$V_R = 0\text{V}, f = 1.0\text{MHz}$	C_T		2.0		pF
Reverse recovery time	$I_F = I_R = 10\text{mA}, I_{RR} = 0.1 \times I_R, R_L = 100\Omega$	t_{rr}			3.0	μs

Rating and characteristic curves for each diode (BAS116-Q1/BAV170-Q1/BAV199-Q1)

FIG.1-Forward Characteristics

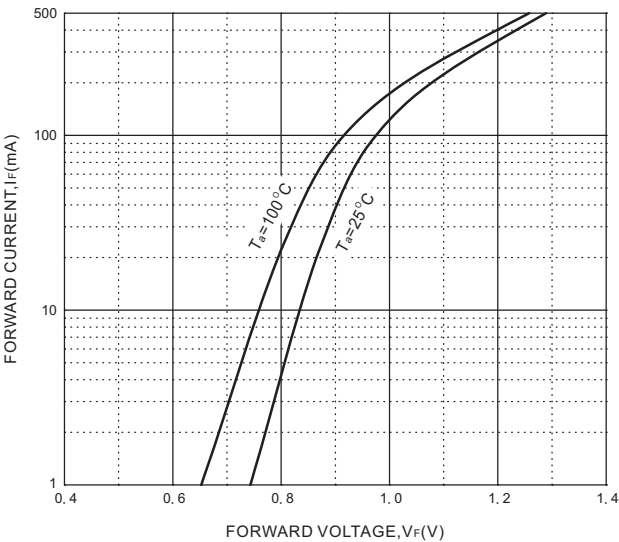


FIG.2-Reverse Characteristics

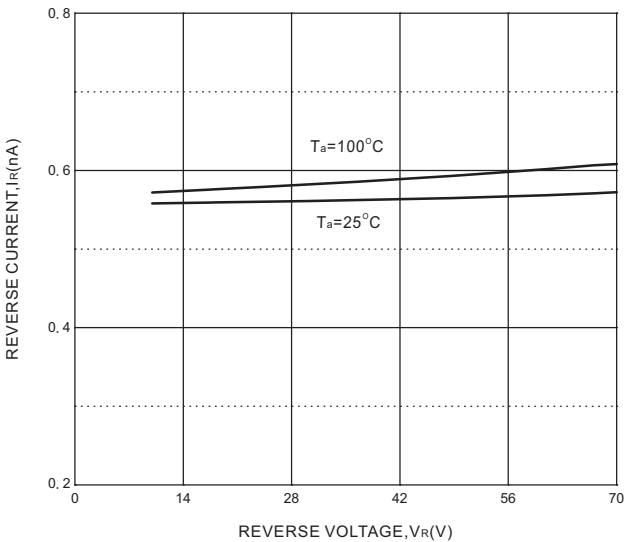


FIG.3-Capacitance Characteristics

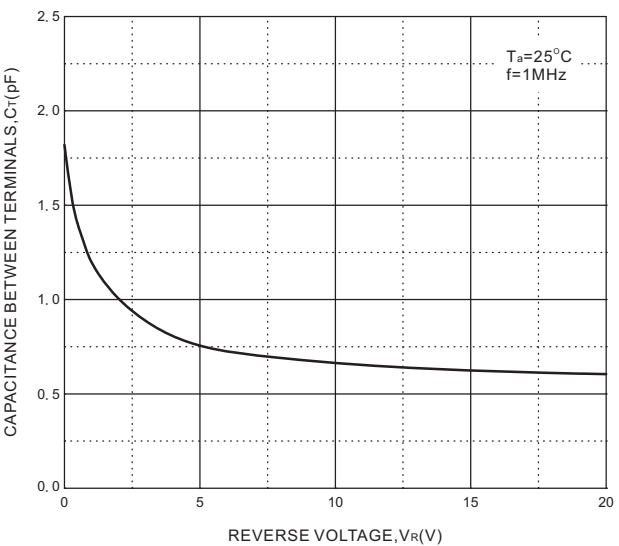
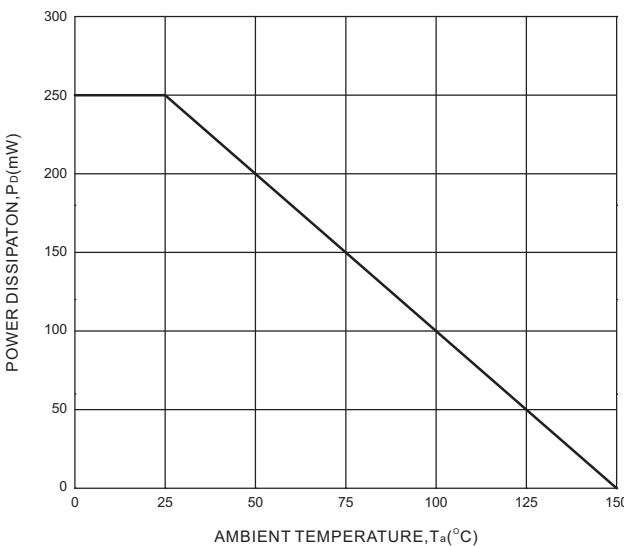
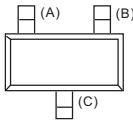
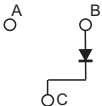
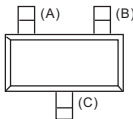
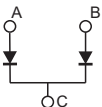
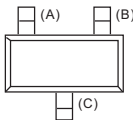
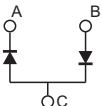


FIG.4-Power Derating Curve

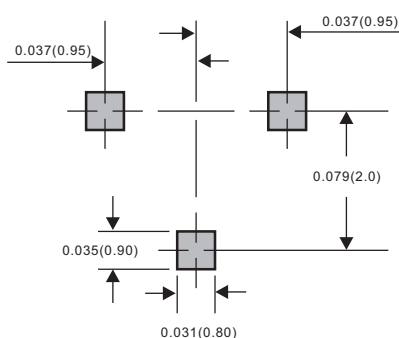


BAS116-Q1/BAV170-Q1/BAV199-Q1**Pinning information**

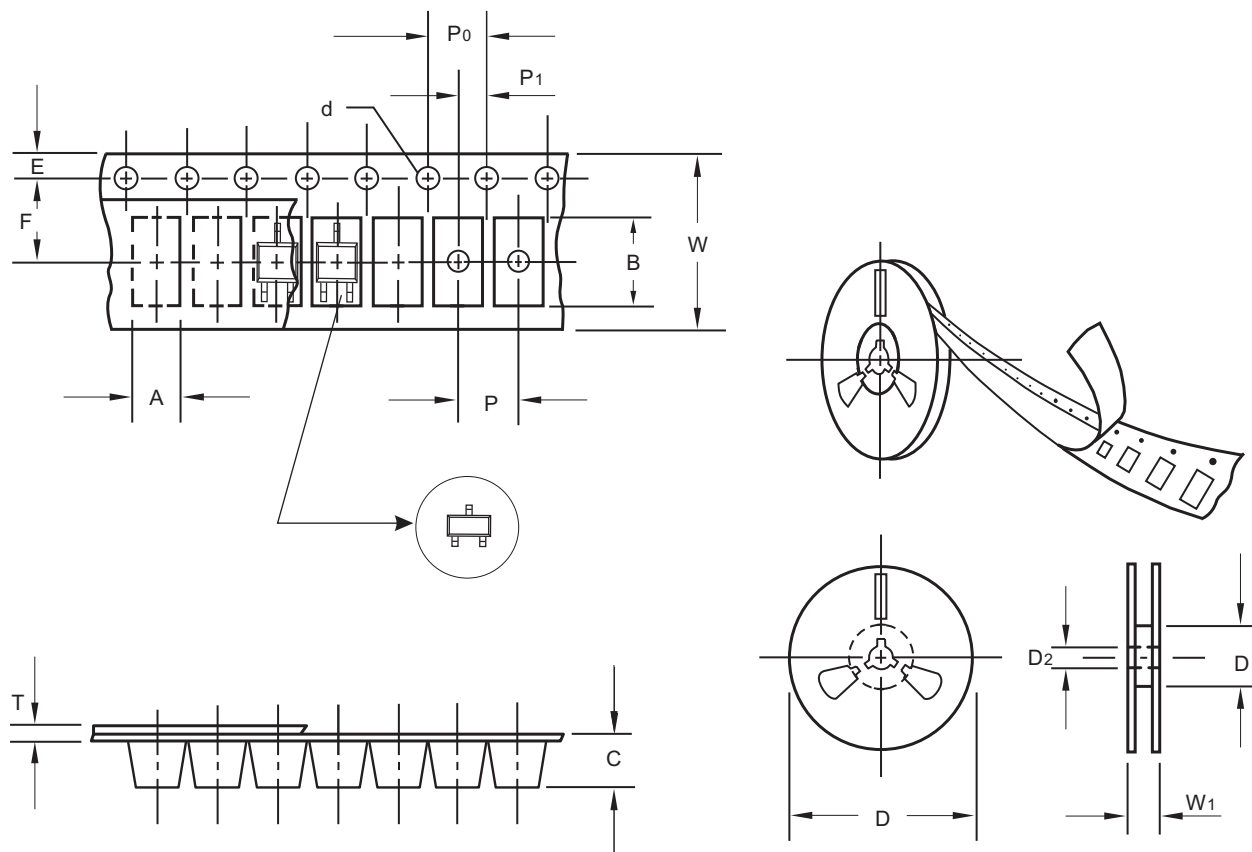
Type number	Marking code	Simplified outline	Symbol
BAS116-Q1	JV		
BAV170-Q1	C7		
BAV199-Q1	PX		

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

BAS116-Q1/BAV170-Q1/BAV199-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

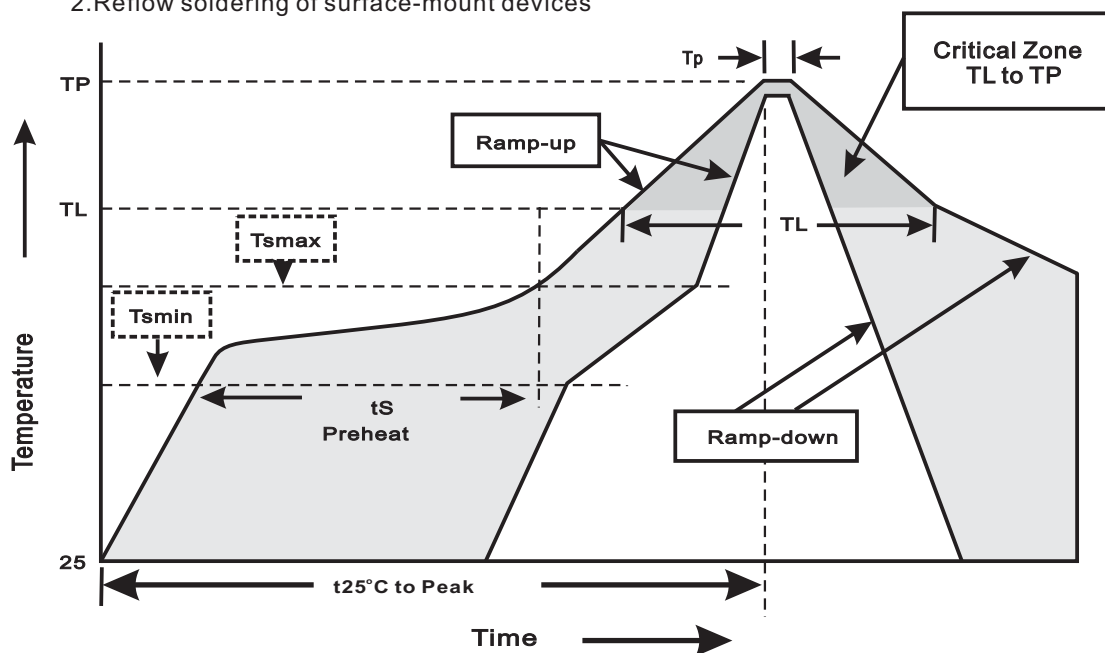
Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

BAS116-Q1/BAV170-Q1/BAV199-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*183*123	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

BAS116-Q1/BAV170-Q1/BAV199-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=Iomax.) Test Duration:1000hrs	MIL-STD-750E METHOD 1027.3
3. High Temperature Reverse Bias	80% Rated VR (Tj=Tjmax.)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