BAS40-Q1 / BAS40-04-Q1 / BAS40-05-Q1 BAS40-06-Q1

List

BAS40-Q1 / BAS40-04-Q1 / BAS40-05-Q1 BAS40-06-Q1

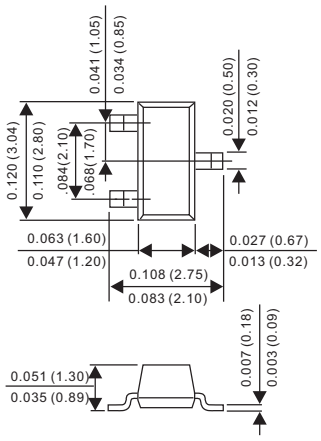
120mA Surface Mount Small Signal Schottky Diodes 40V

Features

- Low forward current
- Guard ring protected
- Low diode capacitance
- Lead-free parts meet RoHS requirements
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen-free part, ex.BAS40-Q1-H

Package outline

SOT-23



Dimensions in inches and (millimeters)

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

Maximum ratings (AT T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Limits	Unit
Continuous reverse voltage		V_R	40	V
Repetitive peak forward surge current	tp<1s;δ<0.5	I_{FSM}	120	mA
Non-repetitive peak forward current	tp<10ms	I_{FSM}	200	mA
Continuous forward current		I_F	120	mA
Thermal resistance	Junction to ambient	$R_{\theta JA}$	500	°C/W
Power dissipation		P_D	200	mW
Operating junction temperature range		T_J	-55 to +125	°C
Storage temperature range		T_{STG}	-55 to +125	°C

Electrical characteristics (AT T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	MIN.	MAX.	Unit
Reverse breakdown voltage	I_R=10μA	$V_{(BR)}$	40		V
Forward voltage	I_F=1mA	V_F		0.40	V
	I_F=10mA	V_F		0.56	V
	I_F=40mA	V_F		1.0	V
Reverse current	V_R=30V	I_R		1.0	μA
	V_R=40V	I_R		10	μA
Diode capacitance	V_R=0V, f=1MHz	C_D		5.0	pF
Reverse recovery time	I_F=I_R=10mA, I_{rr}=1mA, R_L=100Ω	t_{rr}		5.0	ns

Rating and characteristic curves for each diode (BAS40-Q1 / BAS40-04-Q1 / BAS40-05-Q1 / BAS40-06-Q1)

Fig. 1 Forward current as a function of forward voltage; typical values.

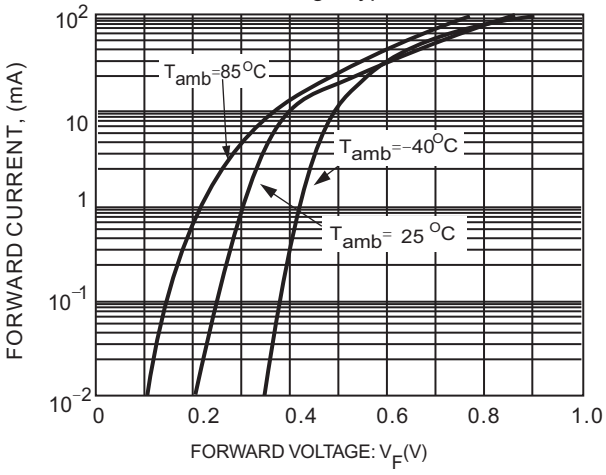


Fig. 2 Reverse current as a function of reverse voltage; typical values.

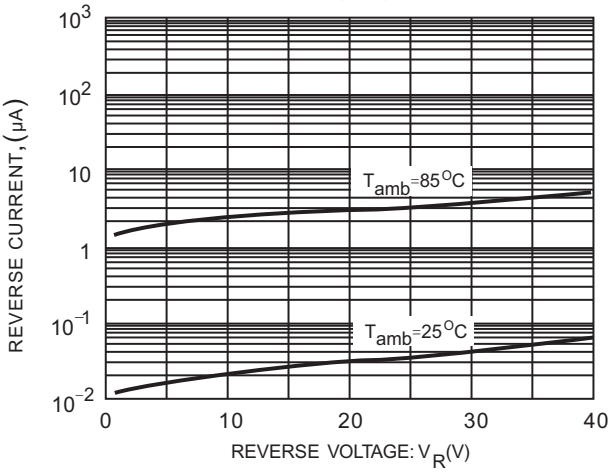


Fig. 3 Differential forward resistance as a function of forward current;typical values.

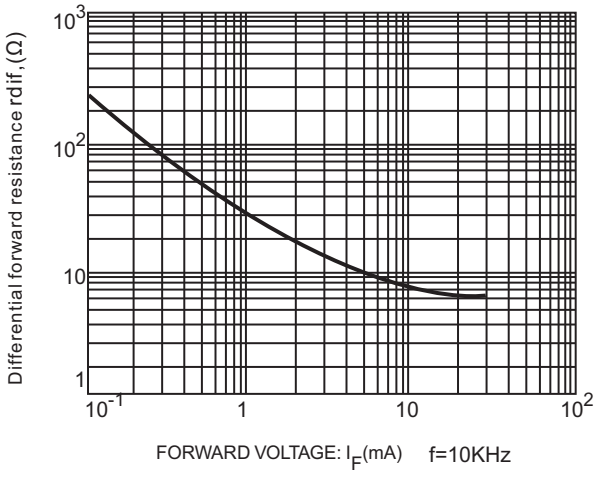
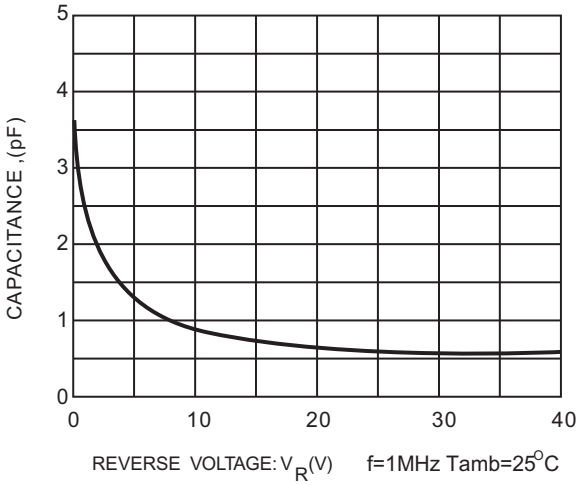


Fig. 4 Diode capacitance as a function of reverse voltage; typical values.



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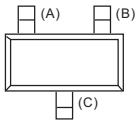
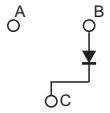
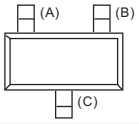
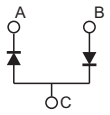
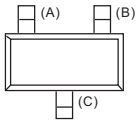
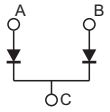
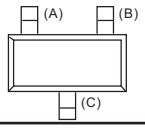
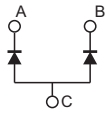
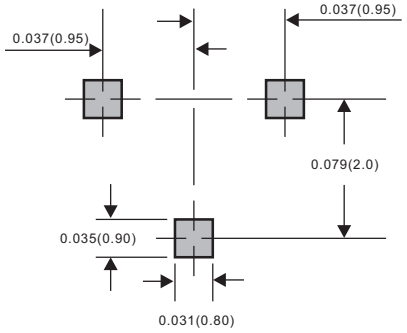
Pinning information

Type number	Marking code	Simplified outline	Symbol
BAS40-Q1	43, B1		
BAS40-04-Q1	44, CB		
BAS40-05-Q1	45		
BAS40-06-Q1	46, L2		

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

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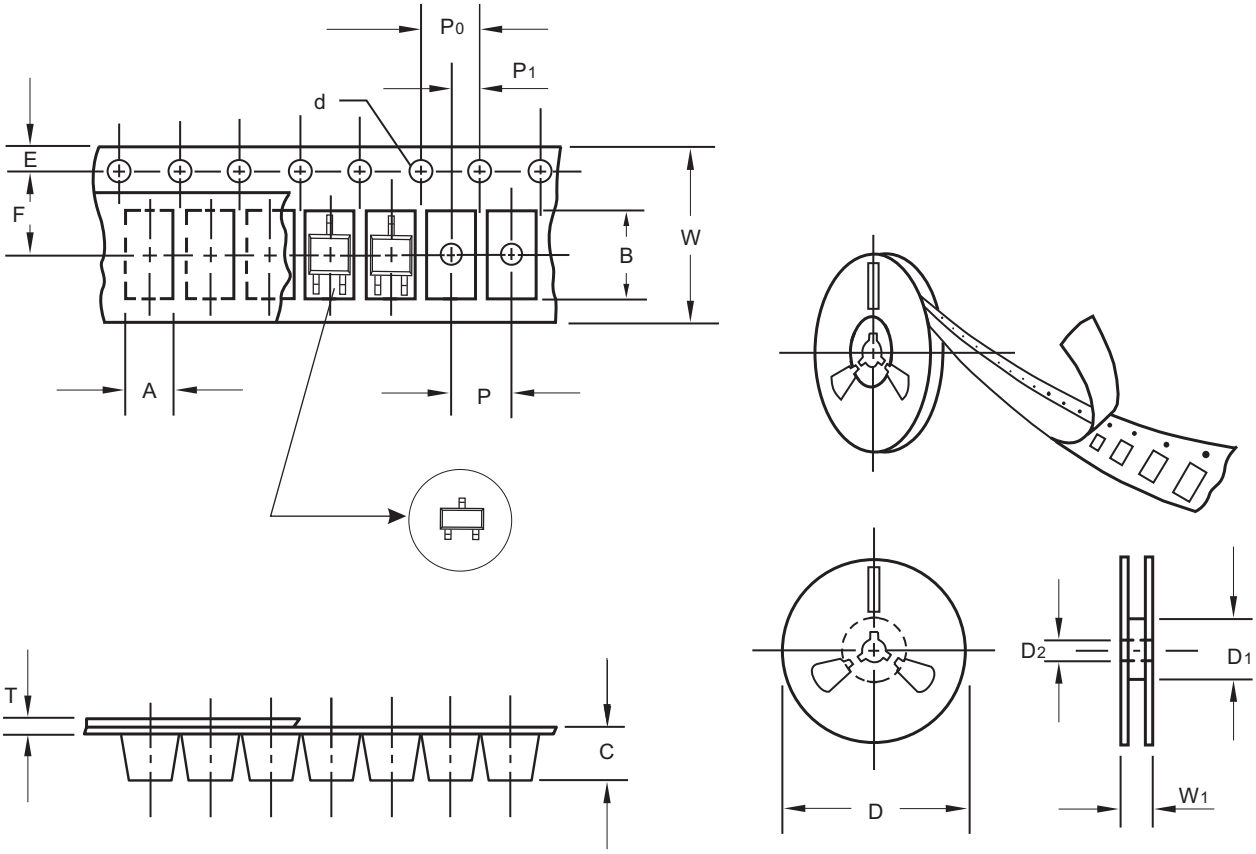
Packing information



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	D_1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	62.00
Feed hole diameter	D_2	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	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	11.40

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

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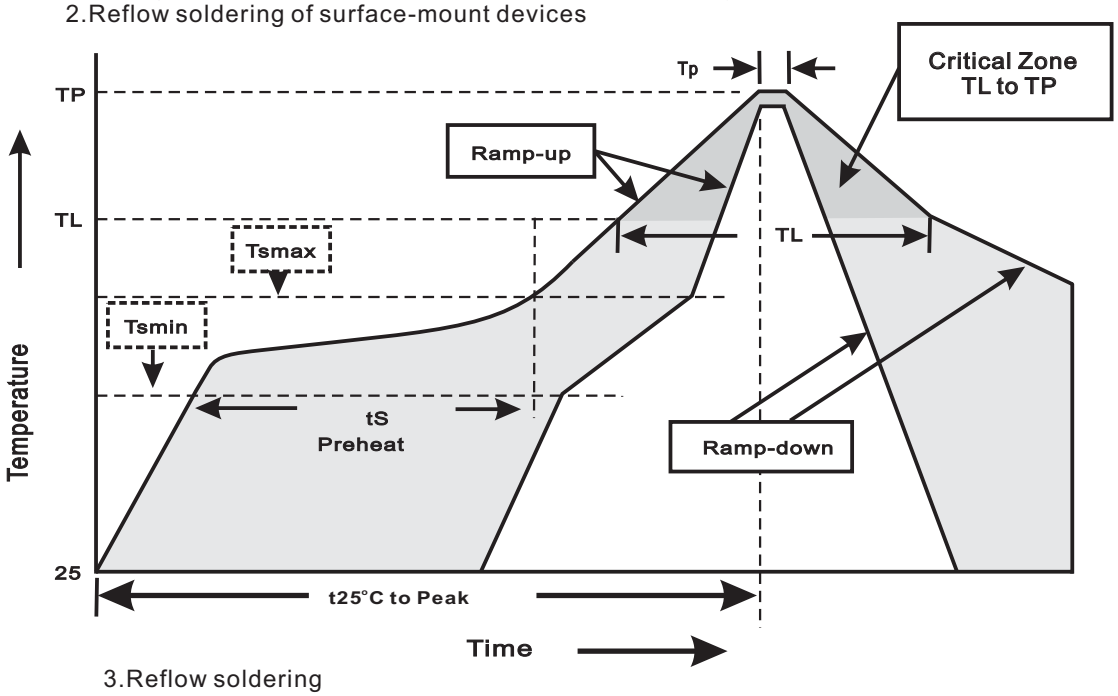
Reel packing

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*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(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax 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℃+168hrs@85℃ /85%RH+3xIR@260℃+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. Operation Life	Ta=25℃,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℃ Test Duration:1000hrs	JESD22 A-103
5. Temperature Cycle	-55℃(15min) to 150℃(15min)Test Cycles:1000cycles	JESD22 A-104
6. Autoclave	P=2atm Ta=121℃ RH=100% Test Duration:96hrs	JESD22 A-102
7. Intermittent Operational Life	Ta=25℃,On/Io Max. 2min, Off/2min, Test Cycles:15000cycles	MIL-STD-750E METHOD 1037
8. Solderability	245±5℃ for 5sec	J-STD-002
9. Moisture Resistance	Ta=85℃/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
10. Resistance To Solder Heat	260±5℃ for 10sec	JESD22 B-106
11. High Temperature High Humidity Reverse Bias	Ta=85℃, 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