

BAS316

List

List.....	1
Package outline.....	2
Features.....	2
Mechanical data.....	2
Maximum ratings	2
Electrical characteristics.....	3
Rating and characteristic curves.....	3~4
Pinning information.....	5
Marking.....	5
Suggested solder pad layout.....	5
Packing information.....	6
Reel packing.....	7
Suggested thermal profiles for soldering processes.....	7
High reliability test capabilities.....	8

BAS316

250mA Surface Mount Switching Diode- 100V

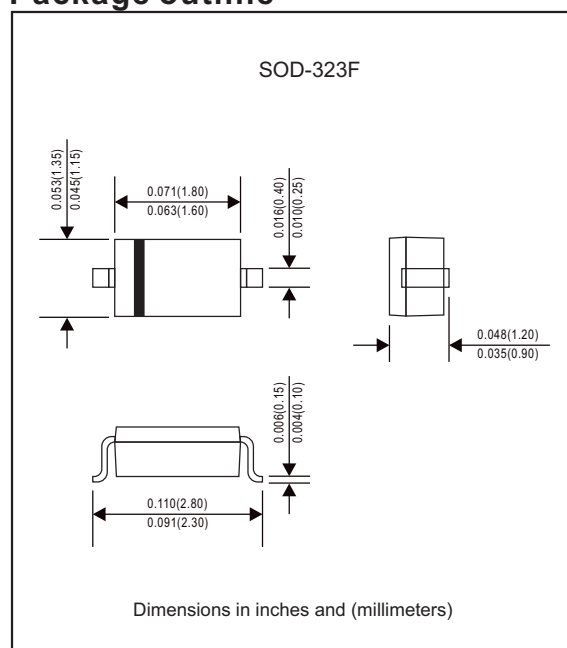
Features

- Ultra small plastic SMD package
- High switching speed: max. 4ns
- Continuous reverse voltage: max.75V
- Repetitive peak reverse voltage: max.100V
- Repetitive peak forward current: max.500mA
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen-free parts, ex. BAS316-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-323F
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.005 gram

Package outline



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

PARAMETER	CONDITIONS	SYMBOL	MAX.	UNIT
Repetitive peak reverse voltage		V_{RRM}	100	V
Continuous reverse voltage		V_R	75	V
RMS reverse voltage		$V_{R(RMS)}$	53	V
Continuous forward current		I_F	250	mA
Repetitive peak forward current		I_{FRM}	500	mA
Non-repetitive peak forward current	square wave; $T_J=25^{\circ}\text{C}$ prior to surge; see Fig.3 $t = 1\mu\text{s}$ $t = 1\text{ms}$ $t = 1\text{s}$	I_{FSM}	5 1 0.5	A A A
Total power dissipation		P_D	200	mW

Thermal characteristics

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Thermal resistance junction to ambient air	$R_{\theta JA}$	-	625	$^{\circ}\text{C/W}$
Storage temperature range	T_{STG}	-55	+150	$^{\circ}\text{C}$
Operating junction temperature range	T_J	-55	+150	$^{\circ}\text{C}$

BAS316

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

PARAMETER	CONDITIONS	SYMBOL	MAX.	UNIT
Forward voltage	see Fig.2 $I_F = 1\text{mA}$	V_F	715	mV
	$I_F = 10\text{mA}$		855	mV
	$I_F = 50\text{mA}$		1	V
	$I_F = 150\text{mA}$		1.25	V
Reverse current	see Fig.4 $V_R = 25\text{V}$	I_R	30	nA
	$V_R = 75\text{V}$		1	μA
	$V_R = 25\text{V}; T_J = 150^\circ\text{C}$		30	μA
	$V_R = 75\text{V}; T_J = 150^\circ\text{C};$		50	μA
Diode capacitance	$f = 1\text{MHz}; V_R = 0$; see Fig.5	C_D	2	pF
Reverse recovery time	when switched from $I_F = 10\text{mA}$ to $I_R = 10\text{mA}$; $R_L = 100\Omega$; measured at $I_R = 1\text{mA}$; see Fig.6	t_{rr}	4	ns
Forward recovery voltage	when switched from $I_F = 10\text{mA}$; $t_r = 20\text{ns}$; see Fig.7	V_{FR}	1.75	V

Rating and characteristic curves(BAS316)

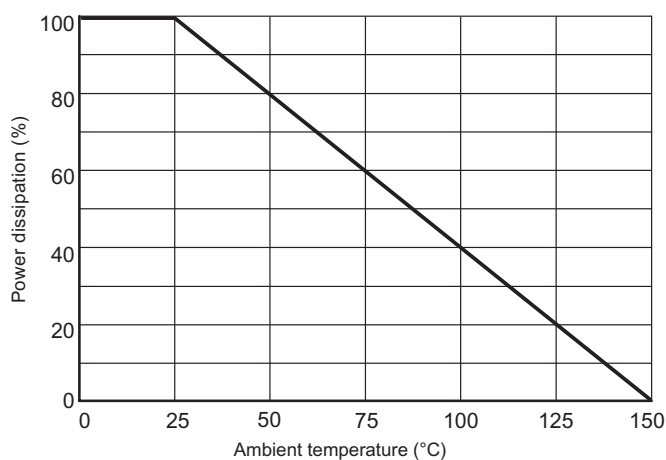


Fig.1 Steady State Power Derating

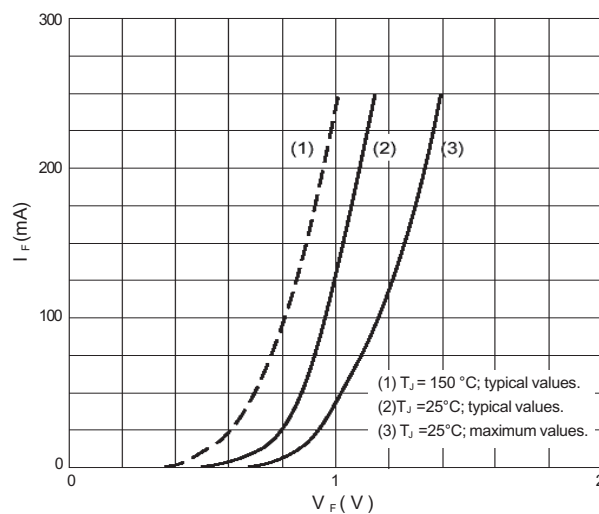


Fig.2 Forward current as a function of forward voltage.

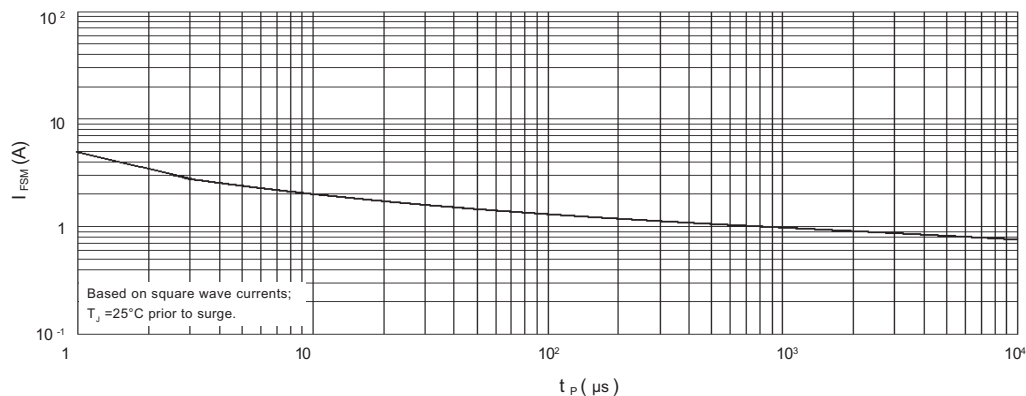


Fig.3 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

Rating and characteristic curves(BAS316)

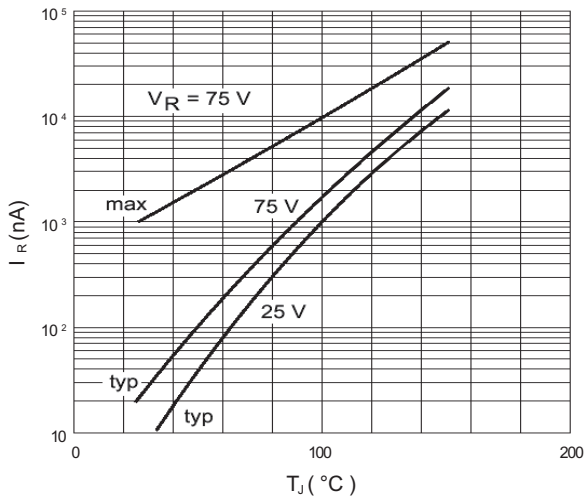


Fig.4 Reverse current as a function of junction temperature.

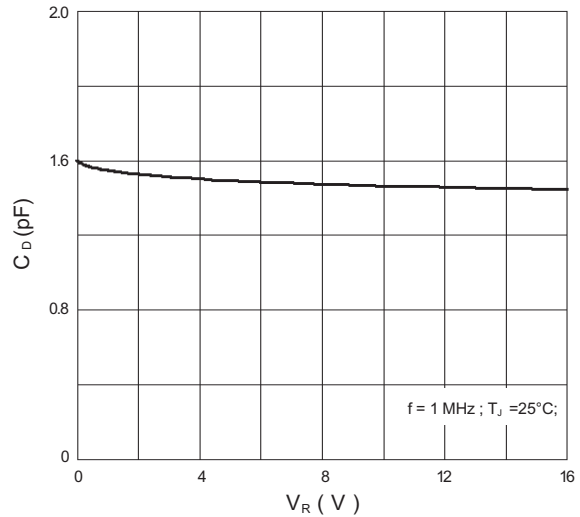
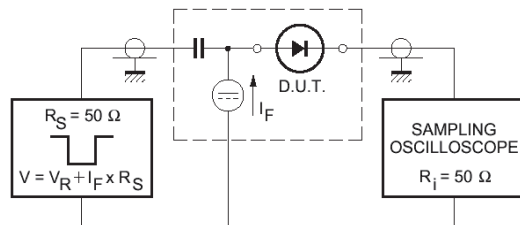


Fig.5 Diode capacitance as a function of reverse voltage; typical values.

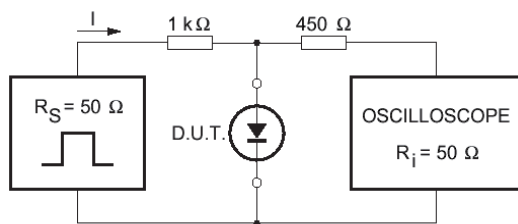


(1) $I_F = 1 \text{ mA}$.

Input signal: reverse pulse rise time $t_r = 0.6 \text{ ns}$; reverse voltage pulse duration $t_p = 100 \text{ ns}$; duty factor $\delta = 0.05$;

Oscilloscope: rise time $t_r = 0.35 \text{ ns}$.

Fig.6 Reverse recovery voltage test circuit and waveforms.



Input signal: forward pulse rise time $t_r = 20 \text{ ns}$; forward current pulse duration $t_p \geq 100 \text{ ns}$; duty factor $\delta \leq 0.005$.

Fig.7 Forward recovery voltage test circuit and waveforms.

BAS316

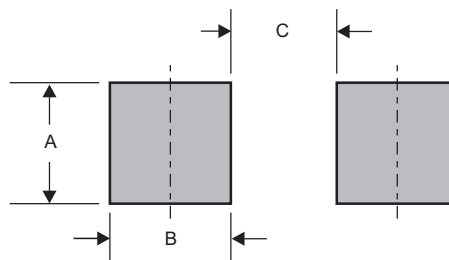
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
BAS316	Z9,A6

Suggested solder pad layout

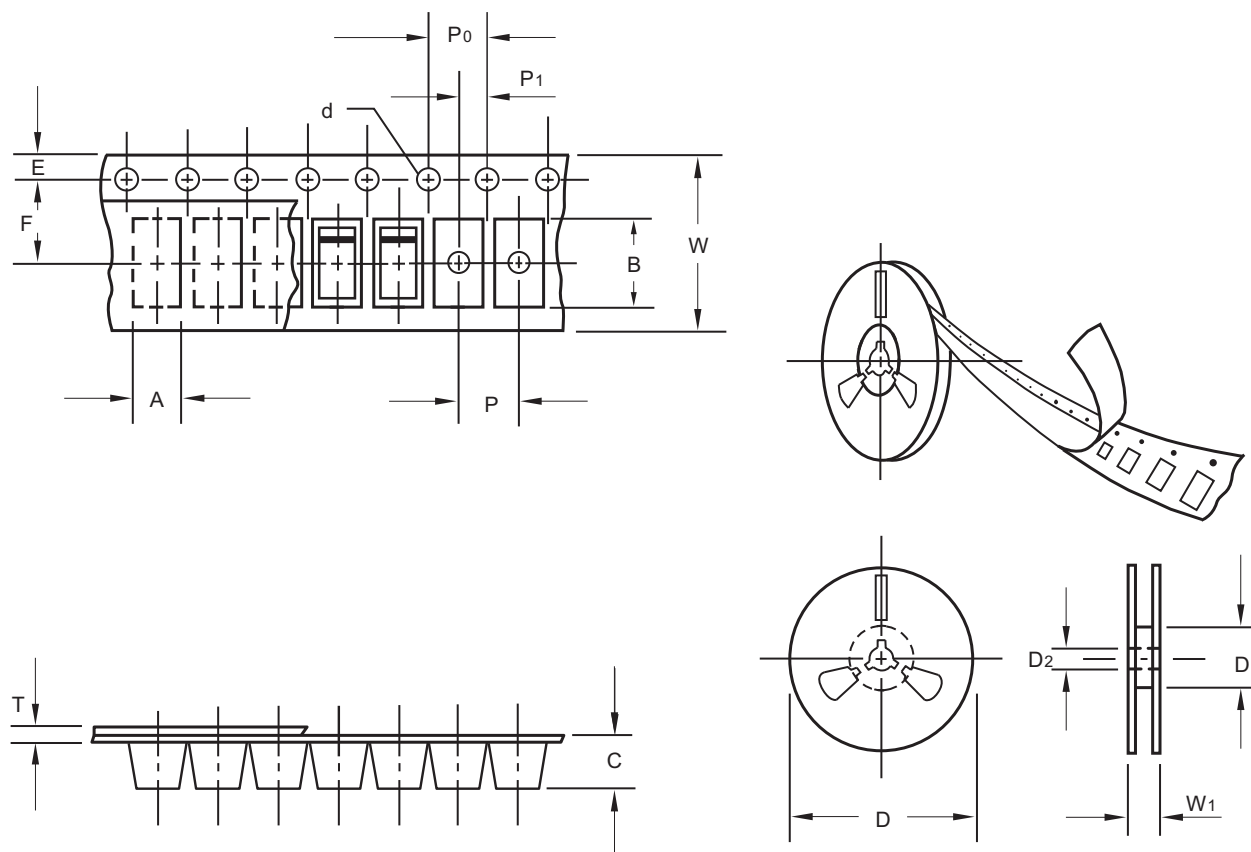


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-323F	0.033 (0.83)	0.025 (0.63)	0.063 (1.60)

BAS316

Packing information



unit:mm

Item	Symbol	Tolerance	SOD-323F
Carrier width	A	0.1	1.48
Carrier length	B	0.1	3.30
Carrier depth	C	0.1	1.25
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	54.40
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	12.3

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

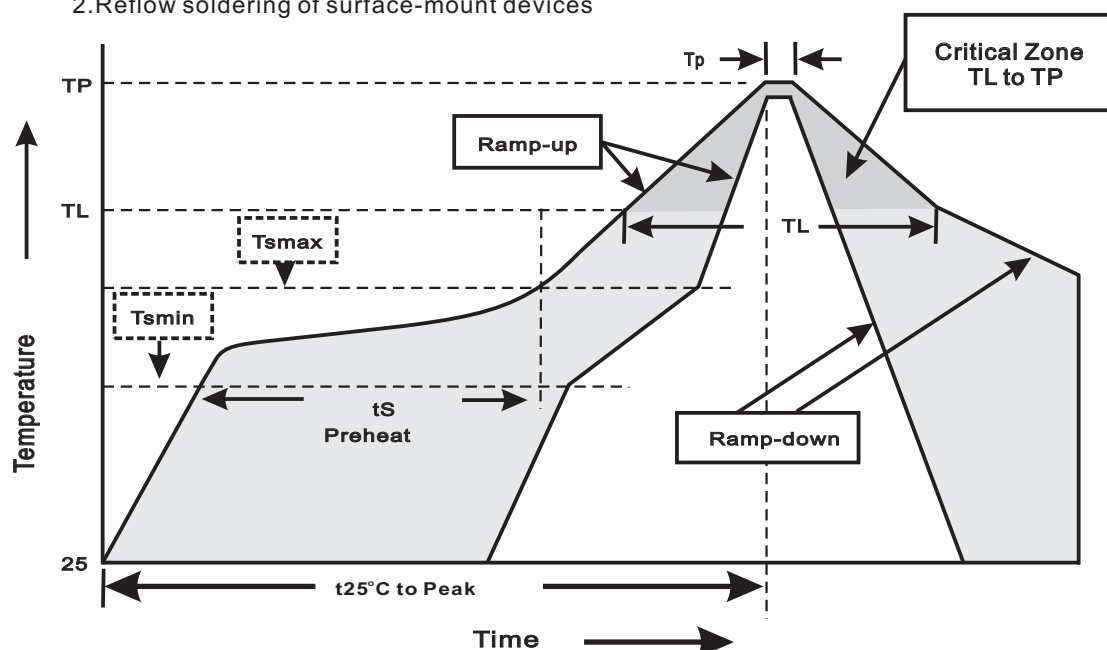
BAS316

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)
SOD-323F	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	8.00

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_{smin}) -Temperature Max(T_{smax}) -Time(min to max)(t_s)	150°C 200°C 60~120sec
T_{smax} 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

BAS316

High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^\circ\text{C}$ for $10 \pm 2\text{sec}$.	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^\circ\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_R = 80\%$ rate at $T_J = 150^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Forward Operation Life	Rated average rectifier current at $T_A = 25^\circ\text{C}$ for 500hrs.	MIL-STD-750D METHOD-1027
5. Intermittent Operation Life	$T_A = 25^\circ\text{C}$, $I_F = I_O$ On state: power on for 5 min. off state: power off for 5 min. on and off for 500 cycles.	MIL-STD-750D METHOD-1036
6. Pressure Cooker	$15P_{SIG}$ at $T_A = 121^\circ\text{C}$ for 4 hrs.	JESD22-A102
7. Temperature Cycling	-55°C to $+125^\circ\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
8. Forward Surge	Non-repetitive peak forward surge current	MIL-STD-750D METHOD-4066-2
9. Humidity	at $T_A = 85^\circ\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
10. High Temperature Storage Life	at 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031