

**Small Signal Schottky diode**

# BAR40S2

## Description

Planar silicon Schottky barrier diode encapsulated in a SOD-323 very small plastic SMD package.

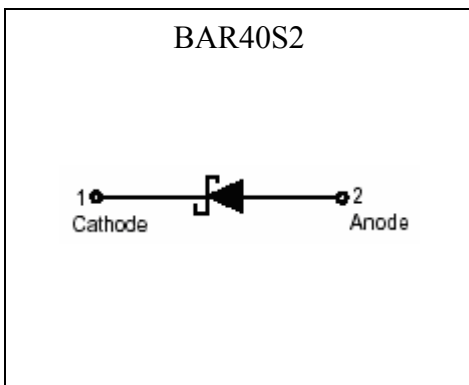
## Features

- Guard ring protected
- Low forward voltage drop
- Very small plastic SMD package
- Pb-free lead plating and halogen-free package

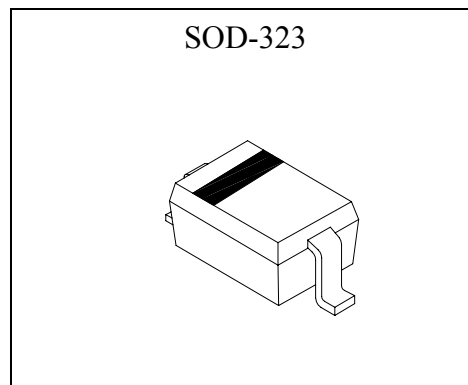
## Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes

## Symbol



## Outline



## Ordering Information

Device	Package	Shipping	Marking
BAR40S2	SOD-323 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel	JV



### Absolute Maximum Ratings

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>R</sub>	continuous reverse voltage		-	40	V
I <sub>F</sub>	continuous forward current		-	200	mA
I <sub>FRM</sub>	repetitive peak forward current	tp≤1s, δ≤0.5	-	300	mA
I <sub>FSM</sub>	non-repetitive peak forward current	tp<1ms	-	1000	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤25°C	-	200	mW
T <sub>stg</sub>	storage temperature		-65	+150	°C
T <sub>j</sub>	junction temperature		-	125	°C
T <sub>amb</sub>	operating ambient temperature		-65	+125	°C

### Characteristics (Ta=25°C, unless otherwise specified)

Parameter	Symbol	Condition	Min.	Max.	Unit
Reverse Breakdown Voltage	V <sub>BR</sub>	I <sub>R</sub> =100μA	40	-	V
Forward Voltage (Note 1)	V <sub>F</sub> (1)	I <sub>F</sub> =0.1mA	-	240	mV
	V <sub>F</sub> (2)	I <sub>F</sub> =1mA	-	320	mV
	V <sub>F</sub> (3)	I <sub>F</sub> =10mA	-	400	mV
	V <sub>F</sub> (4)	I <sub>F</sub> =30mA	-	500	mV
	V <sub>F</sub> (5)	I <sub>F</sub> =100mA	-	800	mV
Reverse Leakage Current (Note 2)	I <sub>R</sub>	V <sub>R</sub> =25V	-	2	μA
Diode Capacitance	C <sub>D</sub>	V <sub>R</sub> =1V, f=1MHz	-	10	pF
Reverse Recovery Time	t <sub>rr</sub>	when switched from I <sub>F</sub> = 10mA to I <sub>R</sub> =10mA; R <sub>L</sub> =100Ω; measured at I <sub>R</sub> =1mA	-	5	ns

Notes: 1.pulse test, tp=380μs, duty cycle<2%.  
2.pulse test, tp=300μs, duty cycle<2%.

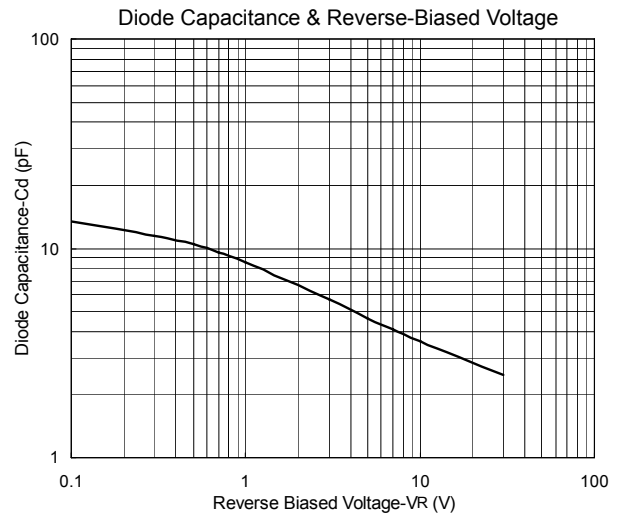
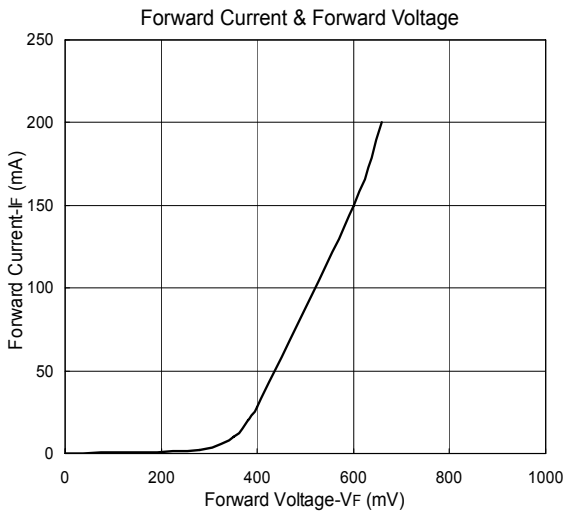
### Thermal Characteristics

Symbol	Parameter	Conditions	Value	Unit
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	635	K/W

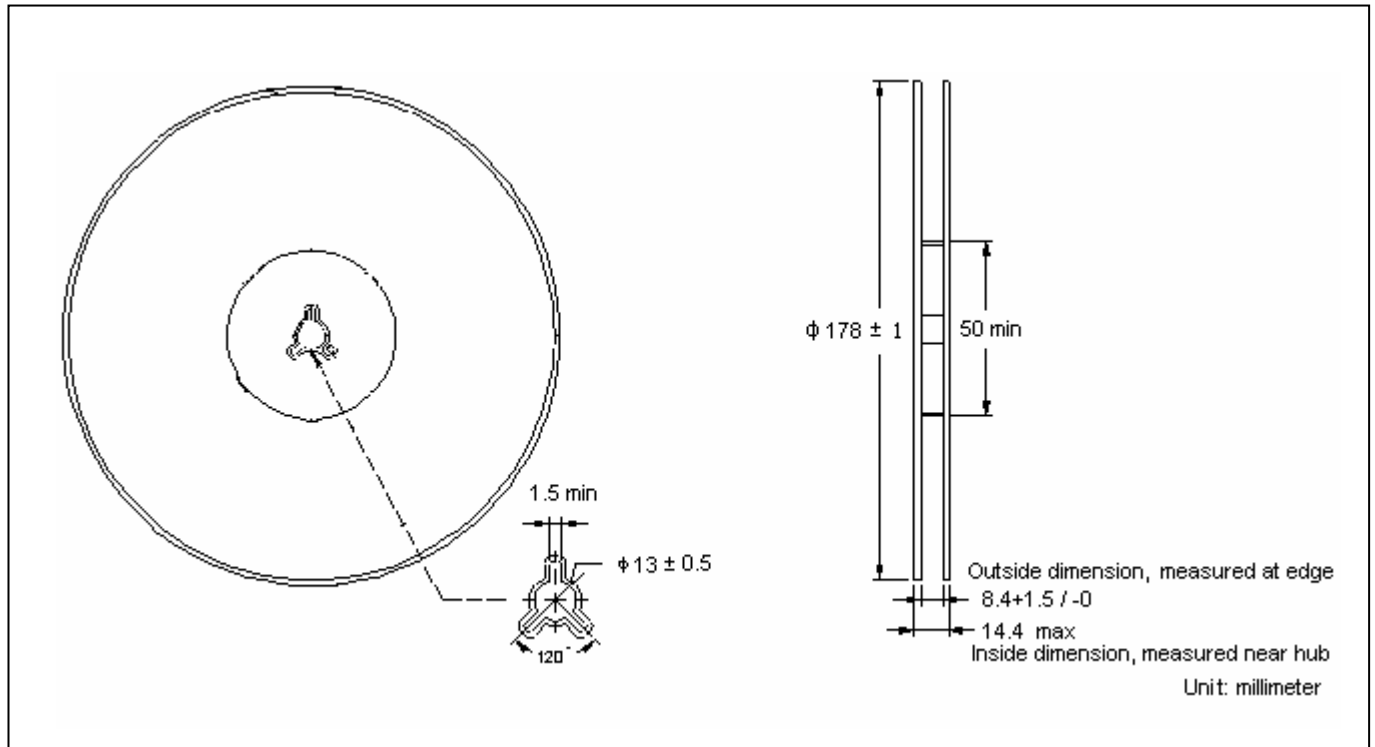
Note 1 : Device mounted on a FR-4 PCB



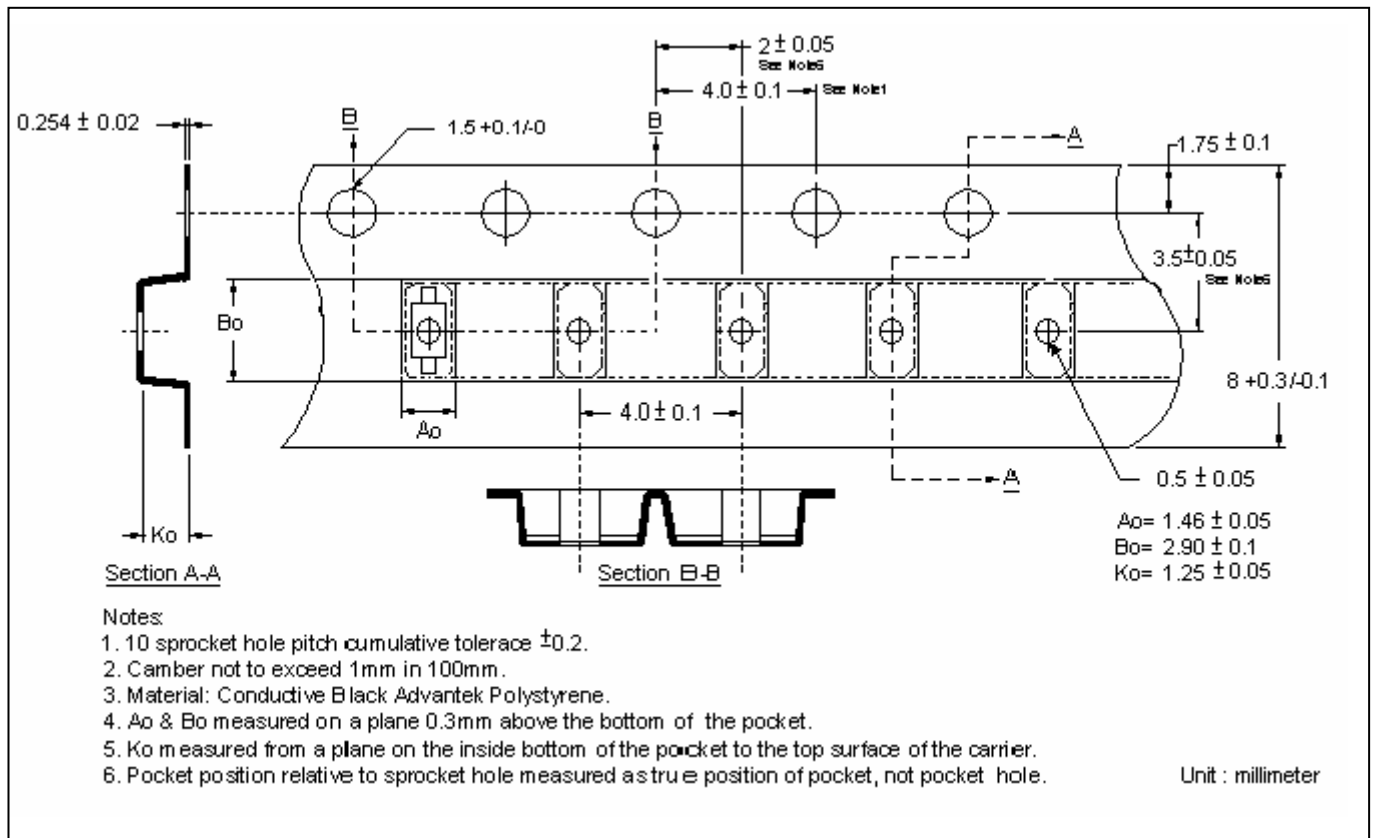
### Characteristic Curves



### Reel Dimension



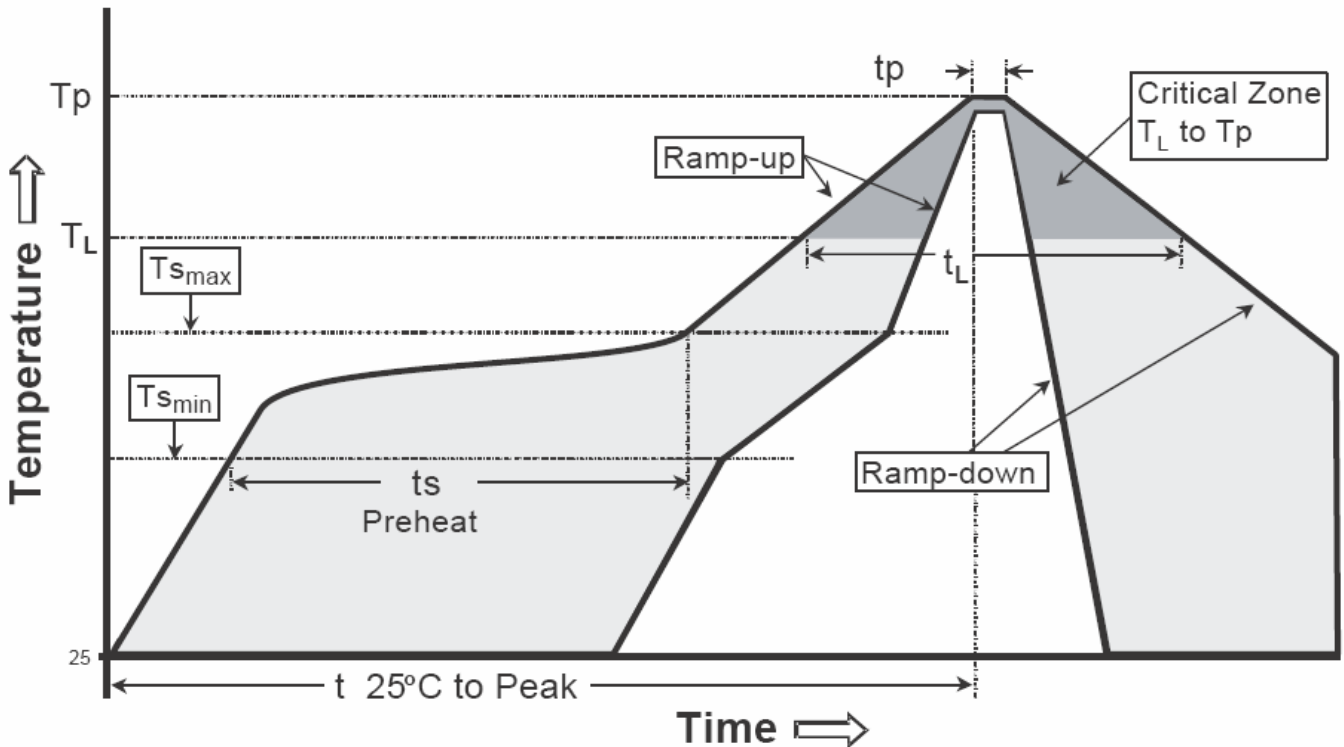
### Carrier Tape Dimension



**Recommended wave soldering condition**

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

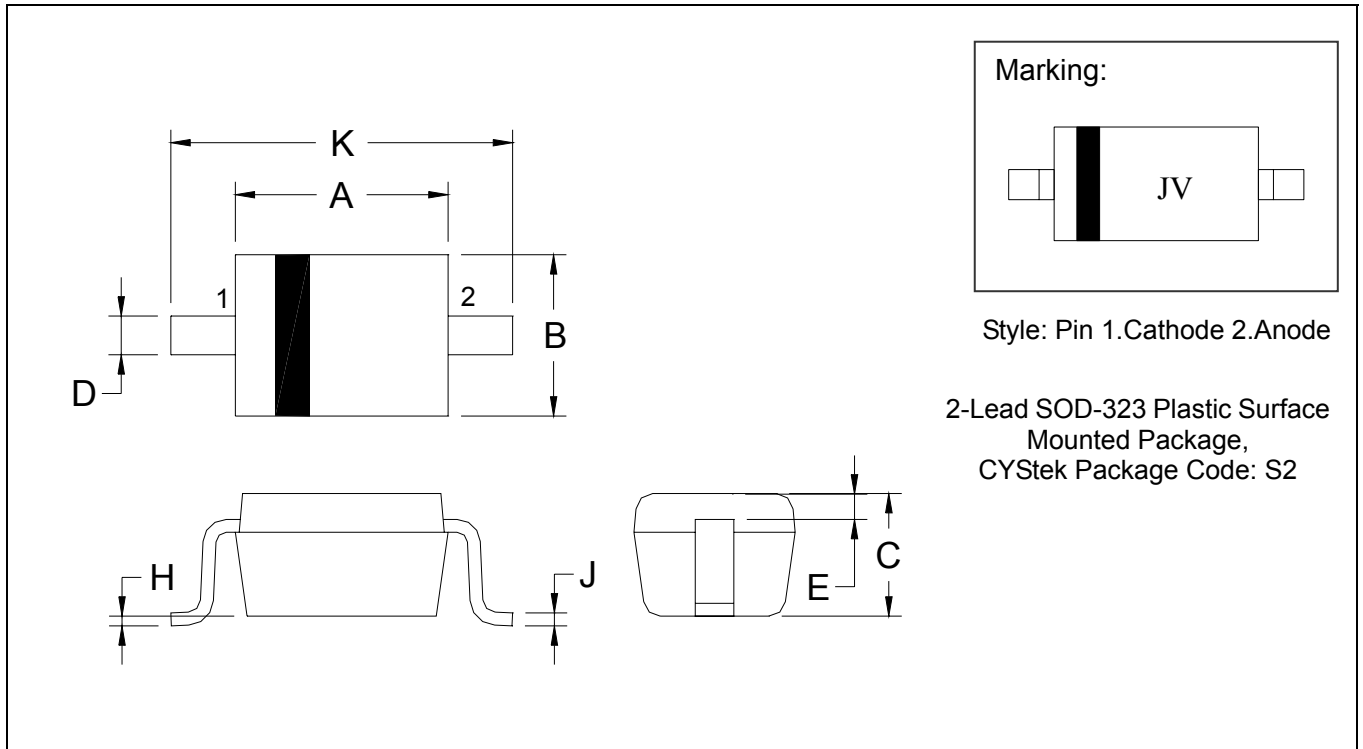
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Temperature(T <sub>P</sub> )	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(t <sub>p</sub> )	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

**SOD-323 Dimension**



\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0630	0.0709	1.60	1.80	E	0.0060 REF		0.15 REF	
B	0.0453	0.0531	1.15	1.35	H	0.0000	0.0040	0.00	0.10
C	0.0315	0.0394	0.80	1.00	J	0.0035	0.0070	0.089	0.177
D	0.0098	0.0157	0.25	0.40	K	0.0906	0.1063	2.30	2.70

Notes: 1.Controlling dimension : millimeters.  
 2.Lead thickness specified per L/F drawing with solder plating.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

**Important Notice:**

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek **semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.