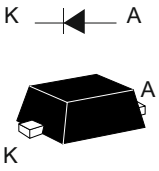
BAT41

Datasheet

Low capacitance small signal Schottky diodes



SOD-523

SOD123

Features

- Low leakage current losses
- Negligible switching losses
- Low forward and reverse recovery times
- Extremely fast switching
- Surface mount device
- Low capacitance diode
- ECOPACK2 compliant

Applications

- General Rectification
- Reverse polarity protection
- Voltage clamping
- High-speed switching

Description

The BAT41 series uses 100 V Schottky barrier diodes packaged in SOD-123 or SOD-523. This series is specially suited for switching mode with low I_R losses.

Product status link
BAT41

Product summary	
I_F	200 mA
V_{RRM}	100 V
T_j (max.)	150 °C
C (typ.)	3 pF

1 Characteristics

Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		100	V
I_F	Continuous forward current		200	mA
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	1	A
T_{stg}	Storage temperature range		-65 to +150	°C
T_j	Maximum operating junction temperature		+150	°C

Table 2. Thermal resistance parameter

Symbol	Parameter		Typ. value	Unit
$R_{th(j-a)}$	Junction to ambient(1)	SOD-123	500	°C/W
		SOD-523	600	

1. *Epoxy printed circuit board with recommended pad layout*

For more information, please refer to the following application note:

- AN5088: Rectifiers thermal management, handling and mounting recommendations

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	V_R = 50 V	-		0.1	µA
		T_j = 100 °C		-		20	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 1 mA	-	400	450	mV
			I_F = 200 mA	-		1000	

1. *Pulse test: t_p = 5 ms, δ < 2%*
2. *Pulse test: t_p = 380 µs, δ < 2%*

Table 4. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C	Diode capacitance	V_R = 1 V, f = 1 MHz	-	3	10	pF

1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current

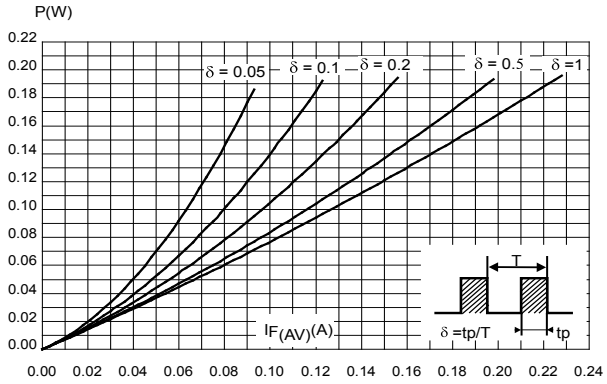


Figure 2. Average forward current versus ambient temperature (δ = 1)

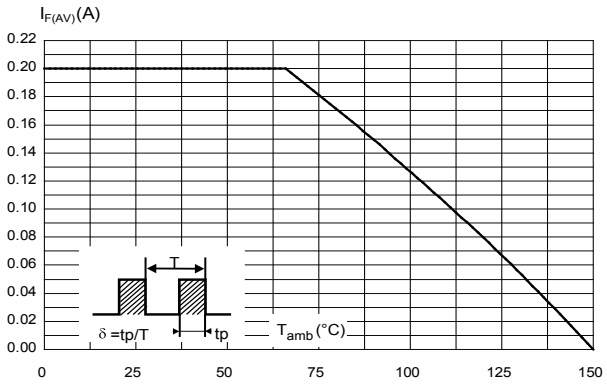


Figure 3. Reverse leakage current versus reverse voltage applied (typical values)

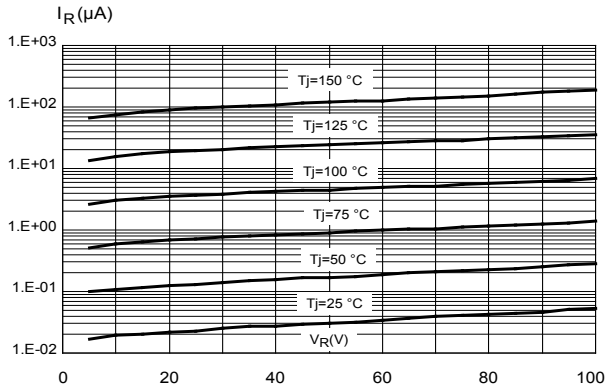


Figure 4. Reverse leakage current versus junction temperature (typical values)

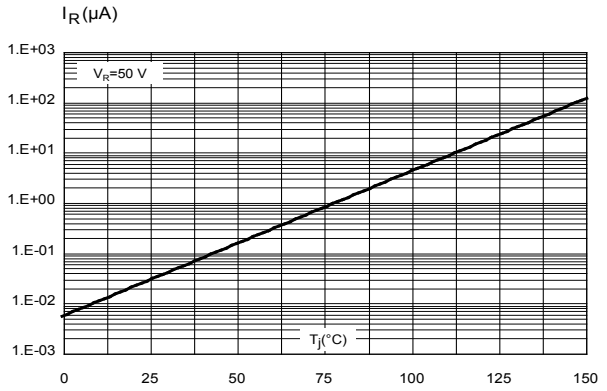


Figure 5. Junction capacitance versus reverse voltage applied (typical values)

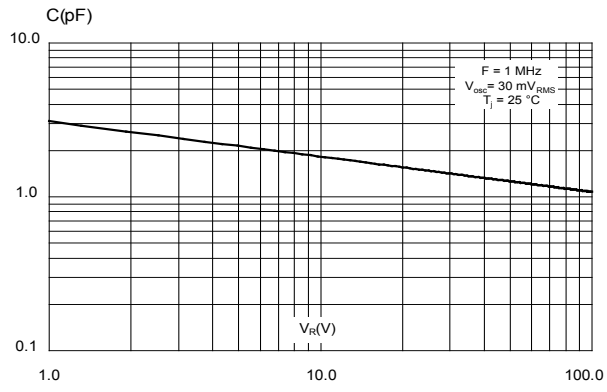


Figure 6. Forward voltage drop versus forward current (typical values)

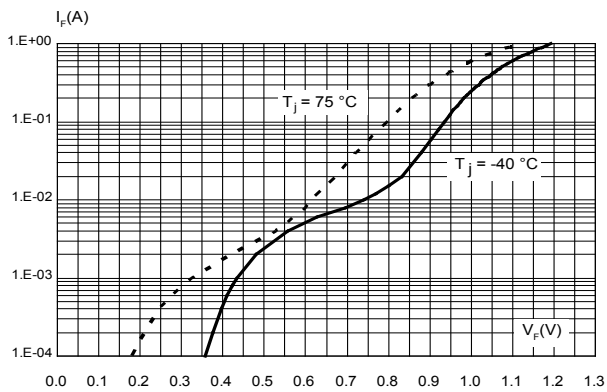
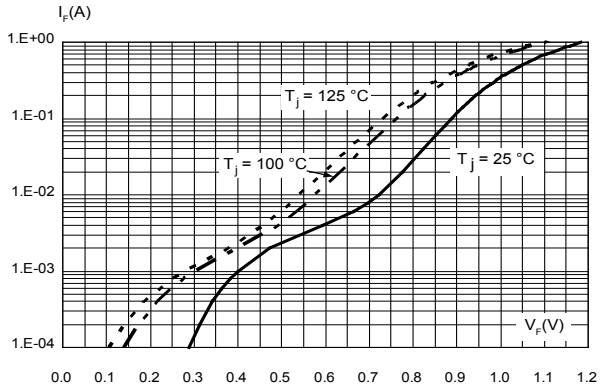


Figure 7. Forward voltage drop versus forward current (typical values)



2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

2.1 SOD123 package information

Figure 8. SOD123 package outline

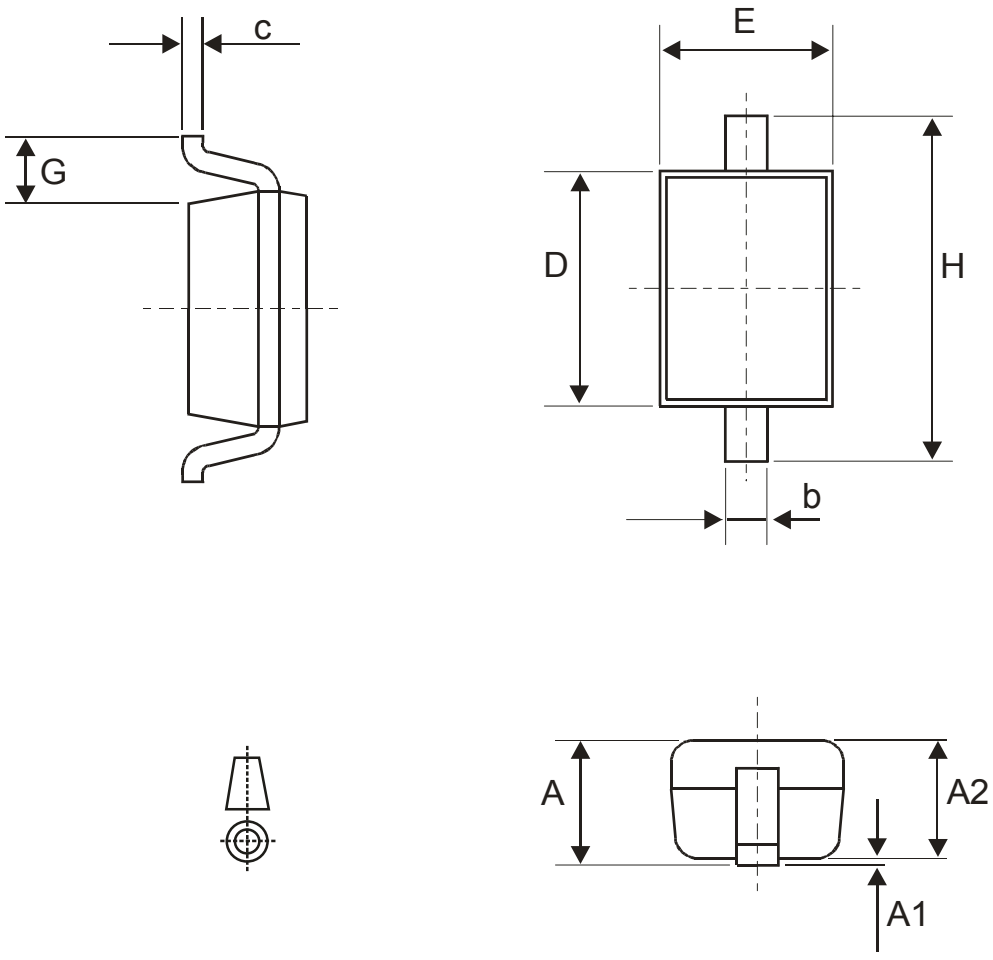
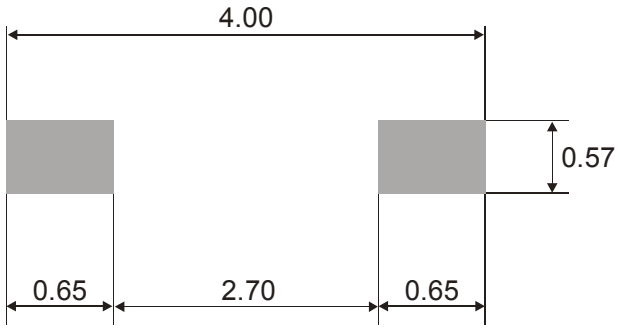


Table 5. **SOD123 package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches[1]		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.45			0.057
A1	0.00		0.10	0.000		0.004
A2	0.85		1.35	0.033		0.053
b		0.55			0.022	
c		0.15			0.039	
D	2.55		2.85	0.100		0.112
E	1.40		1.70	0.055		0.067
G	0.25			0.010		
H	3.55		3.75	0.140		0.148

1. *Values in inches are converted from mm and rounded to 3 decimal digits*

Figure 9. **SOD123 footprint in mm**



2.2 SOD523 package information

Figure 10. **SOD523 package outline**

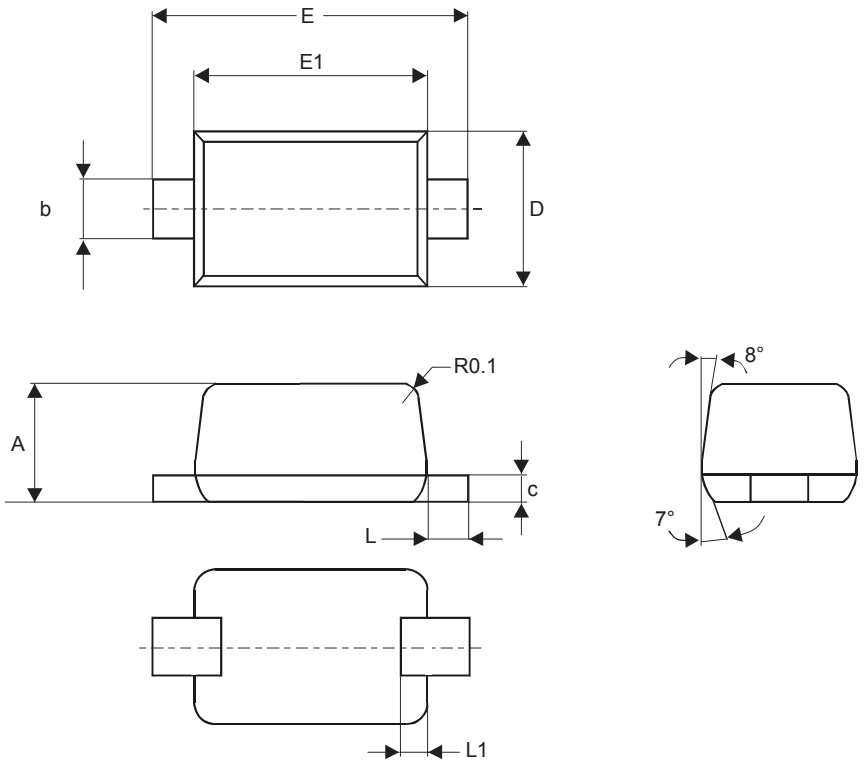
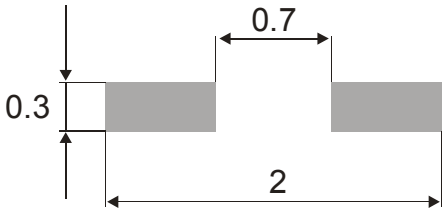


Table 6. **SOD523 package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches[1]		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.50	0.60	0.70	0.020	0.024	0.028
E	1.50	1.60	1.70	0.059	0.063	0.067
E1	1.10	1.20	1.30	0.043	0.047	0.051
D	0.70	0.80	0.90	0.028	0.031	0.035
b	0.25		0.35	0.010		0.014
c	0.07		0.20	0.003		0.008
L	0.15	0.20	0.25	0.006	0.008	0.010
L1	0.00		0.20	0.000		0.008

1. *Values in inches are converted from mm and rounded to 3 decimal digits*

Figure 11. **SOD523 footprint in mm**



3 Ordering information

Figure 12. **Ordering information scheme**

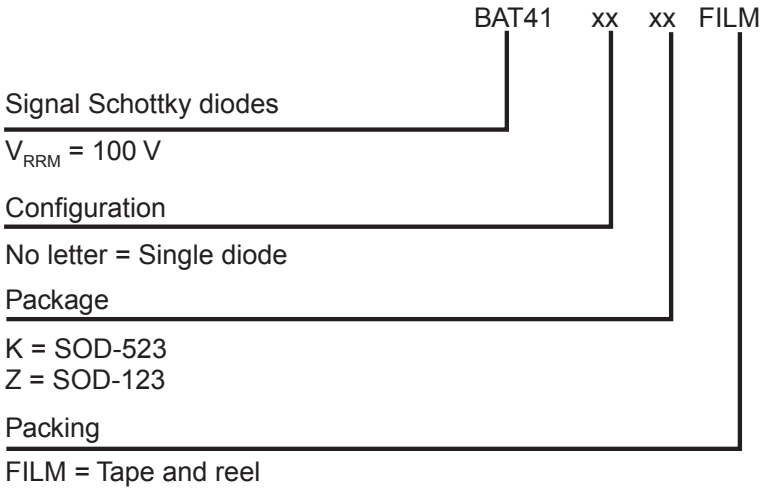


Table 7. **Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
BAT41ZFILM	Z41	SOD-123 Single	10 mg	3000	Tape and reel
BAT41KFILM	41	SOD-523 Single	1.4 mg	3000	Tape and reel

Revision history

Table 8. **Document revision history**

Date	Revision	Changes
08-Aug-2006	1	Initial release.
12-Oct-2009	2	Updated Table 8 quote “L1” from 0.10 to 0.05.
03-Sep-2021	3	Updated all figures. Removal of Obsolete P/N. Minor text changes to improve readability.