BAT48

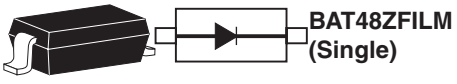
Small signal Schottky diode

Features

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

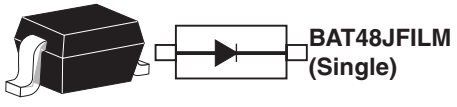
Description

The BAT48 series uses 40 V Schottky barrier diodes packaged in SOD-123, SOD-323 or DO-35. This series is general purpose and features very low turn-on voltage and fast switching.



BAT48ZFILM (Single)

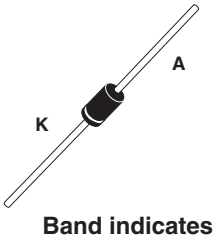
SOD-123



BAT48JFILM (Single)

SOD-323

Configurations in top view



BAT48RL

Band indicates cathode

Table 1. Device summary

Symbol	Value
I_F	350 mA
V_{RRM}	40 V
C (typ)	18 pF
T_j (max)	150 °C

1 Characteristics

Table 2. Absolute ratings (limiting values at T_j = 25 °C, unless otherwise specified)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			40	V
I_F	Continuous forward current			350	mA
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	SOD-123, SOD-323	2	A
			DO-35	7.5	
T_{stg}	Storage temperature range			-65 to +150	°C
T_j	Maximum operating junction temperature range		SOD-123, SOD-323	-40 to +150	°C
			DO-35	-40 to +125	
T_L	Maximum temperature for soldering during 10 s		SOD-123, SOD-323	260	°C
			DO-35 at 4 mm from case	230	

Table 3. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction to ambient(1)	SOD-123	500	°C/W
		SOD-323	550	
$R_{th(j-l)}$	Junction to lead(2)	DO-35	300	°C/W

1. Epoxy printed circuit board with recommended pad layout
2. On infinite heatsink with 4 mm lead length

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
V_{BR}	Breakdown reverse voltage	T_j = 25 °C	I_r = 25 µA	40			V
I_R(1)	Reverse leakage current	T_j = 25 °C	V_R = 1.5 V			1	µA
			V_R = 10 V			2	
			V_R = 20 V			5	
			V_R = 40 V			25	
		T_j = 60 °C	V_R = 1.5 V			10	
			V_R = 10 V			15	
			V_R = 20 V			25	
			V_R = 40 V			50	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 0.1 mA			0.25	V
			I_F = 1 mA			0.3	
			I_F = 10 mA			0.4	
			I_F = 50 mA			0.5	
			I_F = 200 mA			0.75	
			I_F = 500 mA			0.9	

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

Table 5. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C	Diode capacitance	V_R = 0 V, F = 1 MHz		30		pF
		V_R = 1 V, F = 1 MHz		18		

Figure 1. Average forward power dissipation versus average forward current

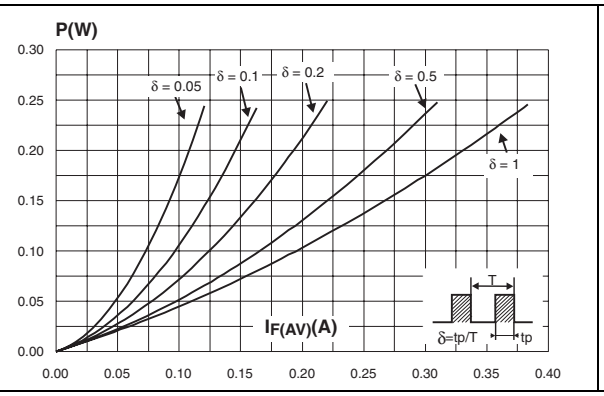


Figure 2. Average forward current versus ambient temperature (δ = 1)

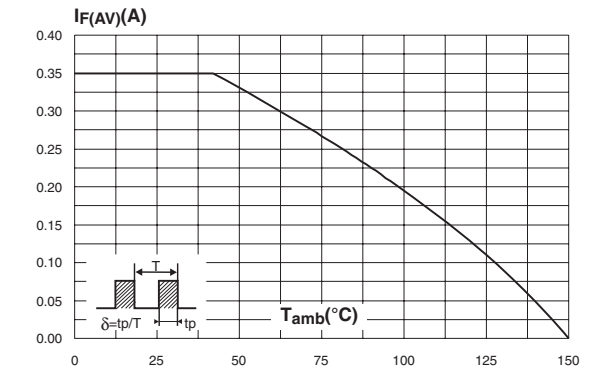


Figure 3. Reverse leakage current versus reverse applied voltage (typical values)

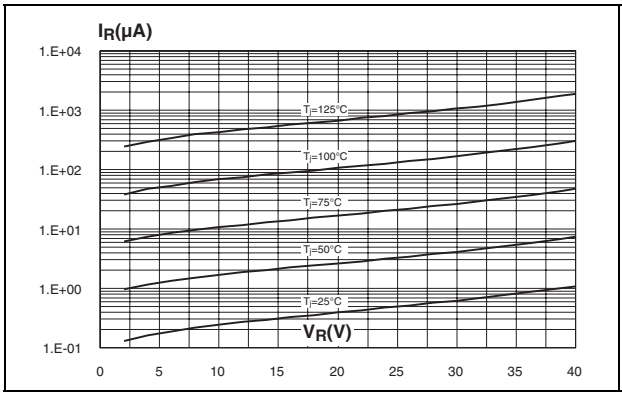


Figure 4. Reverse leakage current versus junction temperature (typical values)

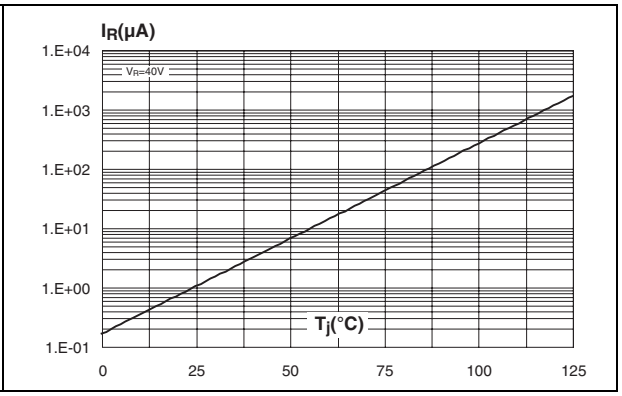


Figure 5. Junction capacitance versus reverse applied voltage (typical values)

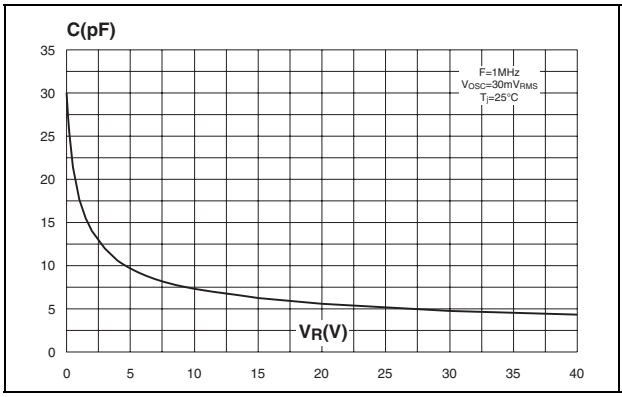


Figure 6. Forward voltage drop versus forward current (typical values)

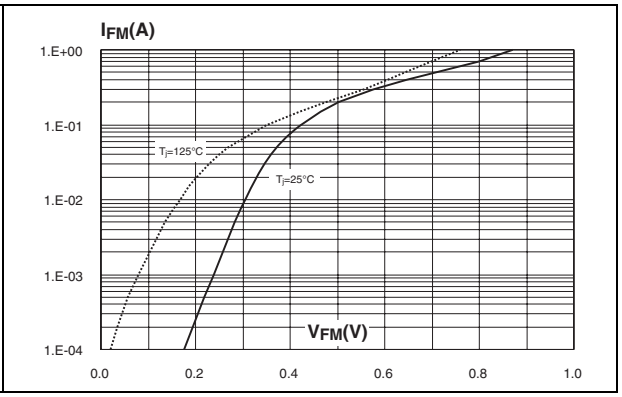


Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration (SOD-323)

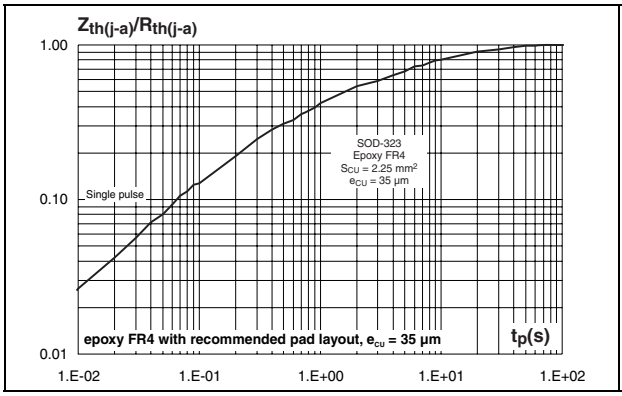
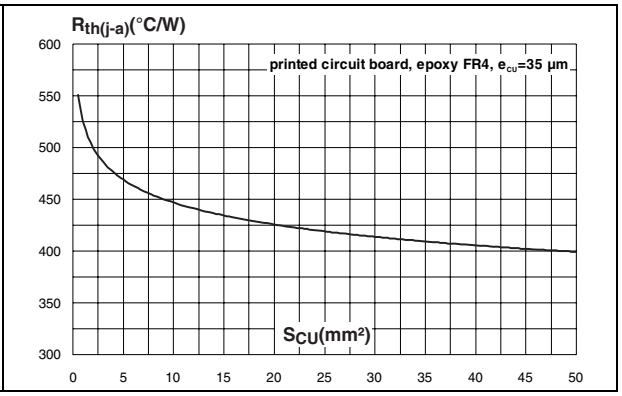


Figure 8. Thermal resistance junction to ambient versus copper surface under each lead (SOD-323)

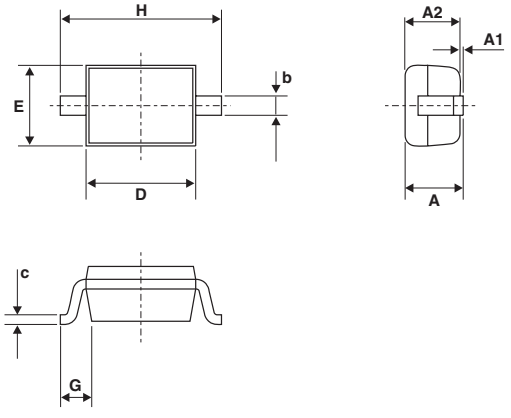


2 Package information

- Epoxy meets UL94,V0
- Lead-free packages

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.

Table 6. SOD-123 dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.45		0.057
A1	0	0.1	0	0.004
A2	0.85	1.35	0.033	0.053
b	0.55 Typ.		0.022 Typ.	
c	0.15 Typ.		0.039 Typ.	
D	2.55	2.85	0.1	0.112
E	1.4	1.7	0.055	0.067
G	0.25		0.01	
H	3.55	3.75	0.14	0.148

Figure 9. SOD-123 footprint, dimensions in mm (inches)

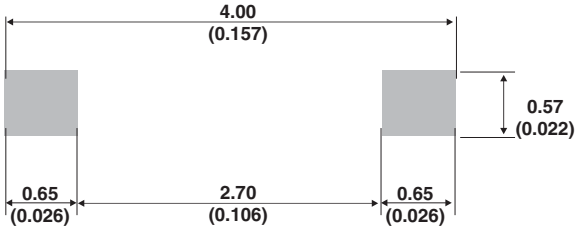
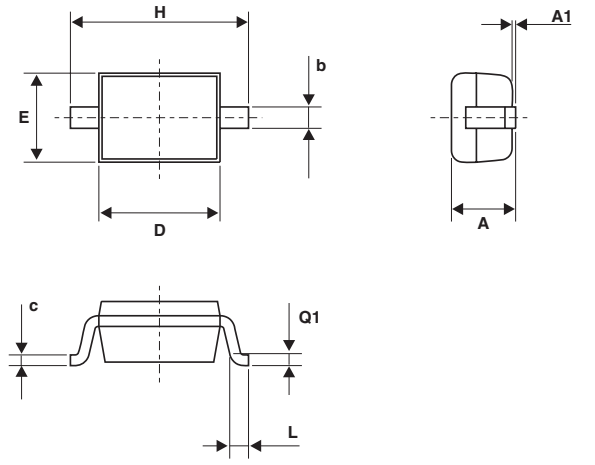


Table 7. SOD-323 dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.17		0.046
A1	0	0.1	0	0.004
b	0.25	0.44	0.01	0.017
c	0.1	0.25	0.004	0.01
D	1.52	1.8	0.06	0.071
E	1.11	1.45	0.044	0.057
H	2.3	2.7	0.09	0.106
L	0.1	0.46	0.004	0.02
Q1	0.1	0.41	0.004	0.016

Figure 10. SOD-323 footprint (dimensions in mm)

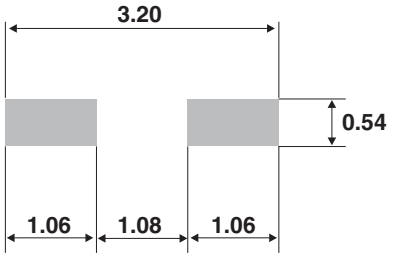
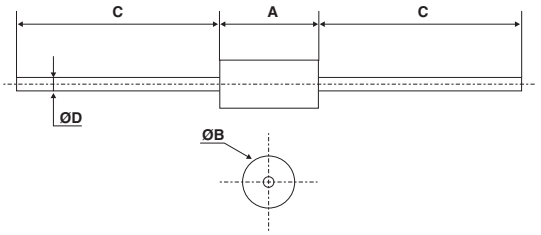


Table 8. DO-35 dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.05	4.50	0.120	0.177
B	1.53	2.00	0.060	0.079
C	12.7		0.500	
D	0.458	0.558	0.018	0.022

3 Ordering information

Table 9. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
BAT48ZFILM	Z48	SOD-123 Single	10 mg	3000	Tape and reel
BAT48JFILM	48	SOD-323 Single	5 mg	3000	Tape and reel
BAT48RL	BAT48	DO-35	15 mg	4000	Tape and reel

4 Revision history

Table 10. Document revision history

Date	Revision	Changes
08-Aug-2006	1	Initial release.
07-Jul-2011	2	Updated package information for SOD-123. Added DO-35 package.