

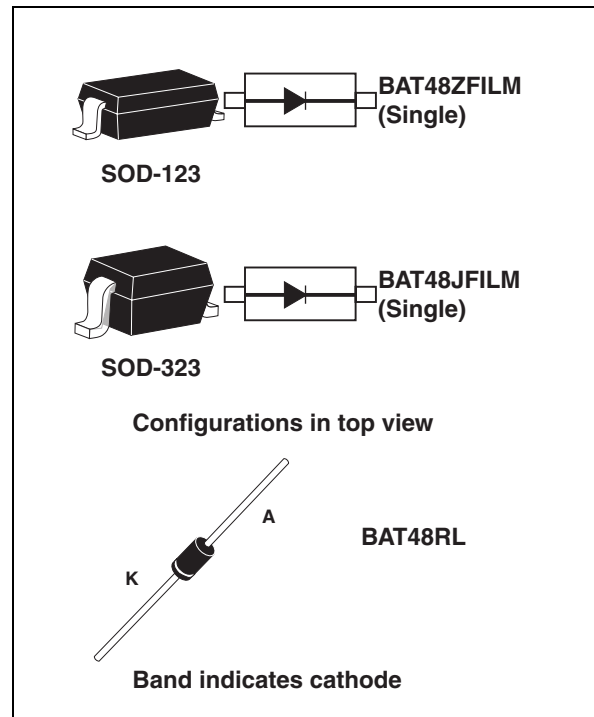
## Small signal Schottky diode

### 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.



**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  $T_j = 25\text{ °C}$ , 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	$t_p = 10\text{ ms}$ sinusoidal	SOD-123, SOD-323	A
			DO-35	
$T_{stg}$	Storage temperature range		-65 to +150	°C
$T_j$	Maximum operating junction temperature range		SOD-123, SOD-323	°C
			DO-35	
$T_L$	Maximum temperature for soldering during 10 s		SOD-123, SOD-323	°C
			DO-35 at 4 mm from case	

**Table 3. Thermal parameters**

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

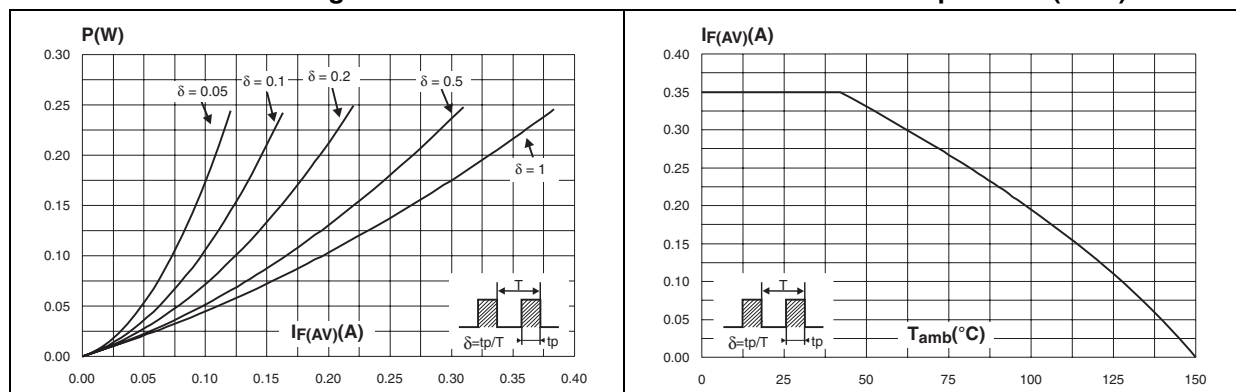
Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$V_{BR}$	Breakdown reverse voltage	$T_j = 25\text{ }^\circ\text{C}$	$I_r = 25\text{ }\mu\text{A}$	40			V
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ }^\circ\text{C}$	$V_R = 1.5\text{ V}$			1	$\mu\text{A}$
			$V_R = 10\text{ V}$			2	
			$V_R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

1. Pulse test:  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$
2. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

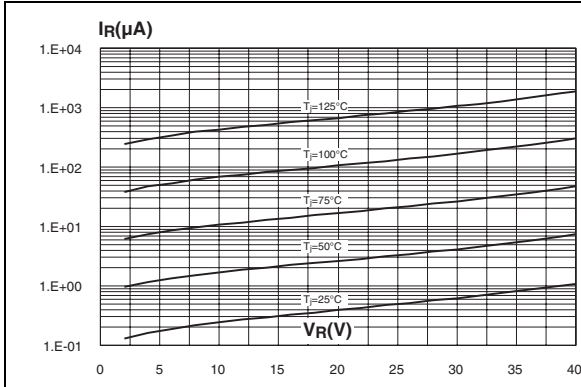
**Table 5. Dynamic characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C	Diode capacitance	$V_R = 0\text{ V}$ , $F = 1\text{ MHz}$		30		$\mu\text{F}$
		$V_R = 1\text{ V}$ , $F = 1\text{ MHz}$		18		

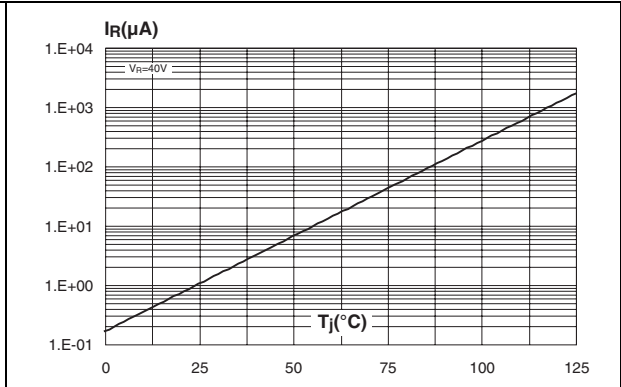
**Figure 1. Average forward power dissipation versus average forward current**      **Figure 2. Average forward current versus ambient temperature ( $\delta = 1$ )**



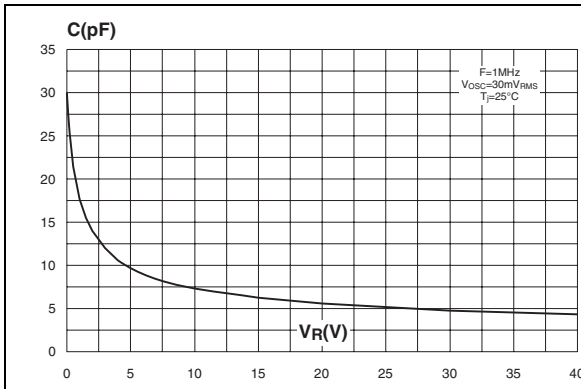
**Figure 3. Reverse leakage current versus reverse applied voltage (typical values)**



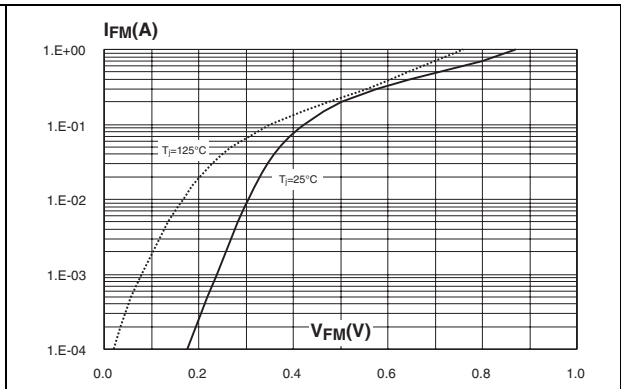
**Figure 4. Reverse leakage current versus junction temperature (typical values)**



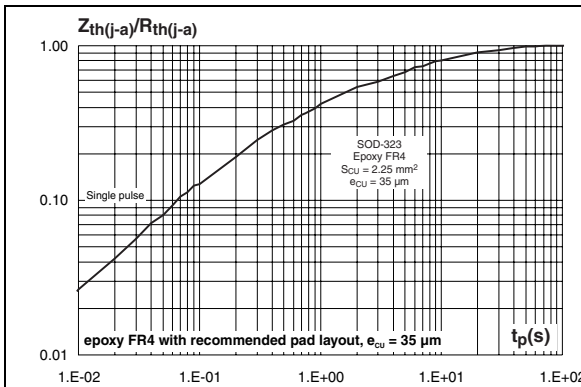
**Figure 5. Junction capacitance versus reverse applied voltage (typical values)**



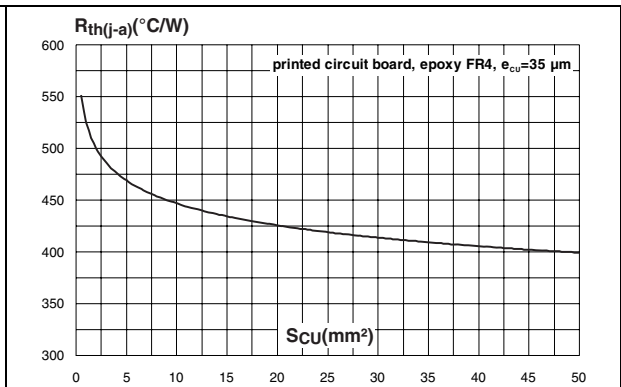
**Figure 6. Forward voltage drop versus forward current (typical values)**



**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<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> 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)**

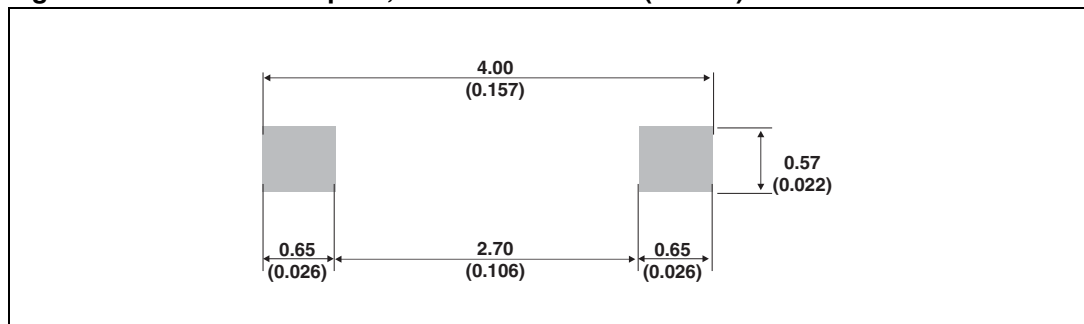


Table 7. SOD-323 dimensions

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)

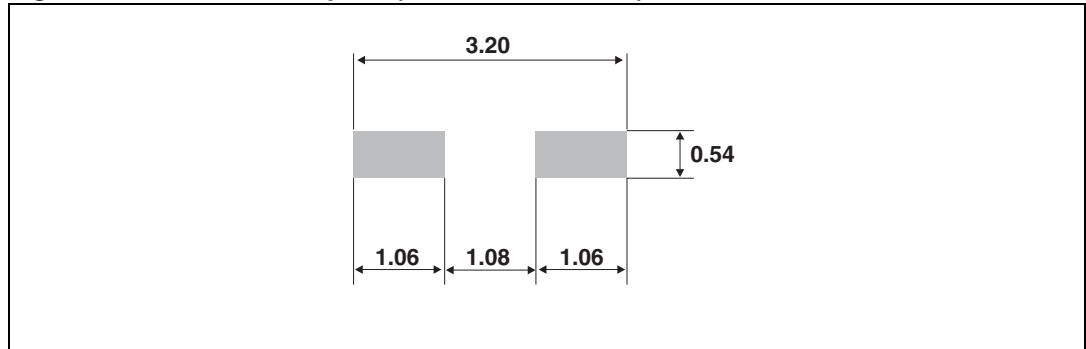


Table 8. DO-35 dimensions

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.

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