

## Small signal Schottky diodes

### Main product characteristics

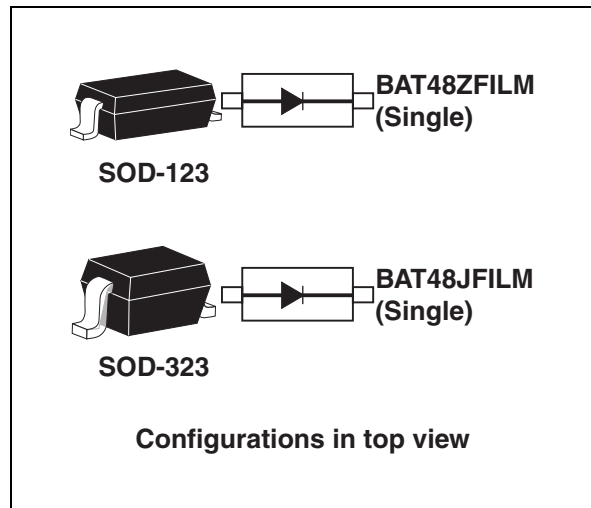
$I_F$	350 mA
$V_{RRM}$	40 V
C (typ)	18 pF
$T_j$ (max)	150° C

### Features and benefits

- 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 or SOD-323. This series is general purpose and features very low turn-on voltage and fast switching



### Order codes

Part Number	Marking
BAT48ZFILM	Z48
BAT48JFILM	48

**Table 1. Absolute ratings (limiting values at  $T_j = 25^\circ\text{C}$ , 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	$t_p = 10\text{ ms Sinusoidal}$	A
$T_{stg}$	Storage temperature range	-65 to +150	°C
$T_j$	Maximum operating junction temperature	150	°C

# 1 Characteristics

**Table 2. Thermal parameters**

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction to ambient <sup>(1)</sup>	SOD-123	500	°C/W
		SOD-323	550	

1. Epoxy printed circuit board with recommended pad layout

**Table 3. Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
$V_{BR}$	Breakdown reverse voltage	$T_j = 25^\circ\text{C}$	$I_r = 25\ \mu\text{A}$	40			V
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = 1.5\ \text{V}$			1	$\mu\text{A}$
			$V_R = 10\ \text{V}$			2	
			$V_R = 20\ \text{V}$			5	
			$V_R = 40\ \text{V}$			25	
		$T_j = 60^\circ\text{C}$	$V_R = 1.5\ \text{V}$			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	$T_j = 25^\circ\text{C}$	$I_F = 0.1\ \text{mA}$			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	

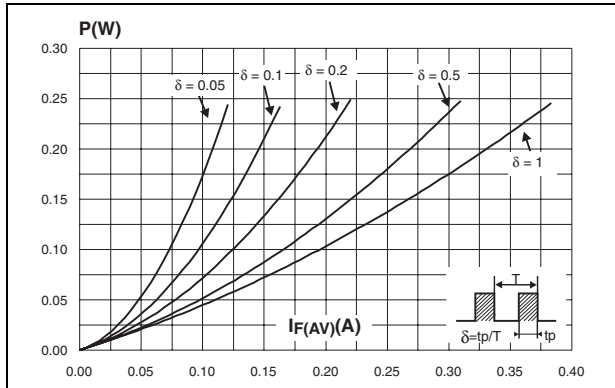
1. Pulse test:  $t_p = 5\ \text{ms}$ ,  $\delta < 2\%$

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

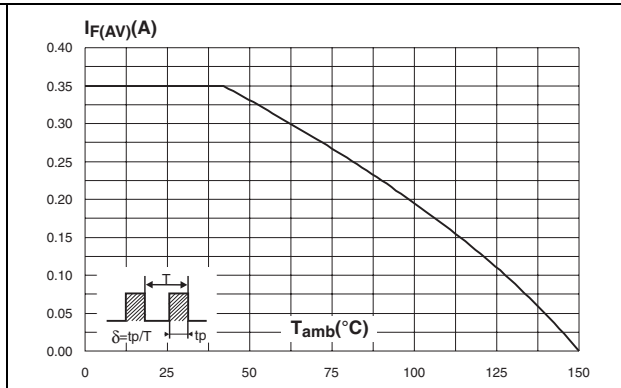
**Table 4. Dynamic characteristics**

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

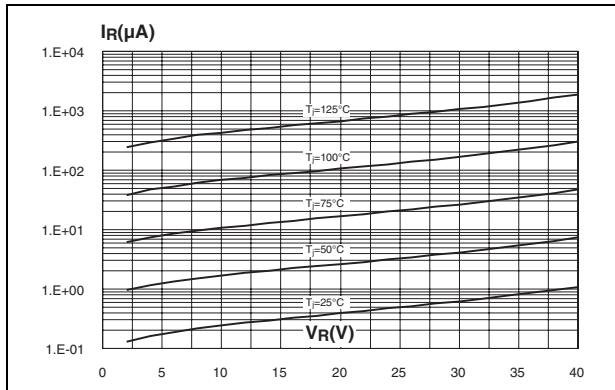
**Figure 1. Average forward power dissipation versus average forward current**



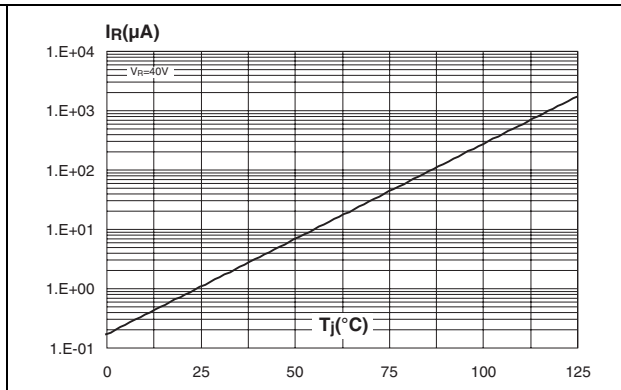
**Figure 2. Average forward current versus ambient temperature (delta = 1)**



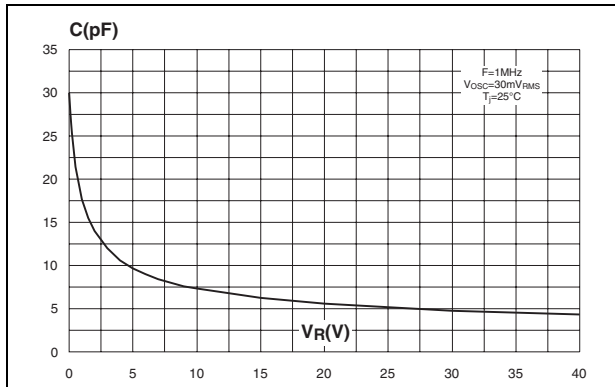
**Figure 3. Reverse leakage current versus reverse applied voltage (typical values)**



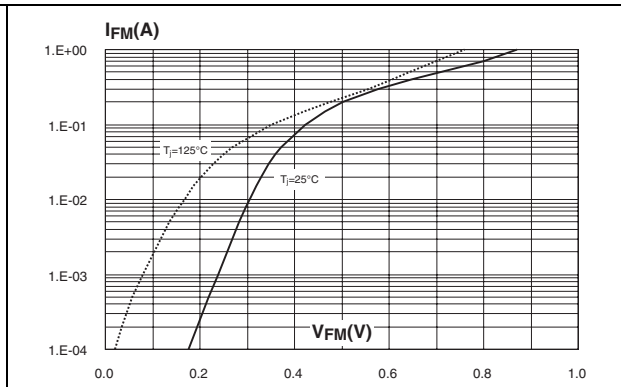
**Figure 4. Reverse leakage current versus junction temperature (typical values)**



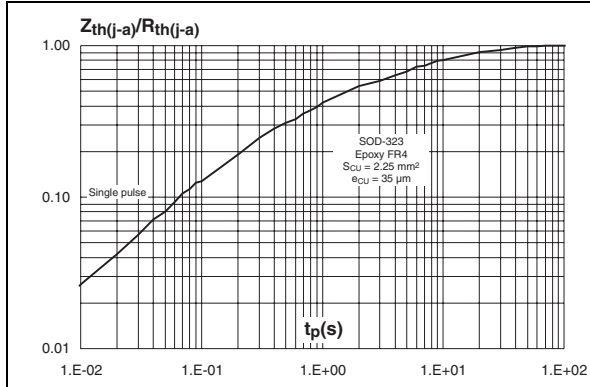
**Figure 5. Junction capacitance versus reverse applied voltage (typical values)**



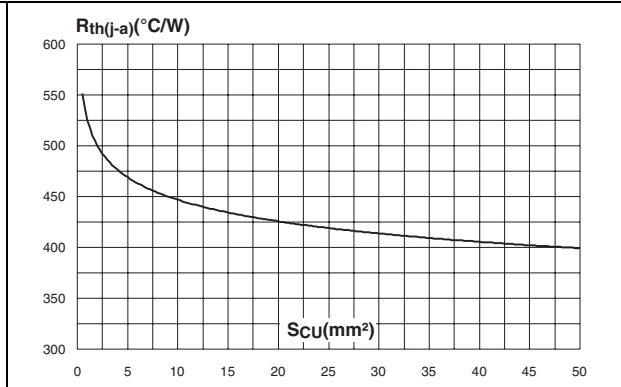
**Figure 6. Forward voltage drop versus forward current (typical values)**



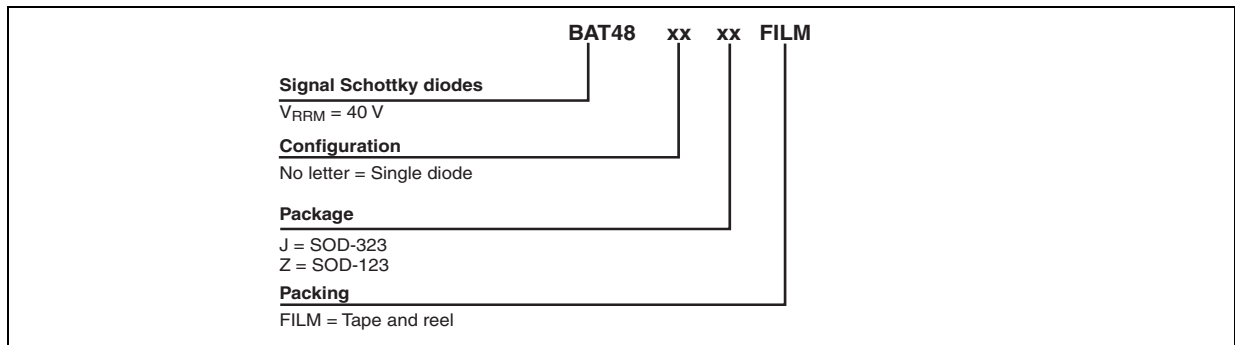
**Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy FR4 with recommended pad layout,  $e_{CU} = 35 \mu\text{m}$ ) (SOD-323)**



**Figure 8. Thermal resistance junction to ambient versus copper surface under each lead (printed circuit board, epoxy FR4,  $e_{CU}=35 \mu\text{m}$ , SOD-323)**



## 2 Ordering information scheme



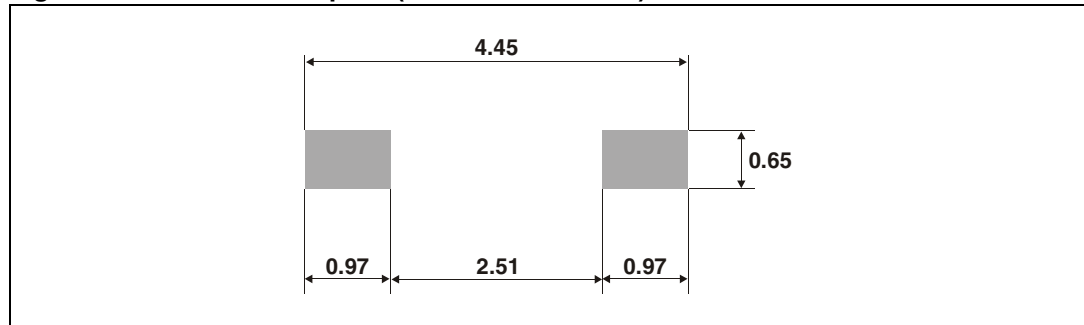
### 3 Package information

Epoxy meets UL94, V0

**Table 5. 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	3.95	0.14	0.156

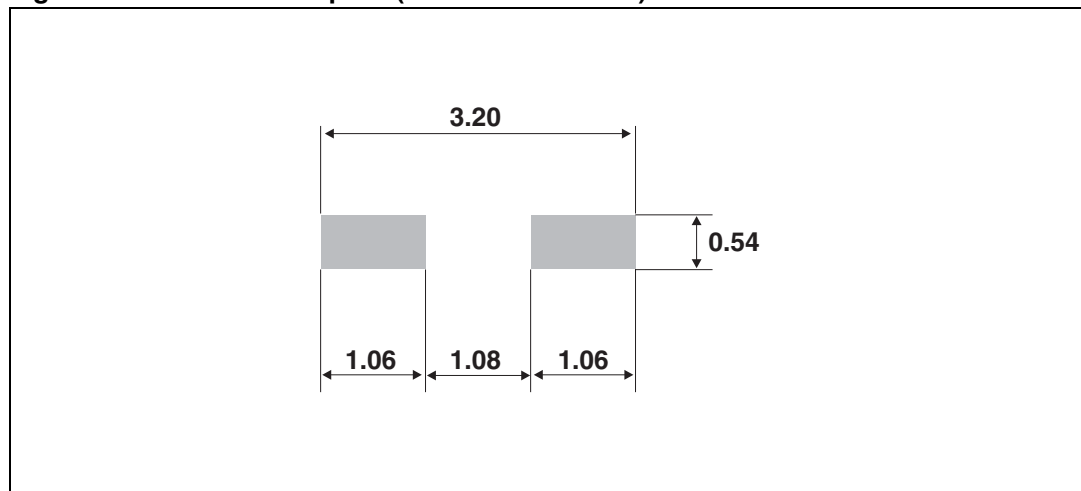
**Figure 9. SOD-123 footprint (dimensions in mm)**



**Table 6. 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)**



In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com).

## 4 Ordering information

Part Number	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

## 5 Revision history

Date	Revision	Description of Changes
08-Aug-2006	1	Initial release.

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