

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.

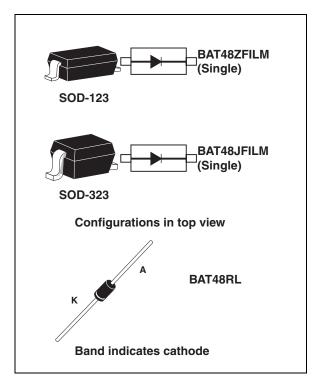


Table 1. Device summary

Symbol	Value
I _F	350 mA
V_{RRM}	40 V
C (typ)	18 pF
T _j (max)	150 °C

Characteristics BAT48

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	
1	Surge non repetitive forward	$t_{p} = 10 \text{ ms}$	SOD-123, SOD-323	2	Α	
I _{FSM}	current	sinusoidal	DO-35	7.5	A	
T _{stg}	Storage temperature range			-65 to +150	°C	
т.	Maximum operating junction te	mperature	SOD-123, SOD-323	-40 to +150	°C	
Tj	range		DO-35	-40 to +125	O	
	Maximum temperature for soldering during		SOD-123, SOD-323	260		
T _L 10 s		aning during	DO-35 at 4 mm from case	230	°C	

Table 3. Thermal parameters

Symbol	Parameter			Value	Unit
В	Junction to ambient ⁽¹⁾		SOD-123	500	°C/W
R _{th(j-a)}	Ath(j-a) Junction to ambient(*)		SOD-323	550	C/VV
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

BAT48 Characteristics

Table 4. Static electrical characteristics

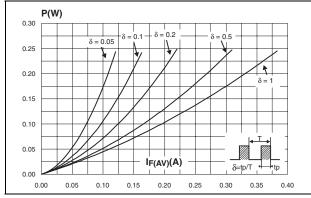
Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
V_{BR}	Breakdown reverse voltage	T _j = 25 °C	I _r = 25 μA	40			٧
			V _R = 1.5 V			1	μΑ
		T _i = 25 °C	V _R = 10 V			2	
		$I_j = 25$ C	V _R = 20 V			5	
ı (1)	I _R ⁽¹⁾ Reverse leakage current		V _R = 40 V			25	
'R` ′		T _j = 60 °C	V _R = 1.5 V			10	
			V _R = 10 V			15	
			V _R = 20 V			25	
			V _R = 40 V			50	
			I _F = 0.1 mA			0.25	
		T _j = 25 °C	I _F = 1 mA			0.3	V
V _F ⁽²⁾	Forward voltage drop		I _F = 10 mA			0.4	
			I _F = 50 mA			0.5	
			I _F = 200 mA			0.75	
			I _F = 500 mA			0.9	

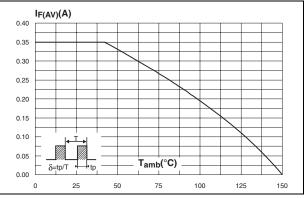
^{1.} Pulse test: t_p = 5 ms, δ < 2 %

Table 5. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
	Diode capacitance	V _R = 0 V, F = 1 MHz		30		рF
		V _R = 1 V, F = 1 MHz		18		рΓ

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





^{2.} Pulse test: t_p = 380 μ s, δ < 2 %

Characteristics BAT48

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

I_R(μA)

1.E+03

1.E+02

1.E+01

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

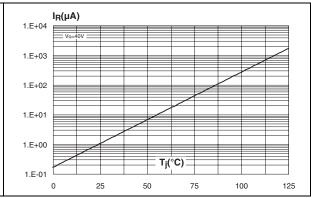
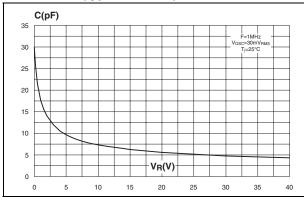


Figure 5. Junction capacitance versus reverse applied voltage (typical values)

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



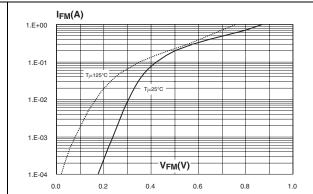


Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration (SOD-323)

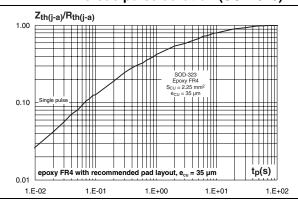
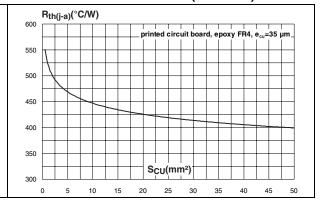


Figure 8. Thermal resistance junction to ambient versus copper surface under each lead (SOD-323)



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

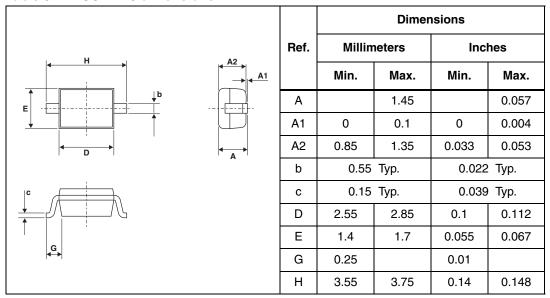


Figure 9. SOD-123 footprint, dimensions in mm (inches)

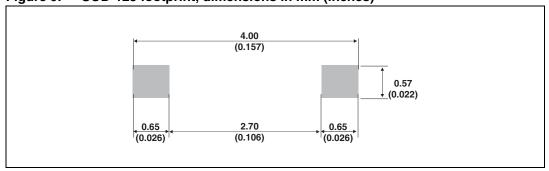
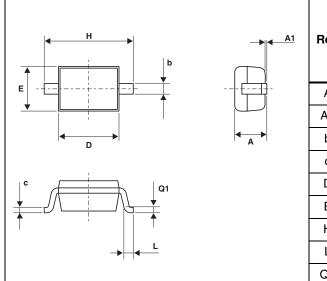


Table 7. SOD-323 dimensions



	Dimensions				
Ref.	Millimeters		Inc	hes	
	Min.	Max.	Min.	Max.	
Α		1.17		0.046	
A1	0	0.1	0	0.004	
b	0.25	0.44	0.01	0.017	
С	0.1	0.25	0.004 0.01		
D	1.52	1.8	0.06	0.071	
Е	1.11	1.45	0.044	0.057	
Н	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)

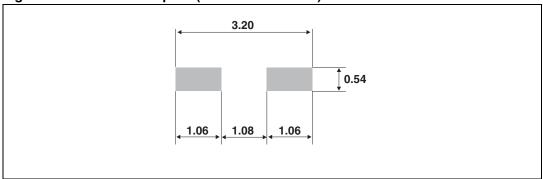
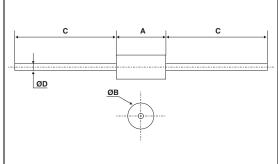


Table 8. DO-35 dimensions



	Dimensions				
Ref.	Millimeters		Aillimeters Inc		
	Min.	Max.	Min.	Max.	
Α	3.05	4.50	0.120	0.177	
В	1.53	2.00	0.060 0.079		
С	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.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2011 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

8/8 Doc ID 12634 Rev 2