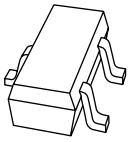


BAT54T

Single Schottky barrier diode

Rev. 01 — 14 December 2009 Product data sheet

1. Product profile

1.1 General description

Single planar Schottky barrier diode with an integrated guard ring for stress protection, encapsulated in a SOT416 (SC-75) ultra small Surface-Mounted Device (SMD) plastic package.

1.2 Features

- Low forward voltage: max. 400 mV
- Low capacitance: max. 10 pF
- Ultra small SMD plastic package
- AEC-Q101 qualified

1.3 Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diode

1.4 Quick reference data

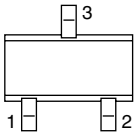
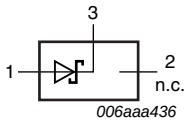
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current			-	-	200	mA
V_R	reverse voltage			-	-	30	V
V_F	forward voltage	I_F = 10 mA	[1]	-	-	400	mV

[1] Pulse test: $t_p \leq 300\ \mu s$; $\delta \leq 0.02$.

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	anode		
2	not connected		
3	cathode		

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAT54T	SC-75	plastic surface-mounted package; 3 leads	SOT416

4. Marking

Table 4. Marking codes

Type number	Marking code
BAT54T	ZW

5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_R	reverse voltage			-	30	V
I_F	forward current			-	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$		-	300	mA
I_{FSM}	non-repetitive peak forward current	square wave				
		$t_p = 100$ μs		-	4	A
		$t_p = 1$ ms		-	2	A
		$t_p = 10$ ms		-	1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	150	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			−55	+150	°C
T_{stg}	storage temperature			−65	+150	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	833	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[2]	-	-	350	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Soldering point of cathode tab.

7. Characteristics

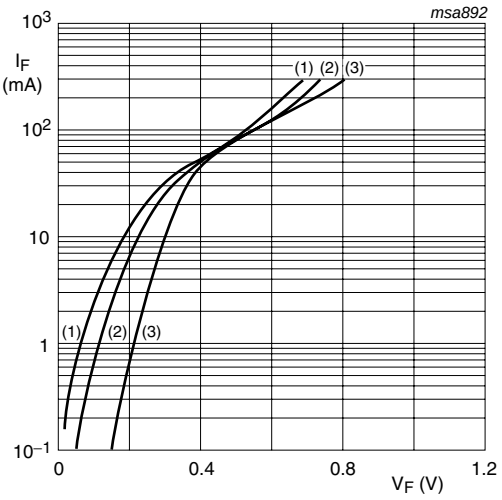
Table 7. Characteristics

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage		[1]				
		I_F = 0.1 mA		-	-	240	mV
		I_F = 1 mA		-	-	320	mV
		I_F = 10 mA		-	-	400	mV
		I_F = 30 mA		-	-	500	mV
		I_F = 100 mA		-	-	800	mV
I_R	reverse current	V_R = 25 V		-	-	2	μA
t_{rr}	reverse recovery time		[2]	-	-	5	ns
C_d	diode capacitance	V_R = 1 V; f = 1 MHz		-	-	10	pF

[1] Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.

[2] When switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA.

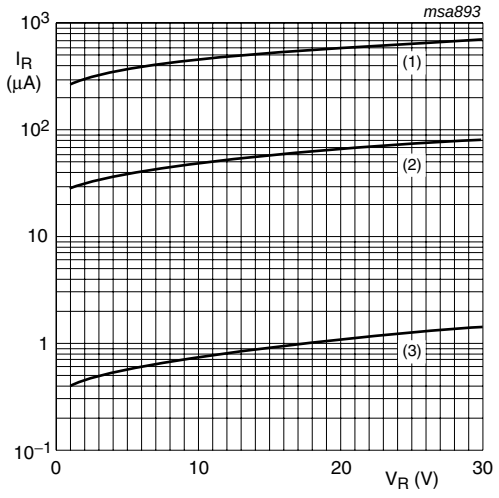


(1) T_{amb} = 125 °C

(2) T_{amb} = 85 °C

(3) T_{amb} = 25 °C

Fig 1. Forward current as a function of forward voltage; typical values

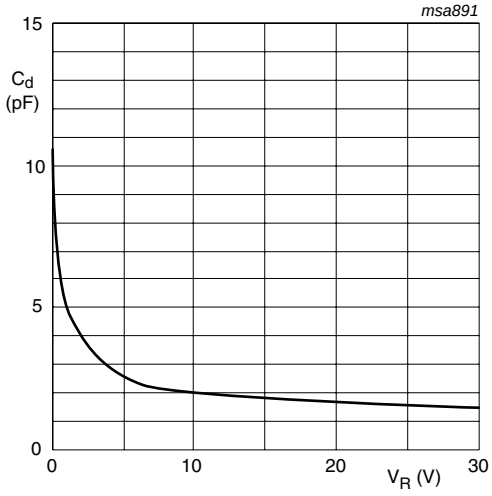


(1) T_{amb} = 125 °C

(2) T_{amb} = 85 °C

(3) T_{amb} = 25 °C

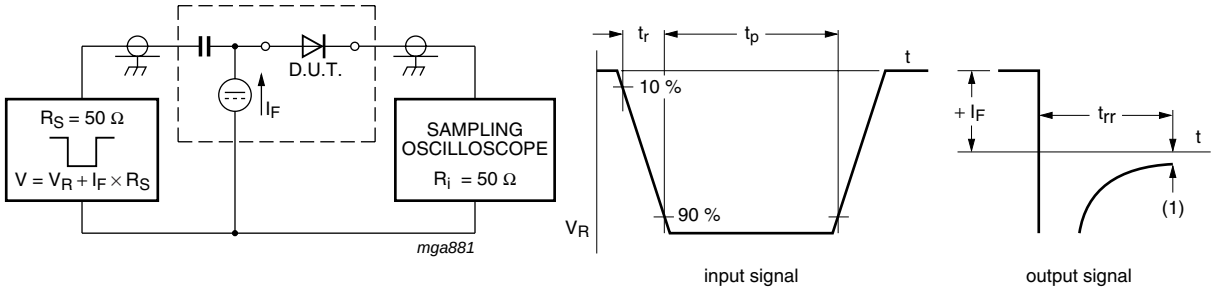
Fig 2. Reverse current as a function of reverse voltage; typical values



f = 1 MHz; T_{amb} = 25 °C

Fig 3. Diode capacitance as a function of reverse voltage; typical values

8. Test information



(1) I_R = 1mA

Fig 4. Reverse recovery time test circuit and waveforms

9. Package outline

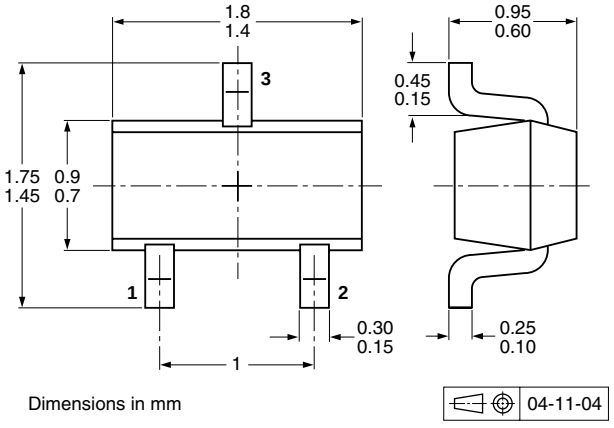


Fig 5. Package outline SOT416 (SC-75)

10. Packing information

Table 8. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity	
			3000	10000
BAT54T	SOT416	4 mm pitch, 8 mm tape and reel	-115	-135

[1] For further information and the availability of packing methods, see Section 14.

11. Soldering

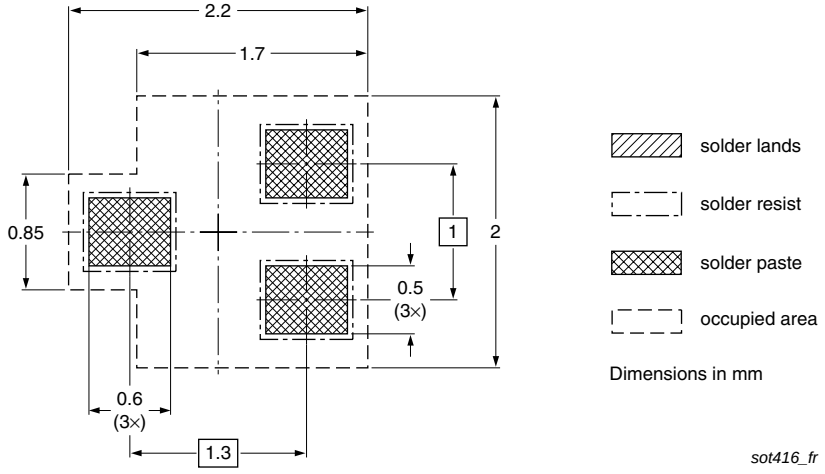


Fig 6. Reflow soldering footprint SOT416 (SC-75)

12. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAT54T_1	20091214	Product data sheet	-	-

13. Legal information

13.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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15. Contents

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Date of release: 14 December 2009
Document identifier: BAT54T_1