

# 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

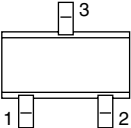
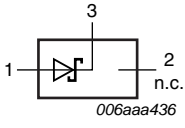
Table 1. Quick reference data

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

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

## 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			
		$t_p = 100$ $\mu$ s	-	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

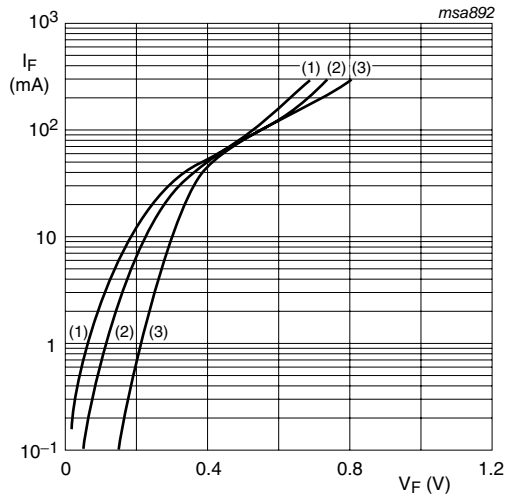
**Table 7. Characteristics**

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

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

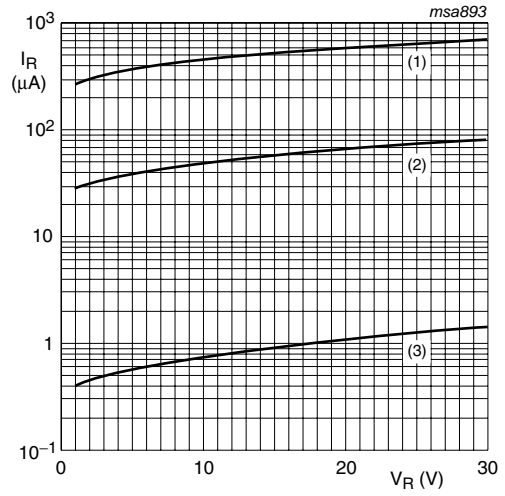
[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

[2] When switched from  $I_F = 10\text{ mA}$  to  $I_R = 10\text{ mA}; R_L = 100\text{ }\Omega$ ; measured at  $I_R = 1\text{ mA}$ .



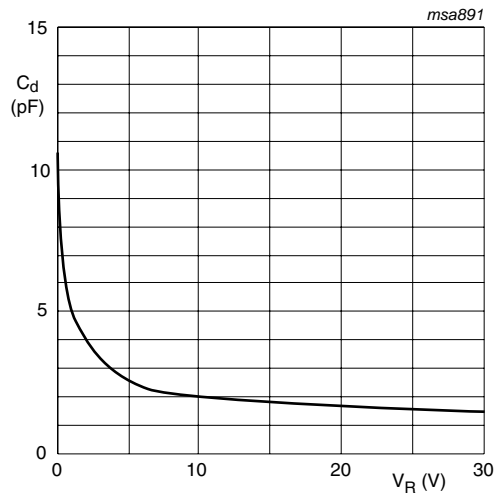
- (1)  $T_{amb} = 125\text{ °C}$
- (2)  $T_{amb} = 85\text{ °C}$
- (3)  $T_{amb} = 25\text{ °C}$

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



- (1)  $T_{amb} = 125\text{ °C}$
- (2)  $T_{amb} = 85\text{ °C}$
- (3)  $T_{amb} = 25\text{ °C}$

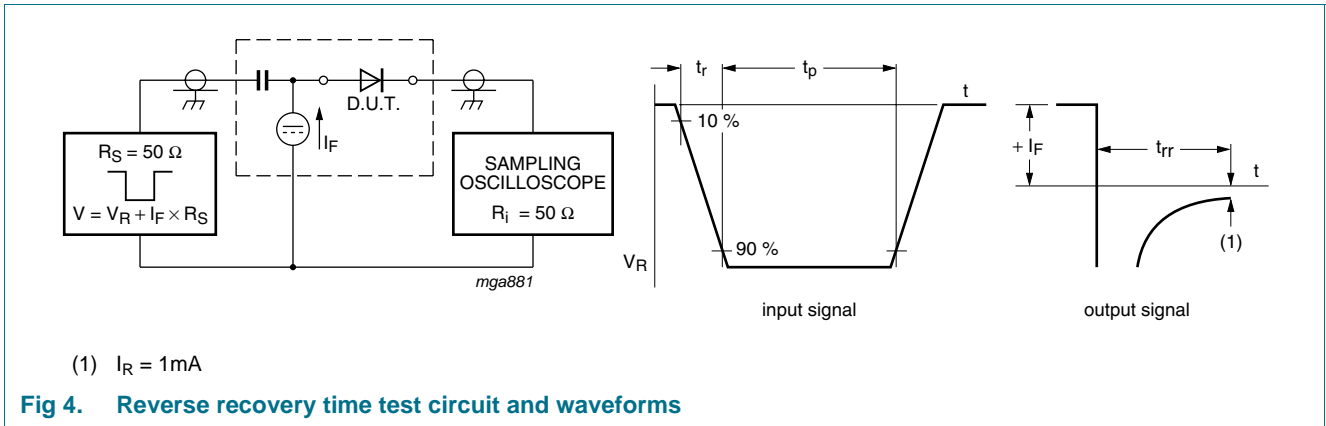
**Fig 2. Reverse current as a function of reverse voltage; typical values**



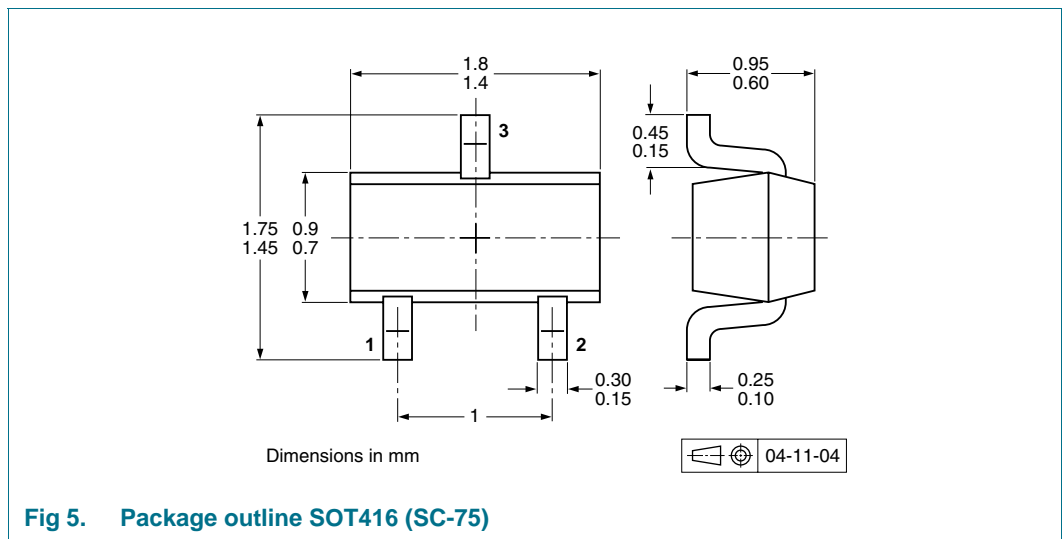
$f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$

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

### 8. Test information



### 9. Package outline



## 10. Packing information

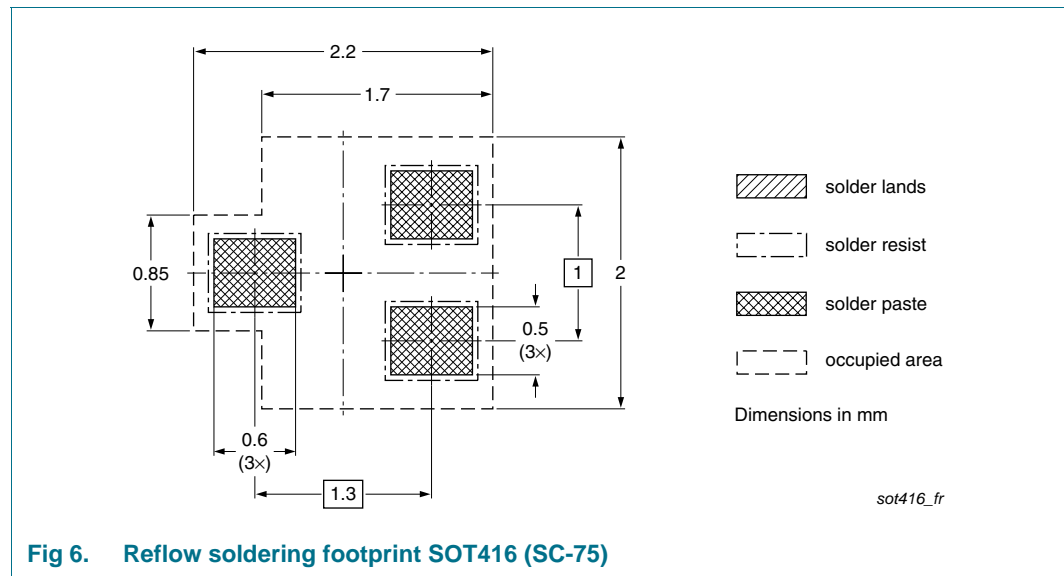
**Table 8. Packing methods**

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

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



## 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 <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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.
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[2] The term 'short data sheet' is explained in section "Definitions".

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Date of release: 14 December 2009

Document identifier: BAT54T\_1