BAT74S

Dual Schottky barrier diode

22 November 2012 Product data sheet

1. Product profile

1.1 General description

Planar Schottky barrier dual diode with an integrated guard ring for stress protection. Two electrically isolated Schottky barrier diodes encapsulated in a very small SOT363 (SC-88) Surface-Mounted Device (SMD) plastic package.

1.2 Features and benefits

- Low forward voltage
- Low capacitance
- AEC-Q101 qualified

1.3 Applications

- Ultra high-speed switching
- Line termination
- Voltage clamping
- Reverse polarity protection

1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
I_F	forward current			-	-	200	mA
V_R	reverse voltage			-	-	30	V
Per diode							
V_F	forward voltage	I_F = 100 mA; pulsed; t_p = 300 µs; δ = 0.02 ; T_{amb} = 25 °C		-	-	800	mV
I_R	reverse current	V_R = 25 V; pulsed; t_p = 300 µs; δ = 0.02 ; T_{amb} = 25 °C		-	-	2	µA

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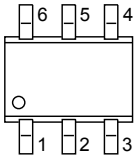
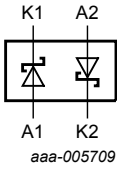
2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 TSSOP6 (SOT363)	
2	n.c.	not connected		
3	K2	cathode (diode 2)		
4	A2	anode (diode 2)		
5	n.c.	not connected		
6	K1	cathode (diode 1)		

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAT74S	TSSOP6	plastic surface-mounted package; 6 leads	SOT363

4. Marking

Table 4. Marking codes

Type number	Marking code [1]
BAT74S	74%

[1] % = placeholder for manufacturing site code

5. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode						
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	$t_p < 10$ ms; $T_{j(init)} = 25$ °C		-	600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C		-	240	mW
T_j	junction temperature			-	125	°C

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Symbol	Parameter	Conditions		Min	Max	Unit
T_{amb}	ambient temperature			-55	125	°C
T_{stg}	storage temperature			-65	150	°C
Per device						
V_R	reverse voltage	series connection		-	60	V
				-	30	V
I_F	forward current		[1]	-	110	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$		-	200	mA

[1] If both diodes are in forward operation at the same moment, total device current is maximum 110 mA. If one diode is in reverse and the other in forward operation at the same moment, total device current is maximum 200 mA.

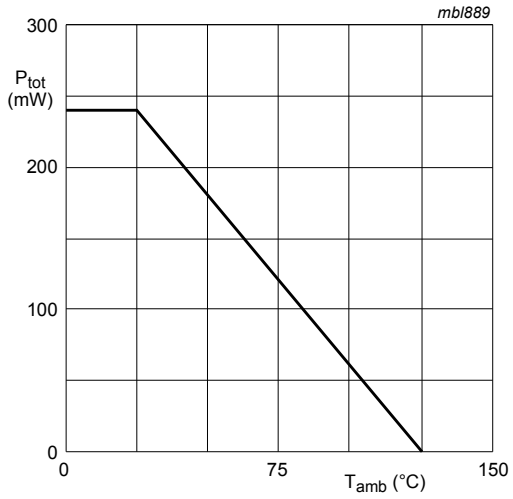

Fig. 1. Power derating curve

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	416	K/W

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

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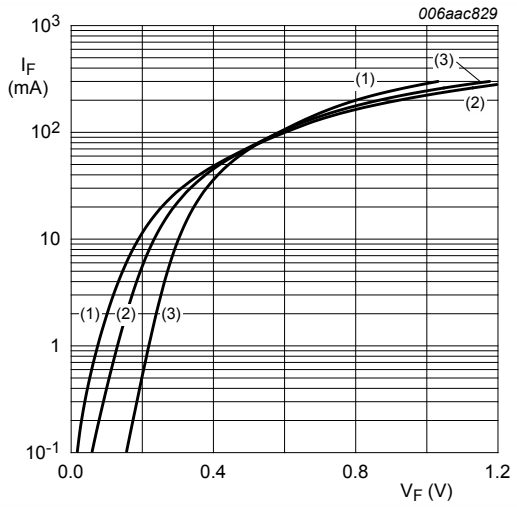
7. Characteristics

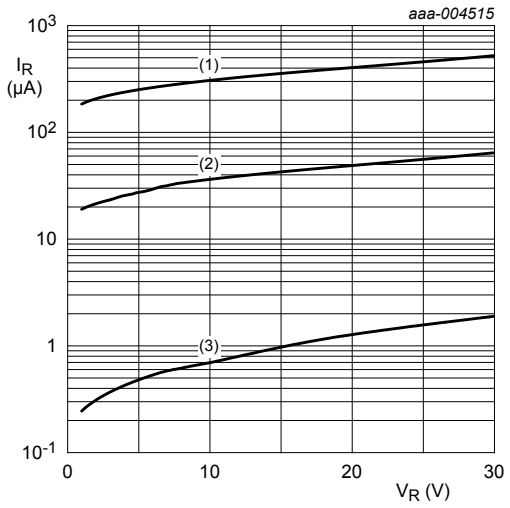
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	I_F = 0.1 mA; pulsed; t_p = 300 µs; δ = 0.02 ; T_{amb} = 25 °C		-	-	240	mV
		I_F = 1 mA; pulsed; t_p = 300 µs; δ = 0.02 ; T_{amb} = 25 °C		-	-	320	mV
		I_F = 10 mA; pulsed; t_p = 300 µs; δ = 0.02 ; T_{amb} = 25 °C		-	-	400	mV
		I_F = 30 mA; pulsed; t_p = 300 µs; δ = 0.02 ; T_{amb} = 25 °C		-	-	500	mV
		I_F = 100 mA; pulsed; t_p = 300 µs; δ = 0.02 ; T_{amb} = 25 °C		-	-	800	mV
I_R	reverse current	V_R = 25 V; pulsed; t_p = 300 µs; δ = 0.02 ; T_{amb} = 25 °C		-	-	2	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; T_{amb} = 25 °C		-	-	10	pF
t_{rr}	reverse recovery time	I_F = 10 mA; I_R = 10 mA; R_L = 100 Ω; $I_{R(meas)}$ = 1 mA; T_{amb} = 25 °C		-	-	5	ns



(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C

Fig. 2. 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. 3. Reverse current as a function of reverse voltage; typical values

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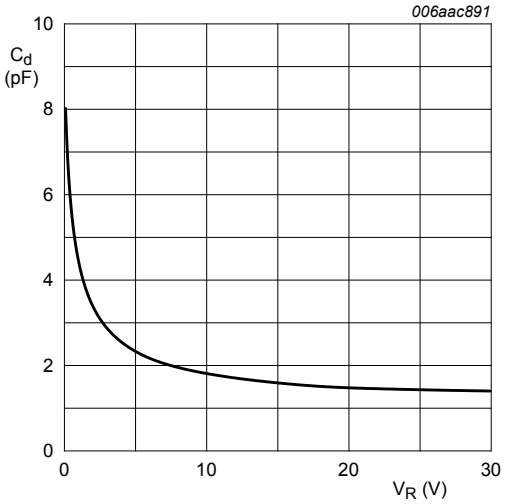
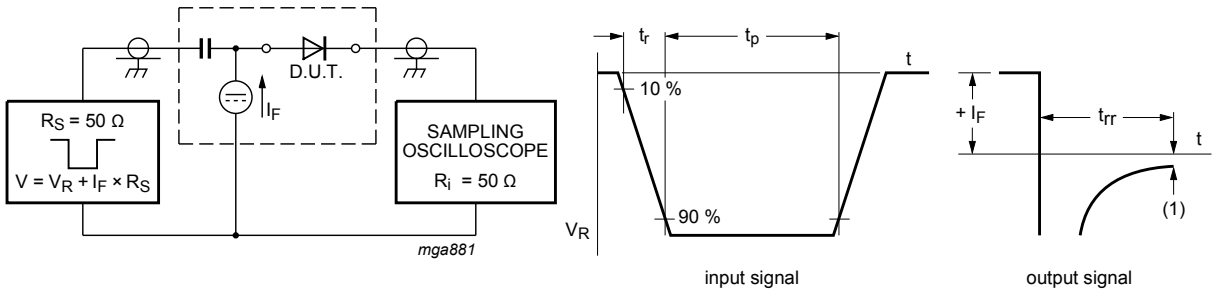


T_{amb} = 25 °C; f = 1 MHz

Fig. 4. Diode capacitance as a function of reverse voltage; typical values

8. Test information



(1) I_R = 1 mA

Fig. 5. Reverse recovery time test circuit and waveforms

8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

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9. Package outline

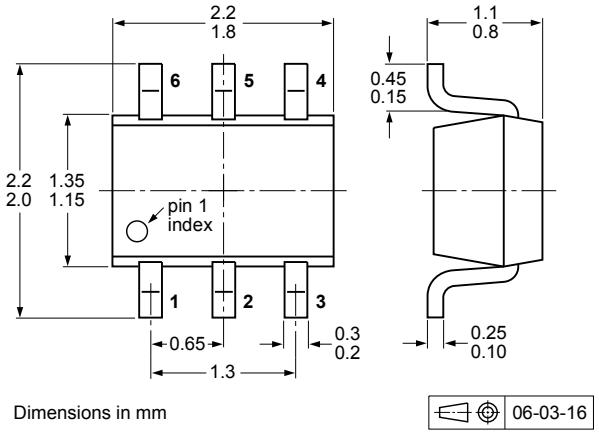

Fig. 6. Package outline TSSOP6 (SOT363)

10. Soldering

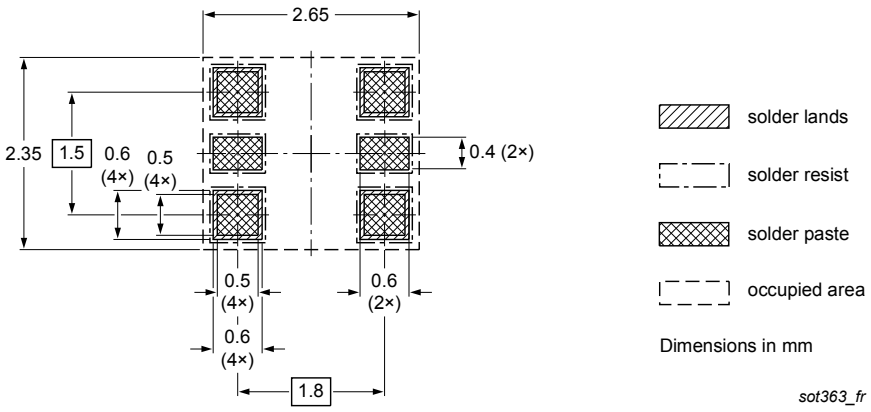

Fig. 7. Reflow soldering footprint for TSSOP6 (SOT363)

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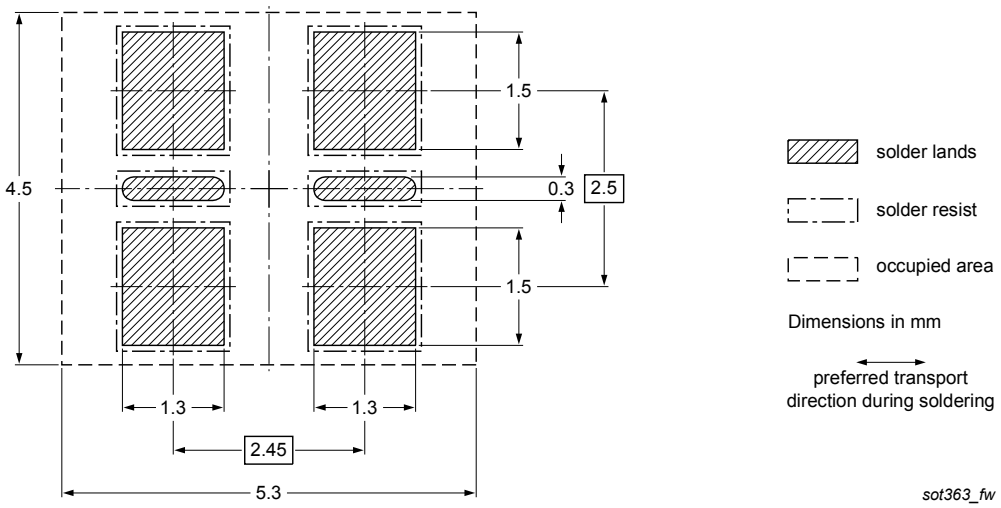

Fig. 8. Wave soldering footprint for TSSOP6 (SOT363)

11. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAT74S v.5	20121122	Product data sheet	-	BAT74S v.4
Modifications:	• The format of this document has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Section 1 Product profile: updated • Section 4 Marking: updated • Table 5 Limiting values: changed Tamb minimum value to -55 °C according to AEC-Q101 • Figure 2 and 3: updated • Section 8 Test information: added • Figure 6: superseded by minimized package outline drawing • Section 10 Soldering: added • Section 11 Legal information: updated			
BAT74S v.4	20030411	Product specification	-	BAT74S v.3
BAT74S v.3	19980710	Product specification	-	BAT74S v.2
BAT74S v.2	19980206	Product specification	-	BAT74S v.1
BAT74S v.1	19971107	Product specification	-	-

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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.nexperia.com.

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