



# BAT854SW

40 V, 200 mA Schottky barrier dual diode

4 January 2023

Product data sheet

## 1. General description

Planar Schottky barrier dual diode with an integrated guard ring for stress protection, encapsulated in a very small SOT323 (SC-70) Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Very low forward voltage
- Very low reverse current
- Guard ring protected
- Very small SMD plastic package
- AEC-Q101 qualified

## 3. Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes
- Low power consumption applications (e.g. hand-held applications)

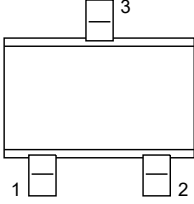
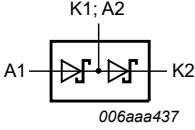
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_R$	reverse voltage		-	-	40	V
$I_F$	forward current		-	-	200	mA
$V_F$	forward voltage	$I_F = 100 \text{ mA}$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	550	mV
$I_R$	reverse current	$V_R = 25 \text{ V}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	0.5	$\mu\text{A}$

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 SC-70 (SOT323)	
2	K2	cathode (diode 2)		
3	K1, A2	cathode (diode 1), anode (diode 2)		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">BAT854SW</a>	SC-70	plastic, surface-mounted package; 3 leads; 1.3 mm pitch; 2 mm x 1.25 mm x 0.95 mm body	<a href="#">SOT323</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAT854SW	84%

[1] % = placeholder for manufacturing site code

## 8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
<b>Per diode</b>					
$V_R$	reverse voltage		-	40	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	$t_p = 8.3$ ms; half sinewave; JEDEC method; $T_{j(\text{init})} = 25$ °C	-	1	A
$T_j$	junction temperature		-	150	°C
$T_{\text{amb}}$	ambient temperature		-65	150	°C
$T_{\text{stg}}$	storage temperature		-65	150	°C

## 9. Thermal characteristics

Table 6. Thermal characteristics

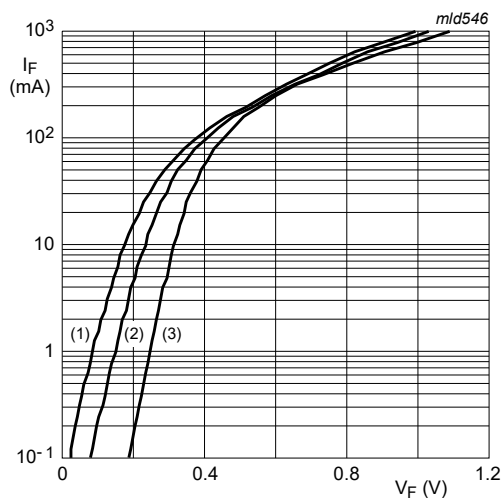
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	[1]	-	-	625	K/W

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

## 10. Characteristics

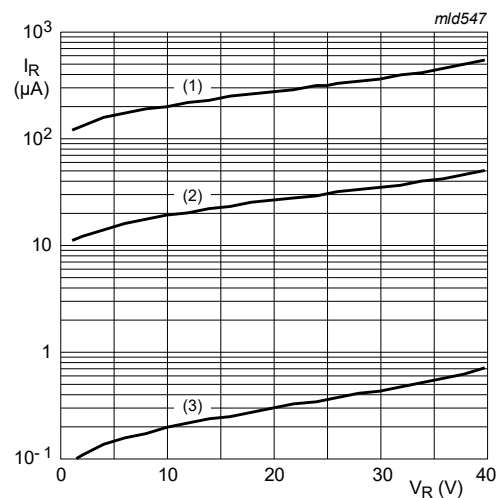
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	forward voltage	$I_F = 0.1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	200	-	mV
		$I_F = 1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	260	-	mV
		$I_F = 10 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	340	-	mV
		$I_F = 30 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	420	mV
		$I_F = 100 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	550	mV
$I_R$	reverse current	$V_R = 25 \text{ V}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	0.5	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1 \text{ V}; f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	20	pF



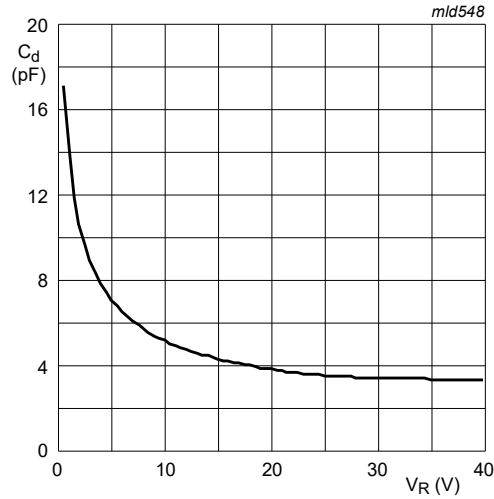
- (1)  $T_{amb} = 125 \text{ }^\circ\text{C}$
- (2)  $T_{amb} = 85 \text{ }^\circ\text{C}$
- (3)  $T_{amb} = 25 \text{ }^\circ\text{C}$

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



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

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



f = 1 MHz; T<sub>amb</sub> = 25 °C

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

## 11. Test information

### 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.

## 12. Package outline

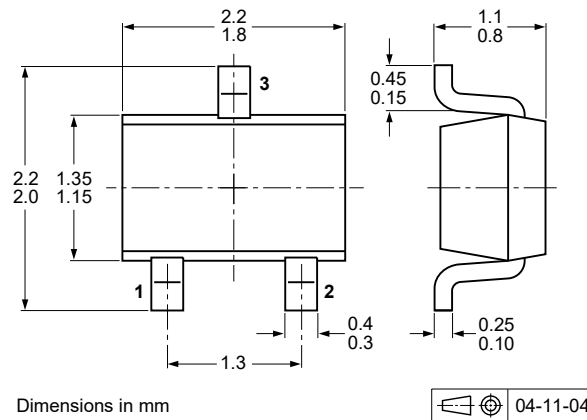


Fig. 4. Package outline SC-70 (SOT323)

### 13. Soldering

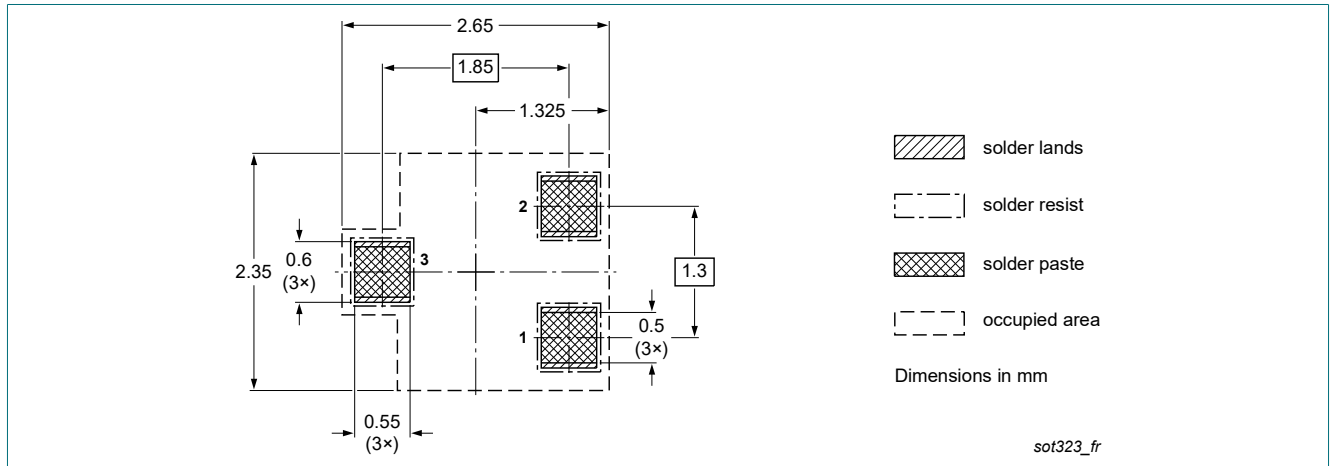


Fig. 5. Reflow soldering footprint for SC-70 (SOT323)

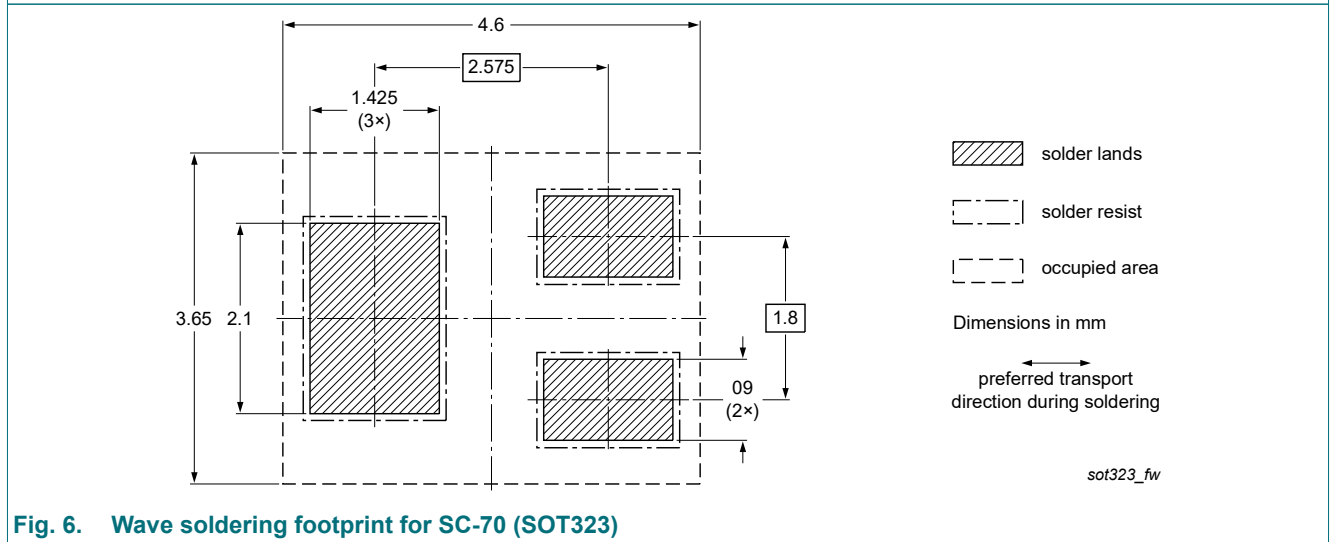


Fig. 6. Wave soldering footprint for SC-70 (SOT323)

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAT854SW v.2	20230104	Product data sheet	-	BAT854W_SERIES v.1
Modifications:	<ul style="list-style-type: none"><li>• Family data sheet splitted to single type data sheets.</li><li>• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li></ul>			
BAT854W_SERIES v.1	20010227	Product data sheet	-	-

## 15. Legal information

### 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".
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