



# BAT854W

40 V, 200 mA Schottky barrier diode

1 July 2023

Product data sheet

## 1. General description

Planar Schottky barrier 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

## 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
Per diode						
$V_R$	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	$V_R = 25 \text{ V}$ ; $t_p = 300 \text{ } \mu\text{s}$ ; $\delta = 0.02$ ; 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	A	anode	 SC-70 (SOT323)	 aaa-005805
2	n.c.	not connected		
3	K	cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAT854W	SC-70	plastic, surface-mounted package; 3 leads; 1.3 mm pitch; 2 mm x 1.25 mm x 0.95 mm body	SOT323

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAT854W	81%

[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
Per diode						
V <sub>R</sub>	reverse voltage			-	40	V
I <sub>F</sub>	forward current			-	200	mA
I <sub>FRM</sub>	repetitive peak forward current	t <sub>p</sub> ≤ 1 s; δ ≤ 0.5		-	300	mA
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 8.3 ms; half sinewave; JEDEC method; T <sub>j(init)</sub> = 25 °C		-	1	A
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-65	150	°C
T <sub>stg</sub>	storage temperature			-65	150	°C

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
R <sub>th(j-a)</sub>	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
Per diode						
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 0.1 mA; T <sub>amb</sub> = 25 °C	-	200	-	mV
		I <sub>F</sub> = 1 mA; T <sub>amb</sub> = 25 °C	-	260	-	mV
		I <sub>F</sub> = 10 mA; T <sub>amb</sub> = 25 °C	-	340	-	mV
		I <sub>F</sub> = 30 mA; T <sub>amb</sub> = 25 °C	-	-	420	mV
		I <sub>F</sub> = 100 mA; T <sub>amb</sub> = 25 °C	-	-	550	mV
I <sub>R</sub>	reverse current	V <sub>R</sub> = 25 V; t <sub>p</sub> = 300 µs; δ = 0.02; pulsed; T <sub>amb</sub> = 25 °C	-	-	0.5	µA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 1 V; f = 1 MHz; T <sub>amb</sub> = 25 °C	-	-	20	pF

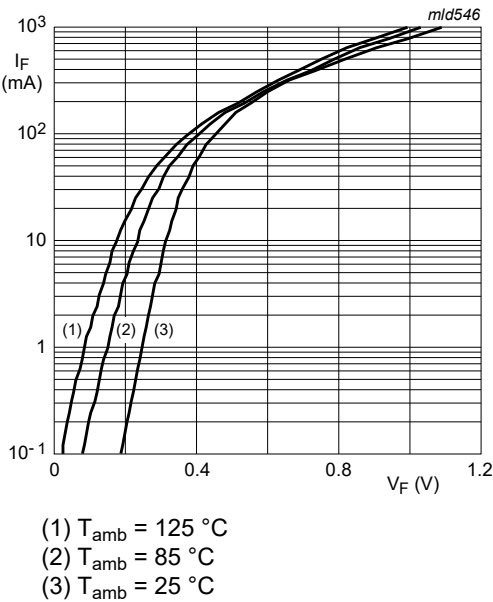


Fig. 1. Forward current as a function of forward voltage; typical values

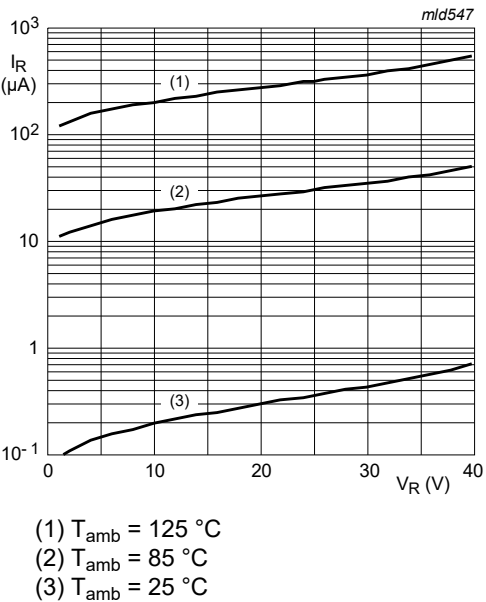
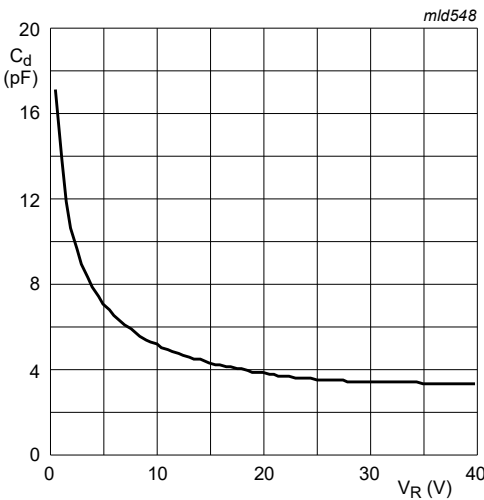


Fig. 2. Reverse current as a function of reverse voltage; typical values



f = 1 MHz; T<sub>amb</sub> = 25 °C

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

11. Package outline

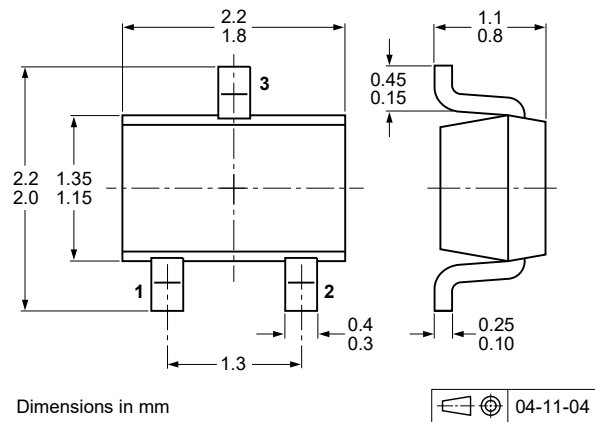


Fig. 4. Package outline SC-70 (SOT323)

12. Soldering

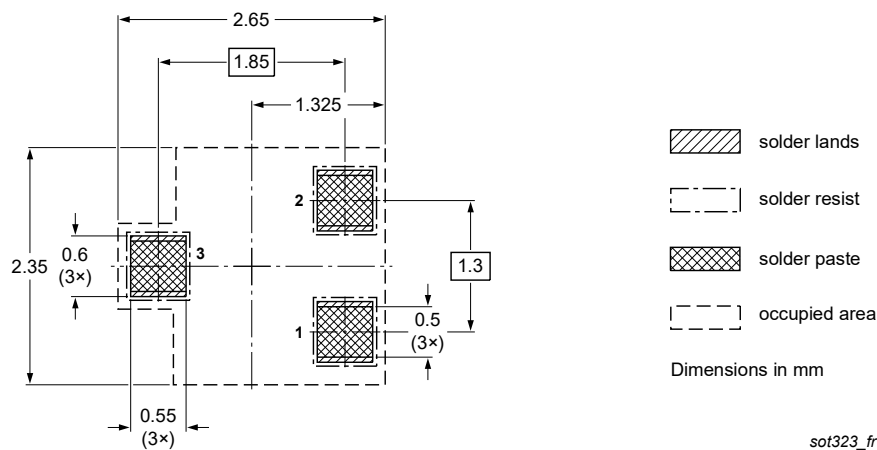


Fig. 5. Reflow soldering footprint for SC-70 (SOT323)

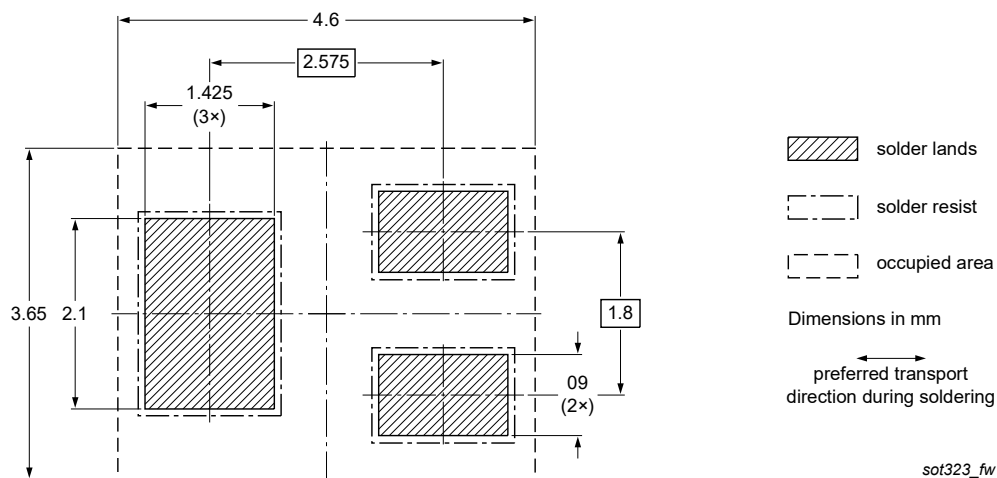


Fig. 6. Wave soldering footprint for SC-70 (SOT323)

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAT854W v.3	20230701	Product data sheet	-	BAT854W v.2
Modifications:	<ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to <a href="https://www.nexperia.com">nexperia.com</a> for automotive (-Q) product alternative(s).</li></ul>			
BAT854W v.2	20230104	Product data sheet	-	BAT854W_SERIES v.1
BAT854W_SERIES v.1	20010227	Product data sheet	-	-

## 14. 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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