BAT54XY

Schottky barrier quadruple diode

12 February 2019 Product data sheet

1. General description

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

2. Features and benefits

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

3. Applications

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

4. Quick reference data

Table 1. Quick reference data

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

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

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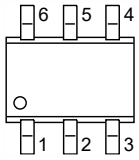
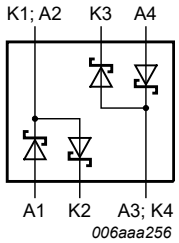
5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 TSSOP6 (SOT363)	
2	K2	cathode 2		
3	A3 / K4	anode3 / cathode4		
4	A4	anode4		
5	K3	cathode3		
6	K1 / A2	cathode1 / anode2		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAT54XY	TSSOP6	plastic, surface-mounted package; 6 leads; 0.65 mm pitch; 2.1 mm x 1.25 mm x 0.95 mm body	SOT363

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAT54XY	%C5

[1] % = placeholder for manufacturing site code

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC60134).

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	[1]	-	220	mW
T_j	junction temperature			-	125	°C
T_{amb}	ambient temperature			-55	125	°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.

9. 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]	-	-	460	K/W

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

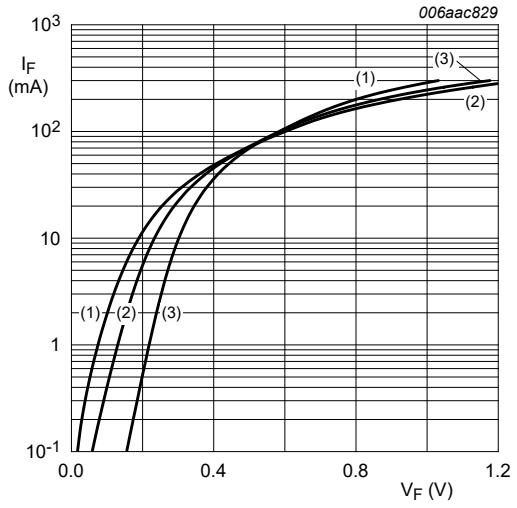
10. Characteristics

Table 7. Characteristics

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

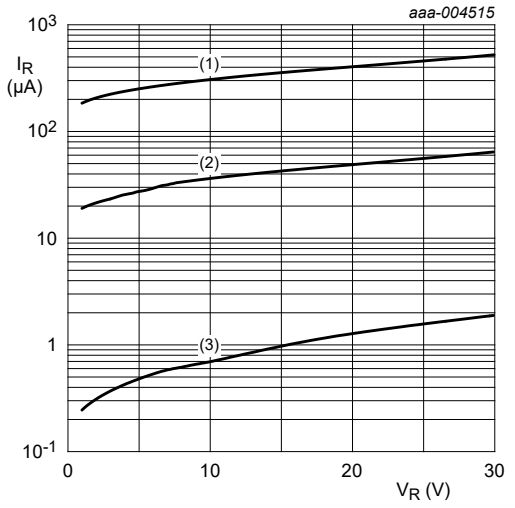
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	I_F = 0.1 mA	[1]	-	-	240	mV
		I_F = 1 mA		-	-	320	mV
		I_F = 10 mA	[1]	-	-	400	mV
		I_F = 30 mA	[1]	-	-	500	mV
		I_F = 100 mA	[1]	-	-	800	mV
I_R	reverse current	V_R = 25 V	[1]	-	-	2	µA
C_d	diode capacitance	V_R = 1 V;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

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



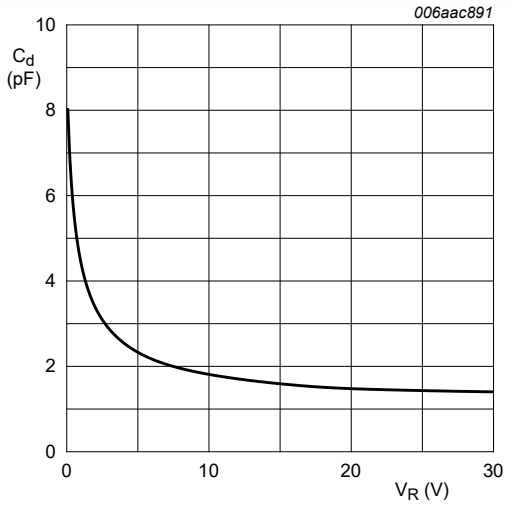
(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C

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



T_{amb} = 25 °C; f = 1 MHz

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

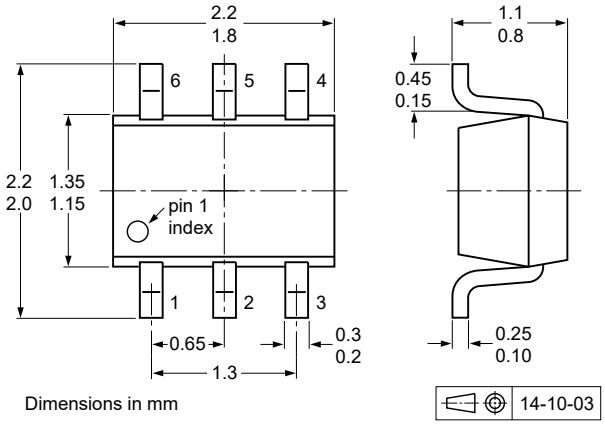


Fig. 4. Package outline TSSOP6 (SOT363)

13. Soldering

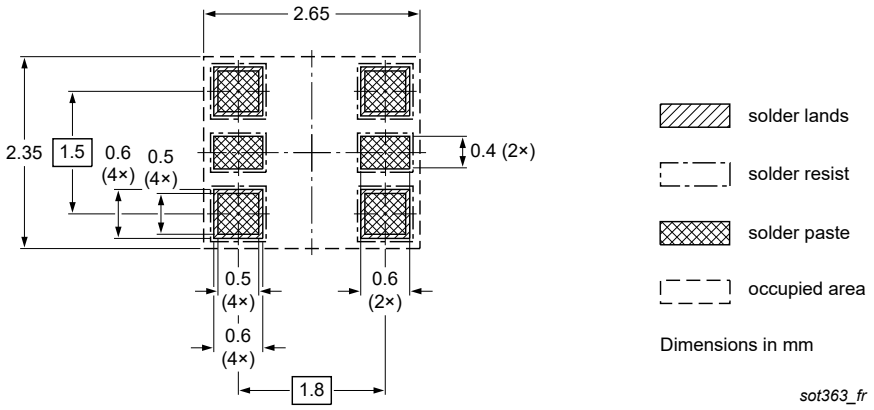


Fig. 5. Reflow soldering footprint for TSSOP6 (SOT363)

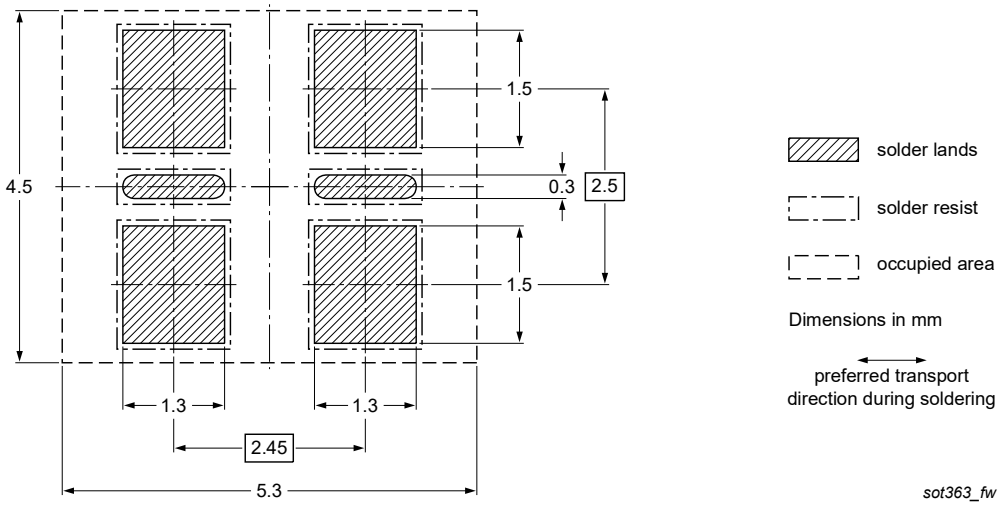


Fig. 6. Wave soldering footprint for TSSOP6 (SOT363)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAT54XY v.4	20190212	Product data sheet	-	BAT54XY v.3
Modifications:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Thermal Characteristics: $R_{th(j-sp)}$ removed and $R_{th(j-a)}$ inserted • Limiting values: P_{tot} inserted • Packing information: section removed			
BAT54XY v.3	20121008	Product data sheet	-	BAT54XY v.2
BAT54XY v.2	20100113	Product data sheet	-	BAT54XY v.1
BAT54XY v.1	20050117	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".
[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 https://www.nexperia.com.

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