



# BAT54CY-Q

## Two Schottky barrier dual diodes

20 April 2023

Product data sheet

### 1. General description

Two planar Schottky barrier dual diodes with common cathodes and an integrated guard ring for stress protection encapsulated in a SOT363 ultra small and flat lead Surface-Mounted Device (SMD) plastic package.

### 2. Features and benefits

- Low forward voltage
- Low capacitance
- Ultra small and flat lead SMD plastic package
- Excellent coplanarity and improved thermal behavior
- Qualified according to AEC-Q101 and recommended for use in automotive applications

### 3. Applications

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

### 4. Quick reference data

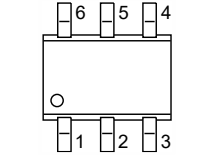
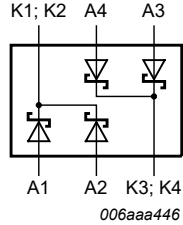
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$I_F$	forward current		[1]	-	200	mA
$V_R$	reverse voltage		-	-	30	V
$V_F$	forward voltage	$I_F = 0.1 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	240	mV
		$I_F = 1 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	320	mV
		$I_F = 10 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	400	mV
		$I_F = 30 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	500	mV
		$I_F = 100 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	800	mV

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

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 <p>TSSOP6 (SOT363)</p>	 <p>006aaa446</p>
2	A2	anode (diode 2)		
3	K3: K4	common cathode (diode 3 and diode 4)		
4	A3	anode (diode 3)		
5	A4	anode (diode 4)		
6	K1: K2	common cathode (diode 1 and diode 2)		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">BAT54CY-Q</a>	TSSOP6	plastic, surface-mounted package; 6 leads; 0.65 mm pitch; 2.1 mm x 1.25 mm x 0.95 mm body	<a href="#">SOT363</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAT54CY-Q	K8%

[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		-	30	V
$I_F$	forward current		[1]	200	mA
$I_{FRM}$	repetitive peak forward current	$t_p \leq 10$ ms; $\delta \leq 0.5$	-	900	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 50$ $\mu$ s; square wave; $T_{j(\text{init})} = 25$ °C	-	11	A
		$t_p = 10$ ms; square wave; $T_{j(\text{init})} = 25$ °C	-	1.5	A
<b>Per device; one diode loaded</b>					
$T_j$	junction temperature		-	150	°C
$T_{\text{amb}}$	ambient temperature		-55	150	°C
$T_{\text{stg}}$	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

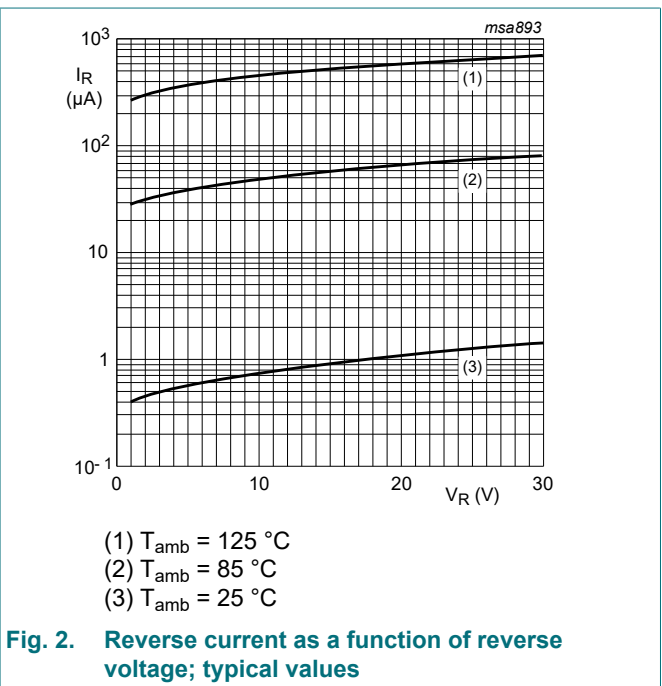
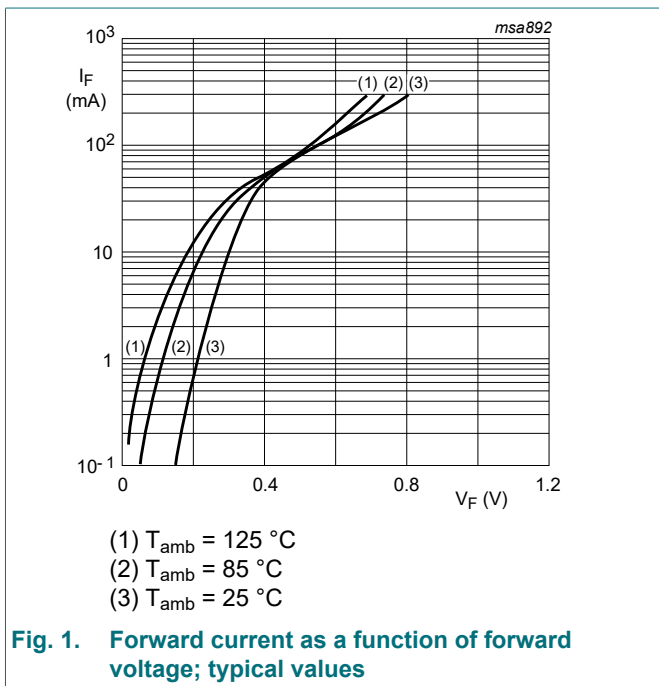
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	450	K/W
			[2]	-	-	400	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	140	K/W

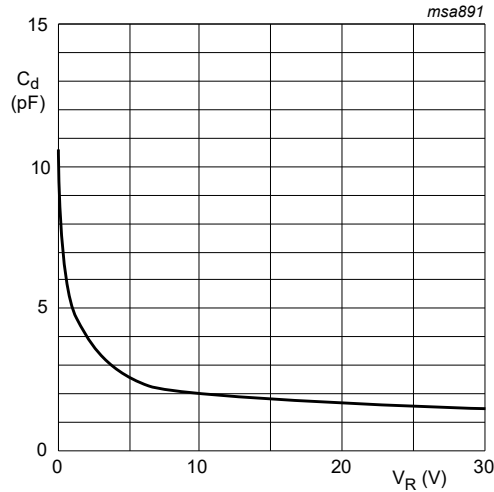
- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.
- [3] Soldering points at pins 4, 5 and 6.

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Per diode</b>							
$V_F$	forward voltage	$I_F = 0.1 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	240	mV
		$I_F = 1 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	320	mV
		$I_F = 10 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	400	mV
		$I_F = 30 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	500	mV
		$I_F = 100 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	800	mV
$I_R$	reverse current	$V_R = 25 \text{ V}$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	2	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1 \text{ V}$ ; $f = 1 \text{ MHz}$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	10	pF





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

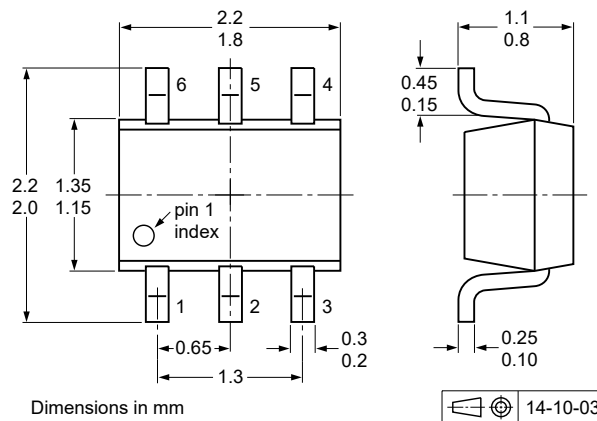


Fig. 4. Package outline TSSOP6 (SOT363)

### 13. Soldering

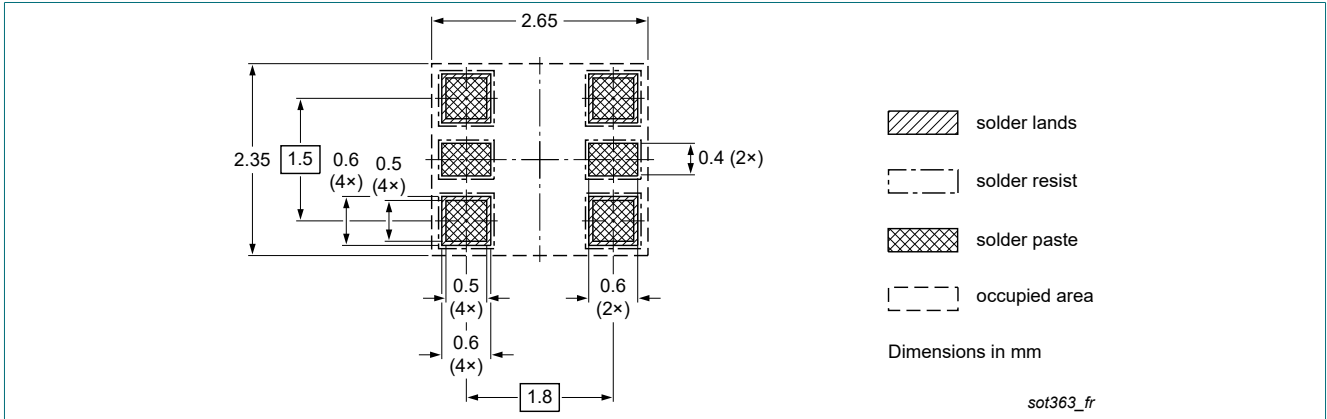


Fig. 5. Reflow soldering footprint for TSSOP6 (SOT363)

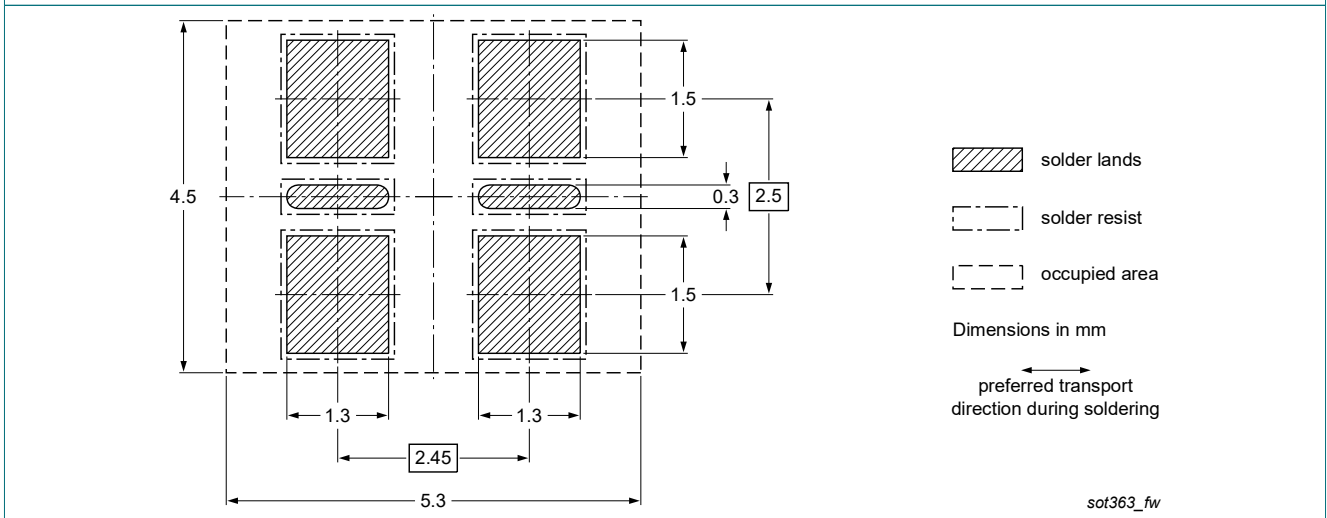


Fig. 6. Wave soldering footprint for TSSOP6 (SOT363)

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAT54CY-Q v.1	20230420	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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