



# BAS16DY-Q

High-speed dual switching diode

20 April 2023

Product data sheet

## 1. General description

High-speed switching, electrically isolated dual diode, encapsulated in an ultra small SOT363 Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- High switching speed:  $t_{rr} \leq 4$  ns
- Low capacitance
- Low leakage current
- Reverse voltage:  $V_R \leq 100$  V
- Repetitive peak reverse voltage:  $V_{RRM} \leq 100$  V
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- High-speed switching
- General-purpose switching

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_R$	reverse voltage		-	-	100	V
$I_R$	reverse current	$V_R = 80$ V; $T_{amb} = 25$ °C	-	-	0.5	$\mu$ A
$t_{rr}$	reverse recovery time	$I_F = 10$ mA; $I_R = 10$ mA; $R_L = 100$ $\Omega$ ; $I_{R(meas)} = 1$ mA; $T_{amb} = 25$ °C	-	-	4	ns

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	<p>TSSOP6 (SOT363)</p>	<p>aaa-033905</p>
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)		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">BAS16DY-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]
BAS16DY-Q	M3%

[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>						
$V_{RRM}$	repetitive peak reverse voltage			-	100	V
$V_R$	reverse voltage			-	100	V
$I_F$	forward current		[1] [2]	-	110	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 50 \mu\text{s}$ ; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	10	A
		$t_p = 10 \text{ ms}$ ; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	1	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 0.5 \text{ ms}$ ; $\delta \leq 0.25$		-	700	mA
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} \leq 25 \text{ }^\circ\text{C}$	[1] [2]	-	260	mW
			[2] [3]	-	290	mW
<b>Per device</b>						
$T_j$	junction temperature			-	150	$^\circ\text{C}$
$T_{\text{amb}}$	ambient temperature			-55	150	$^\circ\text{C}$
$T_{\text{stg}}$	storage temperature			-65	150	$^\circ\text{C}$

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

[2] Single diode loaded.

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode  $1 \text{ cm}^2$ .

## 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]	-	-	480	K/W
			[2]	-	-	430	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	185	K/W

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

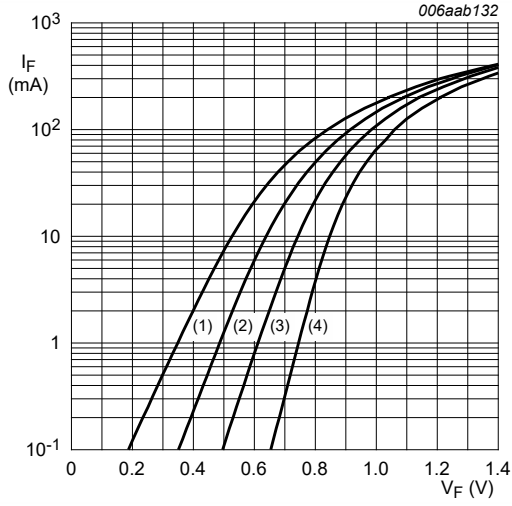
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1cm<sup>2</sup>.

[3] Soldering points at pins 3 and 6.

## 10. Characteristics

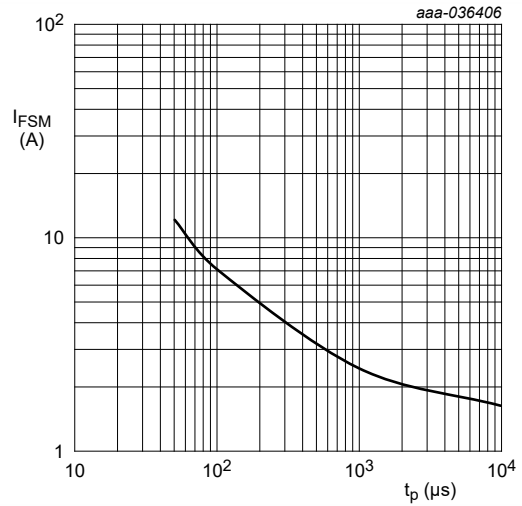
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Per diode</b>							
$V_F$	forward voltage	$I_F = 1 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	715	mV
		$I_F = 10 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	855	mV
		$I_F = 50 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	1	V
		$I_F = 150 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	1.25	V
$I_R$	reverse current	$V_R = 25 \text{ V}; T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	30	nA
		$V_R = 80 \text{ V}; T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	0.5	$\mu\text{A}$
		$V_R = 25 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$		-	-	30	$\mu\text{A}$
		$V_R = 80 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$		-	-	50	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 0 \text{ V}; f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	1.5	pF
$t_{rr}$	reverse recovery time	$I_F = 10 \text{ mA}; I_R = 10 \text{ mA}; R_L = 100 \Omega;$ $I_{R(meas)} = 1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	4	ns
$V_{FRM}$	peak forward recovery voltage	$I_F = 10 \text{ mA}; t_r = 20 \text{ ns}; T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	1.75	V



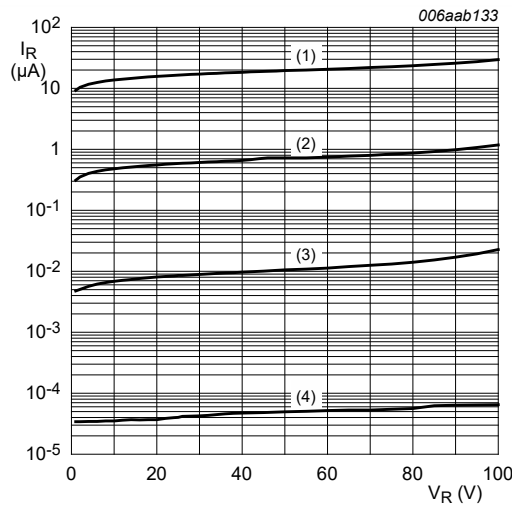
- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$
- (2)  $T_{amb} = 85\text{ }^\circ\text{C}$
- (3)  $T_{amb} = 25\text{ }^\circ\text{C}$
- (4)  $T_{amb} = -40\text{ }^\circ\text{C}$

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



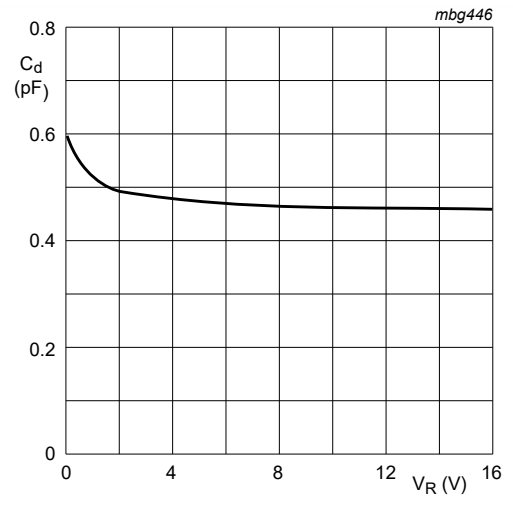
Based on square wave currents.  
 $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$

**Fig. 2. Non-repetitive peak forward current as a function of pulse duration; typical values**



- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$
- (2)  $T_{amb} = 85\text{ }^\circ\text{C}$
- (3)  $T_{amb} = 25\text{ }^\circ\text{C}$
- (4)  $T_{amb} = -40\text{ }^\circ\text{C}$

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



$f = 1\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$

**Fig. 4. 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

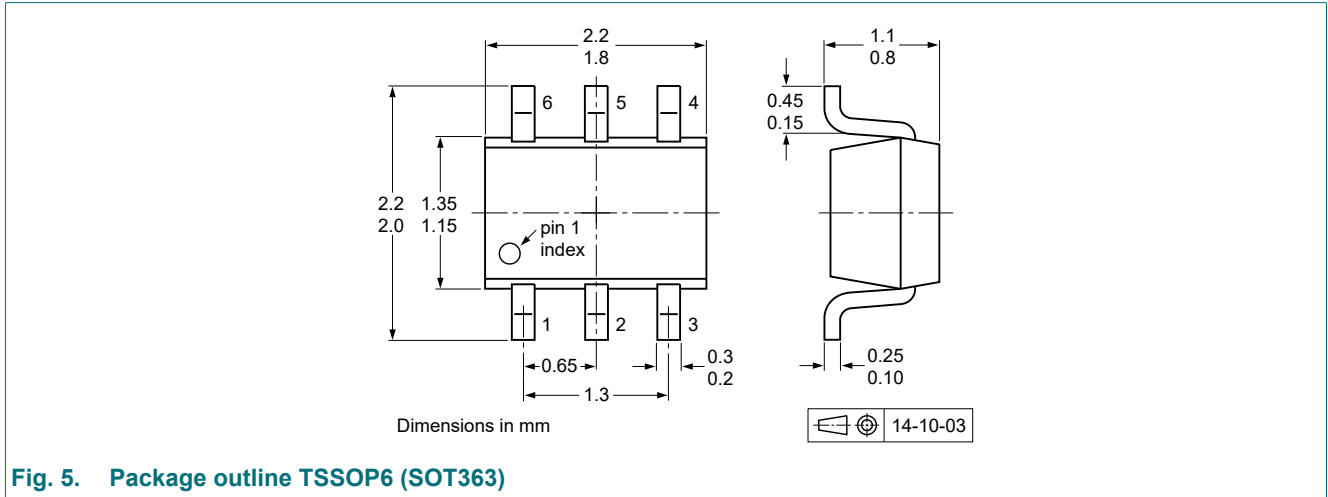


Fig. 5. Package outline TSSOP6 (SOT363)

## 13. Soldering

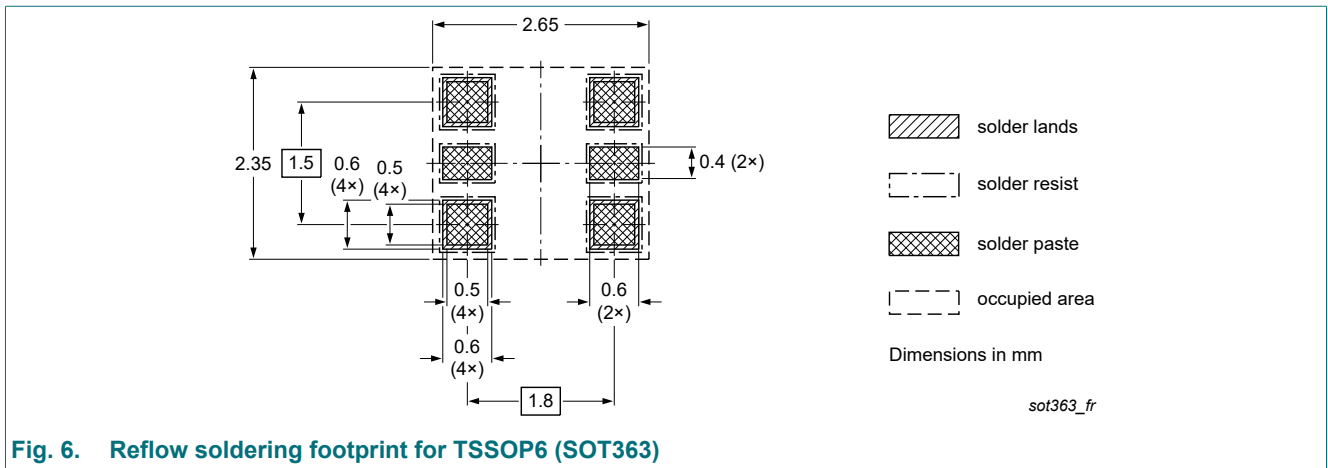
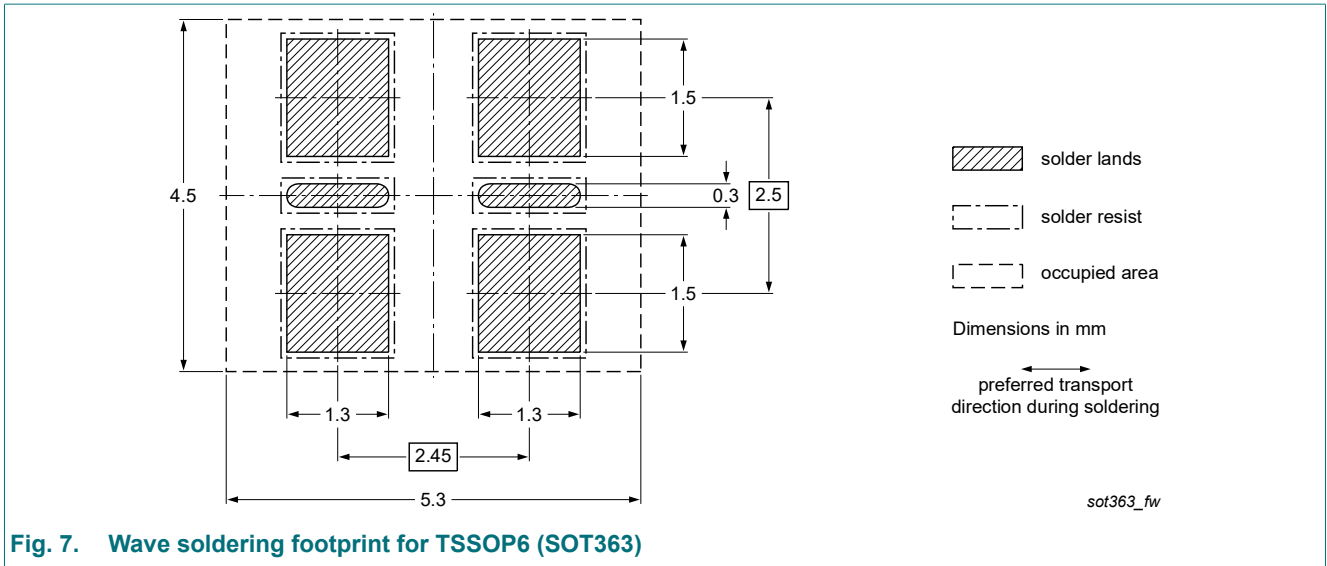


Fig. 6. Reflow soldering footprint for TSSOP6 (SOT363)



## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS16DY-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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