



# BAS116DY

## Low-leakage dual switching diode

19 April 2023

Product data sheet

### 1. General description

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

### 2. Features and benefits

- Low leakage current: maximum 5 nA
- Switching time: typical 0.8  $\mu$ s
- Continuous reverse voltage: maximum 75 V
- Repetitive peak reverse voltage: maximum 85 V
- Repetitive peak forward current: maximum 1 A

### 3. Applications

- Low-leakage current applications in surface mounted circuits

### 4. Quick reference data

Table 1. Quick reference data

| Symbol    | Parameter       | Conditions                                                       | Min | Typ | Max | Unit |
|-----------|-----------------|------------------------------------------------------------------|-----|-----|-----|------|
| Per diode |                 |                                                                  |     |     |     |      |
| $V_R$     | reverse voltage | $T_j = 25\text{ }^{\circ}\text{C}$                               | -   | -   | 75  | V    |
| $I_R$     | reverse current | $V_R = 75\text{ V}$ ; pulsed; $T_j = 25\text{ }^{\circ}\text{C}$ | -   | -   | 5   | nA   |

### 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="#">BAS116DY</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] |
|-------------|-----------------|
| BAS116DY    | 2H%             |

[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>RRM</sub> | repetitive peak reverse voltage     | T <sub>j</sub> = 25 °C                                            |                     | -   | 85  | V    |
| V <sub>R</sub>   | reverse voltage                     |                                                                   |                     | -   | 75  | V    |
| I <sub>F</sub>   | forward current                     | T <sub>amb</sub> = 25 °C                                          | <a href="#">[1]</a> | -   | 200 | mA   |
| I <sub>FSM</sub> | non-repetitive peak forward current | t <sub>p</sub> = 50 µs; square wave; T <sub>j(init)</sub> = 25 °C |                     | -   | 10  | A    |
|                  |                                     | t <sub>p</sub> = 10 ms; square wave; T <sub>j(init)</sub> = 25 °C |                     | -   | 1.5 | A    |
| I <sub>FRM</sub> | repetitive peak forward current     | t <sub>p</sub> ≤ 1 ms; δ ≤ 0.25; T <sub>j</sub> = 25 °C           |                     | -   | 1   | A    |
| P <sub>tot</sub> | total power dissipation             | T <sub>amb</sub> ≤ 25 °C                                          | <a href="#">[1]</a> | -   | 270 | mW   |
| Per device       |                                     |                                                                   |                     |     |     |      |
| T <sub>j</sub>   | junction temperature                |                                                                   |                     | -   | 150 | °C   |
| T <sub>amb</sub> | ambient temperature                 |                                                                   |                     | -55 | 150 | °C   |
| T <sub>stg</sub> | 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

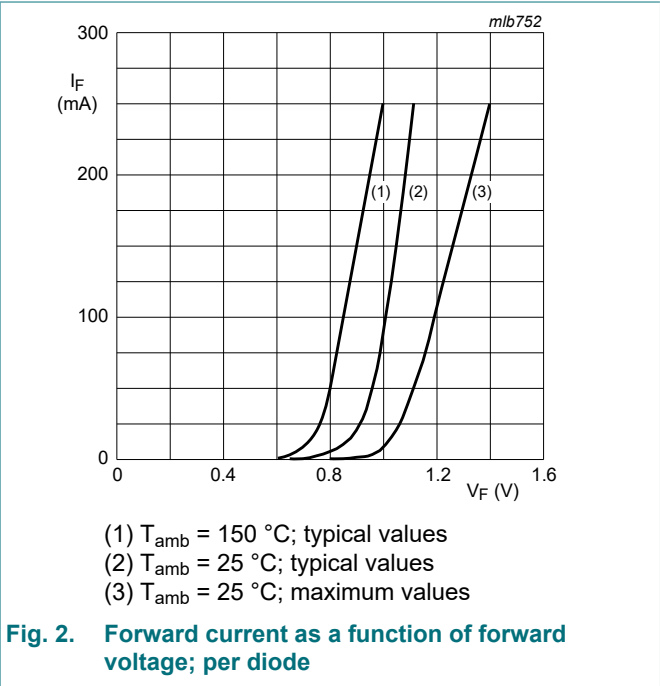
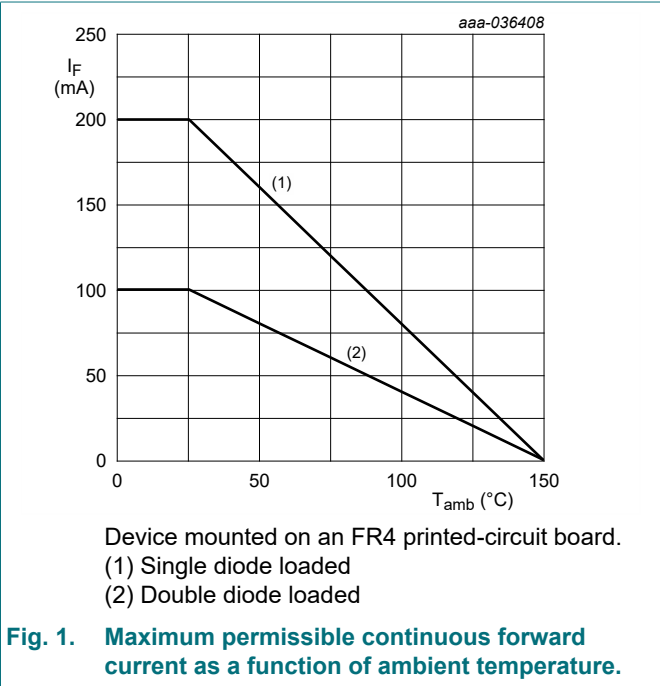
| Symbol        | Parameter                                   | Conditions  |     | Min | Typ | Max | Unit |
|---------------|---------------------------------------------|-------------|-----|-----|-----|-----|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | -   | -   | 475 | K/W  |

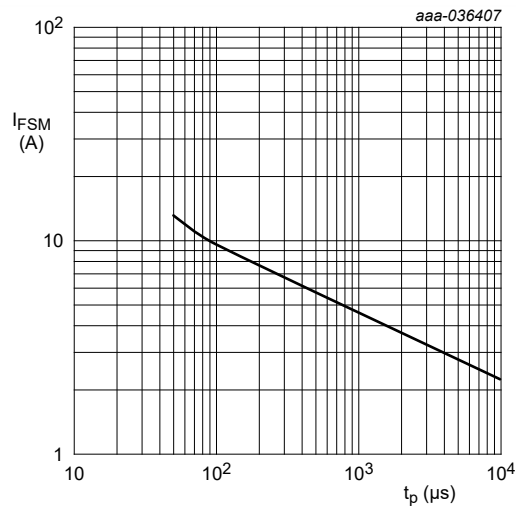
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

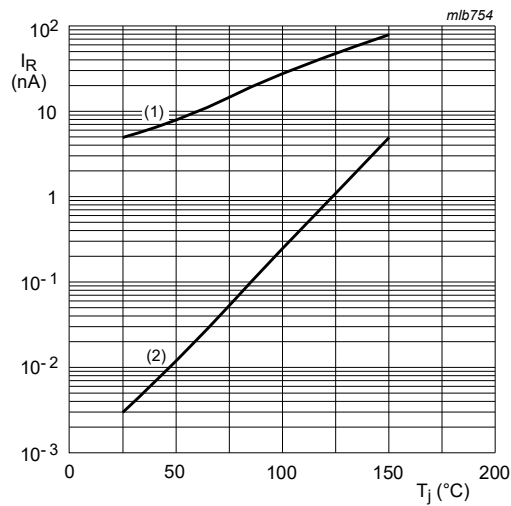
| Symbol    | Parameter             | Conditions                                                                                                                                 |  | Min | Typ | Max  | Unit          |
|-----------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-----|------|---------------|
| Per diode |                       |                                                                                                                                            |  |     |     |      |               |
| $V_F$     | forward voltage       | $I_F = 1\text{ mA}$ ; $T_j = 25\text{ }^{\circ}\text{C}$                                                                                   |  | -   | -   | 0.9  | V             |
|           |                       | $I_F = 10\text{ mA}$ ; $T_j = 25\text{ }^{\circ}\text{C}$                                                                                  |  | -   | -   | 1    | V             |
|           |                       | $I_F = 50\text{ mA}$ ; $T_j = 25\text{ }^{\circ}\text{C}$                                                                                  |  | -   | -   | 1.1  | V             |
|           |                       | $I_F = 150\text{ mA}$ ; $T_j = 25\text{ }^{\circ}\text{C}$                                                                                 |  | -   | -   | 1.25 | V             |
| $I_R$     | reverse current       | $V_R = 75\text{ V}$ ; pulsed; $T_j = 25\text{ }^{\circ}\text{C}$                                                                           |  | -   | -   | 5    | nA            |
|           |                       | $V_R = 75\text{ V}$ ; pulsed; $T_j = 150\text{ }^{\circ}\text{C}$                                                                          |  | -   | 3   | 80   | nA            |
| $C_d$     | diode capacitance     | $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$ ; $T_j = 25\text{ }^{\circ}\text{C}$                                                               |  | -   | 2   | -    | pF            |
| $t_{rr}$  | reverse recovery time | $I_F = 10\text{ mA}$ ; $I_R = 10\text{ mA}$ ; $R_L = 100\text{ }\Omega$ ; $I_{R(meas)} = 1\text{ mA}$ ; $T_j = 25\text{ }^{\circ}\text{C}$ |  | -   | 0.8 | 3    | $\mu\text{s}$ |





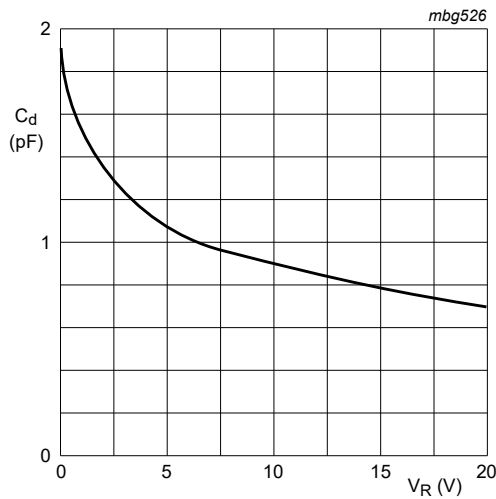
Based on square wave currents.  
 $T_{j(init)} = 25\text{ }^{\circ}\text{C}$

Fig. 3. Non-repetitive peak forward current as a function of pulse duration; typical values



$V_R = 75\text{ V}$   
(1) Maximum values  
(2) Typical values

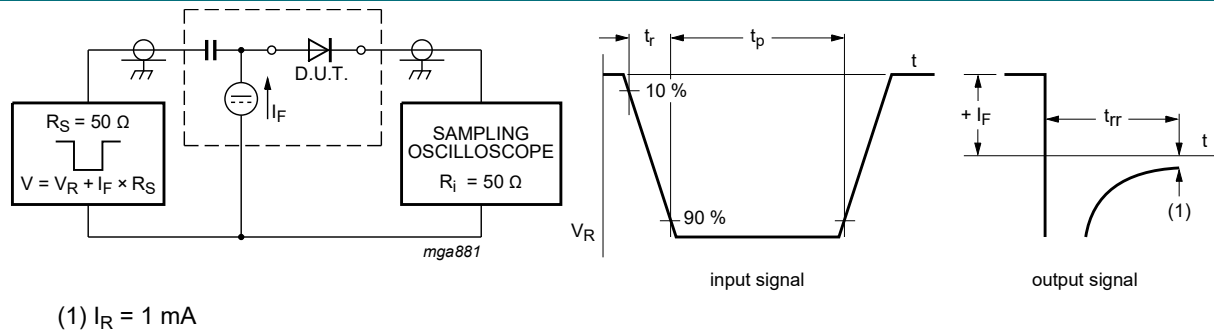
Fig. 4. Reverse current as a function of junction temperature



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

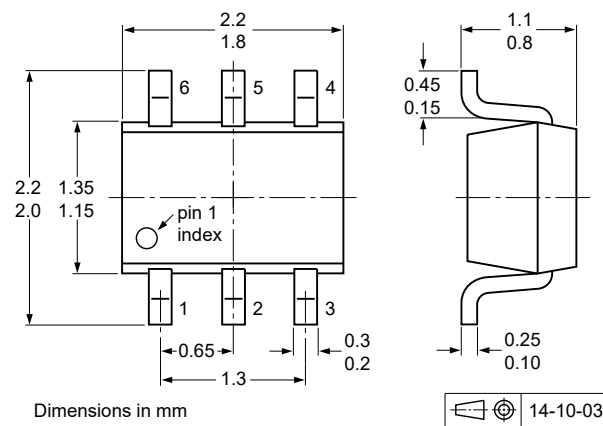
Fig. 5. Diode capacitance as a function of reverse voltage; typical values

## 11. Test information



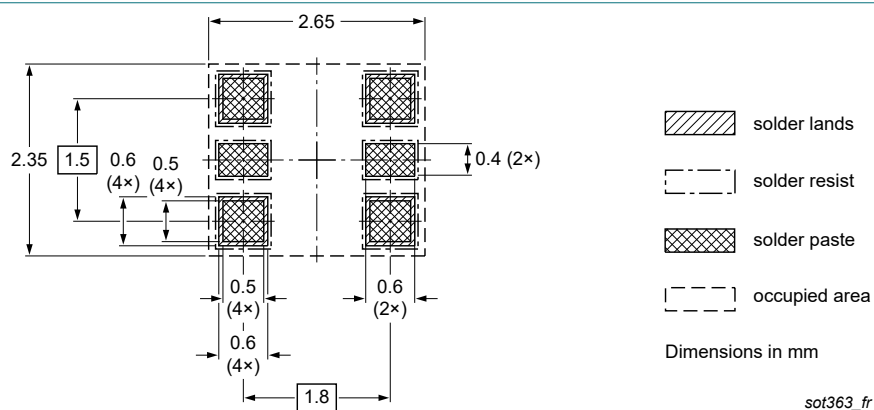
**Fig. 6. Reverse recovery time test circuit and waveforms**

## 12. Package outline

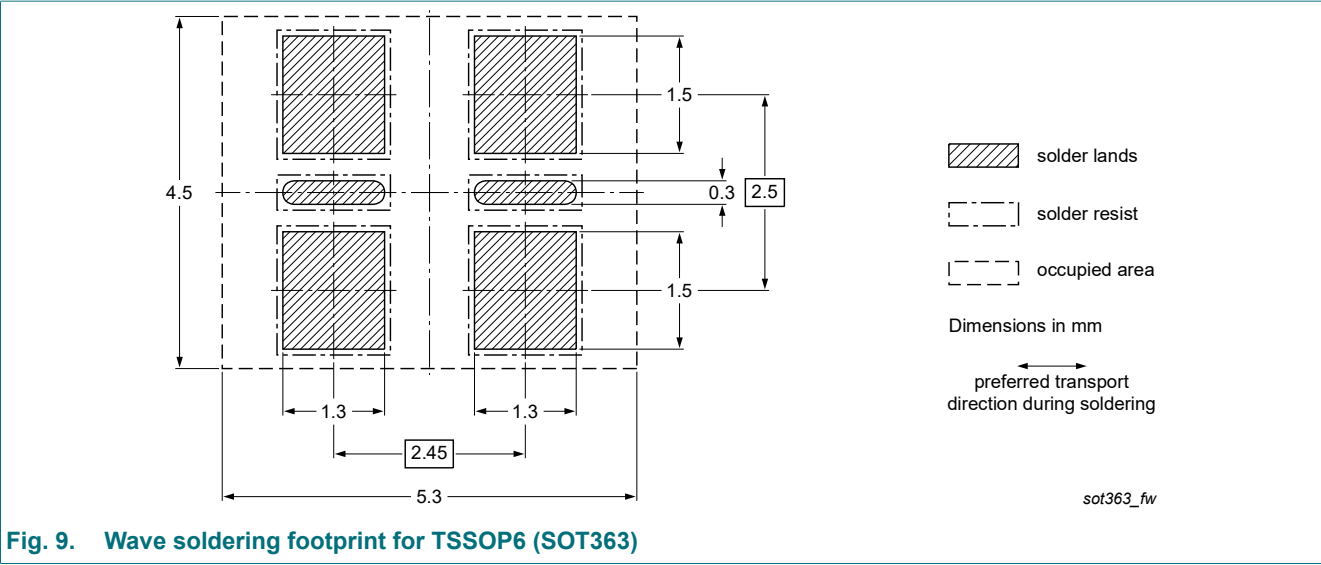


**Fig. 7. Package outline TSSOP6 (SOT363)**

## 13. Soldering



**Fig. 8. Reflow soldering footprint for TSSOP6 (SOT363)**



14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status  | Change notice | Supersedes |
|---------------|--------------|--------------------|---------------|------------|
| BAS116DY v.1  | 20230419     | 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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