

BAT54XY

Schottky barrier quadruple diode in very small SOT363 package

Rev. 01 — 17 January 2005

Product data sheet

1. Product profile

1.1 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 SOT363 very small SMD plastic package.

1.2 Features

- Low forward voltage
- Ultra small SMD plastic package
- Low capacitance

1.3 Applications

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

1.4 Quick reference data

Table 1: Quick reference data

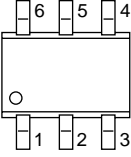
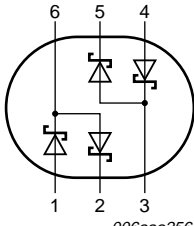
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|----------------------------|---|-------|-----|-----|------|
| V_R | continuous reverse voltage | | - | - | 30 | V |
| I_F | continuous forward current | | - | - | 200 | mA |
| V_F | forward voltage | $I_F = 10 \text{ mA}$; see Figure 1 | [1] - | - | 400 | mV |

[1] Pulse test: $t_p \leq 30 \text{ ms}$; $\delta \leq 0.02$.

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2. Pinning information

Table 2: Pinning

| Pin | Description | Simplified outline | Symbol |
|-----|---------------------|---|---|
| 1 | anode 1 |  |  |
| 2 | cathode 2 | | |
| 3 | anode 3 / cathode 4 | | |
| 4 | anode 4 | | |
| 5 | cathode 3 | | |
| 6 | cathode 1 / anode 2 | | |

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3. Ordering information

Table 3: Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BAT54XY | SC-88 | plastic surface mounted package; 6 leads | SOT363 |

4. Marking

Table 4: Marking codes

| Type number | Marking code ^[1] |
|-------------|-----------------------------|
| BAT54XY | *C5 |

- [1] * = -: made in Hong Kong
 * = t: made in Malaysia
 * = W: made in China

5. 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_R | continuous reverse voltage | | - | 30 | V |
| I_F | continuous forward current | | - | 200 | mA |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1 \text{ s}; \delta \leq 0.5$ | - | 300 | mA |
| I_{FSM} | non-repetitive peak forward current | $t_p < 10 \text{ ms}$ | - | 600 | mA |
| T_j | junction temperature | | - | 125 | °C |
| T_{amb} | ambient temperature | | -65 | +125 | °C |
| T_{stg} | storage temperature | | -65 | +150 | °C |

6. Thermal characteristics

Table 6: Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------|---|-------------|-----|-----|-----|------|
| $R_{th(j-s)}$ | thermal resistance from junction to soldering point | in free air | [1] | - | 260 | K/W |

[1] Soldering point at pins 2, 3, 5 and 6.

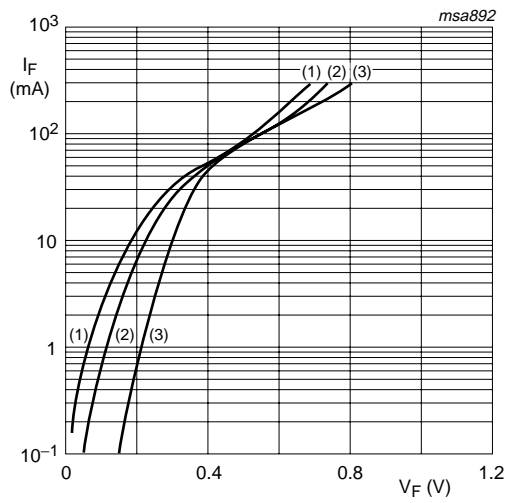
7. Characteristics

Table 7: Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

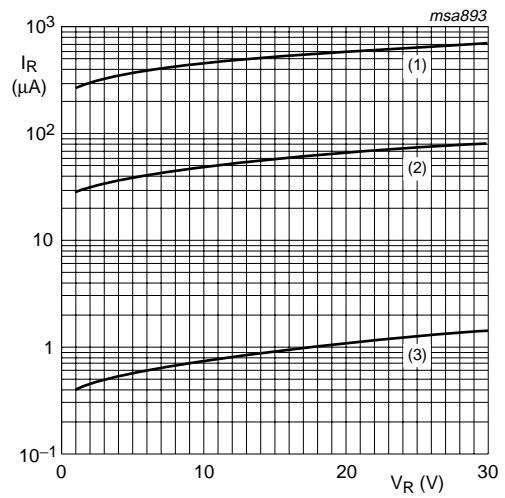
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|-------------------|---|-----|-----|-----|---------------|
| Per diode | | | | | | |
| V_F | forward voltage | see Figure 1 ; | [1] | | | |
| | | $I_F = 0.1\text{ mA}$ | - | - | 240 | mV |
| | | $I_F = 1\text{ mA}$ | - | - | 320 | mV |
| | | $I_F = 10\text{ mA}$ | - | - | 400 | mV |
| | | $I_F = 30\text{ mA}$ | - | - | 500 | mV |
| | | $I_F = 100\text{ mA}$ | - | - | 800 | mV |
| I_R | reverse current | $V_R = 25\text{ V}$; see Figure 2 | - | - | 2 | μA |
| C_d | diode capacitance | $V_R = 1\text{ V}$; $f = 1\text{ MHz}$; see Figure 3 | - | - | 10 | pF |

[1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.



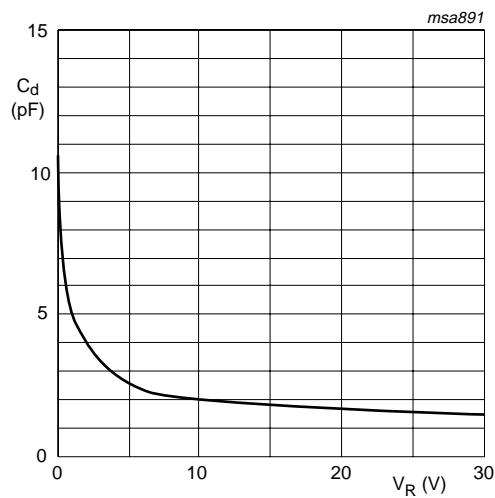
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}$.
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}$.
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}$.

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



- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}$.
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}$.
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}$.

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



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

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

8. Package outline

Plastic surface mounted package; 6 leads

SOT363

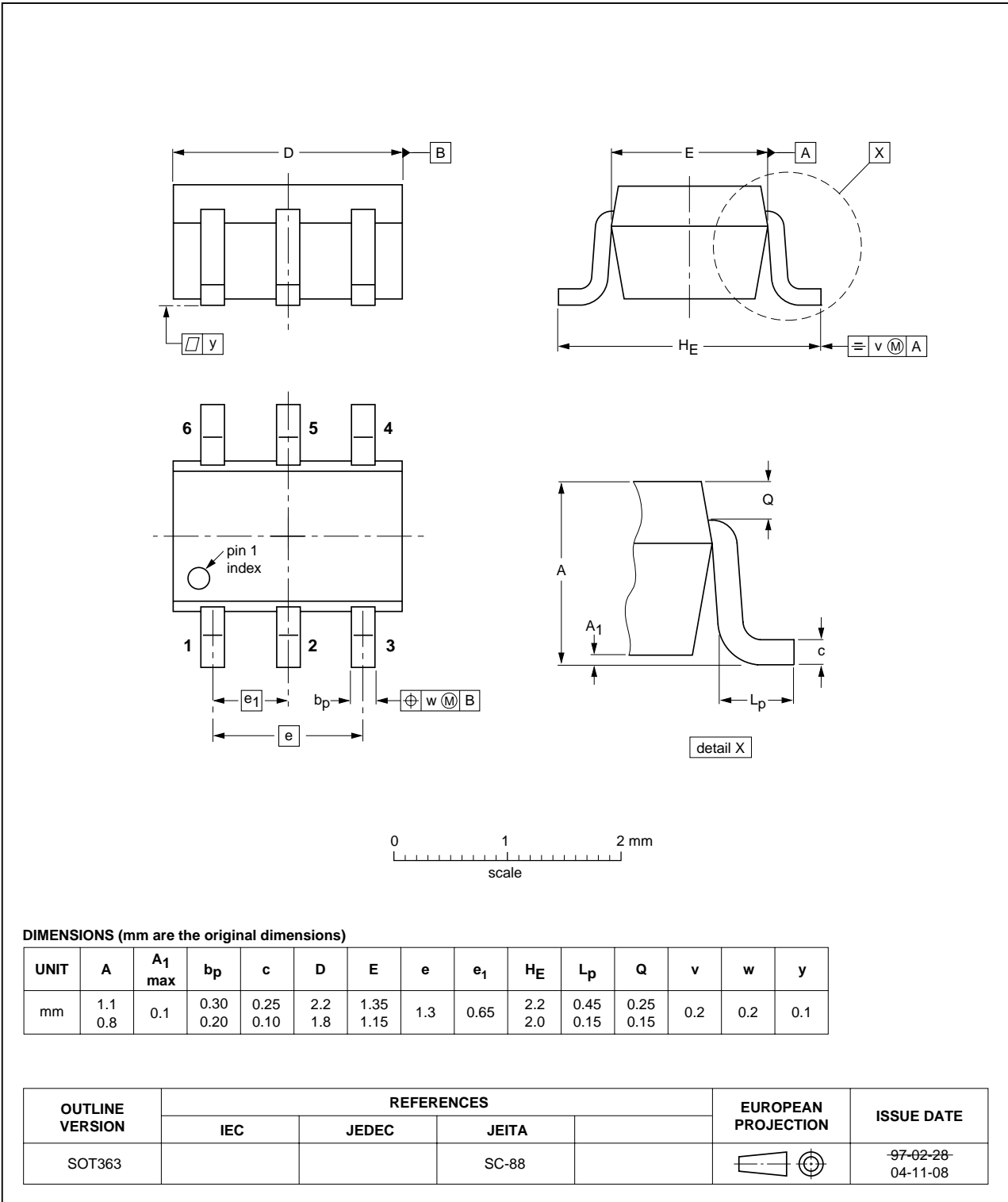


Fig 4. Package outline SOT363 (SC-88).

9. Packing information

Table 8: Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code. [\[1\]](#)

| Type number | Package | Description | Packing quantity | |
|-------------|---------|------------------------------------|--------------------------|-------|
| | | | 3000 | 10000 |
| BAT54XY | SOT363 | 4 mm pitch, 8 mm tape and reel; T1 | [2] -115 | -135 |
| | | 4 mm pitch, 8 mm tape and reel; T2 | [3] -125 | -165 |

[1] For further information and the availability of packing methods, see [Section 14](#).

[2] T1: normal taping

[3] T2: reverse taping

10. Revision history

Table 9: Revision history

| Document ID | Release date | Data sheet status | Change notice | Doc. number | Supersedes |
|-------------|--------------|--------------------|---------------|----------------|------------|
| BAT54XY_1 | 20050117 | Product data sheet | - | 9397 750 14141 | - |

11. Data sheet status

| Level | Data sheet status ^[1] | Product status ^[2] ^[3] | Definition |
|-------|----------------------------------|--|--|
| I | Objective data | Development | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice. |
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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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