

# BAS40 series; 1PSxxSB4x series

General-purpose Schottky diodes

## 1. Product profile

### 1.1 General description

General-purpose Schottky diodes in small Surface-Mounted Device (SMD) plastic packages.

Table 1. Product overview

| Type number | Package |       | Configuration                               |
|-------------|---------|-------|---------------------------------------------|
|             | Philips | JEITA |                                             |
| 1PS70SB40   | SOT323  | SC-70 | single diode                                |
| 1PS76SB40   | SOD323  | SC-76 | single diode                                |
| 1PS79SB40   | SOD523  | SC-79 | single diode                                |
| BAS40       | SOT23   | -     | single diode                                |
| BAS40H      | SOD123F | -     | single diode                                |
| BAS40L      | SOD882  | -     | single diode                                |
| BAS40W      | SOT323  | SC-70 | single diode                                |
| 1PS70SB44   | SOT323  | SC-70 | dual series                                 |
| BAS40-04    | SOT23   | -     | dual series                                 |
| BAS40-04W   | SOT323  | SC-70 | dual series                                 |
| 1PS70SB45   | SOT323  | SC-70 | dual common cathode                         |
| 1PS75SB45   | SOT416  | SC-75 | dual common cathode                         |
| BAS40-05    | SOT23   | -     | dual common cathode                         |
| BAS40-05W   | SOT323  | SC-70 | dual common cathode                         |
| 1PS70SB46   | SOT323  | SC-70 | dual common anode                           |
| BAS40-06    | SOT23   | -     | dual common anode                           |
| BAS40-06W   | SOT323  | SC-70 | dual common anode                           |
| BAS40-07    | SOT143B | -     | dual isolated                               |
| BAS40-07V   | SOT666  | -     | dual isolated                               |
| BAS40-05V   | SOT666  | -     | quadruple common cathode/<br>common cathode |
| 1PS88SB48   | SOT363  | SC-88 | quadruple common cathode/<br>common cathode |
| BAS40XY     | SOT363  | SC-88 | quadruple; 2 series                         |

**PHILIPS**

1.2 Features

- High switching speed

■ High breakdown voltage
- Low leakage current

■ Low capacitance

1.3 Applications

- Ultra high-speed switching
- Voltage clamping

1.4 Quick reference data

Table 2. Quick reference data

| Symbol         | Parameter       | Conditions            | Min   | Typ | Max | Unit |
|----------------|-----------------|-----------------------|-------|-----|-----|------|
| Per diode      |                 |                       |       |     |     |      |
| I <sub>F</sub> | forward current |                       | -     | -   | 120 | mA   |
| V <sub>F</sub> | forward voltage | I <sub>F</sub> = 1 mA | [1] - | -   | 380 | mV   |
| V <sub>R</sub> | reverse voltage |                       | -     | -   | 40  | V    |

[1] Pulse test: t<sub>p</sub> ≤ 300 μs; δ ≤ 0.02.

2. Pinning information

Table 3. Pinning

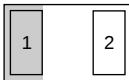
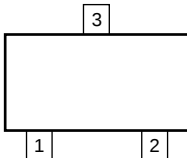
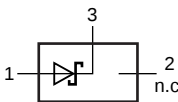
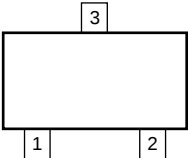
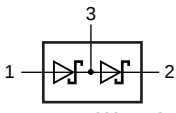
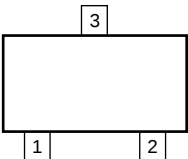
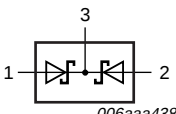
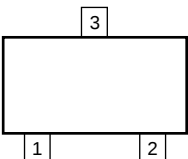
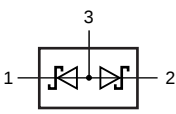
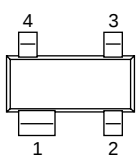
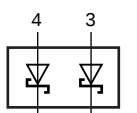
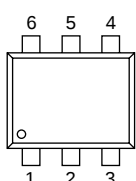
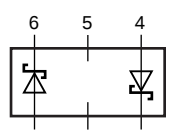
| Pin                          | Description   | Simplified outline                                                                                               | Symbol                                                                                             |
|------------------------------|---------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| BAS40H; 1PS76SB40; 1PS79SB40 |               |                                                                                                                  |                                                                                                    |
| 1                            | cathode       | <br>001aab540               | <br>sym001    |
| 2                            | anode         |                                                                                                                  |                                                                                                    |
| BAS40L                       |               |                                                                                                                  |                                                                                                    |
| 1                            | cathode       | <br>Transparent<br>top view | <br>sym001    |
| 2                            | anode         |                                                                                                                  |                                                                                                    |
| BAS40; BAS40W; 1PS70SB40     |               |                                                                                                                  |                                                                                                    |
| 1                            | anode         | <br>006aaa144               | <br>006aaa436 |
| 2                            | not connected |                                                                                                                  |                                                                                                    |
| 3                            | cathode       |                                                                                                                  |                                                                                                    |

Table 3. Pinning ...continued

| Pin                                              | Description                             | Simplified outline                                                                    | Symbol                                                                                |
|--------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>BAS40-04; BAS40-04W; 1PS70SB44</b>            |                                         |                                                                                       |                                                                                       |
| 1                                                | anode (diode 1)                         |    |    |
| 2                                                | cathode (diode 2)                       |                                                                                       |                                                                                       |
| 3                                                | cathode (diode 1),<br>anode (diode 2)   |                                                                                       |                                                                                       |
|                                                  |                                         | 006aaa144                                                                             | 006aaa437                                                                             |
| <b>BAS40-05; BAS40-05W; 1PS70SB45; 1PS75SB45</b> |                                         |                                                                                       |                                                                                       |
| 1                                                | anode (diode 1)                         |    |    |
| 2                                                | anode (diode 2)                         |                                                                                       |                                                                                       |
| 3                                                | cathode (diode 1),<br>cathode (diode 2) |                                                                                       |                                                                                       |
|                                                  |                                         | 006aaa144                                                                             | 006aaa438                                                                             |
| <b>BAS40-06; BAS40-06W; 1PS70SB46</b>            |                                         |                                                                                       |                                                                                       |
| 1                                                | cathode (diode 1)                       |  |  |
| 2                                                | cathode (diode 2)                       |                                                                                       |                                                                                       |
| 3                                                | anode (diode 1),<br>anode (diode 2)     |                                                                                       |                                                                                       |
|                                                  |                                         | 006aaa144                                                                             | 006aaa439                                                                             |
| <b>BAS40-07</b>                                  |                                         |                                                                                       |                                                                                       |
| 1                                                | cathode (diode 1)                       |  |  |
| 2                                                | cathode (diode 2)                       |                                                                                       |                                                                                       |
| 3                                                | anode (diode 2)                         |                                                                                       |                                                                                       |
| 4                                                | anode (diode 1)                         |                                                                                       |                                                                                       |
|                                                  |                                         |                                                                                       | 006aaa434                                                                             |
| <b>BAS40-07V</b>                                 |                                         |                                                                                       |                                                                                       |
| 1                                                | anode (diode 1)                         |  |  |
| 2                                                | not connected                           |                                                                                       |                                                                                       |
| 3                                                | cathode (diode 2)                       |                                                                                       |                                                                                       |
| 4                                                | anode (diode 2)                         |                                                                                       |                                                                                       |
| 5                                                | not connected                           |                                                                                       |                                                                                       |
| 6                                                | cathode (diode 1)                       |                                                                                       |                                                                                       |
|                                                  |                                         |                                                                                       | 006aaa440                                                                             |

### 3. Ordering information

**Table 4. Ordering information**

| Type number | Package |                                                                               |         |
|-------------|---------|-------------------------------------------------------------------------------|---------|
|             | Name    | Description                                                                   | Version |
| 1PS70SB40   | SC-70   | plastic surface-mounted package; 3 leads                                      | SOT323  |
| 1PS76SB40   | SC-76   | plastic surface-mounted package; 2 leads                                      | SOD323  |
| 1PS79SB40   | SC-79   | plastic surface-mounted package; 2 leads                                      | SOD523  |
| BAS40       | -       | plastic surface-mounted package; 3 leads                                      | SOT23   |
| BAS40H      | -       | plastic surface-mounted package; 2 leads                                      | SOD123F |
| BAS40L      | -       | leadless ultra small plastic package; 2 terminals;<br>body 1.0 × 0.6 × 0.5 mm | SOD882  |
| BAS40W      | SC-70   | plastic surface-mounted package; 3 leads                                      | SOT323  |
| 1PS70SB44   | SC-70   | plastic surface-mounted package; 3 leads                                      | SOT323  |
| BAS40-04    | -       | plastic surface-mounted package; 3 leads                                      | SOT23   |
| BAS40-04W   | SC-70   | plastic surface-mounted package; 3 leads                                      | SOT323  |
| 1PS70SB45   | SC-70   | plastic surface-mounted package; 3 leads                                      | SOT323  |
| 1PS75SB45   | SC-75   | plastic surface-mounted package; 3 leads                                      | SOT416  |
| BAS40-05    | -       | plastic surface-mounted package; 3 leads                                      | SOT23   |
| BAS40-05W   | SC-70   | plastic surface-mounted package; 3 leads                                      | SOT323  |
| 1PS70SB46   | SC-70   | plastic surface-mounted package; 3 leads                                      | SOT323  |
| BAS40-06    | -       | plastic surface-mounted package; 3 leads                                      | SOT23   |
| BAS40-06W   | SC-70   | plastic surface-mounted package; 3 leads                                      | SOT323  |
| BAS40-07    | -       | plastic surface-mounted package; 4 leads                                      | SOT143B |
| BAS40-07V   | -       | plastic surface-mounted package; 6 leads                                      | SOT666  |
| BAS40-05V   | -       | plastic surface-mounted package; 6 leads                                      | SOT666  |
| 1PS88SB48   | SC-88   | plastic surface-mounted package; 6 leads                                      | SOT363  |
| BAS40XY     | SC-88   | plastic surface-mounted package; 6 leads                                      | SOT363  |

## 4. Marking

Table 5. Marking codes

| Type number | Marking code <sup>[1]</sup> | Type number | Marking code <sup>[1]</sup> |
|-------------|-----------------------------|-------------|-----------------------------|
| 1PS70SB40   | 6*3                         | 1PS75SB45   | 45                          |
| 1PS76SB40   | S4                          | BAS40-05    | 45*                         |
| 1PS79SB40   | T                           | BAS40-05W   | 65*                         |
| BAS40       | 43*                         | 1PS70SB46   | 6*6                         |
| BAS40H      | AJ                          | BAS40-06    | 46*                         |
| BAS40L      | S6                          | BAS40-06W   | 66*                         |
| BAS40W      | 63*                         | BAS40-07    | 47*                         |
| 1PS70SB44   | 6*4                         | BAS40-07V   | 67                          |
| BAS40-04    | 44*                         | BAS40-05V   | 65                          |
| BAS40-04W   | 64*                         | 1PS88SB48   | 8*5                         |
| 1PS70SB45   | 6*5                         | BAS40XY     | 40*                         |

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

## 5. Limiting values

Table 6. 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                     |                                         | -                | 40   | V    |
| $I_F$            | forward current                     |                                         | -                | 120  | mA   |
| $I_{FRM}$        | repetitive peak forward current     | $t_p \leq 1 \text{ s}; \delta \leq 0.5$ | -                | 120  | mA   |
| $I_{FSM}$        | non-repetitive peak forward current | $t_p \leq 10 \text{ ms}$                | <sup>[1]</sup> - | 200  | mA   |
| $T_j$            | junction temperature                |                                         | -                | 150  | °C   |
| $T_{amb}$        | ambient temperature                 |                                         | -65              | +150 | °C   |
| $T_{stg}$        | storage temperature                 |                                         | -65              | +150 | °C   |

- [1]  $T_j = 25 \text{ °C}$  prior to surge.

## 6. Thermal characteristics

Table 7. Thermal characteristics

| Symbol            | Parameter                                        | Conditions  | Min | Typ | Max | Unit |
|-------------------|--------------------------------------------------|-------------|-----|-----|-----|------|
| <b>Per device</b> |                                                  |             |     |     |     |      |
| $R_{th(j-a)}$     | thermal resistance from junction to ambient      | in free air | [1] |     |     |      |
|                   | SOT23                                            |             | -   | -   | 500 | K/W  |
|                   | SOT143B                                          |             | -   | -   | 500 | K/W  |
|                   | SOT363 (1PS88SB48)                               |             | -   | -   | 416 | K/W  |
|                   | SOT416                                           |             | -   | -   | 833 | K/W  |
|                   | SOT666 (BAS40-05V)                               | [2]         | -   | -   | 225 | K/W  |
|                   | SOT666 (BAS40-07V)                               | [2]         | -   | -   | 416 | K/W  |
|                   | SOD123F                                          | [2]         | -   | -   | 330 | K/W  |
|                   | SOD323                                           |             | -   | -   | 450 | K/W  |
|                   | SOD523                                           | [2]         | -   | -   | 450 | K/W  |
|                   | SOD882                                           | [2]         | -   | -   | 500 | K/W  |
|                   | SOT323                                           |             | -   | -   | 625 | K/W  |
| $R_{th(j-sp)}$    | thermal resistance from junction to solder point |             |     |     |     |      |
|                   | SOT363 (BAS40XY)                                 | [3]         | -   | -   | 260 | K/W  |

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

[2] Reflow soldering is the only recommended soldering method.

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

## 7. Characteristics

Table 8. Characteristics

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

| Symbol           | Parameter         | Conditions                              | Min | Typ | Max | Unit          |
|------------------|-------------------|-----------------------------------------|-----|-----|-----|---------------|
| <b>Per diode</b> |                   |                                         |     |     |     |               |
| $V_F$            | forward voltage   | [1]                                     |     |     |     |               |
|                  |                   | $I_F = 1\text{ mA}$                     | -   | -   | 380 | mV            |
|                  |                   | $I_F = 10\text{ mA}$                    | -   | -   | 500 | mV            |
|                  |                   | $I_F = 40\text{ mA}$                    | -   | -   | 1   | V             |
| $I_R$            | reverse current   | $V_R = 30\text{ V}$                     | -   | -   | 1   | $\mu\text{A}$ |
|                  |                   | $V_R = 40\text{ V}$                     | -   | -   | 10  | $\mu\text{A}$ |
| $C_d$            | diode capacitance | $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$ | -   | -   | 5   | pF            |

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

8. Package outline

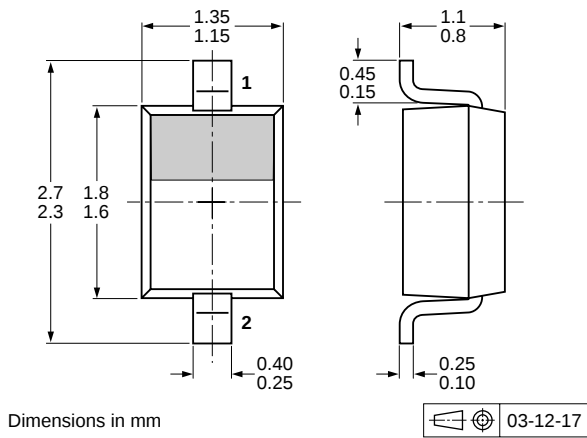


Fig 5. Package outline SOD323 (SC-76)

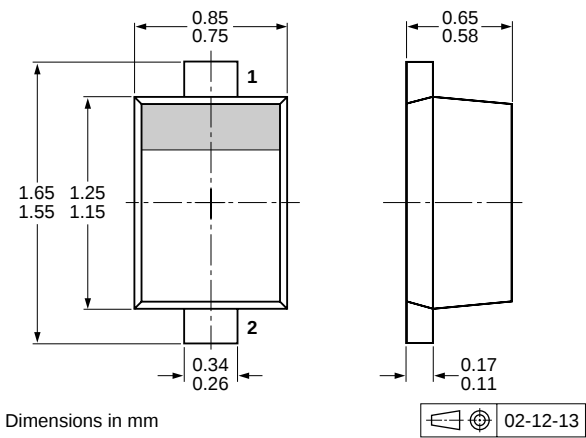


Fig 6. Package outline SOD523 (SC-79)

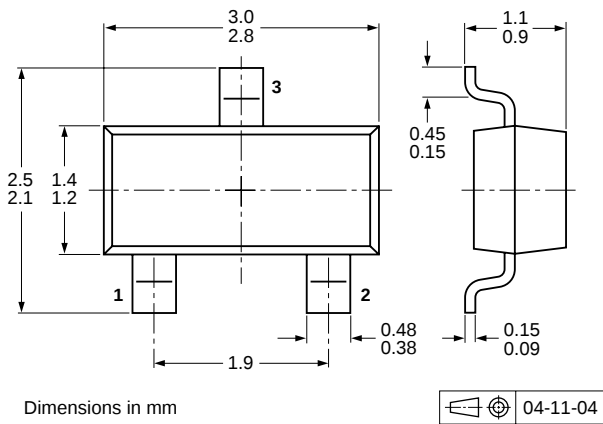


Fig 7. Package outline SOT23 (TO-236AB)

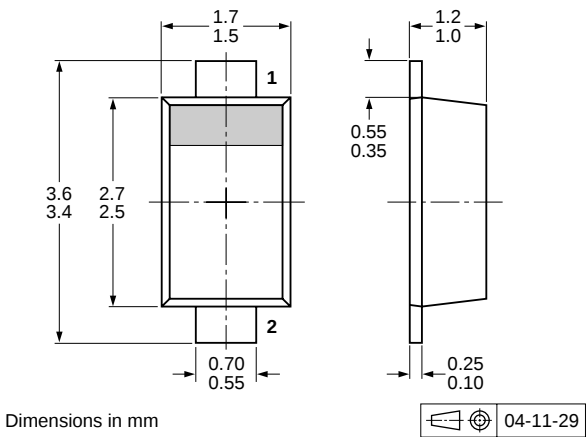


Fig 8. Package outline SOD123F

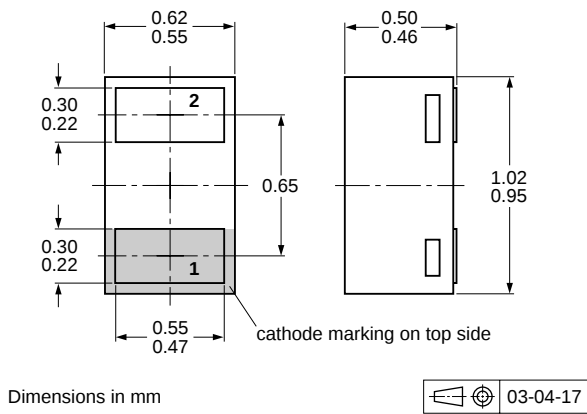


Fig 9. Package outline SOD882

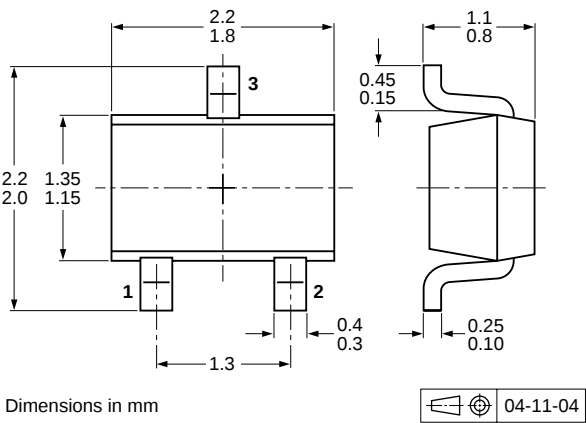


Fig 10. Package outline SOT323 (SC-70)

## 9. Packing information

**Table 9. Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

| Type number | Package | Description                                       | Packing quantity |      |      |       |
|-------------|---------|---------------------------------------------------|------------------|------|------|-------|
|             |         |                                                   | 3000             | 4000 | 8000 | 10000 |
| 1PS70SB40   | SOT323  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| 1PS76SB40   | SOD323  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| 1PS79SB40   | SOD523  | 2 mm pitch, 8 mm tape and reel                    | -                | -    | -315 | -     |
|             |         | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| BAS40       | SOT23   | 4 mm pitch, 8 mm tape and reel                    | -215             | -    | -    | -235  |
| BAS40H      | SOD123F | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| BAS40L      | SOD882  | 2 mm pitch, 8 mm tape and reel                    | -                | -    | -    | -315  |
| BAS40W      | SOT323  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| 1PS70SB44   | SOT323  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| BAS40-04    | SOT23   | 4 mm pitch, 8 mm tape and reel                    | -215             | -    | -    | -235  |
| BAS40-04W   | SOT323  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| 1PS70SB45   | SOT323  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| 1PS75SB45   | SOT416  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| BAS40-05    | SOT23   | 4 mm pitch, 8 mm tape and reel                    | -215             | -    | -    | -235  |
| BAS40-05W   | SOT323  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| 1PS70SB46   | SOT323  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| BAS40-06    | SOT23   | 4 mm pitch, 8 mm tape and reel                    | -215             | -    | -    | -235  |
| BAS40-06W   | SOT323  | 4 mm pitch, 8 mm tape and reel                    | -115             | -    | -    | -135  |
| BAS40-07    | SOT143B | 4 mm pitch, 8 mm tape and reel                    | -215             | -    | -    | -235  |
| BAS40-07V   | SOT666  | 2 mm pitch, 8 mm tape and reel                    | -                | -    | -315 | -     |
|             |         | 4 mm pitch, 8 mm tape and reel                    | -                | -115 | -    | -     |
| BAS40-05V   | SOT666  | 2 mm pitch, 8 mm tape and reel                    | -                | -    | -315 | -     |
|             |         | 4 mm pitch, 8 mm tape and reel                    | -                | -115 | -    | -     |
| 1PS88SB48   | SOT363  | 4 mm pitch, 8 mm tape and reel; T1 <sup>[2]</sup> | -115             | -    | -    | -135  |
|             |         | 4 mm pitch, 8 mm tape and reel; T2 <sup>[3]</sup> | -125             | -    | -    | -165  |
| BAS40XY     | SOT363  | 4 mm pitch, 8 mm tape and reel; T1 <sup>[2]</sup> | -115             | -    | -    | -135  |
|             |         | 4 mm pitch, 8 mm tape and reel; T2 <sup>[3]</sup> | -125             | -    | -    | -165  |

[1] For further information and the availability of packing methods, see [Section 13](#).

[2] T1: normal taping

[3] T2: reverse taping