# BAS40 series; 1PSxxSB4x series

## General-purpose Schottky diodes

Rev. 9 — 18 March 2015 Product data sheet

## 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 |
|---|---|---|---|
| | Nexperia | 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/ common cathode |
| 1PS88SB48 | SOT363 | SC-88 | quadruple common cathode/ common cathode |
| BAS40XY | SOT363 | SC-88 | quadruple; 2 series |

### 1.2 Features and benefits

- High switching speed
- High breakdown voltage
- AEC-Q101 qualified
- Low leakage current
- Low capacitance

### 1.3 Applications

- Ultra high-speed switching
- Voltage clamping

### 1.4 Quick reference data

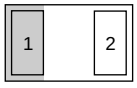
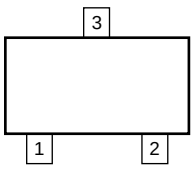
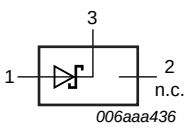
**Table 2. Quick reference data**

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Per diode** | | | | | | |
| $I_F$ | forward current | | - | - | 120 | mA |
| $V_F$ | forward voltage | $I_F$ = 1 mA [1] | - | - | 380 | mV |
| $V_R$ | reverse voltage | | - | - | 40 | V |

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

## 2. Pinning information

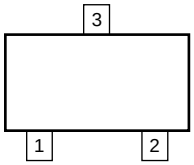
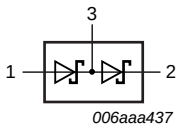
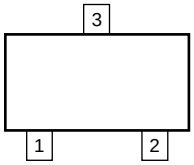
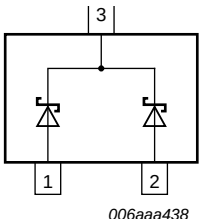
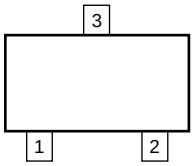
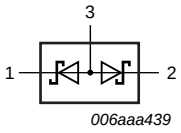
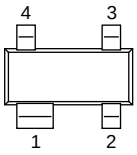
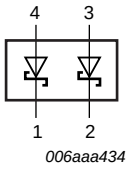
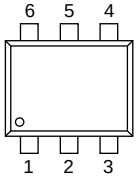
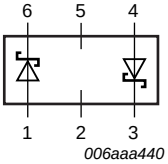
**Table 3. Pinning**

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


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

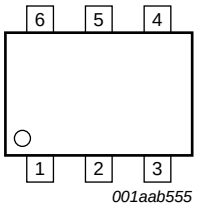
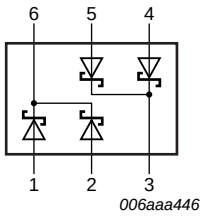
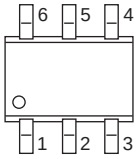
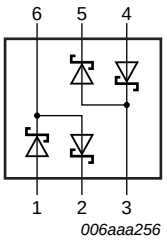
**Table 3. Pinning** *…continued*

| Pin | Description | Simplified outline | Symbol |
|---|---|---|---|
| **BAS40-04; BAS40-04W; 1PS70SB44** | | | |
| 1 | anode (diode 1) |  |  |
| 2 | cathode (diode 2) | | |
| 3 | cathode (diode 1),<br>anode (diode 2) | | |
| **BAS40-05; BAS40-05W; 1PS70SB45; 1PS75SB45** | | | |
| 1 | anode (diode 1) |  |  |
| 2 | anode (diode 2) | | |
| 3 | cathode (diode 1),<br>cathode (diode 2) | | |
| **BAS40-06; BAS40-06W; 1PS70SB46** | | | |
| 1 | cathode (diode 1) |  |  |
| 2 | cathode (diode 2) | | |
| 3 | anode (diode 1),<br>anode (diode 2) | | |
| **BAS40-07** | | | |
| 1 | cathode (diode 1) |  |  |
| 2 | cathode (diode 2) | | |
| 3 | anode (diode 2) | | |
| 4 | anode (diode 1) | | |
| **BAS40-07V** | | | |
| 1 | anode (diode 1) |  |  |
| 2 | not connected | | |
| 3 | cathode (diode 2) | | |
| 4 | anode (diode 2) | | |
| 5 | not connected | | |
| 6 | cathode (diode 1) | | |


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

**Table 3. Pinning** *…continued*

| Pin | Description | Simplified outline | Symbol |
|---|---|---|---|
| **BAS40-05V; 1PS88SB48** | | | |
| 1 | anode (diode 1) |  |  |
| 2 | anode (diode 2) | | |
| 3 | cathode (diode 3),<br>cathode (diode 4) | | |
| 4 | anode (diode 3) | | |
| 5 | anode (diode 4) | | |
| 6 | cathode (diode 1),<br>cathode (diode 2) | | |
| **BAS40XY** | | | |
| 1 | anode (diode 1) |  |  |
| 2 | cathode (diode 2) | | |
| 3 | anode (diode 3),<br>cathode (diode 4) | | |
| 4 | anode (diode 4) | | |
| 5 | cathode (diode 3) | | |
| 6 | cathode (diode 1),<br>anode (diode 2) | | |

[1] The marking bar indicates the cathode.


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

## 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; 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 |


All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2017. All rights reserved

## 4. Marking

**Table 5. Marking codes**

| Type number | Marking code[1] | Type number | Marking code[1] |
|---|---|---|---|
| 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 |
|---|---|---|---|---|---|
| **Per diode** | | | | | |
| $V_R$ | reverse voltage | | - | 40 | V |
| $I_F$ | forward current | | - | 120 | mA |
| $I_{FRM}$ | repetitive peak forward current | $t_p \leq 1$ s; $\delta \leq 0.5$ | - | 120 | mA |
| $I_{FSM}$ | non-repetitive peak forward current | $t_p \leq 10$ ms [1] | - | 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 °C prior to surge.


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

# 6. Thermal characteristics

**Table 7. Thermal characteristics**

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Per device** | | | | | | |
| $R_{th(j-a)}$ | 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

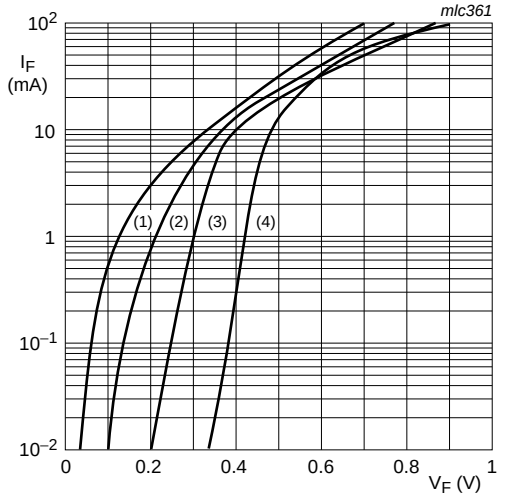
**Table 8. Characteristics**

*$T_{amb}$ = 25 °C unless otherwise specified.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Per diode** | | | | | | |
| $V_F$ | forward voltage | [1] | | | | |
| | | $I_F$ = 1 mA | - | - | 380 | mV |
| | | $I_F$ = 10 mA | - | - | 500 | mV |
| | | $I_F$ = 40 mA | - | - | 1 | V |
| $I_R$ | reverse current | $V_R$ = 30 V | - | - | 1 | µA |
| | | $V_R$ = 40 V | - | - | 10 | µA |
| $C_d$ | diode capacitance | $V_R$ = 0 V; f = 1 MHz | - | - | 5 | pF |

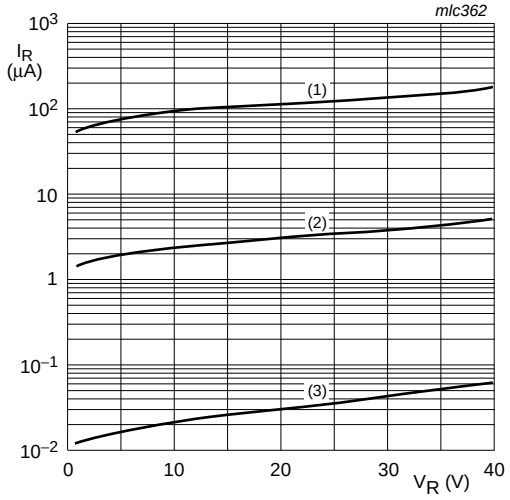
[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.


All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2017. All rights reserved



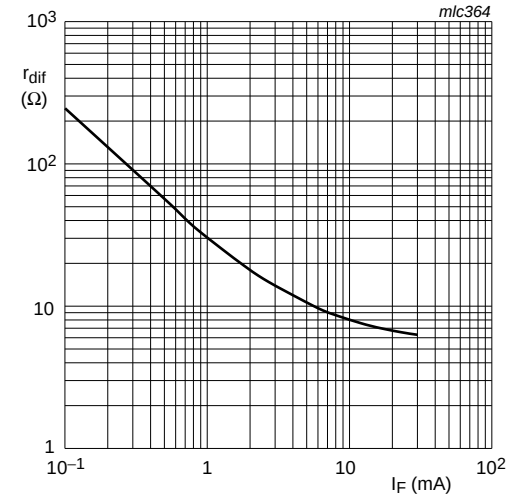

(1) $T_{amb}$ = 125 °C
(2) $T_{amb}$ = 85 °C
(3) $T_{amb}$ = 25 °C
(4) $T_{amb}$ = −40 °C

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



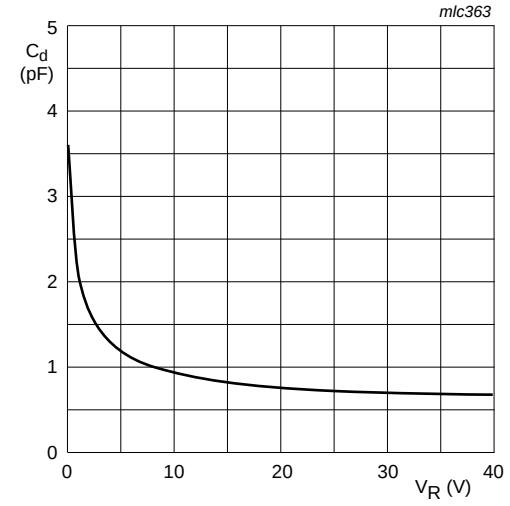

(1) $T_{amb}$ = 125 °C
(2) $T_{amb}$ = 85 °C
(3) $T_{amb}$ = 25 °C

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




f = 10 kHz

**Fig 3. Differential resistance as a function of forward current; typical values**




$T_{amb}$ = 25 °C; f = 1 MHz

**Fig 4. Diode capacitance as a function of reverse voltage; typical values**


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

# 8. Test information

## 8.1 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.

# 9. Package outline

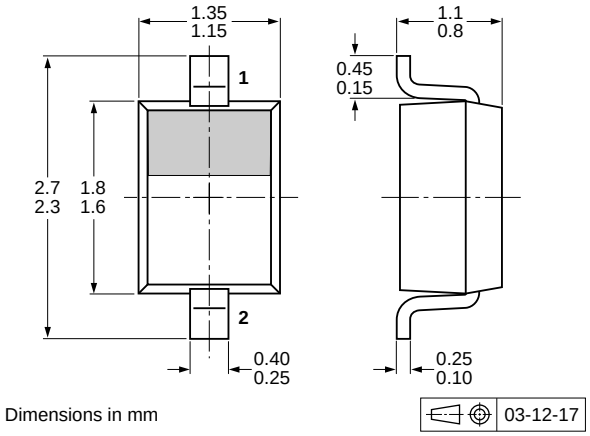



Fig 5. Package outline SOD323 (SC-76)

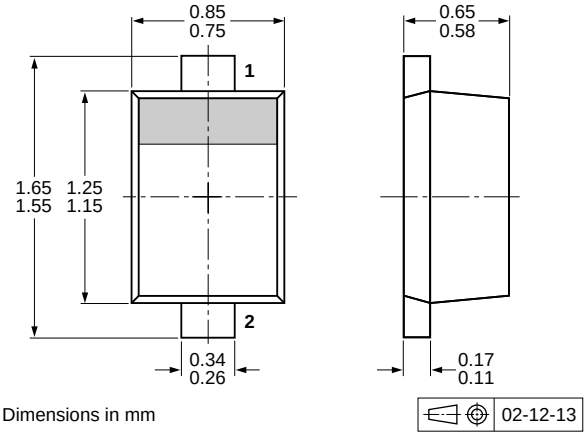



Fig 6. Package outline SOD523 (SC-79)

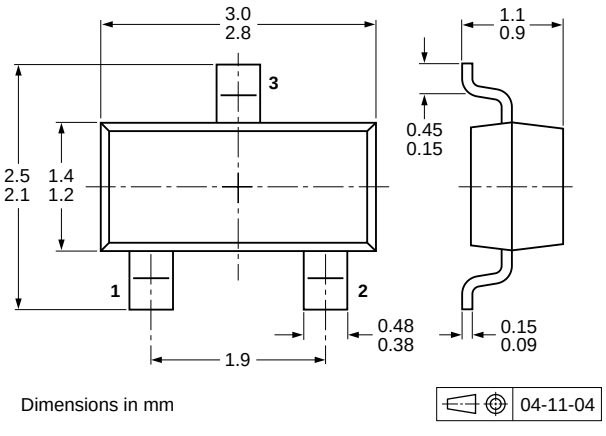



Fig 7. Package outline SOT23 (TO-236AB)

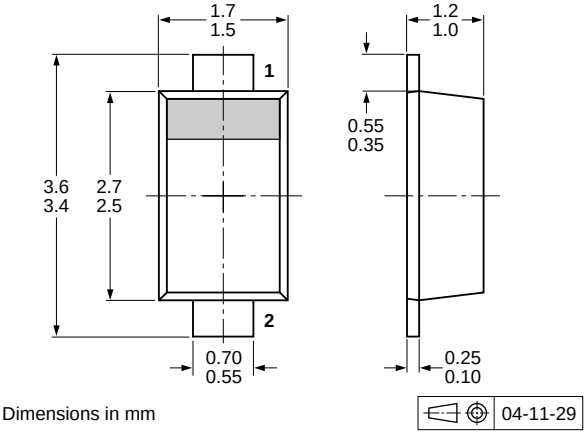



Fig 8. Package outline SOD123F


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

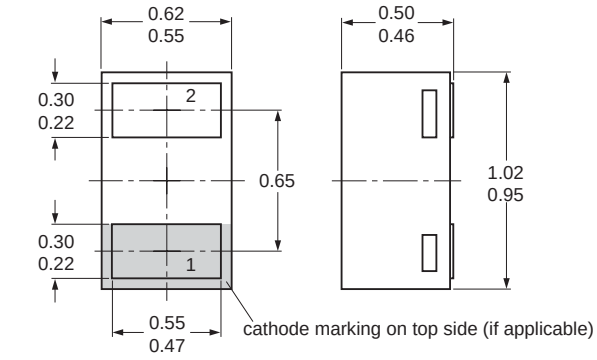



Fig 9. Package outline SOD882

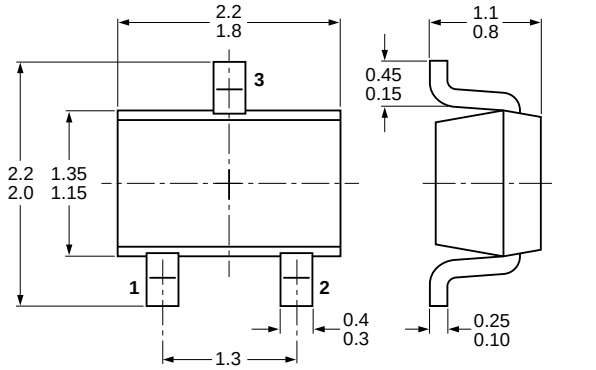



Fig 10. Package outline SOT323 (SC-70)

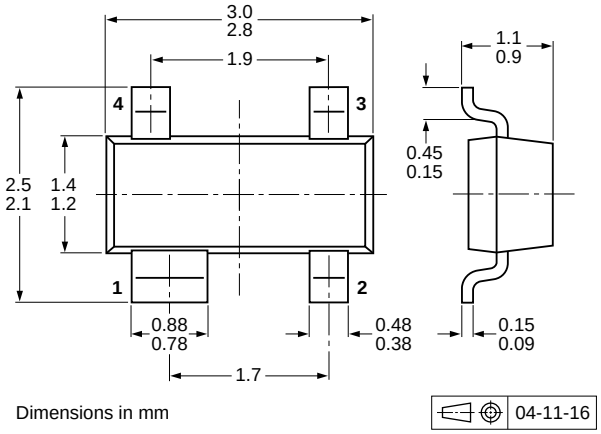



Fig 11. Package outline SOT143B

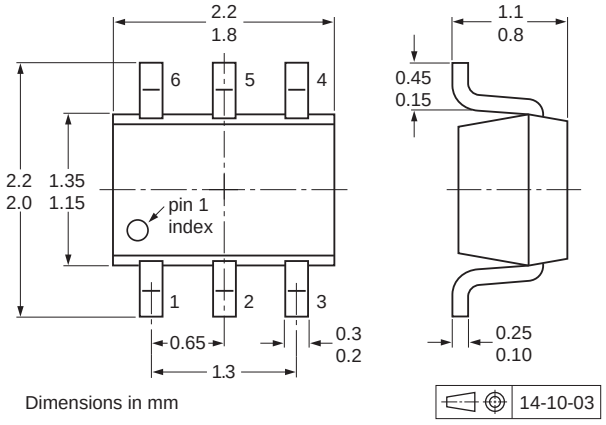



Fig 12. Package outline SOT363 (SC-88)

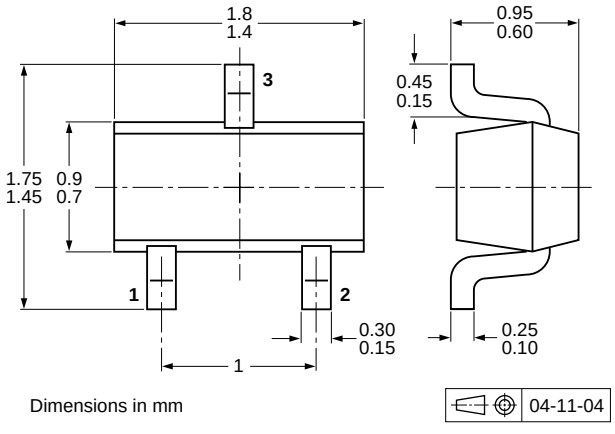



Fig 13. Package outline SOT416 (SC-75)

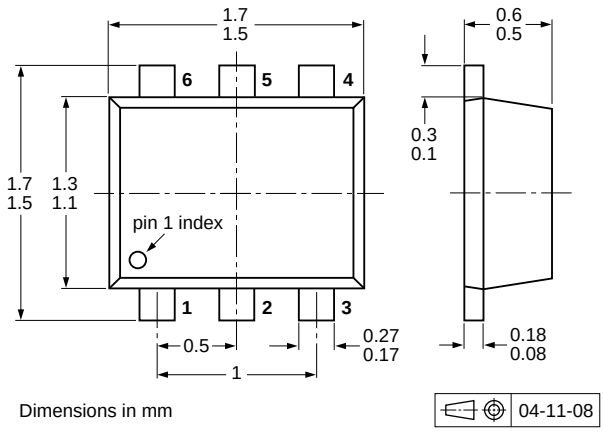



Fig 14. Package outline SOT666


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

## 10. Packing information

**Table 9. Packing methods**

*The indicated -xxx are the last three digits of the 12NC ordering code.*[1]

| 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 [2] | -115 | - | - | -135 |
| | | 4 mm pitch, 8 mm tape and reel; T2 [3] | -125 | - | - | -165 |
| BAS40XY | 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.

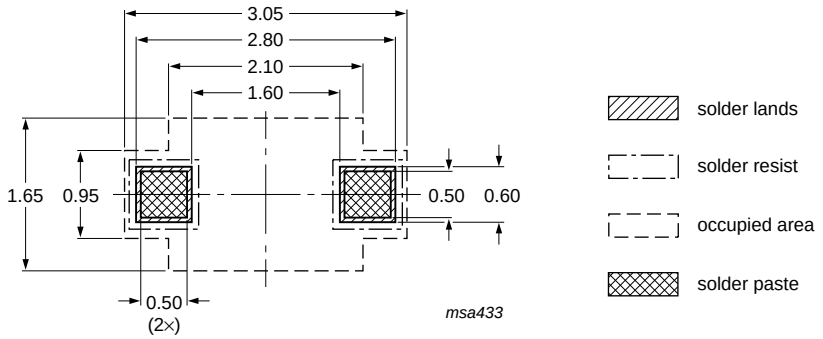
[2] T1: normal taping

[3] T2: reverse taping


All information provided in this document is subject to legal disclaimers.

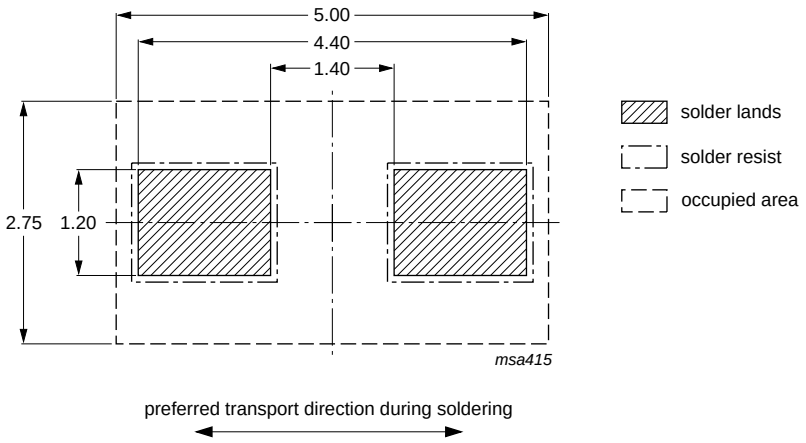
© Nexperia B.V. 2017. All rights reserved

## 11. Soldering



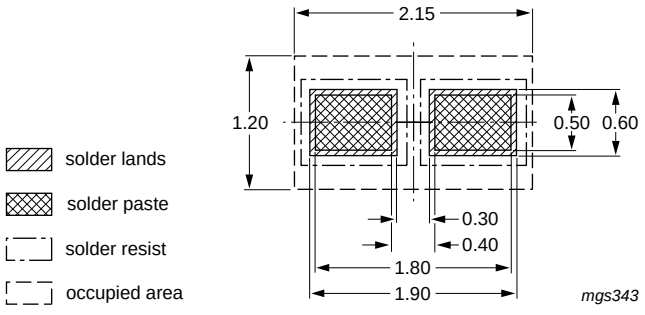

Dimensions in mm

**Fig 15. Reflow soldering footprint SOD323 (SC-76)**




Dimensions in mm

**Fig 16. Wave soldering footprint SOD323 (SC-76)**



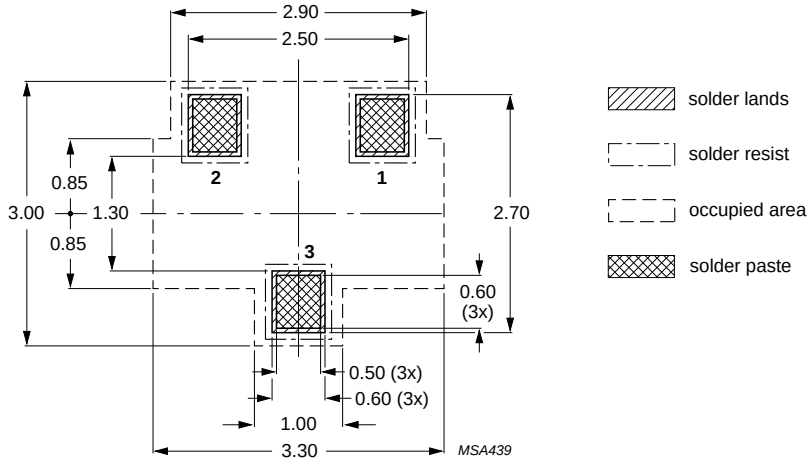

Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 17. Reflow soldering footprint SOD523 (SC-79)**

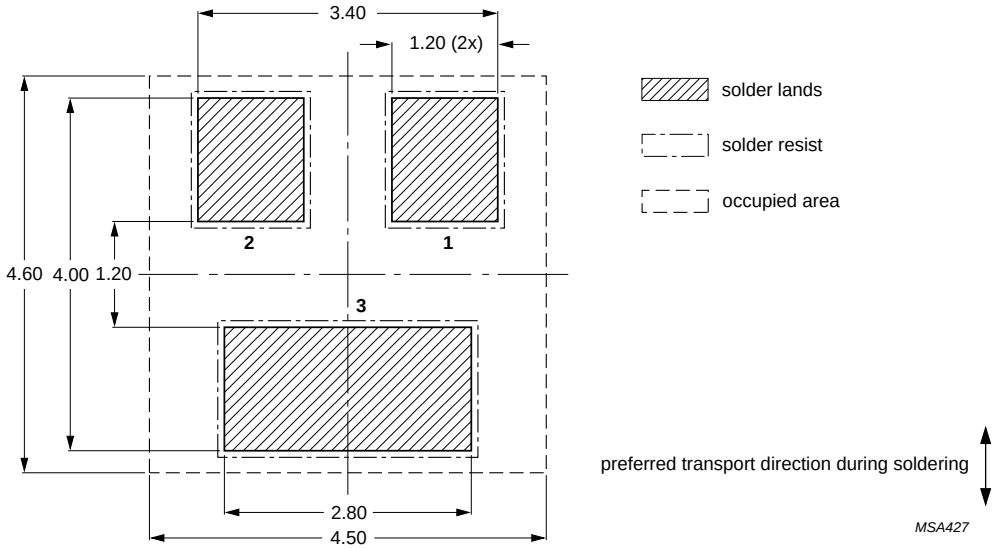

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved




Dimensions in mm

**Fig 18. Reflow soldering footprint SOT23 (TO-236AB)**

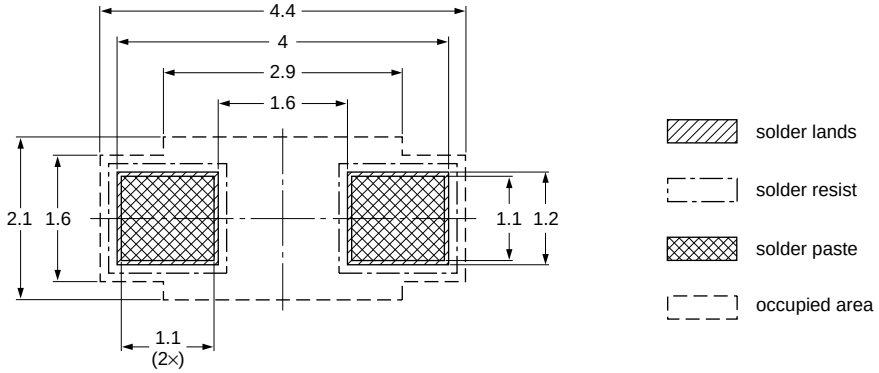



Dimensions in mm

**Fig 19. Wave soldering footprint SOT23 (TO-236AB)**


All information provided in this document is subject to legal disclaimers.

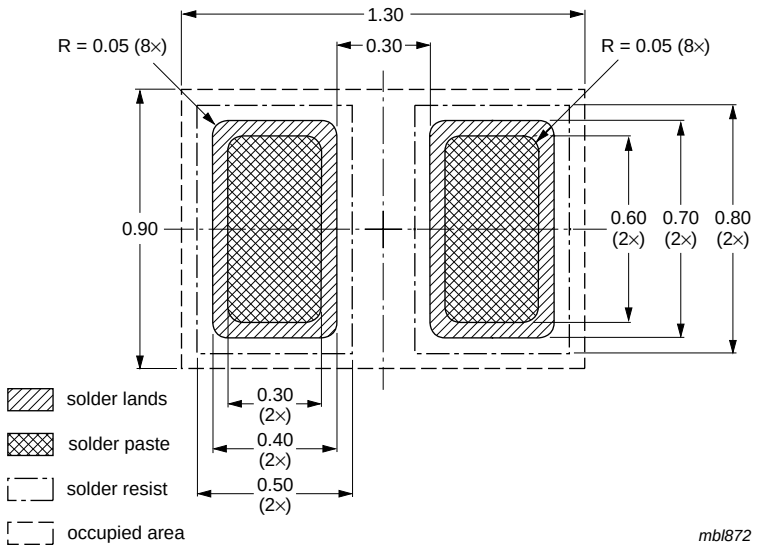
© Nexperia B.V. 2017. All rights reserved




Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 20. Reflow soldering footprint SOD123F**




Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 21. Reflow soldering footprint SOD882**


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

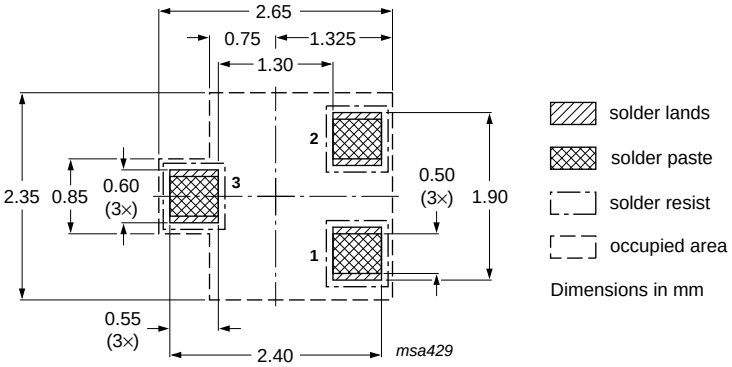



**Fig 22. Reflow soldering footprint SOT323 (SC-70)**

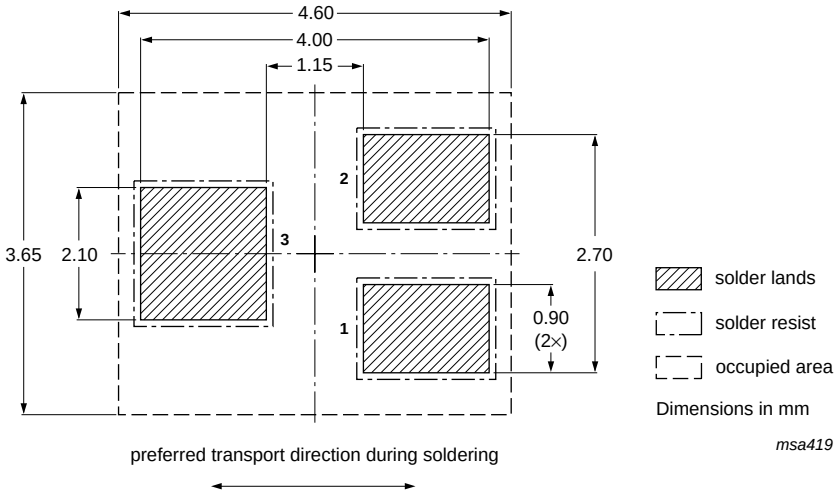
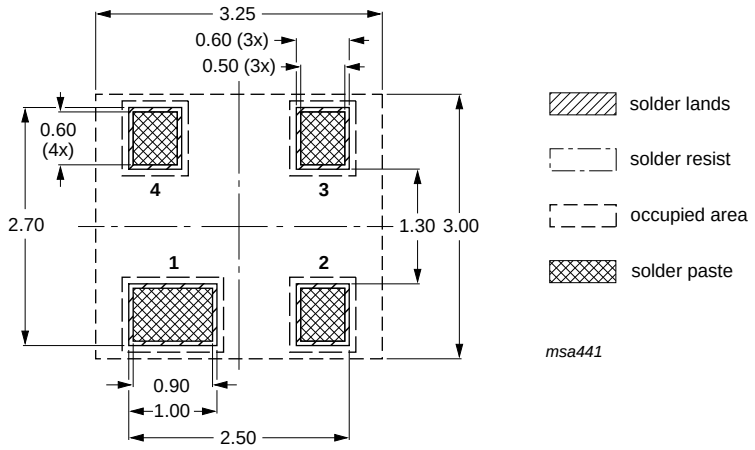



**Fig 23. Wave soldering footprint SOT323 (SC-70)**


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved




Dimensions in mm

**Fig 24. Reflow soldering footprint SOT143B**

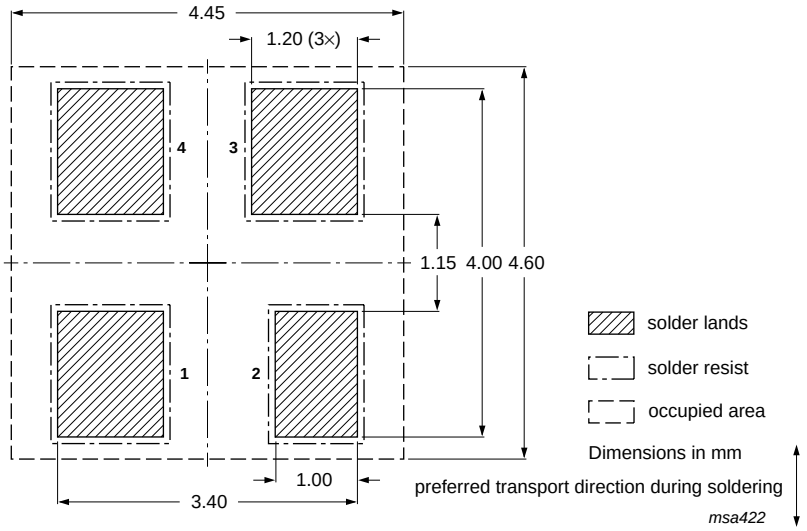



**Fig 25. Wave soldering footprint SOT143B**


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

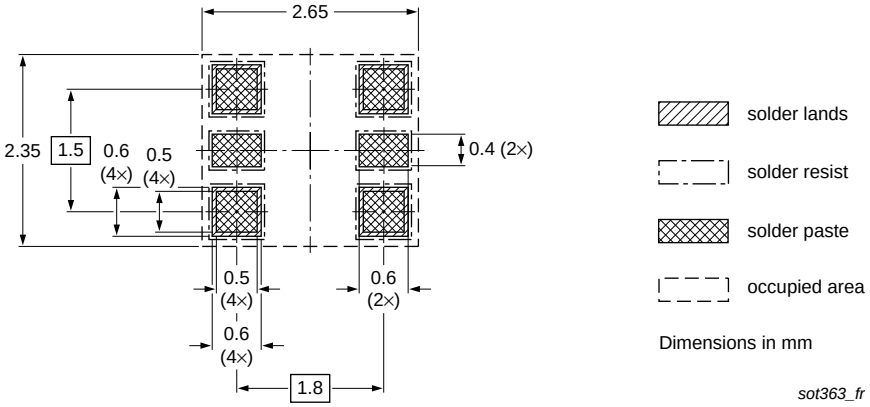



**Fig 26. Reflow soldering footprint SOT363 (SC-88)**

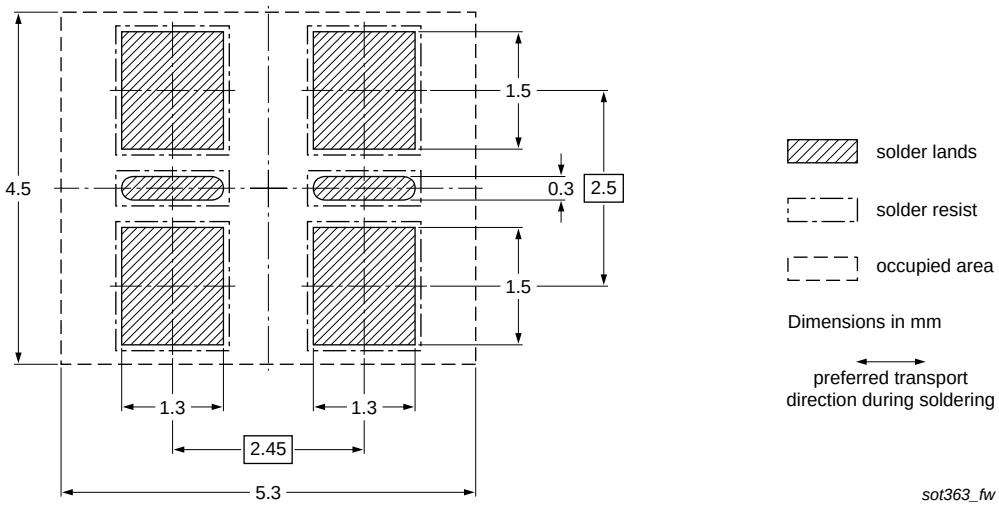



**Fig 27. Wave soldering footprint SOT363 (SC-88)**


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

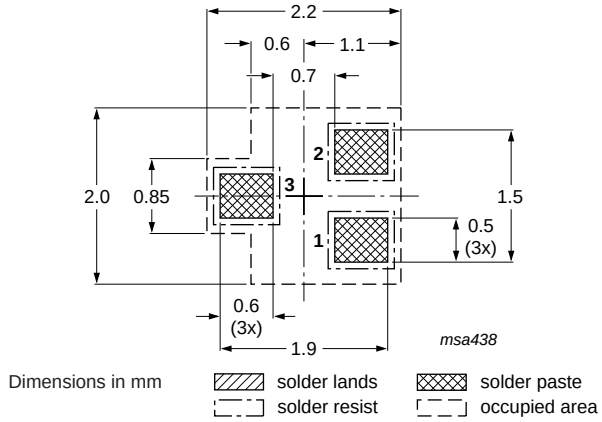
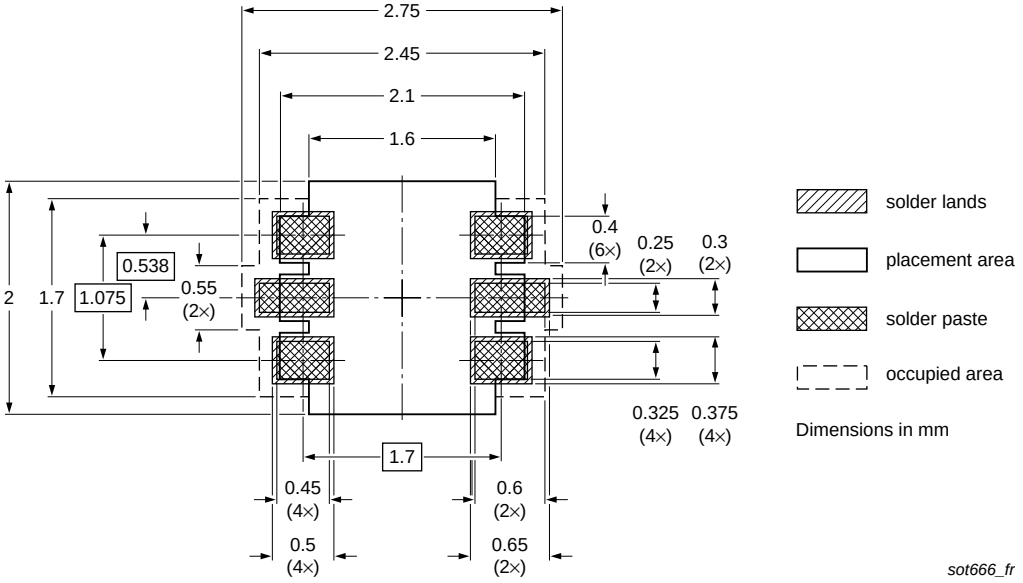



**Fig 28. Reflow soldering footprint SOT416**




Reflow soldering is the only recommended soldering method.

**Fig 29. Reflow soldering footprint SOT666**


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

## 12. Revision history

**Table 10. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| BAS40_1PSXXSB4X_SER v.9 | 20150318 | Product data sheet | - | BAS40_1PSXXSB4X_SER_8 |
| Modifications: | • The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.<br>• Legal texts have been adapted to the new company name where appropriate. | | | |
| BAS40_1PSXXSB4X_SER_8 | 20100113 | Product data sheet | - | BAS40_1PSXXSB4X_SER_7 |
| BAS40_1PSXXSB4X_SER_7 | 20060512 | Product data sheet | - | BAS40_1PSXXSB4X_SER_6 |
| BAS40_1PSXXSB4X_SER_6 | 20050809 | Product data sheet | - | 1PS70SB40_3 1PS75SB45_2 1PS76SB40_3 1PS79SB40_2 1PS88SB48_3 BAS40H_1 BAS40L_1 BAS40-05V_1 BAS40-07V_1 BAS40W_3 BAS40_SERIES_5 |
| 1PS70SB40_3 | 19990426 | Product specification | - | 1PS70SB40_2 |
| 1PS75SB45_2 | 19990426 | Product specification | - | 1PS75SB45_1 |
| 1PS76SB40_3 | 20040126 | Product specification | - | 1PS76SB40_2 |
| 1PS79SB40_2 | 19990426 | Product specification | - | 1PS79SB40_1 |
| 1PS88SB48_3 | 20021107 | Product specification | - | 1PS88SB48_2 |
| BAS40H_1 | 20050425 | Product data sheet | - | - |
| BAS40L_1 | 20030520 | Product specification | - | - |
| BAS40-05V_1 | 20021121 | Product specification | - | - |
| BAS40-07V_1 | 20020327 | Product specification | - | - |
| BAS40W_3 | 19990426 | Product specification | - | BAS40W_2 |
| BAS40_SERIES_5 | 20011010 | Product specification | - | BAS40_4 |


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

# 13. Legal information

## 13.1 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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nexperia.com.

## 13.2 Definitions

**Draft —** The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. Nexperia does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

**Short data sheet —** A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local Nexperia sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

**Product specification —** The information and data provided in a Product data sheet shall define the specification of the product as agreed between Nexperia and its customer, unless Nexperia and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the Nexperia product is deemed to offer functions and qualities beyond those described in the Product data sheet.

## 13.3 Disclaimers

**Limited warranty and liability —** Information in this document is believed to be accurate and reliable. However, Nexperia does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. Nexperia takes no responsibility for the content in this document if provided by an information source outside of Nexperia.

In no event shall Nexperia be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, Nexperia's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the *Terms and conditions of commercial sale* of Nexperia.

**Right to make changes —** Nexperia reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

**Suitability for use in automotive applications —** This Nexperia product has been qualified for use in automotive applications. Unless otherwise agreed in writing, the product is not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of a Nexperia product can reasonably be expected to result in personal injury, death or severe property or environmental damage. Nexperia and its suppliers accept no liability for inclusion and/or use of Nexperia products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

**Applications —** Applications that are described herein for any of these products are for illustrative purposes only. Nexperia makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using Nexperia products, and Nexperia accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the Nexperia product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

Nexperia does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using Nexperia products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). Nexperia does not accept any liability in this respect.

**Limiting values —** Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

**Terms and conditions of commercial sale —** Nexperia products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nexperia.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. Nexperia hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of Nexperia products by customer.


All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2017. All rights reserved

**No offer to sell or license —** Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

**Quick reference data —** The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

**Export control —** This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

**Translations —** A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

### 13.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

## 14. Contact information

For more information, please visit: **http://www.nexperia.com**

For sales office addresses, please send an email to: **salesaddresses@nexperia.com**


All information provided in this document is subject to legal disclaimers.
© Nexperia B.V. 2017. All rights reserved

## 15. Contents


**1 Product profile . . . . . 1**
1.1 General description . . . . . 1
1.2 Features and benefits . . . . . 2
1.3 Applications . . . . . 2
1.4 Quick reference data . . . . . 2
**2 Pinning information . . . . . 2**
**3 Ordering information . . . . . 5**
**4 Marking . . . . . 6**
**5 Limiting values . . . . . 6**
**6 Thermal characteristics . . . . . 7**
**7 Characteristics . . . . . 7**
**8 Test information . . . . . 9**
8.1 Quality information . . . . . 9
**9 Package outline . . . . . 9**
**10 Packing information . . . . . 11**
**11 Soldering . . . . . 12**
**12 Revision history . . . . . 19**
**13 Legal information . . . . . 20**
13.1 Data sheet status . . . . . 20
13.2 Definitions . . . . . 20
13.3 Disclaimers . . . . . 20
13.4 Trademarks . . . . . 21
**14 Contact information . . . . . 21**
**15 Contents . . . . . 22**


© Nexperia B.V. 2017. All rights reserved

For more information, please visit: http://www.nexperia.com
For sales office addresses, please send an email to: salesaddresses@nexperia.com
**Date of release: 18 March 2015**