

# BAS40 series; 1PSxxSB4x series

General-purpose Schottky diodes

Rev. 08 — 13 January 2010

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
	NXP	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

- 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

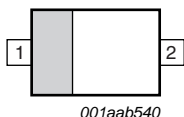



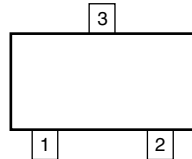
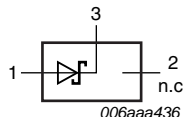
Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$I_F$	forward current		-	-	120	mA
$V_F$	forward voltage	$I_F = 1 \text{ mA}$	[1]	-	380	mV
$V_R$	reverse voltage		-	-	40	V

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

## 2. Pinning information

Table 3. Pinning

Pin	Description	Conditions	Simplified outline	Symbol
<b>BAS40H; 1PS76SB40; 1PS79SB40</b>				
1	cathode	[1]	 <p>001aab540</p>	 <p>sym001</p>
2	anode			
<b>BAS40L</b>				
1	cathode	[1]	 <p>Transparent top view</p>	 <p>sym001</p>
2	anode			
<b>BAS40; BAS40W; 1PS70SB40</b>				
1	anode		 <p>006aaa144</p>	 <p>006aaa436</p>
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)	<p>006aaa144</p>	<p>006aaa437</p>
2	cathode (diode 2)		
3	cathode (diode 1), anode (diode 2)		
<b>BAS40-05; BAS40-05W; 1PS70SB45; 1PS75SB45</b>			
1	anode (diode 1)	<p>006aaa144</p>	<p>006aaa438</p>
2	anode (diode 2)		
3	cathode (diode 1), cathode (diode 2)		
<b>BAS40-06; BAS40-06W; 1PS70SB46</b>			
1	cathode (diode 1)	<p>006aaa144</p>	<p>006aaa439</p>
2	cathode (diode 2)		
3	anode (diode 1), anode (diode 2)		
<b>BAS40-07</b>			
1	cathode (diode 1)		<p>006aaa434</p>
2	cathode (diode 2)		
3	anode (diode 2)		
4	anode (diode 1)		
<b>BAS40-07V</b>			
1	anode (diode 1)		<p>006aaa440</p>
2	not connected		
3	cathode (diode 2)		
4	anode (diode 2)		
5	not connected		
6	cathode (diode 1)		

**Table 3. Pinning ...continued**

Pin	Description	Simplified outline	Symbol
<b>BAS40-05V; 1PS88SB48</b>			
1	anode (diode 1)	<p>001aab555</p>	<p>006aaa446</p>
2	anode (diode 2)		
3	cathode (diode 3), cathode (diode 4)		
4	anode (diode 3)		
5	anode (diode 4)		
6	cathode (diode 1), cathode (diode 2)		
<b>BAS40XY</b>			
1	anode (diode 1)		<p>006aaa256</p>
2	cathode (diode 2)		
3	anode (diode 3), cathode (diode 4)		
4	anode (diode 4)		
5	cathode (diode 3)		
6	cathode (diode 1), anode (diode 2)		

[1] The marking bar indicates the cathode.

### 3. Ordering information

**Table 4. Ordering information**

Type number	Package		Version
	Name	Description	
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

## 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	$t_p \leq 10 \text{ ms}$	[1] -	200	mA
$T_j$	junction temperature		-	150	°C
$T_{amb}$	ambient temperature		-65	+150	°C
$T_{stg}$	storage temperature		-65	+150	°C

- [1]  $T_j = 25 \text{ °C}$  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.

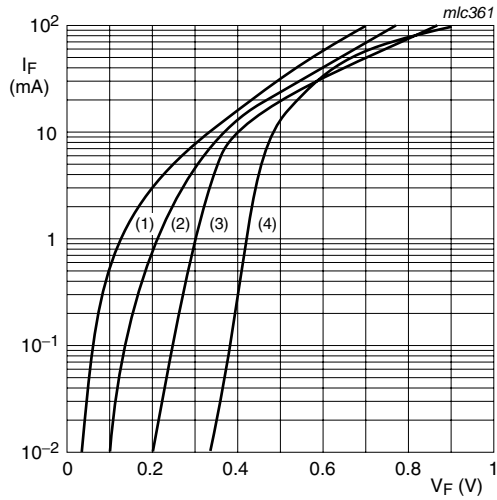
## 7. Characteristics

**Table 8. Characteristics**

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

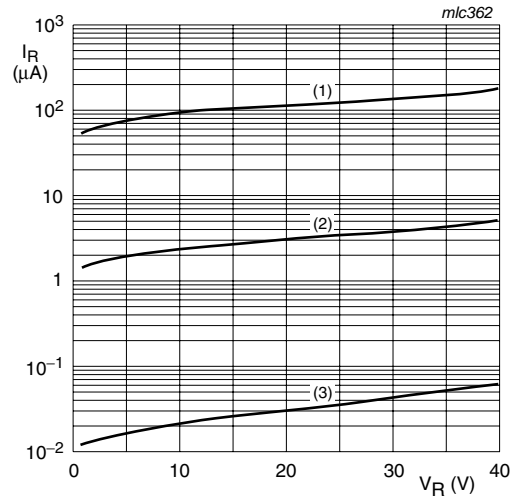
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	forward voltage		[1]			
		$I_F = 1\text{ mA}$	-	-	380	mV
		$I_F = 10\text{ mA}$	-	-	500	mV
		$I_F = 40\text{ mA}$	-	-	1	V
$I_R$	reverse current	$V_R = 30\text{ V}$	-	-	1	$\mu\text{A}$
		$V_R = 40\text{ V}$	-	-	10	$\mu\text{A}$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

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



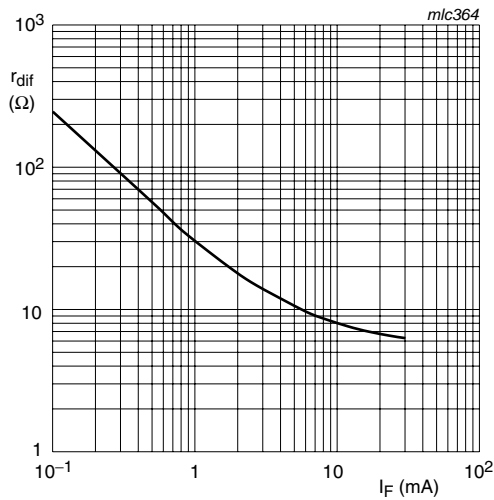
- (1)  $T_{amb} = 125\text{ }^{\circ}\text{C}$
- (2)  $T_{amb} = 85\text{ }^{\circ}\text{C}$
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (4)  $T_{amb} = -40\text{ }^{\circ}\text{C}$

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



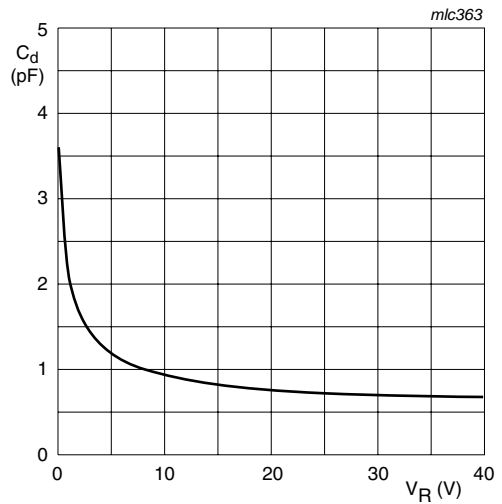
- (1)  $T_{amb} = 125\text{ }^{\circ}\text{C}$
- (2)  $T_{amb} = 85\text{ }^{\circ}\text{C}$
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}$

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



$f = 10\text{ kHz}$

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



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

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



## 8. Package outline

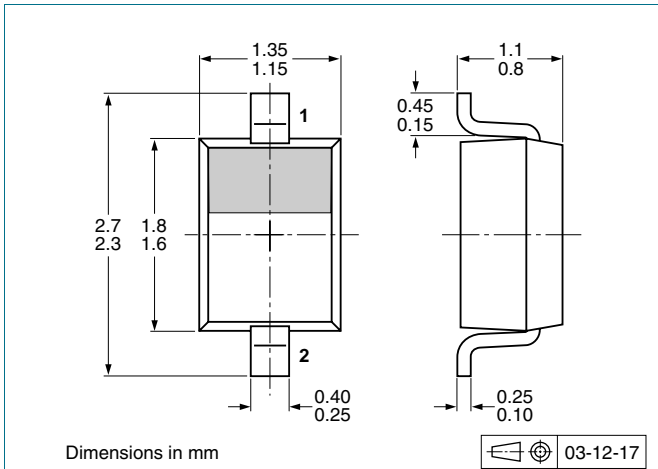


Fig 5. Package outline SOD323 (SC-76)

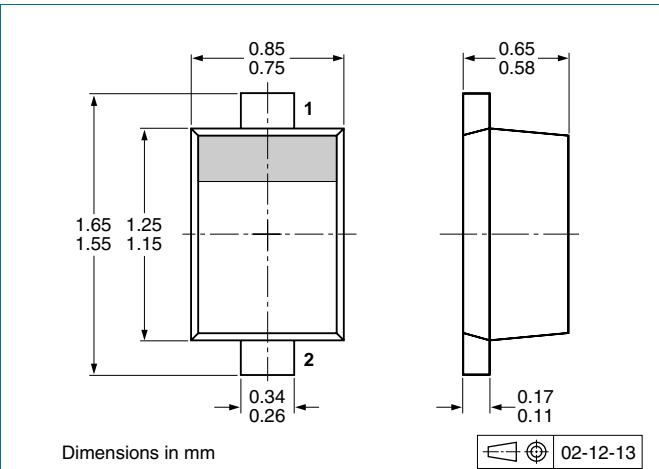


Fig 6. Package outline SOD523 (SC-79)

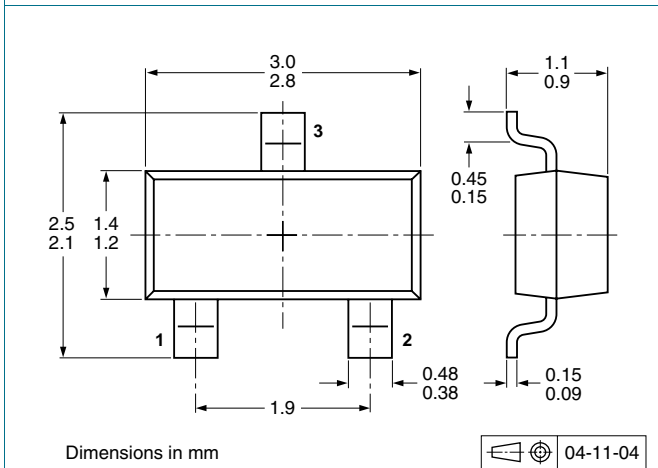


Fig 7. Package outline SOT23 (TO-236AB)

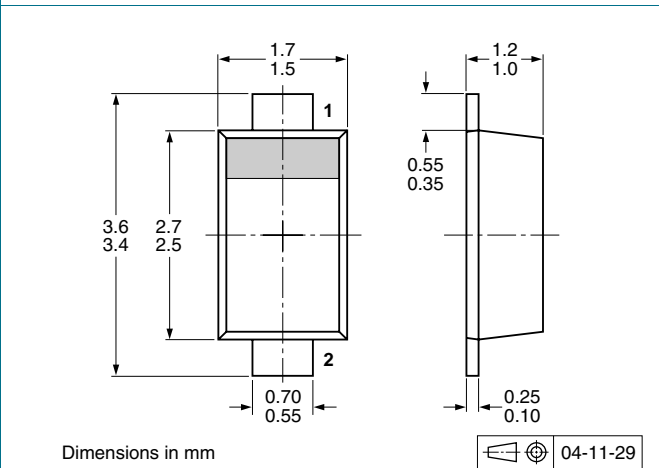


Fig 8. Package outline SOD123F

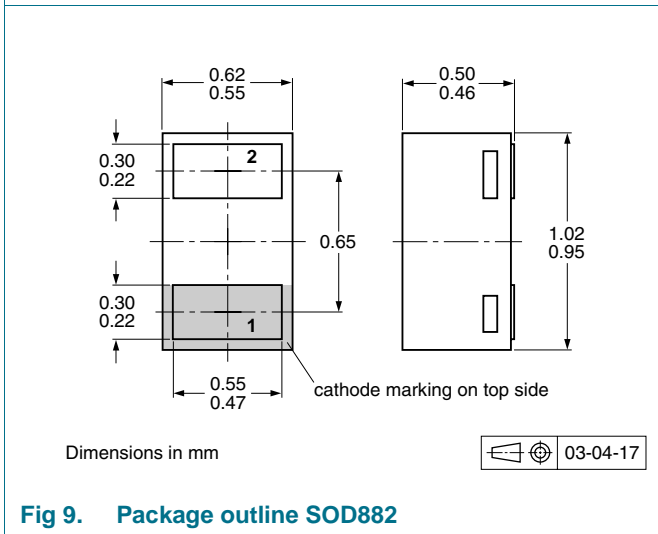


Fig 9. Package outline SOD882

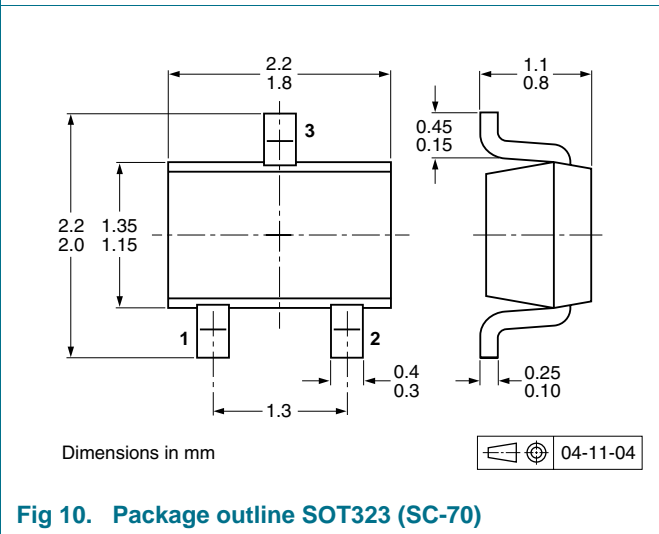
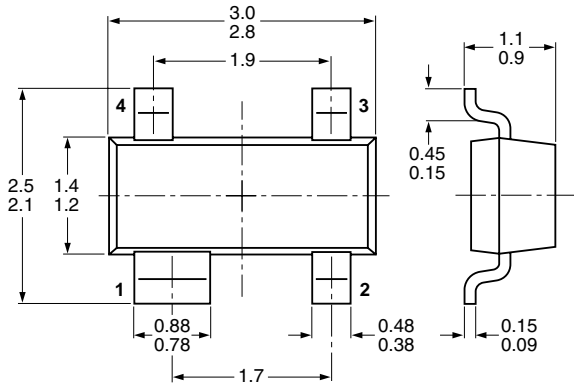
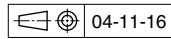


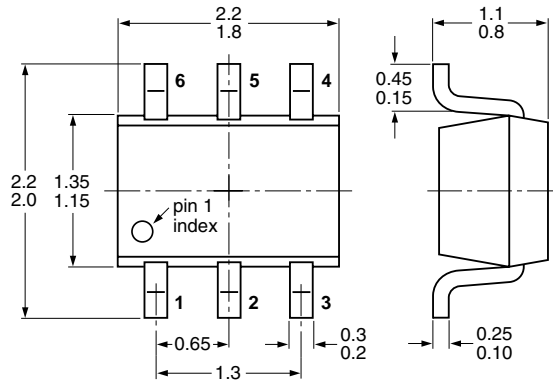
Fig 10. Package outline SOT323 (SC-70)



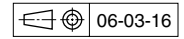
Dimensions in mm



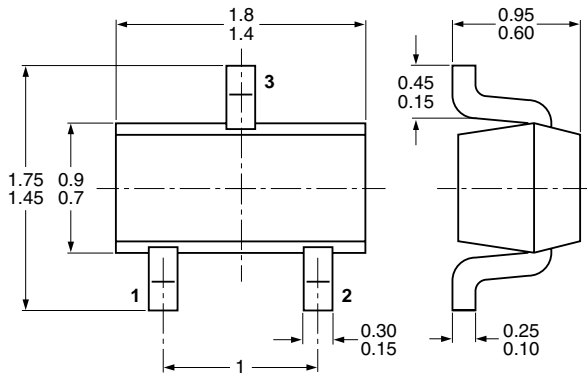
**Fig 11. Package outline SOT143B**



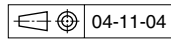
Dimensions in mm



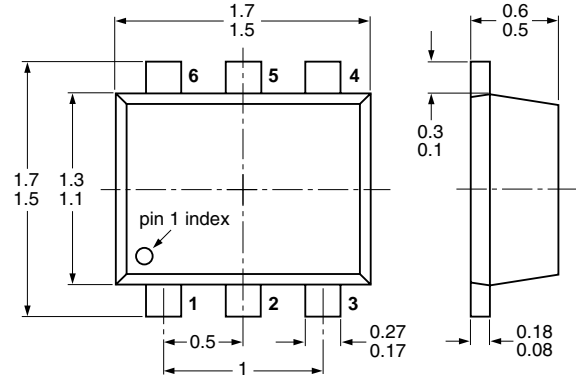
**Fig 12. Package outline SOT363 (SC-88)**



Dimensions in mm



**Fig 13. Package outline SOT416 (SC-75)**



Dimensions in mm



**Fig 14. Package outline SOT666**

## 9. Packing information

**Table 9. Packing methods**

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

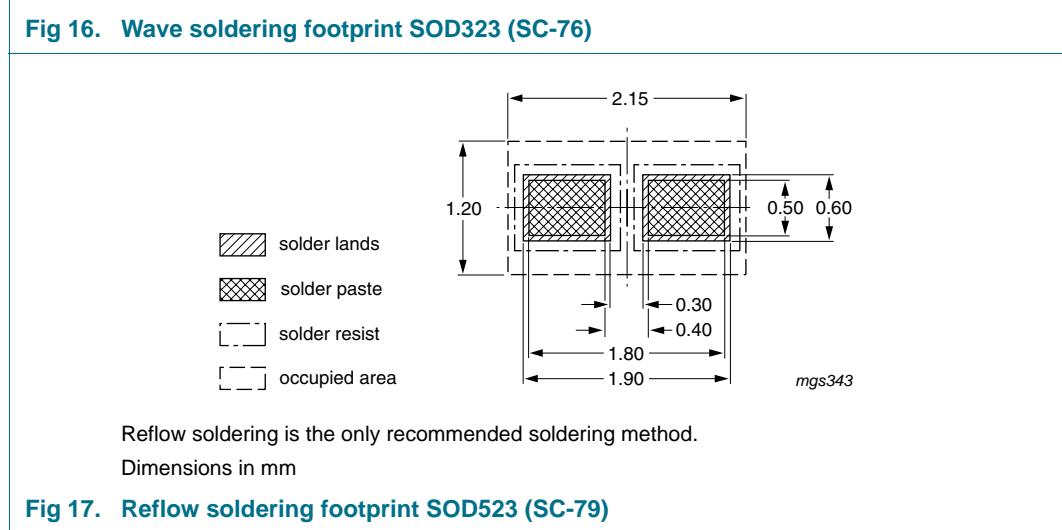
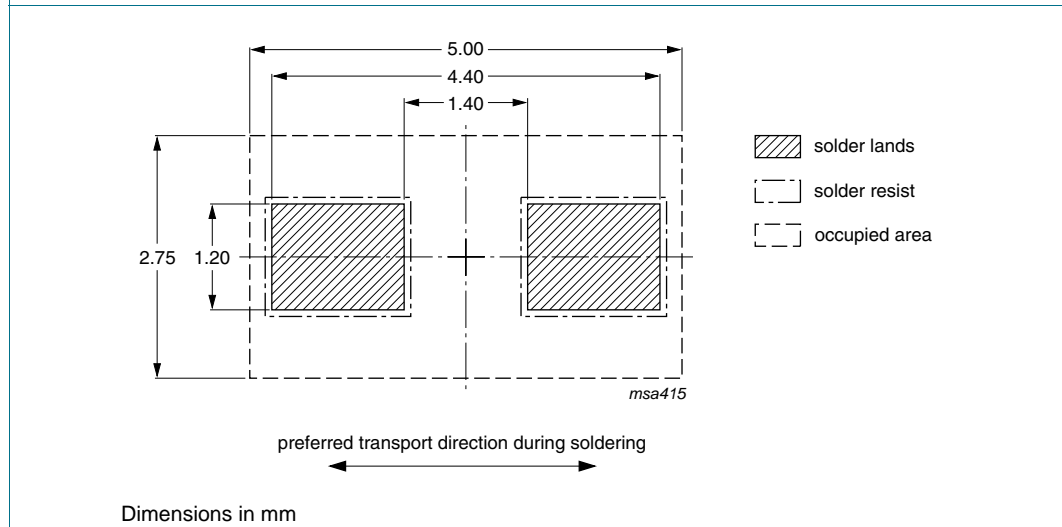
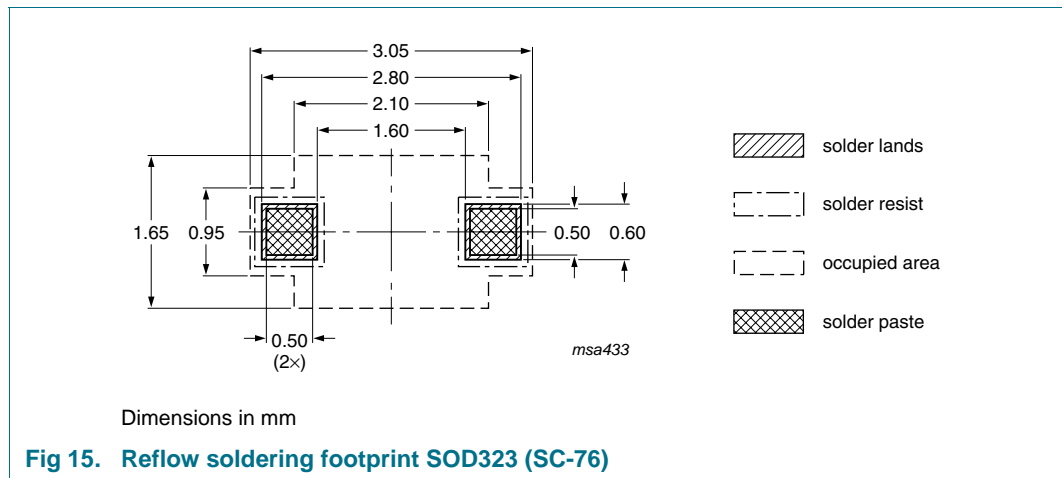
Type number	Package	Description	Packing quantity			
			3000	4000	8000	10000
1PS70SB40	SOT323	4 mm pitch, 8 mm tape and reel	-115	-	-	-135
1PS76SB40	SOD323	4 mm pitch, 8 mm tape and reel	-115	-	-	-135
1PS79SB40	SOD523	2 mm pitch, 8 mm tape and reel	-	-	-315	-
		4 mm pitch, 8 mm tape and reel	-115	-	-	-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

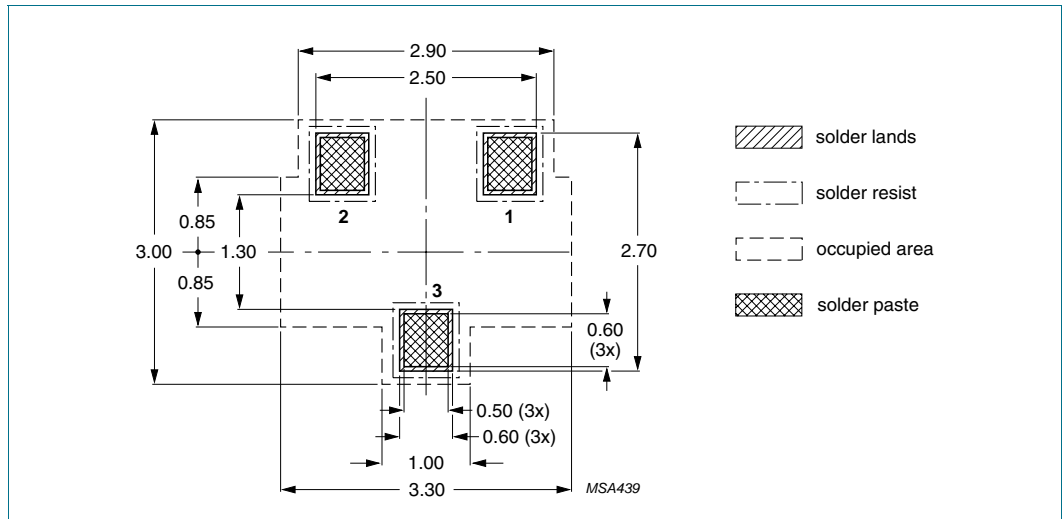
[1] For further information and the availability of packing methods, see [Section 13](#).

[2] T1: normal taping

[3] T2: reverse taping

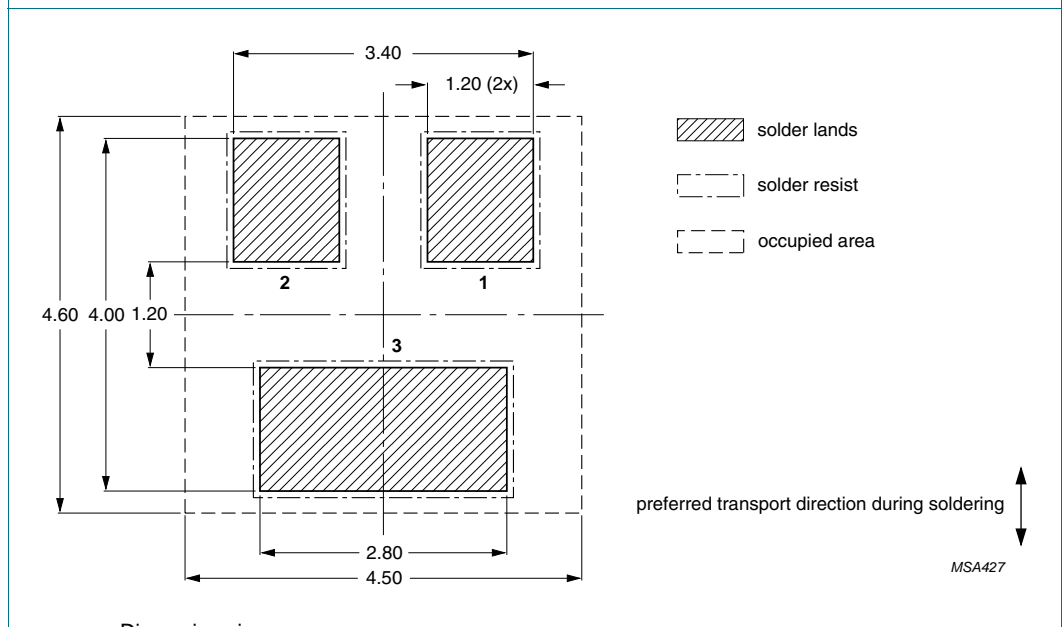
## 10. Soldering





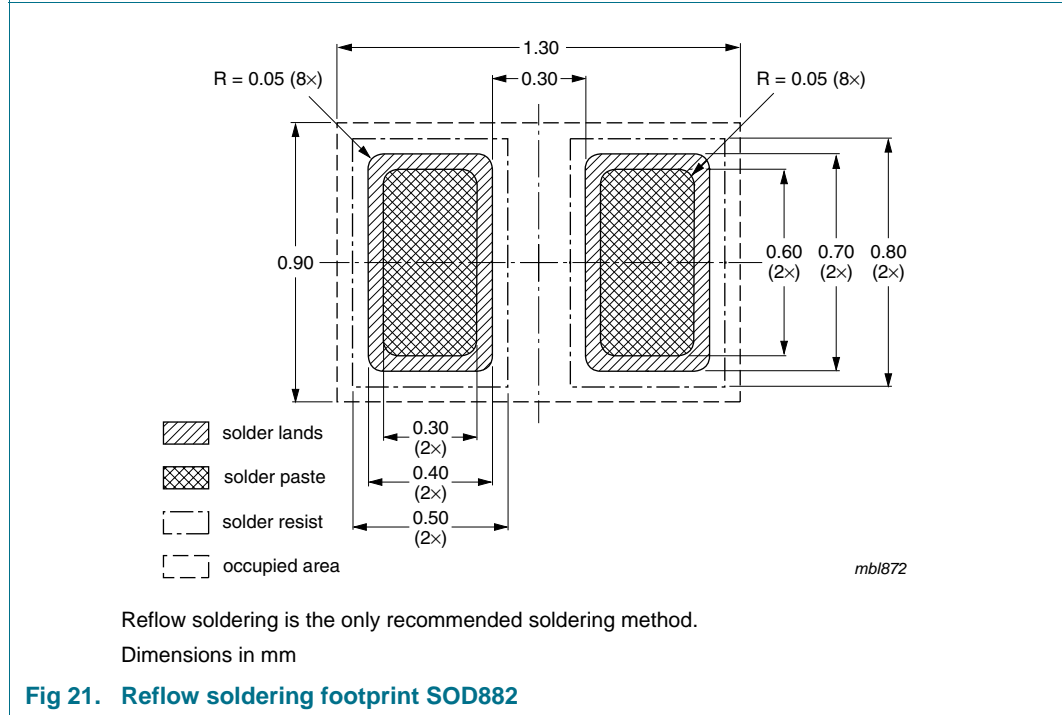
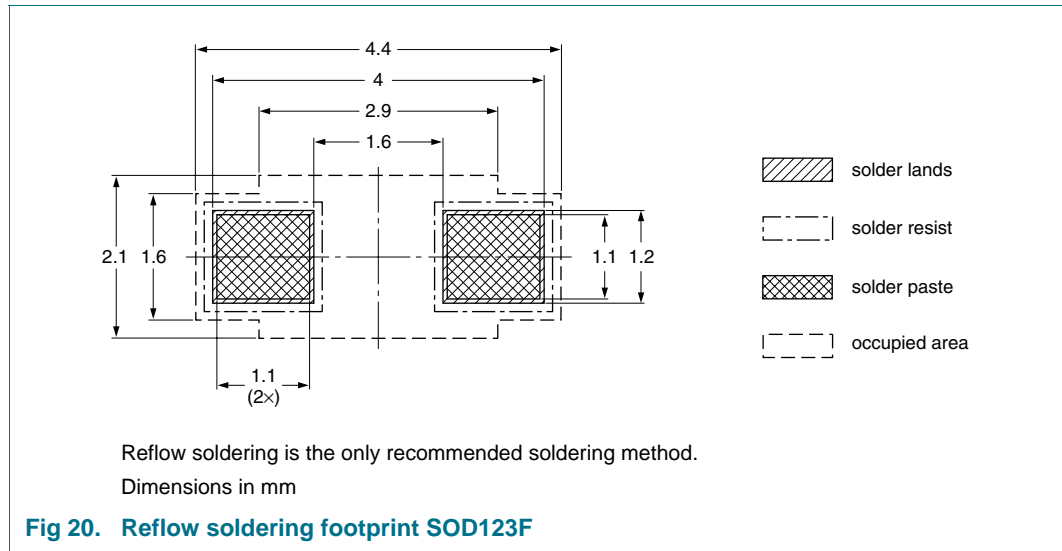
Dimensions in mm

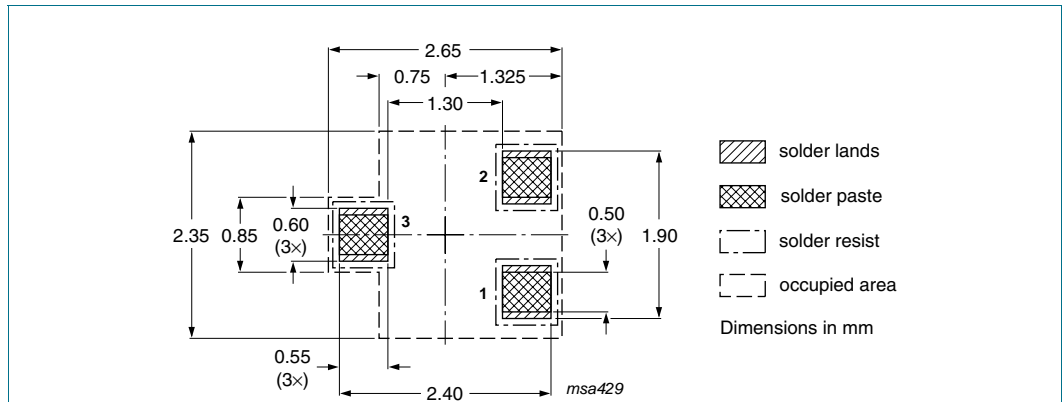
**Fig 18. Reflow soldering footprint SOT23 (TO-236AB)**



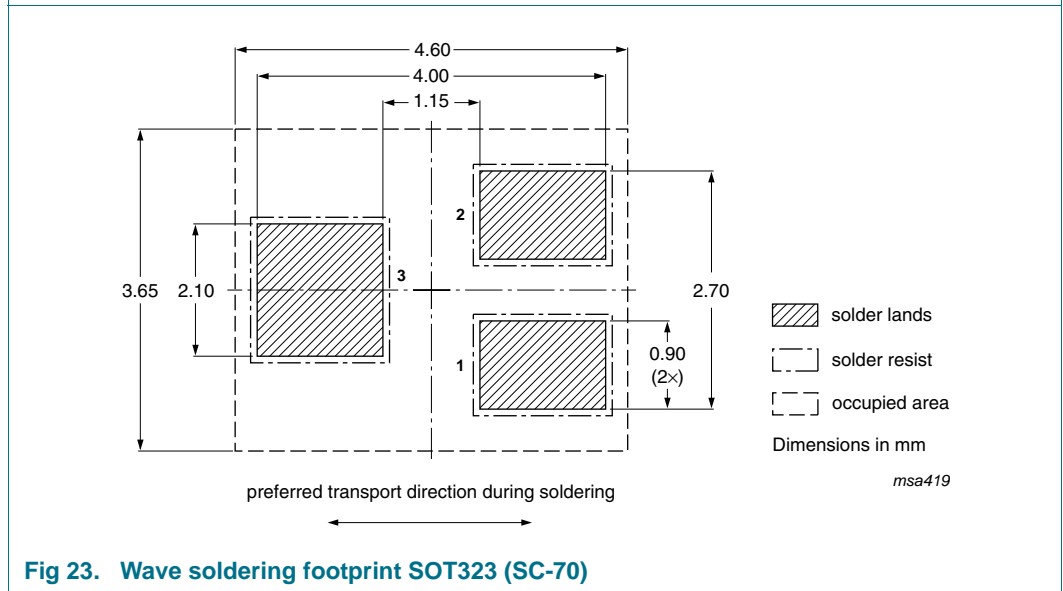
Dimensions in mm

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

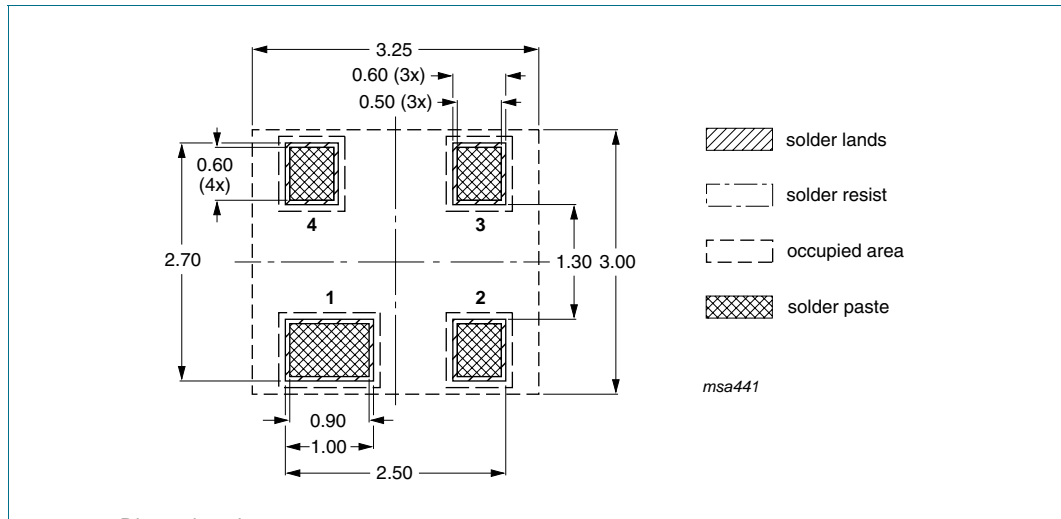




**Fig 22. Reflow soldering footprint SOT323 (SC-70)**

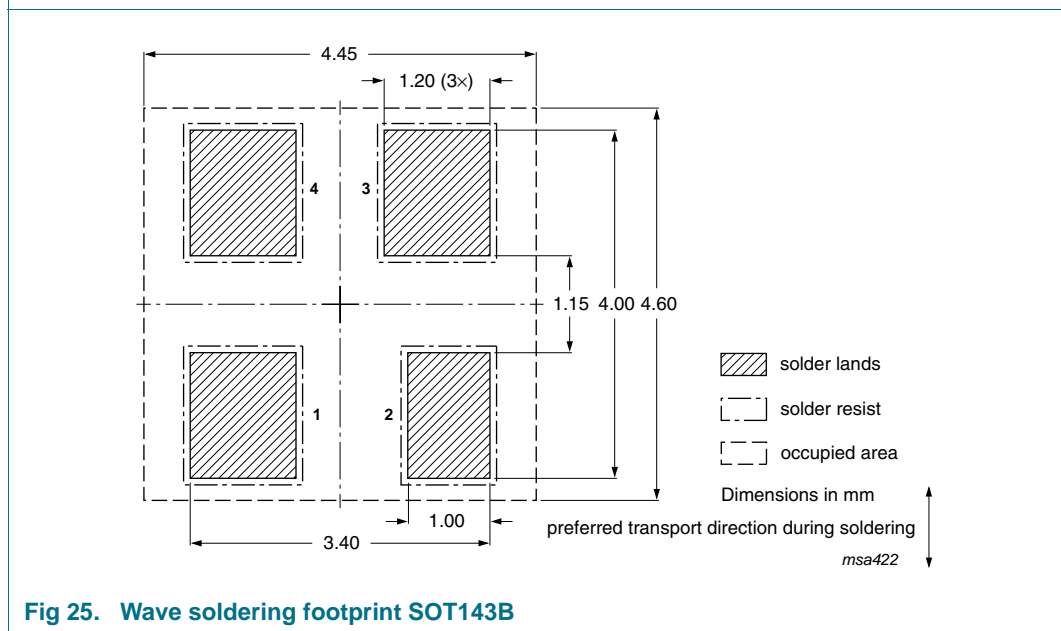


**Fig 23. Wave soldering footprint SOT323 (SC-70)**



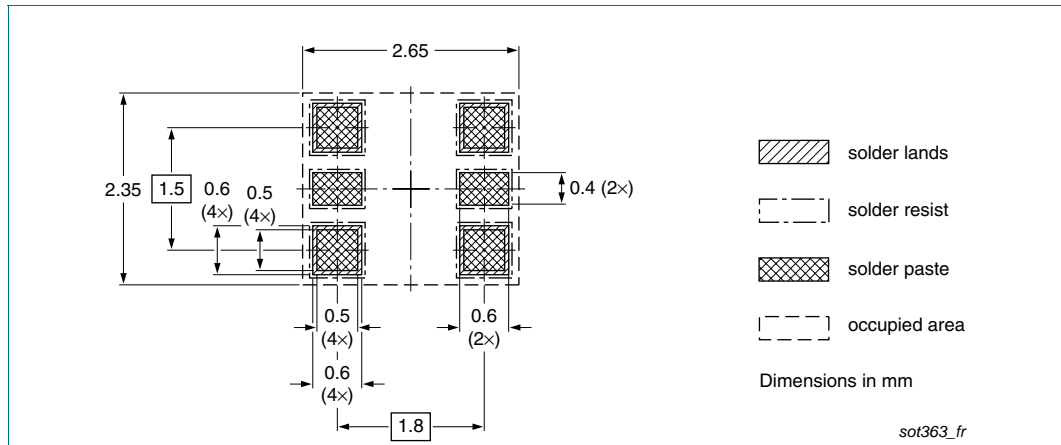
Dimensions in mm

**Fig 24. Reflow soldering footprint SOT143B**

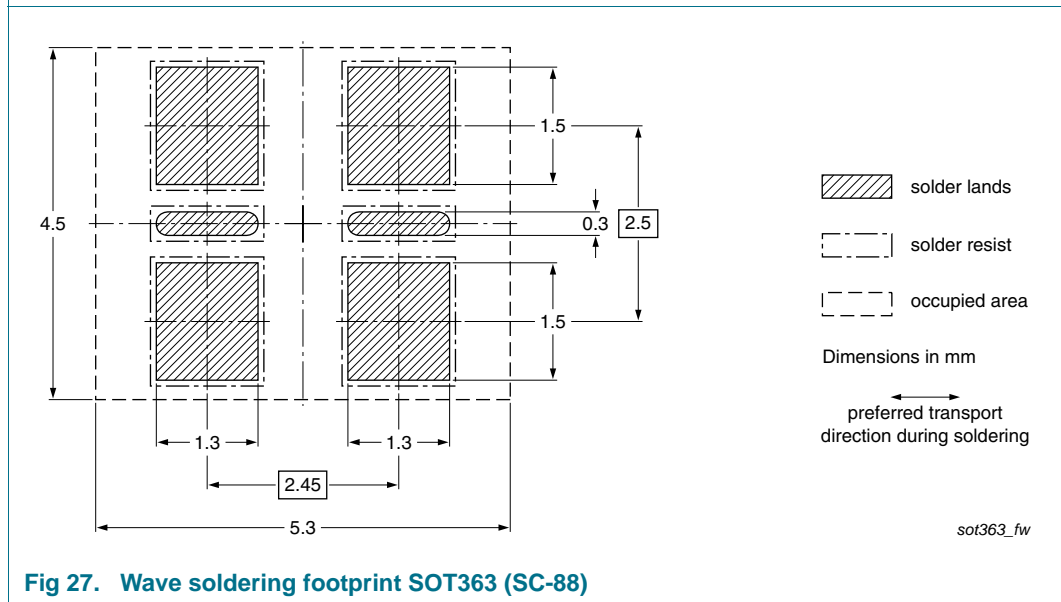


**Fig 25. Wave soldering footprint SOT143B**

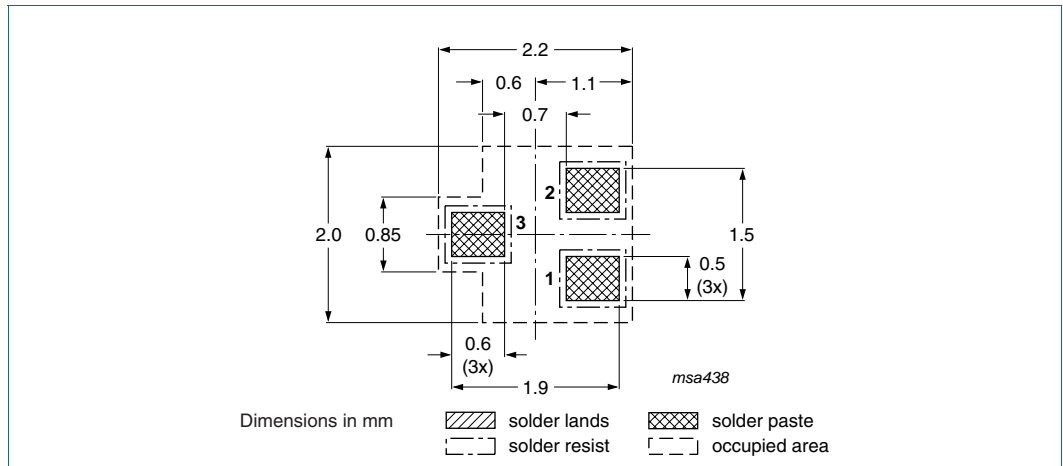




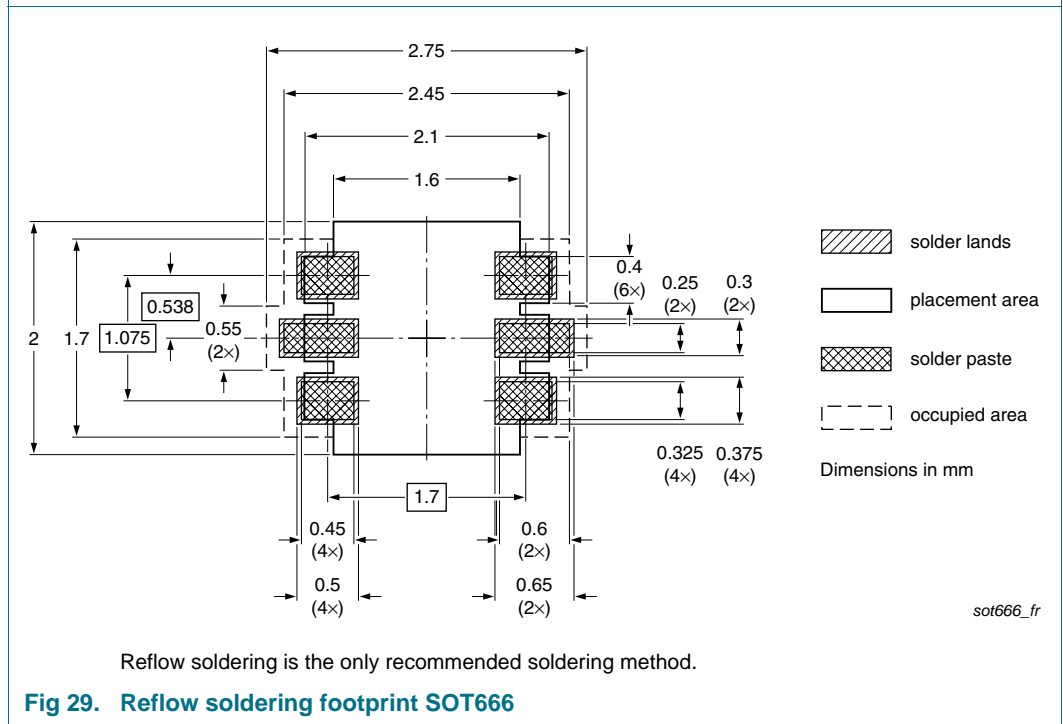
**Fig 26. Reflow soldering footprint SOT363 (SC-88)**



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



**Fig 28. Reflow soldering footprint SOT416**



**Fig 29. Reflow soldering footprint SOT666**

## 11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS40_1PSXXSB4X_SER_8	20100113	Product data sheet	-	BAS40_1PSXXSB4X_SER_7
Modifications:		<ul style="list-style-type: none"> <li>• This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content.</li> <li>• <a href="#">Figure 12 “Package outline SOT363 (SC-88)”</a>: updated</li> <li>• <a href="#">Figure 16 “Wave soldering footprint SOD323 (SC-76)”</a>: updated</li> <li>• <a href="#">Figure 17 “Reflow soldering footprint SOD523 (SC-79)”</a>: updated</li> <li>• <a href="#">Figure 21 “Reflow soldering footprint SOD882”</a>: updated</li> <li>• <a href="#">Figure 22 “Reflow soldering footprint SOT323 (SC-70)”</a>: updated</li> <li>• <a href="#">Figure 23 “Wave soldering footprint SOT323 (SC-70)”</a>: updated</li> <li>• <a href="#">Figure 25 “Wave soldering footprint SOT143B”</a>: updated</li> <li>• <a href="#">Figure 26 “Reflow soldering footprint SOT363 (SC-88)”</a>: updated</li> <li>• <a href="#">Figure 27 “Wave soldering footprint SOT363 (SC-88)”</a>: updated</li> <li>• <a href="#">Figure 28 “Reflow soldering footprint SOT416”</a>: updated</li> <li>• <a href="#">Figure 29 “Reflow soldering footprint SOT666”</a>: updated</li> </ul>		
BAS40_1PSXXSB4X_SER_7	20060512	Product data sheet	-	BAS40_1PSXXSB4X_SER_6
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## 12. Legal information

### 12.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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