

BAS40 series; 1PSxxSB4x series

General-purpose Schottky diodes

Rev. 07 — 12 May 2006

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
	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/ common cathode
1PS88SB48	SOT363	SC-88	quadruple common cathode/ 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 _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 ≤ 300 μs; δ ≤ 0.02.

2. Pinning information

Table 3. Pinning

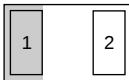
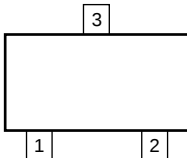
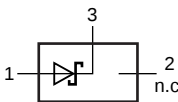
Pin	Description	Simplified outline	Symbol
BAS40H; 1PS76SB40; 1PS79SB40			
1	cathode		 sym001
2	anode		
001aab540			
BAS40L			
1	cathode		 sym001
2	anode		
Transparent top view			
BAS40; BAS40W; 1PS70SB40			
1	anode		 006aaa436
2	not connected		
3	cathode		
006aaa144			

Table 3. Pinning ...continued

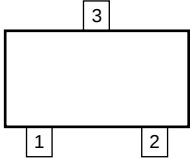
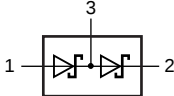
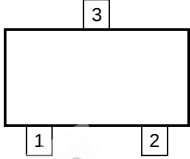
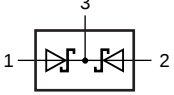
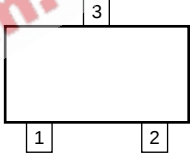
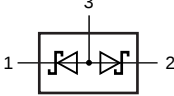
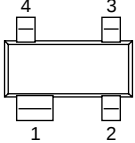
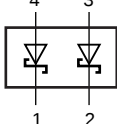
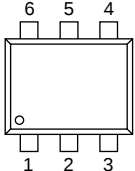
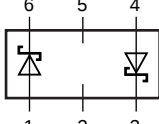
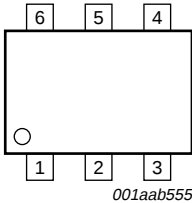
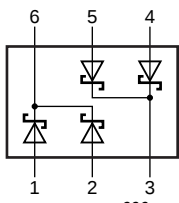
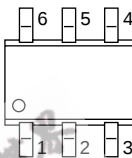
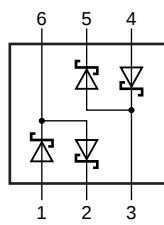
Pin	Description	Simplified outline	Symbol
BAS40-04; BAS40-04W; 1PS70SB44			
1	anode (diode 1)		
2	cathode (diode 2)		
3	cathode (diode 1), anode (diode 2)		
		006aaa144	006aaa437
BAS40-05; BAS40-05W; 1PS70SB45; 1PS75SB45			
1	anode (diode 1)		
2	anode (diode 2)		
3	cathode (diode 1), cathode (diode 2)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

Table 3. Pinning ...continued

Pin	Description	Simplified outline	Symbol
BAS40-05V; 1PS88SB48			
1	anode (diode 1)	 001aab555	 006aaa446
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)		
BAS40XY			
1	anode (diode 1)	 006aaa256	 006aaa256
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		
	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

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	$t_p \leq 1 \text{ s}; \delta \leq 0.5$	-	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
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.

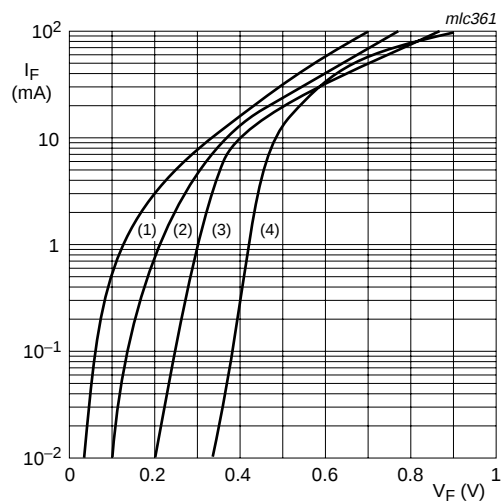
7. Characteristics

Table 8. Characteristics

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

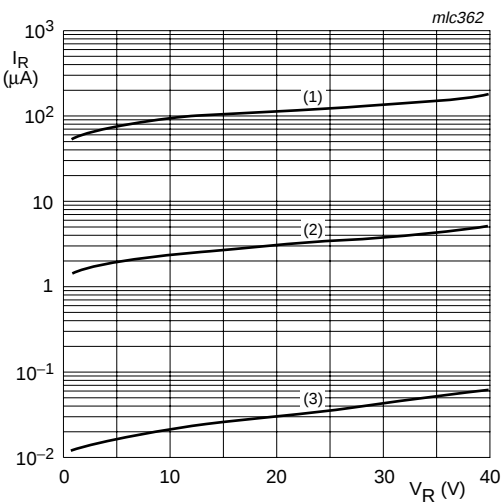
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_F	forward voltage		[1]			
		$I_F = 1\text{ mA}$	-	-	380	mV
		$I_F = 10\text{ mA}$	-	-	500	mV
		$I_F = 40\text{ mA}$	-	-	1	V
I_R	reverse current	$V_R = 30\text{ V}$	-	-	1	μA
		$V_R = 40\text{ V}$	-	-	10	μA
C_d	diode capacitance	$V_R = 0\text{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

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



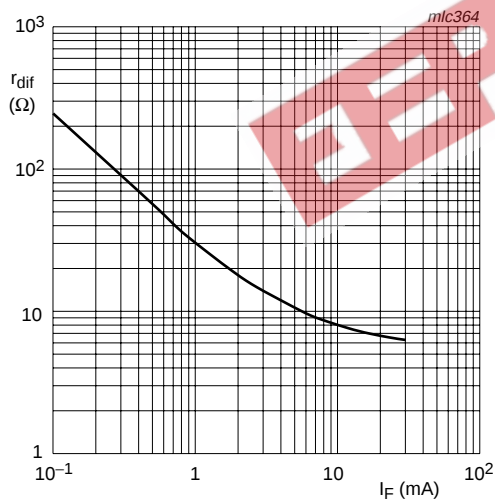
- (1) $T_{amb} = 125^\circ\text{C}$
- (2) $T_{amb} = 85^\circ\text{C}$
- (3) $T_{amb} = 25^\circ\text{C}$
- (4) $T_{amb} = -40^\circ\text{C}$

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



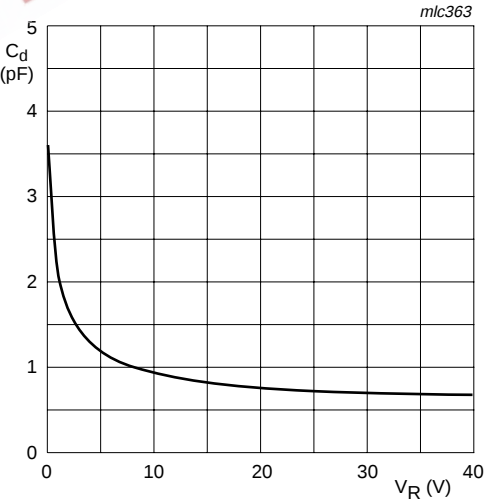
- (1) $T_{amb} = 125^\circ\text{C}$
- (2) $T_{amb} = 85^\circ\text{C}$
- (3) $T_{amb} = 25^\circ\text{C}$

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



$f = 10\text{ kHz}$

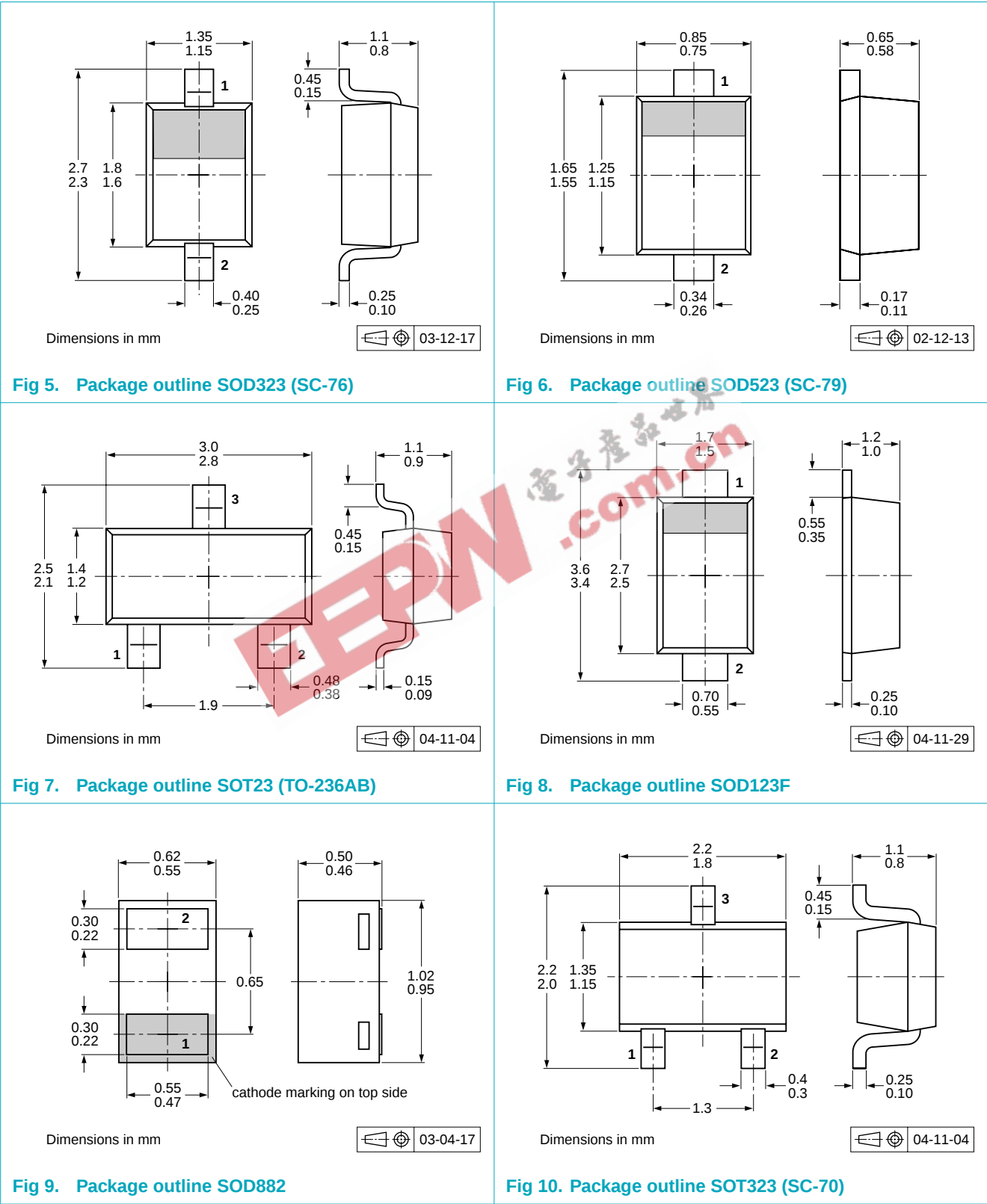
Fig 3. Differential resistance as a function of forward current; typical values

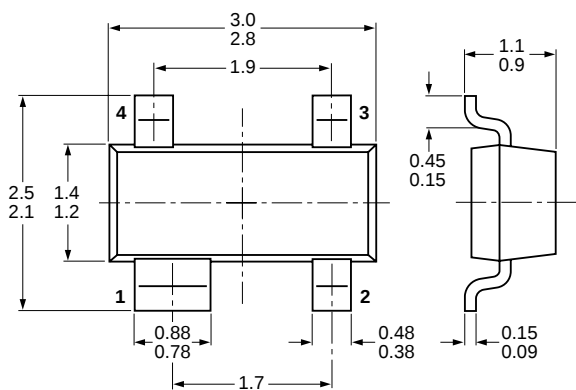


$T_{amb} = 25^\circ\text{C}; f = 1\text{ MHz}$

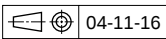
Fig 4. Diode capacitance as a function of reverse voltage; typical values

8. Package outline



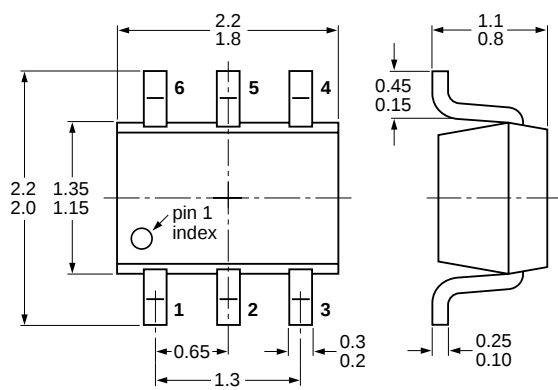


Dimensions in mm

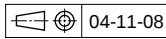


04-11-16

Fig 11. Package outline SOT143B

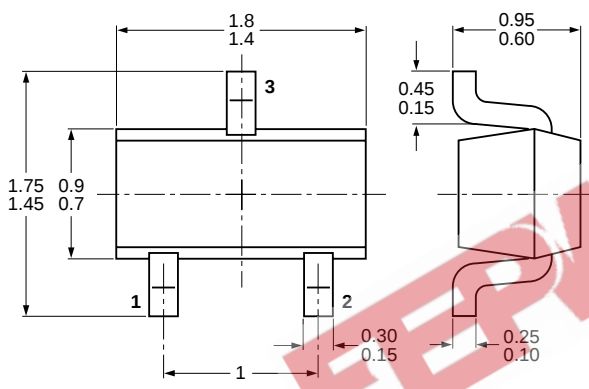


Dimensions in mm

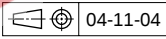


04-11-08

Fig 12. Package outline SOT363 (SC-88)

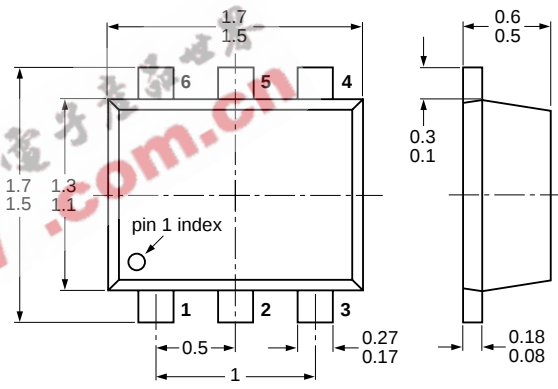


Dimensions in mm



04-11-04

Fig 13. Package outline SOT416 (SC-75)



Dimensions in mm



04-11-08

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.^[1]

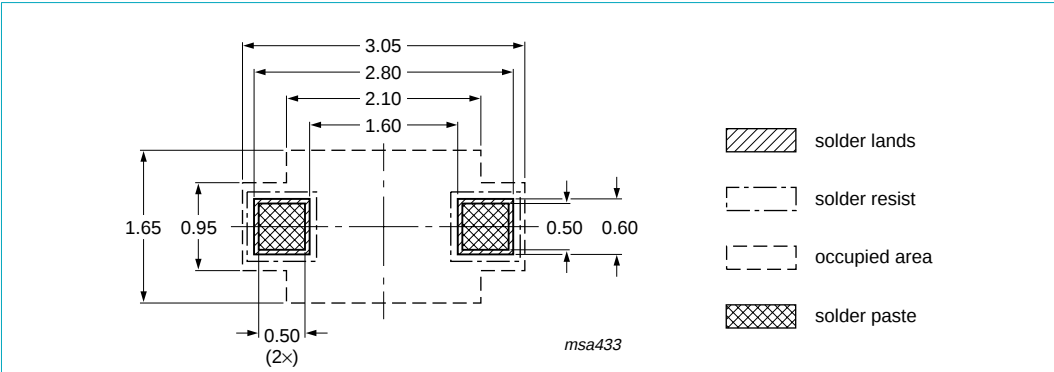
Type number	Package	Description	Packing quantity			
			3000	4000	8000	10000
1PS70SB40	SOT323	4 mm pitch, 8 mm tape and reel	-115	-	-	-135
1PS76SB40	SOD323	4 mm pitch, 8 mm tape and reel	-115	-	-	-135
1PS79SB40	SOD523	2 mm pitch, 8 mm tape and reel	-	-	-315	-
		4 mm pitch, 8 mm tape and reel	-115	-	-	-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 13](#).

[2] T1: normal taping

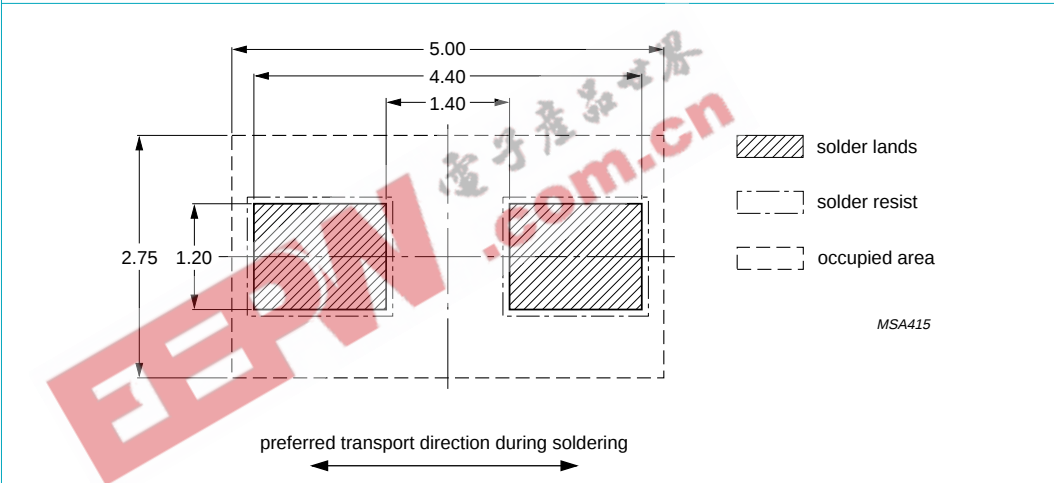
[3] T2: reverse taping

10. Soldering



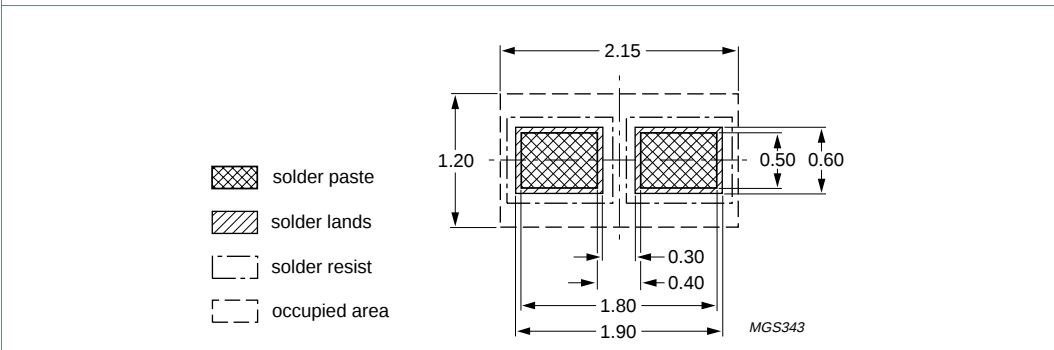
Dimensions in mm

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)

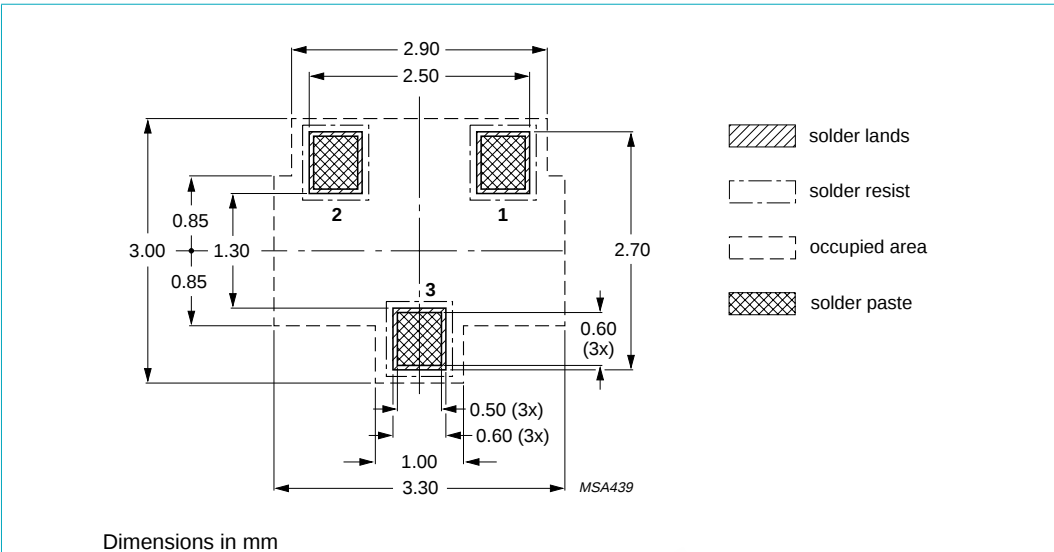


Fig 18. Reflow soldering footprint SOT23 (TO-236AB)

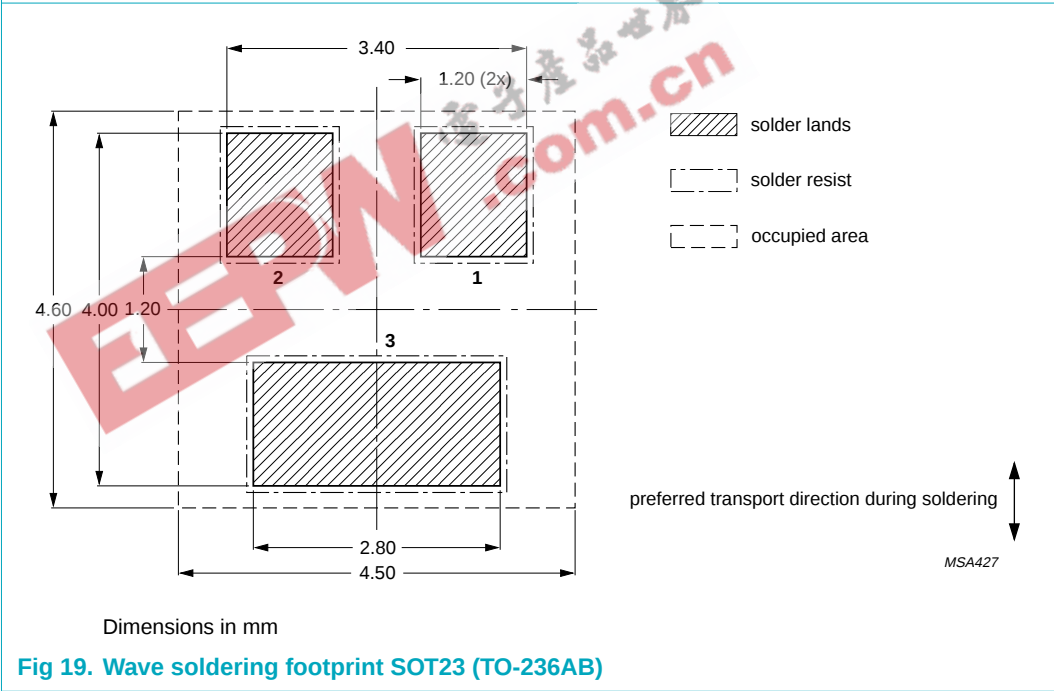
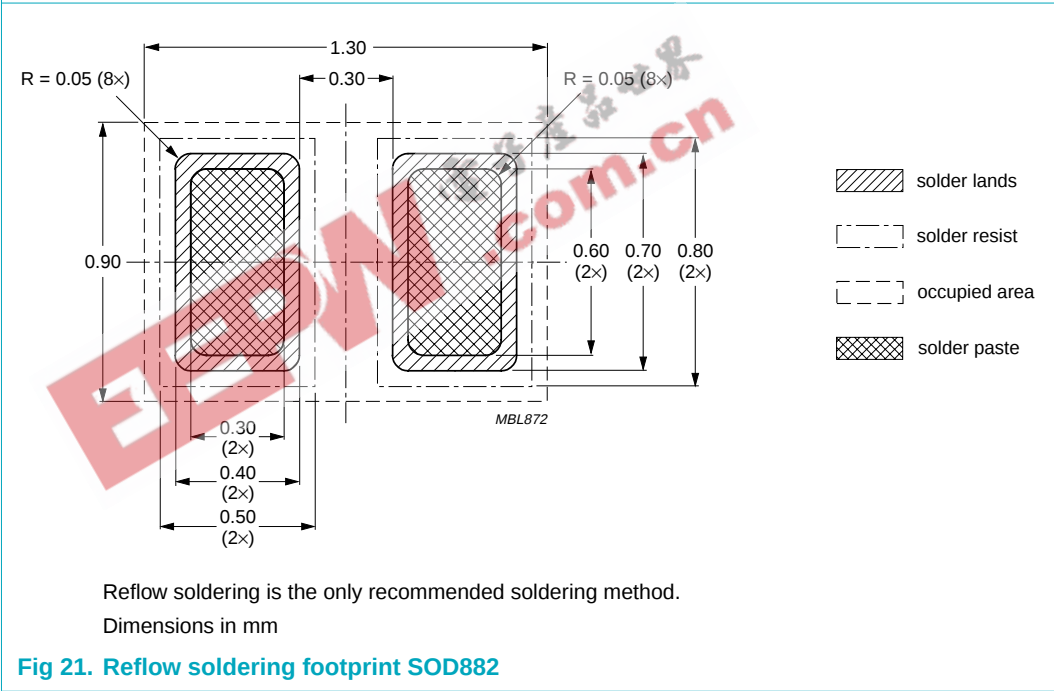
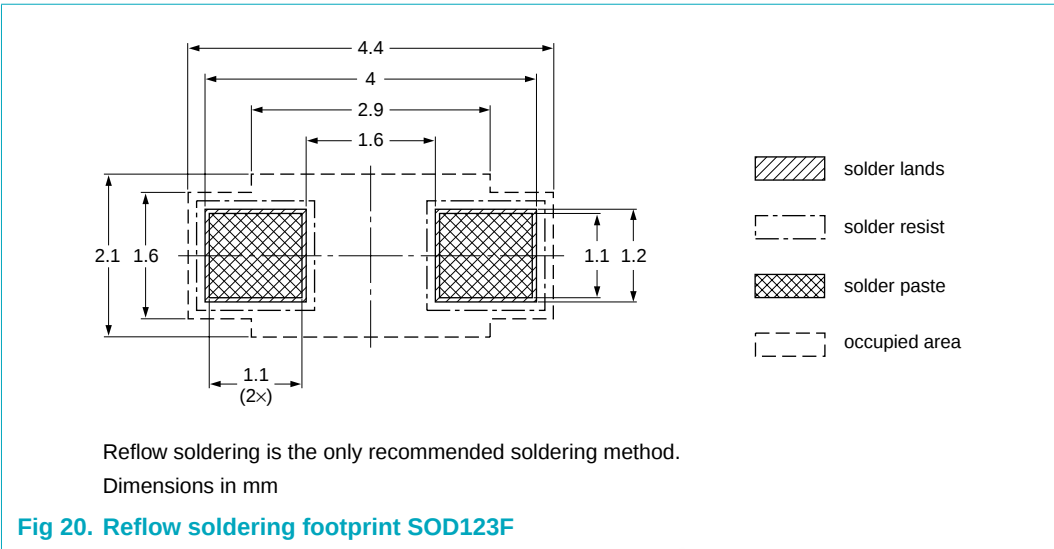
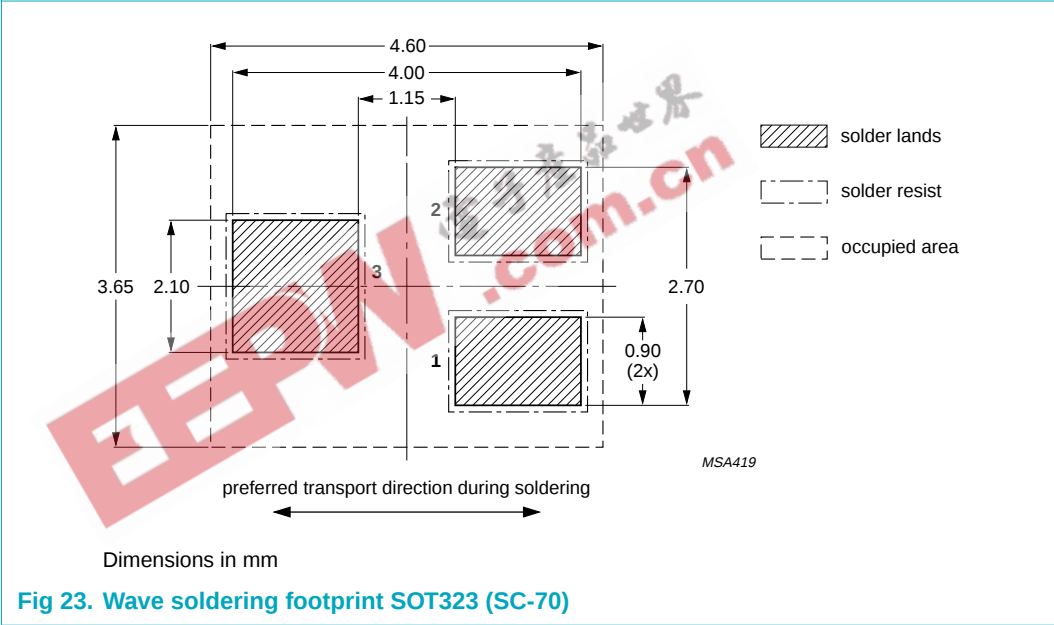
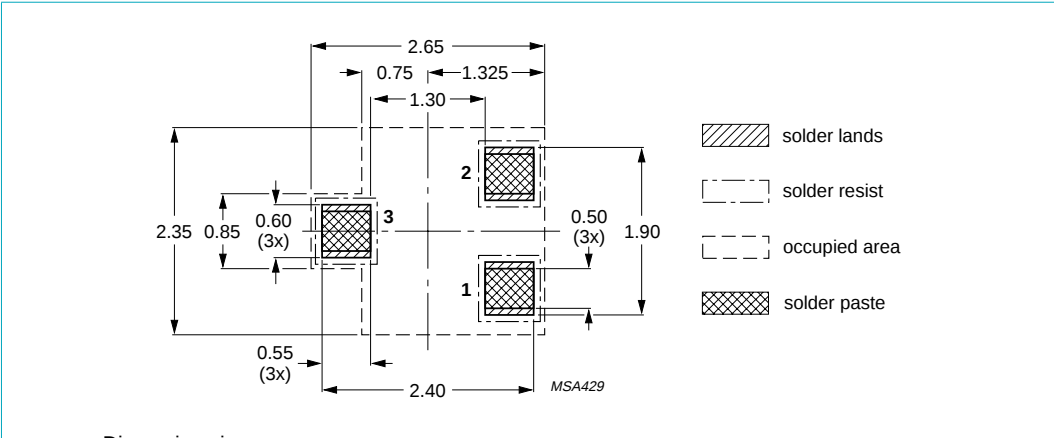
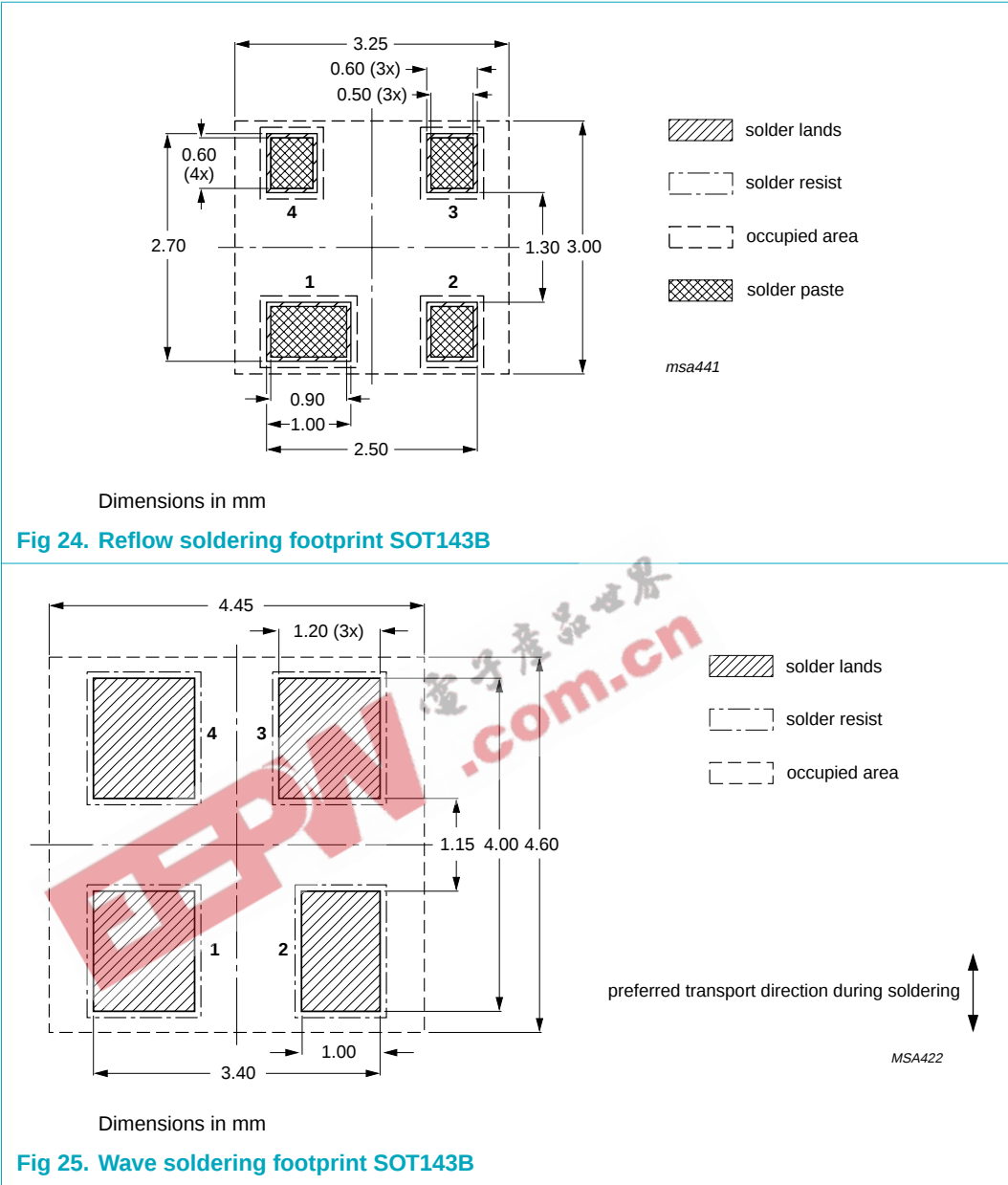
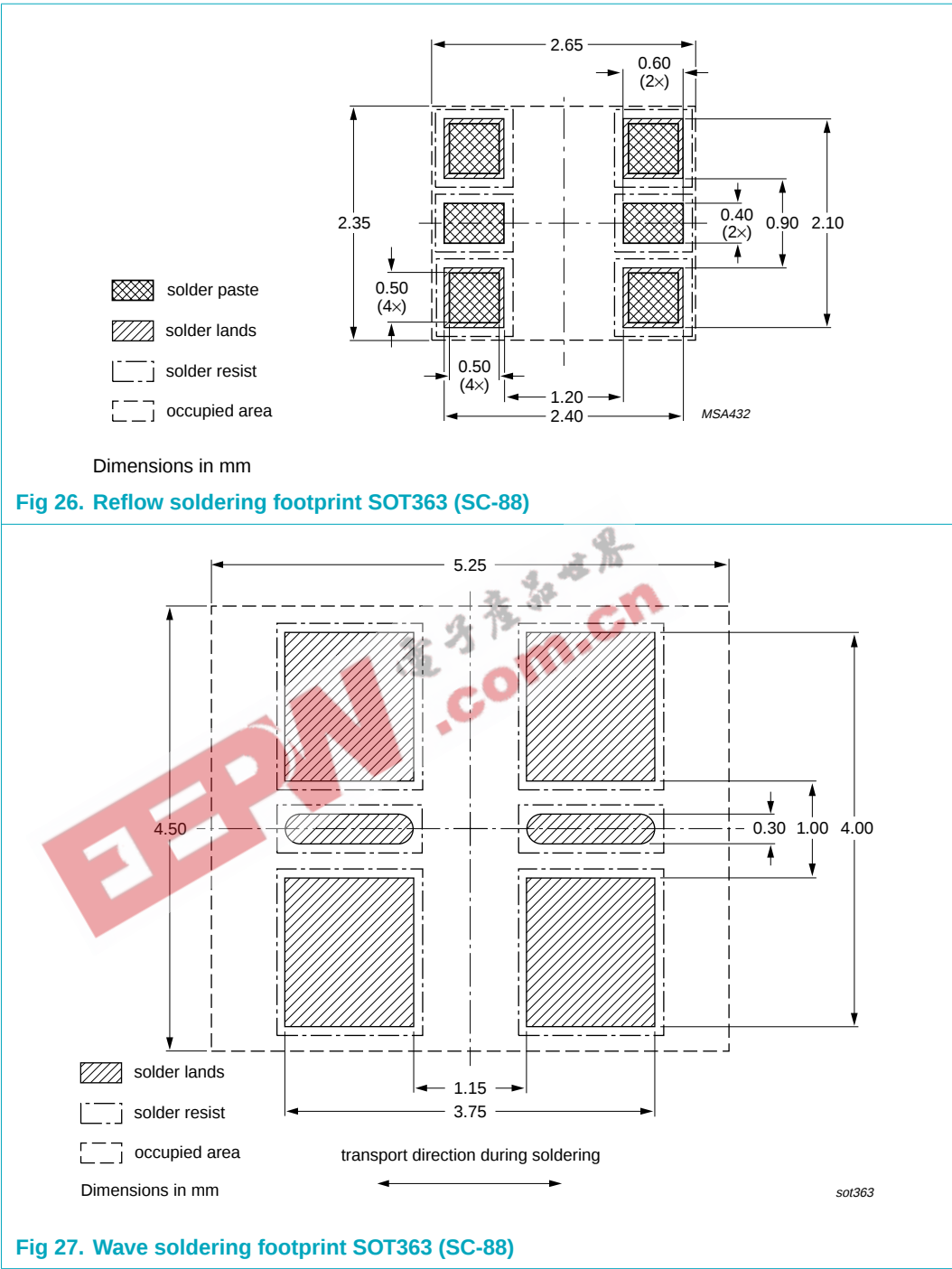


Fig 19. Wave soldering footprint SOT23 (TO-236AB)









11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS40_1PSXXSB4X_SER_7	20060512	Product data sheet	-	BAS40_1PSXXSB4X_SER_6
Modifications: - Type number BAS40XY added Table 9 "Packing methods": added packing method 2 mm pitch for SOD523 Figure 27 "Wave soldering footprint SOT363 (SC-88)": amended Figure 29 "Reflow soldering footprint SOT666": amended Section 12 "Legal information": updated				
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

12. Legal information

12.1 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".

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Date of release: 12 May 2006

Document identifier: BAS40_1PSXXSB4X_SER_7