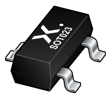


BCW68 series

45 V, 800 mA PNP general-purpose transistor

Rev. 1 — 21 April 2017 **Product data sheet**

1 General description

PNP general-purpose transistors in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

NPN complements: BCW66F/G/H

2 Features and benefits

- High current
- AEC-Q101 qualified

3 Applications

- General-purpose switching and amplification

4 Quick reference data

Table 1. Quick reference data

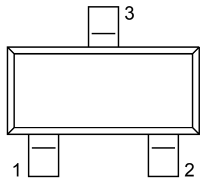
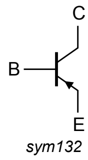
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	-45	V
I_C	collector current			-	-	-800	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	-	-1	A
h_{FE}	DC current gain	V_{CE} = -1 V; I_C = -100 mA; T_{amb} = 25 °C	[1]				
	BCW68F			100	-	250	
	BCW68G			160	-	400	
	BCW68H			250	-	600	

[1] pulsed: $t_p \leq 300$ µs, $\delta \leq 0.02$

nexperia

5 Pinning information

Table 2. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base		
2	E	emitter		
3	C	collector		

6 Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BCW68F	TO-236AB	plastic surface-mounted package; 3 leads	SOT23
BCW68G			
BCW68H			

7 Marking

Table 4. Marking

Type number		Marking code
BCW68F	[1]	ET%
BCW68G	[1]	EU%
BCW68H	[1]	EV%

[1] % = placeholder for manufacturing site code

8 Limiting values

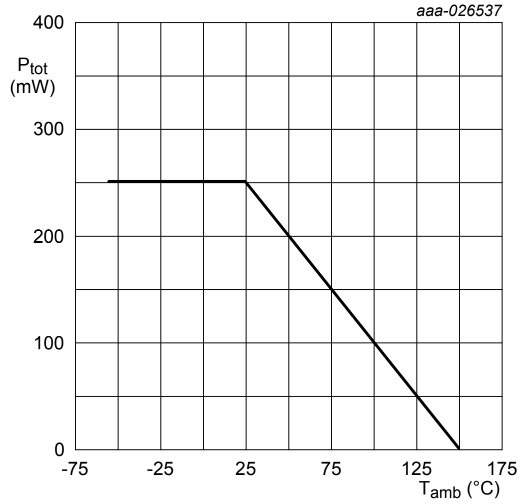
Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CBO}	collector-base voltage	open emitter	-	-50	V
V_{CEO}	collector-emitter voltage	open base	-	-45	V
V_{EBO}	emitter-base voltage	open collector	-	-5	V
I_C	collector current		-	-800	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms	-	-1	A
I_B	base current		-	-100	mA

Symbol	Parameter	Conditions	Min	Max	Unit
I_{BM}	peak base current	single pulse; $t_p \leq 1$ ms	-	-200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C [1]	-	250	mW
T_j	junction temperature		-	150	°C
T_{amb}	ambient temperature		-55	150	°C
T_{stg}	storage temperature		-65	150	°C

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



FR4 PCB, standard footprint

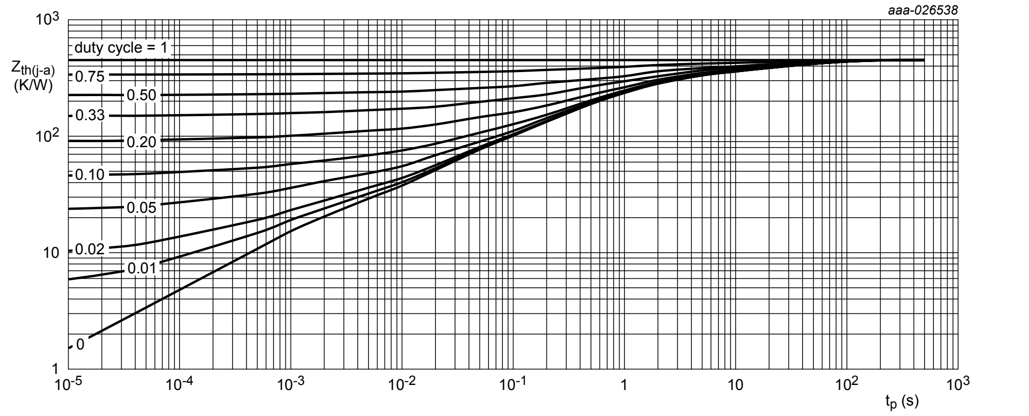
Figure 1. Power derating curve

9 Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air [1]	-	-	500	K/W

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



FR4 PCB, standard footprint

Figure 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10 Electrical characteristics

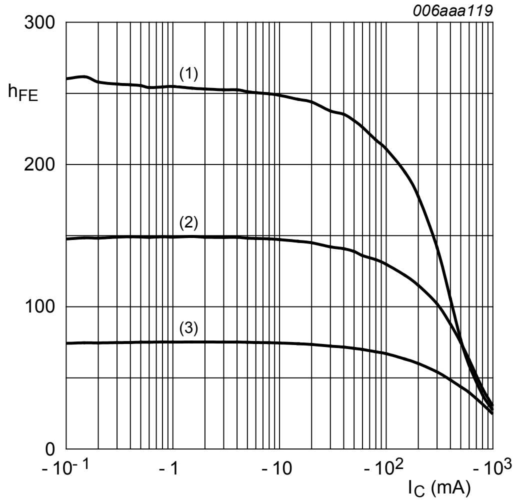
Table 7. Electrical characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = -40 V; I_E = 0 A		-	-	-20	nA
		V_{CB} = -40 V; I_E = 0 A; T_j = 150 °C		-	-	-5	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = -5 V; I_C = 0 A		-	-	-20	nA
h_{FE}	DC current gain						
	BCW68F/G/H	V_{CE} = -1 V; I_C = -100 µA		100	-	-	
	BCW68F/G/H	V_{CE} = -1 V; I_C = -1 mA		100	-	-	
	BCW68F/G/H	V_{CE} = -1 V; I_C = -10 mA		100	-	-	
	BCW68F	V_{CE} = -1 V; I_C = -100 mA	[1]	100	-	250	
	BCW68G			160	-	400	
	BCW68H			250	-	600	
	BCW68F	V_{CE} = -2 V; I_C = -500 mA	[1]	35	-	-	
	BCW68G			60	-	-	
	BCW68H			100	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -100 mA; I_B = -10 mA	[1]	-	-	-350	mV
		I_C = -500 mA; I_B = -50 mA	[1]	-	-	-450	mV
V_{BEsat}	base-emitter saturation voltage	I_C = -100 mA; I_B = -10 mA	[1]	-	-	-1.25	V
		I_C = -500 mA; I_B = -50 mA	[1]	-	-	-1.25	V
f_T	transition frequency	V_{CE} = -5 V; I_C = -10 mA; f = 100 MHz		80	-	-	MHz
C_c	collector capacitance	V_{CB} = -10 V; I_E = i_e = 0 A; f = 1 MHz		-	5	-	pF

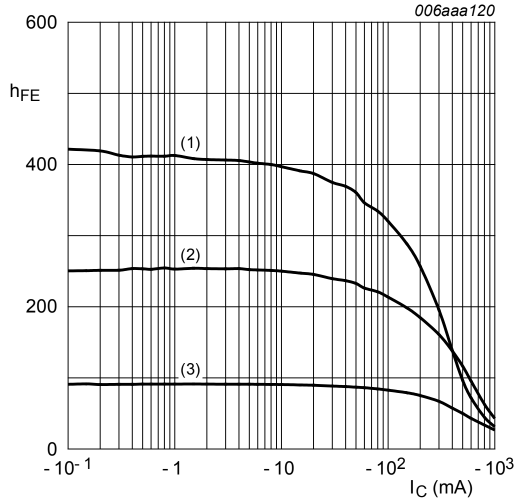
[1] pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02

Table 8.



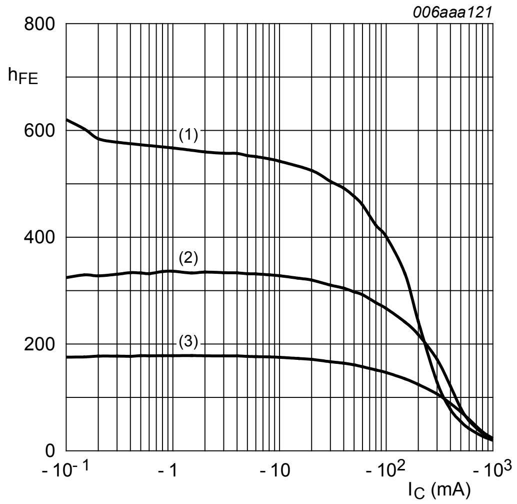
V_{CE} = -1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Figure 3. BCW68F: DC current gain as a function of collector current; typical values



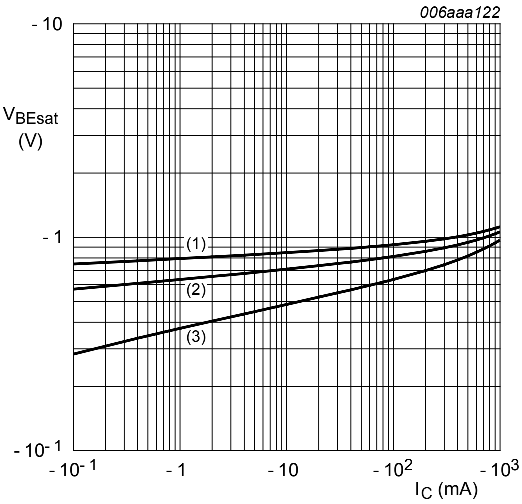
V_{CE} = -1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Figure 4. BCW68G: DC current gain as a function of collector current; typical values



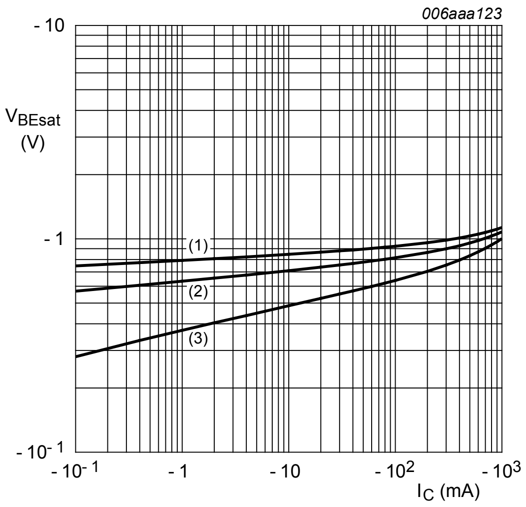
V_{CE} = -1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Figure 5. BCW68H: DC current gain as a function of collector current; typical values



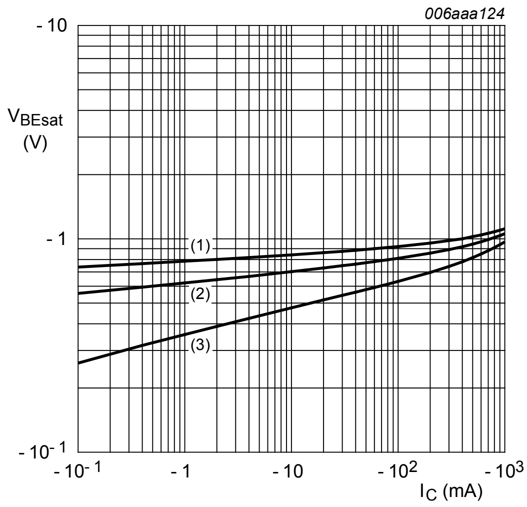
I_C/I_B= 10
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Figure 6. BCW68F: Base-emitter saturation voltage as a function of collector current; typical values



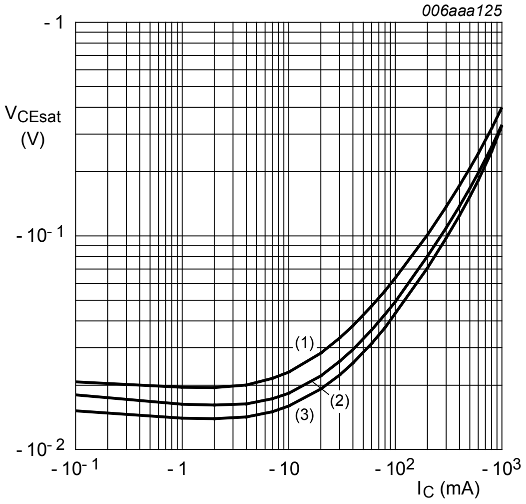
I_C/I_B= 10
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Figure 7. BCW68G: Base-emitter saturation voltage as a function of collector current; typical values



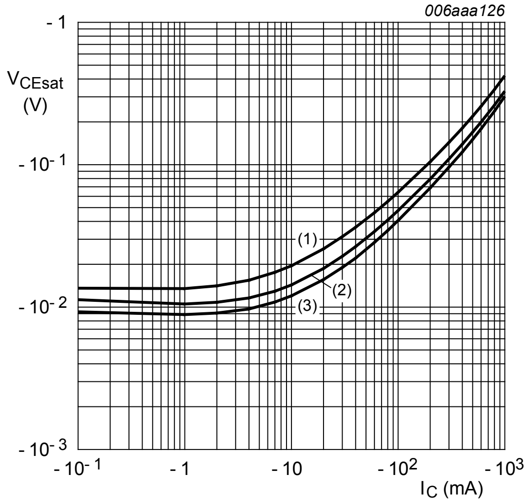
I_C/I_B= 10
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Figure 8. BCW68H: Base-emitter saturation voltage as a function of collector current; typical values



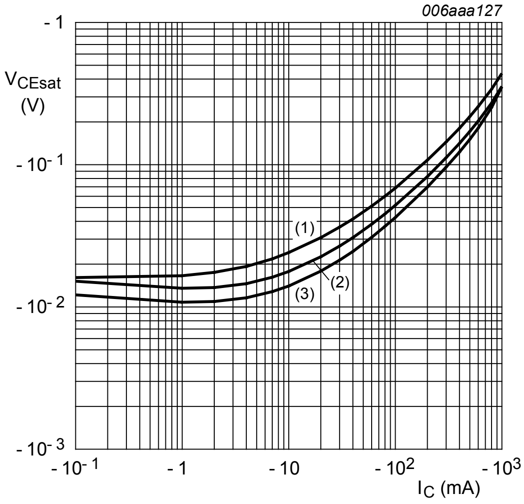
I_C/I_B= 10
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Figure 9. BCW68F: Collector-emitter saturation voltage as a function of collector current; typical values



I_C/I_B= 10
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Figure 10. BCW68G: Collector-emitter saturation voltage as a function of collector current; typical values



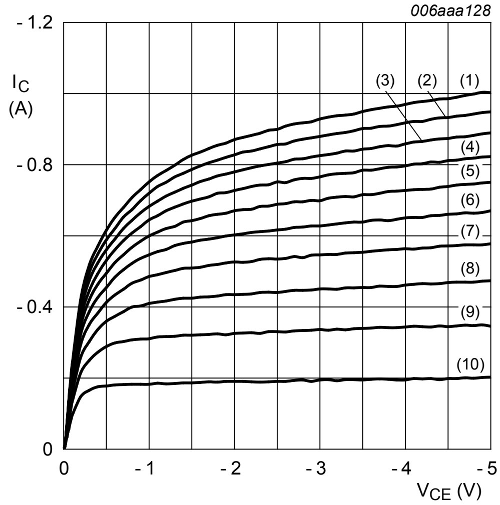
I_C/I_B= 10

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = -55 °C

Figure 11. BCW68H: Collector-emitter saturation voltage as a function of collector current; typical values



T_{amb} = 25 °C

(1) I_B = -16.0 mA

(2) I_B = -14.4 mA

(3) I_B = -12.8 mA

(4) I_B = -11.2 mA

(5) I_B = -9.6 mA

(6) I_B = -8.0 mA

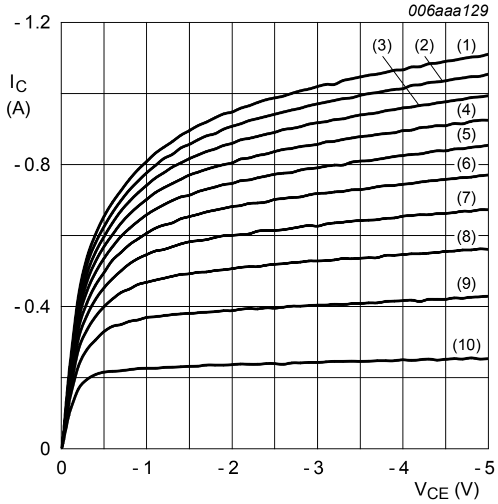
(7) I_B = -6.4 mA

(8) I_B = -4.8 mA

(9) I_B = -3.2 mA

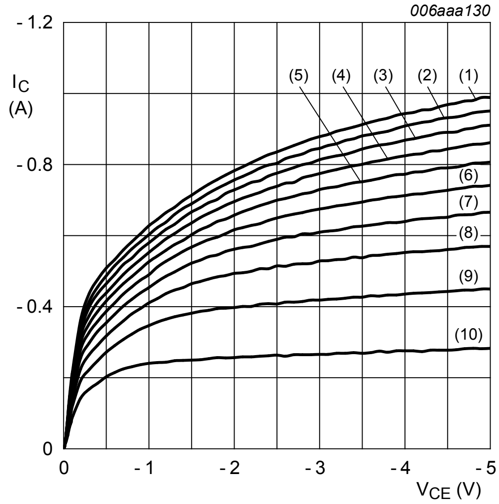
(10) I_B = -1.6 mA

Figure 12. BCW68F: Collector current as a function of collector-emitter voltage; typical values



T_{amb} = 25 °C
(1) I_B = -13.0 mA
(2) I_B = -11.7 mA
(3) I_B = -10.4 mA
(4) I_B = -9.1 mA
(5) I_B = -7.8 mA
(6) I_B = -6.5 mA
(7) I_B = -5.2 mA
(8) I_B = -3.9 mA
(9) I_B = -2.6 mA
(10) I_B = -1.3 mA

Figure 13. BCW68G: Collector current as a function of collector-emitter voltage; typical values



T_{amb} = 25 °C
(1) I_B = -12.0 mA
(2) I_B = -10.8 mA
(3) I_B = -9.6 mA
(4) I_B = -8.4 mA
(5) I_B = -7.2 mA
(6) I_B = -6.0 mA
(7) I_B = -4.8 mA
(8) I_B = -3.6 mA
(9) I_B = -2.4 mA
(10) I_B = -1.2 mA

Figure 14. BCW68H: Collector current as a function of collector-emitter voltage; typical values

11 Test information

11.1 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.

12 Package outline

Table 9. Package outline

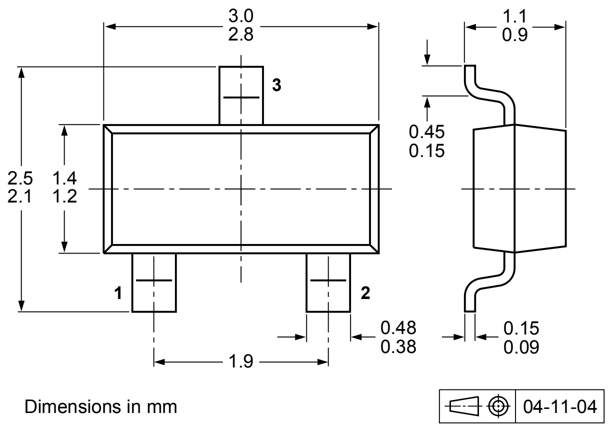


Figure 15. Package outline TO-236 (SOT23)

13 Soldering

Table 10. Soldering

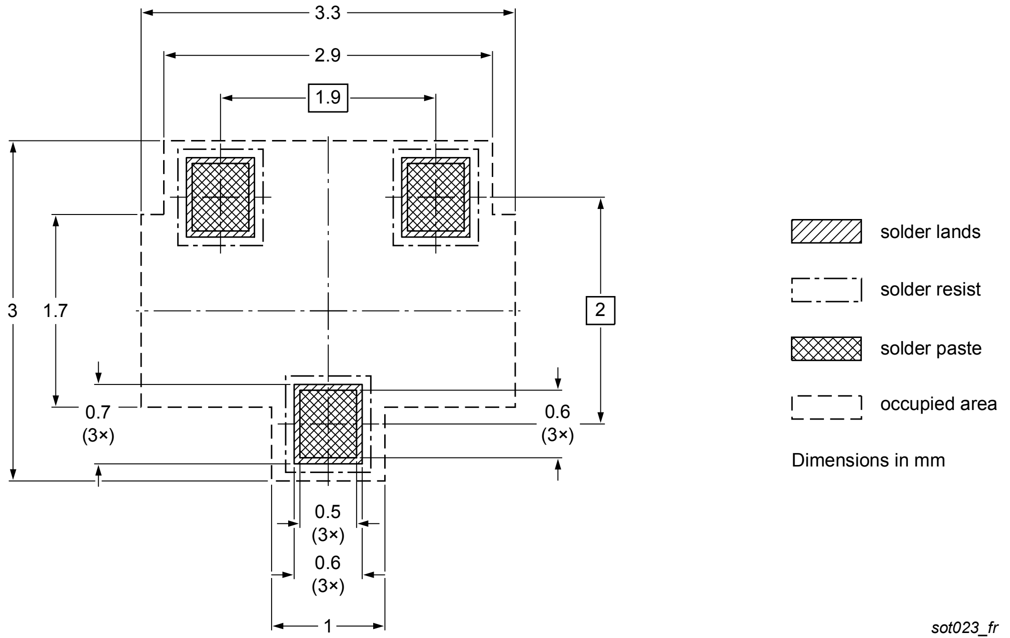


Figure 16. Reflow soldering footprint for SOT23 (TO-236AB)

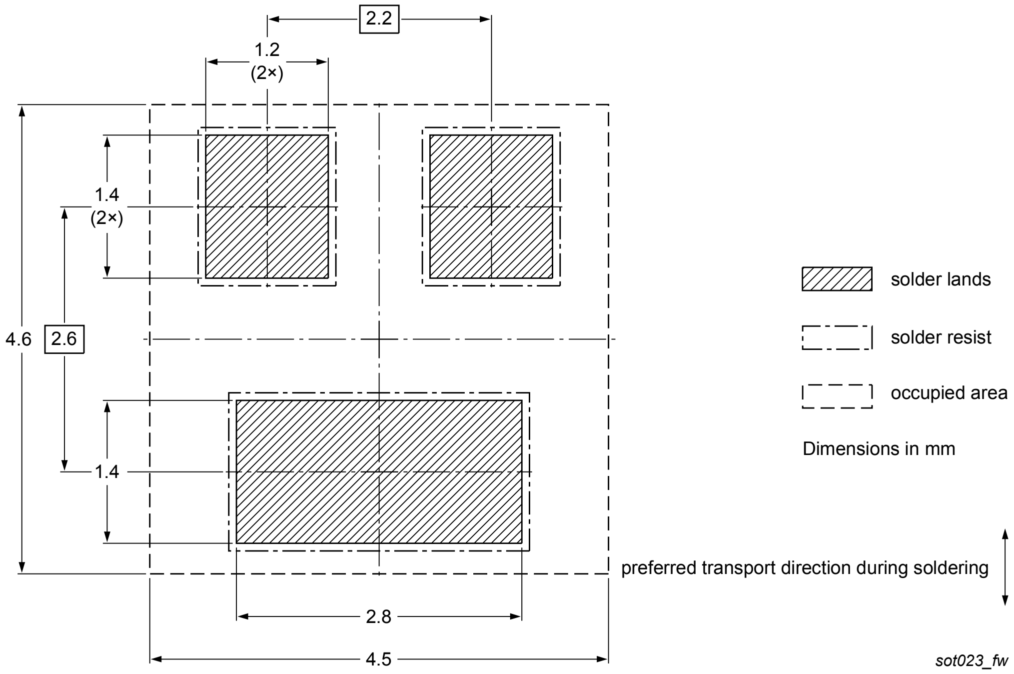


Figure 17. Wave soldering footprint for SOT23 (TO-236AB)

14 Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BCW68X_SER v.1	20170421	Product data sheet	-	-

15 Legal information

15.1 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.

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Contents

Date of release: 21 April 2017
Document identifier: BCW68X_SER

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.