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BC807L; BC807LW

45 V, 500 mA PNP general-purpose transistors

Rev. 1 — 5 January 2018 Product data sheet

1 Product profile

1.1 General description

PNP general-purpose transistors in a small SOT23 (TO-236AB) or SOT323 (SC-70) Surface-Mounted Device (SMD) plastic package.

Table 1. Product overview

Type number	Package		
	Nexperia	JEITA	JEDEC
BC807-16L	SOT23	-	TO-236AB
BC807-25L			
BC807-40L			
BC807-16LW	SOT323	SC70	-
BC807-25LW			
BC807-40LW			

1.2 Features and benefits

- High current
- Three current gain selections
- AEC-Q101 qualified

1.3 Applications

- General-purpose switching and amplification

1.4 Quick reference data

Table 2. Quick reference data

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

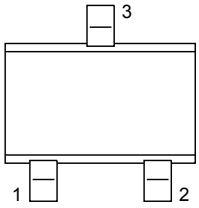
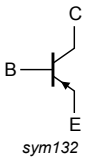
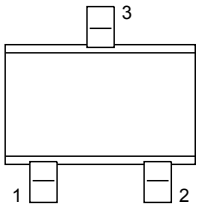
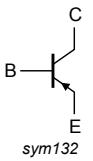
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	-45	V
I_C	collector current			-	-	-500	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	-	-1	A

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
h_{FE}	DC current gain	V_{CE} = -1 V; I_C = -100 mA					
	BC807-16L; BC807-16LW		[1]	100	-	250	-
	BC807-25L; BC807-25LW		[1]	160	-	400	-
	BC807-40L; BC807-40LW		[1]	250	-	600	-

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

2 Pinning information

Table 3. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
SOT23				
1	B	base		
2	E	emitter		
3	C	collector		
SOT323				
1	B	base		
2	E	emitter		
3	C	collector		

3 Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
BC807-16L	TO-236AB	Plastic surface-mounted package; 3 leads	SOT23
BC807-25L			
BC807-40L			
BC807-16LW	SC70		SOT323
BC807-25LW			
BC807-40LW			

4 Marking

Table 5. Marking

Type number		Marking code
BC807-16L	[1]	HL%
BC807-25L	[1]	HM%
BC807-40L	[1]	HN%
BC807-16LW	[1]	C3%
BC807-25LW	[1]	C4%
BC807-40LW	[1]	C5%

[1] % = placeholder for manufacturing site code

5 Limiting values

Table 6. 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		-	-7	V
I_C	collector current			-	-500	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	-1	A
I_{BM}	peak base current	single pulse; $t_p \leq 1$ ms		-	-200	mA
P_{tot}	total power dissipation BC807L (SOT23)	$T_{amb} \leq 25$ °C	[1]	-	250	mW
	total power dissipation BC807LW (SOT323)		[1]	-	200	mW

Symbol	Parameter	Conditions	Min	Max	Unit
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 copper; tin-plated and standard footprint.

6 Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient SOT23	in free air	[1]	-	-	500	K/W
	thermal resistance from junction to ambient SOT323		[1]	-	-	625	K/W

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

7 Characteristics

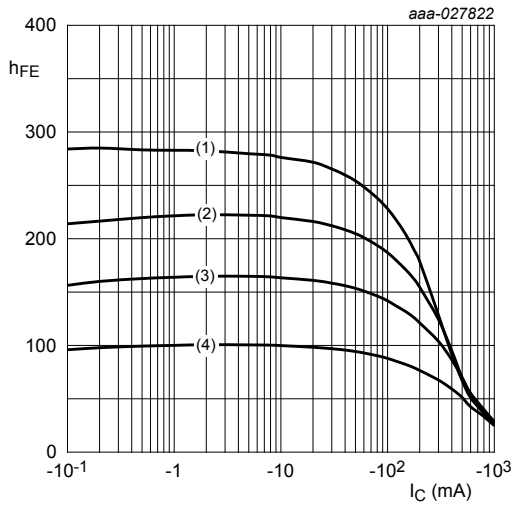
Table 8. Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	I_C = -100 µA; I_E = 0 A		-50	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	I_C = -10 mA; I_B = 0 A		-45	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	I_E = -100 µA; I_C = 0 A		-7	-	-	V
I_{CBO}	collector-base cut-off current	V_{CB} = -40 V; I_E = 0 A		-	-	-100	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		-	-	-100	nA
h_{FE}	DC current gain						
	BC807-16L, BC807-16LW	V_{CE} = -1 V; I_C = -100 mA	[1]	100	-	250	
	BC807-25L, BC807-25LW		[1]	160	-	400	
	BC807-40L, BC807-40LW		[1]	250	-	600	
	DC current gain	V_{CE} = -1 V; I_C = -500 mA	[1]	40	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -500 mA; I_B = -50 mA	[1]	-	-	-700	mV
V_{BE}	base-emitter voltage	V_{CE} = -1 V; I_C = -500 mA	[1]	-	-	-1.2	V

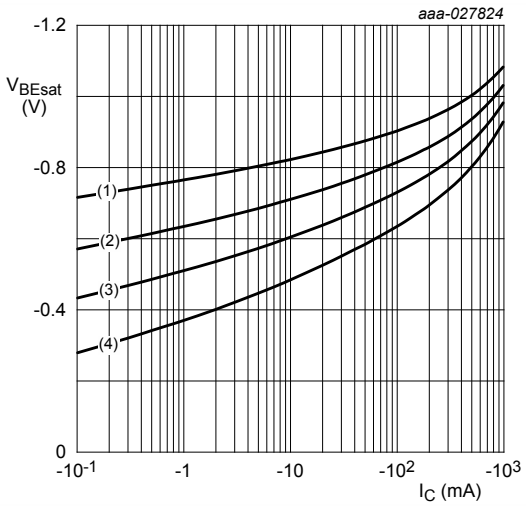
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
f_T	transition frequency	V_{CE} = -5 V; I_C = -10 mA; f = 100 MHz		80	-	-	MHz
C_c	collector capacitance	V_{CB} = -10 V; I_E = i_e = 0 A; f = 1 MHz		-	5.5	-	pF

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



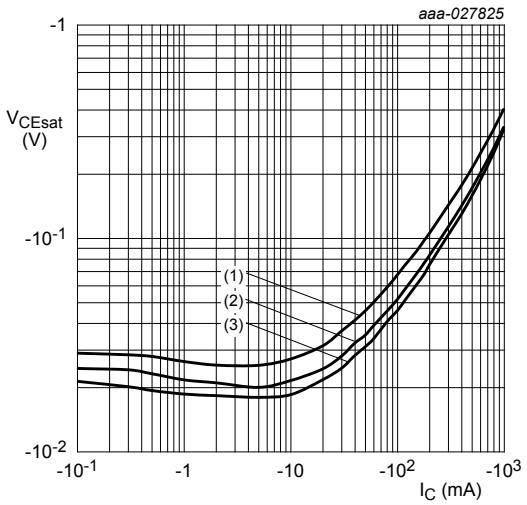
V_{CE} = -1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -40 °C

Figure 1. BC807-16L, BC807-16LW: DC current gain as a function of collector current; typical values



IC/IB = 10
(1) T_{amb} = -40 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 150 °C

Figure 2. BC807-16L, BC807-16LW: Base-emitter saturation voltage as a function of collector current; typical values



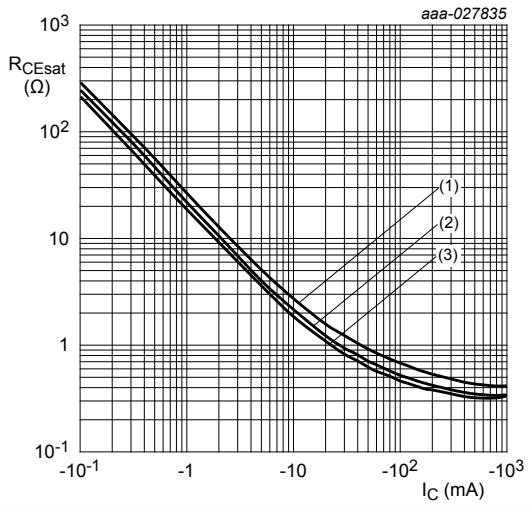
IC/IB = 10

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = -40 °C

Figure 3. BC807-16L, BC807-16LW: Collector-emitter saturation voltage as a function of collector current; typical values



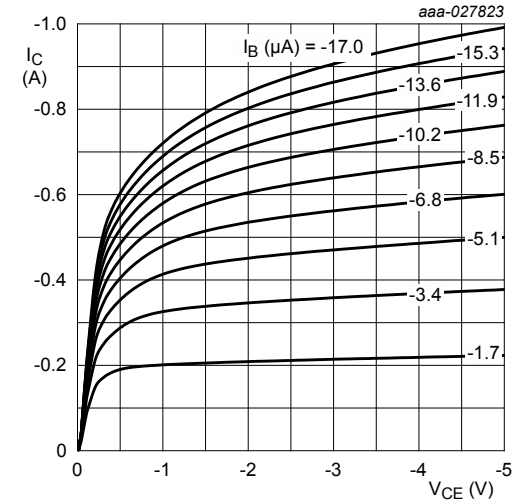
IC/IB = 10

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

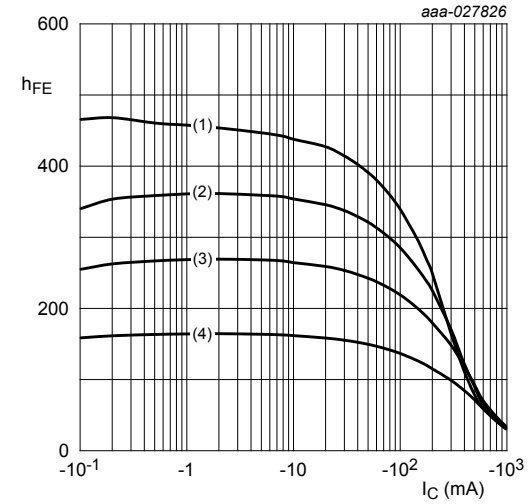
(3) T_{amb} = -40 °C

Figure 4. BC807-16L, BC807-16LW: Collector-emitter saturation resistance as a function of collector current; typical values



T_{amb} = 25 °C

Figure 5. BC807-16L, BC807-16LW: Collector current as a function of collector-emitter voltage; typical values



V_{CE} = -1 V

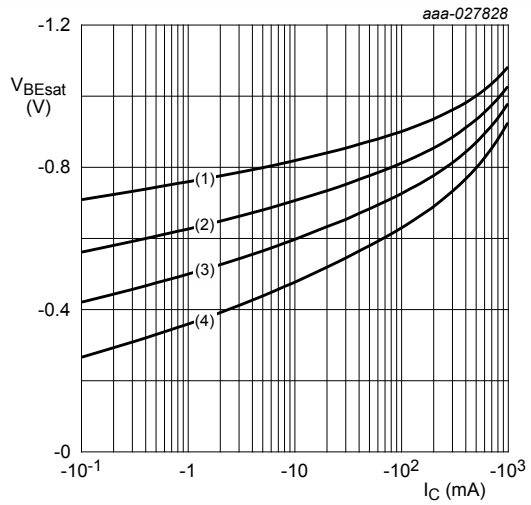
(1) T_{amb} = 150 °C

(2) T_{amb} = 85 °C

(3) T_{amb} = 25 °C

(4) T_{amb} = -40 °C

Figure 6. BC807-25L, BC807-25LW: DC current gain as a function of collector current; typical values



IC/IB = 10

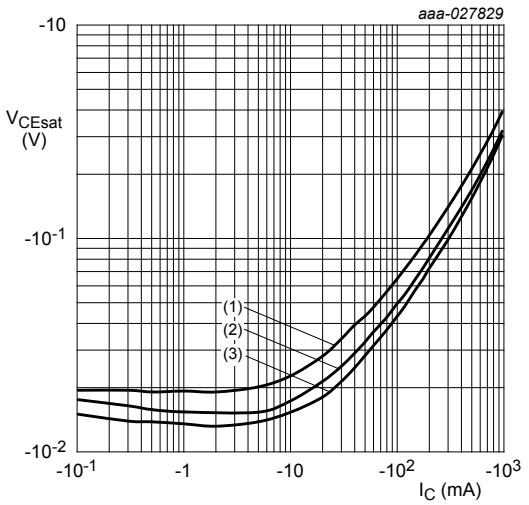
(1) T_{amb} = -40 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 85 °C

(4) T_{amb} = 150 °C

Figure 7. BC807-25L, BC807-25LW: Base-emitter saturation voltage as a function of collector current; typical values



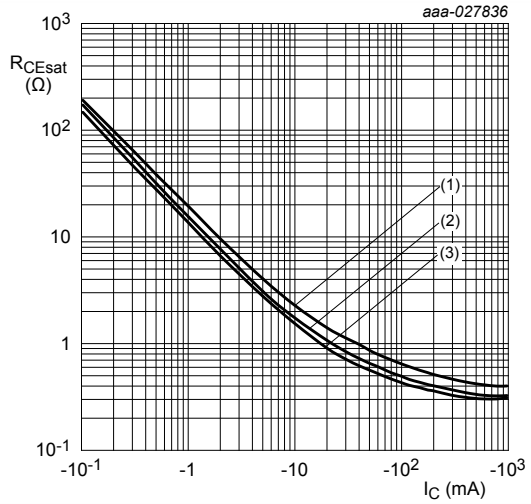
IC/IB = 10

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = -40 °C

Figure 8. BC807-25L, BC807-25LW: Collector-emitter saturation voltage as a function of collector current; typical values



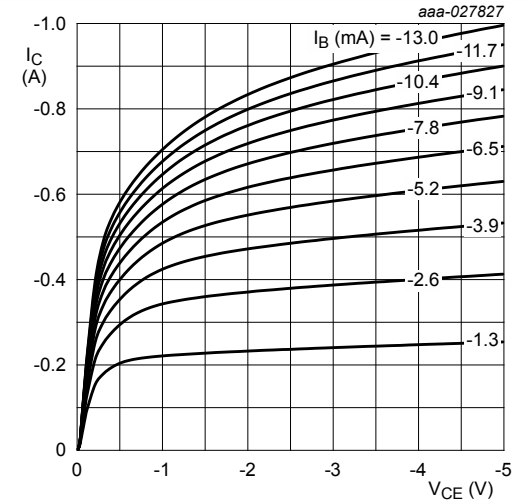
IC/IB = 10

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

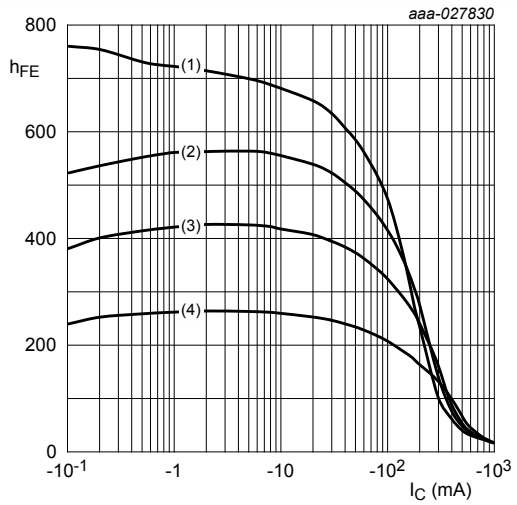
(3) T_{amb} = -40 °C

Figure 9. BC807-25L, BC807-25LW: Collector-emitter saturation resistance as a function of collector current; typical values



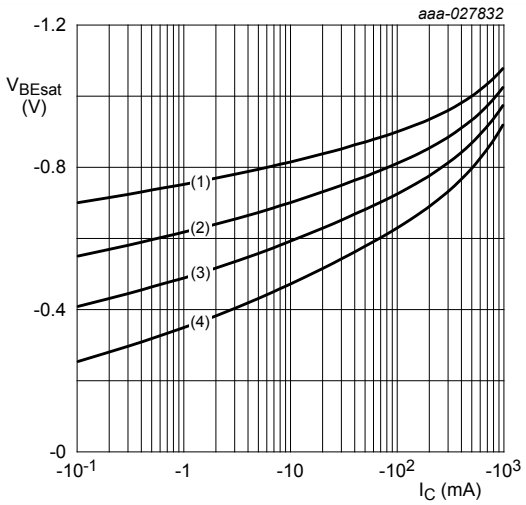
T_{amb} = 25 °C

Figure 10. BC807-25L, BC807-25LW: Collector current as a function of collector-emitter voltage; typical values



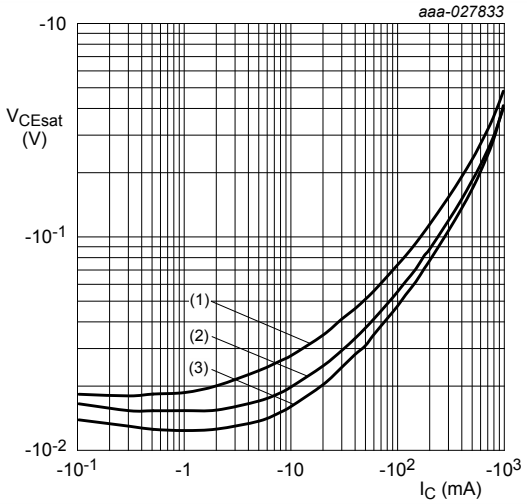
V_{CE} = -1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -40 °C

Figure 11. BC807-40L, BC807-40LW: DC current gain as as a function of collector current; typical values



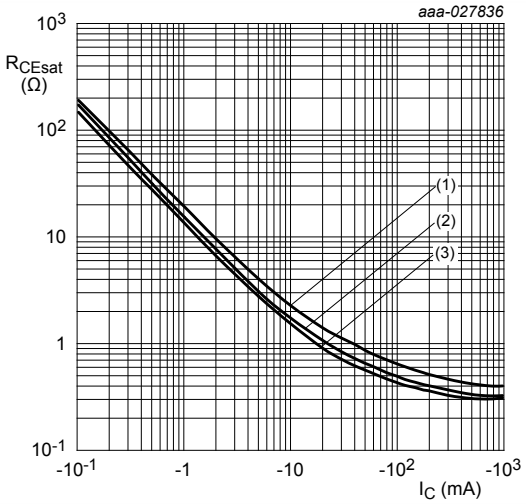
IC/IB = 10
(1) T_{amb} = -40 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 150 °C

Figure 12. BC807-40L, BC807-40LW: Base-emitter saturation voltage as a function of collector current; typical values



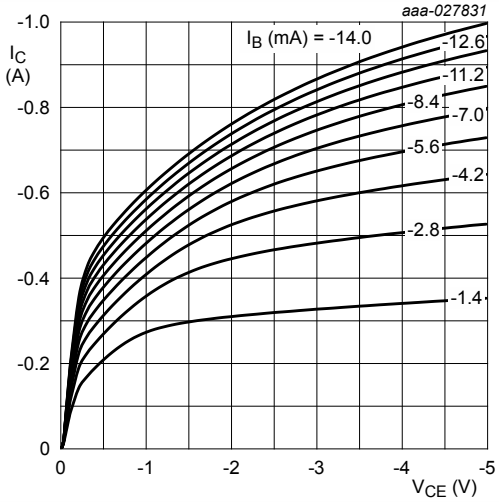
IC/IB = 10
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -40 °C

Figure 13. BC807-40L, BC807-40LW: Collector-emitter saturation voltage as a function of collector current; typical values



IC/IB = 10
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -40 °C

Figure 14. BC807-40L, BC807-40LW: Collector-emitter saturation resistance as a function of collector current; typical values



T_{amb} = 25 °C

Figure 15. BC807-40L, BC807-40LW: Collector current as a function of collector-emitter voltage; typical values

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

Table 9. Package outline

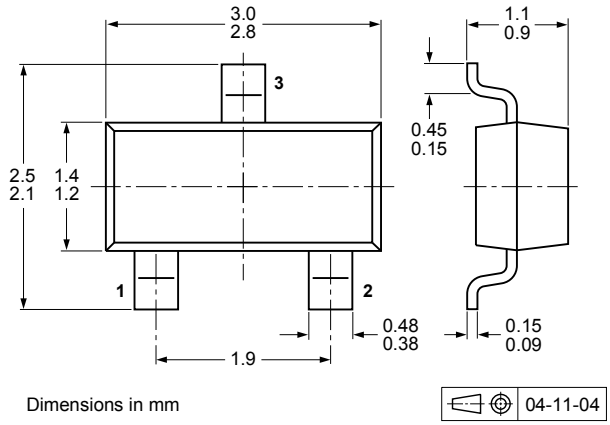


Figure 16. Package outline SOT23 (TO-236)

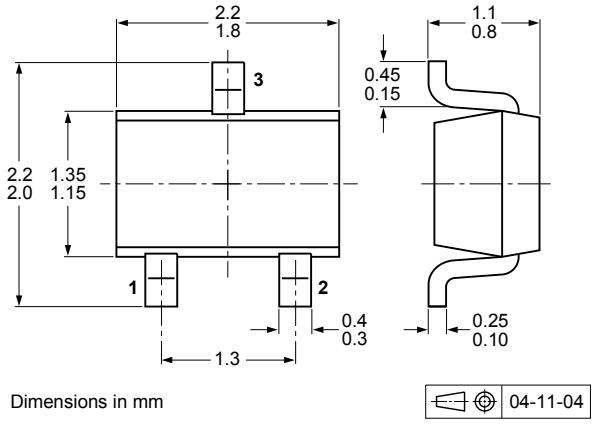


Figure 17. Package outline SOT323 (SC-70)

10 Soldering

Table 10. Soldering

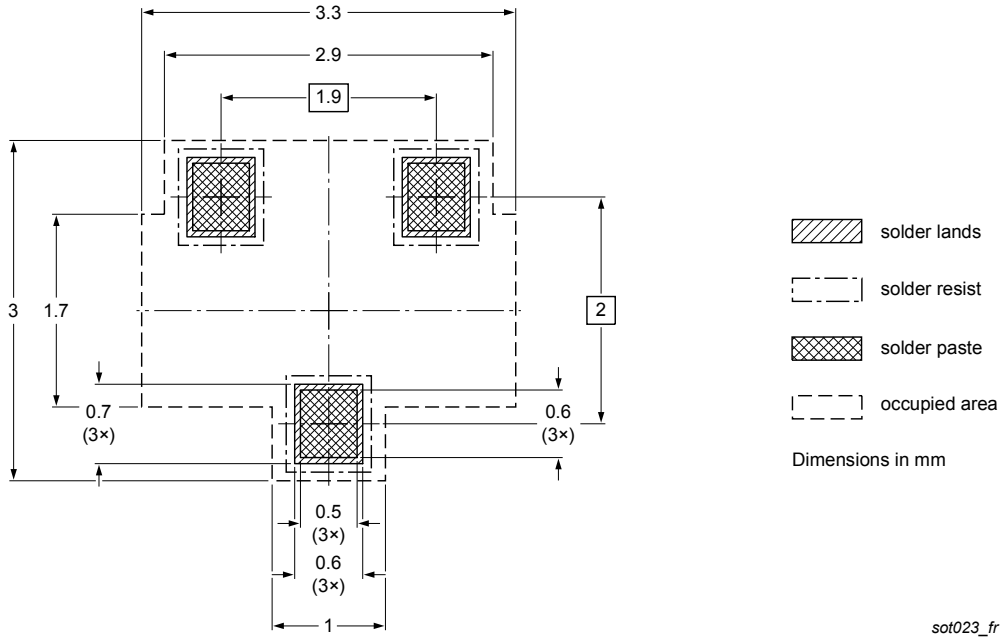


Figure 18. Reflow soldering footprint for SOT23 (TO-236AB)

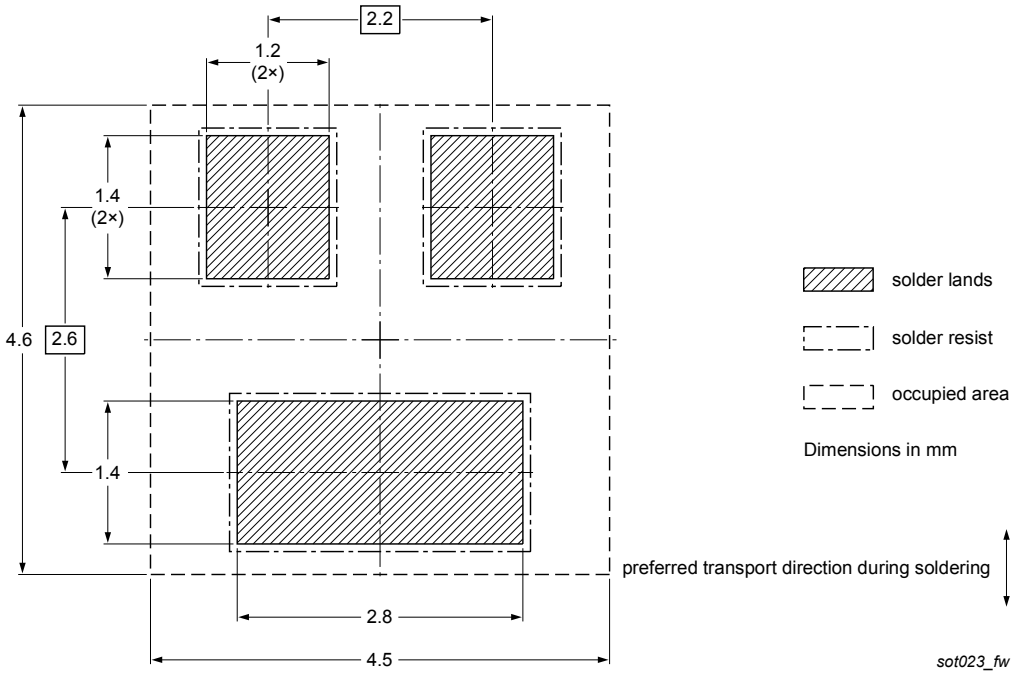


Figure 19. Wave soldering footprint for SOT23 (TO-236AB)

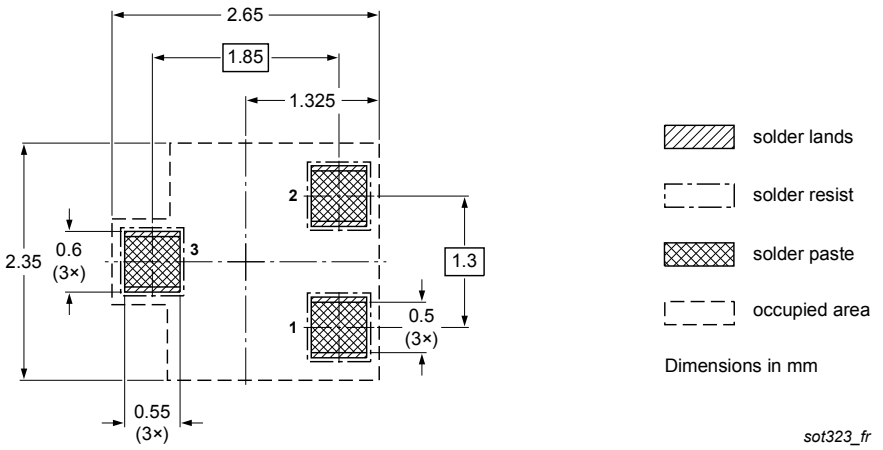


Figure 20. Reflow soldering footprint for SOT323 (SC-70)

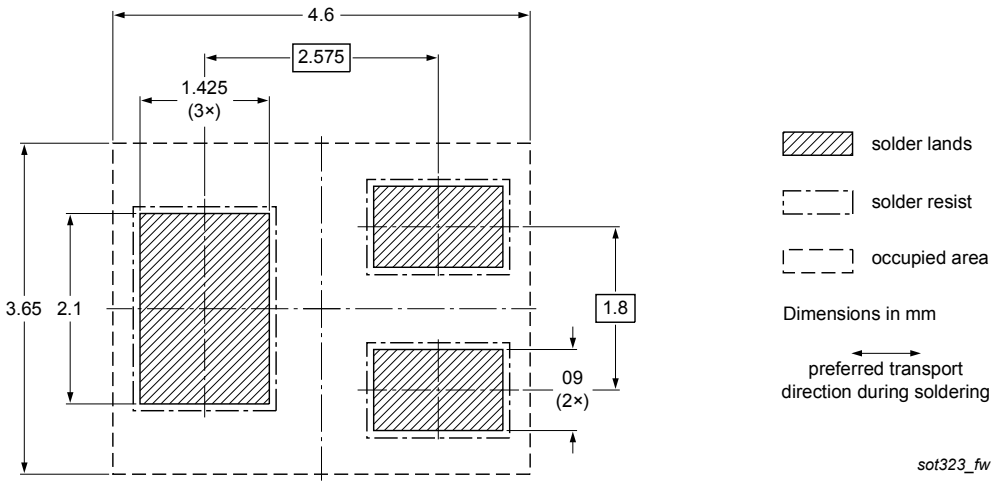


Figure 21. Wave soldering footprint for SOT323 (SC-70)

11 Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BC807L_BC807LW v.1	20180105	Product data sheet	-	-

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".
[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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