

# 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

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

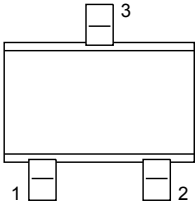
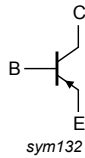
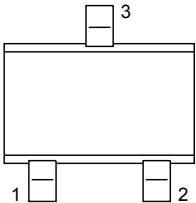
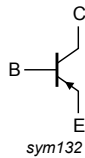
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CEO}$	collector-emitter voltage	open base	-	-	-45	V
$I_C$	collector current		-	-	-500	mA
$I_{CM}$	peak collector current	single pulse; $t_p \leq 1\text{ ms}$	-	-	-1	A

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

[1] pulsed;  $t_p \leq 300 \mu\text{s}$ ;  $\delta \leq 0.02$

## 2 Pinning information

Table 3. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
<b>SOT23</b>				
1	B	base		 sym132
2	E	emitter		
3	C	collector		
<b>SOT323</b>				
1	B	base		 sym132
2	E	emitter		
3	C	collector		

### 3 Ordering information

Table 4. Ordering information

Type number	Package		Version
	Name	Description	
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

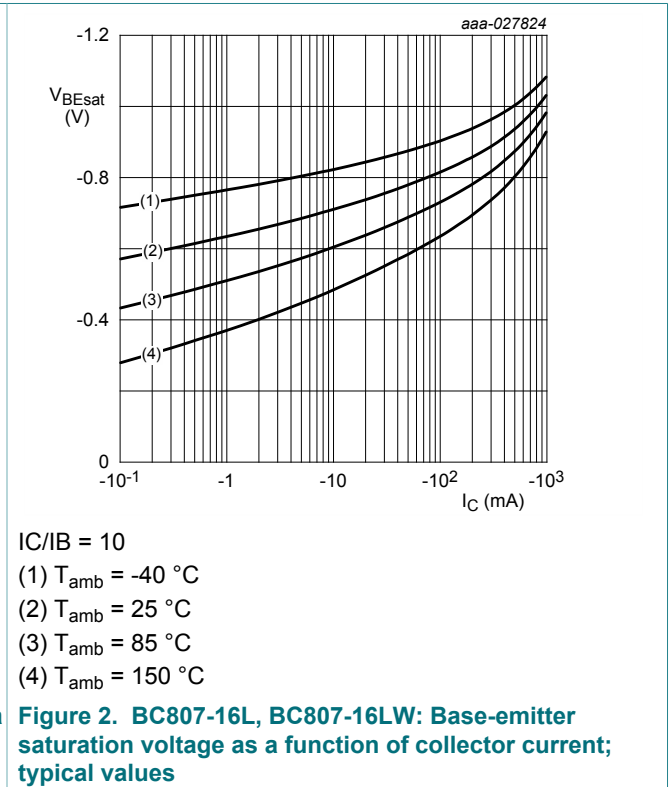
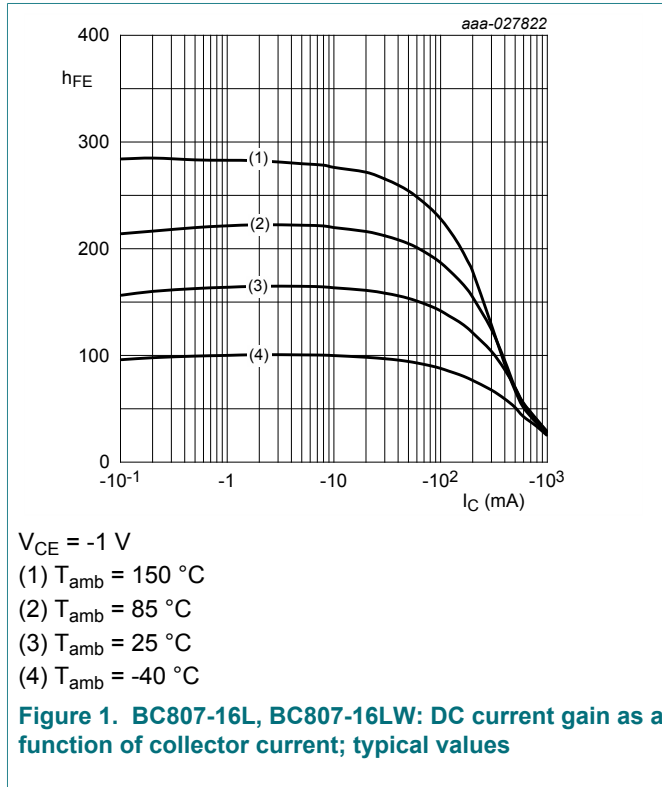
Table 8. Characteristics

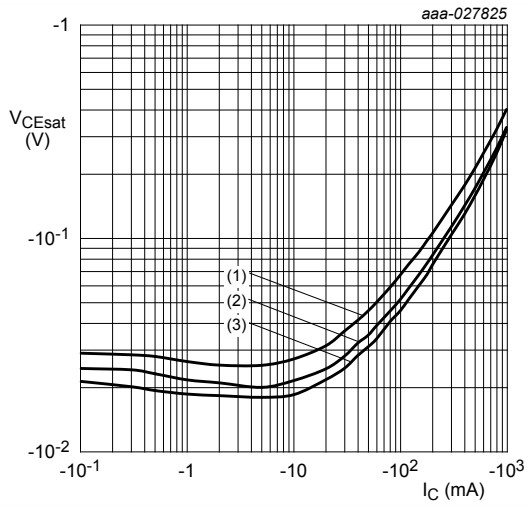
$T_{amb} = 25\text{ °C}$  unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = -100\text{ }\mu\text{A}$ ; $I_E = 0\text{ A}$		-50	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = -10\text{ mA}$ ; $I_B = 0\text{ A}$		-45	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_E = -100\text{ }\mu\text{A}$ ; $I_C = 0\text{ A}$		-7	-	-	V
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -40\text{ V}$ ; $I_E = 0\text{ A}$		-	-	-100	nA
		$V_{CB} = -40\text{ V}$ ; $I_E = 0\text{ A}$ ; $T_j = 150\text{ °C}$		-	-	-5	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -5\text{ V}$ ; $I_C = 0\text{ A}$		-	-	-100	nA
$h_{FE}$	DC current gain						
	BC807-16L, BC807-16LW	$V_{CE} = -1\text{ V}$ ; $I_C = -100\text{ mA}$	[1]	100	-	250	
	BC807-25L, BC807-25LW		[1]	160	-	400	
	BC807-40L, BC807-40LW		[1]	250	-	600	
	DC current gain	$V_{CE} = -1\text{ V}$ ; $I_C = -500\text{ mA}$	[1]	40	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -500\text{ mA}$ ; $I_B = -50\text{ mA}$	[1]	-	-	-700	mV
$V_{BE}$	base-emitter voltage	$V_{CE} = -1\text{ V}$ ; $I_C = -500\text{ mA}$	[1]	-	-	-1.2	V

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

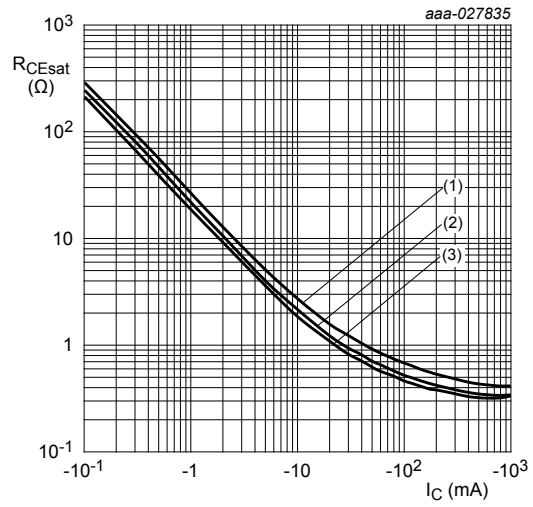
[1] pulsed;  $t_p \leq 300 \mu\text{s}$ ;  $\delta \leq 0.02$





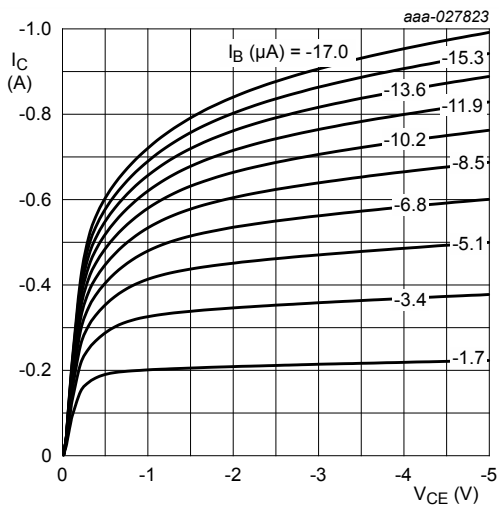
IC/IB = 10  
 (1) T<sub>amb</sub> = 150 °C  
 (2) T<sub>amb</sub> = 25 °C  
 (3) T<sub>amb</sub> = -40 °C

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

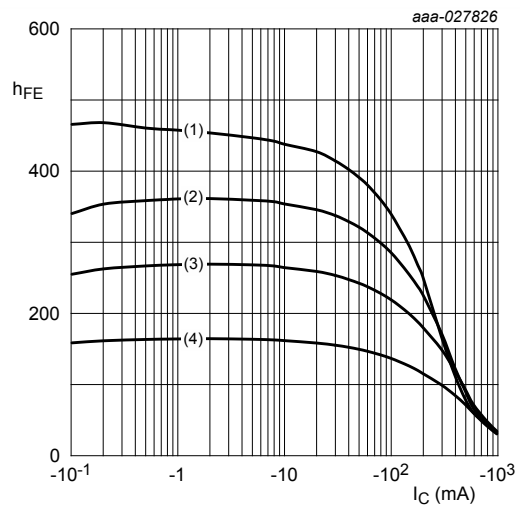


IC/IB = 10  
 (1) T<sub>amb</sub> = 150 °C  
 (2) T<sub>amb</sub> = 25 °C  
 (3) T<sub>amb</sub> = -40 °C

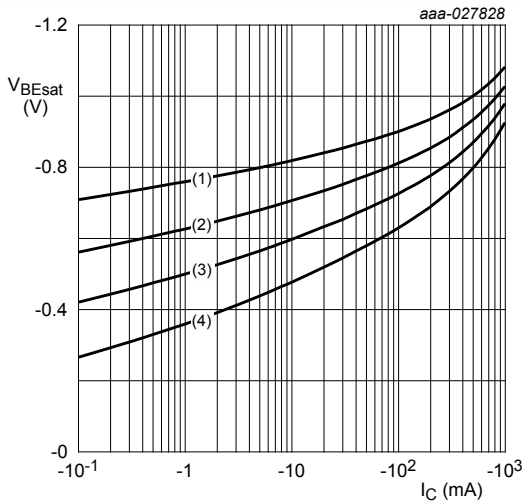
**Figure 4. BC807-16L, BC807-16LW: Collector-emitter saturation resistance as a function of collector current; typical values**



T<sub>amb</sub> = 25 °C  
**Figure 5. BC807-16L, BC807-16LW: Collector current as a function of collector-emitter voltage; typical values**

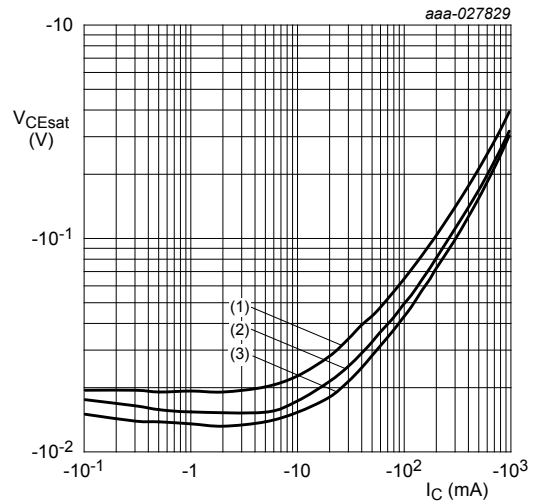


V<sub>CE</sub> = -1 V  
 (1) T<sub>amb</sub> = 150 °C  
 (2) T<sub>amb</sub> = 85 °C  
 (3) T<sub>amb</sub> = 25 °C  
 (4) T<sub>amb</sub> = -40 °C  
**Figure 6. BC807-25L, BC807-25LW: DC current gain as a function of collector current; typical values**



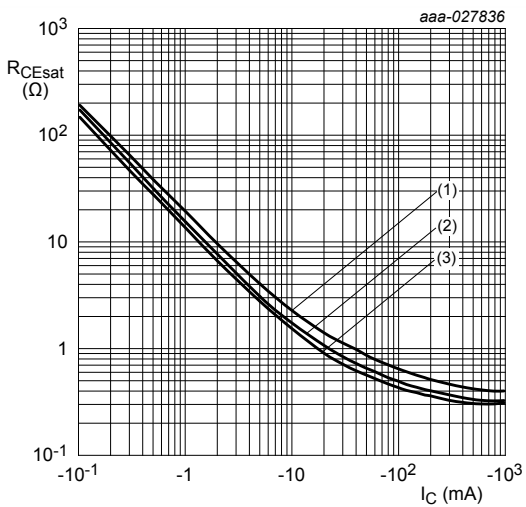
IC/IB = 10  
 (1)  $T_{amb} = -40\text{ °C}$   
 (2)  $T_{amb} = 25\text{ °C}$   
 (3)  $T_{amb} = 85\text{ °C}$   
 (4)  $T_{amb} = 150\text{ °C}$

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



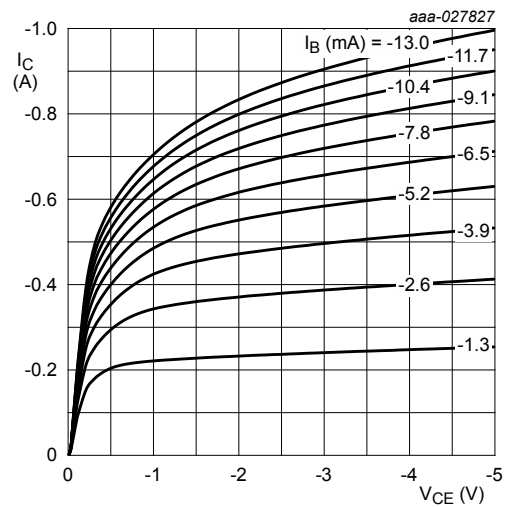
IC/IB = 10  
 (1)  $T_{amb} = 150\text{ °C}$   
 (2)  $T_{amb} = 25\text{ °C}$   
 (3)  $T_{amb} = -40\text{ °C}$

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



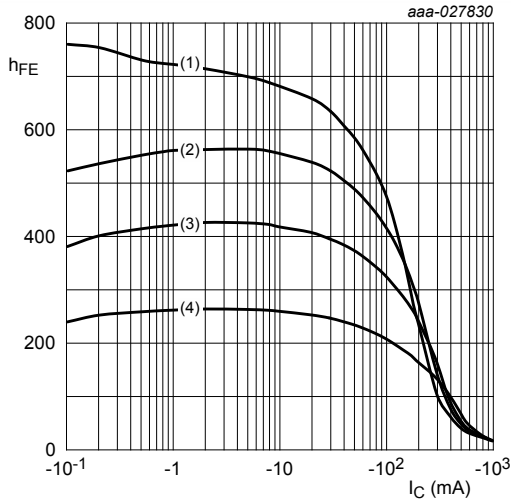
IC/IB = 10  
 (1)  $T_{amb} = 150\text{ °C}$   
 (2)  $T_{amb} = 25\text{ °C}$   
 (3)  $T_{amb} = -40\text{ °C}$

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



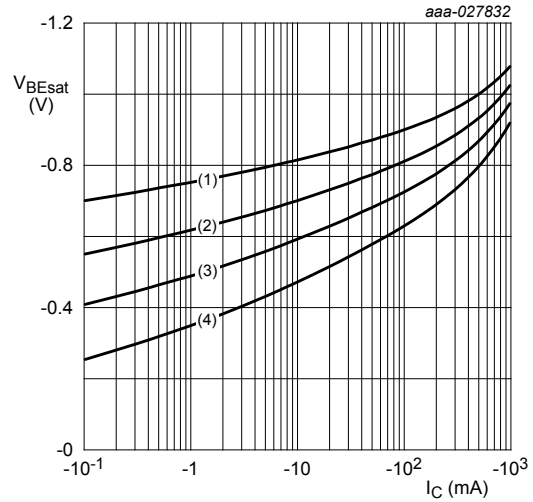
$T_{amb} = 25\text{ °C}$

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



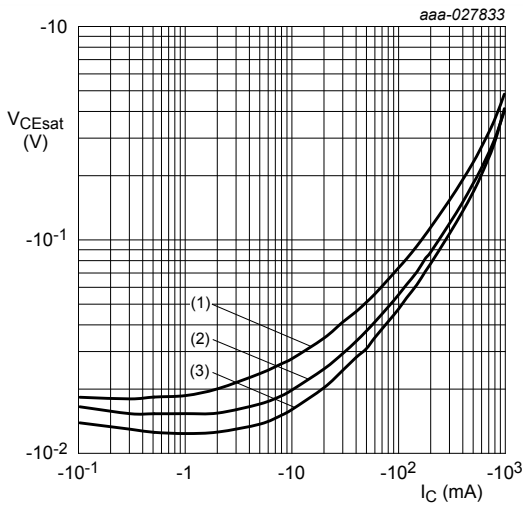
$V_{CE} = -1 \text{ V}$   
 (1)  $T_{amb} = 150 \text{ }^\circ\text{C}$   
 (2)  $T_{amb} = 85 \text{ }^\circ\text{C}$   
 (3)  $T_{amb} = 25 \text{ }^\circ\text{C}$   
 (4)  $T_{amb} = -40 \text{ }^\circ\text{C}$

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



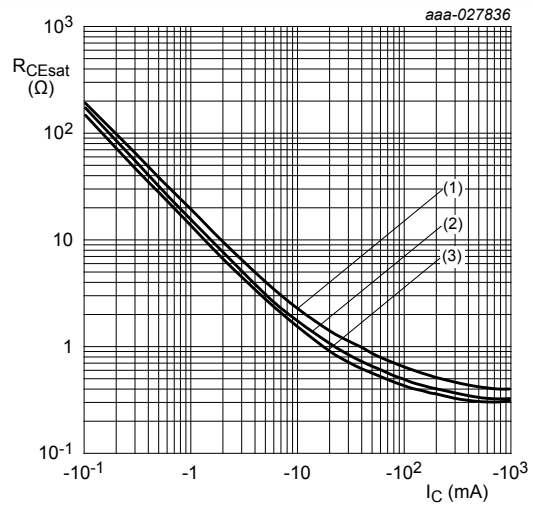
$I_C/I_B = 10$   
 (1)  $T_{amb} = -40 \text{ }^\circ\text{C}$   
 (2)  $T_{amb} = 25 \text{ }^\circ\text{C}$   
 (3)  $T_{amb} = 85 \text{ }^\circ\text{C}$   
 (4)  $T_{amb} = 150 \text{ }^\circ\text{C}$

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



$I_C/I_B = 10$   
 (1)  $T_{amb} = 150 \text{ }^\circ\text{C}$   
 (2)  $T_{amb} = 25 \text{ }^\circ\text{C}$   
 (3)  $T_{amb} = -40 \text{ }^\circ\text{C}$

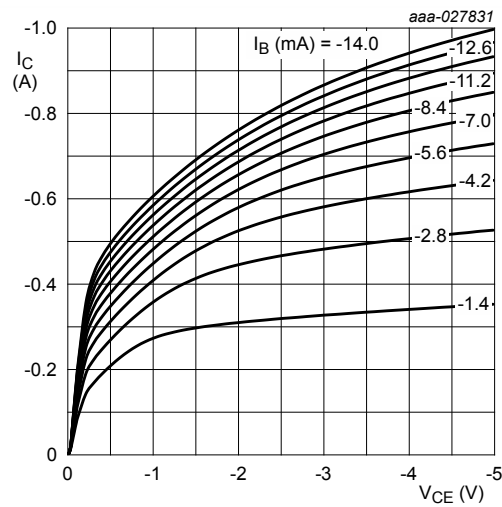
**Figure 13. BC807-40L, BC807-40LW: Collector-emitter saturation voltage as a function of collector current; typical values**



$I_C/I_B = 10$   
 (1)  $T_{amb} = 150 \text{ }^\circ\text{C}$   
 (2)  $T_{amb} = 25 \text{ }^\circ\text{C}$   
 (3)  $T_{amb} = -40 \text{ }^\circ\text{C}$

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





$T_{amb} = 25\text{ }^{\circ}\text{C}$

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

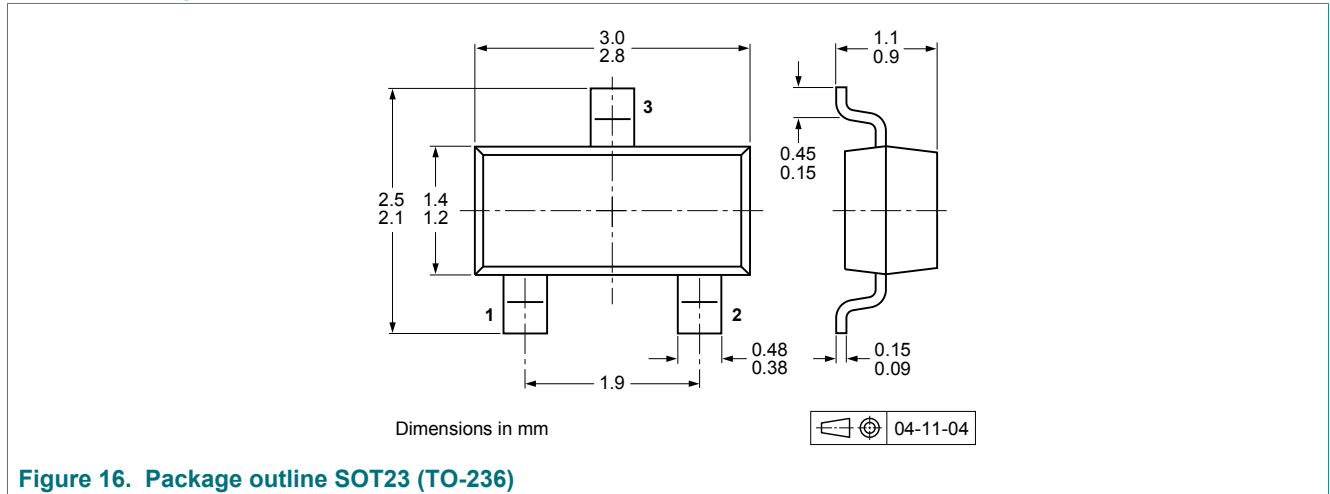
## 8 Test information

### 8.1 Quality information

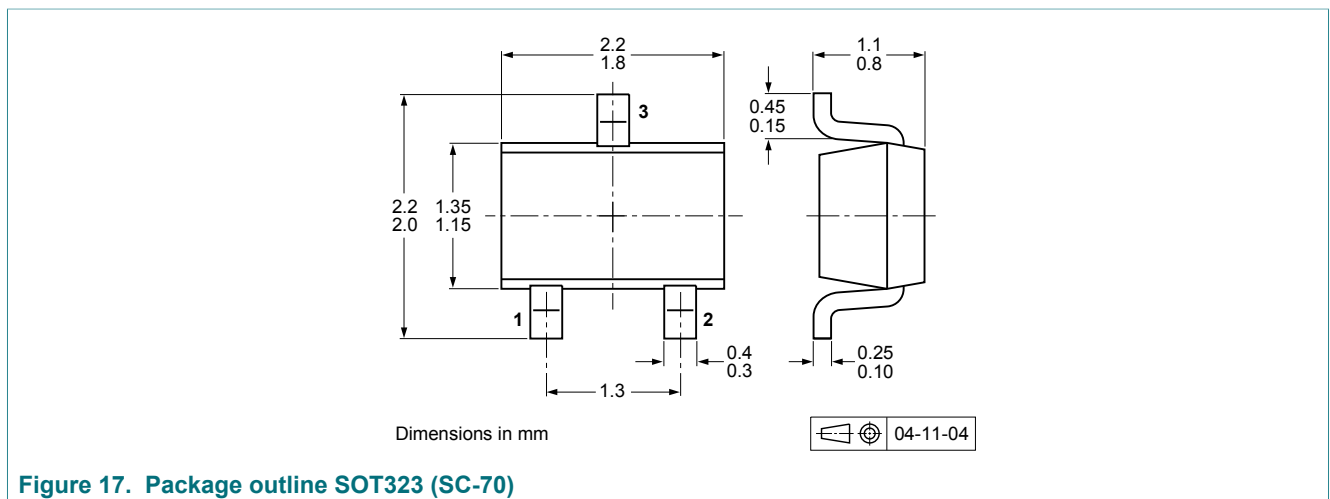
This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

**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

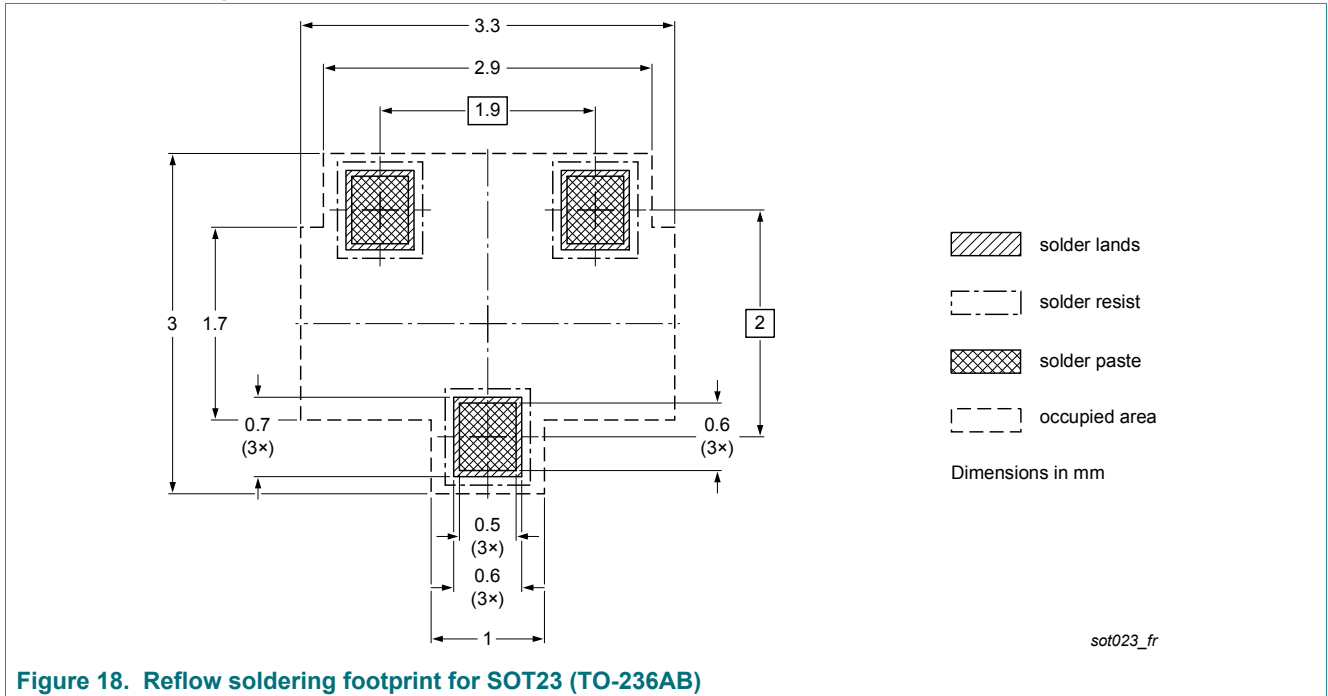


Figure 18. Reflow soldering footprint for SOT23 (TO-236AB)

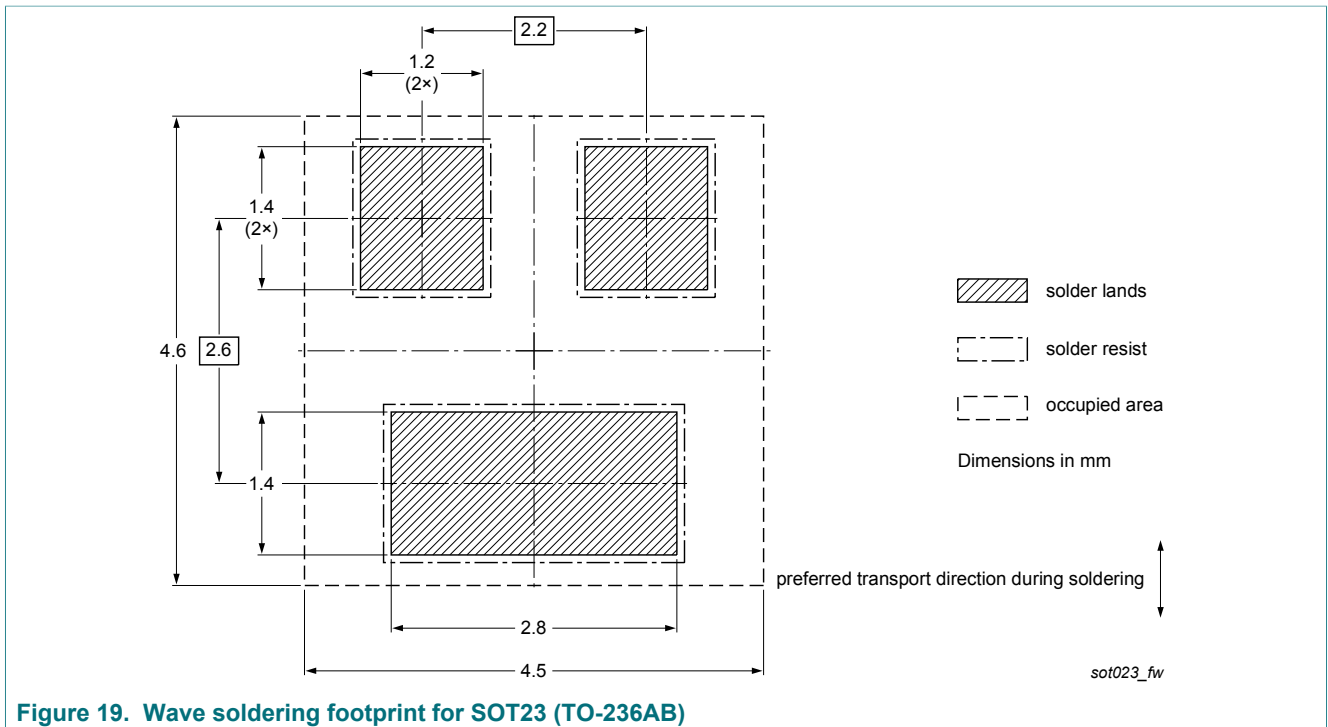
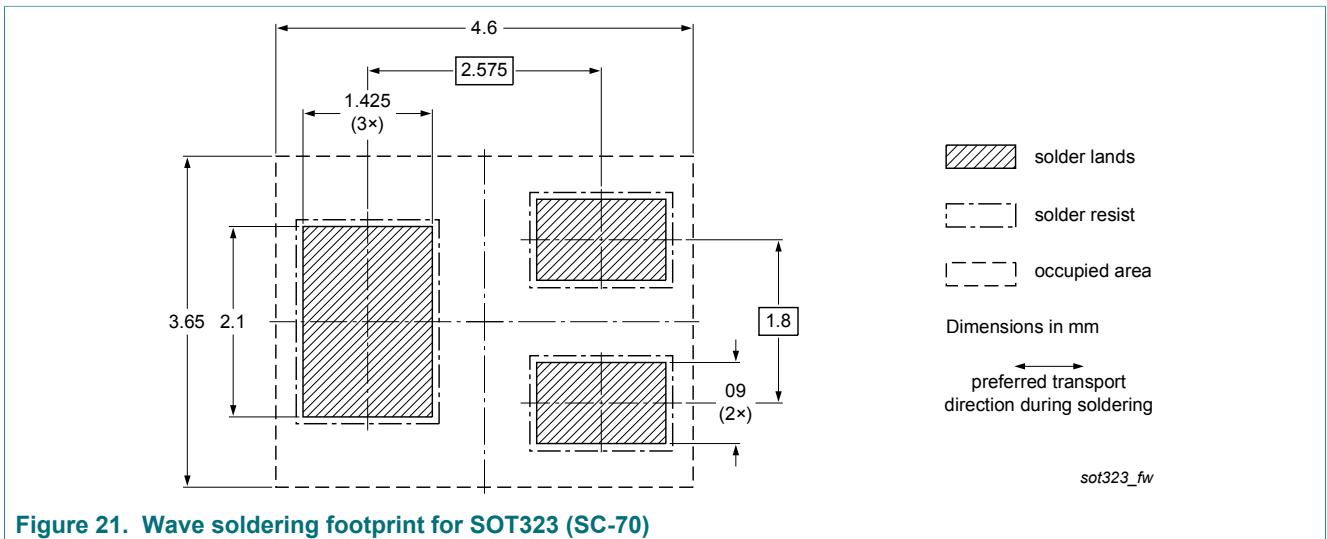
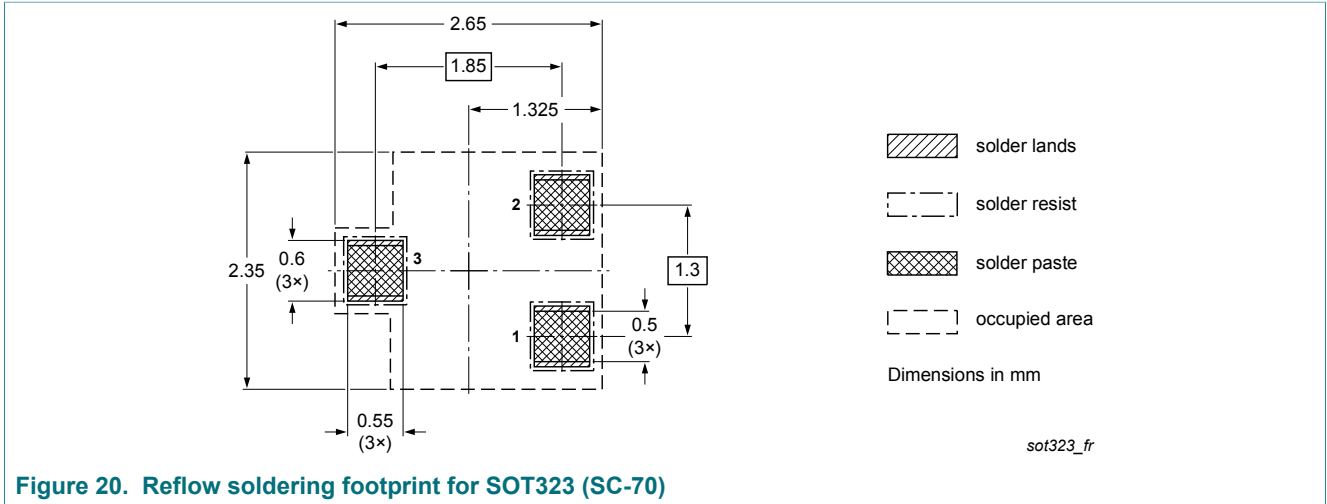


Figure 19. Wave soldering footprint for SOT23 (TO-236AB)



## 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 <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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