

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.

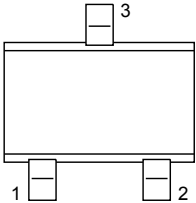
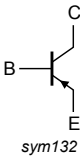
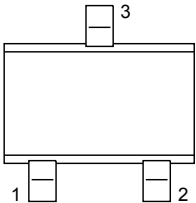
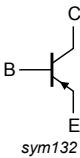
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	-45	V
I_C	collector current		-	-	-500	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1\text{ ms}$	-	-	-1	A

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
SOT23				
1	B	base		 sym132
2	E	emitter		
3	C	collector		
SOT323				
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

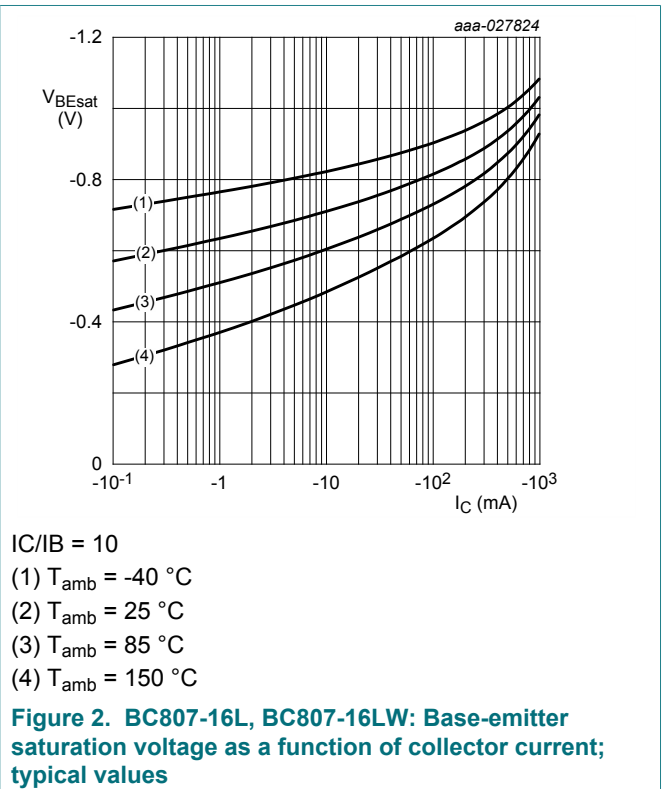
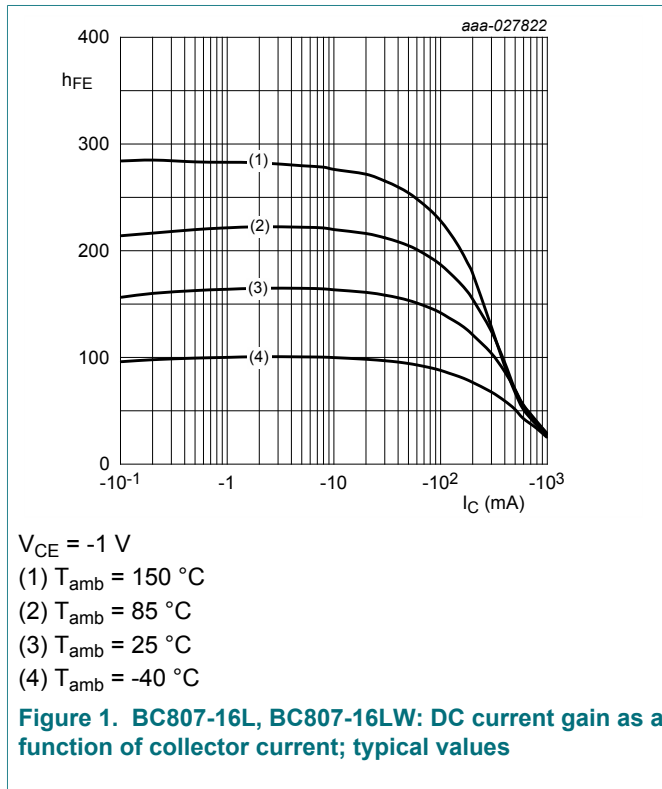
Table 8. Characteristics

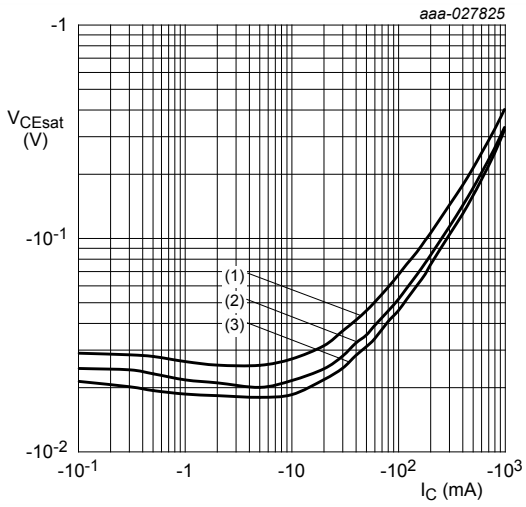
$T_{amb} = 25\text{ °C}$ unless otherwise specified.

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	μA
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

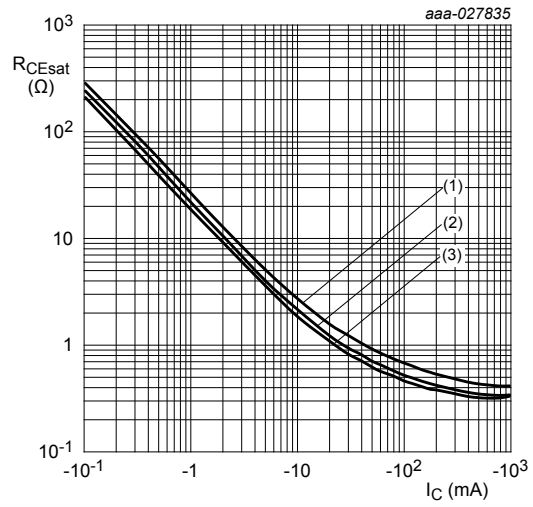
[1] pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$





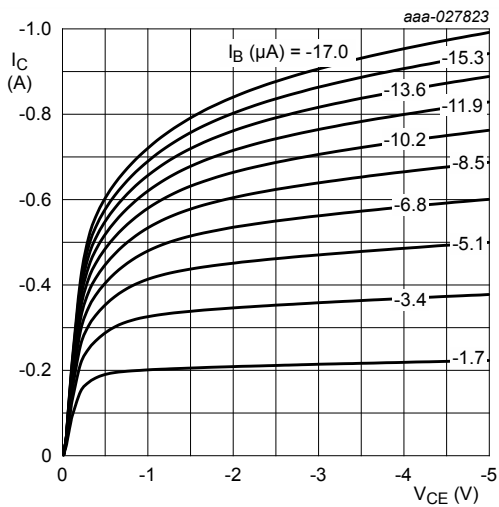
$I_C/I_B = 10$
 (1) $T_{amb} = 150\text{ °C}$
 (2) $T_{amb} = 25\text{ °C}$
 (3) $T_{amb} = -40\text{ °C}$

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

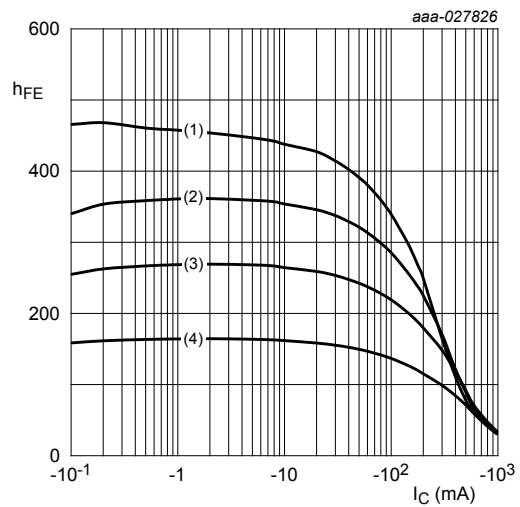


$I_C/I_B = 10$
 (1) $T_{amb} = 150\text{ °C}$
 (2) $T_{amb} = 25\text{ °C}$
 (3) $T_{amb} = -40\text{ °C}$

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

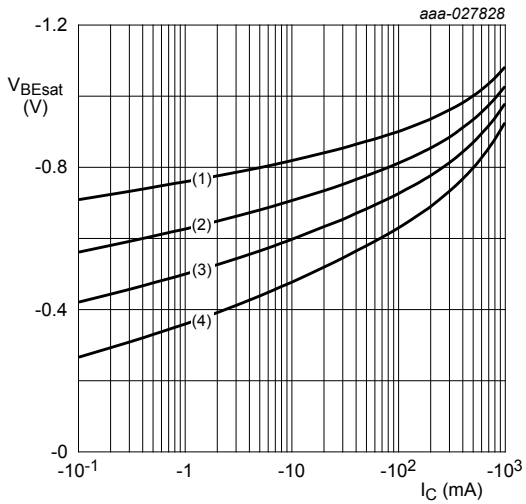


$T_{amb} = 25\text{ °C}$
Figure 5. BC807-16L, BC807-16LW: Collector current as a function of collector-emitter voltage; typical values



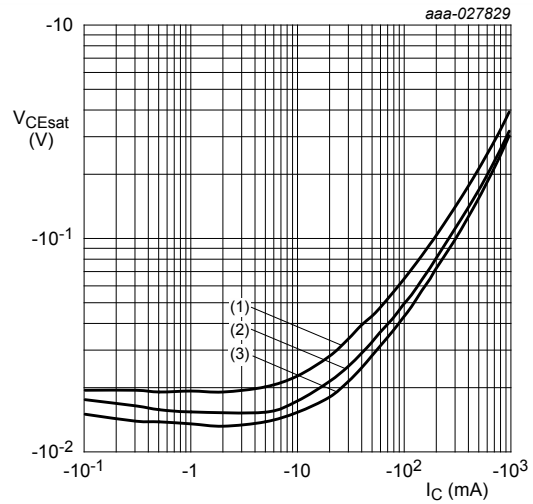
$V_{CE} = -1\text{ V}$
 (1) $T_{amb} = 150\text{ °C}$
 (2) $T_{amb} = 85\text{ °C}$
 (3) $T_{amb} = 25\text{ °C}$
 (4) $T_{amb} = -40\text{ °C}$

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



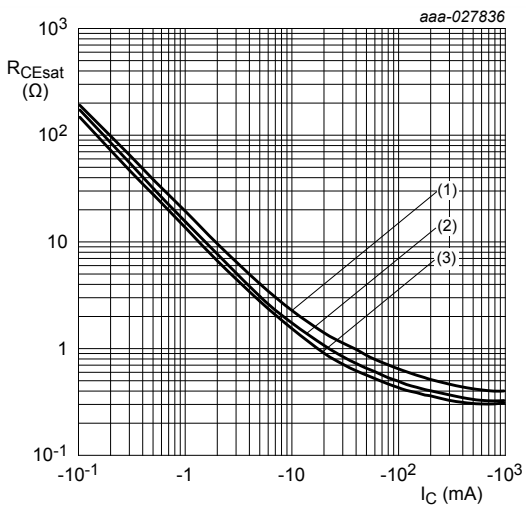
IC/IB = 10
 (1) T_{amb} = -40 °C
 (2) T_{amb} = 25 °C
 (3) T_{amb} = 85 °C
 (4) T_{amb} = 150 °C

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



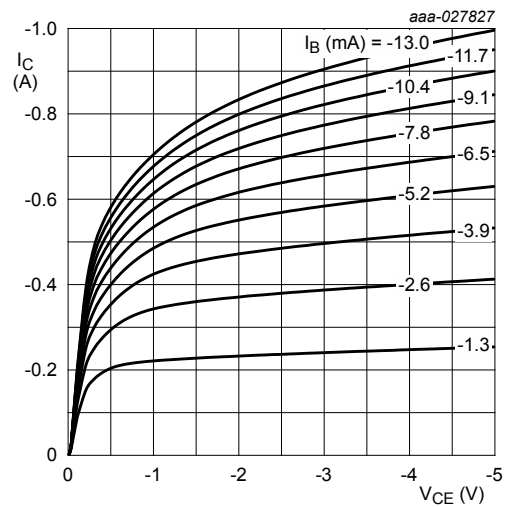
IC/IB = 10
 (1) T_{amb} = 150 °C
 (2) T_{amb} = 25 °C
 (3) T_{amb} = -40 °C

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



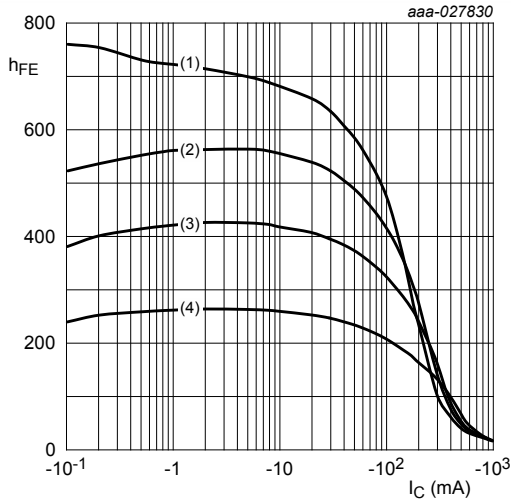
IC/IB = 10
 (1) T_{amb} = 150 °C
 (2) T_{amb} = 25 °C
 (3) T_{amb} = -40 °C

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



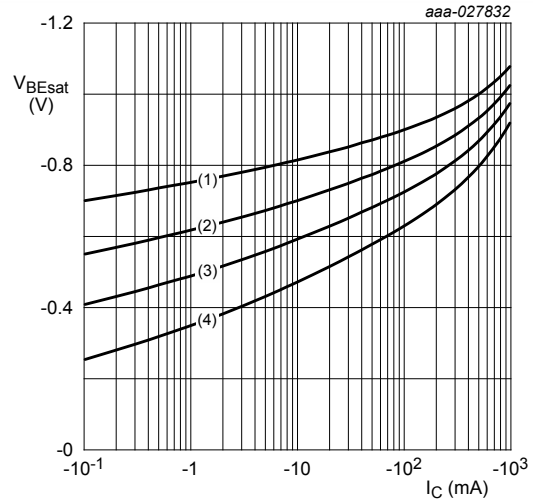
T_{amb} = 25 °C

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



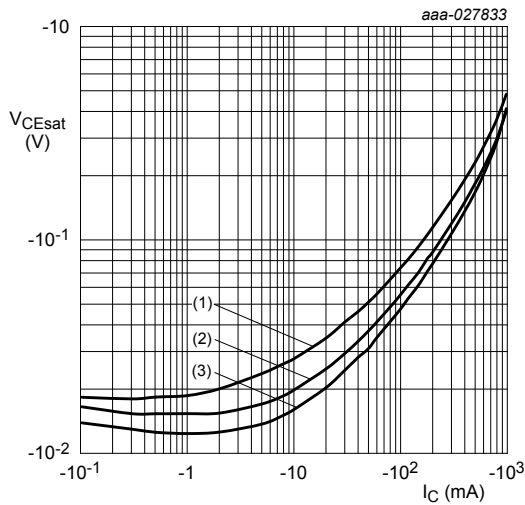
$V_{CE} = -1 \text{ V}$
 (1) $T_{amb} = 150 \text{ }^\circ\text{C}$
 (2) $T_{amb} = 85 \text{ }^\circ\text{C}$
 (3) $T_{amb} = 25 \text{ }^\circ\text{C}$
 (4) $T_{amb} = -40 \text{ }^\circ\text{C}$

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



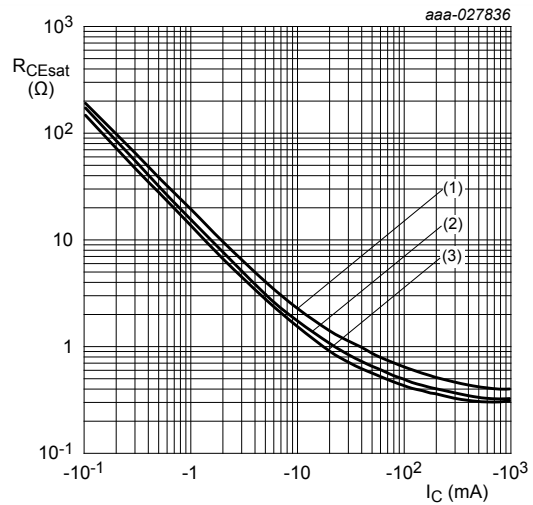
$I_C/I_B = 10$
 (1) $T_{amb} = -40 \text{ }^\circ\text{C}$
 (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
 (3) $T_{amb} = 85 \text{ }^\circ\text{C}$
 (4) $T_{amb} = 150 \text{ }^\circ\text{C}$

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



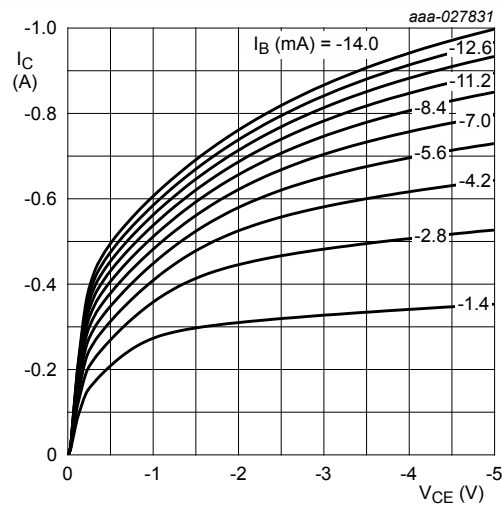
$I_C/I_B = 10$
 (1) $T_{amb} = 150 \text{ }^\circ\text{C}$
 (2) $T_{amb} = 25 \text{ }^\circ\text{C}$
 (3) $T_{amb} = -40 \text{ }^\circ\text{C}$

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

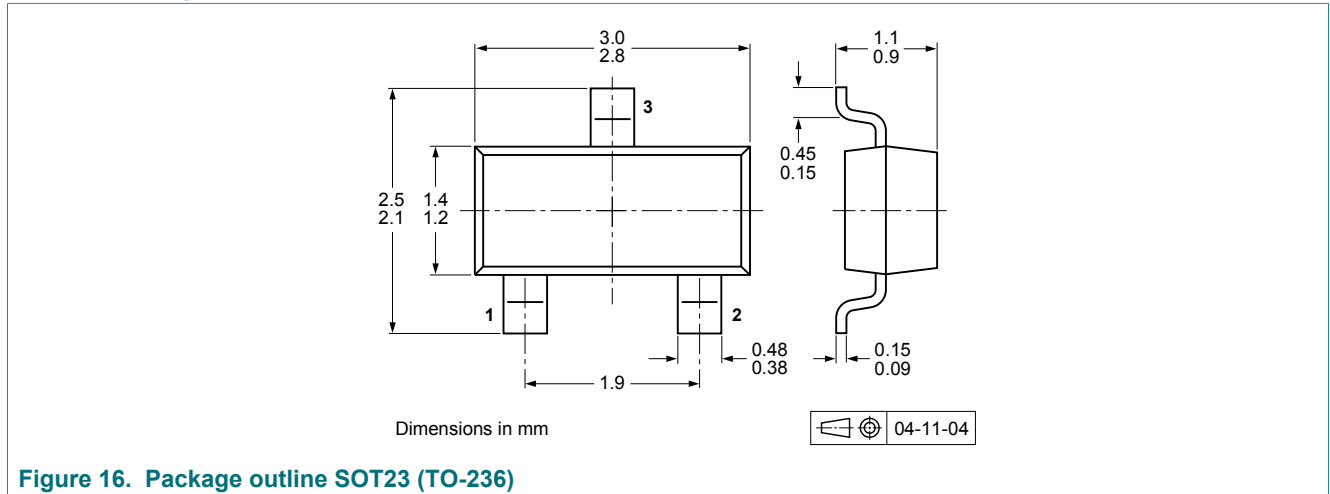


Figure 16. Package outline SOT23 (TO-236)

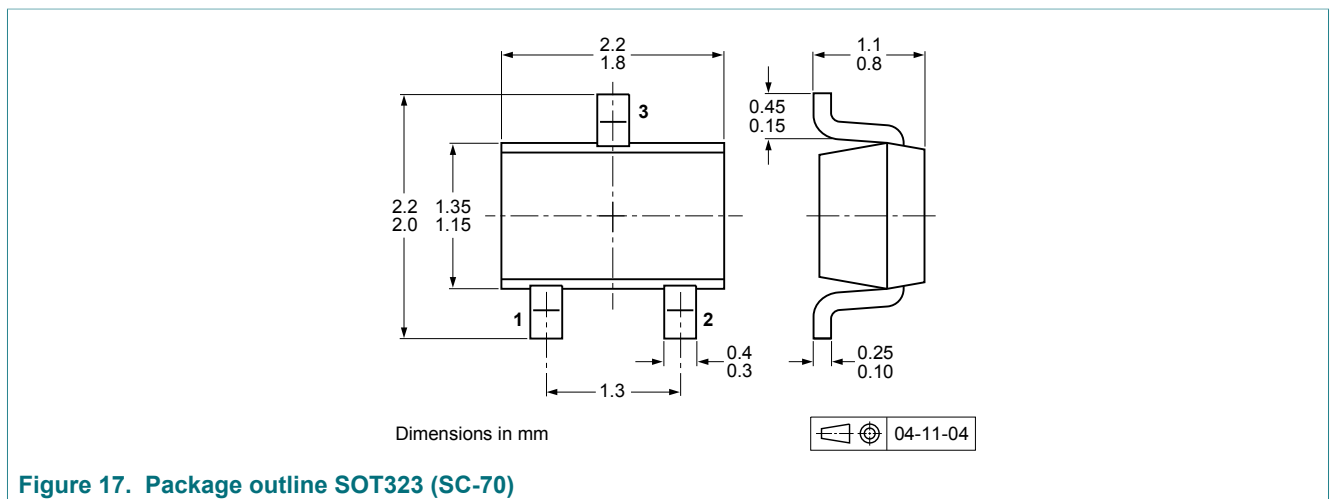
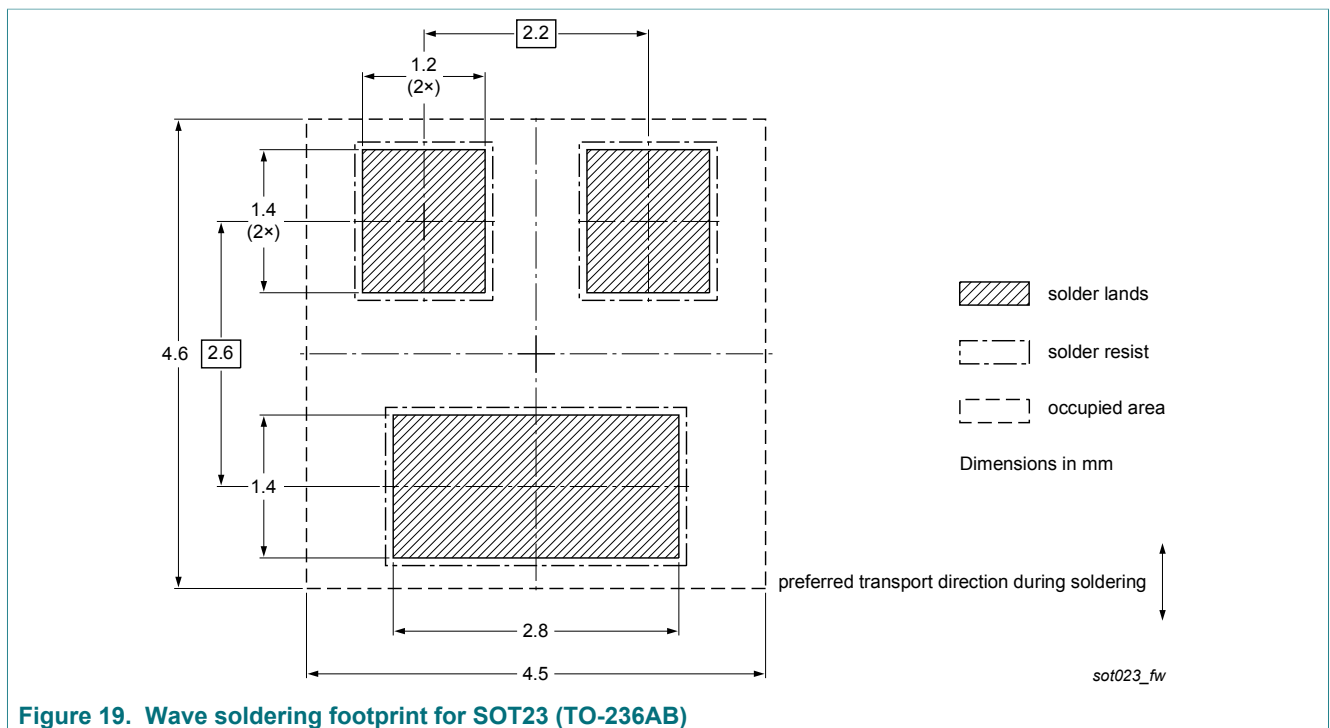
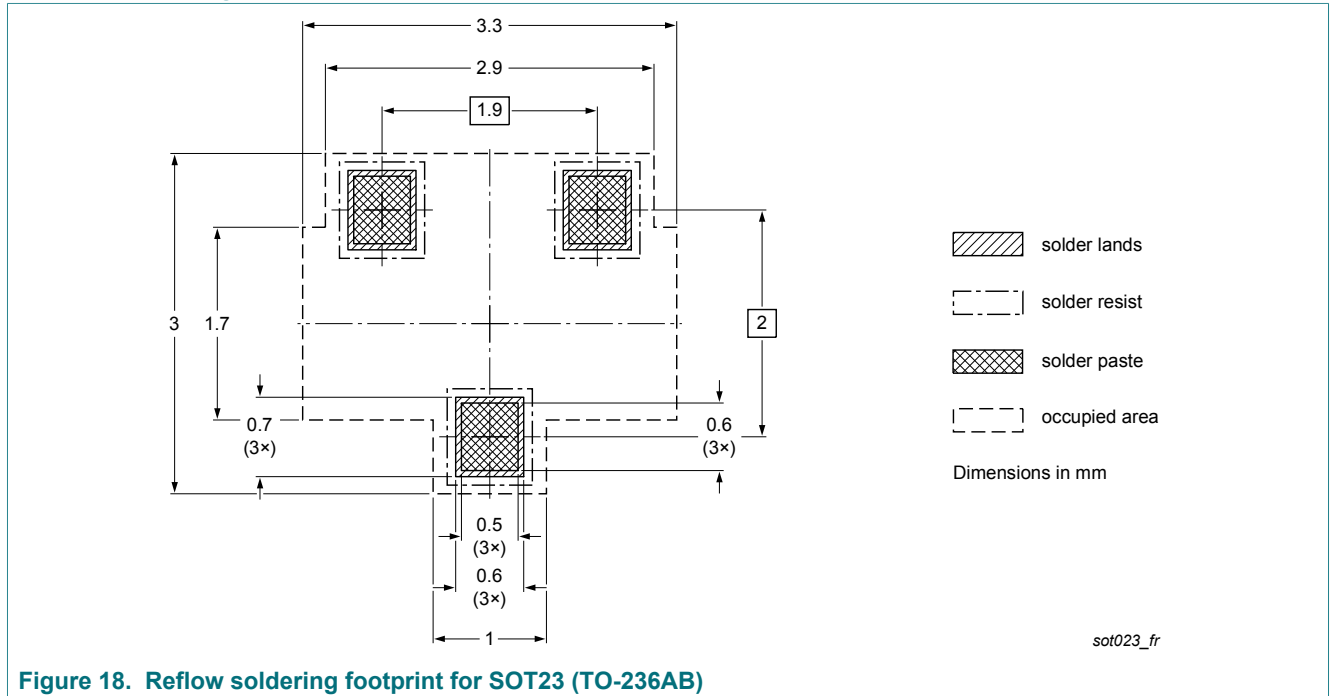
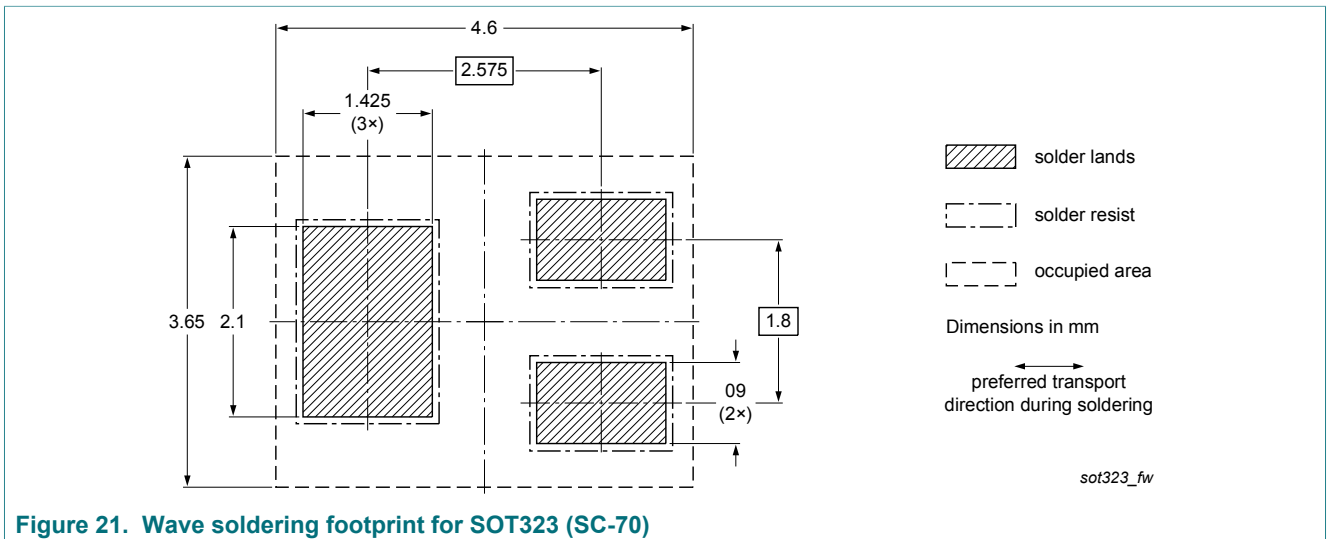
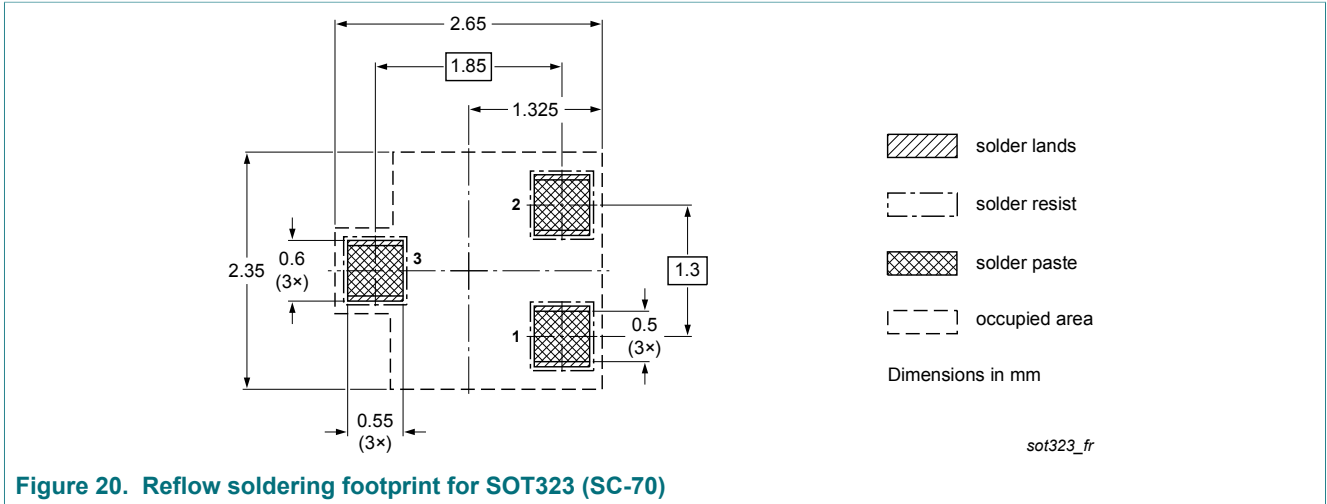


Figure 17. Package outline SOT323 (SC-70)

10 Soldering

Table 10. Soldering





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.

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Document identifier: BC807L_BC807LW

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