

# BC807; BC807W; BC327

45 V, 500 mA PNP general-purpose transistors

Rev. 06 — 17 November 2009

Product data sheet

## 1. Product profile

### 1.1 General description

PNP general-purpose transistors.

Table 1. Product overview

Type number	Package		NPN complement
	NXP	JEITA	
BC807	SOT23	-	BC817
BC807W	SOT323	SC-70	BC817W
BC327 <sup>[1]</sup>	SOT54 (TO-92)	SC-43A	BC337

[1] Also available in SOT54A and SOT54 variant packages (see [Section 2](#)).

### 1.2 Features

- High current
- Low voltage

### 1.3 Applications

- General-purpose switching and amplification

### 1.4 Quick reference data

Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CEO}$	collector-emitter voltage	open base; $I_C = 10 \text{ mA}$	-	-	-45	V
$I_C$	collector current (DC)		-	-	-500	mA
$I_{CM}$	peak collector current		-	-	-1	A
$h_{FE}$	DC current gain	$I_C = -100 \text{ mA}$ ; <sup>[1]</sup> $V_{CE} = -1 \text{ V}$				
	BC807; BC807W; BC327		100	-	600	
	BC807-16; BC807-16W; BC327-16		100	-	250	
	BC807-25; BC807-25W; BC327-25		160	-	400	
	BC807-40; BC807-40W; BC327-40		250	-	600	

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

## 2. Pinning information

**Table 3. Pinning**

Pin	Description	Simplified outline	Symbol
<b>SOT23</b>			
1	base		 sym013
2	emitter		
3	collector		
<b>SOT323</b>			
1	base		 sym013
2	emitter		
3	collector		
<b>SOT54</b>			
1	emitter		 006aaa149
2	base		
3	collector		
<b>SOT54A</b>			
1	emitter		 006aaa149
2	base		
3	collector		
<b>SOT54 variant</b>			
1	emitter		 006aaa149
2	base		
3	collector		

### 3. Ordering information

**Table 4. Ordering information**

Type number <sup>[1]</sup>	Package		Version
	Name	Description	
BC807	-	plastic surface mounted package; 3 leads	SOT23
BC807W	SC-70	plastic surface mounted package; 3 leads	SOT323
BC327 <sup>[2]</sup>	SC-43A	plastic single-ended leaded (through hole) package; 3 leads	SOT54

[1] Valid for all available selection groups.

[2] Also available in SOT54A and SOT54 variant packages (see [Section 2](#) and [Section 9](#)).

### 4. Marking

**Table 5. Marking codes**

Type number	Marking code <sup>[1]</sup>
BC807	5D*
BC807-16	5A*
BC807-25	5B*
BC807-40	5C*
BC807W	5D*
BC807-16W	5A*
BC807-25W	5B*
BC807-40W	5C*
BC327	C327
BC327-16	C32716
BC327-25	C32725
BC327-40	C32740

[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	
$V_{CBO}$	collector-base voltage	open emitter	-	-50	V	
$V_{CEO}$	collector-emitter voltage	open base; $I_C = 10\text{ mA}$	-	-45	V	
$V_{EBO}$	emitter-base voltage	open collector	-	-5	V	
$I_C$	collector current (DC)		-	-500	mA	
$I_{CM}$	peak collector current		-	-1	A	
$I_{BM}$	peak base current		-	-200	mA	
$P_{tot}$	total power dissipation					
	BC807	$T_{amb} \leq 25\text{ °C}$	[1][2]	-	250	mW
	BC807W	$T_{amb} \leq 25\text{ °C}$	[1][2]	-	200	mW
	BC327	$T_{amb} \leq 25\text{ °C}$	[1][2]	-	625	mW
$T_{stg}$	storage temperature		-65	+150	°C	
$T_j$	junction temperature		-	150	°C	
$T_{amb}$	ambient temperature		-65	+150	°C	

[1] Transistor mounted on an FR4 printed-circuit board, single-sided copper, tin-plated and standard footprint.

[2] Valid for all available selection groups.

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$R_{th(j-a)}$	thermal resistance from junction to ambient						
	BC807	$T_{amb} \leq 25\text{ °C}$	[1][2]	-	-	500	K/W
	BC807W	$T_{amb} \leq 25\text{ °C}$	[1][2]	-	-	625	K/W
	BC327	$T_{amb} \leq 25\text{ °C}$	[1][2]	-	-	200	K/W

[1] Transistor mounted on an FR4 printed-circuit board, single-sided copper, tin-plated and standard footprint.

[2] Valid for all available selection groups.

## 7. Characteristics

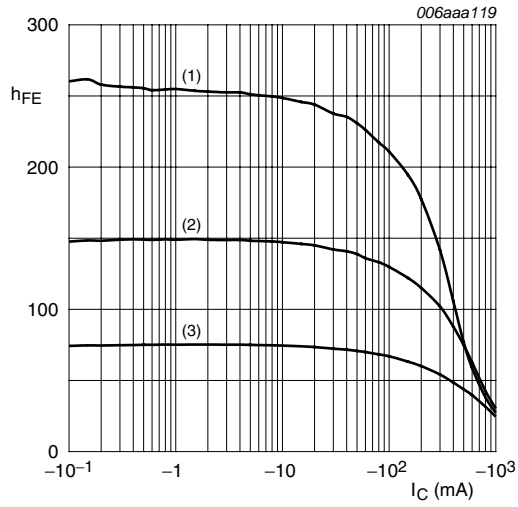
**Table 8. Characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$I_E = 0\text{ A}; V_{CB} = -20\text{ V}$	-	-	-100	nA
		$I_E = 0\text{ A}; V_{CB} = -20\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	-5	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$I_C = 0\text{ A}; V_{EB} = -5\text{ V}$	-	-	-100	nA
$h_{FE}$	DC current gain	$I_C = -100\text{ mA}; V_{CE} = -1\text{ V}$	[1]			
		BC807; BC807W; BC327	100	-	600	
		BC807-16; BC807-16W; BC327-16	100	-	250	
		BC807-25; BC807-25W; BC327-25	160	-	400	
	BC807-40; BC807-40W; BC327-40	250	-	600		
$h_{FE}$	DC current gain	$I_C = -500\text{ mA}; V_{CE} = -1\text{ V}$	[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	$I_C = -500\text{ mA}; V_{CE} = -1\text{ V}$	[2] -	-	-1.2	V
$C_c$	collector capacitance	$I_E = i_e = 0\text{ A}; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	-	5	-	pF
$f_T$	transition frequency	$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$	80	-	-	MHz

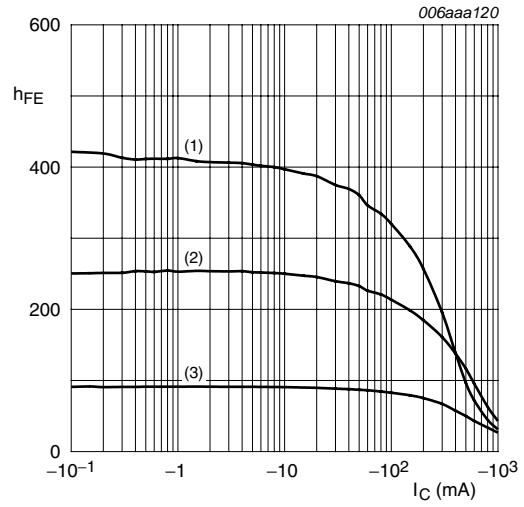
[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

[2]  $V_{BE}$  decreases by approximately 2 mV/K with increasing temperature.



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

**Fig 1. Selection -16: DC current gain as a function of collector current; typical values**



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

**Fig 2. Selection -25: DC current gain as a function of collector current; typical values**



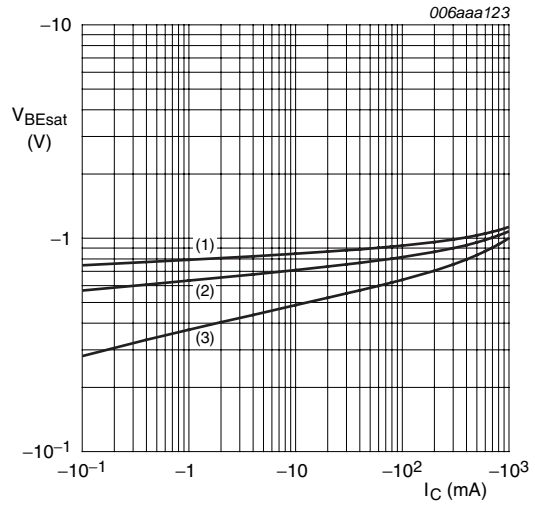
- $V_{CE} = -1\text{ V}$
- (1)  $T_{amb} = 150\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = -55\text{ °C}$

**Fig 3. Selection -40: DC current gain as a function of collector current; typical values**



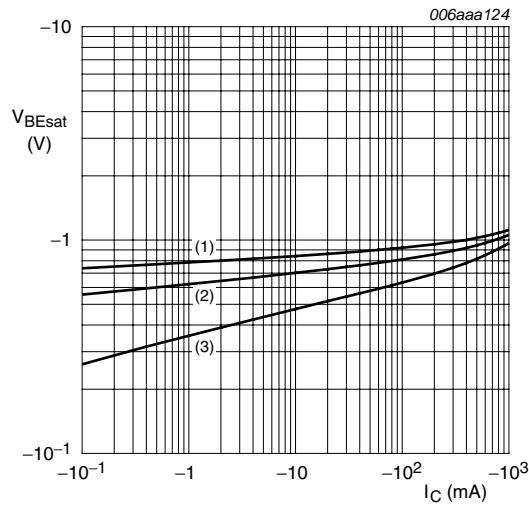
- $I_C/I_B = 10$
- (1)  $T_{amb} = -55\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = 150\text{ °C}$

**Fig 4. Selection -16: Base-emitter saturation voltage as a function of collector current; typical values**



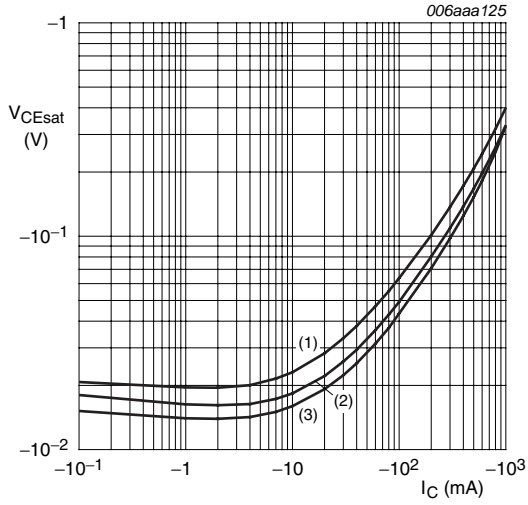
- $I_C/I_B = 10$
- (1)  $T_{amb} = -55\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = 150\text{ °C}$

**Fig 5. Selection -25: Base-emitter saturation voltage as a function of collector current; typical values**



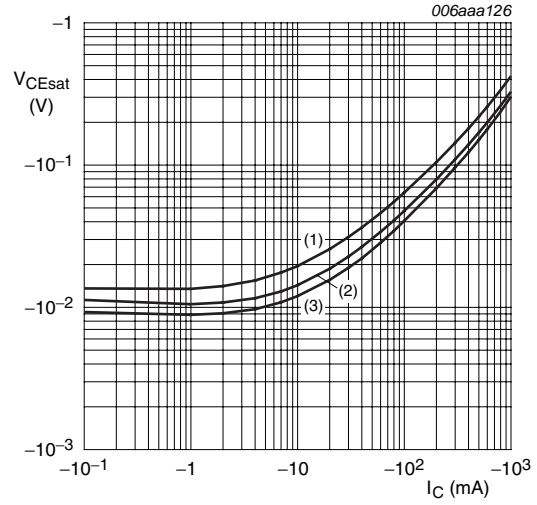
- $I_C/I_B = 10$
- (1)  $T_{amb} = -55\text{ °C}$
  - (2)  $T_{amb} = 25\text{ °C}$
  - (3)  $T_{amb} = 150\text{ °C}$

**Fig 6. Selection -40: Base-emitter saturation voltage as a function of collector current; typical values**



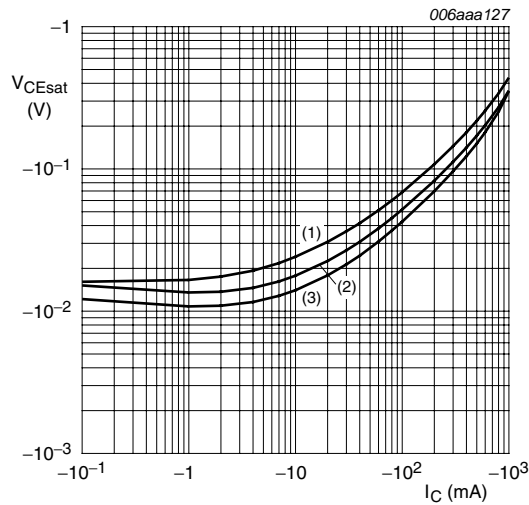
- $I_C/I_B = 10$
- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$
  - (2)  $T_{amb} = 25\text{ }^\circ\text{C}$
  - (3)  $T_{amb} = -55\text{ }^\circ\text{C}$

**Fig 7. Selection -16: 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)  $T_{amb} = -55\text{ }^\circ\text{C}$

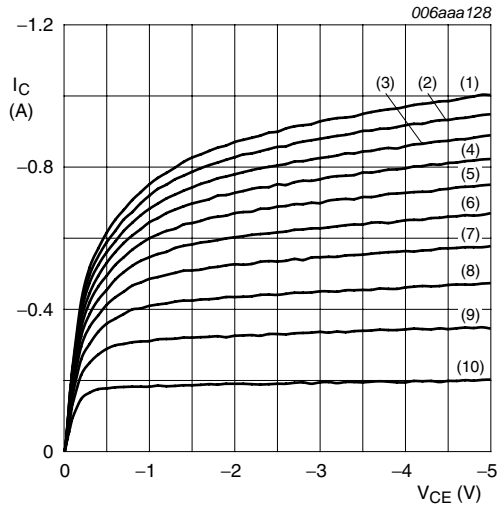
**Fig 8. Selection -25: Collector-emitter saturation voltage as a function of collector current; typical values**



- $I_C/I_B = 10$
- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$
  - (2)  $T_{amb} = 25\text{ }^\circ\text{C}$
  - (3)  $T_{amb} = -55\text{ }^\circ\text{C}$

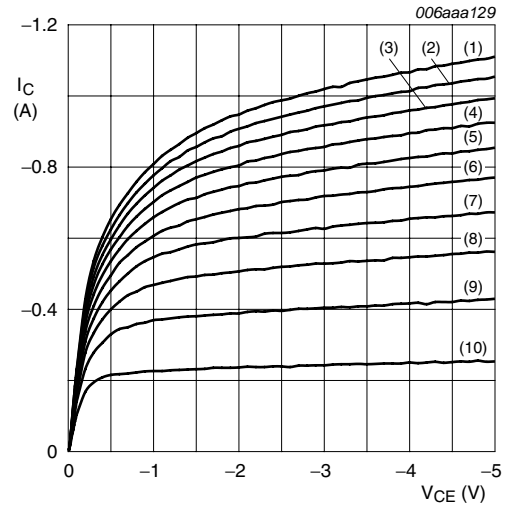
**Fig 9. Selection -40: Collector-emitter saturation voltage as a function of collector current; typical values**





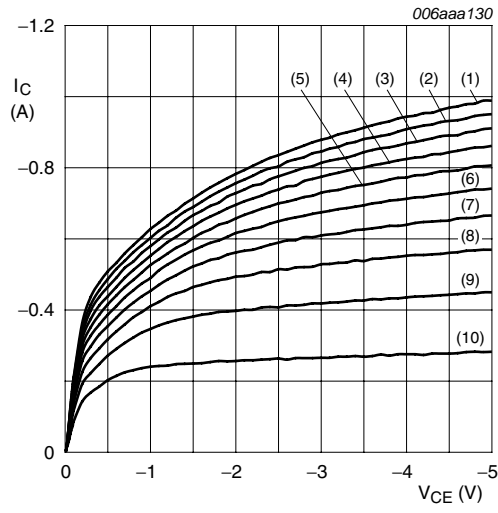
- $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (1)  $I_B = -16.0\text{ mA}$
  - (2)  $I_B = -14.4\text{ mA}$
  - (3)  $I_B = -12.8\text{ mA}$
  - (4)  $I_B = -11.2\text{ mA}$
  - (5)  $I_B = -9.6\text{ mA}$
  - (6)  $I_B = -8.0\text{ mA}$
  - (7)  $I_B = -6.4\text{ mA}$
  - (8)  $I_B = -4.8\text{ mA}$
  - (9)  $I_B = -3.2\text{ mA}$
  - (10)  $I_B = -1.6\text{ mA}$

**Fig 10. Selection -16: Collector current as a function of collector-emitter voltage; typical values**



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

**Fig 11. Selection -25: Collector current as a function of collector-emitter voltage; typical values**



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

- (1)  $I_B = -12.0\text{ mA}$
- (2)  $I_B = -10.8\text{ mA}$
- (3)  $I_B = -9.6\text{ mA}$
- (4)  $I_B = -8.4\text{ mA}$
- (5)  $I_B = -7.2\text{ mA}$
- (6)  $I_B = -6.0\text{ mA}$
- (7)  $I_B = -4.8\text{ mA}$
- (8)  $I_B = -3.6\text{ mA}$
- (9)  $I_B = -2.4\text{ mA}$
- (10)  $I_B = -1.2\text{ mA}$

**Fig 12. Selection -40: Collector current as a function of collector-emitter voltage; typical values**

**8. Package outline**

Plastic surface-mounted package; 3 leads

SOT23



Fig 13. Package outline SOT23 (TO-236AB)

Plastic surface-mounted package; 3 leads

SOT323



Fig 14. Package outline SOT323 (SC-70)

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



Fig 15. Package outline SOT54 (SC-43A/TO-92)

Plastic single-ended leaded (through hole) package; 3 leads (wide pitch)

SOT54A



Fig 16. Package outline SOT54A

Plastic single-ended leaded (through hole) package; 3 leads (on-circle)

SOT54 variant



Fig 17. Package outline SOT54 variant

## 9. Packing information

**Table 9. Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

Type number	Package	Description	Packing quantity		
			3000	5000	10000
BC807	SOT23	4 mm pitch, 8 mm tape and reel	-215	-	-235
BC807W	SOT323	4 mm pitch, 8 mm tape and reel	-115	-	-135
BC327	SOT54	bulk, straight leads	-	-412	-
BC327	SOT54A	tape and reel, wide pitch	-	-	-116
BC327	SOT54A	tape ammopack, wide pitch	-	-	-126
BC327	SOT 54 variant	bulk, delta pinning (on-circle)	-	-112	-

[1] For further information and the availability of packing methods, see [Section 12](#).



## 10. Revision history

**Table 10. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
BC807_BC807W_ BC327_6	20091117	Product data sheet	-	BC807_BC807W_ BC327_5
Modifications:		<ul style="list-style-type: none"> <li>This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content.</li> <li><a href="#">Table 3 "Pinning"</a>: updated</li> <li><a href="#">Figure 13 "Package outline SOT23 (TO-236AB)"</a>: updated</li> <li><a href="#">Figure 14 "Package outline SOT323 (SC-70)"</a>: updated</li> </ul>		
BC807_BC807W_ BC327_5	20050221	Product data sheet	CPCN200302007F CPCN200405006F	BC807_4; BC807W_3; BC327_3
BC807_4	20040116	Product specification	-	BC807_3
BC807W_3	19990518	Product specification	-	BC807W_808W_CNV_2
BC327_3	19990415	Product specification	-	BC327_2

## 11. Legal information

### 11.1 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".

[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.nxp.com>.

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Date of release: 17 November 2009

Document identifier: BC807\_BC807W\_BC327\_6