BC807; BC807W; BC327

45 V, 500 mA PNP general-purpose transistors

Rev. 05 — 21 February 2005 Product data sheet

1. Product profile

1.1 General description

PNP general-purpose transistors.

Table 1: Product overview

Type number	Package		NPN complement
	Philips	JEITA	
BC807	SOT23	-	BC817
BC807W	SOT323	SC-70	BC817W
BC327 [1]	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

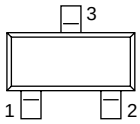
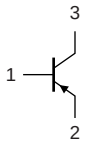
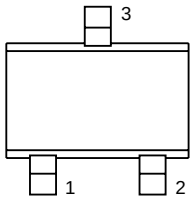
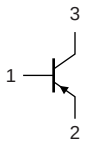
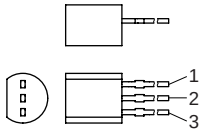
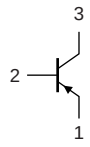
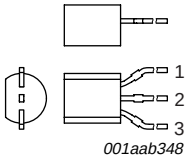
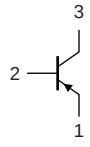
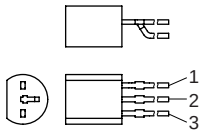
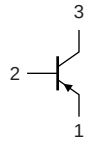
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base; I_C = 10 mA	-	-	–45	V
I_C	collector current (DC)		-	-	–500	mA
I_{CM}	peak collector current		-	-	–1	A
h_{FE}	DC current gain	I_C = –100 mA; V_{CE} = –1 V [1]				
	BC807; BC807W; BC327		100	-	600	
	BC807-16; BC807-16W;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

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

PHILIPS

2. Pinning information

Table 3: Pinning

Pin	Description	Simplified outline	Symbol
SOT23			
1	base		
2	emitter		
3	collector		sym013
SOT323			
1	base		
2	emitter	sot323_so	sym013
3	collector		
SOT54			
1	emitter		
2	base	001aab347	006aaa149
3	collector		
SOT54A			
1	emitter		
2	base	001aab348	006aaa149
3	collector		
SOT54 variant			
1	emitter		
2	base	001aab447	006aaa149
3	collector		

3. Ordering information

Table 4: Ordering information

Type number [1]	Package		
	Name	Description	Version
BC807	-	plastic surface mounted package; 3 leads	SOT23
BC807W	SC-70	plastic surface mounted package; 3 leads	SOT323
BC327 [2]	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 [1]
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 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	$T_{amb} \leq 25$ °C	[1] [2]	-	250	mW
	BC807W	$T_{amb} \leq 25$ °C	[1] [2]	-	200	mW
	BC327	$T_{amb} \leq 25$ °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	$T_{amb} \leq 25$ °C	[1] [2]	-	-	500	K/W
	BC807W	$T_{amb} \leq 25$ °C	[1] [2]	-	-	625	K/W
	BC327	$T_{amb} \leq 25$ °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

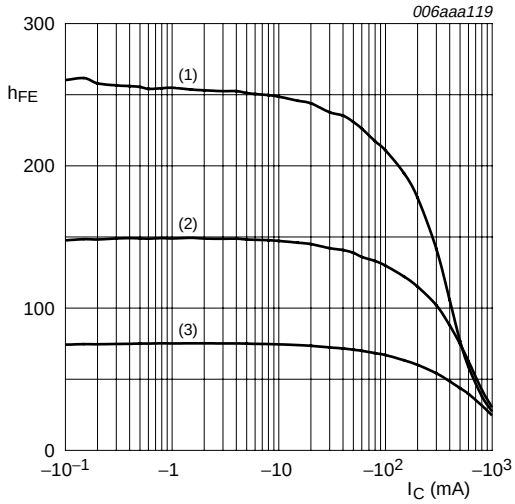
Table 8: Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	I_E = 0 A; V_{CB} = –20 V		-	-	–100	nA
		I_E = 0 A; V_{CB} = –20 V; T_j = 150 °C		-	-	–5	µA
I_{EBO}	emitter-base cut-off current	I_C = 0 A; V_{EB} = –5 V		-	-	–100	nA
h_{FE}	DC current gain	I_C = –100 mA; V_{CE} = –1 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 mA; V_{CE} = –1 V	[1]	40	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = –500 mA; I_B = –50 mA	[1]	-	-	–700	mV
V_{BE}	base-emitter voltage	I_C = –500 mA; V_{CE} = –1 V	[2]	-	-	–1.2	V
C_c	collector capacitance	$I_E = i_e$ = 0 A; V_{CB} = –10 V; f = 1 MHz		-	5	-	pF
f_T	transition frequency	I_C = –10 mA; V_{CE} = –5 V; f = 100 MHz		80	-	-	MHz

[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

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



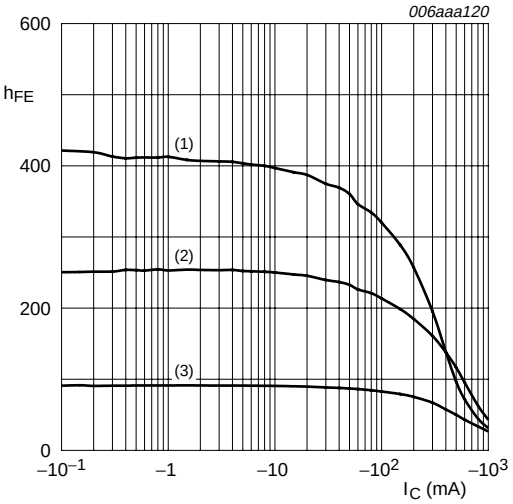
V_{CE} = −1 V.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = −55 °C.

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



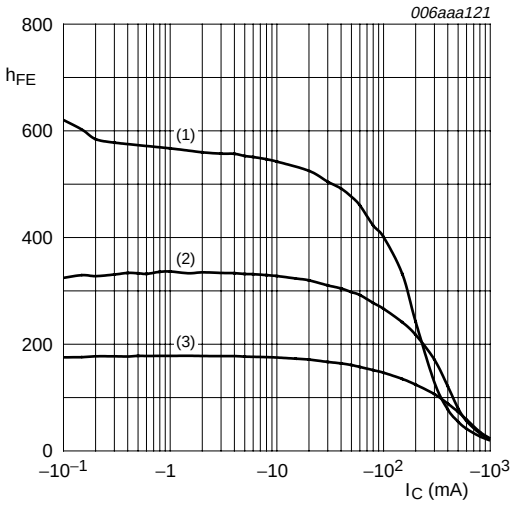
V_{CE} = −1 V.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = −55 °C.

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



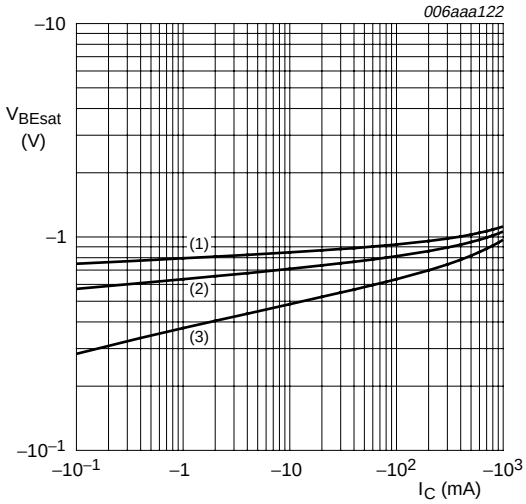
V_{CE} = −1 V.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = −55 °C.

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



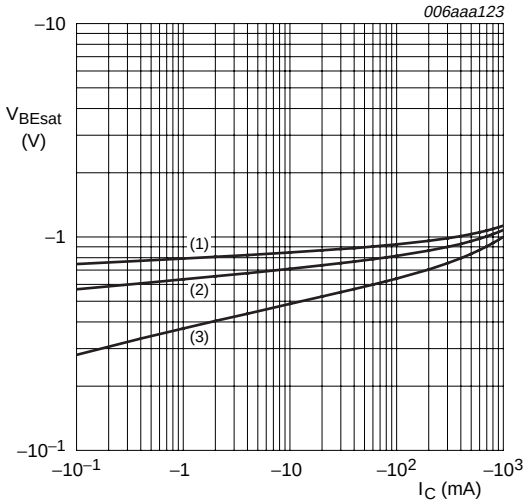
I_C/I_B = 10.

(1) T_{amb} = –55 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = 150 °C.

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



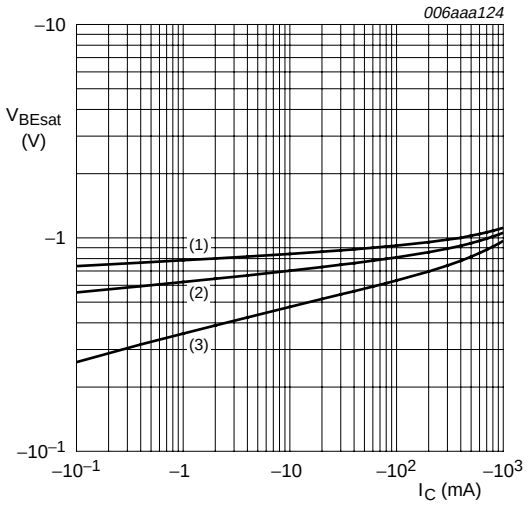
I_C/I_B = 10.

(1) T_{amb} = –55 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = 150 °C.

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



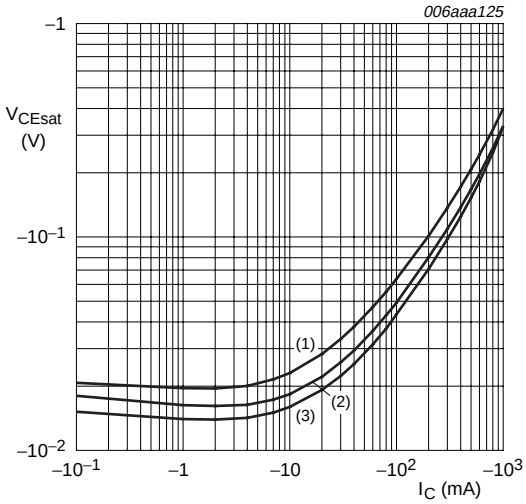
I_C/I_B = 10.

(1) T_{amb} = –55 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = 150 °C.

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



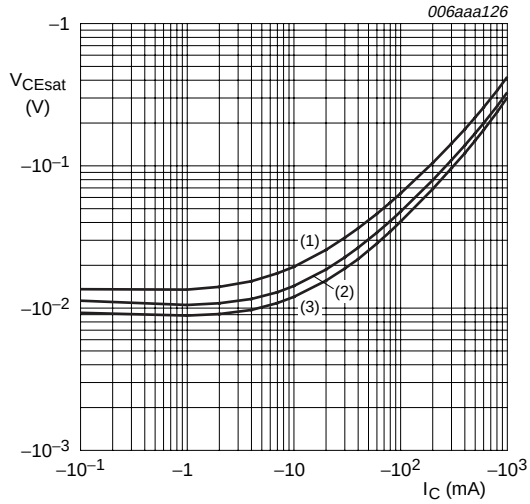
I_C/I_B = 10.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = −55 °C.

Fig 7. Selection -16: Collector-emitter saturation voltage as a function of collector current; typical values.



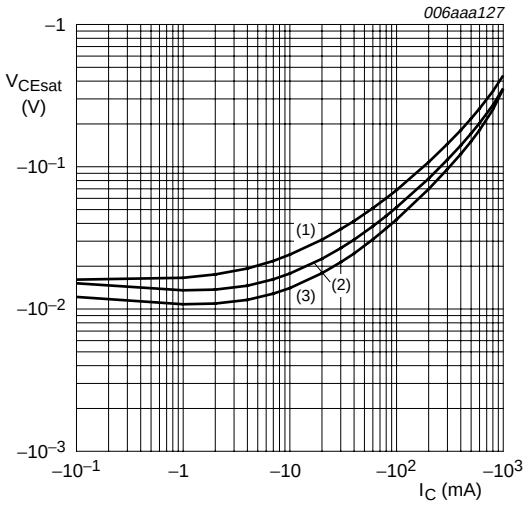
I_C/I_B = 10.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = −55 °C.

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



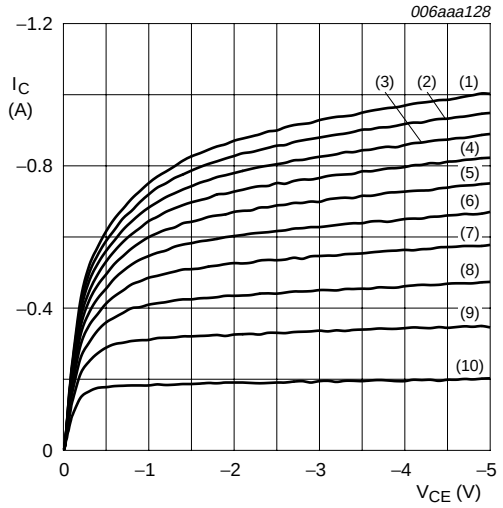
I_C/I_B = 10.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = −55 °C.

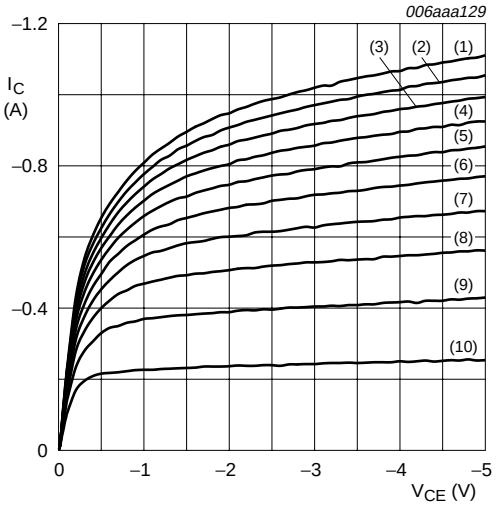
Fig 9. Selection -40: Collector-emitter saturation voltage as a function of collector current; typical values.



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.

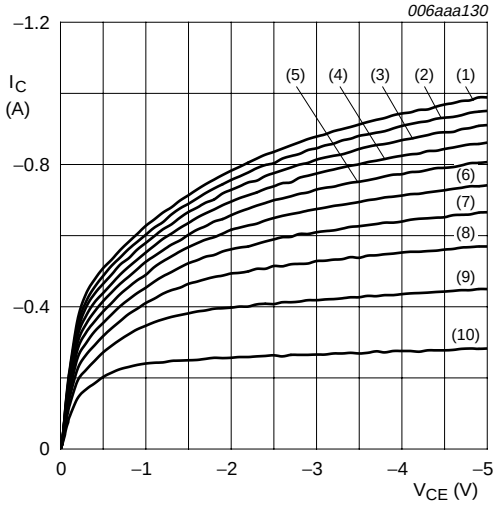
Fig 10. Selection -16: Collector current as a function of collector-emitter voltage; typical values.



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.

Fig 11. Selection -25: 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.

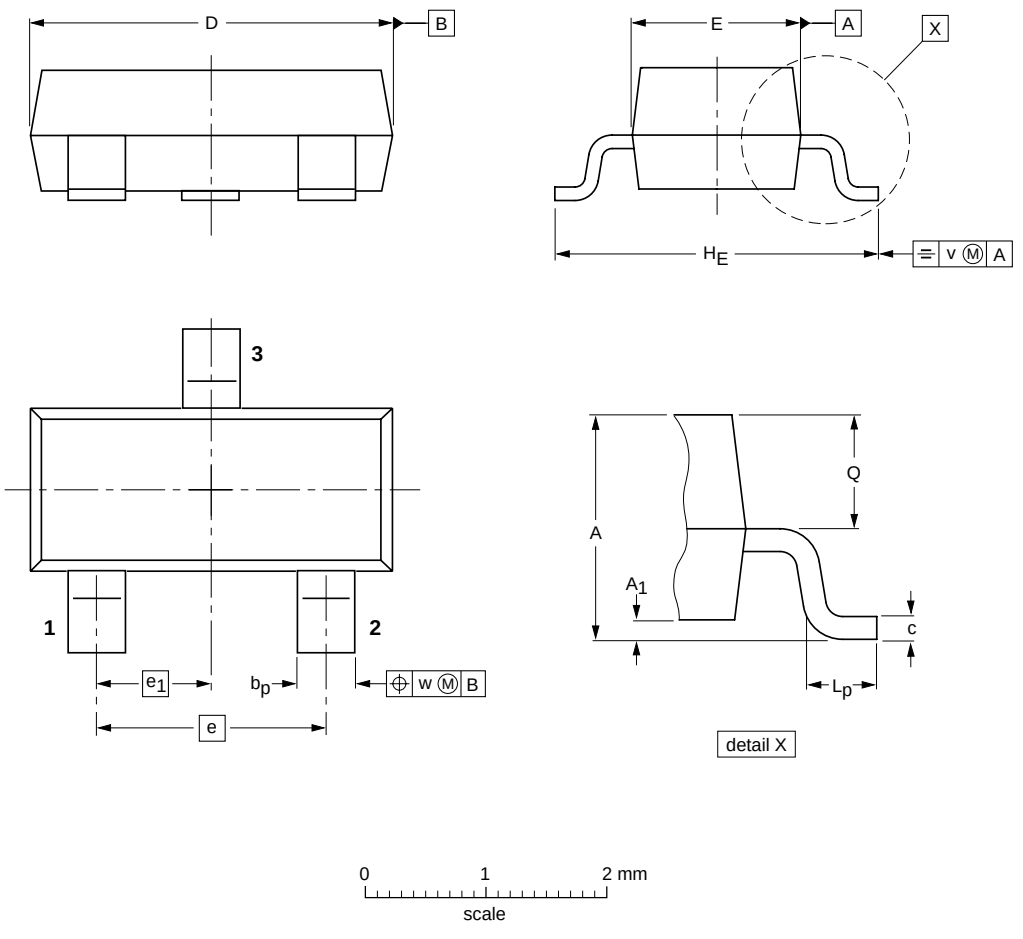
(9) I_B = −2.4 mA.

(10) I_B = −1.2 mA.

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**



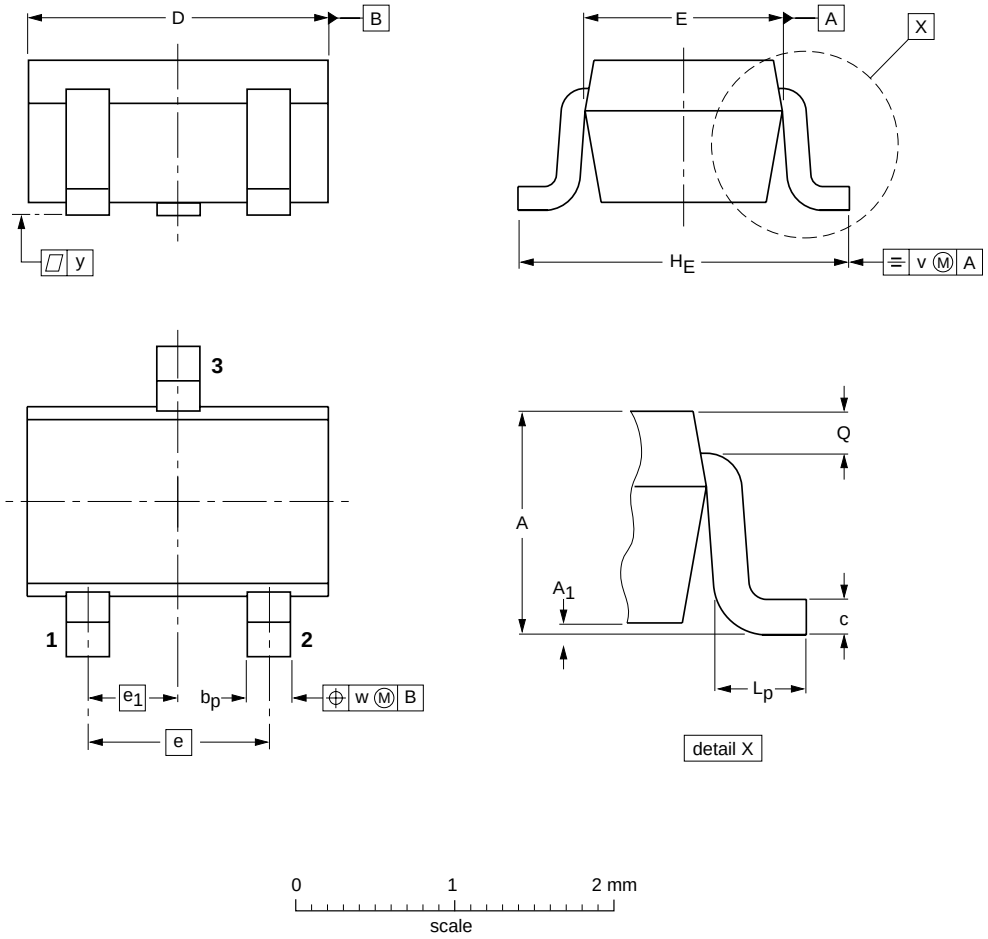
DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				~~99-09-13~~ 04-11-04

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

Plastic surface mounted package; 3 leads **SOT323**



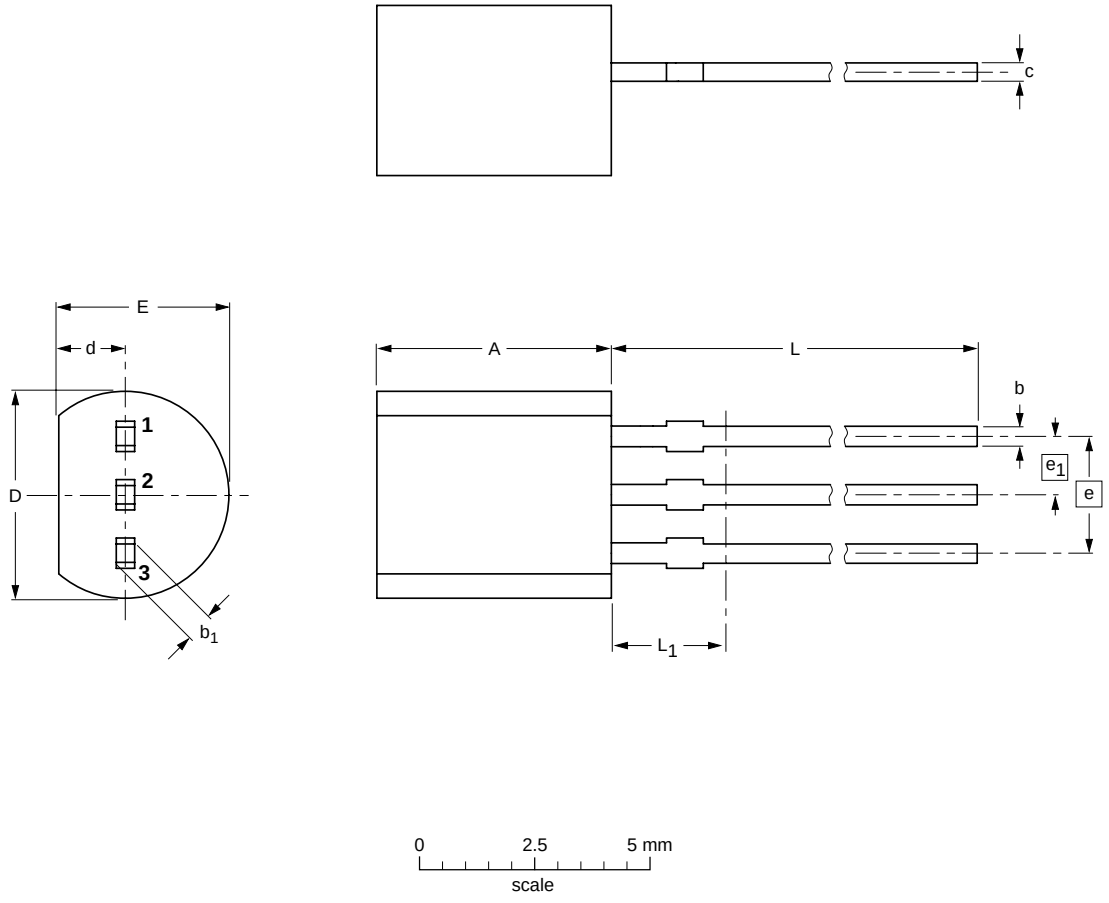
DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT323			SC-70			~~97-02-28~~ 04-11-04

Fig 14. Package outline SOT323 (SC-70).

Plastic single-ended leaded (through hole) package; 3 leads **SOT54**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b_1	c	D	d	E	e	e_1	L	L_1 (1) max.
mm	5.2 5.0	0.48 0.40	0.66 0.55	0.45 0.38	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

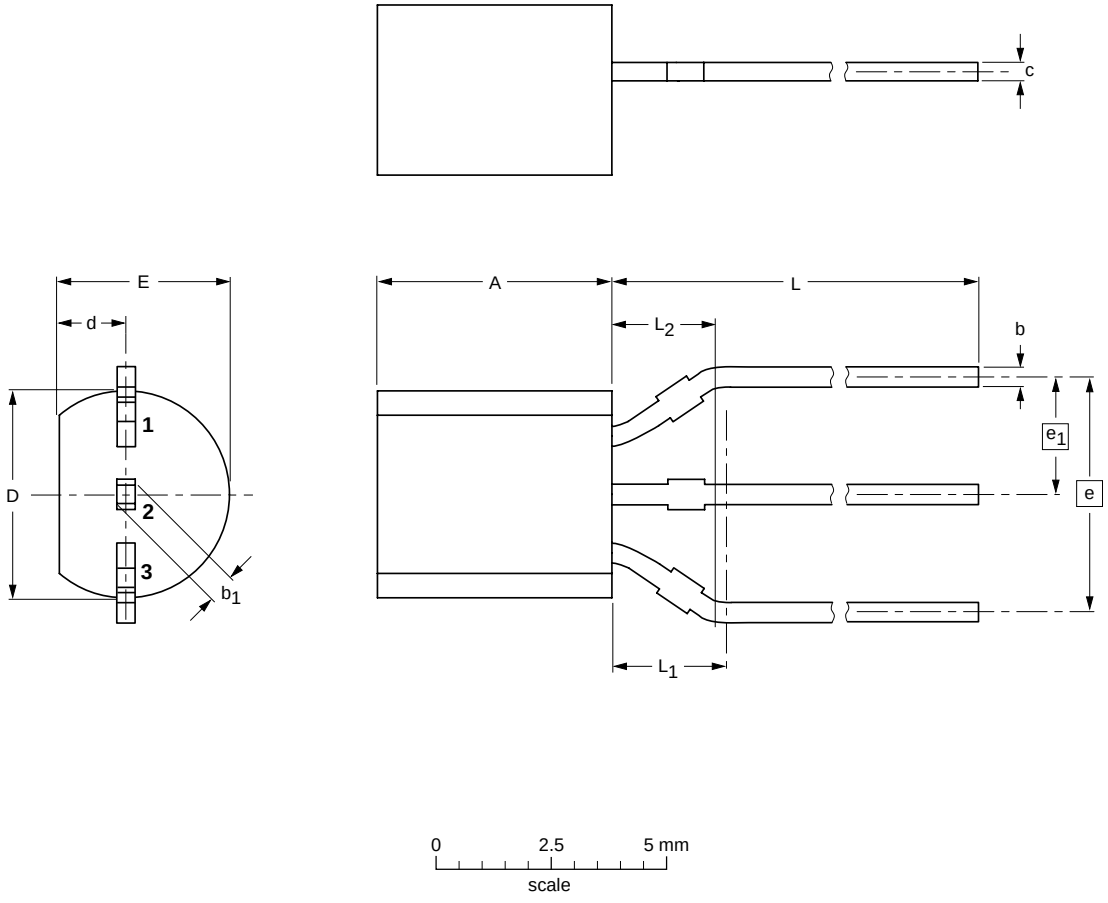
Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT54		TO-92	SC-43A			~~04-06-28~~ 04-11-16

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

Plastic single-ended leaded (through hole) package; 3 leads (wide pitch) **SOT54A**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b_1	c	D	d	E	e	e_1	L	L_1 (1) max.	L_2
mm	5.2 5.0	0.48 0.40	0.66 0.55	0.45 0.38	4.8 4.4	1.7 1.4	4.2 3.6	5.08	2.54	14.5 12.7	3	3 2

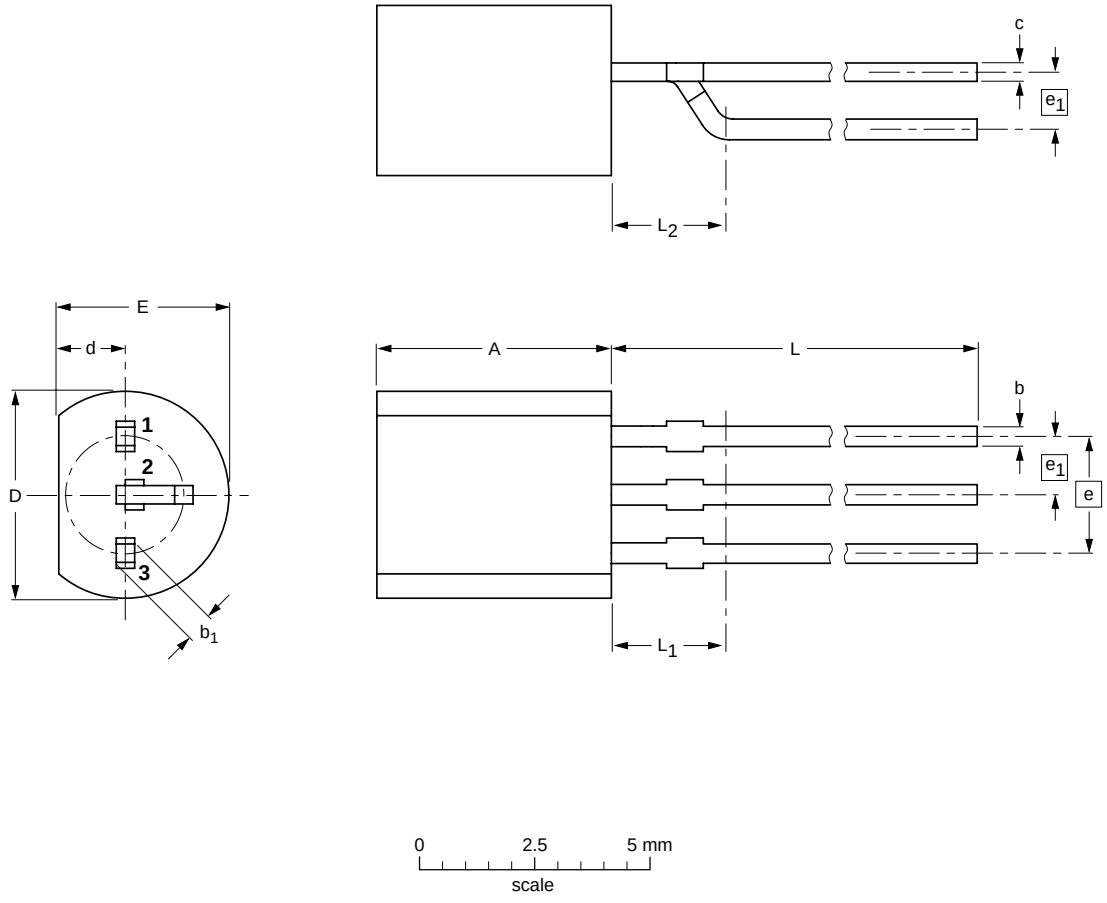
Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT54A						~~97-05-13~~ 04-06-28

Fig 16. Package outline SOT54A.

Plastic single-ended leaded (through hole) package; 3 leads (on-circle) **SOT54 variant**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b_1	c	D	d	E	e	e_1	L	L_1 (1) max	L_2 max
mm	5.2 5.0	0.48 0.40	0.66 0.55	0.45 0.38	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5	2.5

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT54 variant						~~04-06-28~~ 05-01-10

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. [1]

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 14.

10. Revision history

Table 10: Revision history

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
BC807_BC807W_BC327_5	20050221	Product data sheet	CPCN200302007F CPCN200405006F	9397 750 14023	BC807_4; BC807W_3; BC327_3
Modifications:	• The format of the data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors. • This data sheet is a combination of the previous data sheets BC807_4, BC807W_3 and BC327_3. • Table 1 and 2 added • Table 3 Discrete pinning for SOT54A and SOT54 variant added • Table 5 Marking codes for BC327, BC327-16, BC327-25 and BC327-40 added • Table 8 Typical value for C_c changed to 5 pF according to CPCN200302007F1 • Figure 1, 2 and 3 amended • Figure 4, 5, 6, 7, 8, 9, 10, 11 and 12 added • Figure 15 changed according to CPCN200405006F • Figure 16 and 17 added • Section 9 added				
BC807_4	20040116	Product specification	-	9397 750 12393	BC807_3
BC807W_3	19990518	Product specification	-	9397 750 05954	BC807W_808W_CNV_2
BC327_3	19990415	Product specification	-	9397 750 05675	BC327_2

11. Data sheet status

Level	Data sheet status [1]	Product status [2] [3]	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

[1] Please consult the most recently issued data sheet before initiating or completing a design.

[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

12. Definitions

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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15. Contents

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