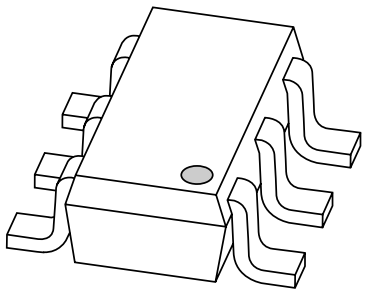
DATA SHEET



BC817DPN
NPN/PNP general purpose transistor

Product specification
Supersedes data of 2002 Aug 09

2002 Nov 22

Philips
Semiconductors

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NPN/PNP general purpose transistor BC817DPN

FEATURES

- High current (500 mA)
- 600 mW total power dissipation
- Replaces two SOT23 packaged transistors on same PCB area.

APPLICATIONS

- General purpose switching and amplification
- Complementary driver
- Half and full bridge driver.

DESCRIPTION

NPN/PNP transistor pair in a SOT457 (SC-74) plastic package.

MARKING

TYPE NUMBER	MARKING CODE
BC817DPN	N4

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	45	V
I_C	collector current (DC)	500	mA
I_{CM}	peak collector current	1	A

PINNING

PIN	DESCRIPTION	
1, 4	emitter	TR1; TR2
2, 5	base	TR1; TR2
6, 3	collector	TR1; TR2

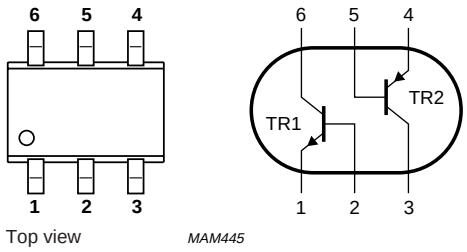


Fig.1 Simplified outline (SOT457) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per transistor; for the PNP transistor with negative polarity					
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	–	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	$T_{amb} \leq 25$ °C; note 1	–	370	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C
Per device					
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	600	mW

Note

1. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm^2.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	208	K/W

Note

1. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm^2.

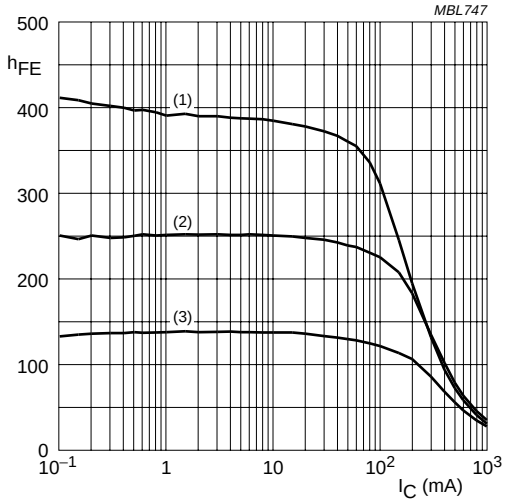
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per transistor unless otherwise specified; for the PNP transistor with negative polarity						
I_{CBO}	collector-base cut-off current	V_{CB} = 20 V; I_E = 0	–	–	100	nA
		V_{CB} = 20 V; I_E = 0; T_j = 150 °C	–	–	5	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0	–	–	100	nA
h_{FE}	DC current gain	V_{CE} = 1 V; I_C = 100 mA; note 1	160	–	400	
		V_{CE} = 1 V; I_C = 500 mA; note 1	40	–	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = 500 mA; I_B = 50 mA; note 1	–	–	700	mV
V_{BE}	base-emitter voltage	V_{CE} = 1 V; I_C = 500 mA; notes 1 and 2	–	–	1.2	V
NPN transistor						
C_c	collector capacitance	V_{CB} = 10 V; $I_E = I_e$ = 0; f = 1 MHz	–	5	–	pF
f_T	transition frequency	V_{CE} = 5 V; I_C = 10 mA; f = 100 MHz	100	–	–	MHz
PNP transistor						
C_c	collector capacitance	V_{CB} = –10 V; $I_E = I_e$ = 0; f = 1 MHz	–	9	–	pF
f_T	transition frequency	V_{CE} = –5 V; I_C = –10 mA; f = 100 MHz	80	–	–	MHz

Notes

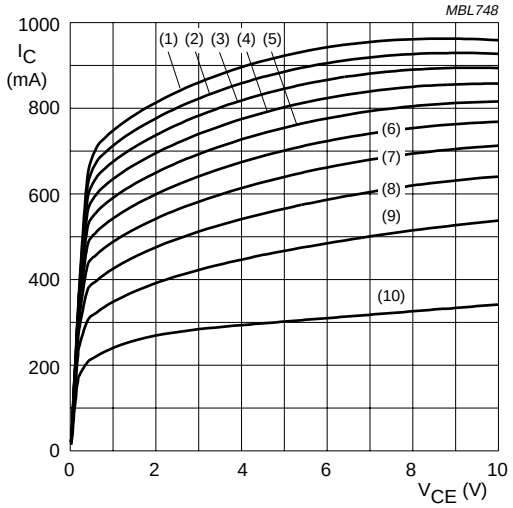
1. Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.
2. V_{BE} decreases by approximately –2 mV/K with increasing temperature.



TR1 (NPN) V_{CE} = 1 V.

(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

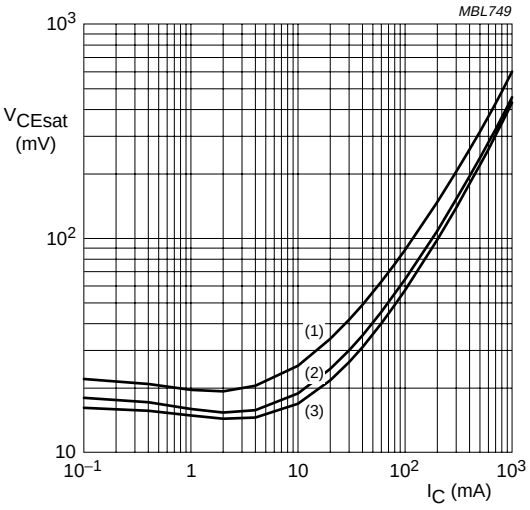
Fig.2 DC current gain as a function of collector current; typical values.



TR1 (NPN)

(1) I_B = 15 mA.
(2) I_B = 13.5 mA.
(3) I_B = 12 mA.
(4) I_B = 10.5 mA.
(5) I_B = 9 mA.
(6) I_B = 7.5 mA.
(7) I_B = 6 mA.
(8) I_B = 4.5 mA.
(9) I_B = 3 mA.
(10) I_B = 1.5 mA.

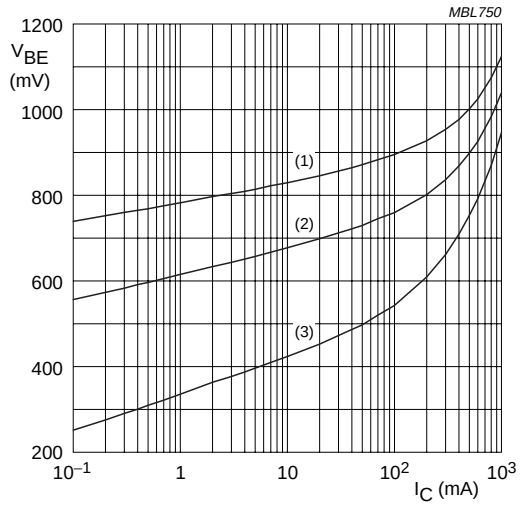
Fig.3 Collector current as a function of collector-emitter voltage; typical values.



TR1 (NPN) $I_C/I_B = 10$.

(1) $T_{amb} = 150$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

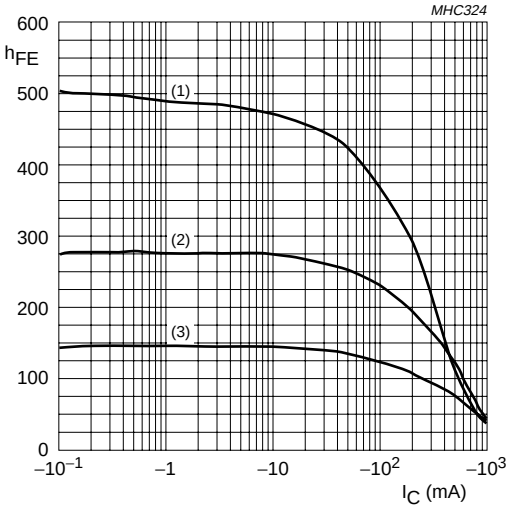
Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.



TR1 (NPN) $V_{CE} = 1$ V.

(1) $T_{amb} = -55$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = 150$ °C.

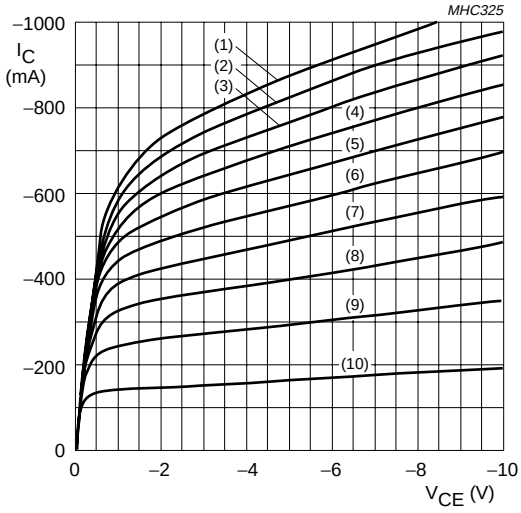
Fig.5 Base-emitter voltage as a function of collector current; typical values.



TR2 (PNP) V_{CE} = −1 V.

(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

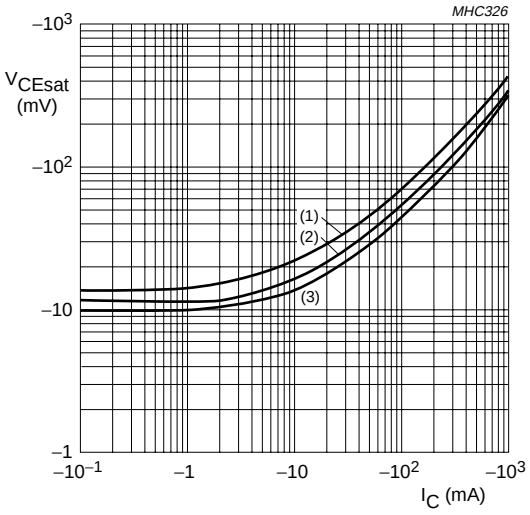
Fig.6 DC current gain as a function of collector current; typical values.



TR2 (PNP)

(1) I_B = −7 mA.
(2) I_B = −6.3 mA.
(3) I_B = −5.6 mA.
(4) I_B = −4.9 mA.
(5) I_B = −4.2 mA.
(6) I_B = −3.5 mA.
(7) I_B = −2.8 mA.
(8) I_B = −2.1 mA.
(9) I_B = −1.4 mA.
(10) I_B = −0.7 mA.

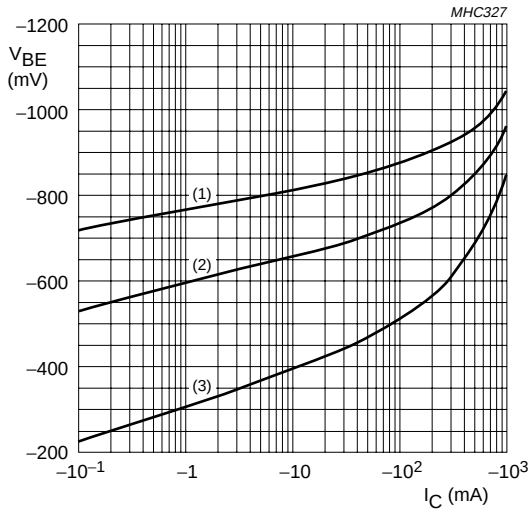
Fig.7 Collector current as a function of collector-emitter voltage; typical values.



TR2 (PNP) $I_C/I_B = 10$.

(1) $T_{amb} = 150$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

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



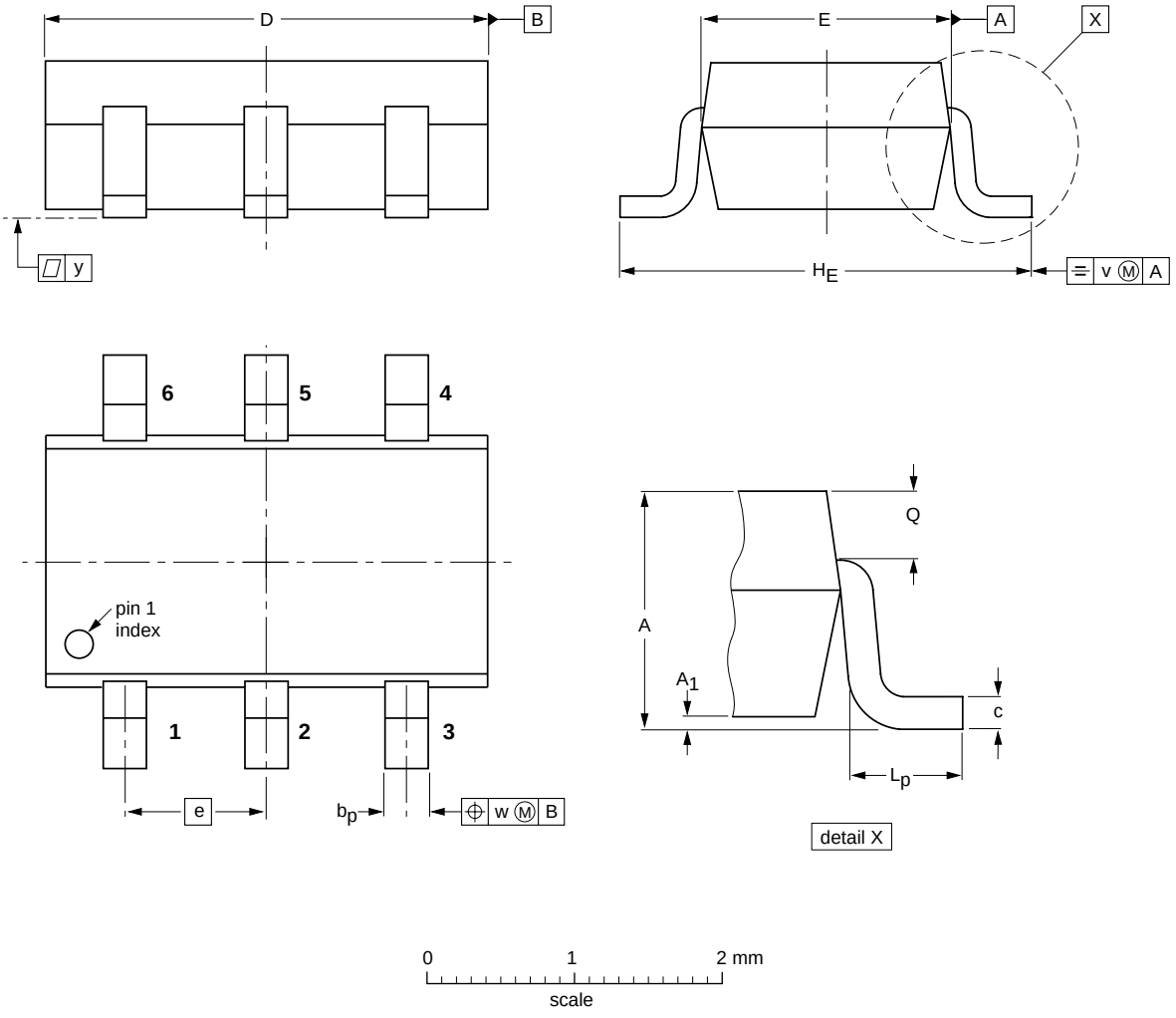
TR2 (PNP) $V_{CE} = -1$ V.

(1) $T_{amb} = -55$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = 150$ °C.

Fig.9 Base-emitter voltage as a function of collector current; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads **SOT457**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b_p	c	D	E	e	H_E	L_p	Q	v	w	y
mm	1.1 0.9	0.1 0.013	0.40 0.25	0.26 0.10	3.1 2.7	1.7 1.3	0.95	3.0 2.5	0.6 0.2	0.33 0.23	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT457			SC-74			~~97-02-28~~ 01-05-04

DATA SHEET STATUS

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