BC817DPN

NPN/PNP general purpose transistor

27 November 2019 **Product data sheet**

1. General description

NPN/PNP general-purpose double transistors in an SOT457 (SC-74) plastic package.

2. Features and benefits

- Reduces component count
- Reduces pick and place costs
- AEC-Q101 qualified

3. Applications

- General purpose switching and amplification

4. Quick reference data

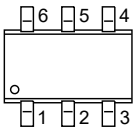
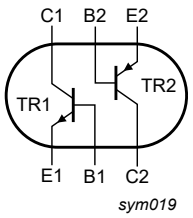
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor; for the PNP transistor with negative polarity							
V_{CEO}	collector-emitter voltage	open base		-	-	45	V
I_C	collector current			-	-	500	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	-	1	A
Per transistor unless otherwise specified; for the PNP transistor with negative polarity							
h_{FE}	DC current gain	V_{CE} = 1 V; I_C = 100 mA	[1]	160	-	400	

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

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E1	emitter TR1		
2	B1	base TR1		
3	C2	collector TR2		
4	E2	emitter TR2		
5	B2	base TR2		
6	C1	collector TR1		

SC-74; TSOP6 (SOT457)

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BC817DPN	SC-74; TSOP6	plastic, surface-mounted package (SC-74; TSOP6); 6 leads	SOT457

7. Marking

Table 4. Marking codes

Type number	Marking code
BC817DPN	N4

8. Limiting values

Table 5. 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			-	500	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	1	A
I_{BM}	peak base current			-	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	370	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	600	mW

[1] Device mounted on an FR4 Printed-Circuit Board (PCB); single-sided copper; tin plated; mounting pad for collector 1 cm^2.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per device							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	208	K/W

[1] Device mounted on an FR4 PCB; single-sided copper; tin-plated; mounting pad for collector 1 cm^2.

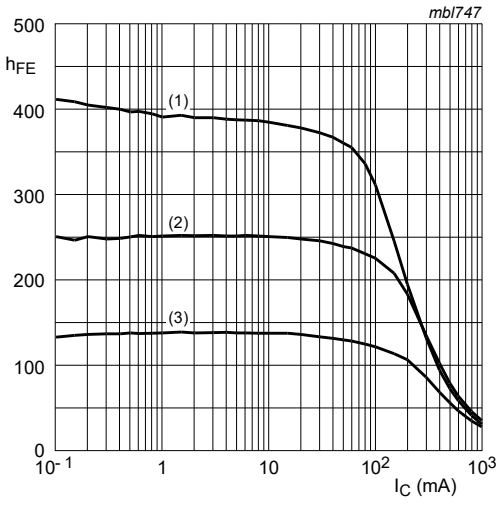
10. Characteristics

Table 7. Characteristics

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 A; T_{amb} = 25 °C		-	-	100	nA
		V_{CB} = 20 V; I_E = 0 A; T_j = 150 °C		-	-	5	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0 A; T_{amb} = 25 °C		-	-	100	nA
h_{FE}	DC current gain	V_{CE} = 1 V; I_C = 100 mA	[1]	160	-	400	
		V_{CE} = 1 V; I_C = 500 mA; T_{amb} = 25 °C	[1]	40	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 500 mA; I_B = 50 mA; T_{amb} = 25 °C	[1]	-	-	700	mV
V_{BE}	base-emitter voltage	V_{CE} = 1 V; I_C = 500 mA	[1] [2]	-	-	1.2	V
NPN transistor							
C_c	collector capacitance	V_{CB} = 10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	5	-	pF
f_T	transition frequency	V_{CE} = 5 V; I_C = 10 mA; f = 100 MHz; T_{amb} = 25 °C		100	-	-	MHz
PNP transistor							
C_c	collector capacitance	V_{CB} = -10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	9	-	pF
f_T	transition frequency	V_{CE} = -5 V; I_C = -10 mA; f = 100 MHz; T_{amb} = 25 °C		80	-	-	MHz

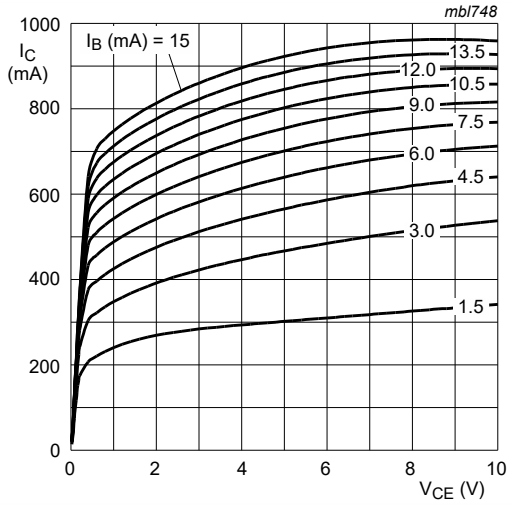
[1] Pulsed test: $t_p \leq 300$ µs; $\delta \leq 0.02$

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



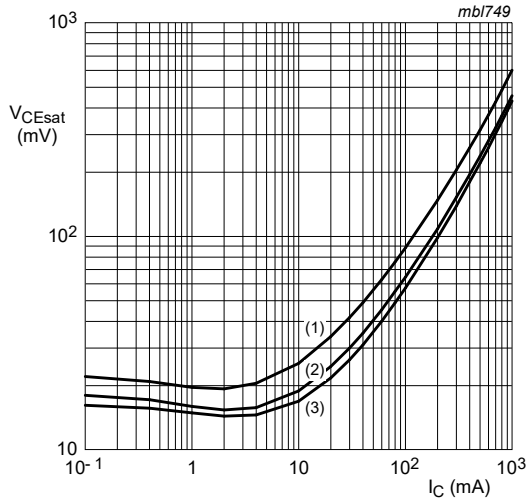
V_{CE} = 1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

Fig. 1. TR1 (NPN): DC current gain as a function of collector current; typical values



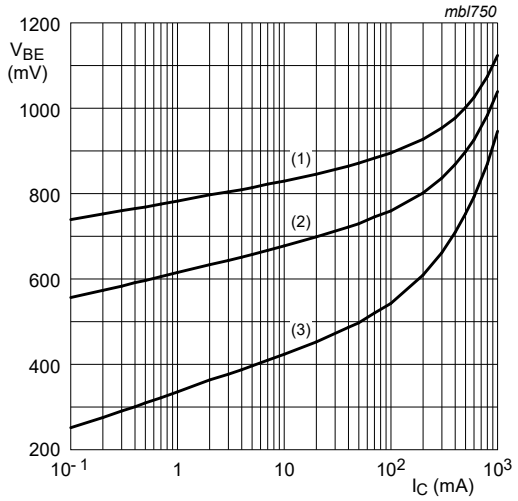
T_{amb} = 25 °C

Fig. 2. TR1 (NPN): Collector current as a function of collector-emitter voltage; typical values



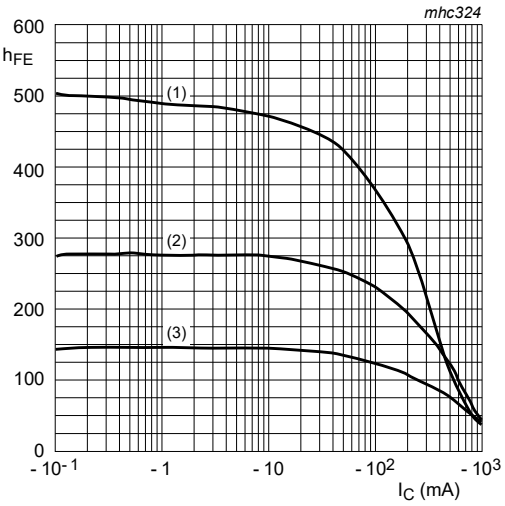
I_C/I_B = 10
(1) T_{amb} = 150°C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Fig. 3. TR1 (NPN): Collector-emitter saturation voltage as a function of collector current; typical values



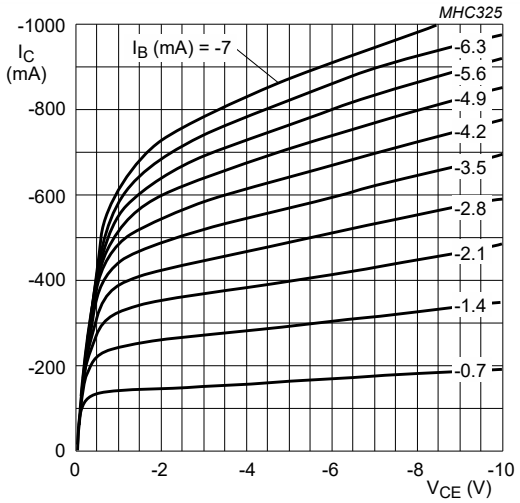
V_{CE} = 1 V
(1) T_{amb} = −55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Fig. 4. TR1 (NPN): Base-emitter voltage as a function of collector current; typical values



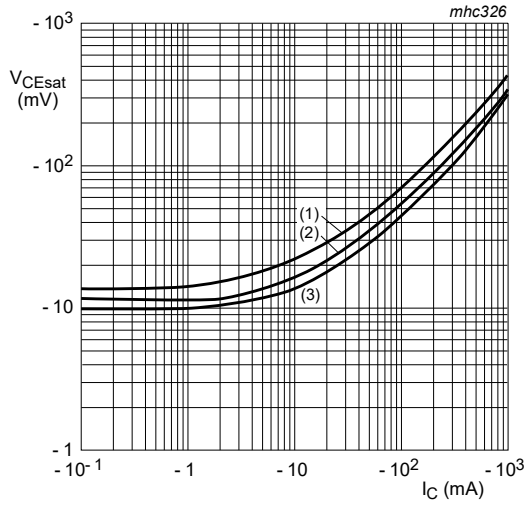
V_{CE} = -1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

Fig. 5. TR2 (PNP): DC current gain as a function of collector current; typical values



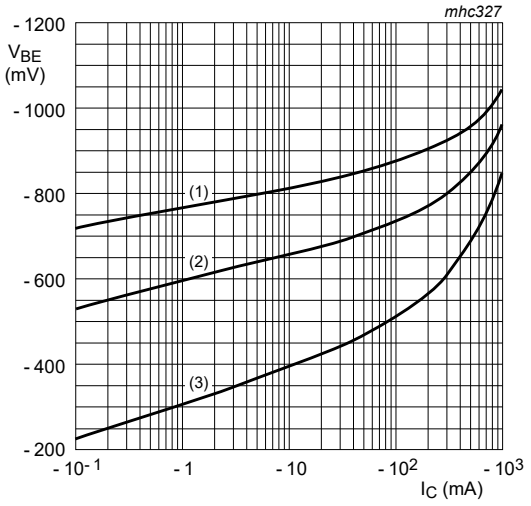
T_{amb} = 25 °C

Fig. 6. TR2 (PNP): Collector current as a function of collector-emitter voltage; typical values



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

Fig. 7. TR2 (PNP): Collector-emitter saturation voltage as a function of collector current; typical values



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

Fig. 8. TR2 (PNP): Base-emitter voltage as a function of collector current; typical values

11. Test information

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.

12. Package outline

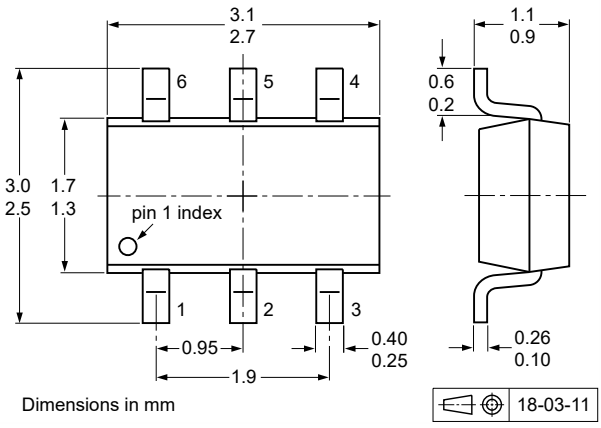


Fig. 9. Package outline SC-74; TSOP6 (SOT457)

13. Soldering

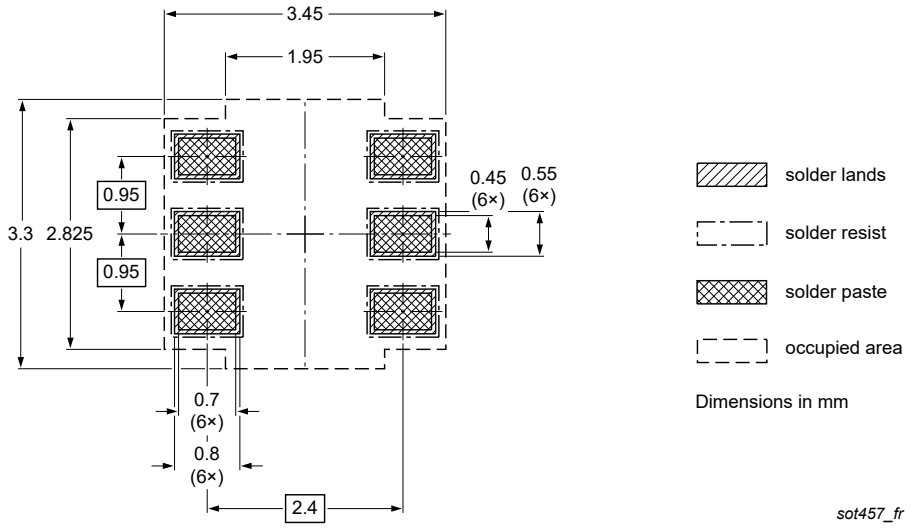


Fig. 10. Reflow soldering footprint for SC-74; TSOP6 (SOT457)

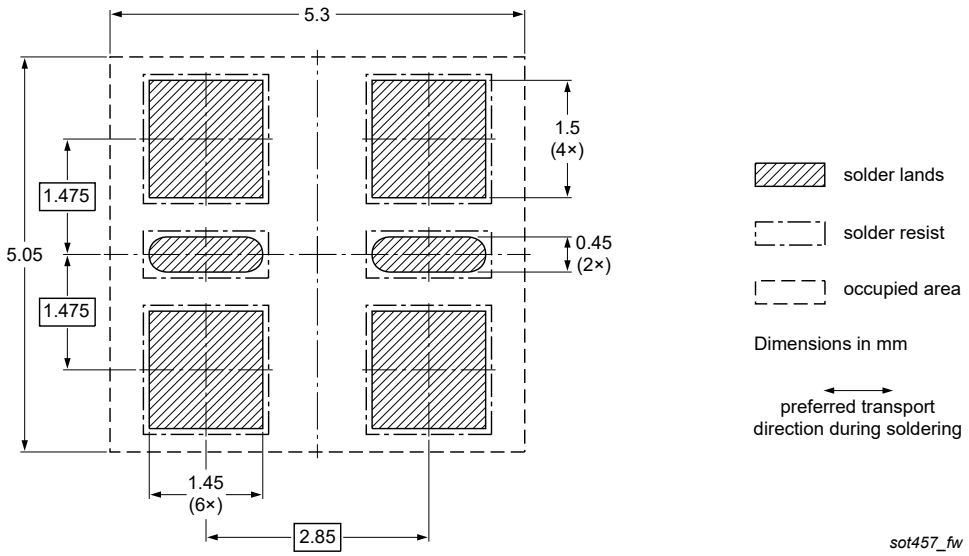


Fig. 11. Wave soldering footprint for SC-74; TSOP6 (SOT457)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BC817DPN v.3	20191127	Product data sheet	-	BC817DPN v.2
Modifications:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate.			
BC817DPN v.2	20021122	Product data sheet	-	BC817DPN v.1
BC817DPN v.1	20020809	Product data sheet	-	-

15. Legal information

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.

[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 https://www.nexperia.com.

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