BCV47

NPN Darlington transistor

1 October 2022 **Product data sheet**

1. General description

NPN Darlington transistor in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

PNP complement: BCV26

2. Features and benefits

- Medium current of 500 mA
- Low voltage of 60 V
- High DC current gain of minimum 2000

3. Applications

- Preamplifier input amplification

4. Quick reference data

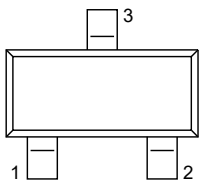
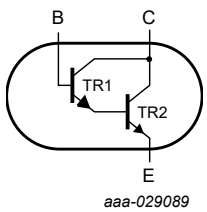
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CBO}	collector-base voltage	open emitter		-	-	80	V
V_{CES}	collector-emitter voltage	base short-circuited to emitter		-	-	60	V
I_C	collector current			-	-	500	mA
I_{CM}	peak collector current			-	-	800	mA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 100 mA; T_{amb} = 25 °C	[1]	10000	-	-	

[1] Pulse 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	B	base	 SOT23	 aaa-029089
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BCV47	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BCV47	FG%

[1] % = placeholder for manufacturing site code

8. Limiting values

Table 5. 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		-	80	V
V_{CES}	collector-emitter voltage	base short-circuited to emitter		-	60	V
V_{EBO}	emitter-base voltage	open collector		-	10	V
I_C	collector current			-	500	mA
I_{CM}	peak collector current			-	800	mA
I_{BM}	peak base current	single pulse; $t_p \leq 1$ ms		-	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	250	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	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.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient		[1]	-	-	500	K/W

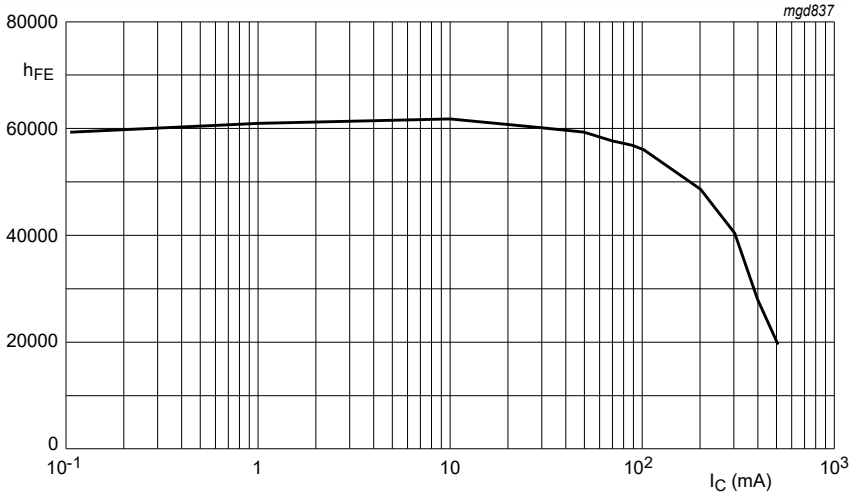
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	I_C = 100 µA; I_E = 0 A; T_{amb} = 25 °C		80	-	-	V
$V_{(BR)CES}$	collector-emitter breakdown voltage	I_C = 2 mA; V_{BE} = 0 V; T_{amb} = 25 °C		60	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	I_C = 0 A; I_E = 100 µA; T_{amb} = 25 °C		10	-	-	V
I_{CBO}	collector-base cut-off current	V_{CB} = 60 V; I_E = 0 A; T_{amb} = 25 °C		-	-	100	nA
I_{CES}	collector-emitter cut-off current	V_{CE} = 60 V; V_{BE} = 0 V; T_{amb} = 25 °C		-	-	100	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = 10 V; I_C = 0 A; T_{amb} = 25 °C		-	-	100	nA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 1 mA; T_{amb} = 25 °C	[1]	2000	-	-	
		V_{CE} = 5 V; I_C = 10 mA; T_{amb} = 25 °C	[1]	4000	-	-	
		V_{CE} = 5 V; I_C = 100 mA; T_{amb} = 25 °C	[1]	10000	-	-	
		V_{CE} = 5 V; I_C = 500 mA; T_{amb} = 25 °C	[1]	2000	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 100 mA; I_B = 1 mA; T_{amb} = 25 °C		-	-	1	V
V_{BEsat}	base-emitter saturation voltage	I_C = 100 mA; I_B = 0.1 mA; T_{amb} = 25 °C		-	-	1.5	V
V_{BEon}	base-emitter turn-on voltage	I_C = 10 mA; V_{CE} = 5 V; T_{amb} = 25 °C		-	-	1.4	V

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



V_{CE} = 2 V

Fig. 1. DC current gain; typical values

11. Package outline

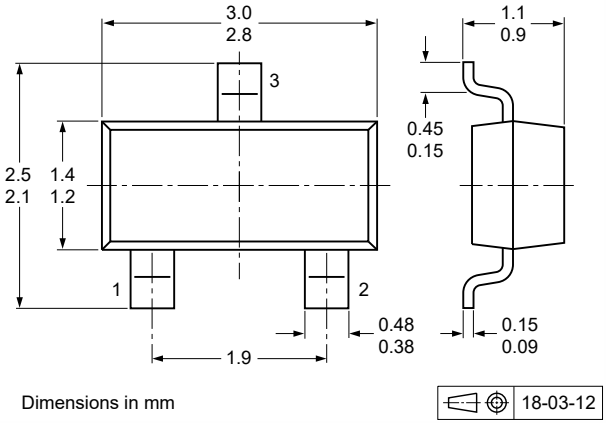


Fig. 2. Package outline SOT23

12. Soldering

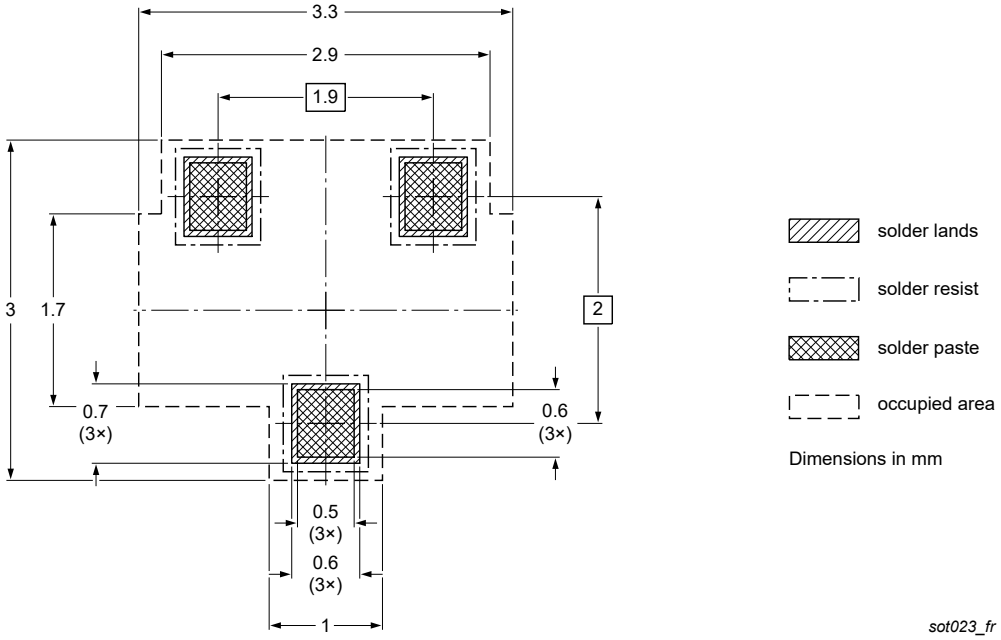


Fig. 3. Reflow soldering footprint for SOT23

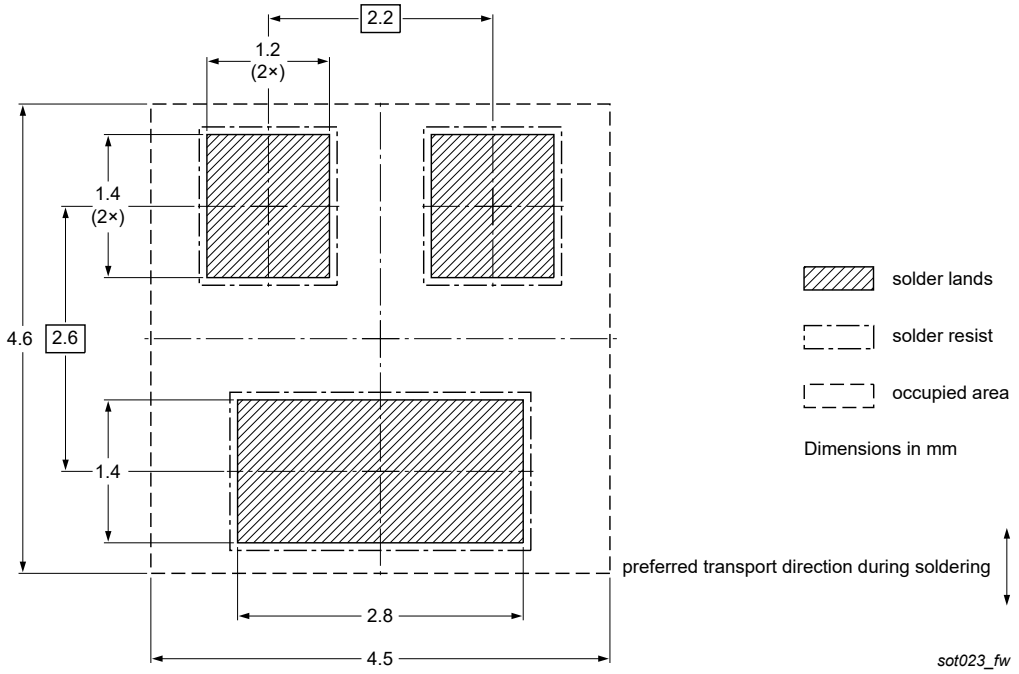


Fig. 4. Wave soldering footprint for SOT23

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BCV47 v.4	20221001	Product data sheet	-	BCV47 v.3
Modifications:	• Product changed to non-automotive qualification. Please refer to nexperia.com for automotive(-Q) product alternative(s).			
BCV47 v.3	20190821	Product data sheet	-	BCV27_BCV47 v.2
BCV27_BCV47 v.2	20040113	Product data sheet	-	BCV27_BCV47 v.1
BCV27_BCV47 v.1	19970408	Product data sheet	-	-

14. 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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