



# BCV47-Q

NPN Darlington transistor

9 December 2021

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
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Pre-amplifier 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	$V_{CE} = 5 \text{ V}$ ; $I_C = 100 \text{ mA}$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$	[1]	10000	-	-

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

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	<p>SOT23</p>	<p>aaa-029089</p>
2	E	emitter		
3	C	collector		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BCV47-Q	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-Q	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	$I_C = 100 \mu\text{A}; I_E = 0 \text{ A}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	80	-	-	V	
$V_{(BR)CES}$	collector-emitter breakdown voltage	$I_C = 2 \text{ mA}; V_{BE} = 0 \text{ V}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	60	-	-	V	
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_C = 0 \text{ A}; I_E = 100 \mu\text{A}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	10	-	-	V	
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 60 \text{ V}; I_E = 0 \text{ A}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	100	nA	
$I_{CES}$	collector-emitter cut-off current	$V_{CE} = 60 \text{ V}; V_{BE} = 0 \text{ V}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	100	nA	
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 10 \text{ V}; I_C = 0 \text{ A}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	100	nA	
$h_{FE}$	DC current gain	$V_{CE} = 5 \text{ V}; I_C = 1 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	2000	-	-	
		$V_{CE} = 5 \text{ V}; I_C = 10 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	4000	-	-	
		$V_{CE} = 5 \text{ V}; I_C = 100 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	10000	-	-	
		$V_{CE} = 5 \text{ V}; I_C = 500 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	2000	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 100 \text{ mA}; I_B = 1 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	1	V	
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 100 \text{ mA}; I_B = 0.1 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	1.5	V	
$V_{BEon}$	base-emitter turn-on voltage	$I_C = 10 \text{ mA}; V_{CE} = 5 \text{ V}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	1.4	V	

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

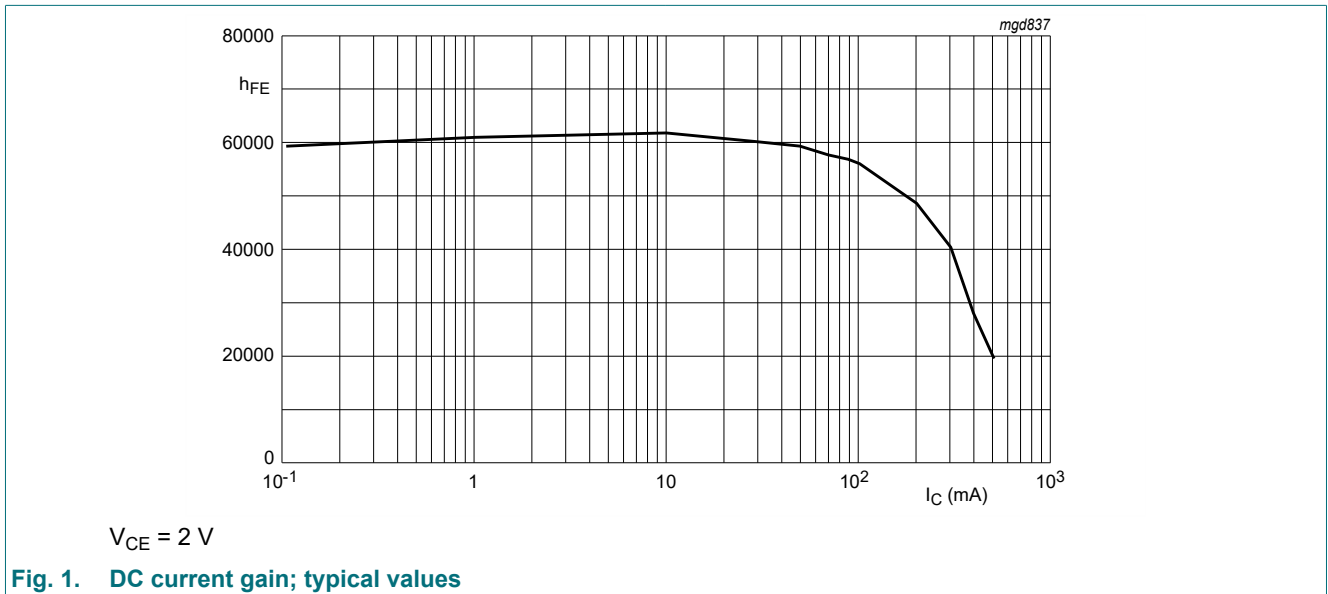


Fig. 1. DC current gain; typical values

## 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

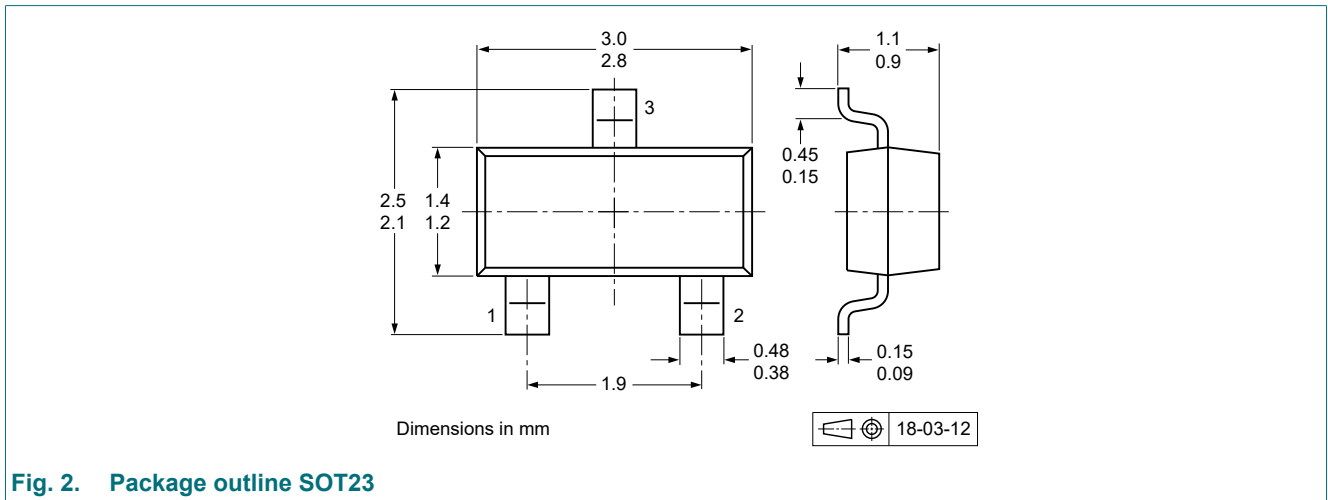


Fig. 2. Package outline SOT23

## 13. Soldering

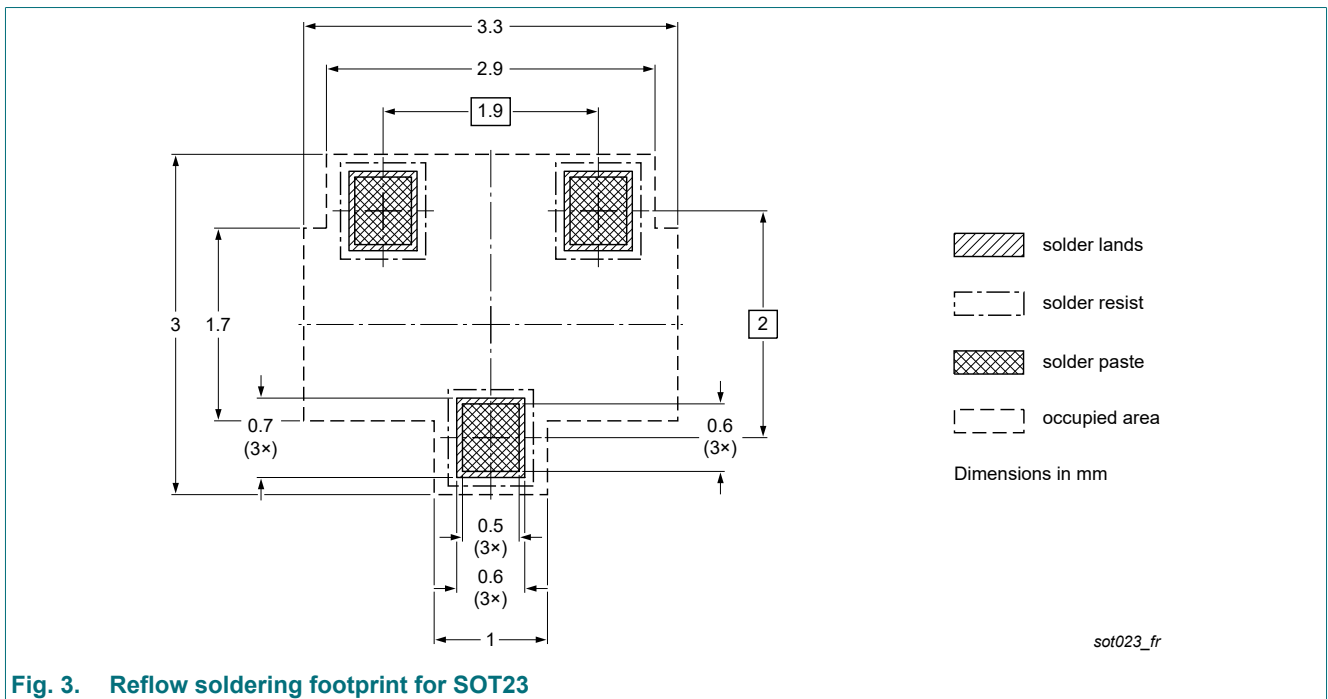


Fig. 3. Reflow soldering footprint for SOT23

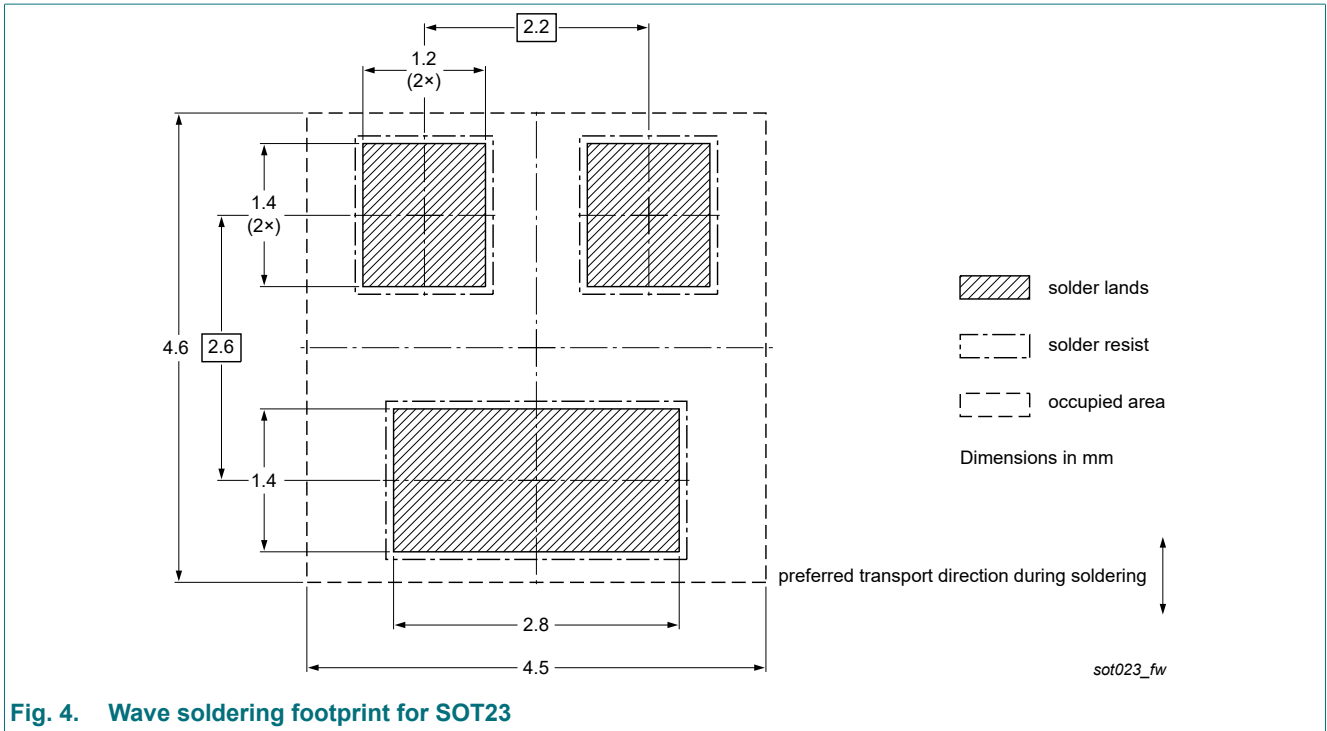


Fig. 4. Wave soldering footprint for SOT23

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BCV47-Q v.1	20211209	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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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