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Kind regards,

Team Nexperia



PBSS5230T

30 V, 2 A PNP low V_{CEsat} (BISS) transistor

Rev. 2 — 4 June 2012

Product data sheet

1. Product profile

1.1 General description

PNP low V_{CEsat} Breakthrough In Small Signal (BISS) transistor in a SOT23 small Surface-Mounted Device (SMD) plastic package.

NPN complement: PBSS4230T.

1.2 Features and benefits

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability: I_C and I_{CM}
- Higher efficiency leading to less heat generation
- AEC-Q101 qualified

1.3 Applications

- DC-to-DC conversion
- Supply line switching
- Battery charger
- LCD backlighting
- Driver in low supply voltage applications (e.g. lamps and LEDs)
- Inductive load driver (e.g. relays, buzzers and motors)

1.4 Quick reference data

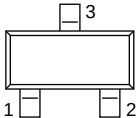
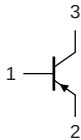
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{CEO}	collector-emitter voltage	open base	-	-	-30	V
I _C	collector current		-	-	-2	A
I _{CM}	peak collector current	single pulse; t _p ≤ 1 ms	-	-	-3	A
R _{CEsat}	collector-emitter saturation resistance	I _C = -500 mA; I _B = -50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C	-	160	220	Ω



2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SOT23 (TO-236AB)	 sym013
2	E	emitter		
3	C	collector		

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PBSS5230T	TO-236AB	plastic surface-mounted package; 3 leads	SOT23

4. Marking

Table 4. Marking codes

Type number	Marking code ^[1]
PBSS5230T	%3G

[1] % = placeholder for manufacturing site code

5. 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	-	-30	V
V_{CEO}	collector-emitter voltage	open base	-	-30	V
V_{EBO}	emitter-base voltage	open collector	-	-5	V
I_C	collector current		-	-2	A
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms	-	-3	A
I_B	base current		-	-300	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	^[1]	300	mW
			^[2]	480	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 PCB, single-sided copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm².

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	417 K/W
			[2]	-	-	260 K/W

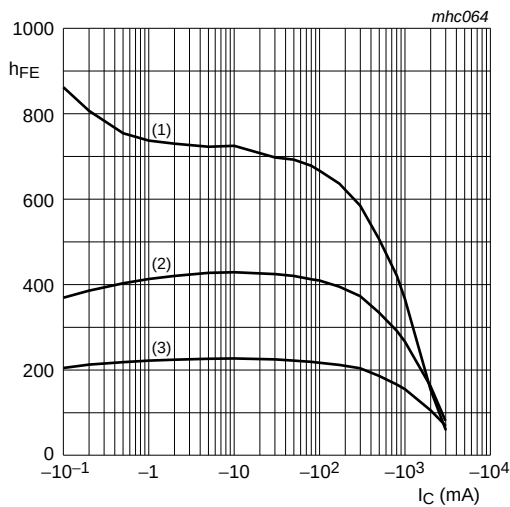
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm².

7. Characteristics

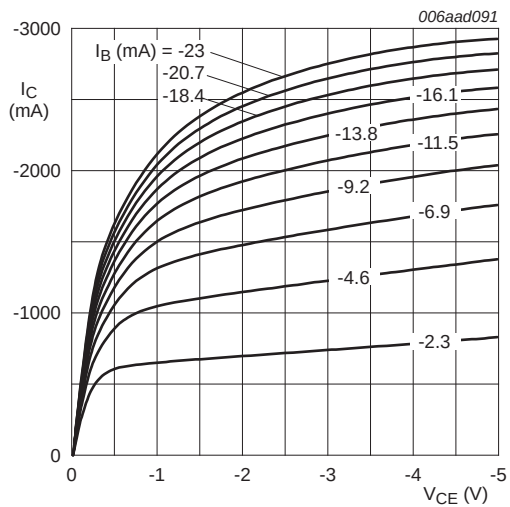
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	$V_{CB} = -30\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ °C}$	-	-	-100	nA
		$V_{CB} = -30\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ °C}$	-	-	-50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -4\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ °C}$	-	-	-100	nA
h_{FE}	DC current gain	$V_{CE} = -2\text{ V}; I_C = -100\text{ mA}; T_{amb} = 25\text{ °C}$	300	450	-	
		$V_{CE} = -2\text{ V}; I_C = -1\text{ A}; \text{pulsed}; t_p \leq 300\text{ μs}; \delta \leq 0.02; T_{amb} = 25\text{ °C}$	200	290	-	
		$V_{CE} = -2\text{ V}; I_C = -2\text{ A}; \text{pulsed}; t_p \leq 300\text{ μs}; \delta \leq 0.02; T_{amb} = 25\text{ °C}$	100	180	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -500\text{ mA}; I_B = -50\text{ mA}; T_{amb} = 25\text{ °C}$	-	-70	-110	mV
		$I_C = -1\text{ A}; I_B = -50\text{ mA}; T_{amb} = 25\text{ °C}$	-	-140	-225	mV
		$I_C = -2\text{ A}; I_B = -200\text{ mA}; T_{amb} = 25\text{ °C}$	-	-240	-350	mV
R_{CEsat}	collector-emitter saturation resistance	$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{pulsed}; t_p \leq 300\text{ μs}; \delta \leq 0.02; T_{amb} = 25\text{ °C}$	-	160	220	Ω
V_{BEsat}	base-emitter saturation voltage	$I_C = -2\text{ A}; I_B = -50\text{ mA}; \text{pulsed}; t_p \leq 300\text{ μs}; \delta \leq 0.02; T_{amb} = 25\text{ °C}$	-	-	-1.1	V
V_{BEon}	base-emitter turn-on voltage	$V_{CE} = -2\text{ V}; I_C = -100\text{ mA}; T_{amb} = 25\text{ °C}$	-	-	-0.75	V
f_T	transition frequency	$V_{CE} = -10\text{ V}; I_C = -100\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ °C}$	100	200	-	MHz
C_c	collector capacitance	$V_{CB} = -10\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$	-	23	28	pF



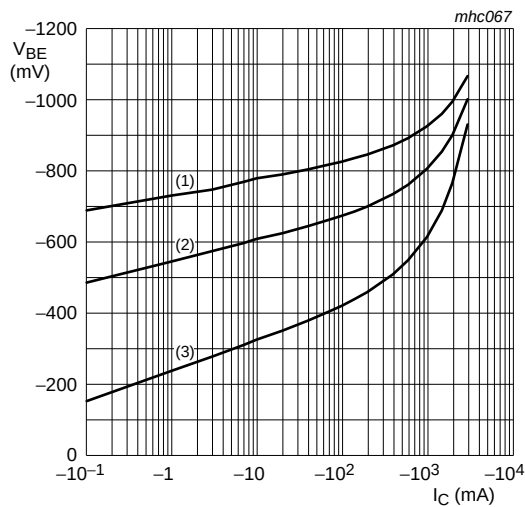
$V_{CE} = -2\text{ V}$
(1) $T_{amb} = 150^\circ\text{C}$
(2) $T_{amb} = 25^\circ\text{C}$
(3) $T_{amb} = -55^\circ\text{C}$

Fig 1. DC current gain as a function of collector current; typical values



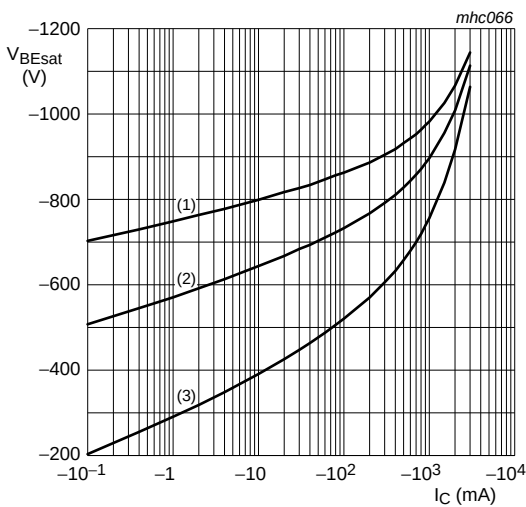
$T_{amb} = 25^\circ\text{C}$

Fig 2. Collector current as a function of collector-emitter voltage; typical values



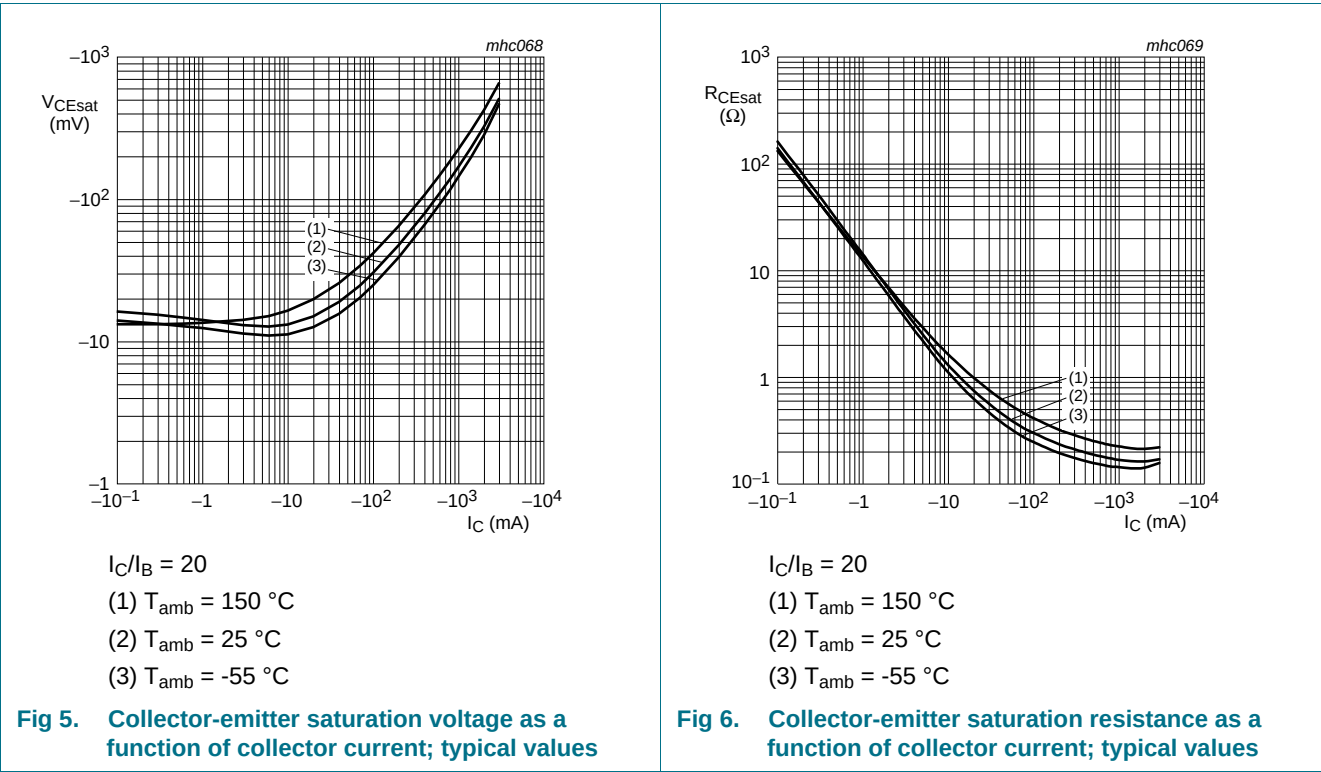
$V_{CE} = -2\text{ V}$
(1) $T_{amb} = -55^\circ\text{C}$
(2) $T_{amb} = 25^\circ\text{C}$
(3) $T_{amb} = 150^\circ\text{C}$

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



$I_C/I_B = 20$
(1) $T_{amb} = -55^\circ\text{C}$
(2) $T_{amb} = 25^\circ\text{C}$
(3) $T_{amb} = 150^\circ\text{C}$

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

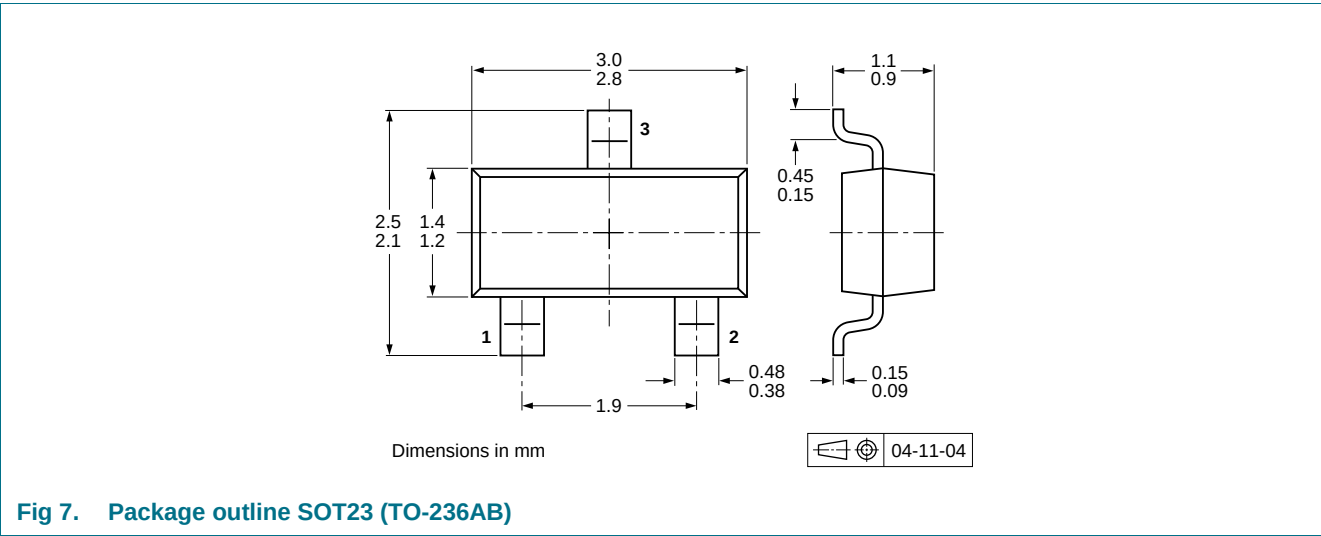


8. Test information

8.1 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.

9. Package outline



10. Soldering

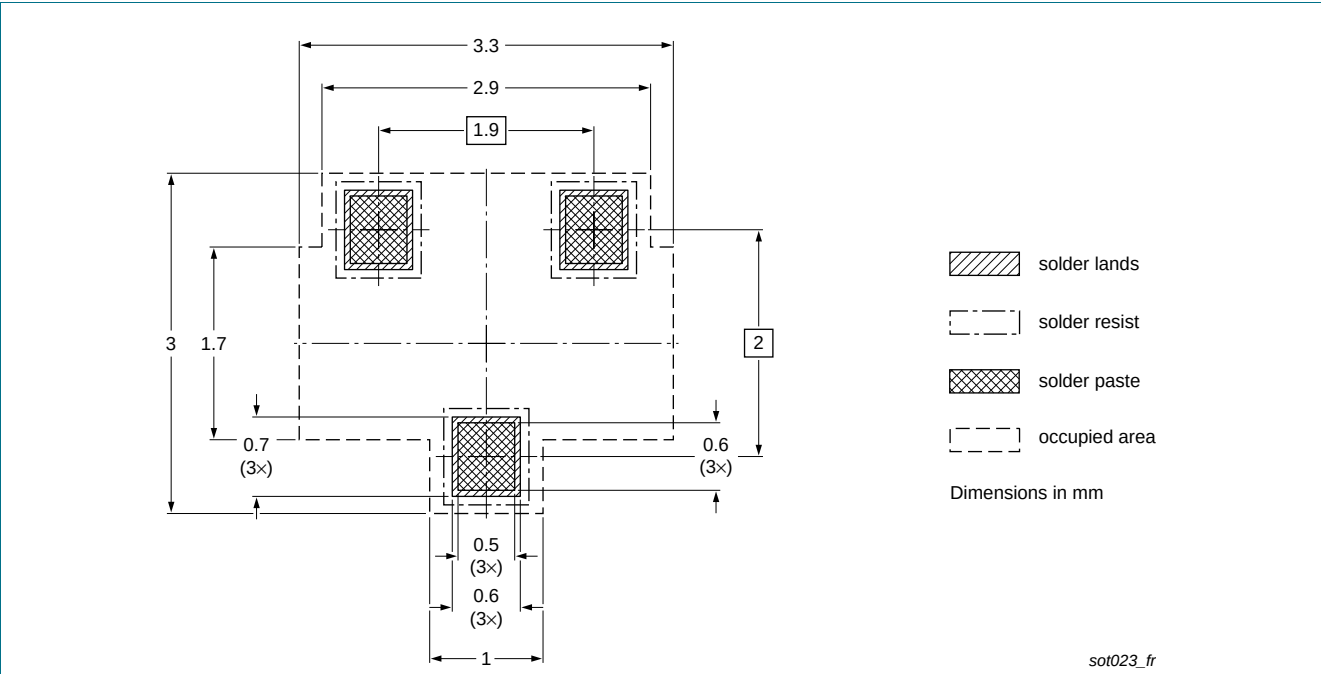


Fig 8. Reflow soldering footprint for SOT23 (TO-236AB)

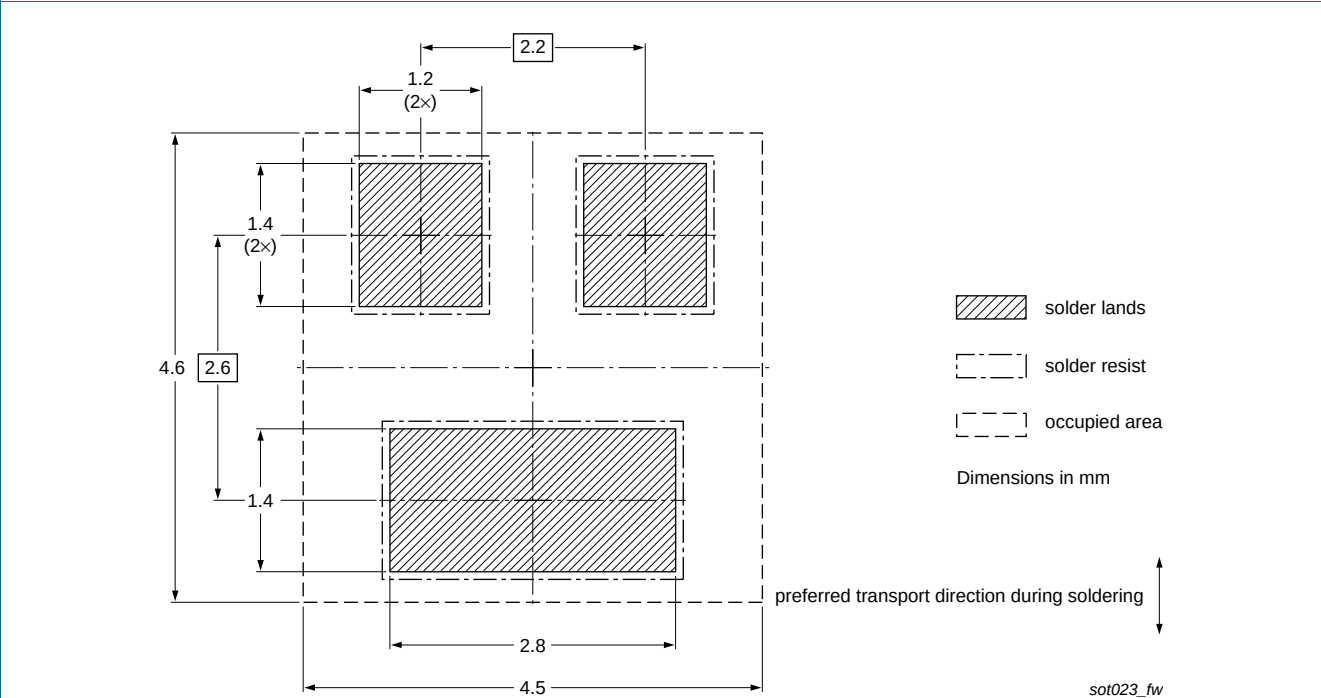


Fig 9. Wave soldering footprint for SOT23 (TO-236AB)

11. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PBSS5230T v.2	20120604	Product data sheet	-	PBSS5230T v.1
Modifications:	• The format of this document has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • 1 "Product profile": updated • 4 "Marking": corrected • Table 5.: updated • 7 "Characteristics": V_{CEsat} corrected, Fig 1. to Fig 6. added • 8 "Test information": added • 9 "Package outline": replaced by minimized package outline drawing • 10 "Soldering": added			
PBSS5230T v.1	20031218	Product data sheet	-	-

12. Legal information

12.1 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 URL <http://www.nxp.com>.

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