



# PBSS5120T

20 V; 1 A PNP low V<sub>CEsat</sub> transistor

4 August 2025

Product data sheet

## 1. General description

PNP low V<sub>CEsat</sub> transistor in a small SOT23 Surface-Mounted Device (SMD) plastic package.

NPN complement: PBSS4120T

## 2. Features and benefits

- Small SMD plastic package
- Low collector-emitter saturation voltage V<sub>CEsat</sub>
- High collector current capability I<sub>C</sub> and I<sub>CM</sub>
- Higher efficiency to less heat generation
- AEC-Q101 qualified

## 3. Applications

- DC-to-DC conversion
- Supply line switching
- Battery charger
- LCD backlighting
- Driver in low supply voltage applications (e.g. lamps and LEDs)

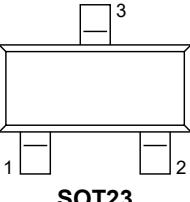
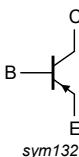
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>CEO</sub>	collector-emitter voltage	open base	-	-	-20	V
I <sub>C</sub>	collector current		-	-	-1	A
I <sub>CM</sub>	peak collector current	single pulse; t <sub>p</sub> ≤ 1 ms	-	-	-2	A
R <sub>CEsat</sub>	collector-emitter saturation resistance	I <sub>C</sub> = -500 mA; I <sub>B</sub> = -50 mA; pulsed; t <sub>p</sub> ≤ 300 µs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C	-	-	250	mΩ

## 5. Pinning information

**Table 2. Pinning information**

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SOT23	 sym132
2	E	emitter		
3	C	collector		

## 6. Ordering information

**Table 3. Ordering information**

Type number	Package		
	Name	Description	Version
PBSS5120T	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 <sup>[1]</sup>
PBSS5120T	%3K

[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	-	-20	V	
$V_{CEO}$	collector-emitter voltage	open base	-	-20	V	
$V_{EBO}$	emitter-base voltage	open collector	-	-5	V	
$I_C$	collector current		-	-1	A	
$I_{CM}$	peak collector current	single pulse; $t_p \leq 1$ ms	-	-2	A	
$I_{BM}$	peak base current		-	-200	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		-55	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 cm<sup>2</sup>.

## 9. 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 cm<sup>2</sup>.

## 10. Characteristics

**Table 7. Characteristics**

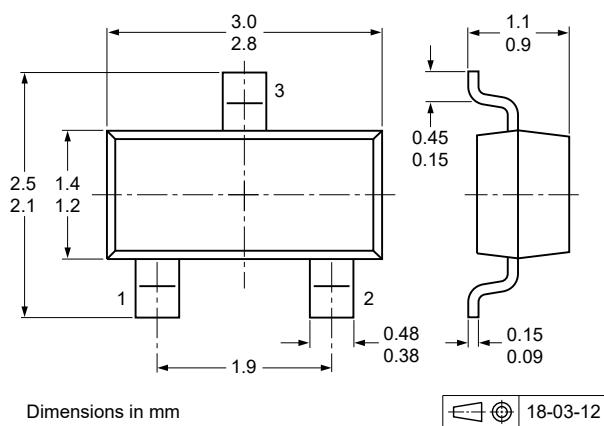
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -20 \text{ V}$ ; $I_E = 0 \text{ A}$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	-100	nA
		$V_{CB} = -20 \text{ V}$ ; $I_E = 0 \text{ A}$ ; $T_j = 150 \text{ }^\circ\text{C}$		-	-	-50	μA
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -4 \text{ V}$ ; $I_C = 0 \text{ A}$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	-100	nA
$h_{FE}$	DC current gain	$V_{CE} = -2 \text{ V}$ ; $I_C = -100 \text{ mA}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		300	450	-	
		$V_{CE} = -2 \text{ V}$ ; $I_C = -500 \text{ mA}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		250	350	-	
		$V_{CE} = -2 \text{ V}$ ; $I_C = -1 \text{ A}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		200	290	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -100 \text{ mA}$ ; $I_B = -1 \text{ mA}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	-100	mV
		$I_C = -500 \text{ mA}$ ; $I_B = -50 \text{ mA}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	-125	mV
		$I_C = -1 \text{ A}$ ; $I_B = -50 \text{ mA}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	-250	mV
$R_{CEsat}$	collector-emitter saturation resistance	$I_C = -500 \text{ mA}$ ; $I_B = -50 \text{ mA}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	250	mΩ
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -1 \text{ A}$ ; $I_B = -100 \text{ mA}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	-1.1	V
$V_{BEon}$	base-emitter turn-on voltage	$V_{CE} = -2 \text{ V}$ ; $I_C = -100 \text{ mA}$ ; pulsed; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	-0.75	V
$f_T$	transition frequency	$V_{CE} = -10 \text{ V}$ ; $I_C = -100 \text{ mA}$ ; $f = 100 \text{ MHz}$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		100	200	-	MHz
$C_c$	collector capacitance	$V_{CB} = -10 \text{ V}$ ; $I_E = 0 \text{ A}$ ; $i_e = 0 \text{ A}$ ; $f = 1 \text{ MHz}$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	-	28	pF

## 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. 1. Package outline SOT23**

## 13. Soldering

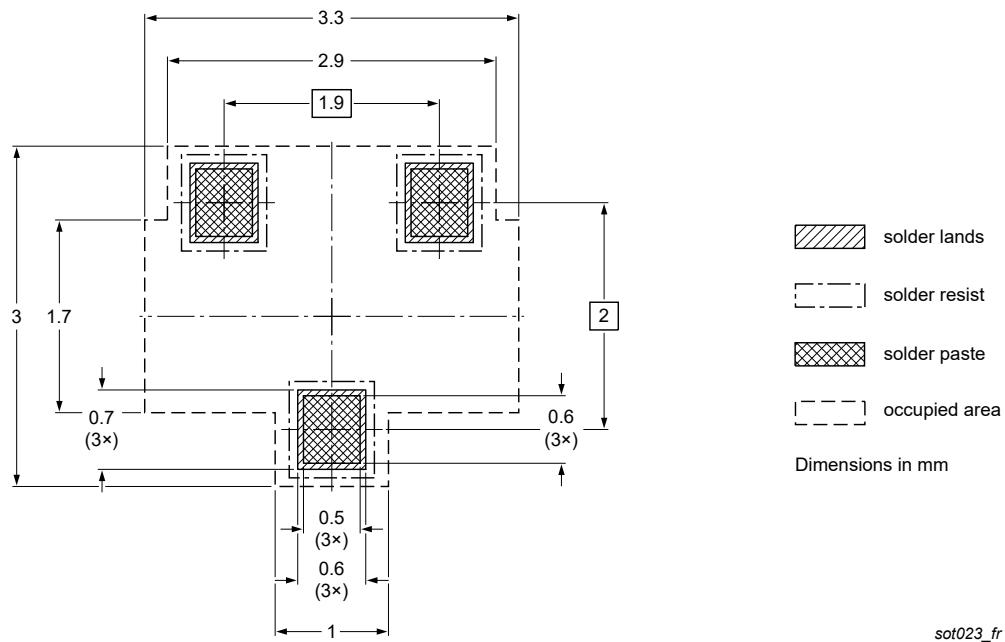


Fig. 2. Reflow soldering footprint for SOT23

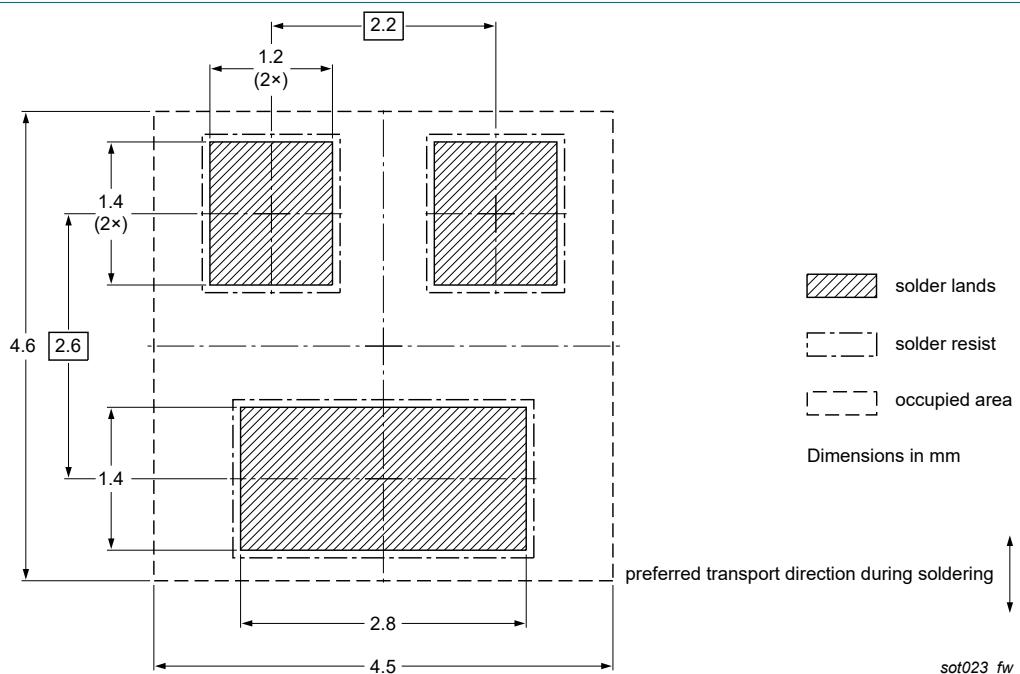


Fig. 3. Wave soldering footprint for SOT23

## 14. Revision history

**Table 8. Revision history**

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PBSS5120T v.2	20250804	Product data sheet	-	PBSS5120T v.1
Modifications	<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Legal texts have been adapted to the new company name where appropriate.</li></ul>			
PBSS5120T v.1	20031127	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".
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Date of release: 4 August 2025

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