



PBSS4320T

20 V NPN low V_{CEsat} transistor

4 August 2025

Product data sheet

1. General description

NPN low V_{CEsat} transistor in a SOT23 Surface-Mounted Device (SMD) plastic package.

PNP complement: PBSS5320T

2. Features and benefits

- Low collector-emitter saturation voltage V_{CEsat} and corresponding low R_{CEsat}
- High collector current capability
- High collector current gain
- Improved efficiency due to reduced heat generation
- AEC-Q101 qualified

3. Applications

- Power management applications
- Low and medium power DC/DC convertors
- Supply line switching
- Battery chargers
- Linear voltage regulation with low voltage drop-out (LDO)

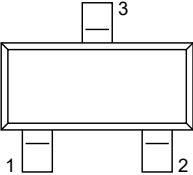
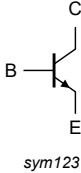
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{CEO}	collector-emitter voltage	open base	-	-	20	V
I _C	collector current		-	-	2	A
I _{CRM}	repetitive peak collector current	$\delta \leq 0.25$; $t_p \leq 100$ ms	-	-	3	A
R _{CEsat}	collector-emitter saturation resistance	$I_C = 2$ A; $I_B = 200$ mA; pulsed; $t_p \leq 300$ μ s; $\delta \leq 0.02$; $T_{amb} = 25$ °C	-	80	105	m Ω

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SOT23	 sym123
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PBSS4320T	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]
PBSS4320T	ZG%

[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			-	2	A
I _{CRM}	repetitive peak collector current	δ ≤ 0.25; t _p ≤ 100 ms		-	3	A
I _{CM}	peak collector current	single pulse; t _p ≤ 1 ms		-	5	A
I _B	base current			-	0.5	A
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	300	mW
			[2]	-	480	mW
			[3]	-	540	mW
			[1] [4]	-	1.2	W
T _j	junction temperature			-	150	°C
T _{amb}	ambient temperature			-65	150	°C

Symbol	Parameter	Conditions		Min	Max	Unit
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.
- [3] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.
- [4] Operated under pulsed conditions: t_p ≤ 100 ms; duty cycle δ ≤ 0.25.

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
			[3]	-	-	230	K/W
			[4]	-	-	104	K/W

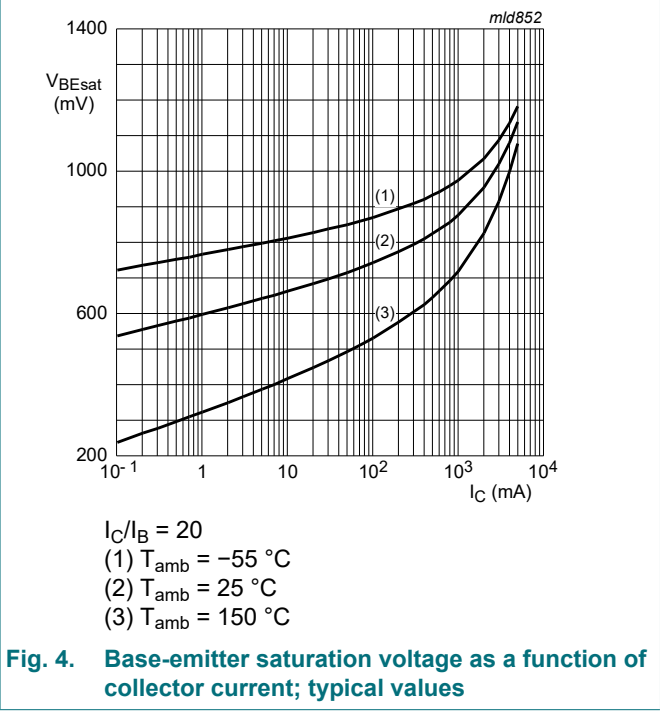
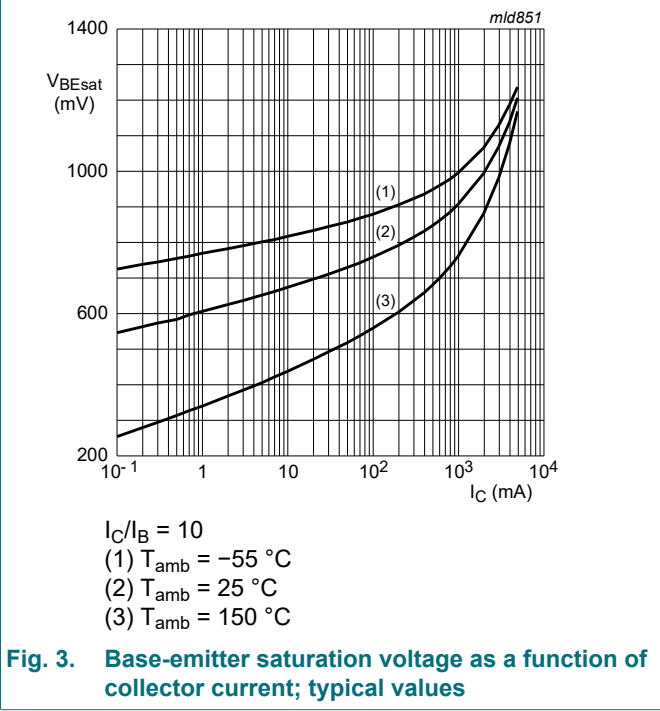
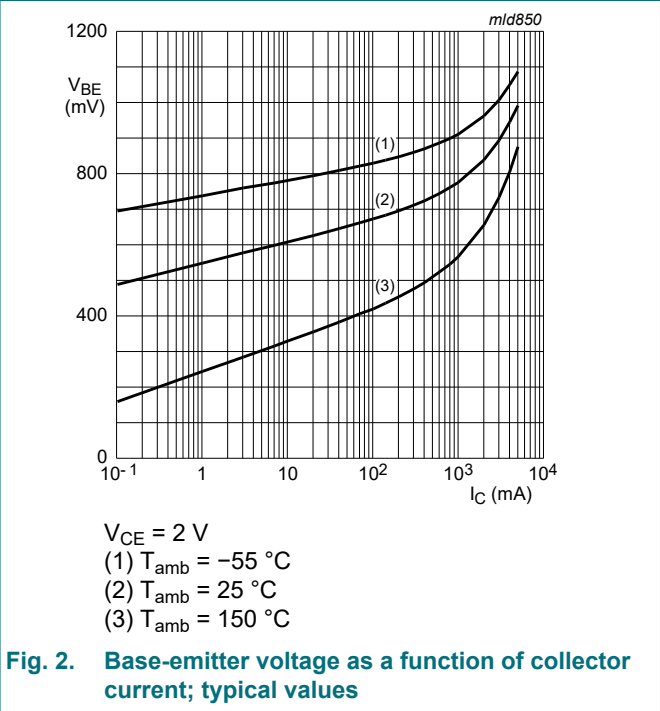
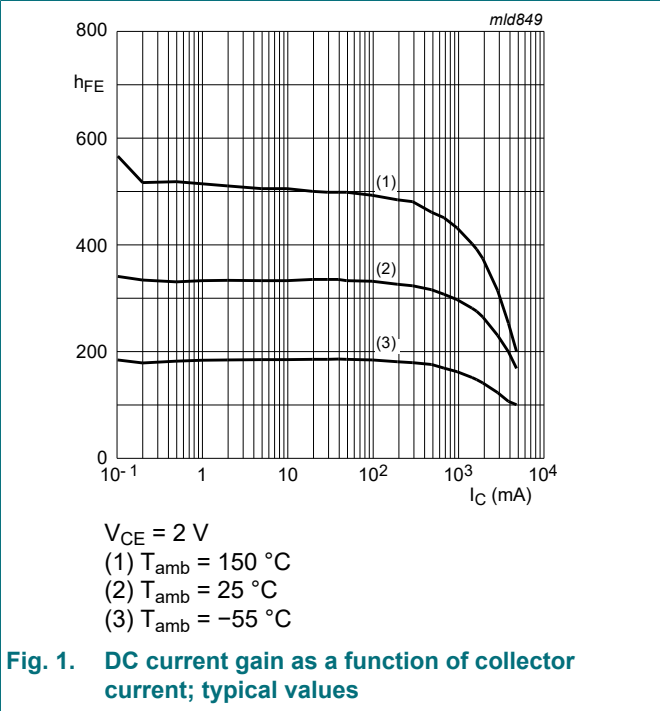
- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm².
- [3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm².
- [4] Operated under pulsed conditions: pulse width t_p ≤ 100 ms; δ ≤ 0.25.

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
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		-	-	50	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} = 2 V; I _C = 100 mA; T _{amb} = 25 °C		220	-	-	
		V _{CE} = 2 V; I _C = 500 mA; T _{amb} = 25 °C		220	-	-	
		V _{CE} = 2 V; I _C = 1 A; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		220	-	-	
		V _{CE} = 2 V; I _C = 2 A; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		200	-	-	
		V _{CE} = 2 V; I _C = 3 A; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		150	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = 500 mA; I _B = 50 mA; T _{amb} = 25 °C		-	-	70	mV
		I _C = 1 A; I _B = 50 mA; T _{amb} = 25 °C		-	-	120	mV
		I _C = 2 A; I _B = 40 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	230	mV
		I _C = 2 A; I _B = 200 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	210	mV
		I _C = 3 A; I _B = 300 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	310	mV
R _{CEsat}	collector-emitter saturation resistance	I _C = 2 A; I _B = 200 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		-	80	105	mΩ
V _{BEsat}	base-emitter saturation voltage	I _C = 2 A; I _B = 40 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	1.1	V
		I _C = 3 A; I _B = 300 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	1.2	V

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{BEon}	base-emitter turn-on voltage	$V_{CE} = 2\text{ V}$; $I_C = 1\text{ A}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^\circ\text{C}$	1.2	-	-	V
f_T	transition frequency	$V_{CE} = 5\text{ V}$; $I_C = 100\text{ mA}$; $f = 100\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$	100	-	-	MHz
C_c	collector capacitance	$V_{CB} = 10\text{ V}$; $I_E = 0\text{ A}$; $i_e = 0\text{ A}$; $f = 1\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-	-	35	pF



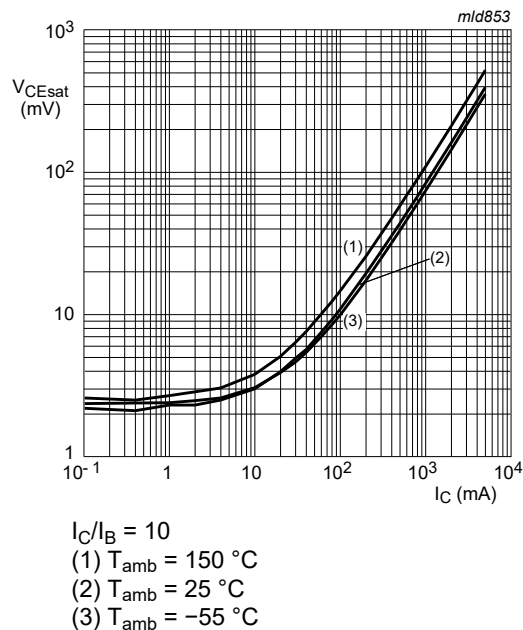


Fig. 5. Collector-emitter saturation voltage as a function of collector current; typical values

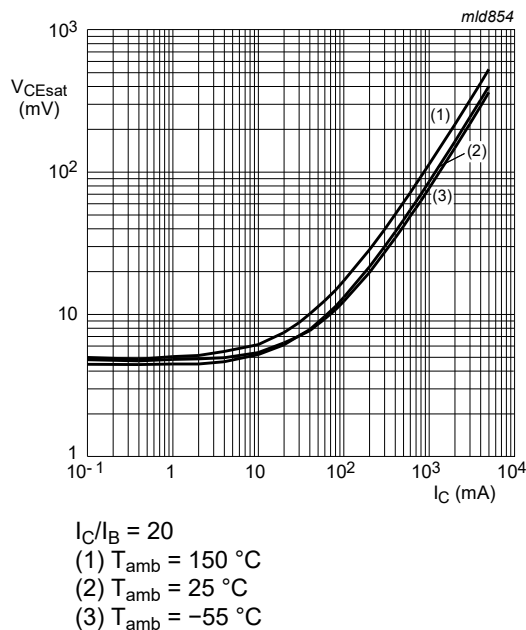


Fig. 6. Collector-emitter saturation voltage as a function of collector current; typical values

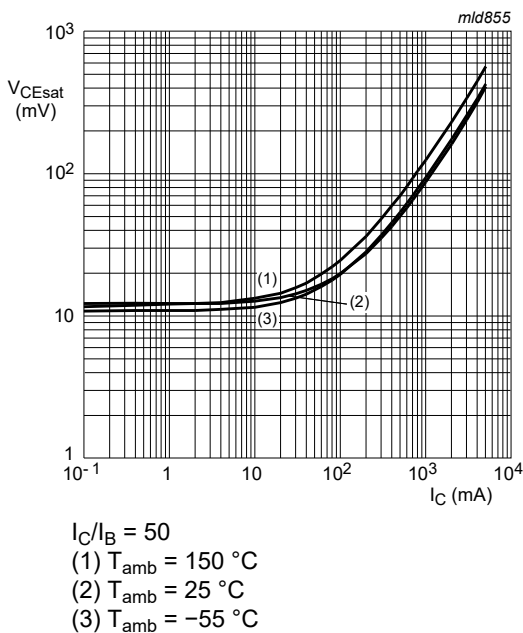


Fig. 7. Collector-emitter saturation voltage as a function of collector current; typical values

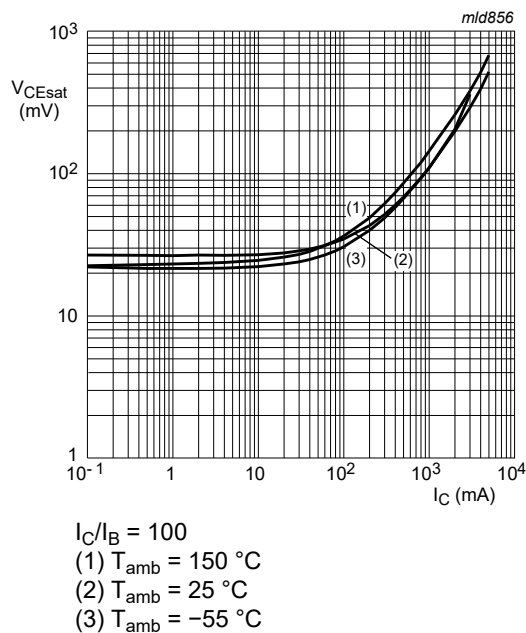
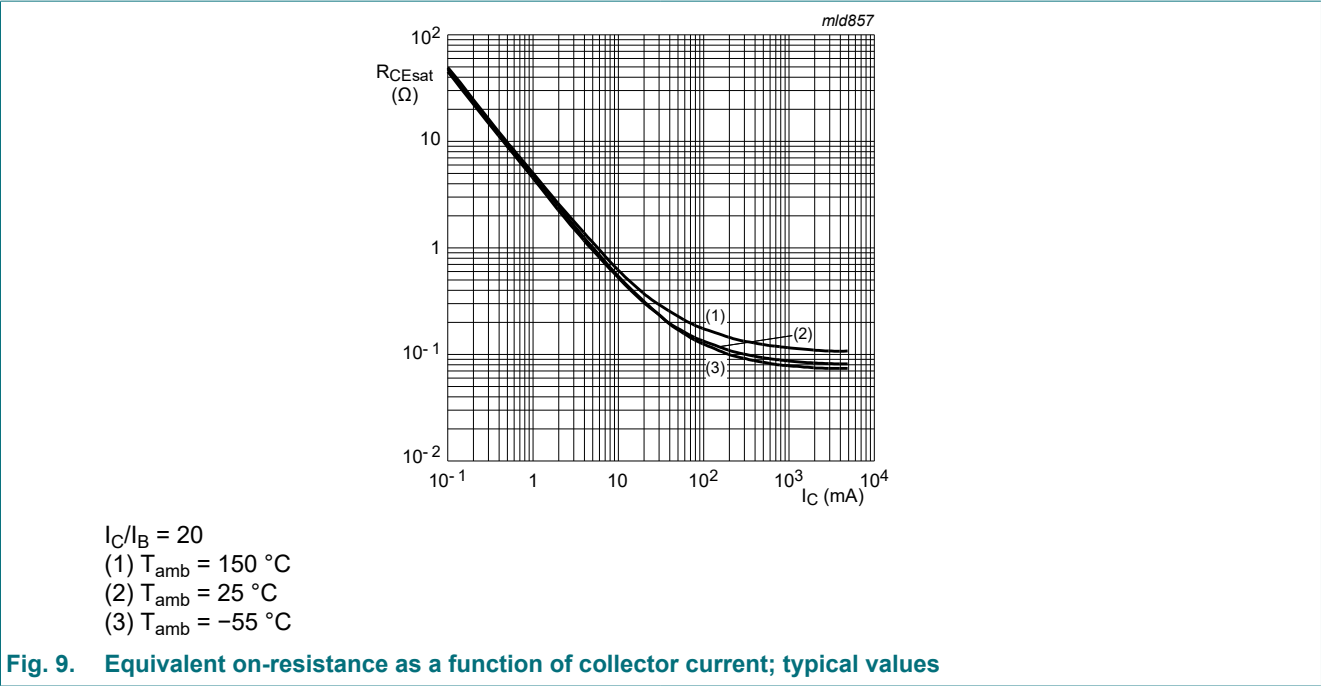


Fig. 8. Collector-emitter saturation voltage as a function of collector current; typical values

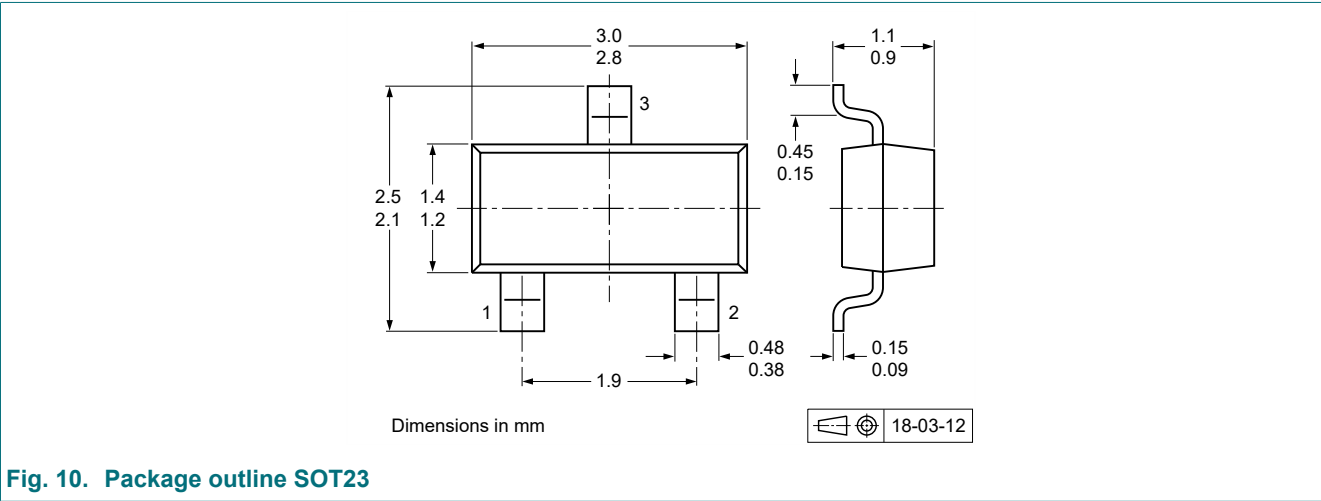


11. Test information

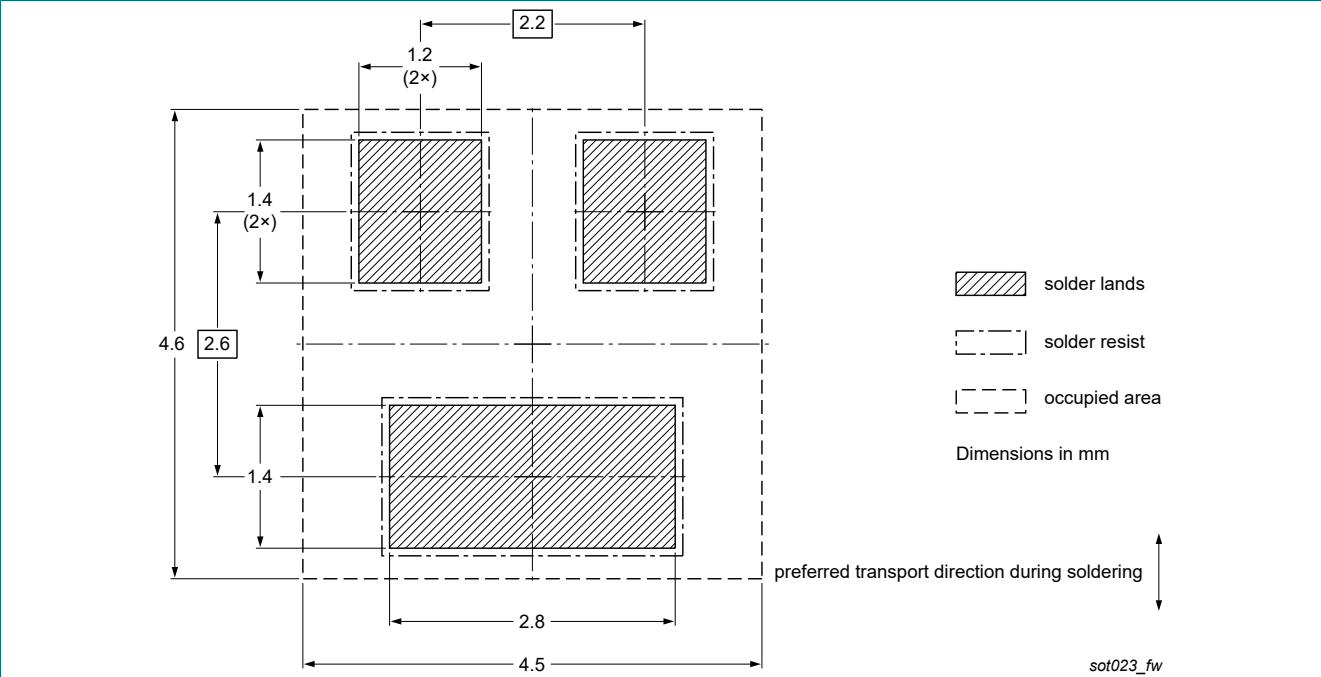
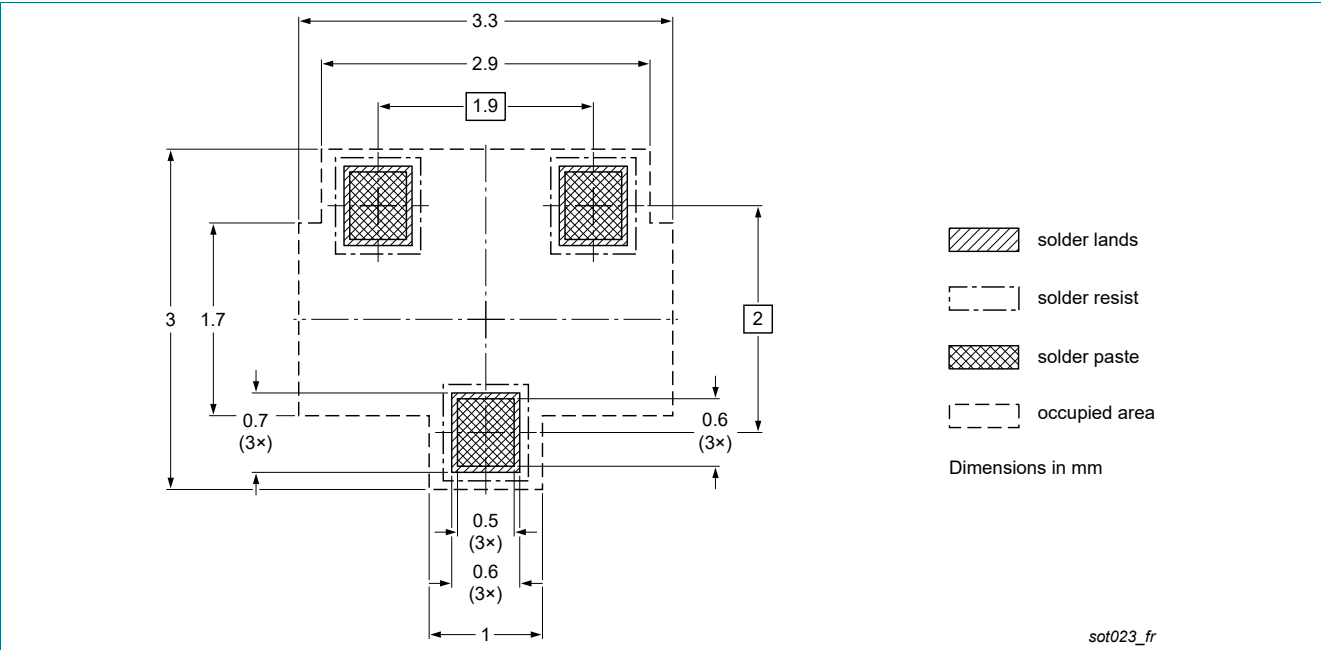
Quality information

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



13. Soldering



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PBSS4320T v.2	20250804	Product data sheet	-	PBSS4320T v.1
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.			
PBSS4320T 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".
- [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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