



PBSS5330X

30 V, 3 A PNP low V_{CEsat} transistor

13 August 2025

Product data sheet

1. General description

PNP low V_{CEsat} transistor in a SOT89 (SC-62) medium power and flat lead Surface-Mounted Device (SMD) plastic package.

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
- Reduced printed-circuit board requirements.
- AEC-Q101 qualified

3. Applications

- Power management
 - DC/DC converters
 - Supply line switching
 - Battery charger
 - LCD backlighting.
- Peripheral drivers
 - Driver in low supply voltage applications (e.g. lamps and LEDs)
 - Inductive load driver (e.g. relays, buzzers and motors).

4. Quick reference data

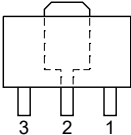
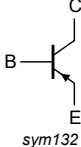
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V _{CEO}	collector-emitter voltage	open base		-	-	-30	V
I _C	collector current		[1]	-	-	-3	A
I _{CM}	peak collector current	limited by T _{j(max)}		-	-	-5	A
R _{CEsat}	collector-emitter saturation resistance	I _C = -3 A; I _B = -300 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		-	80	107	mΩ

[1] Device mounted on a ceramic printed-circuit board 7 cm², single-sided copper, tin-plated.

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E	emitter	 SOT89	 sym132
2	C	collector		
3	B	base		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PBSS5330X	SOT89	plastic, surface-mounted package; 3 leads; 1.5 mm pitch; 4.5 mm x 2.5 mm x 1.5 mm body	SOT89

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PBSS5330X	%1S

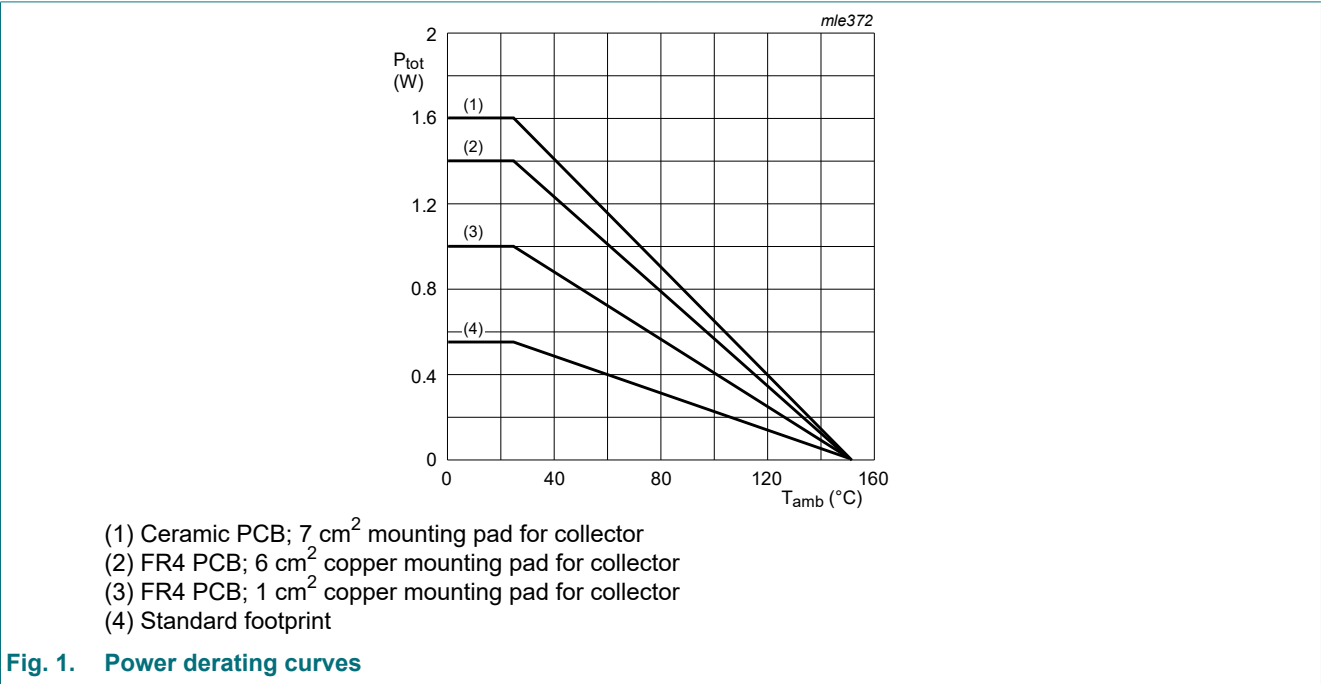
[1] % = placeholder for manufacturing site code

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		-	-30	V
V _{CEO}	collector-emitter voltage	open base		-	-30	V
V _{EBO}	emitter-base voltage	open collector		-	-6	V
I _C	collector current		[1]	-	-3	A
I _{CM}	peak collector current	limited by T _{j(max)}		-	-5	A
I _B	base current			-	-0.5	A
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[2]	-	550	mW
			[3]	-	1	W
			[4]	-	1.4	W
			[1]	-	1.6	W
T _j	junction temperature			-	150	°C
T _{amb}	ambient temperature			-65	150	°C
T _{stg}	storage temperature			-65	150	°C

- [1] Device mounted on a ceramic printed-circuit board 7 cm², single-sided copper, tin-plated.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm².
[4] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm².



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]	-	-	225	K/W
			[2]	-	-	125	K/W
			[3]	-	-	90	K/W
			[4]	-	-	80	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	16	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] Device mounted on a ceramic printed-circuit board 7 cm², single-sided copper, tin-plated.

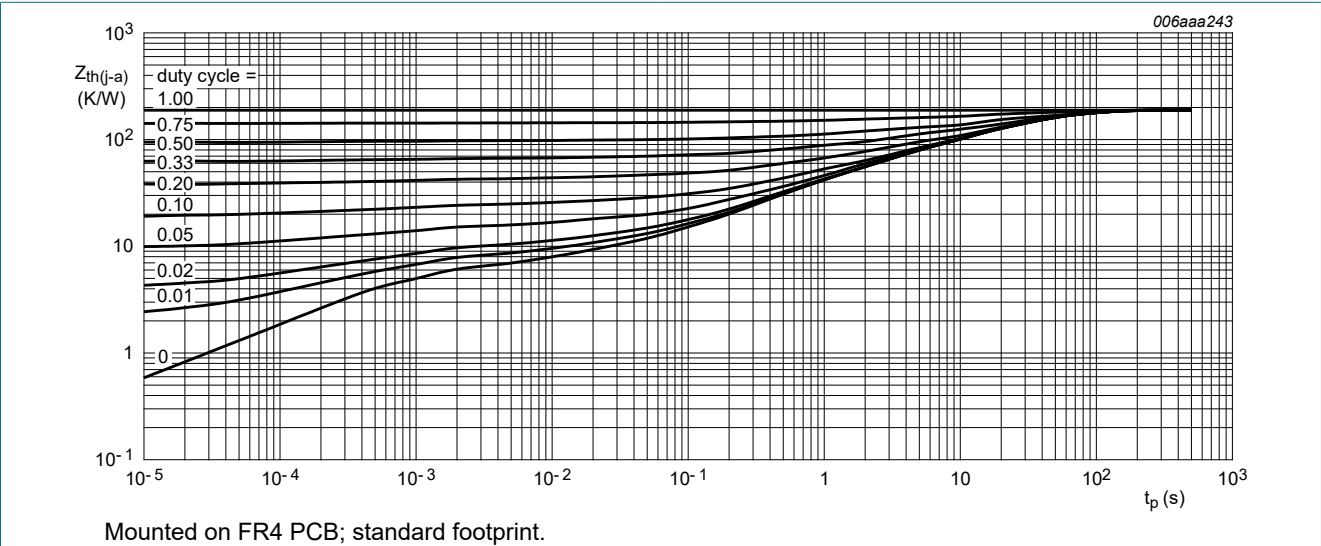


Fig. 2. Transient thermal impedance as a function of pulse duration; typical values

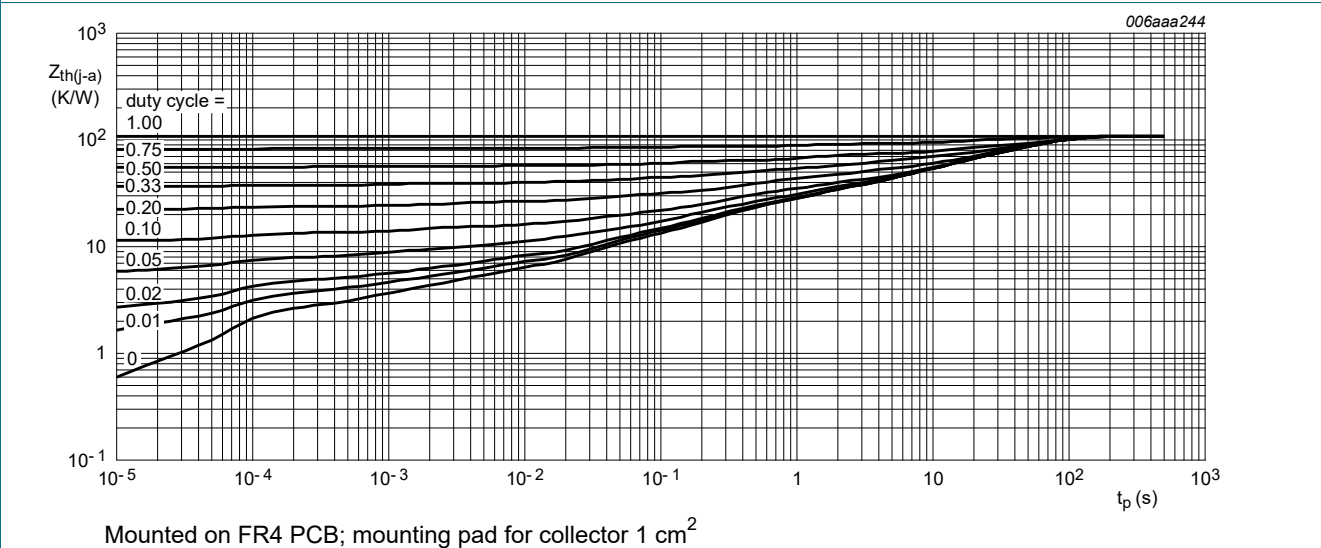
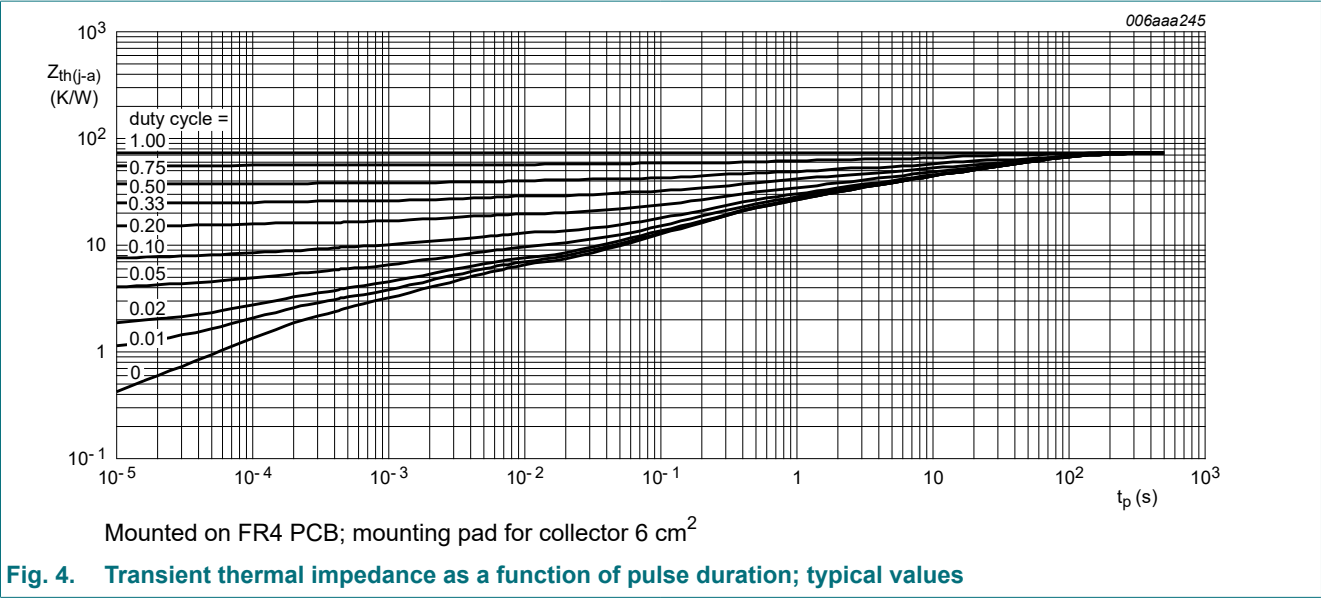


Fig. 3. Transient thermal impedance as a function of pulse duration; typical values



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I _{CBO}	collector-base cut-off current	V _{CB} = -30 V; I _E = 0 A; T _{amb} = 25 °C	-	-	-100	nA
		V _{CB} = -30 V; I _E = 0 A; T _j = 150 °C	-	-	-50	µA
I _{CES}	collector-emitter cut-off current	V _{CE} = -30 V; V _{BE} = 0 V; T _{amb} = 25 °C	-	-	-100	nA
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 = -0.1 A; T _{amb} = 25 °C	200	-	-	
		V _{CE} = -2 V; I _C = -0.5 A; T _{amb} = 25 °C	200	-	-	
		V _{CE} = -2 V; I _C = -1 A; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C	175	-	450	
		V _{CE} = -2 V; I _C = -2 A; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C	140	-	-	
		V _{CE} = -2 V; I _C = -3 A; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C	100	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = -0.5 A; I _B = -50 mA; T _{amb} = 25 °C	-	-	-70	mV
		I _C = -1 A; I _B = -50 mA; T _{amb} = 25 °C	-	-	-130	mV
		I _C = -2 A; I _B = -100 mA; T _{amb} = 25 °C	-	-	-240	mV
		I _C = -3 A; I _B = -300 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C	-	-	-320	mV
R _{CEsat}	collector-emitter saturation resistance		-	80	107	mΩ
V _{BEsat}	base-emitter saturation voltage	I _C = -2 A; I _B = -100 mA; 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
V _{BEon}	base-emitter turn-on voltage	V _{CE} = -2 V; I _C = -1 A; T _{amb} = 25 °C	-1	-	-	V
f _T	transition frequency	V _{CE} = -5 V; I _C = -100 mA; f = 100 MHz; T _{amb} = 25 °C	100	-	-	MHz
C _c	collector capacitance	V _{CB} = -10 V; I _E = 0 A; i _e = 0 A; f = 1 MHz; T _{amb} = 25 °C	-	-	45	pF

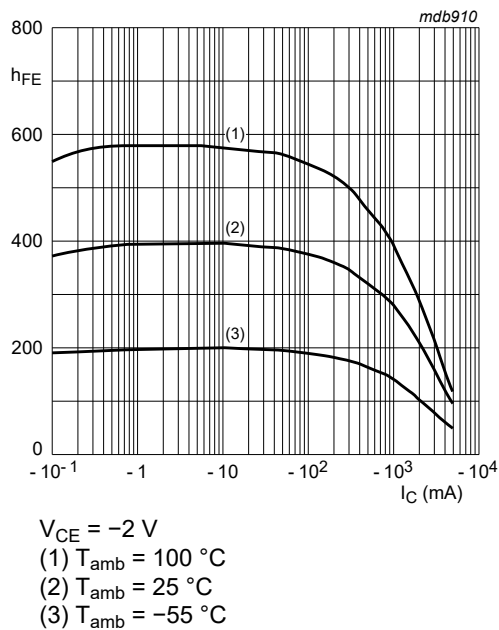


Fig. 5. DC current gain as a function of collector current; typical values

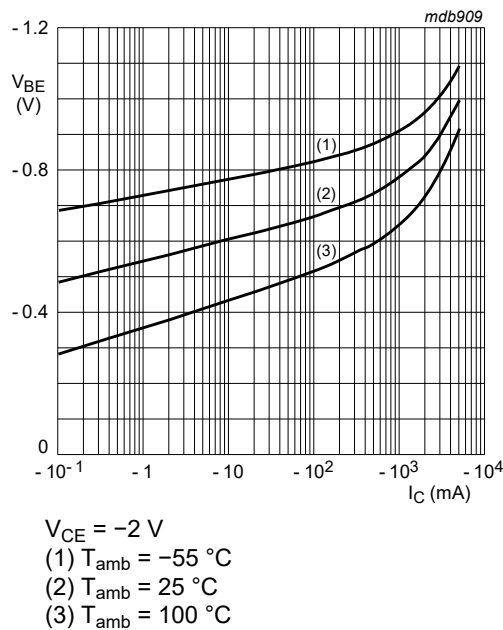


Fig. 6. Base-emitter voltage as a function of collector current; typical values

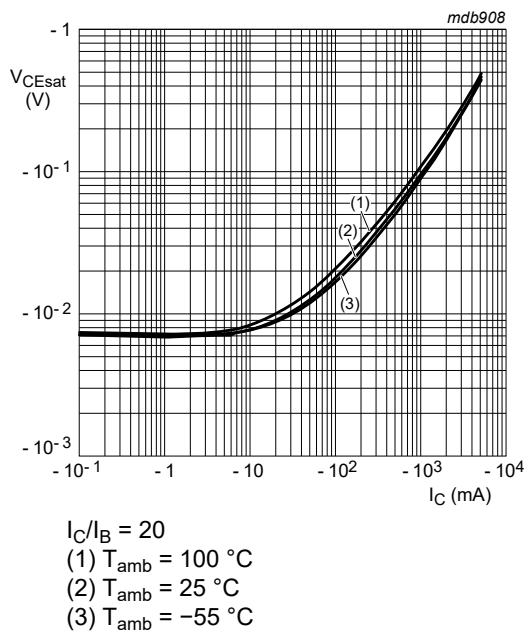


Fig. 7. Collector-emitter saturation voltage as a function of collector current; typical values

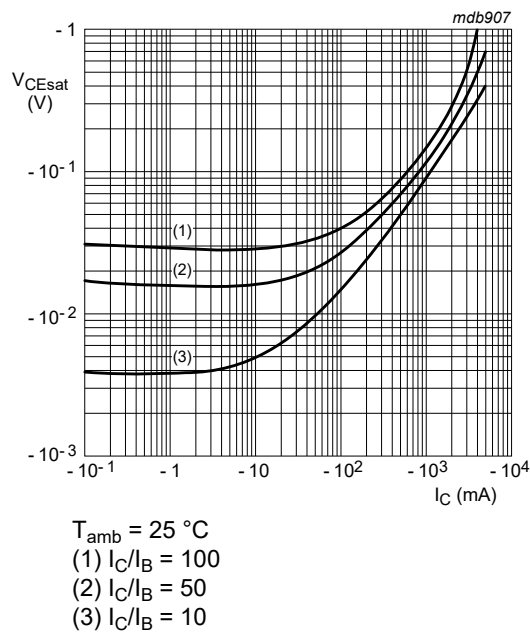


Fig. 8. Collector-emitter saturation voltage as a function of collector current; typical values

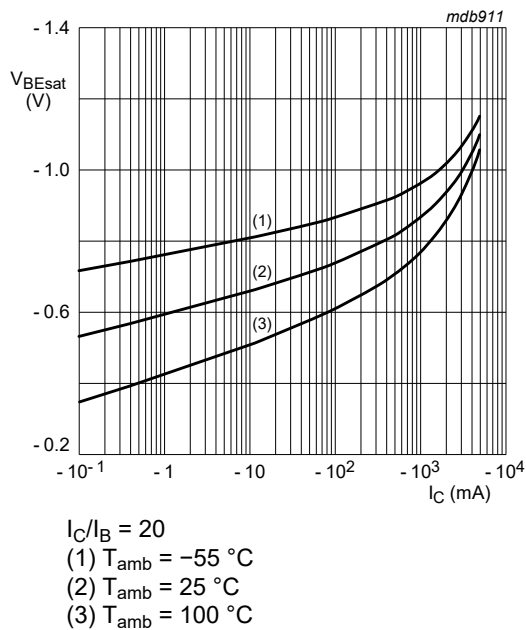


Fig. 9. Base-emitter saturation voltage as a function of collector current; typical values

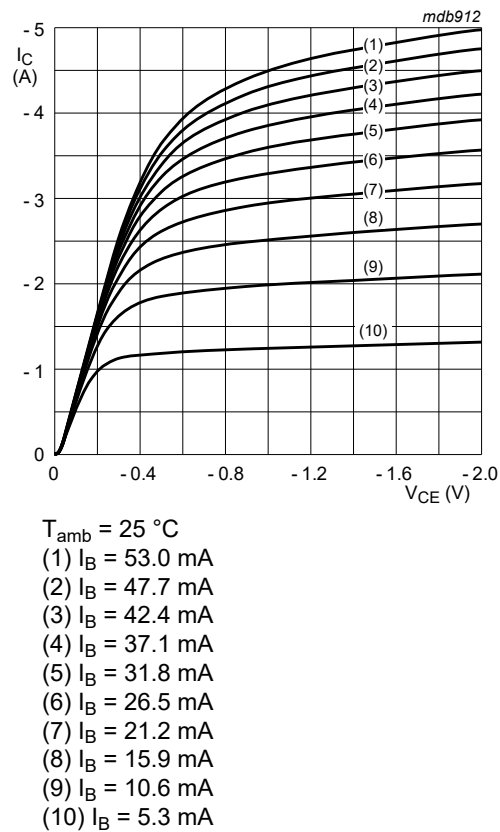


Fig. 10. Collector current as a function of collector-emitter voltage; typical values

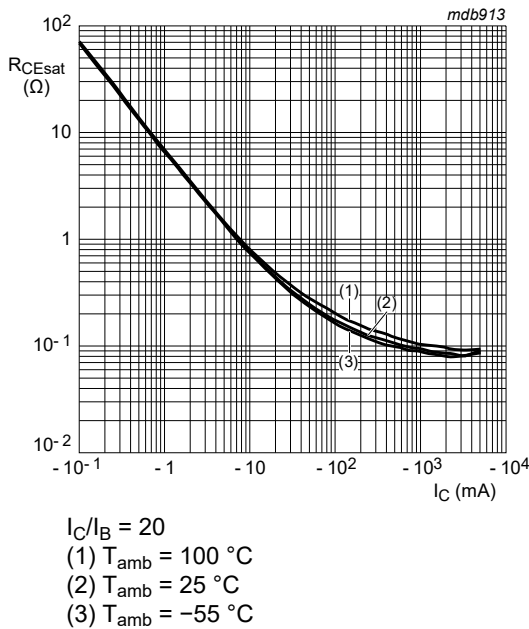


Fig. 11. Equivalent on-resistance as a function of collector current; typical values

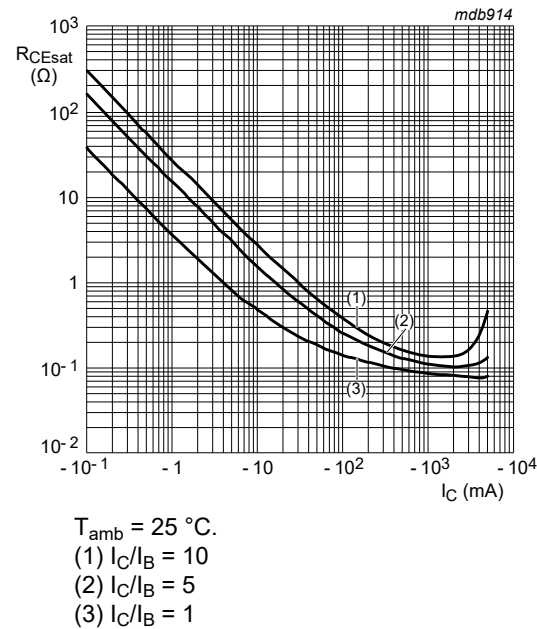


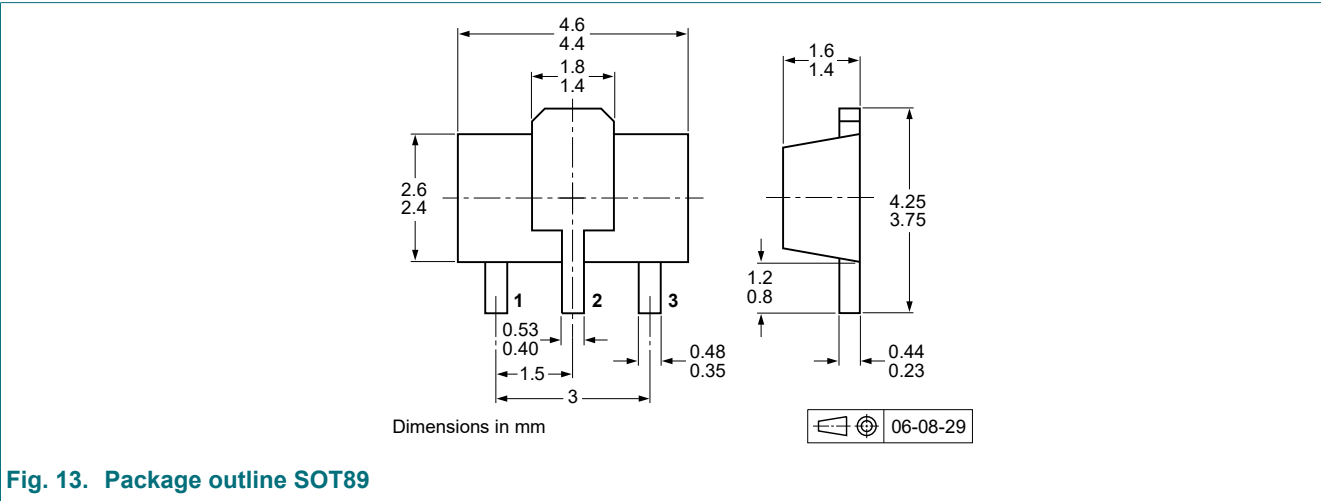
Fig. 12. Equivalent on-resistance as a function of collector current; typical values

11. Test information

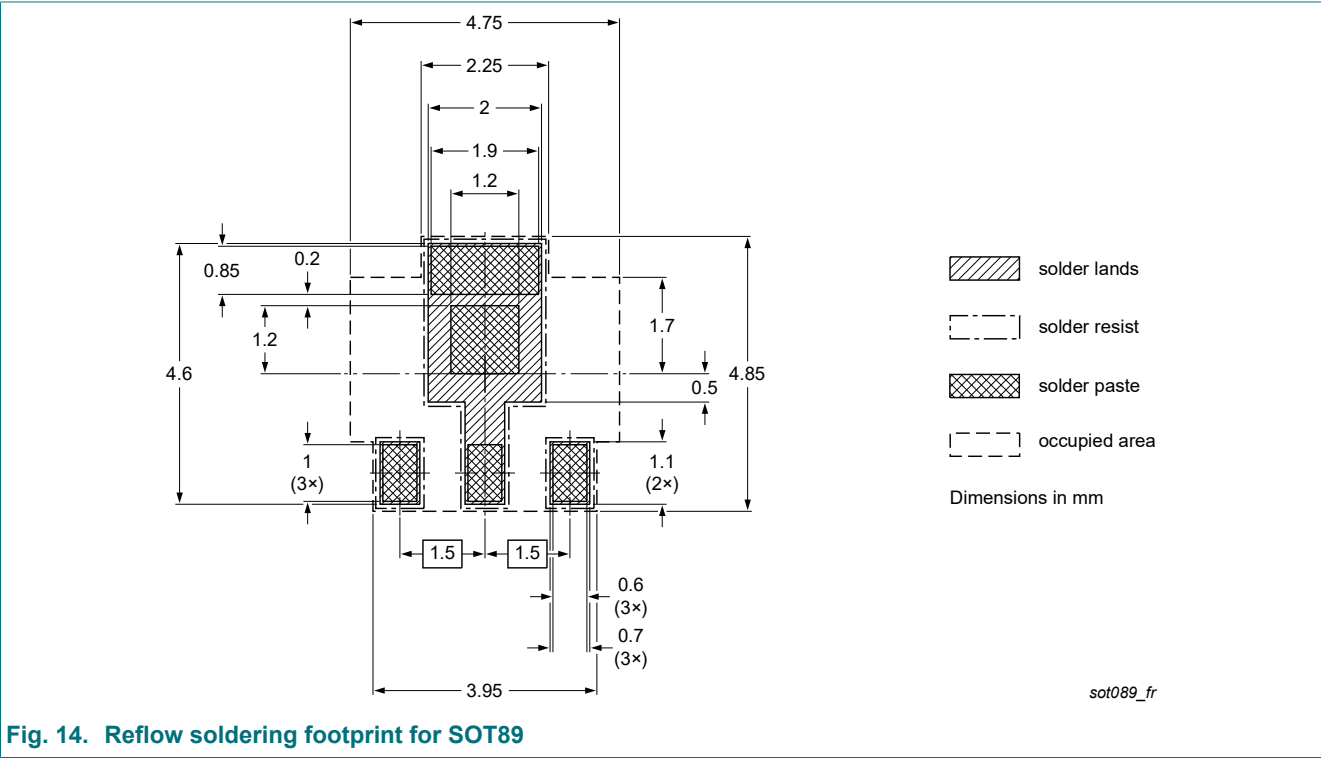
Quality information

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
PBSS5330X v.3	20250813	Product data sheet	-	PBSS5330X v.2
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.			
PBSS5330X v.2	20041103	Product data sheet	-	PBSS5330X v.1
PBSS5330X v.1	20031128	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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