



PBSS2540M-Q

40 V, 0.5 A NPN low V_{CEsat} transistor

21 July 2025

Product data sheet

1. General description

NPN low V_{CEsat} transistor in a SOT883 small Surface-Mounted Device (SMD) plastic package.

PNP complement: PBSS3540M-Q

2. Features and benefits

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability I_C and I_{CM}
- High efficiency due to less heat generation
- Reduced printed-circuit board requirements
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

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

4. Quick reference data

Table 1. Quick reference data

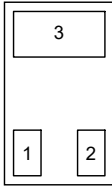
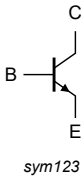
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V _{CEO}	collector-emitter voltage	open base		-	-	40	V
I _C	collector current		[1] [2]	-	-	500	mA
I _{CM}	peak collector current	single pulse; t _p ≤ 1 ms		-	-	1	A
h _{FE}	DC current gain	V _{CE} = 2 V; I _C = 10 mA; T _{amb} = 25 °C		200	-	-	
R _{CEsat}	collector-emitter saturation resistance	I _C = 500 mA; I _B = 50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C		-	380	500	mΩ

[1] Device mounted on an FR4 Printed-Circuit Board, (PCB), single-sided copper, tinplated, standard footprint, with 60 μm copper strip line.

[2] Refer to SOT883 standard mounting conditions.

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 Transparent top view DFN1006-3 (SOT883)	 sym123
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PBSS2540M-Q	DFN1006-3	plastic, leadless ultra small package; 3 terminals; 0.35 mm pitch; 1 mm x 0.6 mm x 0.48 mm body	SOT883

7. Marking

Table 4. Marking codes

Type number	Marking code
PBSS2540M-Q	DC

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		-	40	V
V _{CEO}	collector-emitter voltage	open base		-	40	V
V _{EBO}	emitter-base voltage	open collector		-	6	V
I _C	collector current		[1] [2]	-	500	mA
I _{CM}	peak collector current	single pulse; t _p ≤ 1 ms		-	1	A
I _{BM}	peak base current			-	100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1] [2]	-	250	mW
			[2] [3]	-	430	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, tinplated, standard footprint, with 60 μm copper strip line.
- [2] Refer to SOT883 standard mounting conditions.
- [3] Device mounted on an FR4 PCB, single-sided copper, tinplated, mounting pad for collector 1 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] [2]	-	-	500	K/W
			[2] [3] [4]	-	-	290	K/W

- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint, with 60 µm copper strip line.
[2] Refer to SOT883 standard mounting conditions.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm².
[4] Operated under pulsed conditions: duty cycle δ ≤ 20%, pulse width t_p ≤ 30 ms.

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 _{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 = 10 mA; T _{amb} = 25 °C		200	-	-	
		V _{CE} = 2 V; I _C = 100 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		150	-	-	
		V _{CE} = 2 V; I _C = 500 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		50	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = 10 mA; I _B = 0.5 mA; T _{amb} = 25 °C		-	-	50	mV
		I _C = 100 mA; I _B = 5 mA; T _{amb} = 25 °C		-	-	100	mV
		I _C = 200 mA; I _B = 10 mA; T _{amb} = 25 °C		-	-	200	mV
		I _C = 500 mA; I _B = 50 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	250	mV
R _{CEsat}	collector-emitter saturation resistance			-	380	500	mΩ
V _{BEsat}	base-emitter saturation voltage			-	-	1.2	V
V _{BEon}	base-emitter turn-on voltage	V _{CE} = 2 V; I _C = 100 mA; T _{amb} = 25 °C		-	-	1.1	V
f _T	transition frequency	V _{CE} = 5 V; I _C = 100 mA; f = 100 MHz; T _{amb} = 25 °C		250	450	-	MHz
C _c	collector capacitance	V _{CB} = 10 V; I _E = 0 A; i _e = 0 A; f = 1 MHz; T _{amb} = 25 °C		-	-	6	pF

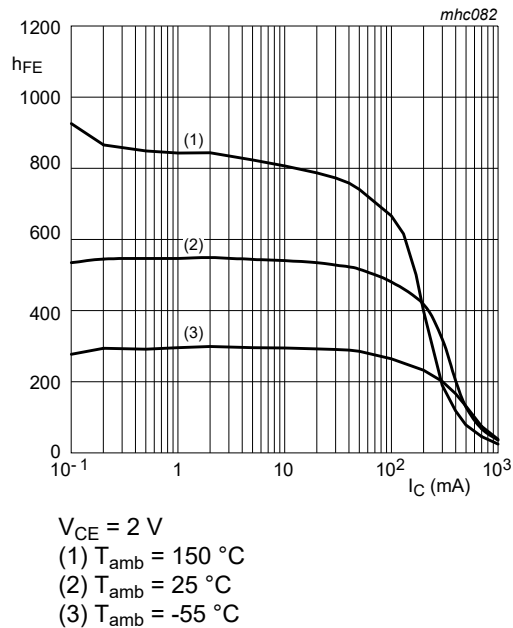


Fig. 1. DC current gain as a function of collector current; typical values

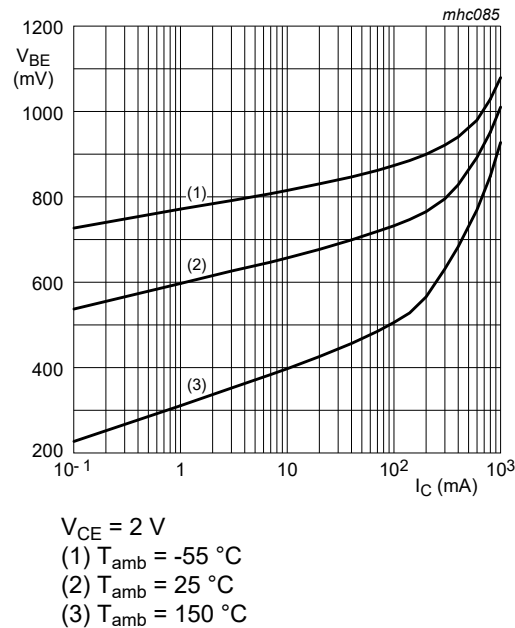


Fig. 2. Base-emitter voltage as a function of collector current; typical values

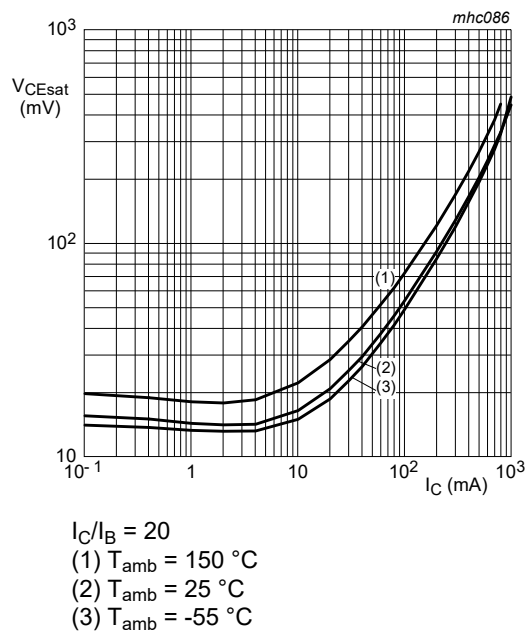


Fig. 3. Collector-emitter saturation voltage as a function of collector current; typical values

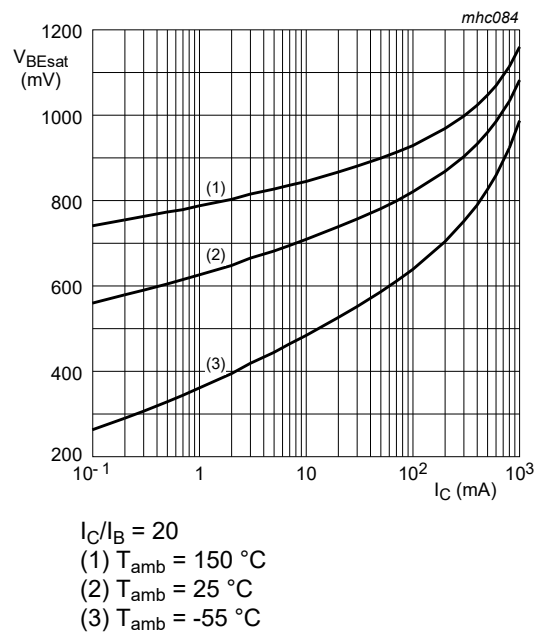
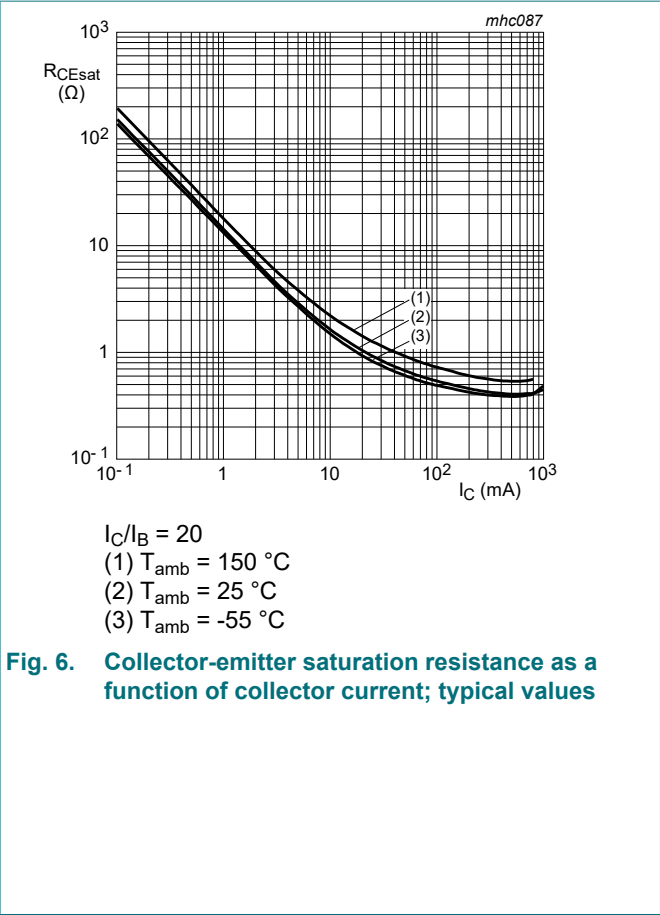
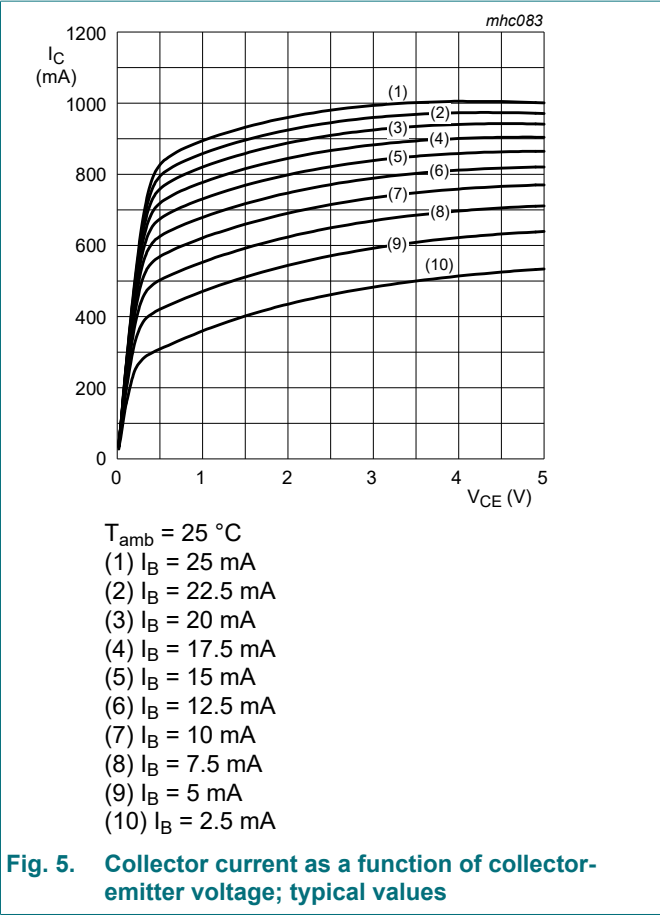


Fig. 4. Base-emitter saturation voltage as a function of collector current; typical values

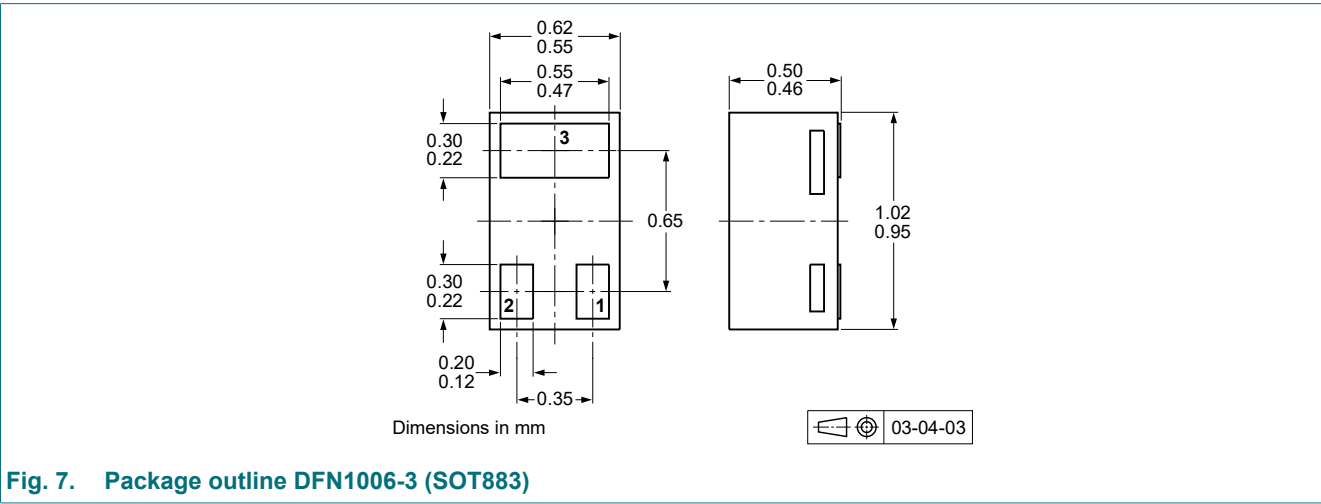


11. Test information

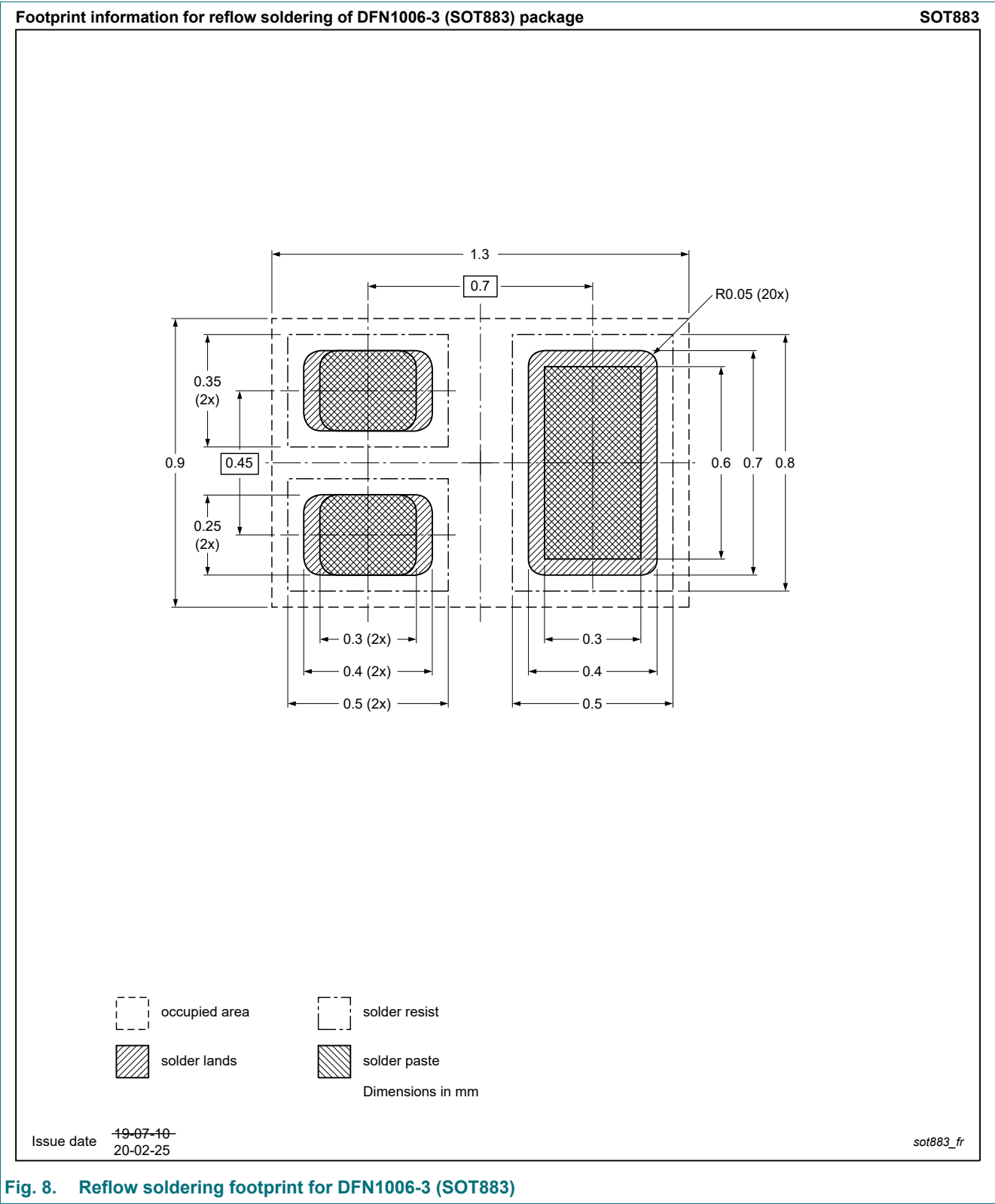
Quality information

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
PBSS2540M-Q v.1	20250721	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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