



PBSS5240Z-Q

40 V; 2 A PNP low V_{CEsat} transistor

26 March 2025

Product data sheet

1. General description

PNP low V_{CEsat} transistor in a medium power SOT223 (SC-73) 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
- Qualified according to AEC-Q101 and recommended for use in automotive applications

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)

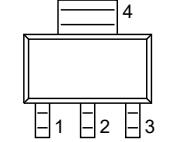
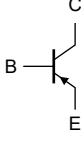
4. Quick reference data

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		-	-	-2	A
I _{CM}	peak collector current	single pulse; t _p ≤ 1 ms	-	-	-3	A
R _{CEsat}	collector-emitter saturation resistance	I _C = -1 A; I _B = -100 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C	-	-	320	mΩ

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SC-73 (SOT223)	 sym028
2	C	collector		
3	E	emitter		
4	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PBSS5240Z-Q	SC-73	plastic, surface-mounted package with increased heatsink; 4 leads; 2.3 mm pitch; 6.5 mm x 3.5 mm x 1.65 mm body	SOT223

7. Marking

Table 4. Marking codes

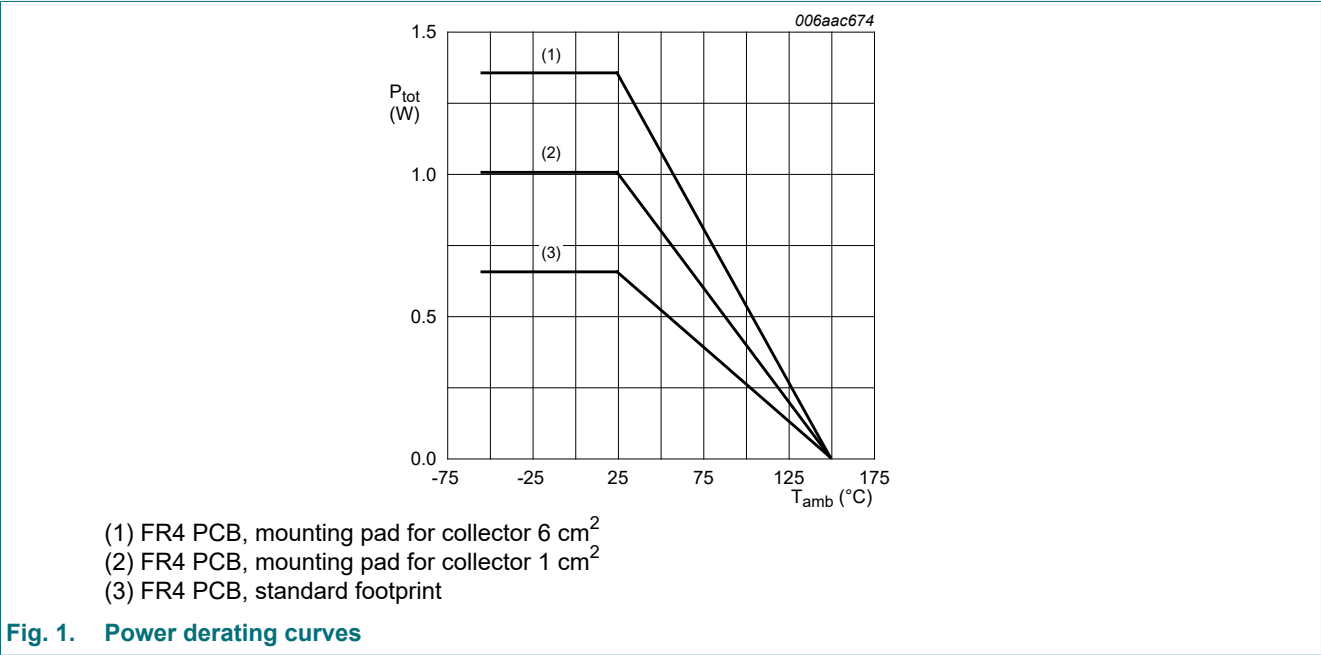
Type number	Marking code
PBSS5240Z-Q	S5240Z

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		-	-7	V
I _C	collector current			-	-2	A
I _{CM}	peak collector current	single pulse; t _p ≤ 1 ms		-	-3	A
I _B	base current			-	-300	mA
I _{BM}	peak base current	single pulse; t _p ≤ 1 ms		-	-1	A
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	0.65	W
			[2]	-	1	W
			[3]	-	1.35	W
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 Printed-Circuit Board (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.



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]	-	-	192	K/W
			[2]	-	-	125	K/W
			[3]	-	-	93	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.

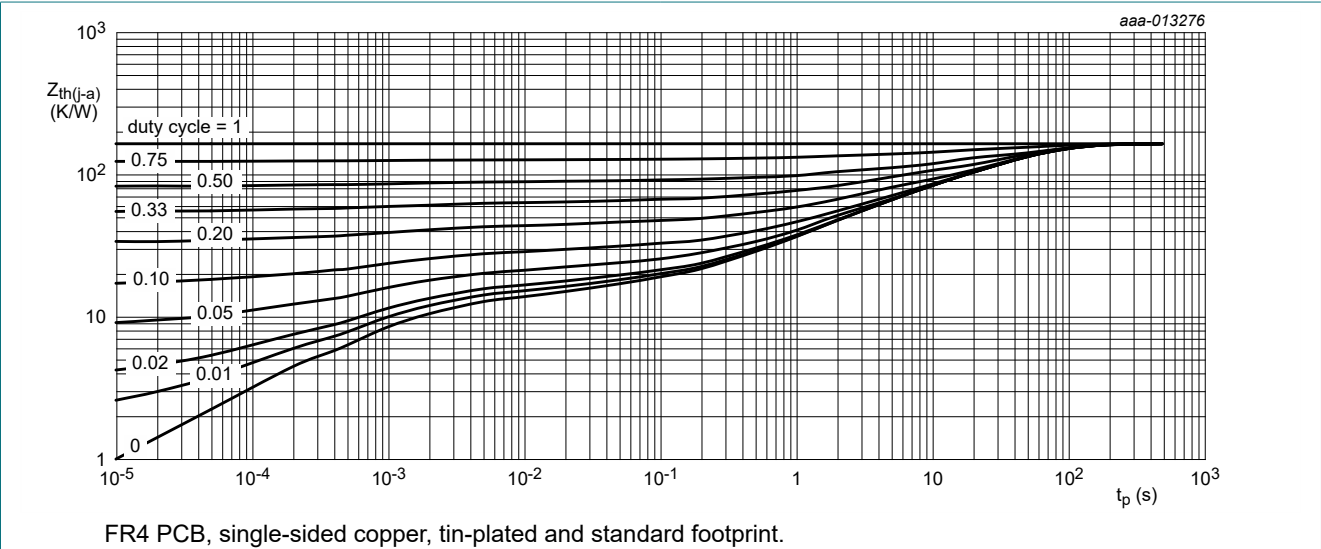


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

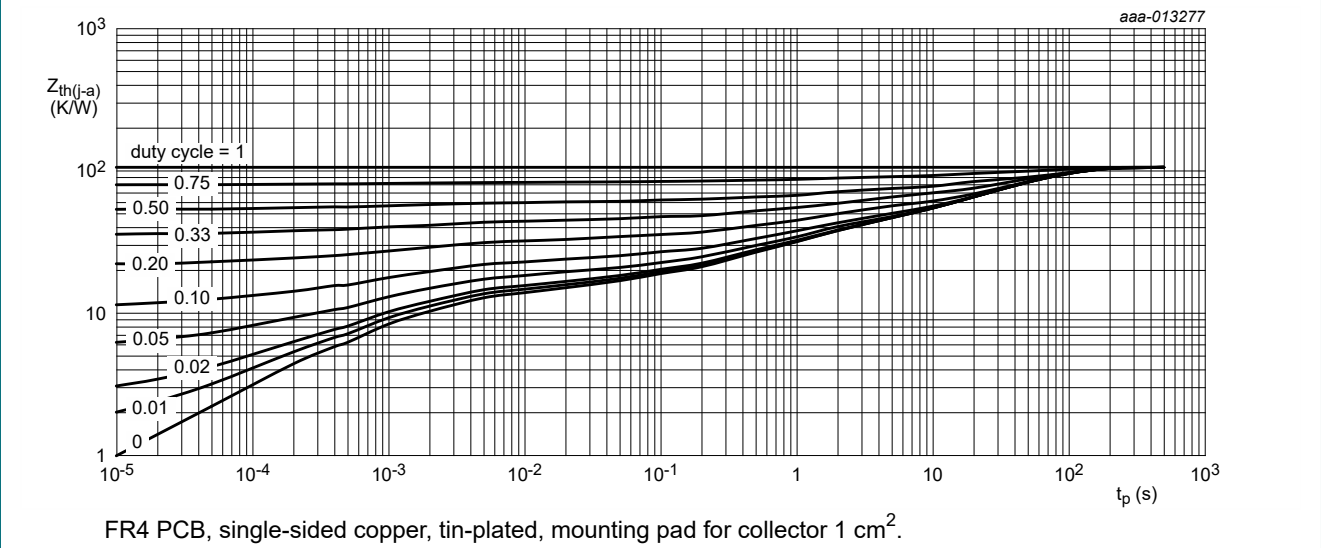
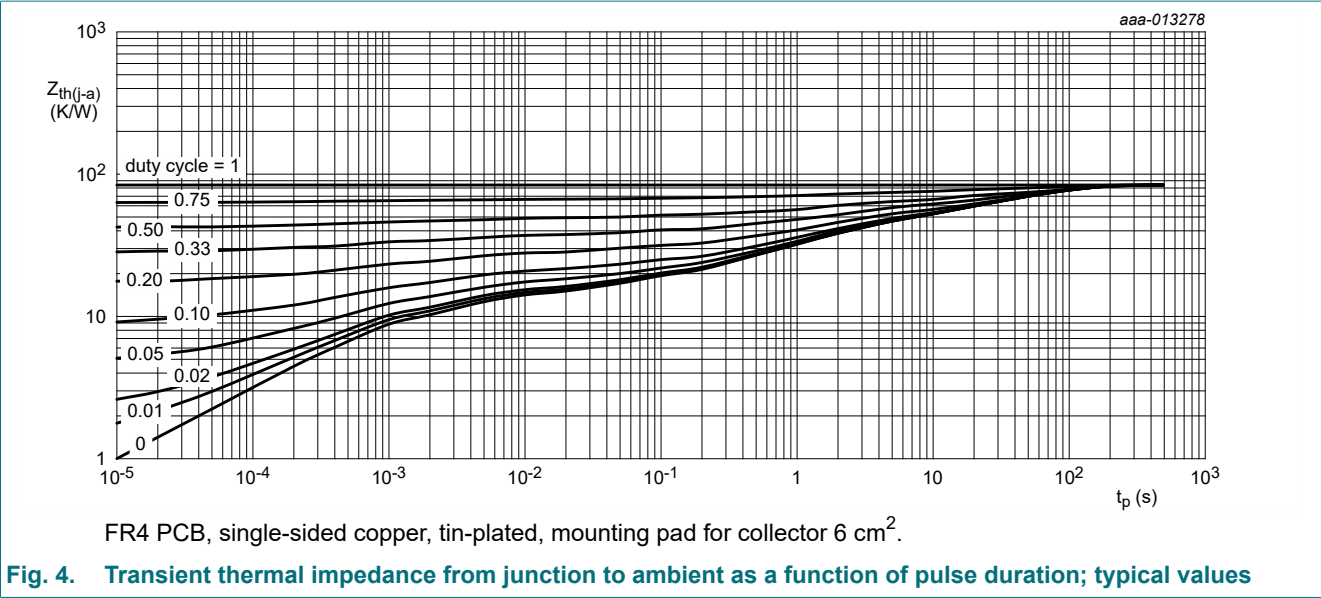


Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I _{CBO}	collector-base cut-off current	V _{CB} = -32 V; I _E = 0 A; T _{amb} = 25 °C		-	-	-100	nA
		V _{CB} = -32 V; I _E = 0 A; T _j = 150 °C		-	-	-50	µA
I _{CES}	collector-emitter cut-off current	V _{CE} = -32 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} = -5 V; I _C = -1 mA; T _{amb} = 25 °C		300	-	-	
		V _{CE} = -5 V; I _C = -500 mA; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		215	-	-	
		V _{CE} = -5 V; I _C = -1 A; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		145	-	-	
		V _{CE} = -5 V; I _C = -2 A; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C; pulsed		55	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = -100 mA; I _B = -1 mA; T _{amb} = 25 °C		-	-	-140	mV
		I _C = -500 A; I _B = -50 mA; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	-170	mV
		I _C = -1 A; I _B = -100 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	-320	mV
		I _C = -2 A; I _B = -200 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	-650	mV
R _{CEsat}	collector-emitter saturation resistance	I _C = -1 A; I _B = -100 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	320	mΩ
V _{BEsat}	base-emitter saturation voltage			-	-	-1.2	V
V _{BEon}	base-emitter turn-on voltage	V _{CE} = -5 V; I _C = -1 A; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	-1.1	V
f _T	transition frequency	V _{CE} = -10 V; I _C = -50 mA; f = 100 MHz; T _{amb} = 25 °C		150	-	-	MHz
C _c	collector capacitance	V _{CB} = -10 V; I _E = 0 A; i _e = 0 A; f = 1 MHz; T _{amb} = 25 °C		-	-	12	pF

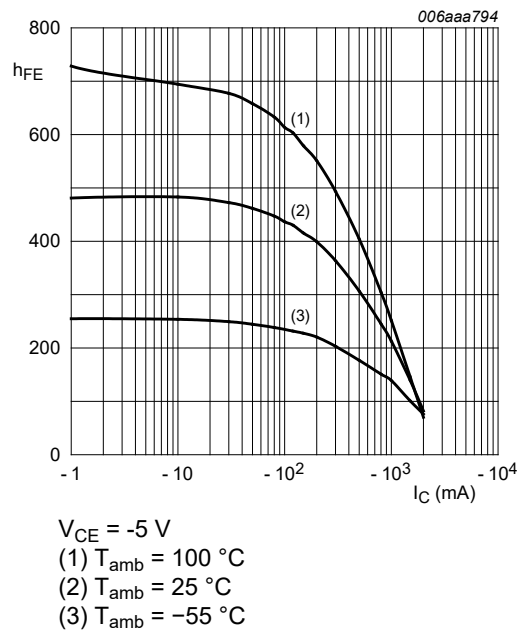


Fig. 5. DC current gain as a function of collector current; typical values

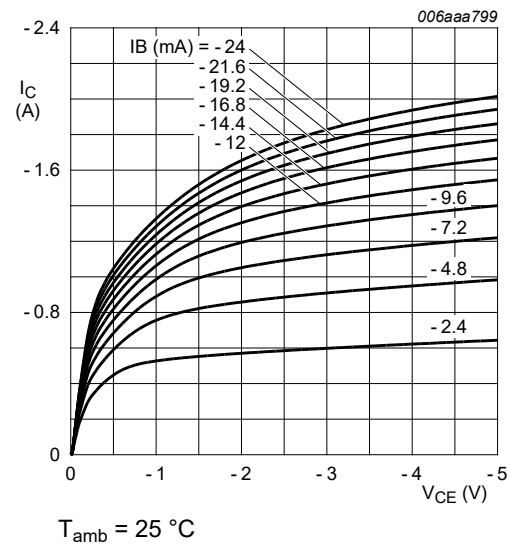


Fig. 6. Collector current as a function of collector-emitter voltage; typical values

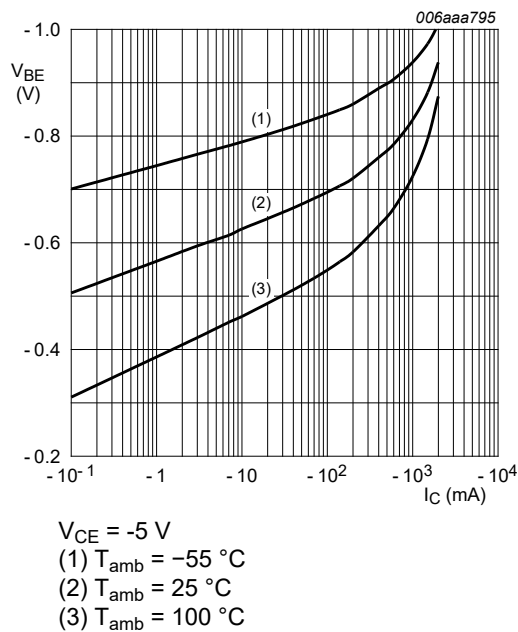


Fig. 7. Base-emitter voltage as a function of collector current; typical values

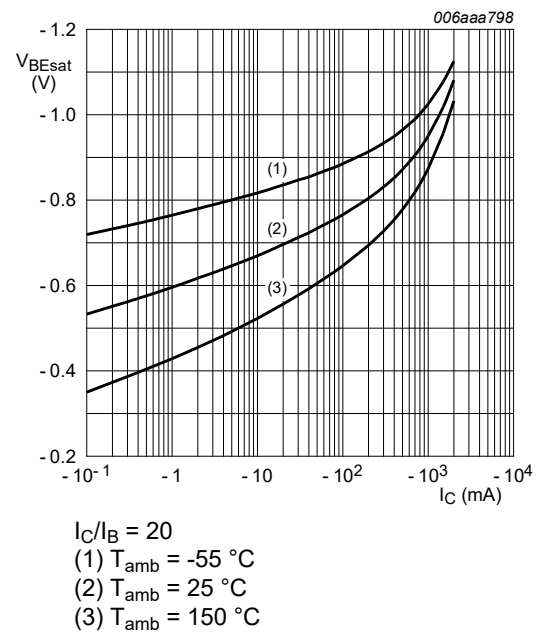
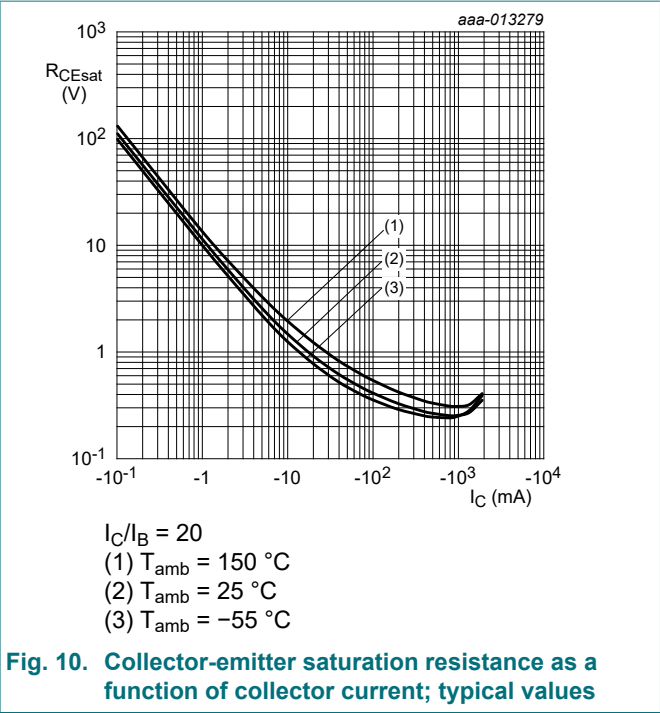
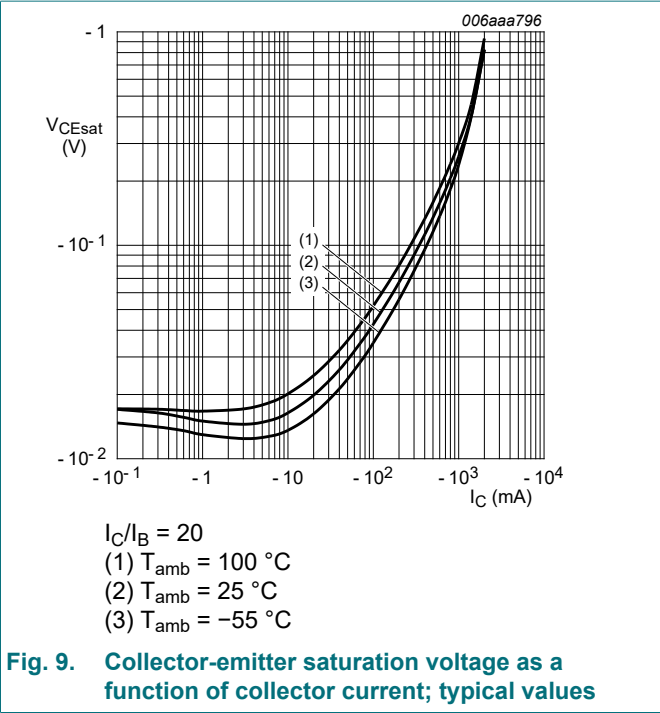


Fig. 8. Base-emitter saturation voltage as a function of collector current; typical values

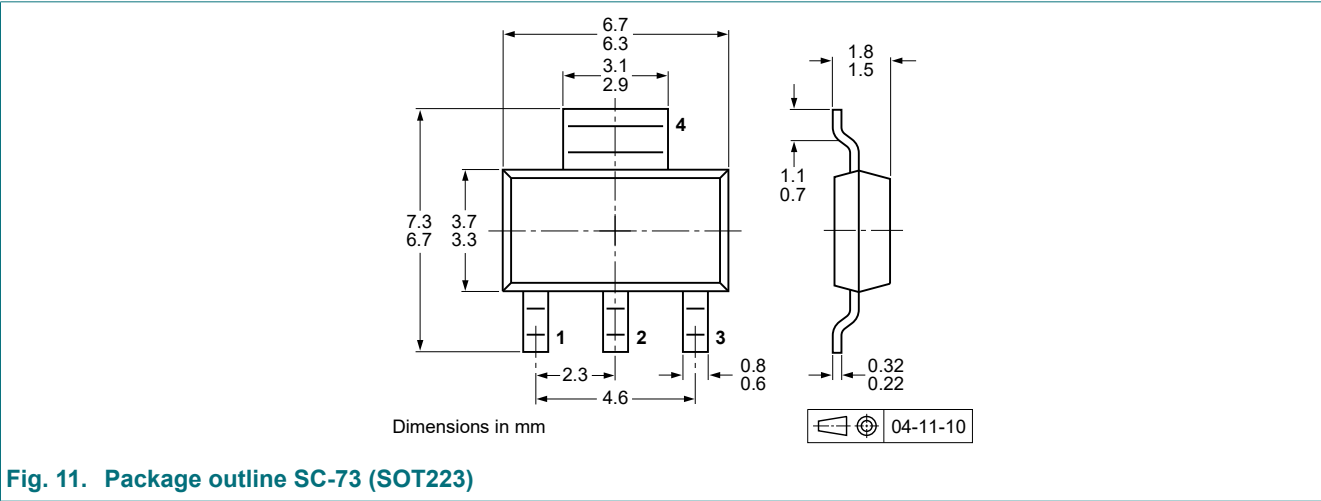


11. Test information

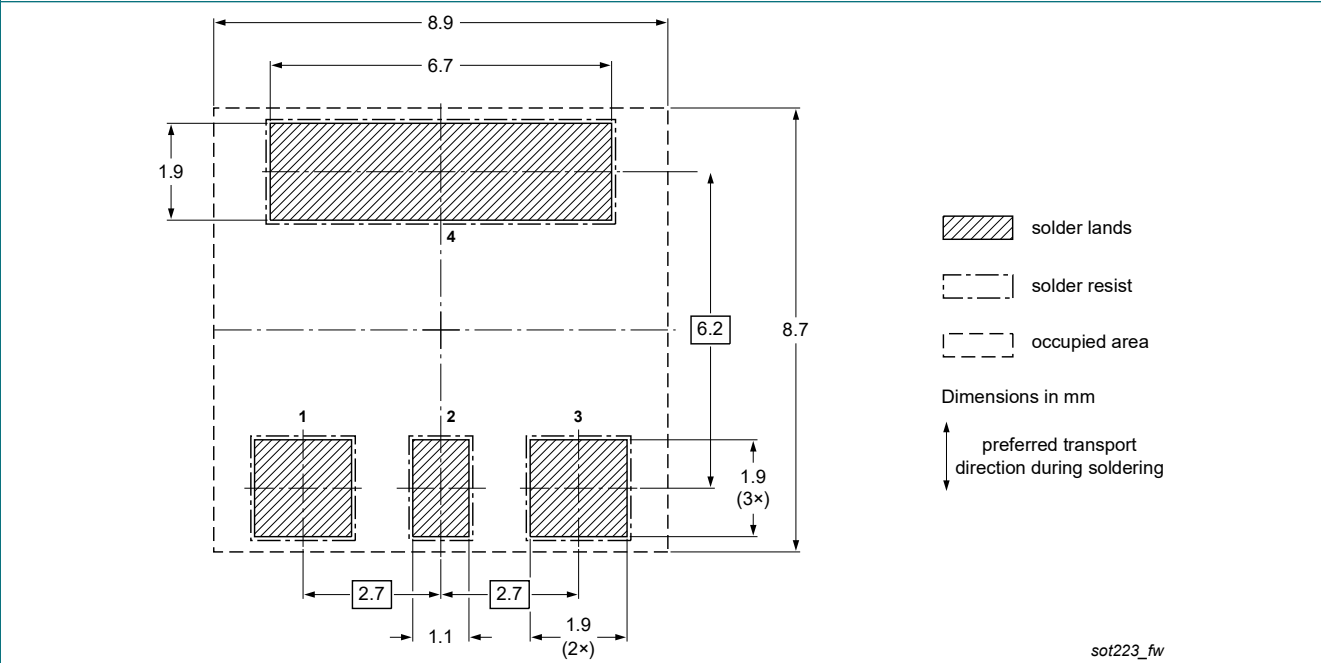
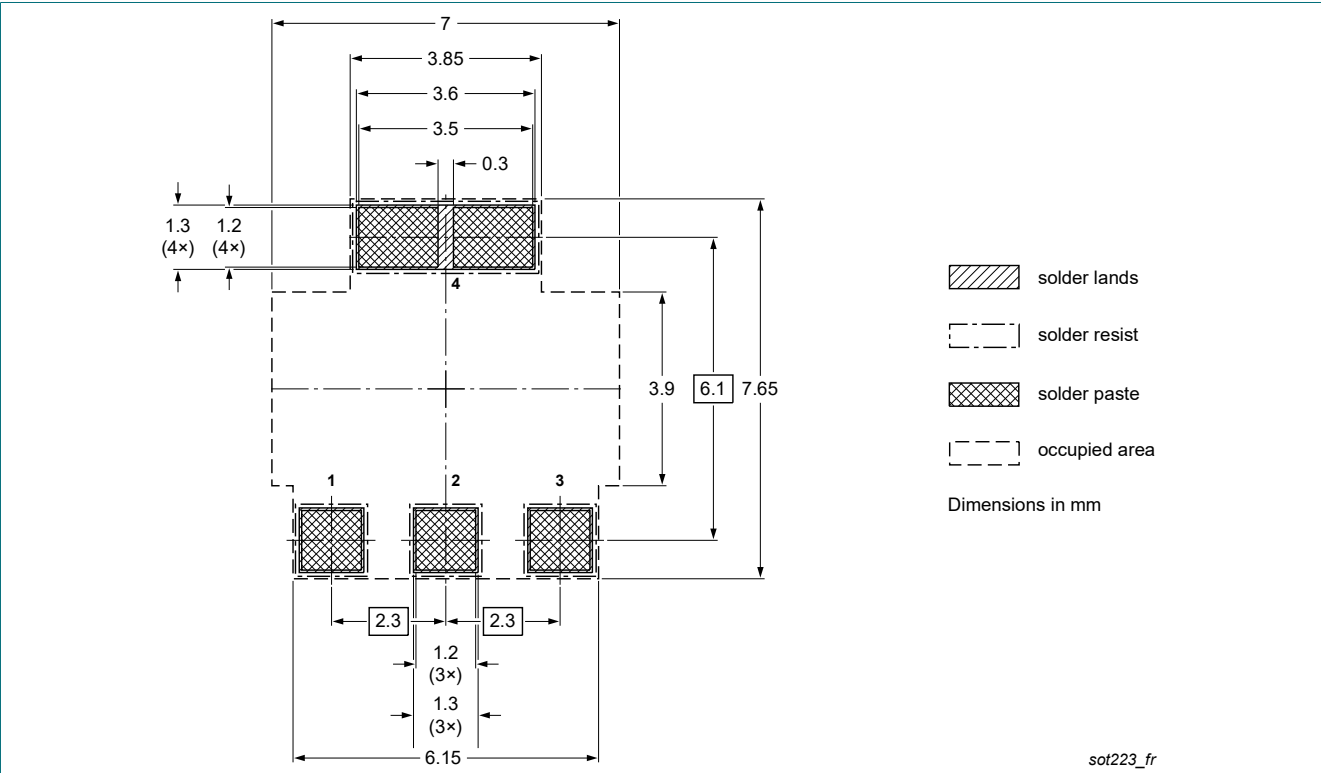
Quality information

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
PBSS5240Z-Q v.1	20250326	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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- [2] The term 'short data sheet' is explained in section "Definitions".
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Date of release: 26 March 2025