



PBSS5250X-Q

50 V, 2 A PNP low V_{CEsat} transistor

31 July 2025

Product data sheet

1. General description

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

NPN complement: PBSS4250X-Q

2. Features and benefits

- SOT89 (SC-62) package
- 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
- Qualified according to AEC-Q101 and recommended for use in automotive applications

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)

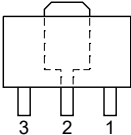
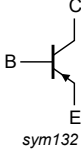
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	-50	V
I_C	collector current		-	-	-2	A
h_{FE}	DC current gain	$V_{CE} = -2\text{ V}$; $I_C = -0.1\text{ A}$; $T_{amb} = 25\text{ °C}$	200	-	-	

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
PBSS5250X-Q	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]
PBSS5250X-Q	%1L

[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		-	-50	V
V _{CEO}	collector-emitter voltage	open base		-	-50	V
V _{EBO}	emitter-base voltage	open collector		-	-5	V
I _C	collector current			-	-2	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	[1]	-	550	mW
			[2]	-	1	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 an FR4 PCB, single-sided, 35 µm copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided, 35 µm copper, tin-plated, 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]	-	-	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, 35 μm copper, tin-plated and standard footprint.
 [2] Device mounted on an FR4 PCB, single-sided, 35 μm copper, tin-plated, mounting pad for collector 1 cm^2 .
 [3] Device mounted on an FR4 PCB, single-sided, 35 μm copper, tin-plated, mounting pad for collector 6 cm^2 .
 [4] Device mounted on a ceramic PCB, 7 cm^2 , single-sided, 35 μm copper, tin-plated; standard footprint.

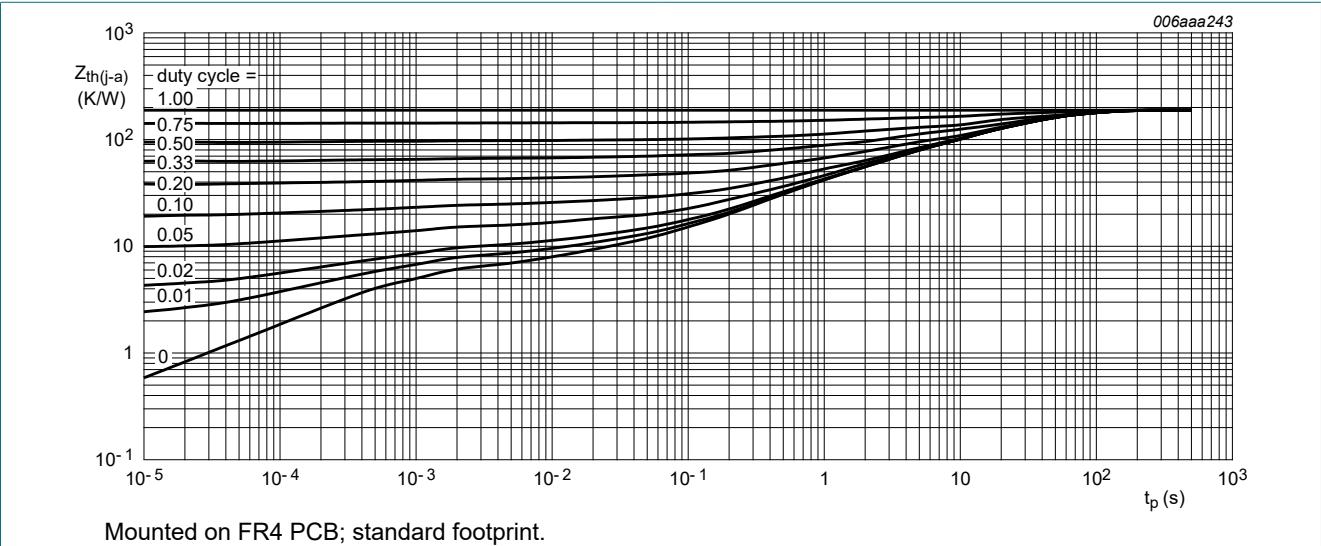


Fig. 1. Transient thermal impedance as a function of pulse duration; typical values

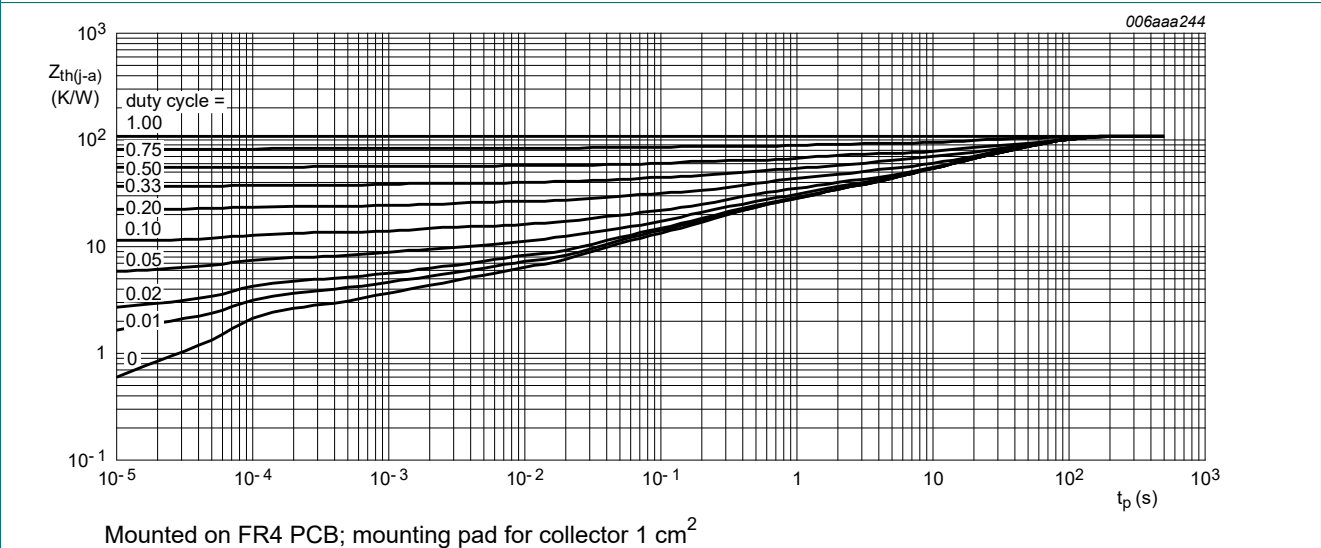
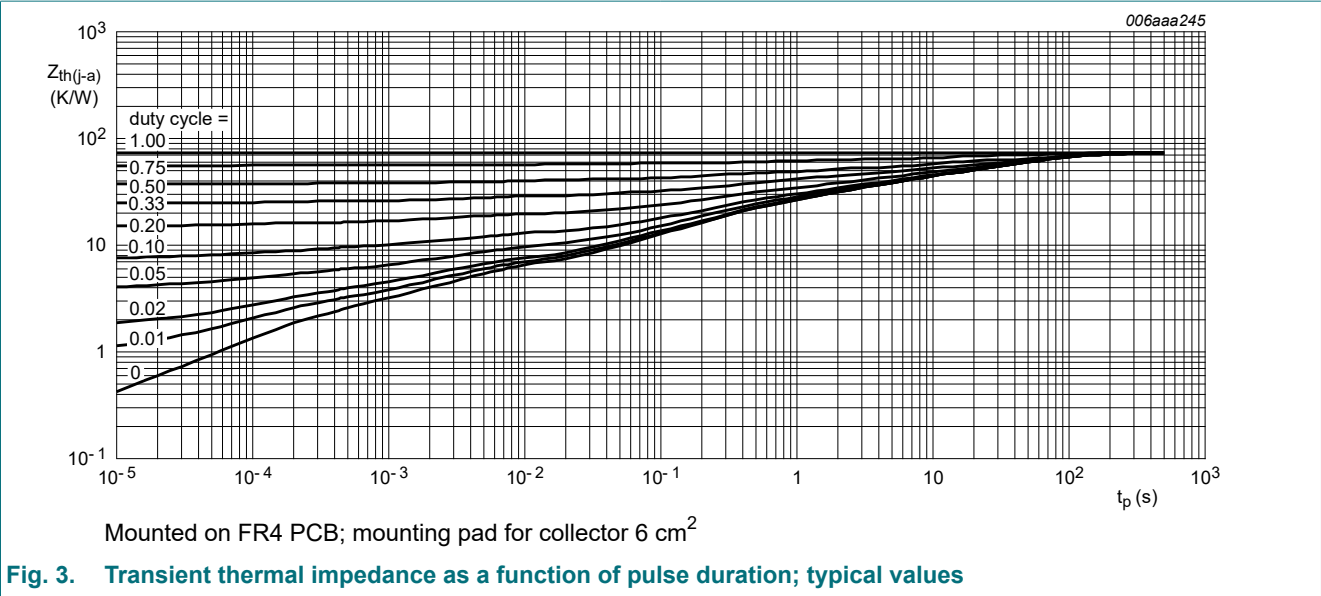


Fig. 2. Transient thermal impedance as a function of pulse duration; typical values



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = -100\text{ }\mu\text{A}$; $I_E = 0\text{ A}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-50	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = -2\text{ mA}$; $I_B = 0\text{ A}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-50	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_E = -100\text{ }\mu\text{A}$; $I_C = 0\text{ A}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-5	-	-	V
I_{CBO}	collector-base cut-off current	$V_{CB} = -50\text{ V}$; $I_E = 0\text{ A}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-	-	-100	nA
		$V_{CB} = -50\text{ V}$; $I_E = 0\text{ A}$; $T_j = 150\text{ }^\circ\text{C}$	-	-	-50	μA
I_{CES}	collector-emitter cut-off current	$V_{CE} = -50\text{ V}$; $V_{BE} = 0\text{ V}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-	-	-100	nA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\text{ V}$; $I_C = 0\text{ A}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-	-	-100	nA
h_{FE}	DC current gain	$V_{CE} = -2\text{ V}$; $I_C = -0.1\text{ A}$; $T_{amb} = 25\text{ }^\circ\text{C}$	200	-	-	
		$V_{CE} = -2\text{ V}$; $I_C = -0.5\text{ A}$; $T_{amb} = 25\text{ }^\circ\text{C}$	200	-	-	
		$V_{CE} = -2\text{ V}$; $I_C = -1\text{ A}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^\circ\text{C}$	200	-	-	
		$V_{CE} = -2\text{ V}$; $I_C = -2\text{ A}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^\circ\text{C}$	100	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -0.5\text{ A}$; $I_B = -50\text{ mA}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-	-	-90	mV
		$I_C = -1\text{ A}$; $I_B = -50\text{ mA}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-	-	-250	mV
		$I_C = -2\text{ A}$; $I_B = -100\text{ mA}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-	-	-380	mV
		$I_C = -2\text{ A}$; $I_B = -200\text{ mA}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^\circ\text{C}$	-	-	-320	mV
R_{CEsat}	collector-emitter saturation resistance		-	-	160	m Ω
V_{BEsat}	base-emitter saturation voltage	$I_C = -2\text{ A}$; $I_B = -100\text{ mA}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-	-	-1.1	V
V_{BEon}	base-emitter turn-on voltage	$V_{CE} = -2\text{ V}$; $I_C = -1\text{ A}$; $T_{amb} = 25\text{ }^\circ\text{C}$	-1.1	-	-	V

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
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

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

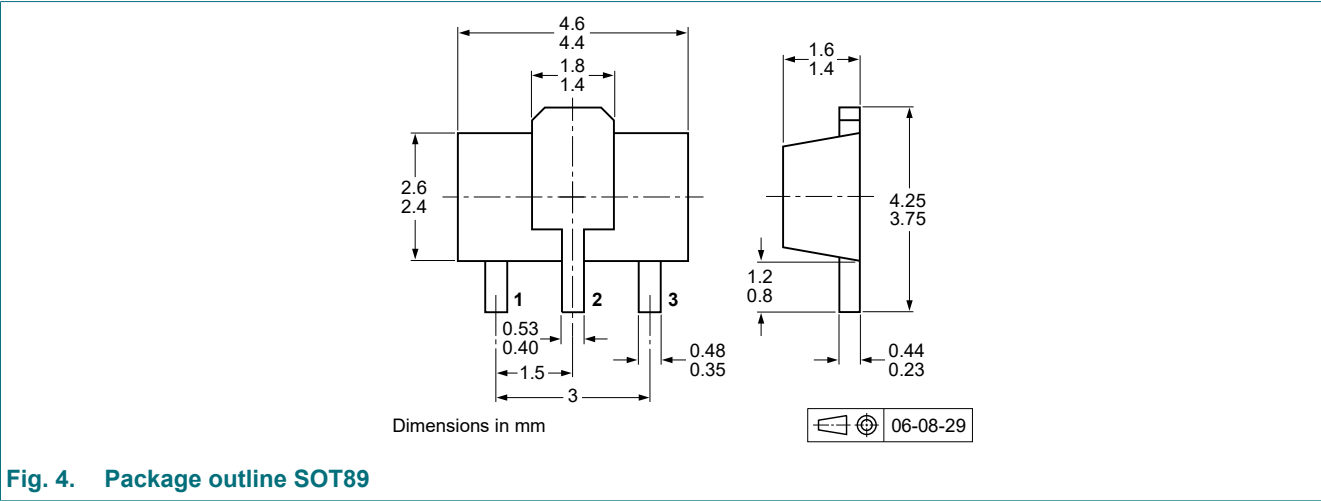


Fig. 4. Package outline SOT89

13. Soldering

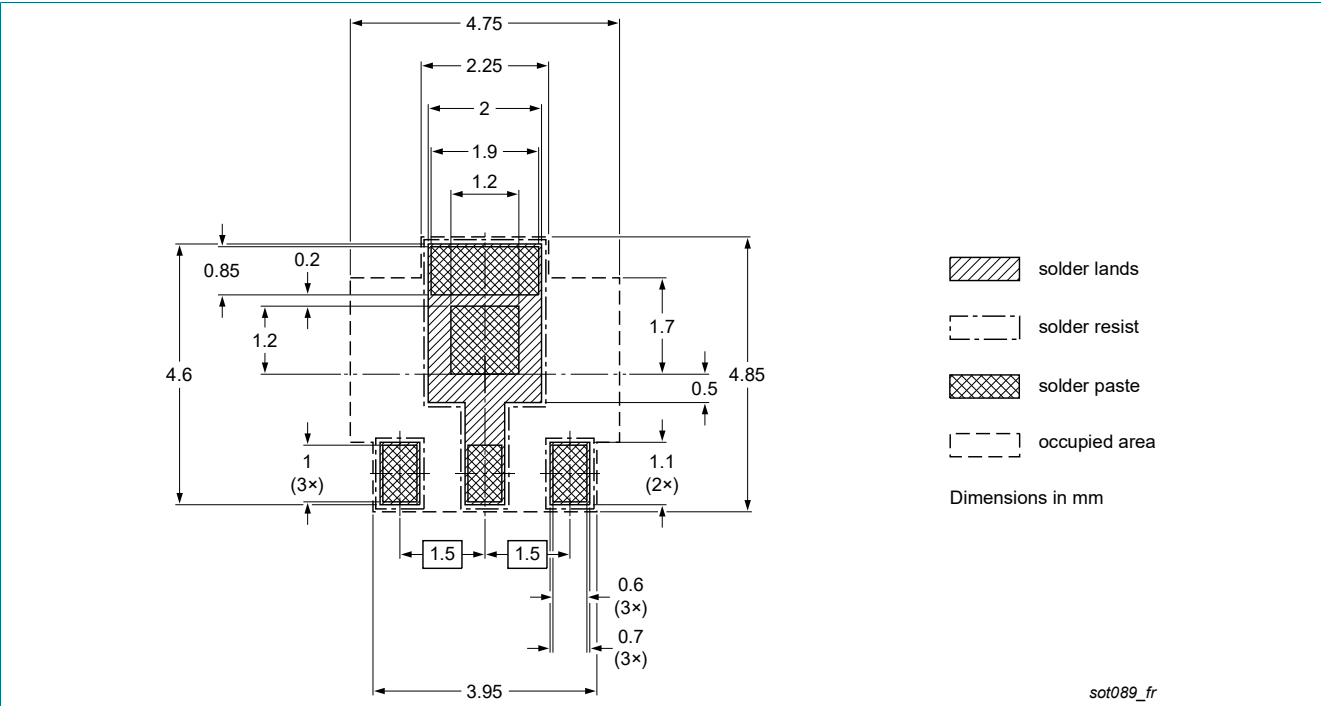


Fig. 5. Reflow soldering footprint for SOT89

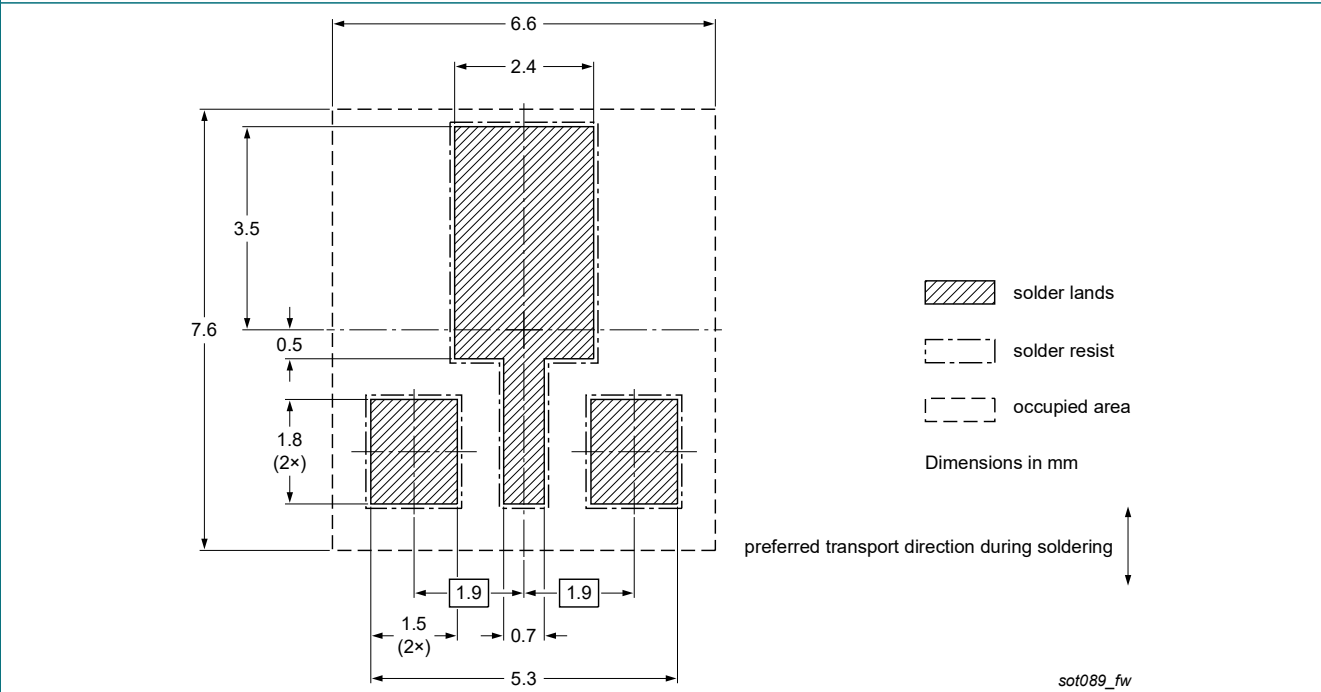


Fig. 6. Wave soldering footprint for SOT89

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PBSS5250X-Q v.1	20250731	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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