



# PBSS5350D-Q

50 V, 3 A PNP low V<sub>CEsat</sub> transistor

10 May 2022

Product data sheet

## 1. General description

PNP low V<sub>CEsat</sub> transistor in a small SOT457 (SC-74) Surface-Mounted Device (SMD) plastic package.

NPN complement: PBSS4350D-Q

## 2. Features and benefits

- Low collector-emitter saturation voltage V<sub>CEsat</sub>
- High current capability
- High efficiency due to less heat generation
- Smaller Printed-Circuit Board (PCB) area than for conventional transistors
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Supply line switching circuits
- Battery management applications
- DC-to-DC conversion

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>CEO</sub>	collector-emitter voltage	open base	-	-	-50	V
I <sub>C</sub>	collector current		-	-	-3	A
I <sub>CM</sub>	peak collector current		-	-	-5	A
R <sub>CEsat</sub>	collector-emitter saturation resistance	I <sub>C</sub> = -2 A; I <sub>B</sub> = -200 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C	-	120	150	mΩ

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	C	collector	<p>SC-74; TSOP6 (SOT457)</p>	<p>sym030</p>
2	C	collector		
3	B	base		
4	E	emitter		
5	C	collector		
6	C	collector		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PBSS5350D-Q</a>	SC-74; TSOP6	plastic, surface-mounted package (SC-74; TSOP6); 6 leads	<a href="#">SOT457</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code
PBSS5350D-Q	53

## 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		-	-60	V
$V_{CEO}$	collector-emitter voltage	open base		-	-50	V
$V_{EBO}$	emitter-base voltage	open collector		-	-6	V
$I_C$	collector current			-	-3	A
$I_{CM}$	peak collector current			-	-5	A
$I_{BM}$	peak base current			-	-1	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	-	600	mW
			[2]	-	750	mW
			[3]	-	1200	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, tin-plated, mounting pad for collector 1 cm<sup>2</sup>.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm<sup>2</sup>.

[3] Device mounted on an FR4 4-layer PCB.

## 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]	-	-	208	K/W
			[2]	-	-	160	K/W
		pulsed; $t_p \leq 50\text{ ms}$ ; $\delta \leq 0.5\%$ ; in free air	[2]	-	-	100	K/W

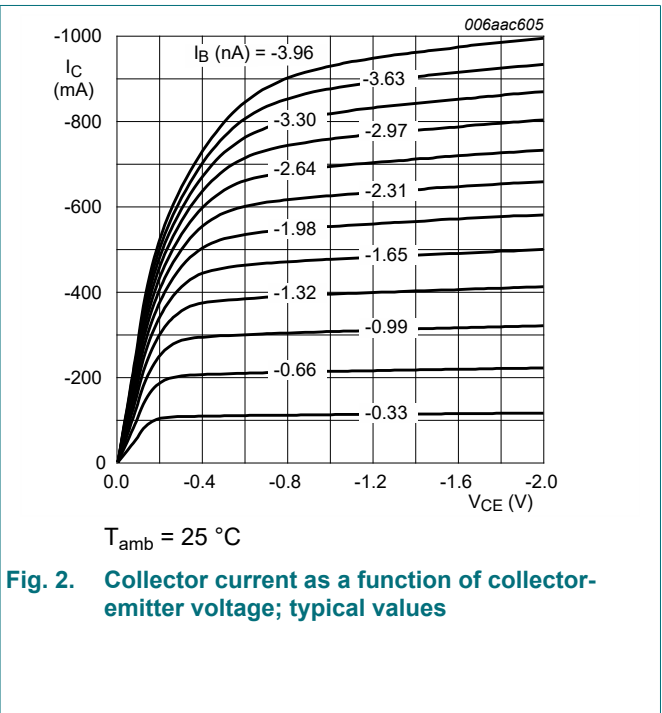
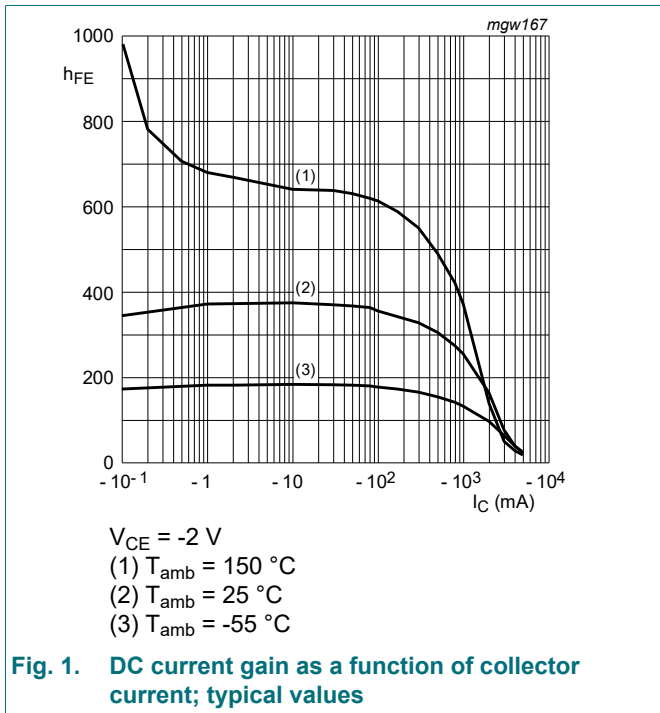
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm<sup>2</sup>.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm<sup>2</sup>.

### 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I <sub>CBO</sub>	collector-base cut-off current	V <sub>CB</sub> = -50 V; I <sub>E</sub> = 0 A; T <sub>amb</sub> = 25 °C	-	-	-100	nA
		V <sub>CB</sub> = -50 V; I <sub>E</sub> = 0 A; T <sub>j</sub> = 150 °C	-	-	-50	μA
I <sub>EBO</sub>	emitter-base cut-off current	V <sub>EB</sub> = -5 V; I <sub>C</sub> = 0 A; T <sub>amb</sub> = 25 °C	-	-	-100	nA
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = -2 V; I <sub>C</sub> = -500 mA; T <sub>amb</sub> = 25 °C	200	-	-	
		V <sub>CE</sub> = -2 V; I <sub>C</sub> = -1 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C	200	-	-	
		V <sub>CE</sub> = -2 V; I <sub>C</sub> = -2 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C	100	-	-	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = -500 mA; I <sub>B</sub> = -50 mA; T <sub>amb</sub> = 25 °C	-	-	-100	mV
		I <sub>C</sub> = -1 A; I <sub>B</sub> = -50 mA; T <sub>amb</sub> = 25 °C	-	-	-180	mV
		I <sub>C</sub> = -2 A; I <sub>B</sub> = -200 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C	-	-	-300	mV
R <sub>CEsat</sub>	collector-emitter saturation resistance		-	120	150	mΩ
V <sub>BEsat</sub>	base-emitter saturation voltage		-	-	-1.2	V
V <sub>BEon</sub>	base-emitter turn-on voltage	V <sub>CE</sub> = -2 V; I <sub>C</sub> = -1 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C	-	-	-1.1	V
f <sub>T</sub>	transition frequency	V <sub>CE</sub> = -5 V; I <sub>C</sub> = -100 mA; f = 100 MHz; T <sub>amb</sub> = 25 °C	100	-	-	MHz
C <sub>c</sub>	collector capacitance	V <sub>CB</sub> = -10 V; I <sub>E</sub> = 0 A; i <sub>e</sub> = 0 A; f = 1 MHz; T <sub>amb</sub> = 25 °C	-	-	40	pF



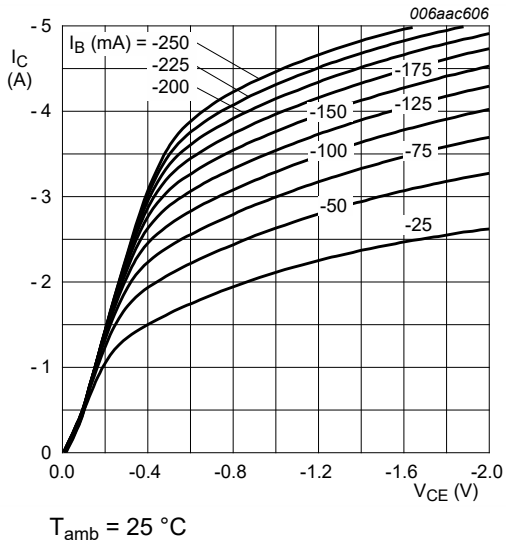


Fig. 3. Collector current as a function of collector-emitter voltage; typical values

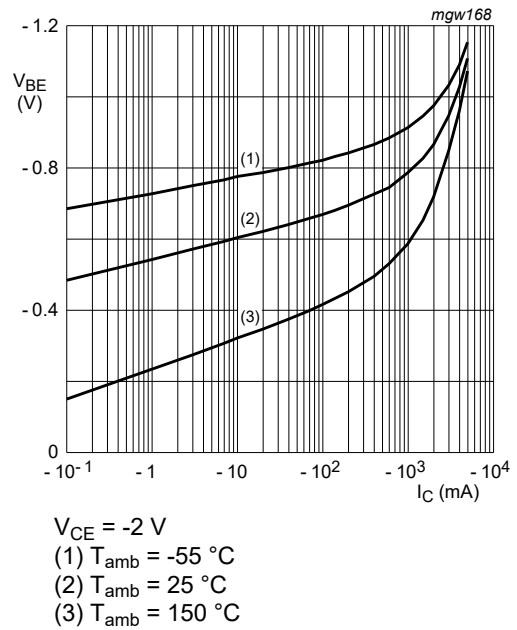


Fig. 4. Base-emitter voltage as a function of collector current; typical values

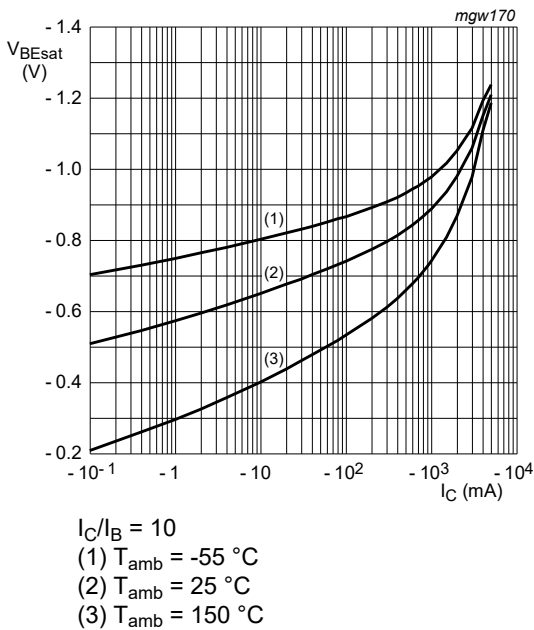


Fig. 5. Base-emitter saturation voltage as a function of collector current; typical values

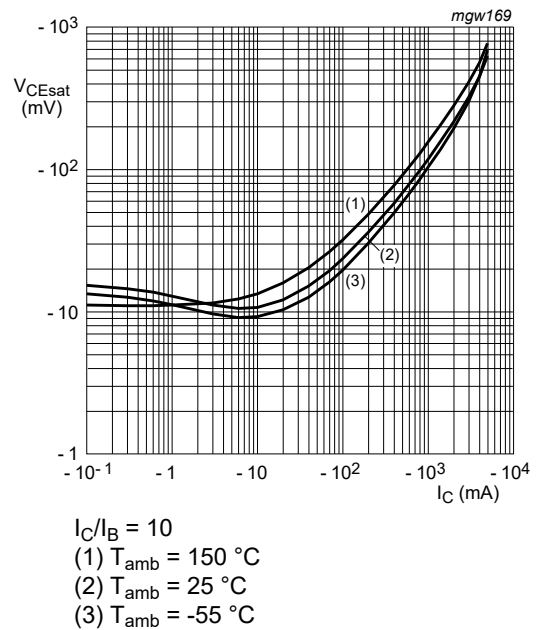
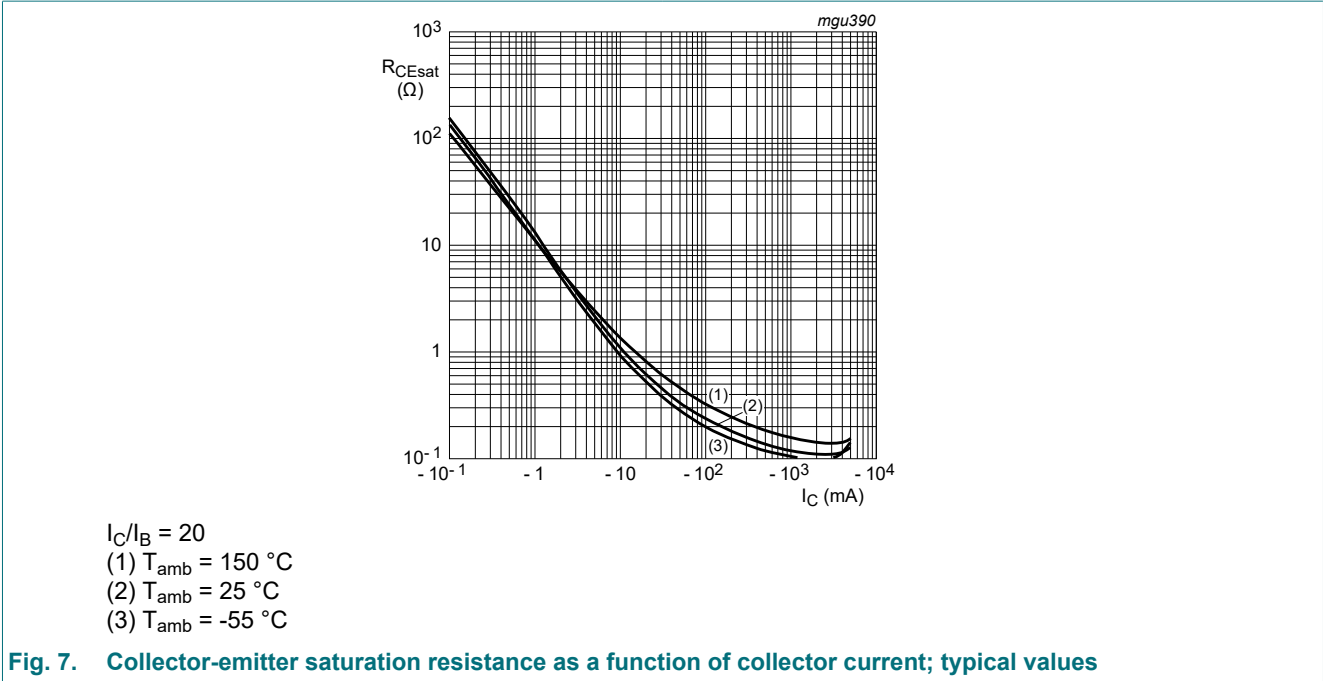


Fig. 6. Collector-emitter saturation voltage as a function of collector current; typical values

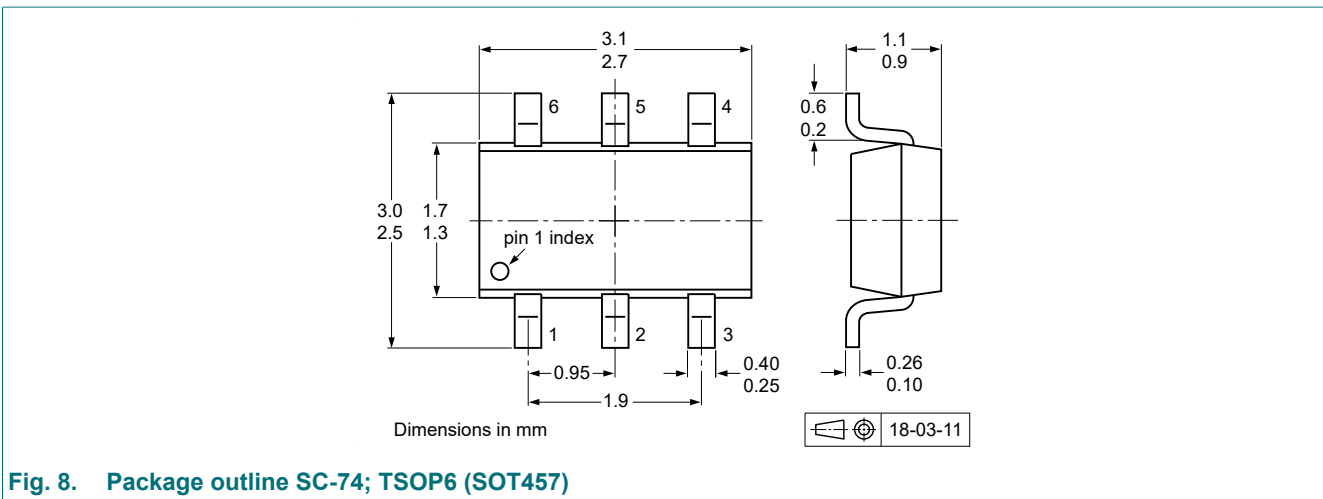


## 11. Test information

### 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

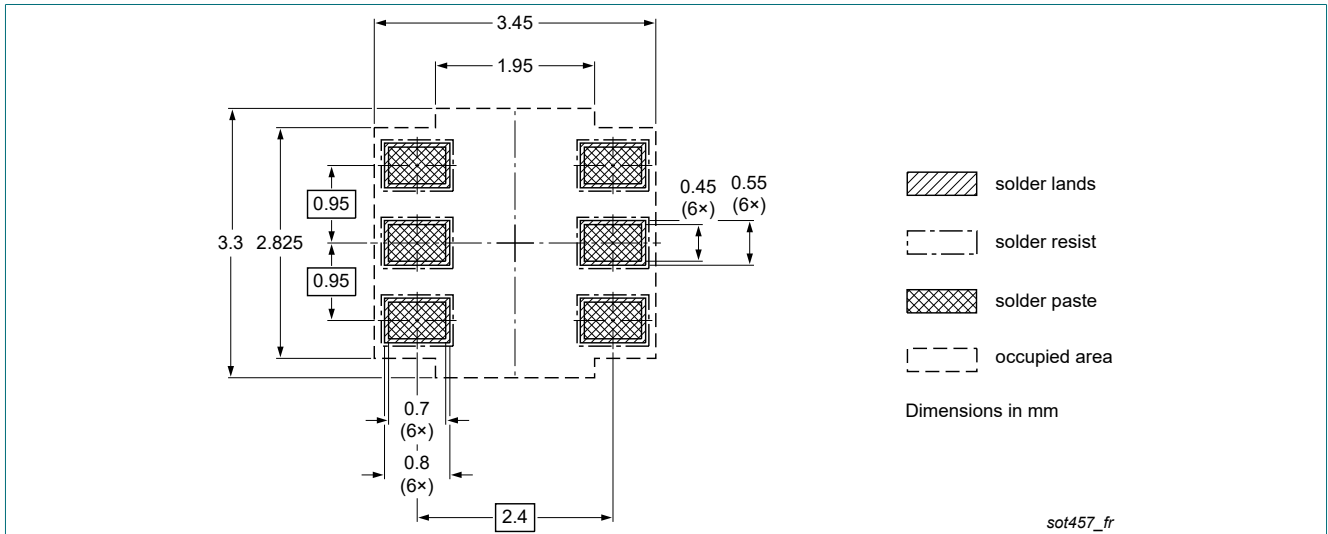


Fig. 9. Reflow soldering footprint for SC-74; TSOP6 (SOT457)

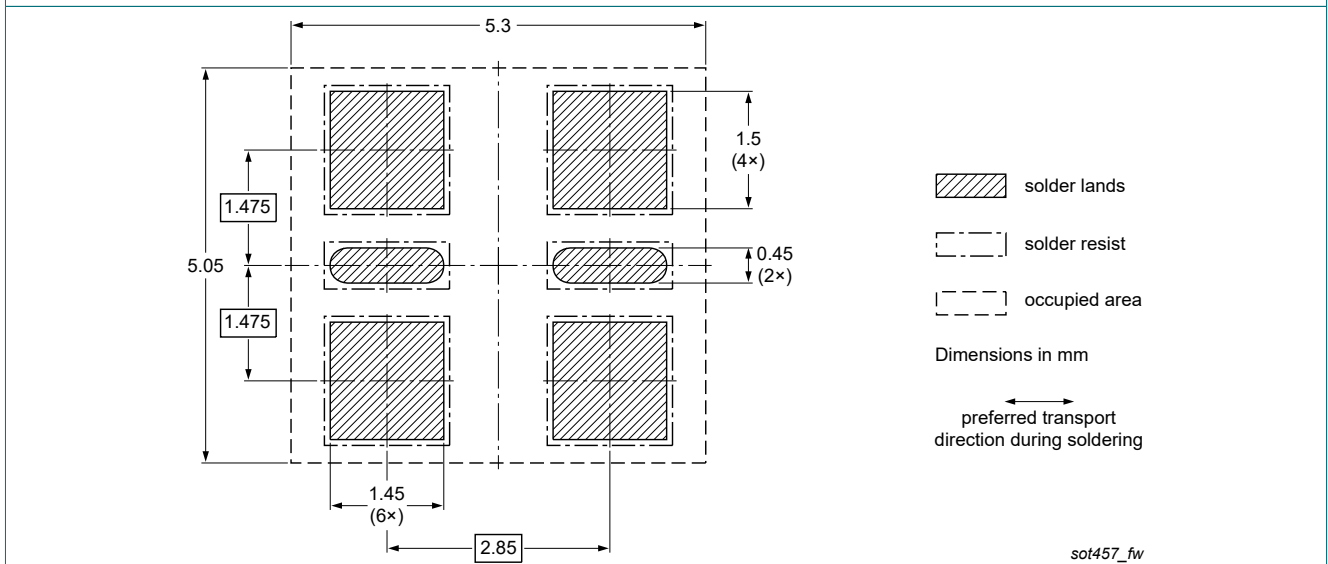


Fig. 10. Wave soldering footprint for SC-74; TSOP6 (SOT457)

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PBSS5350D-Q v.1	20220510	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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