



BSR43-Q

22 July 2025

Product data sheet

1. General description

NPN general-purpose transistor in a medium power SOT89 (SC-62) Surface-Mounted Device (SMD) plastic package. PNP complement: BSR33-Q.

2. Features and benefits

- High current (max. 1 A)
- Low voltage (max. 80 V)
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Linear voltage regulators
- Low-side switches
- Battery-driven devices
- Power management
- MOSFET drivers
- Amplifiers

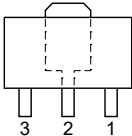
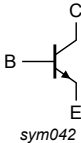
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CE0}	collector-emitter voltage	open base	-	-	80	V
I_C	collector current		-	-	1	A
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms	-	-	2	A
h_{FE}	DC current gain	$V_{CE} = 5$ V; $I_C = 100$ μ A; pulsed; $t_p \leq 300$ μ s; $\delta \leq 0.01$; $T_{amb} = 25$ °C	30	-	-	
		$V_{CE} = 5$ V; $I_C = 100$ mA; pulsed; $t_p \leq 300$ μ s; $\delta \leq 0.01$; $T_{amb} = 25$ °C	100	-	300	
		$V_{CE} = 5$ V; $I_C = 500$ mA; pulsed; $t_p \leq 300$ μ s; $\delta \leq 0.01$; $T_{amb} = 25$ °C	50	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E	emitter	 SOT89	 sym042
2	C	collector		
3	B	base		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BSR43-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
BSR43-Q	AR 4

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		-	90	V
V _{CEO}	collector-emitter voltage	open base		-	80	V
V _{EBO}	emitter-base voltage	open collector		-	5	V
I _C	collector current	single pulse; t _p ≤ 1 ms		-	1	A
I _{CM}	peak collector current			-	2	A
I _{BM}	peak base current			-	0.2	A
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	1.35	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 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]	-	-	93	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	13	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm².

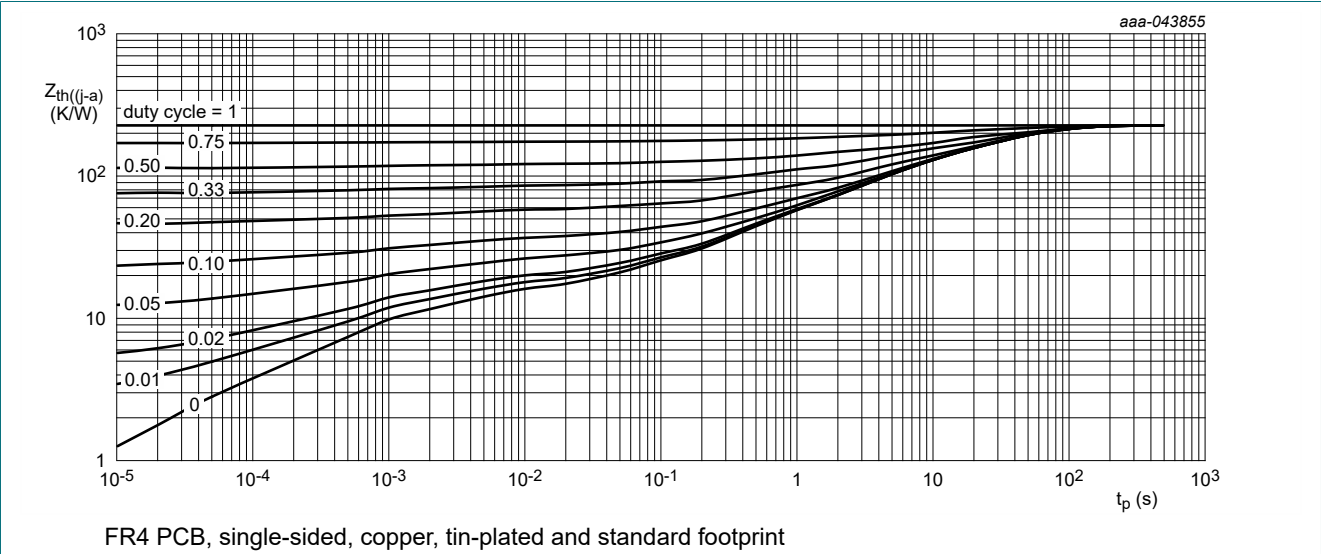


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

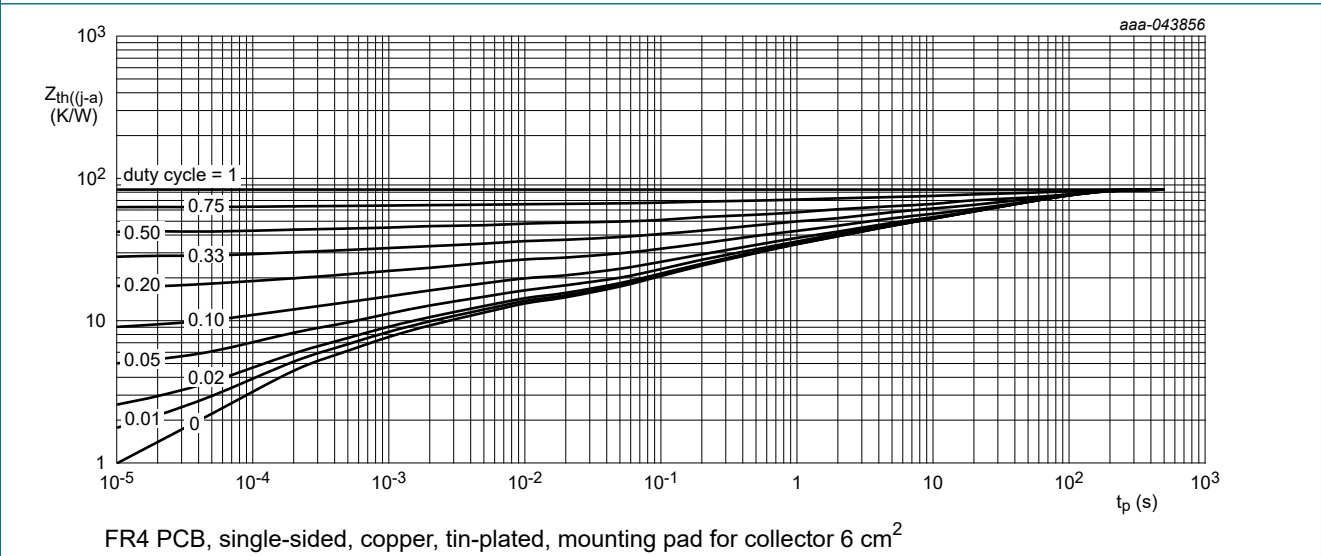


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I _{CBO}	collector-base cut-off current (emitter open)	V _{CB} = 60 V; I _E = 0 A; T _{amb} = 25 °C		-	-	100	nA
		V _{CB} = 60 V; I _E = 0 A; T _j = 150 °C		-	-	50	μA
I _{EBO}	emitter-base cut-off current (collector open)	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 = 100 μA; pulsed; t _p ≤ 300 μs; δ ≤ 0.01; T _{amb} = 25 °C		30	-	-	
		V _{CE} = 5 V; I _C = 100 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.01; T _{amb} = 25 °C		100	-	300	
		V _{CE} = 5 V; I _C = 500 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.01; T _{amb} = 25 °C		50	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = 150 mA; I _B = 15 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.01; T _{amb} = 25 °C		-	-	250	mV
		I _C = 500 mA; I _B = 50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.01; T _{amb} = 25 °C		-	-	500	mV
V _{BEsat}	base-emitter saturation voltage	I _C = 150 mA; I _B = 15 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.01; T _{amb} = 25 °C		-	-	1	V
		I _C = 500 mA; I _B = 50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.01; T _{amb} = 25 °C		-	-	1.2	V
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
C _e	emitter capacitance	V _{EB} = 0.5 V; I _C = 0 A; i _c = 0 A; f = 1 MHz; T _{amb} = 25 °C		-	-	90	pF
f _T	transition frequency	V _{CE} = 10 V; I _C = 50 mA; f = 100 MHz; T _{amb} = 25 °C		100	-	-	MHz
Switching times (between 10% and 90% levels)							
t _{on}	turn-on time	I _C = 100 mA; I _{Bon} = 5 mA; I _{Boff} = -5 mA; T _{amb} = 25 °C		-	-	250	ns
t _{off}	turn-off time			-	-	1	μs

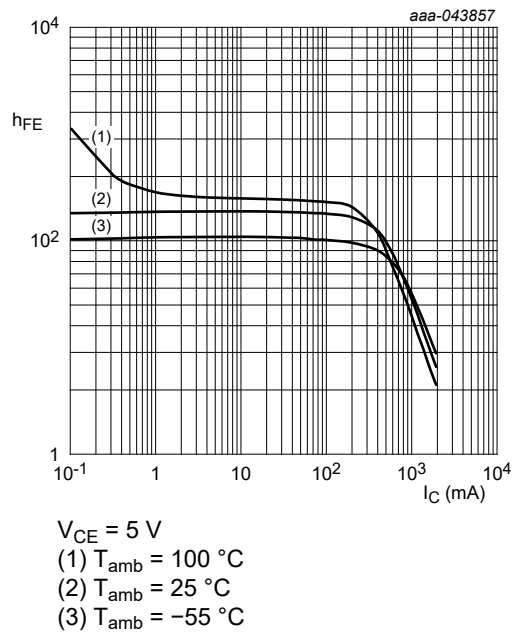


Fig. 3. DC current gain as a function of collector current; typical values

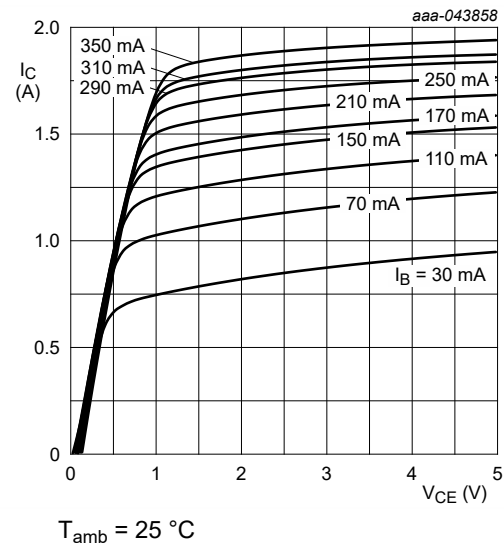


Fig. 4. Collector current as a function of collector-emitter voltage; typical values

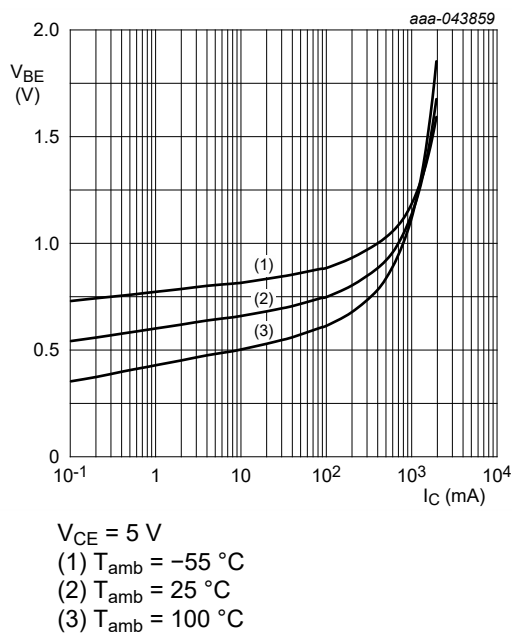


Fig. 5. Base-emitter voltage as a function of collector current; typical values

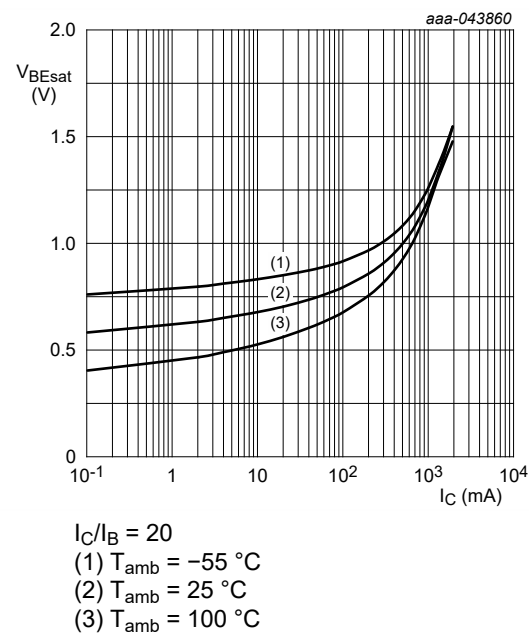
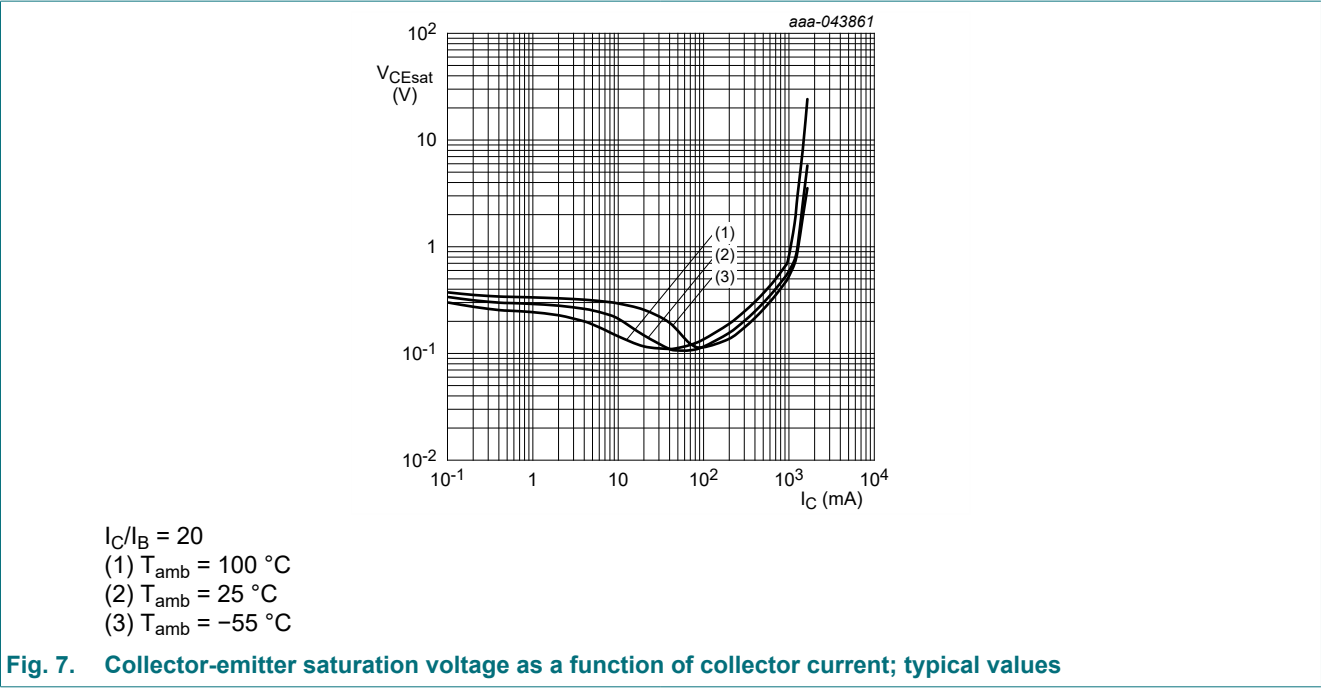


Fig. 6. Base-emitter saturation voltage as a function of collector current; typical values

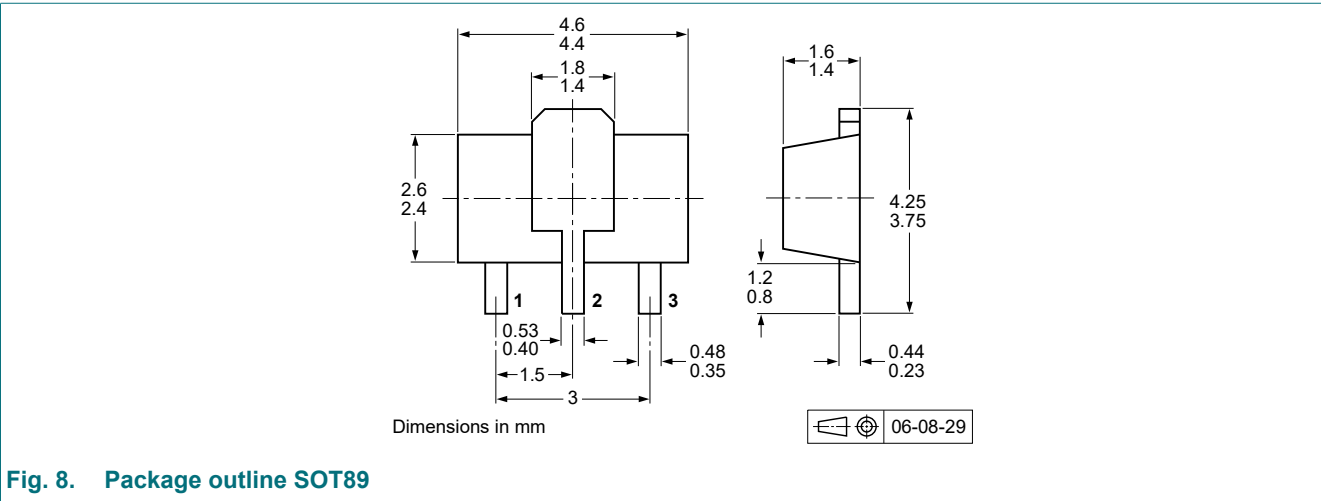


11. Test information

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

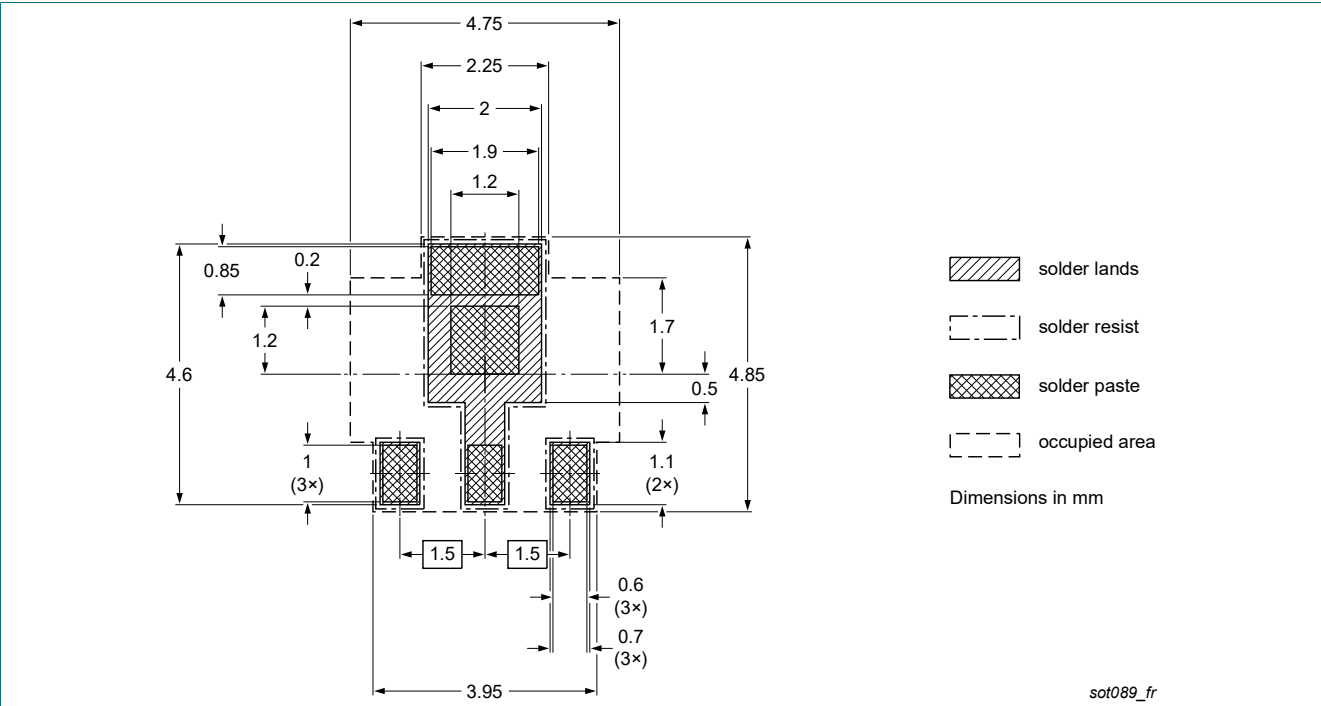


Fig. 9. Reflow soldering footprint for SOT89

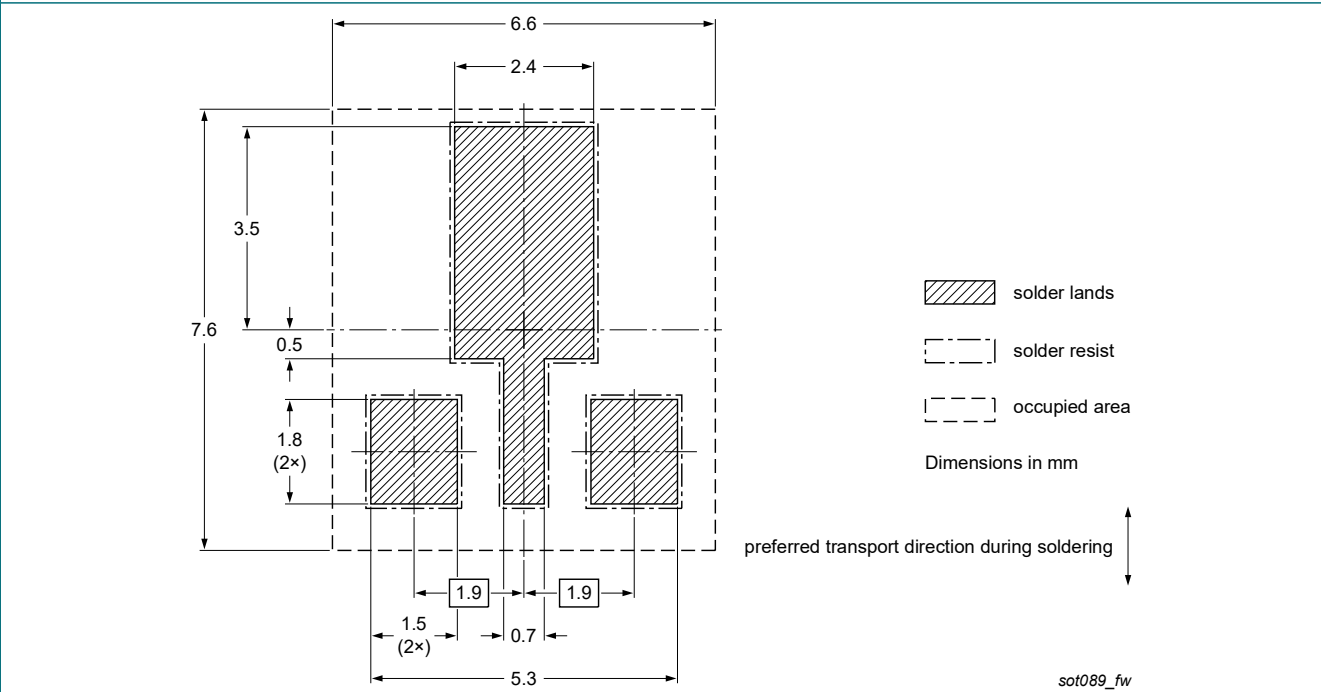


Fig. 10. Wave soldering footprint for SOT89

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BSR43-Q v.2	20250722	Product data sheet	-	BSR43-Q v.1
Modifications:	<ul style="list-style-type: none">Figures 1 - 7 added			
BSR43-Q v.1	20211209	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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Date of release: 22 July 2025