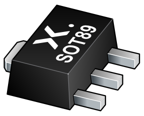

BC869-Q series

20 V, 2 A PNP medium power transistors

Rev. 2 — 8 December 2025 Product data sheet

1. General description

PNP medium power transistor in a SOT89 (SC-62) medium power and flat lead plastic package.

2. Features and benefits

- High current
- Three current gain selections
- High power dissipation capability
- Exposed heatsink for excellent thermal and electrical conductivity
- Leadless very small SMD plastic package with medium power capability
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

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

4. Quick reference data

Table 1. Quick reference data

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	-20	V
I_C	collector current			-	-	-2	A
I_{CM}	peak collector current	single pulse; t_p ≤ 1 ms		-	-	-3	A
h_{FE}	DC current gain						
	BC869-Q	V_{CE} = -1 V; I_C = -500 mA T_{amb} = 25 °C	[1]	85	-	375	
	BC869-16-Q		[1]	100	-	250	
	BC869-25-Q		[1]	160	-	375	

[1] pulsed; t_p ≤ 300 µs; δ ≤ 0.02

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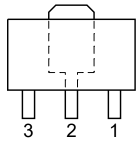
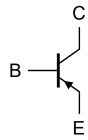
5. Pinning information

Table 2. Pinning

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E	emitter		 006aaa231
2	C	collector		
3	B	base		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BC869-Q	-	plastic thermal enhanced ultra thin small outline package; no leads; 3 terminals; body 2 x 2 x 0.65 mm	SOT89
BC869-16-Q			
BC869-25-Q			

7. Marking

Table 4. Marking

Type number	Marking code
BC869-Q	CEC
BC869-16-Q	CGC
BC869-25-Q	CHC

8. Limiting values

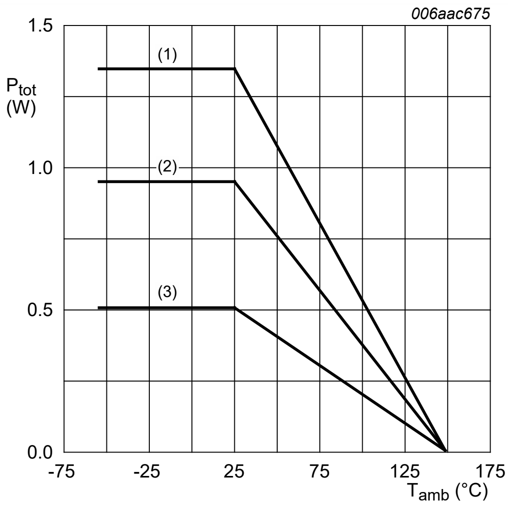
Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CBO}	collector-base voltage	open emitter		-	-32	V
V_{CEO}	collector-emitter voltage	open base		-	-20	V
V_{EBO}	emitter-base voltage	open collector		-	-5	V
I_C	collector current			-	-2	A
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	-3	A
I_B	base current			-	-0.4	A
I_{BM}	peak base current	single pulse; $t_p \leq 1$ ms		-	-0.4	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	0.50	W
			[2]	-	0.95	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 cm^2.
[3] Device mounted on an FR4 PCB; single-sided copper; tin-plated; mounting pad for collector 6 cm^2.



(1) FR4 PCB, single-sided copper, mounting pad for collector 6 cm^2
(2) FR4 PCB, single-sided copper, mounting pad for collector 1cm^2
(3) FR4 PCB, single-sided copper, standard footprint

Fig. 1. Power derating curves

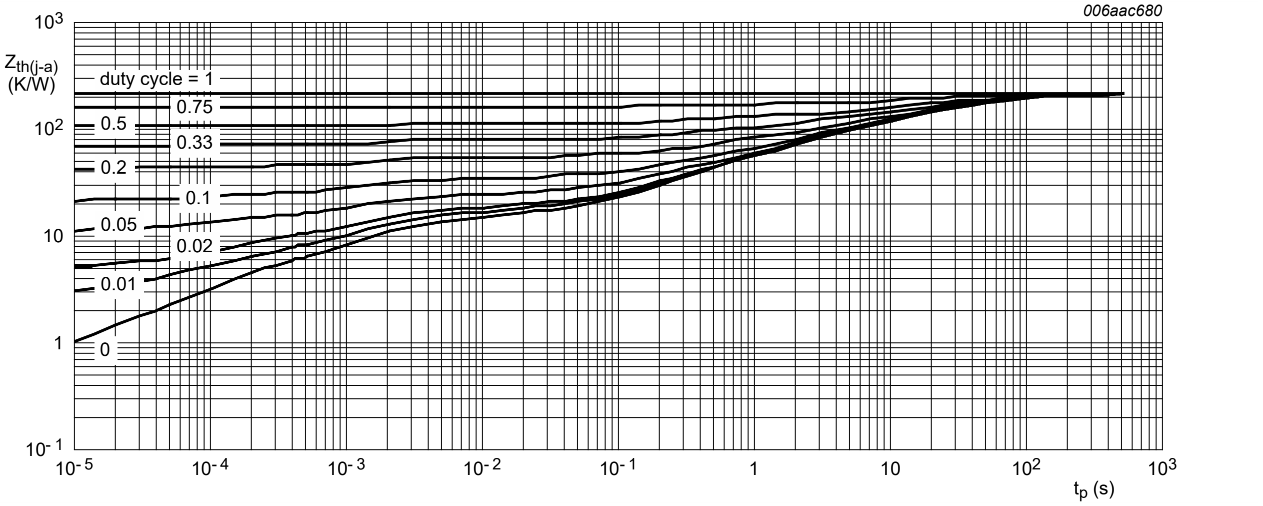
9. Thermal characteristics

Table 6. Thermal characteristics

T_{amb} = 25 °C unless otherwise specified.

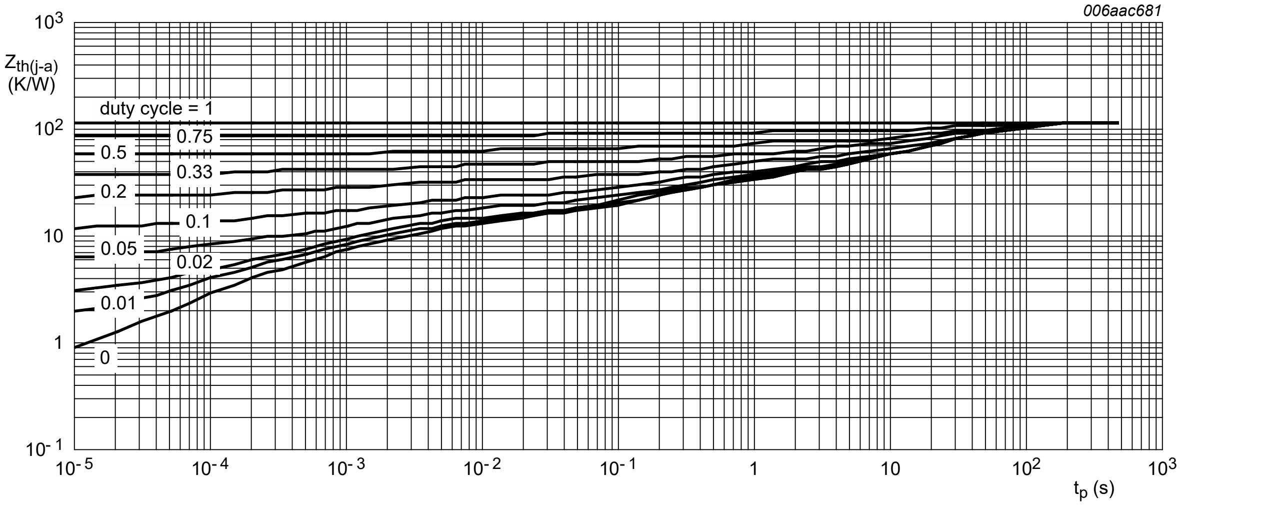
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	250	K/W
			[2]	-	-	132	K/W
			[3]	-	-	93	K/W
$R_{(j-sp)}$	thermal resistance from junction to solder point			-	-	16	K/W

[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 cm^2.
[3] Device mounted on an FR4 PCB; single-sided copper; tin-plated; mounting pad for collector 6 cm^2.



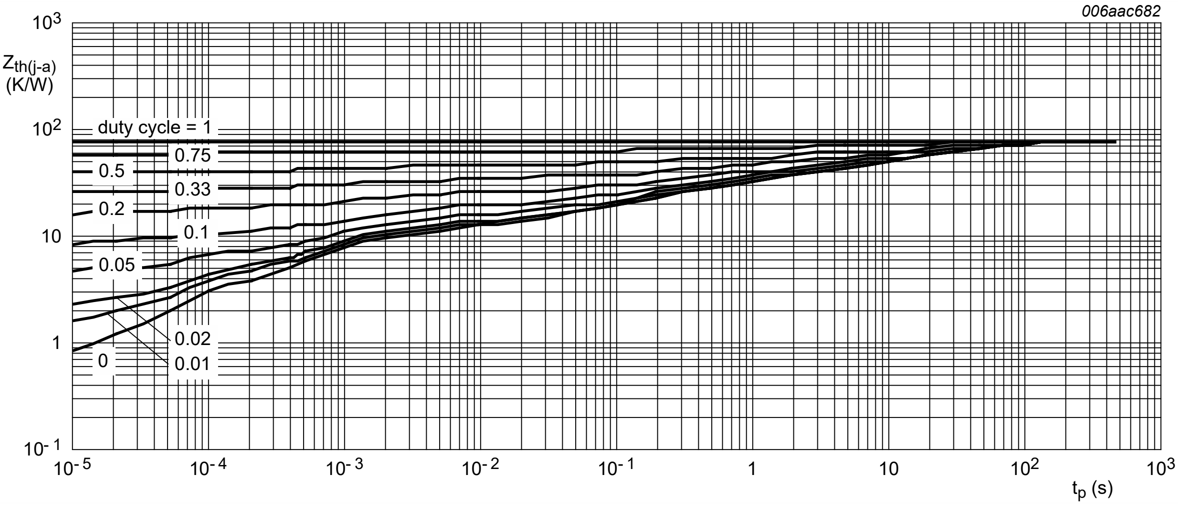
FR4 PCB; single-sided copper; tin-plated and standard footprint

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



FR4 PCB; single-sided copper; tin-plated; mounting pad for collector 1 cm^2

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



FR4 PCB; single-sided copper; tin-plated; mounting pad for collector 6 cm^2

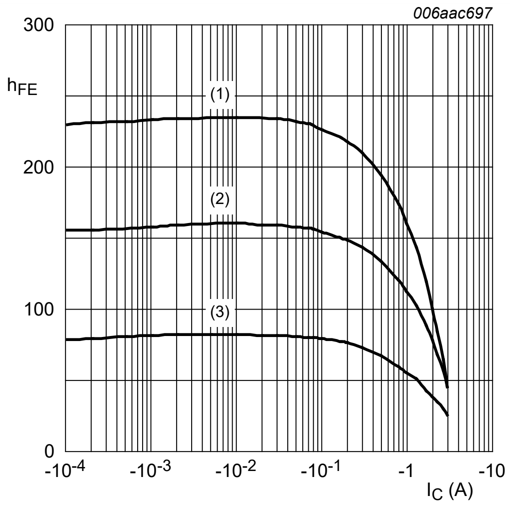
Fig. 4. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

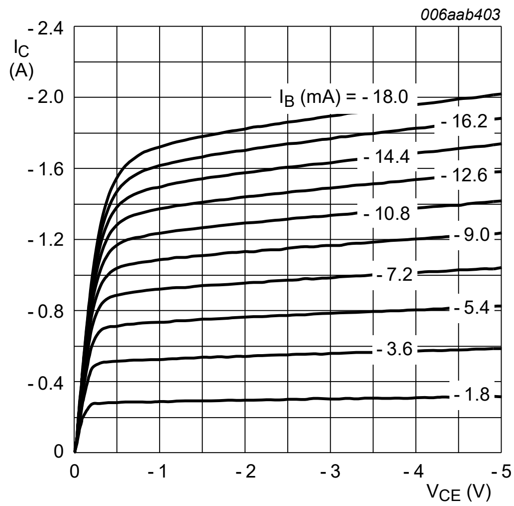
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = -25 V; I_E = 0 A T_{amb} = 25 °C		-	-	-100	nA
		V_{CB} = -25 V; I_E = 0 A; T_j = 150 °C		-	-	-10	μA
I_{EBO}	emitter-base cut-off current	V_{EB} = -5 V; I_C = 0 A T_{amb} = 25 °C		-	-	-100	nA
h_{FE}	DC current gain						
	BC869-Q	V_{CE} = -10 V; I_C = -5 mA T_{amb} = 25 °C	[1]	50	-	-	
		V_{CE} = -1 V; I_C = -500 mA T_{amb} = 25 °C	[1]	85	-	375	
		V_{CE} = -1 V; I_C = -1 A T_{amb} = 25 °C	[1]	60	-	-	
		V_{CE} = -1 V; I_C = -2 A T_{amb} = 25 °C	[1]	40	-	-	
	BC869-16-Q	V_{CE} = -10 V; I_C = -5 mA T_{amb} = 25 °C	[1]	50	-	-	
		V_{CE} = -1 V; I_C = -500 mA T_{amb} = 25 °C	[1]	100	-	250	
		V_{CE} = -1 V; I_C = -1 A T_{amb} = 25 °C	[1]	60	-	-	
		V_{CE} = -1 V; I_C = -2 A T_{amb} = 25 °C	[1]	40	-	-	
	BC869-25-Q	V_{CE} = -10 V; I_C = -5 mA T_{amb} = 25 °C	[1]	50	-	-	
		V_{CE} = -1 V; I_C = -500 mA T_{amb} = 25 °C	[1]	160	-	375	
		V_{CE} = -1 V; I_C = -1 A T_{amb} = 25 °C	[1]	60	-	-	
		V_{CE} = -1 V; I_C = -2 A T_{amb} = 25 °C	[1]	40	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -1 A; I_B = -100 mA T_{amb} = 25 °C	[1]	-	-	-0.5	V
		I_C = -2 A; I_B = -200 mA T_{amb} = 25 °C	[1]	-	-	-0.6	V
V_{BE}	base-emitter voltage	V_{CE} = -10 V; I_C = -5 mA T_{amb} = 25 °C	[1]	-	-	-0.7	V
		V_{CE} = -1 V; I_C = -1 A T_{amb} = 25 °C	[1]	-	-	-1	V
C_c	collector capacitance	V_{CB} = -10 V; I_E = i_e = 0 A; f = 1 MHz T_{amb} = 25 °C		-	28	-	pF
f_T	transition frequency	V_{CE} = -5 V; I_C = -50 mA; f = 100 MHz T_{amb} = 25 °C		40	140	-	MHz

[1] pulsed; $t_p \leq 300$ μs; $\delta \leq 0.02$



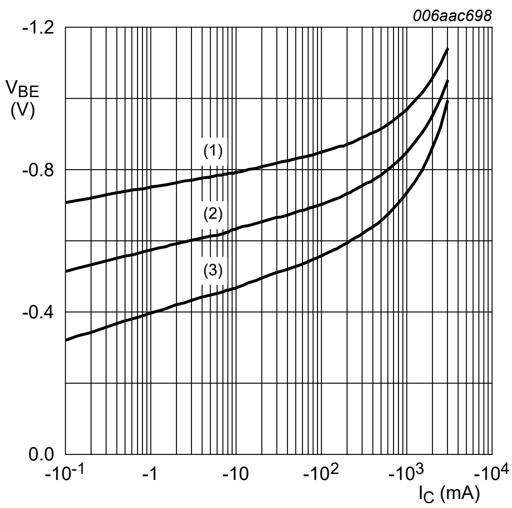
V_{CE} = -1 V
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Fig. 5. hFE selection -16: DC current gain as a function of collector current; typical values



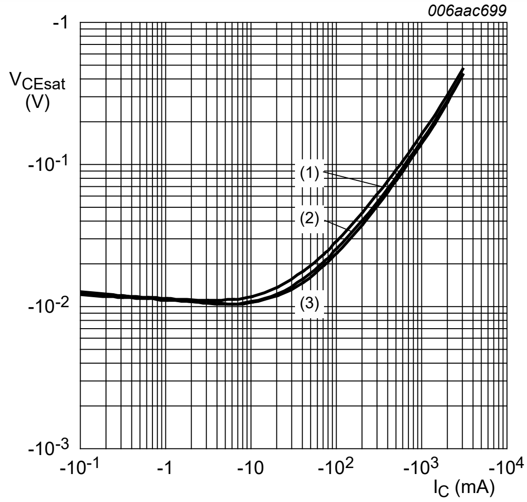
T_{amb} = 25 °C

Fig. 6. hFE selection -16: Collector current as a function of collector-emitter voltage; typical values



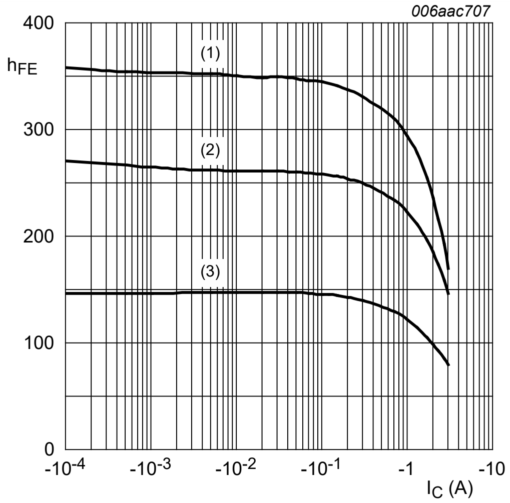
V_{CE} = -1 V
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 100 °C

Fig. 7. hFE selection -16: Base-emitter voltage as a function of collector current; typical values



I_C/I_B = 10
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Fig. 8. hFE selection -16: Collector-emitter saturation voltage as a function of collector current; typical values



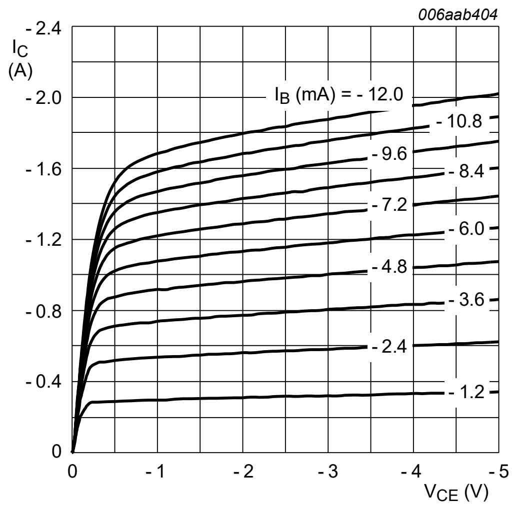
V_{CE} = -1 V

(1) T_{amb} = 100 °C

(2) T_{amb} = 25 °C

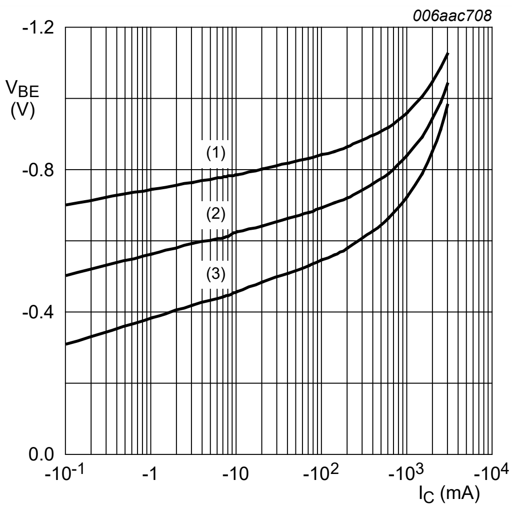
(3) T_{amb} = -55 °C

Fig. 9. hFE selection -25: DC current gain as a function of collector current; typical values



T_{amb} = 25 °C

Fig. 10. hFE selection -25: Collector current as a function of collector-emitter voltage; typical values



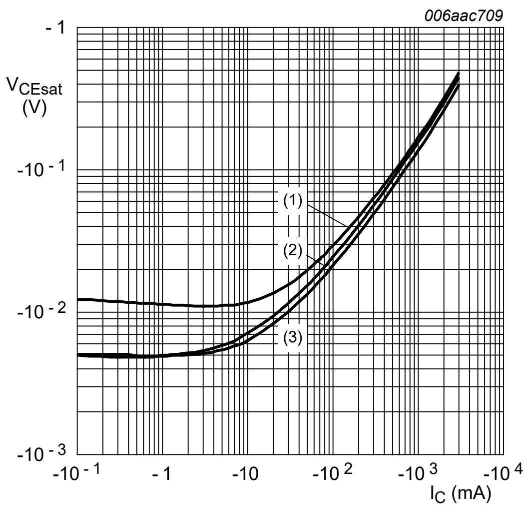
V_{CE} = -1 V

(1) T_{amb} = -55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 100 °C

Fig. 11. hFE selection -25: Base-emitter voltage as a function of collector current; typical values



I_C/I_B = 10

(1) T_{amb} = 100 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = -55 °C

Fig. 12. hFE selection -25: Collector-emitter saturation voltage as a function of collector current; typical values

11. Test information

11.1. 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

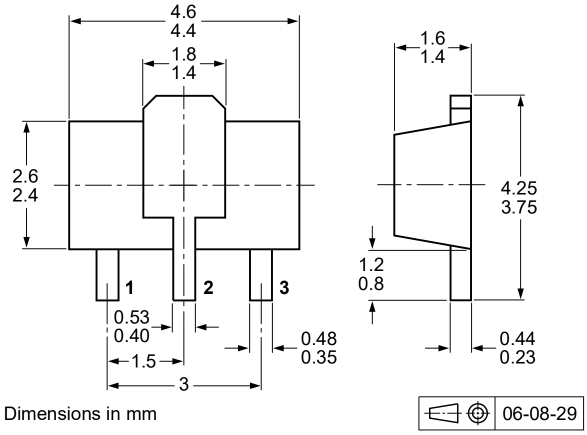


Fig. 13. Package outline SOT89

13. Soldering

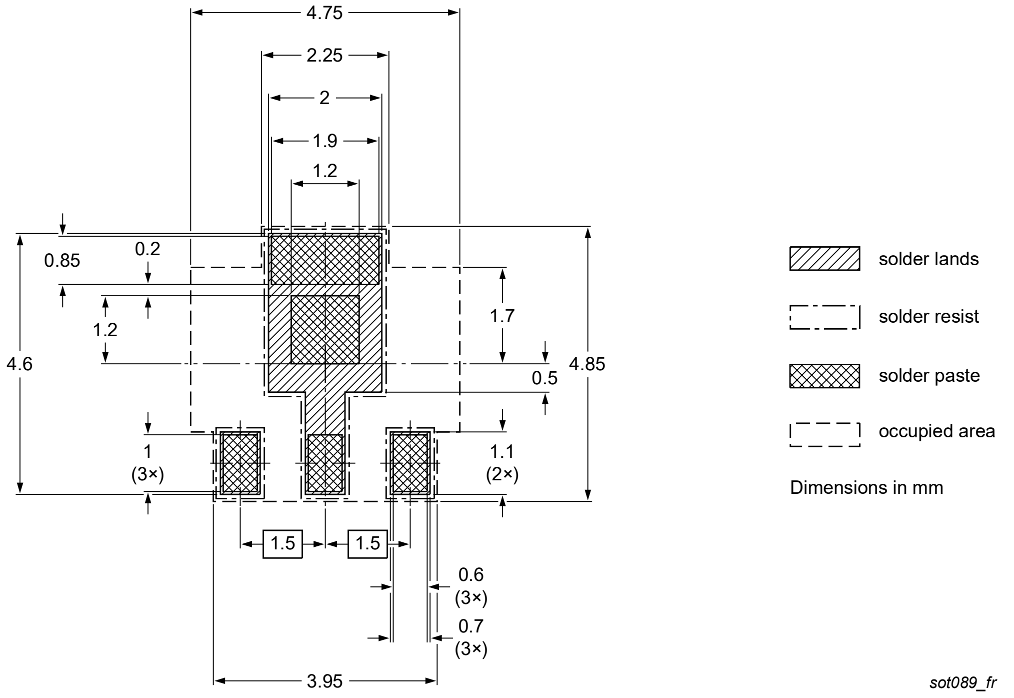


Fig. 14. Reflow soldering footprint for SOT89

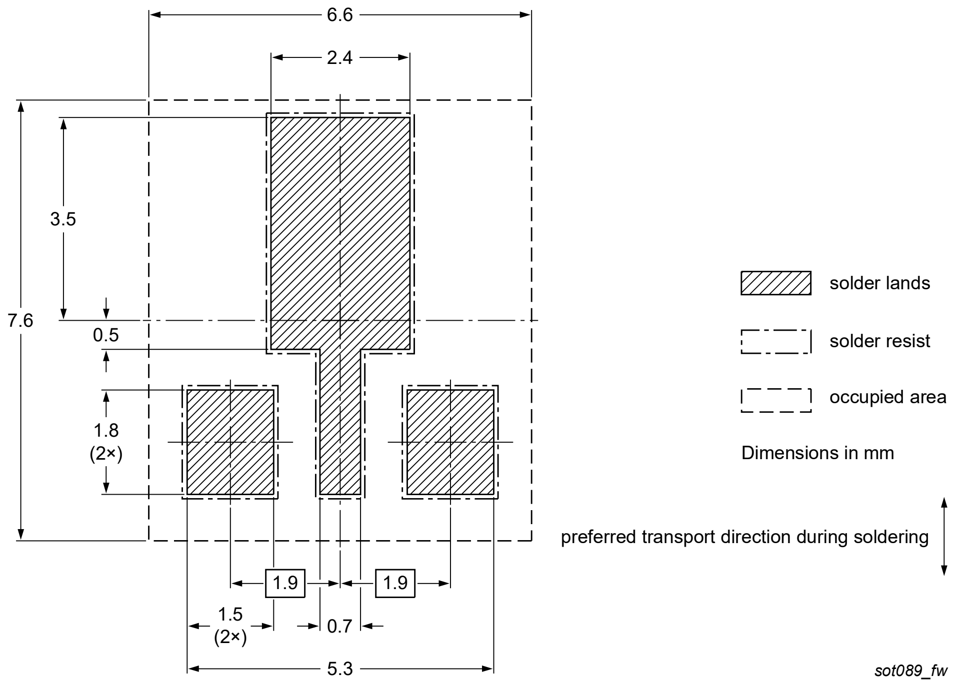


Fig. 15. Wave soldering footprint for SOT89

14. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BC869-Q_SER v.2	20251208	Product data sheet	-	BC869-Q_SER v.1
Modifications:	• Section "Pinning information": Table3. Pinning corrected			
BC869-Q_SER v.1	20241211	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".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

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