



PBSS4032NX

30 V, 4.7 A NPN low V_{CEsat} transistor

30 September 2025

Product data sheet

1. General description

NPN low V_{CEsat} transistor in a medium power and flat lead SOT89 (SC-62) Surface-Mounted Device (SMD) plastic package.

PNP complement: PBSS4032PX

2. Features and benefits

- Very low collector-emitter saturation voltage V_{CEsat}
- Optimized switching time
- High collector current capability I_C and I_{CM}
- High collector current gain (h_{FE}) at high I_C
- High energy efficiency due to less heat generation
- Smaller required Printed-Circuit Board (PCB) area than for conventional transistors

3. Applications

- Battery-driven devices
- Power management
- Charging circuits
- Power switches (e.g. motors, fans)

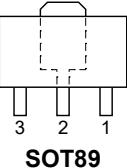
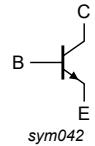
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V _{CEO}	collector-emitter voltage	open base		-	-	30	V
I _C	collector current			-	-	4.7	A
I _{CM}	peak collector current	single pulse; t _p ≤ 1 ms		-	-	10	A
R _{CEsat}	collector-emitter saturation resistance	I _C = 4 A; I _B = 400 mA; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	45	62.5	mΩ

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
PBSS4032NX	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]
PBSS4032NX	%6H

[1] % = placeholder for manufacturing site code

8. Limiting values

Table 5. Limiting values

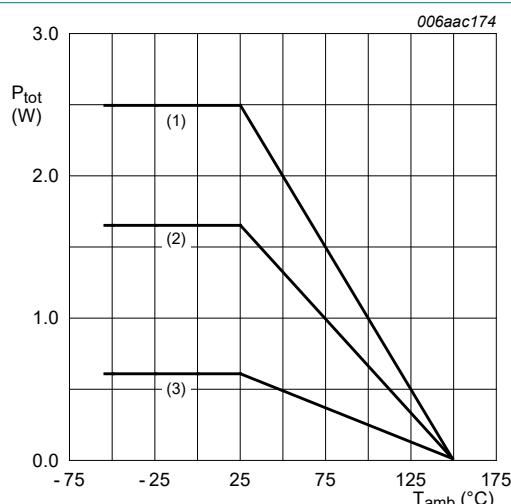
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CBO}	collector-base voltage	open emitter		-	30	V
V_{CEO}	collector-emitter voltage	open base		-	30	V
V_{EBO}	emitter-base voltage	open collector		-	5	V
I_C	collector current			-	4.7	A
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	10	A
I_B	base current			-	1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	600	mW
			[2]	-	1650	mW
			[3]	-	2500	mW
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 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 6 cm².

[3] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.



(1) Ceramic PCB, Al₂O₃, standard footprint

(2) FR4 PCB, mounting pad for collector 6 cm²

(3) FR4 PCB, standard footprint

Fig. 1. Power derating curves

9. Thermal characteristics

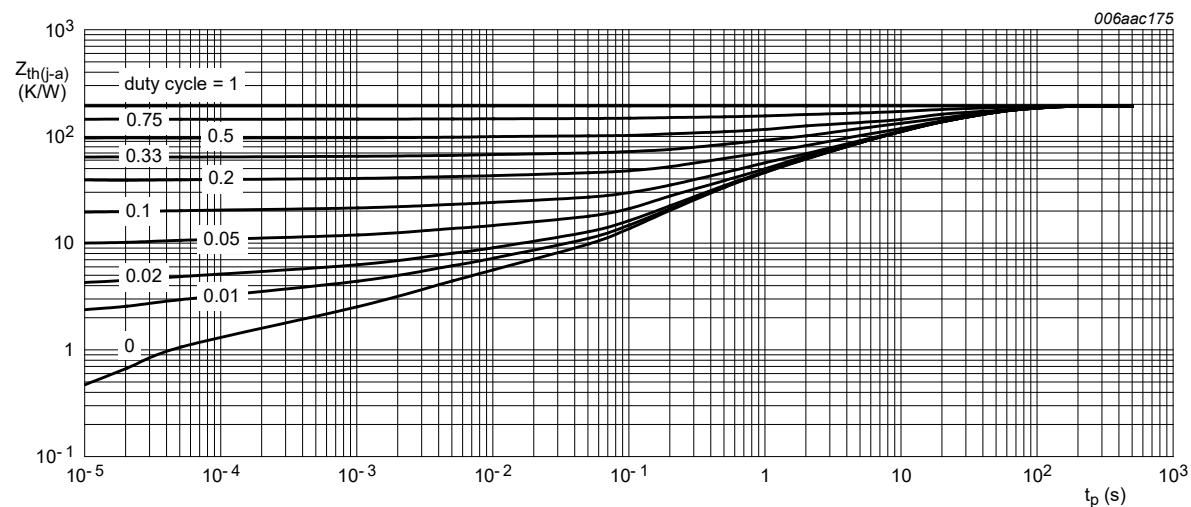
Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	210	K/W
			[2]	-	-	75	K/W
			[3]	-	-	50	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	20	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

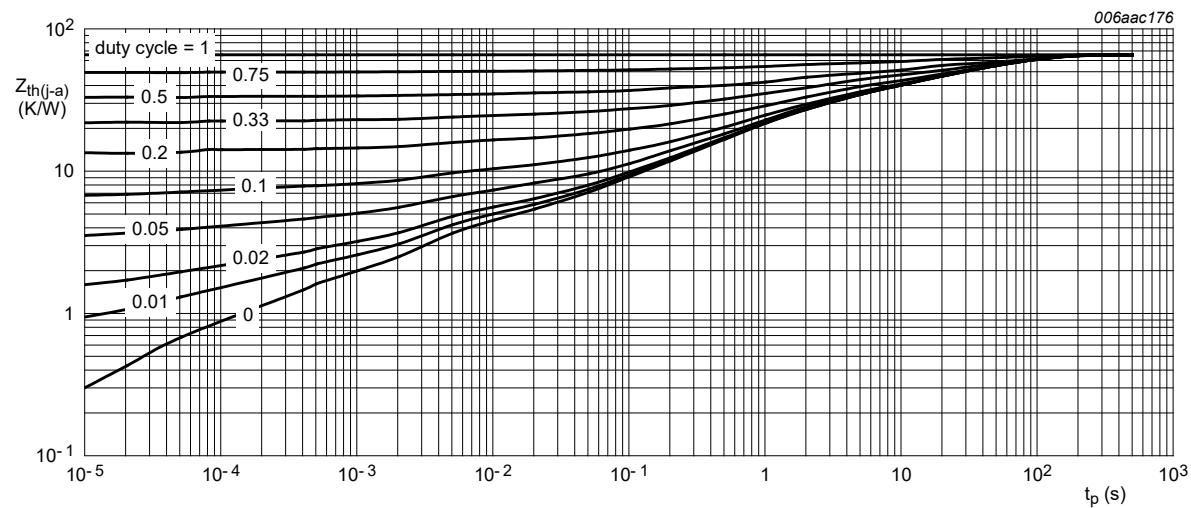
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm².

[3] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.



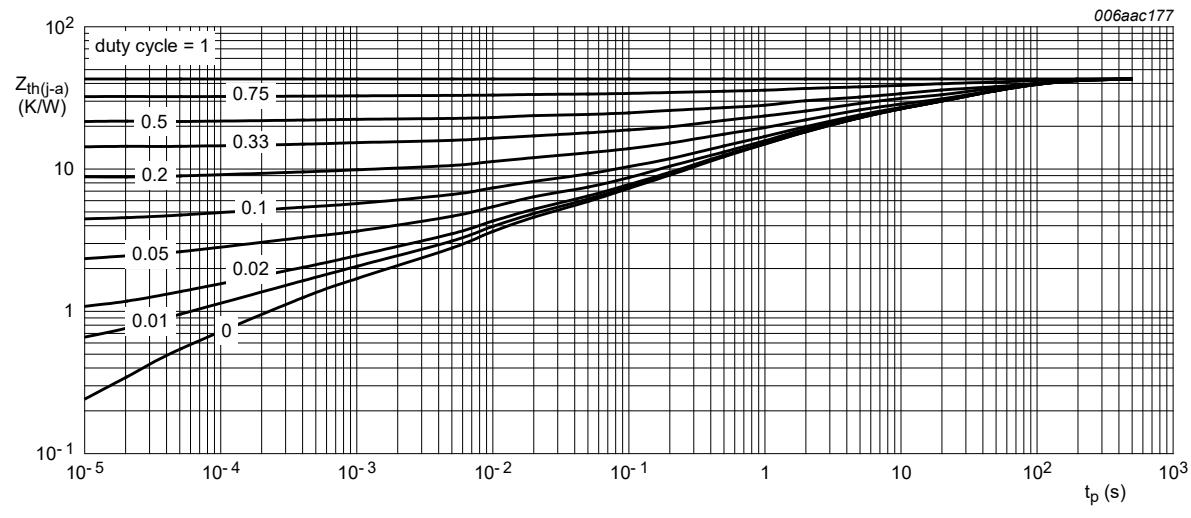
FR4 PCB, standard footprint

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



FR4 PCB, mounting pad for collector 6 cm²

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



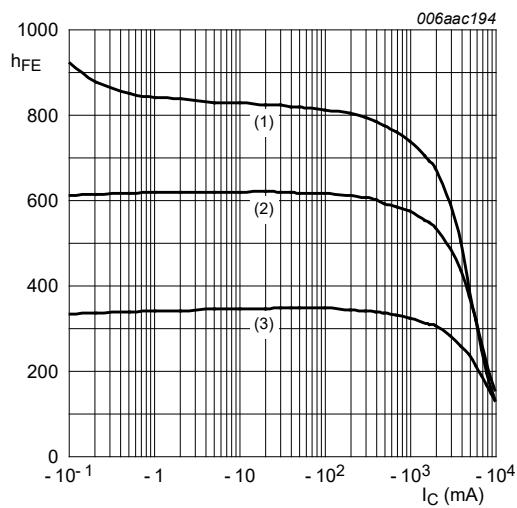
Ceramic PCB, Al_2O_3 , standard footprint

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

10. Characteristics

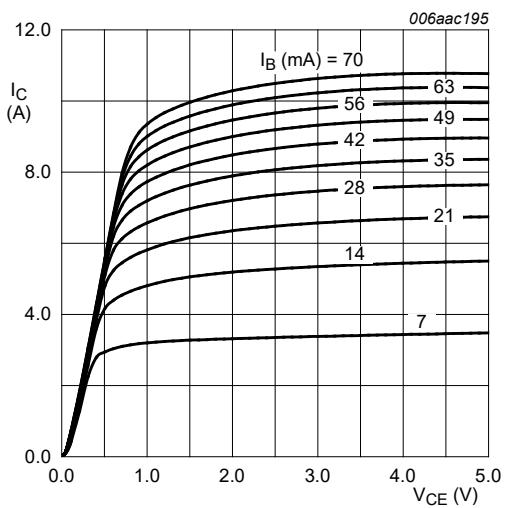
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	$V_{CB} = 30 \text{ V}; I_E = 0 \text{ A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	100	nA
		$V_{CB} = 30 \text{ V}; I_E = 0 \text{ A}; T_j = 150 \text{ }^\circ\text{C}$	-	-	50	µA
I_{CES}	collector-emitter cut-off current	$V_{CE} = 24 \text{ V}; V_{BE} = 0 \text{ V}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	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	$V_{CE} = 2 \text{ V}; I_C = 500 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	300	500	-	
		$V_{CE} = 2 \text{ V}; I_C = 1 \text{ A}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	300	500	-	
		$V_{CE} = 2 \text{ V}; I_C = 2 \text{ A}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	250	450	-	
		$V_{CE} = 2 \text{ V}; I_C = 4 \text{ A}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	200	350	-	
		$V_{CE} = 2 \text{ V}; I_C = 6 \text{ A}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	150	275	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 1 \text{ A}; I_B = 50 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	90	125	mV
		$I_C = 1 \text{ A}; I_B = 10 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	130	180	mV
		$I_C = 2 \text{ A}; I_B = 40 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	150	210	mV
		$I_C = 4 \text{ A}; I_B = 400 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	180	250	mV
		$I_C = 4 \text{ A}; I_B = 40 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	250	375	mV
		$I_C = 5.4 \text{ A}; I_B = 270 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	240	340	mV
R_{CEsat}	collector-emitter saturation resistance	$I_C = 4 \text{ A}; I_B = 400 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	45	62.5	mΩ
V_{BEsat}	base-emitter saturation voltage	$I_C = 1 \text{ A}; I_B = 100 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	0.75	0.9	V
		$I_C = 4 \text{ A}; I_B = 400 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02$	-	0.92	1.05	V
V_{BEon}	base-emitter turn-on voltage	$V_{CE} = 2 \text{ V}; I_C = 2 \text{ A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	0.77	0.85	V
t_d	delay time	$V_{CC} = 12.5 \text{ V}; I_C = 1 \text{ A}; I_{Bon} = 0.05 \text{ A}; I_{Boff} = -0.05 \text{ A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	35	-	ns
t_r	rise time		-	30	-	ns
t_{on}	turn-on time		-	65	-	ns
t_s	storage time		-	150	-	ns
t_f	fall time		-	65	-	ns
t_{off}	turn-off time		-	215	-	ns
f_T	transition frequency	$V_{CE} = 10 \text{ V}; I_C = 100 \text{ mA}; f = 100 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	145	-	MHz
C_c	collector capacitance	$V_{CB} = 10 \text{ V}; I_E = 0 \text{ A}; i_e = 0 \text{ A}; f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	65	-	pF



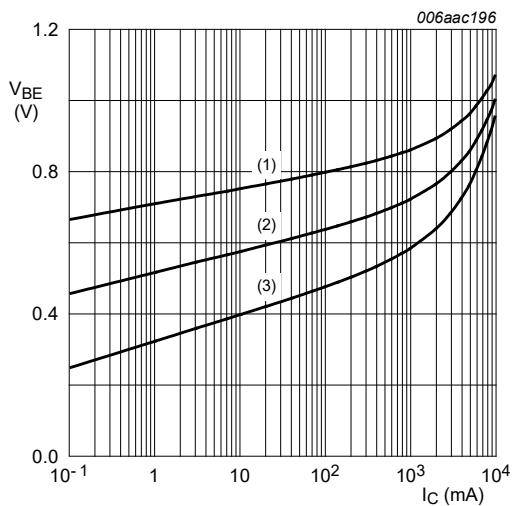
$V_{CE} = 2 \text{ V}$
 (1) $T_{amb} = 100 \text{ }^{\circ}\text{C}$
 (2) $T_{amb} = 25 \text{ }^{\circ}\text{C}$
 (3) $T_{amb} = -55 \text{ }^{\circ}\text{C}$

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



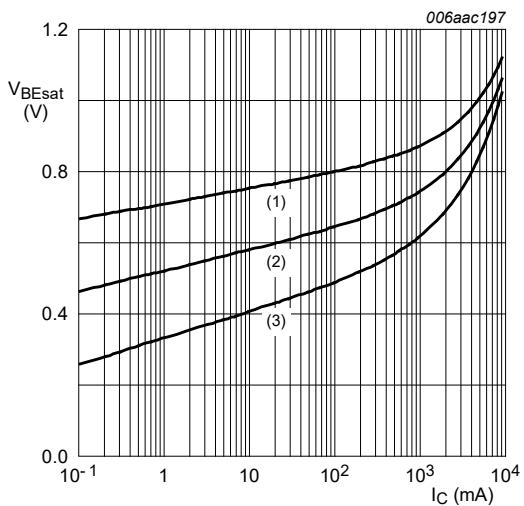
$T_{amb} = 25 \text{ }^{\circ}\text{C}$

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



$V_{CE} = 2 \text{ V}$
 (1) $T_{amb} = -55 \text{ }^{\circ}\text{C}$
 (2) $T_{amb} = 25 \text{ }^{\circ}\text{C}$
 (3) $T_{amb} = 100 \text{ }^{\circ}\text{C}$

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



$I_C/I_B = 20$
 (1) $T_{amb} = -55 \text{ }^{\circ}\text{C}$
 (2) $T_{amb} = 25 \text{ }^{\circ}\text{C}$
 (3) $T_{amb} = 100 \text{ }^{\circ}\text{C}$

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

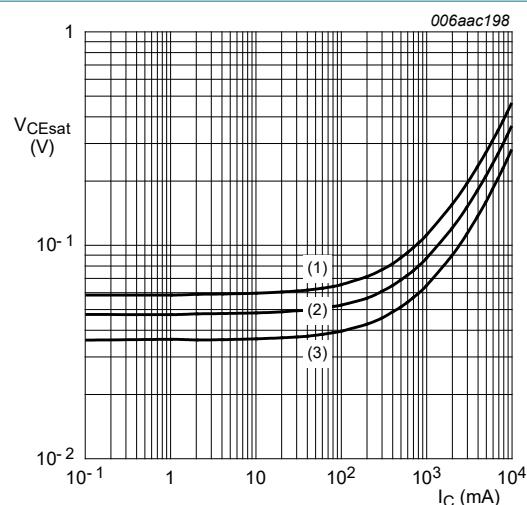


Fig. 9. Collector-emitter saturation voltage as a function of collector current; typical values

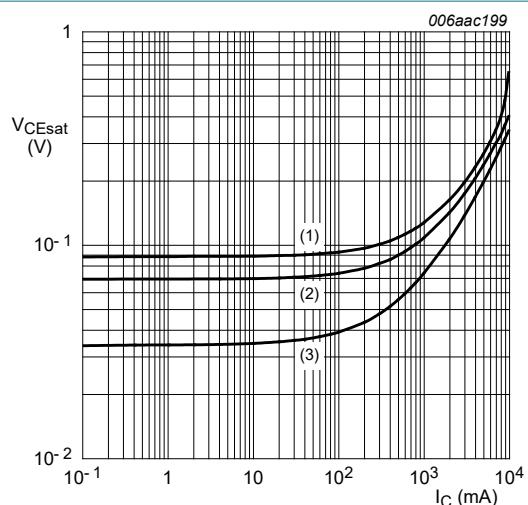


Fig. 10. Collector-emitter saturation voltage as a function of collector current; typical values

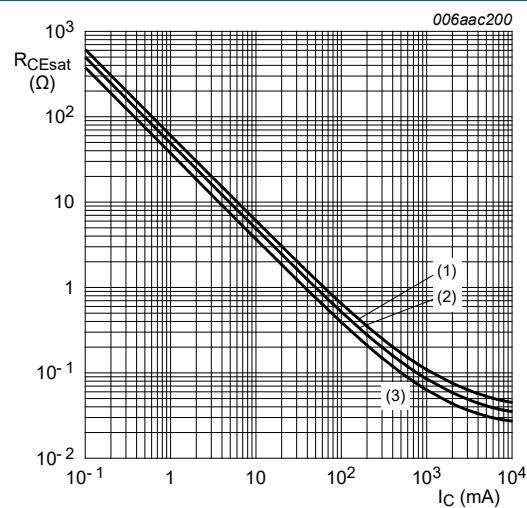


Fig. 11. Collector-emitter saturation resistance as a function of collector current; typical values

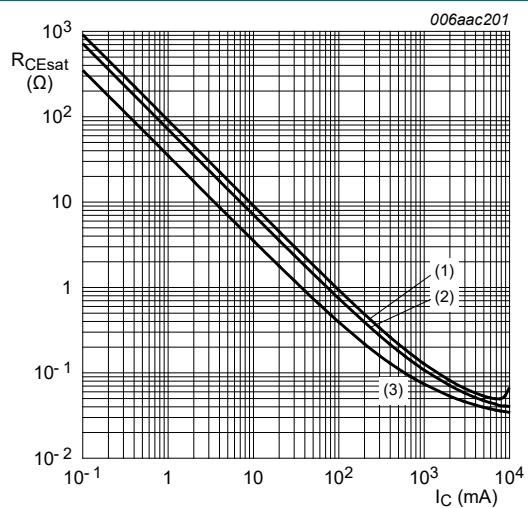


Fig. 12. Collector-emitter saturation resistance as a function of collector current; typical values

11. Test information

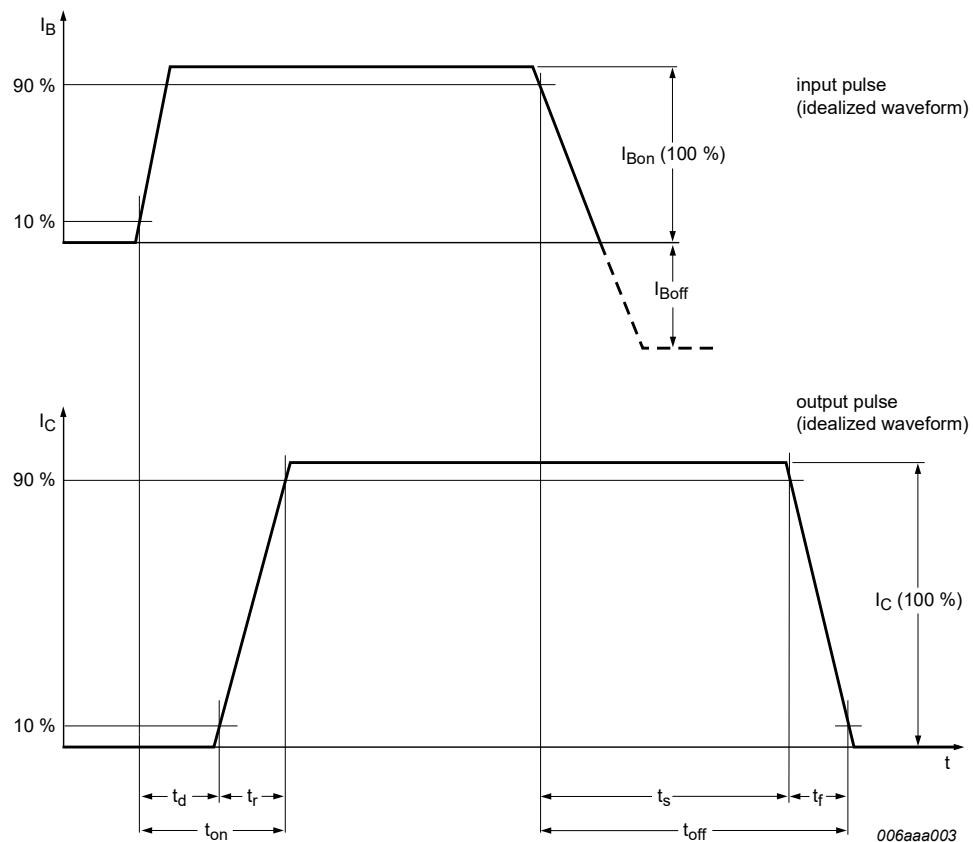


Fig. 13. Switching time definition

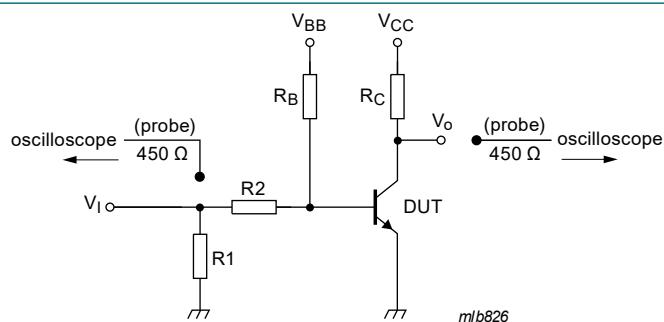


Fig. 14. Test circuit for switching times

12. Package outline

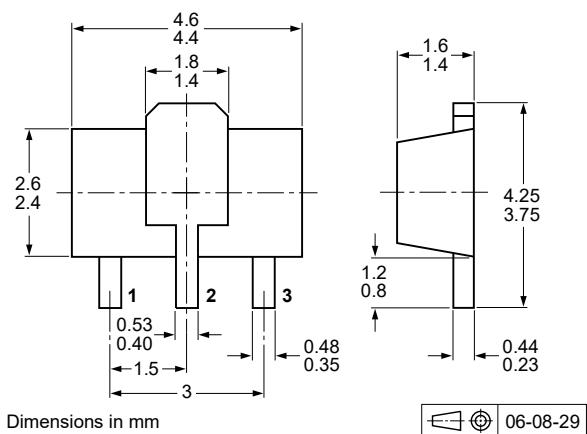


Fig. 15. Package outline SOT89

13. Soldering

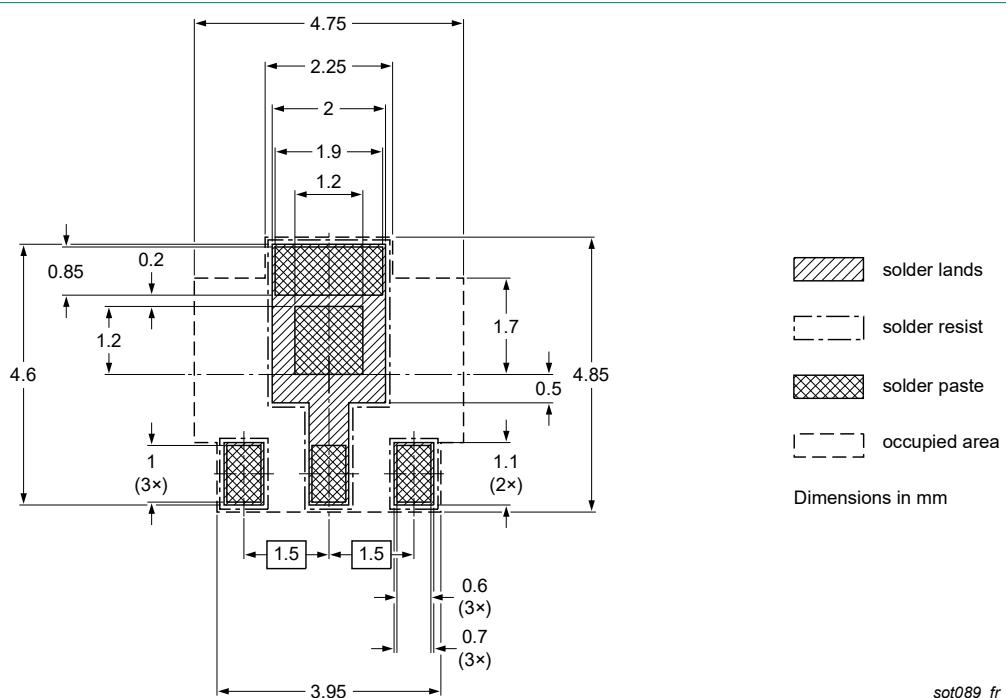


Fig. 16. Reflow soldering footprint for SOT89

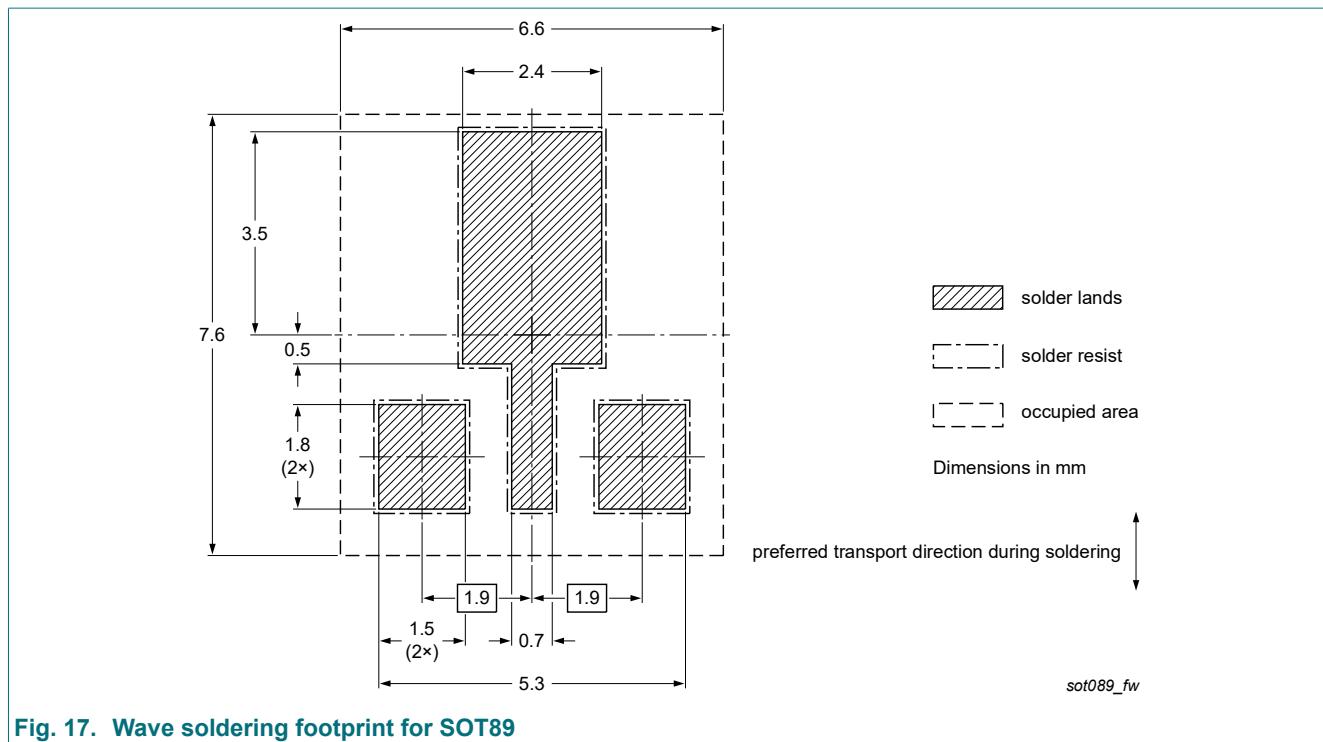


Fig. 17. Wave soldering footprint for SOT89

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PBSS4032NX v.2	20250930	Product data sheet	-	PBSS4032NX_1
Modifications:	<ul style="list-style-type: none">Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).Section "Packing information" removed.			
PBSS4032NX_1	20100401	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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