

PXT2907A

60 V, 600 mA, PNP switching transistor

10 October 2014

Product data sheet

1. General description

PNP switching transistor in a medium power flat lead SOT89 (SC-62/TO-243) Surface-Mounted Device (SMD) plastic package.

NPN complement: PXT2222A

2. Features and benefits

- High current: max. 600 mA
- Low voltage: max. 60 V
- AEC-Q101 qualified

3. Applications

- Switching and linear amplification

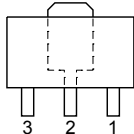
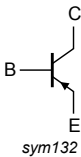
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CE0}	collector-emitter voltage	open base	-	-	-60	V
I_C	collector current		-	-	-600	mA
h_{FE}	DC current gain	$V_{CE} = -1\text{ V}$; $I_C = -10\text{ mA}$; $T_{amb} = 25\text{ }^\circ\text{C}$	100	-	-	

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
PXT2907A	SOT89	plastic surface-mounted package; die pad for good heat transfer; 3 leads	SOT89

7. Marking

Table 4. Marking codes

Type number	Marking code
PXT2907A	/

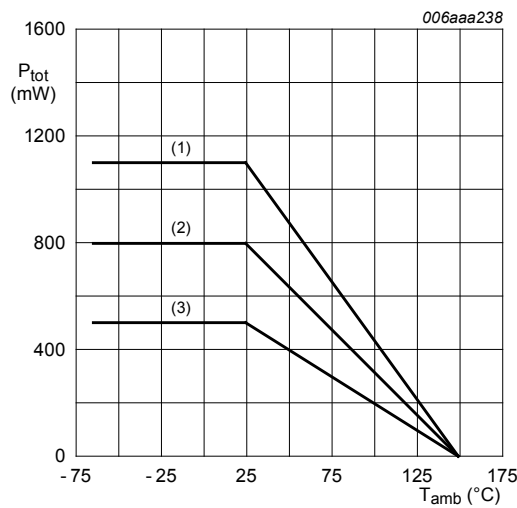
8. Limiting values

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		-	-60	V
V_{EBO}	emitter-base voltage	open collector		-	-5	V
I_C	collector current			-	-600	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	-800	mA
I_{BM}	peak base current			-	-200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	0.5	W
			[2]	-	0.8	W
			[3]	-	1.1	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 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 1 cm².
- [3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 6 cm².



- (1) FR4 PCB; 6 cm² mounting pad for collector.
- (2) FR4 PCB; 1 cm² mounting pad for collector.
- (3) FR4 PCB; standard footprint.

Fig. 1. Power derating curves

9. Thermal characteristics

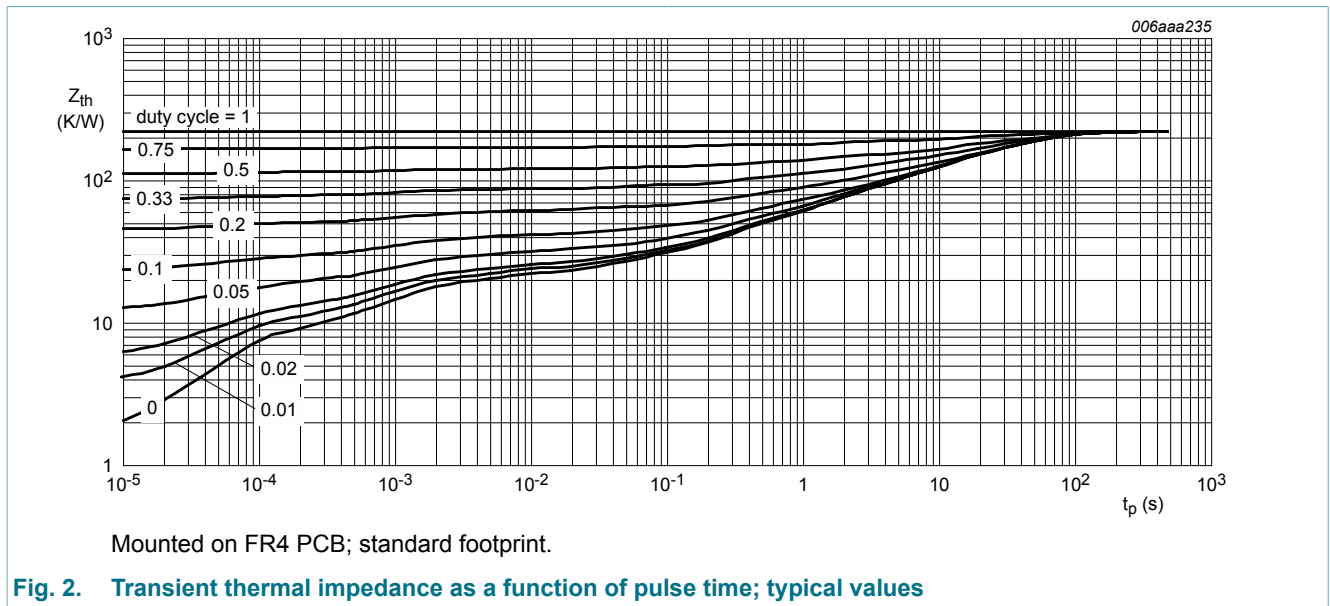
Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	250	K/W
			[2]	-	-	156	K/W
			[3]	-	-	113	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	30	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 and mounting pad for collector 1 cm².

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



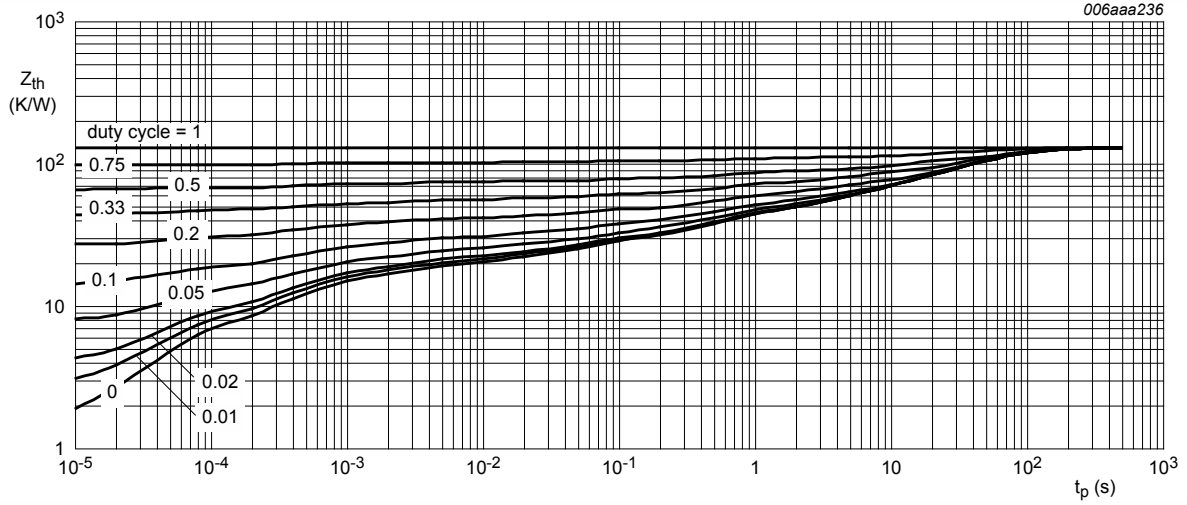


Fig. 3. Transient thermal impedance as a function of pulse time; typical values

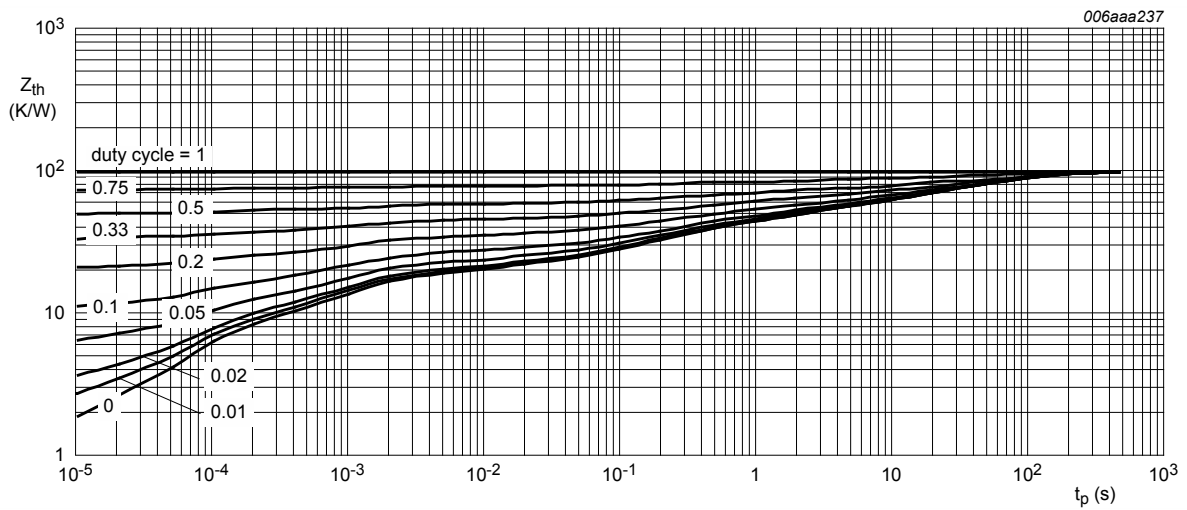


Fig. 4. Transient thermal impedance as a function of pulse time; typical values

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I _{CBO}	collector-base cut-off current	V _{CB} = -50 V; I _E = 0 A; T _{amb} = 25 °C	-	-	-10	nA
		V _{CB} = -50 V; I _E = 0 A; T _j = 125 °C	-	-	-10	μA
I _{EBO}	emitter-base cut-off current	V _{EB} = -5 V; I _C = 0 A; T _{amb} = 25 °C	-	-	-50	nA
h _{FE}	DC current gain	V _{CE} = -1 V; I _C = -0.1 mA; T _{amb} = 25 °C	75	-	-	
		V _{CE} = -1 V; I _C = -1 mA; T _{amb} = 25 °C	100	-	-	
		V _{CE} = -1 V; I _C = -10 mA; T _{amb} = 25 °C	100	-	-	
		V _{CE} = -2 V; I _C = -150 mA; T _{amb} = 25 °C	100	-	300	
		V _{CE} = -10 V; I _C = -500 mA; T _{amb} = 25 °C	50	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = -150 mA; I _B = -15 mA; T _{amb} = 25 °C	-	-	-400	mV
		I _C = -500 mA; I _B = -50 mA; T _{amb} = 25 °C	-	-	-1.6	V
V _{BEsat}	base-emitter saturation voltage	I _C = -150 mA; I _B = -15 mA; T _{amb} = 25 °C	-	-	-1.3	V
		I _C = -500 mA; I _B = -50 mA; T _{amb} = 25 °C	-	-	-2.6	V
t _d	delay time	I _C = -150 mA; I _{Bon} = -15 mA; I _{Boff} = 15 mA; T _{amb} = 25 °C	-	-	12	ns
t _r	rise time		-	-	30	ns
t _{on}	turn-on time		-	-	40	ns
t _s	storage time		-	-	300	ns
t _f	fall time		-	-	65	ns
t _{off}	turn-off time		-	-	365	ns
C _C	collector capacitance		V _{CB} = -10 V; I _E = 0 A; i _e = 0 A; f = 1 MHz; T _{amb} = 25 °C	-	-	8
C _E	emitter capacitance	V _{EB} = -500 mV; I _C = 0 A; i _c = 0 A; f = 1 MHz; T _{amb} = 25 °C	-	-	35	pF
f _T	transition frequency	V _{CE} = -20 V; I _C = -50 mA; f = 100 MHz; T _{amb} = 25 °C	200	-	-	MHz

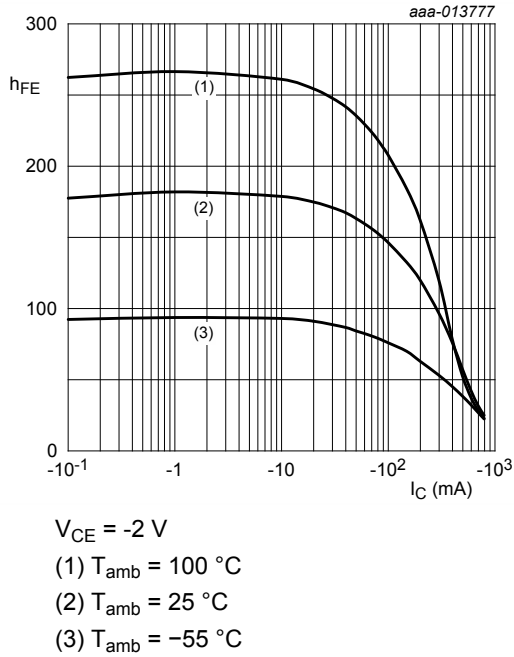


Fig. 5. DC current gain as a function of collector current; typical values

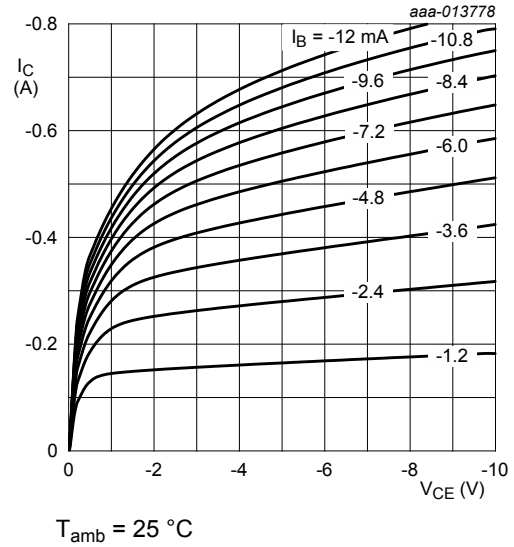


Fig. 6. Collector current as a function of collector-emitter voltage; typical values

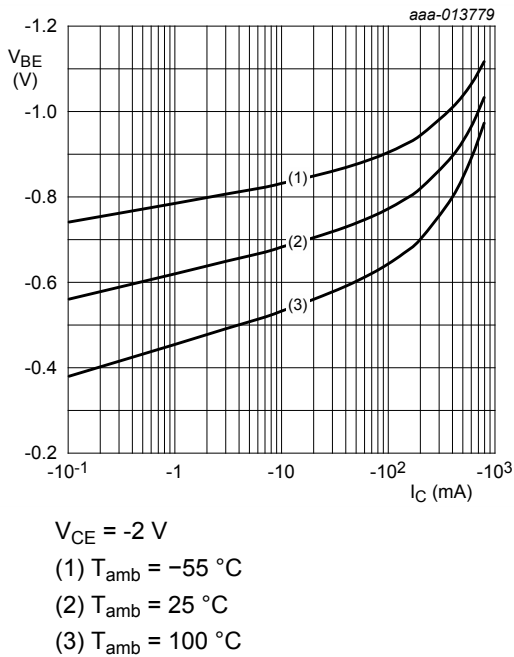


Fig. 7. Base-emitter voltage as a function of collector current; typical values

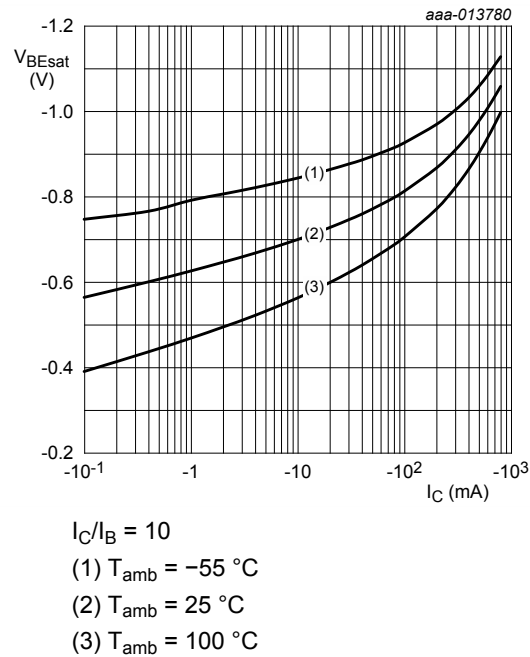
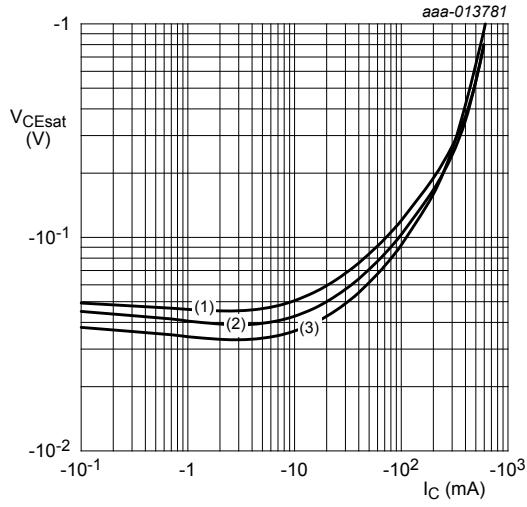


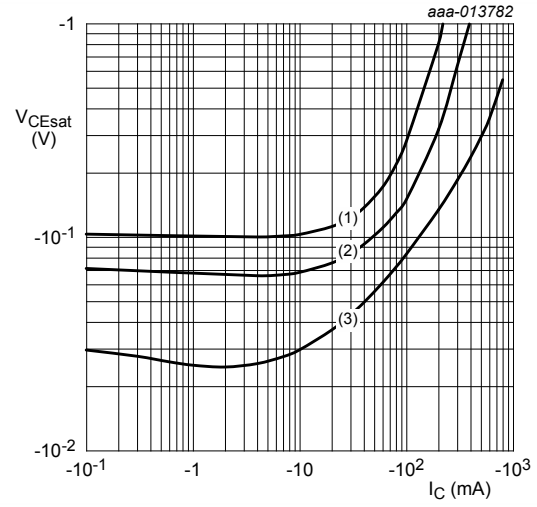
Fig. 8. Base-emitter saturation voltage as a function of collector current; typical values



$I_C/I_B = 20$

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



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

- (1) $I_C/I_B = 100$
- (2) $I_C/I_B = 50$
- (3) $I_C/I_B = 10$

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

11. Test information

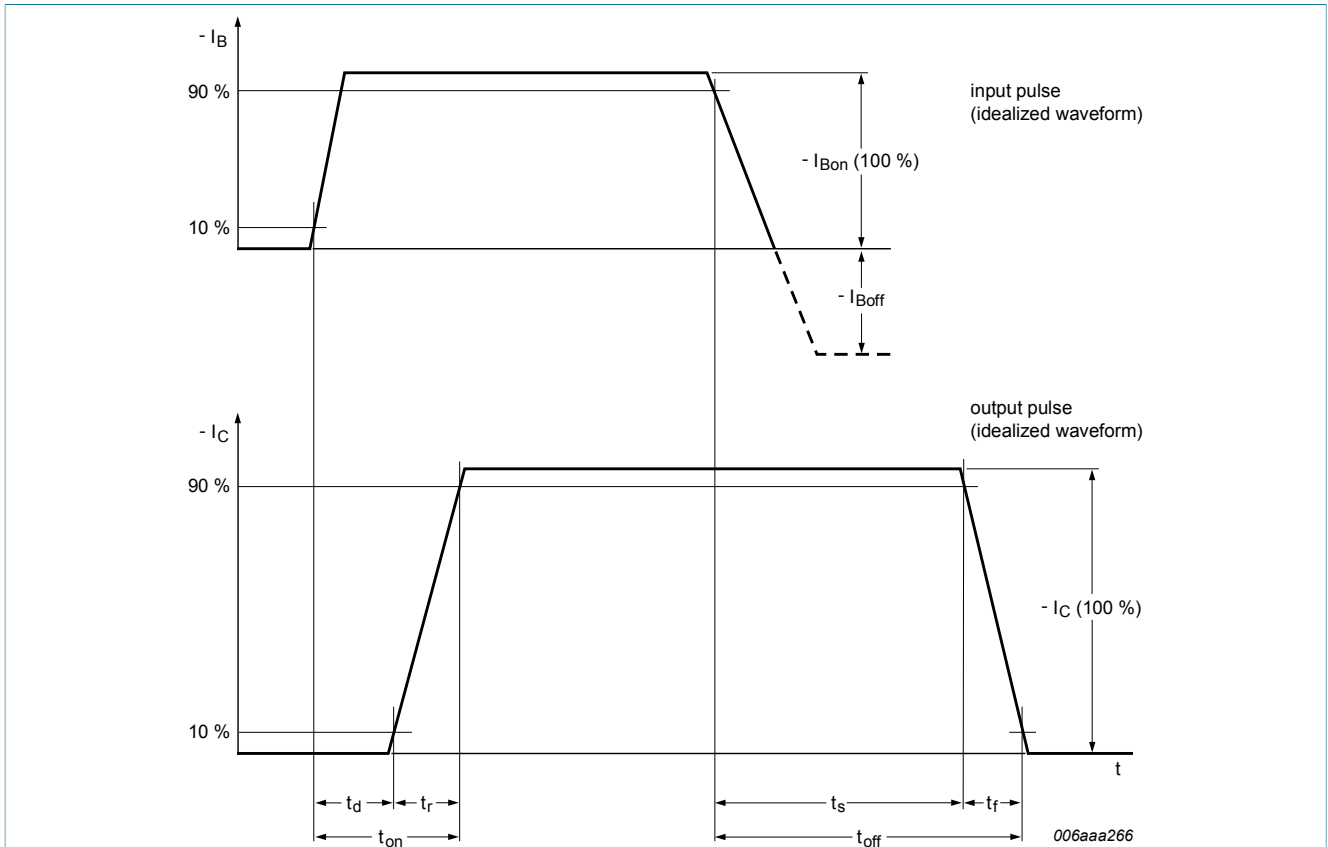


Fig. 11. BISS transistor switching time definition

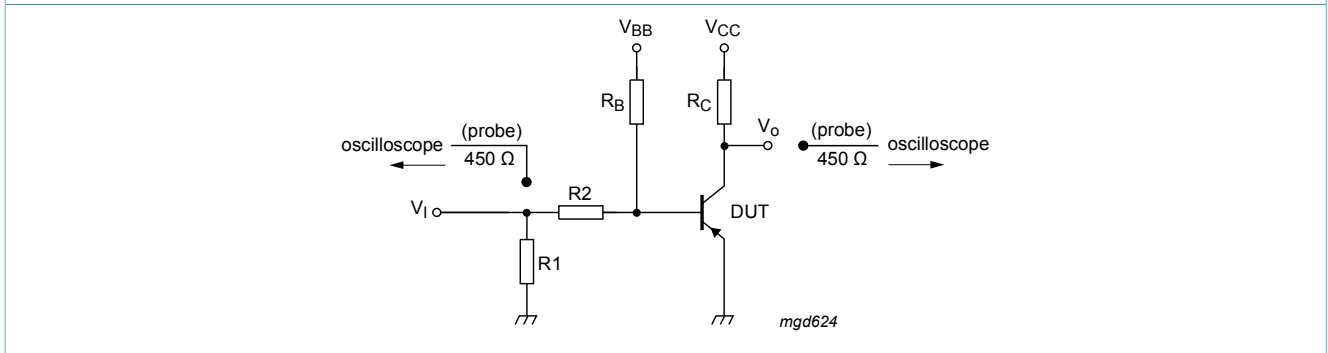


Fig. 12. Test circuit for switching times

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

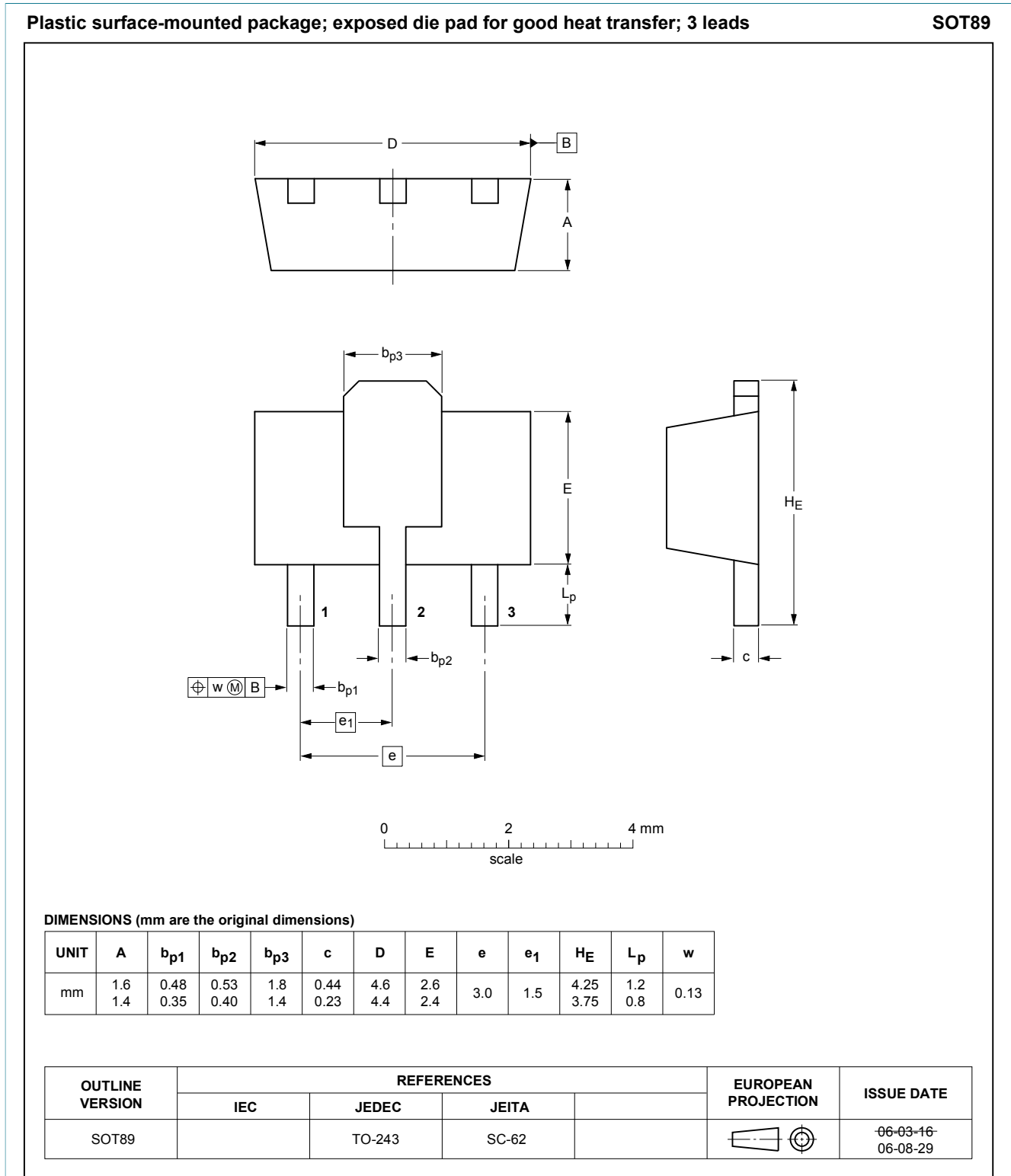


Fig. 13. Package outline SOT89

13. Soldering

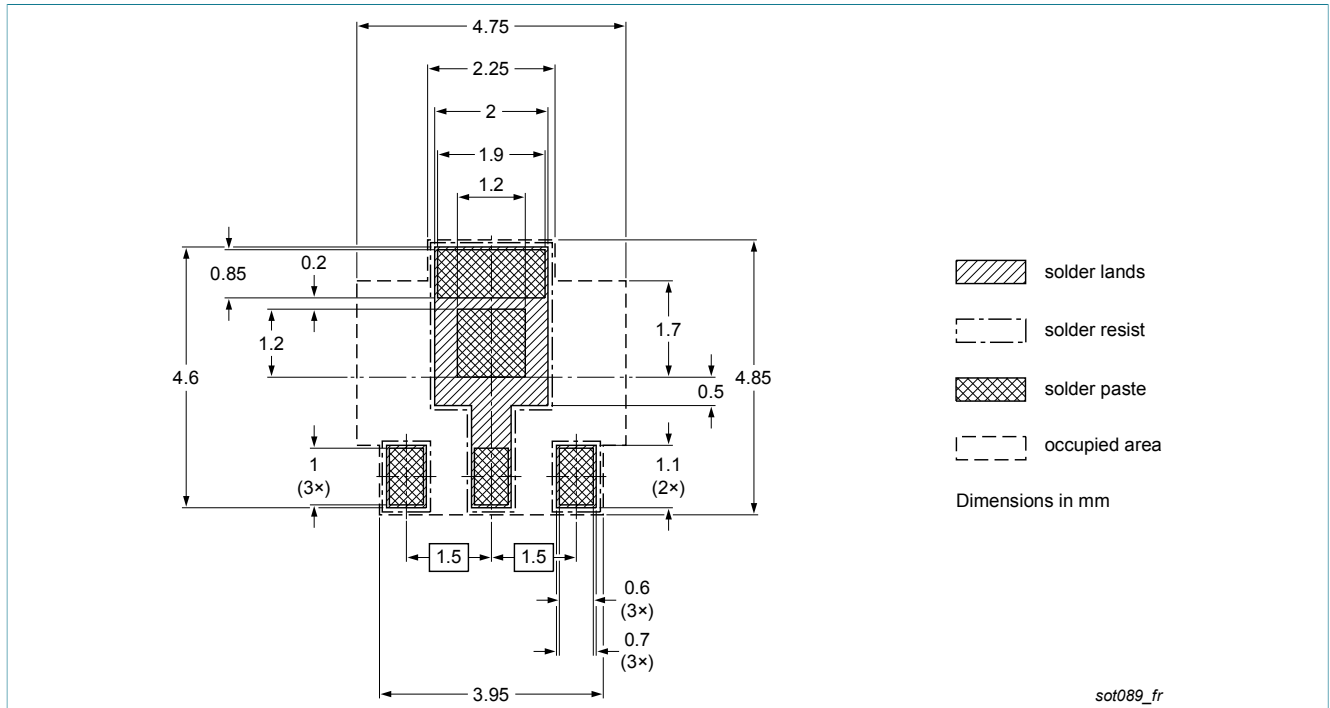


Fig. 14. Reflow soldering footprint for SOT89

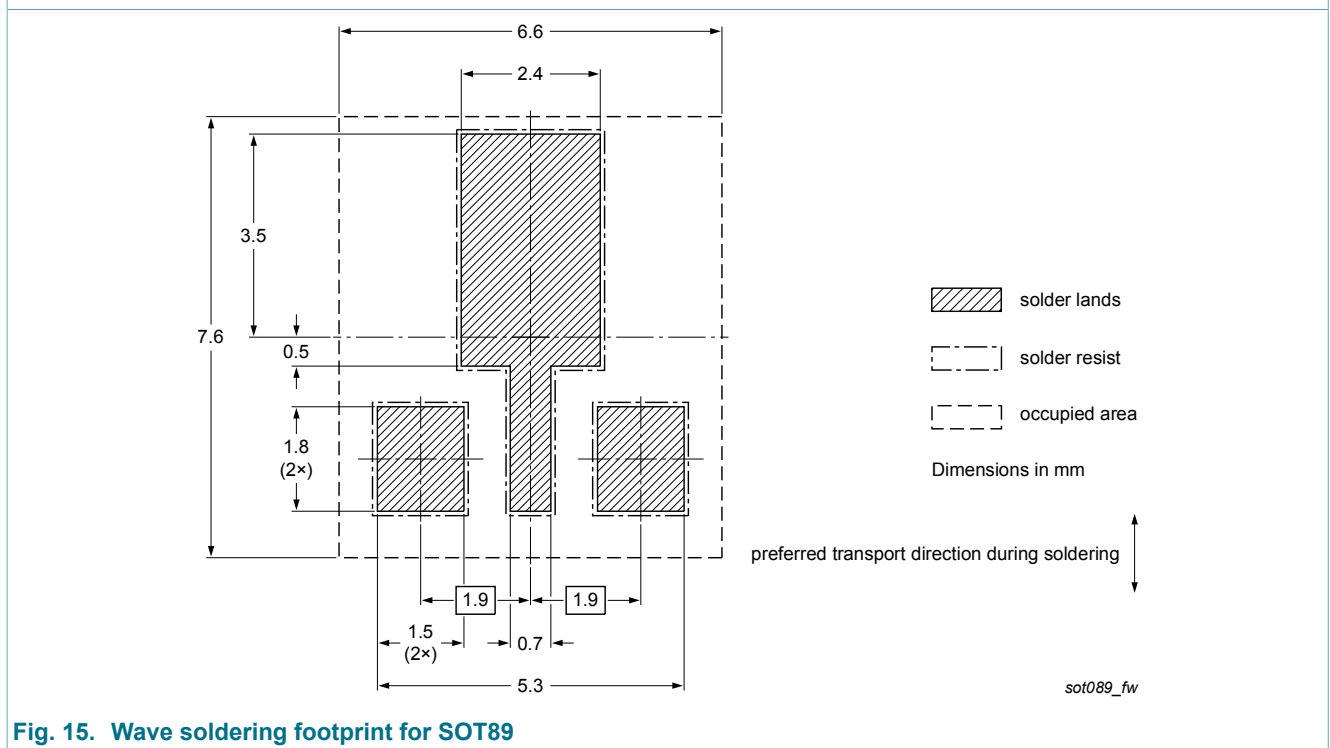


Fig. 15. Wave soldering footprint for SOT89

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PXT2907A v.6	20141010	Product data sheet		PXT2907A v.5
Modifications:	<ul style="list-style-type: none">• Conditions for transition frequency changed• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors• Legal texts have been adapted to the new company name where appropriate			
PXT2907A v.5	20041209	Product data sheet		PXT2907A v.4
PXT2907A v.4	20020320	Product data sheet	-	-

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15.1 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.
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