

# PXT2907A

60 V, 600 mA, PNP switching transistor

3 August 2015

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	$V_{CE} = -1\text{ V}$ ; $I_C = -10\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	100	-	-	

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E	emitter	<p>SOT89</p>	<p>sym132</p>
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 [1]
PXT2907A	%2F

[1] % = placeholder for manufacturing site code

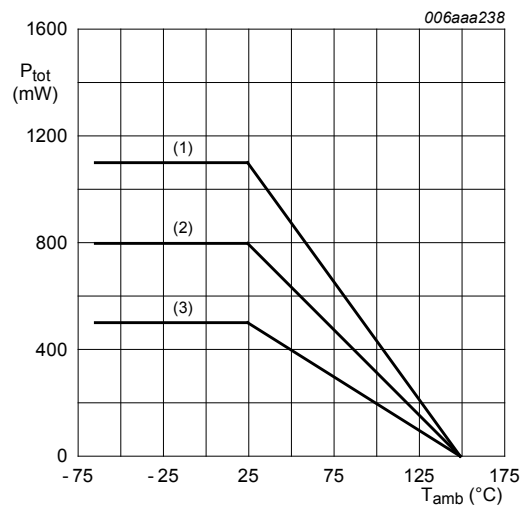
## 8. Limiting values

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



- (1) FR4 PCB; 6 cm<sup>2</sup> mounting pad for collector.  
 (2) FR4 PCB; 1 cm<sup>2</sup> mounting pad for collector.  
 (3) FR4 PCB; standard footprint.

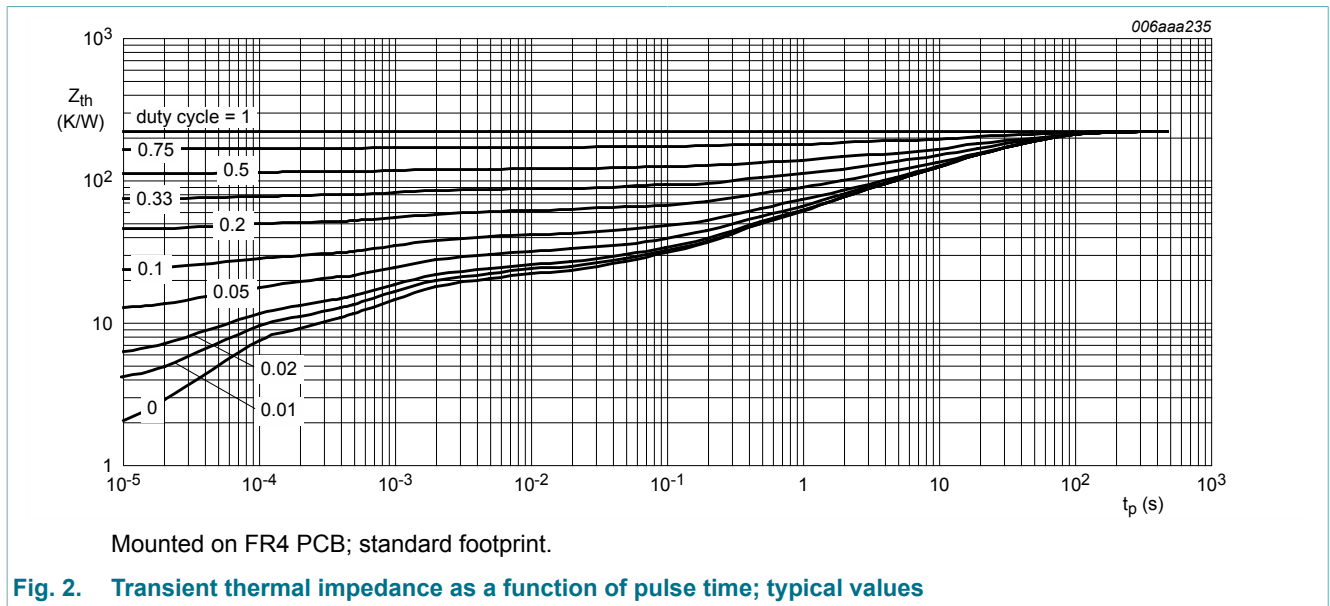
**Fig. 1. Power derating curves**

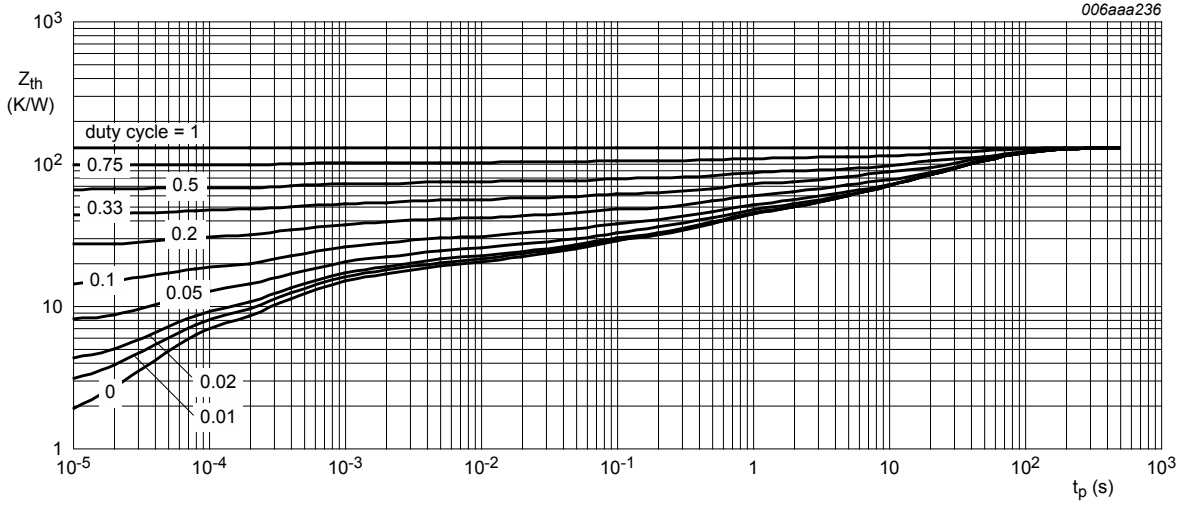
## 9. Thermal characteristics

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

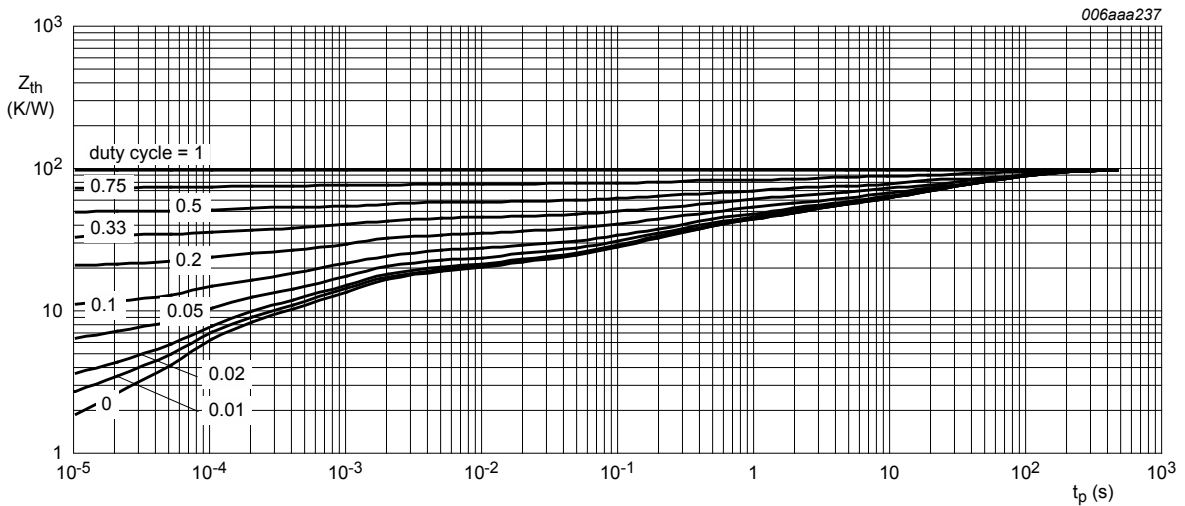
- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 1 cm<sup>2</sup>.
- [3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 6 cm<sup>2</sup>.





Mounted on FR4 PCB; mounting pad for collector 1 cm<sup>2</sup>.

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



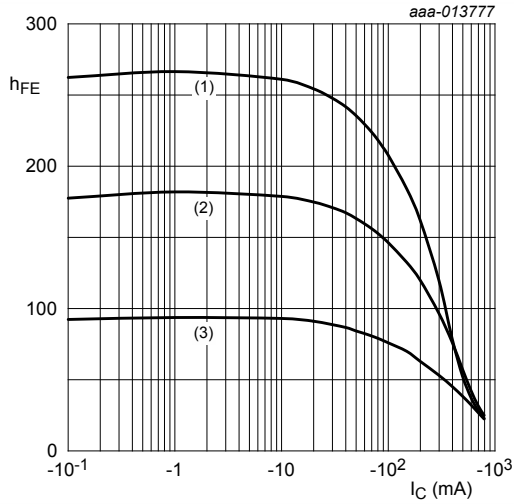
Mounted on FR4 PCB; mounting pad for collector 6 cm<sup>2</sup>.

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

## 10. Characteristics

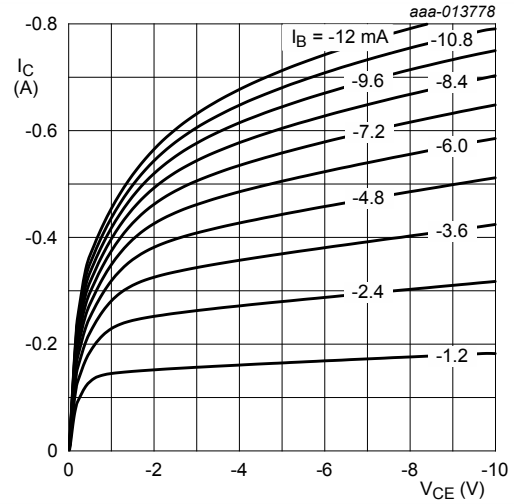
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -50\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ °C}$	-	-	-10	nA
		$V_{CB} = -50\text{ V}; I_E = 0\text{ A}; T_j = 125\text{ °C}$	-	-	-10	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ °C}$	-	-	-50	nA
$h_{FE}$	DC current gain	$V_{CE} = -1\text{ V}; I_C = -0.1\text{ mA}; T_{amb} = 25\text{ °C}$	75	-	-	
		$V_{CE} = -1\text{ V}; I_C = -1\text{ mA}; T_{amb} = 25\text{ °C}$	100	-	-	
		$V_{CE} = -1\text{ V}; I_C = -10\text{ mA}; T_{amb} = 25\text{ °C}$	100	-	-	
		$V_{CE} = -2\text{ V}; I_C = -150\text{ mA}; T_{amb} = 25\text{ °C}$	100	-	300	
		$V_{CE} = -10\text{ V}; I_C = -500\text{ mA}; T_{amb} = 25\text{ °C}$	50	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -150\text{ mA}; I_B = -15\text{ mA}; T_{amb} = 25\text{ °C}$	-	-	-400	mV
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}; T_{amb} = 25\text{ °C}$	-	-	-1.6	V
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -150\text{ mA}; I_B = -15\text{ mA}; T_{amb} = 25\text{ °C}$	-	-	-1.3	V
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}; T_{amb} = 25\text{ °C}$	-	-	-2.6	V
$t_d$	delay time	$I_C = -150\text{ mA}; I_{Bon} = -15\text{ mA}; I_{Boff} = 15\text{ mA}; T_{amb} = 25\text{ °C}$	-	-	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		$V_{CB} = -10\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$	-	-	8
$C_E$	emitter capacitance	$V_{EB} = -500\text{ mV}; I_C = 0\text{ A}; i_c = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$	-	-	35	pF
$f_T$	transition frequency	$V_{CE} = -20\text{ V}; I_C = -50\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ °C}$	200	-	-	MHz



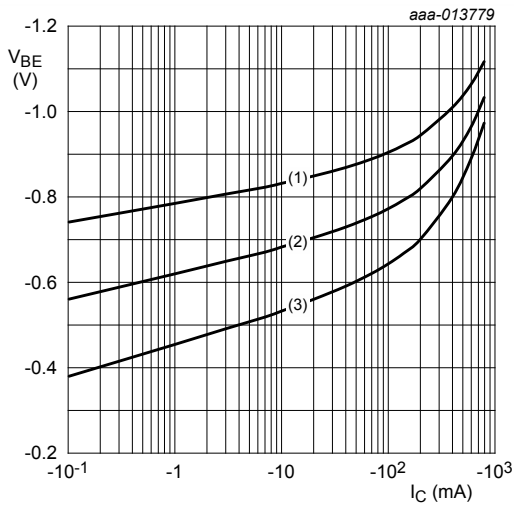
$V_{CE} = -2\text{ V}$   
 (1)  $T_{amb} = 100^\circ\text{C}$   
 (2)  $T_{amb} = 25^\circ\text{C}$   
 (3)  $T_{amb} = -55^\circ\text{C}$

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



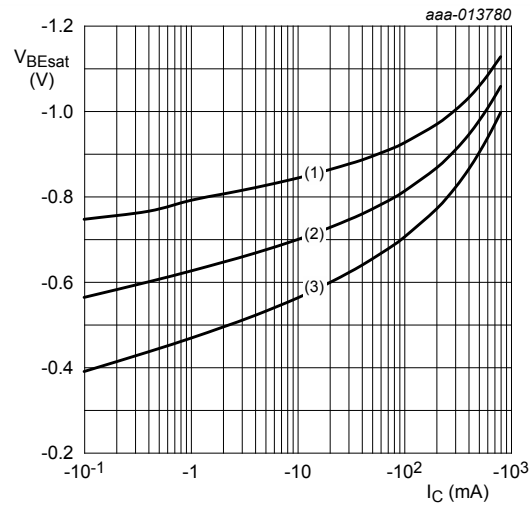
$T_{amb} = 25^\circ\text{C}$

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



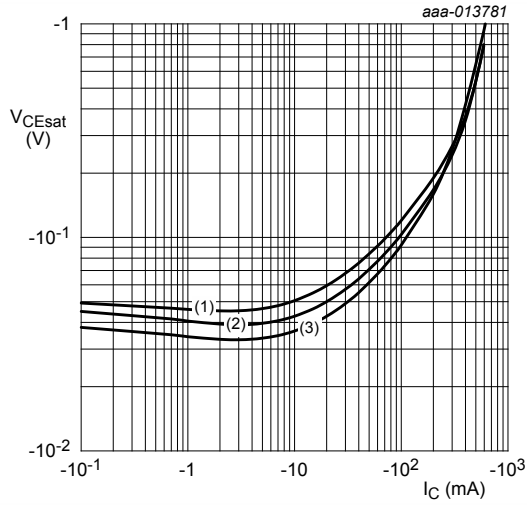
$V_{CE} = -2\text{ V}$   
 (1)  $T_{amb} = -55^\circ\text{C}$   
 (2)  $T_{amb} = 25^\circ\text{C}$   
 (3)  $T_{amb} = 100^\circ\text{C}$

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



$I_C/I_B = 10$   
 (1)  $T_{amb} = -55^\circ\text{C}$   
 (2)  $T_{amb} = 25^\circ\text{C}$   
 (3)  $T_{amb} = 100^\circ\text{C}$

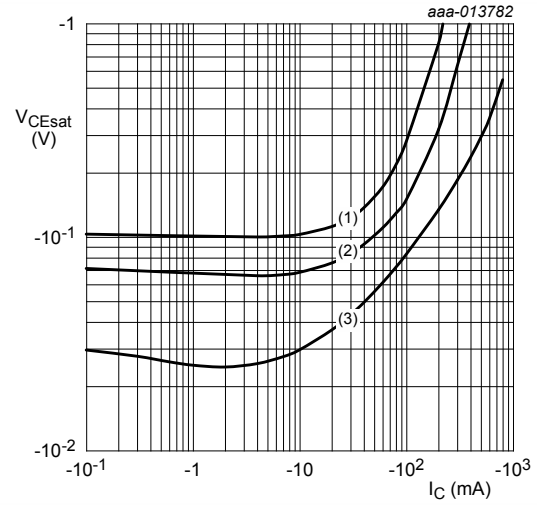
**Fig. 8. Base-emitter saturation voltage as a function of collector current; typical values**



$I_C/I_B = 20$

- (1)  $T_{amb} = 100\text{ °C}$
- (2)  $T_{amb} = 25\text{ °C}$
- (3)  $T_{amb} = -55\text{ °C}$

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



$T_{amb} = 25\text{ °C}$

- (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

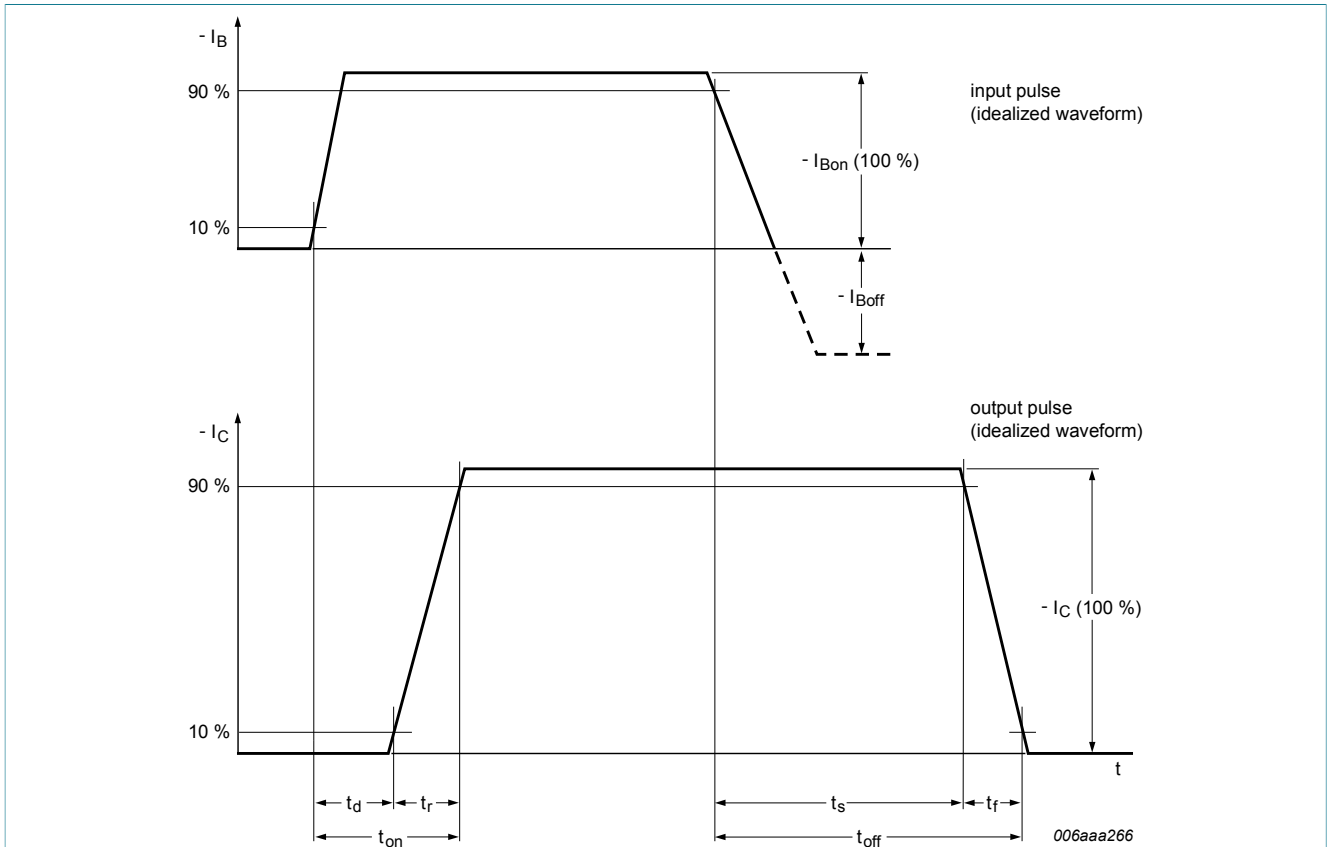


Fig. 11. BISS transistor switching time definition

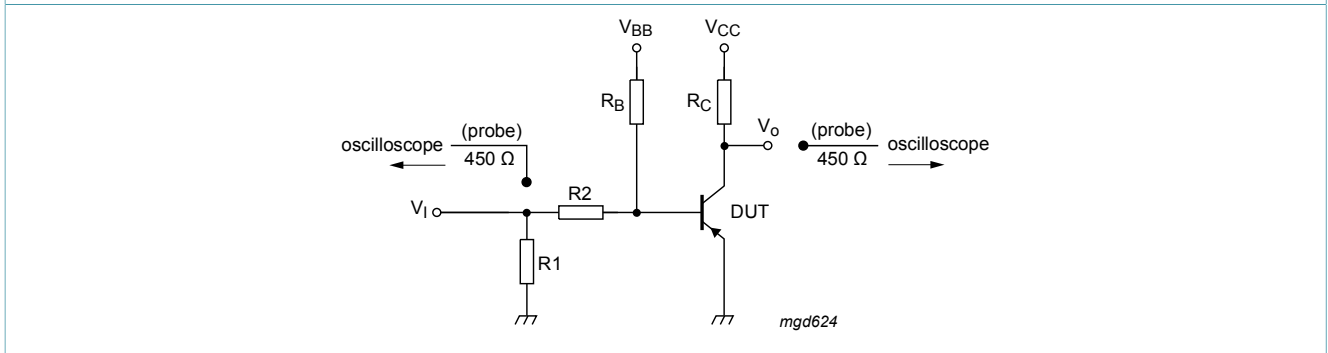


Fig. 12. Test circuit for switching times

#### 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

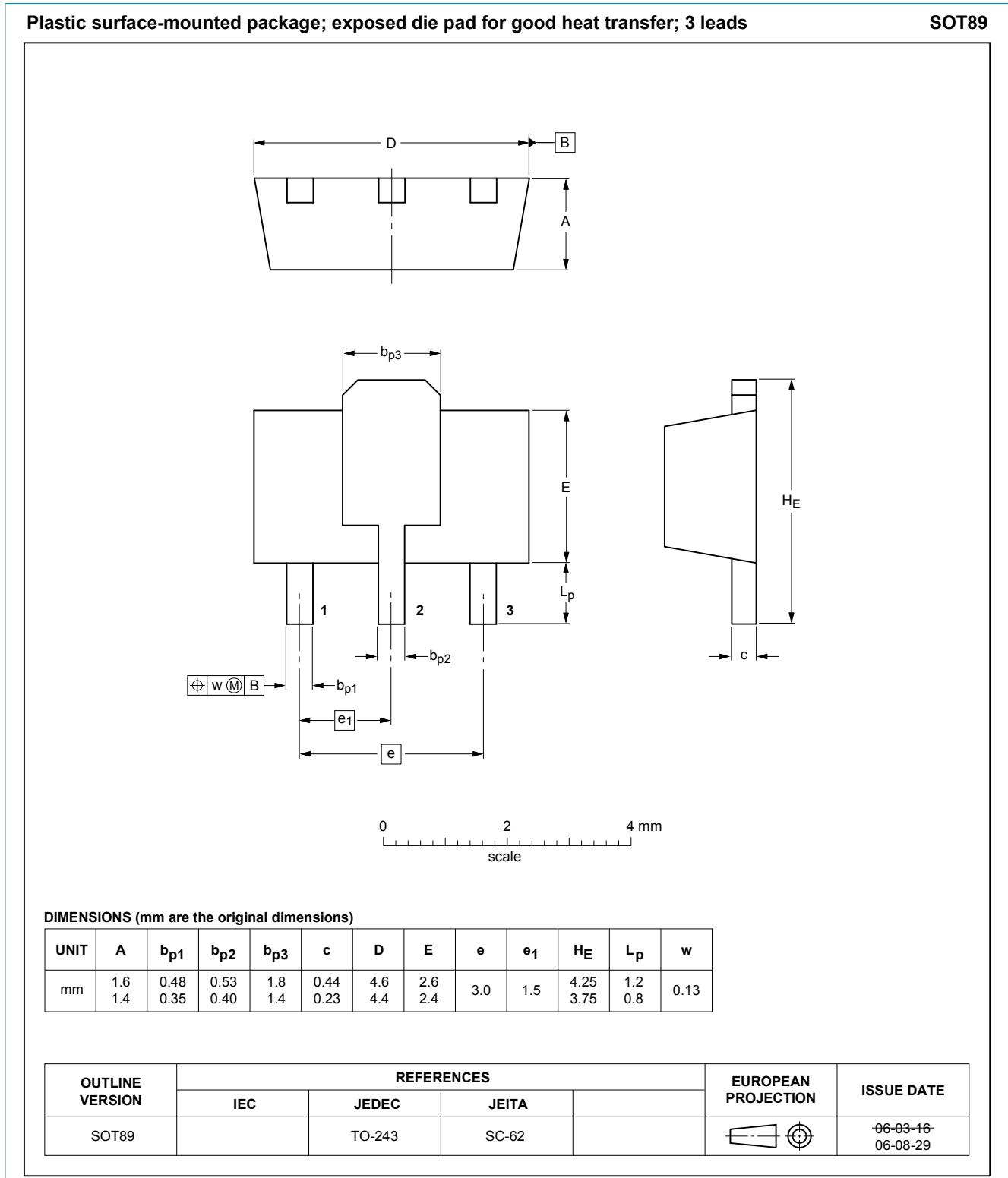


Fig. 13. Package outline SOT89

### 13. Soldering

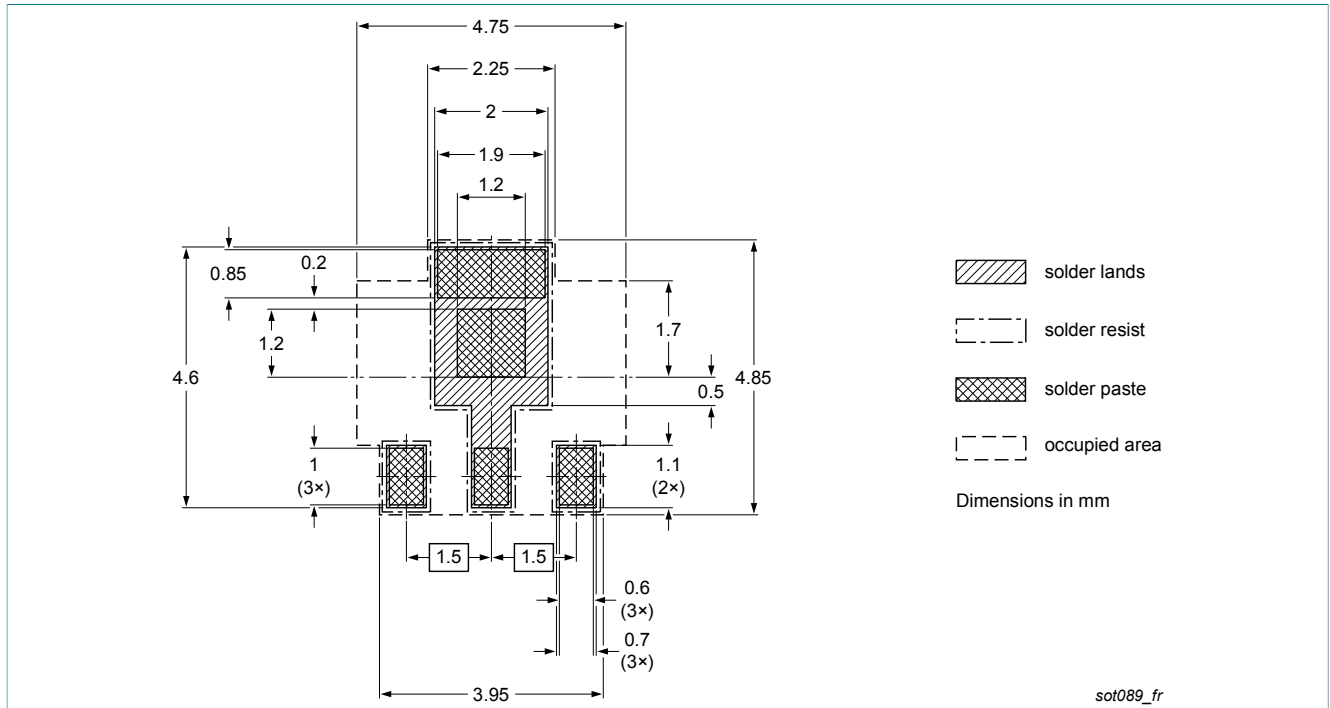


Fig. 14. Reflow soldering footprint for SOT89

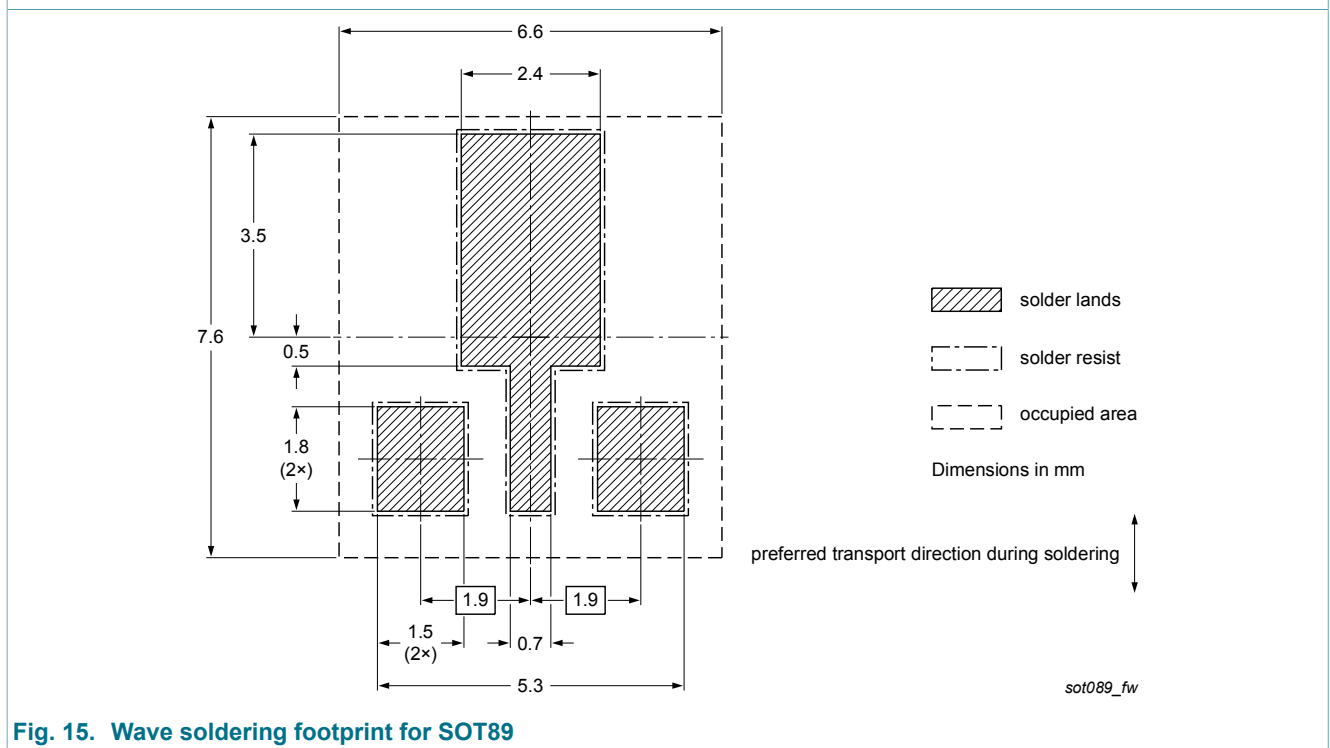


Fig. 15. Wave soldering footprint for SOT89

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PXT2907A v.7	20150803	Product data sheet	-	PXT2907A v.6
Modifications:	<ul style="list-style-type: none"><li>Marking code corrected</li></ul>			
PXT2907A v.6	20141010	Product data sheet	-	PXT2907A v.5
PXT2907A v.5	20041209	Product data sheet	-	PXT2907A v.4
PXT2907A v.4	20020320	Product data sheet	-	-

## 15. Legal information

### 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.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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