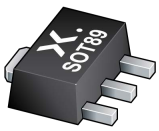



# PXT2907A

## 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

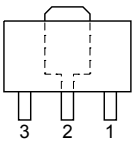
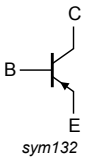
## 4. Quick reference data

**Table 1. Quick reference data**

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

## 5. Pinning information

**Table 2. Pinning information**

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|---|---|---|---|---|
| 1 | E | emitter |   **SOT89** |   |
| 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**

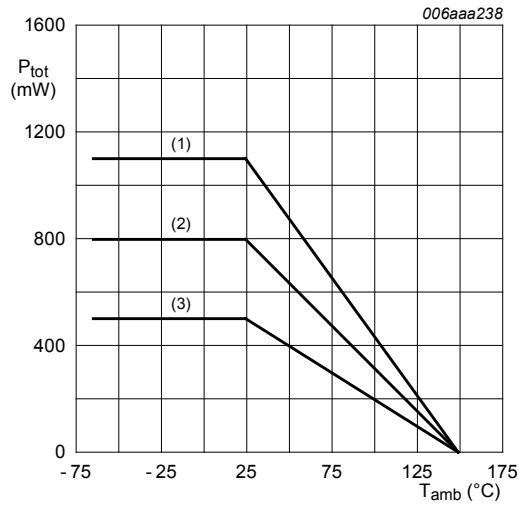
*In accordance with the Absolute Maximum Rating System (IEC 60134).*

| 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 $cm^2$.

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




(1) FR4 PCB; 6 $cm^2$ mounting pad for collector.

(2) FR4 PCB; 1 $cm^2$ mounting pad for collector.

(3) FR4 PCB; standard footprint.

**Fig. 1. Power derating curves**

# 9. Thermal characteristics

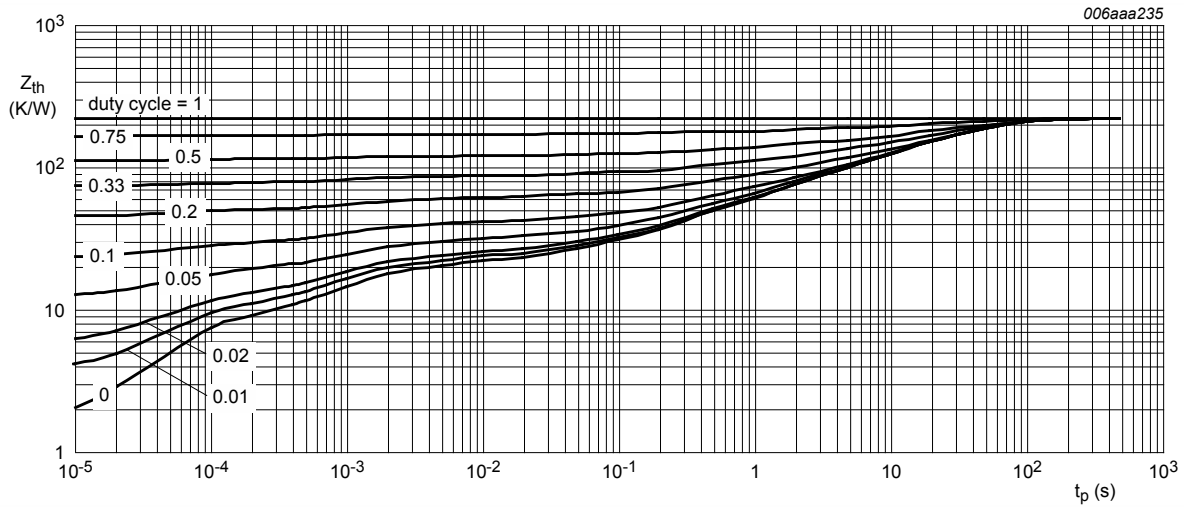
**Table 6. Thermal characteristics**

| 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.

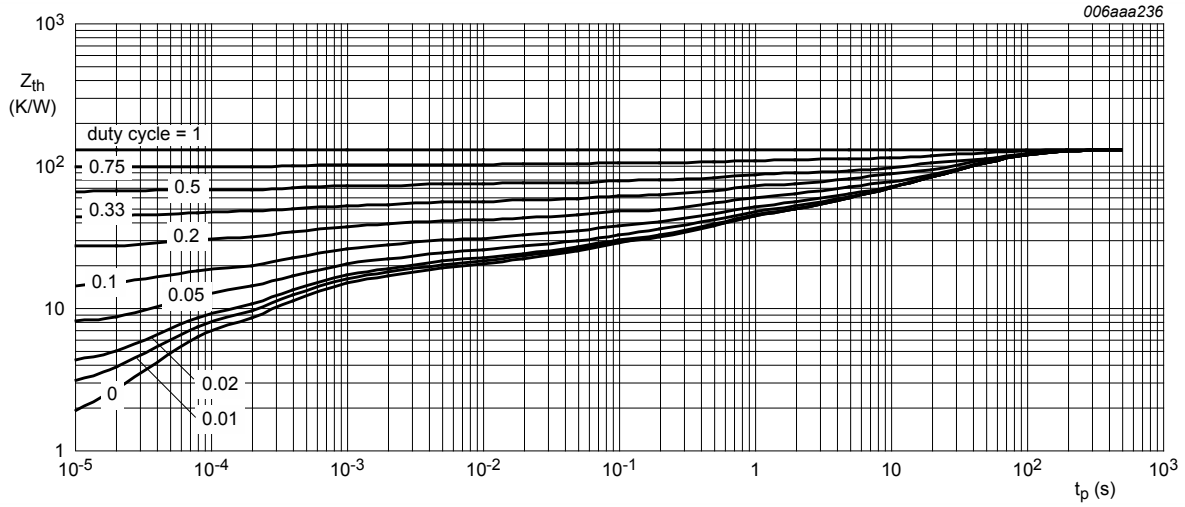
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 1 $cm^2$.

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



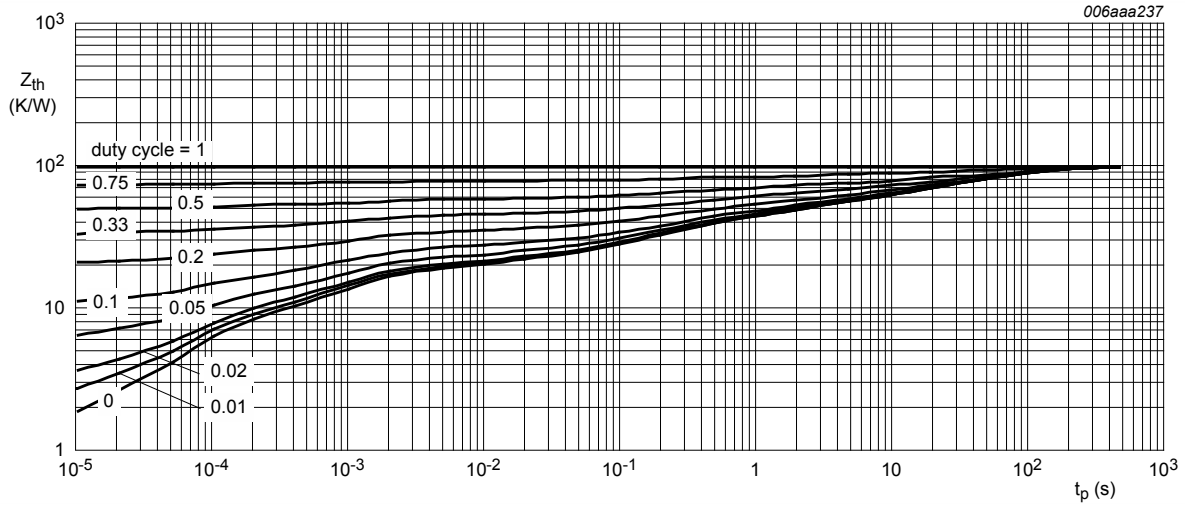

Mounted on FR4 PCB; standard footprint.

**Fig. 2. Transient thermal impedance as a function of pulse time; typical values**




Mounted on FR4 PCB; mounting pad for collector 1 $cm^2$.

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



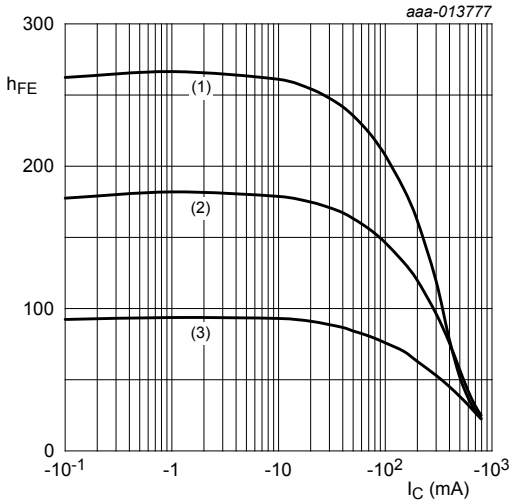

Mounted on FR4 PCB; mounting pad for collector 6 $cm^2$.

**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 | pF |
| $C_E$ | 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 |



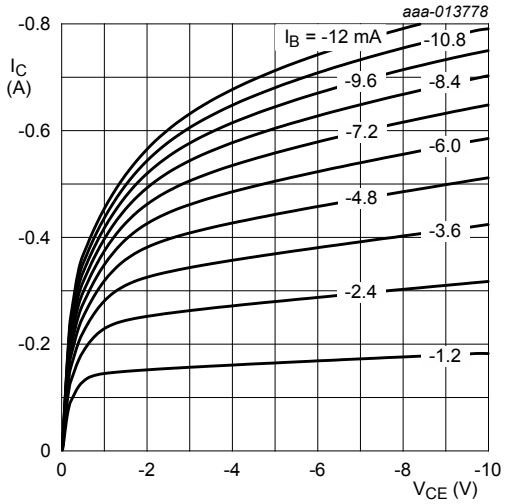

$V_{CE}$ = -2 V

(1) $T_{amb}$ = 100 °C

(2) $T_{amb}$ = 25 °C

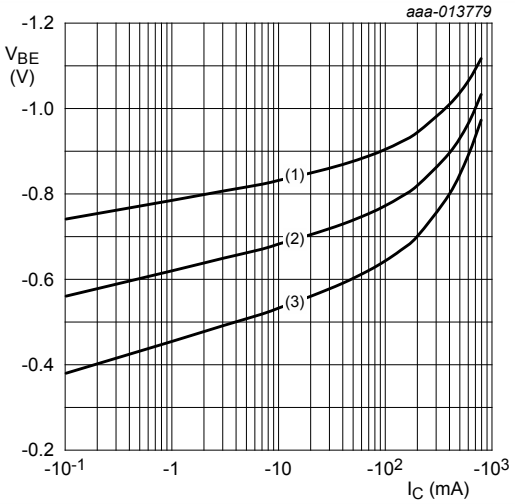
(3) $T_{amb}$ = −55 °C

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




$T_{amb}$ = 25 °C

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



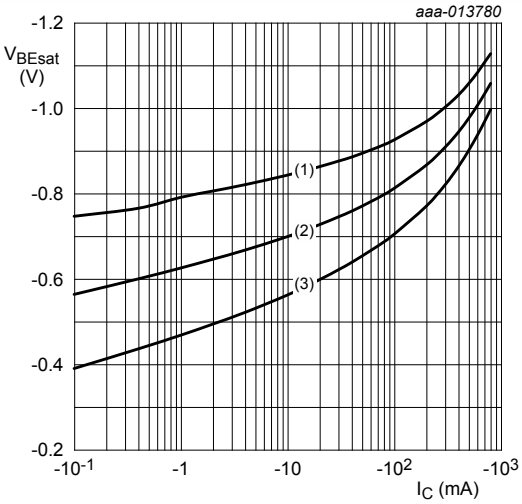

$V_{CE}$ = -2 V

(1) $T_{amb}$ = −55 °C

(2) $T_{amb}$ = 25 °C

(3) $T_{amb}$ = 100 °C

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



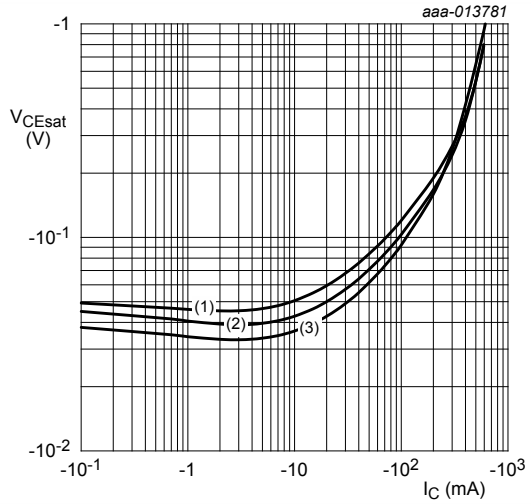

$I_C/I_B$ = 10

(1) $T_{amb}$ = −55 °C

(2) $T_{amb}$ = 25 °C

(3) $T_{amb}$ = 100 °C

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



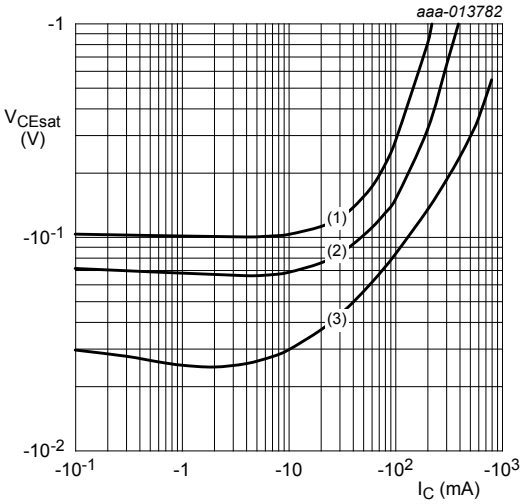

$I_C/I_B$ = 20

(1) $T_{amb}$ = 100 °C

(2) $T_{amb}$ = 25 °C

(3) $T_{amb}$ = −55 °C

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




$T_{amb}$ = 25 °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

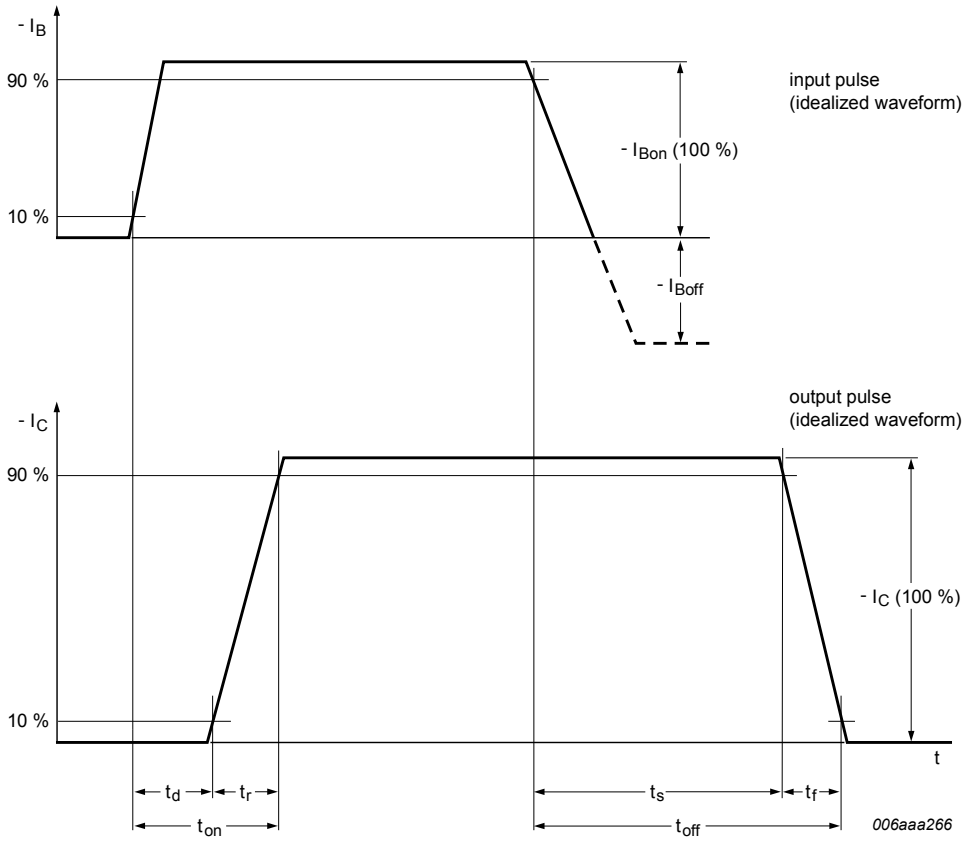



**Fig. 11. BISS transistor switching time definition**

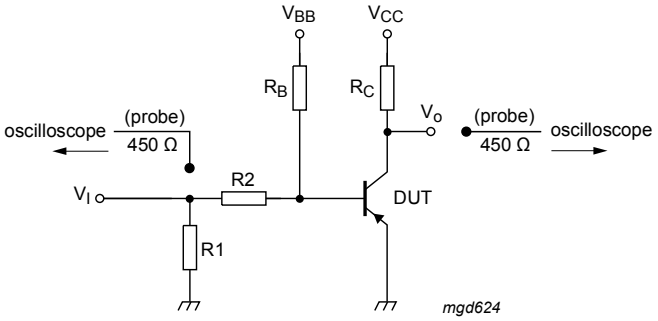


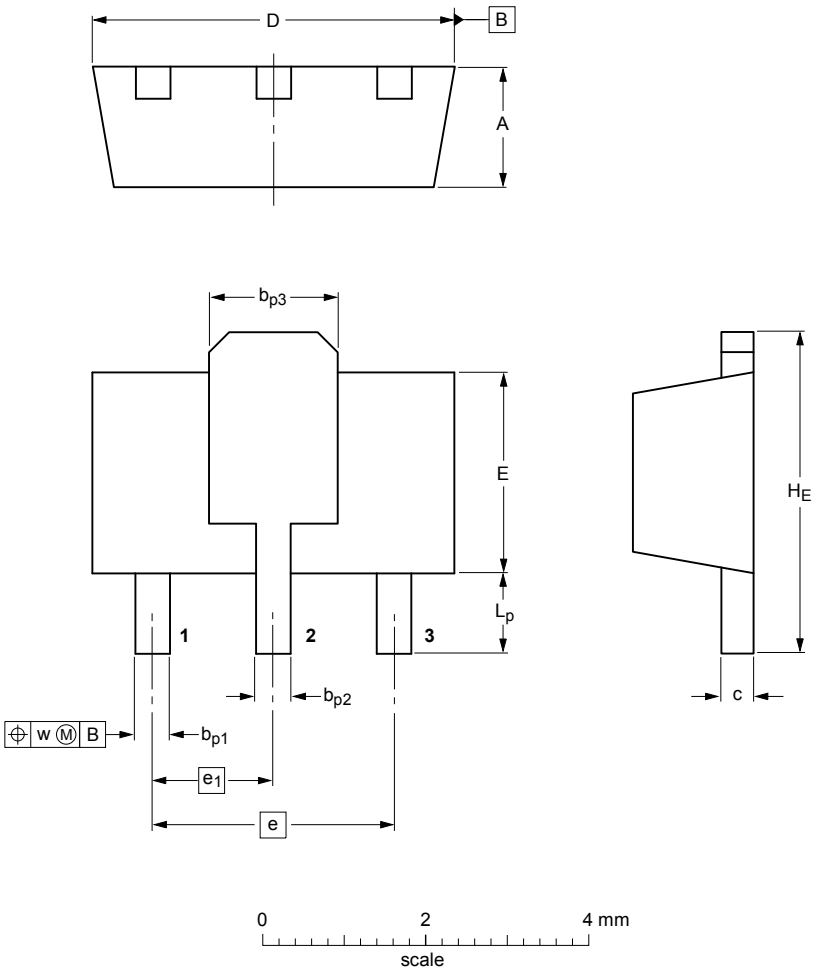

**Fig. 12. Test circuit for switching times**

## 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

**Plastic surface-mounted package; exposed die pad for good heat transfer; 3 leads** **SOT89**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $b_{p1}$ | $b_{p2}$ | $b_{p3}$ | c | D | E | e | $e_1$ | $H_E$ | $L_p$ | w |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.6<br>1.4 | 0.48<br>0.35 | 0.53<br>0.40 | 1.8<br>1.4 | 0.44<br>0.23 | 4.6<br>4.4 | 2.6<br>2.4 | 3.0 | 1.5 | 4.25<br>3.75 | 1.2<br>0.8 | 0.13 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT89 | | TO-243 | SC-62 | | | ~~06-03-16~~<br>06-08-29 |

**Fig. 13. Package outline SOT89**

# 13. Soldering

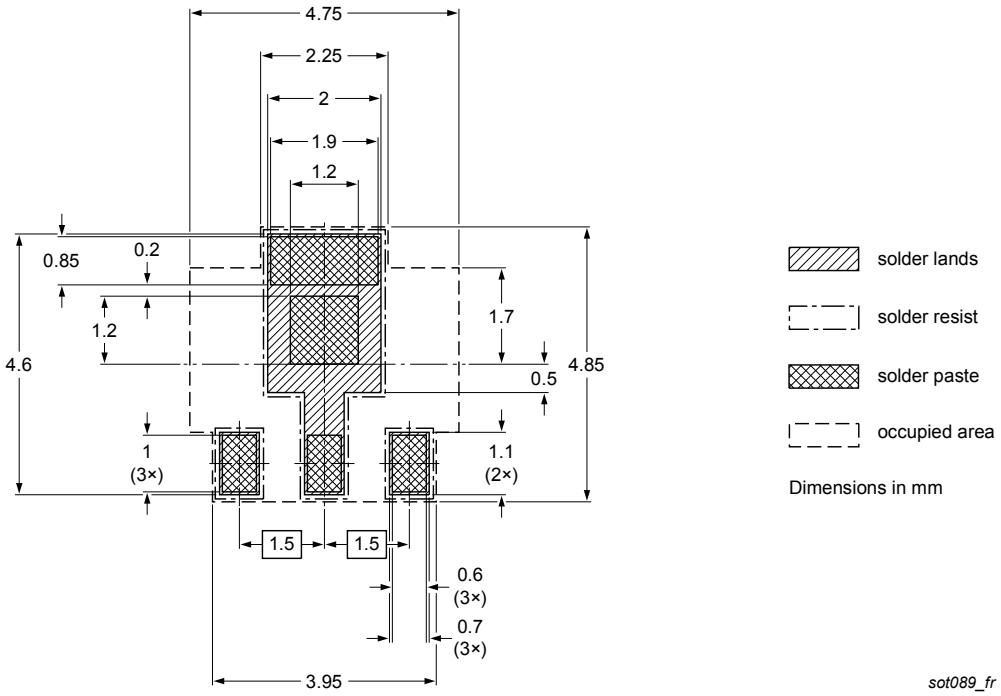



**Fig. 14. Reflow soldering footprint for SOT89**

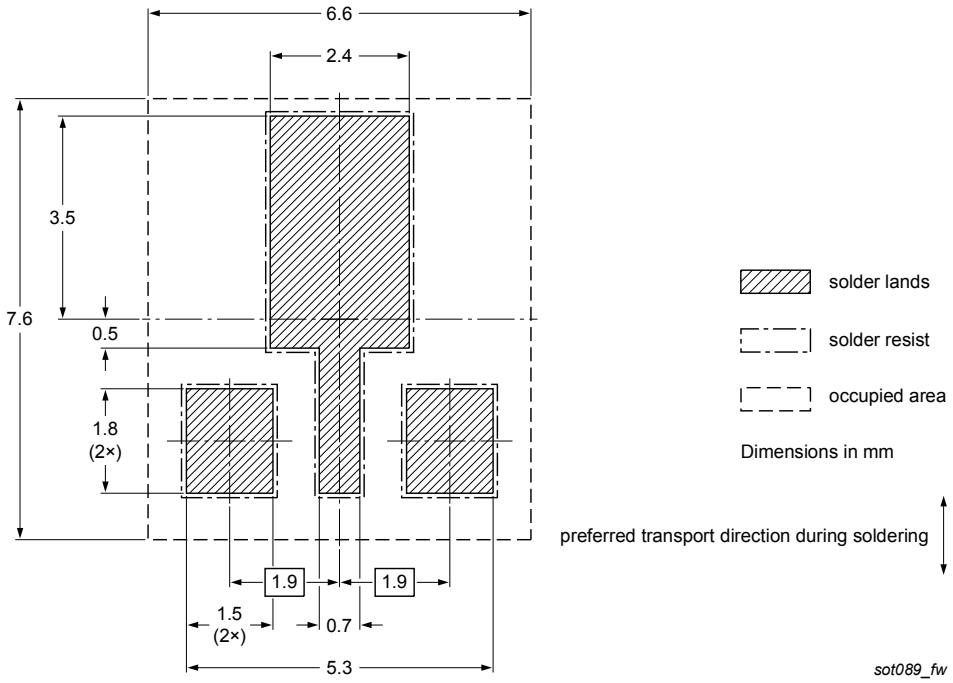



**Fig. 15. Wave soldering footprint for SOT89**

# 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: | • Marking code corrected | | | |
| 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. |

[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 URL http://www.nexperia.com.

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# 16. Contents





For more information, please visit: http://www.nexperia.com
For sales office addresses, please send an email to: salesaddresses@nexperia.com
**Date of release: 03 August 2015**