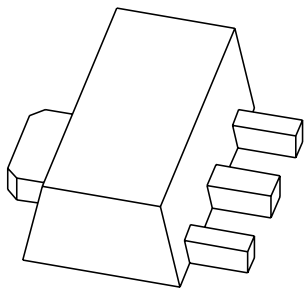


# DATA SHEET



## **PXT2222A** NPN switching transistor

Product specification  
Supersedes data of 1999 Apr 14

2004 Nov 22

# NPN switching transistor

# PXT2222A

### FEATURES

- High current (max. 600 mA)
- Low voltage (max. 40 V).

### APPLICATIONS

- General purpose switching and linear amplification.

### DESCRIPTION

NPN switching transistor in a SOT89 plastic package.  
PNP complement: PXT2907A.

### MARKING

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PXT2222A	*1P

### Note

- \* = p: Made in Hong Kong.  
\* = t: Made in Malaysia.  
\* = W: Made in China.

### PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base

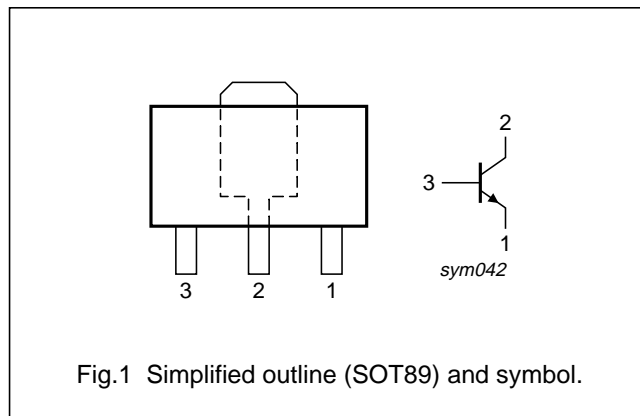


Fig.1 Simplified outline (SOT89) and symbol.

### ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PXT2222A	SC-62	plastic surface mounted package; collector pad for good heat transfer; 3 leads	SOT89

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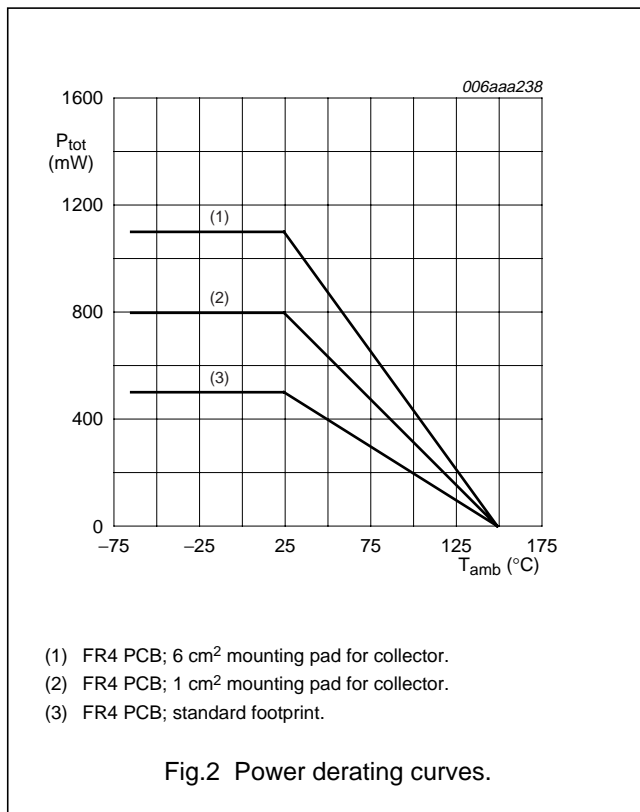
**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter	–	60	V
V <sub>CEO</sub>	collector-emitter voltage	open base	–	40	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	6	V
I <sub>C</sub>	collector current (DC)		–	100	mA
I <sub>CM</sub>	peak collector current		–	200	mA
I <sub>BM</sub>	peak base current		–	100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C note 1 note 2 note 3	–	0.5 0.8 1.1	W W W
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C
T <sub>amb</sub>	ambient temperature		–65	+150	°C

**Notes**

1. Device mounted on a printed-circuit board, single-sided copper, tin-plated and standard footprint.
2. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 1 cm<sup>2</sup>.
3. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 6 cm<sup>2</sup>.



NPN switching transistor

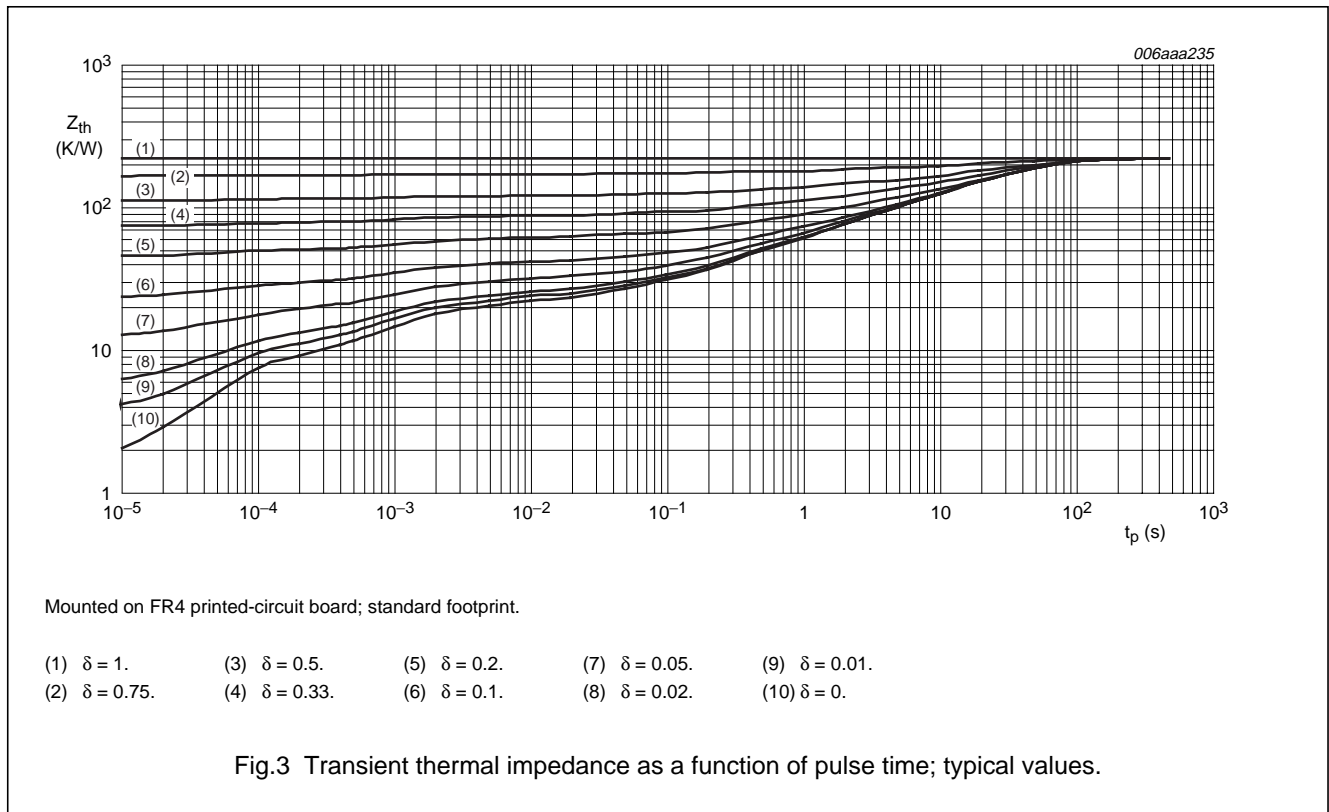
PXT2222A

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air		
		note 1	250	K/W
		note 2	156	K/W
		note 3	113	K/W
$R_{th(j-s)}$	thermal resistance from junction to soldering point		30	K/W

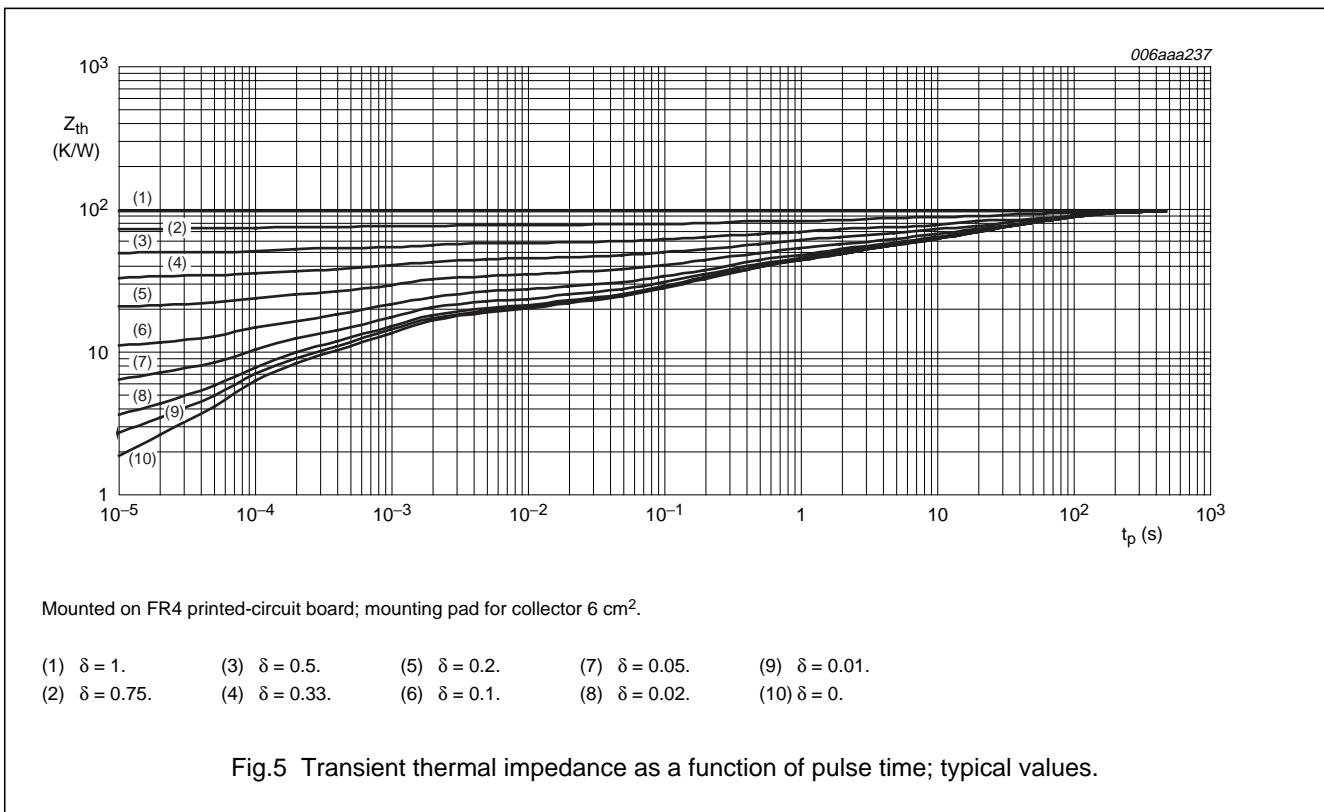
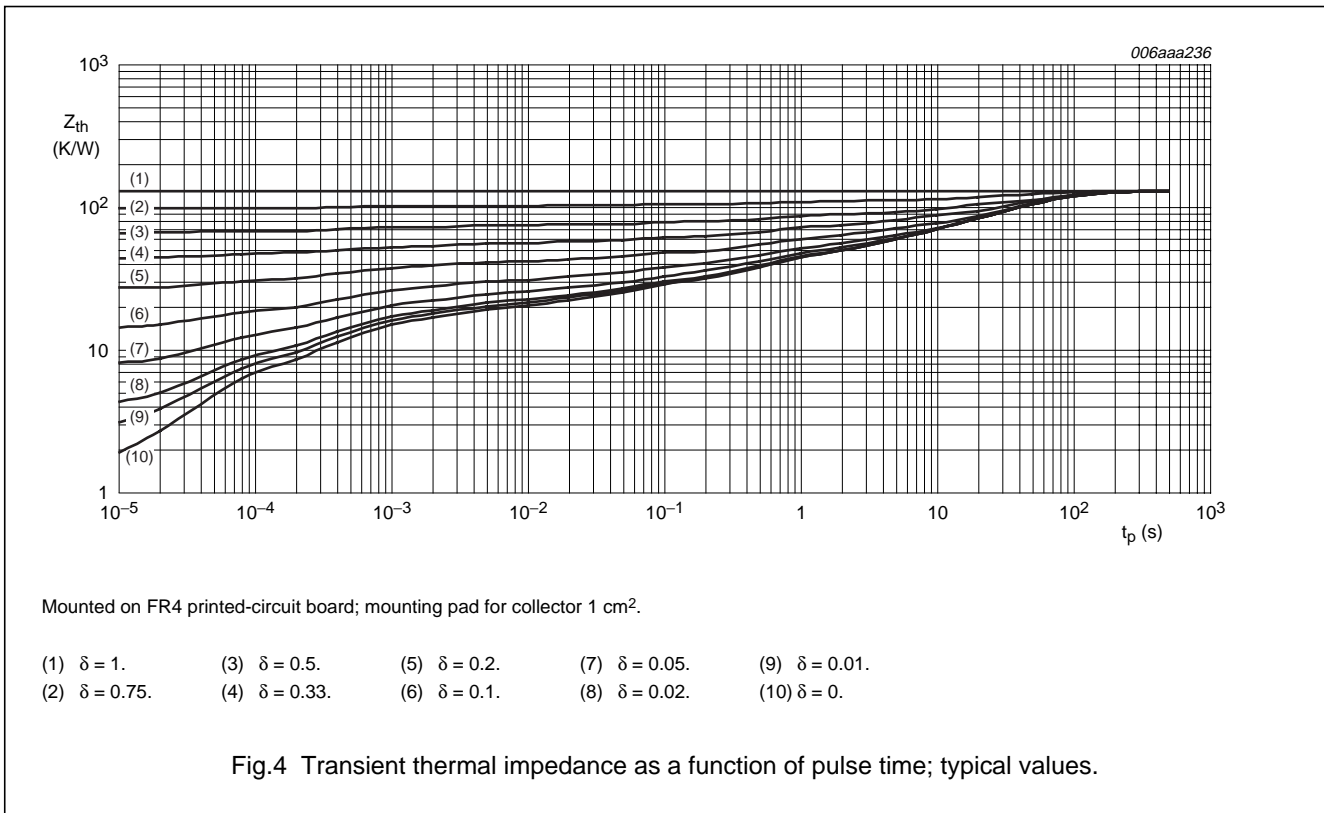
**Notes**

1. Device mounted on a printed-circuit board, single-sided copper, tin-plated and standard footprint.
2. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 1 cm<sup>2</sup>.
3. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 6 cm<sup>2</sup>.



NPN switching transistor

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## NPN switching transistor

PXT2222A

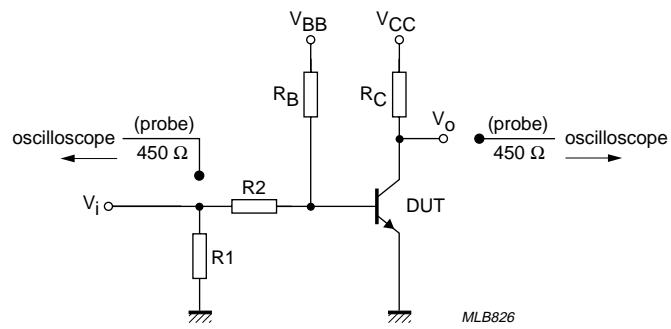
## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$I_E = 0\text{ A}; V_{CB} = 60\text{ V}$	–	10	nA
		$I_E = 0\text{ A}; V_{CB} = 60\text{ V}; T_j = 125\text{ °C}$	–	10	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$I_C = 0\text{ A}; V_{BE} = 5\text{ V}$	–	10	nA
$h_{FE}$	DC current gain	$I_C = 0.1\text{ mA}; V_{CE} = 10\text{ V}$	35	–	
		$I_C = 1\text{ mA}; V_{CE} = 10\text{ V}$	50	–	
		$I_C = 10\text{ mA}; V_{CE} = 10\text{ V}$	75	–	
		$I_C = 10\text{ mA}; V_C = 10\text{ V}; T_j = -55\text{ °C}$	35	–	
		$I_C = 150\text{ mA}; V_{CE} = 1\text{ V}$	50	–	
		$I_C = 150\text{ mA}; V_{CE} = 10\text{ V}$	100	300	
		$I_C = 500\text{ mA}; V_{CE} = 10\text{ V}$	40	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 150\text{ mA}; I_B = 15\text{ mA}$	–	300	mV
		$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	–	1	V
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 150\text{ mA}; I_B = 15\text{ mA}$	0.6	1.2	V
		$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	–	2	V
$C_c$	collector capacitance	$I_E = i_e = 0\text{ A}; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$	–	8	pF
$C_e$	emitter capacitance	$I_C = i_c = 0\text{ A}; V_{EB} = 500\text{ mV}; f = 1\text{ MHz}$	–	25	pF
$f_T$	transition frequency	$I_C = 20\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	300	–	MHz
F	noise figure	$I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 1\text{ kHz}; B = 200\text{ Hz}$	–	4	dB
<b>Switching times (between 10% and 90% levels); (see Fig.6)</b>					
$t_{on}$	turn-on time	$I_{Con} = 150\text{ mA}; I_{Bon} = 15\text{ mA};$ $I_{Boff} = -15\text{ mA}$	–	35	ns
$t_d$	delay time		–	15	ns
$t_r$	rise time		–	20	ns
$t_{off}$	turn-off time		–	250	ns
$t_s$	storage time		–	200	ns
$t_f$	fall time		–	60	ns

## NPN switching transistor

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$V_i = 9.5 \text{ V}$ ;  $T = 500 \mu\text{s}$ ;  $t_p = 10 \mu\text{s}$ ;  $t_r = t_f \leq 3 \text{ ns}$ .  
 $R_1 = 68 \Omega$ ;  $R_2 = 325 \Omega$ ;  $R_B = 325 \Omega$ ;  $R_C = 160 \Omega$ .  
 $V_{BB} = -3.5 \text{ V}$ ;  $V_{CC} = 29.5 \text{ V}$ .  
Oscilloscope: input impedance  $Z_i = 50 \Omega$ .

Fig.6 Test circuit for switching times.

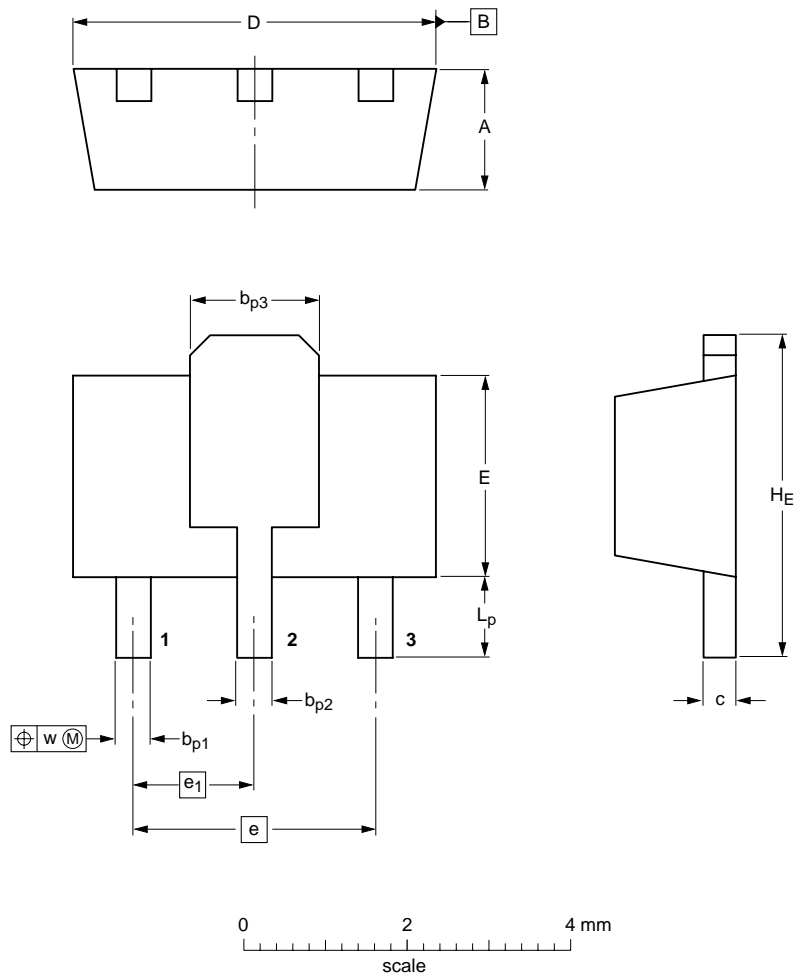
NPN switching transistor

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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

UNIT	A	bp1	bp2	bp3	c	D	E	e	e1	HE	Lp	w
mm	1.6 1.4	0.48 0.35	0.53 0.40	1.8 1.4	0.44 0.23	4.6 4.4	2.6 2.4	3.0	1.5	4.25 3.75	1.2 0.8	0.13

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT89		TO-243	SC-62		99-09-13 04-08-03



## NPN switching transistor

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## DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	DEFINITION
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Printed in The Netherlands

R75/04/pp10

Date of release: 2004 Nov 22

Document order number: 9397 750 13894

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