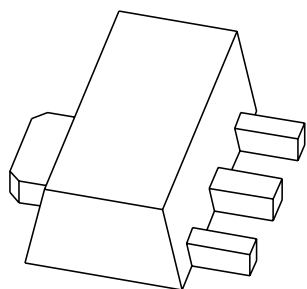


DATA SHEET



PXT2222A NPN switching transistor

Product specification
Supersedes data of September 1994
File under Discrete Semiconductors, SC04

1997 May 05

NPN switching transistor

PXT2222A

FEATURES

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

APPLICATIONS

- General purpose switching and linear amplification.

DESCRIPTION

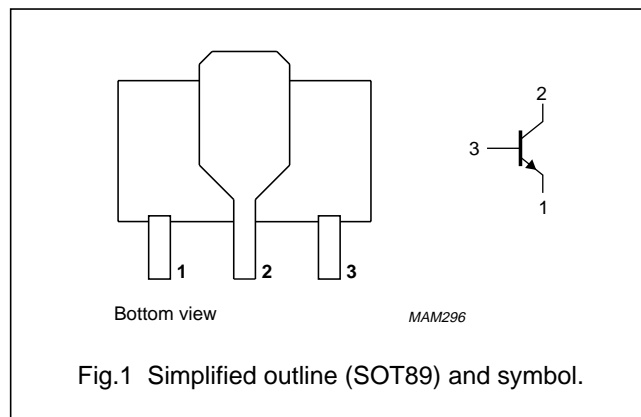
NPN switching transistor in a SOT89 plastic package.
PNP complement: PXT2907A.

MARKING

TYPE NUMBER	MARKING CODE
PXT2222A	p1P

PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	75	V
V_{CEO}	collector-emitter voltage	open base	–	40	V
I_C	collector current (DC)		–	600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	–	1.2	W
h_{FE}	DC current gain	$I_C = 150\text{ mA}; V_{CE} = 10\text{ V}$	100	300	
f_T	transition frequency	$I_C = 20\text{ mA}; V_{CE} = 20\text{ V}; f = 100\text{ MHz}$	300	–	MHz
t_{off}	turn-off time	$I_{Con} = 150\text{ mA}; I_{Bon} = 15\text{ mA}; I_{Boff} = -15\text{ mA}$	–	250	ns

NPN switching transistor

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LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	75	V
V_{CEO}	collector-emitter voltage	open base	–	40	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	600	mA
I_{CM}	peak collector current		–	800	mA
I_{BM}	peak base current		–	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$; note 1	–	1.2	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

- Device mounted on a printed-circuit board, single-sided copper, tinned, m
 - ounting pad for collector 1 cm².
For other mounting conditions, see “*Thermal considerations for SOT89 in the General part of handbook SC04*”.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	101	K/W
$R_{th\ j-s}$	thermal resistance from junction to soldering point		20	K/W

Note

- Device mounted on a printed-circuit board, single-sided copper, tinned, mounting pad for collector 1 cm².
For other mounting conditions, see “*Thermal considerations for SOT89 in the General part of handbook SC04*”.

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0$; $V_{CB} = 60\text{ V}$	–	10	nA
		$I_E = 0$; $V_{CB} = 60\text{ V}$; $T_{amb} = 125\text{ °C}$	–	10	μA
I_{EBO}	emitter cut-off current	$I_C = 0$; $V_{BE} = 5\text{ V}$	–	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	–	
		$I_C = 10\text{ mA}$; $V_C = 10\text{ V}$; $T_{amb} = -55\text{ °C}$	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

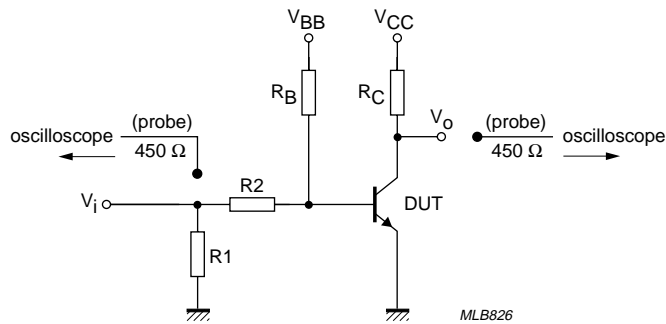
NPN switching transistor

PXT2222A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
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	$I_E = i_e = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$	–	8	pF
C_e	emitter capacitance	$I_C = i_c = 0; V_{EB} = 500\text{ mV}; f = 1\text{ MHz}$	–	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

Switching times (between 10% and 90% levels); see Fig.2

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



$V_i = 9.5\text{ V}; T = 500\text{ }\mu\text{s}; t_p = 10\text{ }\mu\text{s}; t_r = t_f \leq 3\text{ ns}.$
 $R1 = 68\text{ }\Omega; R2 = 325\text{ }\Omega; R_B = 325\text{ }\Omega; R_C = 160\text{ }\Omega.$
 $V_{BB} = -3.5\text{ V}; V_{CC} = 29.5\text{ V}.$
 Oscilloscope: input impedance $Z_i = 50\text{ }\Omega.$

Fig.2 Test circuit for switching times.

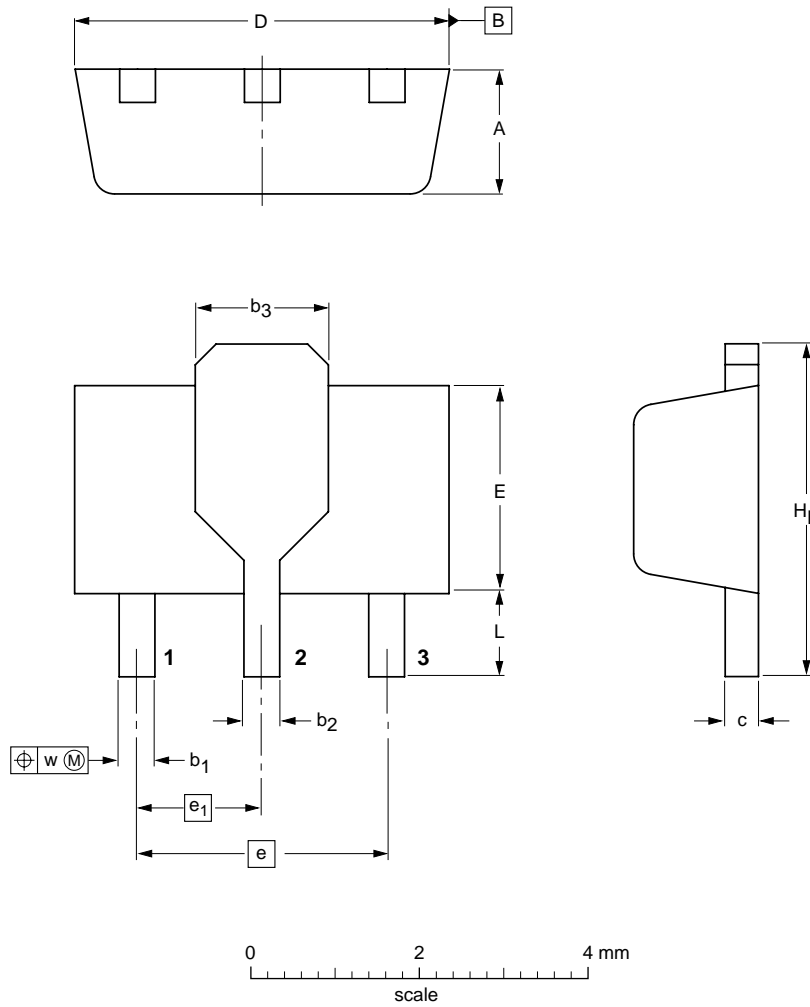
NPN switching transistor

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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	b ₁	b ₂	b ₃	c	D	E	e	e ₁	H _E	L min.	w
mm	1.6 1.4	0.48 0.35	0.53 0.40	1.8 1.4	0.44 0.37	4.6 4.4	2.6 2.4	3.0	1.5	4.25 3.75	0.8	0.13

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT89						97-02-28

NPN switching transistor

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DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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NPN switching transistor

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Printed in The Netherlands

117047/00/02/pp8

Date of release: 1997 May 05

Document order number: 9397 750 02047

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