

PNP switching transistor

PXT3906

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 40 V).

APPLICATIONS

- High-speed saturated switching applications.

DESCRIPTION

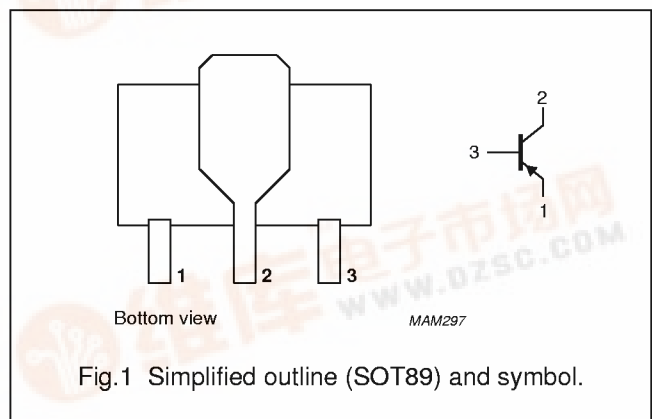
PNP switching transistor in a SOT89 plastic package.
NPN complement: PXT3904.

MARKING

TYPE NUMBER	MARKING CODE
PXT3906	p2A

PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base



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	–	–40	V
V_{CEO}	collector-emitter voltage	open base	–	–40	V
V_{EBO}	emitter-base voltage	open collector	–	–6	V
I_C	collector current (DC)		–	–100	mA
I_{CM}	peak collector current		–	–200	mA
I_{BM}	peak base current		–	–100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$; note 1	–	1.2	W
T_{stg}	storage temperature		–55	+150	$^{\circ}\text{C}$
T_j	junction temperature		–	150	$^{\circ}\text{C}$
T_{amb}	operating ambient temperature		–55	+150	$^{\circ}\text{C}$

Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 6 cm².
For other mounting conditions, see “Thermal considerations for SOT89 in the General Part of associated Handbook”.

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PXT3906

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	104	K/W
$R_{th\ j-s}$	thermal resistance from junction to soldering point		24	K/W

Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 6 cm².
For other mounting conditions, see "Thermal considerations for SOT89 in the General Part of associated Handbook".

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0$; $V_{CB} = -30\ \text{V}$	–	–50	nA
I_{EBO}	emitter cut-off current	$I_C = 0$; $V_{EB} = -6\ \text{V}$	–	–50	nA
h_{FE}	DC current gain	$V_{CE} = -1\ \text{V}$; (see Fig.2) $I_C = -0.1\ \text{mA}$ $I_C = -1\ \text{mA}$ $I_C = -10\ \text{mA}$ $I_C = -50\ \text{mA}$ $I_C = -100\ \text{mA}$	60 80 100 60 30	– – 300 – –	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\ \text{mA}$; $I_B = -1\ \text{mA}$	–	–250	mV
		$I_C = -50\ \text{mA}$; $I_B = -5\ \text{mA}$	–	–400	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = -10\ \text{mA}$; $I_B = -1\ \text{mA}$	–650	–850	mV
		$I_C = -50\ \text{mA}$; $I_B = -5\ \text{mA}$	–	–950	mV
C_c	collector capacitance	$I_E = I_C = 0$; $V_{CB} = -5\ \text{V}$; $f = 1\ \text{MHz}$	–	4.5	pF
C_e	emitter capacitance	$I_C = I_E = 0$; $V_{EB} = -500\ \text{mV}$; $f = 1\ \text{MHz}$	–	10	pF
f_T	transition frequency	$I_C = -10\ \text{mA}$; $V_{CE} = -20\ \text{V}$; $f = 100\ \text{MHz}$	250	–	MHz
F	noise figure	$I_C = -100\ \mu\text{A}$; $V_{CE} = -5\ \text{V}$; $R_S = 1\ \text{k}\Omega$; $f = 10\ \text{Hz}$ to $15.7\ \text{kHz}$	–	4	dB
Switching times (between 10% and 90% levels); (see Fig.3)					
t_{on}	turn-on time	$I_{Con} = -10\ \text{mA}$; $I_{Bon} = -1\ \text{mA}$; $I_{Boff} = 1\ \text{mA}$	–	65	ns
t_d	delay time		–	35	ns
t_r	rise time		–	35	ns
t_{off}	turn-off time		–	300	ns
t_s	storage time		–	225	ns
t_f	fall time		–	75	ns

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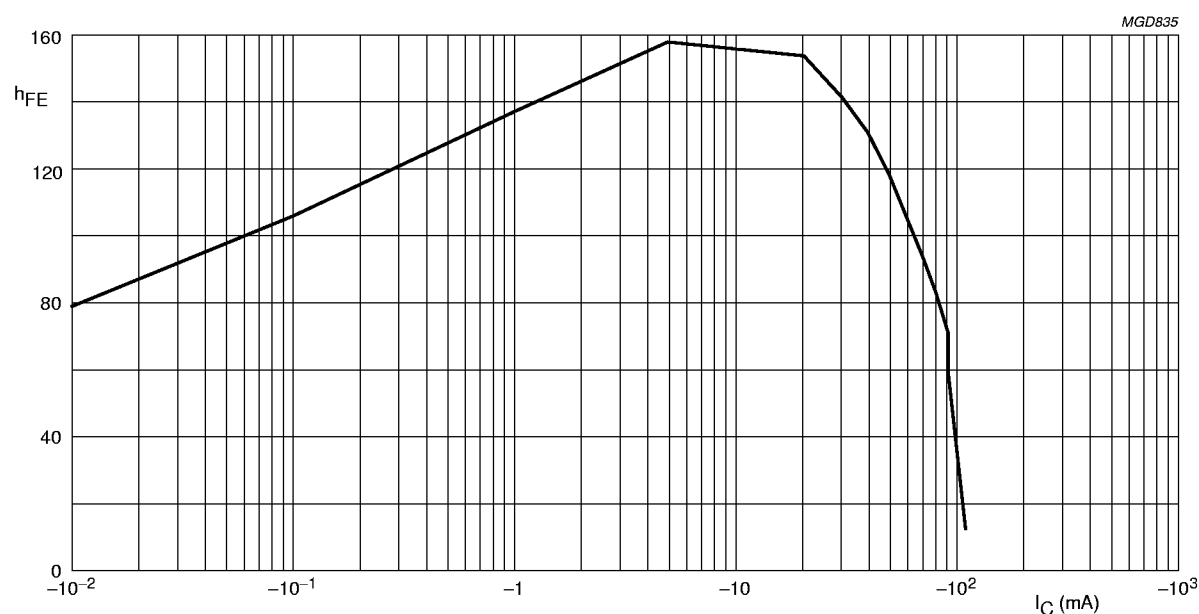
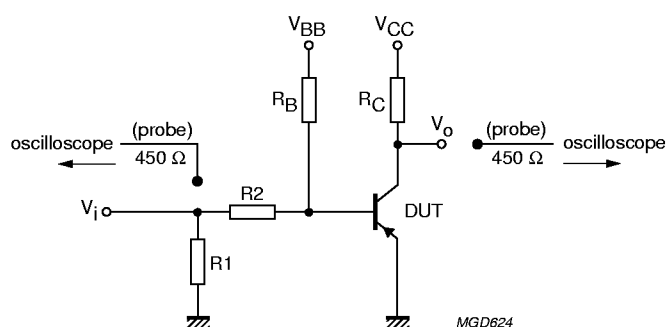
 $V_{CE} = -1$ V.

Fig.2 DC current gain; typical values.



$V_i = 5$ V; $T = 500$ μ s; $t_p = 10$ μ s; $t_r = t_f \leq 3$ ns.
 $R_1 = 56$ Ω ; $R_2 = 2.5$ k Ω ; $R_B = 3.9$ k Ω ; $R_C = 270$ Ω .
 $V_{BB} = 1.9$ V; $V_{CC} = -3$ V.
 Oscilloscope: input impedance $Z_i = 50$ Ω .

Fig.3 Test circuit for switching times.

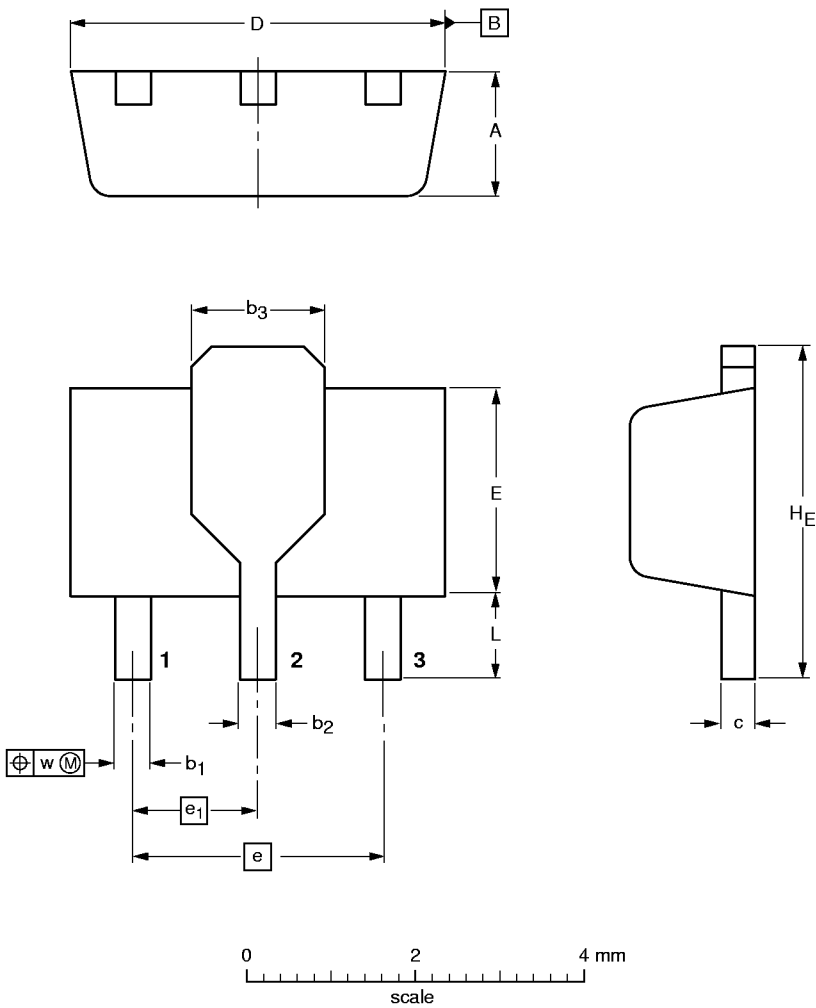
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PACKAGE OUTLINE

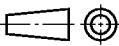
Plastic surface mounted package; collector pad for good heat transfer; 3 leads

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