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

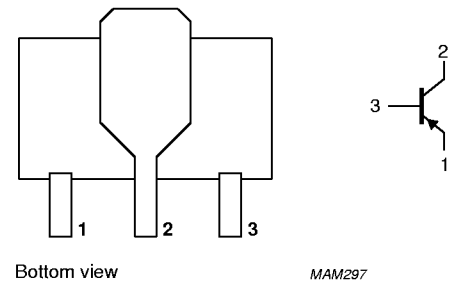


Fig.1 Simplified outline (SOT89) and symbol.

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	$T_{amb} \leq 25$ °C; note 1	–	1.2	W
T_{stg}	storage temperature		−55	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		−55	+150	°C

Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 6 cm^2.
   For other mounting conditions, see *"Thermal considerations for SOT89 in the General Part of associated Handbook"*.

THERMAL CHARACTERISTICS

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

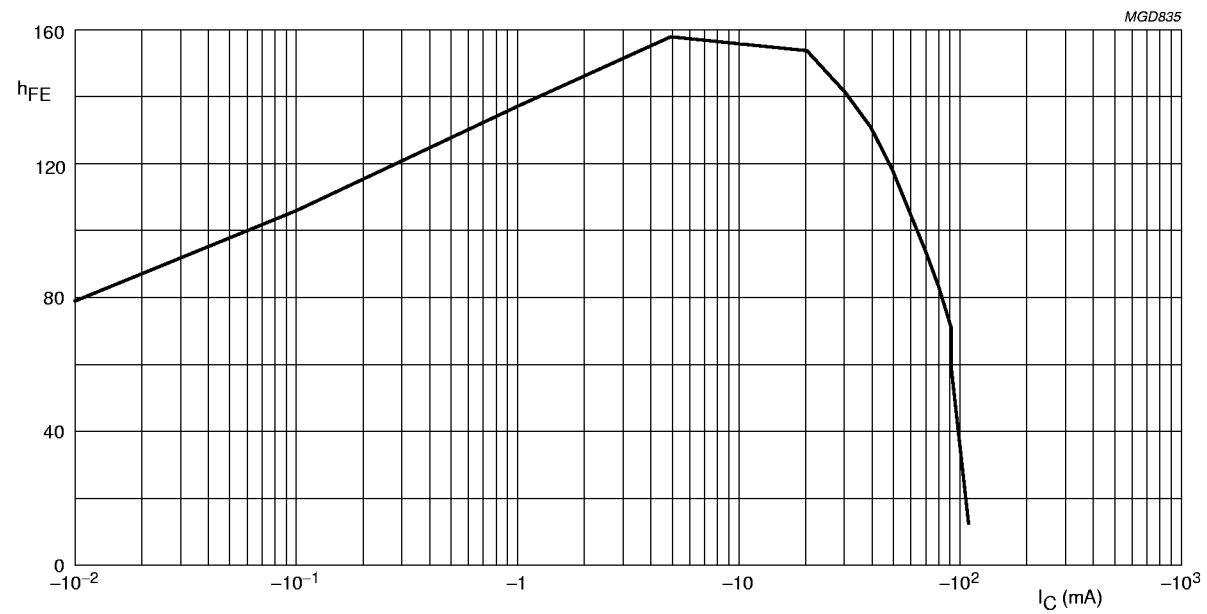
Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 6 cm^2. For other mounting conditions, see *"Thermal considerations for SOT89 in the General Part of associated Handbook".*

CHARACTERISTICS

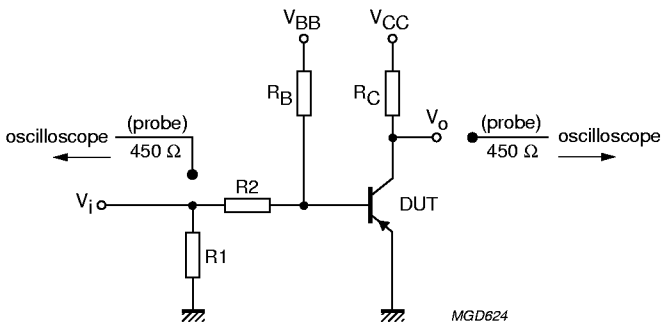
T_j = 25 °C unless otherwise specified.

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



$V_{CE} = -1$ V.

Fig.2 DC current gain; typical values.

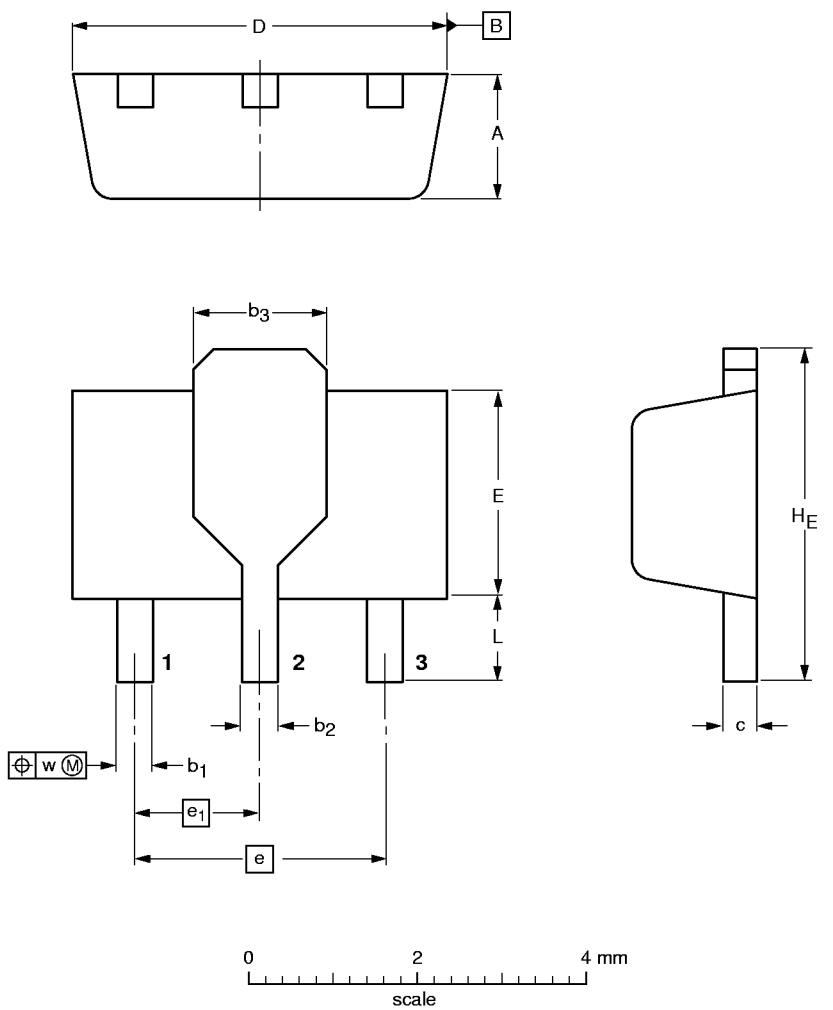


$V_i = 5$ V; T = 500 µs; $t_p = 10$ µs; $t_r = t_f \leq 3$ ns.
R1 = 56 Ω; R2 = 2.5 kΩ; $R_B = 3.9$ kΩ; $R_C = 270$ Ω.
$V_{BB} = 1.9$ V; $V_{CC} = -3$ V.
Oscilloscope: input impedance $Z_i = 50$ Ω.

Fig.3 Test circuit for switching times.

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