

PNP switching transistor

PZT3906

FEATURES

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

APPLICATIONS

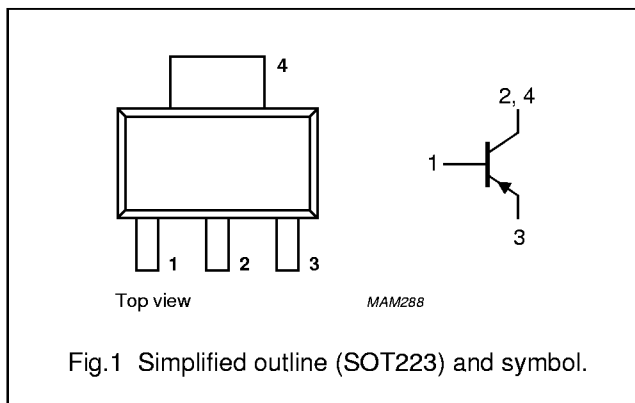
- High-speed switching.

DESCRIPTION

PNP switching transistor in a SOT223 plastic package.
NPN complement: PZT3904.

PINNING

PIN	DESCRIPTION
1	base
2, 4	collector
3	emitter



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	–	1.05	W
T_{stg}	storage temperature		–65	+150	$^{\circ}\text{C}$
T_j	junction temperature		–	150	$^{\circ}\text{C}$
T_{amb}	operating ambient temperature		–65	+150	$^{\circ}\text{C}$

Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm². For other mounting conditions, see “Thermal considerations for SOT223 in the General Part of associated Handbook”.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	115	K/W
$R_{th\ j-s}$	thermal resistance from junction to soldering point		34	K/W

Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm².
For other mounting conditions, see "Thermal considerations for SOT223 in the General Part of associated Handbook".

CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$ 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	$I_C = -10\text{ mA}$; $I_B = -1\text{ mA}$	—	–200	mV
		$I_C = -50\text{ mA}$; $I_B = -5\text{ mA}$	—	–200	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	$I_C = -100\text{ }\mu\text{A}$; $V_{CE} = -5\text{ V}$; $R_S = 1\text{ k}\Omega$; $f = 10\text{ Hz to }15.7\text{ kHz}$	—	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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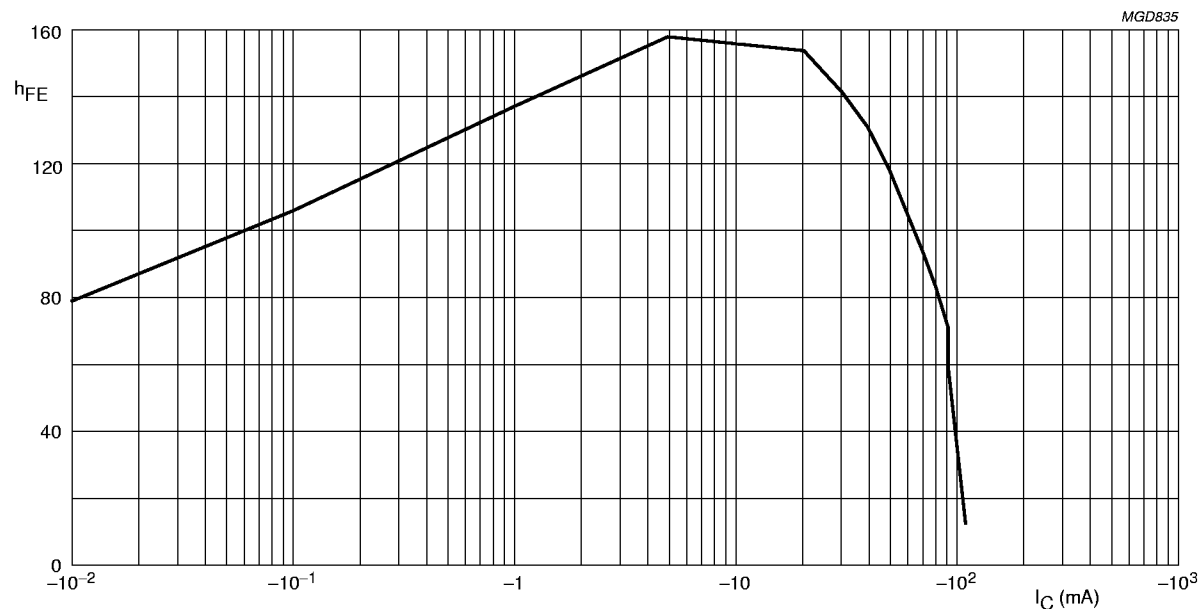
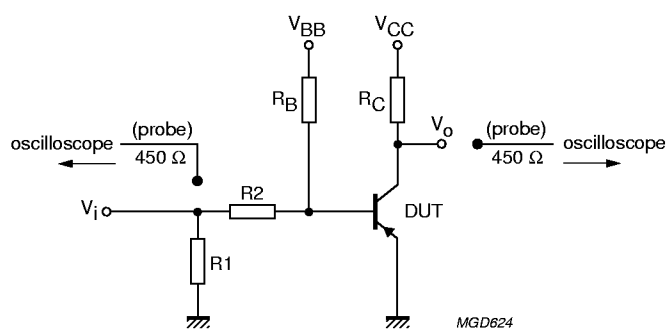
 $V_{CE} = -1$ V.

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; 4 leads

SOT223

