PNP switching transistor 2N4403

FEATURES

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

APPLICATIONS

- Industrial and consumer switching applications.

DESCRIPTION

PNP switching transistor in a TO-92; SOT54 plastic package. NPN complement: 2N4401.

PINNING

PIN	DESCRIPTION
1	collector
2	base
3	emitter

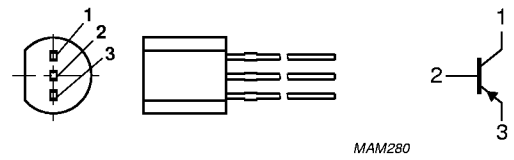


Fig.1 Simplified outline (TO-92; SOT54) and symbol.

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	–	–5	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	$T_{amb} \leq 25$ °C	–	630	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	200	K/W

Note

1. Transistor mounted on an FR4 printed-circuit board.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	I_E = 0 mA; V_{CB} = –40 V	–	–50	nA
I_{EBO}	emitter cut-off current	I_C = 0 mA; V_{EB} = –5 V	–	–50	nA
h_{FE}	DC current gain	V_{CE} = –1 V; see Fig.2			
		I_C = –0.1 mA	30	–	
		I_C = –1 mA	60	–	
		I_C = –10 mA	100	–	
		V_{CE} = –2 V			
		I_C = –150 mA	100	300	
		I_C = –500 mA	20	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = –150 mA; I_B = –15 mA	–	–400	mV
		I_C = –500 mA; I_B = –50 mA	–	–750	mV
V_{BEsat}	base-emitter saturation voltage	I_C = –150 mA; I_B = –15 mA	–	–950	mV
		I_C = –500 mA; I_B = –50 mA	–	–1.3	V
C_c	collector capacitance	$I_E = i_e$ = 0; V_{CB} = –10 V; f = 1 MHz	–	8.5	pF
C_e	emitter capacitance	$I_C = i_c$ = 0; V_{EB} = –500 mV; f = 1 MHz	–	30	pF
f_T	transition frequency	I_C = –20 mA; V_{CE} = –10 V; f = 100 MHz	200	–	MHz
Switching times (between 10% and 90% levels); see Fig.3					
t_{on}	turn-on time	I_{Con} = –150 mA; I_{Bon} = –15 mA; I_{Boff} = 15 mA	–	40	ns
t_d	delay time		–	15	ns
t_r	rise time		–	30	ns
t_{off}	turn-off time		–	350	ns
t_s	storage time		–	300	ns
t_f	fall time		–	50	ns

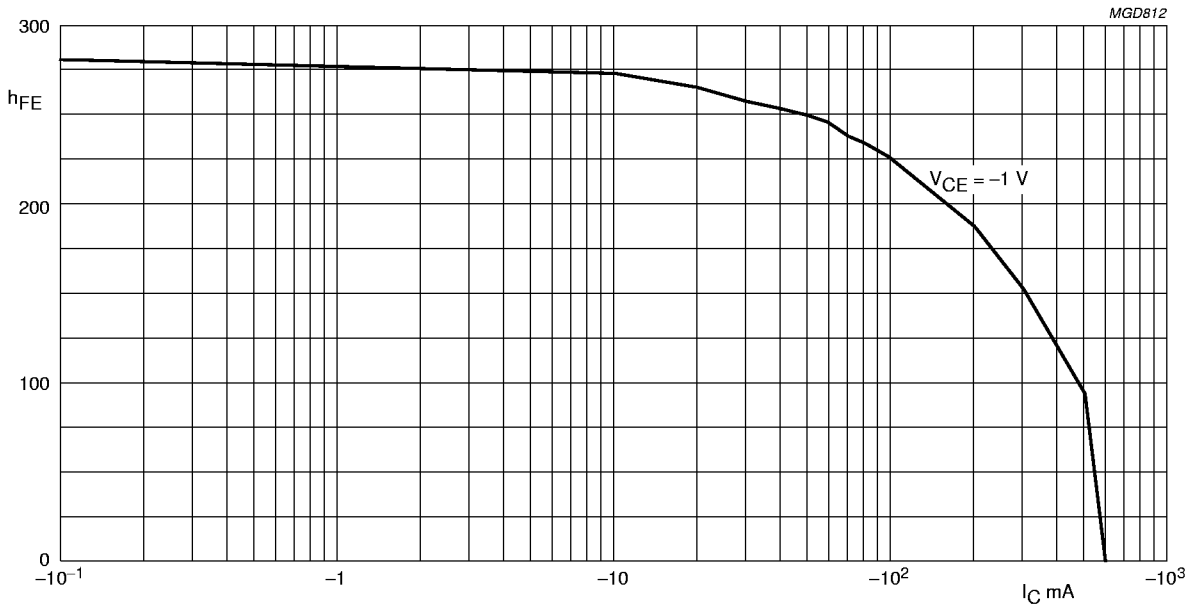
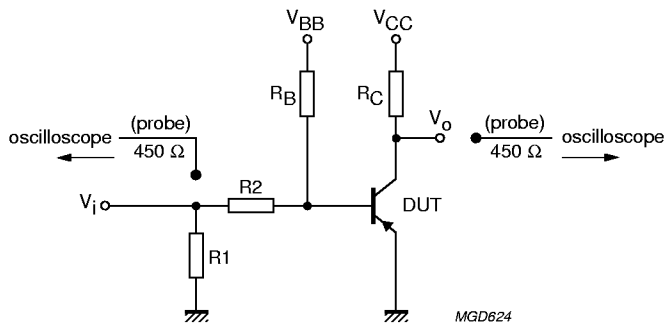


Fig.2 DC current gain; typical values.

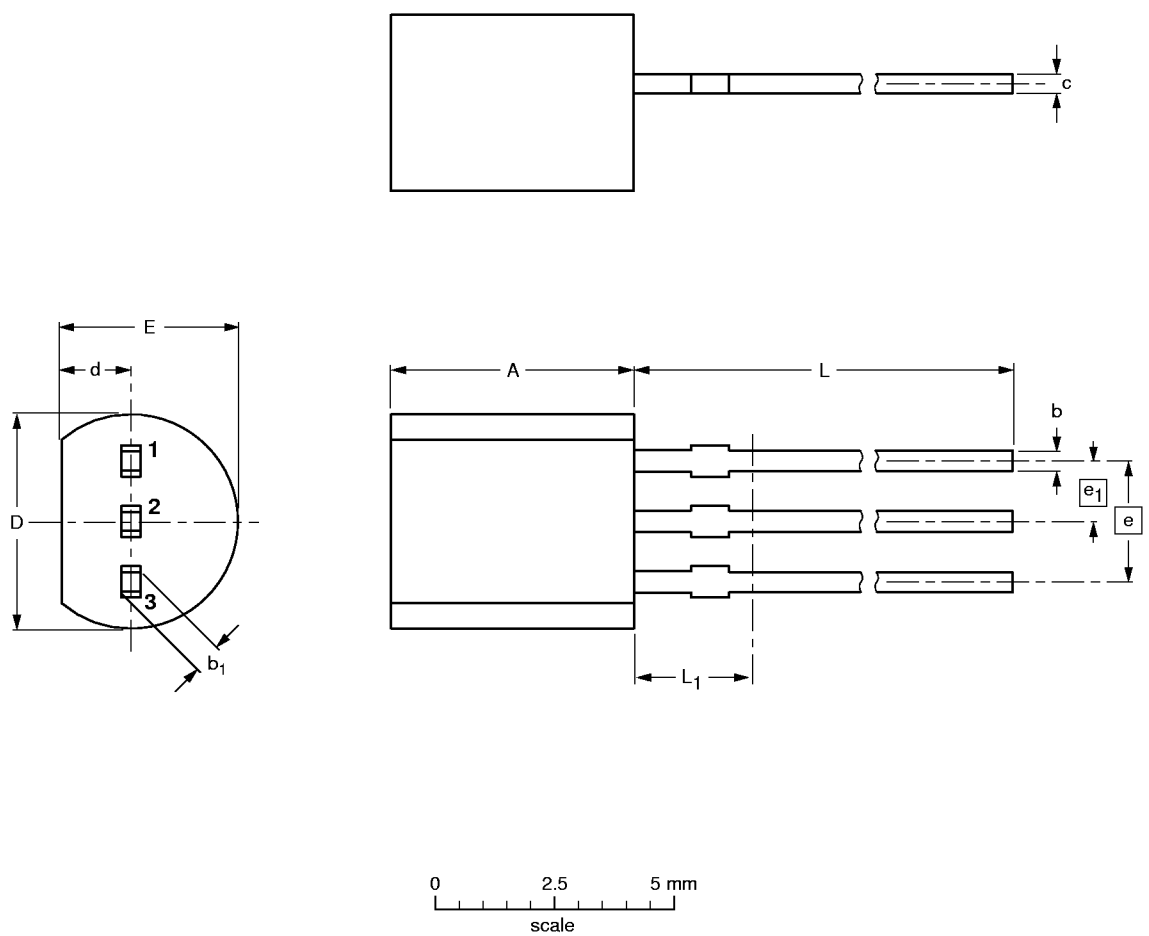


V_i = −9.5 V; T = 500 μs; t_p = 10 μs; t_r = t_f ≤ 3 ns.
R1 = 68 Ω; R2 = 325 Ω; R_B = 325 Ω; R_C = 160 Ω.
V_{BB} = 3.5 V; V_{CC} = −29.5 V.
Oscilloscope: input impedance Z_i = 50 Ω.

Fig.3 Test circuit for switching times.

PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads **SOT54**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b_1	c	D	d	E	e	e_1	L	L_1(1)
mm	5.2 5.0	0.48 0.40	0.66 0.56	0.45 0.40	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT54		TO-92	SC-43			97-02-28