

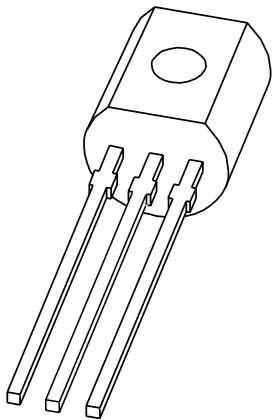
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DATA SHEET



PN2369A NPN switching transistor

Product specification
Supersedes data of 1999 Apr 14

2004 Dec 08

NPN switching transistor

PN2369A

FEATURES

- Low current (max. 200 mA)
- Low voltage (max. 15 V).

APPLICATIONS

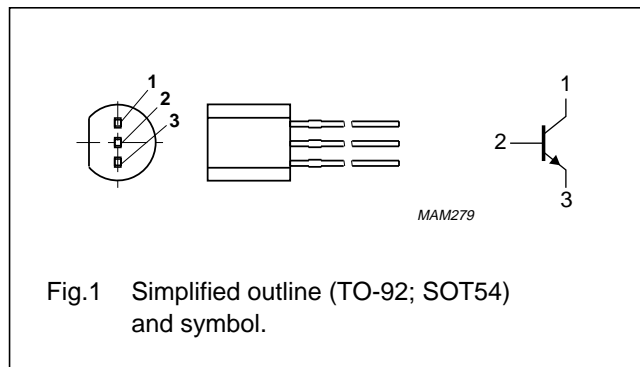
- High-speed switching applications.

DESCRIPTION

NPN switching transistor in a TO-92; SOT54 plastic package.

PINNING

PIN	DESCRIPTION
1	collector
2	base
3	emitter



ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PN2369A	SC-43A	plastic single-ended leaded (through hole) package; 3 leads	SOT54

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	40	V
V_{CEO}	collector-emitter voltage	open base	–	15	V
V_{EBO}	emitter-base voltage	open collector	–	5	V
I_C	collector current (DC)		–	200	mA
I_{CM}	peak collector current		–	300	mA
I_{BM}	peak base current		–	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	–	500	mW
T_{stg}	storage temperature		–65	+150	$^\circ\text{C}$
T_j	junction temperature		–	150	$^\circ\text{C}$
T_{amb}	ambient temperature		–65	+150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1	250	K/W

Note

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

NPN switching transistor

PN2369A

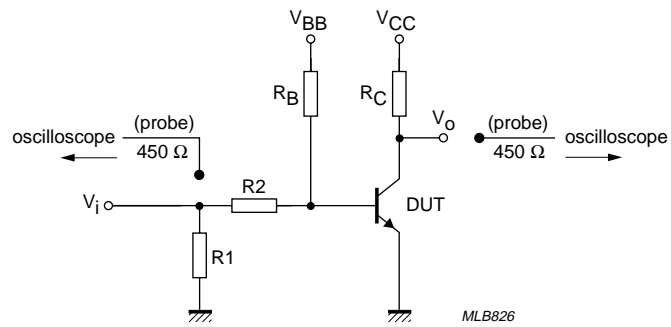
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = 20\text{ V}; I_E = 0\text{ A}$	–	–	400	nA
		$V_{CB} = 20\text{ V}; I_E = 0\text{ A}; T_{amb} = 125\text{ °C}$	–	–	30	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 4\text{ V}; I_C = 0\text{ A}$	–	–	100	nA
h_{FE}	DC current gain	$V_{CE} = 350\text{ mV}; I_C = 10\text{ mA}$	40	–	120	
		$V_{CE} = 350\text{ mV}; I_C = 10\text{ mA}; T_{amb} = -55\text{ °C}$	20	–	–	
		$V_{CE} = 400\text{ mV}; I_C = 30\text{ mA}$	30	–	–	
		$V_{CE} = 1\text{ V}; I_C = 100\text{ mA}$	20	–	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 1\text{ mA}$	–	–	200	mV
		$I_C = 10\text{ mA}; I_B = 10\text{ mA}$	–	–	300	mV
		$I_C = 30\text{ mA}; I_B = 3\text{ mA}$	–	–	250	mV
		$I_C = 100\text{ mA}; I_B = 10\text{ mA}$	–	–	500	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 1\text{ mA}$	700	–	850	mV
C_c	collector capacitance	$V_{CB} = 5\text{ V}; I_E = i_e = 0\text{ A}; f = 1\text{ MHz}$	–	–	4	pF
f_T	transition frequency	$V_{CE} = 10\text{ V}; I_C = 10\text{ mA}; f = 100\text{ MHz}$	500	–	–	MHz
Switching times (between 10% and 90% levels); see Fig.2						
t_{on}	turn-on time	$I_{Con} = 10\text{ mA}; I_{Bon} = 3\text{ mA}; I_{Boff} = -1.5\text{ mA}$	–	8	10	ns
t_d	delay time		–	–	4	ns
t_r	rise time		–	–	6	ns
t_{off}	turn-off time		–	10	20	ns
t_s	storage time		–	–	10	ns
t_f	fall time		–	–	10	ns

NPN switching transistor

PN2369A



$V_i = 0.5 \text{ V to } 4.2 \text{ V}$; $T = 500 \mu\text{s}$; $t_p = 10 \mu\text{s}$; $t_r = t_f \leq 1 \text{ ns}$.

$R_1 = 56 \Omega$; $R_2 = 1 \text{ k}\Omega$; $R_B = 1 \text{ k}\Omega$; $R_C = 270 \Omega$.

$V_{BB} = 0.2 \text{ V}$; $V_{CC} = 2.7 \text{ V}$.

Oscilloscope: input impedance $Z_i = 50 \Omega$.

Fig.2 Test circuit for switching times.

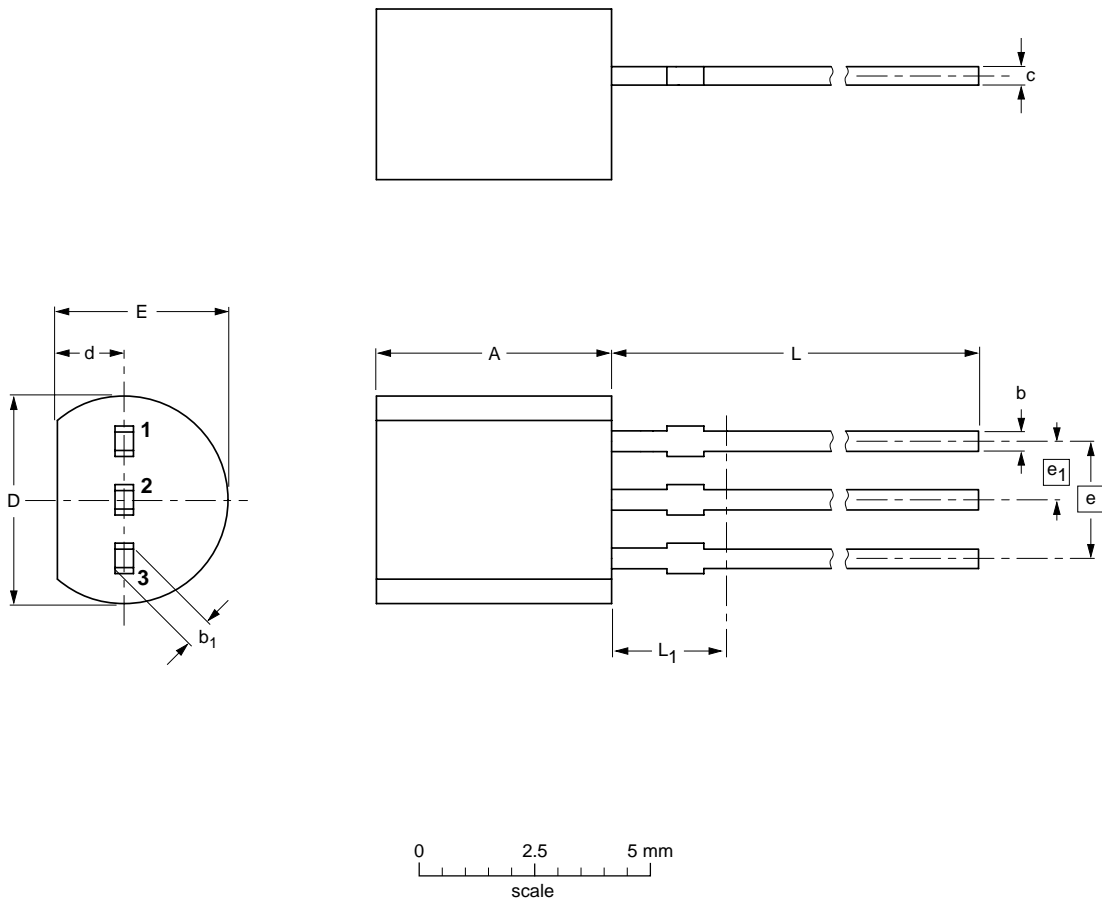
NPN switching transistor

PN2369A

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⁾ max.
mm	5.2 5.0	0.48 0.40	0.66 0.55	0.45 0.38	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	JEITA		
SOT54		TO-92	SC-43A		04-06-28 04-11-16

NPN switching transistor

PN2369A

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