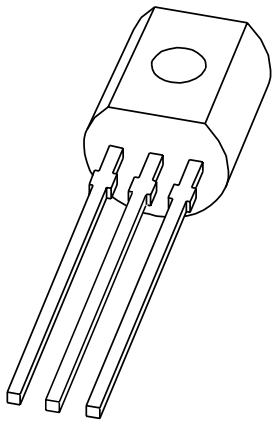
DATA SHEET



PN2369A
NPN switching transistor

Product specification
Supersedes data of 1999 Apr 14

2004 Dec 08

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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

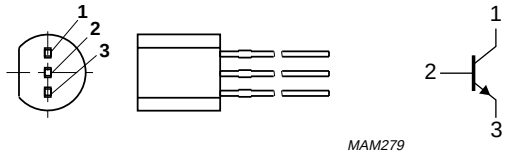


Fig.1 Simplified outline (TO-92; SOT54) and symbol.

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	$T_{amb} \leq 25$ °C	–	500	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	ambient temperature		–65	+150	°C

THERMAL CHARACTERISTICS

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

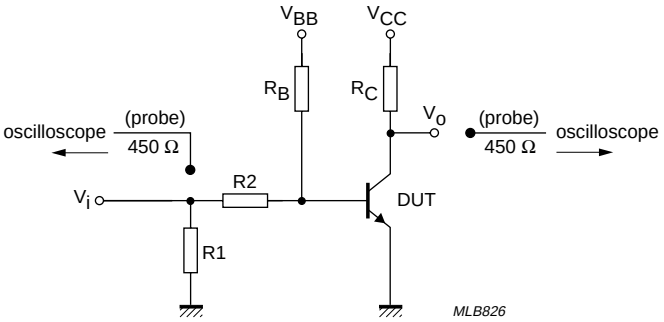
Note

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

CHARACTERISTICS

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

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

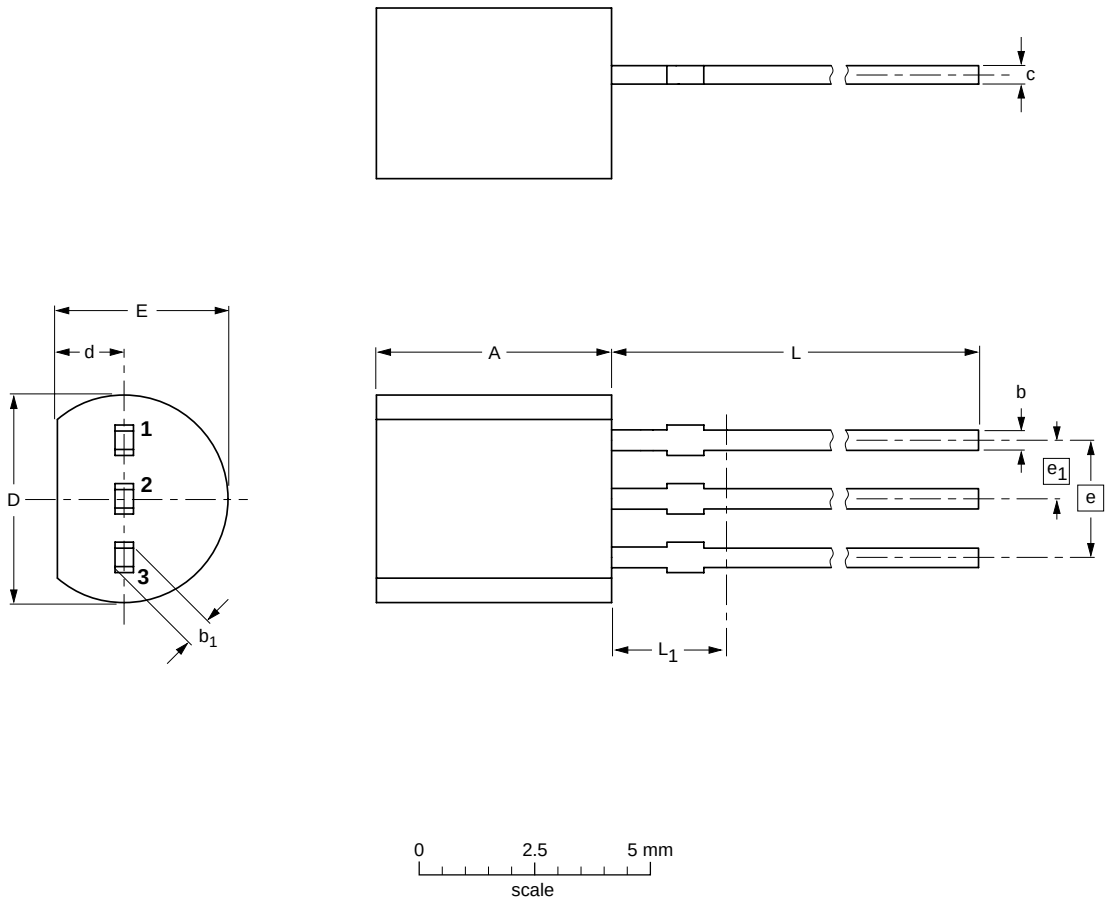


V_i = 0.5 V to 4.2 V; T = 500 µs; t_p = 10 µs; $t_r = t_f \leq 1$ ns.
R1 = 56 Ω; R2 = 1 kΩ; R_B = 1 kΩ; R_C = 270 Ω.
V_{BB} = 0.2 V; V_{CC} = 2.7 V.
Oscilloscope: input impedance Z_i = 50 Ω.

Fig.2 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) 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

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS(1)	PRODUCT STATUS(2)(3)	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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Contact information

For additional information please visit **http://www.semiconductors.philips.com**. Fax: **+31 40 27 24825**
For sales offices addresses send e-mail to: **sales.addresses@www.semiconductors.philips.com**.

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