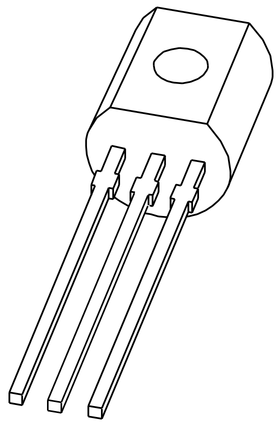
DATA SHEET



2N5550; 2N5551
NPN high-voltage transistors

Product specification
Supersedes data of September 1994
File under Discrete Semiconductors, SC04

1997 Apr 09

Philips
Semiconductors

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NPN high-voltage transistors — 2N5550; 2N5551

FEATURES

- Low current (max. 300 mA)
- High voltage (max. 160 V).

APPLICATIONS

- Switching and amplification in high voltage applications such as telephony.

DESCRIPTION

NPN high-voltage transistor in a TO-92; SOT54 plastic package. PNP complements: 2N5400 and 2N5401.

PINNING

PIN	DESCRIPTION
1	collector
2	base
3	emitter

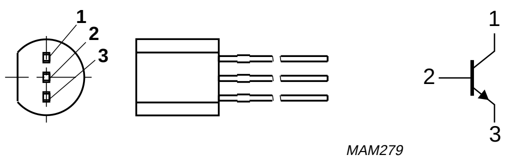


Fig.1 Simplified outline (TO-92; SOT54) and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	2N5550		–	160	V
	2N5551		–	180	V
V_{CEO}	collector-emitter voltage	open base			
	2N5550		–	140	V
	2N5551		–	160	V
I_{CM}	peak collector current		–	600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	–	630	mW
h_{FE}	DC current gain	I_C = 10 mA; V_{CE} = 5 V			
	2N5550		60	–	
	2N5551		80	–	
C_c	collector capacitance	$I_E = i_e = 0$; V_{CB} = 10 V; f = 1 MHz	–	6	pF
f_T	transition frequency	I_C = 10 mA; V_{CE} = 10 V; f = 100 MHz	100	300	MHz

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			
	2N5550		–	160	V
	2N5551		–	180	V
V_{CEO}	collector-emitter voltage	open base			
	2N5550		–	140	V
	2N5551		–	160	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	300	mA
I_{CM}	peak collector current		–	600	mA
I_{BM}	peak base current		–	100	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	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	200	K/W

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current				
	2N5550	$I_E = 0$; $V_{CB} = 100$ V	–	100	nA
		$I_E = 0$; $V_{CB} = 100$ V; $T_{amb} = 100$ °C	–	100	μA
I_{CBO}	collector cut-off current				
	2N5551	$I_E = 0$; $V_{CB} = 120$ V	–	50	nA
		$I_E = 0$; $V_{CB} = 120$ V; $T_{amb} = 100$ °C	–	50	μA
I_{EBO}	emitter cut-off current	$I_C = 0$; $V_{EB} = 4$ V	–	50	nA
h_{FE}	DC current gain	$I_C = 1$ mA; $V_{CE} = 5$ V; see Fig.2			
	2N5550		60	–	
	2N5551		80	–	
h_{FE}	DC current gain	$I_C = 10$ mA; $V_{CE} = 5$ V; see Fig.2			
	2N5550		60	250	
	2N5551		80	250	
h_{FE}	DC current gain	$I_C = 50$ mA; $V_{CE} = 5$ V; see Fig.2			
	2N5550		20	–	
	2N5551		30	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10$ mA; $I_B = 1$ mA	–	150	mV
V_{CEsat}	collector-emitter saturation voltage	$I_C = 50$ mA; $I_B = 5$ mA			
	2N5550		–	250	mV
	2N5551		–	200	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10$ mA; $I_B = 1$ mA	–	1	V
		$I_C = 50$ mA; $I_B = 5$ mA	–	1	V
C_c	collector capacitance	$I_E = i_e = 0$; $V_{CB} = 10$ V; f = 1 MHz	–	6	pF
C_e	emitter capacitance	$I_C = i_c = 0$; $V_{EB} = 0.5$ V; f = 1 MHz	–	30	pF
f_T	transition frequency	$I_C = 10$ mA; $V_{CE} = 10$ V; f = 100 MHz	100	300	MHz
F	noise figure	$I_C = 200$ μA; $V_{CE} = 5$ V; $R_S = 2$ kΩ; f = 10 Hz to 15.7 kHz			
	2N5550		–	10	dB
	2N5551		–	8	dB

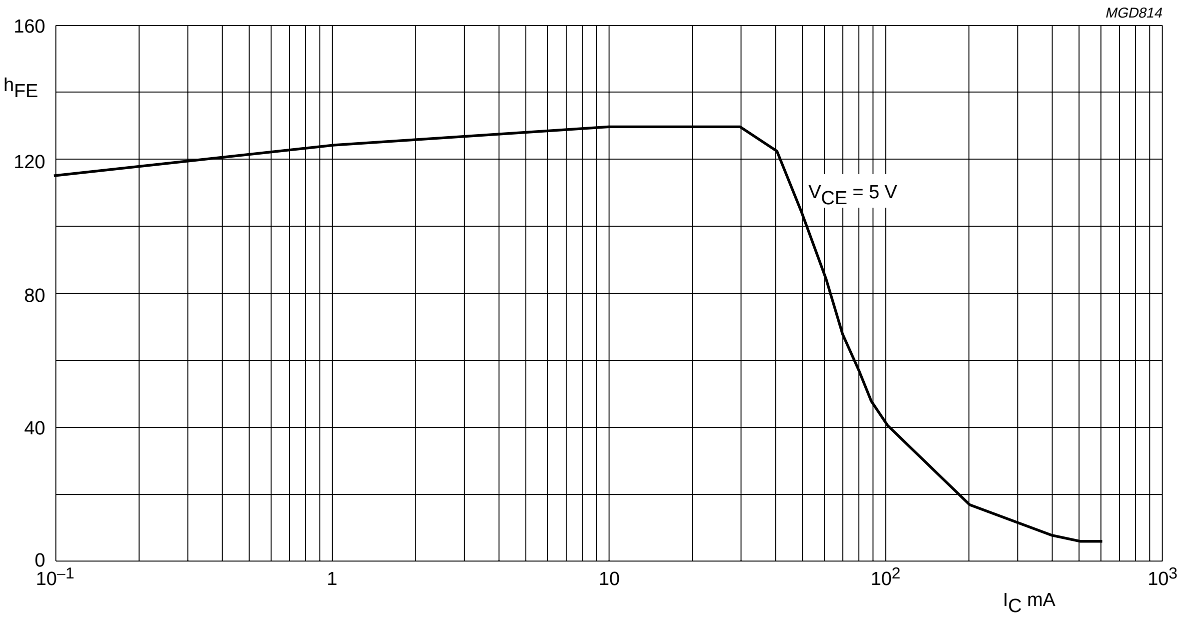
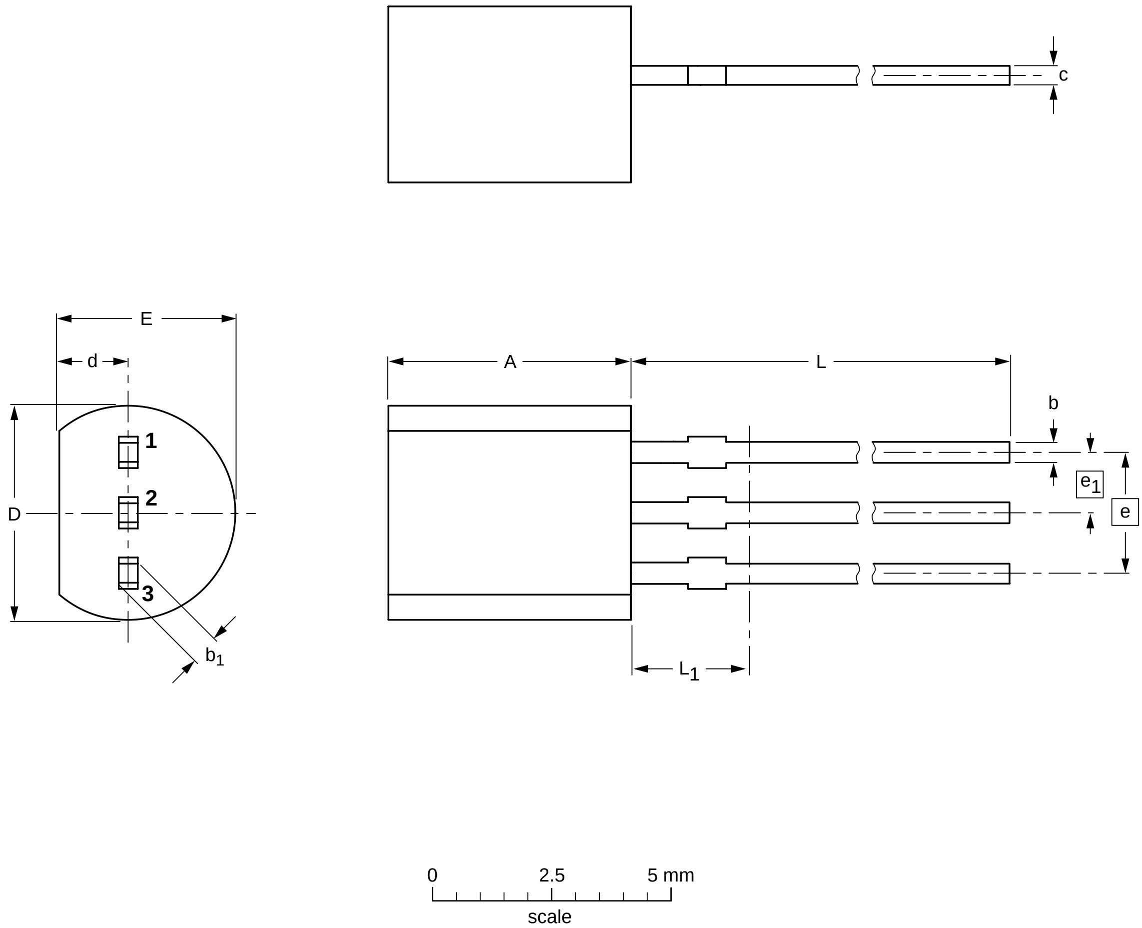


Fig.2 DC current gain; typical values.

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

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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