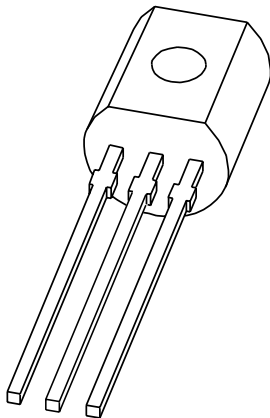


# DATA SHEET



## **2N5550; 2N5551** NPN high-voltage transistors

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

1997 Apr 09

# NPN high-voltage transistors

# 2N5550; 2N5551

### FEATURES

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

### APPLICATIONS

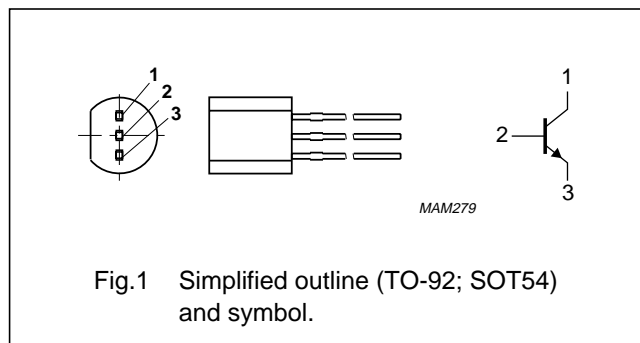
- Switching and amplification in high voltage applications such as telephony.

### 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



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CB0</sub>	collector-base voltage	open emitter			
	2N5550		–	160	V
	2N5551		–	180	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	2N5550		–	140	V
	2N5551		–	160	V
I <sub>CM</sub>	peak collector current		–	600	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	–	630	mW
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 5 V			
	2N5550		60	–	
	2N5551		80	–	
C <sub>c</sub>	collector capacitance	I <sub>E</sub> = i <sub>e</sub> = 0; V <sub>CB</sub> = 10 V; f = 1 MHz	–	6	pF
f <sub>T</sub>	transition frequency	I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 10 V; f = 100 MHz	100	300	MHz

## NPN high-voltage transistors

2N5550; 2N5551

**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter			
	2N5550		–	160	V
	2N5551		–	180	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	2N5550		–	140	V
	2N5551		–	160	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	6	V
I <sub>C</sub>	collector current (DC)		–	300	mA
I <sub>CM</sub>	peak collector current		–	600	mA
I <sub>BM</sub>	peak base current		–	100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	–	630	mW
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C
T <sub>amb</sub>	operating ambient temperature		–65	+150	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	200	K/W

## NPN high-voltage transistors

## 2N5550; 2N5551

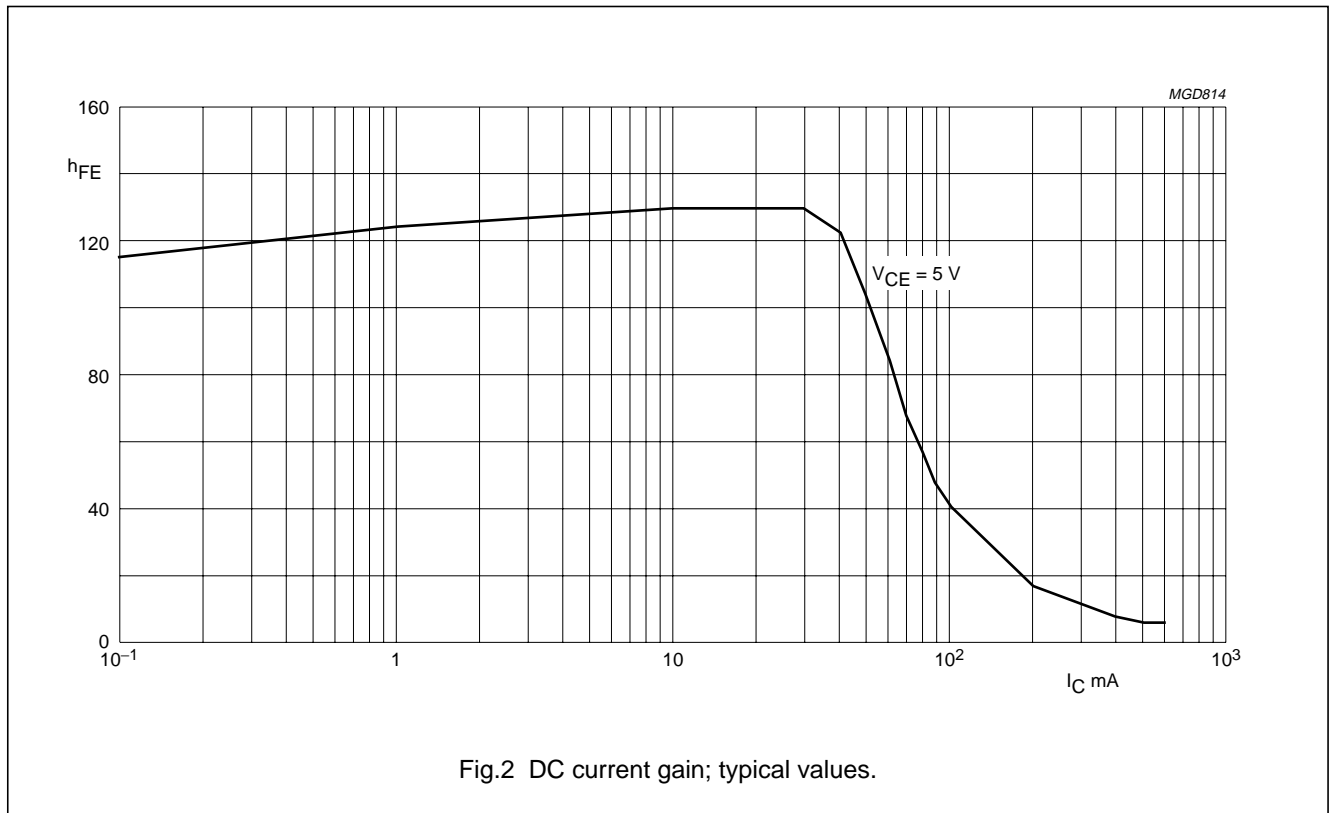
## CHARACTERISTICS

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

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

NPN high-voltage transistors

2N5550; 2N5551



NPN high-voltage transistors

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PACKAGE OUTLINE

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

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b <sub>1</sub>	c	D	d	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup>
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

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**NPN high-voltage transistors****2N5550; 2N5551**

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**DEFINITIONS**

<b>Data sheet status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
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