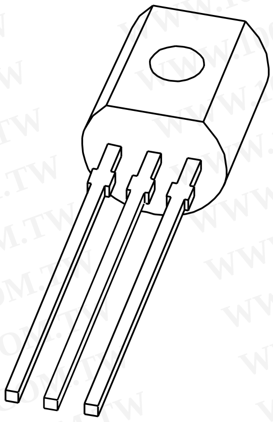
DATA SHEET



PSS8050
NPN medium power 25 V transistor

Product specification
2002 Nov 18

Philips
Semiconductors

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NPN medium power 25 V transistor PSS8050

FEATURES

- High total power dissipation
- High current capability.

APPLICATIONS

- Medium power switching and muting
- Amplification
- Portable radio output amplifier (class-B, push-pull).

DESCRIPTION

NPN transistor in a SOT54 (TO-92) plastic package.
PNP complement: PSS8550.

MARKING

TYPE NUMBER	MARKING CODE
PSS8050C	S8050C
PSS8050D	S8050D

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	25	V
I_C	collector current (DC)	1.5	A

PINNING

PIN	DESCRIPTION
1	collector
2	base
3	emitter

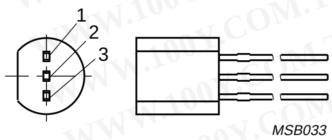


Fig.1 Simplified outline (SOT54).

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	–	25	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	1.5	A
I_{CM}	peak collector current		–	2	A
I_B	base current (DC)		–	300	mA
I_{BM}	peak base current		–	1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	850	mW
		$T_{amb} \leq 25$ °C; note 2	–	900	mW
		$T_{amb} \leq 25$ °C; note 3	–	1	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Notes

1. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm^2.
3. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint. Operated under pulsed conditions: pulse width $t_p \leq 1$ s; duty cycle $\delta \leq 0.75\%$.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	in free air; note 1	147	K/W
		in free air; note 2	139	K/W
		in free air; note 3	125	K/W

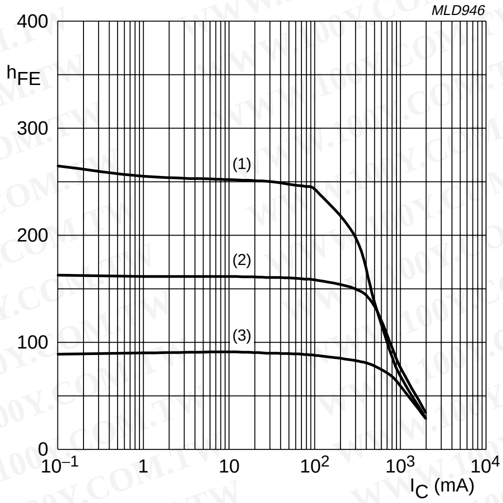
Notes

1. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm^2.
3. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint. Operated under pulsed conditions: pulse width $t_p \leq 1$ s; duty cycle $\delta \leq 0.75\%$.

CHARACTERISTICS

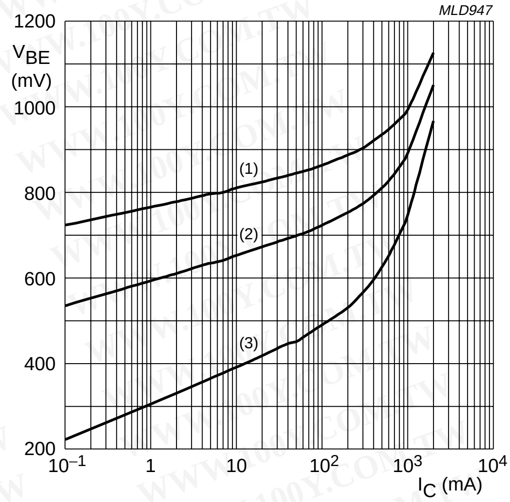
T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	V_{CB} = 35 V; I_E = 0	–	–	100	nA
		V_{CB} = 35 V; I_E = 0; T_{amb} = 150 °C	–	–	50	µA
I_{CEO}	collector-emitter cut-off current	V_{CE} = 25 V; I_B = 0	–	–	100	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = 6 V; I_C = 0	–	–	100	nA
h_{FE}	DC current gain	I_C = 5 mA; V_{CE} = 1 V	45	–	–	
		I_C = 800 mA; V_{CE} = 1 V	40	–	–	
	DC current gain	I_C = 100 mA; V_{CE} = 1 V				
	PSS8050C		120	–	200	
	PSS8050D		160	–	300	
V_{CEsat}	collector-emitter saturation voltage	I_C = 800 mA; I_B = 80 mA	–	165	500	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 800 mA; I_B = 80 mA	–	–	1.2	V
V_{BEon}	base-emitter turn-on voltage	I_C = 10 mA; V_{CE} = 1 V	–	–	1	V
f_T	transition frequency	I_C = 50 mA; V_{CE} = 10 V; f = 100 MHz	100	–	–	MHz
C_c	collector capacitance	V_{CB} = 10 V; I_E = i_e = 0; f = 1 MHz	–	–	10	pF



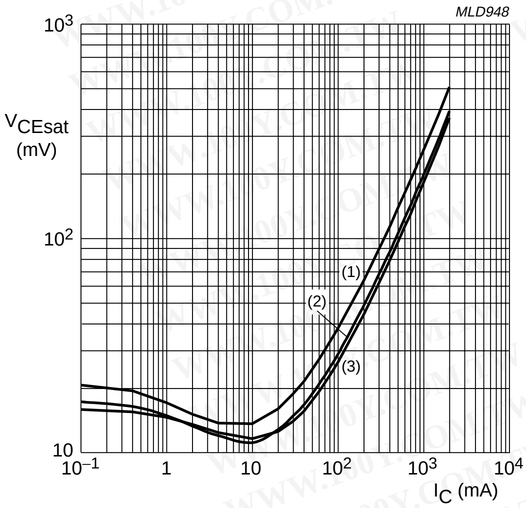
PSS8050C V_{CE} = 1 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.2 DC current gain as a function of collector current; typical values.



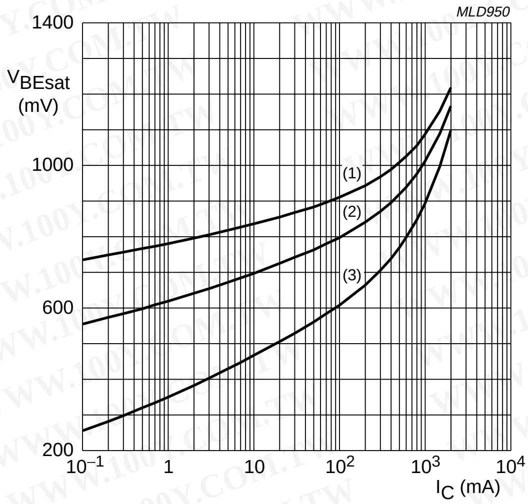
PSS8050C V_{CE} = 1 V.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.3 Base-emitter voltage as a function of collector current; typical values.



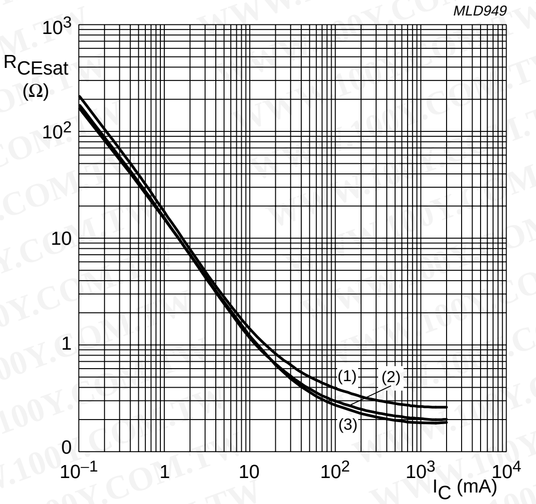
PSS8050C I_C/I_B = 10.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.



PSS8050C I_C/I_B = 10.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.



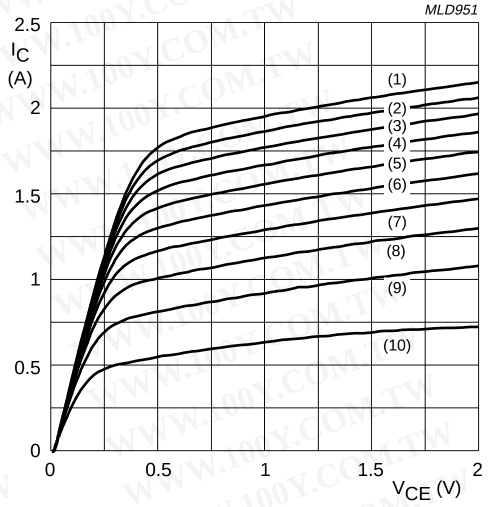
PSS8050C $I_C/I_B = 10$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

Fig.6 Equivalent on-resistance as a function of collector current; typical values.



PSS8050C

(1) $I_B = 55$ mA.

(2) $I_B = 49.5$ mA.

(3) $I_B = 44$ mA.

(4) $I_B = 38.5$ mA.

(5) $I_B = 33$ mA.

(6) $I_B = 27.5$ mA.

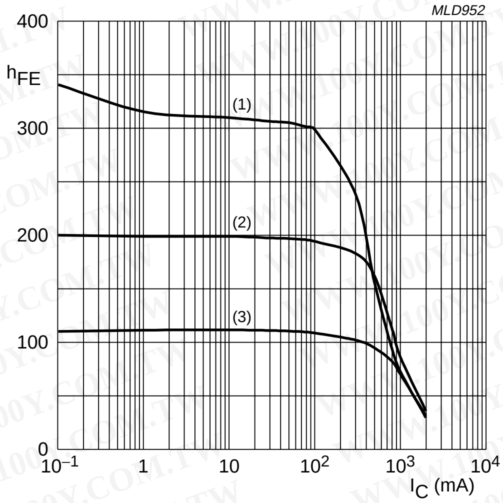
(7) $I_B = 22$ mA.

(8) $I_B = 16.5$ mA.

(9) $I_B = 11$ mA.

(10) $I_B = 5.5$ mA.

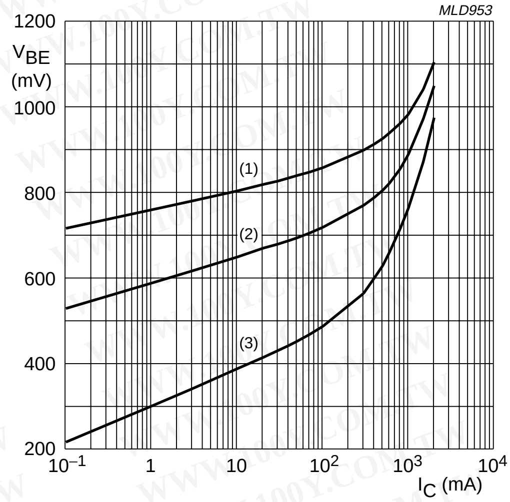
Fig.7 Collector current as a function of collector-emitter voltage; typical values.



PSS8050D V_{CE} = 1 V.

(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

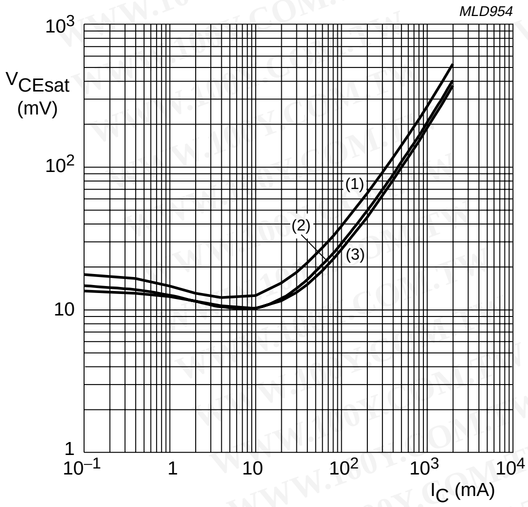
Fig.8 DC current gain as a function of collector current; typical values.



PSS8050D V_{CE} = 1 V.

(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

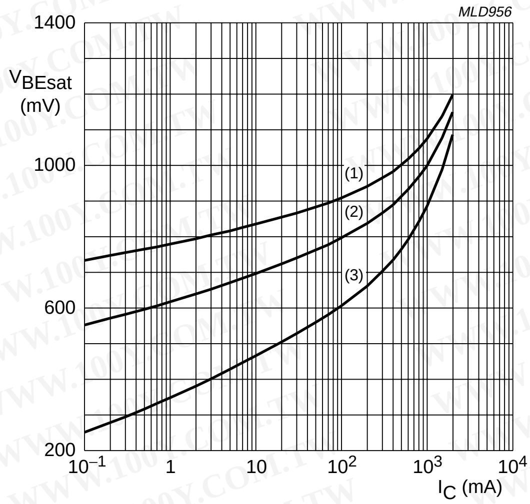
Fig.9 Base-emitter voltage as a function of collector current; typical values.



PSS8050D I_C/I_B = 10.

(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

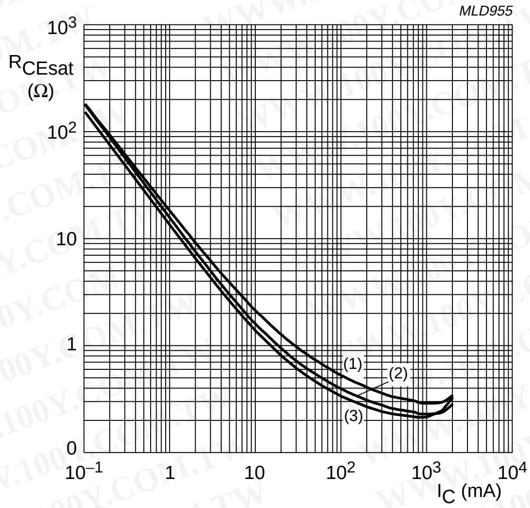
Fig.10 Collector-emitter saturation voltage as a function of collector current; typical values.



PSS8050D I_C/I_B = 10.

(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.11 Base-emitter saturation voltage as a function of collector current; typical values.



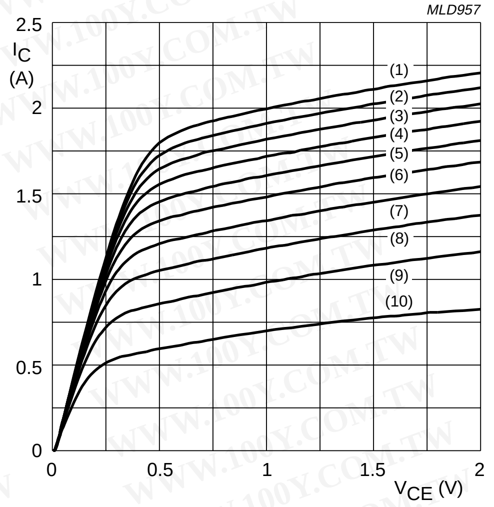
PSS8050D $I_C/I_B = 10$.

(1) T_{amb} = 150 °C.

(2) T_{amb} = 25 °C.

(3) T_{amb} = −55 °C.

Fig.12 Equivalent on-resistance as a function of collector current; typical values.



PSS8050D

(1) I_B = 55 mA.

(2) I_B = 49.5 mA.

(3) I_B = 44 mA.

(4) I_B = 38.5 mA.

(5) I_B = 33 mA.

(6) I_B = 27.5 mA.

(7) I_B = 22 mA.

(8) I_B = 16.5 mA.

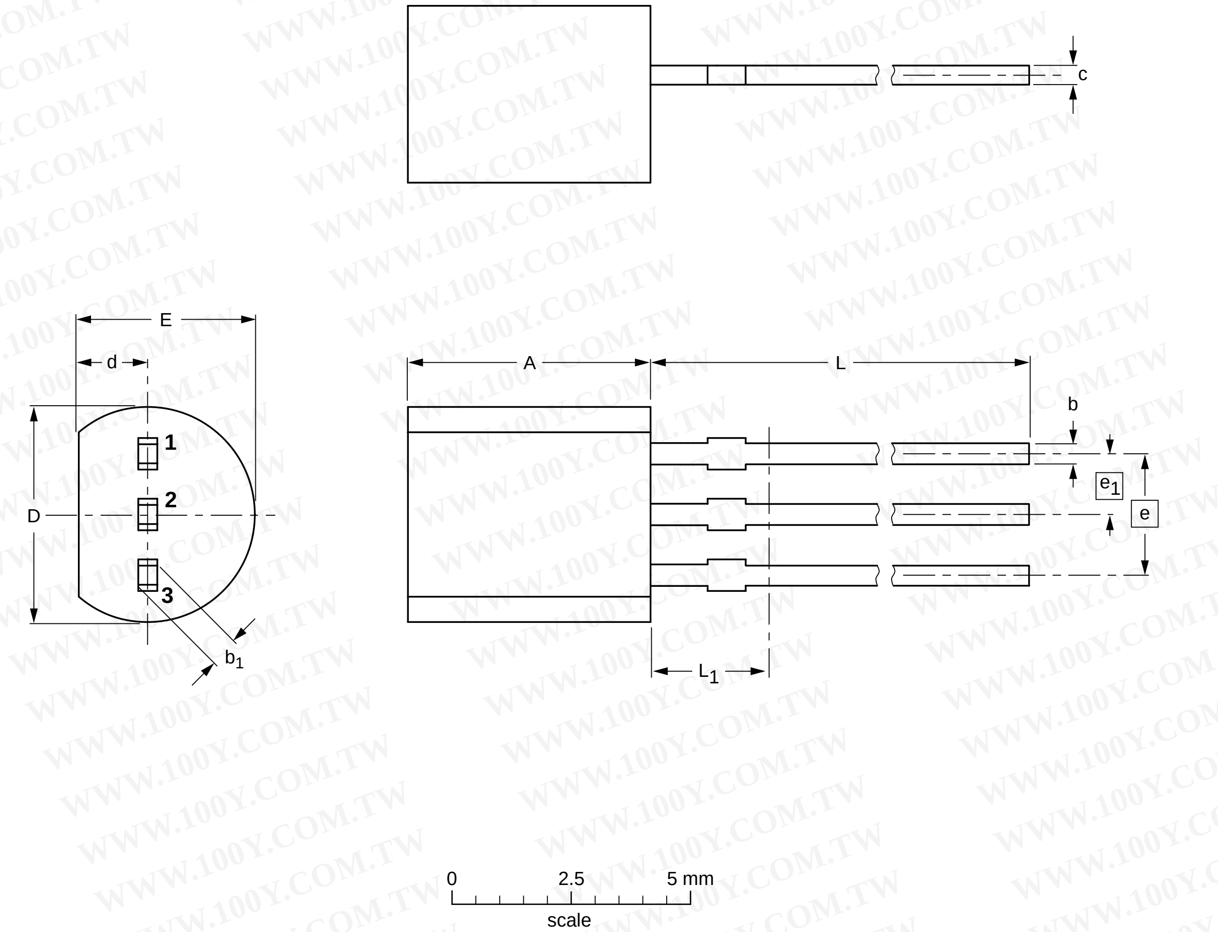
(9) I_B = 11 mA.

(10) I_B = 5.5 mA.

Fig.13 Collector current as a function of collector-emitter voltage; 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

NPN medium power 25 V transistor — PSS8050

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.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
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2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.
3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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.

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