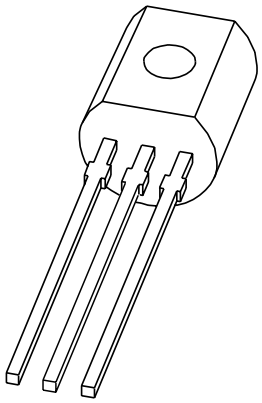
DATA SHEET



PSS9012 series
20 V PNP general purpose transistors

Product specification
Supersedes data of 2003 May 15

2004 Aug 10

Philips
Semiconductors

PHILIPS

20 V PNP general purpose transistors PSS9012 series

FEATURES

- High power dissipation: 710 mW
- Low collector capacitance
- Low collector-emitter saturation voltage
- High current capability.

APPLICATIONS

- General purpose switching and amplification.

DESCRIPTION

PNP general purpose transistor in a SOT54 (TO-92) leaded plastic package. NPN complement: PSS9013 series.

MARKING

TYPE NUMBER	MARKING CODE
PSS9012G	S9012G
PSS9012H	S9012H

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	–20	V
I_C	collector current (DC)	–500	mA
I_{CM}	peak collector current	–1	A

PINNING

PIN	DESCRIPTION
1	collector
2	base
3	emitter

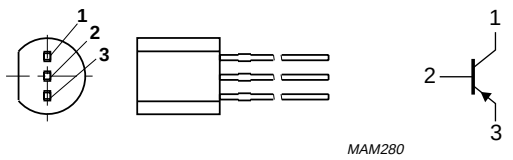


Fig.1 Simplified outline (SOT54; TO-92) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum 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	–	–20	V
V_{EBO}	emitter-base voltage	open collector	–	–5	V
I_C	collector current (DC)		–	–500	mA
I_{CM}	peak collector current		–	–1	A
I_{BM}	peak base current		–	–100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	710	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

1. Device mounted on a FR4 printed-circuit board, single-sided copper, tinplated and standard footprint.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	in free air; note 1	175	K/W

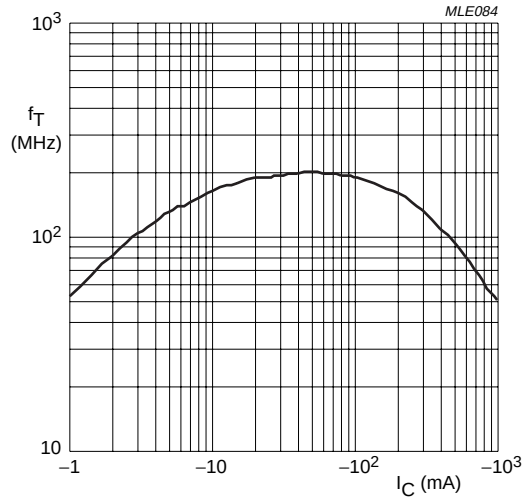
Note

1. Device mounted on a FR4 printed-circuit board, single-sided copper, tinplated and standard footprint.

CHARACTERISTICS

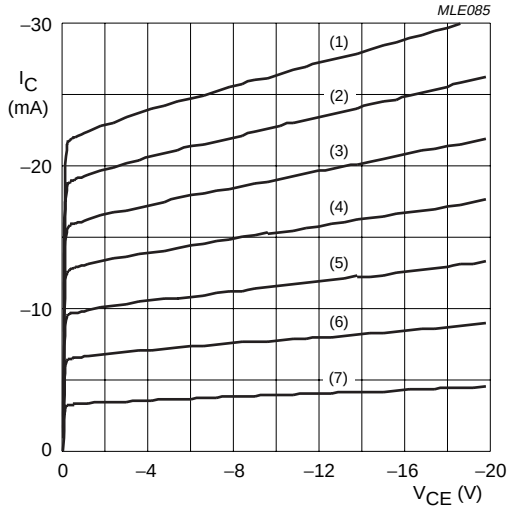
T_{amb} = 25 °C unless otherwise specified.

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_j = 150 °C	–	–	–50	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = –5 V; I_C = 0	–	–	–100	nA
h_{FE}	DC current gain	V_{CE} = –1 V; I_C = –500 mA	40	–	–	
h_{FE}	DC current gain	V_{CE} = –1 V; I_C = –50 mA				
	PSS9012G		112	–	166	
	PSS9012H		144	–	202	
V_{CEsat}	collector-emitter saturation voltage	I_C = –100 mA; I_B = –10 mA	–	–60	–250	mV
		I_C = –500 mA; I_B = –50 mA	–	–230	–600	mV
V_{BEsat}	base-emitter saturation voltage	I_C = –500 mA; I_B = –50 mA	–	–1	–1.2	V
V_{BEon}	base-emitter turn on voltage	V_{CE} = –1 V; I_C = –100mA	–	–760	–1000	mV
C_c	collector capacitance	V_{CB} = –6 V; I_E = I_e = 0; f = 1 MHz	–	6	–	pF



V_{CE} = –6 V.

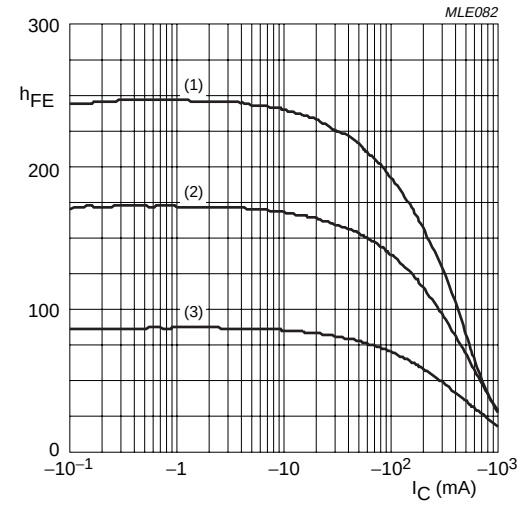
Fig.2 Transition frequency as a function of collector current; typical values.



T_{amb} = 25 °C.

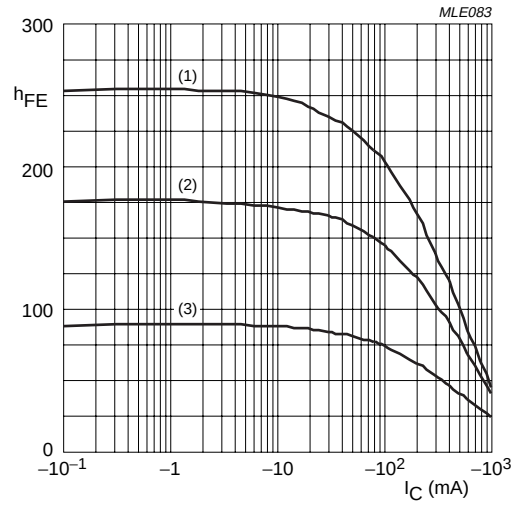
(1) I_B = –140 µA.
(2) I_B = –120 µA.
(3) I_B = –100 µA.
(4) I_B = –80 µA.
(5) I_B = –60 µA.
(6) I_B = –40 µA.
(7) I_B = –20 µA.

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



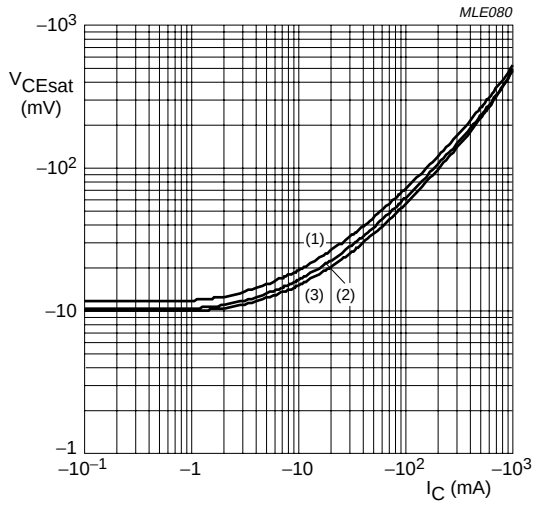
V_{CE} = –1 V.
(1) T_{amb} = 100 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

Fig.4 DC current gain as a function of collector current; typical values.



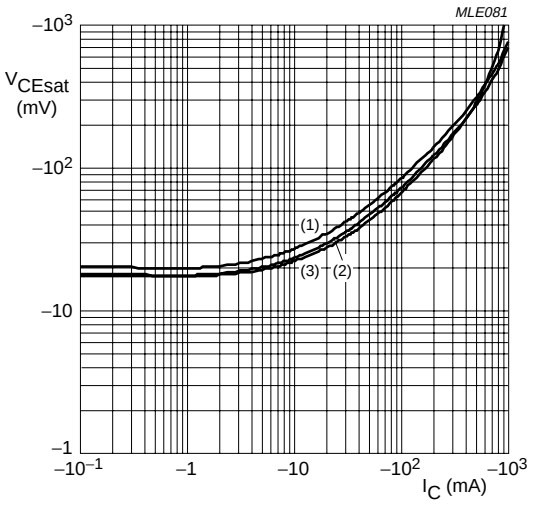
V_{CE} = –2 V.
(1) T_{amb} = 100 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

Fig.5 DC current gain as a function of collector current; typical values.



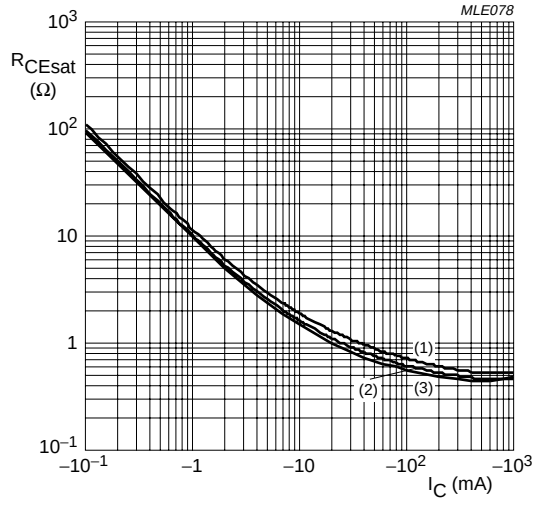
$I_C/I_B = 10$.
(1) $T_{amb} = 100$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

Fig.6 Collector-emitter saturation voltage as a function of collector current; typical values.



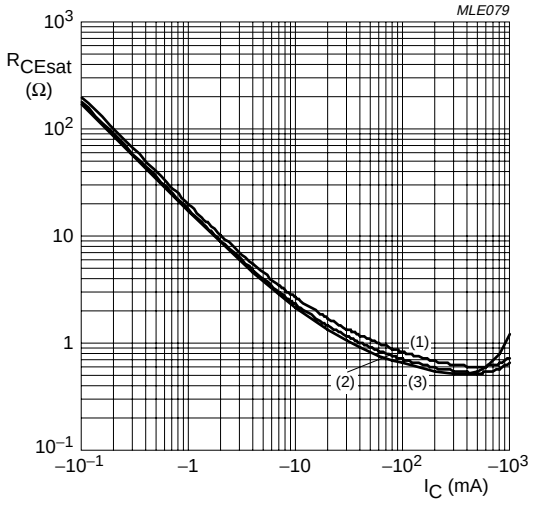
$I_C/I_B = 20$.
(1) $T_{amb} = 100$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

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



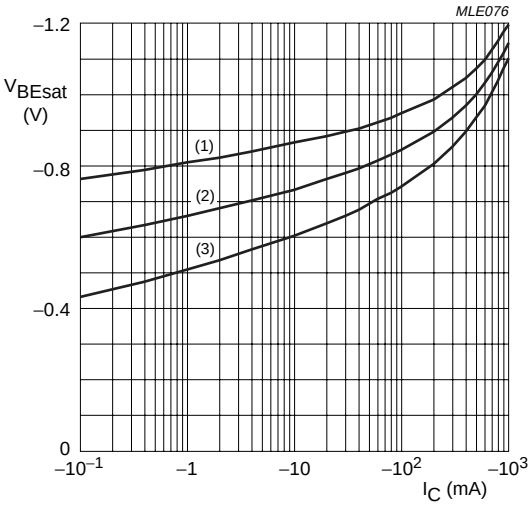
$I_C/I_B = 10$.
(1) $T_{amb} = 100$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

Fig.8 Collector-emitter equivalent on-resistance as a function of collector current; typical values.



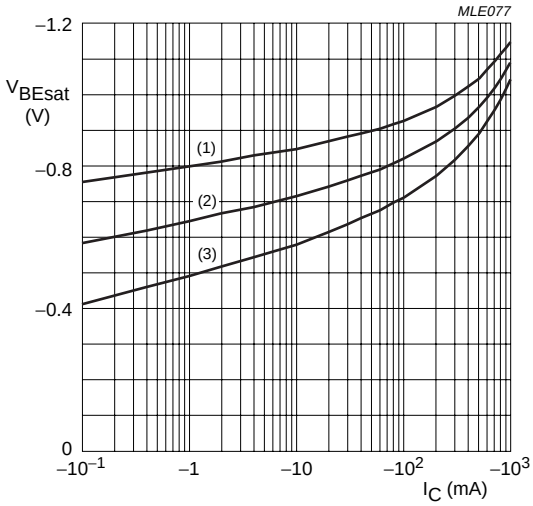
$I_C/I_B = 20$.
(1) $T_{amb} = 25$ °C.
(2) $T_{amb} = 100$ °C.
(3) $T_{amb} = -55$ °C.

Fig.9 Collector-emitter equivalent on-resistance as a function of collector current; typical values.



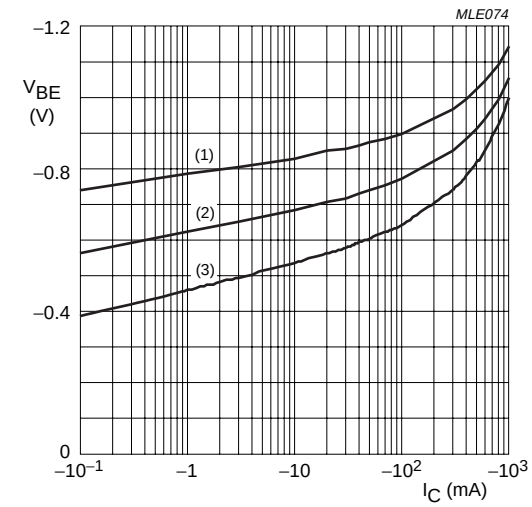
I_C/I_B = 10.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

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



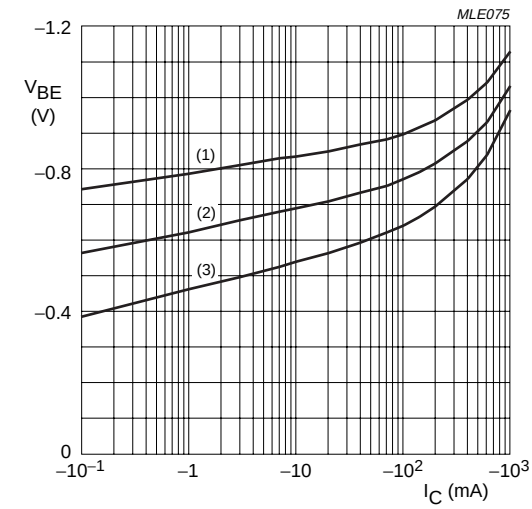
I_C/I_B = 20.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

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



V_{CE} = –1 V.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

Fig.12 Base-emitter voltage as a function of collector current; typical values.

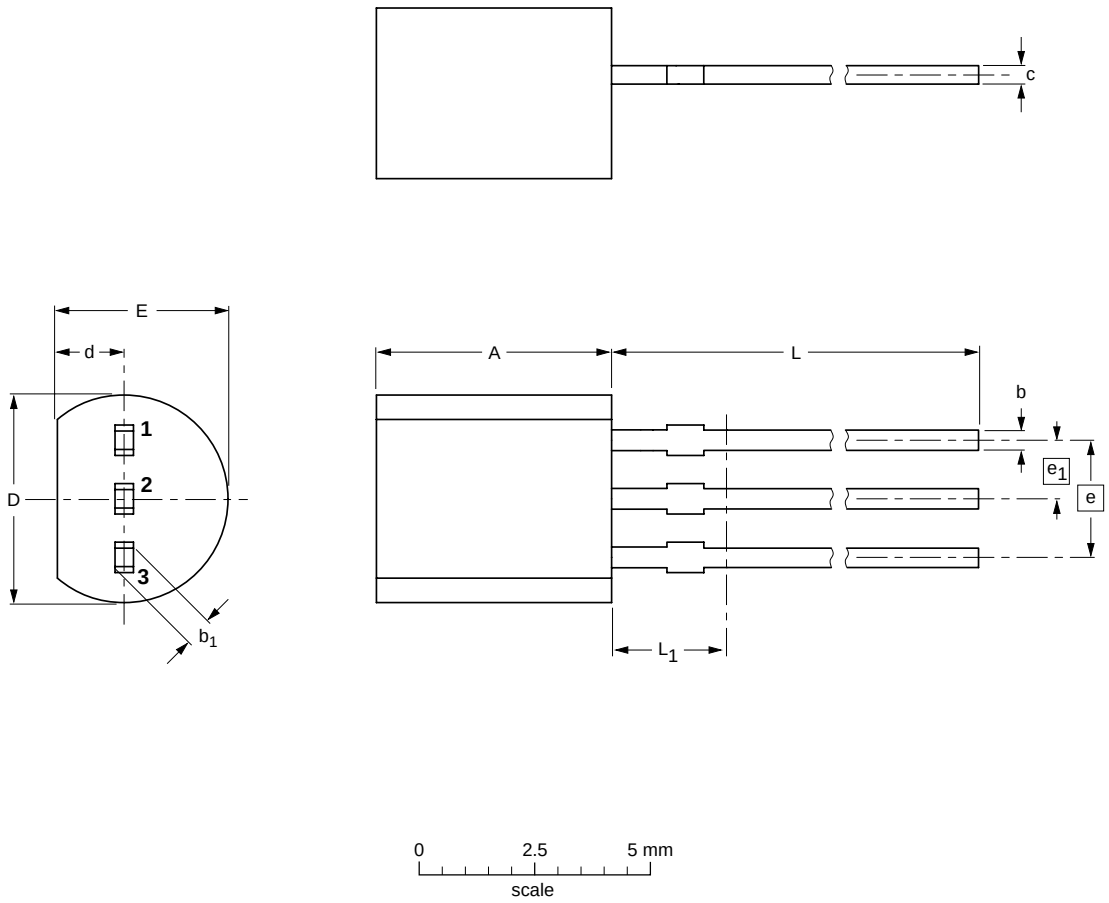


V_{CE} = –2 V.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

Fig.13 Base-emitter voltage as a function of collector current; 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) 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			~~97-02-28~~ 04-06-28

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS(1)	PRODUCT STATUS(2)(3)	DEFINITION
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