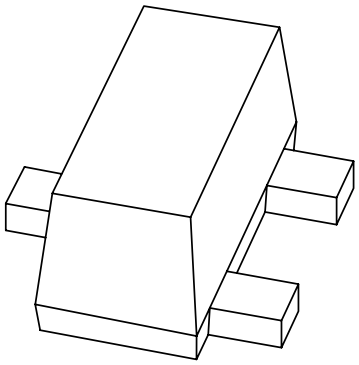
DATA SHEET



PBSS2540F

40 V low V_{CEsat} NPN transistor

Product specification

2001 Oct 31

Philips
Components

PHILIPS

40 V low V_{CEsat} NPN transistor PBSS2540F

FEATURES

- Low collector-emitter saturation voltage
- High current capability
- Improved thermal behaviour due to flat leads
- Enhanced performance over SOT23 general purpose transistors.

APPLICATIONS

- General purpose switching and muting
- Low frequency driver circuits
- Audio frequency general purpose amplifier applications
- Battery driven equipment (mobile phones, video cameras, hand-held devices).

DESCRIPTION

NPN low V_{CEsat} transistor in a SC-89 (SOT490) plastic package.
PNP complement: PBSS3540F.

MARKING

TYPE NUMBER	MARKING CODE
PBSS2540F	2C

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	40	V
I_C	collector current (DC)	500	mA
I_{CM}	peak collector current	1	A
R_{CEsat}	equivalent on-resistance	<500	mΩ

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

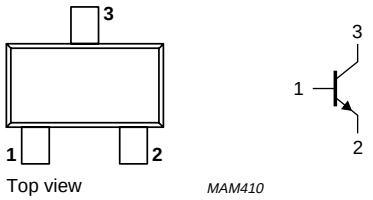


Fig.1 Simplified outline (SC-89; SOT490) and symbol.

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	–	40	V
V_{EBO}	emitter-base voltage	open collector	–	6	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	–	250	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	CONDITIONS	MAX.	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	in free air	500	K/W

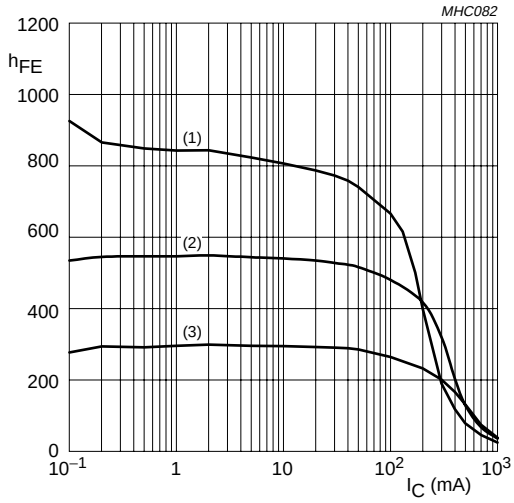
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	V_{CB} = 30 V; I_E = 0	–	–	100	nA
		V_{CB} = 30 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} = 2 V; I_C = 10 mA	200	–	–	
		V_{CE} = 2 V; I_C = 100 mA; note 1	100	–	–	
		V_{CE} = 2 V; I_C = 500 mA; note 1	50	–	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA	–	–	50	mV
		I_C = 100 mA; I_B = 5 mA	–	–	100	mV
		I_C = 200 mA; I_B = 10 mA	–	–	200	mV
		I_C = 500 mA; I_B = 50 mA; note 1	–	–	250	mV
R_{CEsat}	equivalent on-resistance	I_C = 500 mA; I_B = 50 mA; note 1	–	380	<500	mΩ
V_{BEsat}	base-emitter saturation voltage	I_C = 500 mA; I_B = 50 mA; note 1	–	–	1.2	V
V_{BEon}	base-emitter turn-on voltage	V_{CE} = 2 V; I_C = 100 mA; note 1	–	–	1.1	V
f_T	transition frequency	I_C = 100 mA; V_{CE} = 5 V; f = 100 MHz	250	450	–	MHz
C_c	collector capacitance	V_{CB} = 10 V; I_E = I_e = 0; f = 1 MHz	–	–	6	pF

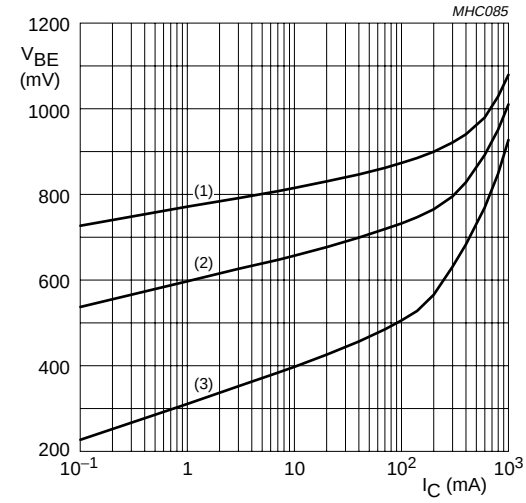
Note

1. Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.



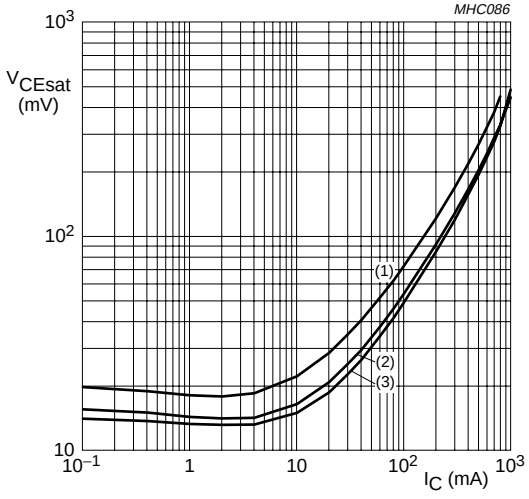
V_{CE} = 2 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

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



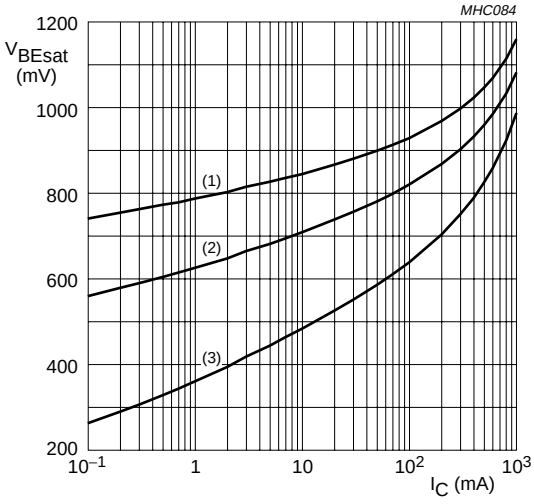
V_{CE} = 2 V.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

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



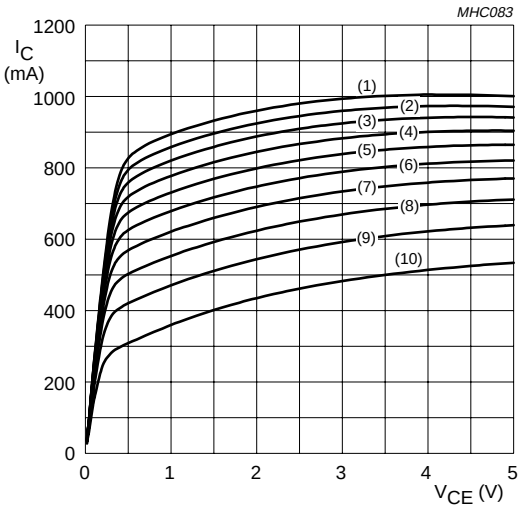
I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

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



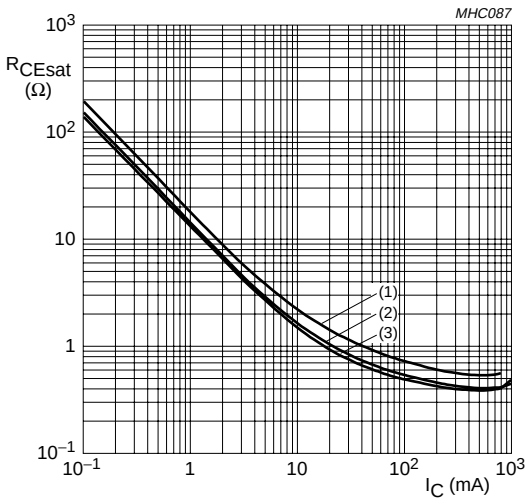
I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

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



(1) I_B = 25 mA.
(2) I_B = 22.5 mA.
(3) I_B = 20 mA.
(4) I_B = 17.5 mA.
(5) I_B = 15 mA.
(6) I_B = 12.5 mA.
(7) I_B = 10 mA.
(8) I_B = 7.5 mA.
(9) I_B = 5.0 mA.
(10) I_B = 2.5 mA.

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

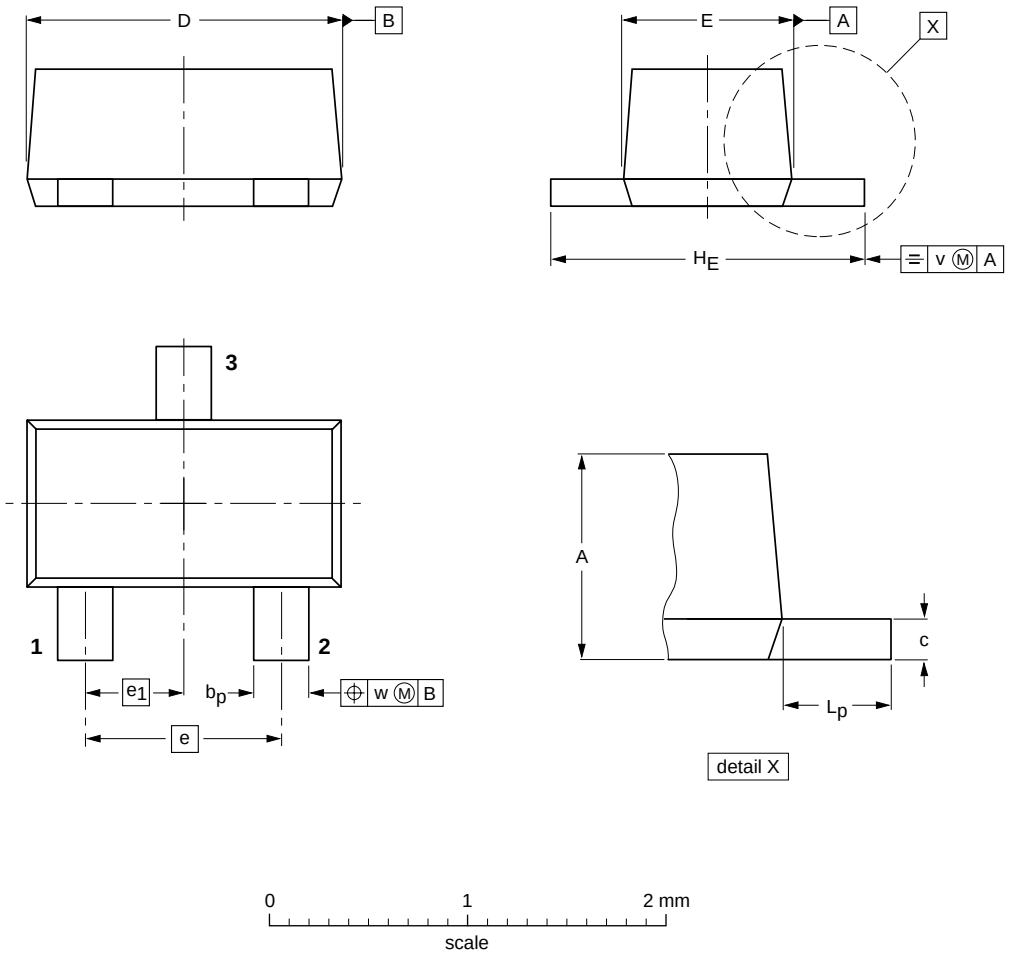


I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

Fig.7 Collector-emitter equivalent on-resistance as a function of collector current; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT490**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b_p	c	D	E	e	e_1	H_E	L_p	v	w
mm	0.8 0.6	0.33 0.23	0.2 0.1	1.7 1.5	0.95 0.75	1.0	0.5	1.7 1.5	0.5 0.3	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT490			SC-89			98-10-23

DATA SHEET STATUS

DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
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