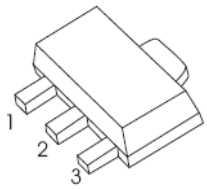
SOT-89-3L Plastic-Encapsulate Transistors

PBSS4540X TRANSISTOR (NPN)

SOT-89-3L



1. BASE
2. COLLECTOR
3. EMITTER

FEATURES

- High h_{FE} and low V_{CEsat} at high current operation
- High collector current capability: I_C maximum 4 A
- High efficiency leading to less heat generation.

APPLICATIONS

- Medium power peripheral drivers (e.g. fan and motor)
- Strobe flash units for DSC and mobile phones
- Inverter applications (e.g. TFT displays)
- Power switch for LAN and ADSL systems
- Medium power DC-to-DC conversion
- Battery chargers.

MARKING: W1B

MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

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)		–	4	A
I_{CM}	peak collector current	$t_p \leq 1$ ms	–	10	A
I_B	base current (DC)		–	1	A
I_{BM}	peak base current	$t_p \leq 1$ ms	–	2	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	–	0.55	W
T_{stg}	storage temperature		–55	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–55	+150	°C

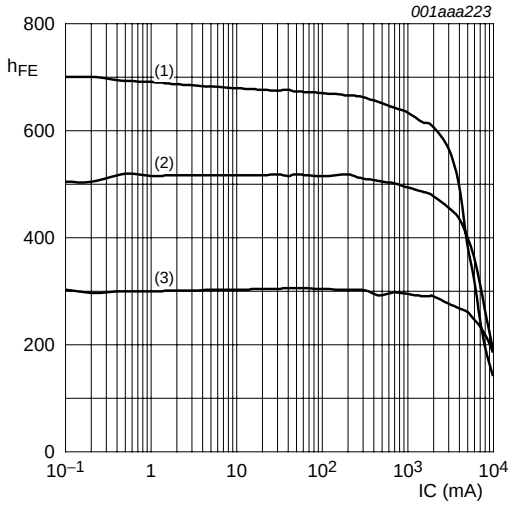
ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise specified)

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	V_{CB} = 30 V; I_E = 0 A	–	–	100	nA
		V_{CB} = 30 V; I_E = 0 A; T_j = 150 °C	–	–	50	μA
I_{CES}	collector-emitter cut-off current	V_{CE} = 30 V; V_{BE} = 0 V	–	–	0.1	μA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0 A	–	–	100	nA
h_{FE}	DC current gain	V_{CE} = 2 V; I_C = 0.5 A	300	–	–	
		V_{CE} = 2 V; I_C = 1 A; note 1	300	–	–	
		V_{CE} = 2 V; I_C = 2 A; note 1	250	–	–	
		V_{CE} = 2 V; I_C = 5 A; note 1	100	–	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = 0.5 A; I_B = 5 mA	–	–	90	mV
		I_C = 1 A; I_B = 10 mA	–	–	120	mV
		I_C = 2 A; I_B = 200 mA; note 1	–	–	150	mV
		I_C = 4 A; I_B = 200 mA; note 1	–	–	290	mV
		I_C = 5 A; I_B = 500 mA; note 1	–	–	355	mV
R_{CEsat}	equivalent on-resistance	I_C = 5 A; I_B = 500 mA; note 1	–	40	71	mΩ
V_{BEsat}	base-emitter saturation voltage	I_C = 4 A; I_B = 200 mA; note 1	–	–	1.1	V
		I_C = 5 A; I_B = 500 mA; note 1	–	–	1.2	V
V_{BEon}	base-emitter turn-on voltage	V_{CE} = 2 V; I_C = 2 A	–	–	1.1	V
f_T	transition frequency	V_{CE} = 10 V; I_C = 0.1 A; f = 100 MHz	70	–	–	MHz
C_c	collector capacitance	V_{CB} = 10 V; I_E = i_e = 0 A; f = 1 MHz	–	–	75	pF

Note

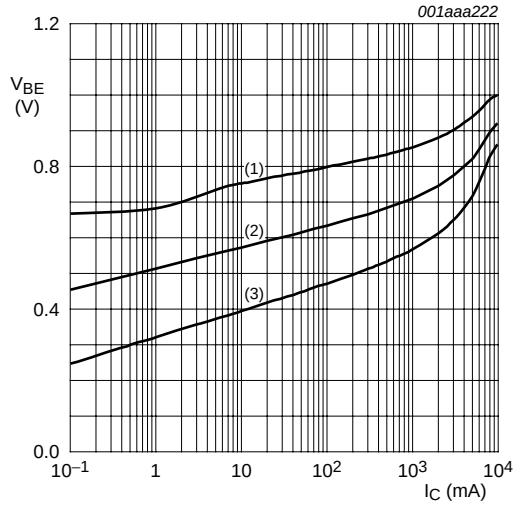
1. Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.

Typical Characteristics



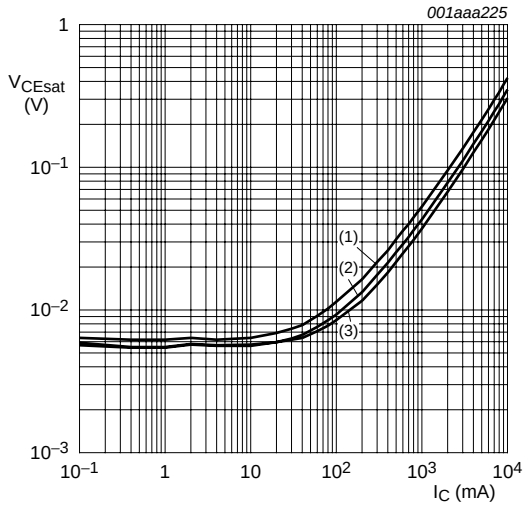
V_{CE} = 2 V.
(1) T_{amb} = 100 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.1 DC current gain as a function of collector current; typical values.



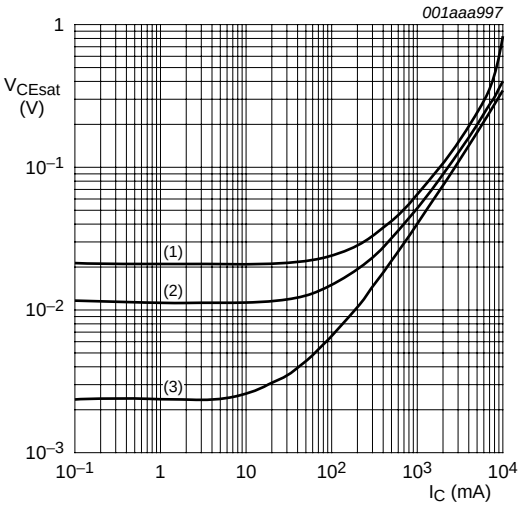
V_{CE} = 2 V.
(1) T_{amb} = 55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

Fig.2 Base-emitter 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.

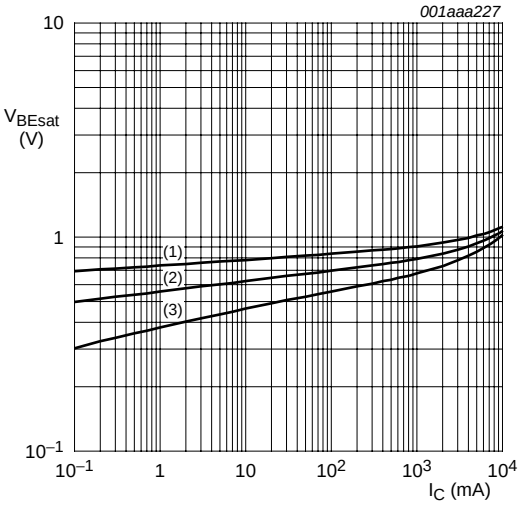
Fig.3 Collector-emitter saturation voltage as a function of collector current; typical values.



T_{amb} = 25 °C.
(1) I_C/I_B = 100.
(2) I_C/I_B = 50.
(3) I_C/I_B = 10.

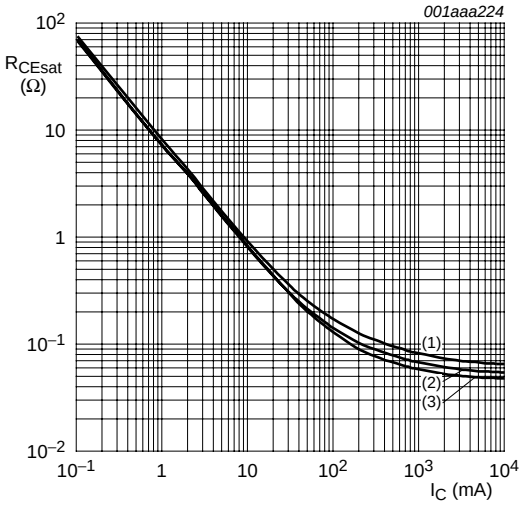
Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.

Typical Characteristics



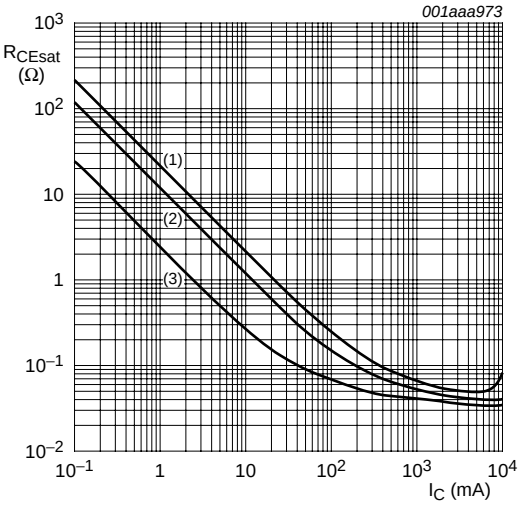
I_C/I_B = 20.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

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



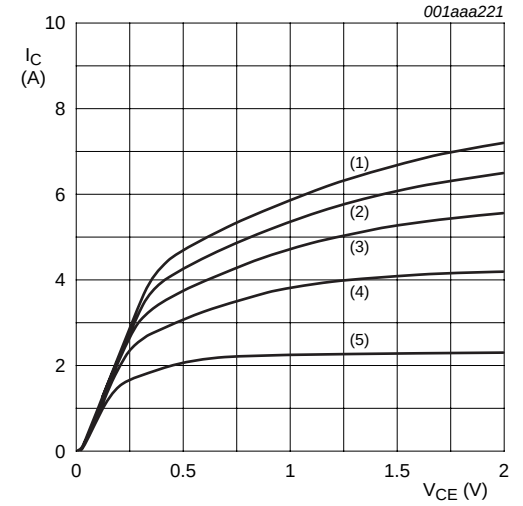
I_C/I_B = 20.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

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



T_{amb} = 25 °C.
(1) I_C/I_B = 100. (2) I_C/I_B = 50. (3) I_C/I_B = 10.

Fig.7 Equivalent on-resistance as a function of collector current; typical values.



(1) I_B = 25 mA. (3) I_B = 15 mA. (5) I_B = 5 mA.
(2) I_B = 20 mA. (4) I_B = 10 mA.

Fig.8 Collector current as a function of collector-emitter voltage; typical values.