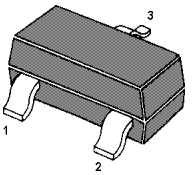
Plastic-Encapsulate Transistors

FEATURES

- Low collector-emitter saturation voltage
- High current capability
- Improved device reliability due to reduced heat generation

MARKING: ZF

SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

Absolute Maximum Ratings Ta = 25℃

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	-	- 5	V
I_C	collector current (DC)		-	- 2	A
I_{CM}	peak collector current		-	- 3	A
I_{BM}	peak base current		-	- 300	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ ℃ ; note 1	-	300	mW
		$T_{amb} \leq 25$ ℃ ; note 2	-	480	mW
T_{stg}	storage temperature		- 65	+150	℃
T_j	junction temperature		-	150	℃
T_{amb}	operating ambient temperature		- 65	+150	℃

Notes

1. Device mounted on a printed-circuit board, single sided copper, tin plated, standard footprint.
2. Device mounted on a printed-circuit board, single sided copper, tin plated, mounting pad for collector 1 cm^2.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air; note 1	417	K/W
		in free air; note 2	260	K/W

Notes

1. Device mounted on a printed-circuit board, single sided copper, tin plated, standard footprint.
2. Device mounted on a printed-circuit board, single sided copper, tin plated, mounting pad for collector 1 cm^2.

CHARACTERISTICS

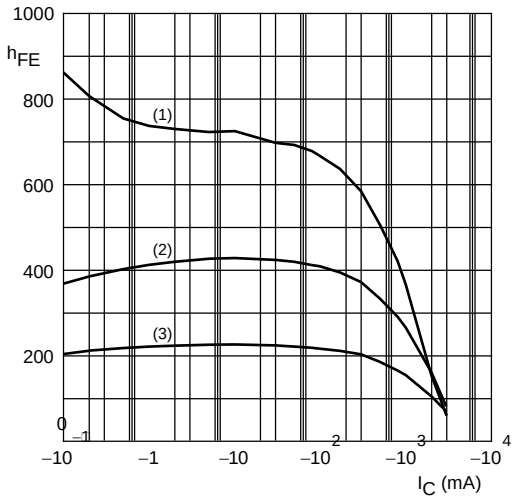
T_{amb} = 25 ℃ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	V_{CB} = - 30 V; I_E =0	-	-	- 100	nA
		V_{CB} = - 30 V; I_E = 0; T_j = 150 ℃	-	-	- 50	μA
I_{BEO}	emitter-base cut-off current	V_{EB} = - 4 V; I_C =0	-	-	- 100	nA
h_{FE}	DC current gain	V_{CE} = - 2V				
		I_C = - 100 mA	300	450	-	
		I_C = - 500 mA	260	350	-	
		I_C = - 1 A	210	290	-	
		I_C = - 2 A	100	180	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = - 100 mA; I_B = - 1 mA	-	- 55	- 100	mV
		I_C = - 500 mA; I_B = - 50 mA	-	- 70	- 110	mV
		I_C = - 750 mA; I_B = - 15 mA	-	- 140	- 225	mV
		I_C = - 1 A; I_B = - 50 mA	-	- 140	- 225	mV
		I_C = - 2 A; I_B = - 200 mA	-	- 240	- 350	mV
R_{CEsat}	equivalent on-resistance	I_C = - 500 mA; I_B = - 50 mA; note 1	-	160	220	mΩ
V_{BEsat}	base-emitter saturation voltage	I_C = - 2 A; I_B = - 200 mA	-	-	- 1.1	V
$V_{BE(on)}$	base-emitter turn-on voltage	V_{CE} = - 2 V; I_C = - 100 mA	-	-	- 0.75	V
f_T	transition frequency	I_C = - 100 mA; V_{CE} = - 10 V; f = 100 MHz	100	200	-	MHz
C_c	collector capacitance	V_{CB} = - 10 V; I_E = I_e = 0; f = 1 MHz	-	23	28	pF

Note

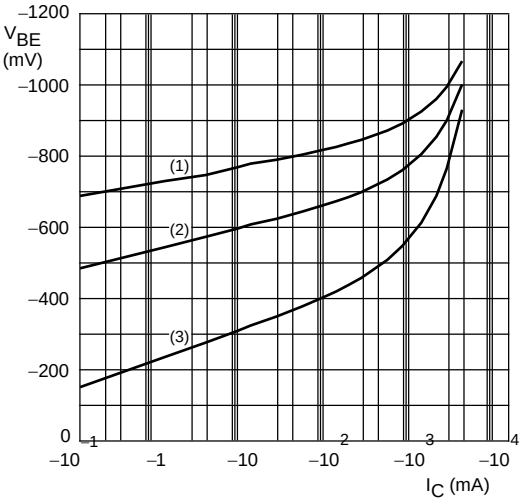
1. Device mounted on a printed-circuit board, single sided copper, tin plated, standard footprint.

Typical Characteristics



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

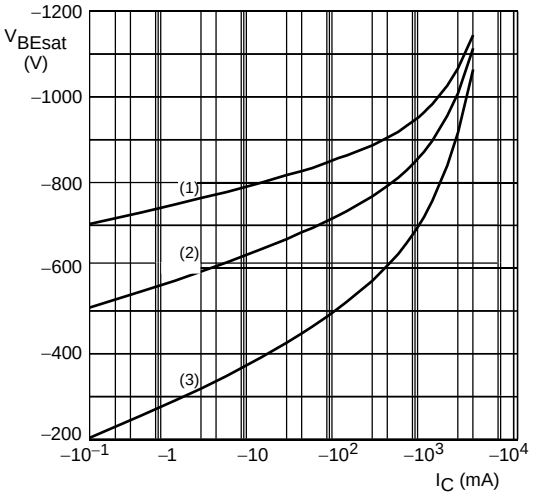
Fig.1 DC current gain as a function ofcollector current; typical values.



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

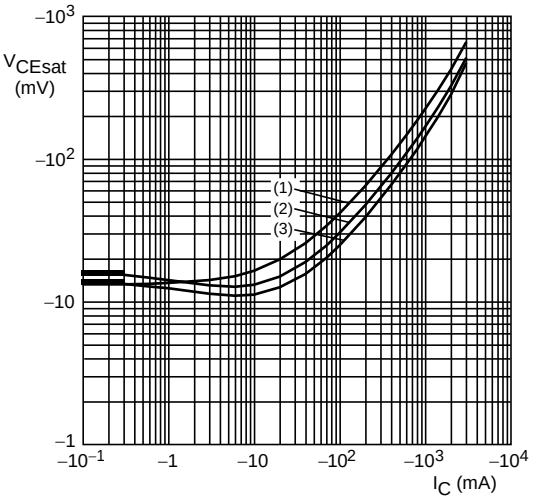
Fig.2 Base-emitter voltage as a function of collector current; typical values.

Typical Characteristics



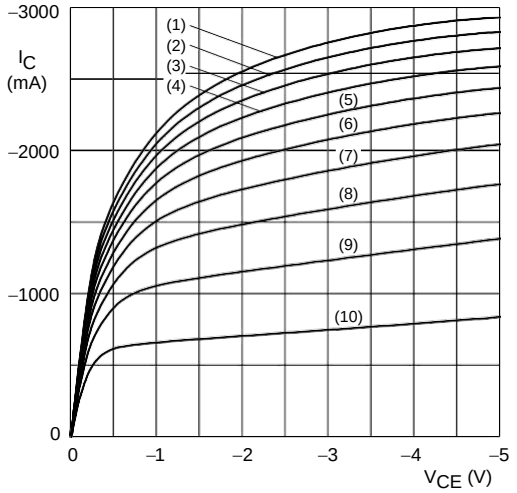
I_C/I_B = 20.
(1) T_{amb} = −55 ℃ .
(2) T_{amb} = 25 ℃ .
(3) T_{amb} = 150 ℃ .

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



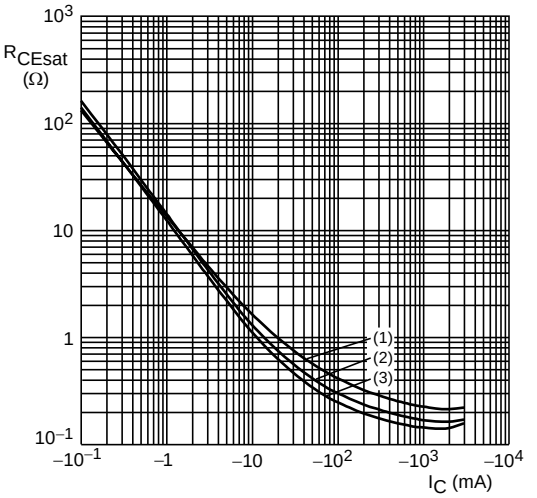
I_C/I_B = 20.
(1) T_{amb} = 150 ℃ .
(2) T_{amb} = 25 ℃ .
(3) T_{amb} = −55 ℃ .

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



(1) I_B = −23.0 mA.
(2) I_B = −20.7 mA.
(3) I_B = −18.4 mA.
(4) I_B = −16.1 mA.
(5) I_B = −13.8 mA.
(6) I_B = −11.5 mA.
(7) I_B = −9.2 mA.
(8) I_B = −6.9 mA.
(9) I_B = −4.6 mA.
(10) I_B = −2.3 mA.

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

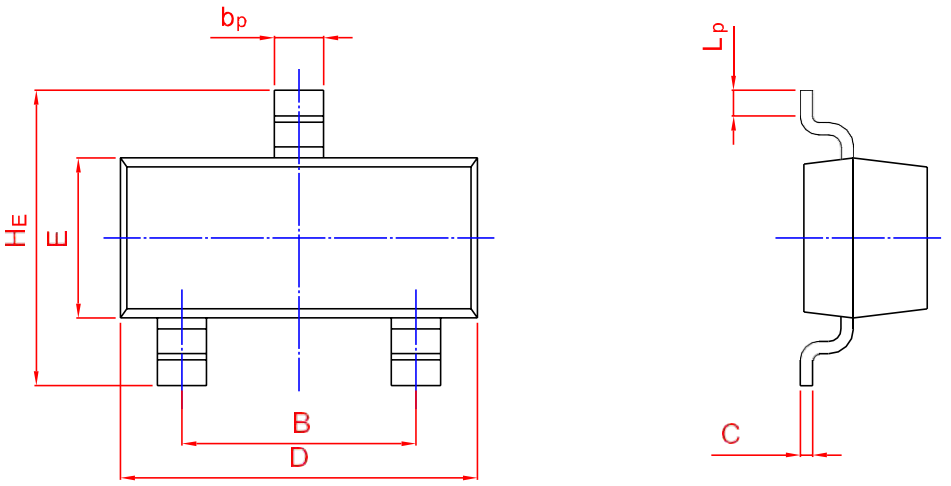


I_C/I_B = 20.
(1) T_{amb} = 150 ℃ .
(2) T_{amb} = 25 ℃ .
(3) T_{amb} = −55 ℃ .

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

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT-23**



UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20