

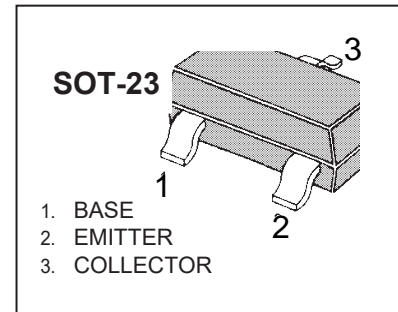
## SOT-23 Plastic-Encapsulate Transistors

### PBSS5140 40 V ,PNP,low $V_{CEsat}$ (BISS)

#### FEATURES

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

MARKING: 2H



Absolute Maximum Ratings  $T_a = 25^\circ\text{C}$

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)		–	–1	A
$I_{CM}$	peak collector current		–	–2	A
$I_{BM}$	peak base current		–	–1	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25^\circ\text{C}$ ; note 1	–	300	mW
		$T_{amb} \leq 25^\circ\text{C}$ ; note 2	–	450	mW
$T_{stg}$	storage temperature		–65	+150	$^\circ\text{C}$
$T_j$	junction temperature		–	150	$^\circ\text{C}$
$T_{amb}$	operating ambient temperature		–65	+150	$^\circ\text{C}$

#### 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  $1\text{ cm}^2$ .

#### 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	278	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  $1\text{ cm}^2$ .

## CHARACTERISTICS

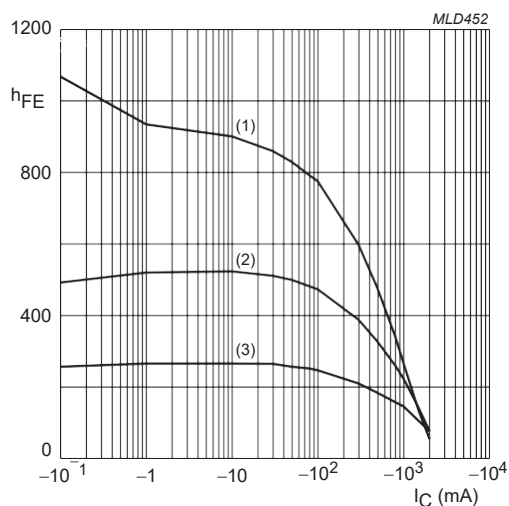
$T_{amb} = 25\text{ °C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -40\text{ V}; I_C = 0$	–	–	100	nA
		$V_{CB} = -40\text{ V}; I_C = 0; T_j = 150\text{ °C}$	–	–	50	$\mu\text{A}$
$I_{CEO}$	collector-emitter cut-off current	$V_{CE} = -30\text{ V}; I_B = 0$	–	–	100	nA
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	–	–	100	nA
$h_{FE}$	DC current gain	$V_{CE} = -5\text{ V}; I_C = -1\text{ mA}$	300	–	–	
		$V_{CE} = -5\text{ V}; I_C = -100\text{ mA}$	300	–	800	
		$V_{CE} = -5\text{ V}; I_C = -500\text{ mA}$	250	–	–	
		$V_{CE} = -5\text{ V}; I_C = -1\text{ A}$	160	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -100\text{ mA}; I_B = -1\text{ mA}$	–	–	200	mV
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}$	–	–	250	mV
		$I_C = -1\text{ A}; I_B = -100\text{ mA}$	–	–	500	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$	–	300	<500	$\text{m}\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -1\text{ A}; I_B = -50\text{ mA}$	–	–	1.1	V
$V_{BEon}$	base-emitter turn-on voltage	$V_{CE} = -5\text{ V}; I_C = -1\text{ A}$	–	–	1	V
$f_T$	transition frequency	$I_C = -50\text{ mA}; V_{CE} = -10\text{ V}; f = 100\text{ MHz}$	150	–	–	MHz
$C_c$	collector capacitance	$V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	–	12	pF

### Note

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

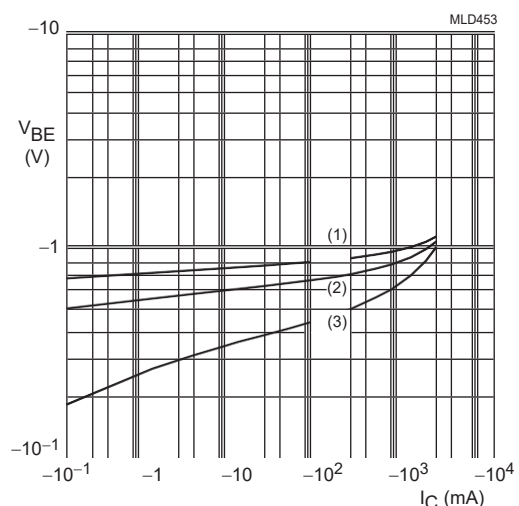
## Typical Characteristics



$V_{CE} = -5\text{ V}$ .

- (1)  $T_{amb} = 150\text{ °C}$ .
- (2)  $T_{amb} = 25\text{ °C}$ .
- (3)  $T_{amb} = -55\text{ °C}$ .

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

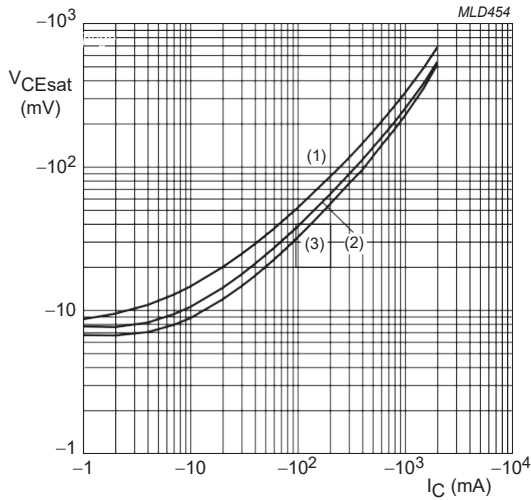


$V_{CE} = -5\text{ V}$ .

- (1)  $T_{amb} = -55\text{ °C}$ .
- (2)  $T_{amb} = 25\text{ °C}$ .
- (3)  $T_{amb} = 150\text{ °C}$ .

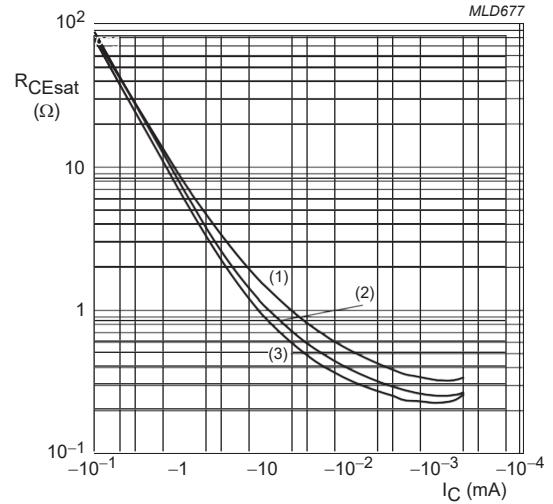
Fig.3 Base-emitter voltage as a function of collector current; typical values.

Typical Characteristics



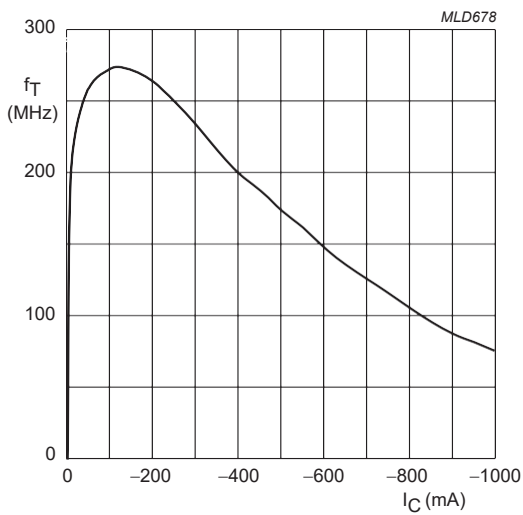
$I_C/I_B = 10$ .  
 (1)  $T_{amb} = 150\text{ }^\circ\text{C}$ .  
 (2)  $T_{amb} = 25\text{ }^\circ\text{C}$ .  
 (3)  $T_{amb} = -55\text{ }^\circ\text{C}$ .

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



$I_C/I_B = 10$ .  
 (1)  $T_{amb} = 150\text{ }^\circ\text{C}$ .  
 (2)  $T_{amb} = 25\text{ }^\circ\text{C}$ .  
 (3)  $T_{amb} = -55\text{ }^\circ\text{C}$ .

Fig.5 Equivalent on-resistance as a function of collector current; typical values.



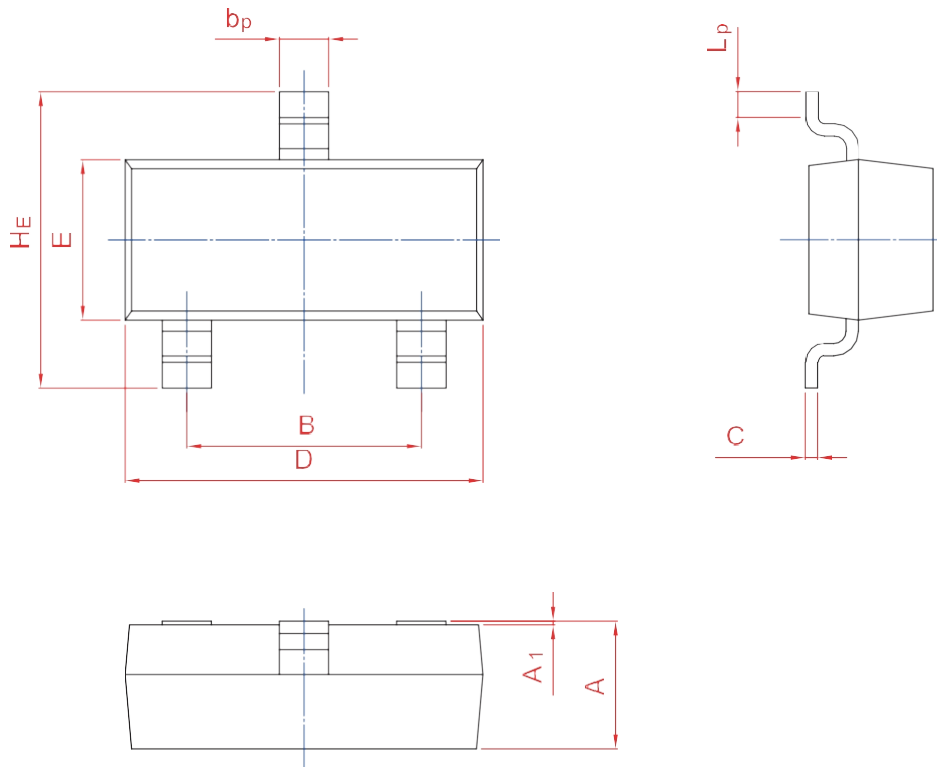
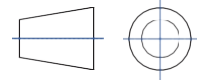
$V_{CE} = -10\text{ V}$ .  
 (1)  $T_{amb} = 150\text{ }^\circ\text{C}$ .  
 (2)  $T_{amb} = 25\text{ }^\circ\text{C}$ .  
 (3)  $T_{amb} = -55\text{ }^\circ\text{C}$ .

Fig.6 Transition frequency as a function of collector current; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	b <sub>p</sub>	C	D	E	H <sub>E</sub>	A <sub>1</sub>	L <sub>p</sub>
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20