

NPN Low VCEsat Transistor

PBSS4160T

FEATURES

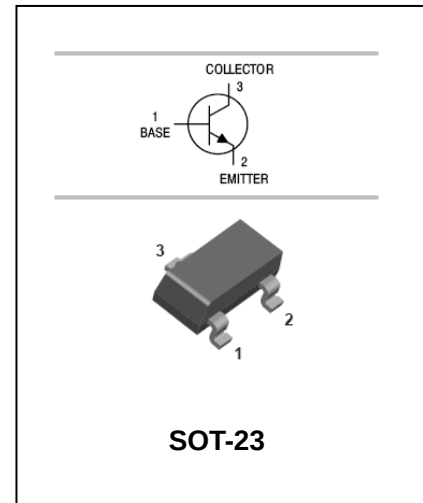
- Low collector-emitter saturation voltage VCEsat
- High collector current capability IC and ICM
- High efficiency, reduces heat generation
- Reduces printed-circuit board area required



Lead-free

APPLICATIONS

- Major application segments
- Power management
- Peripheral driver



ORDERING INFORMATION

Type No.	Marking	Package Code
PBSS4160T	U5	SOT-23

MAXIMUM RATING @ Ta=25°C unless otherwise specified

Symbol	Parameter	Value	Units
V _{CBO}	Collector-Base Voltage	80	V
V _{CEO}	Collector-Emitter Voltage	60	V
V _{EBO}	Emitter-Base Voltage	5	V
I _C	Collector Current -Continuous	0.9 (note 1) 1 (note 2)	A
I _{CM}	peak collector current (t = 1 ms or limited by T _{j(max)})	2	A
I _B	base current (DC)	300	mA
I _{BM}	peak base current (tp ≤ 300 ms; δ ≤ 0.02)	1	A
P _C	Collector Dissipation T _{amb} ≤ 25 °C; note 1 T _{amb} ≤ 25 °C; note 2 T _{amb} ≤ 25 °C; notes 1 and 3	270 400 1.25	mW mW W
T _{stg} , T _{amb}	Storage and operating ambient temperature	-65 to +150	°C
T _j	Junction temperature	150	°C

Notes

1. Device mounted on an FR4 printed-circuit board, single-sided copper, tin-plated, standard

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footprint.

- Device mounted on an FR4 printed-circuit board, single-sided copper, tin-plated, 1 cm² collector mounting pad.
- Operated under pulsed conditions: duty cycle $\delta \leq 20\%$, pulse width $t_p \leq 10$ ms.

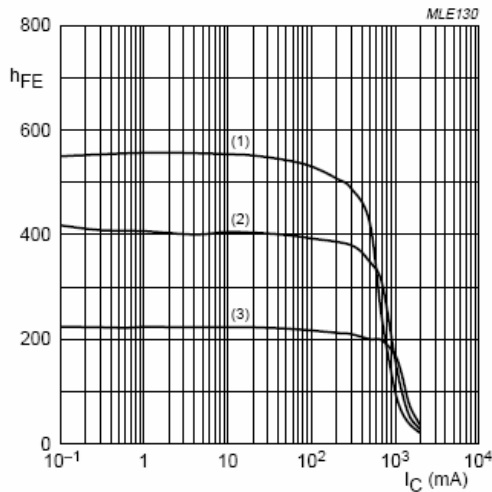
ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu A, I_E=0$	80			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=10mA, I_B=0$	60			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu A, I_C=0$	5			V
Collector cut-off current	I_{CBO}	$V_{CB}=60V, I_E=0$			0.1	μA
collector-emitter cut-off current	I_{CES}	$V_{CE}=60V, I_E=0$			0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB}=5V, I_C=0$			0.1	μA
DC current gain	h_{FE}	$V_{CE}=5V, I_C=500mA$	200	350		
		$V_{CE}=5V, I_C=1A$	100	150		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=500mA, I_B=50mA$ $I_C=1A, I_B=100mA$ $I_C=100mA, I_B=1mA$		0.11 0.2 0.09	0.14 0.25 0.11	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=1A, I_B=50mA$		0.95	1.1	V
Base-emitter voltage	$V_{BE(on)}$	$I_C=1A, V_{CE}=5V$		0.82	0.9	V
Transition frequency	f_T	$V_{CE}=10V, I_C=50mA$ $f=100MHz$	150	220		MHz
Collector output capacitance	C_{ob}	$V_{CB}=10V, f=1MHz$		5.5	10	pF

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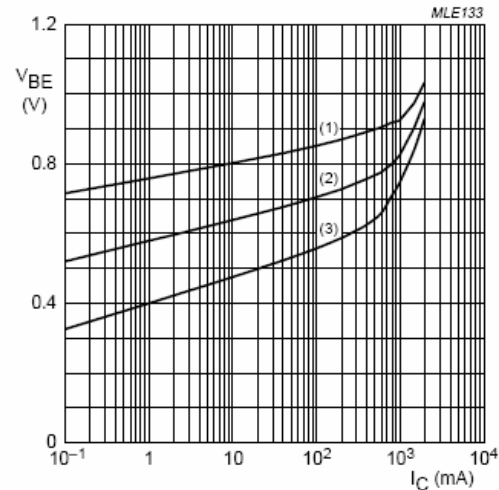
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TYPICAL CHARACTERISTICS @ $T_a=25^\circ\text{C}$ unless otherwise specified



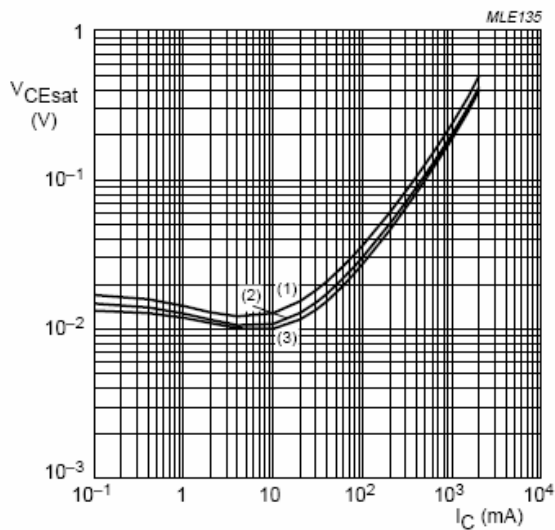
$V_{CE} = 5\text{ V}$.
(1) $T_{amb} = 100^\circ\text{C}$.
(2) $T_{amb} = 25^\circ\text{C}$.
(3) $T_{amb} = -55^\circ\text{C}$.

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



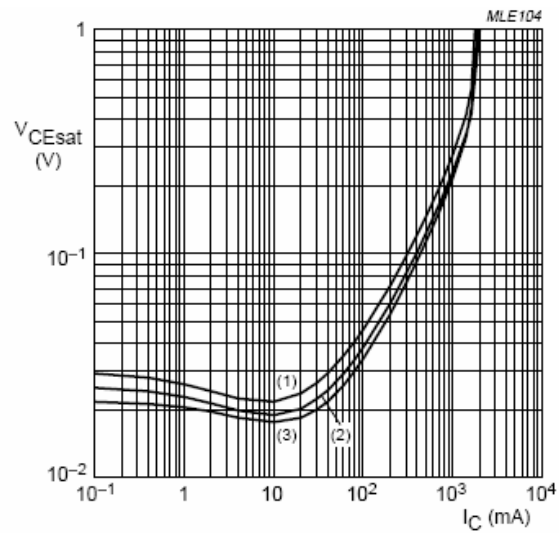
$V_{CE} = 5\text{ V}$.
(1) $T_{amb} = -55^\circ\text{C}$.
(2) $T_{amb} = 25^\circ\text{C}$.
(3) $T_{amb} = 100^\circ\text{C}$.

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



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

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

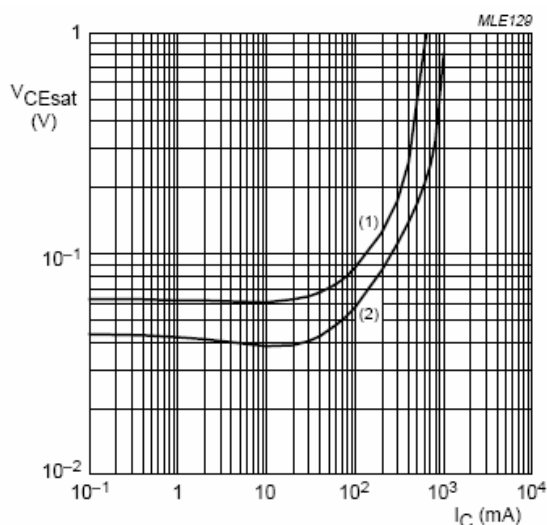


$I_C/I_B = 20$.
(1) $T_{amb} = 100^\circ\text{C}$.
(2) $T_{amb} = 25^\circ\text{C}$.
(3) $T_{amb} = -55^\circ\text{C}$.

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

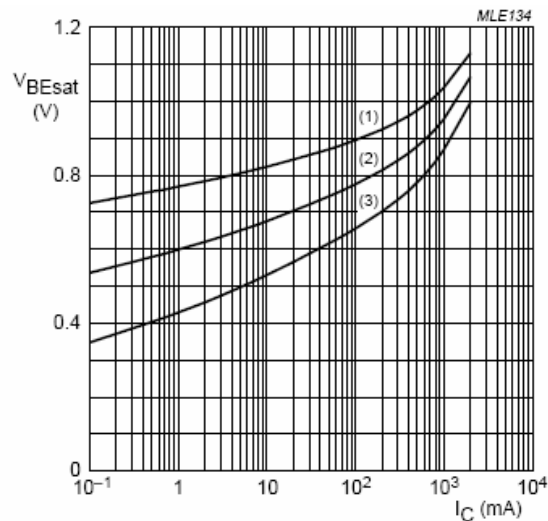
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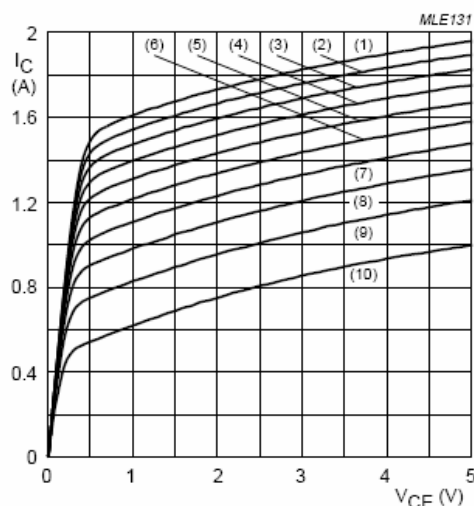
$T_{amb} = 25\text{ }^{\circ}\text{C}.$
(1) $I_C/I_B = 100.$
(2) $I_C/I_B = 50.$

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



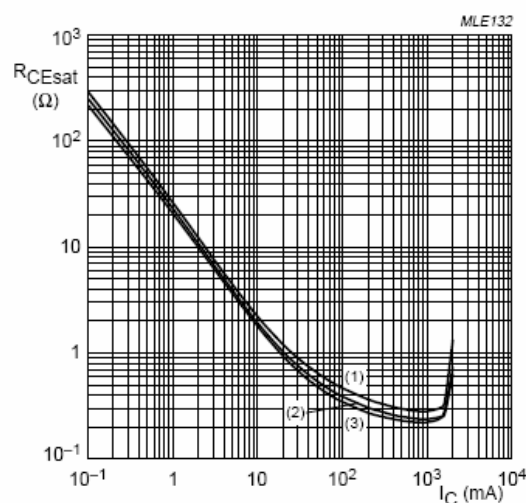
$I_C/I_B = 20.$
(1) $T_{amb} = -55\text{ }^{\circ}\text{C}.$
(2) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
(3) $T_{amb} = 100\text{ }^{\circ}\text{C}.$

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



$T_{amb} = 25\text{ }^{\circ}\text{C}.$
(1) $I_B = 60\text{ mA}.$ (5) $I_B = 36\text{ mA}.$ (9) $I_B = 12\text{ mA}.$
(2) $I_B = 54\text{ mA}.$ (6) $I_B = 30\text{ mA}.$ (10) $I_B = 6\text{ mA}.$
(3) $I_B = 48\text{ mA}.$ (7) $I_B = 24\text{ mA}.$
(4) $I_B = 42\text{ mA}.$ (8) $I_B = 18\text{ mA}.$

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



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

Fig. 8 Equivalent on-resistance as a function of collector current; typical values.

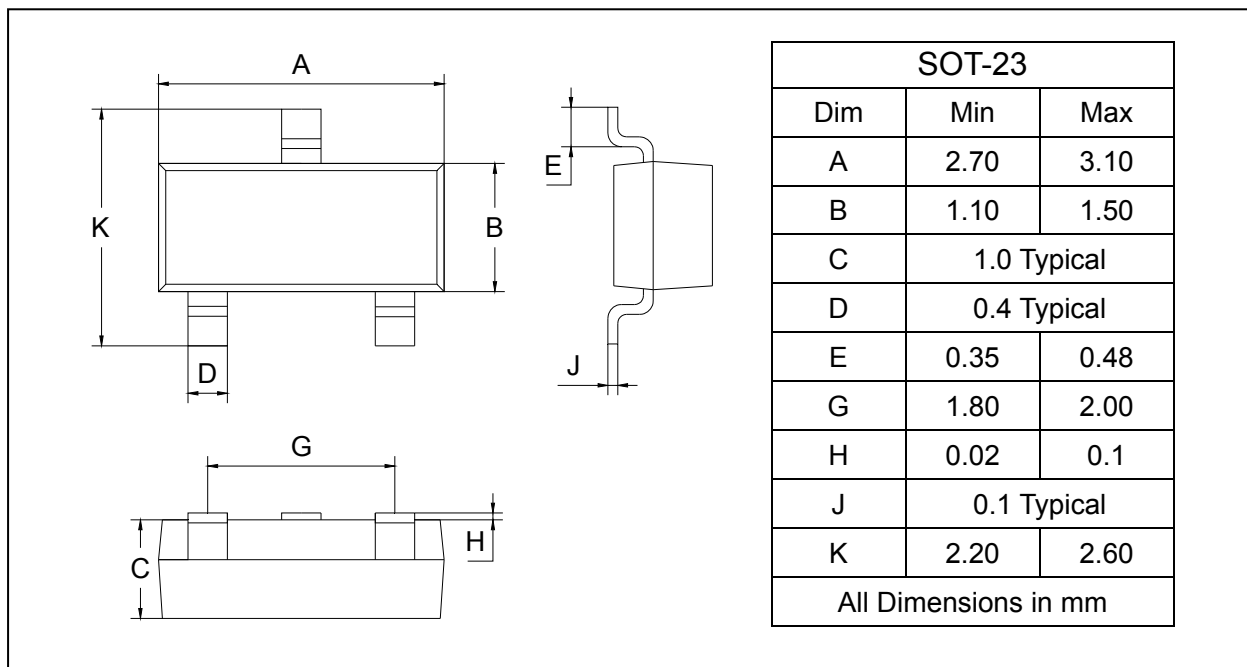
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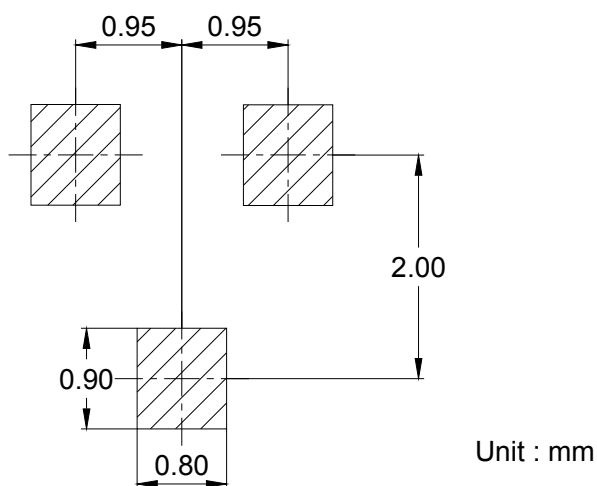
PACKAGE OUTLINE

Plastic surface mounted package

SOT-23



SOLDERING FOOTPRINT



PACKAGE INFORMATION

Device	Package	Shipping
PBSS4160T	SOT-23	3000/Tape&Reel