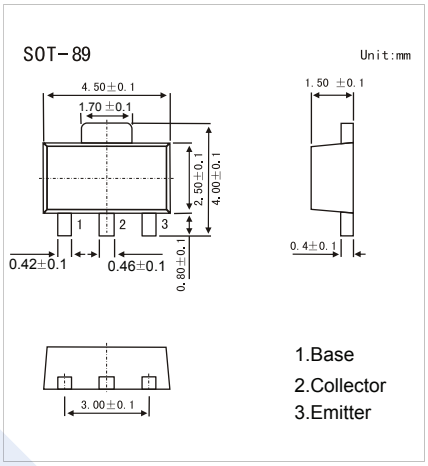
PNP Transistor

PBSS5350X (KBSS5350X)



■ Features

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability: I_C and I_{CM}
- Higher efficiency leading to less heat generation
- Reduced printed-circuit board requirements.

■ Absolute Maximum Ratings (Ta = 25℃ unless otherwise noted)

Parameter		Symbol	Rating	Unit
Collector - base voltage		V_{CBO}	-50	V
Collector - emitter voltage		V_{CEO}	-50	
Emitter - base voltage		V_{EBO}	-5	
Collector current (DC)	Note 4	I_C	-3	A
Peak collector current	Limited by $T_{j(max)}$	I_{CM}	-5	
Base current (DC)		I_B	-0.5	
Collector power dissipation	Note 1	P_{tot}	0.55	W
	Note 2		1	
	Note 3		1.4	
	Note 4		1.6	
Thermal resistance junction to ambient	Note 1	$R_{th(j-a)}$	225	℃/W
	Note 2		125	
	Note 3		90	
	Note 4		80	
Thermal resistance from junction to soldering point		$R_{th(j-s)}$	16	
Junction temperature		T_J	150	℃
Storage temperature range		T_{stg}	-65 to 150	

Notes:

1.Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; standard footprint.

2.Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 1 cm^2.

3.Device mounted on a FR4 printed-circuit board; single-sided copper; tin-plated; mounting pad for collector 6 cm^2.

4.Device mounted on a ceramic printed-circuit board 7 cm^2, single-sided copper, tin-plated.

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■ Electrical Characteristics (Ta = 25℃ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= -100 μA， I_E=0	-50			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= -1 mA， I_B=0	-50			
Emitter - base breakdown voltage	V_{EBO}	I_E= -100μA， I_C=0	-5			
Collector-base cut-off current	I_{CBO}	V_{CB}= -50 V , I_E=0			-100	nA
		V_{CB}= -50 V , I_E=0; T_j = 150℃			-50	μA
Collector- emitter cut-off current	I_{CES}	V_{CB}= -50 V , V_{BE} = 0 V			-100	nA
Emitter cut-off current	I_{EBO}	V_{EB}= -5V , I_C=0			-100	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=-0.5 A, I_B=- 50 mA			-90	mV
		I_C=-1 A, I_B=- 50 mA			-180	
		I_C=-2 A, I_B=- 100 mA			-320	
		I_C=-2 A, I_B=- 200 mA; Note 1			-270	
		I_C=-3 A, I_B=- 300 mA; Note 1			-390	
Base - emitter saturation voltage	$V_{BE(sat)}$	I_C=-2 A, I_B=- 100 mA			-1.1	V
		I_C=-3 A, I_B=- 300 mA; Note 1			-1.2	
Base-emitter turn-on voltage	V_{BEon}	V_{CE}= -2 V, I_C= -1A	-1.1			
Equivalent on-resistance	R_{CEsat}	I_C=-2 A, I_B=- 200 mA; Note 1			135	mΩ
DC current gain	h_{FE}	V_{CE}= -2 V, I_C= -0.1A	200			
		V_{CE}= -2 V, I_C= -0.5A	200			
		V_{CE}= -2 V, I_C= -1A; Note 1	200		450	
		V_{CE}= -2 V, I_C= -2A; Note 1	130			
		V_{CE}= -2 V, I_C= -3A; Note 1	80			
Transition frequency	f_T	I_C = −100 mA; V_{CE} = −5 V; f = 100 MHz	100			MHz
Collector capacitance	C_c	V_{CB} = −10 V; I_E = i_e = 0 A; f = 1 MHz			35	pF

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

■ Marking

Marking	S46

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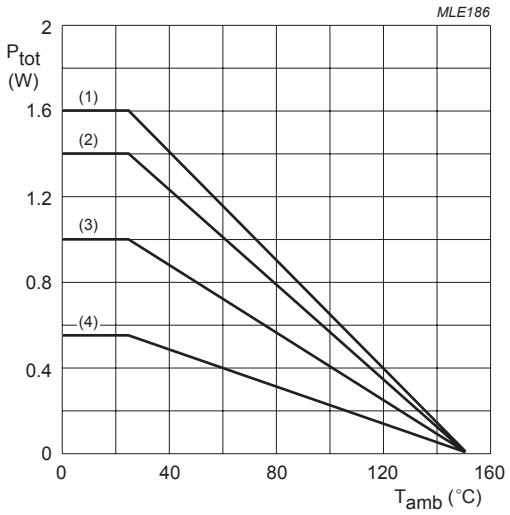
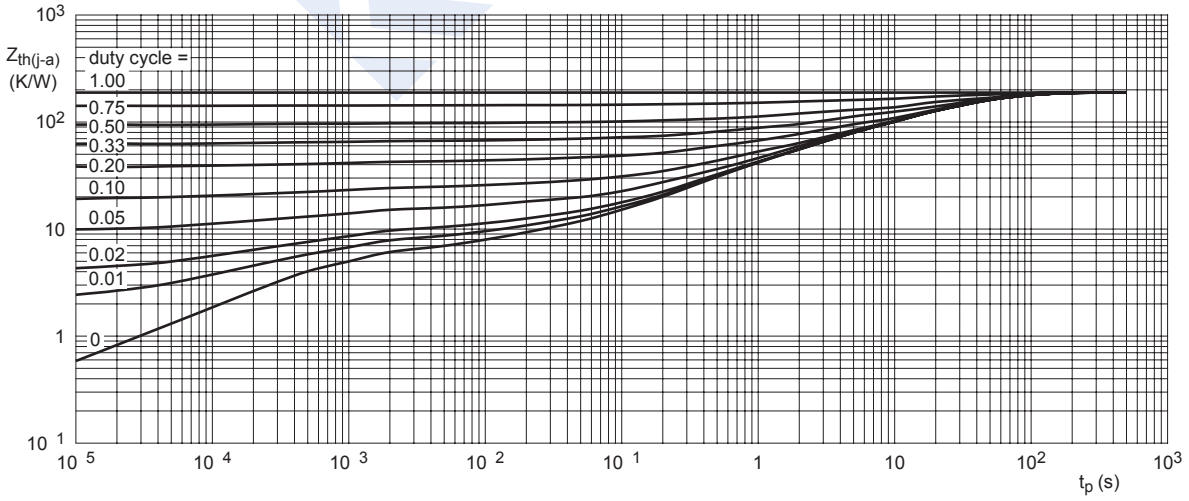
■ Typical Characterisitics



(1) Ceramic PCB; 7 cm^2 mounting pad for collector.
(2) FR4 PCB; 6 cm^2 copper mounting pad for collector.
(3) FR4 PCB; 1 cm^2 copper mounting pad for collector.
(4) Standard footprint.

Fig.1 Power derating curves.



Mounted on FR4 printed-circuit board; standard footprint.

Fig.2 Transient thermal impedance as a function of pulse time; typical values.

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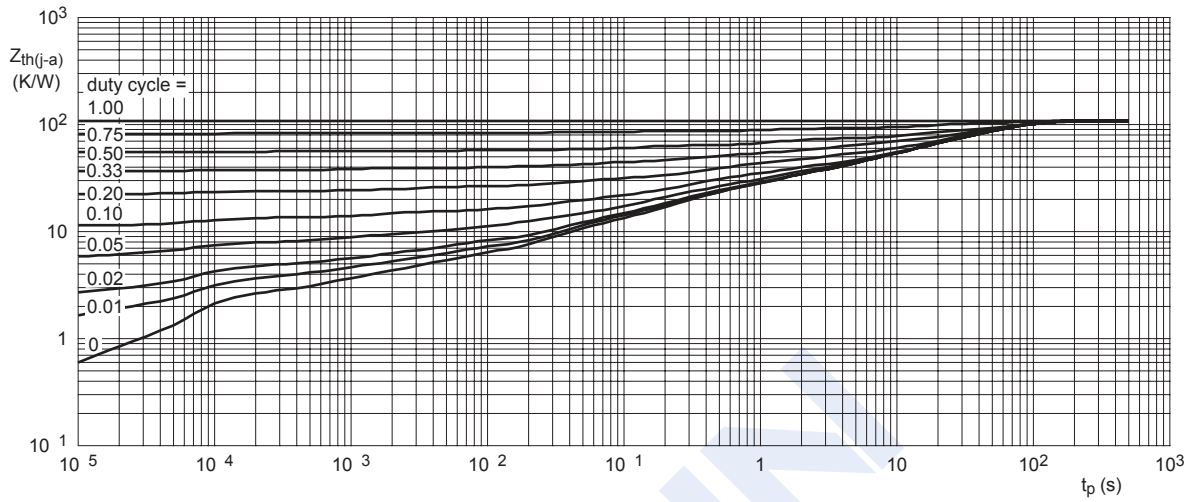
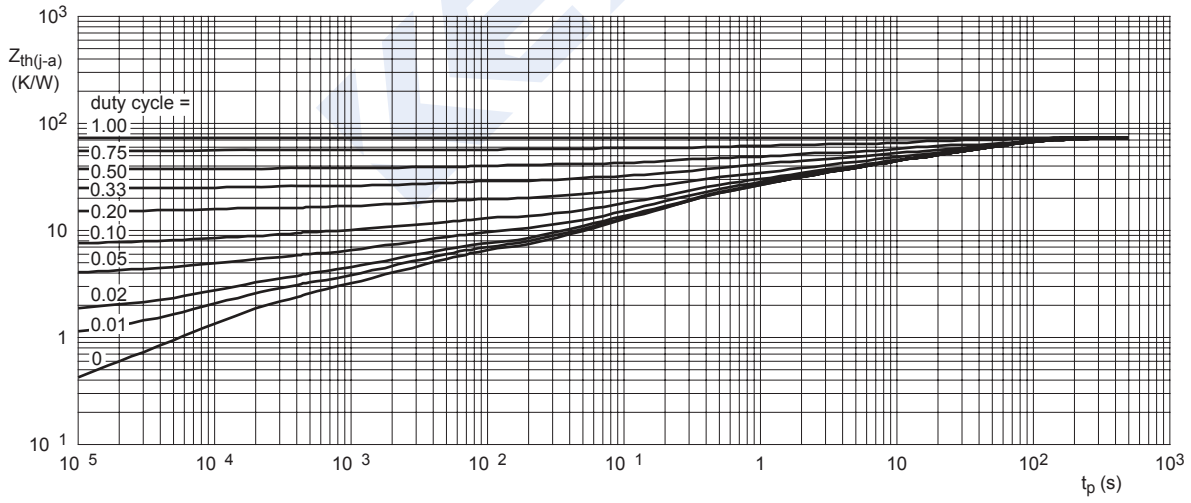


Mounted on FR4 printed-circuit board; mounting pad for collector 1 cm^2.

Fig.3 Transient thermal impedance as a function of pulse time; typical values.



Mounted on FR4 printed-circuit board; mounting pad for collector 6 cm^2.

Fig.4 Transient thermal impedance as a function of pulse time; typical values.

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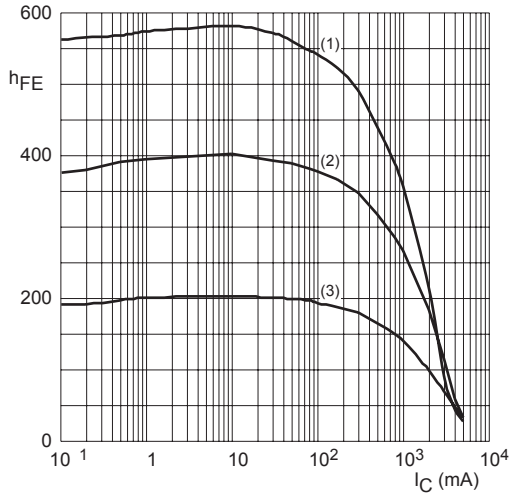
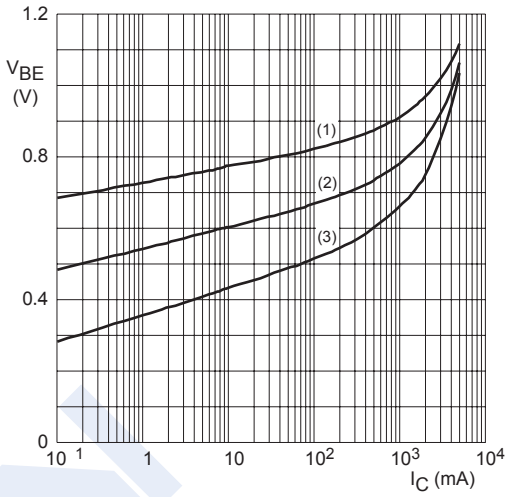


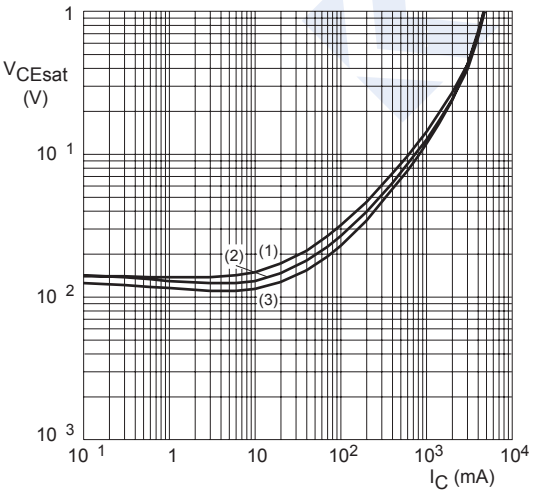
V_{CE} = −2 V.
(1) T_{amb} = 100 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.5 DC current gain as a function of collector current; typical values.



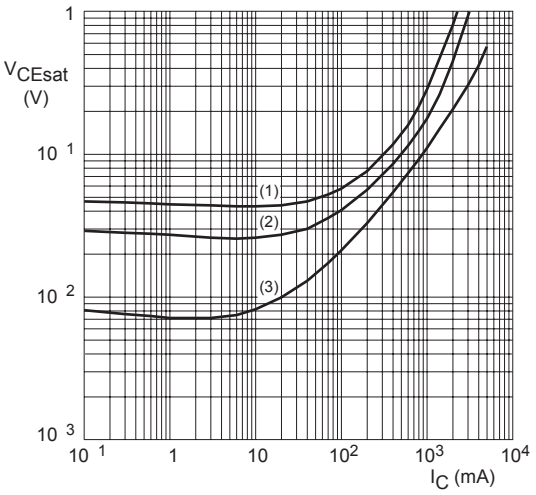
V_{CE} = −2 V.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 100 °C.

Fig.6 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.7 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.8 Collector-emitter saturation voltage as a function of collector current; typical values.

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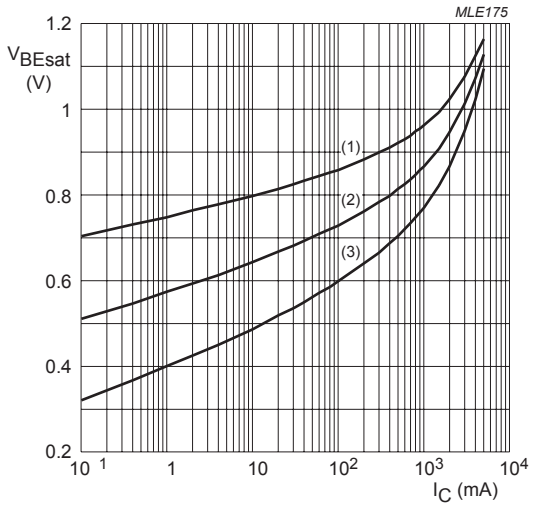
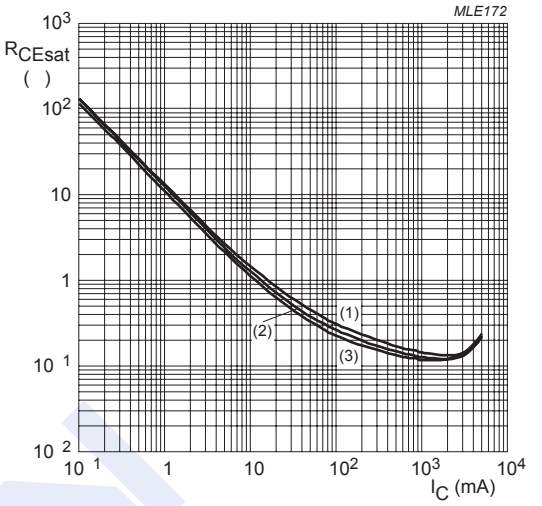


I_C/I_B = 20.

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

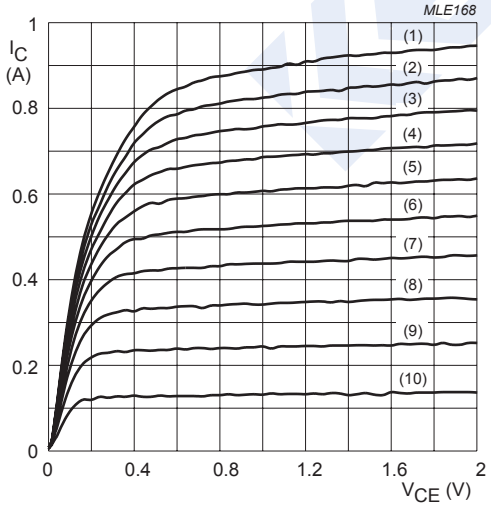
Fig.9 Base-emitter saturation voltage as a function of collector current; typical values.



I_C/I_B = 20.

(1) T_{amb} = 150 °C. (2) T_{amb} = 25 °C. (3) T_{amb} = −55 °C.

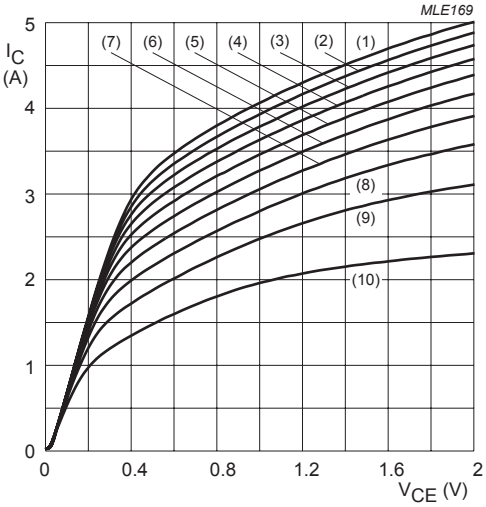
Fig.10 Equivalent on-resistance as a function of collector current; typical values.



T_{amb} = 25 °C.

(1) I_B = −3500 μA. (5) I_B = −2100 μA. (9) I_B = −700 μA.
(2) I_B = −3150 μA. (6) I_B = −1750 μA. (10) I_B = −350 μA.
(3) I_B = −2800 μA. (7) I_B = −1400 μA.
(4) I_B = −2450 μA. (8) I_B = −1050 μA.

Fig.11 Collector current as a function of collector-emitter voltage; typical values.



T_{amb} = 25 °C.

(1) I_B = −140 mA. (5) I_B = −84 mA. (9) I_B = −28 mA.
(2) I_B = −126 mA. (6) I_B = −70 mA. (10) I_B = −14 mA.
(3) I_B = −112 mA. (7) I_B = −56 mA.
(4) I_B = −98 mA. (8) I_B = −42 mA.

Fig.12 Collector current as a function of collector-emitter voltage; typical values.