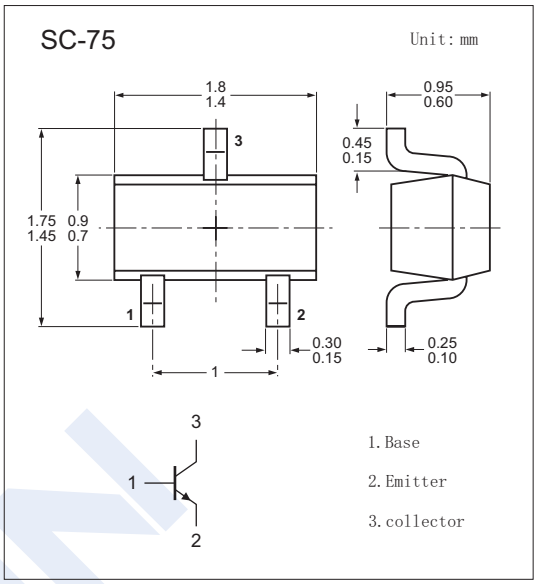
NPN Transistor

PBSS2515E

■ Features

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability I_C and I_{CM}
- High collector current gain (h_{FE}) at high I_C
- High efficiency due to less heat generation
- Reduced printed-circuit board area requirements



■ Absolute Maximum Ratings

Parameter		Symbol	Rating	Unit
Collector - Base Voltage		V_{CBO}	15	V
Collector - Emitter Voltage		V_{CEO}	15	
Emitter - Base Voltage		V_{EBO}	6	
Collector Current		I_C	0.5	A
Peak Collector Current		I_{CM}	1	
Peak Base Current		I_{BM}	0.1	
Total Power Dissipation（Ta=25℃）	*1	P_{tot}	150	mW
	*2		250	
Thermal Resistance from Junction to Ambient	*1	$R_{th(j-a)}$	833	℃/W
	*2		500	
Thermal Resistance from Junction to Solder Point		$R_{th(j-sp)}$	170	
Junction Temperature		T_J	150	℃
Storage Temperature range		T_{stg}	-65 to +150	

Note:

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 1cm^2.

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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	15			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= 1 mA， I_B= 0	15			
Emitter - base breakdown voltage	V_{EBO}	I_E= 100 μA， I_C= 0	6			
Collector-base cut-off current	I_{CBO}	V_{CB}= 15 V , I_E= 0			100	nA
		V_{CB}= 15 V , I_E= 0, Tj=150℃			50	μA
Emitter cut-off current	I_{EBO}	V_{EB}= 5V , I_C=0			100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=10 mA, I_B=0.5 mA			25	mV
		I_C=200 mA, I_B=10 mA			150	
		I_C=500 mA, I_B=50 mA *1			250	
Collector-emittersaturation resistance	R_{CEsat}	I_C=500 mA, I_B=50 mA *1		300	500	mΩ
Base - emitter saturation voltage	$V_{BE(sat)}$	I_C=500 mA, I_B=50 mA *1			1.1	V
Base - emitter turn-on voltage	V_{BEon}	VCE= 2 V, IC= 100 mA *1			0.9	V
DC current gain	h_{FE}	VCE= 2 V, IC= 10 mA	200			
		VCE= 2 V, IC= 100 mA *1	150			
		VCE= 2 V, IC= 500 mA *1	90			
Delay time	t_d	V_{CC}=11V; I_C=250mA; I_{Bon}=12.5mA; I_{Boff}=-12.5mA		10		ns
Rise time	t_r			15		
Turn-on time	t_{on}			25		
Storage time	t_s			215		
Fall time	t_f			34		
Turn-off time	t_{off}			249		
Transition frequency	f_T	I_C=100mA; V_{CE}=5V; f=100MHz	250			MHz
Collector capacitance	C_c	V_{CB}=10V; I_E=I_e=0; f=1MHz			6	pF

Note: 1. Pulse test: tp≤300μs; δ ≤0.02

■ Marking

Marking	1Q

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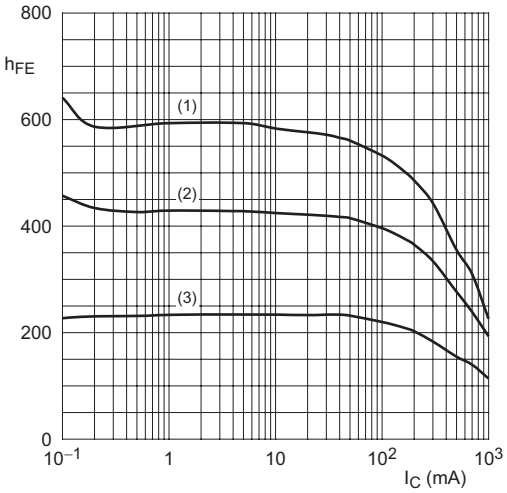
■ Typical Characterisitics



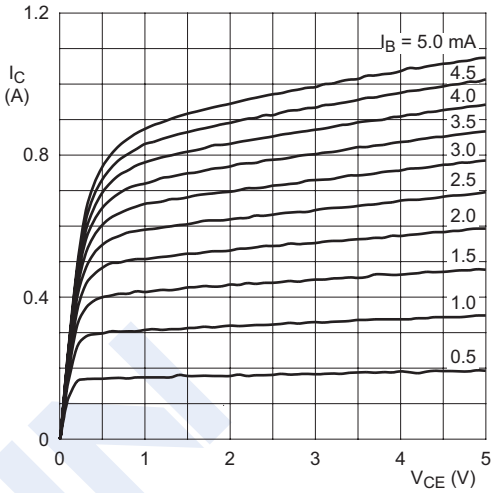
V_{CE} = 2 V

(1) T_{amb} = 100 °C

(2) T_{amb} = 25 °C

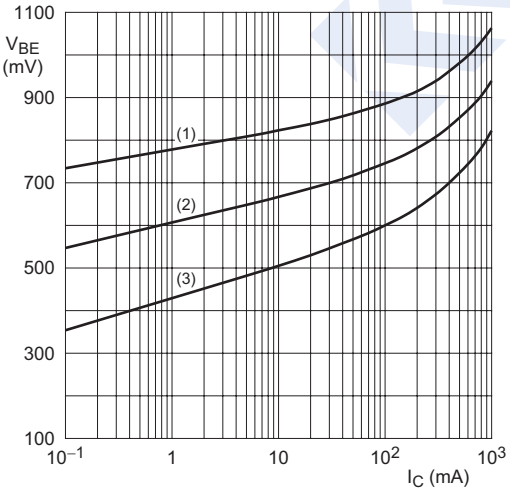
(3) T_{amb} = −55 °C

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



T_{amb} = 25 °C

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



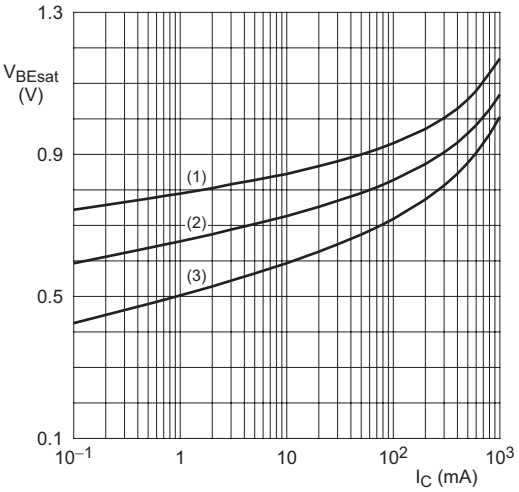
V_{CE} = 2 V

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 100 °C

Fig 3. Base-emitter 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 4. Base-emitter saturation voltage as a function of collector current; typical values

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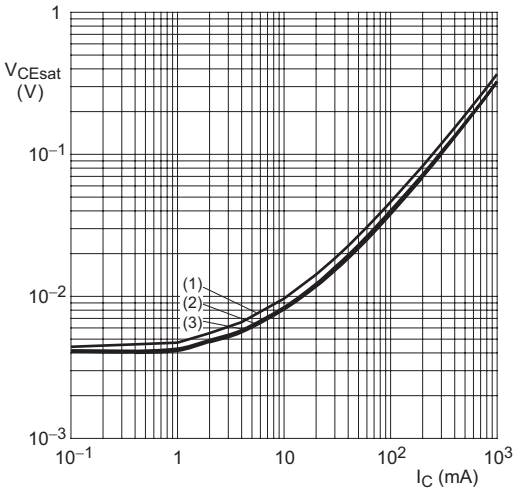


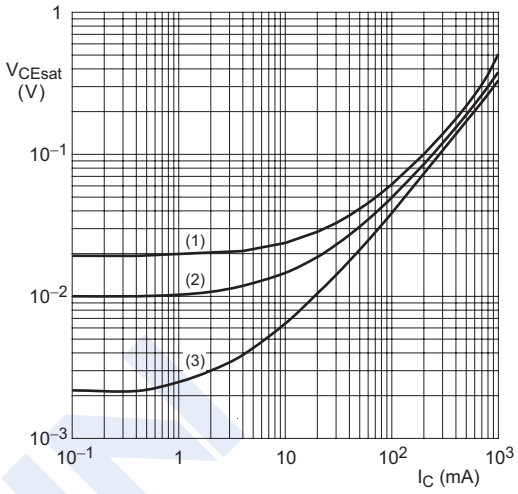
I_C/I_B = 20

(1) T_{amb} = 100 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

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



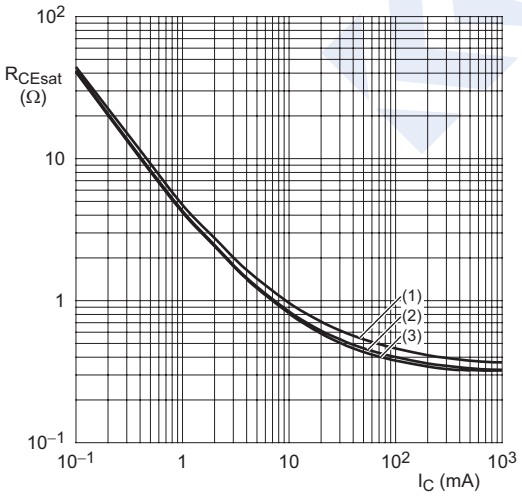
T_{amb} = 25 °C

(1) I_C/I_B = 100

(2) I_C/I_B = 50

(3) I_C/I_B = 10

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



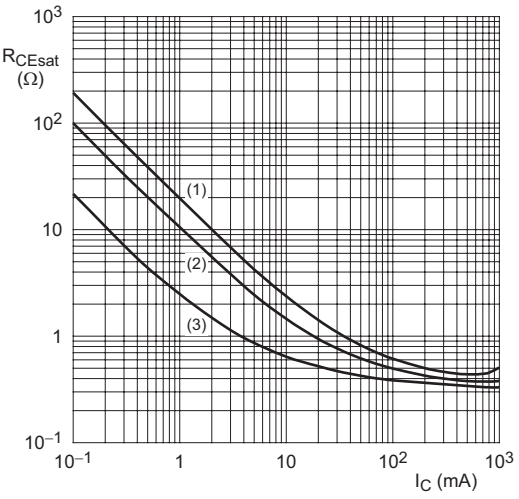
I_C/I_B = 20

(1) T_{amb} = 100 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

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