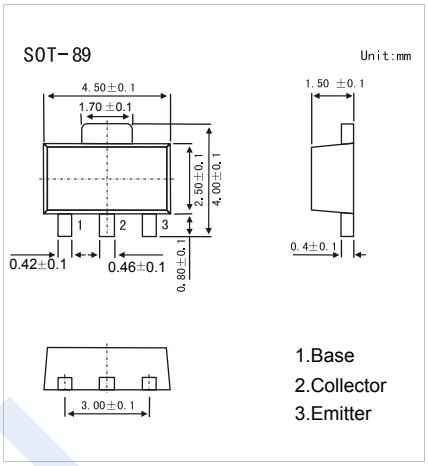
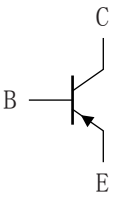
PNP Transistors

PBSS306PX (KBSS306PX)



■ Features

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability I_C and I_{CM}
- High collector current gain (hFE) at high I_C
- High efficiency due to less heat generation
- Complement to PBSS306NX.



■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	-100	V
Collector - Emitter Voltage	V_{CEO}	-100	
Emitter - Base Voltage	V_{EBO}	-5	
Collector Current - Continuous	I_C	-3.7	A
Collector Current - Pulse @ tp ⩽ 1 ms	I_{CP}	-7.4	
Collector Power Dissipation (Note.1)	P_C	0.6	W
Collector Power Dissipation (Note.2)		1.65	
Collector Power Dissipation (Note.3)		2.1	
Thermal Resistance from Junction to Ambient (Note.1)	$R_{\theta JA}$	208	℃/W
Thermal Resistance from Junction to Ambient (Note.2)		76	
Thermal Resistance from Junction to Ambient (Note.3)		60	
Thermal Resistance from Junction to Solder Point	$R_{\theta SP}$	20	
Junction Temperature	T_J	150	℃
Storage Temperature range	T_{stg}	-65 to 150	

Note.1: Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

Note.2: Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm^2.

Note.3: Device mounted on a ceramic PCB, Al_2O_3, standard footprint.

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= -100 μA， I_E=0	-100			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= -1 mA， I_B=0	-100			
Emitter - base breakdown voltage	V_{EBO}	I_E= -100 μ A， I_C=0	-5			
Collector-base cut-off current	I_{CBO}	V_{CB}= -80 V , I_E=0			-100	nA
		V_{CB}= -80 V , I_E=0 ,T_J= 150℃			-50	uA
Emitter cut-off current	I_{EBO}	V_{EB}= -5V , I_C=0			-100	nA
Collector-emitter saturation voltage (Note.1)	$V_{CE(sat)}$	I_C=-500 mA, I_B=-50mA			-60	mV
		I_C=-1 A, I_B=-50mA			-130	
		I_C=-4 A, I_B=-400mA			-300	
Base - emitter saturation voltage (Note.1)	$V_{BE(sat)}$	I_C=-1 A, I_B=-100mA			-0.9	V
		I_C=-4 A, I_B=-400mA			-1.05	
Base-emitter turn-on voltage (Note.1)	$V_{BE(on)}$	V_{CE}= -2V, I_C= -2 A			-0.85	
Collector-emitter saturation resistance	R_{CEsat}	I_C=-4 A, I_B=-400mA (Note.1)			75	mΩ
DC current gain (Note.1)	h_{FE}	V_{CE}= -2V, I_C= -500mA	200			
		V_{CE}= -2V, I_C= -1A	150			
		V_{CE}= -2V, I_C= -2A	100			
		V_{CE}= -2V, I_C= -4A	25			
DelayTime	t_d	V_{CC} = −12.5V; I_C = −3 A; I_{Bon} = −0.15 A; I_{Boff} = 0.15 A		15		ns
Rise Time	t_r			185		
Turn-On Time	t_{on}			200		
Storage Time	t_s			150		
Fall time	t_f			175		
Turn-off time	t_{off}			325		
Collector capacitance	C_c	V_{CB}= -10V, I_E=i_e=0,f=1MHz			80	pF
Transition frequency	f_T	V_{CE}= -10V, I_C= -100mA,f=100MHz		100		MHz

Note.1: Pulse test: tp ⩽ 300 us; δ ⩽ 0.02.

■ Marking

Marking	*5N

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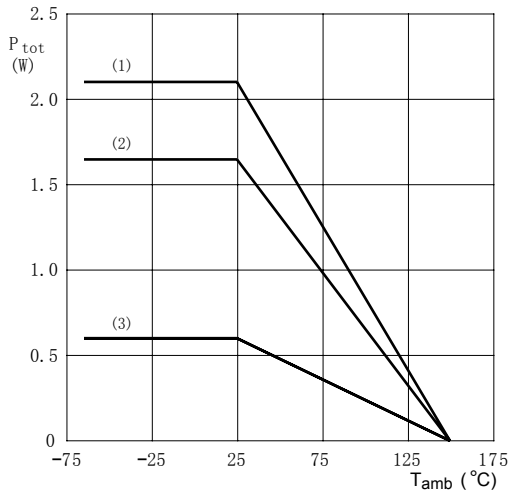
■ Typical Characterisitics

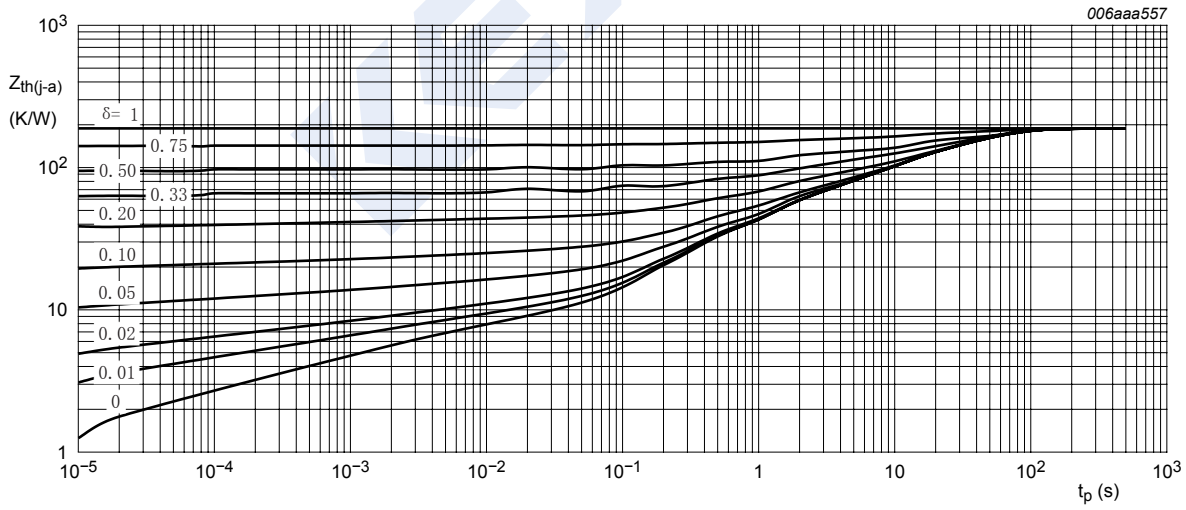


(1) Ceramic PCB, Al_2O_3, standard footprint

(2) FR4 PCB, mounting pad for collector 6 cm^2

(3) FR4 PCB, standard footprint

Fig 1. Power derating curves



FR4 PCB, standard footprint

Fig 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

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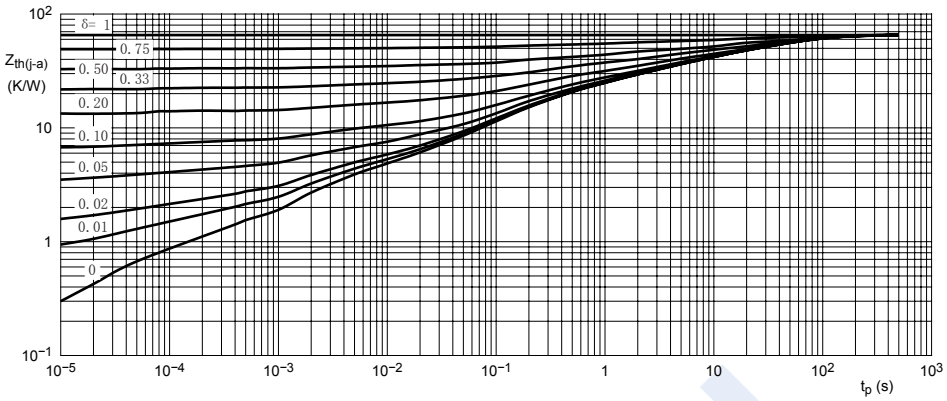
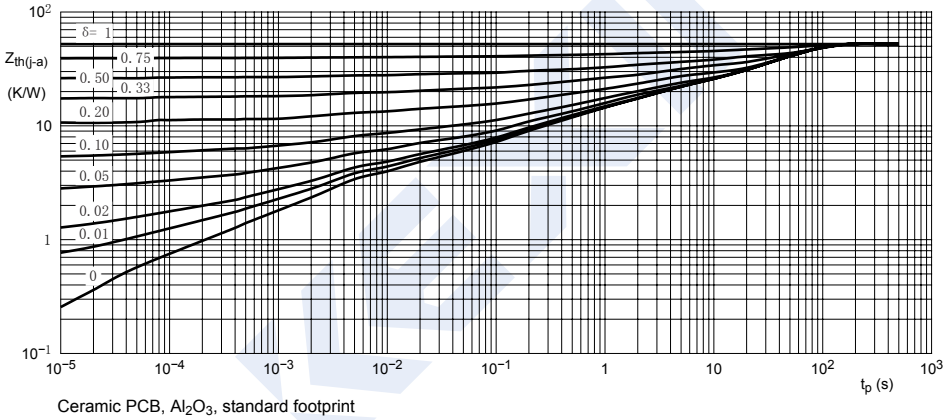
■ Typical Characterisitics



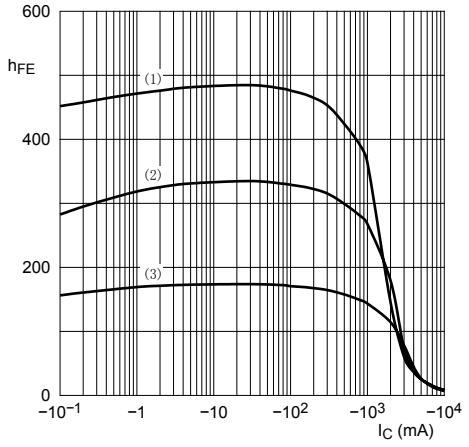
FR4 PCB, mounting pad for collector 6 cm^2

Fig 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



Ceramic PCB, Al_2O_3, standard footprint

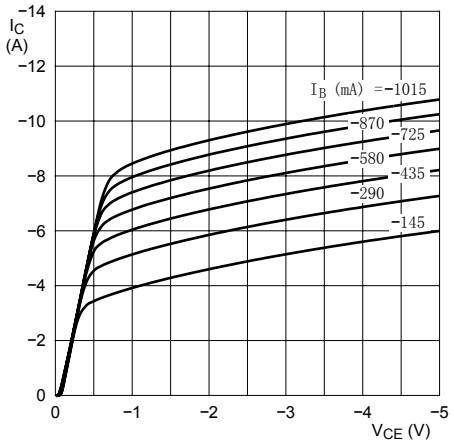
Fig 4. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



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



T_{amb} = 25 °C

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

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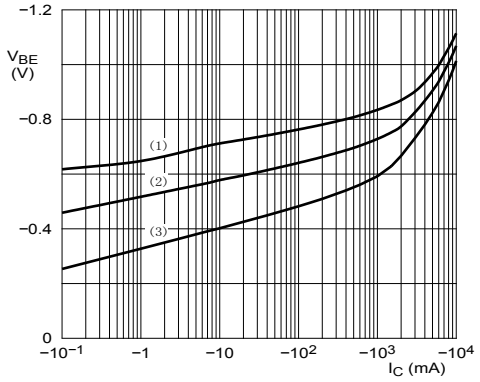
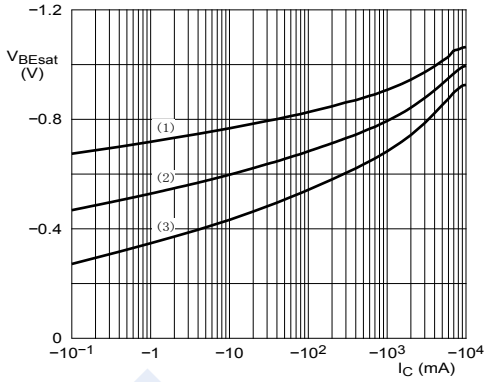
■ Typical Characterisitics



V_{CE} = −2 V

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

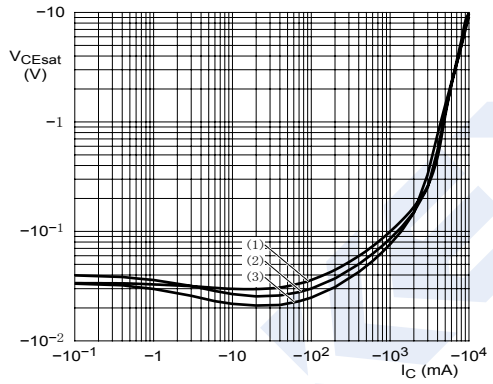
Fig 7. Base-emitter voltage as a function of collector current; typical values



I_C/I_B = 20

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

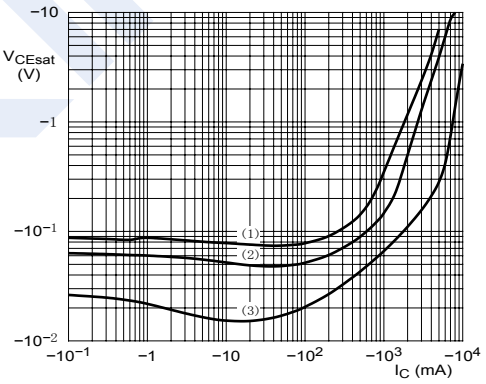
Fig 8. Base-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 20

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

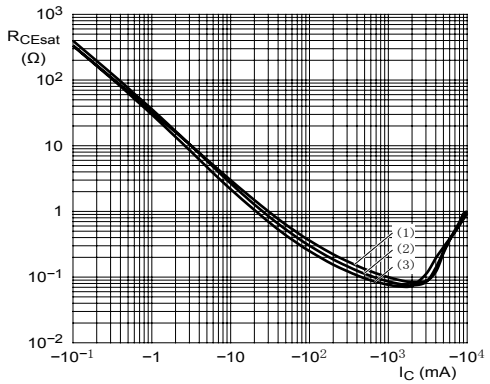
Fig 9. Collector-emitter saturation voltage as a function of collector current; typical values



T_{amb} = 25 °C

(1) I_C/I_B = 100 (2) I_C/I_B = 50 (3) I_C/I_B = 10

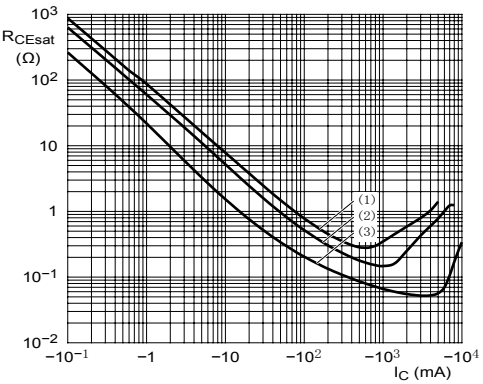
Fig 10. Collector-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 20

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

Fig 11. 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 12. Collector-emitter saturation resistance as a function of collector current; typical values

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■ Typical Characterisitics

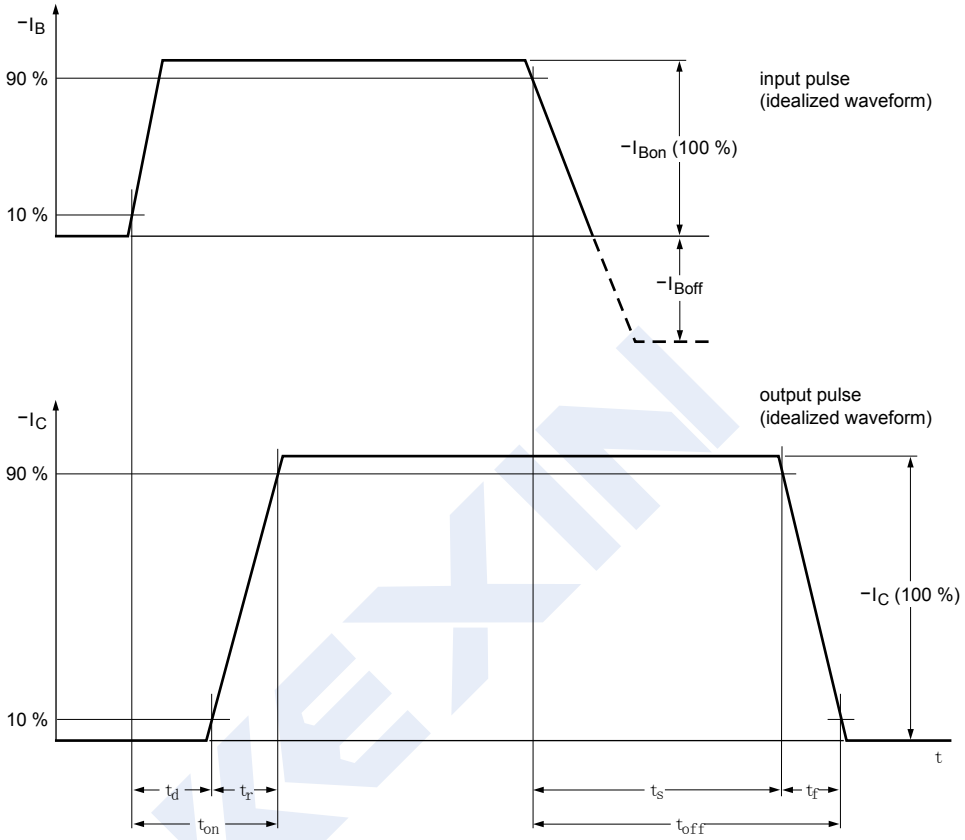
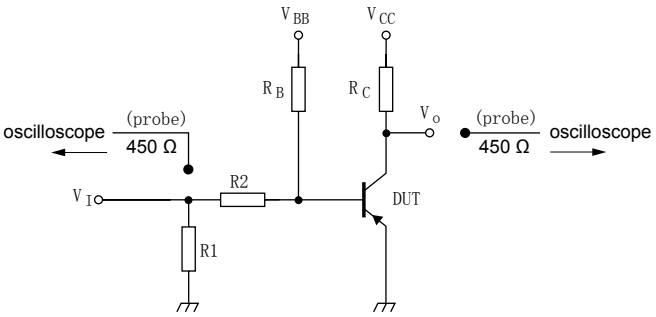


Fig 13. BISS transistor switching time definition



V_{CC} = −12.5 V; I_C = −3 A; I_{Bon} = −0.15 A; I_{Boff} = 0.15 A

Fig 14. Test circuit for switching times