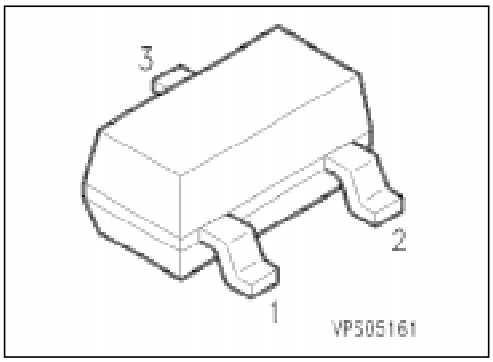
SIEMENS

PNP Silicon Transistors

SMBT 5086
SMBT 5087

- For AF input stages and driver applications
- High current gain
- Low collector-emitter saturation voltage
- Low noise between 30 Hz and 15 kHz



Type	Marking	Ordering Code (tape and reel)	Pin Configuration 1	2	3	Package[1]
SMBT 5086 SMBT 5087	s2P s2Q	Q62702-M0002 Q68000-A8319	B	E	C	SOT-23

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE0}	50	V
Collector-base voltage	V_{CB0}	50	
Emitter-base voltage	V_{EB0}	3	
Collector current	I_C	50	mA
Total power dissipation, T_S = 71 ˚C	P_{tot}	330	mW
Junction temperature	T_j	150	˚C
Storage temperature range	T_{stg}	– 65 … + 150	

Thermal Resistance

Junction - ambient[2]	$R_{th\ JA}$	≤ 310	K/W
Junction - soldering point	$R_{th\ JS}$	≤ 240	

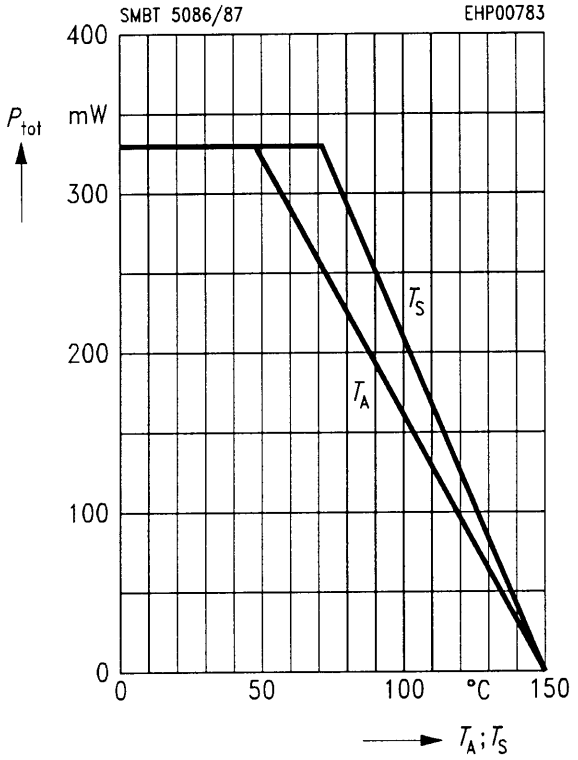
1) For detailed information see chapter Package Outlines.
2) Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm² Cu.

Electrical Characteristics
at T_A = 25 °C, unless otherwise specified.

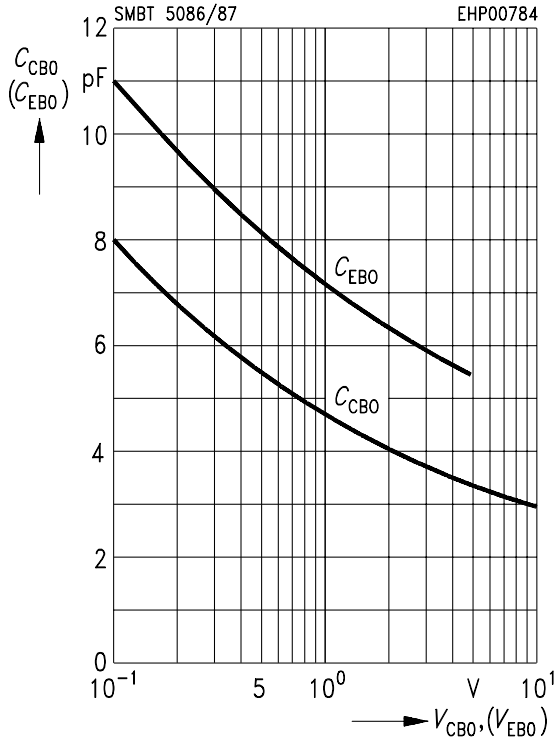
Parameter		Symbol	Values			Unit
			min.	typ.	max.	
DC characteristics						
Collector-emitter breakdown voltage I_C = 1 mA		$V_{(BR)CE0}$	50	–	–	V
Collector-base breakdown voltage I_C = 100 µA		$V_{(BR)CB0}$	50	–	–	
Emitter-base breakdown voltage, I_E = 10 µA		$V_{(BR)EB0}$	3	–	–	
Collector-base cutoff current		I_{CB0}				
V_{CB} = 10 V, I_E = 0			–	–	10	nA
V_{CB} = 35 V, I_E = 0			–	–	50	nA
V_{CB} = 35 V, I_E = 0, T_A = 150 °C			–	–	20	µA
DC current gain		h_{FE}				–
I_C = 100 µA, V_{CE} = 5 V	SMBT 5086		150	–	500	
	SMBT 5087		250	–	800	
I_C = 1 mA, V_{CE} = 5 V	SMBT 5086		150	–	–	
	SMBT 5087		250	–	–	
I_C = 10 mA, V_{CE} = 5 V	SMBT 5086		150	–	–	
	SMBT 5087		250	–	–	
Collector-emitter saturation voltage[1)] I_C = 10 mA, I_B = 1 mA		V_{CEsat}	–	–	0.3	V
Base-emitter saturation voltage[1)] I_C = 10 mA, I_B = 1 mA		V_{BEsat}	–	–	0.85	
AC characteristics						
Transition frequency I_C = 0.5 mA, V_{CE} = 5 V, f = 100 MHz		f_t	40	–	–	MHz
Output capacitance, V_{CB} = 5 V, f = 1 MHz		C_{obo}	–	–	4	pF
Small-signal current gain		h_{fe}				–
I_C = 1 mA, V_{CE} = 5 V, f = 1 kHz	SMBT 5086		150	–	600	
I_C = 1 mA, V_{CE} = 5 V, f = 1 kHz	SMBT 5087		250	–	900	
Noise figure		NF				
I_C = 100 µA, V_{CE} = 5 V, f = 1 kHz,						
R_S = 3 kΩ	SMBT 5086		–	–	3	dB
	SMBT 5087		–	–	2	dB
I_C = 2 mA, V_{CE} = 5 V, f = 10 Hz to 15 kHz,						
R_S = 10 kΩ	SMBT 5086		–	–	3	dB
	SMBT 5087		–	–	2	dB

[1)] Pulse test conditions: $t \leq$ 300 µs, $D \leq$ 2 %.

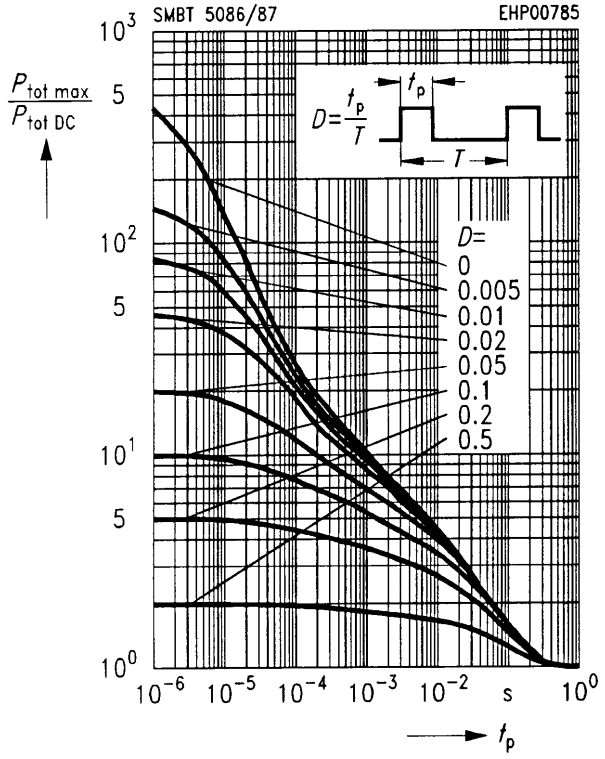
Total power dissipation $P_{tot} = f(T_A^*; T_S)$
* Package mounted on epoxy



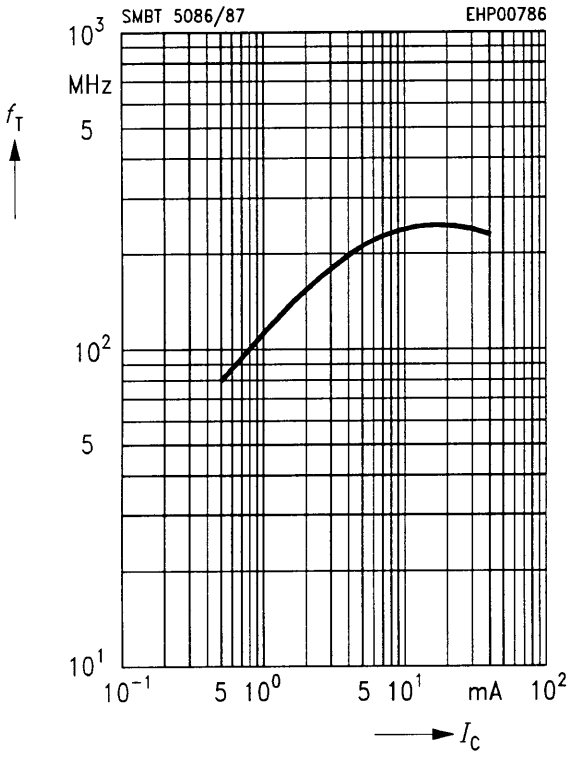
Collector-base capacitance $C_{CB0} = f(V_{CB0})$
Emitter-base capacitance $C_{EB0} = f(V_{EB0})$



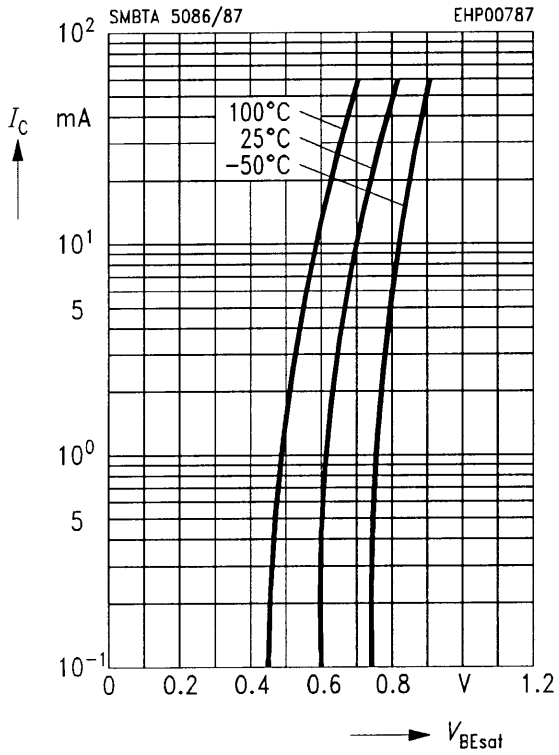
Permissible pulse load $P_{tot\,max}/P_{tot\,DC} = f(t_p)$



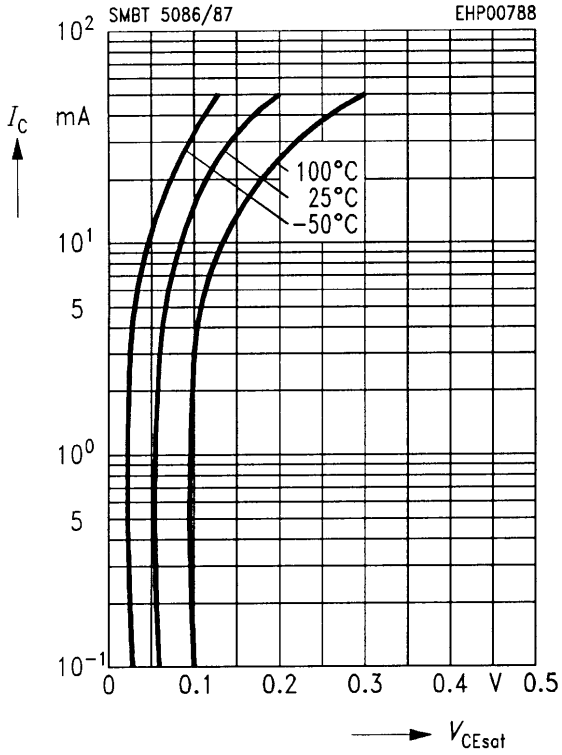
Transition frequency $f_T = f(I_C)$
V_{CE} = 5 V



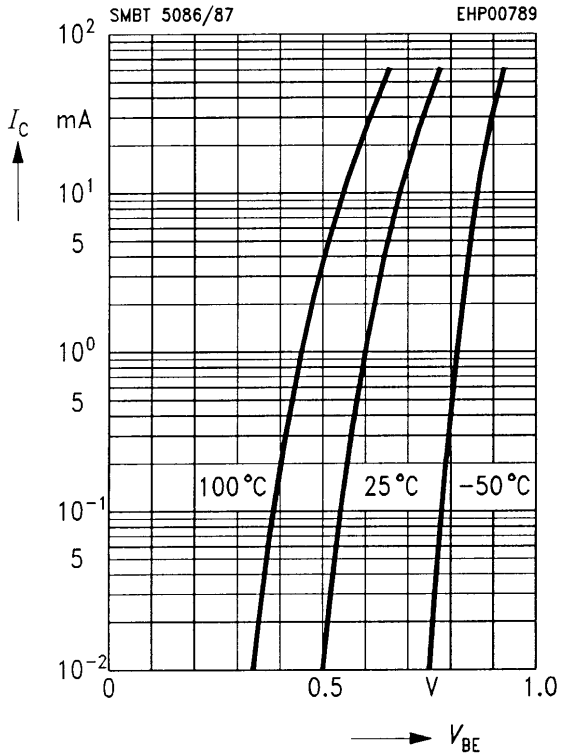
Base-emitter saturation voltage
$I_C = f(V_{BE\,sat})$, $h_{FE} = 40$



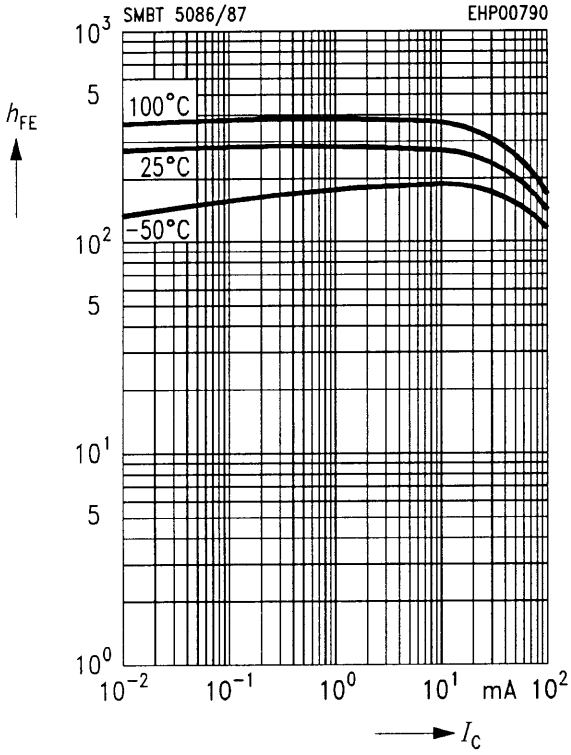
Collector-emitter saturation voltage
$I_C = f(V_{CE\,sat})$, $h_{FE} = 40$



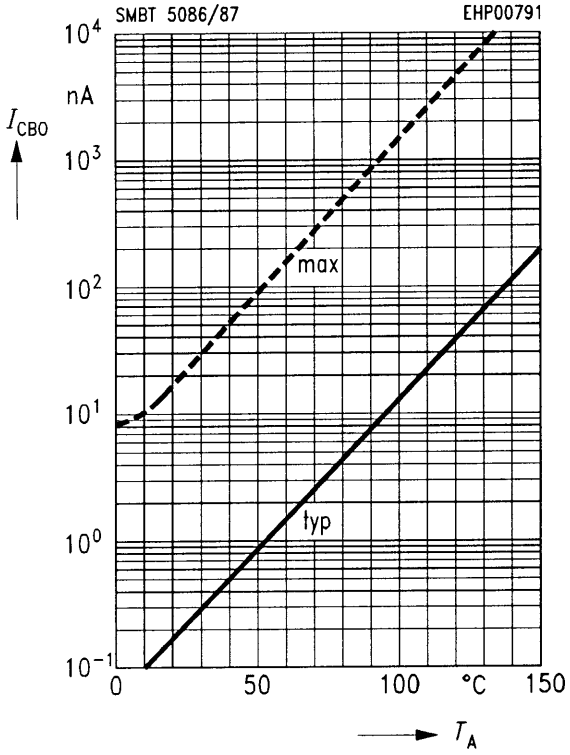
Collector current $I_C = f(V_{BE})$
V_{CE} = 1 V



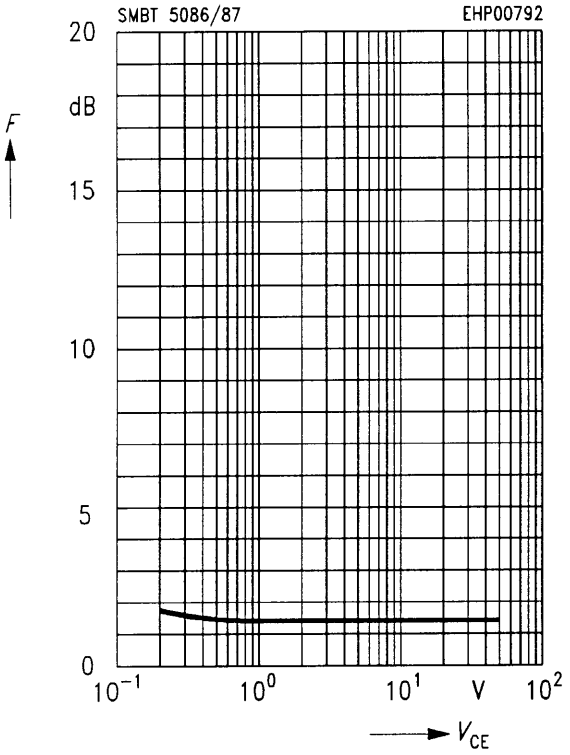
DC current gain $h_{FE} = f(I_C)$
V_{CE} = 1 V



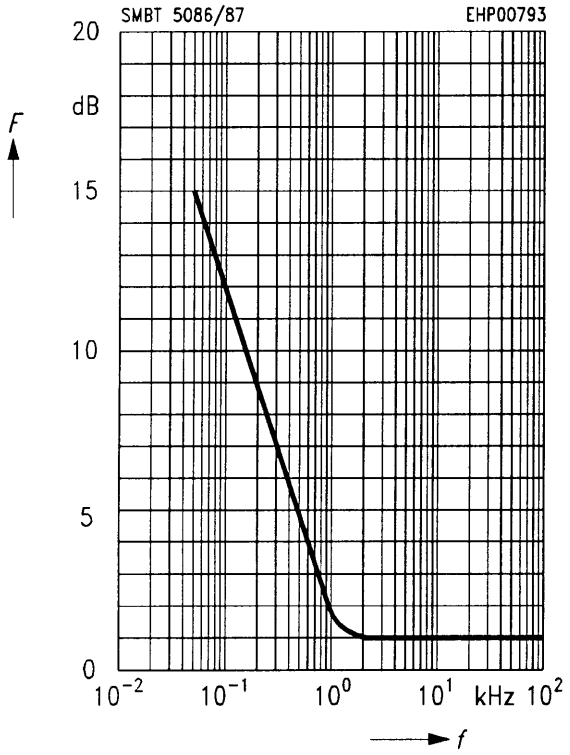
Collector cutoff current $I_{CB0} = f(T_A)$



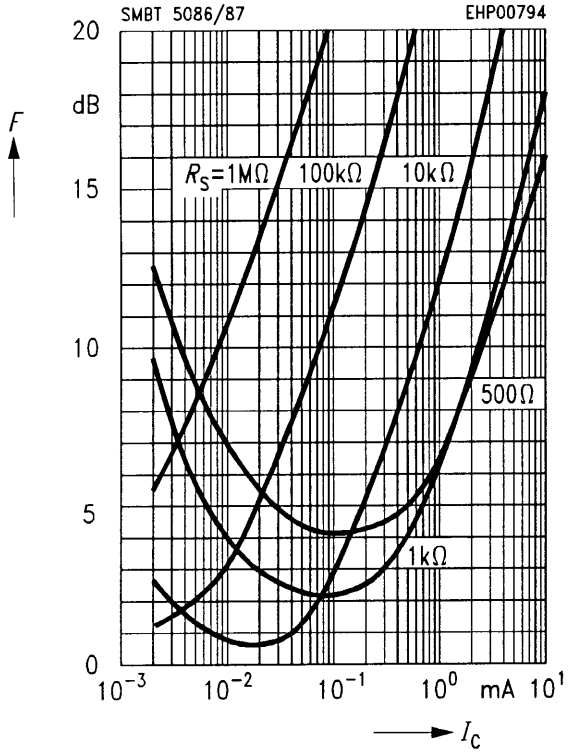
Noise figure $NF = f(V_{CE})$
I_C = 0.2 mA, R_S = 2 kΩ, f = 1 kHz



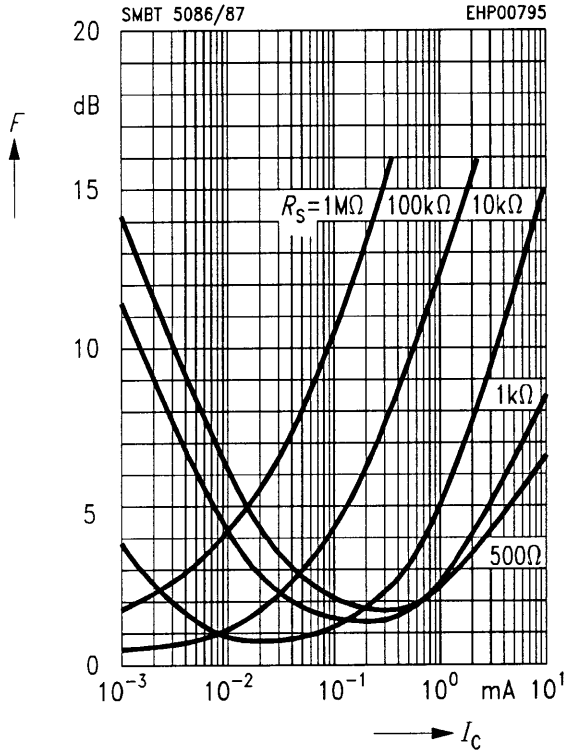
Noise figure $NF = f(I_C)$
I_C = 0.2 mA, R_S = 2 kΩ, V_{CE} = 5 V



Noise figure $NF = f(I_C)$
V_{CE} = 5 V, f = 120 kHz



Noise figure $NF = f(I_C)$
V_{CE} = 5 V, f = 1 kHz



Noise figure $NF = f(I_C)$
V_{CE} = 5 V, f = 10 kHz