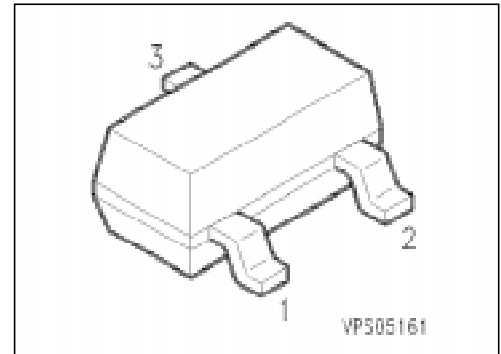


## NPN Silicon Transistors

**SMBT 6428**  
**SMBT 6429**

- For AF input stages and driver applications
- High current gain
- Low collector-emitter saturation voltage



Type	Marking	Ordering Code (tape and reel)	Pin Configuration			Package <sup>1)</sup>
			1	2	3	
SMBT 6428	s1K	Q68000-A8321	B	E	C	SOT-23
SMBT 6429	s1L	Q68000-A8322				

### Maximum Ratings

Parameter	Symbol	Values		Unit
		SMBT 6428	SMBT 6429	
Collector-emitter voltage	$V_{CE0}$	50	45	V
Collector-base voltage	$V_{CB0}$	60	55	
Emitter-base voltage	$V_{EB0}$	6		
Collector current	$I_C$	200		mA
Total power dissipation, $T_s = 71\text{ °C}$	$P_{tot}$	330		mW
Junction temperature	$T_j$	150		°C
Storage temperature range	$T_{stg}$	- 65 ... + 150		

### Thermal Resistance

Junction - ambient <sup>2)</sup>	$R_{th\ JA}$	≤ 310	K/W
Junction - soldering point	$R_{th\ JS}$	≤ 240	

<sup>1)</sup> For detailed information see chapter Package Outlines.

<sup>2)</sup> Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm<sup>2</sup> Cu.

## Electrical Characteristics

at  $T_A = 25\text{ °C}$ , unless otherwise specified.

Parameter	Symbol	Values			Unit	
		min.	typ.	max.		
<b>DC characteristics</b>						
Collector-emitter breakdown voltage $I_C = 1\text{ mA}$	$V_{(BR)CE0}$	50	–	–	V	
SMBT 6428		45	–	–		
SMBT 6429						
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$	$V_{(BR)CB0}$	60	–	–		
SMBT 6428		55	–	–		
SMBT 6429						
Emitter-base breakdown voltage $I_E = 1\text{ }\mu\text{A}$	$V_{(BR)EB0}$	6	–	–		
Collector-base cutoff current $V_{CB} = 30\text{ V}, I_E = 0$ $V_{CB} = 30\text{ V}, I_E = 0, T_A = 150\text{ °C}$	$I_{CB0}$	–	–	10	nA	
		–	–	10	$\mu\text{A}$	
Collector cutoff current $V_{CE} = 30\text{ V}, I_B = 0$	$I_{CE0}$	–	–	100	nA	
Emitter-base cutoff current $V_{EB} = 5\text{ V}, I_C = 0$	$I_{EB0}$	–	–	10		
DC current gain $I_C = 10\text{ }\mu\text{A}, V_{CE} = 5\text{ V}$	$h_{FE}$	250	–	–	–	
SMBT 6428		500	–	–		
SMBT 6429		250	–	650		
$I_C = 100\text{ }\mu\text{A}, V_{CE} = 5\text{ V}$		SMBT 6428	500	–		1250
		SMBT 6429	250	–		–
$I_C = 1\text{ mA}, V_{CE} = 5\text{ V}$		SMBT 6428	500	–		–
		SMBT 6429	250	–		–
$I_C = 10\text{ mA}, V_{CE} = 5\text{ V}$		SMBT 6428	500	–		–
		SMBT 6429	250	–		–
		SMBT 6428	500	–		–
		SMBT 6429	250	–		–
		SMBT 6429	500	–		–
Collector-emitter saturation voltage <sup>1)</sup> $I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}, I_B = 5\text{ mA}$	$V_{CEsat}$	–	–	0.2	V	
		–	–	0.6		
Base-emitter voltage $I_C = 1\text{ mA}, V_{CE} = 5\text{ V}$	$V_{BE(on)}$	0.56	–	0.66		

<sup>1)</sup> Pulse test conditions:  $t \leq 300\text{ }\mu\text{s}$ ,  $D \leq 2\%$ .

## Electrical Characteristics

at  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

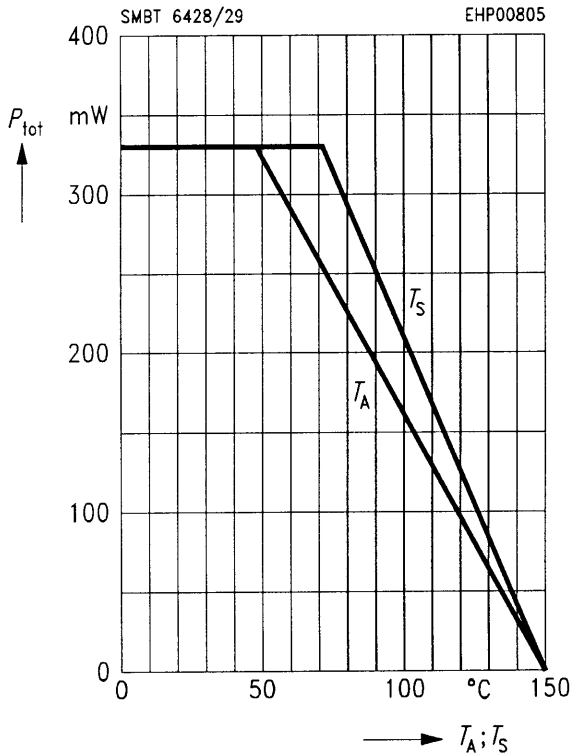
Parameter	Symbol	Values			Unit
		min.	typ.	max.	

### AC characteristics

Transition frequency $I_C = 5\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 100\text{ MHz}$	$f_T$	100	–	700	MHz
Output capacitance $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	$C_{obo}$	–	–	3	pF
Input capacitance $V_{EB} = 0.5\text{ V}$ , $f = 1\text{ MHz}$	$C_{ibo}$	–	–	15	

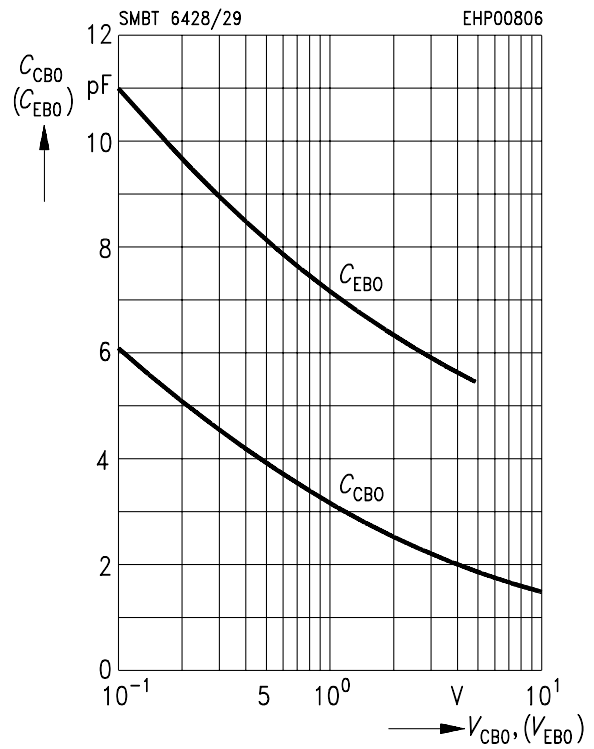
### Total power dissipation $P_{tot} = f(T_A^*; T_S)$

\* Package mounted on epoxy

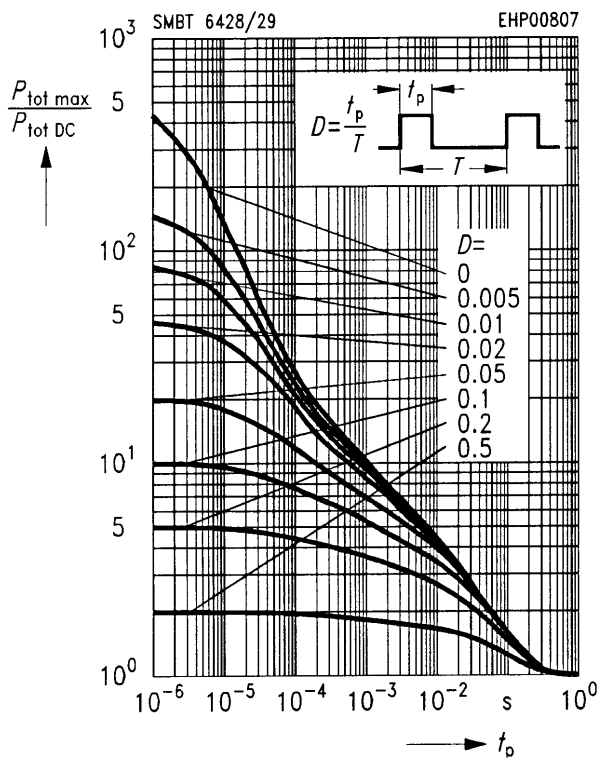


### Collector-base capacitance $C_{CB0} = f(V_{CB0})$

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

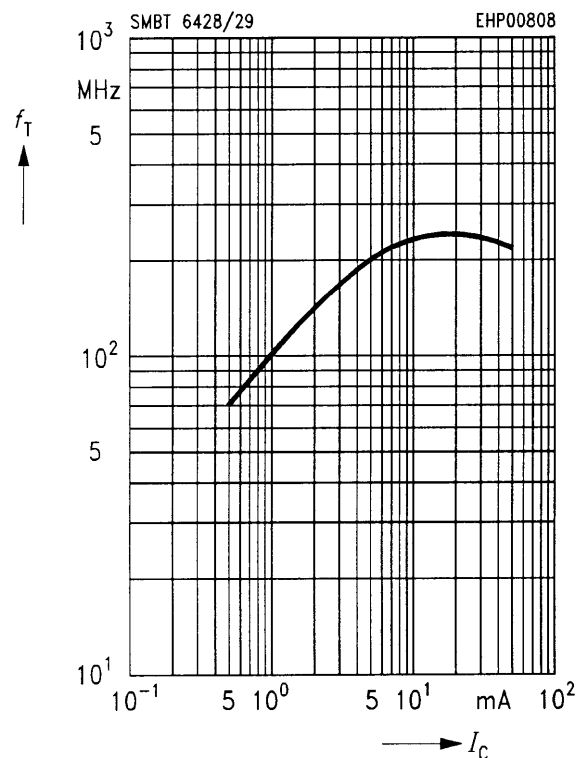


### Permissible pulse load $P_{tot max} / P_{tot DC} = f(t_p)$



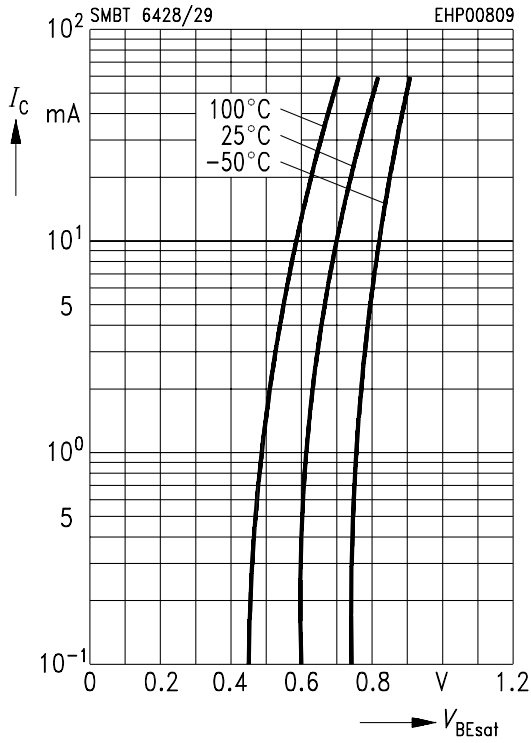
### Transition frequency $f_T = f(I_C)$

$V_{CE} = 5 V$



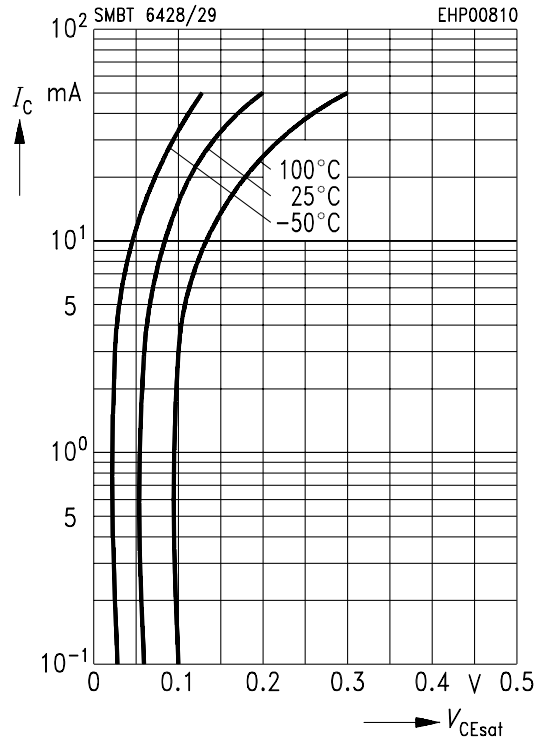
**Base-emitter saturation voltage**

$I_C = f(V_{BEsat}), h_{FE} = 40$



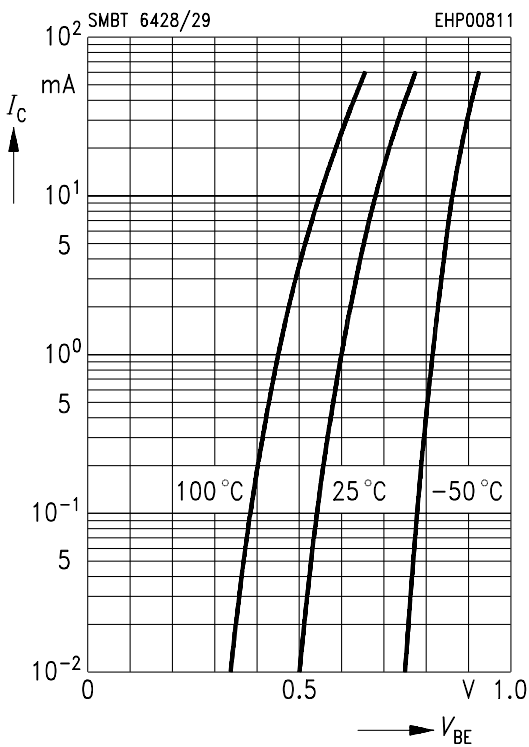
**Collector-emitter saturation voltage**

$I_C = f(V_{CEsat}), h_{FE} = 40$



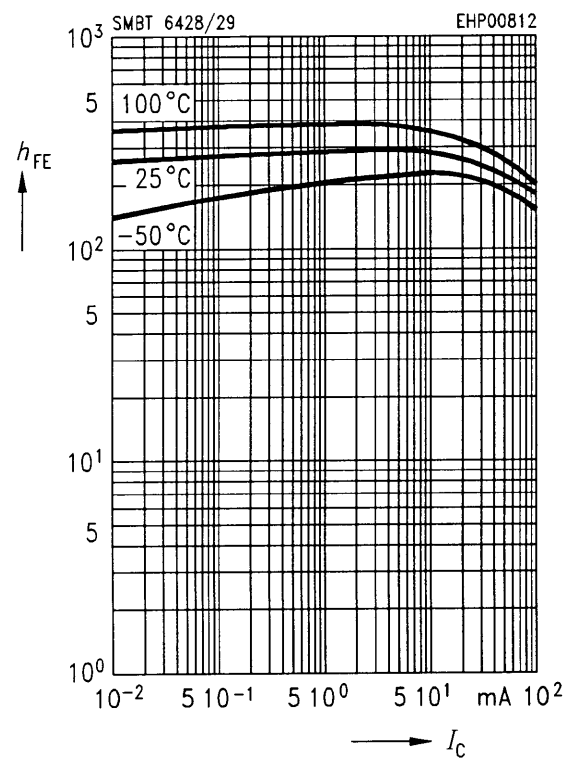
**Collector current  $I_C = f(V_{BE})$**

$V_{CE} = 1\text{ V}$



**DC current gain  $h_{FE} = f(I_C)$**

$V_{CE} = 1\text{ V}$



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

$V_{CB} = 30 \text{ V}$

