

NPN Silicon Darlington Transistor

SMBT 6427

- For general amplifier applications
- High collector current
- High current gain



Type	Marking	Ordering Code (tape and reel)	Pin Configuration			Package ¹⁾
			1	2	3	
SMBT 6427	s1V	Q68000-A8320	B	E	C	SOT-23

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE0}	40	V
Collector-base voltage	V_{CB0}	40	
Emitter-base voltage	V_{EB0}	12	
Collector current	I_C	500	mA
Peak collector current	I_{CM}	800	
Total power dissipation, $T_s = 74\text{ °C}$	P_{tot}	360	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	- 65 ... + 150	

Thermal Resistance

Junction - ambient ²⁾	$R_{th\ JA}$	≤ 280	K/W
Junction - soldering point	$R_{th\ JS}$	≤ 210	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC characteristics

Collector-emitter breakdown voltage $I_C = 10\text{ mA}$	$V_{(BR)CE0}$	40	–	–	V
Collector-base breakdown voltage $I_C = 100\text{ }\mu\text{A}$	$V_{(BR)CB0}$	40	–	–	
Emitter-base breakdown voltage, $I_E = 10\text{ }\mu\text{A}$	$V_{(BR)EB0}$	12	–	–	
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}	–	–	50 10	nA μA
Collector cutoff current $V_{CE} = 30\text{ V}$, $I_B = 0$	I_{CE0}	–	–	1	μA
Emitter-base cutoff current $V_{EB} = 10\text{ V}$, $I_C = 0$	I_{EB0}	–	–	50	nA
DC current gain $I_C = 10\text{ mA}$, $V_{CE} = 5\text{ V}$ $I_C = 100\text{ mA}$, $V_{CE} = 5\text{ V}$ $I_C = 500\text{ mA}$, $V_{CE} = 5\text{ V}$	h_{FE}	10000 20000 14000	– – –	100000 200000 140000	–
Collector-emitter saturation voltage ¹⁾ $I_C = 50\text{ mA}$, $I_B = 0.5\text{ mA}$ $I_C = 500\text{ mA}$, $I_B = 0.5\text{ mA}$	V_{CEsat}	– –	– –	1.2 1.5	V
Base-emitter saturation voltage ¹⁾ $I_C = 500\text{ mA}$, $I_B = 0.5\text{ mA}$	V_{BEsat}	–	–	2.0	
Base-emitter voltage $I_C = 50\text{ mA}$, $V_{CE} = 5\text{ V}$	$V_{BE(on)}$	–	–	1.75	

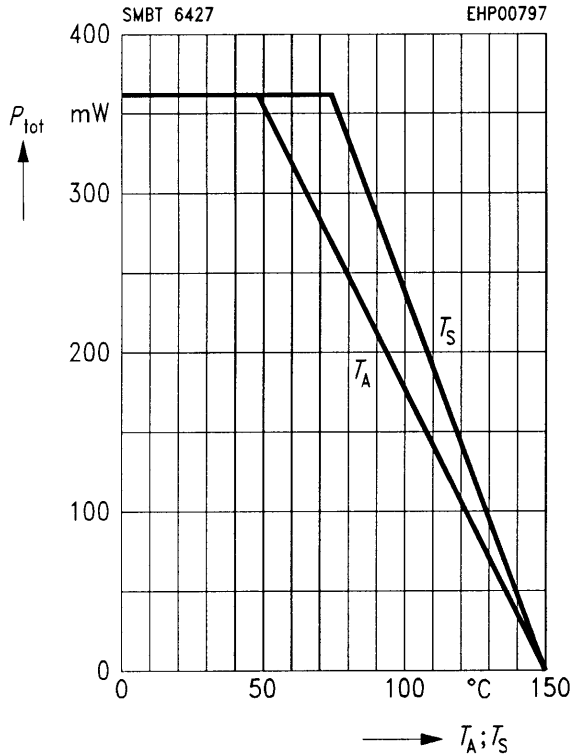
AC characteristics

Transition frequency $I_C = 50\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 100\text{ MHz}$	f_t	130	–	–	MHz
Output capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$	C_{obo}	–	–	7	pF
Input capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$	C_{ibo}	–	–	25	
Noise figure $I_C = 1\text{ mA}$, $V_{CE} = 5\text{ V}$, $R_S = 100\text{ k}\Omega$ $f = 1\text{ kHz to }15\text{ kHz}$	NF	–	–	10	dB

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

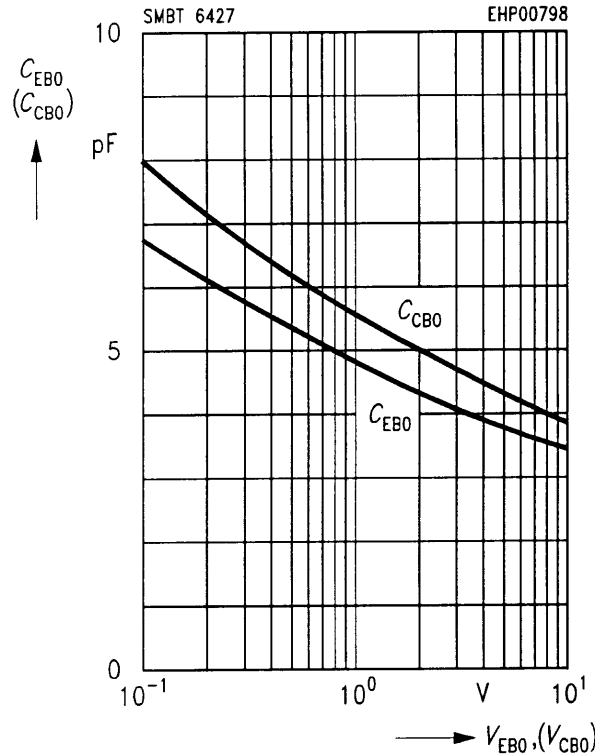
Total power dissipation $P_{tot} = f(T_A^*; T_S)$

* Package mounted on epoxy



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

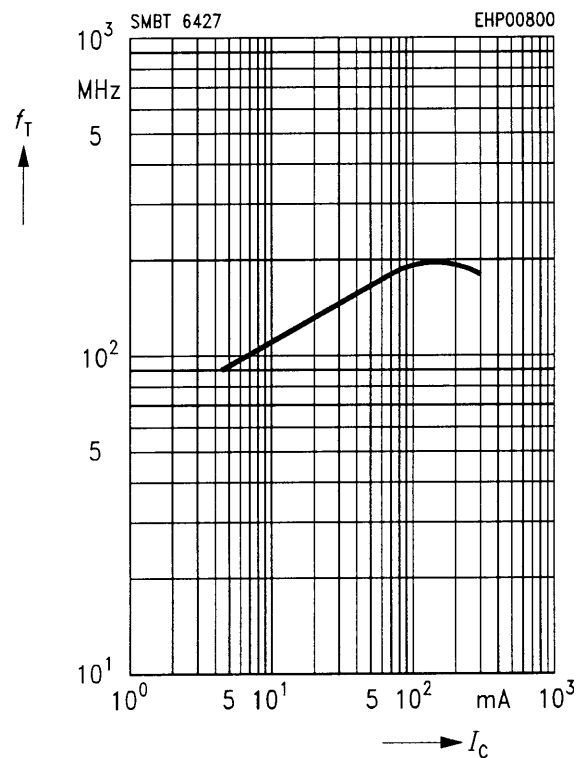
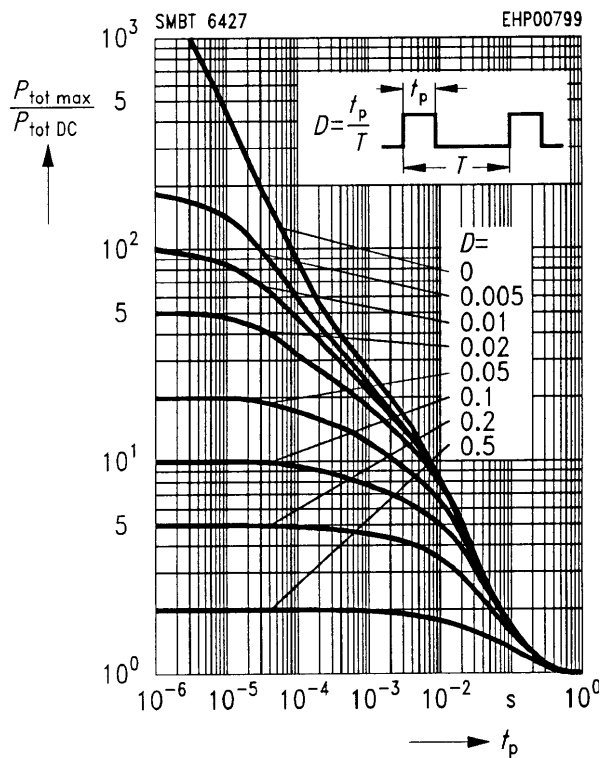
Emitter-base capacitance $C_{EB0} = f(V_{EB0})$



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

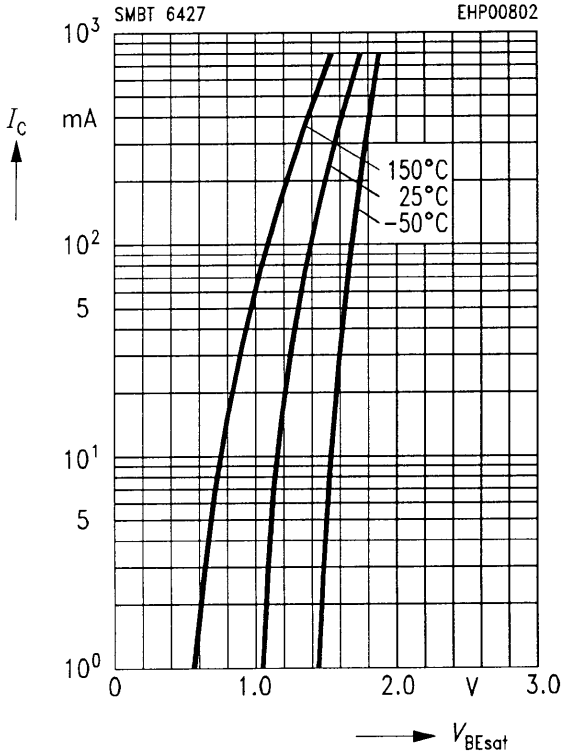
Transition frequency $f_T = f(I_C)$

$V_{CE} = 5 V$



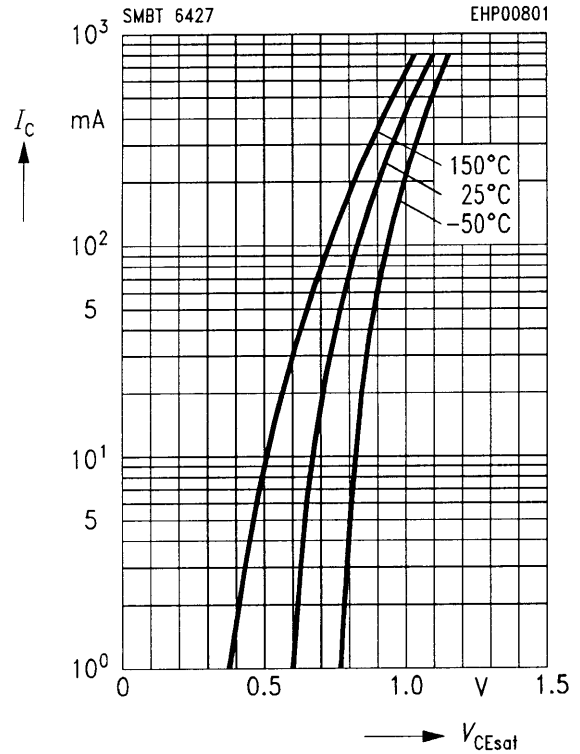
Base-emitter saturation voltage

$I_C = f(V_{BE\ sat}), h_{FE} = 1000$



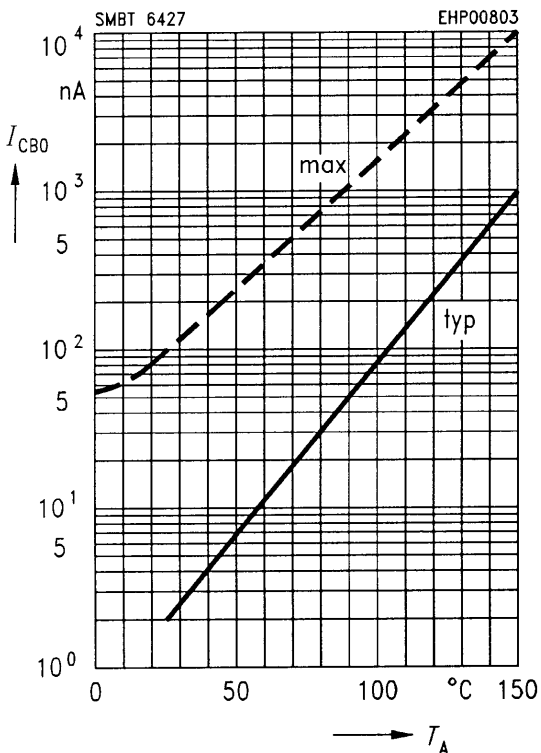
Collector-emitter saturation voltage

$I_C = f(V_{CE\ sat}), h_{FE} = 1000$



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

$V_{CB} = V_{CE\ max}$



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

$V_{CE} = 5\ V$

