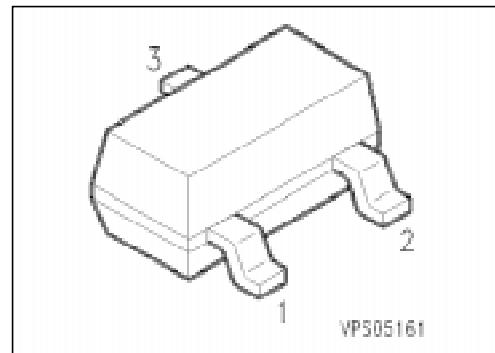


NPN Silicon Darlington Transistor

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, $T_S = 74^\circ\text{C}$	P_{tot}	360	mW
Junction temperature	T_j	150	$^\circ\text{C}$
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 Characteristicsat $T_A = 25^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC characteristics

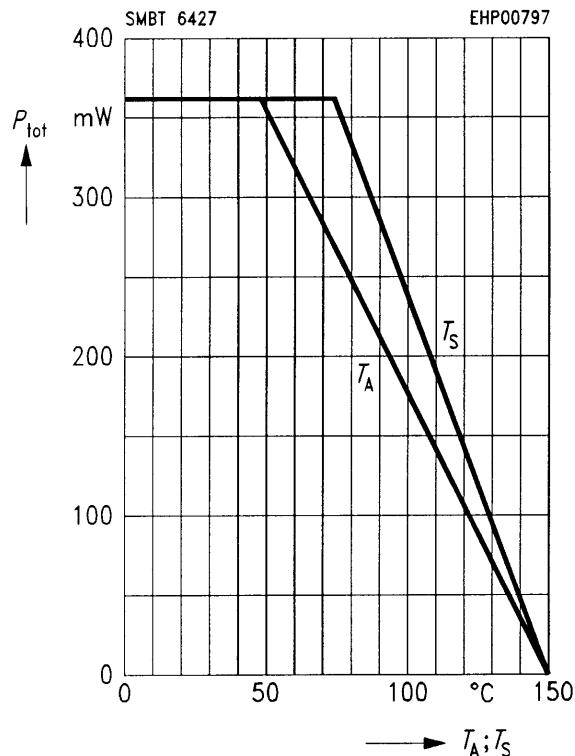
Collector-emitter breakdown voltage $I_C = 10 \text{ mA}$	$V_{(\text{BR})\text{CE}0}$	40	—	—	V
Collector-base breakdown voltage $I_C = 100 \mu\text{A}$	$V_{(\text{BR})\text{CB}0}$	40	—	—	
Emitter-base breakdown voltage, $I_E = 10 \mu\text{A}$	$V_{(\text{BR})\text{EB}0}$	12	—	—	
Collector-base cutoff current $V_{\text{CB}} = 30 \text{ V}, I_E = 0$ $V_{\text{CB}} = 30 \text{ V}, I_E = 0, T_A = 150^\circ\text{C}$	I_{CBO}	— —	— —	50 10	nA μA
Collector cutoff current $V_{\text{CE}} = 30 \text{ V}, I_B = 0$	I_{CEO}			1	μA
Emitter-base cutoff current $V_{\text{EB}} = 10 \text{ V}, I_C = 0$	I_{EBO}	—	—	50	nA
DC current gain $I_C = 10 \text{ mA}, V_{\text{CE}} = 5 \text{ V}$ $I_C = 100 \text{ mA}, V_{\text{CE}} = 5 \text{ V}$ $I_C = 500 \text{ mA}, V_{\text{CE}} = 5 \text{ V}$	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 $I_C = 50 \text{ mA}, V_{\text{CE}} = 5 \text{ V}$	$V_{\text{BE(on)}}$	—	—	1.75	

AC characteristics

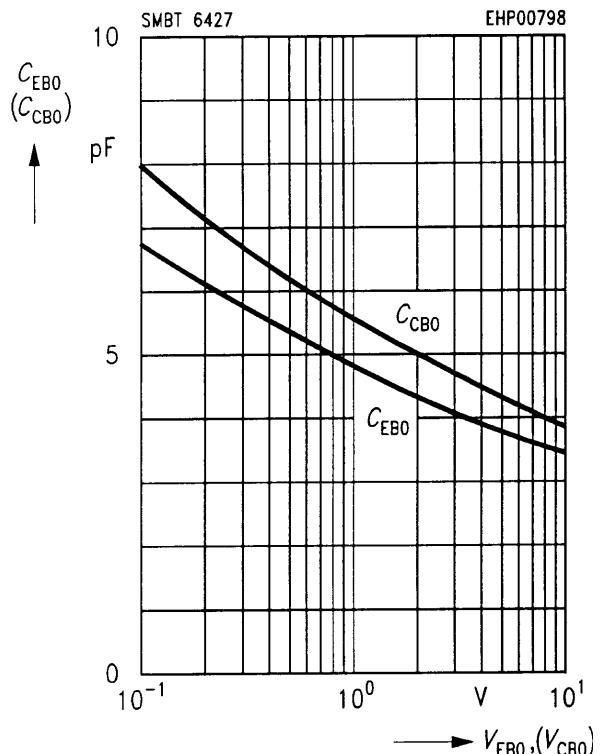
Transition frequency $I_C = 50 \text{ mA}, V_{\text{CE}} = 5 \text{ V}, f = 100 \text{ MHz}$	f_T	130	—	—	MHz
Output capacitance $V_{\text{CB}} = 10 \text{ V}, f = 1 \text{ MHz}$	C_{obo}	—	—	7	pF
Input capacitance $V_{\text{EB}} = 0.5 \text{ V}, f = 1 \text{ MHz}$	C_{ibo}	—	—	25	
Noise figure $I_C = 1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

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

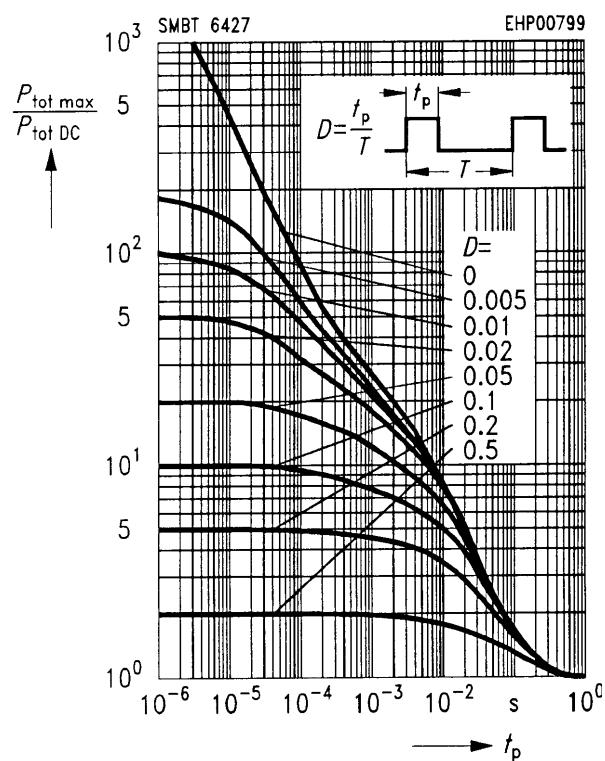
Total power dissipation $P_{\text{tot}} = f(T_A^*; T_S)$
 * Package mounted on epoxy



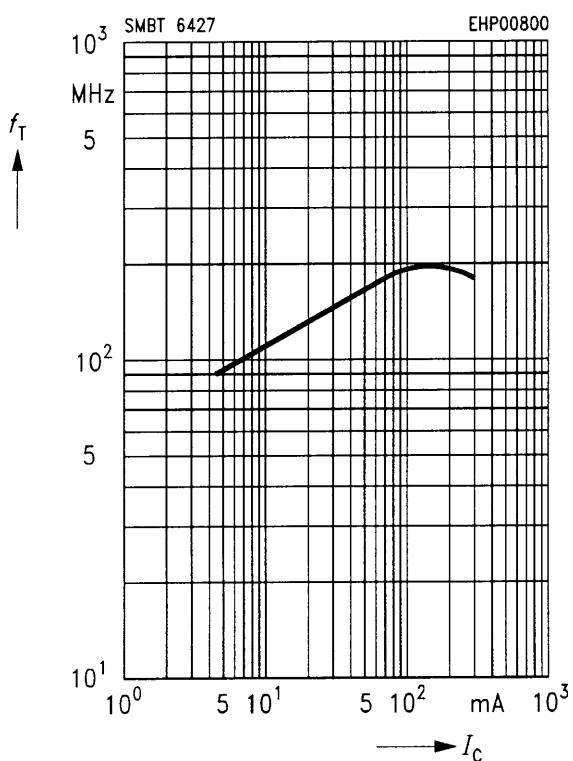
Collector-base capacitance $C_{CB0} = f(V_{CB0})$
Emitter-base capacitance $C_{EB0} = f(V_{EB0})$



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

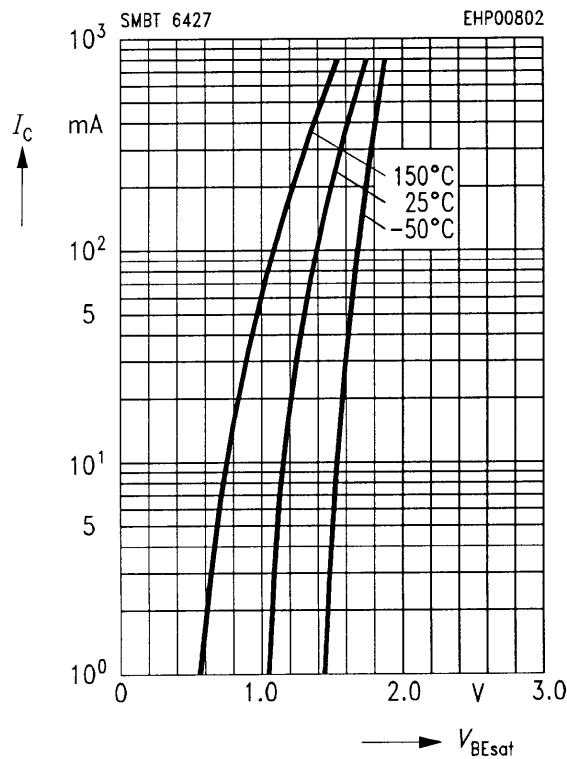


Transition frequency $f_T = f(I_C)$
 $V_{CE} = 5 \text{ V}$

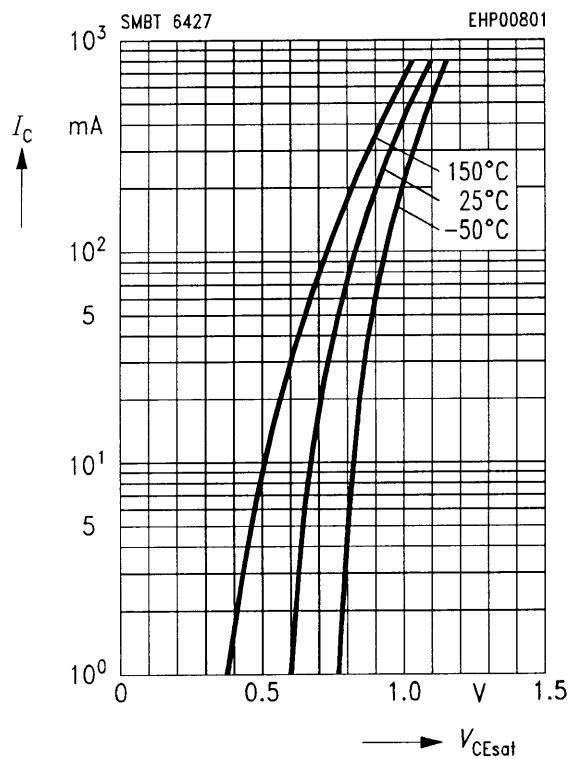


Base-emitter saturation voltage

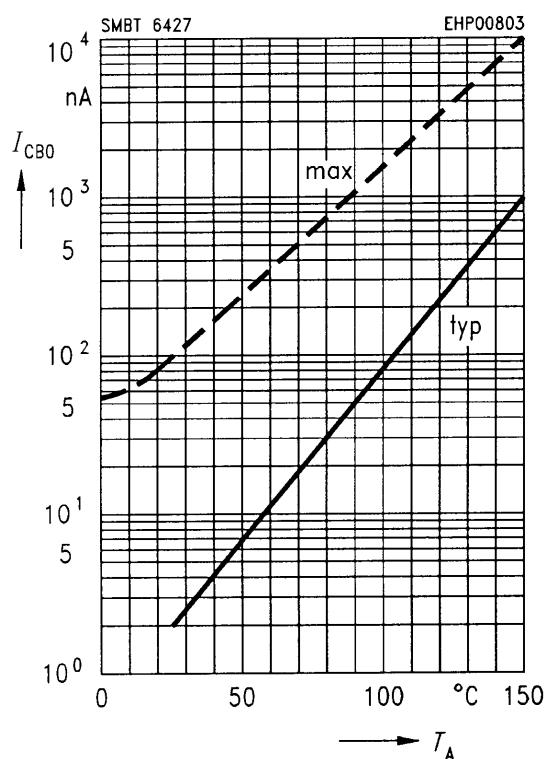
$$I_C = f(V_{BE\text{sat}}), h_{FE} = 1000$$

**Collector-emitter saturation voltage**

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

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

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

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

$$V_{CE} = 5 \text{ V}$$

