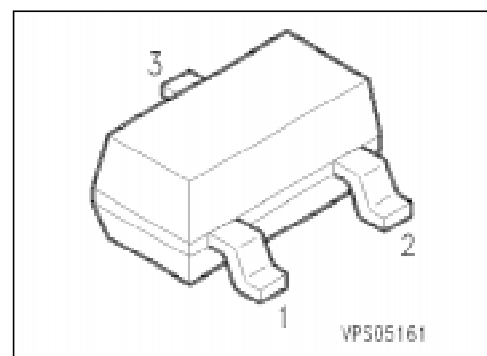


PNP Silicon Darlington Transistors

SMBTA 63
SMBTA 64

- High collector current
- High DC current gain



Type	Marking	Ordering Code (tape and reel)	Pin Configuration			Package ¹⁾
			1	2	3	
SMBTA 63 SMBTA 64	s2U s2V	Q68000-A2625 Q68000-A2485	B	E	C	SOT-23

Maximum Ratings

Parameter	Symbol	Values		Unit
		SMBTA 63	SMBTA 64	
Collector-emitter voltage	V_{CE0}	30	30	V
Collector-base voltage	V_{CB0}	30	30	
Emitter-base voltage	V_{EB0}	10	10	
Collector current	I_C	500		mA
Peak collector current	I_{CM}	800		
Base current	I_B	100		
Peak base current	I_{BM}	200		
Total power dissipation, $T_S = 81\text{ °C}$	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 $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC characteristics

Collector-emitter breakdown voltage $I_C = 10 \mu A$	$V_{(BR)CE0}$	30	—	—	V
Collector-base breakdown voltage $I_C = 10 \mu A$	$V_{(BR)CB0}$	30	—	—	
Emitter-base breakdown voltage $I_E = 10 \mu A$	$V_{(BR)EB0}$	10	—	—	
Collector-base cutoff current $V_{CB} = 30 V$	I_{CB0}	—	—	100	nA
Emitter cutoff current $V_{EB} = 10 V$	I_{EB0}	—	—	100	
DC current gain ¹⁾ <div style="display: flex; justify-content: space-between;"> $I_C = 10 mA, V_{CE} = 5 V$ SMBTA 63 </div> <div style="display: flex; justify-content: space-between;"> SMBTA 64 </div> <div style="display: flex; justify-content: space-between;"> $I_C = 100 mA, V_{CE} = 5 V$ SMBTA 63 </div> <div style="display: flex; justify-content: space-between;"> SMBTA 64 </div>	h_{FE}	5000 10000 10000 20000	— — — —	— — — —	—
Collector-emitter saturation voltage ¹⁾ $I_C = 100 mA, I_B = 0.1 mA$	V_{CESat}	—	—	1.5	V
Base-emitter saturation voltage ¹⁾ $I_C = 100 mA, I_B = 0.1 mA$	V_{BESat}	—	—	2	

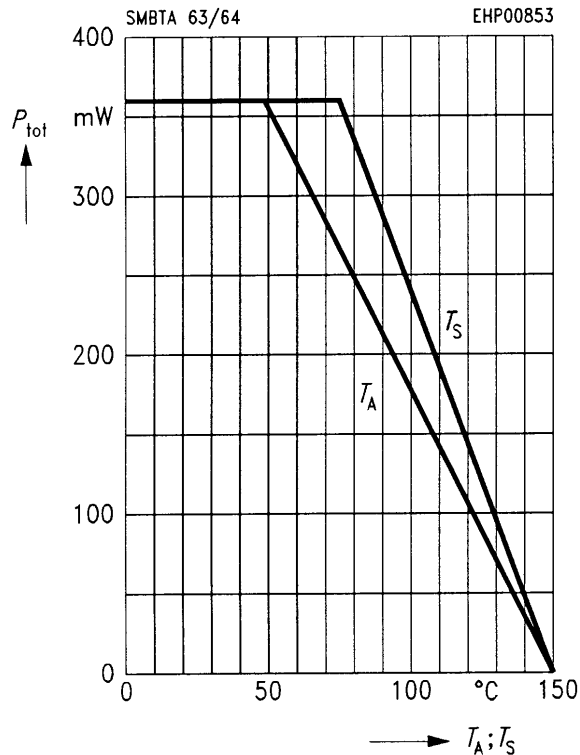
AC characteristics

Transition frequency $I_C = 50 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $f = 20 \text{ MHz}$	f_T	125	–	–	MHz
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1) Pulse test conditions: $t \leq 300 \mu\text{s}$, $D = 2 \%$.

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

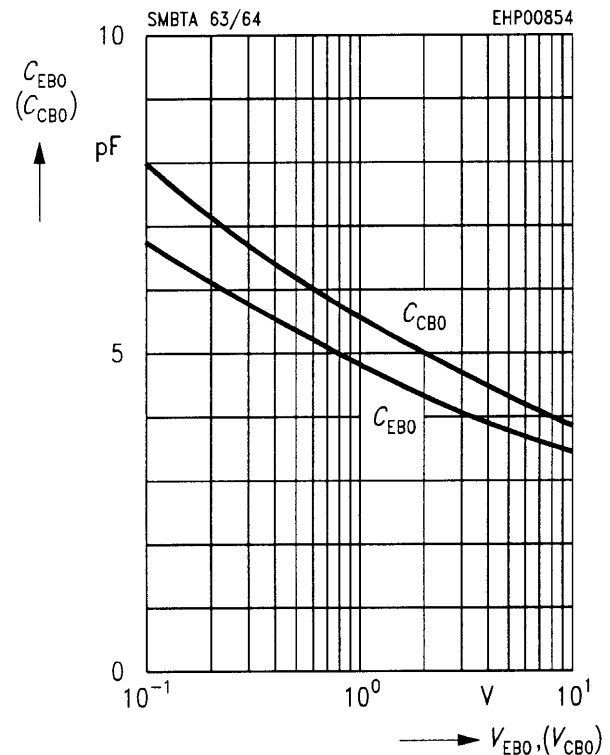
* Package mounted on epoxy



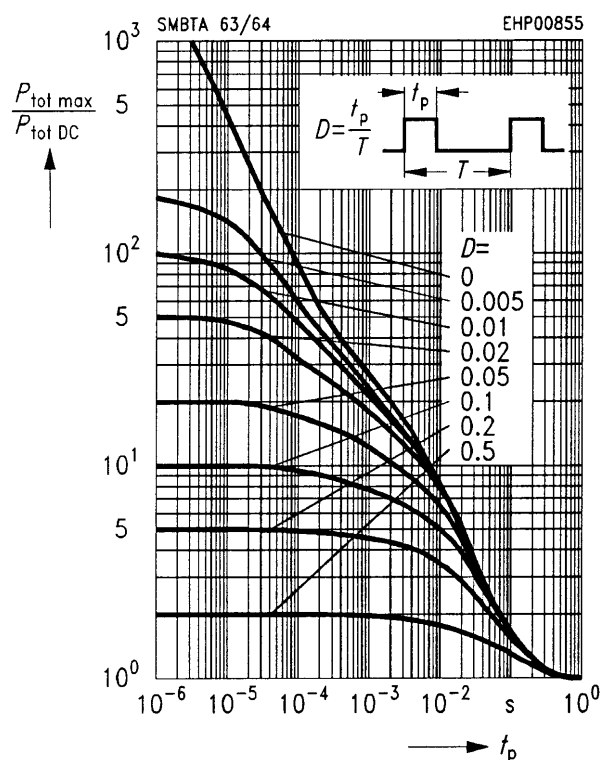
Collector-base capacitance $C_{CB0} = f(V_{CB0})$

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

$f = 1 \text{ MHz}$

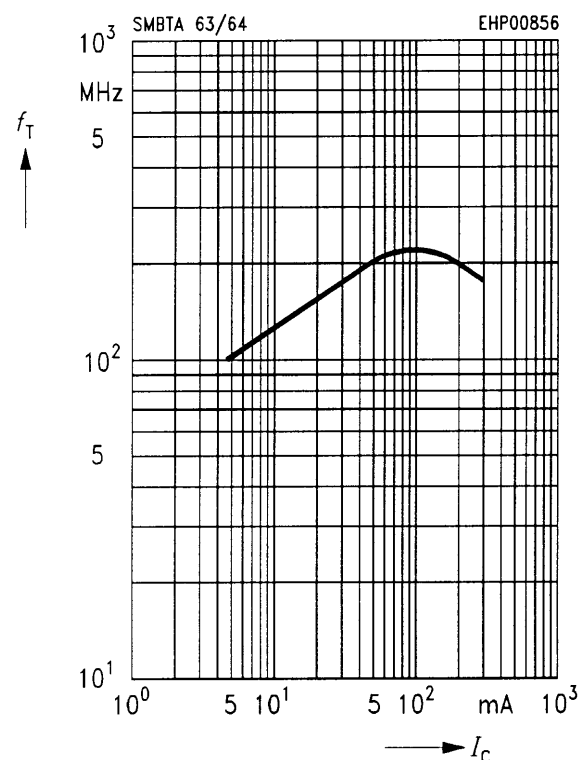


Permissible pulse load $P_{\text{tot max}}/P_{\text{tot DC}} = f(t_p)$



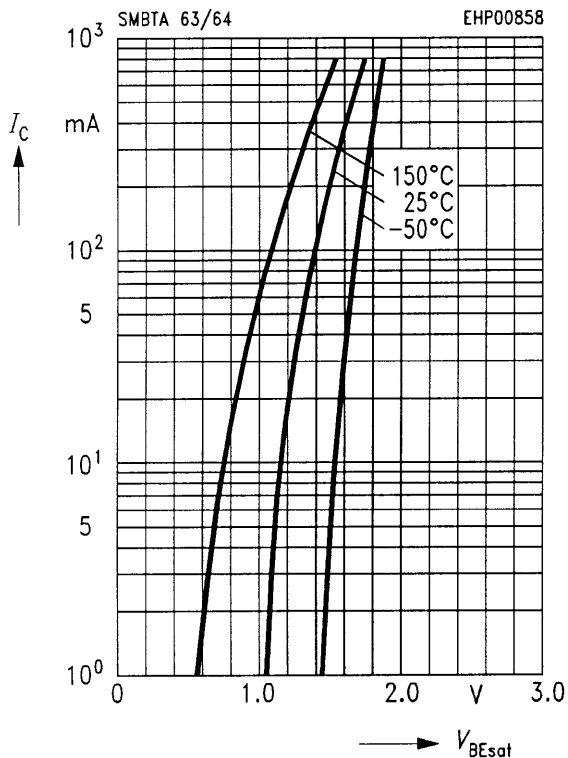
Transition frequency $f_T = f(I_C)$

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



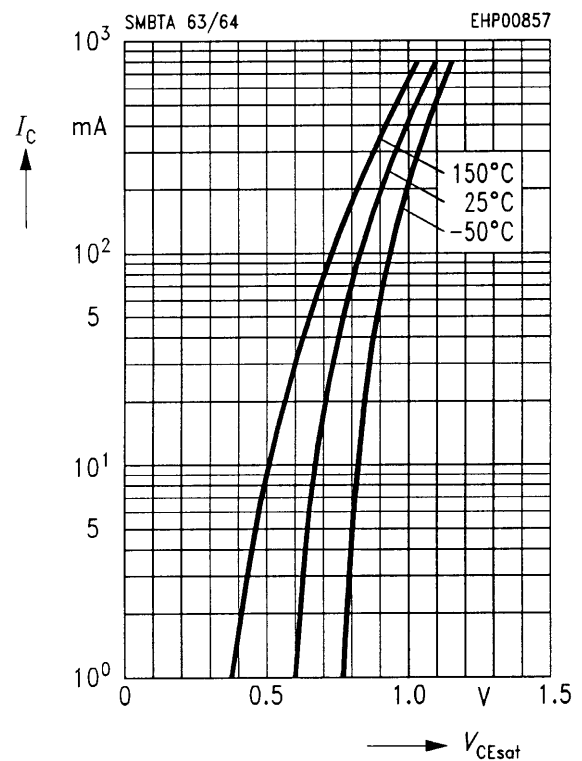
Base-emitter saturation voltage

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



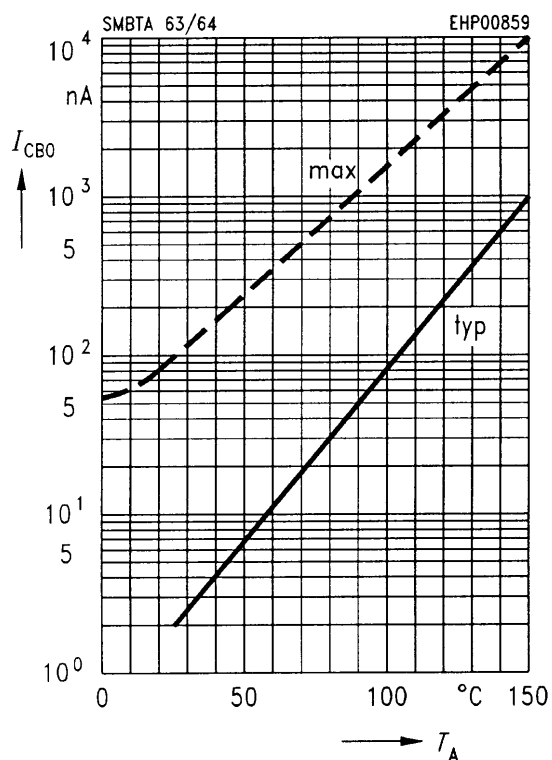
Collector-emitter saturation voltage

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



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

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



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

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

