

SIEMENS

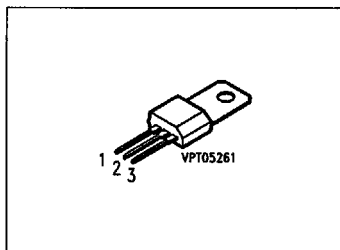
SIEMENS AKTIENGESELLSCHAFT

T-33-05

**NPN Silicon Transistors
with High Reverse Voltage**

**BF 869
... BF 881**

- High breakdown voltage
- Low collector-emitter saturation voltage
- Low capacitance
- Complementary types: BF 870, BF 872 (PNP)



Type	Marking	Ordering Code	Pin Configuration			Package ¹⁾
			1	2	3	
BF 869 BF 871 BF 881	—	Q62702-F683 Q62702-F676 Q62702-F794	E	C	B	TO-202

Maximum Ratings

Parameter	Symbol	Values			Unit
		BF 869	BF 871	BF 881	
Collector-emitter voltage	V_{CE0}	250	—	—	V
Collector-emitter voltage, $R_{BE} = 2.7 \text{ k}\Omega$	V_{CER}	—	300	400	
Collector-base voltage	V_{CBO}	250	300	400	
Emitter-base voltage	V_{EB0}	5			
Collector current	I_C	50			mA
Peak base current	I_{BM}	100			
Total power dissipation $T_A = 40 \text{ }^\circ\text{C}$ $T_C = 110 \text{ }^\circ\text{C}$	P_{tot}	1.6 1.6			W
Junction temperature	T_j	150			
Storage temperature range	T_{stg}	- 65 ... + 150			

Thermal Resistance

Junction - ambient	R_{thJA}	≤ 70	K/W
Junction - case	R_{thJC}	≤ 25	

¹⁾ For detailed information see chapter Package Outlines.

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC characteristics

Collector-emitter breakdown voltage $I_C = 1\text{ mA}$ BF 869	$V_{(BR)CEO}$	250	—	—	V
Collector-emitter breakdown voltage $I_C = 10\text{ }\mu\text{A}$ BF 871 BF 881	$V_{(BR)CER}$	300 400	— —	— —	
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$ BF 869 BF 871 BF 881	$V_{(BR)CBO}$	250 300 400	— — —	— — —	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$	$V_{(BR)EBO}$	5	—	—	
Collector-base cutoff current $V_{CB} = 200\text{ V}$ BF 869, BF 871 $V_{CB} = 350\text{ V}$ BF 881	I_{CBO}	— —	— —	10 100	nA
Collector cutoff current $V_{CE} = 200\text{ V}$, $R_{BE} = 2.7\text{ k}\Omega$, $T_A = 150^\circ\text{C}$ BF 869, BF 871 $V_{CE} = 350\text{ V}$, $R_{BE} = 2.7\text{ k}\Omega$, $T_A = 150^\circ\text{C}$ BF 881	I_{CER}	— —	— —	10 10	μA
Emitter-base cutoff current $V_{EB} = 5\text{ V}$	I_{EBO}	—	—	10	
DC current gain $I_C = 25\text{ mA}$, $V_{CE} = 20\text{ V}$ BF 869 BF 871, BF 881	h_{FE}	50 40	— —	— —	—
Collector-emitter saturation voltage ¹⁾ $I_C = 25\text{ mA}$, $T_j = 150^\circ\text{C}$	$V_{CEsatRF}$	—	—	20	V

AC characteristics

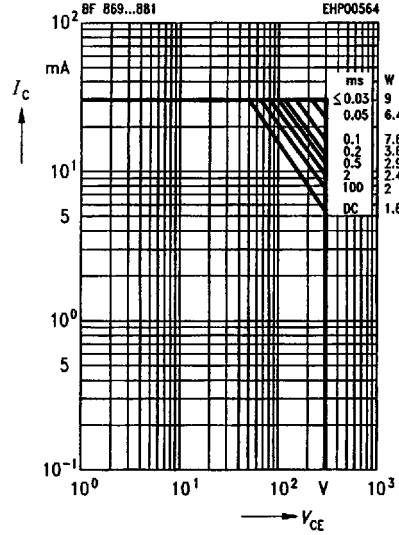
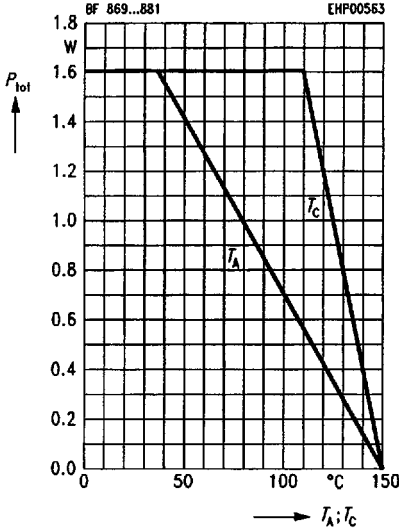
Transition frequency $I_C = 10\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 20\text{ MHz}$	f_T	—	100	—	MHz
Output capacitance $V_{CB} = 30\text{ V}$, $f = 1\text{ MHz}$	C_{obo}	—	1.2	—	pF

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

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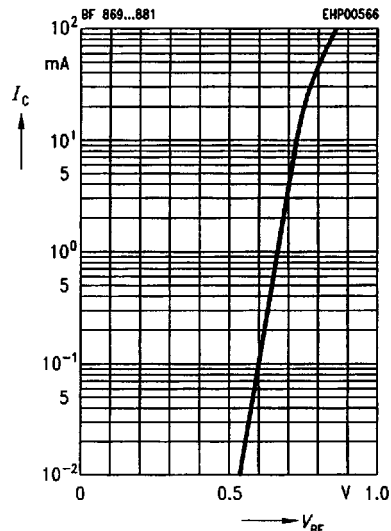
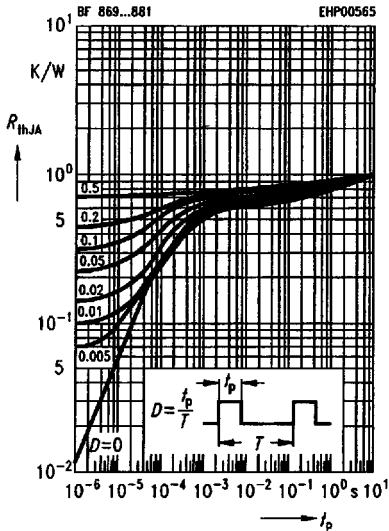
Total power dissipation $P_{tot} = f(T_A; T_C)$

**Operating range $I_C = f(V_{CE})$
 $T_A \leq 110^\circ\text{C}, D = 0.01$**

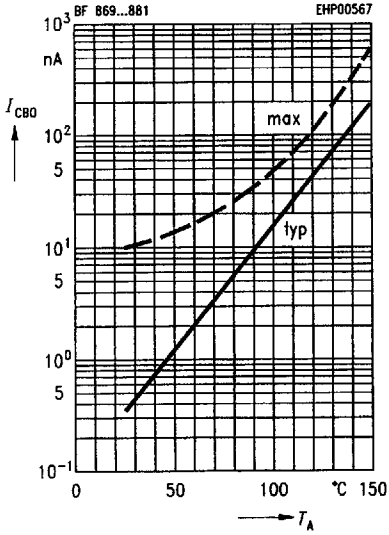


Permissible pulse load $R_{thJA} = f(t_p)$

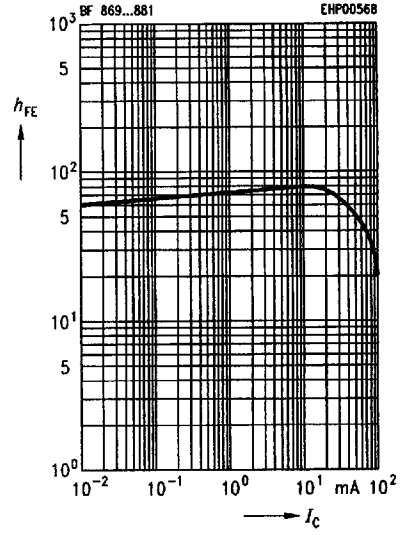
**Collector current $I_C = f(V_{BE})$
 $V_{CE} = 20\text{ V}$**



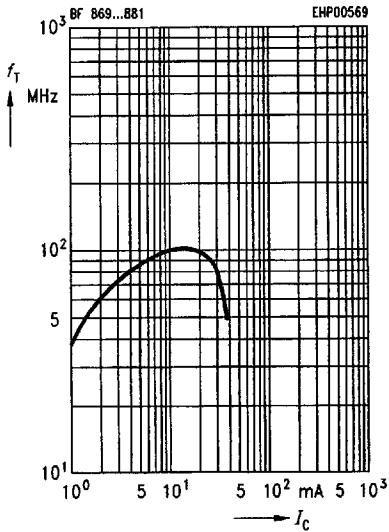
Collector cutoff current $I_{CBO} = f(T_A)$
 $V_{CB} = 200 \text{ V}, 350 \text{ V}$



DC current gain $h_{FE} = f(I_C)$
 $V_{CE} = 20 \text{ V}, T_A = 25 \text{ °C}$



Transition frequency $f_T = f(I_C)$
 $V_{CE} = 10 \text{ V}, f = 20 \text{ MHz}$



Output capacitance $C_{obo} = f(V_{CB})$
 $I_C = 0, f = 1 \text{ MHz}$

