

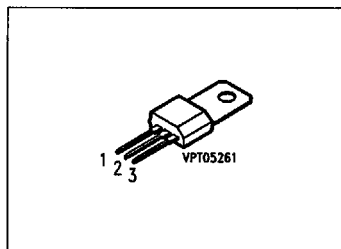
**SIEMENS**

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 <sup>1)</sup>
			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	$R_{thJA}$	$\leq 70$	K/W
Junction - case	$R_{thJC}$	$\leq 25$	

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

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**Electrical Characteristics**at  $T_A = 25^\circ\text{C}$ , 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	$\mu\text{A}$
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 <sup>1)</sup> $I_C = 25\text{ mA}$ , $T_j = 150^\circ\text{C}$	$V_{CEsatRF}$	—	—	20	V

**AC characteristics**

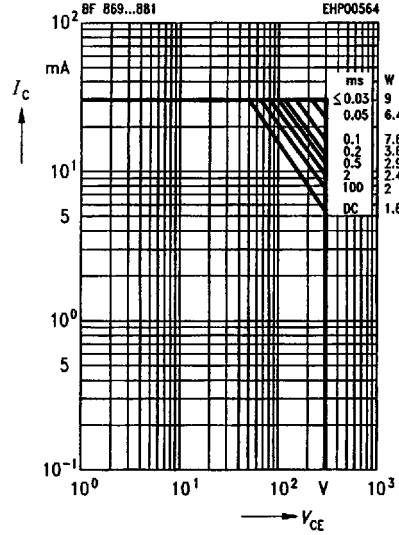
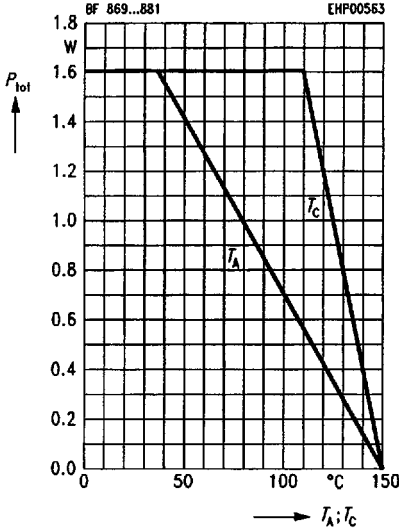
Transition frequency $I_C = 10\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 20\text{ MHz}$	$f_T$	—	100	—	MHz
Output capacitance $V_{CB} = 30\text{ V}$ , $f = 1\text{ MHz}$	$C_{obo}$	—	1.2	—	pF

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

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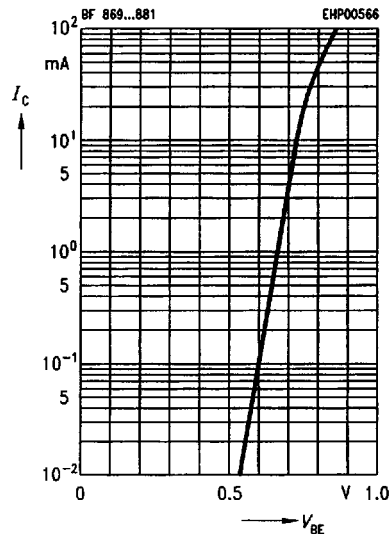
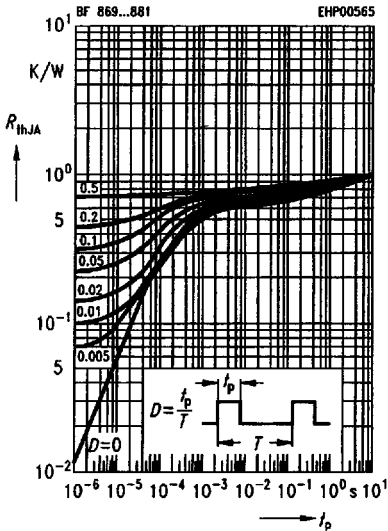
**Total power dissipation  $P_{tot} = f(T_A; T_C)$**

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

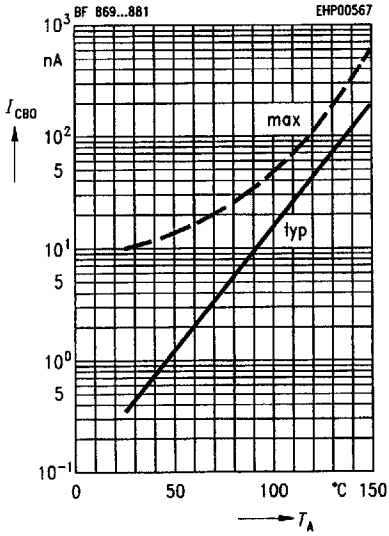


**Permissible pulse load  $R_{thJA} = f(t_p)$**

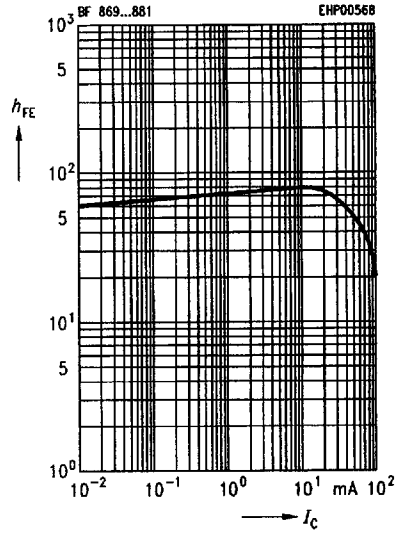
**Collector current  $I_C = f(V_{BE})$   
 $V_{CE} = 20\text{ V}$**



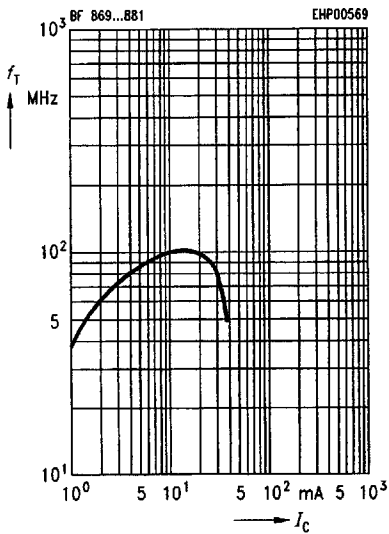
**Collector cutoff current  $I_{CBO} = f(T_A)$**   
 $V_{CB} = 200 \text{ V}, 350 \text{ V}$



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

