

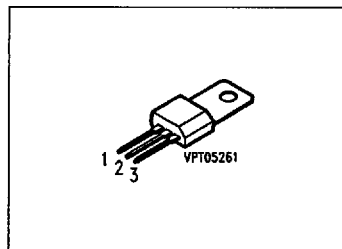
SIEMENS

SIEMENS AKTIENGESELLSCHAFT

T-33-05

**NPN Silicon Transistors
with High Reverse Voltage****BF 857
... BF 859**

- High breakdown voltage
- Low collector-emitter saturation voltage



Type	Marking	Ordering Code	Pin Configuration			Package ¹⁾
			1	2	3	
BF 857 BF 858 BF 859	—	Q62702-F784 Q62702-F785 Q62702-F786	E	C	B	TO-202

Maximum Ratings

Parameter	Symbol	Values			Unit
		BF 857	BF 858	BF 859	
Collector-emitter voltage	V_{CE0}	160	250	300	V
Collector-base voltage	V_{CB0}	160	250	300	
Emitter-base voltage	V_{EB0}	5			
Collector current	I_C	200			mA
Peak collector current	I_{CM}	500			
Base current	I_B	100			
Peak base current	I_{BM}	200			
Total power dissipation $T_A = 25\text{ °C}$ $T_C = 114\text{ °C}$	P_{tot}	1.8 2.5			W
Junction temperature	T_j	150			
Storage temperature range	T_{stg}	- 65 ... + 150			°C

Thermal Resistance

Junction - ambient	R_{thJA}	≤ 70	K/W
Junction - case	R_{thJC}	≤ 20	

1) For detailed information see chapter Package Outlines.

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC characteristics

Collector-emitter breakdown voltage $I_C = 10\text{ mA}$	$V_{(BR)CEO}$	160 250 300	— — —	— — —	V
Collector-base breakdown voltage $I_C = 100\ \mu\text{A}$	$V_{(BR)CBO}$	160 250 300	— — —	— — —	
Emitter-base breakdown voltage $I_E = 100\ \mu\text{A}$	$V_{(BR)EBO}$	5	—	—	
Collector-base cutoff current $V_{CB} = 100\text{ V}$	I_{CBO}	—	—	50	nA
$V_{CB} = 200\text{ V}$		—	—	50	nA
$V_{CB} = 250\text{ V}$		—	—	50	nA
$V_{CB} = 100\text{ V}, T_A = 150^\circ\text{C}$		—	—	20	μA
$V_{CB} = 200\text{ V}, T_A = 150^\circ\text{C}$		—	—	20	μA
$V_{CB} = 250\text{ V}, T_A = 150^\circ\text{C}$		—	—	20	μA
Emitter-base cutoff current $V_{EB} = 3\text{ V}$	I_{EBO}	—	—	50	nA
DC current gain $I_C = 30\text{ mA}, V_{CE} = 10\text{ V}^1)$	h_{FE}	25	—	—	—
Collector-emitter saturation voltage ¹⁾ $I_C = 30\text{ mA}, I_B = 6\text{ mA}$	V_{CEsat}	—	—	1	V

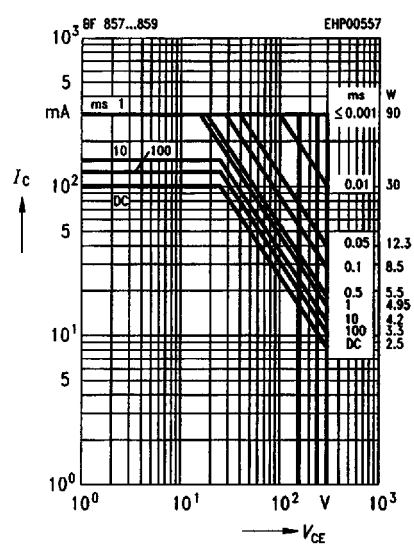
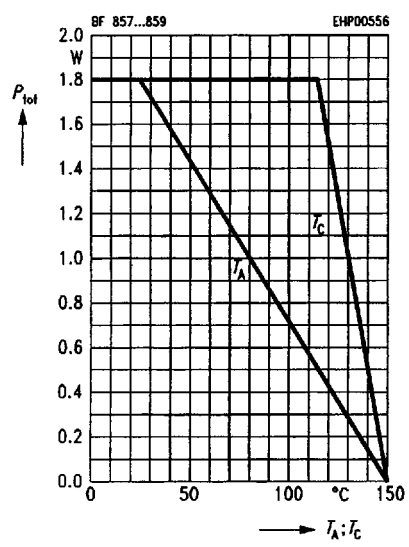
AC characteristics

Transition frequency $I_C = 20\text{ mA}, V_{CE} = 10\text{ V}, f = 20\text{ MHz}$	f_T	—	100	—	MHz
Output capacitance $V_{CB} = 30\text{ V}, f = 1\text{ MHz}$	C_{obo}	—	5.5	—	pF

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

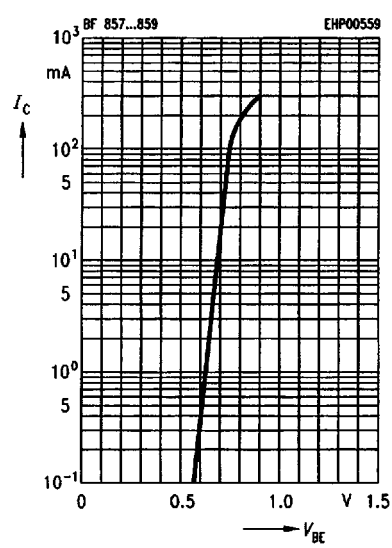
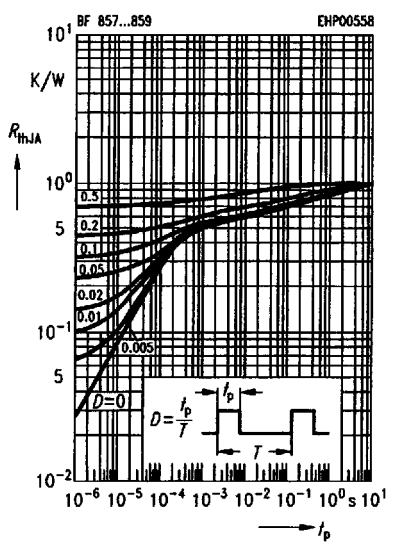
Total power dissipation $P_{tot} = f(T_A, T_C)$

Permissible operating range $I_C = f(V_{CE})$
 $T_A = 100^\circ\text{C}, D = 0$



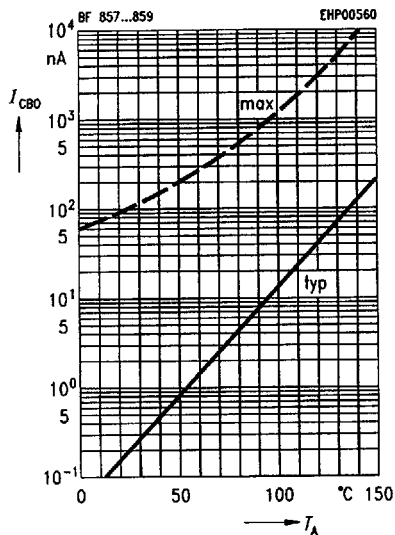
Permissible pulse load $R_{thJA} = f(t_p)$

Collector current $I_C = f(V_{BE})$
 $V_{CE} = 10\text{ V}$



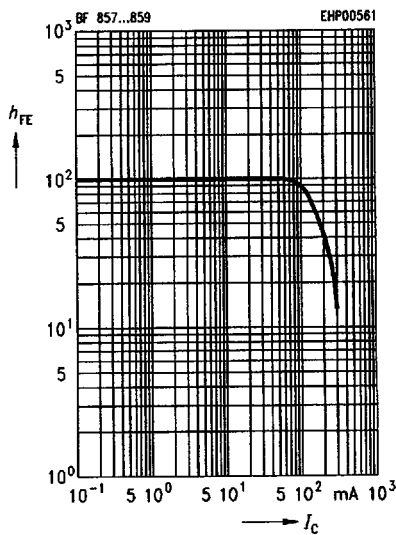
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CB} = 100 \text{ V}/200 \text{ V}/250 \text{ V}$



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

$V_{CE} = 10 \text{ V}, T_A = 25 \text{ °C}$



Transition frequency $f_T = f(I_C)$

$V_{CE} = 10 \text{ V}, f = 20 \text{ MHz}$

