

NPN Silicon High-Voltage Transistors

- Suitable for video output stages TV sets and switching power supplies
- High breakdown voltage
- Low collector-emitter saturation voltage
- Complementary type: BFN39 (PNP)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



Type	Marking	Pin Configuration						Package
BFN38	BFN38	1=B	2=C	3=E	4=C	-	-	SOT223

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	300	V
Collector-base voltage	V_{CBO}	300	
Emitter-base voltage	V_{EBO}	6	
Collector current	I_C	200	mA
Peak collector current, $t_p \leq 10$ ms	I_{CM}	500	
Base current	I_B	100	
Peak base current	I_{BM}	200	
Total power dissipation- $T_S \leq 124$ °C	P_{tot}	1.5	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾	R_{thJS}	≤ 17	K/W

¹⁾For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)

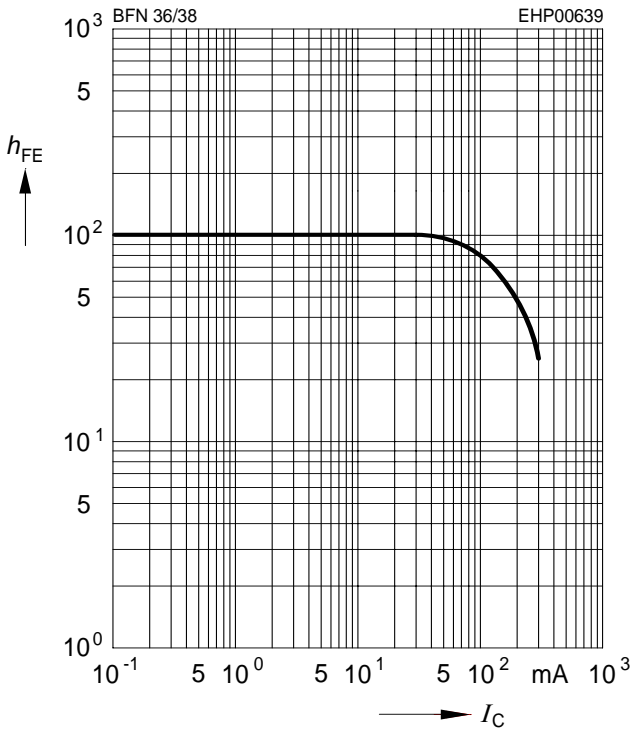
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$	$V_{(BR)CEO}$	300	-	-	V
Collector-base breakdown voltage $I_C = 100 \mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	300	-	-	
Emitter-base breakdown voltage $I_E = 100 \mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	6	-	-	
Collector-base cutoff current $V_{CB} = 250 \text{ V}, I_E = 0$ $V_{CB} = 250 \text{ V}, I_E = 0, T_A = 150^\circ\text{C}$	I_{CBO}	-	-	0.1 20	μA
Emitter-base cutoff current $V_{EB} = 5 \text{ V}, I_C = 0$	I_{EBO}	-	-	100	nA
DC current gain ¹⁾ $I_C = 1 \text{ mA}, V_{CE} = 10 \text{ V}$ $I_C = 10 \text{ mA}, V_{CE} = 10 \text{ V}$ $I_C = 30 \text{ mA}, V_{CE} = 10 \text{ V}$	h_{FE}	25 40 30	- - -	- - -	-
Collector-emitter saturation voltage ¹⁾ $I_C = 20 \text{ mA}, I_B = 2 \text{ mA}$	V_{CEsat}	-	-	0.5	V
Base emitter saturation voltage ¹⁾ $I_C = 20 \text{ mA}, I_B = 2 \text{ mA}$	V_{BEsat}	-	-	0.9	
AC Characteristics					
Transition frequency $I_C = 20 \text{ MHz}, V_{CE} = 10 \text{ V}, f = 20 \text{ MHz}$	f_T	-	70	-	MHz
Collector-base capacitance $V_{CB} = 30 \text{ V}, f = 1 \text{ MHz}$	C_{cb}	-	1.5	-	pF

¹⁾Pulse test: $t < 300\mu\text{s}; D < 2\%$

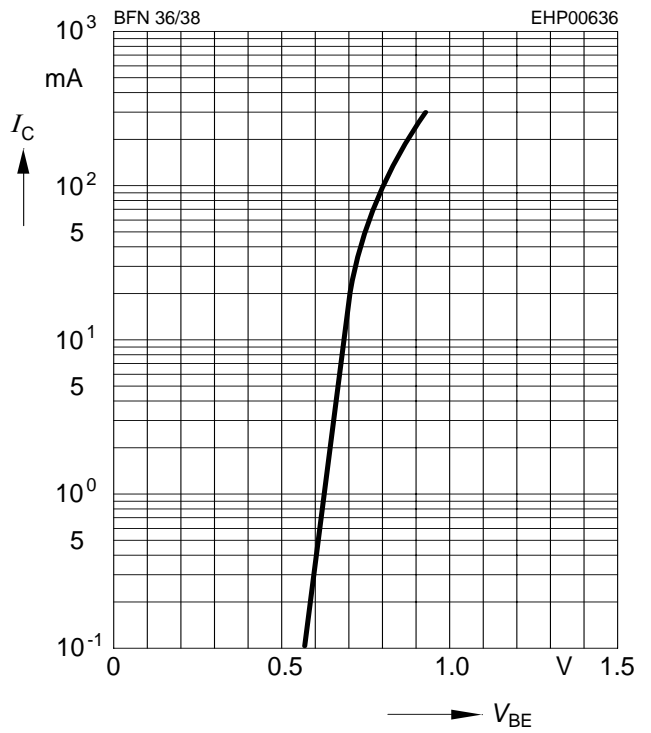
DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 10\text{ V}$



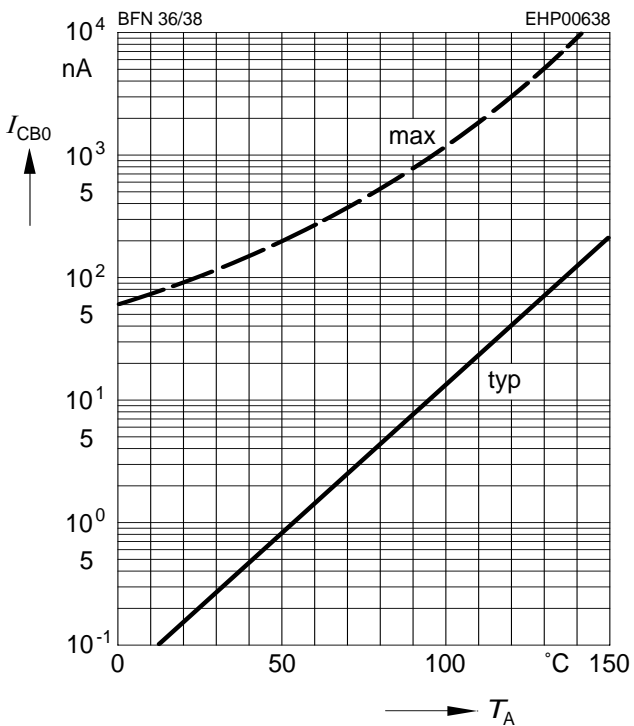
Collector current $I_C = f(V_{BE})$

$V_{CE} = 10\text{ V}$



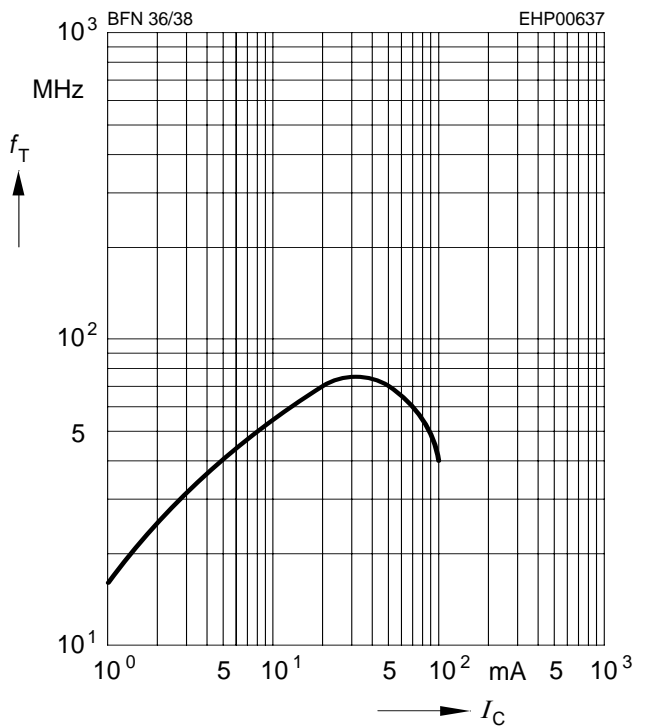
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CB} = 30\text{ V}$



Transition frequency $f_T = f(I_C)$

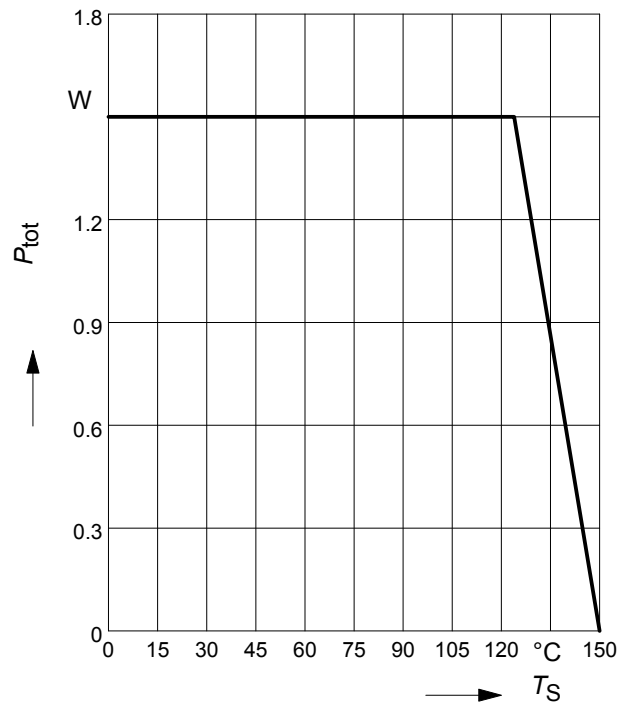
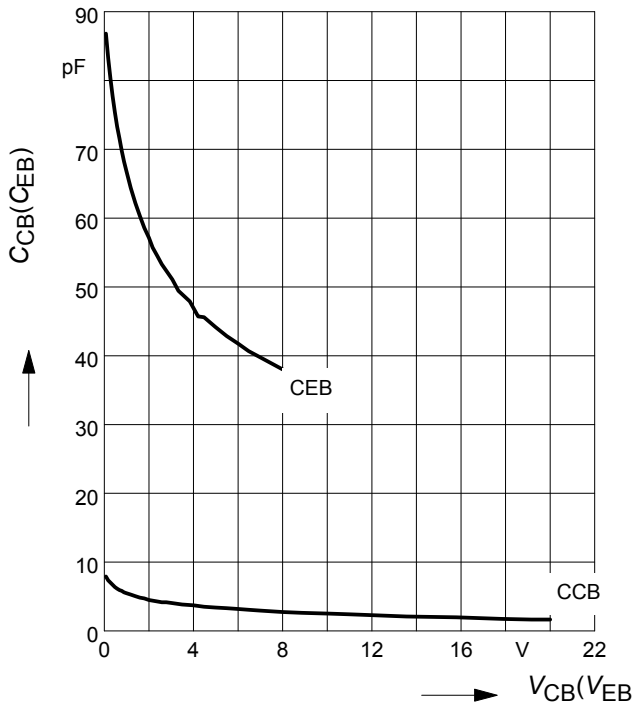
$V_{CE} = 10\text{ V}, f = 100\text{ MHz}$



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

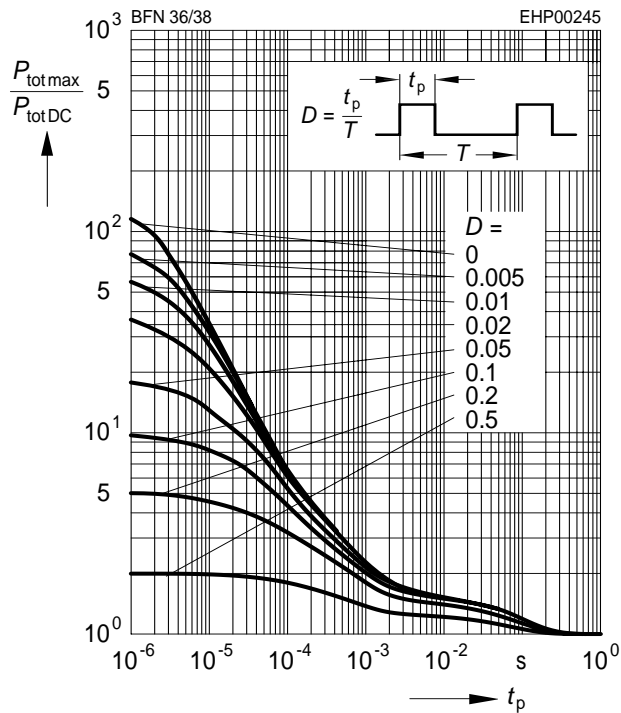
Emitter-base capacitance $C_{eb} = f(V_{EB})$

Total power dissipation $P_{tot} = f(T_S)$

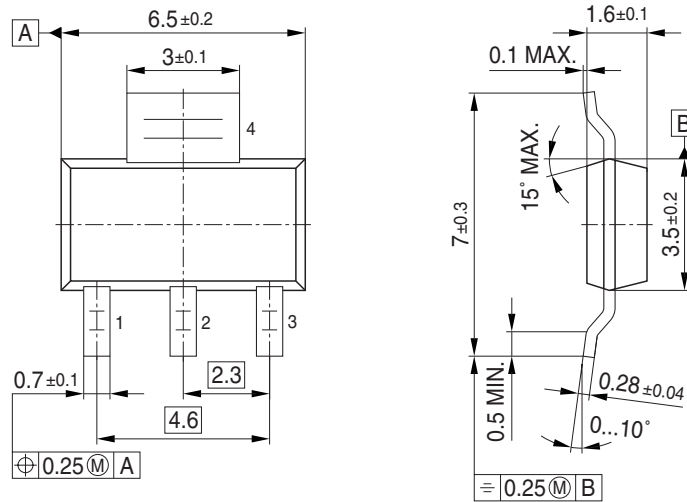
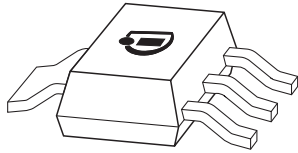


Permissible Pulse Load

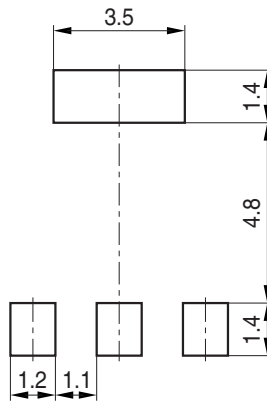
$P_{totmax}/P_{totDC} = f(t_p)$



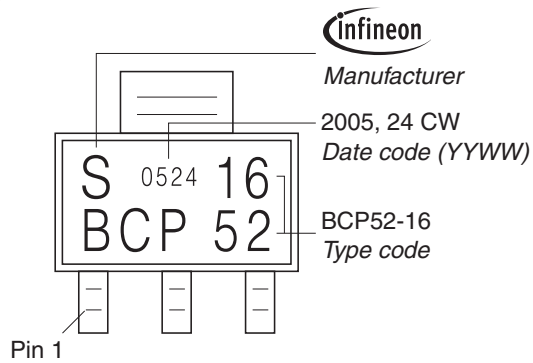
Package Outline



Foot Print

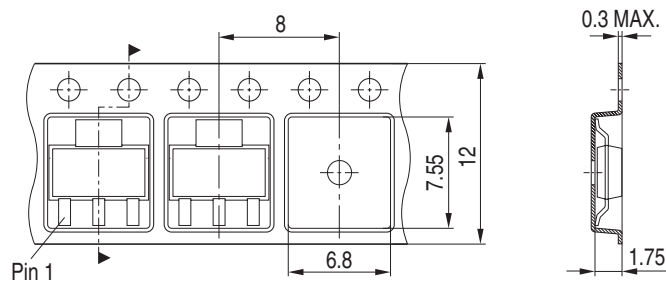


Marking Layout (Example)



Packing

Reel $\varnothing 180$ mm = 1.000 Pieces/Reel
 Reel $\varnothing 330$ mm = 4.000 Pieces/Reel



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