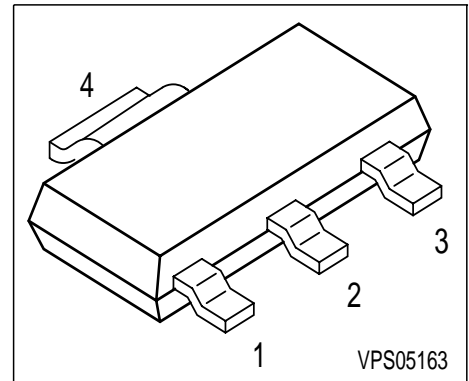


NPN Silicon High-Voltage Transistors

- Suited for video output stages in TV sets and switching power supplies
- High breakdown voltage
- Low collector-emitter saturation voltage
- Complementary types: BFN37, BFN39 (PNP)



| Type | Marking | Pin Configuration | | | | Package |
|-------|---------|-------------------|-------|-------|-------|---------|
| BFN36 | BFN 36 | 1 = B | 2 = C | 3 = E | 4 = C | SOT223 |
| BFN38 | BFN 38 | 1 = B | 2 = C | 3 = E | 4 = C | SOT223 |

Maximum Ratings

| Parameter | Symbol | BFN36 | BFN38 | Unit |
|--|-----------|-------------|-------|------|
| Collector-emitter voltage | V_{CEO} | 250 | 300 | V |
| Collector-base voltage | V_{CBO} | 250 | 300 | |
| Emitter-base voltage | V_{EBO} | 5 | 5 | |
| DC 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, $T_S = 124\text{ °C}$ | P_{tot} | 1.5 | | W |
| Junction temperature | T_j | 150 | | °C |
| Storage temperature | T_{stg} | -65 ... 150 | | |

Thermal Resistance

| | | | |
|---|------------|-----|-----|
| Junction - soldering point ⁽¹⁾ | R_{thJS} | ≤17 | K/W |
|---|------------|-----|-----|

¹For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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

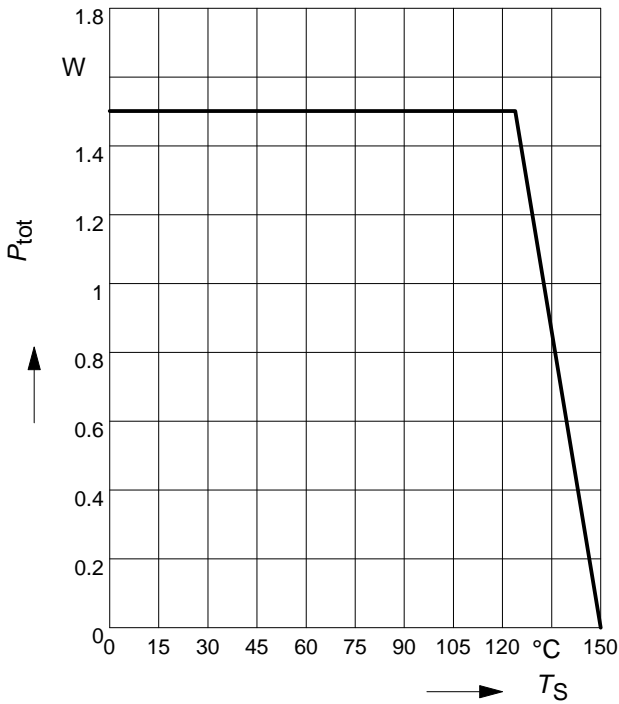
| Parameter | Symbol | Values | | | Unit |
|--|---------------|--------|------|------|---------------|
| | | min. | typ. | max. | |
| DC Characteristics | | | | | |
| Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$ | $V_{(BR)CEO}$ | | | | V |
| BFN36 | | 250 | - | - | |
| BFN38 | | 300 | - | - | |
| Collector-base breakdown voltage $I_C = 100 \mu\text{A}, I_E = 0$ | $V_{(BR)CBO}$ | | | | |
| BFN36 | | 250 | - | - | |
| BFN38 | | 300 | - | - | |
| Emitter-base breakdown voltage $I_E = 100 \mu\text{A}, I_C = 0$ | $V_{(BR)EBO}$ | 5 | - | - | |
| Collector cutoff current $V_{CB} = 200 \text{ V}, I_E = 0$ | I_{CBO} | | | | nA |
| BFN36 | | - | - | 100 | |
| $V_{CB} = 250 \text{ V}, I_E = 0$ | BFN38 | | | 100 | |
| Collector cutoff current $V_{CB} = 200 \text{ V}, I_E = 0, T_A = 150^\circ\text{C}$ | I_{CBO} | | | | μA |
| BFN36 | | - | - | 20 | |
| $V_{CB} = 250 \text{ V}, I_E = 0, T_A = 150^\circ\text{C}$ | BFN38 | | | 20 | |
| Emitter cutoff current $V_{EB} = 4 \text{ V}, I_C = 0$ | I_{EBO} | - | - | 100 | nA |
| DC current gain 1) $I_C = 1 \text{ mA}, V_{CE} = 10 \text{ V}$ | h_{FE} | 25 | - | - | - |
| $I_C = 10 \text{ mA}, V_{CE} = 10 \text{ V}$ | | 40 | - | - | |
| $I_C = 30 \text{ mA}, V_{CE} = 10 \text{ V}$ | BFN36 | 40 | - | - | |
| | BFN38 | 30 | - | - | |
| Collector-emitter saturation voltage1) $I_C = 20 \text{ mA}, I_B = 2 \text{ mA}$ | V_{CEsat} | | | | V |
| BFN36 | | - | - | 0.4 | |
| BFN38 | | - | - | 0.5 | |
| Base-emitter saturation voltage 1) $I_C = 20 \text{ mA}, I_B = 2 \text{ mA}$ | V_{BEsat} | - | - | 0.9 | |

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

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

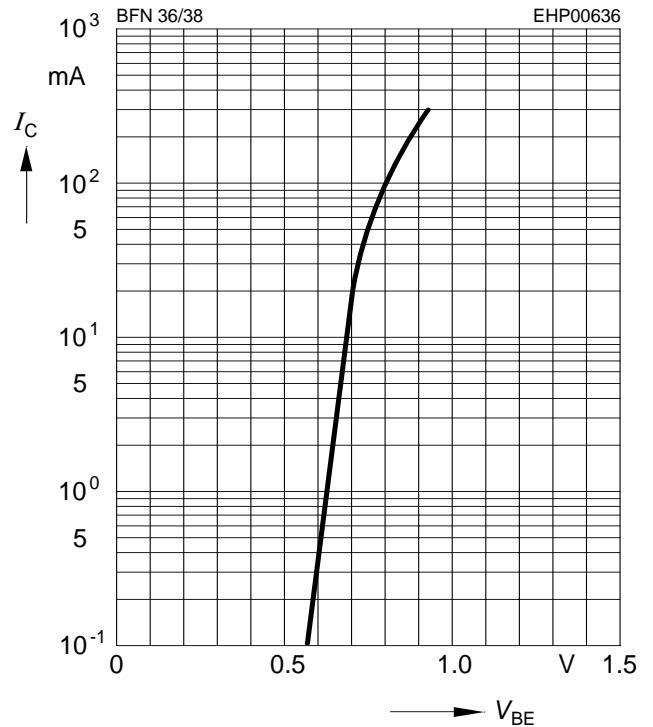
| Parameter | Symbol | Values | | | Unit |
|---|----------|--------|------|------|------|
| | | min. | typ. | max. | |
| AC Characteristics | | | | | |
| Transition frequency $I_C = 20\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 20\text{ MHz}$ | f_T | - | 70 | - | MHz |
| Collector-base capacitance $V_{CB} = 30\text{ V}$, $f = 1\text{ MHz}$ | C_{cb} | - | 1.5 | - | pF |

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



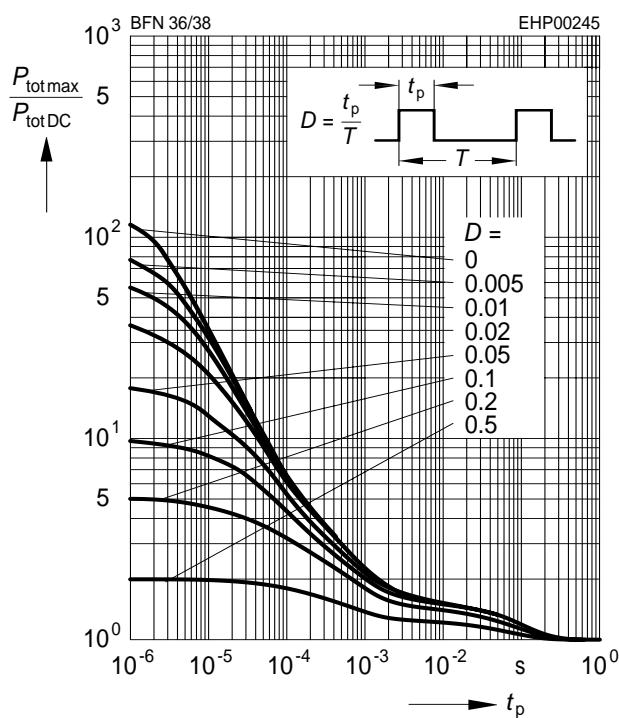
Collector current $I_C = f(V_{BE})$

$V_{CE} = 10V$



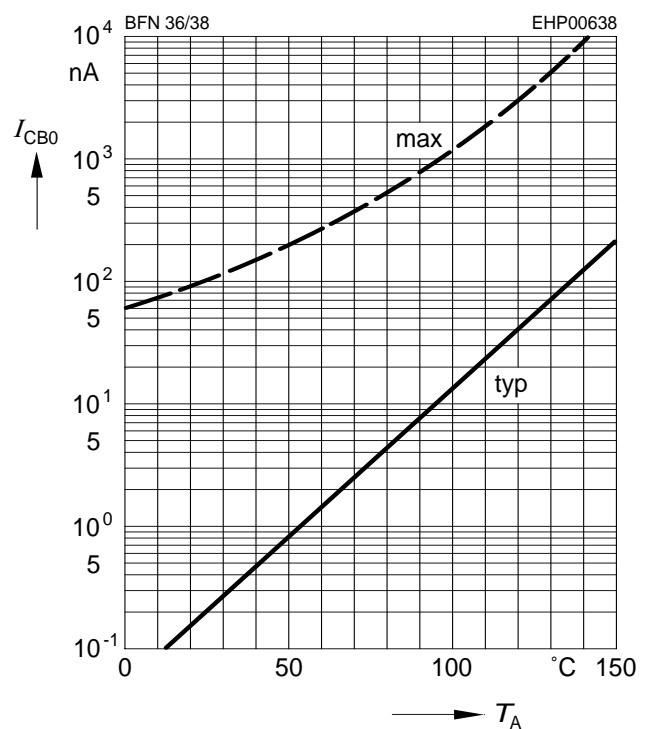
Permissible pulse load

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



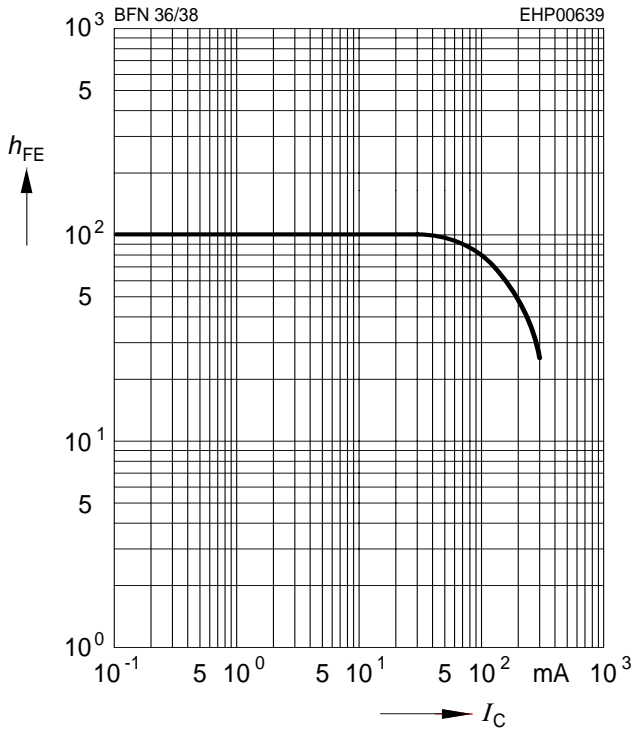
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CB} = 30V$



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

$V_{CE} = 10V$



Transition frequency $f_T = f(I_C)$

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

