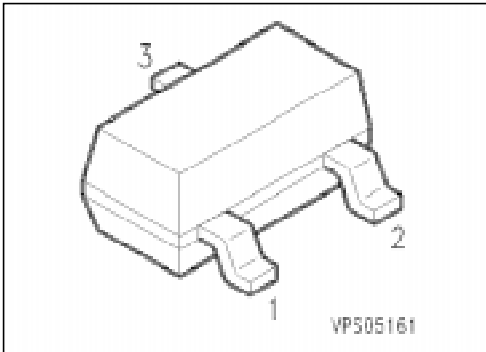


## NPN Silicon High-Voltage Transistor

**BFN 22**

- Suitable for video output stages in TV sets and switching power supplies
- High breakdown voltage
- Low collector-emitter saturation voltage
- Low capacitance
- Complementary type: BFN 23 (PNP)



| Type   | Marking | Ordering Code<br>(tape and reel) | Pin Configuration |   |   | Package <sup>1)</sup> |
|--------|---------|----------------------------------|-------------------|---|---|-----------------------|
|        |         |                                  | 1                 | 2 | 3 |                       |
| BFN 22 | HBs     | Q62702-F1024                     | B                 | E | C | SOT-23                |

### Maximum Ratings

| Parameter                                                 | Symbol    | Values         | Unit             |
|-----------------------------------------------------------|-----------|----------------|------------------|
| Collector-emitter voltage                                 | $V_{CE0}$ | 250            | V                |
| Collector-base voltage                                    | $V_{CB0}$ | 250            |                  |
| Collector-emitter voltage, $R_{BE} = 2.7 \text{ k}\Omega$ | $V_{CER}$ | 250            |                  |
| Emitter-base voltage                                      | $V_{EB0}$ | 5              |                  |
| Collector current                                         | $I_C$     | 50             | mA               |
| Peak collector current                                    | $I_{CM}$  | 100            |                  |
| Total power dissipation, $T_S = 71^\circ\text{C}$         | $P_{tot}$ | 360            | mW               |
| Junction temperature                                      | $T_j$     | 150            | $^\circ\text{C}$ |
| Storage temperature range                                 | $T_{stg}$ | - 65 ... + 150 |                  |

### Thermal Resistance

|                                  |             |            |     |
|----------------------------------|-------------|------------|-----|
| Junction - ambient <sup>2)</sup> | $R_{th JA}$ | $\leq 290$ | K/W |
| Junction - soldering point       | $R_{th JS}$ | $\leq 220$ |     |

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

<sup>2)</sup> Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm<sup>2</sup> Cu.

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

| Parameter | Symbol | Values |      |      | Unit |
|-----------|--------|--------|------|------|------|
|           |        | min.   | typ. | max. |      |

**DC characteristics**

|                                                                                                                                                                                      |               |        |        |           |                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|--------|-----------|---------------------|
| Collector-emitter breakdown voltage<br>$I_C = 1\text{ mA}$                                                                                                                           | $V_{(BR)CE0}$ | 250    | —      | —         | V                   |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$                                                                                                                    | $V_{(BR)CB0}$ | 250    | —      | —         |                     |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $R_{BE} = 2.7\text{ k}\Omega$                                                                                 | $V_{(BR)CER}$ | 250    | —      | —         |                     |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$                                                                                                                      | $V_{(BR)EB0}$ | 5      | —      | —         |                     |
| Collector-base cutoff current<br>$V_{CB} = 200\text{ V}$<br>$V_{CB} = 200\text{ V}$ , $T_A = 150\text{ }^{\circ}\text{C}$                                                            | $I_{CB0}$     | —<br>— | —<br>— | 100<br>20 | nA<br>$\mu\text{A}$ |
| Collector cutoff current<br>$V_{CE} = 250\text{ V}$ , $R_{BE} = 2.7\text{ k}\Omega$<br>$V_{CE} = 250\text{ V}$ , $T_A = 150\text{ }^{\circ}\text{C}$ , $R_{BE} = 2.7\text{ k}\Omega$ | $I_{CER}$     | —<br>— | —<br>— | 1<br>50   | $\mu\text{A}$       |
| Emitter-base cutoff current<br>$V_{EB} = 5\text{ V}$                                                                                                                                 | $I_{EB0}$     | —      | —      | 10        |                     |
| DC current gain <sup>1)</sup><br>$I_C = 25\text{ mA}$ , $V_{CE} = 20\text{ V}$                                                                                                       | $h_{FE}$      | 50     | —      | —         | —                   |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 10\text{ mA}$ , $I_B = 1\text{ mA}$                                                                                     | $V_{CEsat}$   | —      | —      | 0.5       | V                   |
| Base-emitter saturation voltage <sup>1)</sup><br>$I_C = 10\text{ mA}$ , $I_B = 1\text{ mA}$                                                                                          | $V_{BEsat}$   | —      | —      | 1         |                     |

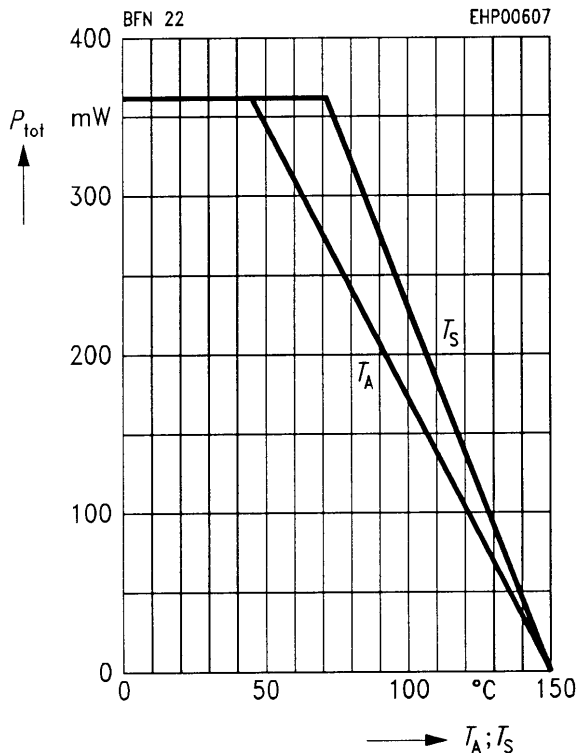
**AC characteristics**

|                                                                                             |           |   |     |   |     |
|---------------------------------------------------------------------------------------------|-----------|---|-----|---|-----|
| Transition frequency<br>$I_C = 10\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 20\text{ MHz}$ | $f_T$     | — | 100 | — | MHz |
| Output capacitance<br>$V_{CB} = 30\text{ V}$ , $f = 1\text{ MHz}$                           | $C_{obo}$ | — | 0.8 | — | pF  |

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

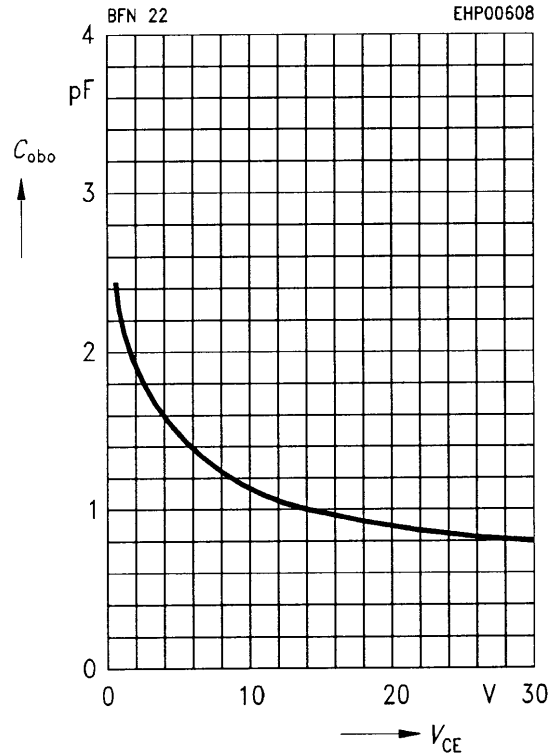
## Total power dissipation $P_{\text{tot}} = f(T_A^*; T_S)$

\* Package mounted on epoxy

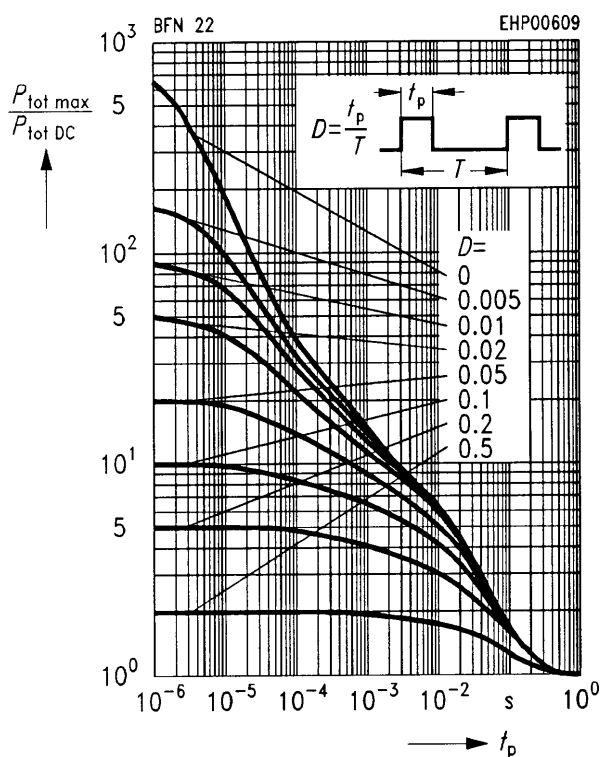


## Output capacitance $C_{\text{obo}} = f(V_{\text{CE}})$

$f = 1 \text{ MHz}$

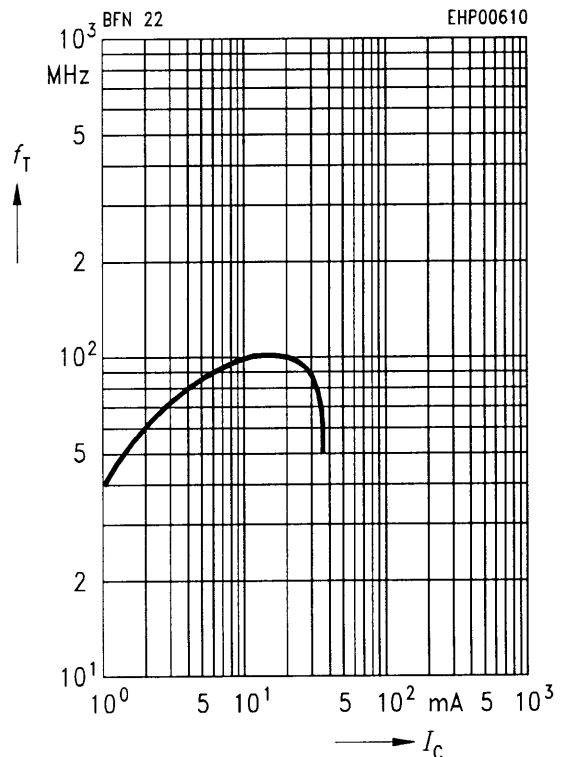


## Permissible pulse load $P_{\text{tot max}}/P_{\text{tot DC}} = f(t_p)$



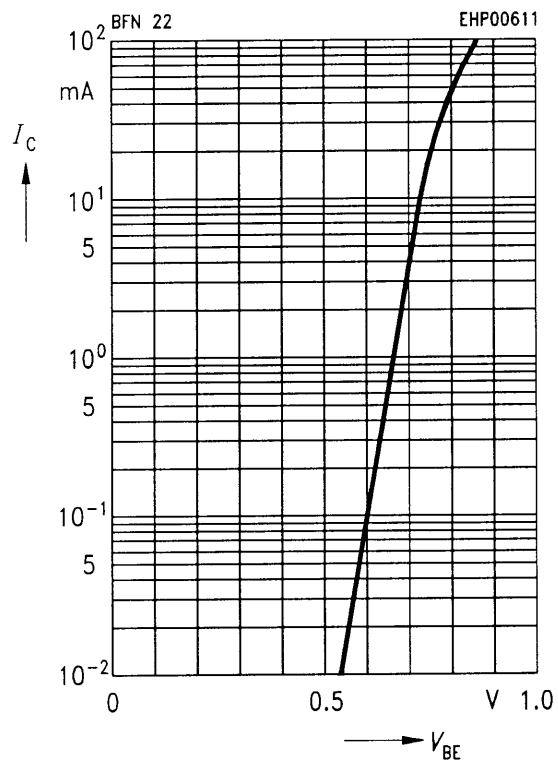
## Transition frequency $f_T = f(I_C)$

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



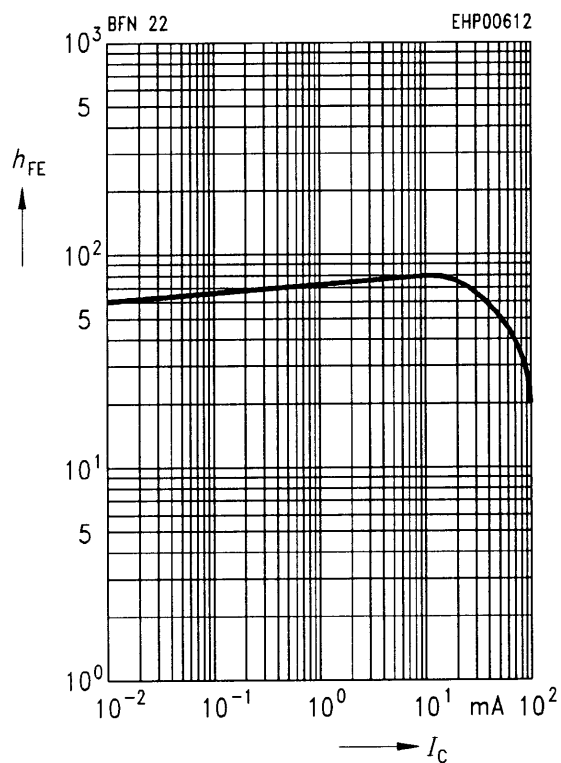
**Collector current  $I_C = f(V_{BE})$**

$V_{CE} = 20 \text{ V}$



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

$V_{CE} = 20 \text{ V}$



**Collector cutoff current  $I_{CB0} = f(T_A)$**

$V_{CB} = 200 \text{ V}$

