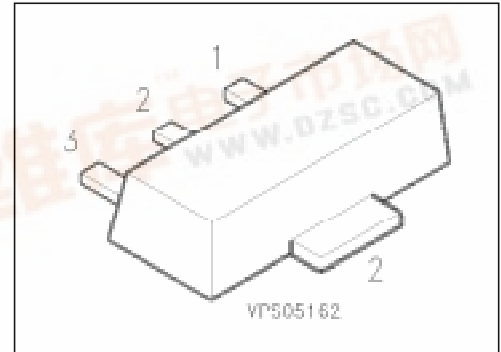


# SIEMENS

## PNP Silicon High-Voltage Transistor

**BFN 21**

- 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 20 (NPN)



| Type   | Marking | Ordering Code<br>(tape and reel) | Pin Configuration |   |   | Package <sup>1)</sup> |
|--------|---------|----------------------------------|-------------------|---|---|-----------------------|
|        |         |                                  | 1                 | 2 | 3 |                       |
| BFN 21 | DF      | Q62702-F1059                     | B                 | C | E | SOT-89                |

### Maximum Ratings

| Parameter                                                 | Symbol    | Values           | Unit             |
|-----------------------------------------------------------|-----------|------------------|------------------|
| Collector-emitter voltage                                 | $V_{CE0}$ | 300              | V                |
| Collector-base voltage                                    | $V_{CB0}$ | 300              |                  |
| Collector-emitter voltage, $R_{BE} = 2.7 \text{ k}\Omega$ | $V_{CER}$ | 300              |                  |
| Emitter-base voltage                                      | $V_{EB0}$ | 5                |                  |
| Collector current                                         | $I_C$     | 50               | mA               |
| Peak collector current                                    | $I_{CM}$  | 100              |                  |
| Total power dissipation, $T_s = 120^\circ\text{C}$        | $P_{tot}$ | 1                | W                |
| Junction temperature                                      | $T_j$     | 150              | $^\circ\text{C}$ |
| Storage temperature range                                 | $T_{stg}$ | $-65 \dots +150$ |                  |

### Thermal Resistance

|                                  |             |           |     |
|----------------------------------|-------------|-----------|-----|
| Junction - ambient <sup>2)</sup> | $R_{th JA}$ | $\leq 90$ | K/W |
| Junction - soldering point       | $R_{th JS}$ | $\leq 30$ |     |

<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  $T_A = 25\text{ °C}$ , unless otherwise specified.

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

**DC characteristics**

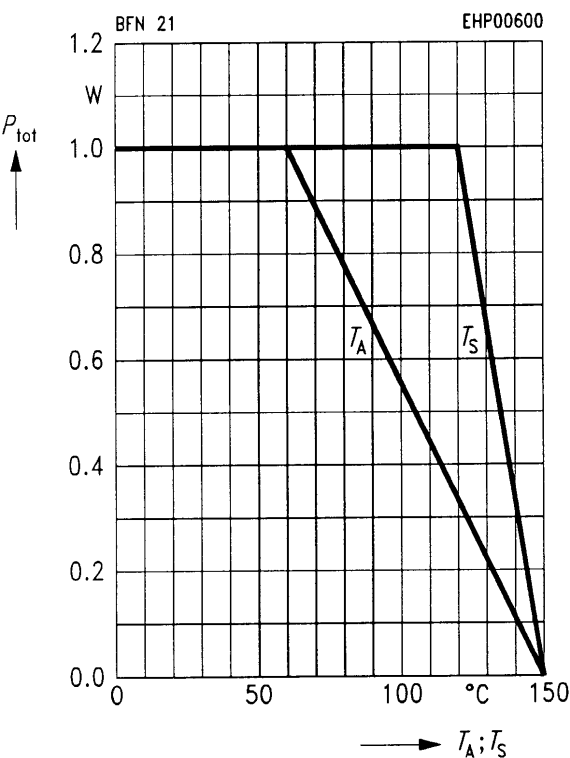
|                                                                                                                                                                        |               |        |        |           |                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|--------|-----------|---------------------|
| Collector-emitter breakdown voltage<br>$I_C = 1\text{ mA}$                                                                                                             | $V_{(BR)CE0}$ | 300    | —      | —         | V                   |
| Collector-base breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$                                                                                                      | $V_{(BR)CB0}$ | 300    | —      | —         |                     |
| Collector-emitter breakdown voltage<br>$I_C = 10\text{ }\mu\text{A}$ , $R_{BE} = 2.7\text{ k}\Omega$                                                                   | $V_{(BR)CER}$ | 300    | —      | —         |                     |
| Emitter-base breakdown voltage<br>$I_E = 10\text{ }\mu\text{A}$                                                                                                        | $V_{(BR)EB0}$ | 5      | —      | —         |                     |
| Collector-base cutoff current<br>$V_{CB} = 250\text{ V}$<br>$V_{CB} = 250\text{ V}$ , $T_A = 150\text{ °C}$                                                            | $I_{CB0}$     | —<br>— | —<br>— | 100<br>20 | nA<br>$\mu\text{A}$ |
| Collector cutoff current<br>$V_{CE} = 300\text{ V}$ , $R_{BE} = 2.7\text{ k}\Omega$<br>$V_{CE} = 300\text{ V}$ , $T_A = 150\text{ °C}$ , $R_{BE} = 2.7\text{ k}\Omega$ | $I_{CER}$     | —<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>$I_C = 25\text{ mA}$ , $V_{CE} = 20\text{ V}$                                                                                         | $h_{FE}$      | 40     | —      | —         | —                   |
| 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**

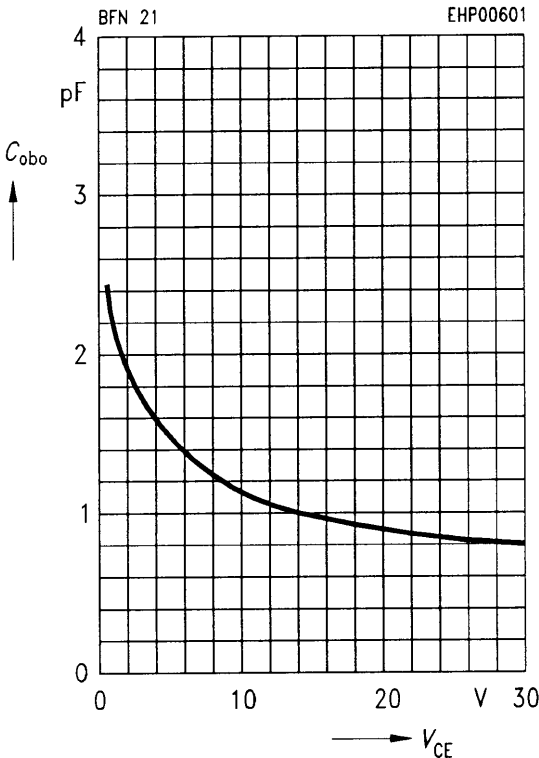
|                                                                                             |           |   |     |   |     |
|---------------------------------------------------------------------------------------------|-----------|---|-----|---|-----|
| Transition frequency<br>$I_C = 10\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 20\text{ MHz}$ | $f_t$     | — | 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:  $t \leq 300\text{ }\mu\text{s}$ ,  $D = 2\text{ %}$ .

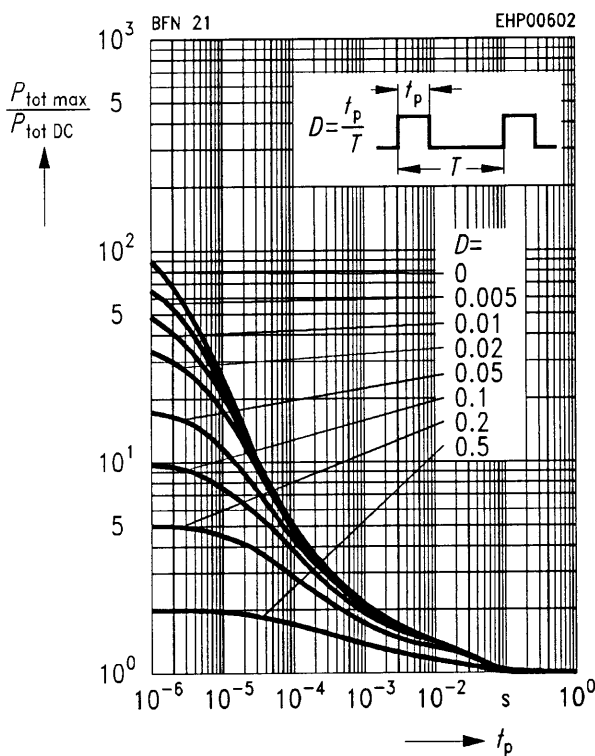
**Total power dissipation**  $P_{\text{tot}} = f(T_A^*; T_S)$   
\* Package mounted on epoxy



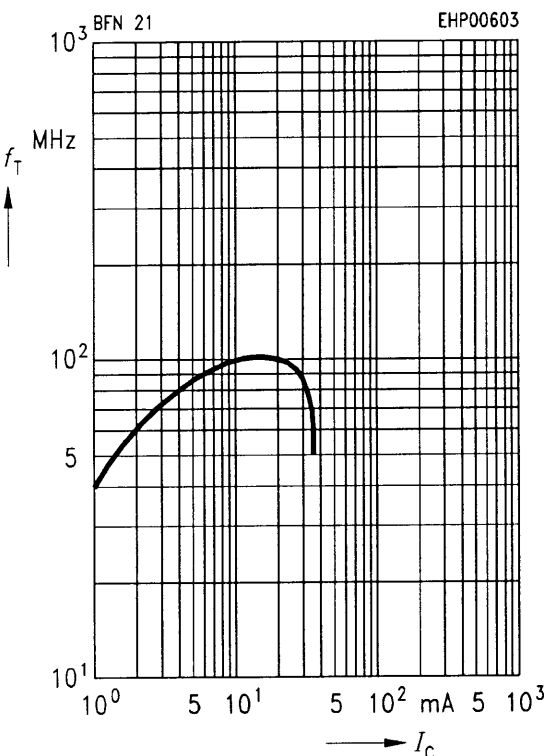
**Output capacitance**  $C_{\text{obo}} = f(V_{\text{CE}})$   
 $f = 1 \text{ MHz}$



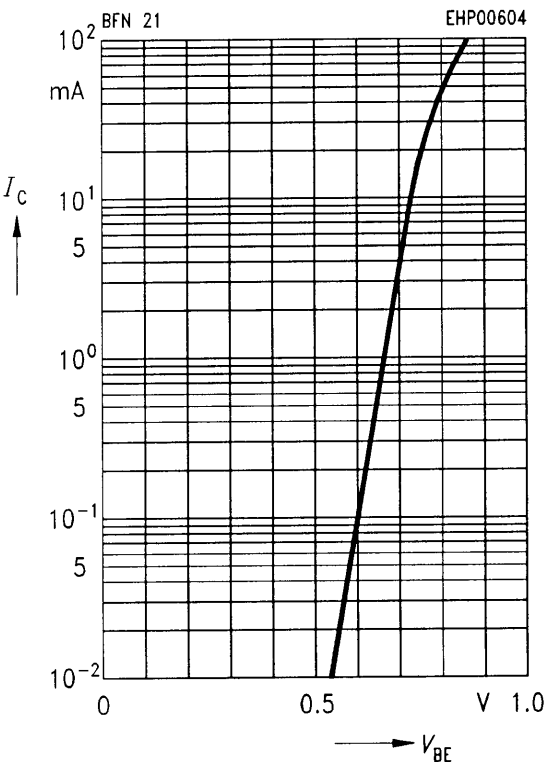
**Permissible pulse load**  $P_{\text{tot max}} / P_{\text{tot DC}} = f(t_p)$



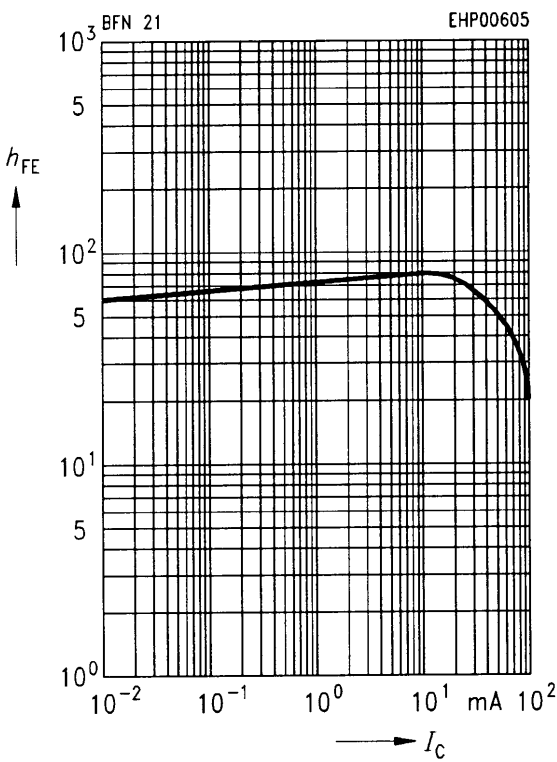
**Transition frequency**  $f_T = f(I_C)$   
 $V_{\text{CE}} = 10 \text{ V}$



**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**  $I_{CB0} = f(T_A)$   
 $V_{CB} = 250\text{ V}$

