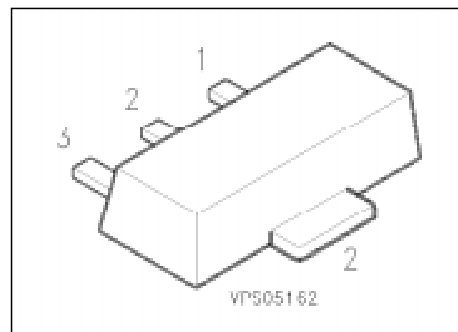


PNP Silicon Switching Transistor

SXT 3906

- High current gain: 0.1 mA to 100 mA
- Low collector-emitter saturation voltage



| Type | Marking | Ordering Code (tape and reel) | Pin Configuration | | | Package ¹⁾ |
|----------|---------|----------------------------------|-------------------|---|---|-----------------------|
| | | | 1 | 2 | 3 | |
| SXT 3906 | 2A | Q68000-A8397 | B | C | E | SOT-89 |

Maximum Ratings

| Parameter | Symbol | Values | Unit |
|--|-----------|----------------|------|
| Collector-emitter voltage | V_{CE0} | 40 | V |
| Collector-base voltage | V_{CB0} | 40 | |
| Emitter-base voltage | V_{EB0} | 5 | |
| Collector current | I_C | 200 | mA |
| Total power dissipation, $T_s = 100\text{ °C}$ | P_{tot} | 1 | W |
| Junction temperature | T_j | 150 | °C |
| Storage temperature range | T_{stg} | - 65 ... + 150 | |

Thermal Resistance

| | | | |
|----------------------------------|-------------|-------|-----|
| Junction - ambient ²⁾ | $R_{th JA}$ | ≤ 120 | K/W |
| Junction - soldering point | $R_{th JS}$ | ≤ 50 | |

1) For detailed information see chapter Package Outlines.

2) Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm² Cu.

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

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

DC characteristics

| | | | | | |
|---|---------------|-----------------------------|-----------------------|-------------------------|----|
| Collector-emitter breakdown voltage $I_C = 1\text{ mA}$ | $V_{(BR)CE0}$ | 40 | – | – | V |
| Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$ | $V_{(BR)CB0}$ | 40 | – | – | |
| Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$ | $V_{(BR)EB0}$ | 5 | – | – | |
| Collector-base cutoff current $V_{CB} = 30\text{ V}$ | I_{CB0} | – | – | 50 | nA |
| Collector-emitter cutoff current $V_{CE} = 30\text{ V}$, $V_{BE} = -3\text{ V}$ | I_{CEV} | – | – | 50 | |
| DC current gain $I_C = 100\text{ }\mu\text{A}$, $V_{CE} = 1\text{ V}$ $I_C = 1\text{ mA}$, $V_{CE} = 1\text{ V}$ $I_C = 10\text{ mA}$, $V_{CE} = 1\text{ V}$ $I_C = 50\text{ mA}$, $V_{CE} = 1\text{ V}$ $I_C = 100\text{ mA}$, $V_{CE} = 1\text{ V}$ | h_{FE} | 60 80 100 60 30 | – – – – – | – – 300 – – | – |
| Collector-emitter saturation voltage ¹⁾ $I_C = 10\text{ mA}$, $I_B = 1\text{ mA}$ $I_C = 50\text{ mA}$, $I_B = 5\text{ mA}$ | V_{CEsat} | – – | – – | 0.25 0.4 | V |
| Base-emitter saturation voltage ¹⁾ $I_C = 10\text{ mA}$, $I_B = 1\text{ mA}$ $I_C = 50\text{ mA}$, $I_B = 5\text{ mA}$ | V_{BEsat} | 0.65 – | – – | 0.85 0.95 | |

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

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

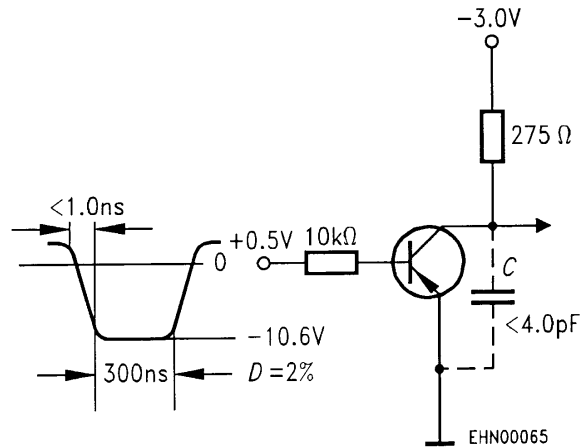
| Parameter | Symbol | Values | | | Unit |
|-----------|--------|--------|------|------|------|
| | | min. | typ. | max. | |

AC characteristics

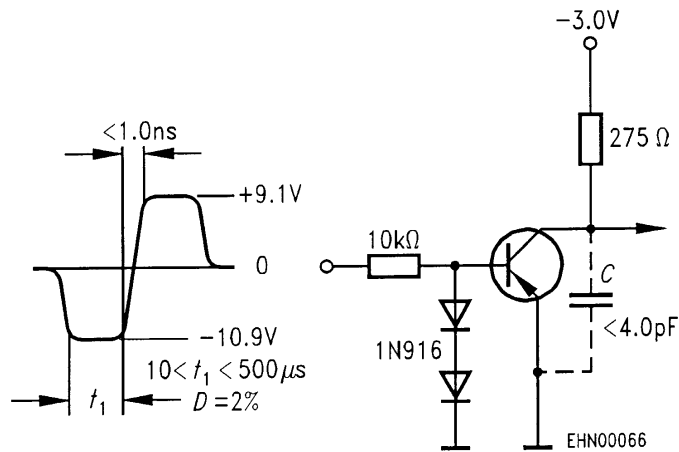
| | | | | | |
|---|-----------|-----|---|-----|---------------|
| Transition frequency $I_C = 10\text{ mA}$, $V_{CE} = 20\text{ V}$, $f = 100\text{ MHz}$ | f_T | 250 | – | – | MHz |
| Output capacitance $V_{CB} = 5\text{ V}$, $f = 1\text{ MHz}$ | C_{obo} | – | – | 4.5 | pF |
| Input capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$ | C_{ibo} | – | – | 10 | |
| Input impedance $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ kHz}$ | h_{ie} | 2 | – | 12 | k Ω |
| Voltage feedback ratio $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ kHz}$ | h_{re} | 0.1 | – | 10 | 10^{-4} |
| Small-signal current gain $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ kHz}$ | h_{fe} | 100 | – | 400 | – |
| Output admittance $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ kHz}$ | h_{oe} | 3 | – | 60 | μS |
| Noise figure $I_C = 0.1\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 10\text{ Hz to }15\text{ kHz}$ $R_S = 1\text{ k}\Omega$ | NF | – | – | 4 | dB |
| Switching times $V_{CC} = 3\text{ V}$, $V_{BE} = 0.5\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = 1\text{ mA}$ | t_d | – | – | 35 | ns |
| | t_r | – | – | 35 | ns |
| $V_{CC} = 3\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = 1\text{ mA}$ | t_s | – | – | 225 | ns |
| | t_f | – | – | 75 | ns |

Test circuits

Delay and rise time

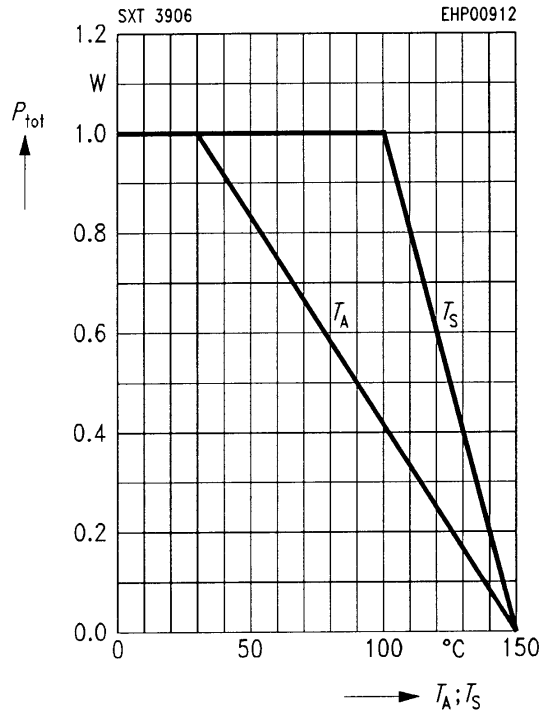


Storage and fall time

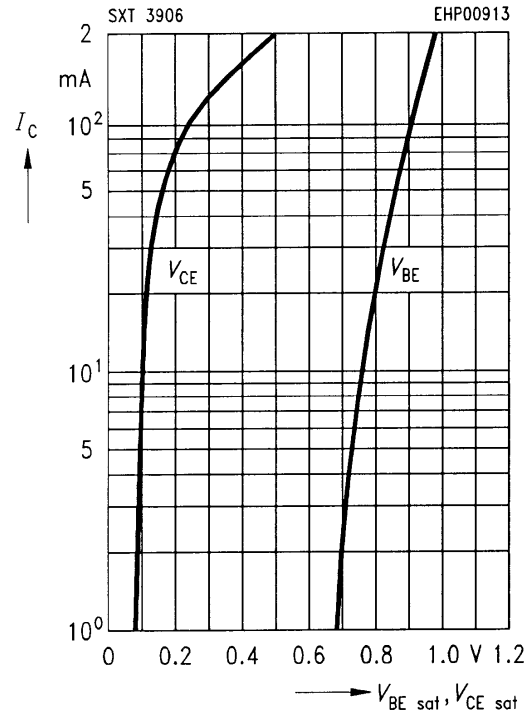


Total power dissipation $P_{tot} = f(T_A^*; T_S)$

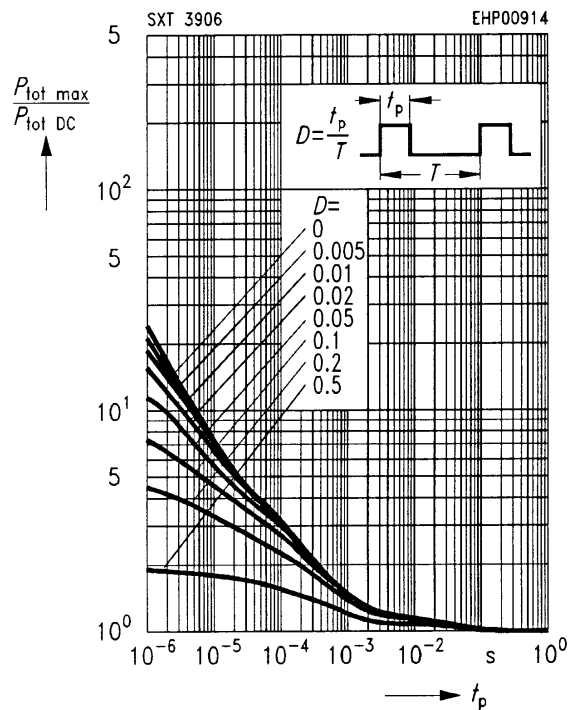
* Package mounted on epoxy



Saturation voltage $I_C = f(V_{BE sat}, V_{CE sat})$

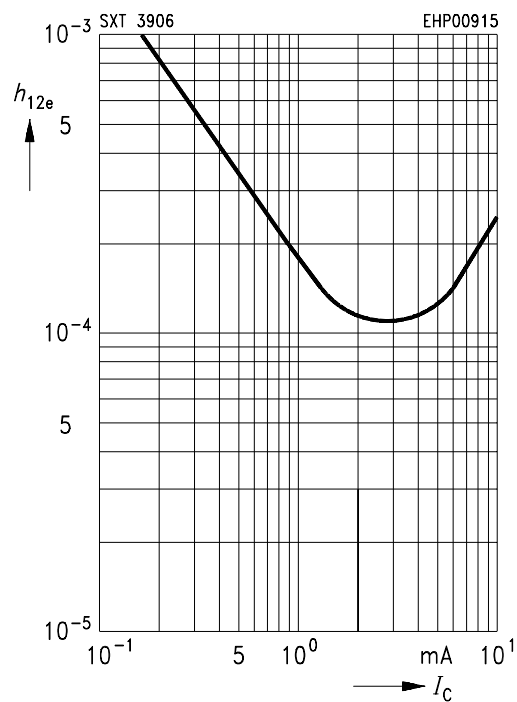


Permissible pulse load $P_{tot max}/P_{tot DC} = f(t_p)$



Open-circuit reverse voltage transfer ratio

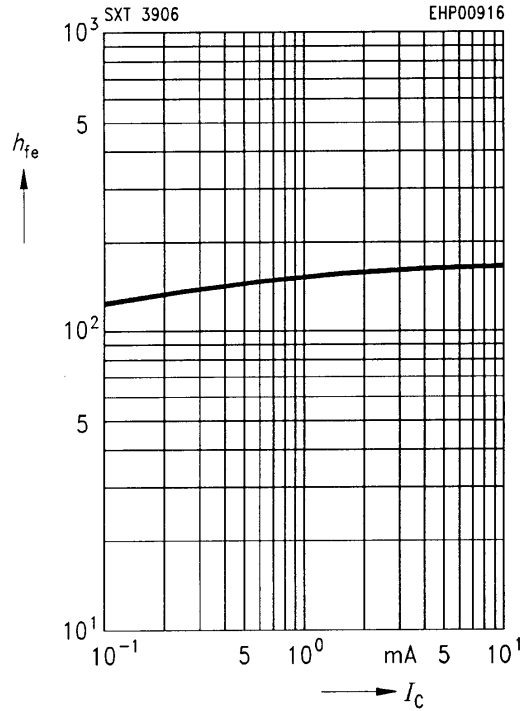
$h_{12e} = f(I_C)$



Small-signal current gain

$h_{fe} = f(I_C)$

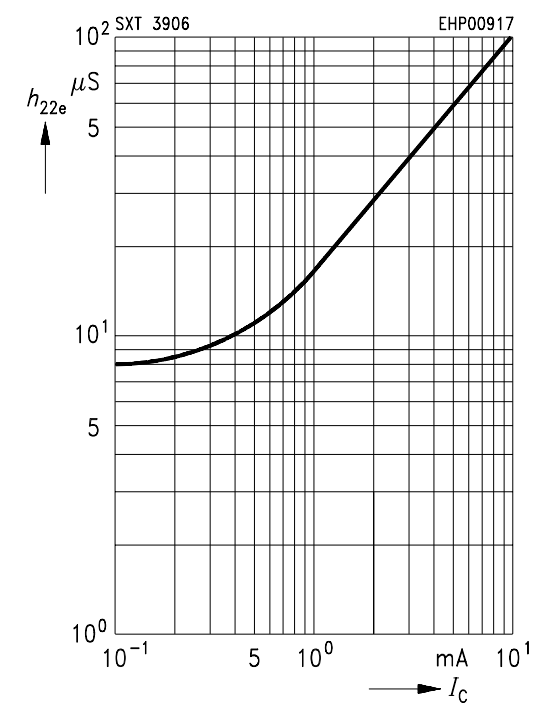
$V_{CE} = 10\text{ V}, f = 1\text{ MHz}$



Output admittance

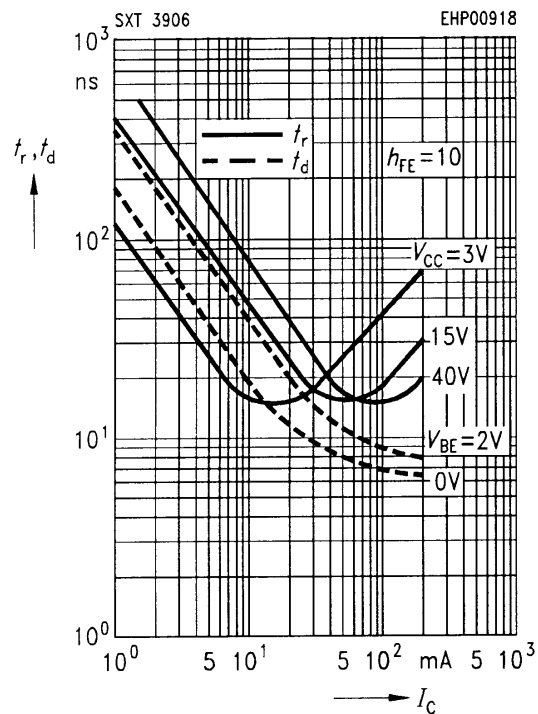
$h_{22e} = f(I_C)$

$V_{CE} = 10\text{ V}, f = 1\text{ MHz}$

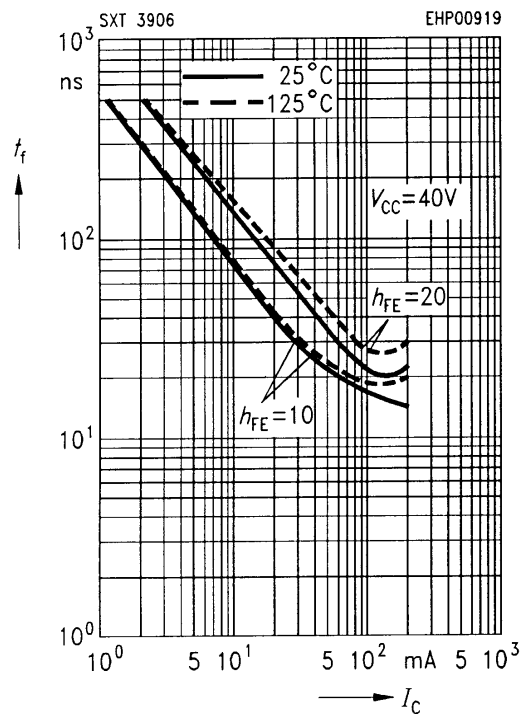


Delay time $t_d = f(I_C)$

Rise time $t_r = f(I_C)$



Fall time $t_f = f(I_C)$



DC current gain $h_{FE} = f(I_C)$
 $V_{CE} = 1\text{ V}$, normalized

