

SEBT3906U
PNP switching transistor

Features

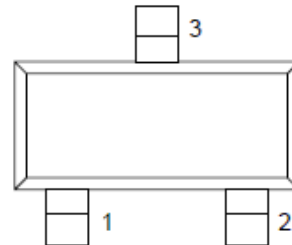
- Low current (max. 100 mA).
- Low voltage (max. 40 V).

Applications

- Telephony and professional communication equipment.

DESCRIPTION

- PNP switching transistor in a SOT323 plastic package
- NPN complement: SEBT3904U.



Top view

Fig.1 Simplified outline (SOT323) and symbol.

Absolute maximum ratings (Ta=25°C)

| Parameter | Symbol | CONDITIO NS | MIN. | MAX. | Unit |
|-------------------------------|-----------|----------------------------------|------|------|------|
| collector-base voltage | V_{CBO} | open emitter | - | -60 | V |
| collector-emitter voltage | V_{CEO} | open base | - | -40 | V |
| emitter-base voltage | V_{EBO} | open collector | - | -6 | V |
| collector current DC | I_C | | - | -200 | mA |
| peak collector current | I_{CM} | | - | -200 | mA |
| peak base current | I_{BM} | | - | -100 | mA |
| total power dissipation | P_{tot} | $T_{amb} \leq 25$ ° C; note 1 | - | 250 | mW |
| storage temperature | T_{stg} | | -65 | +150 | °C |
| junction temperature | T_j | | - | 150 | °C |
| operating ambient temperature | T_{amb} | | -65 | +150 | °C |

Electrical characteristics (Ta=25°C)

| Parameter | Symbol | CONDITIONS | Min. | Max. | Unit |
|---------------------------|-----------|--------------------------|------|------|------|
| collector cut-off current | I_{CBO} | $I_E = 0; V_{CB} = -30V$ | - | -50 | nA |
| emitter cut-off current | I_{EBO} | $I_C = 0; V_{EB} = -6V$ | - | -50 | nA |

| | | | | | |
|--------------------------------------|-------------|---|------|------|-----|
| DC current gain | h_{FE} | $V_{CE} = 1\text{ V}$; note 1; Fig.2 $I_C = -0.1\text{ mA}$ | 60 | - | |
| | | $I_C = -1\text{ mA}$ | 80 | - | |
| | | $I_C = -10\text{ mA}$ | 100 | 300 | |
| | | $I_C = -50\text{ mA}$ | 60 | - | |
| | | $I_C = -100\text{ mA}$ | 30 | - | |
| collector-emitter saturation voltage | V_{CEsat} | $I_C = -10\text{ mA}$; $I_B = -1\text{ mA}$ | - | -200 | mV |
| | | $I_C = -50\text{ mA}$; $I_B = -5\text{ mA}$ | - | -200 | mV |
| base-emitter saturation voltage | V_{BEsat} | $I_C = -10\text{ mA}$; $I_B = -1\text{ mA}$ | -650 | -850 | mV |
| | | $I_C = -50\text{ mA}$; $I_B = -5\text{ mA}$ | - | -950 | mV |
| collector capacitance | C_c | $I_E = I_C = 0$; $V_{CB} = 5\text{ V}$; $f = 1\text{ MHz}$ | - | 4 | pF |
| emitter capacitance | C_e | $I_C = I_E = 0$; $V_{BE} = 500\text{ mV}$; $f = 1\text{ MHz}$ | - | 8 | pF |
| transition frequency | f_T | $I_C = 10\text{ mA}$; $V_{CE} = 20\text{ V}$; $f = 100\text{ MHz}$ | 300 | - | MHz |
| noise figure | F | $I_C = 100\text{ mA}$; $V_{CE} = 5\text{ V}$; $R_S = 1\text{ kW}$; $f = 10\text{ Hz to } 15.7\text{ kHz}$ | - | 5 | dB |

Switching times (between 10% and 90% levels); (see Fig.3)

| | | | | | |
|------|---------------|---|---|-----|----|
| ton | turn-on time | $I_{Con} = 10\text{ mA}$; $I_{Bon} = 1\text{ mA}$; $I_{Boff} = -1\text{ mA}$ | - | 65 | ns |
| td | delay time | | - | 35 | ns |
| tr | rise time | | - | 35 | ns |
| toff | turn-off time | | - | 240 | ns |
| ts | storage time | | - | 200 | ns |
| tf | fall time | | - | 50 | ns |

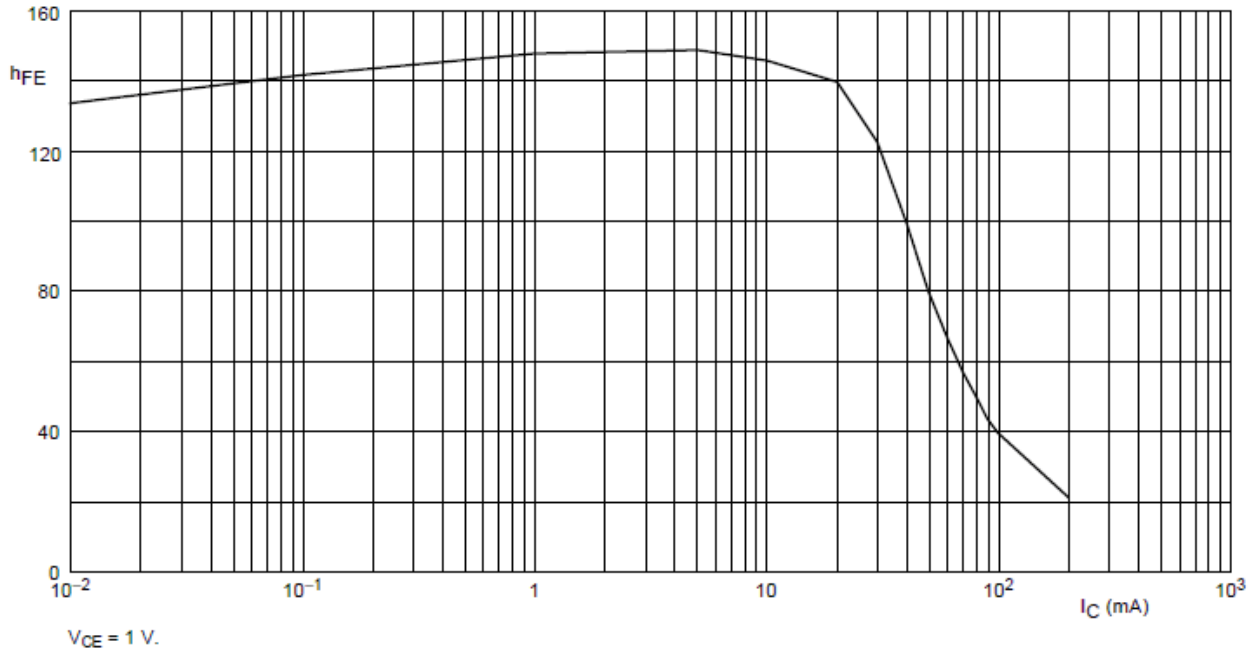
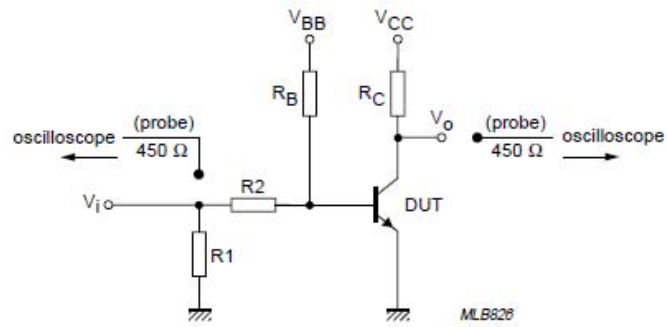


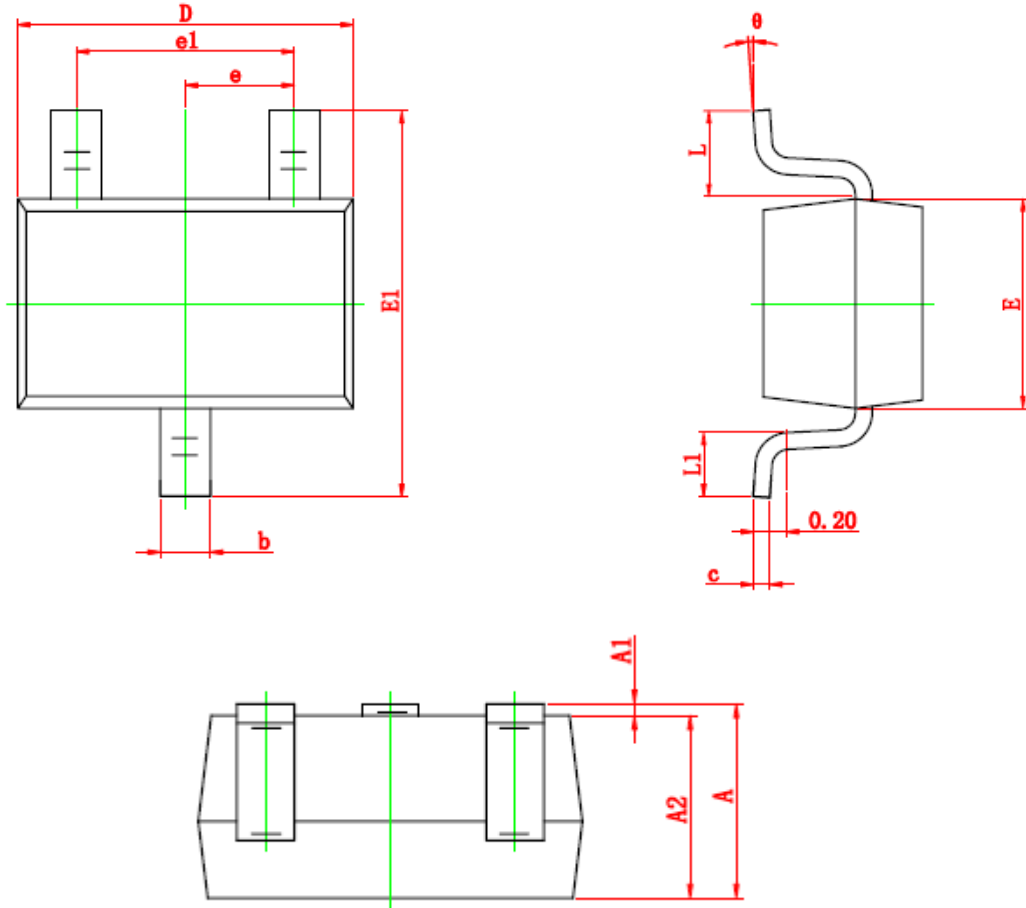
Fig.2 DC current gain; typical values.



$V_i = 5$ V; $T = 500$ μ s; $t_p = 10$ μ s; $t_r = t_f \leq 3$ ns.
 $R_1 = 56$ Ω ; $R_2 = 2.5$ k Ω ; $R_B = 3.9$ k Ω ; $R_C = 270$ Ω .
 $V_{BB} = -1.9$ V; $V_{CC} = 3$ V.
 Oscilloscope: input impedance $Z_i = 50$ Ω .

Fig.3 Test circuit for switching times.

SOT-323 PACKAGE OUTLINE



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.200 | 0.400 | 0.008 | 0.016 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| e | 0.650 TYP | | 0.026 TYP | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525 REF | | 0.021 REF | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| theta | 0° | 8° | 0° | 8° |

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