

Silicon NPN epitaxial planer transistor (Tr1)
Silicon PNP epitaxial planer transistor (Tr2)

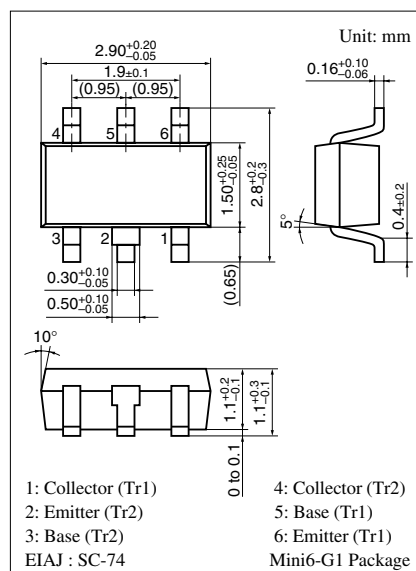
■ Features

- Two elements incorporated into one package
- Reduction of the mounting area and assembly cost by one half

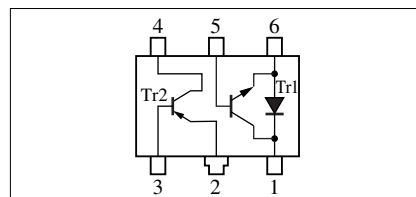
- 2SB0970 (2SB970) + ARN-5

| Parameter | | Symbol | Rating | Unit |
|-----------|---------------------------------------|-----------|-------------|------|
| Tr1 | Collector to base voltage | V_{CBO} | 20 | V |
| | Collector to emitter voltage | V_{CEO} | 15 | V |
| | Emitter to base voltage | V_{EBO} | 7 | V |
| | Collector current | I_C | 0.55 | A |
| | Peak collector current | I_{CP} | 1.1 | A |
| | Collector current * ¹ | I_C | 0.7 | A |
| Tr2 | Collector to base voltage | V_{CBO} | −15 | V |
| | Collector to emitter voltage | V_{CEO} | −10 | V |
| | Emitter to base voltage | V_{EBO} | −7 | V |
| | Collector current | I_C | − 0.55 | A |
| | Peak collector current | I_{CP} | −1.1 | A |
| | Collector current* ¹ | I_C | − 0.7 | A |
| Overall | Total power dissipation | P_T | 350 | mW |
| | Total power dissipation* ² | P_T | 750 | mW |
| | Junction temperature | T_j | 150 | °C |
| | Storage temperature | T_{stg} | −55 to +150 | °C |

*2: An instantaneous total power dissipation (for the single pulse of 50 ms)



Internal Connection



■ Electrical characteristics $T_a = 25^\circ\text{C} \pm 2^\circ\text{C}$

• Tr1

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|-------------------------------------|--|-----|-----|-----|---------------|
| Collector to base voltage | V_{CBO} | $I_{\text{C}} = 10\ \mu\text{A}$, $I_{\text{E}} = 0$ | 20 | | | V |
| Collector to emitter voltage | V_{CEO} | $I_{\text{C}} = 1\ \text{mA}$, $I_{\text{B}} = 0$ | 15 | | | V |
| Emitter to base voltage | V_{EBO} | $I_{\text{E}} = 10\ \mu\text{A}$, $I_{\text{C}} = 0$ | 7 | | | V |
| Collector cutoff current | I_{CBO} | $V_{\text{CB}} = 15\ \text{V}$, $I_{\text{E}} = 0$ | | | 0.1 | μA |
| Forward current transfer ratio | h_{FE1} ^{*1} | $V_{\text{CE}} = 2\ \text{V}$, $I_{\text{C}} = 0.5\ \text{A}$ | 200 | | 800 | — |
| | h_{FE2} ^{*1} | $V_{\text{CE}} = 2\ \text{V}$, $I_{\text{C}} = 1\ \text{A}$ | 60 | | | — |
| Collector to emitter saturation voltage | $V_{\text{CE(sat)1}}$ ^{*1} | $I_{\text{C}} = 0.3\ \text{A}$, $I_{\text{B}} = 8\ \text{mA}$ | | | 0.2 | V |
| | $V_{\text{CE(sat)2}}$ ^{*1} | $I_{\text{C}} = 0.7\ \text{A}$, $I_{\text{B}} = 8\ \text{mA}$ | | | 0.5 | V |
| Diode forward voltage | V_{F} ^{*2} | $I_{\text{F}} = 0.55\ \text{A}$ | | | 1.4 | V |
| Transition frequency | f_{T} | $V_{\text{CB}} = 10\ \text{V}$, $I_{\text{E}} = -50\ \text{mA}$, $f = 200\ \text{MHz}$ | | 200 | | MHz |
| Collector output capacitance | C_{ob} | $V_{\text{CB}} = 10\ \text{V}$, $I_{\text{E}} = 0$, $f = 1\ \text{MHz}$ | | 10 | | pF |

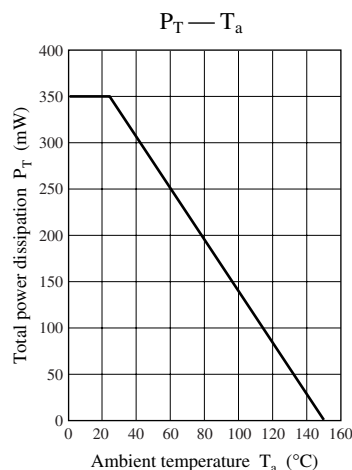
• Tr2

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|-------------------------------------|--|-----|-----|-------|---------------|
| Collector to base voltage | V_{CBO} | $I_{\text{C}} = -10\ \mu\text{A}$, $I_{\text{E}} = 0$ | -15 | | | V |
| Collector to emitter voltage | V_{CEO} | $I_{\text{C}} = -1\ \text{mA}$, $I_{\text{B}} = 0$ | -10 | | | V |
| Emitter to base voltage | V_{EBO} | $I_{\text{E}} = -10\ \mu\text{A}$, $I_{\text{C}} = 0$ | -7 | | | V |
| Collector cutoff current | I_{CBO} | $V_{\text{CB}} = -10\ \text{V}$, $I_{\text{E}} = 0$ | | | -0.1 | μA |
| Forward current transfer ratio | h_{FE1} ^{*1} | $V_{\text{CE}} = -2\ \text{V}$, $I_{\text{C}} = -0.5\ \text{A}$ | 100 | | 350 | — |
| | h_{FE2} ^{*1} | $V_{\text{CE}} = -2\ \text{V}$, $I_{\text{C}} = -1\ \text{A}$ | 60 | | | — |
| Collector to emitter saturation voltage | $V_{\text{CE(sat)1}}$ ^{*1} | $I_{\text{C}} = -0.3\ \text{A}$, $I_{\text{B}} = -8\ \text{mA}$ | | | -0.22 | V |
| | $V_{\text{CE(sat)2}}$ ^{*1} | $I_{\text{C}} = -0.7\ \text{A}$, $I_{\text{B}} = -8\ \text{mA}$ | | | -0.6 | V |
| Transition frequency | f_{T} | $V_{\text{CB}} = -10\ \text{V}$, $I_{\text{E}} = 50\ \text{mA}$, $f = 200\ \text{MHz}$ | | 130 | | MHz |
| Collector output capacitance | C_{ob} | $V_{\text{CB}} = -10\ \text{V}$, $I_{\text{E}} = 0$, $f = 1\ \text{MHz}$ | | 22 | | pF |

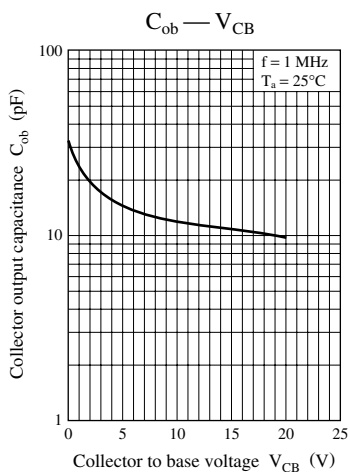
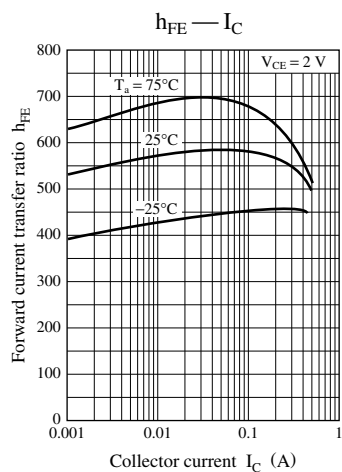
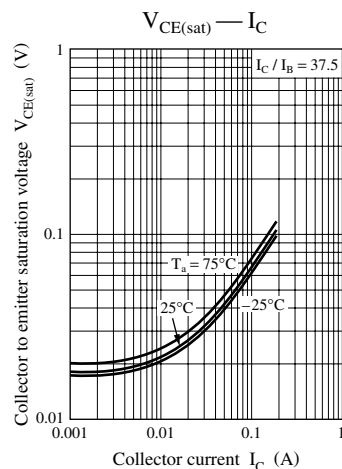
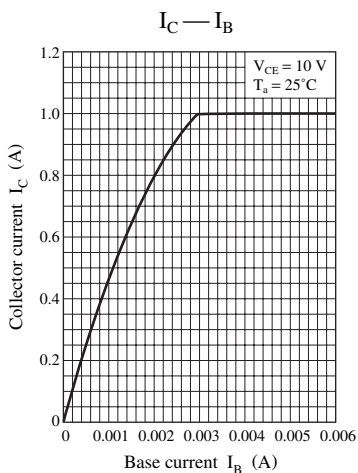
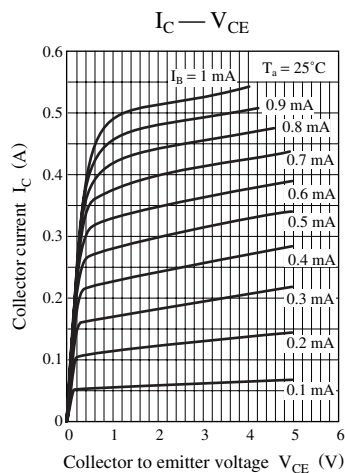
Note) *1: Pulse measurement

*2: Effective for the transistor with a built-in diode

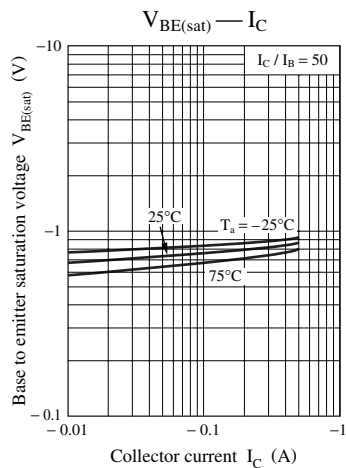
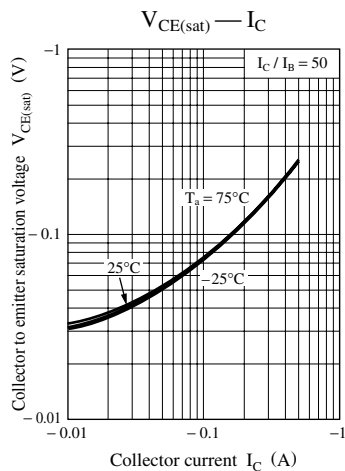
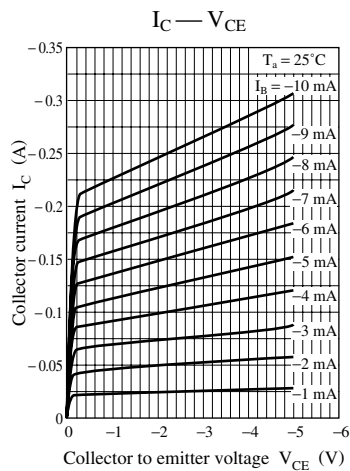
Common characteristics chart

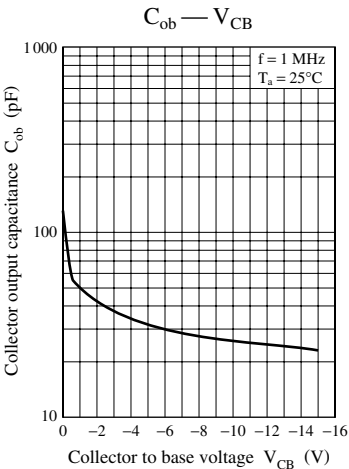
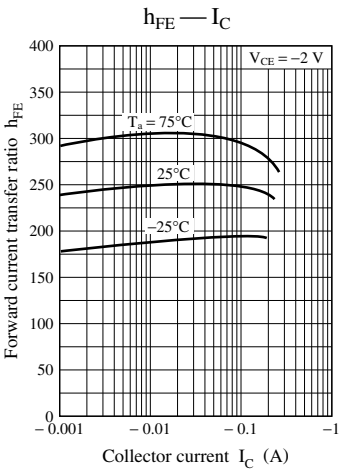


Characteristics charts of Tr1



Characteristics charts of Tr2





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