

UNR31A9

Silicon PNP epitaxial planar type

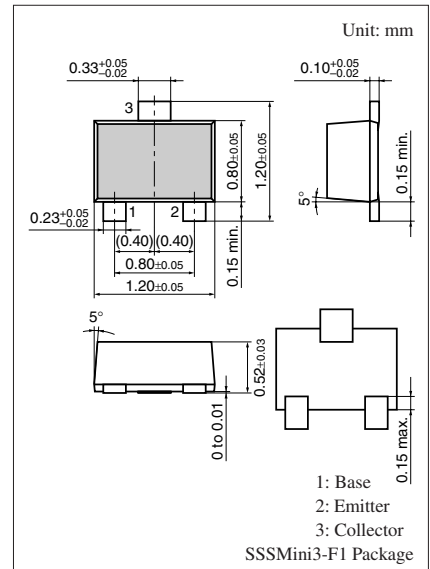
For digital circuits

■ Features

- Suitable for high-density mounting downsizing of the equipment
- Contribute to low power consumption

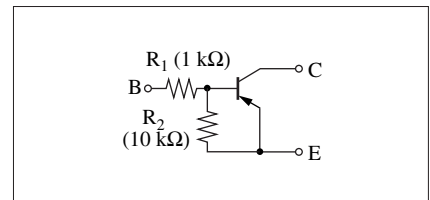
■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Rating | Unit |
|---------------------------------------|-----------|-------------|------------------|
| Collector-base voltage (Emitter open) | V_{CBO} | -50 | V |
| Collector-emitter voltage (Base open) | V_{CEO} | -50 | V |
| Collector current | I_C | -80 | mA |
| Total power dissipation | P_T | 100 | mW |
| Junction temperature | T_j | 125 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +125 | $^\circ\text{C}$ |



Marking Symbol: DC

Internal Connection

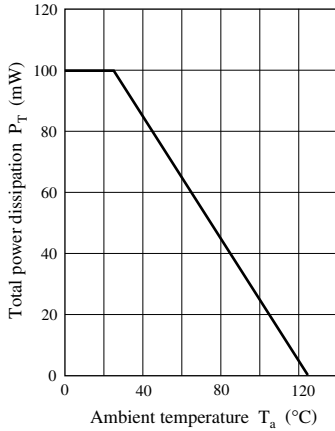


■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

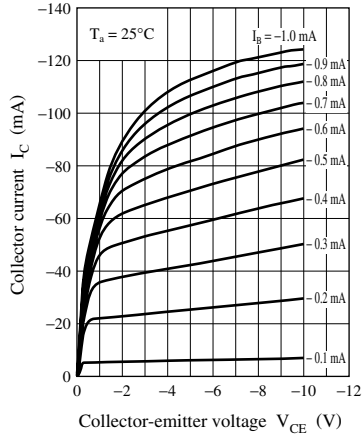
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|---------------|--|------|------|-------|---------------|
| Collector-base voltage (Emitter open) | V_{CBO} | $I_C = -10 \mu\text{A}, I_E = 0$ | -50 | | | V |
| Collector-emitter voltage (Base open) | V_{CEO} | $I_C = -2 \text{ mA}, I_B = 0$ | -50 | | | V |
| Collector-base cutoff current (Emitter open) | I_{CBO} | $V_{CB} = -50 \text{ V}, I_E = 0$ | | | -0.1 | μA |
| Collector-emitter cutoff current (Base open) | I_{CEO} | $V_{CE} = -50 \text{ V}, I_B = 0$ | | | -0.5 | μA |
| Emitter-base cutoff current (Collector open) | I_{EBO} | $V_{EB} = -6 \text{ V}, I_C = 0$ | | | -1.5 | mA |
| Forward current transfer ratio | h_{FE} | $V_{CE} = -10 \text{ V}, I_C = -5 \text{ mA}$ | 30 | | | — |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -10 \text{ mA}, I_B = -0.3 \text{ mA}$ | | | -0.25 | V |
| Output voltage high-level | V_{OH} | $V_{CC} = -5 \text{ V}, V_B = -0.5 \text{ V}, R_L = 1 \text{ k}\Omega$ | -4.9 | | | V |
| Output voltage low-level | V_{OL} | $V_{CC} = -5 \text{ V}, V_B = -2.5 \text{ V}, R_L = 1 \text{ k}\Omega$ | | | -0.2 | V |
| Input resistance | R_1 | | -30% | 1 | +30% | k Ω |
| Resistance ratio | R_1 / R_2 | | 0.08 | 0.10 | 0.12 | — |
| Transition frequency | f_T | $V_{CB} = -10 \text{ V}, I_E = 1 \text{ mA}, f = 200 \text{ MHz}$ | | 80 | | MHz |

Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

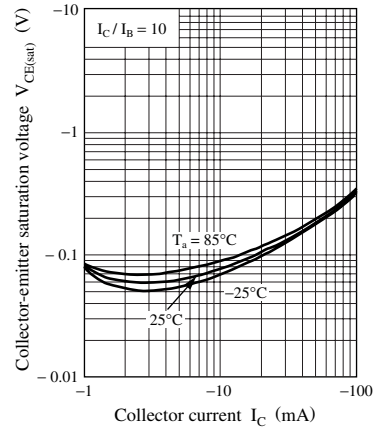
$P_T - T_a$



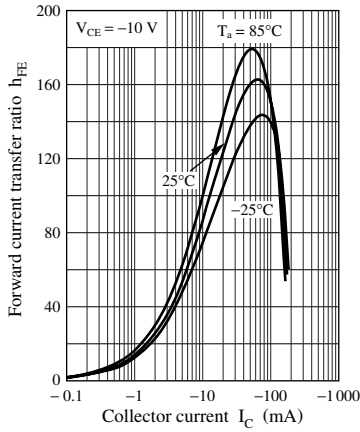
$I_C - V_{CE}$



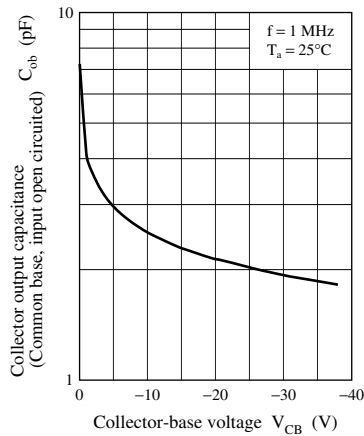
$V_{CE(sat)} - I_C$



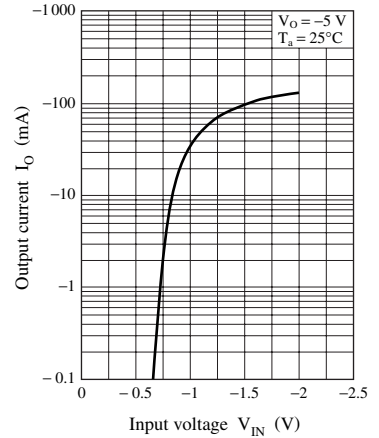
$h_{FE} - I_C$



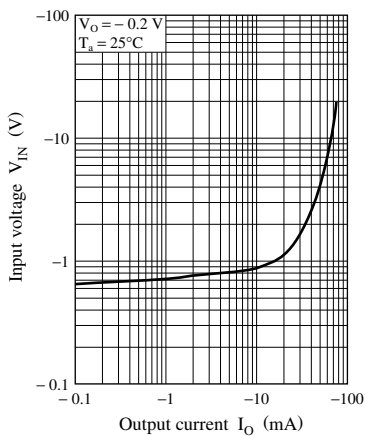
$C_{ob} - V_{CB}$



$I_O - V_{IN}$



$V_{IN} - I_O$



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