

UNA0222 (UN222)

Silicon PNP epitaxial planar type (3 elements)
 Silicon NPN epitaxial planar type (3 elements)

For motor drives

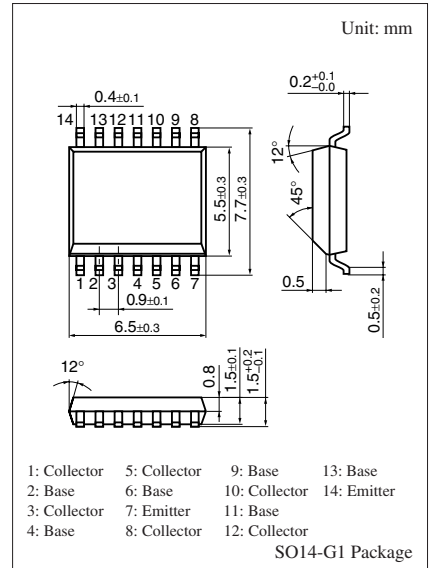
■ Features

- Small and lightweight
- Low power consumption (low $V_{CE(sat)}$ transistor used)
- Low voltage drive
- Transistors with built-in resistor with 6 elements incorporated

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

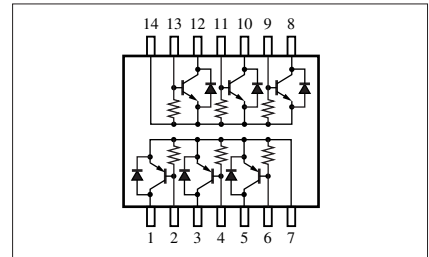
| | Parameter | Symbol | Rating | Unit |
|---------|---------------------------------------|-----------|-------------|------------------|
| PNP | Collector-base voltage (Emitter open) | V_{CBO} | -10 | V |
| | Collector-emitter voltage (Base open) | V_{CEO} | -10 | V |
| | Collector current | I_C | -3 | A |
| | Peak collector current | I_{CP} | -4 | A |
| NPN | Collector-base voltage (Emitter open) | V_{CBO} | 10 | V |
| | Collector-emitter voltage (Base open) | V_{CEO} | 10 | V |
| | Collector current | I_C | 3 | A |
| | Peak collector current | I_{CP} | 4 | A |
| Overall | Total power dissipation * | P_T | 0.5 | W |
| | Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| | Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

Note) *: When the dissipation on one device is $T_C = 25^\circ\text{C}$



Marking Symbol: UN222

Internal Connection



Note) The part number in the parenthesis shows conventional part number.

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

• PNP

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---------------|---|------|-----|-------|---------------|
| Collector-base voltage (Emitter open) | V_{CBO} | $I_C = -10 \mu\text{A}, I_E = 0$ | -10 | | | V |
| Collector-emitter voltage (Base open) | V_{CEO} | $I_C = -1 \text{ mA}, I_B = 0$ | -10 | | | V |
| Collector-base cutoff current (Emitter open) | I_{CBO} | $V_{CB} = -6 \text{ V}, I_E = 0$ | | | -1 | μA |
| Forward current transfer ratio | h_{FE} | $V_{CE} = -1 \text{ V}, I_C = -0.5 \text{ A}$ | 200 | | 700 | — |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -2 \text{ A}, I_B = -50 \text{ mA}$ | | | -0.45 | V |
| Transition frequency | f_T | $V_{CB} = -6 \text{ V}, I_E = 50 \text{ mA}, f = 200 \text{ MHz}$ | | 150 | | MHz |
| Collector output capacitance (Common base, input open circuited) | C_{ob} | $V_{CB} = -6 \text{ V}, I_E = 0, f = 1 \text{ MHz}$ | | 70 | | pF |
| Forward voltage ^{*1} | V_F | $I_F = -1 \text{ A}$ | | | -1.5 | V |
| Bias resistance ^{*2} | R_{EB} | | -30% | 10 | +30% | k Ω |

• NPN

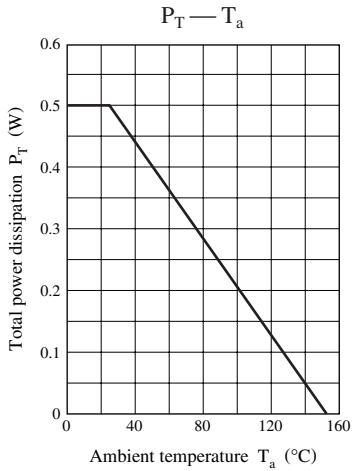
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---------------|---|------|-----|------|---------------|
| Collector-base voltage (Emitter open) | V_{CBO} | $I_C = 10 \mu\text{A}, I_E = 0$ | 10 | | | V |
| Collector-emitter voltage (Base open) | V_{CEO} | $I_C = 1 \text{ mA}, I_B = 0$ | 10 | | | V |
| Collector-base cutoff current (Emitter open) | I_{CBO} | $V_{CB} = 6 \text{ V}, I_E = 0$ | | | 1 | μA |
| Forward current transfer ratio | h_{FE} | $V_{CE} = 1 \text{ V}, I_C = 0.5 \text{ A}$ | 200 | | 700 | — |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 2 \text{ A}, I_B = 50 \text{ mA}$ | | | 0.25 | V |
| Transition frequency | f_T | $V_{CB} = 6 \text{ V}, I_E = -50 \text{ mA}, f = 200 \text{ MHz}$ | | 150 | | MHz |
| Collector output capacitance (Common base, input open circuited) | C_{ob} | $V_{CB} = 6 \text{ V}, I_E = 0, f = 1 \text{ MHz}$ | | 50 | | pF |
| Forward voltage ^{*1} | V_F | $I_F = 1 \text{ A}$ | | | 1.5 | V |
| Bias resistance ^{*2} | R_{EB} | | -30% | 10 | +30% | k Ω |

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

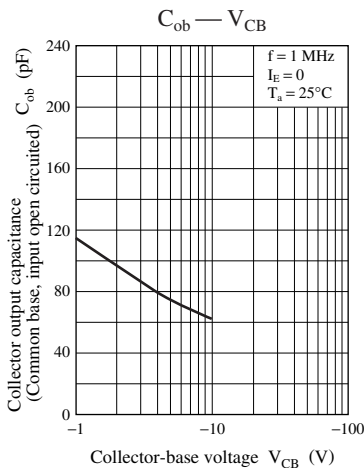
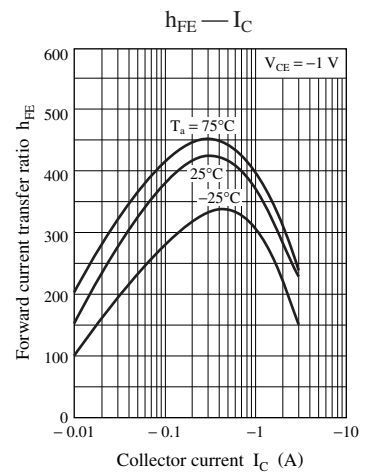
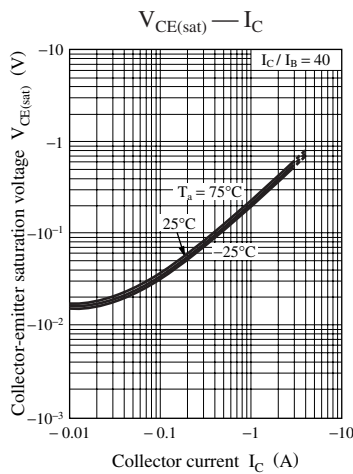
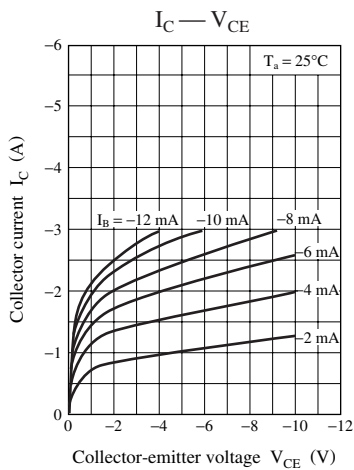
2. *1: Application to the built-in diode

*2: Application to the built-in resistance

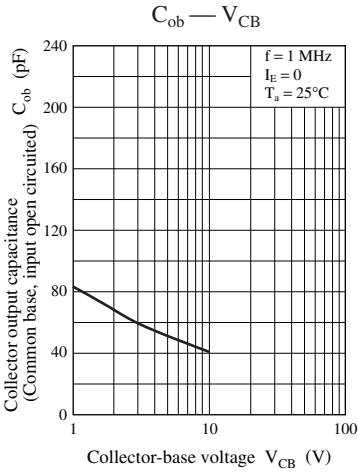
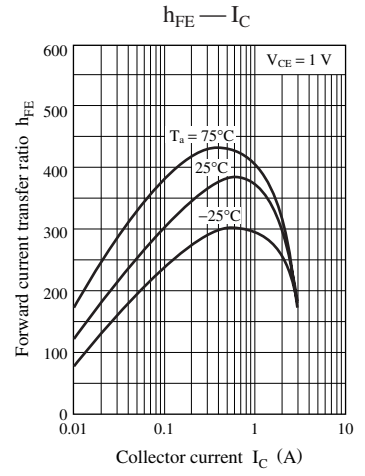
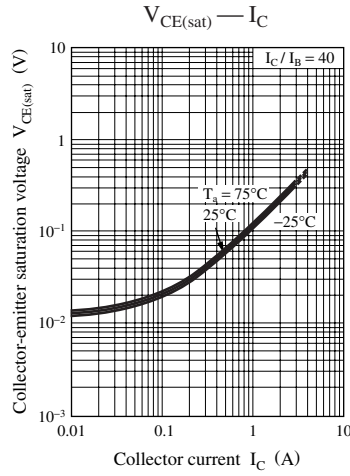
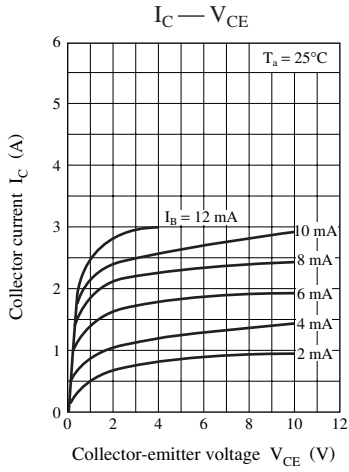
Common characteristics chart



Characteristics charts of PNP transistor block



Characteristics charts of NPN transistor block



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