

XP04316 (XP4316)

Silicon NPN epitaxial planar type (Tr1)
Silicon PNP epitaxial planar type (Tr2)

For switching/digital circuits

■ Features

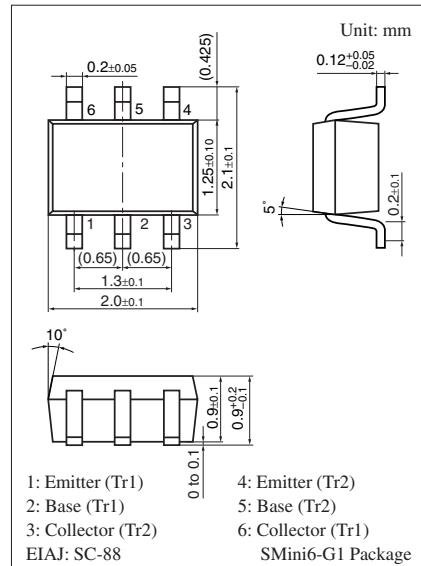
- Two elements incorporated into one package
(Transistors with built-in resistor)
- Reduction of the mounting area and assembly cost by one half

■ Basic Part Number

- UNR2216 (UN2216) + UNR2116 (UN2116)

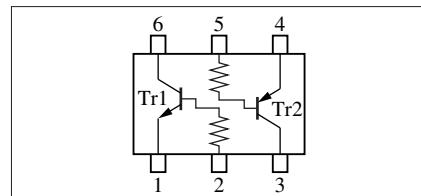
■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| | Parameter | Symbol | Rating | Unit |
|---------|--|------------------|-------------|------|
| Tr1 | Collector-base voltage (Emitter open) | V_{CBO} | 50 | V |
| | Collector-emitter voltage (Base open) | V_{CEO} | 50 | V |
| | Collector current | I_C | 100 | mA |
| Tr2 | Collector-base voltage (Emitter open) | V_{CBO} | -50 | V |
| | Collector-emitter voltage (Base open) | V_{CEO} | -50 | V |
| | Collector current | I_C | -100 | mA |
| Overall | Total power dissipation | P_T | 150 | mW |
| | Junction temperature | T_j | 150 | °C |
| | Storage temperature | T_{stg} | -55 to +150 | °C |



Marking Symbol: 7U

Internal Connection



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

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

• Tr1

| 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} | $V_{\text{CB}} = 50 \text{ V}, I_E = 0$ | | | 0.1 | μA |
| Collector-emitter cutoff current (Base open) | I_{CEO} | $V_{\text{CE}} = 50 \text{ V}, I_B = 0$ | | | 0.5 | μA |
| Emitter-base cutoff current (Collector open) | I_{EBO} | $V_{\text{EB}} = 6 \text{ V}, I_C = 0$ | | | 0.01 | mA |
| Forward current transfer ratio | h_{FE} | $V_{\text{CE}} = 10 \text{ V}, I_C = 5 \text{ mA}$ | 160 | 460 | | — |
| Collector-emitter saturation voltage | $V_{\text{CE(sat)}}$ | $I_C = 10 \text{ mA}, I_B = 0.3 \text{ mA}$ | | | 0.25 | V |
| Output voltage high-level | V_{OH} | $V_{\text{CC}} = 5 \text{ V}, V_B = 0.5 \text{ V}, R_L = 1 \text{ k}\Omega$ | 4.9 | | | V |
| Output voltage low-level | V_{OL} | $V_{\text{CC}} = 5 \text{ V}, V_B = 2.5 \text{ V}, R_L = 1 \text{ k}\Omega$ | | | 0.2 | V |
| Input resistance | R_I | | -30% | 4.7 | +30% | $\text{k}\Omega$ |
| Transition frequency | f_T | $V_{\text{CB}} = 10 \text{ V}, I_E = -2 \text{ mA}, f = 200 \text{ MHz}$ | | 150 | | MHz |

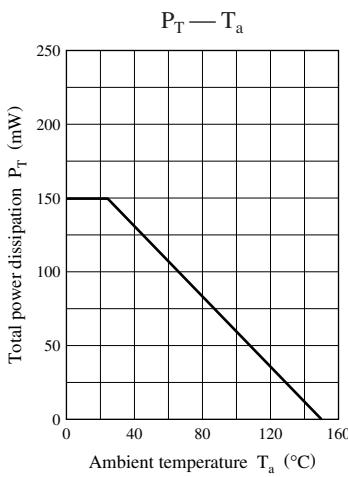
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

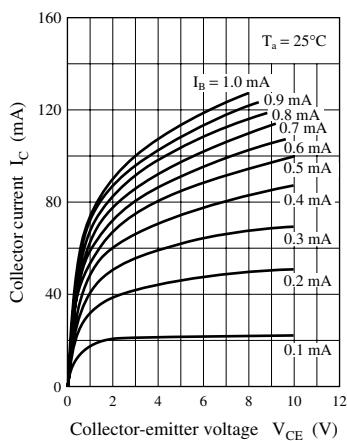
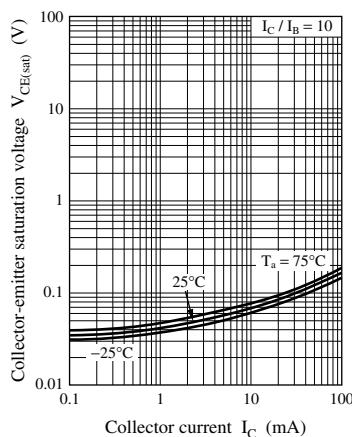
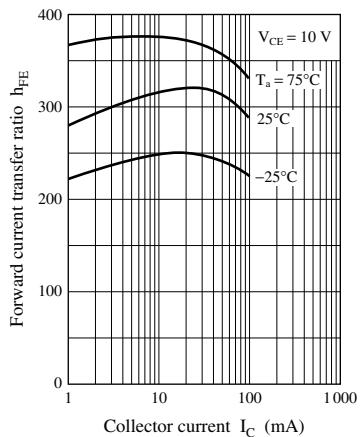
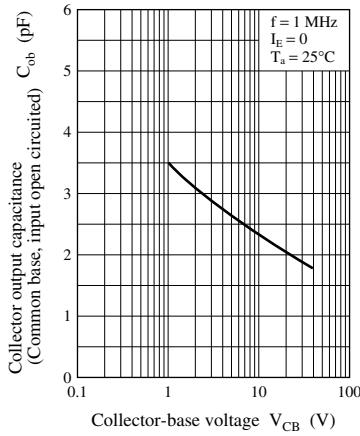
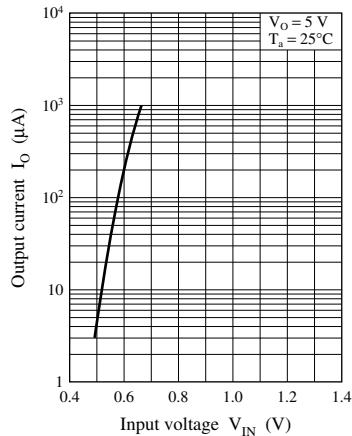
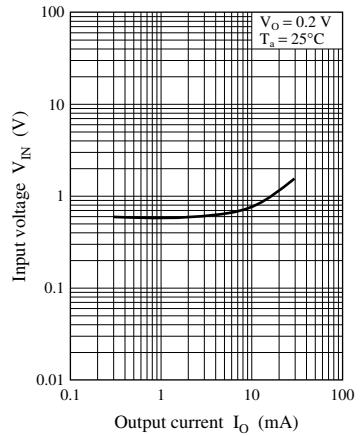
• Tr2

| 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} | $V_{\text{CB}} = -50 \text{ V}, I_E = 0$ | | | -0.1 | μA |
| Collector-emitter cutoff current (Base open) | I_{CEO} | $V_{\text{CE}} = -50 \text{ V}, I_B = 0$ | | | -0.5 | μA |
| Emitter-base cutoff current (Collector open) | I_{EBO} | $V_{\text{EB}} = -6 \text{ V}, I_C = 0$ | | | -0.01 | mA |
| Forward current transfer ratio | h_{FE} | $V_{\text{CE}} = -10 \text{ V}, I_C = -5 \text{ mA}$ | 160 | 460 | | — |
| Collector-emitter saturation voltage | $V_{\text{CE(sat)}}$ | $I_C = -10 \text{ mA}, I_B = -0.3 \text{ mA}$ | | | -0.25 | V |
| Output voltage high-level | V_{OH} | $V_{\text{CC}} = -5 \text{ V}, V_B = -0.5 \text{ V}, R_L = 1 \text{ k}\Omega$ | -4.9 | | | V |
| Output voltage low-level | V_{OL} | $V_{\text{CC}} = -5 \text{ V}, V_B = -2.5 \text{ V}, R_L = 1 \text{ k}\Omega$ | | | -0.2 | V |
| Input resistance | R_I | | -30% | 4.7 | +30% | $\text{k}\Omega$ |
| Transition frequency | f_T | $V_{\text{CB}} = -10 \text{ V}, I_E = 1 \text{ mA}, f = 200 \text{ MHz}$ | | 80 | | MHz |

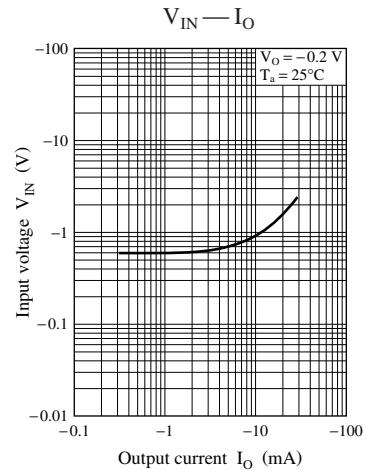
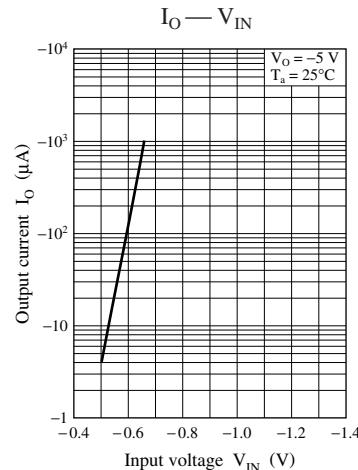
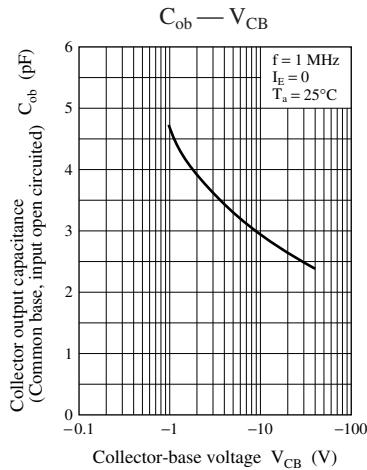
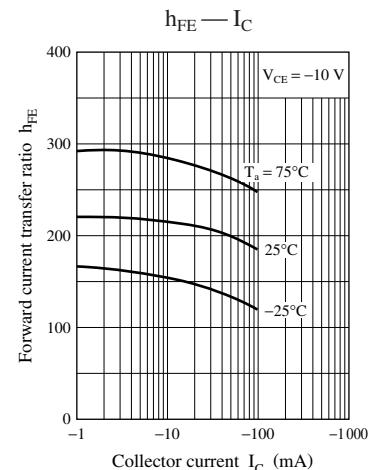
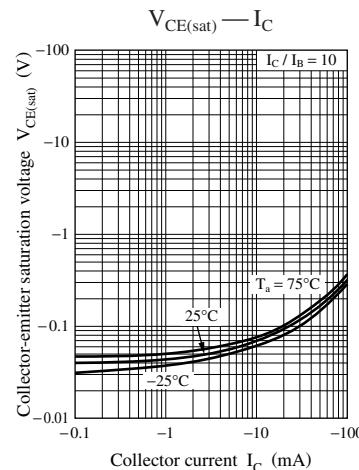
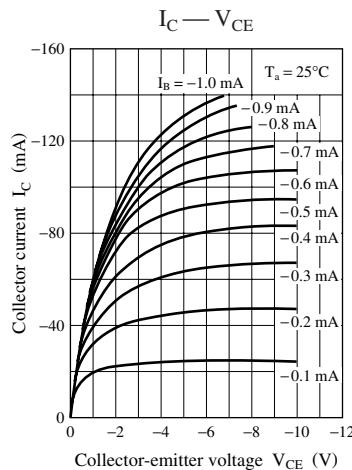
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Common characteristics chart



Characteristics charts of Tr1 I_C — V_{CE}  $V_{CE(\text{sat})}$ — I_C  h_{FE} — I_C  C_{ob} — V_{CB}  I_O — V_{IN}  V_{IN} — I_O 

Characteristics charts of Tr2



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