

# XN04315 (XN4315)

Silicon NPN epitaxial planer transistor (Tr1)

Silicon PNP epitaxial planer transistor (Tr2)

For switching/digital circuits

## Features

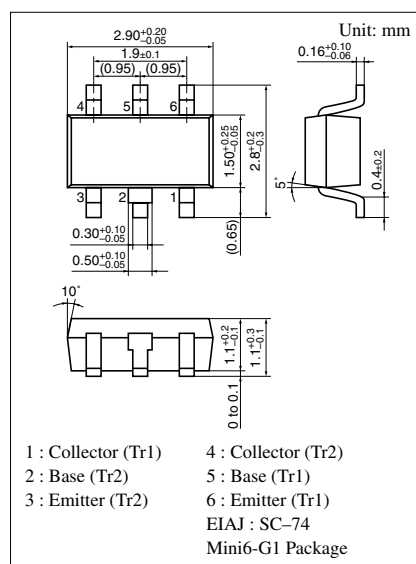
- Two elements incorporated into one package.  
(Transistors with built-in resistor)
- Reduction of the mounting area and assembly cost by one half.

## Basic Part Number of Element

- UNR1215(UN1215) + UNR1115(UN1115)

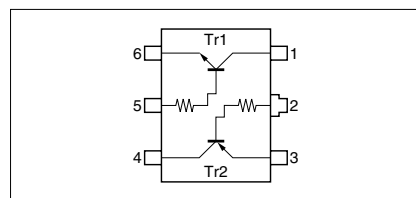
## Absolute Maximum Ratings (Ta=25°C)

|         | Parameter                    | Symbol    | Ratings     | Unit |
|---------|------------------------------|-----------|-------------|------|
| Tr1     | Collector to base voltage    | $V_{CBO}$ | 50          | V    |
|         | Collector to emitter voltage | $V_{CEO}$ | 50          | V    |
|         | Collector current            | $I_C$     | 100         | mA   |
| Tr2     | Collector to base voltage    | $V_{CBO}$ | -50         | V    |
|         | Collector to emitter voltage | $V_{CEO}$ | -50         | V    |
|         | Collector current            | $I_C$     | -100        | mA   |
| Overall | Total power dissipation      | $P_T$     | 300         | mW   |
|         | Junction temperature         | $T_j$     | 150         | °C   |
|         | Storage temperature          | $T_{stg}$ | -55 to +150 | °C   |



Marking Symbol: CB

Internal Connection



Note) The Part number in the Parenthesis shows conventional part number.

# ■ Electrical Characteristics (Ta=25°C)

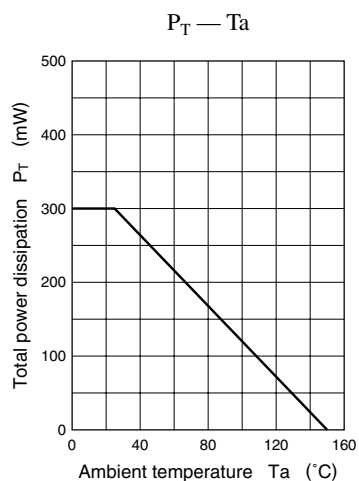
## ● Tr1

| Parameter                               | Symbol        | Conditions                                | min  | typ | max  | Unit       |
|-----------------------------------------|---------------|-------------------------------------------|------|-----|------|------------|
| Collector to base voltage               | $V_{CBO}$     | $I_C = 10\mu A, I_E = 0$                  | 50   |     |      | V          |
| Collector to emitter voltage            | $V_{CEO}$     | $I_C = 2mA, I_B = 0$                      | 50   |     |      | V          |
| Collector cutoff current                | $I_{CBO}$     | $V_{CB} = 50V, I_E = 0$                   |      |     | 0.1  | $\mu A$    |
|                                         | $I_{CEO}$     | $V_{CE} = 50V, I_B = 0$                   |      |     | 0.5  | $\mu A$    |
| Emitter cutoff current                  | $I_{EBO}$     | $V_{EB} = 6V, I_C = 0$                    |      |     | 0.01 | mA         |
| Forward current transfer ratio          | $h_{FE}$      | $V_{CE} = 10V, I_C = 5mA$                 | 160  |     | 460  |            |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 10mA, I_B = 0.3mA$                 |      |     | 0.25 | V          |
| Output voltage high level               | $V_{OH}$      | $V_{CC} = 5V, V_B = 0.5V, R_L = 1k\Omega$ | 4.9  |     |      | V          |
| Output voltage low level                | $V_{OL}$      | $V_{CC} = 5V, V_B = 2.5V, R_L = 1k\Omega$ |      |     | 0.2  | V          |
| Transition frequency                    | $f_T$         | $V_{CB} = 10V, I_E = -2mA, f = 200MHz$    |      | 150 |      | MHz        |
| Input resistance                        | $R_1$         |                                           | -30% | 10  | +30% | k $\Omega$ |

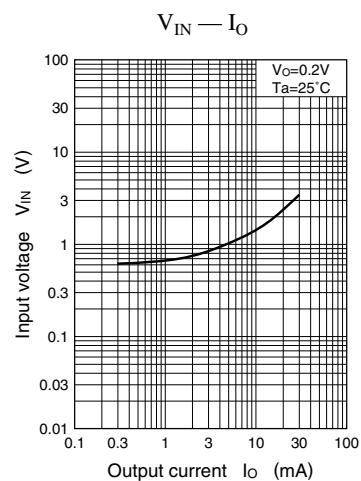
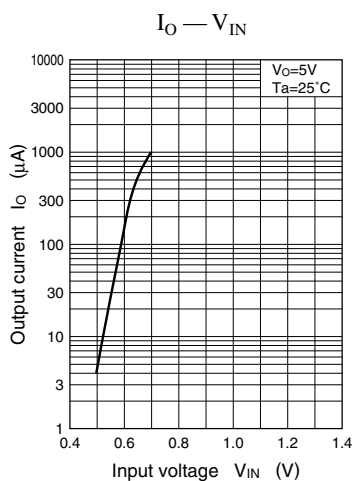
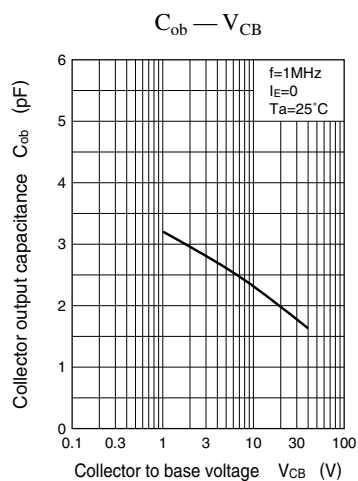
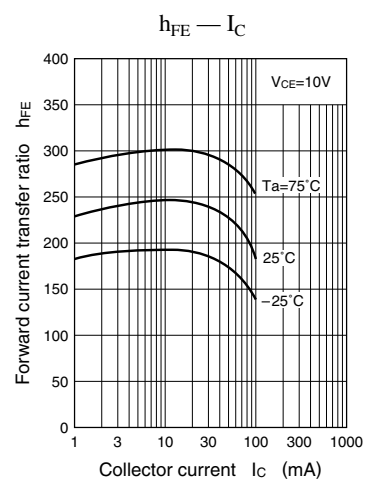
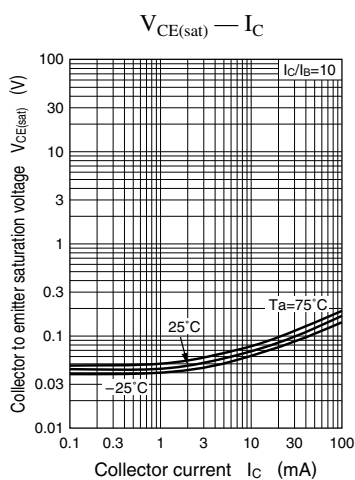
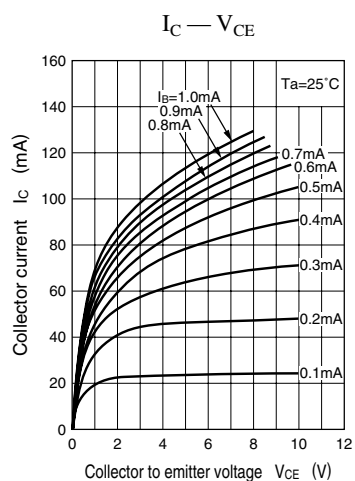
## ● Tr2

| Parameter                               | Symbol        | Conditions                                  | min  | typ | max   | Unit       |
|-----------------------------------------|---------------|---------------------------------------------|------|-----|-------|------------|
| Collector to base voltage               | $V_{CBO}$     | $I_C = -10\mu A, I_E = 0$                   | -50  |     |       | V          |
| Collector to emitter voltage            | $V_{CEO}$     | $I_C = -2mA, I_B = 0$                       | -50  |     |       | V          |
| Collector cutoff current                | $I_{CBO}$     | $V_{CB} = -50V, I_E = 0$                    |      |     | -0.1  | $\mu A$    |
|                                         | $I_{CEO}$     | $V_{CE} = -50V, I_B = 0$                    |      |     | -0.5  | $\mu A$    |
| Emitter cutoff current                  | $I_{EBO}$     | $V_{EB} = -6V, I_C = 0$                     |      |     | -0.01 | mA         |
| Forward current transfer ratio          | $h_{FE}$      | $V_{CE} = -10V, I_C = -5mA$                 | 160  |     | 460   |            |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -10mA, I_B = -0.3mA$                 |      |     | -0.25 | V          |
| Output voltage high level               | $V_{OH}$      | $V_{CC} = -5V, V_B = -0.5V, R_L = 1k\Omega$ | -4.9 |     |       | V          |
| Output voltage low level                | $V_{OL}$      | $V_{CC} = -5V, V_B = -2.5V, R_L = 1k\Omega$ |      |     | -0.2  | V          |
| Transition frequency                    | $f_T$         | $V_{CB} = -10V, I_E = 1mA, f = 200MHz$      |      | 80  |       | MHz        |
| Input resistance                        | $R_1$         |                                             | -30% | 10  | +30%  | k $\Omega$ |

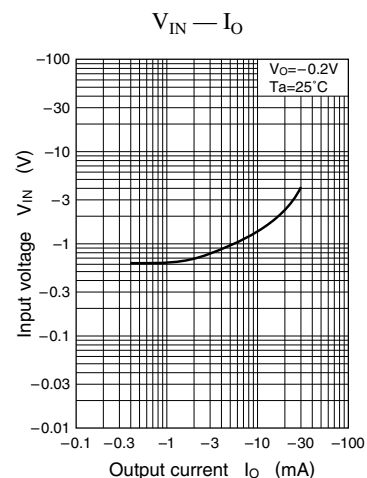
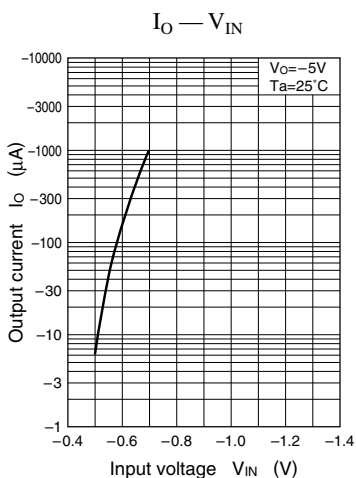
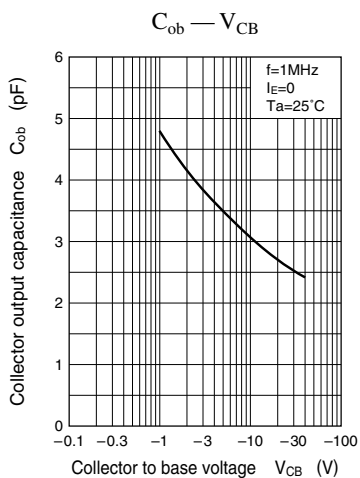
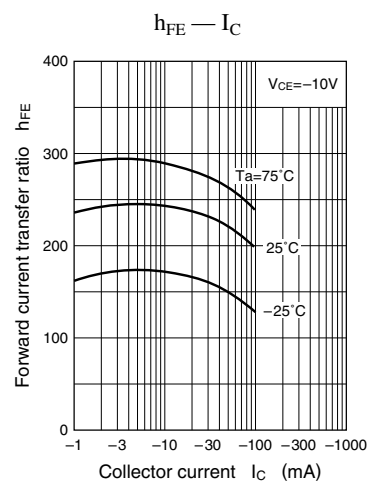
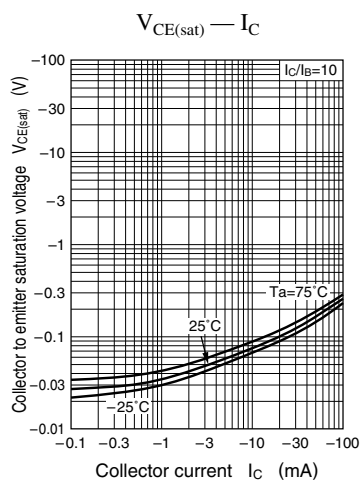
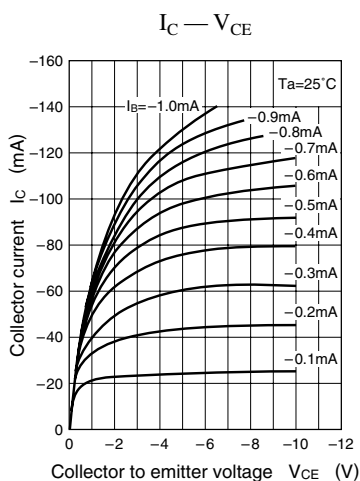
Common characteristics chart



Characteristics charts of Tr1



## Characteristics charts of Tr2



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