

# XN4601

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

For general amplification

**Features**

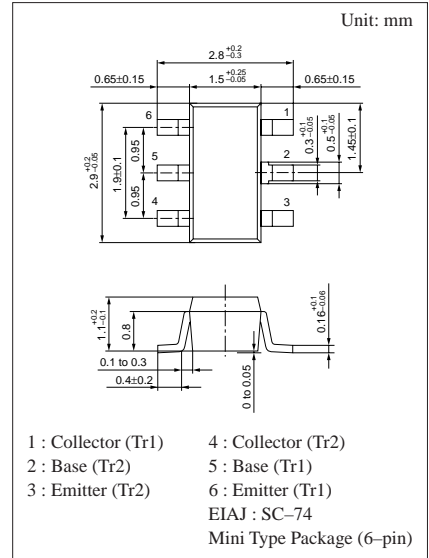
- Two elements incorporated into one package.
- Reduction of the mounting area and assembly cost by one half.

**Basic Part Number of Element**

- 2SD601A+2SB709A

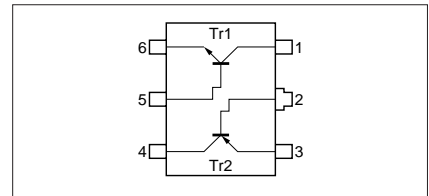
**Absolute Maximum Ratings (Ta=25°C)**

|         | Parameter                    | Symbol    | Ratings     | Unit |
|---------|------------------------------|-----------|-------------|------|
| Tr1     | Collector to base voltage    | $V_{CBO}$ | 60          | V    |
|         | Collector to emitter voltage | $V_{CEO}$ | 50          | V    |
|         | Emitter to base voltage      | $V_{EBO}$ | 7           | V    |
|         | Collector current            | $I_C$     | 100         | mA   |
|         | Peak collector current       | $I_{CP}$  | 200         | mA   |
| Tr2     | Collector to base voltage    | $V_{CBO}$ | -60         | V    |
|         | Collector to emitter voltage | $V_{CEO}$ | -50         | V    |
|         | Emitter to base voltage      | $V_{EBO}$ | -7          | V    |
|         | Collector current            | $I_C$     | -100        | mA   |
|         | Peak collector current       | $I_{CP}$  | -200        | 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: 5C

Internal Connection



### ■ Electrical Characteristics (T<sub>a</sub>=25°C)

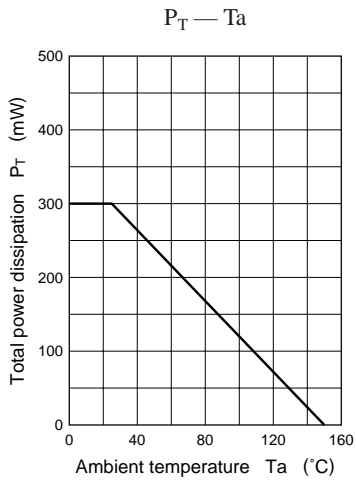
#### ● Tr1

| Parameter                               | Symbol               | Conditions   | min | typ | max | Unit |
|---|----------------------|--|-----|-----|-----|------|
| Collector to base voltage               | V <sub>CBO</sub>     | I <sub>C</sub> = 10μA, I <sub>E</sub> = 0                | 60  |     |     | V    |
| Collector to emitter voltage            | V <sub>CEO</sub>     | I <sub>C</sub> = 2mA, I <sub>B</sub> = 0                 | 50  |     |     | V    |
| Emitter to base voltage                 | V <sub>EBO</sub>     | I <sub>E</sub> = 10μA, I <sub>C</sub> = 0                | 7   |     |     | V    |
| Collector cutoff current                | I <sub>CBO</sub>     | V <sub>CB</sub> = 20V, I <sub>E</sub> = 0                |     |     | 0.1 | μA   |
|   | I <sub>CEO</sub>     | V <sub>CE</sub> = 10V, I <sub>B</sub> = 0                |     |     | 100 | μA   |
| Forward current transfer ratio          | h <sub>FE</sub>      | V <sub>CE</sub> = 10V, I <sub>C</sub> = 2mA              | 160 |     | 460 |      |
| Collector to emitter saturation voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> = 100mA, I <sub>B</sub> = 10mA            |     | 0.1 | 0.3 | V    |
| Transition frequency                    | f <sub>T</sub>       | V <sub>CB</sub> = 10V, I <sub>E</sub> = -2mA, f = 200MHz |     | 150 |     | MHz  |
| Collector output capacitance            | C <sub>ob</sub>      | V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz      |     | 3.5 |     | pF   |

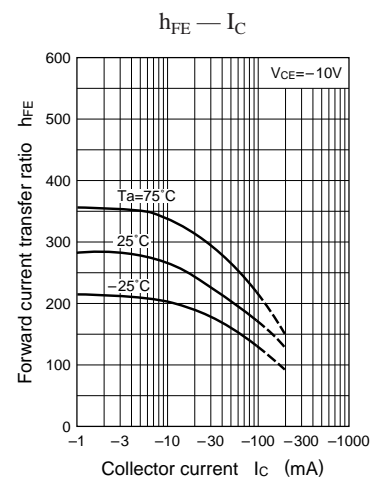
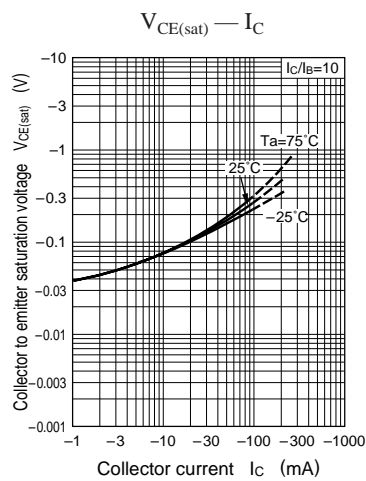
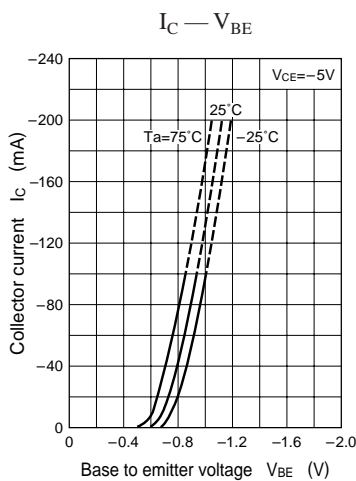
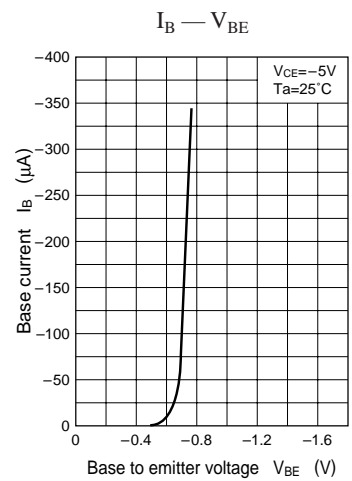
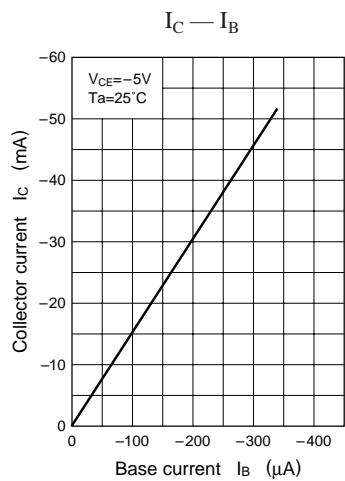
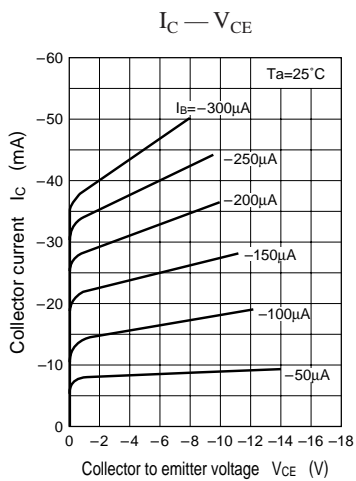
#### ● Tr2

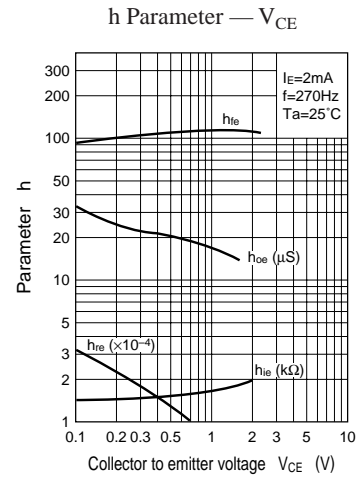
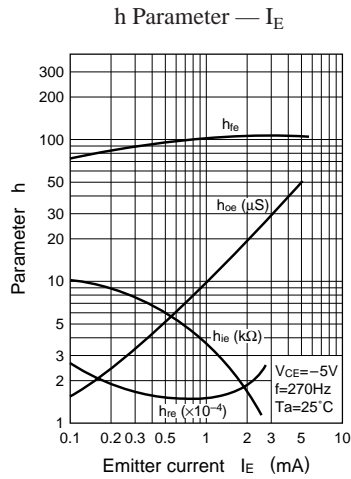
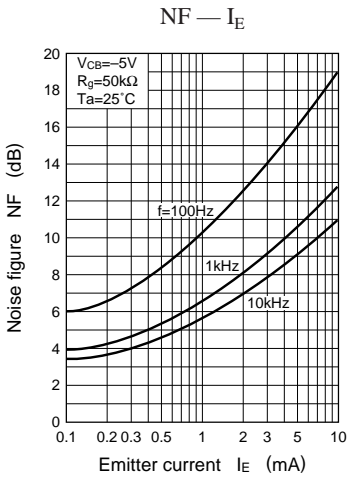
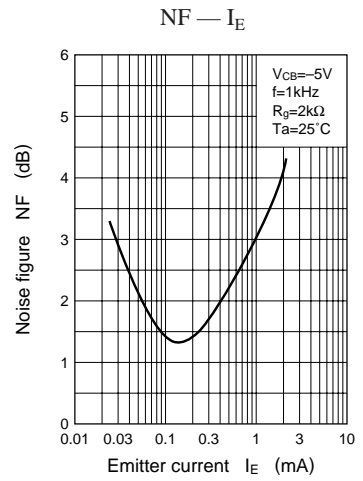
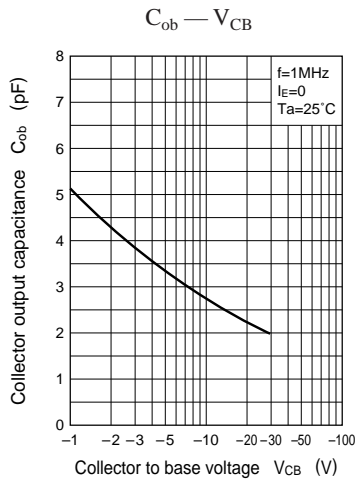
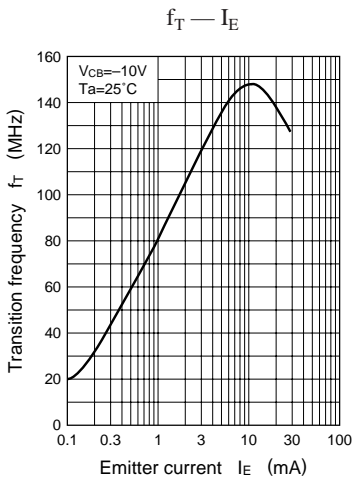
| Parameter                               | Symbol               | Conditions   | min | typ  | max  | Unit |
|---|----------------------|--|-----|------|------|------|
| Collector to base voltage               | V <sub>CBO</sub>     | I <sub>C</sub> = -10μA, I <sub>E</sub> = 0               | -60 |      |      | V    |
| Collector to emitter voltage            | V <sub>CEO</sub>     | I <sub>C</sub> = -2mA, I <sub>B</sub> = 0                | -50 |      |      | V    |
| Emitter to base voltage                 | V <sub>EBO</sub>     | I <sub>E</sub> = -10μA, I <sub>C</sub> = 0               | -7  |      |      | V    |
| Collector cutoff current                | I <sub>CBO</sub>     | V <sub>CB</sub> = -20V, I <sub>E</sub> = 0               |     |      | -0.1 | μA   |
|   | I <sub>CEO</sub>     | V <sub>CE</sub> = -10V, I <sub>B</sub> = 0               |     |      | -100 | μA   |
| Forward current transfer ratio          | h <sub>FE</sub>      | V <sub>CE</sub> = -10V, I <sub>C</sub> = -2mA            | 160 |      | 460  |      |
| Collector to emitter saturation voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> = -100mA, I <sub>B</sub> = -10mA          |     | -0.3 | -0.5 | V    |
| Transition frequency                    | f <sub>T</sub>       | V <sub>CB</sub> = -10V, I <sub>E</sub> = 1mA, f = 200MHz |     | 80   |      | MHz  |
| Collector output capacitance            | C <sub>ob</sub>      | V <sub>CB</sub> = -10V, I <sub>E</sub> = 0, f = 1MHz     |     | 2.7  |      | pF   |

Common characteristics chart

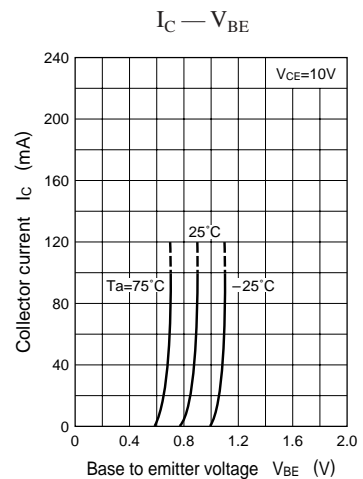
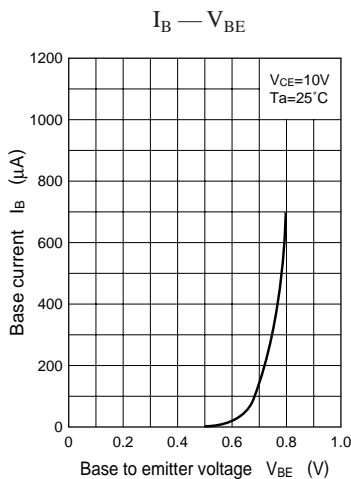
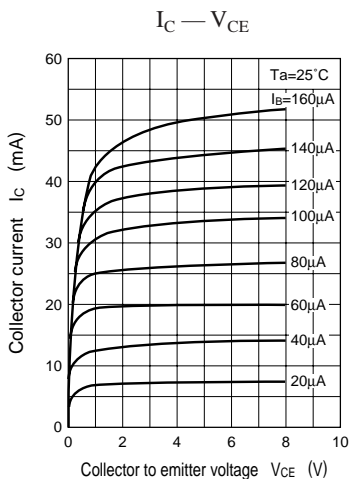


Characteristics charts of Tr1

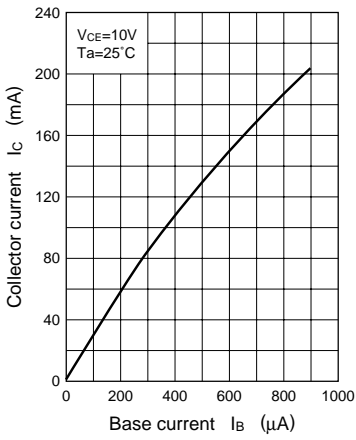




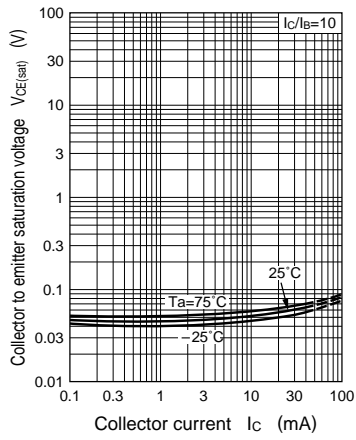
Characteristics charts of Tr2



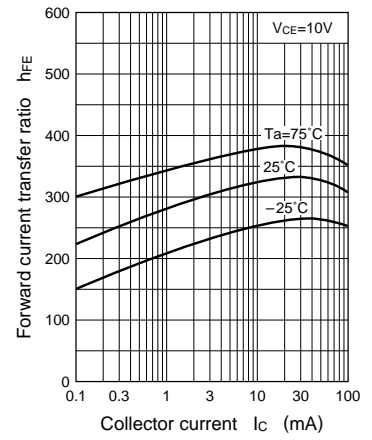
$I_C - I_B$



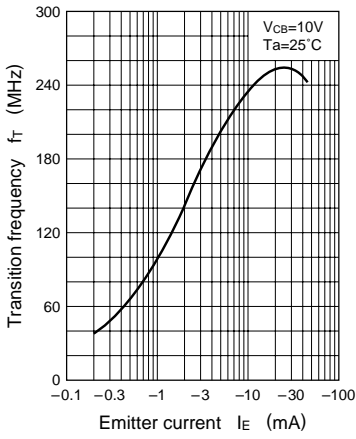
$V_{CE(sat)} - I_C$



$h_{FE} - I_C$



$f_T - I_E$



$NV - I_C$

