

# UN9111/9112/9113/9114/9115/9116/9117/9118/9119/9110/ 911D/911E/911F/911H/911L/UNR911AJ/911BJ/911CJ

## Silicon PNP epitaxial planer transistor

For digital circuits

### Features

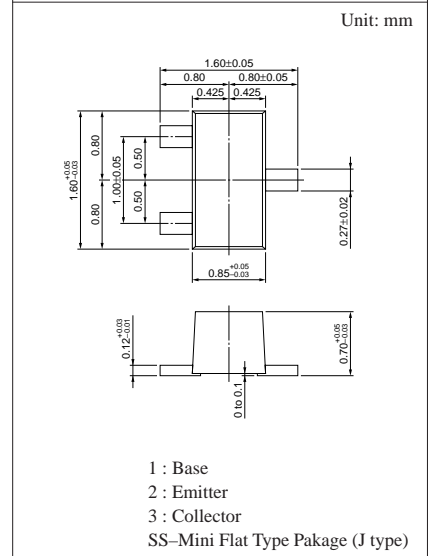
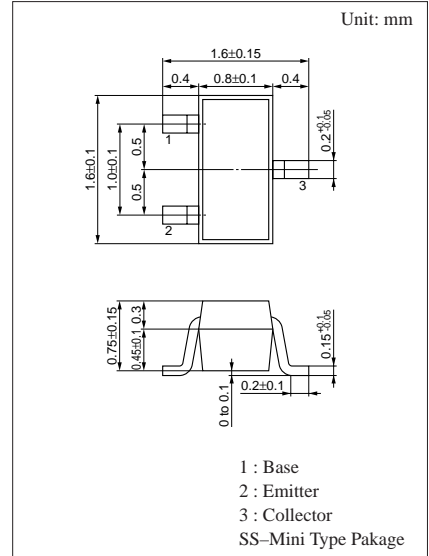
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- SS-Mini type package, allowing automatic insertion through tape packing and magazine packing.

### Resistance by Part Number

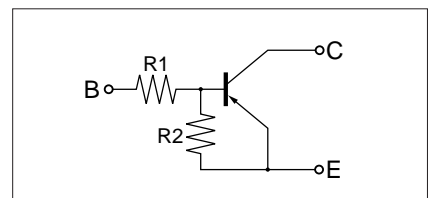
|            | Marking Symbol | (R <sub>1</sub> ) | (R <sub>2</sub> ) |
|------------|----------------|-------------------|-------------------|
| • UN9111   | 6A             | 10kΩ              | 10kΩ              |
| • UN9112   | 6B             | 22kΩ              | 22kΩ              |
| • UN9113   | 6C             | 47kΩ              | 47kΩ              |
| • UN9114   | 6D             | 10kΩ              | 47kΩ              |
| • UN9115   | 6E             | 10kΩ              | —                 |
| • UN9116   | 6F             | 4.7kΩ             | —                 |
| • UN9117   | 6H             | 22kΩ              | —                 |
| • UN9118   | 6I             | 0.51kΩ            | 5.1kΩ             |
| • UN9119   | 6K             | 1kΩ               | 10kΩ              |
| • UN9110   | 6L             | 47kΩ              | —                 |
| • UN911D   | 6M             | 47kΩ              | 10kΩ              |
| • UN911E   | 6N             | 47kΩ              | 22kΩ              |
| • UN911F   | 6O             | 4.7kΩ             | 10kΩ              |
| • UN911H   | 6P             | 2.2kΩ             | 10kΩ              |
| • UN911L   | 6Q             | 4.7kΩ             | 4.7kΩ             |
| • UNR911AJ | 6X             | 100kΩ             | 100kΩ             |
| • UNR911BJ | 6Y             | 100kΩ             | —                 |
| • UNR911CJ | 6Z             | —                 | 47kΩ              |

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

| Parameter                    | Symbol           | Ratings     | Unit |
|------------------------------|------------------|-------------|------|
| Collector to base voltage    | V <sub>CBO</sub> | -50         | V    |
| Collector to emitter voltage | V <sub>CEO</sub> | -50         | V    |
| Collector current            | I <sub>C</sub>   | -100        | mA   |
| Total power dissipation      | P <sub>T</sub>   | 125         | mW   |
| Junction temperature         | T <sub>j</sub>   | 125         | °C   |
| Storage temperature          | T <sub>stg</sub> | -55 to +125 | °C   |



### Internal Connection



UN9111/9112/9113/9114/9115/9116/9117/9118/9119/9110/  
 Transistors with built-in Resistor 911D/911E/911F/911H/911L/UNR911AJ/911BJ/911CJ

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

| Parameter                               |                                  | Symbol               | Conditions  | min             | typ | max    | Unit |      |
|---|----------------------------------|----------------------|---|-----------------|-----|--------|------|------|
| Collector cutoff current                |                                  | I <sub>CBO</sub>     | V <sub>CB</sub> = -50V, I <sub>E</sub> = 0                          |                 |     | -0.1   | μA   |      |
|   |                                  | I <sub>CEO</sub>     | V <sub>CE</sub> = -50V, I <sub>B</sub> = 0                          |                 |     | -0.5   | μA   |      |
| Emitter cutoff current                  | UN9111                           | I <sub>EBO</sub>     | V <sub>EB</sub> = -6V, I <sub>C</sub> = 0                           |                 |     | -0.5   | mA   |      |
|   | UN9112/9114/911E/911D            |                      |   |                 |     | -0.2   |      |      |
|   | UN9113/UNR911AJ                  |                      |   |                 |     | -0.1   |      |      |
|   | UN9115/9116/9117/9110/UNR911BJ   |                      |   |                 |     | -0.01  |      |      |
|   | UN911F/911H                      |                      |   |                 |     | -1.0   |      |      |
|   | UN9119                           |                      |   |                 |     | -1.5   |      |      |
|   | UN9118/911L/911CJ                |                      |   |                 |     | -2.0   |      |      |
| Collector to base voltage               |                                  | V <sub>CBO</sub>     | I <sub>C</sub> = -10μA, I <sub>E</sub> = 0                          | -50             |     |        | V    |      |
| Collector to emitter voltage            |                                  | V <sub>CEO</sub>     | I <sub>C</sub> = -2mA, I <sub>B</sub> = 0                           | -50             |     |        | V    |      |
| Forward current transfer ratio          | UN9111                           | h <sub>FE</sub>      | V <sub>CE</sub> = -10V, I <sub>C</sub> = -5mA                       | 35              |     |        |      |      |
|   | UN9112/911E                      |                      |   | 60              |     |        |      |      |
|   | UN9113/9114/UNR911AJ/911CJ       |                      |   | 80              |     |        |      |      |
|   | UN9115*9116*/9117*/9110*UNR911BJ |                      |   | 160             |     | 460    |      |      |
|   | UN911F/911D/9119/911H            |                      |   | 30              |     |        |      |      |
|   | UN9118/911L                      |                      |   | 20              |     |        |      |      |
| Collector to emitter saturation voltage |                                  | V <sub>CE(sat)</sub> | I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.3mA                     |                 |     | -0.25  | V    |      |
| Output voltage high level               |                                  | V <sub>OH</sub>      | V <sub>CC</sub> = -5V, V <sub>B</sub> = -0.5V, R <sub>L</sub> = 1kΩ | -4.9            |     |        | V    |      |
| Output voltage low level                |                                  | V <sub>OL</sub>      | V <sub>CC</sub> = -5V, V <sub>B</sub> = -10V, R <sub>L</sub> = 1kΩ  |                 |     | -0.2   | V    |      |
|   |                                  |                      |   | UN9113/UNR911BJ |     |        |      | -0.2 |
|   |                                  |                      |   | UN911D          |     |        |      | -0.2 |
|   |                                  |                      |   | UN911E          |     |        |      | -0.2 |
|   |                                  |                      |   | UNR911AJ        |     |        |      | -0.2 |
|   |                                  |                      |   |                 |     |        |      | -0.2 |
| Transition frequency                    |                                  | f <sub>T</sub>       | V <sub>CB</sub> = -10V, I <sub>E</sub> = 2mA, f = 200MHz            |                 | 150 |        | MHz  |      |
|   |                                  |                      |   | UNR911AJ        |     | 80     |      |      |
| Input resistance                        | UN9111/9114/9115                 | R <sub>i</sub>       |   | (-30%)          |     | (+30%) | 10   |      |
|   | UN9112/9117                      |                      |   |                 |     |        | 22   |      |
|   | UN9113/9110/911D/911E            |                      |   |                 |     |        | 47   |      |
|   | UN9116/911F/911L                 |                      |   |                 |     |        | 4.7  |      |
|   | UN9118                           |                      |   |                 |     |        | 0.51 |      |
|   | UN9119                           |                      |   |                 |     |        | 1    |      |
|   | UN911H                           |                      |   |                 |     |        | 2.2  |      |
|   | UNR911AJ/911BJ                   |                      |   |                 |     |        | 100  |      |

\* h<sub>FE</sub> rank classification (UN9115/9116/9117/9110)

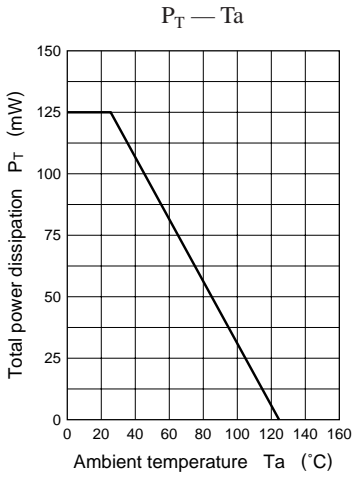
| Rank            | Q          | R          | S          |
|-----------------|------------|------------|------------|
| h <sub>FE</sub> | 160 to 260 | 210 to 340 | 290 to 460 |

UN9111/9112/9113/9114/9115/9116/9117/9118/9119/9110/  
 Transistors with built-in Resistor 911D/911E/911F/911H/911L/UNR911AJ/911BJ/911CJ

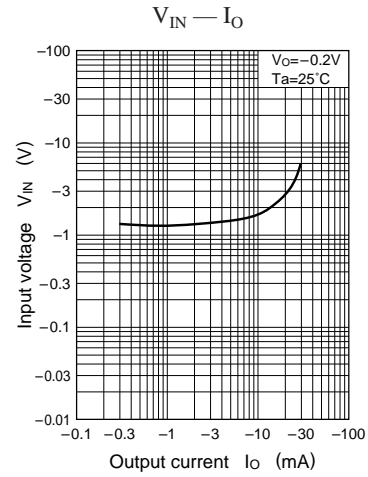
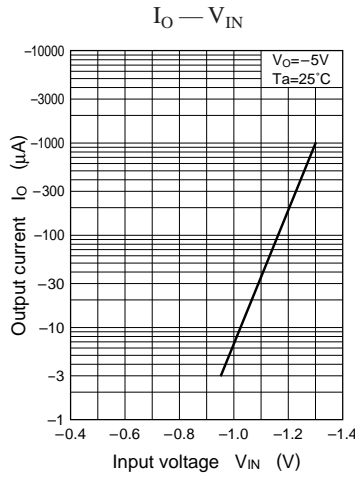
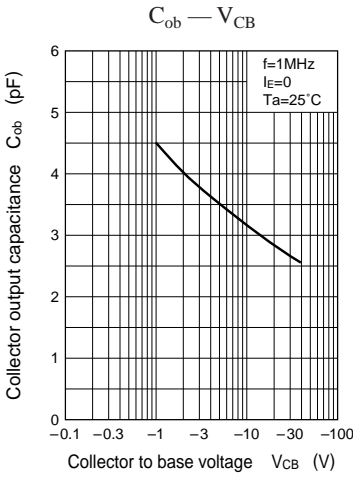
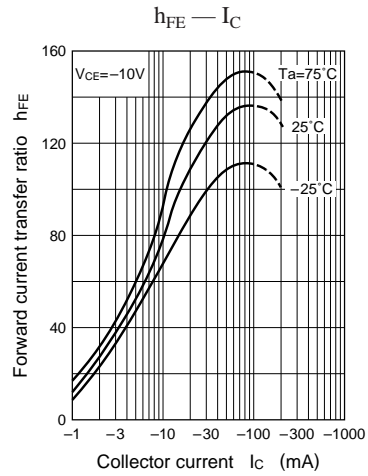
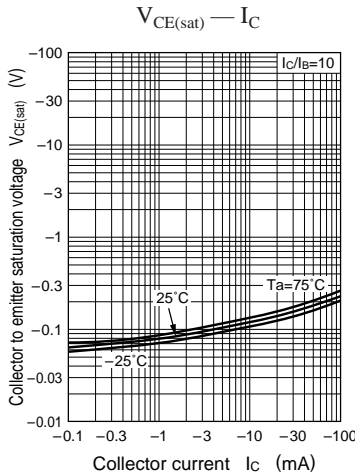
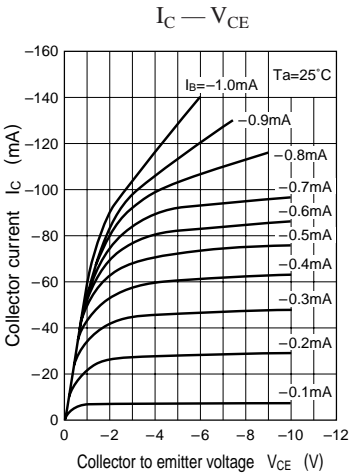
■ Electrical Characteristics (continued) (Ta=25°C)

| Parameter                          |                       | Symbol    | Conditions | min  | typ  | max  | Unit |
|------------------------------------|-----------------------|-----------|------------|------|------|------|------|
| Resis-<br>tance<br>ratio           | UN9111/9112/9113/911L | $R_1/R_2$ |            | 0.8  | 1.0  | 1.2  |      |
|                                    | UN9114                |           |            | 0.17 | 0.21 | 0.25 |      |
|                                    | UN9118/9119           |           |            | 0.08 | 0.1  | 0.12 |      |
|                                    | UN911D                |           |            |      | 4.7  |      |      |
|                                    | UN911E                |           |            |      | 2.14 |      |      |
|                                    | UN911F                |           |            |      | 0.47 |      |      |
|                                    | UN911H                |           |            | 0.17 | 0.22 | 0.27 |      |
|                                    | UNR911AJ              |           |            |      | 1.0  |      |      |
| Resistance between Emitter to Base | UNR911CJ              | $R_2$     |            | -30% | 47   | 30%  |      |

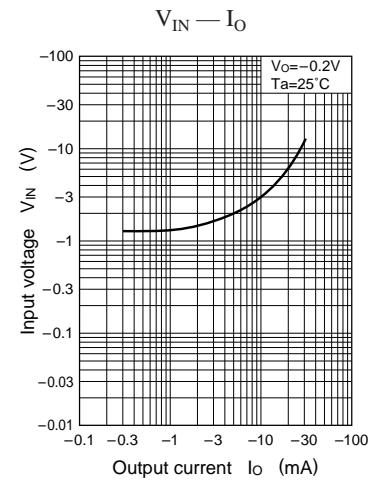
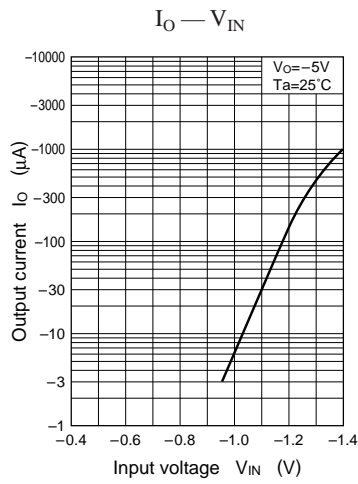
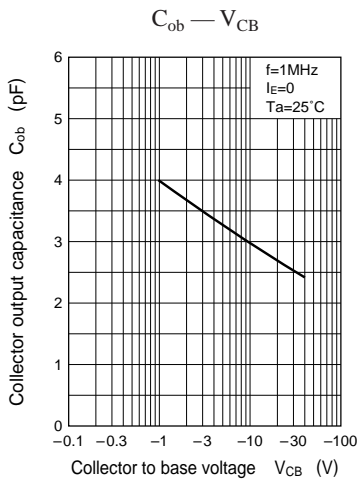
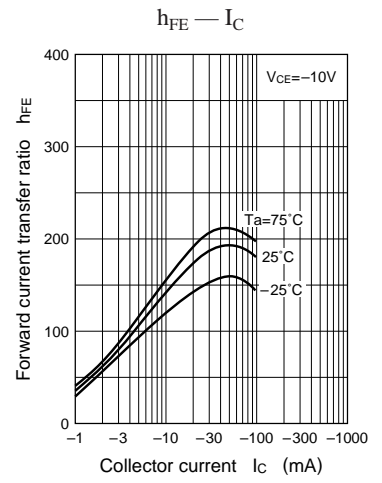
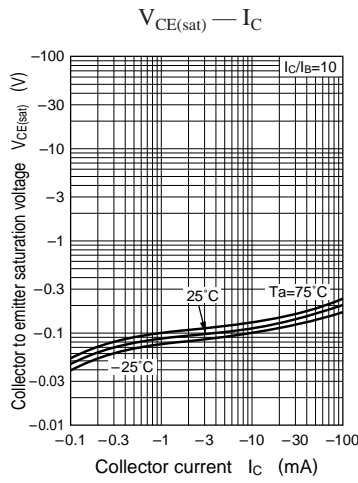
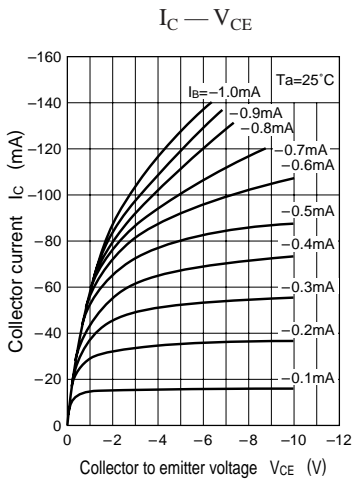
Common characteristics chart



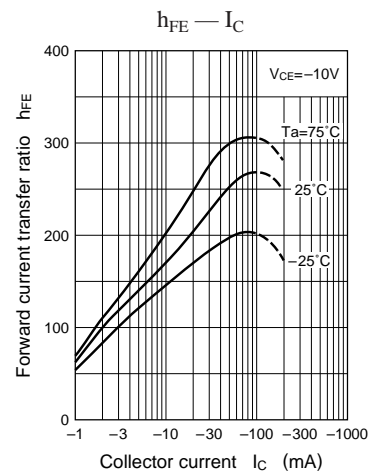
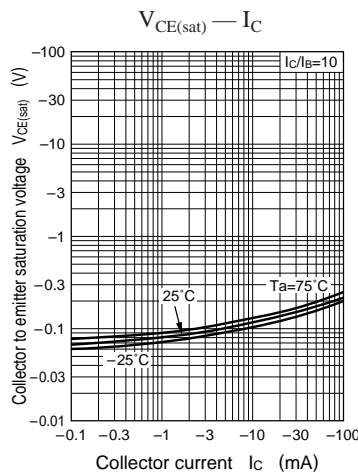
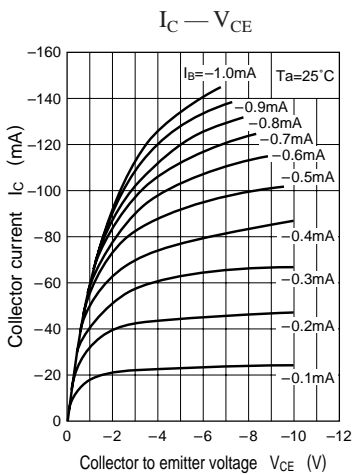
Characteristics charts of UN9111

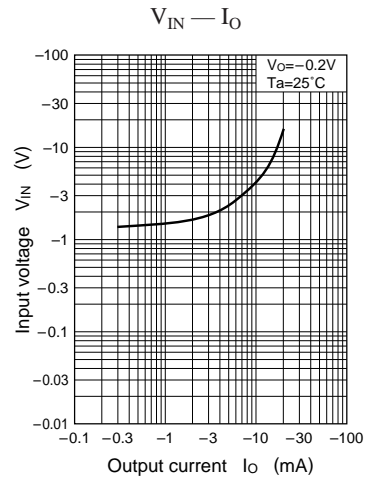
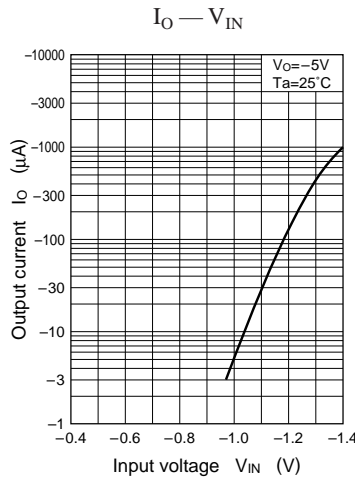
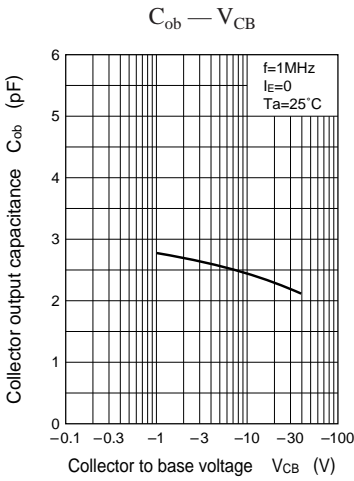


Characteristics charts of UN9112

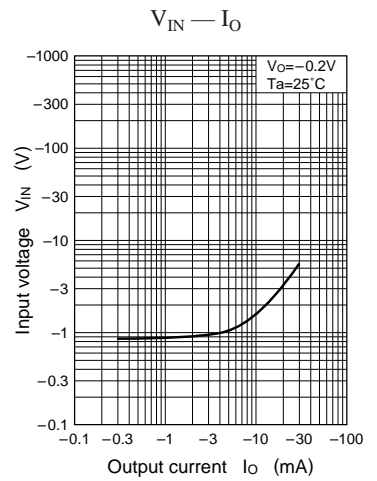
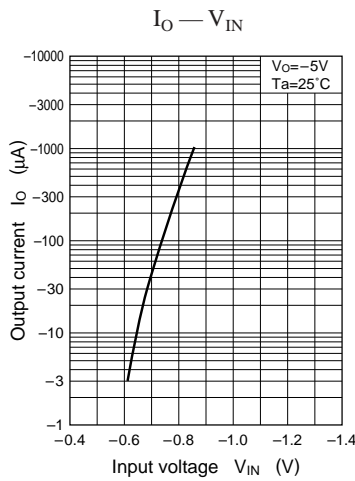
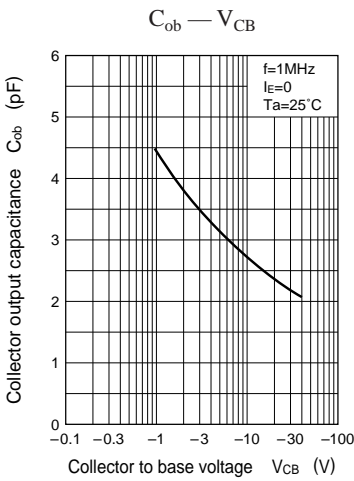
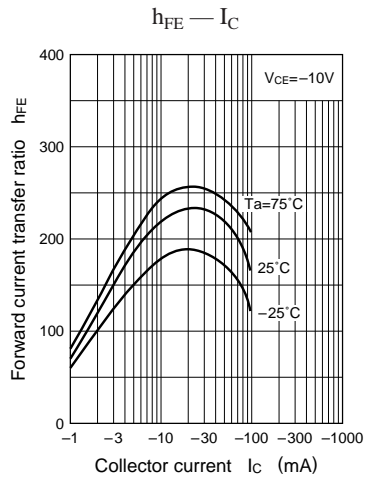
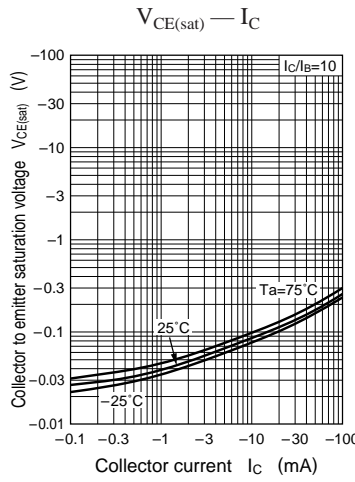
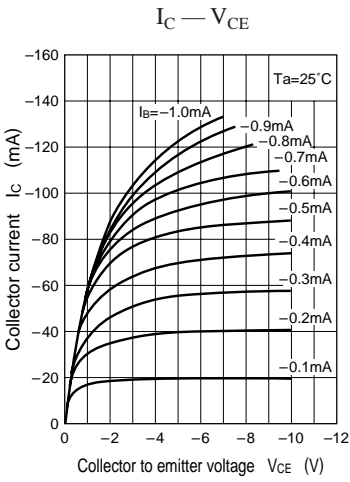


Characteristics charts of UN9113

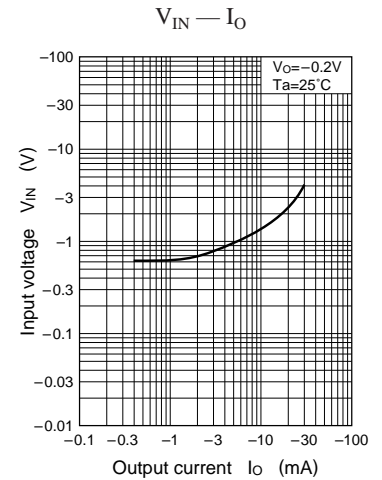
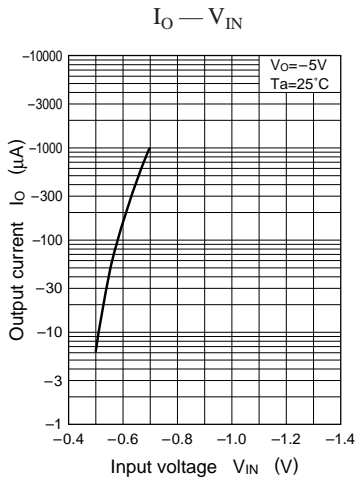
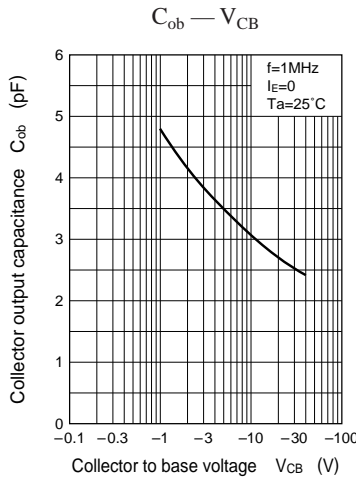
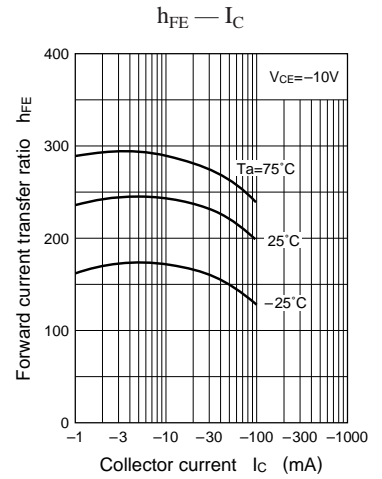
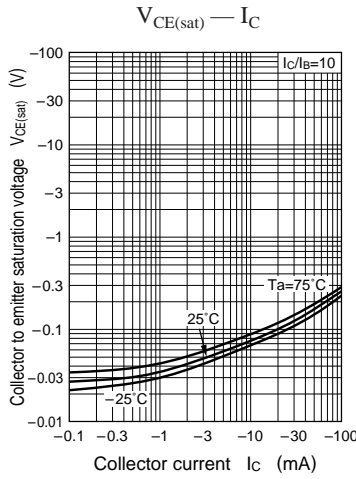
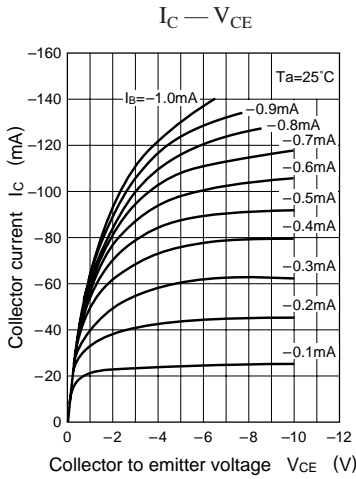




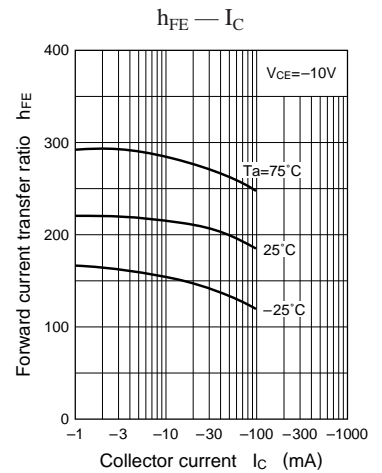
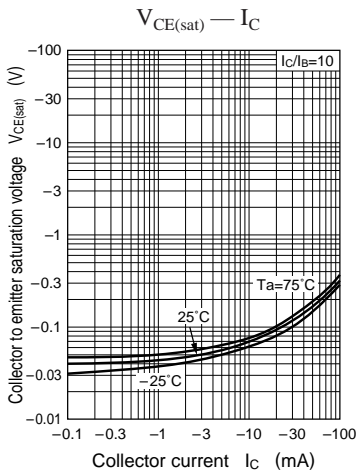
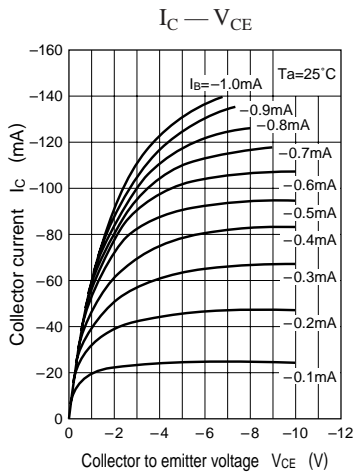
Characteristics charts of UN9114

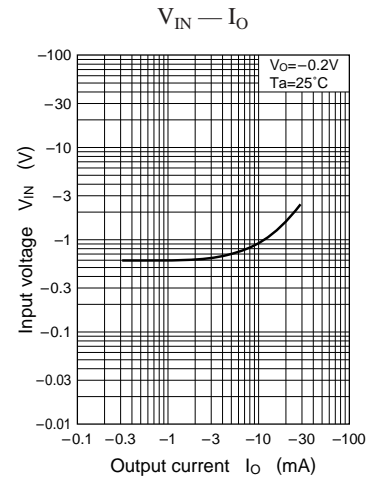
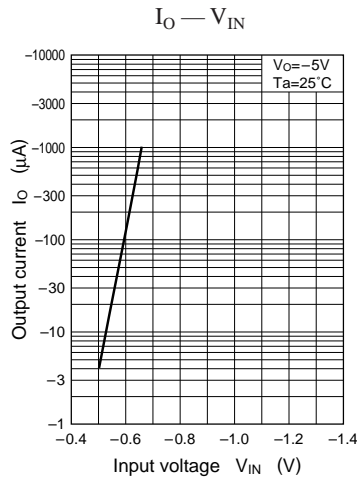
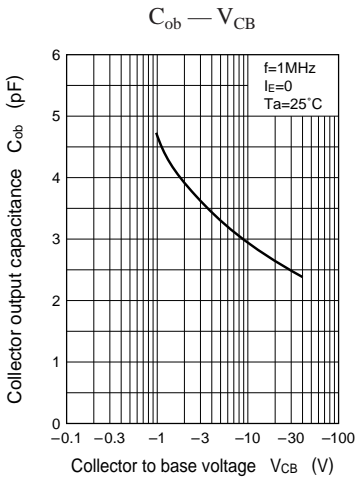


Characteristics charts of UN9115

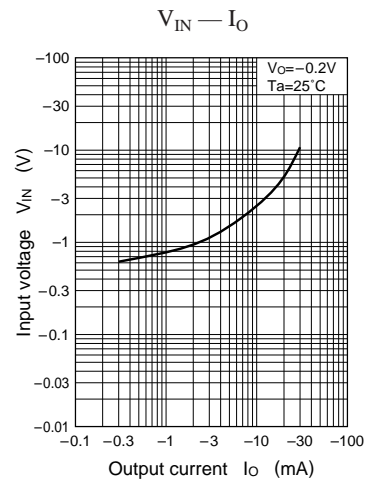
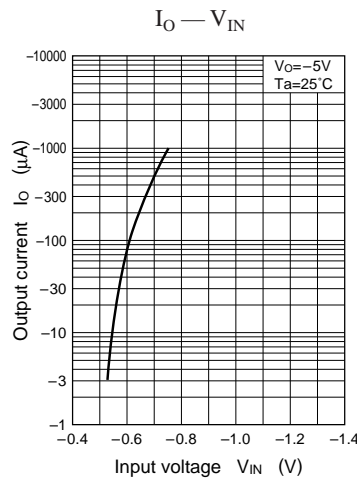
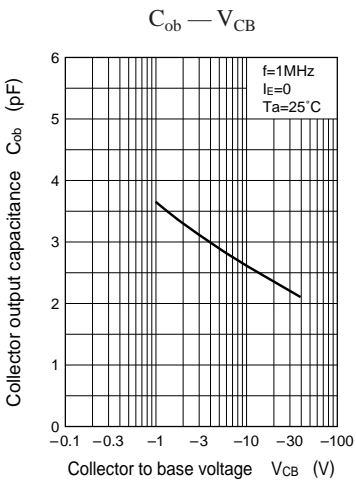
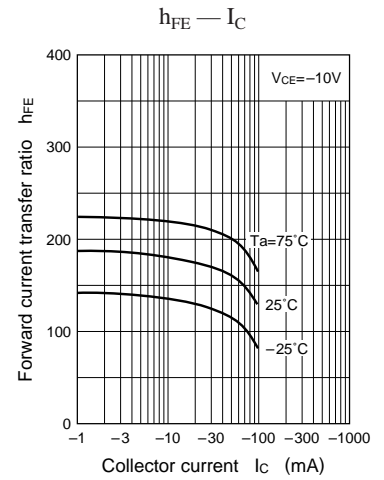
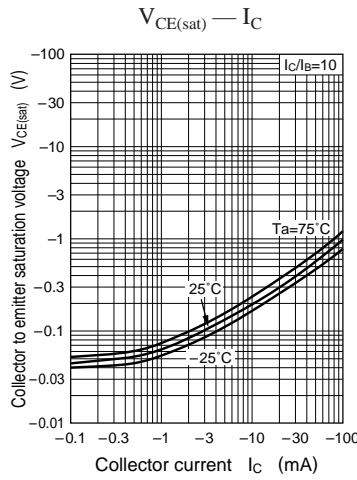
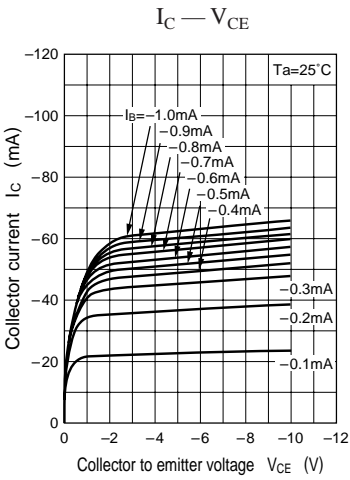


Characteristics charts of UN9116



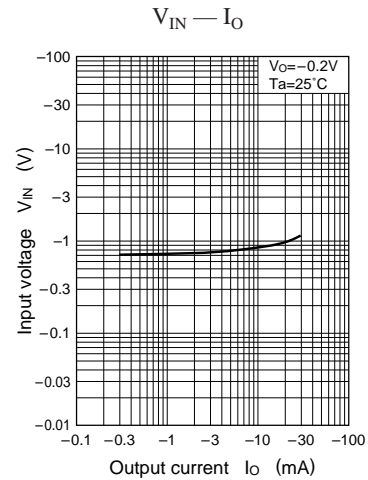
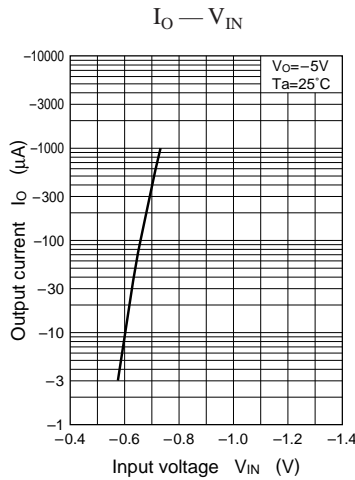
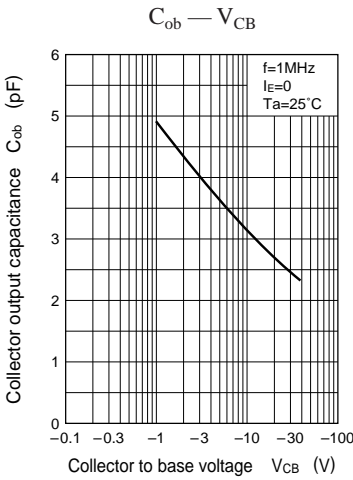
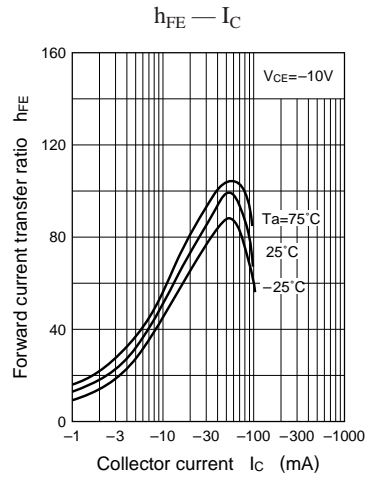
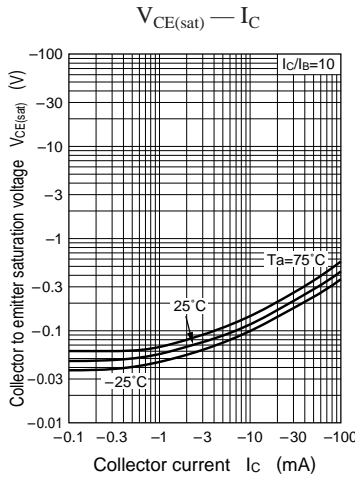
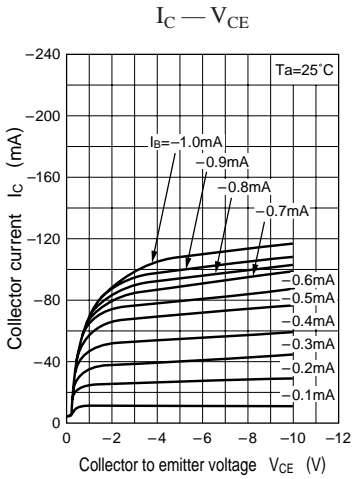


Characteristics charts of UN9117

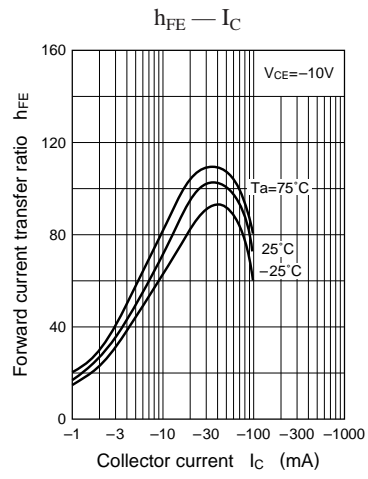
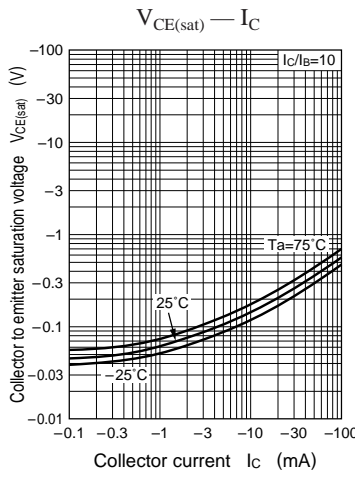
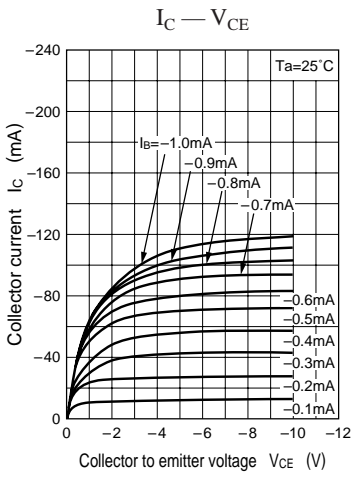


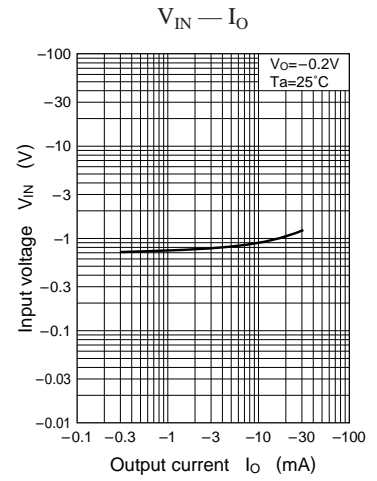
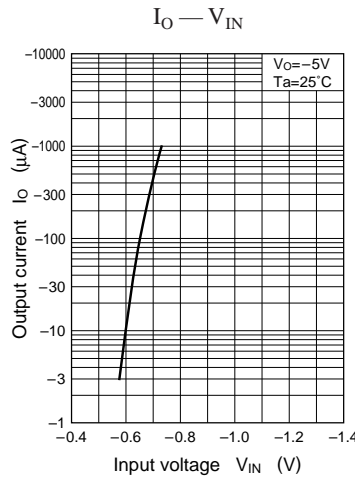
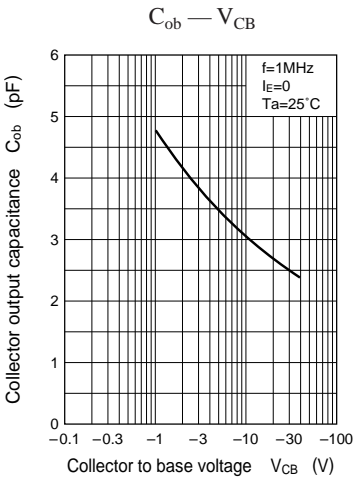


Characteristics charts of UN9118

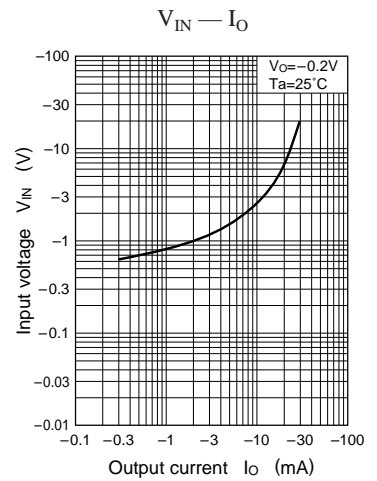
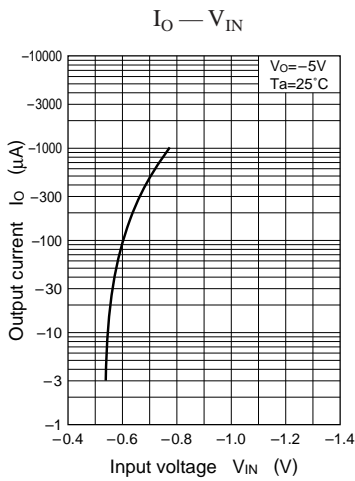
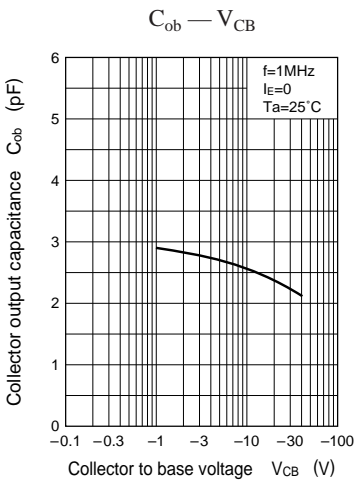
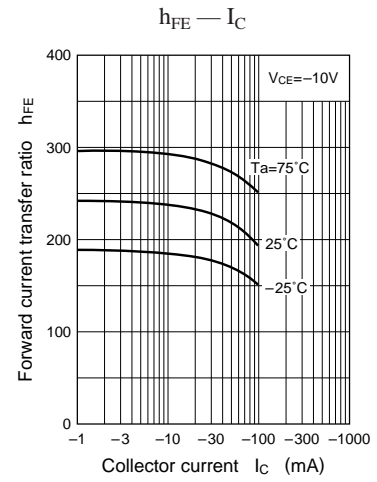
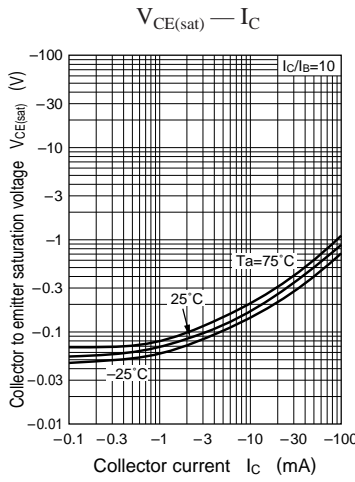
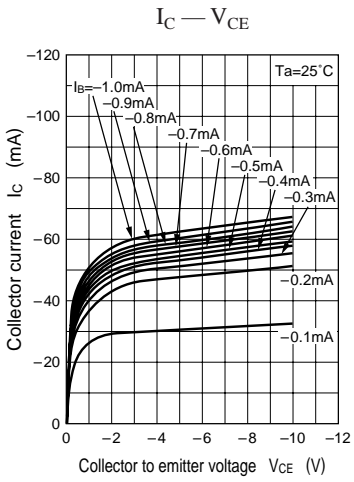


Characteristics charts of UN9119

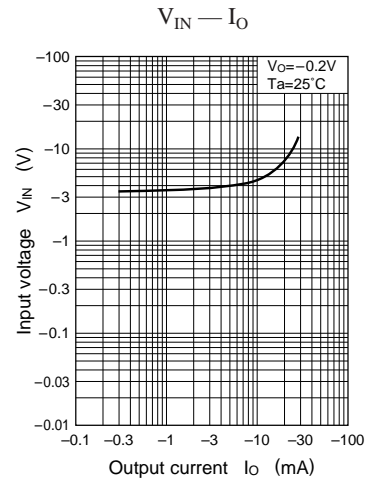
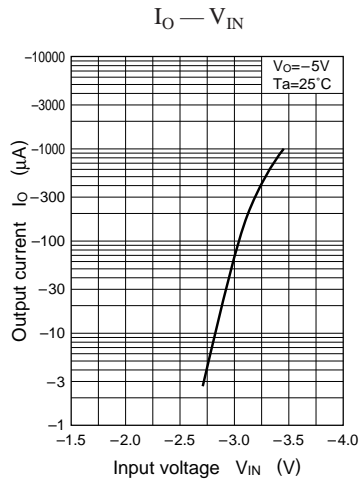
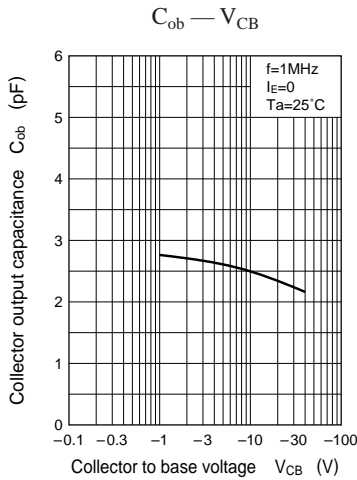
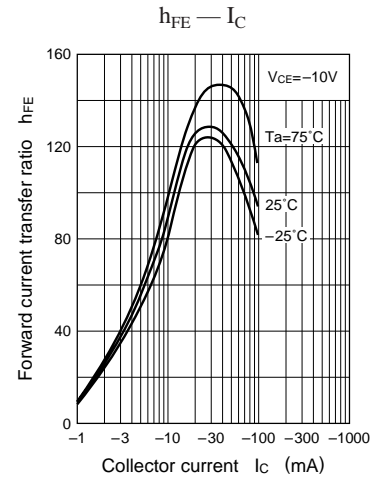
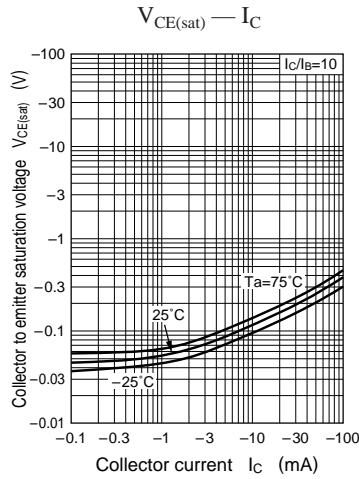
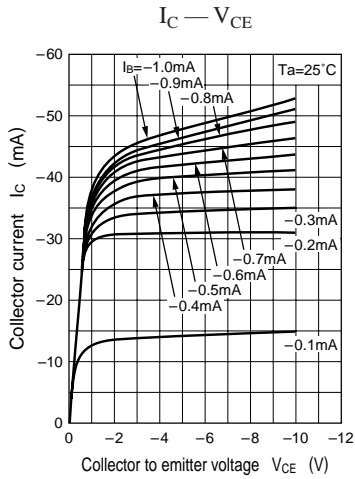




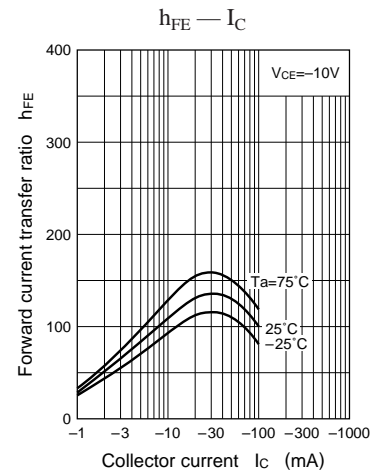
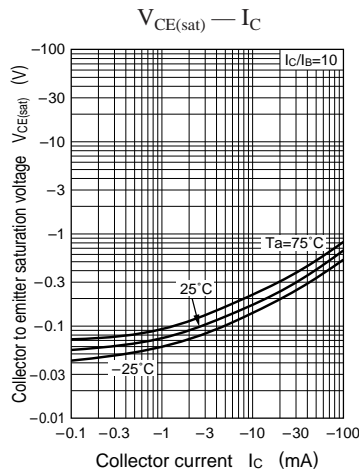
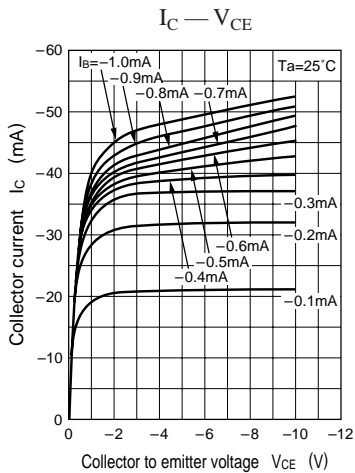
Characteristics charts of UN9110

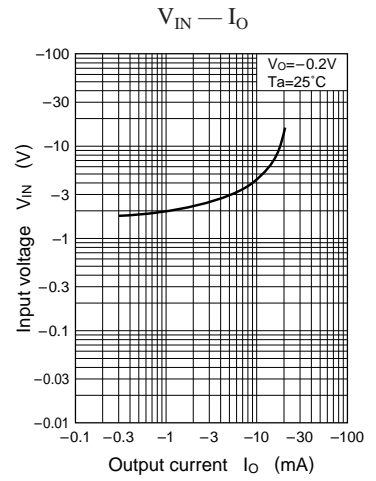
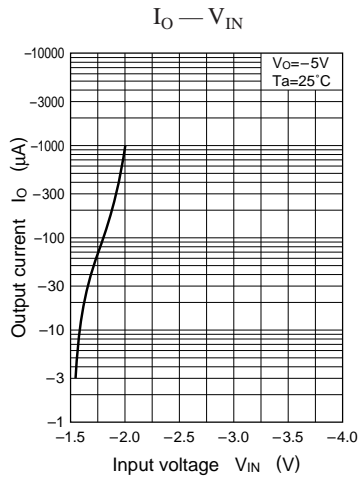
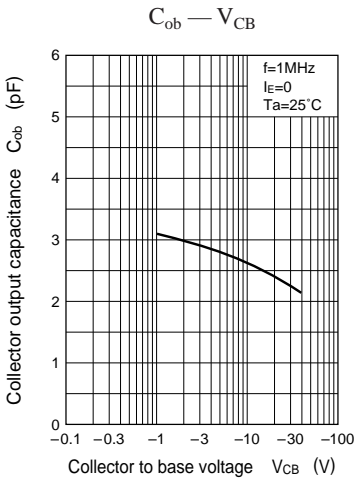


Characteristics charts of UN911D

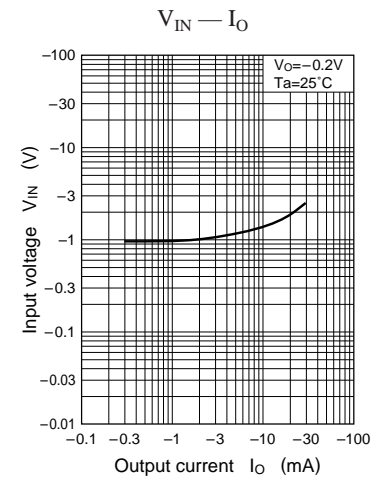
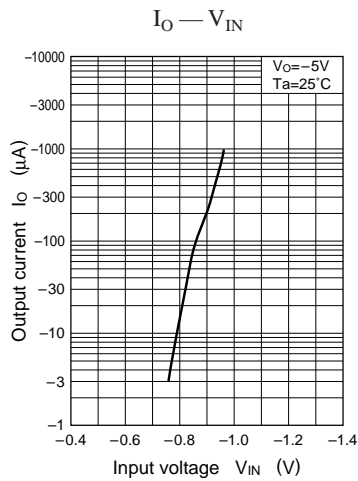
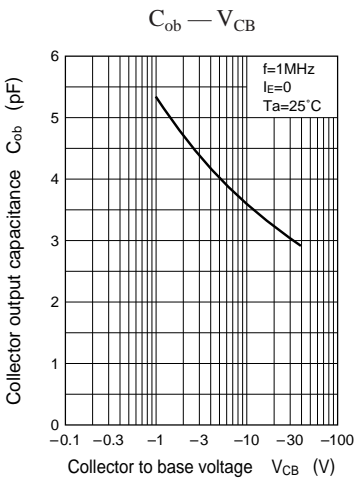
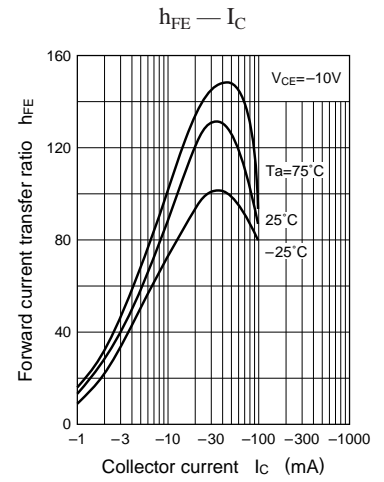
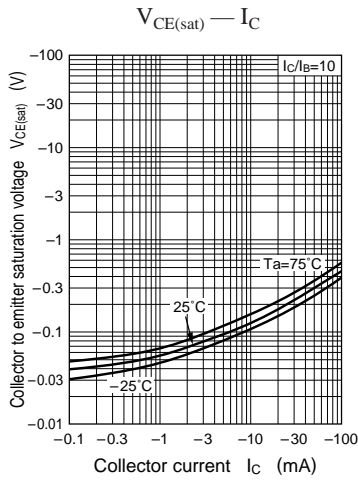
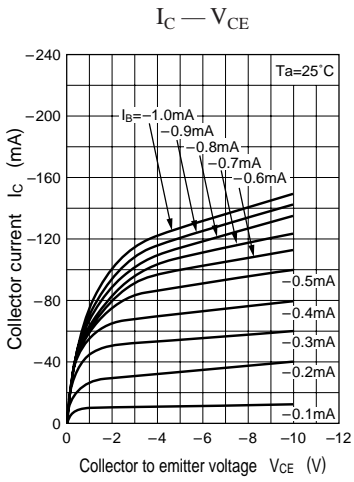


Characteristics charts of UN911E

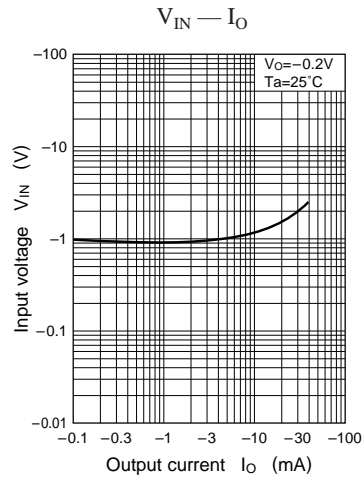
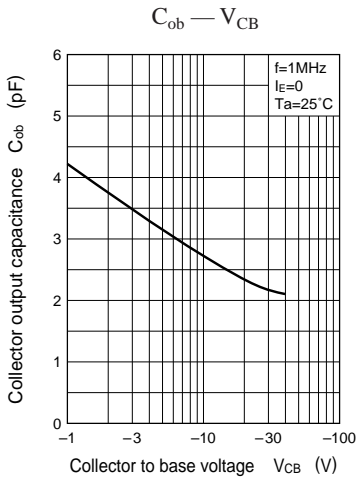
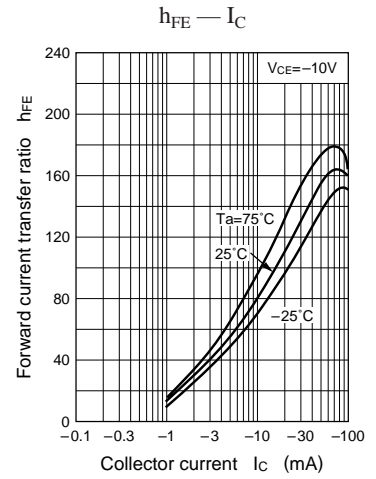
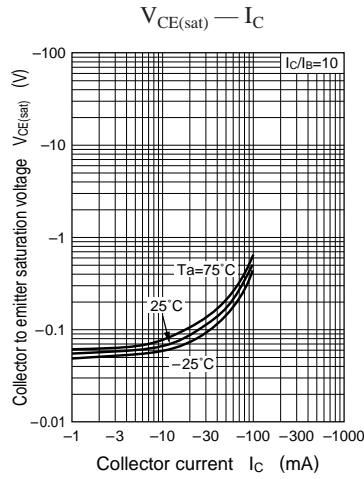
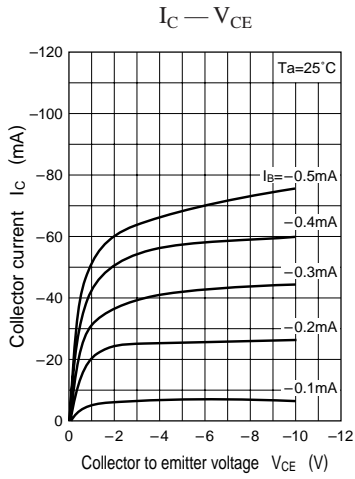




Characteristics charts of UN911F



Characteristics charts of UN911H



Characteristics charts of UN911L

