

UNR511x Series (UN511x Series)

Silicon PNP epitaxial planar type

For digital circuits

■ Features

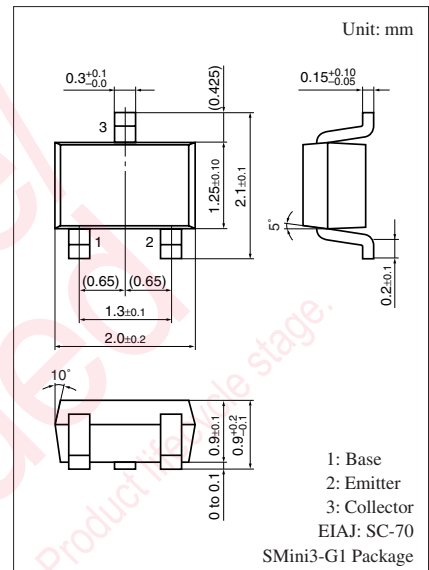
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- S-Mini type package, allowing automatic insertion through the tape/magazine packing

■ Resistance by Part Number

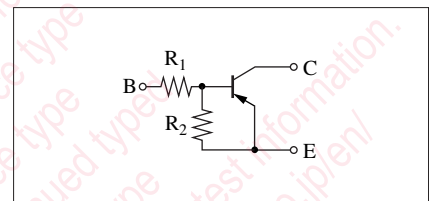
| | Marking symbol | (R ₁) | (R ₂) |
|--------------------|----------------|-------------------|-------------------|
| • UNR5110 (UN5110) | 6L | 47 kΩ | — |
| • UNR5111 (UN5111) | 6A | 10 kΩ | 10 kΩ |
| • UNR5112 (UN5112) | 6B | 22 kΩ | 22 kΩ |
| • UNR5113 (UN5113) | 6C | 47 kΩ | 47 kΩ |
| • UNR5114 (UN5114) | 6D | 10 kΩ | 47 kΩ |
| • UNR5115 (UN5115) | 6E | 10 kΩ | — |
| • UNR5116 (UN5116) | 6F | 4.7 kΩ | — |
| • UNR5117 (UN5117) | 6H | 22 kΩ | — |
| • UNR5118 (UN5118) | 6I | 0.51 kΩ | 5.1 kΩ |
| • UNR5119 (UN5119) | 6K | 1 kΩ | 10 kΩ |
| • UNR511D (UN511D) | 6M | 47 kΩ | 10 kΩ |
| • UNR511E (UN511E) | 6N | 47 kΩ | 22 kΩ |
| • UNR511F (UN511F) | 6O | 4.7 kΩ | 10 kΩ |
| • UNR511H (UN511H) | 6P | 2.2 kΩ | 10 kΩ |
| • UNR511L (UN511L) | 6Q | 4.7 kΩ | 4.7 kΩ |
| • UNR511M (UN511M) | EI | 2.2 kΩ | 47 kΩ |
| • UNR511N (UN511N) | EW | 4.7 kΩ | 47 kΩ |
| • UNR511T (UN511T) | EY | 22 kΩ | 47 kΩ |
| • UNR511V (UN511V) | FC | 2.2 kΩ | 2.2 kΩ |
| • UNR511Z (UN511Z) | FE | 4.7 kΩ | 22 kΩ |

■ Absolute Maximum Ratings T_a = 25°C

| Parameter | Symbol | Rating | Unit |
|---------------------------------------|------------------|-------------|------|
| Collector-base voltage (Emitter open) | V _{CBO} | -50 | V |
| Collector-emitter voltage (Base open) | V _{CEO} | -50 | V |
| Collector current | I _C | -100 | mA |
| Total power dissipation | P _T | 150 | mW |
| Junction temperature | T _j | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |



Internal Connection



Note) The part numbers in the parenthesis show conventional part number.

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

| 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} | $V_{CB} = -50 \text{ V}, I_E = 0$ | | | -0.1 | μA | |
| Collector-emitter cutoff current (Base open) | | I_{CEO} | $V_{CE} = -50 \text{ V}, I_B = 0$ | | | -0.5 | μA | |
| Emitter-base cutoff current (Collector open) | UNR5110/5115/5116/5117 | I_{EBO} | $V_{EB} = -6 \text{ V}, I_C = 0$ | | | -0.01 | mA | |
| | UNR5113 | | | | | -0.1 | | |
| | UNR5112/5114/511D/511E/511M/511N/511T | | | | | -0.2 | | |
| | UNR511Z | | | | | -0.4 | | |
| | UNR5111 | | | | | -0.5 | | |
| | UNR511F/511H | | | | | -1.0 | | |
| | UNR5119 | | | | | -1.5 | | |
| | UNR5118/511L/511V | | | | | -2.0 | | |
| Forward current transfer ratio | UNR511V | h_{FE} | $V_{CE} = -10 \text{ V}, I_C = -5 \text{ mA}$ | 6 | | 20 | — | |
| | UNR5118/511L | | | 20 | | | | |
| | UNR5119/511D/511F/511H | | | 30 | | | | |
| | UNR5111 | | | 35 | | | | |
| | UNR5112/511E | | | 60 | | | | |
| | UNR511Z | | | 60 | 200 | | | |
| | UNR5113/5114/511M | | | 80 | | | | |
| | UNR511N/511T | | | 80 | 400 | | | |
| | UNR5110*/5115*/5116*/5117* | | | 160 | 460 | | | |
| Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_C = -10 \text{ mA}, I_B = -0.3 \text{ mA}$ | | | -0.25 | V | |
| | UNR511V | | | $I_C = -10 \text{ mA}, I_B = -1.5 \text{ mA}$ | | | | |
| Output voltage high-level | | V_{OH} | $V_{CC} = -5 \text{ V}, V_B = -0.5 \text{ V}, R_L = 1 \text{ k}\Omega$ | -4.9 | | | V | |
| Output voltage low-level | | V_{OL} | $V_{CC} = -5 \text{ V}, V_B = -2.5 \text{ V}, R_L = 1 \text{ k}\Omega$ | | | -0.2 | V | |
| | | | | UNR5113 | $V_{CC} = -5 \text{ V}, V_B = -3.5 \text{ V}, R_L = 1 \text{ k}\Omega$ | | | |
| | | | | UNR511D | $V_{CC} = -5 \text{ V}, V_B = -10 \text{ V}, R_L = 1 \text{ k}\Omega$ | | | |
| | | | | UNR511E | $V_{CC} = -5 \text{ V}, V_B = -6 \text{ V}, R_L = 1 \text{ k}\Omega$ | | | |
| Transition frequency | | f_T | $V_{CB} = -10 \text{ V}, I_E = 1 \text{ mA}, f = 200 \text{ MHz}$ | | 80 | | MHz | |
| | | | | UNR5116 | $V_{CB} = -10 \text{ V}, I_E = 2 \text{ mA}, f = 200 \text{ MHz}$ | | | 150 |
| Input resistance | UNR5118 | R_1 | | -30% | 0.51 | +30% | k Ω | |
| | UNR5119 | | | | 1.0 | | | |
| | UNR511H/511M/511V | | | | 2.2 | | | |
| | UNR5116/511F/511L/511N/511Z | | | | 4.7 | | | |
| | UNR5111/5114/5115 | | | | 10 | | | |
| | UNR5112/5117/511T | | | | 22 | | | |
| | UNR5110/5113/511D/511E | | | | 47 | | | |
| Resistance ratio | UNR511M | R_1/R_2 | | | 0.047 | | — | |
| | UNR511N | | | | 0.1 | | | |
| | UNR5118/5119 | | | 0.08 | 0.10 | 0.12 | | |
| | UNR511Z | | | | 0.21 | | | |

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

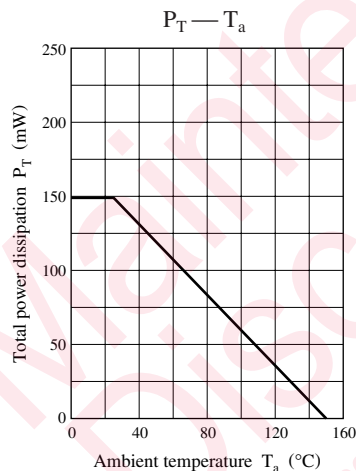
| Parameter | | Symbol | Conditions | Min | Typ | Max | Unit |
|------------------|------------------------|--------|------------|------|------|------|------|
| Resistance ratio | UNR5114 | | | 0.17 | 0.21 | 0.25 | |
| | UNR511H | | | 0.17 | 0.22 | 0.27 | |
| | UNR511T | | | | 0.47 | | |
| | UNR511F | | | 0.37 | 0.47 | 0.57 | |
| | UNR511V | | | | 1.0 | | |
| | UNR5111/5112/5113/511L | | | 0.8 | 1.0 | 1.2 | |
| | UNR511E | | | 1.70 | 2.14 | 2.60 | |
| | UNR511D | | | 3.7 | 4.7 | 5.7 | |

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

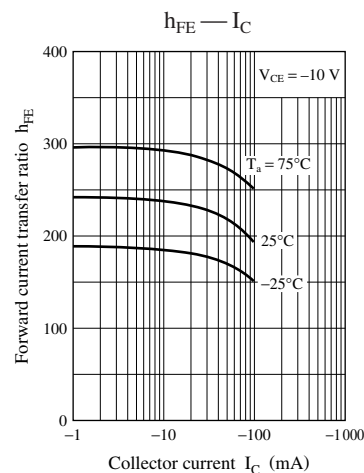
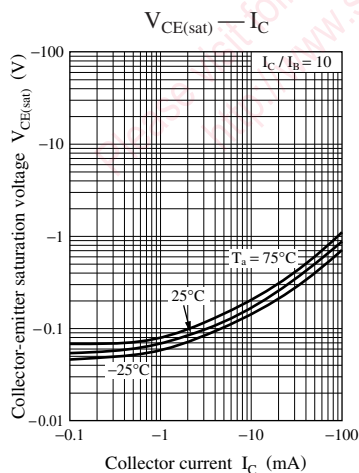
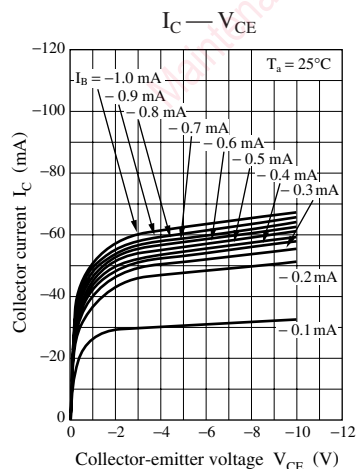
2. *: Rank classification

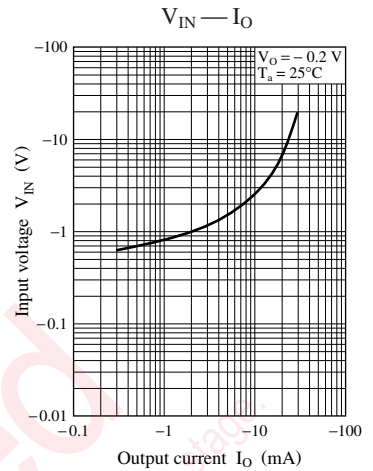
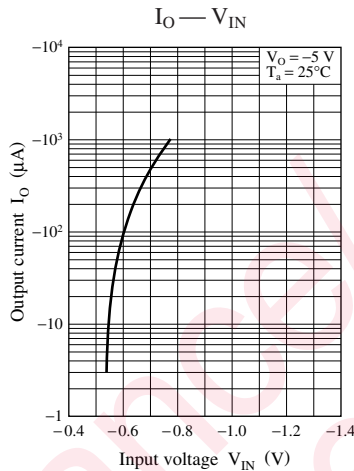
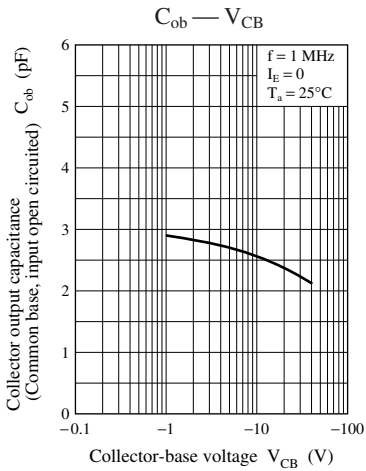
| Rank | Q | R | S | No-rank |
|----------|------------|------------|------------|------------|
| h_{FE} | 160 to 260 | 210 to 340 | 290 to 460 | 160 to 460 |

Common characteristics chart

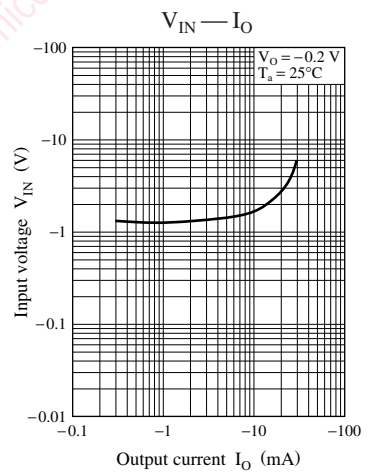
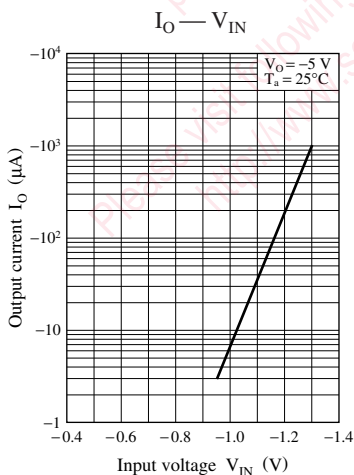
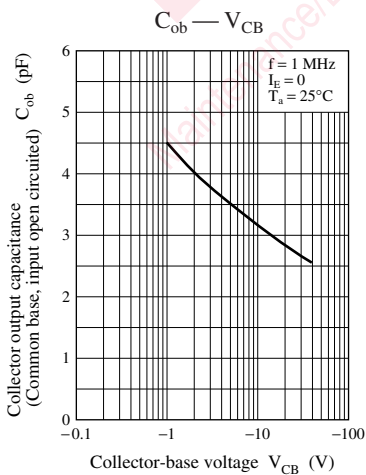
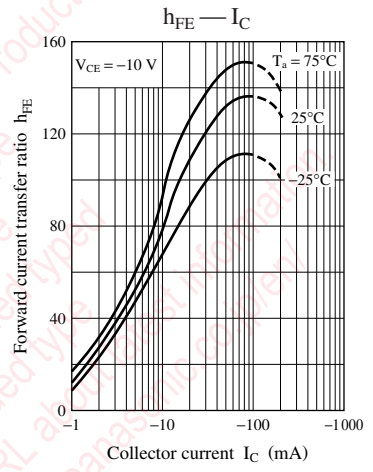
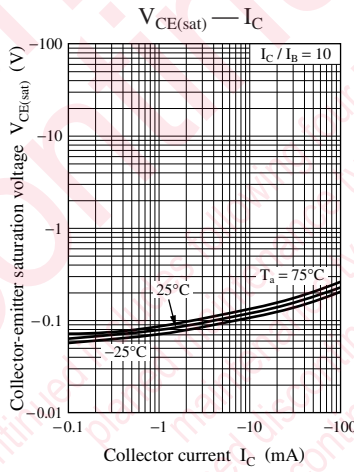
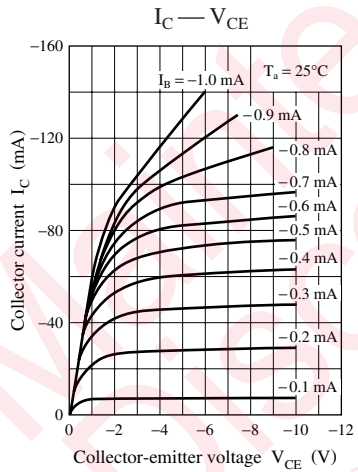


Characteristics charts of UNR5110

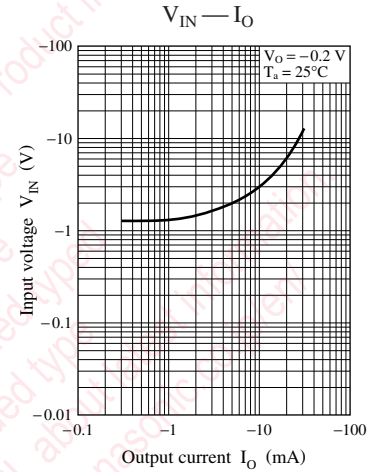
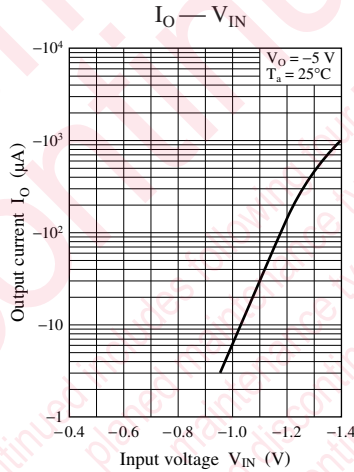
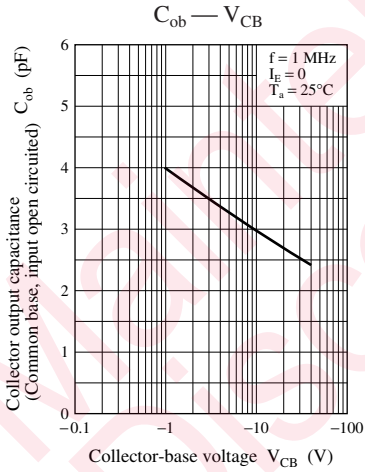
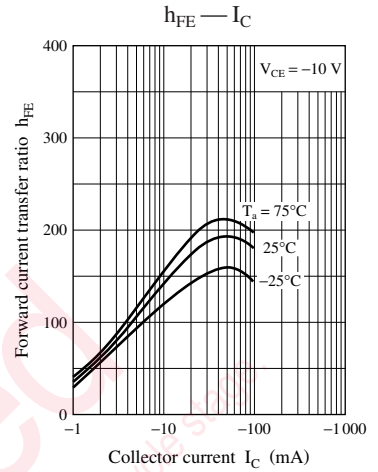
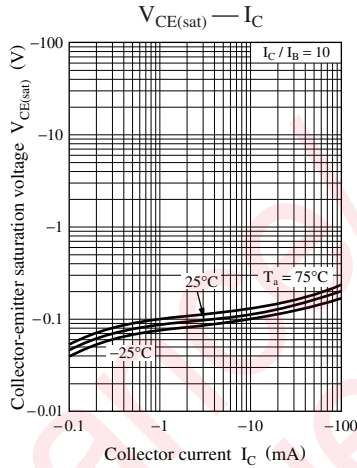
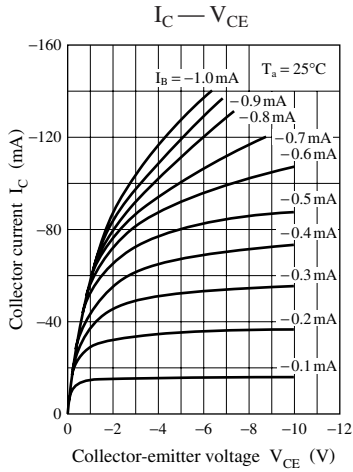




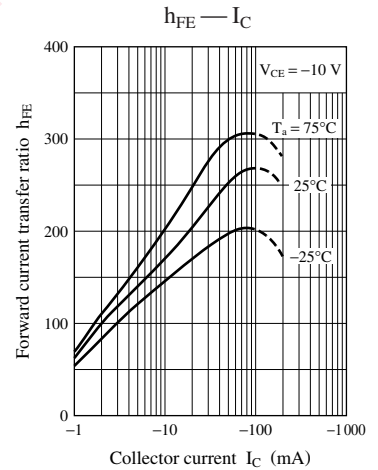
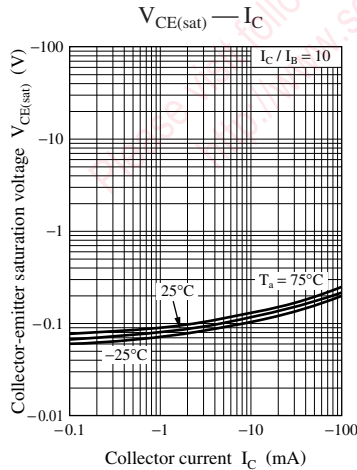
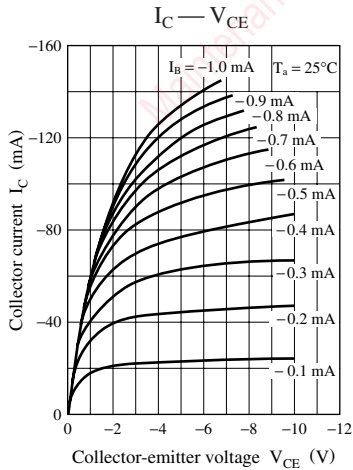
Characteristics charts of UNR5111

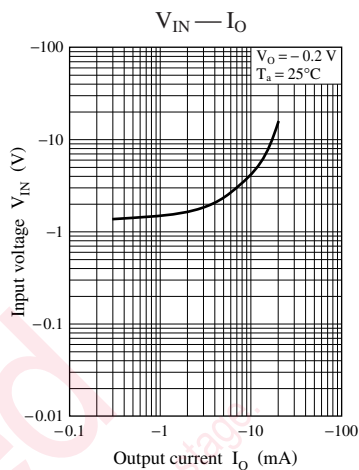
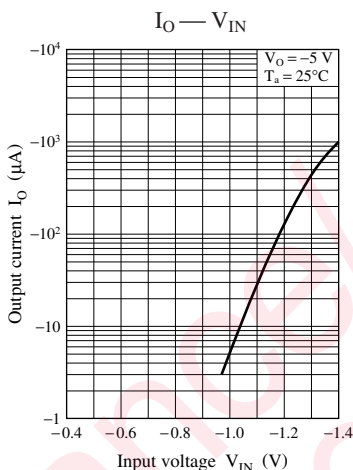
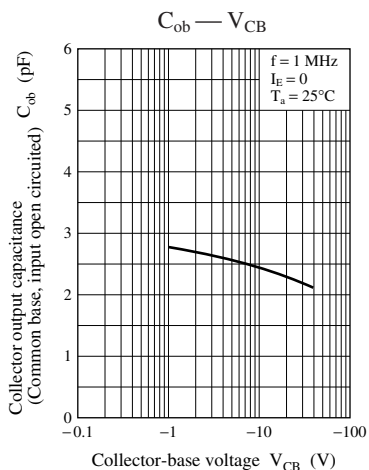


Characteristics charts of UNR5112

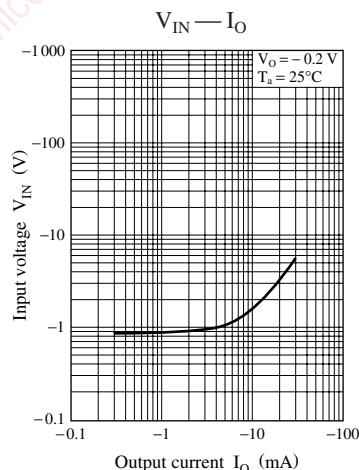
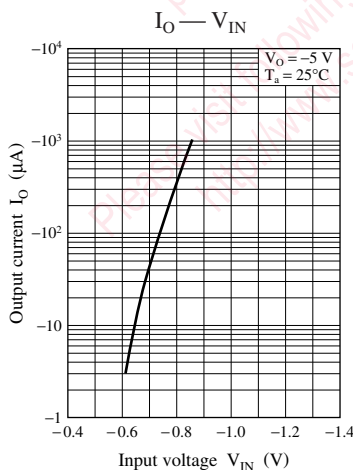
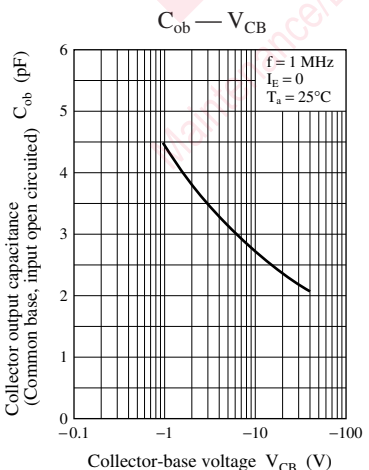
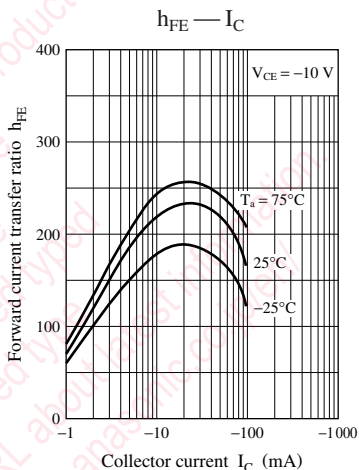
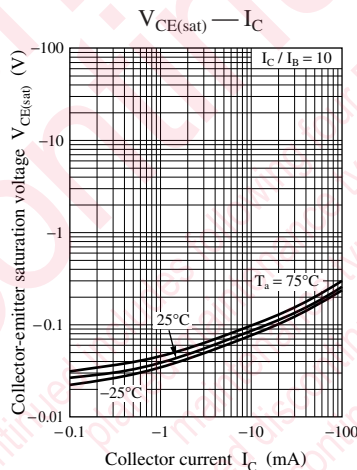
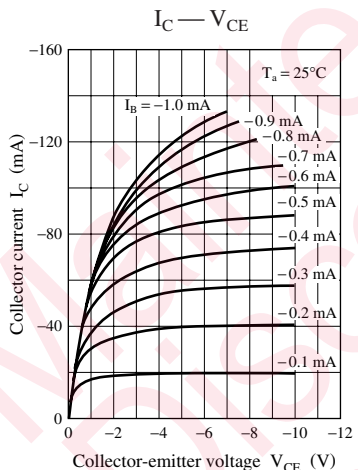


Characteristics charts of UNR5113

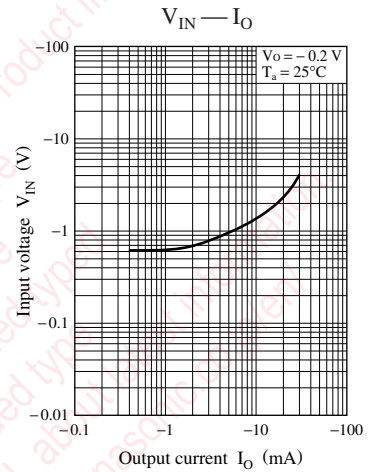
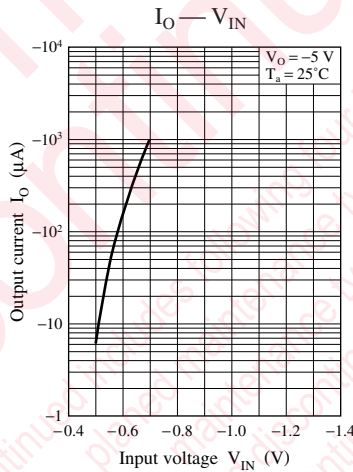
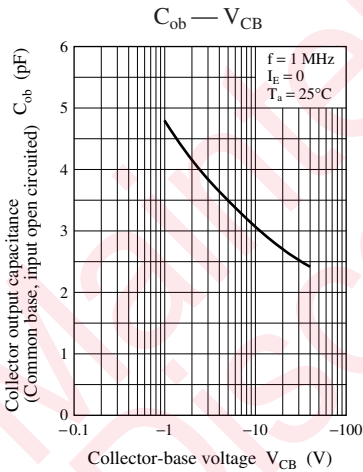
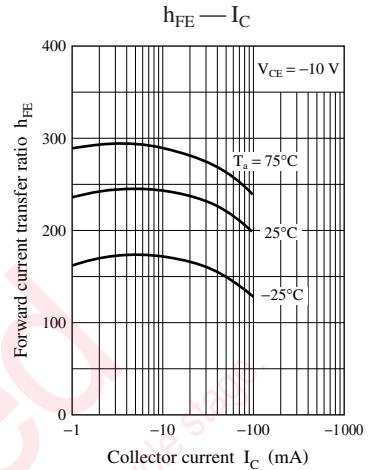
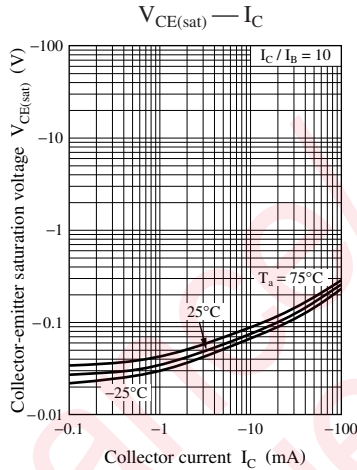
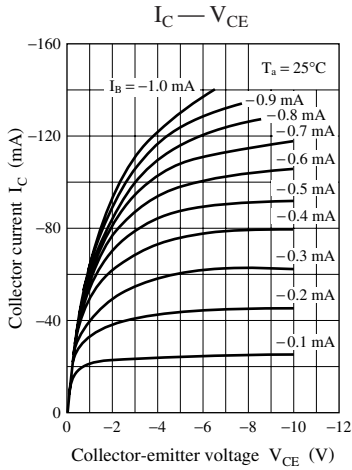




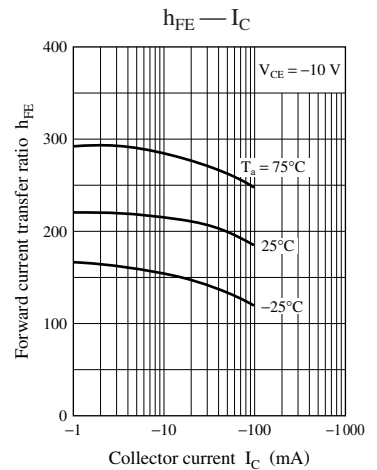
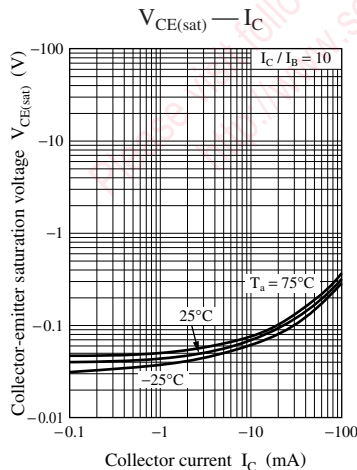
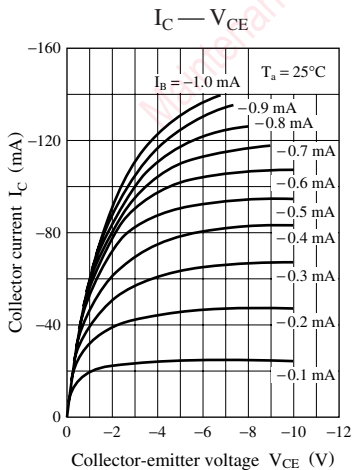
Characteristics charts of UNR5114

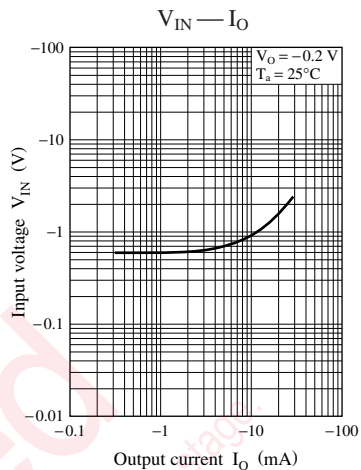
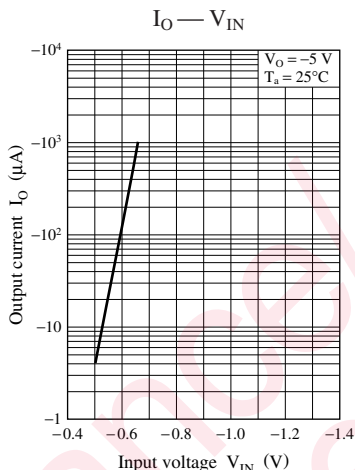
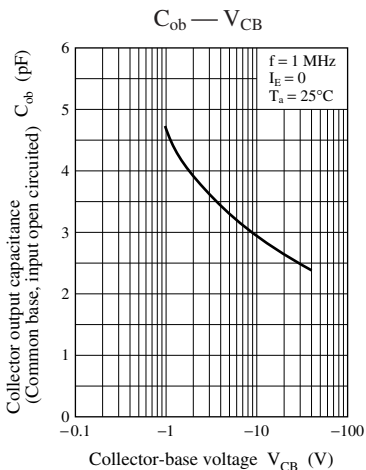


Characteristics charts of UNR5115

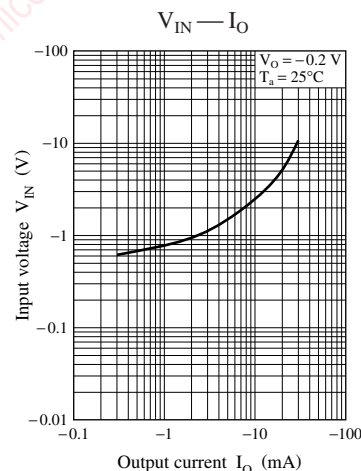
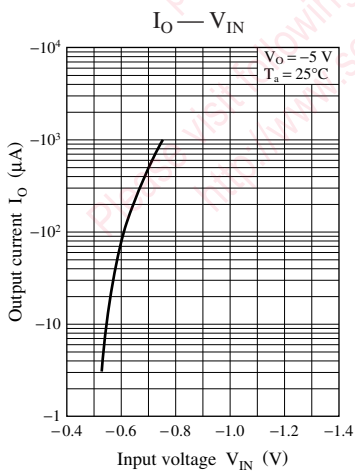
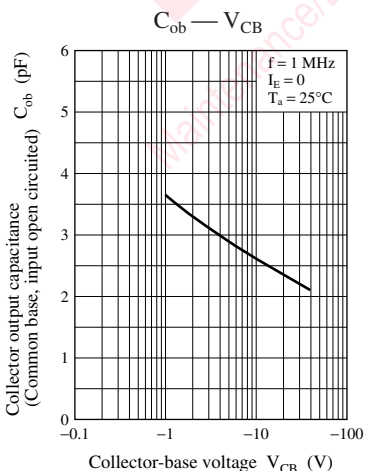
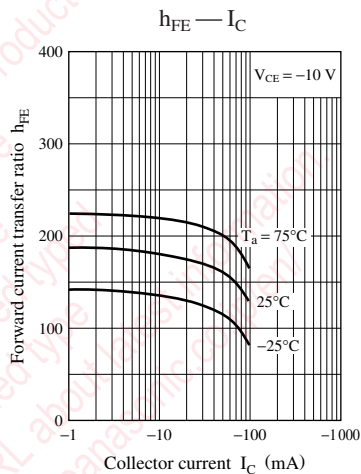
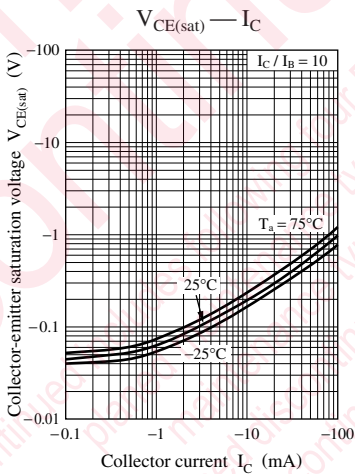
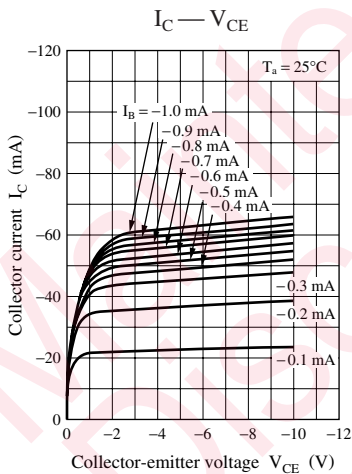


Characteristics charts of UNR5116

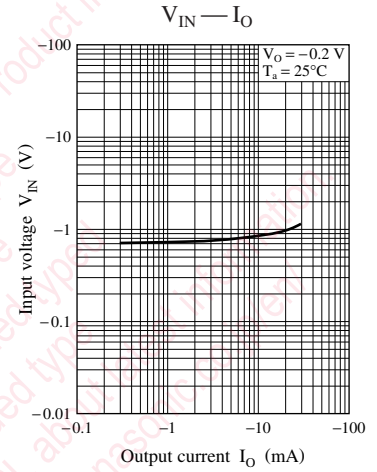
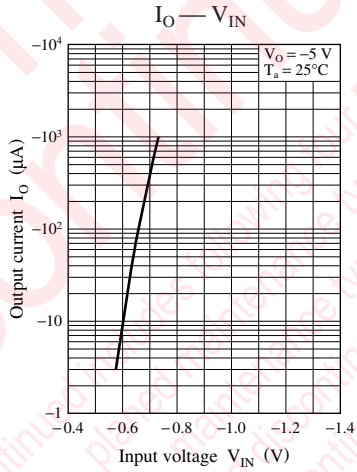
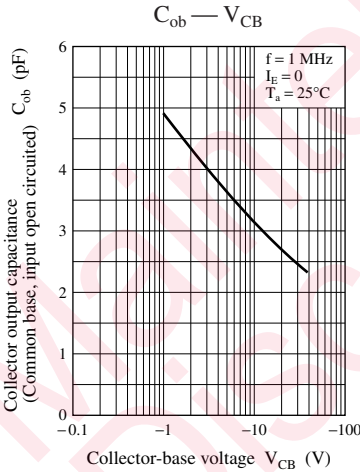
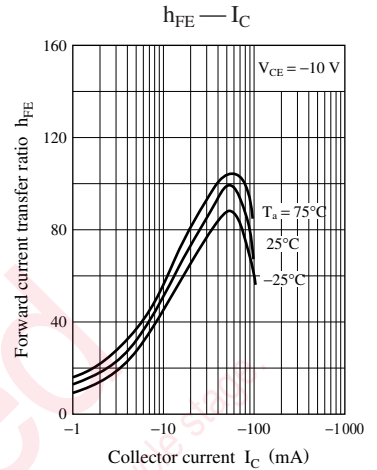
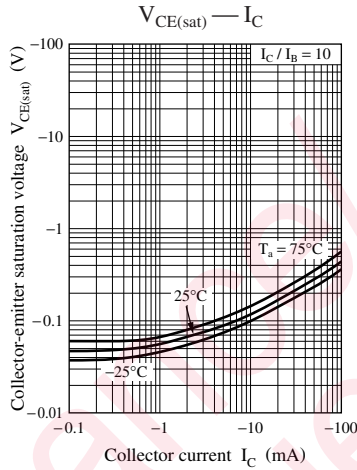
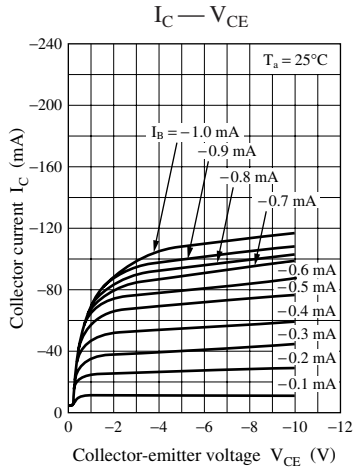




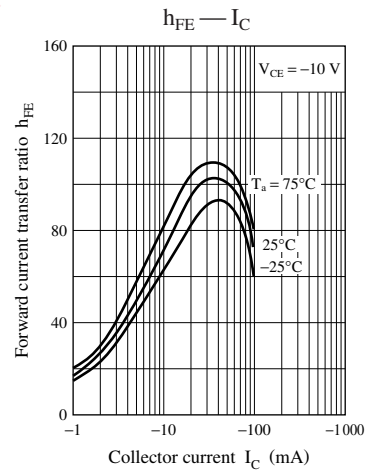
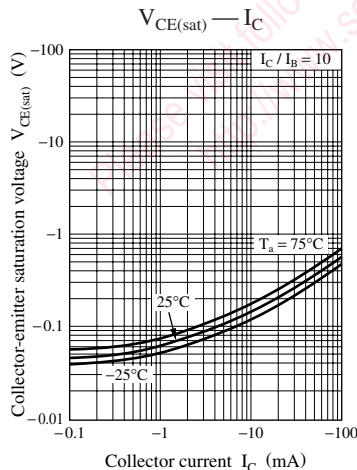
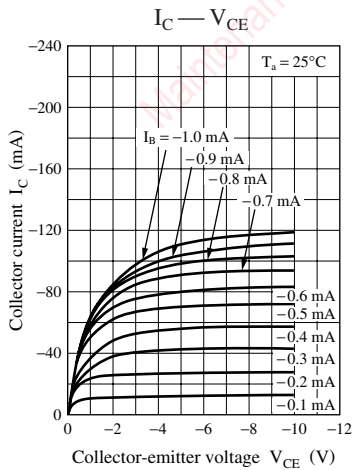
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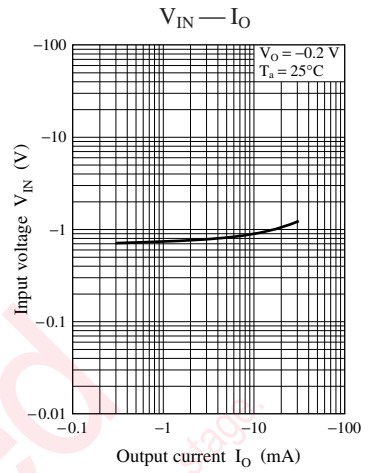
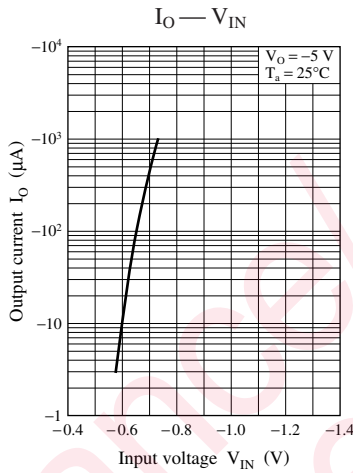
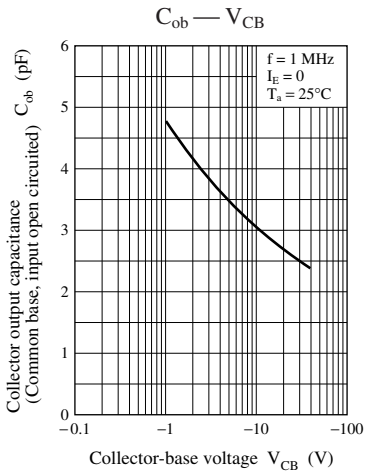


Characteristics charts of UNR5118

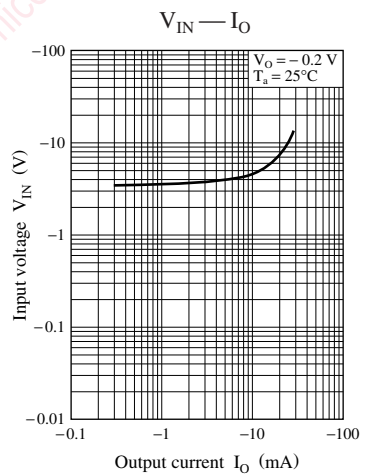
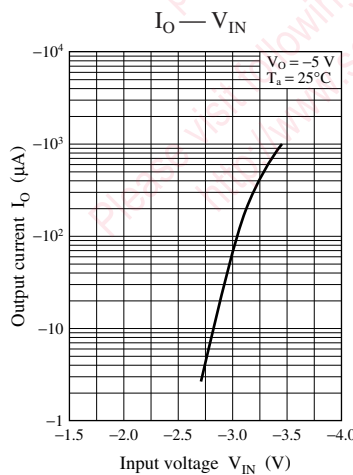
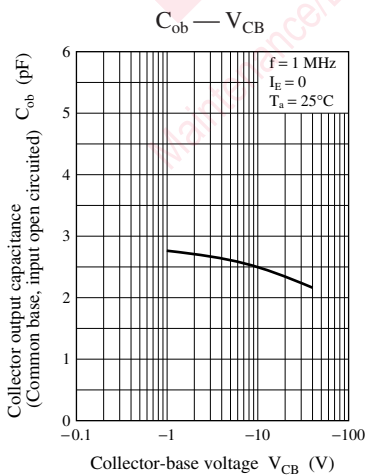
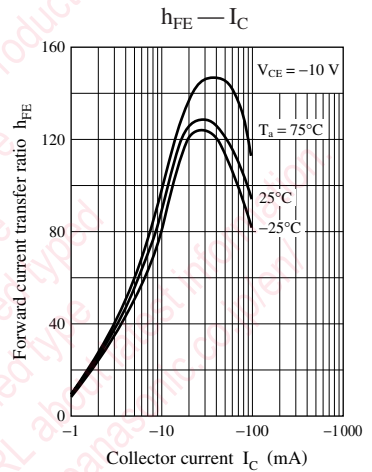
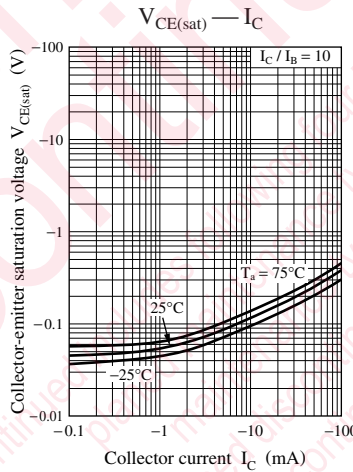
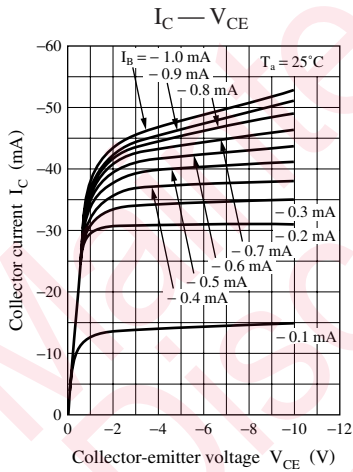


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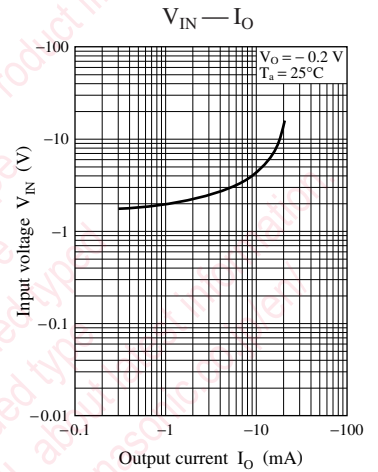
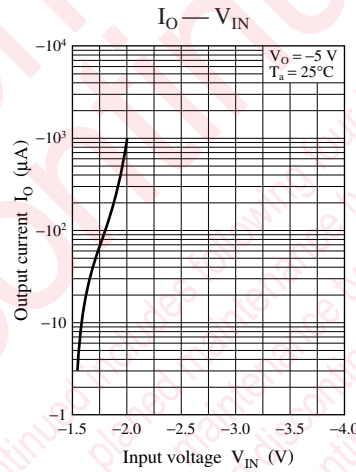
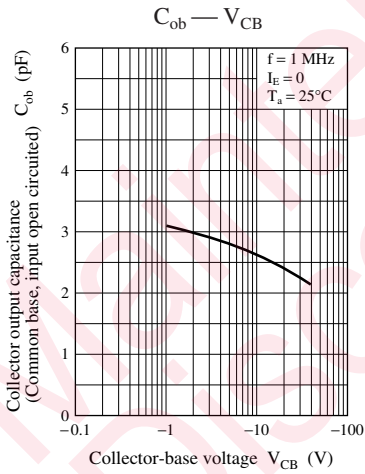
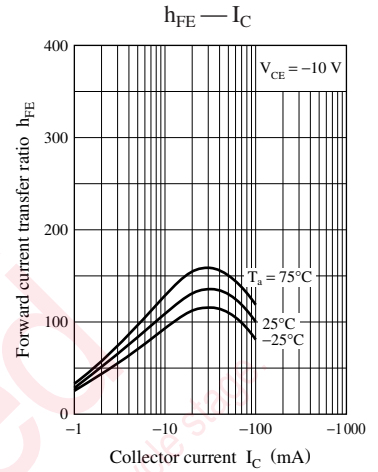
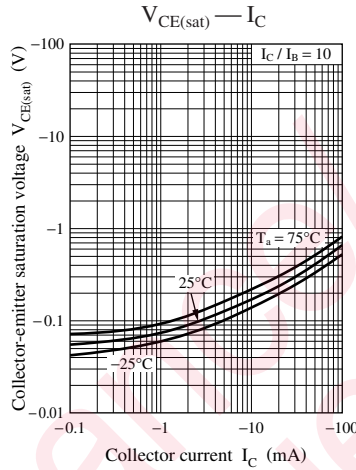
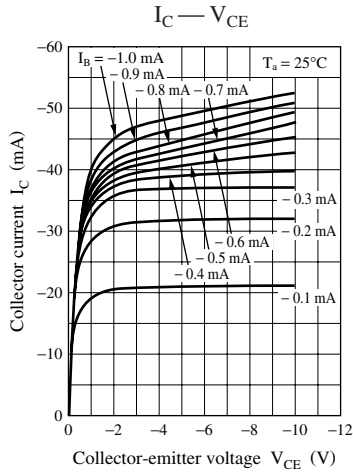




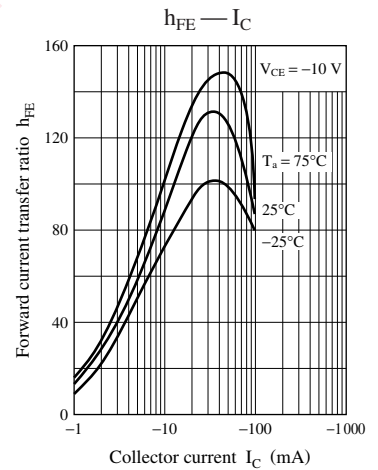
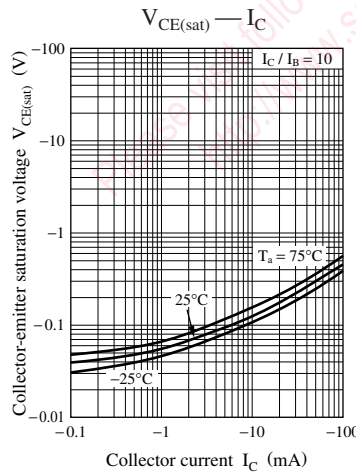
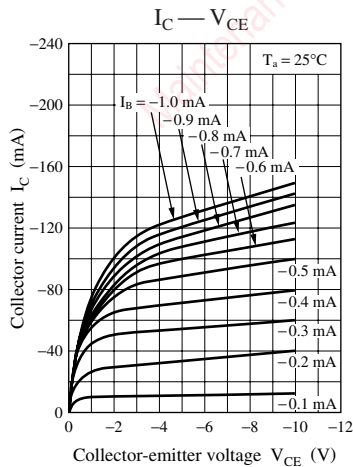
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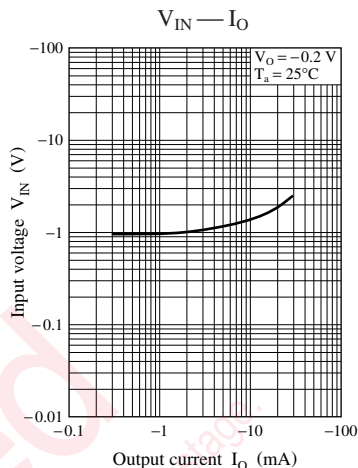
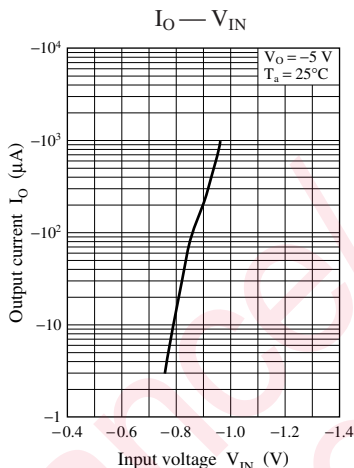
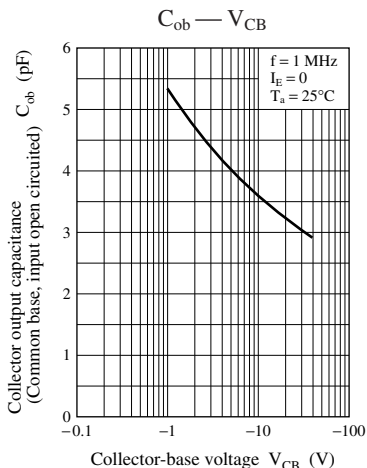


Characteristics charts of UNR511E

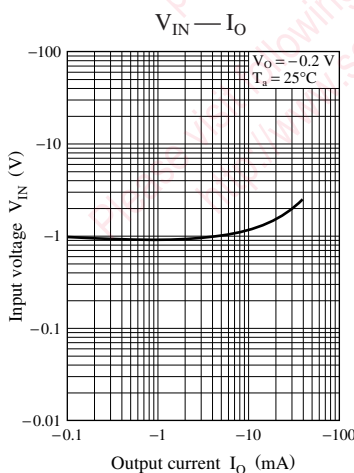
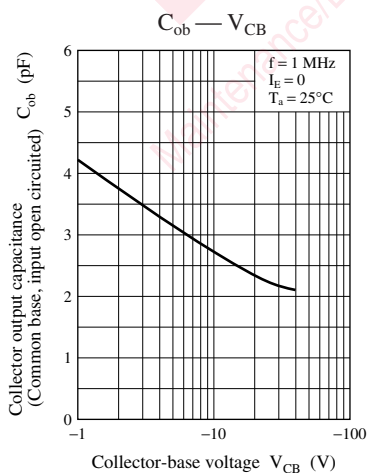
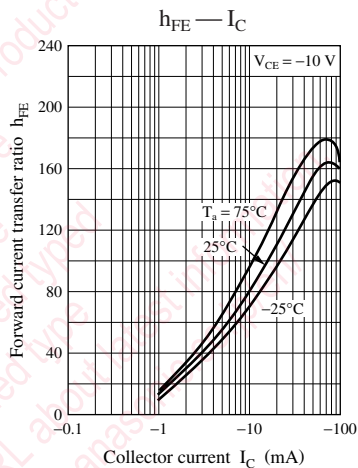
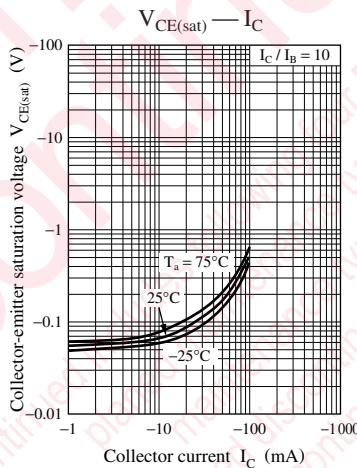
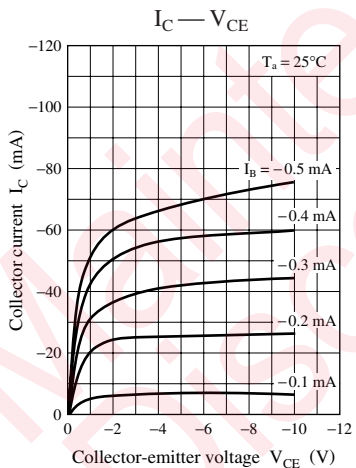


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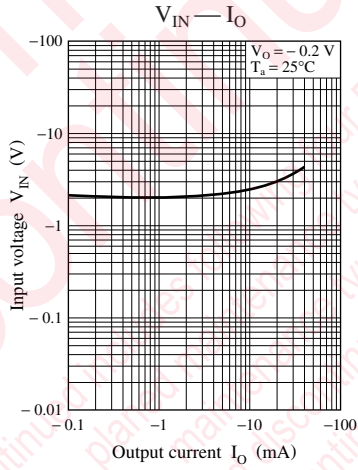
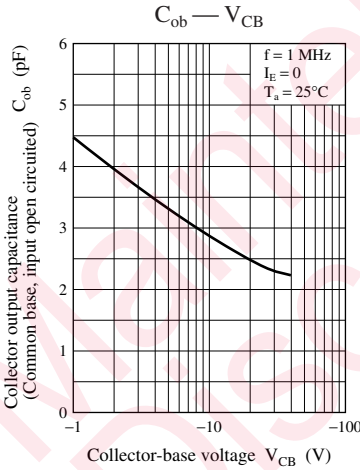
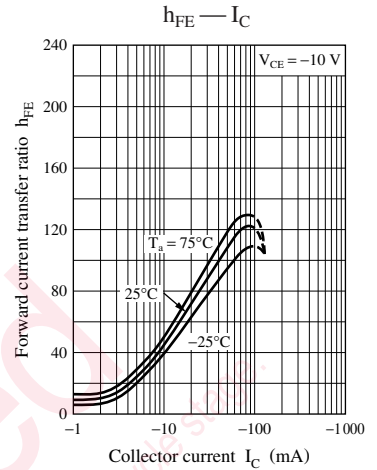
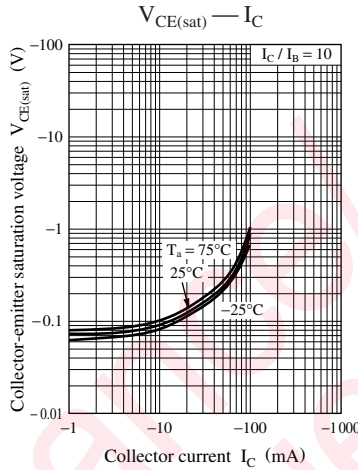
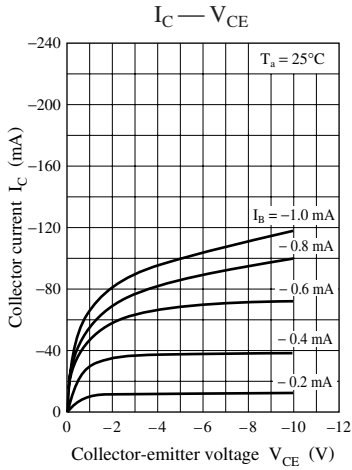




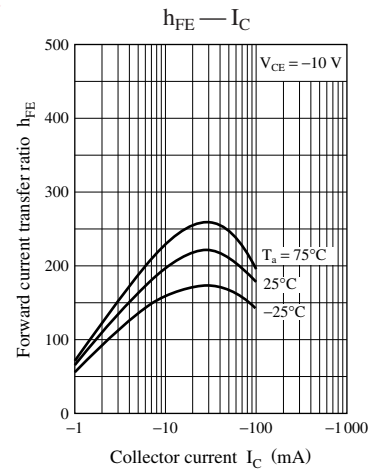
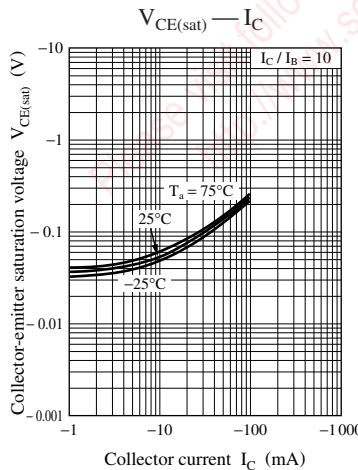
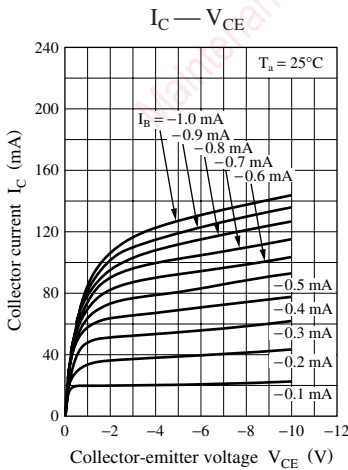
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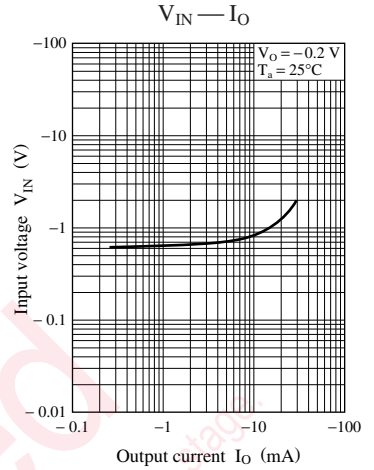
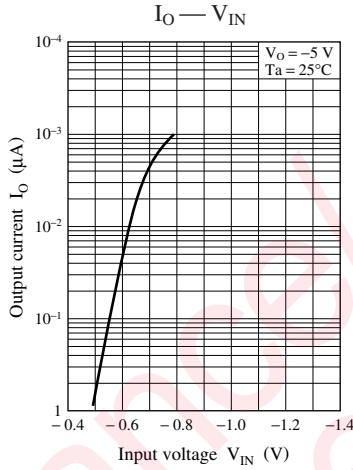
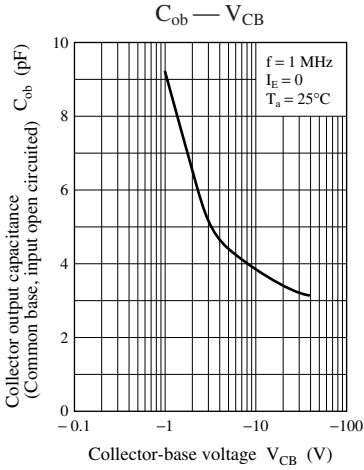


Characteristics charts of UNR511L

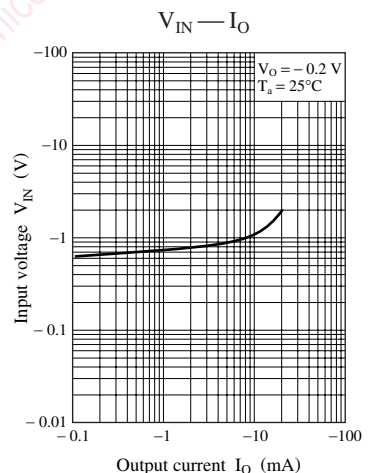
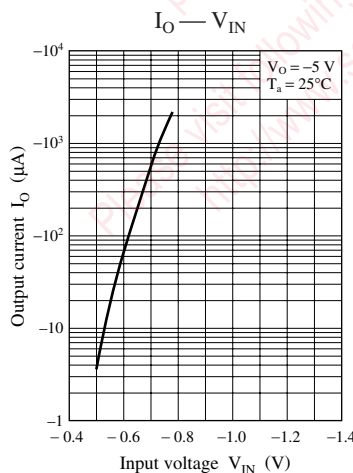
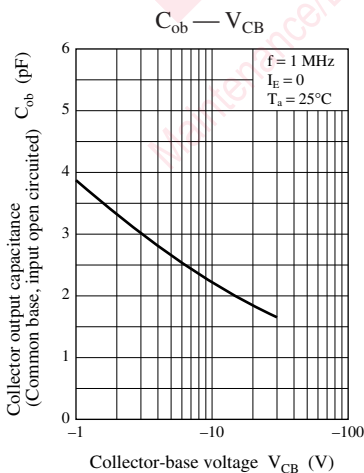
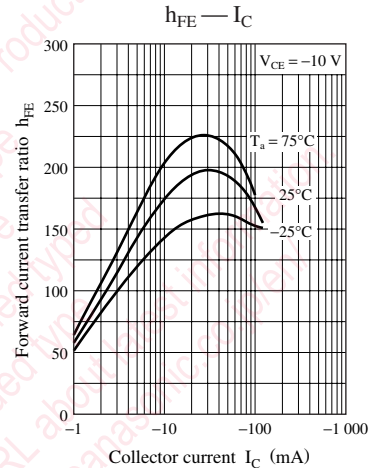
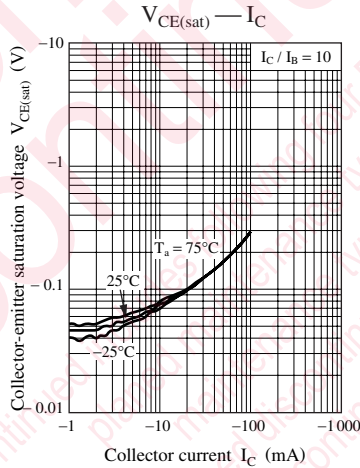
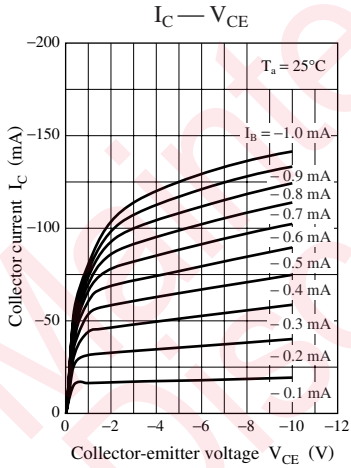


Characteristics charts of UNR511M

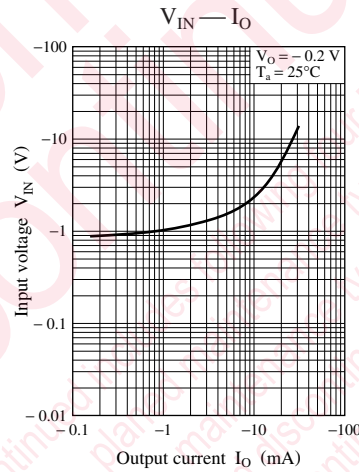
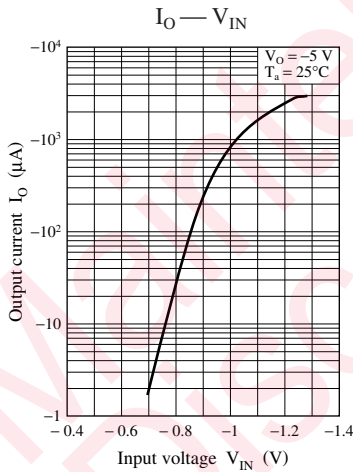
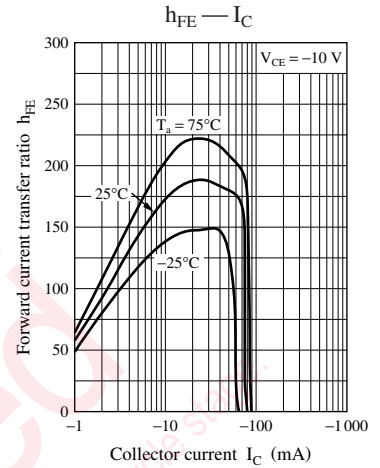
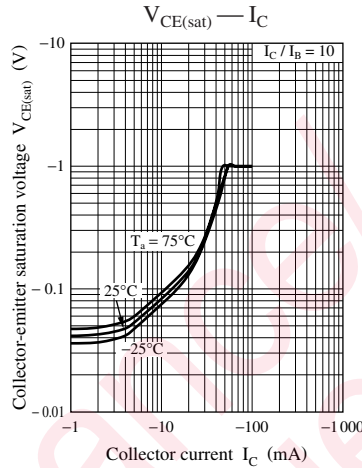
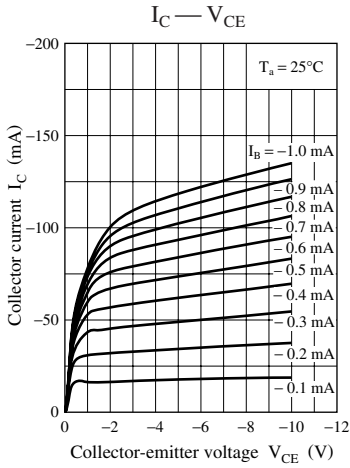




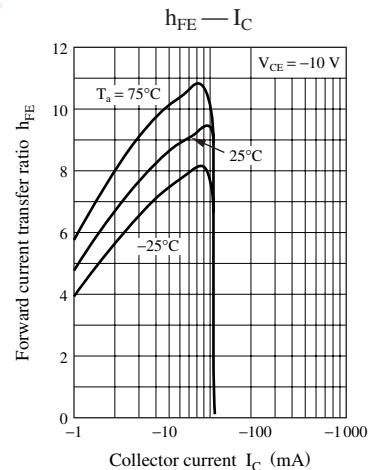
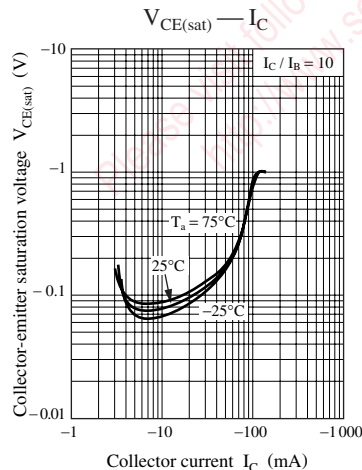
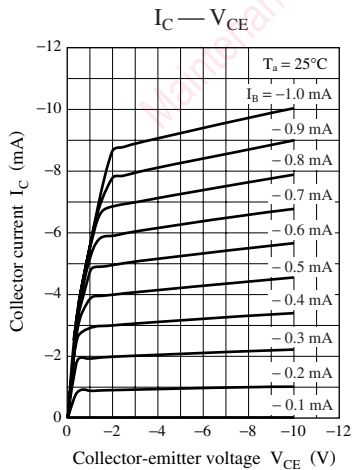
Characteristics charts of UNR511N

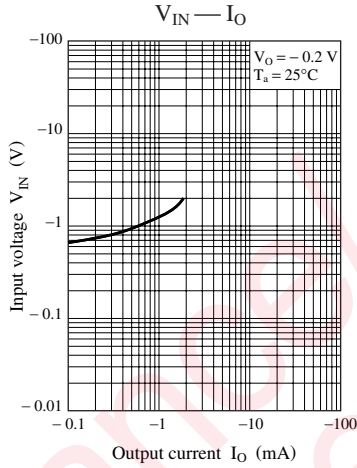
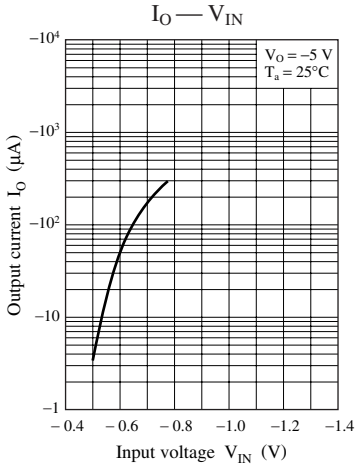


Characteristics charts of UNR511T

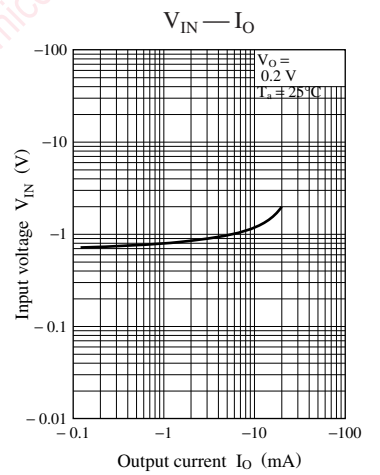
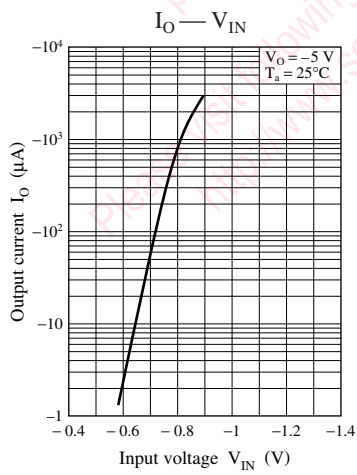
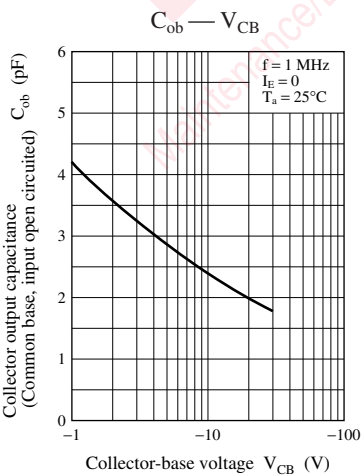
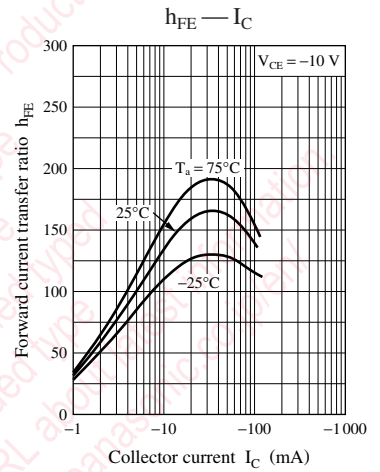
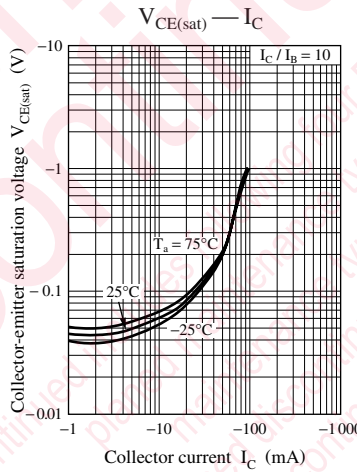
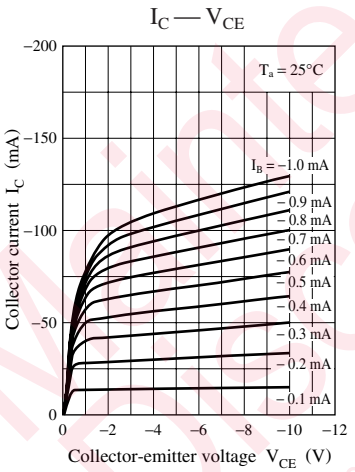


Characteristics charts of UNR511V





Characteristics charts of UNR511Z



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