

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

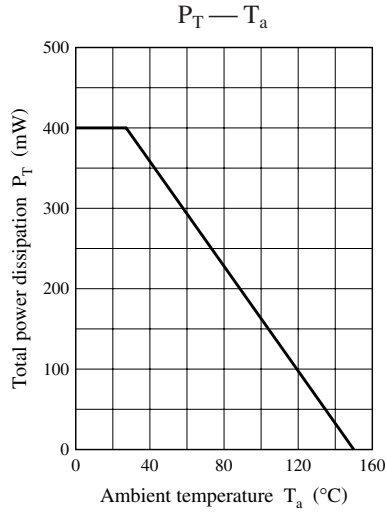
| Parameter | | Symbol | Conditions | Min | Typ | Max | Unit | | |
|--|--------------------------------|---------------|---|---------|------|-------|------------------|---|--|
| Collector-base voltage (Emitter open) | | V_{CBO} | $I_C = -10 \mu\text{A}, I_E = 0$ | -50 | | | V | | |
| Collector-emitter 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) | UNR1111 | I_{EBO} | $V_{EB} = -6 \text{V}, I_C = 0$ | | | -0.5 | mA | | |
| | UNR1112/1114/111D/111E | | | | | -0.2 | | | |
| | UNR1113 | | | | | -0.1 | | | |
| | UNR1110/1115/1116/1117 | | | | | -0.01 | | | |
| | UNR111F/111H | | | | | -1.0 | | | |
| | UNR1119 | | | | | -1.5 | | | |
| | UNR1118/111L | | | | | -2.0 | | | |
| Forward current transfer ratio | UNR1111 | h_{FE} | $V_{CE} = -10 \text{V}, I_C = -5 \text{mA}$ | 35 | | | — | | |
| | UNR1112/111E | | | 60 | | | | | |
| | UNR1113/1114 | | | 80 | | | | | |
| | UNR1110*/1115*/1116*/ 1117* | | | 160 | | 460 | | | |
| | UNR1118/111L | | | 20 | | | | | |
| | UNR1119/111D/111F/111H | | | 30 | | | | | |
| Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_C = -10 \text{mA}, I_B = -0.3 \text{mA}$ | | | -0.25 | V | | |
| 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 | | |
| | | | | UNR1113 | | | | $V_{CC} = -5 \text{V}, V_B = -3.5 \text{V}, R_L = 1 \text{k}\Omega$ | |
| | | | | UNR111D | | | | $V_{CC} = -5 \text{V}, V_B = -10 \text{V}, R_L = 1 \text{k}\Omega$ | |
| | | | | UNR111E | | | | $V_{CC} = -5 \text{V}, V_B = -6 \text{V}, R_L = 1 \text{k}\Omega$ | |
| Transition frequency | | f_T | $V_{CB} = -10 \text{V}, I_E = 2 \text{mA}, f = 200 \text{MHz}$ | | 80 | | MHz | | |
| Input resistance | UNR1111/1114/1115 | R_1 | | -30% | 10 | +30% | $\text{k}\Omega$ | | |
| | UNR1112/1117 | | | | 22 | | | | |
| | UNR1110/1113/111D/111E | | | | 47 | | | | |
| | UNR1116/111F/111L | | | | 4.7 | | | | |
| | UNR1118 | | | | 0.51 | | | | |
| | UNR1119 | | | | 1 | | | | |
| | UNR111H | | | | 2.2 | | | | |
| Resistance ratio | UNR1111/1112/1113/111L | R_1/R_2 | | 0.8 | 1.0 | 1.2 | — | | |
| | UNR1114 | | | 0.17 | 0.21 | 0.25 | | | |
| | UNR1118/1119 | | | 0.08 | 0.1 | 0.12 | | | |
| | UNR111D | | | | 4.7 | | | | |
| | UNR111E | | | | 2.14 | | | | |
| | UNR111F | | | | 0.47 | | | | |
| | UNR111H | | | 0.17 | 0.22 | 0.27 | | | |

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

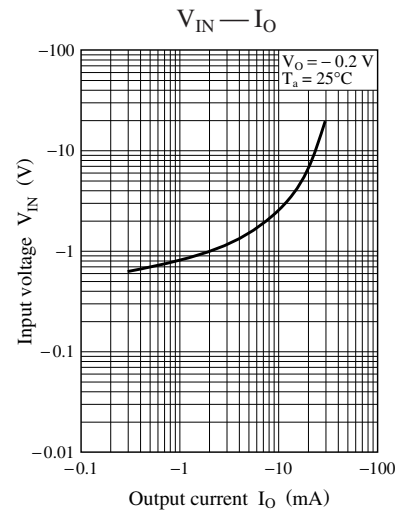
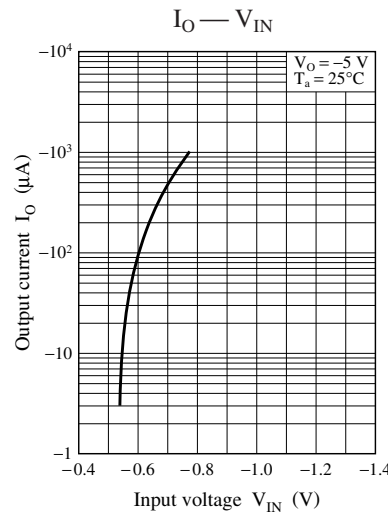
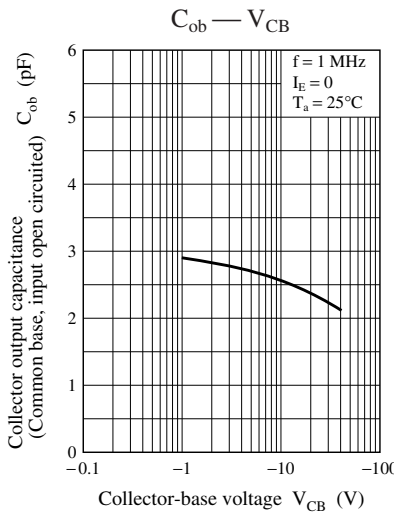
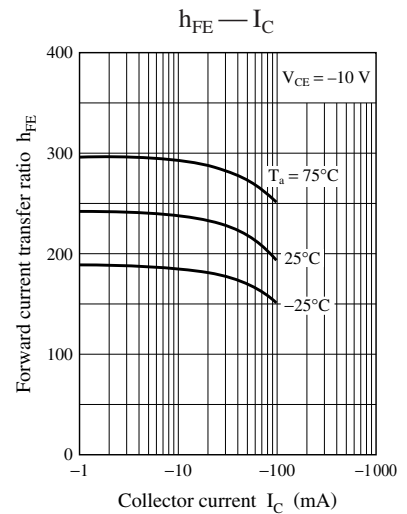
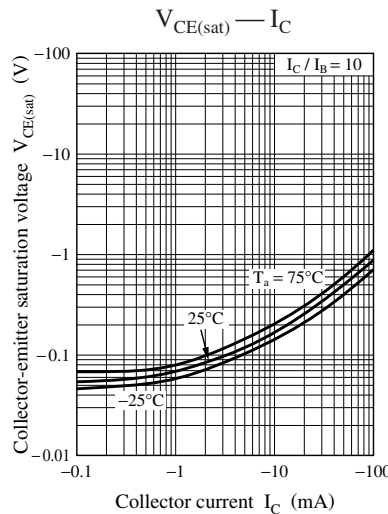
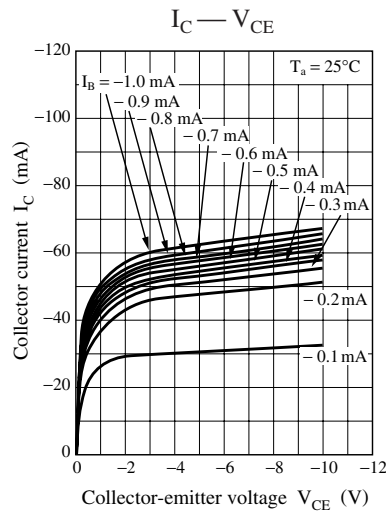
2. *: Rank classification (UNR1110/1115/1116/1117)

| Rank | Q | R | S |
|----------|------------|------------|------------|
| h_{FE} | 160 to 260 | 210 to 340 | 290 to 460 |

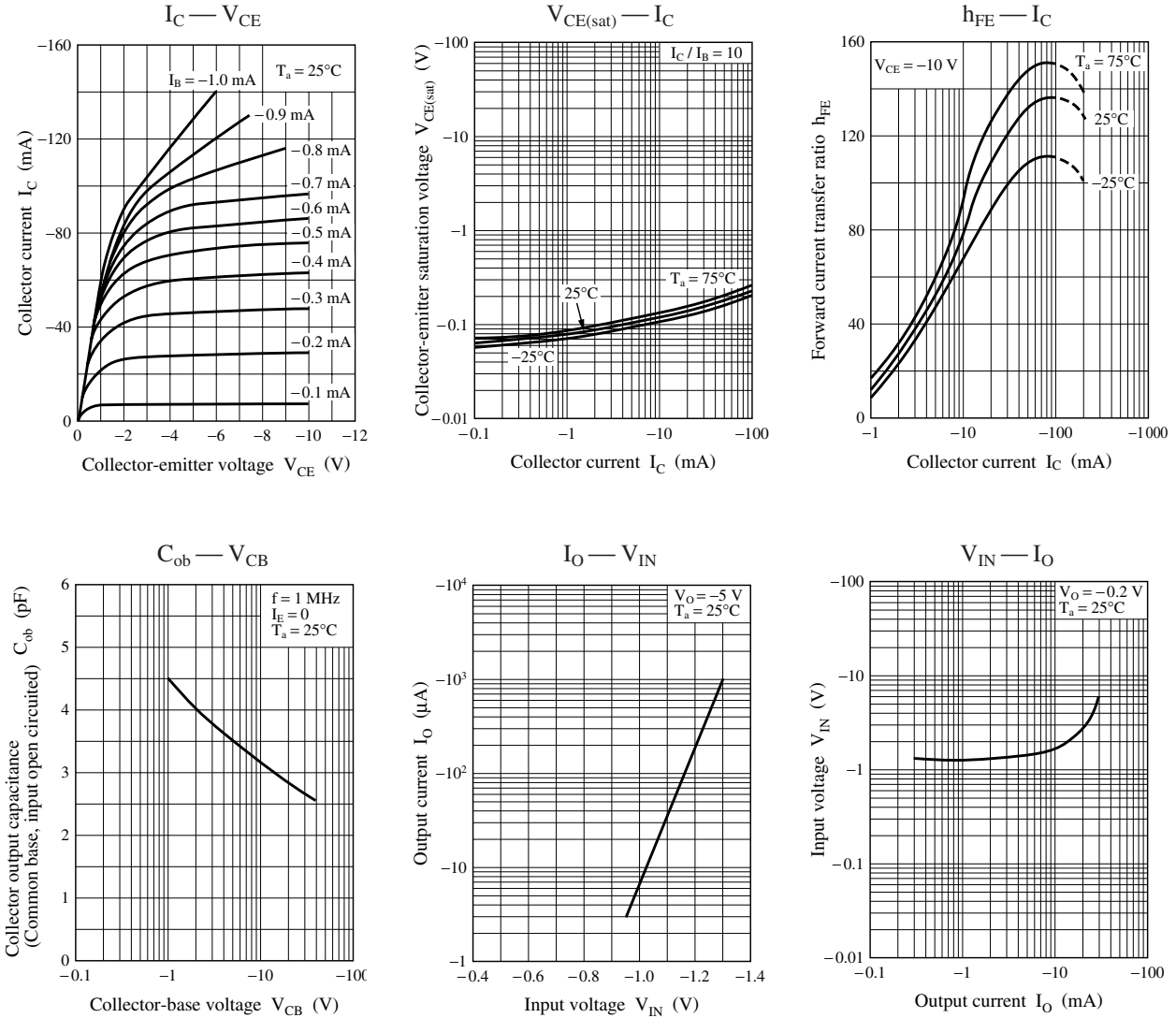
Common characteristics chart



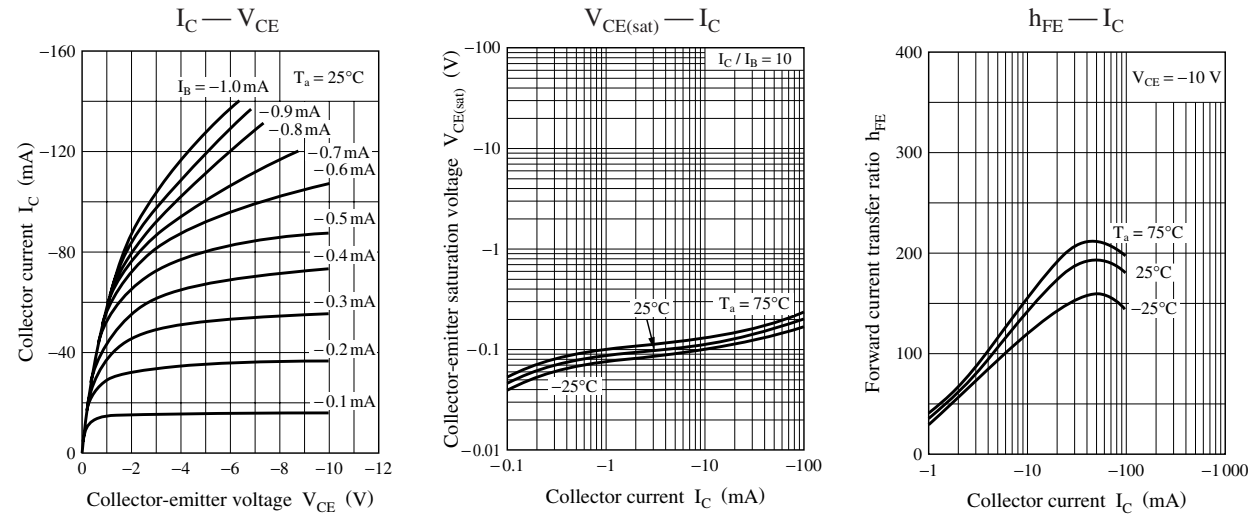
Characteristics charts of UNR1110

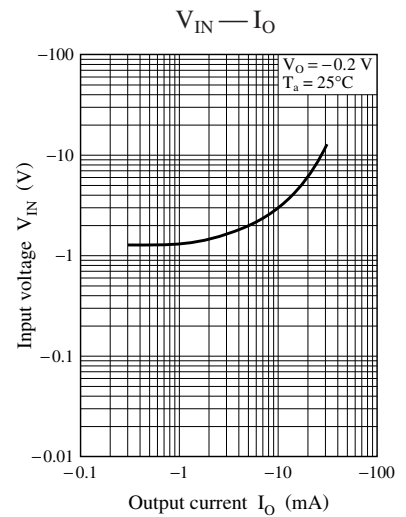
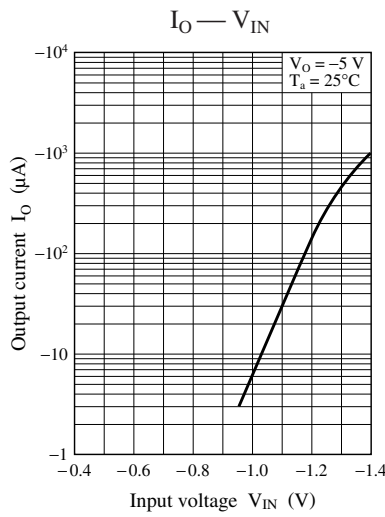
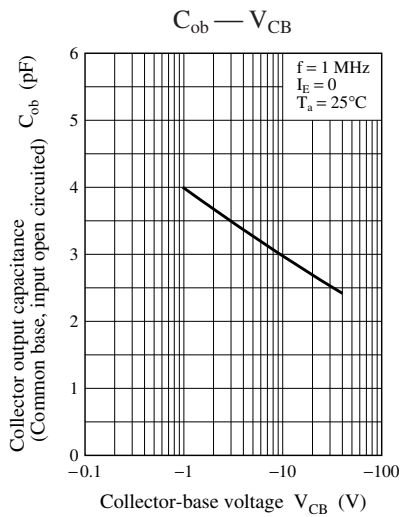


Characteristics charts of UNR1111

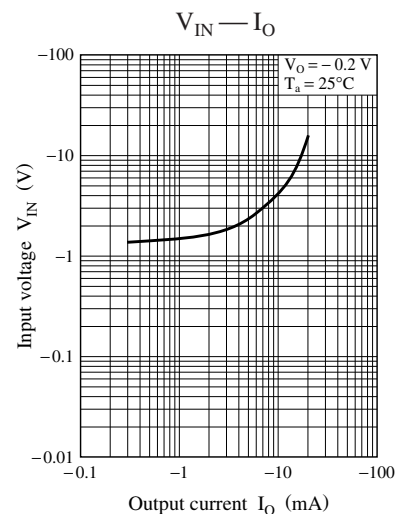
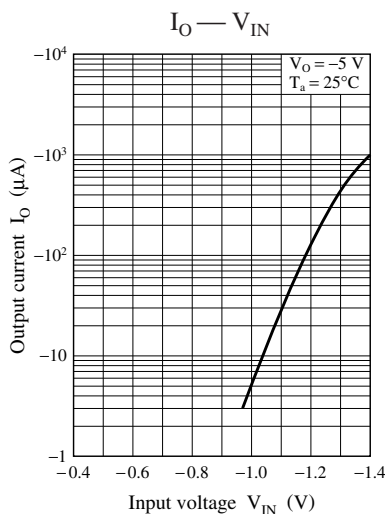
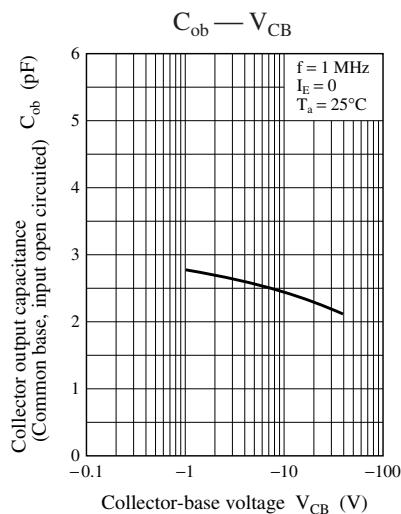
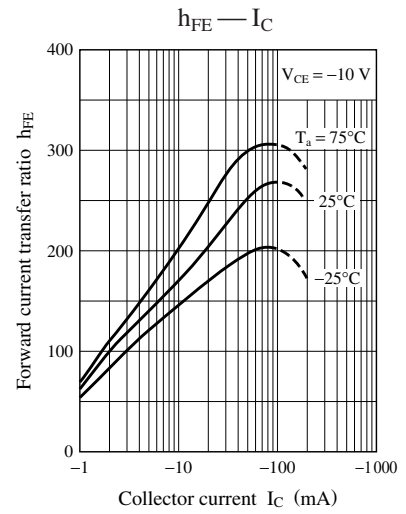
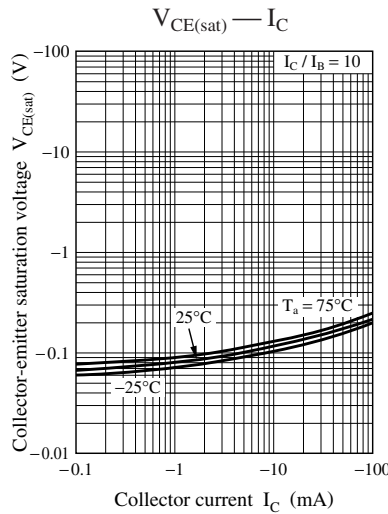
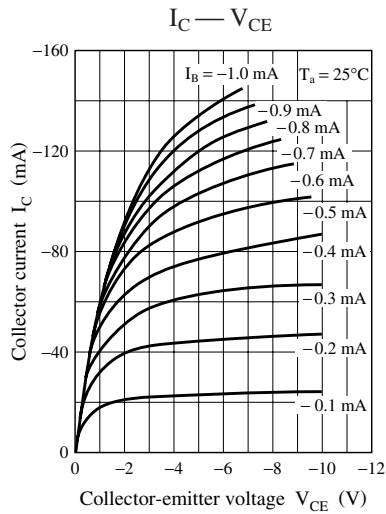


Characteristics charts of UNR1112

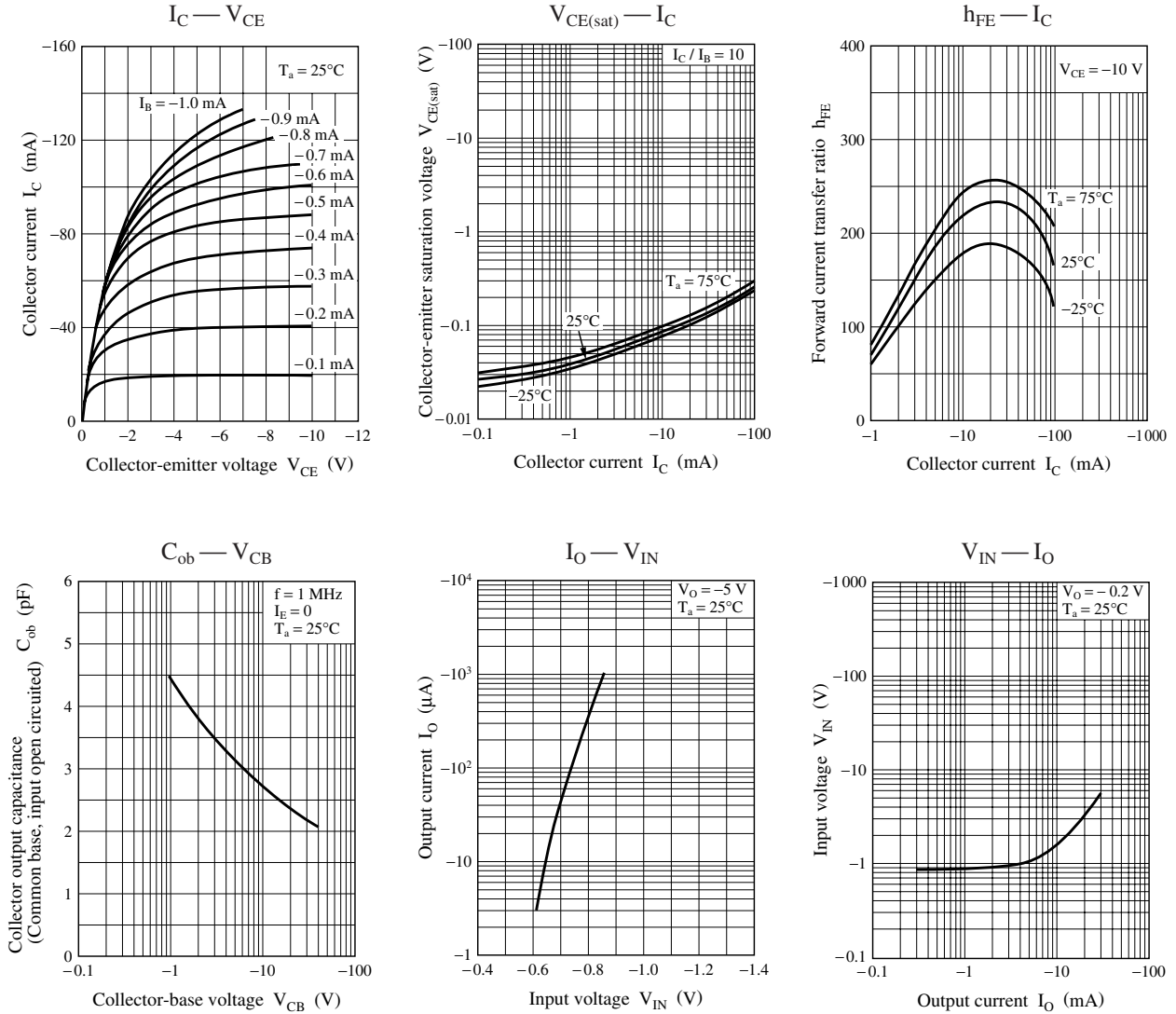




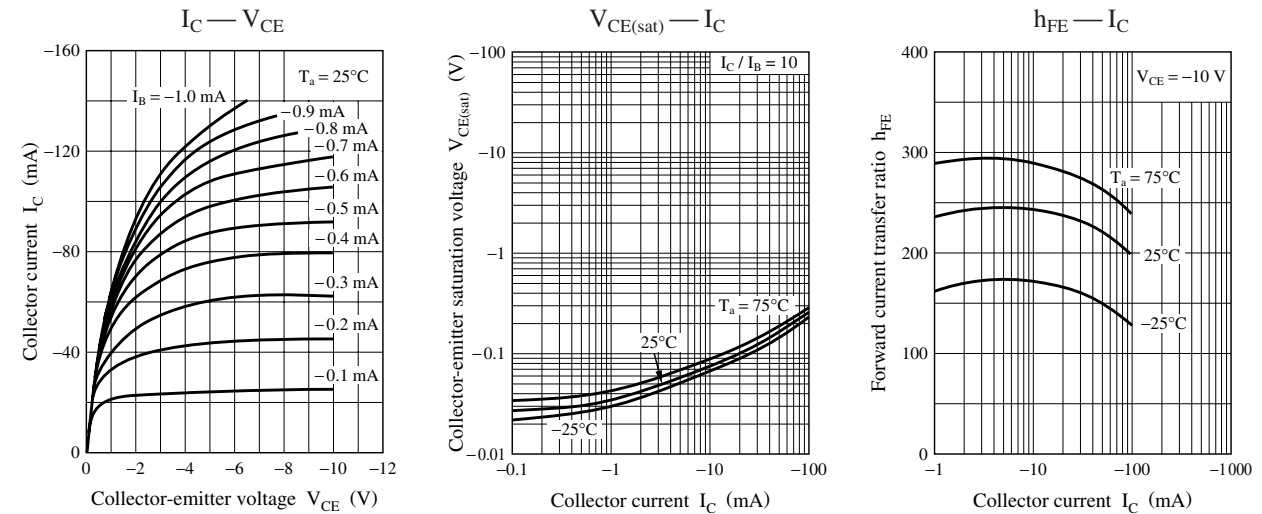
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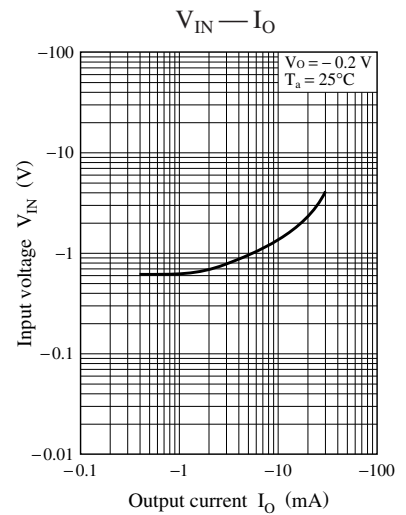
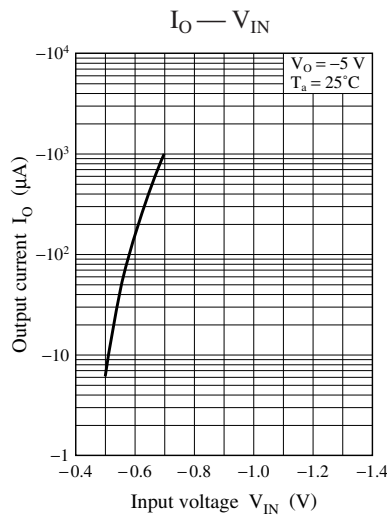
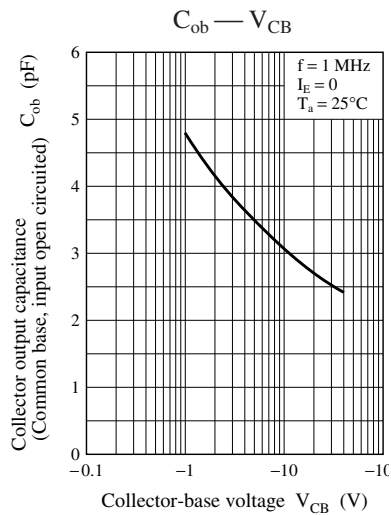


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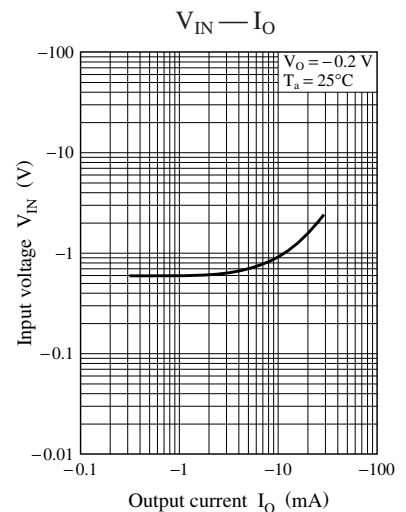
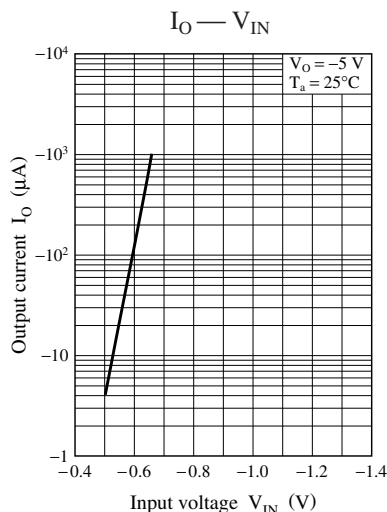
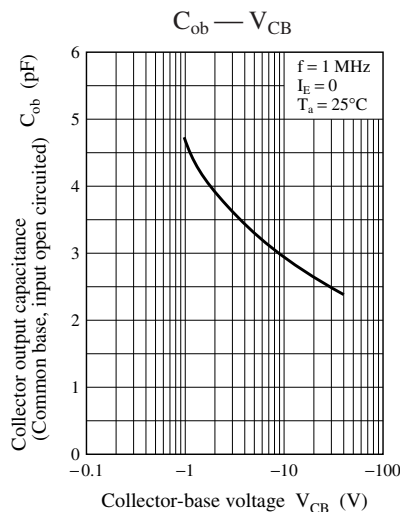
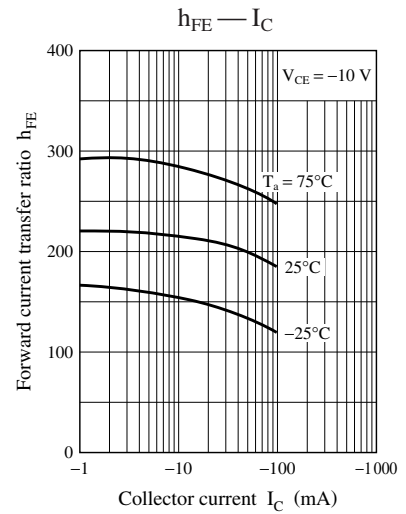
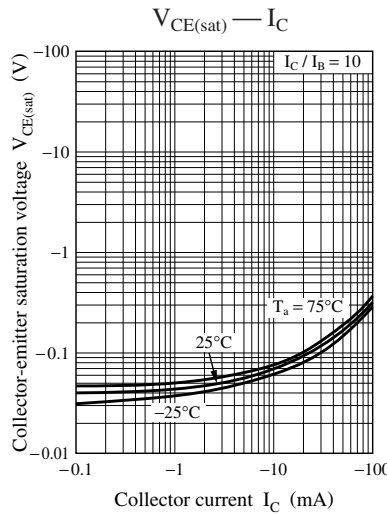
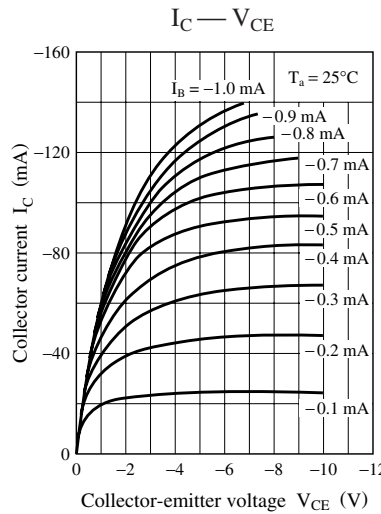


Characteristics charts of UNR1115

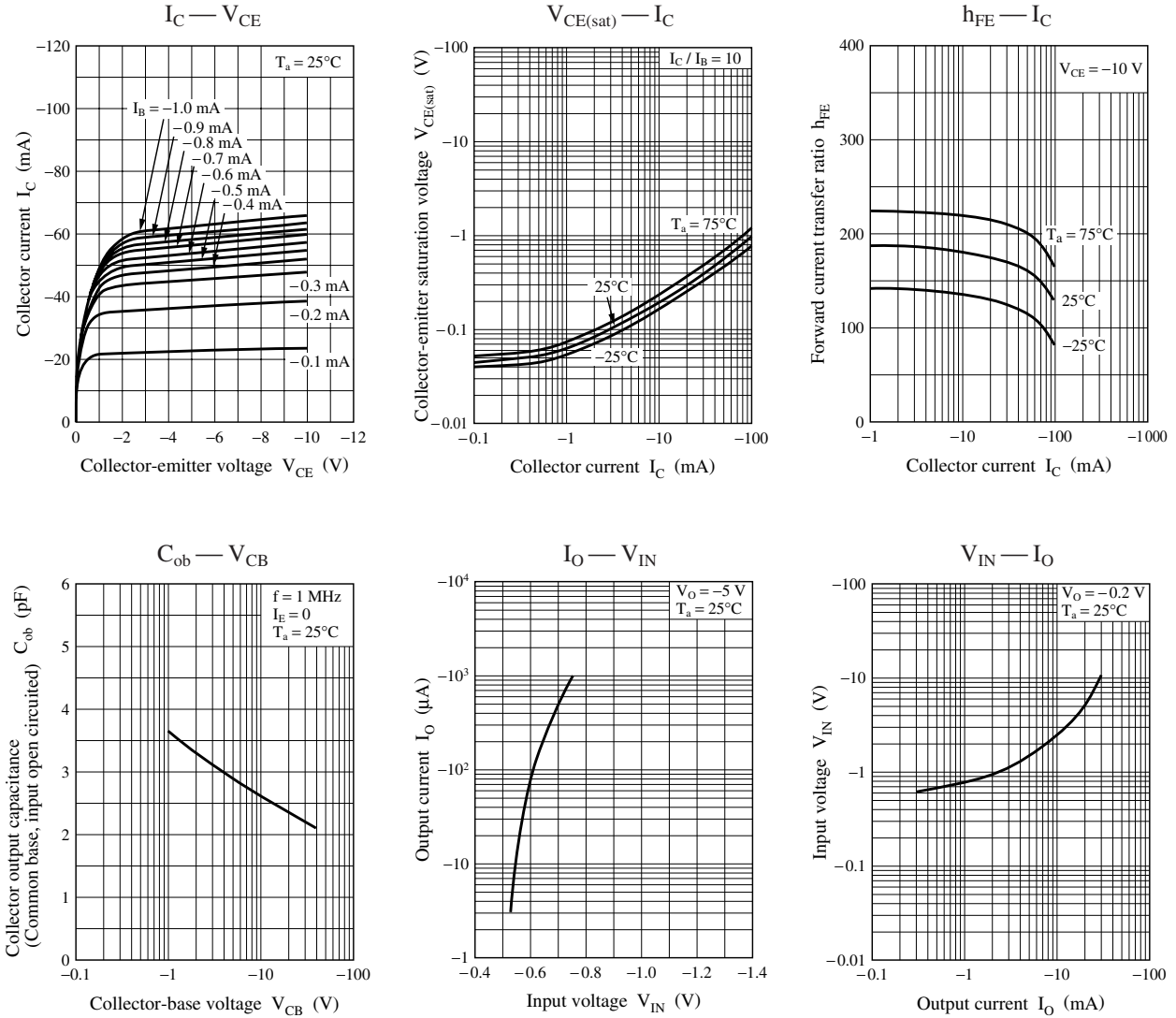




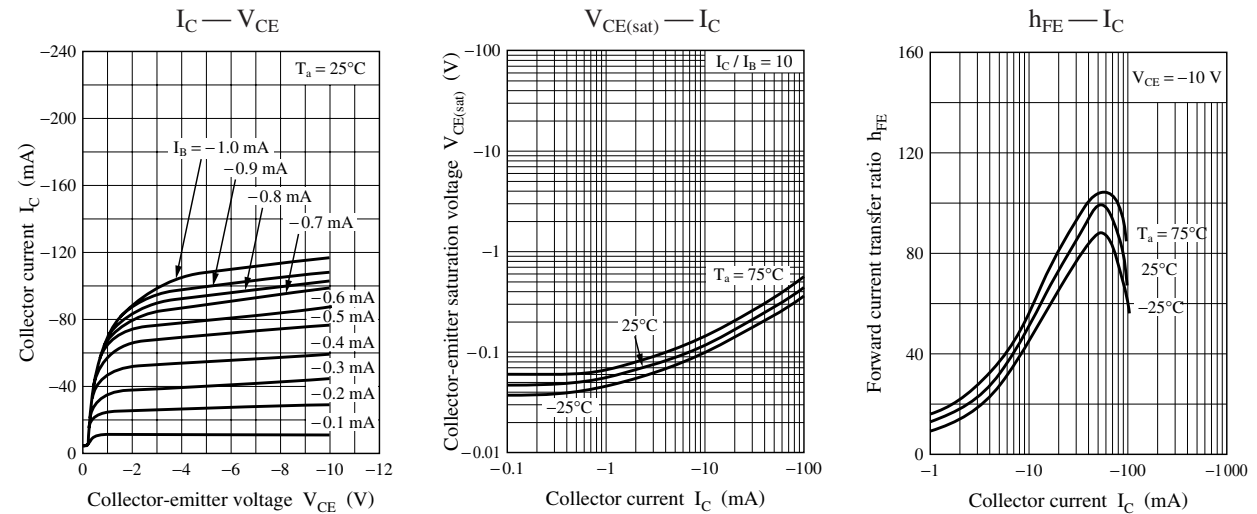
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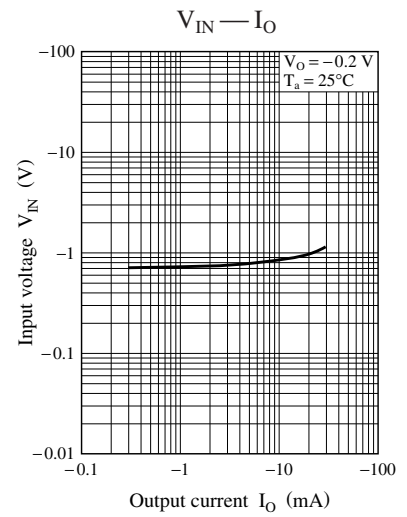
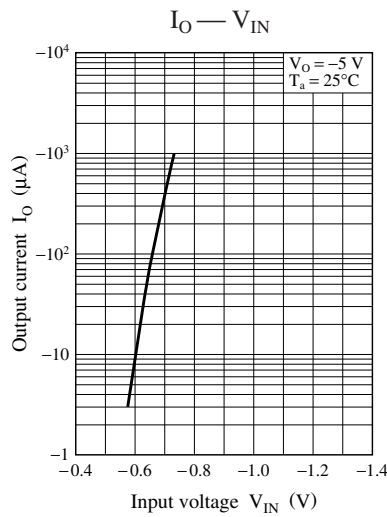
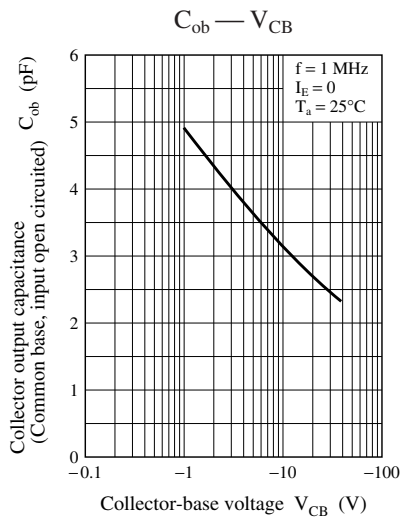


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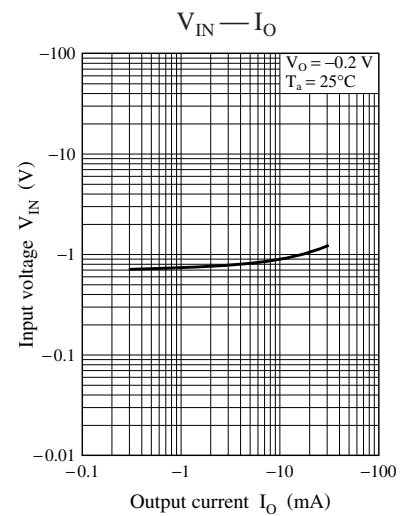
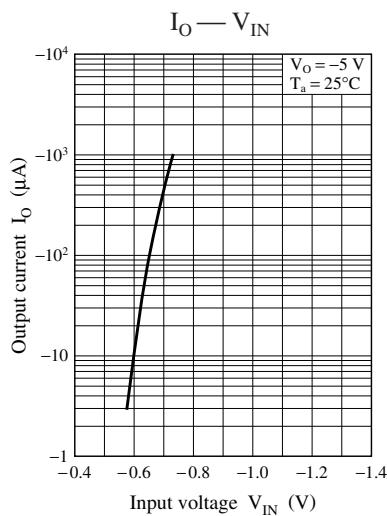
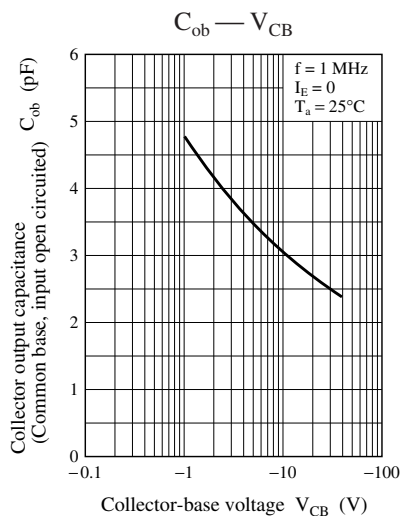
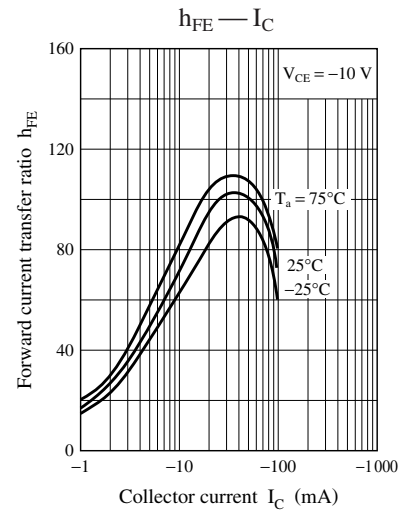
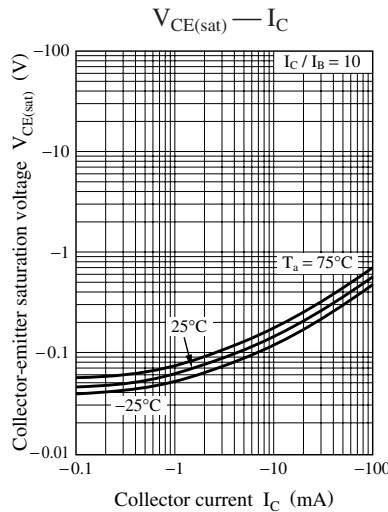
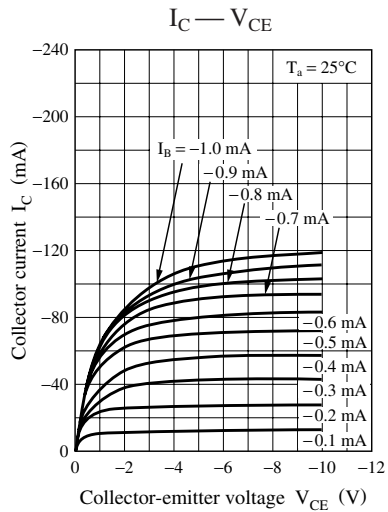


Characteristics charts of UNR1118

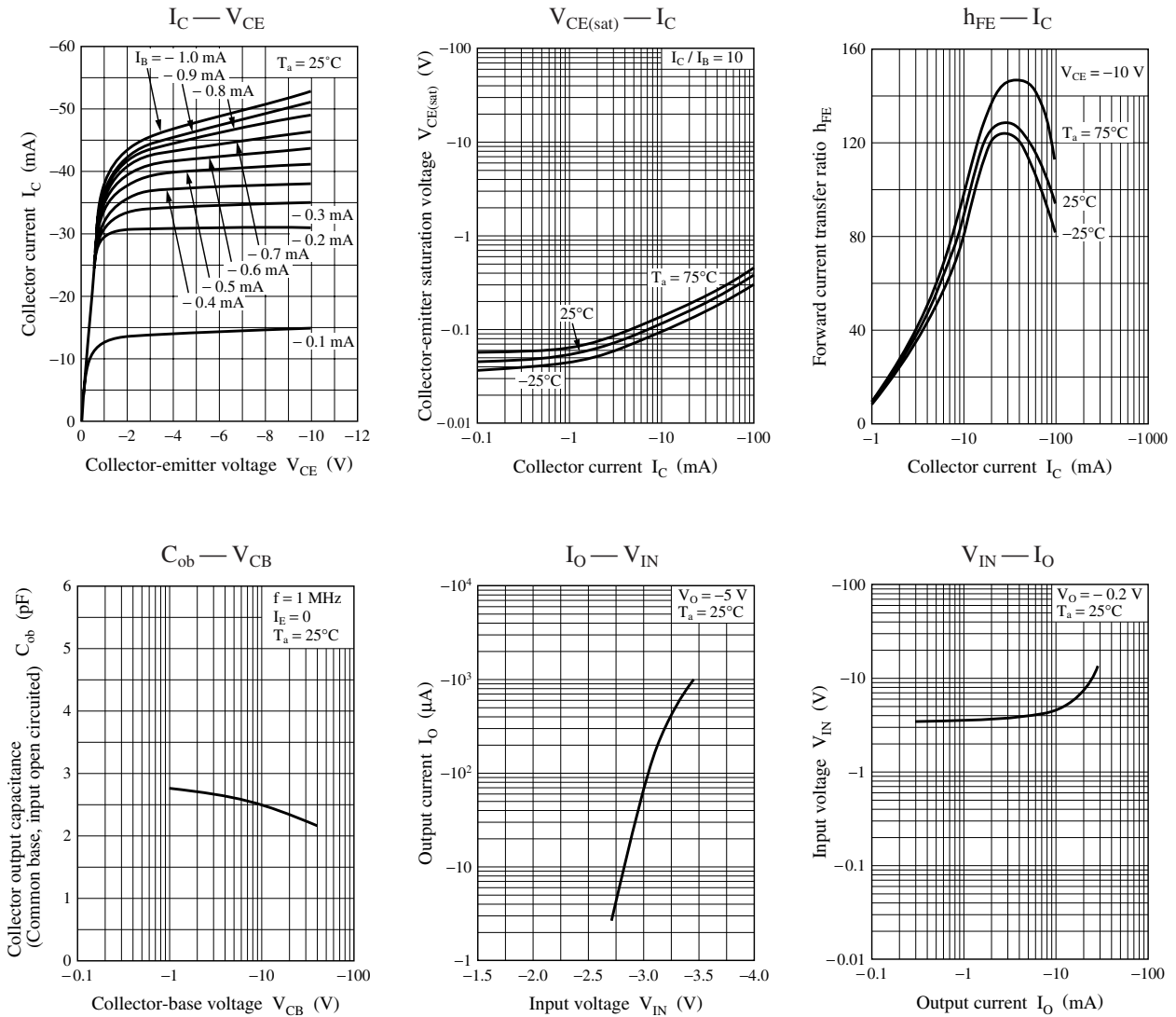




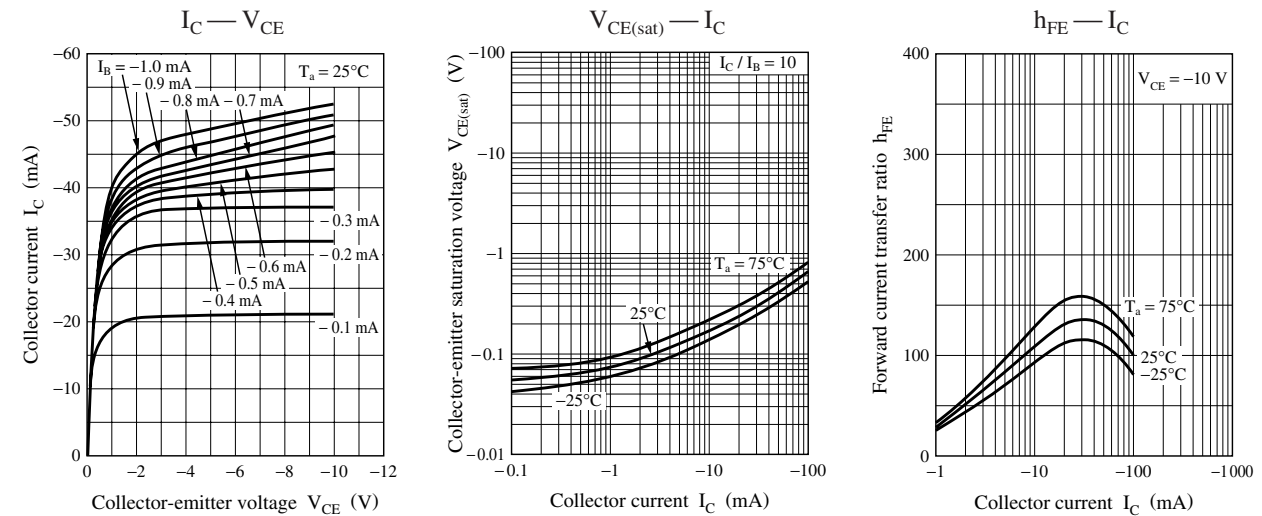
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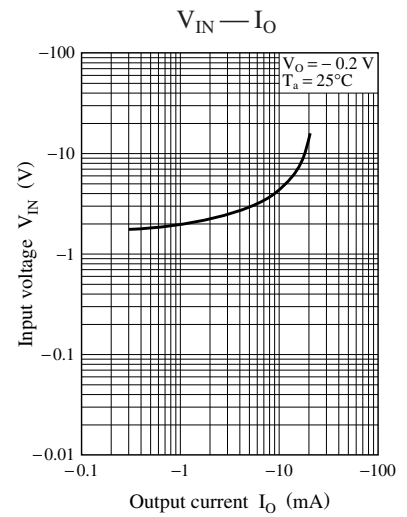
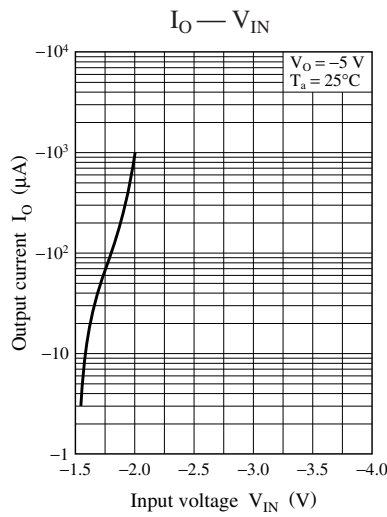
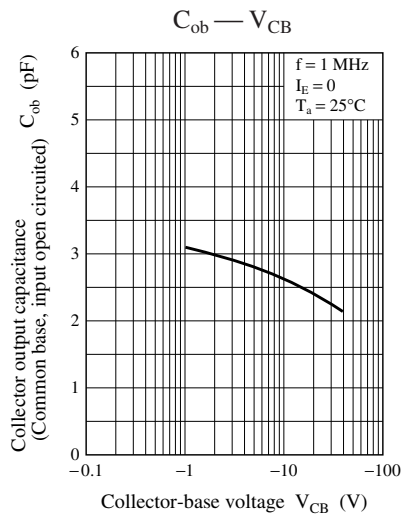


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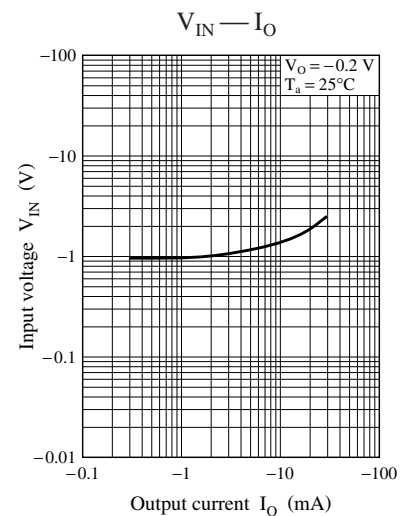
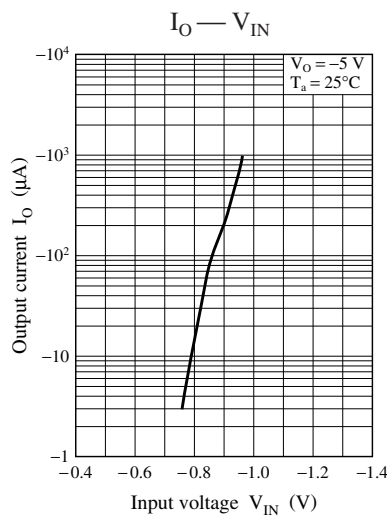
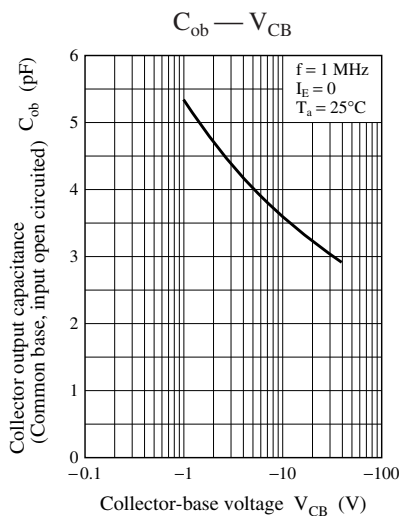
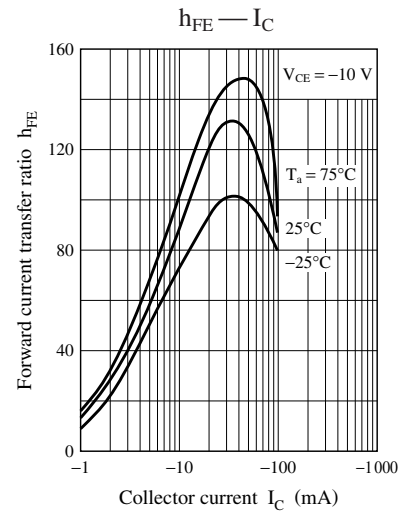
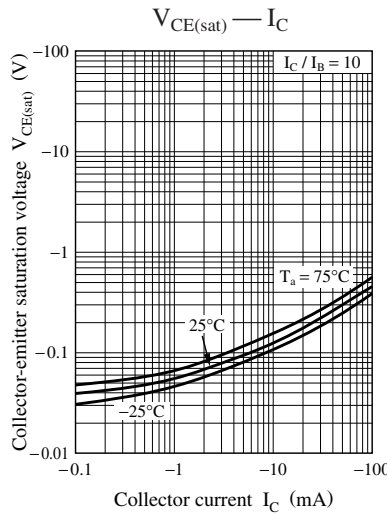
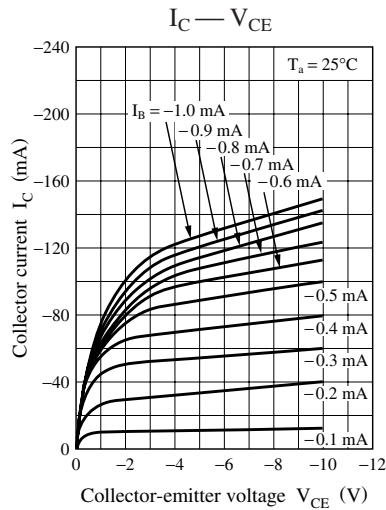


Characteristics charts of UNR111E

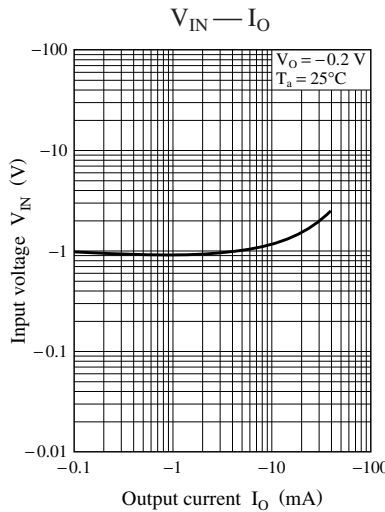
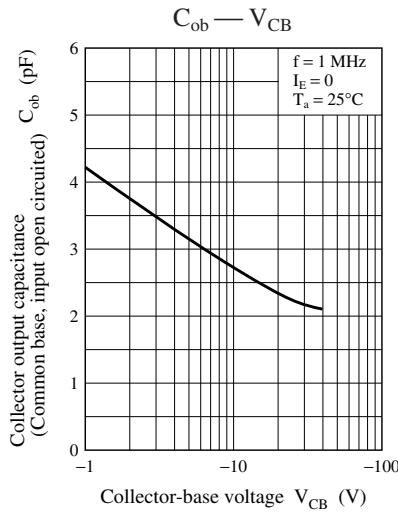
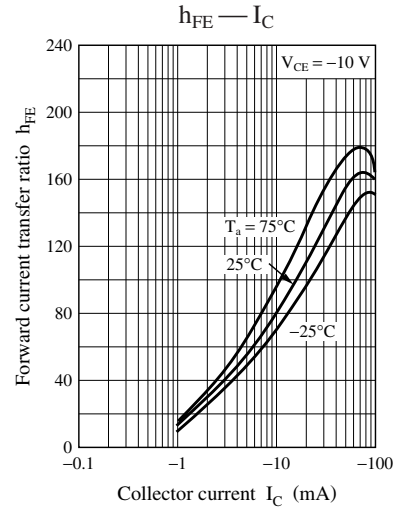
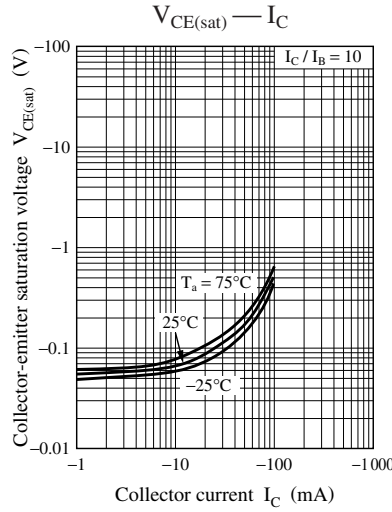
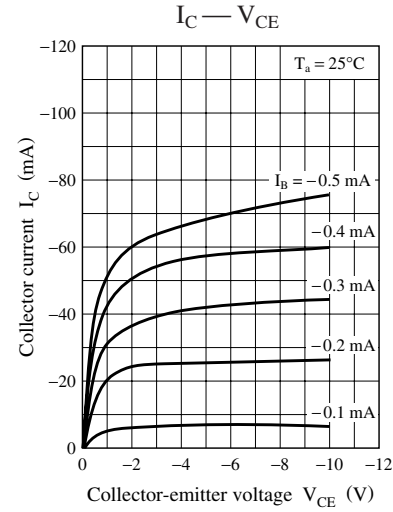




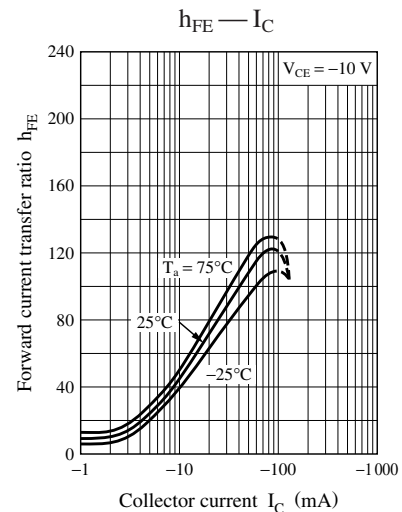
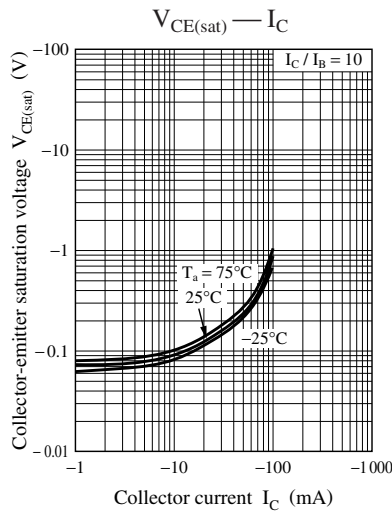
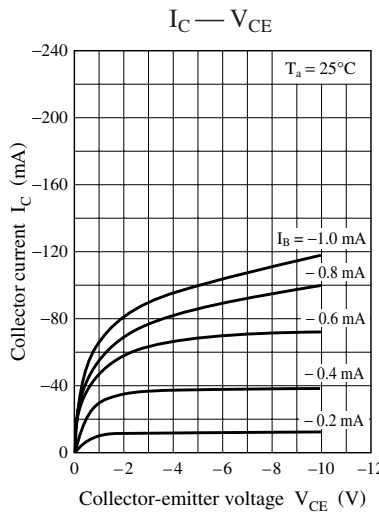
Characteristics charts of UNR111F

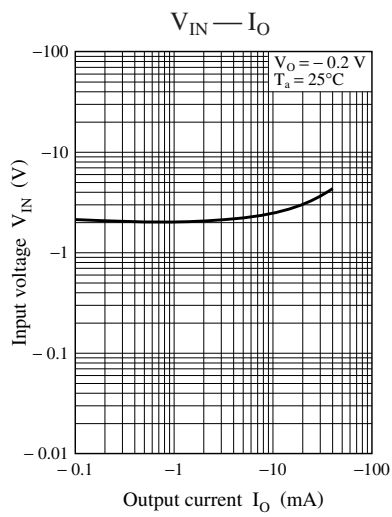
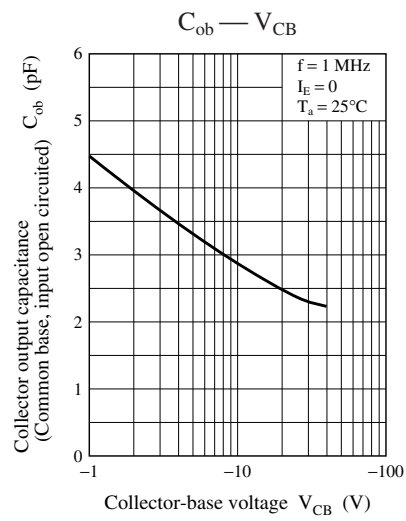


Characteristics charts of UNR111H



Characteristics charts of UNR111L





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