

# UNR111x Series (UN111x Series)

Silicon PNP epitaxial planar transistor

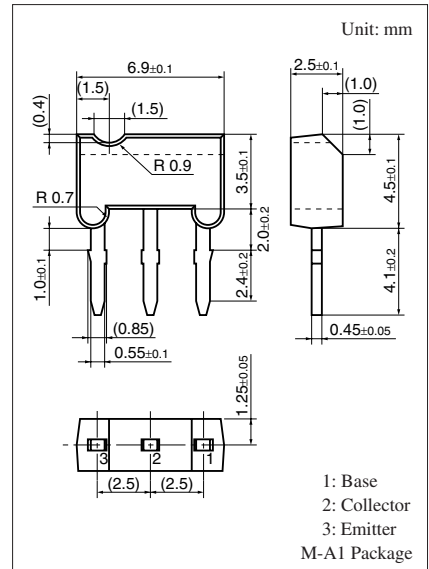
For digital circuits

### ■ Features

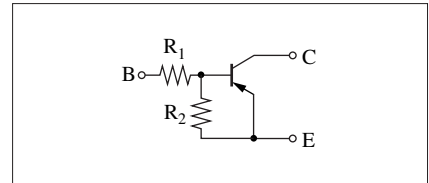
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- M type package allowing easy automatic and manual insertion as well as stand-alone fixing to the printed circuit board.

### ■ Resistance by Part Number

	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR1110 (UN1110)	47 kΩ	—
• UNR1111 (UN1111)	10 kΩ	10 kΩ
• UNR1112 (UN1112)	22 kΩ	22 kΩ
• UNR1113 (UN1113)	47 kΩ	47 kΩ
• UNR1114 (UN1114)	10 kΩ	47 kΩ
• UNR1115 (UN1115)	10 kΩ	—
• UNR1116 (UN1116)	4.7 kΩ	—
• UNR1117 (UN1117)	22 kΩ	—
• UNR1118 (UN1118)	0.51 kΩ	5.1 kΩ
• UNR1119 (UN1119)	1 kΩ	10 kΩ
• UNR111D (UN111D)	47 kΩ	10 kΩ
• UNR111E (UN111E)	47 kΩ	22 kΩ
• UNR111F (UN111F)	4.7 kΩ	10 kΩ
• UNR111H (UN111H)	2.2 kΩ	10 kΩ
• UNR111L (UN111L)	4.7 kΩ	4.7 kΩ



### Internal Connection



### ■ Absolute Maximum Ratings T<sub>a</sub> = 25°C

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V <sub>CBO</sub>	-50	V
Collector-emitter voltage (Base open)	V <sub>CEO</sub>	-50	V
Collector current	I <sub>C</sub>	-100	mA
Total power dissipation	P <sub>T</sub>	400	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

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

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

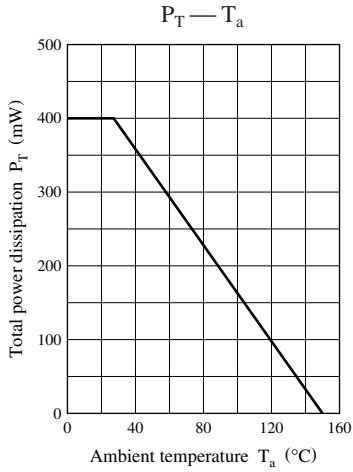
Parameter		Symbol	Conditions	Min	Typ	Max	Unit	
Collector-base voltage (Emitter open)		$V_{CBO}$	$I_C = -10 \mu\text{A}, I_E = 0$	-50			V	
Collector-emitter voltage (Base open)		$V_{CEO}$	$I_C = -2 \text{ mA}, I_B = 0$	-50			V	
Collector-base cutoff current (Emitter open)		$I_{CBO}$	$V_{CB} = -50 \text{ V}, I_E = 0$			-0.1	$\mu\text{A}$	
Collector-emitter cutoff current (Base open)		$I_{CEO}$	$V_{CE} = -50 \text{ V}, I_B = 0$			-0.5	$\mu\text{A}$	
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%	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.

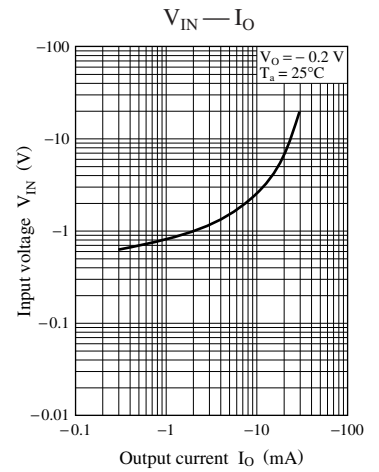
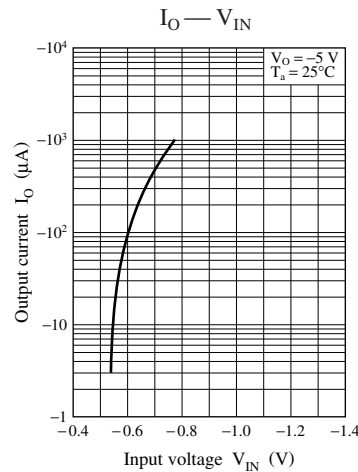
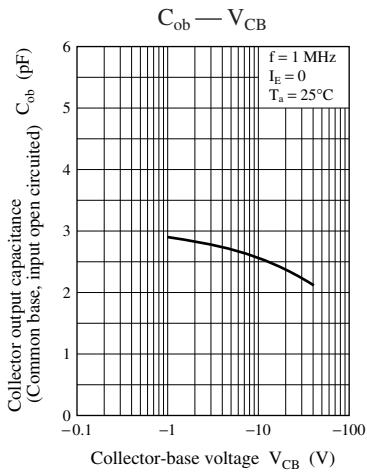
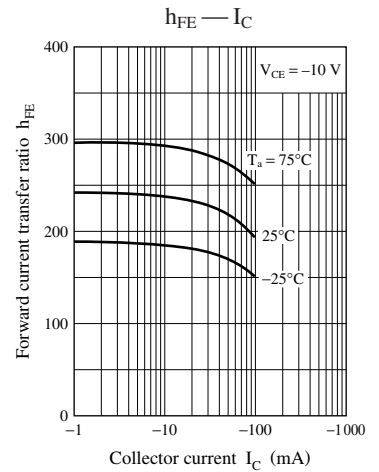
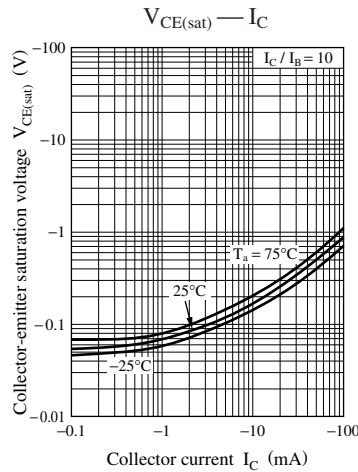
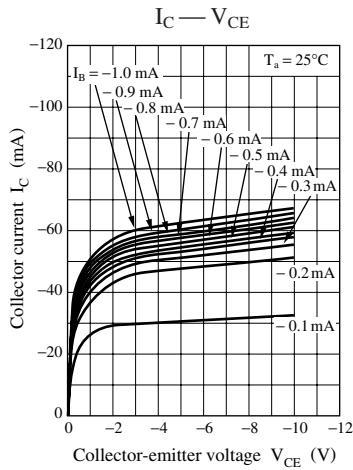
2. \*: Rank classification (UNR1110/1115/1116/1117)

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

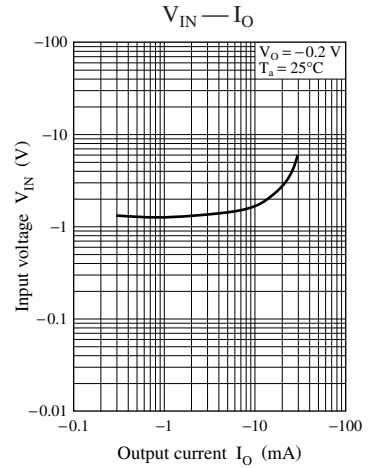
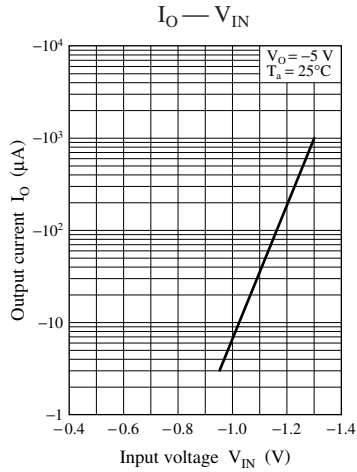
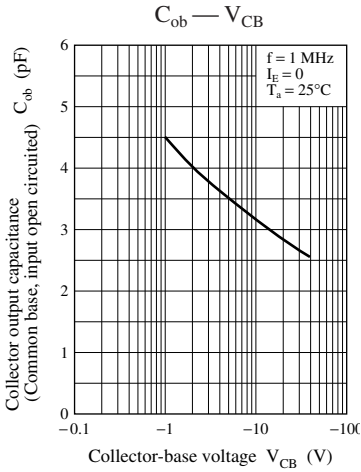
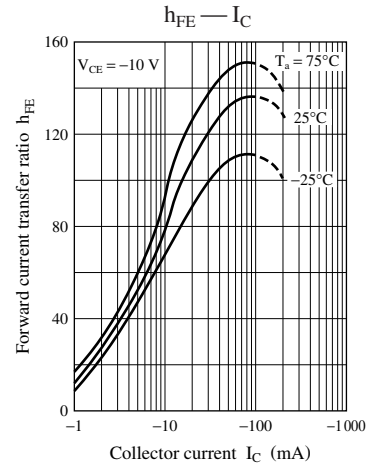
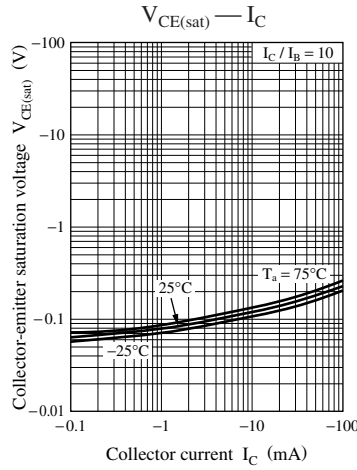
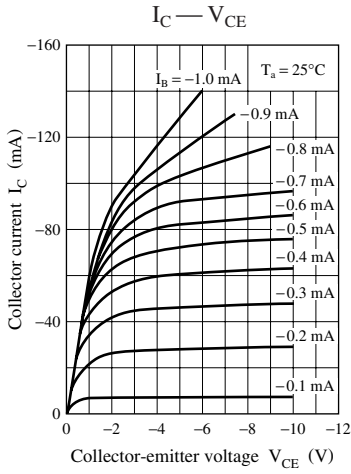
Common characteristics chart



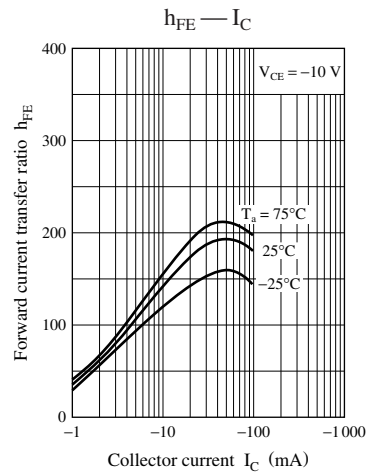
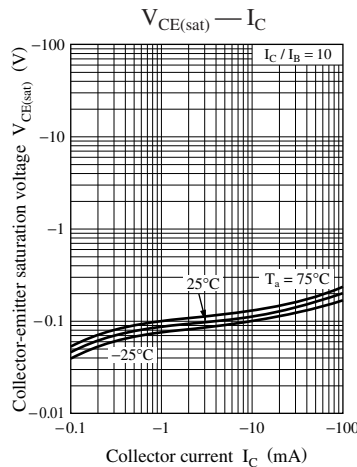
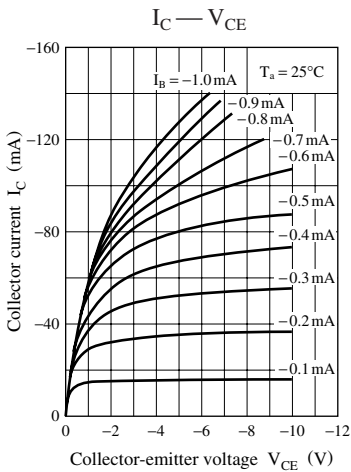
Characteristics charts of UNR1110

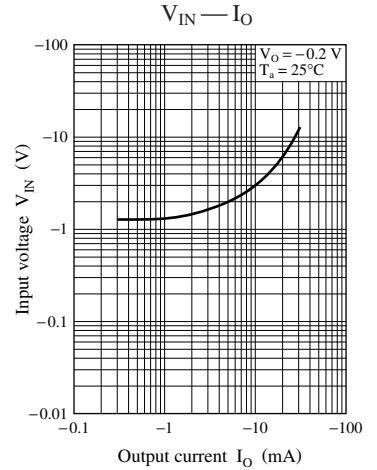
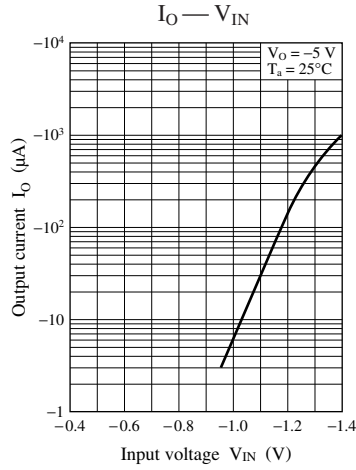
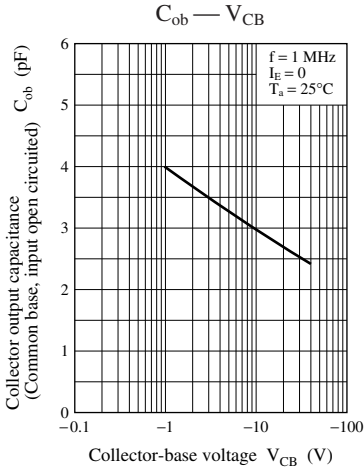


Characteristics charts of UNR1111

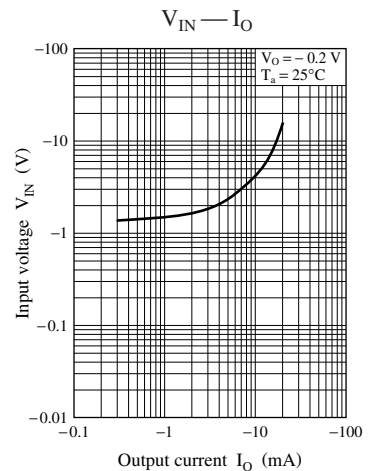
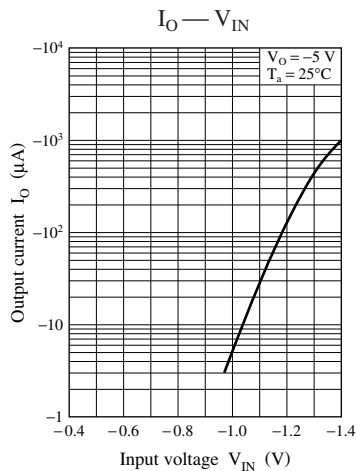
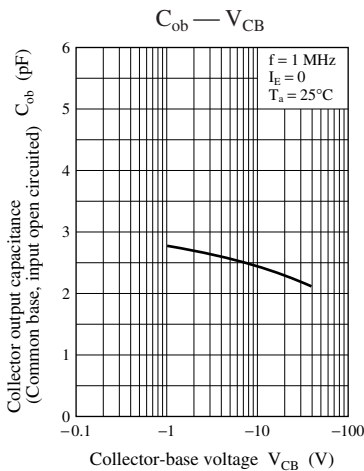
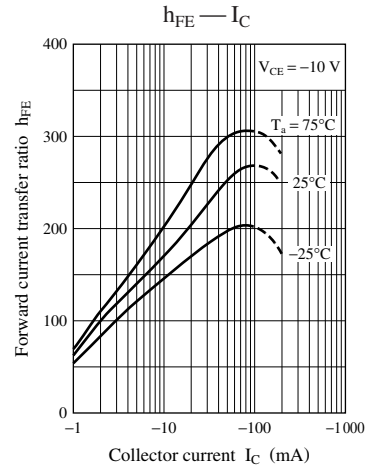
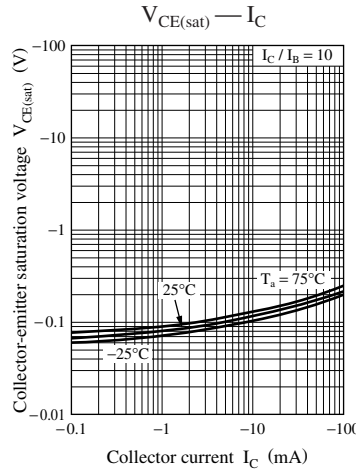
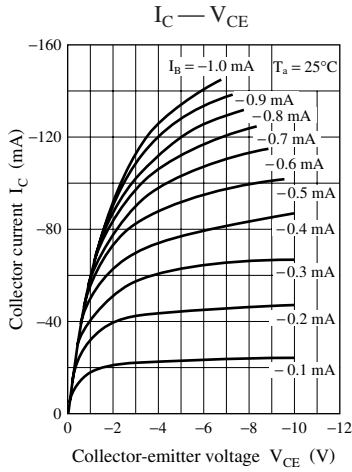


Characteristics charts of UNR1112

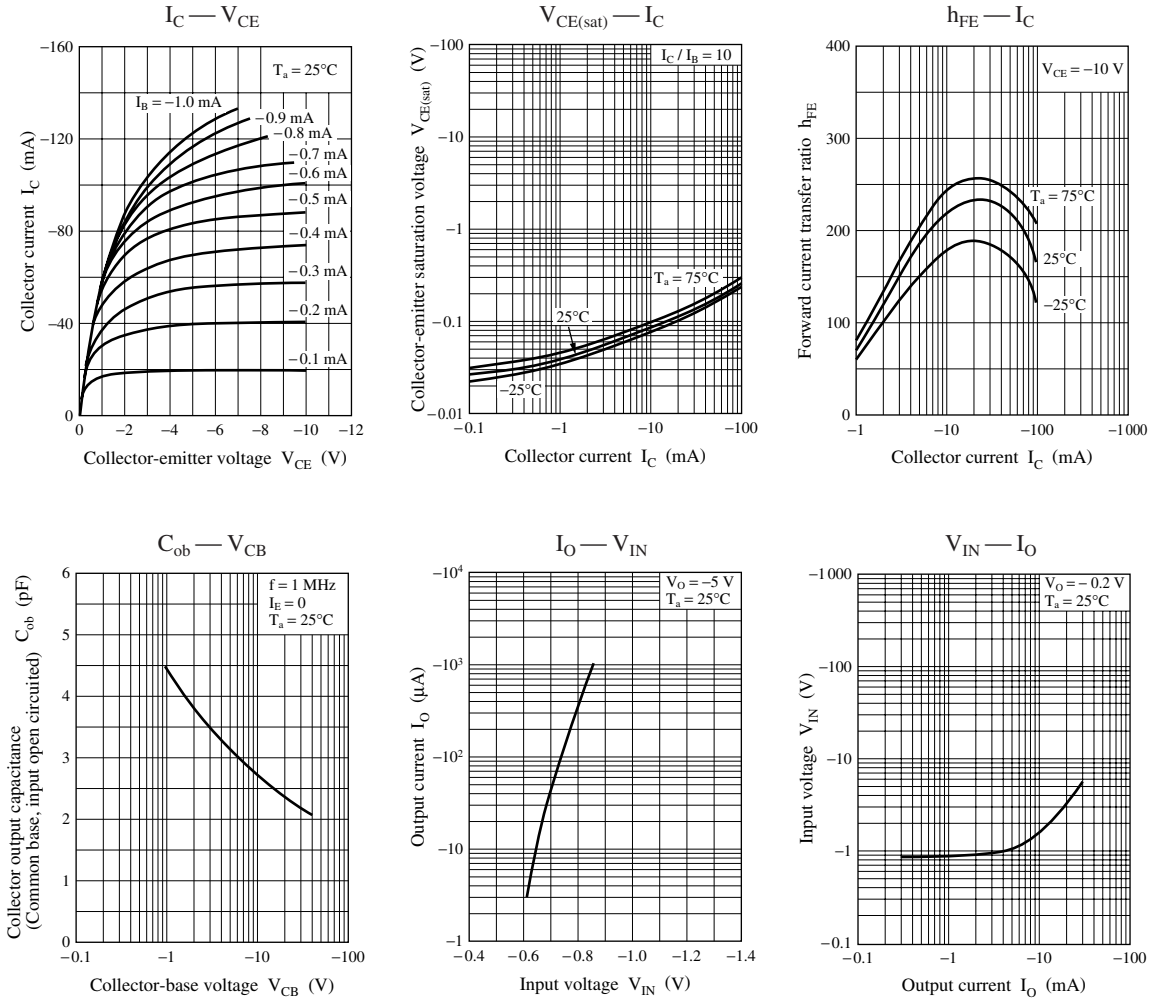




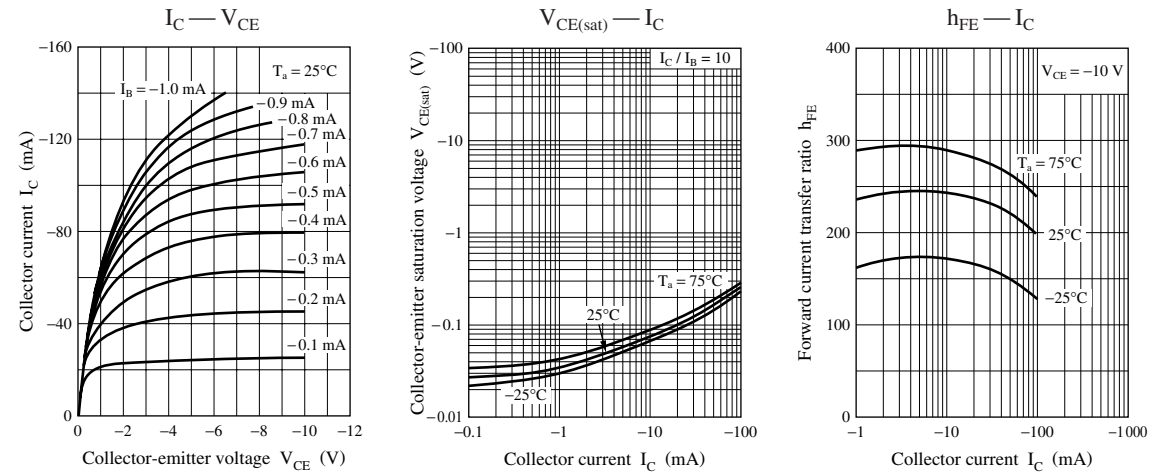
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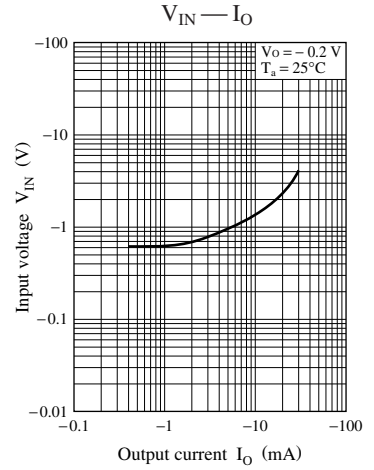
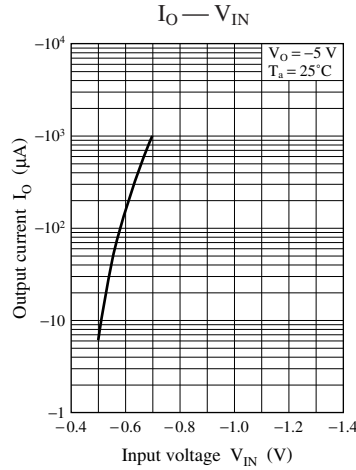
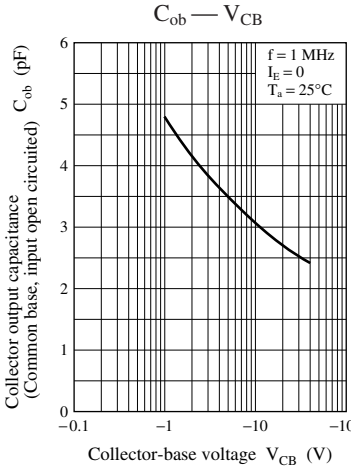


Characteristics charts of UNR1114

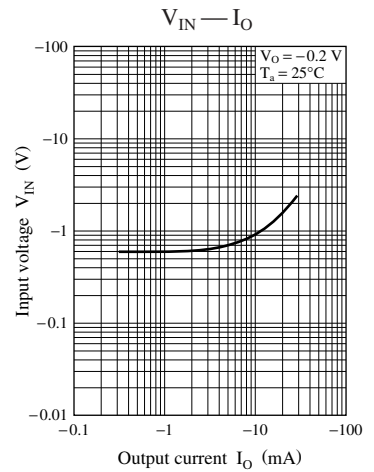
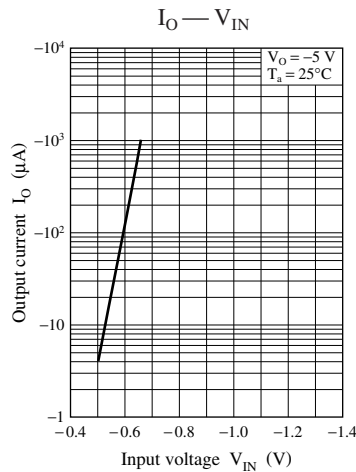
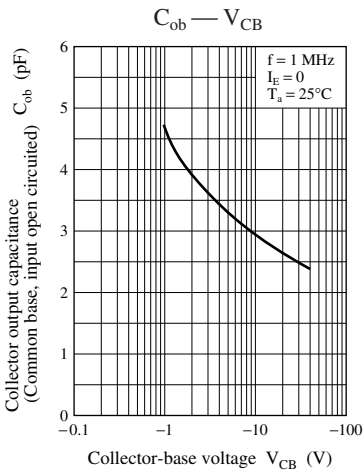
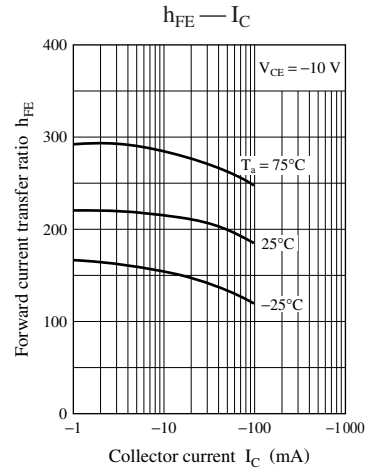
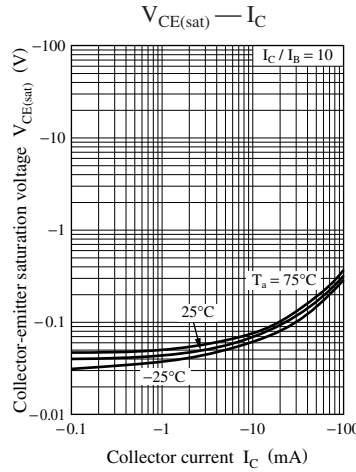
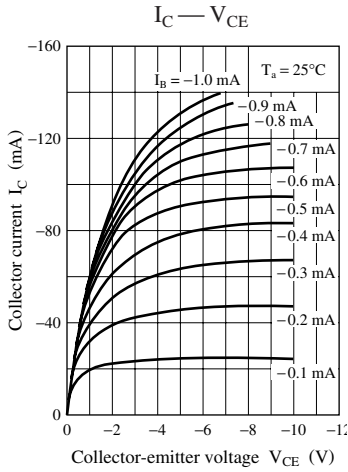


Characteristics charts of UNR1115

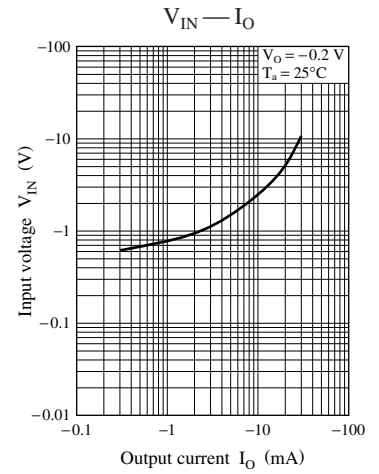
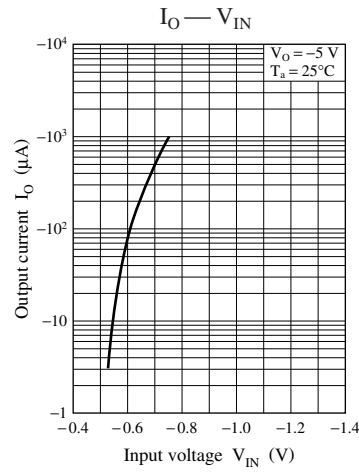
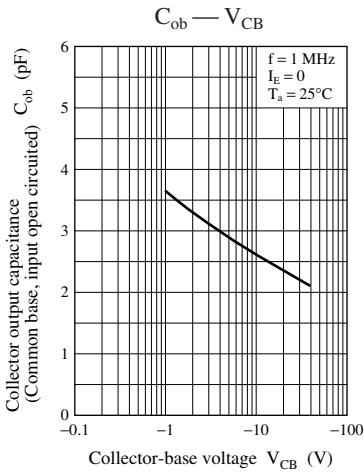
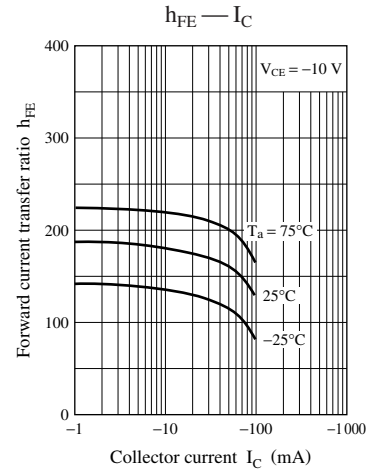
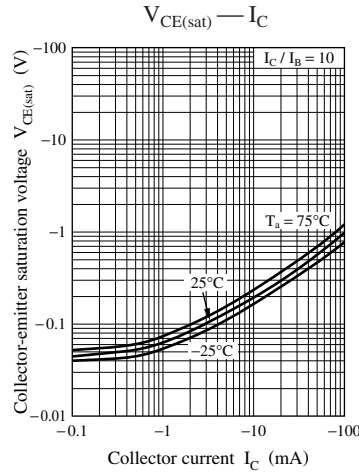
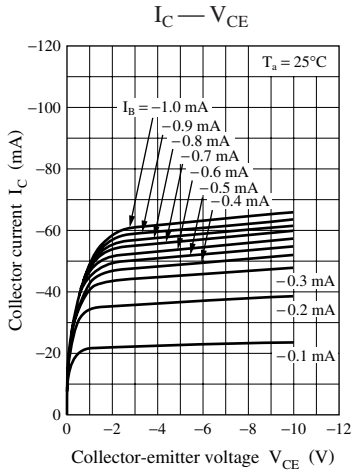




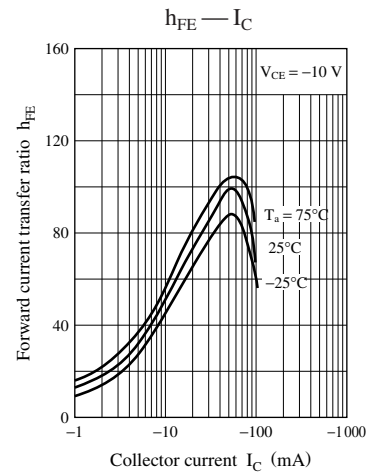
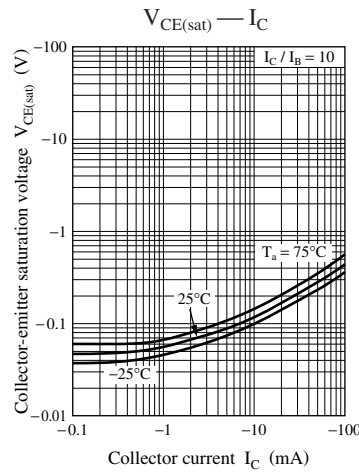
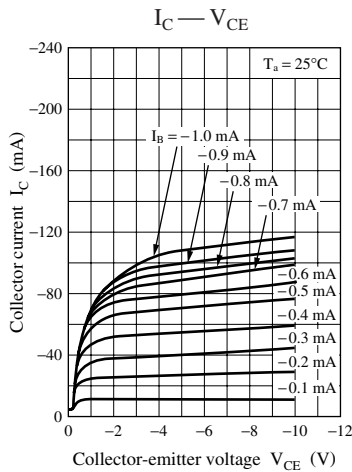
Characteristics charts of UNR1116



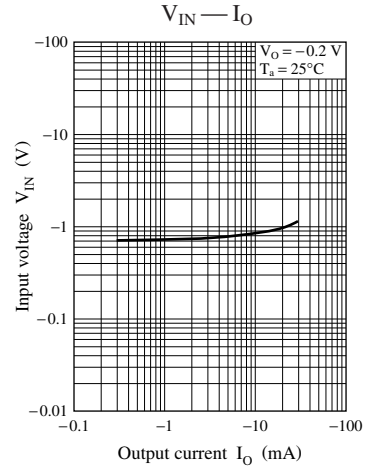
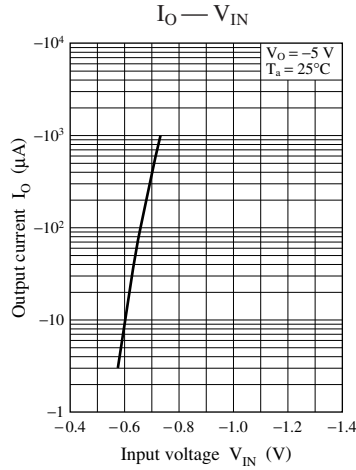
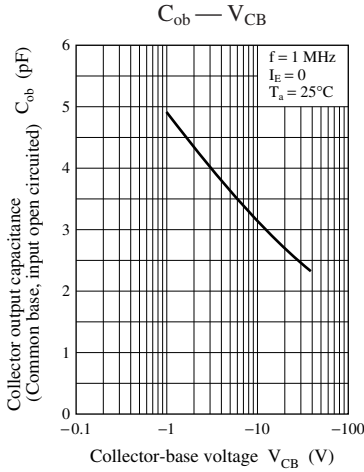
Characteristics charts of UNR1117



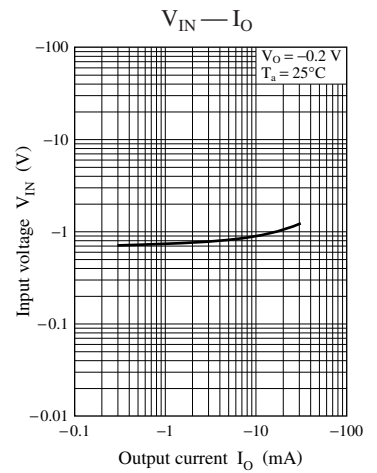
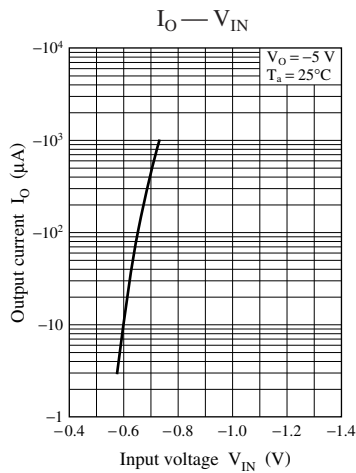
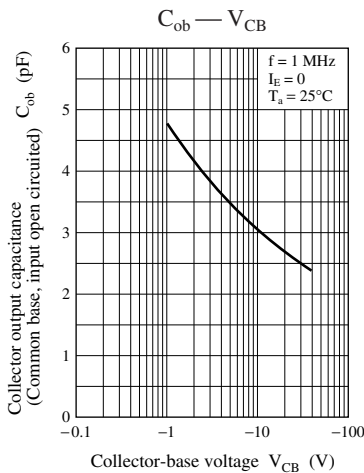
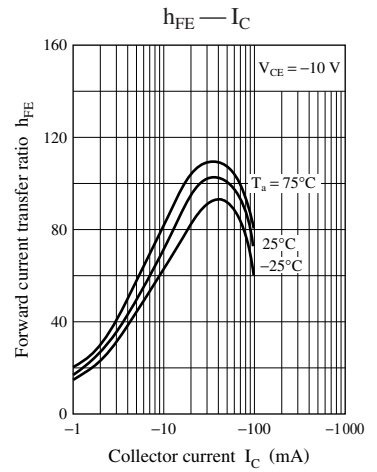
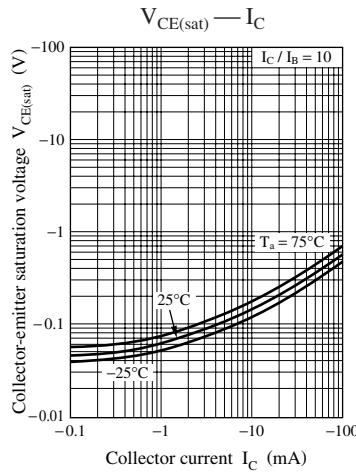
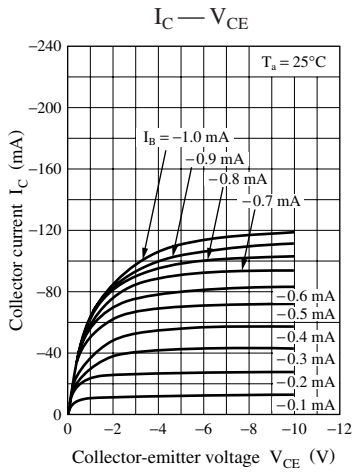
Characteristics charts of UNR1118



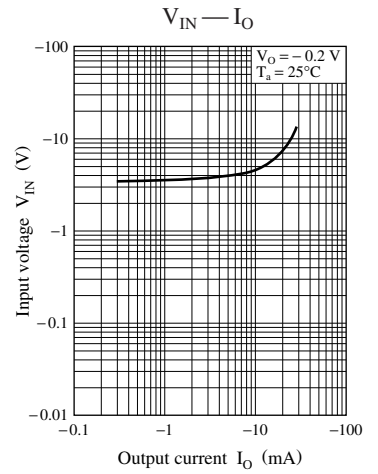
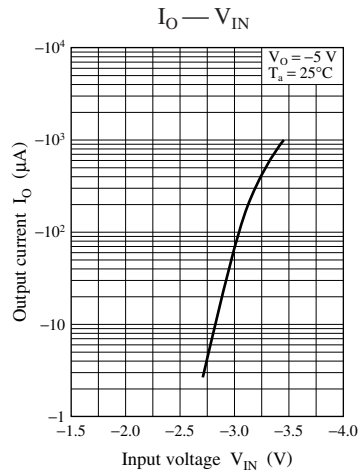
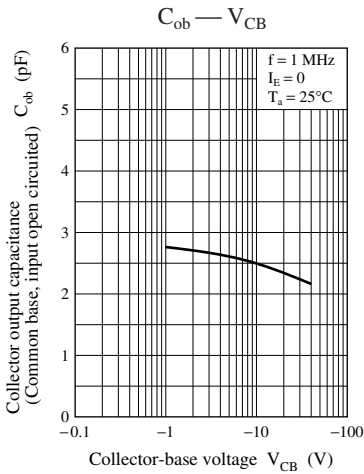
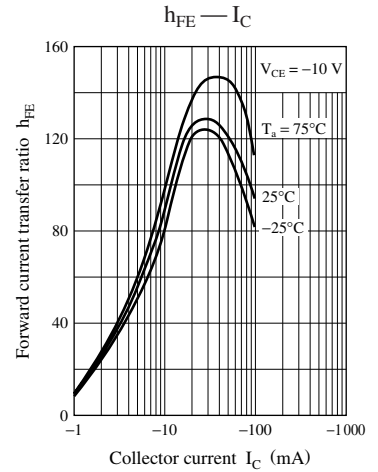
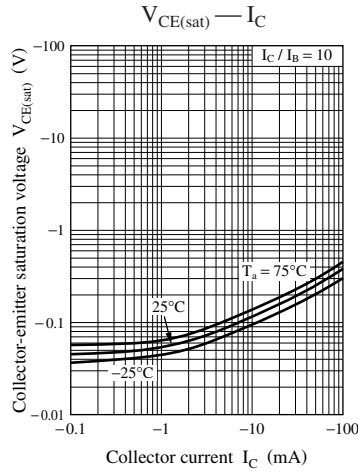
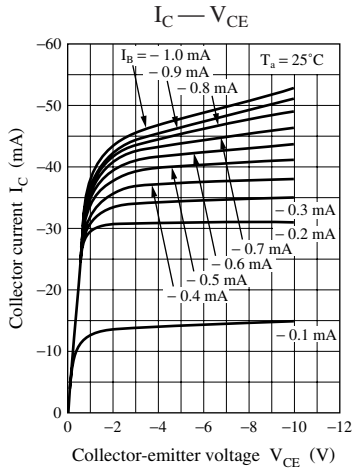




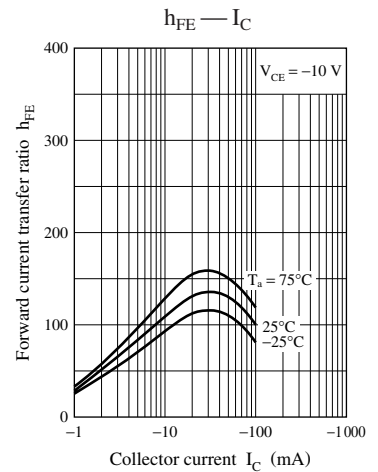
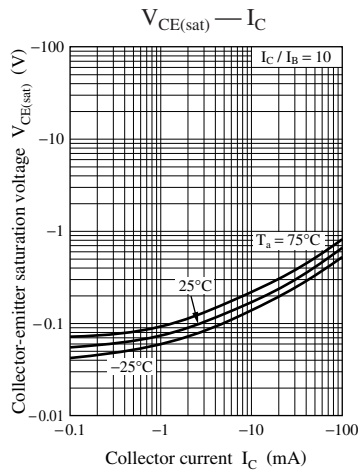
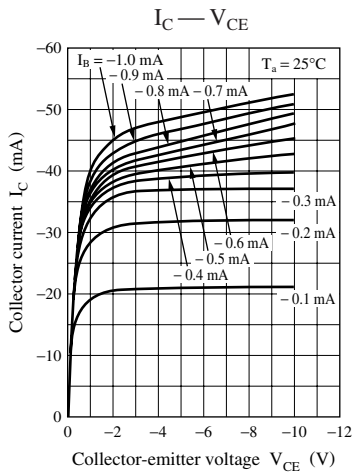
Characteristics charts of UNR1119

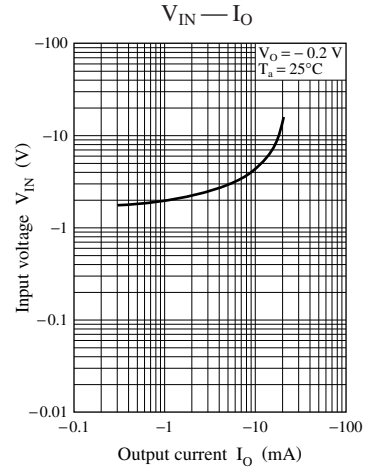
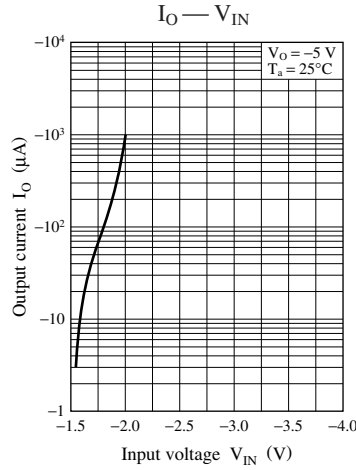
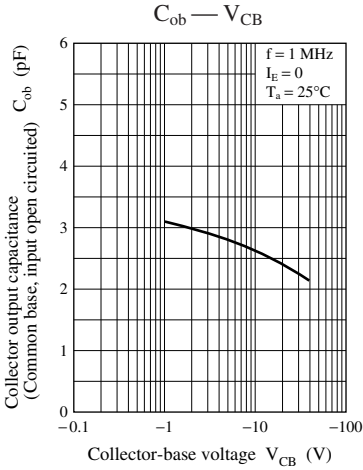


Characteristics charts of UNR111D

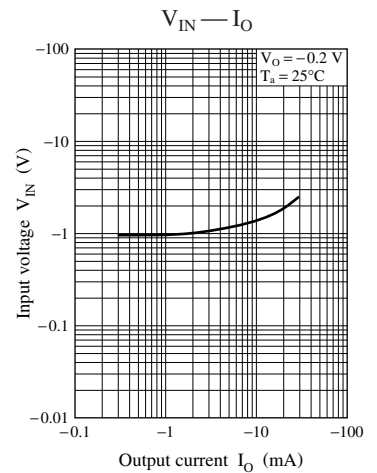
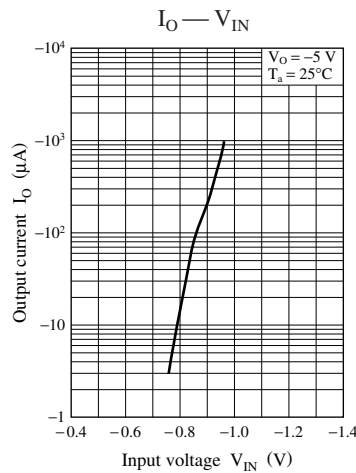
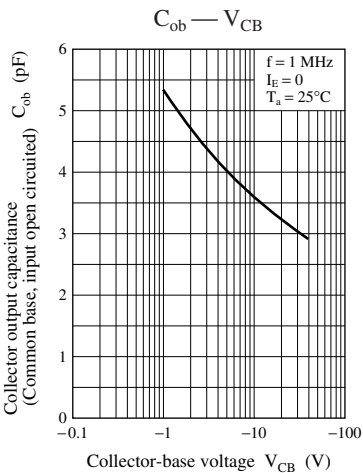
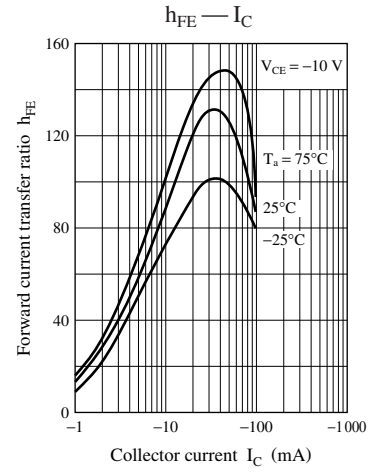
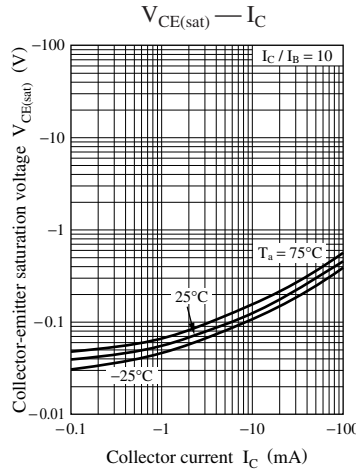
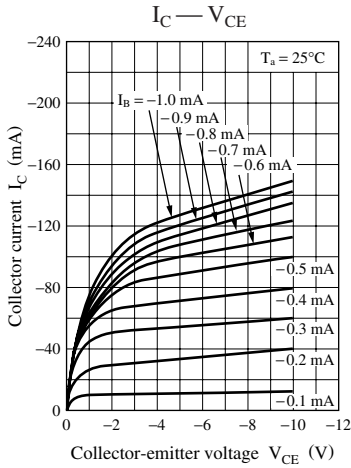


Characteristics charts of UNR111E

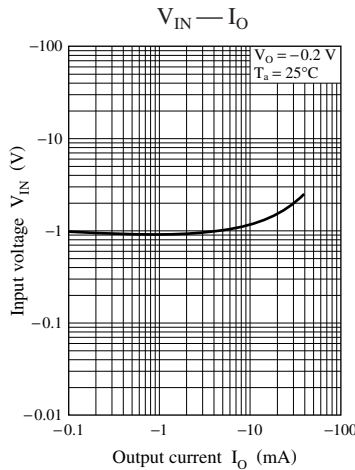
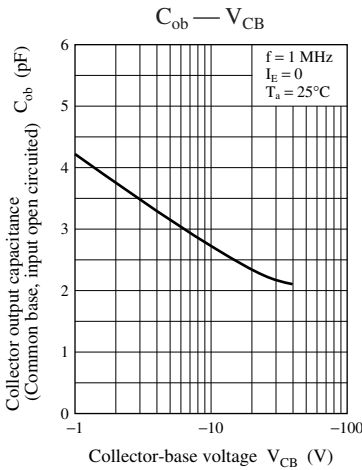
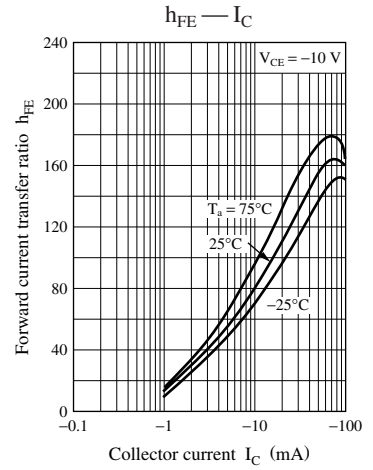
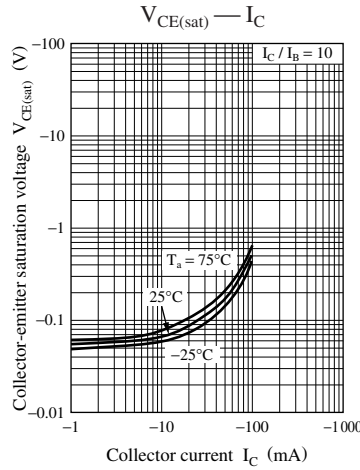
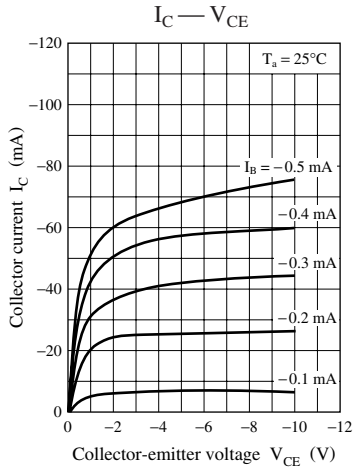




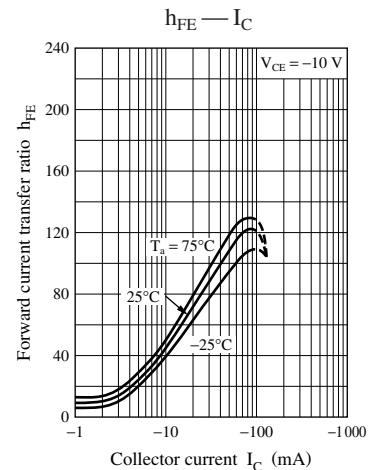
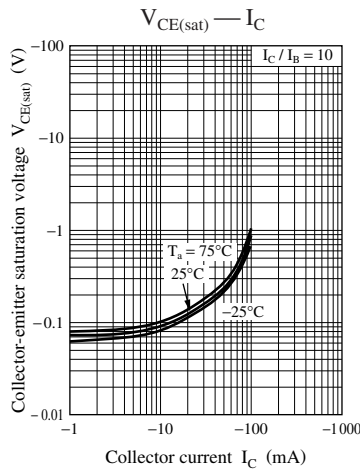
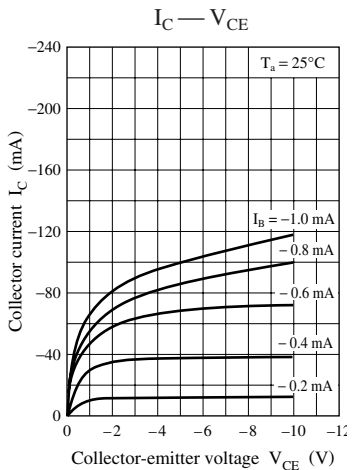
Characteristics charts of UNR111F

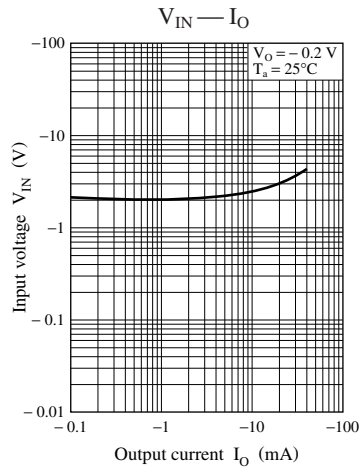
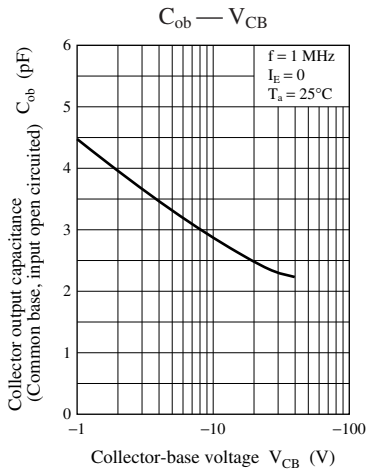


Characteristics charts of UNR111H



Characteristics charts of UNR111L





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