

# UNR411x Series (UN411x Series)

## Silicon PNP epitaxial planar type

For digital circuits

### ■ Features

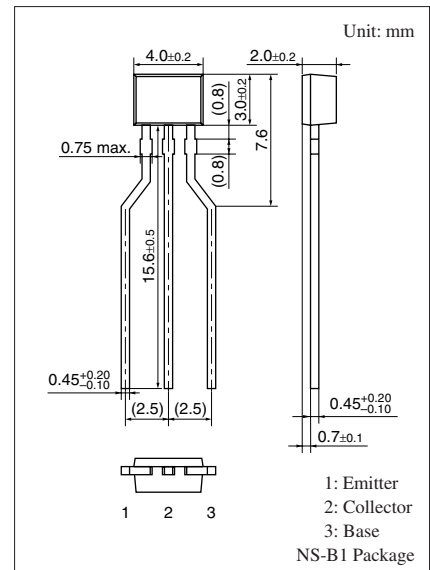
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- New S type package, allowing supply with the radial taping

### ■ Resistance by Part Number

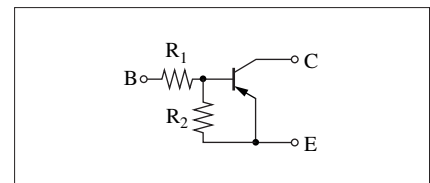
	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR4110 (UN4110)	47 kΩ	—
• UNR4111 (UN4111)	10 kΩ	10 kΩ
• UNR4112 (UN4112)	22 kΩ	22 kΩ
• UNR4113 (UN4113)	47 kΩ	47 kΩ
• UNR4114 (UN4114)	10 kΩ	47 kΩ
• UNR4115 (UN4115)	10 kΩ	—
• UNR4116 (UN4116)	4.7 kΩ	—
• UNR4117 (UN4117)	22 kΩ	—
• UNR4118 (UN4118)	0.51 kΩ	5.1 kΩ
• UNR4119 (UN4119)	1 kΩ	10 kΩ
• UNR411D (UN411D)	47 kΩ	10 kΩ
• UNR411E (UN411E)	47 kΩ	22 kΩ
• UNR411F (UN411F)	4.7 kΩ	10 kΩ
• UNR411H (UN411H)	2.2 kΩ	10 kΩ
• UNR411L (UN411L)	4.7 kΩ	4.7 kΩ
• UNR411M	2.2 kΩ	47 kΩ
• UNR411N	4.7 kΩ	47 kΩ

### ■ 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>	300	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-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	$\mu\text{A}$
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)	UNR4110/4115/4116/4117	$I_{EBO}$	$V_{EB} = -6 \text{ V}, I_C = 0$			-0.01	mA
	UNR4113					-0.1	
	UNR4112/4114/411D/ 411E/411M/411N					-0.2	
	UNR4111					-0.5	
	UNR411F/411H					-1.0	
	UNR4119					-1.5	
	UNR4118/411L					-2.0	
Forward current transfer ratio	UNR4118/411L	$h_{FE}$	$V_{CE} = -10 \text{ V}, I_C = -5 \text{ mA}$	20			—
	UNR4119/411D/411F/411H			30			
	UNR4111			35			
	UNR4112/411E			60			
	UNR4113/4114/411M			80			
	UNR411N			80	400		
	UNR4110*/4115*/4116*/ 4117*			160	460		
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
			$V_{CC} = -5 \text{ V}, V_B = -3.5 \text{ V}, R_L = 1 \text{ k}\Omega$				
			$V_{CC} = -5 \text{ V}, V_B = -10 \text{ V}, R_L = 1 \text{ k}\Omega$				
			$V_{CC} = -5 \text{ V}, V_B = -6 \text{ V}, R_L = 1 \text{ k}\Omega$				
Transition frequency		$f_T$	$V_{CB} = -10 \text{ V}, I_E = 1 \text{ mA}, f = 200 \text{ MHz}$		80		MHz
Input resistance	UNR4118	$R_1$		-30%	0.51	+30%	k $\Omega$
	UNR4119				1.0		
	UNR411H/411M				2.2		
	UNR4116/411F/411L/411N				4.7		
	UNR4111/4114/4115				10		
	UNR4112/4117				22		
	UNR4110/4113/411D/411E				47		

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

2. \*: Rank classification

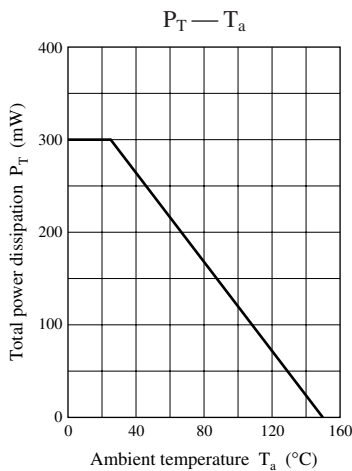
Rank	Q	R	S	No-rank
$h_{FE}$	160 to 260	210 to 340	290 to 460	160 to 460

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

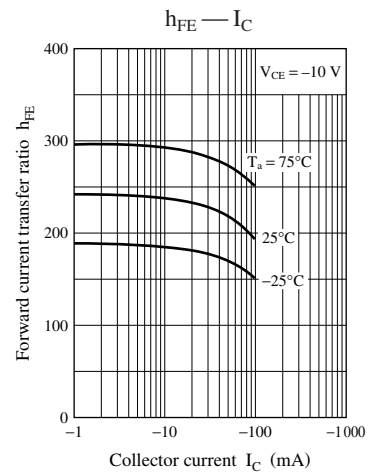
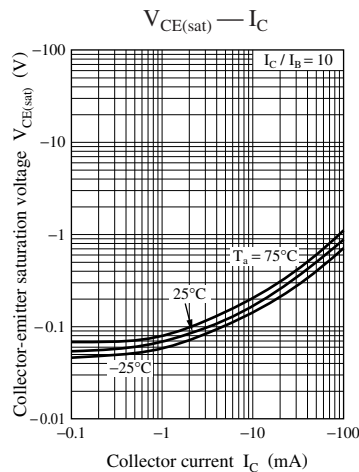
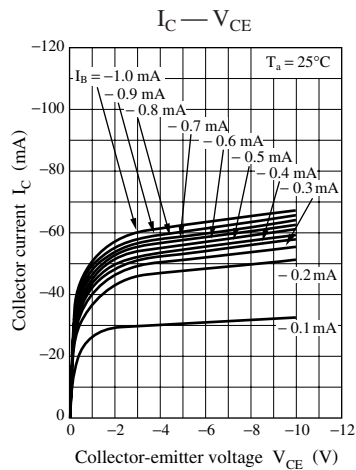
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR411M	$R_1/R_2$		0.047		—
	UNR411N			0.1		
	UNR4118/4119		0.08	0.10	0.12	
	UNR4114		0.17	0.21	0.25	
	UNR411H		0.17	0.22	0.27	
	UNR411F		0.37	0.47	0.57	
	UNR4111/4112/4113/411L		0.8	1.0	1.2	
	UNR411E		1.70	2.14	2.60	
UNR411D	3.7	4.7	5.7			

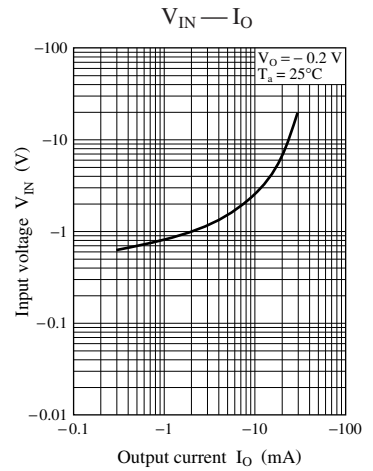
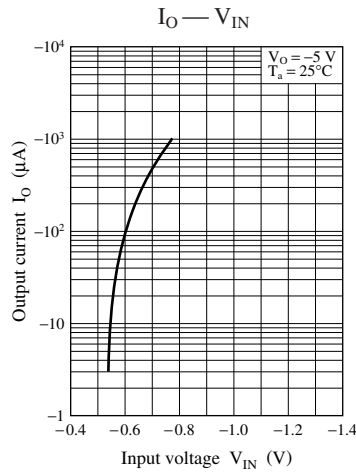
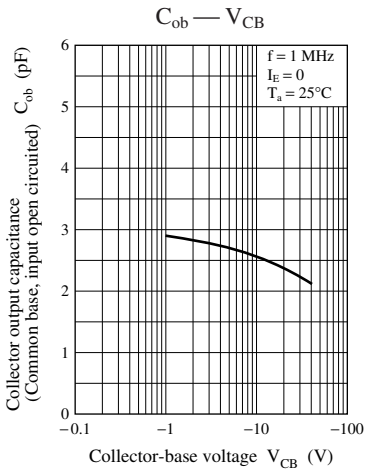
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

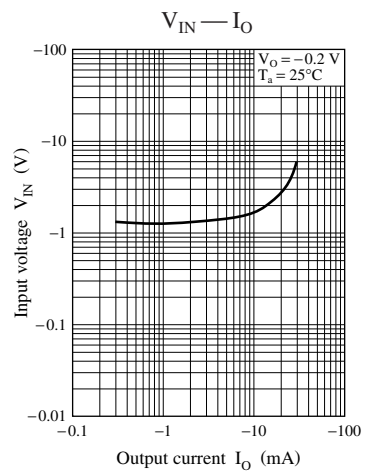
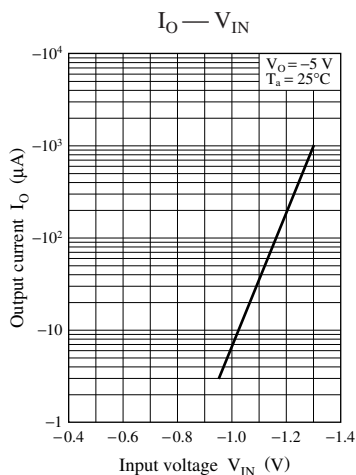
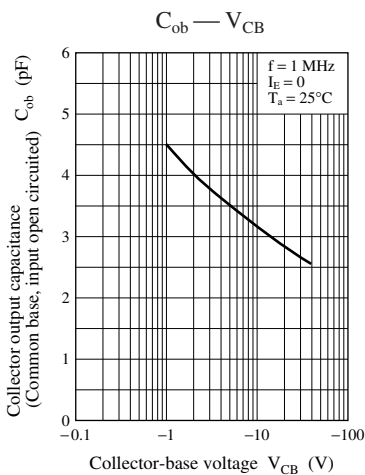
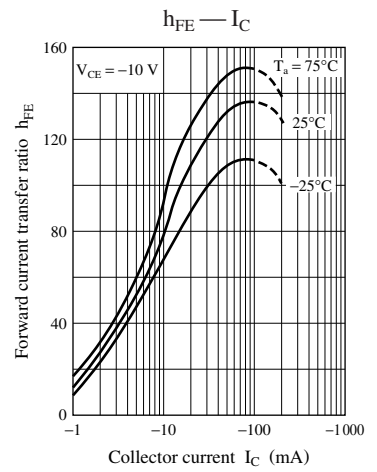
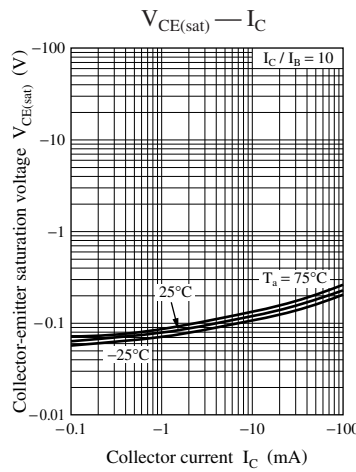
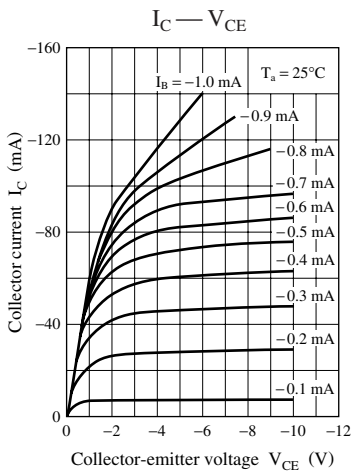


Characteristics charts of UNR4110

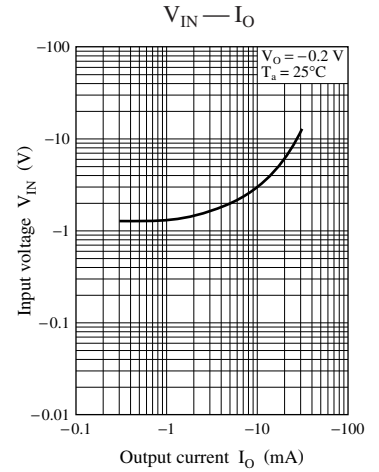
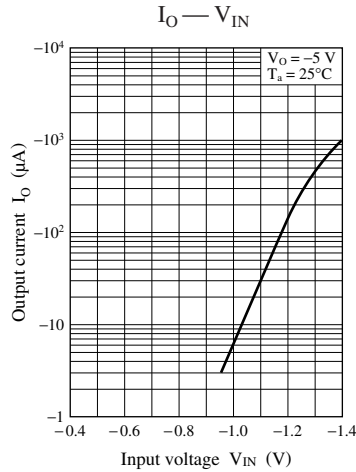
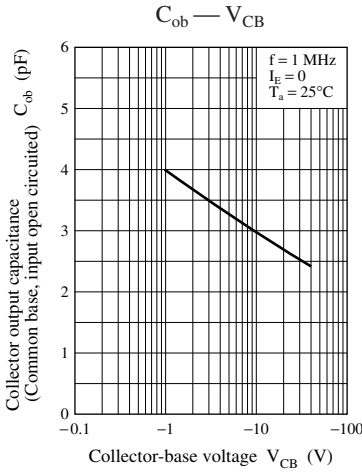
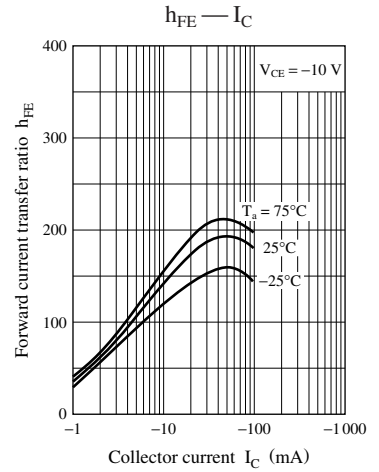
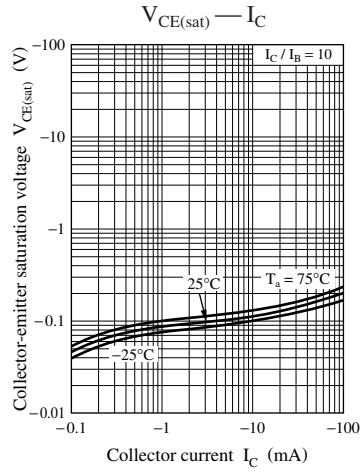
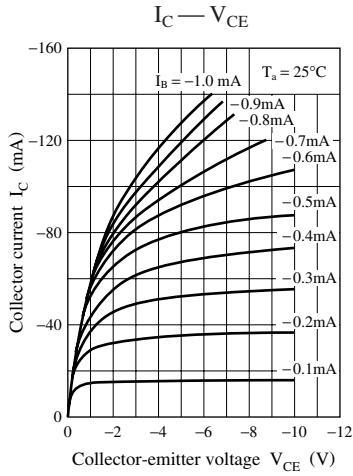




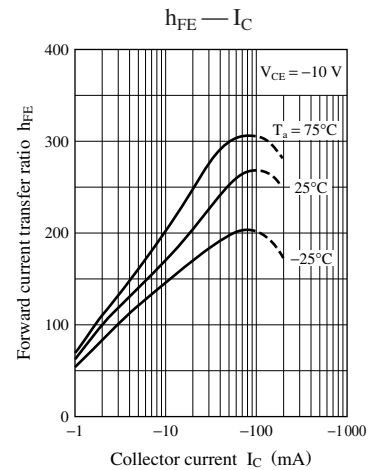
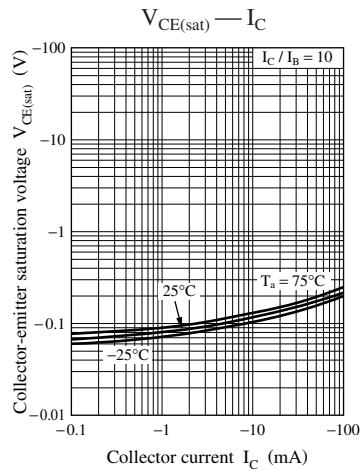
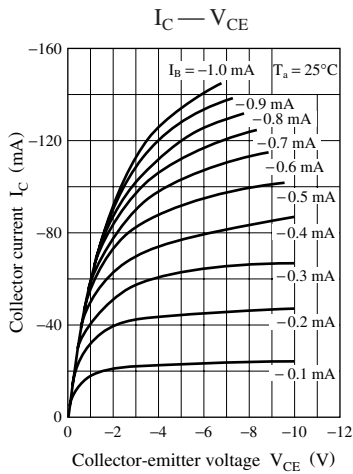
Characteristics charts of UNR4111

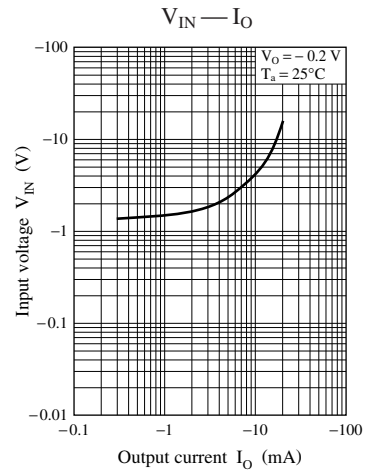
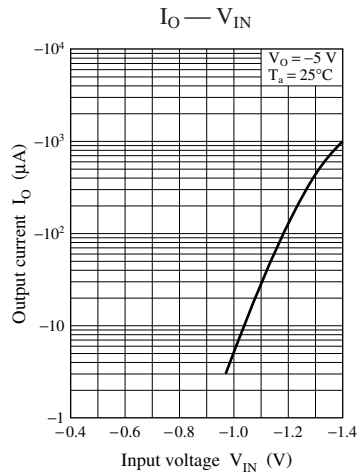
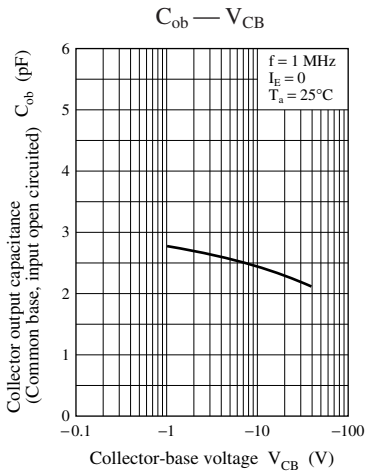


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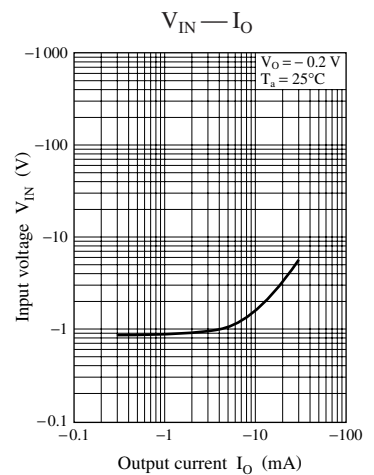
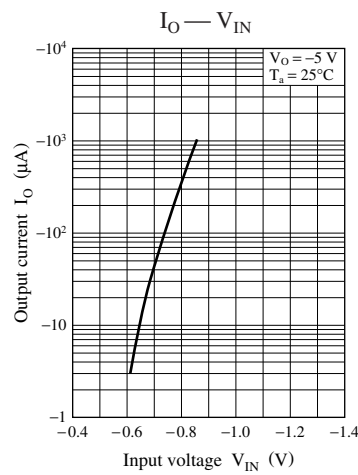
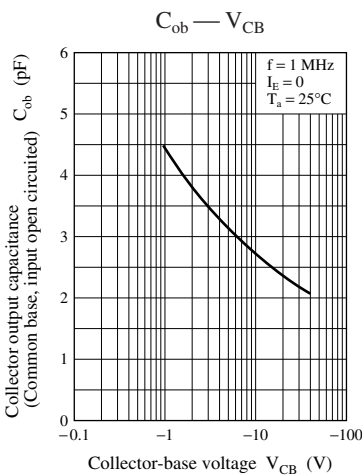
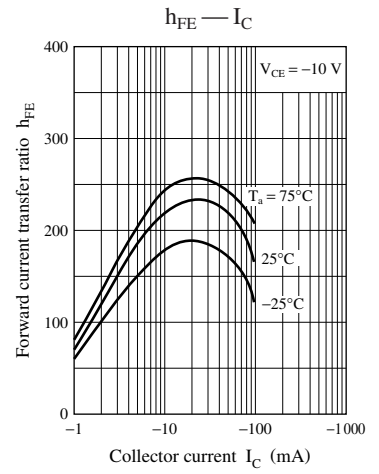
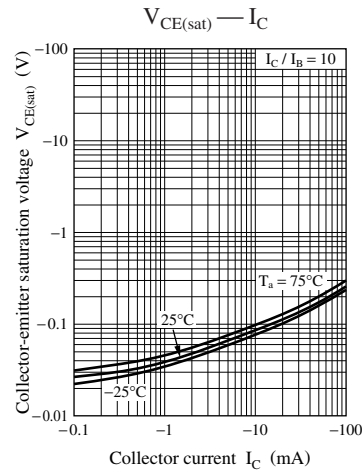
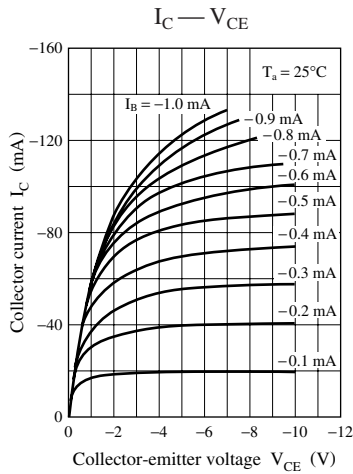


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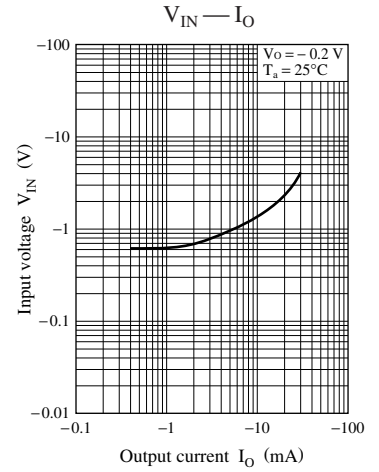
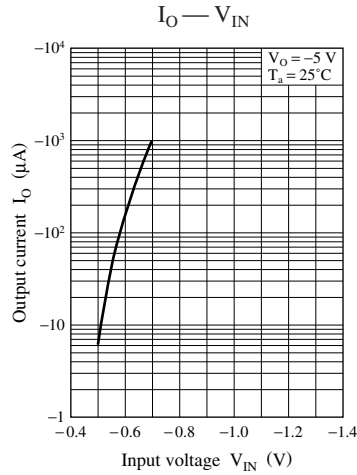
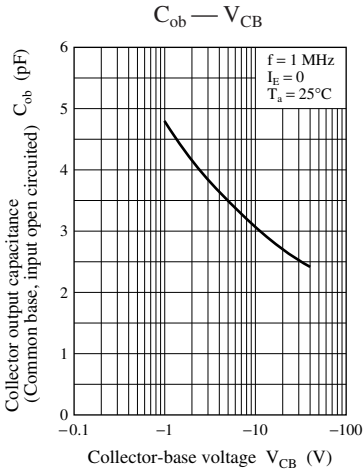
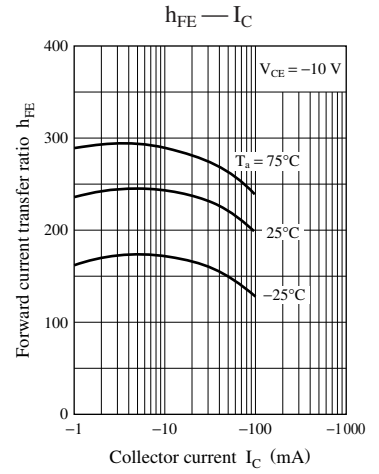
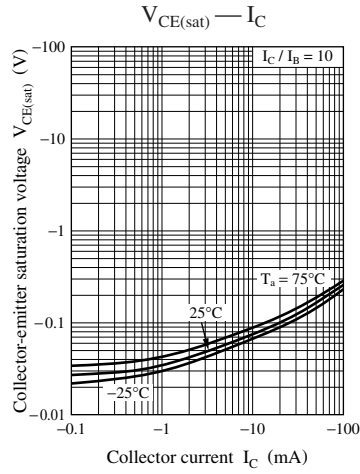
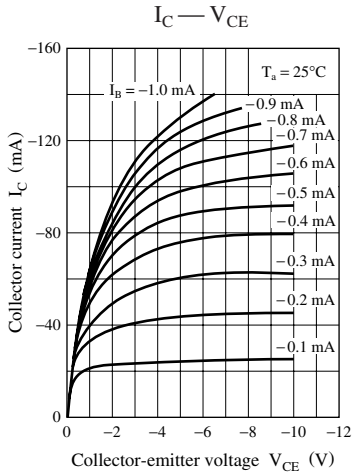




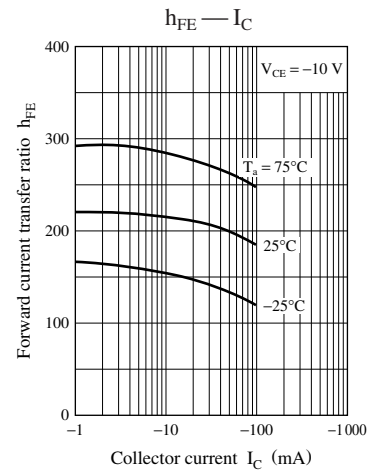
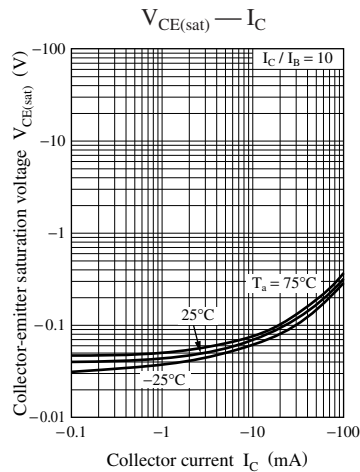
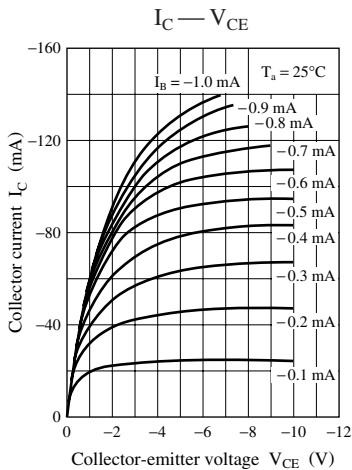
Characteristics charts of UNR4114

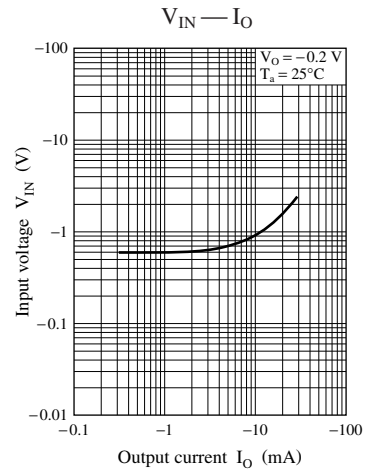
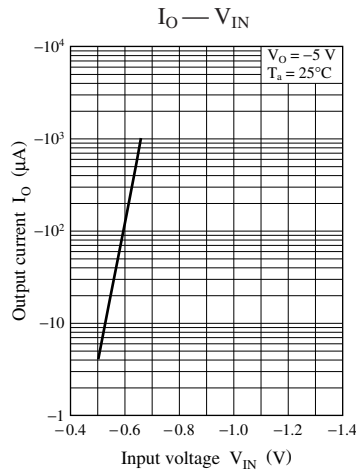
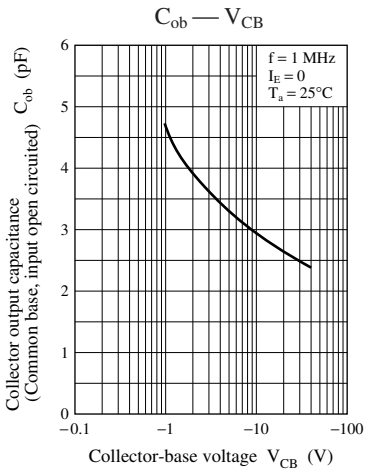


Characteristics charts of UNR4115

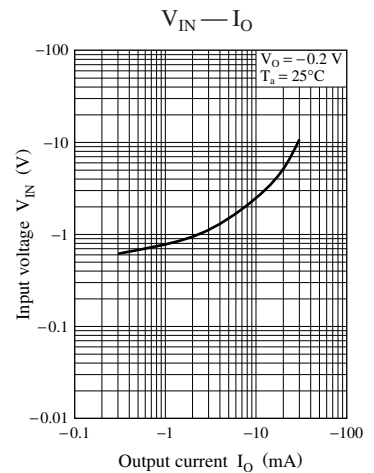
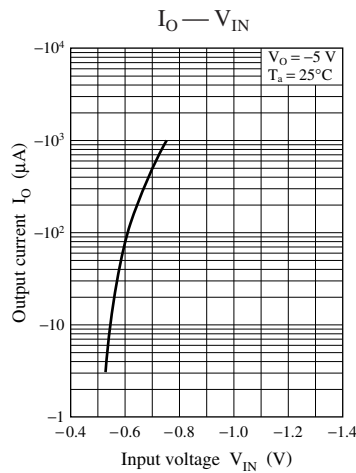
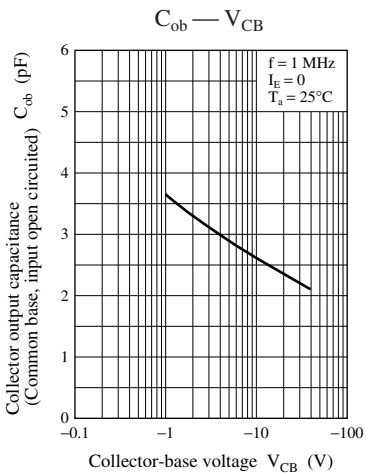
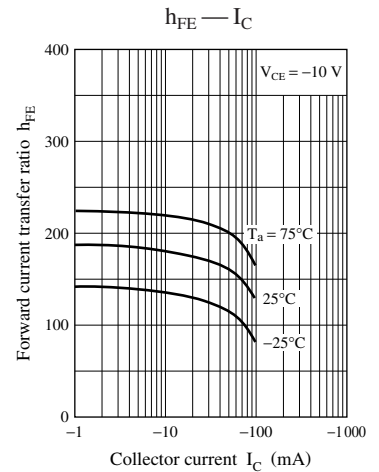
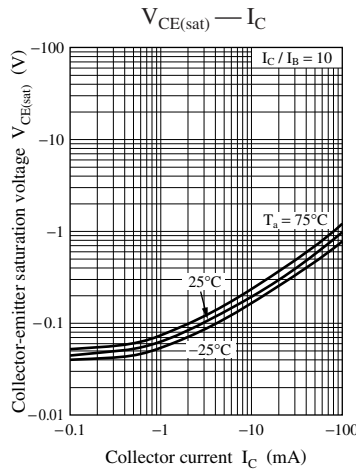
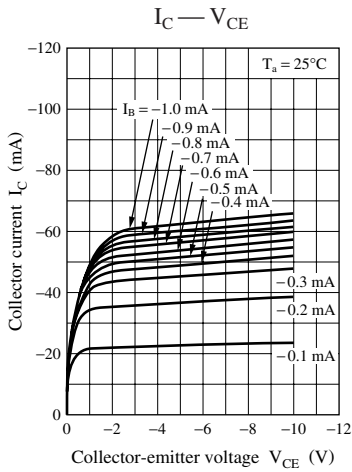


Characteristics charts of UNR4116



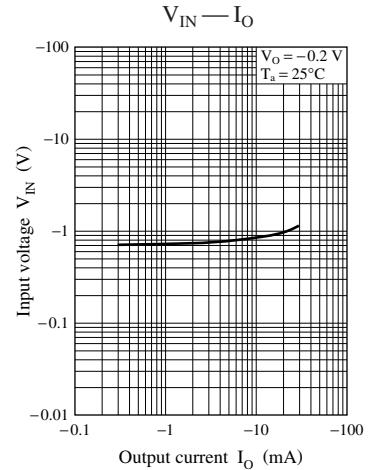
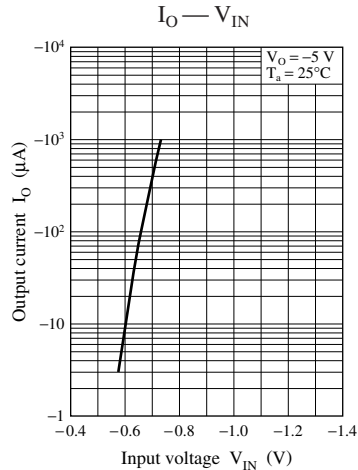
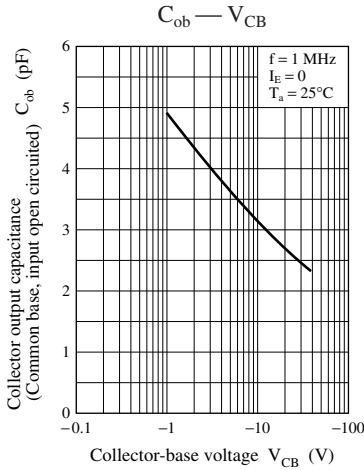
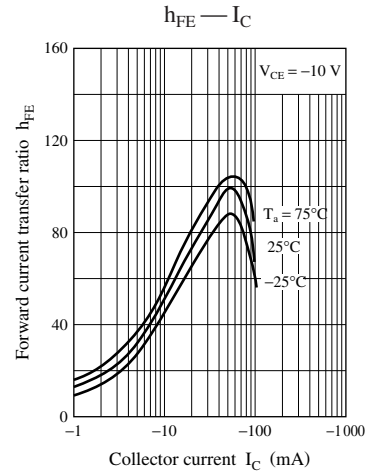
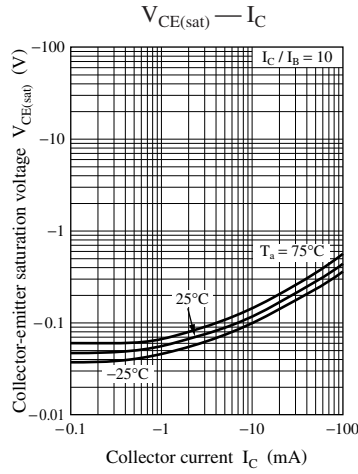
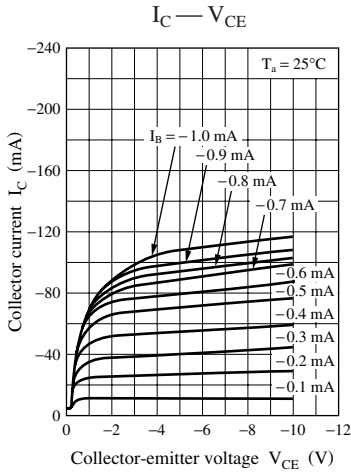


Characteristics charts of UNR4117

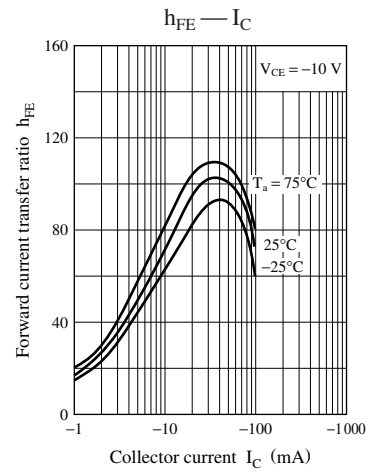
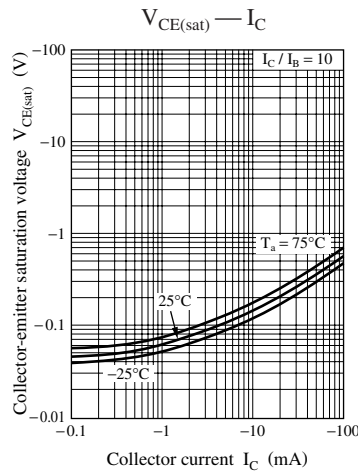
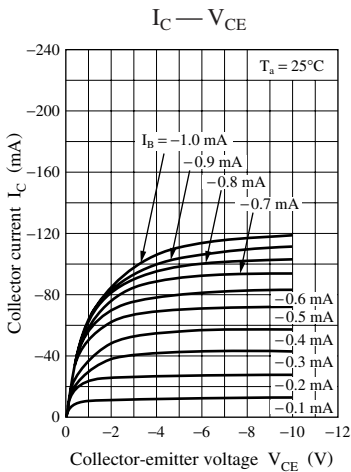


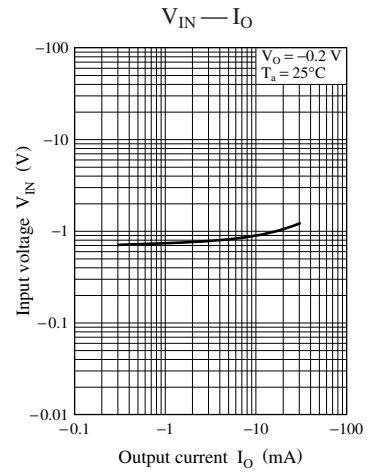
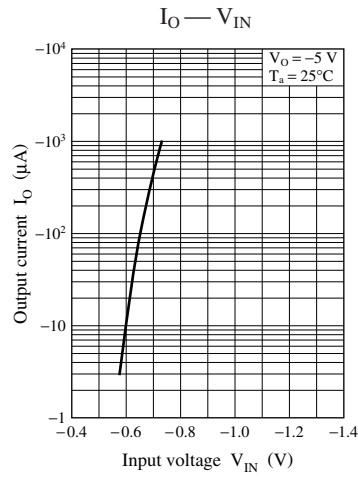
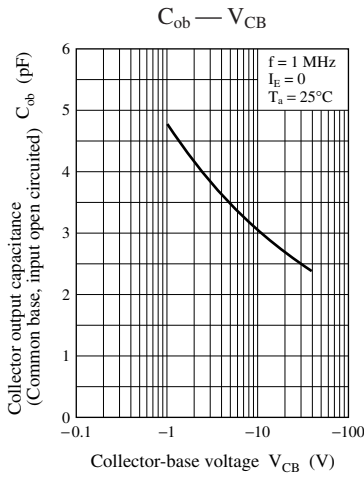


Characteristics charts of UNR4118

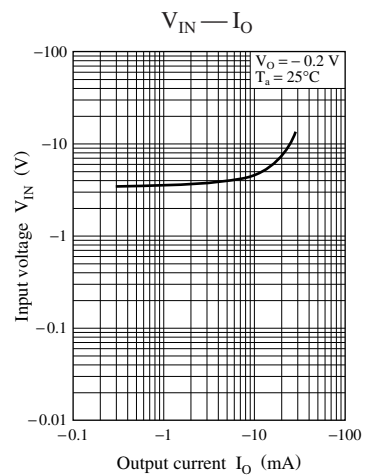
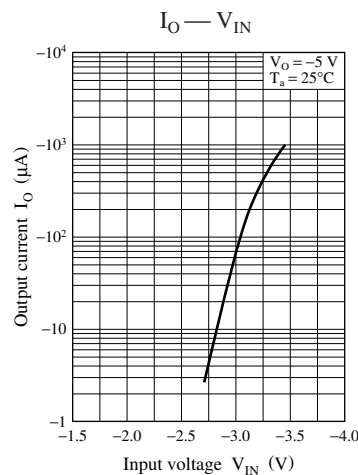
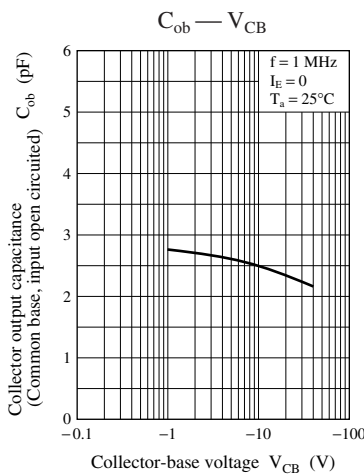
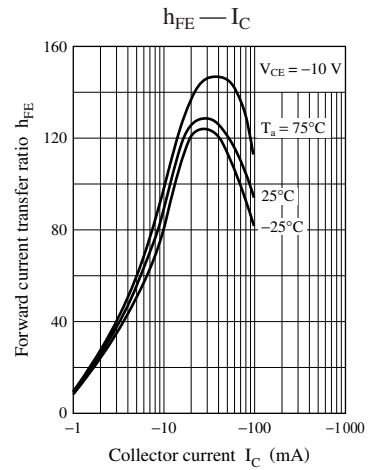
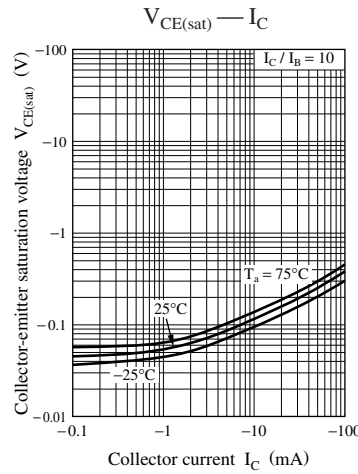
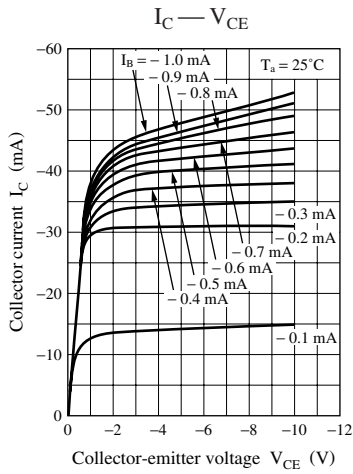


Characteristics charts of UNR4119

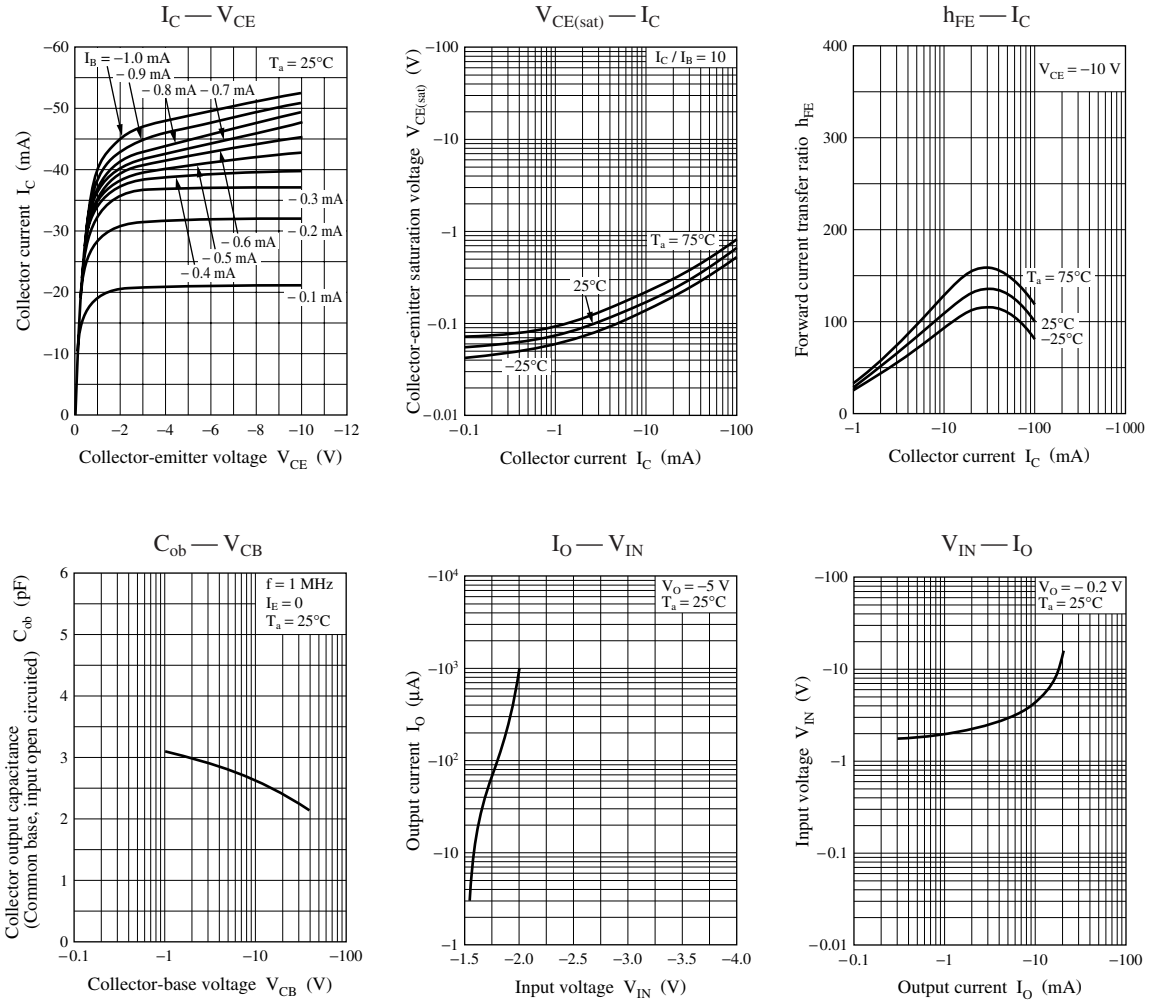




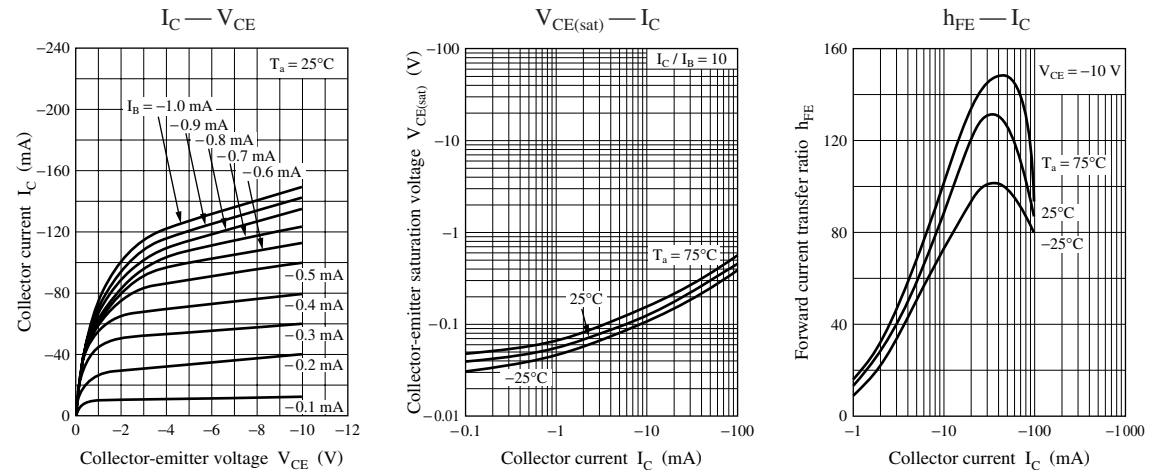
Characteristics charts of UNR411D

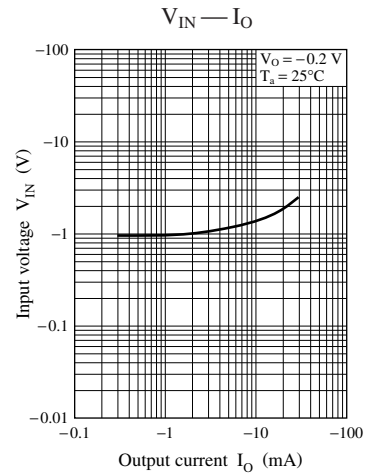
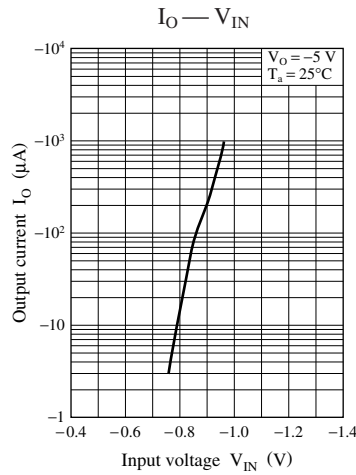
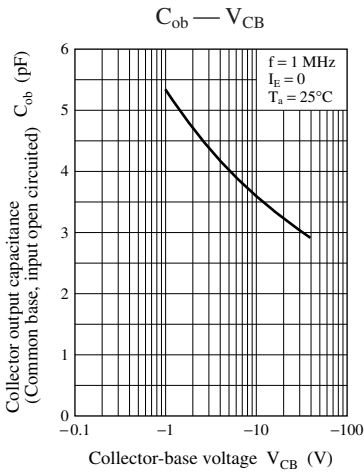


Characteristics charts of UNR411E

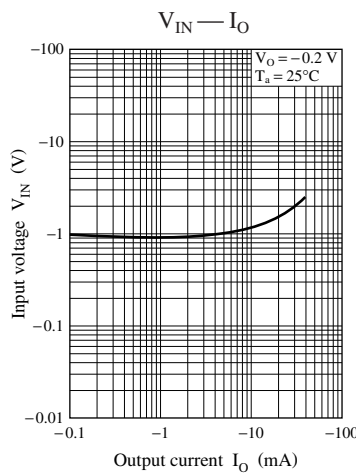
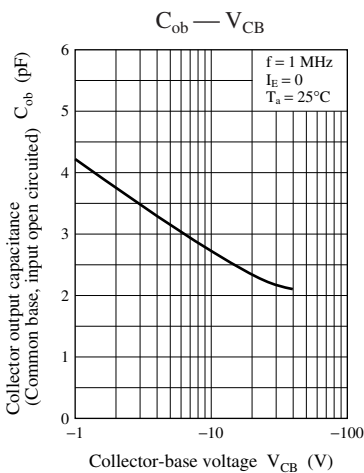
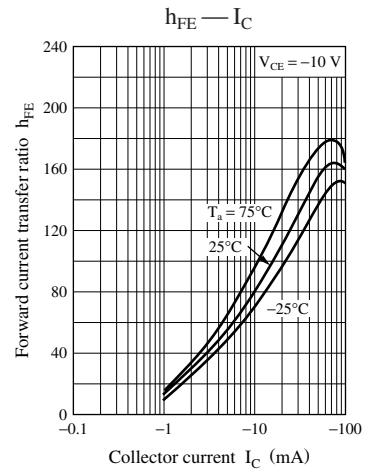
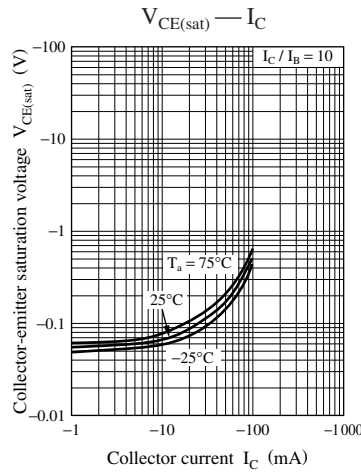
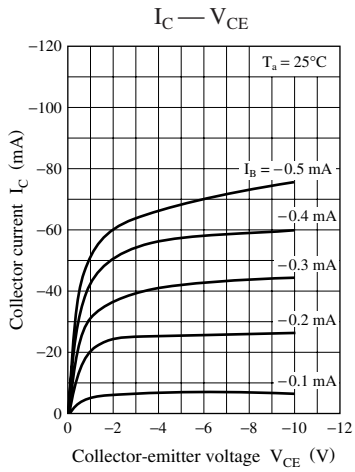


Characteristics charts of UNR411F

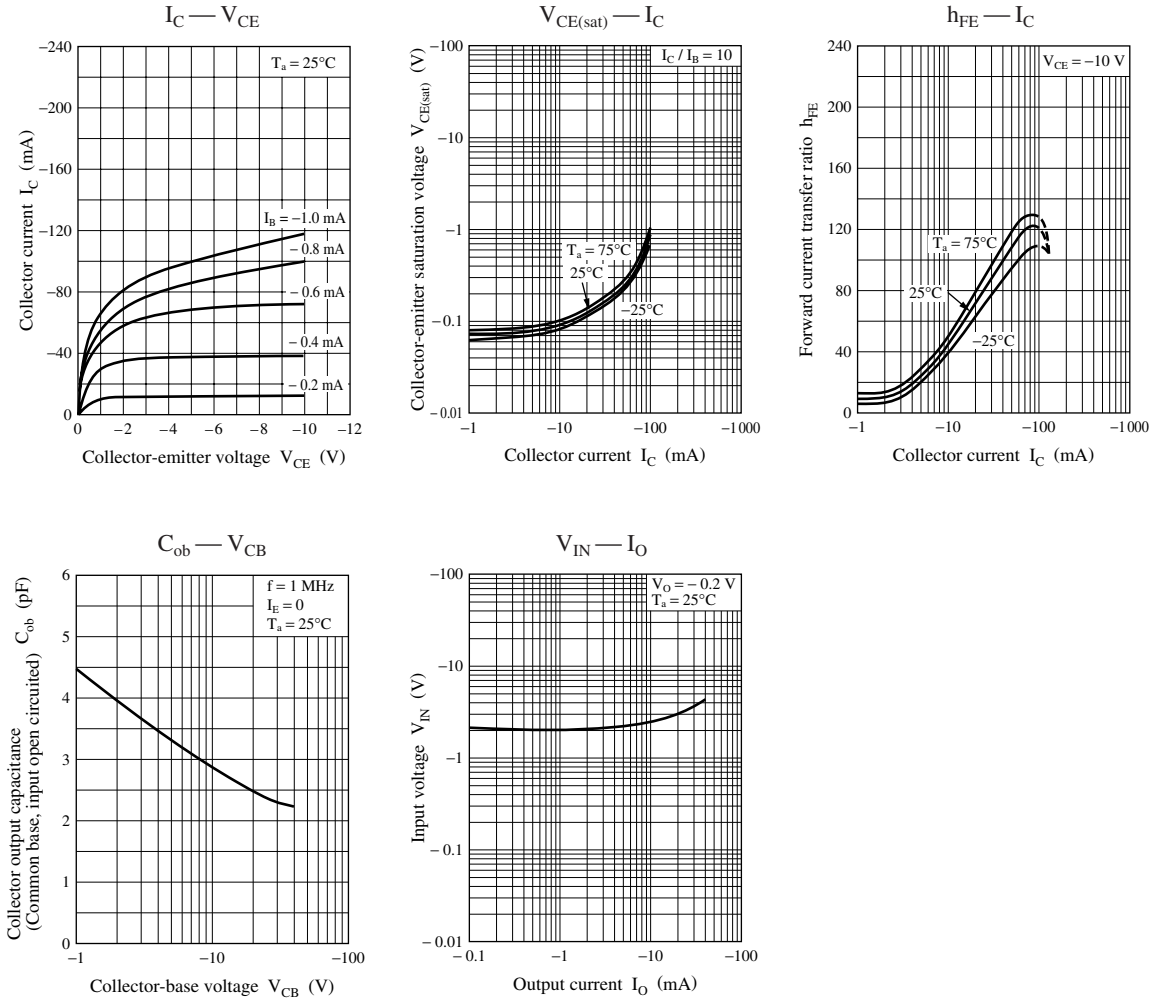




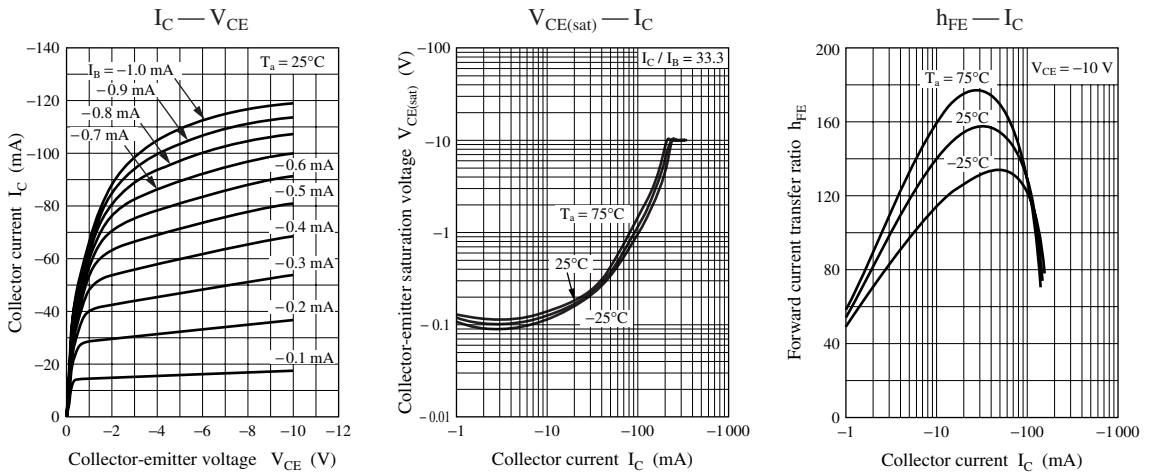
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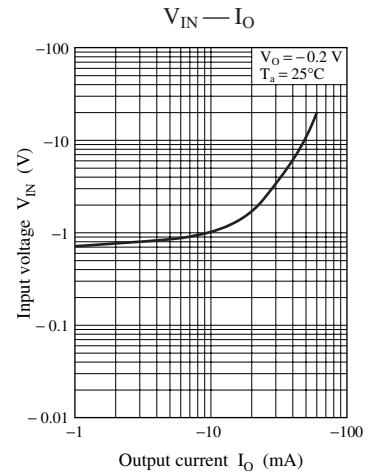
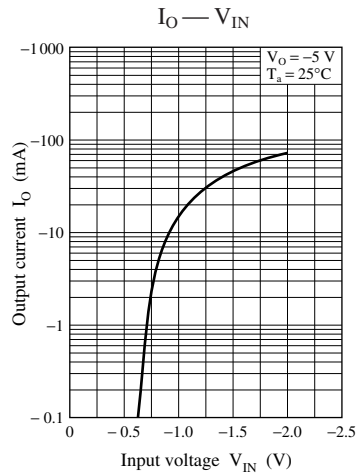
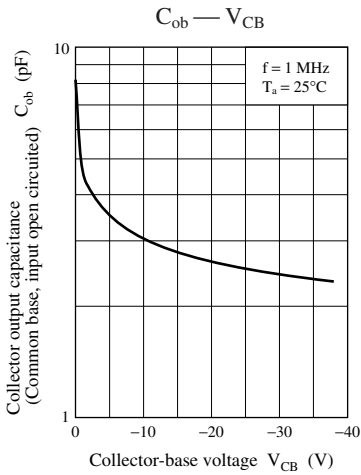


Characteristics charts of UNR411L

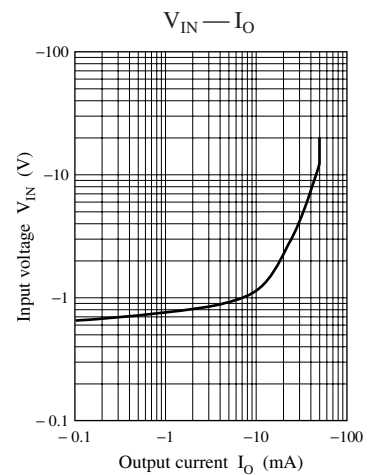
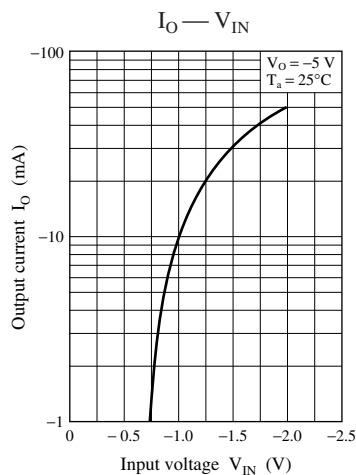
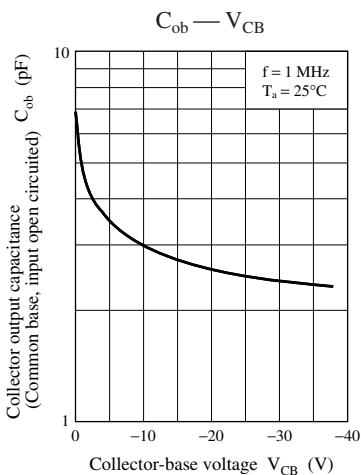
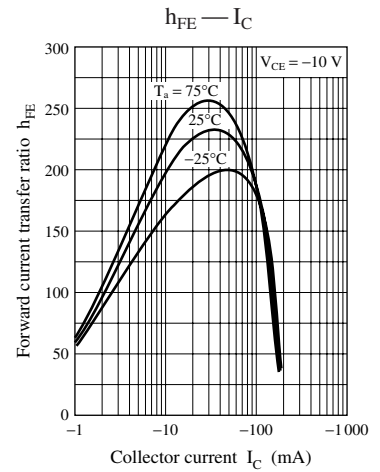
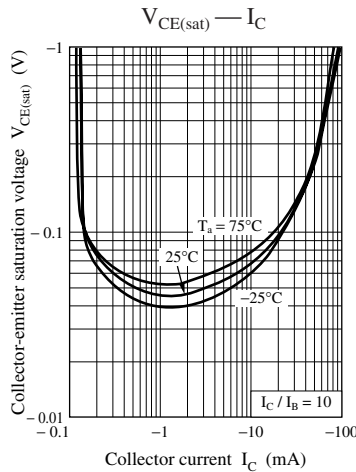
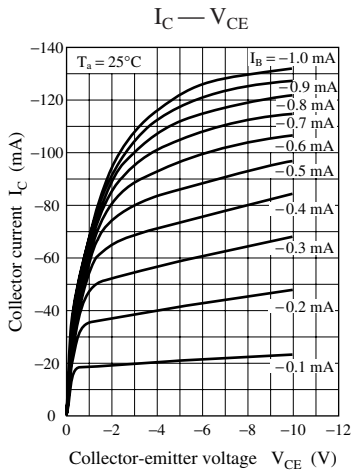


Characteristics charts of UNR411M





Characteristics charts of UNR411N



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