

# UNR411x Series (UN411x Series)

## Silicon PNP epitaxial planar type

For digital circuits

### ■ Features

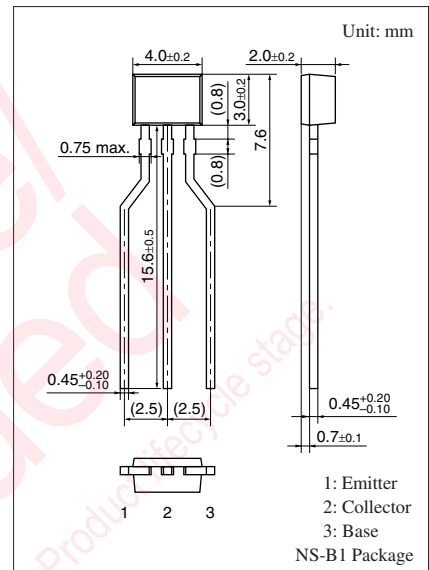
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- New S type package, allowing supply with the radial taping

### ■ Resistance by Part Number

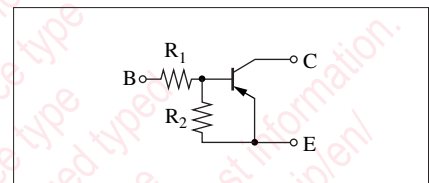
	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR4110 (UN4110)	47 kΩ	—
• UNR4111 (UN4111)	10 kΩ	10 kΩ
• UNR4112 (UN4112)	22 kΩ	22 kΩ
• UNR4113 (UN4113)	47 kΩ	47 kΩ
• UNR4114 (UN4114)	10 kΩ	47 kΩ
• UNR4115 (UN4115)	10 kΩ	—
• UNR4116 (UN4116)	4.7 kΩ	—
• UNR4117 (UN4117)	22 kΩ	—
• UNR4118 (UN4118)	0.51 kΩ	5.1 kΩ
• 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	
				UNR4113	$V_{CC} = -5 \text{ V}, V_B = -3.5 \text{ V}, R_L = 1 \text{ k}\Omega$			
				UNR411D	$V_{CC} = -5 \text{ V}, V_B = -10 \text{ V}, R_L = 1 \text{ k}\Omega$			
				UNR411E	$V_{CC} = -5 \text{ V}, V_B = -6 \text{ V}, R_L = 1 \text{ k}\Omega$			
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

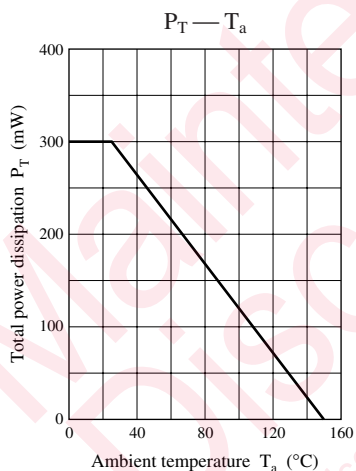
Rank	Q	R	S	No-rank
$h_{FE}$	160 to 260	210 to 340	290 to 460	160 to 460

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

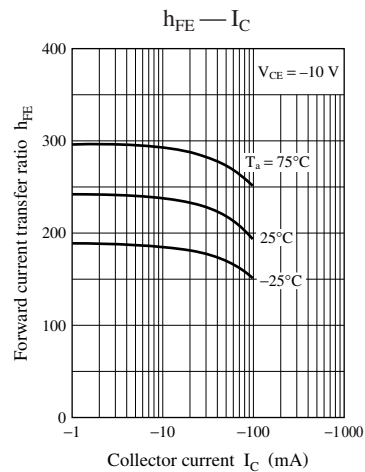
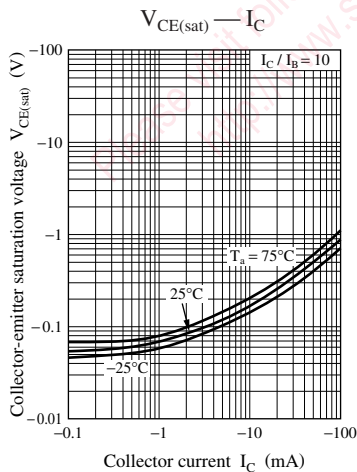
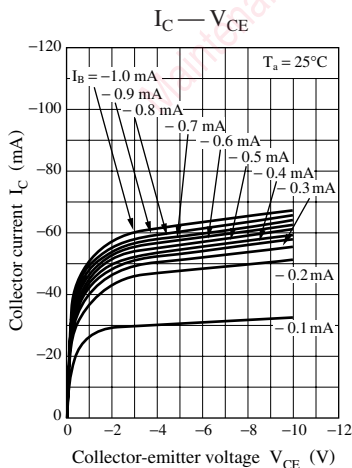
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR411M	$R_1/R_2$			0.047		—
	UNR411N				0.1		
	UNR4118/4119			0.08	0.10	0.12	
	UNR4114			0.17	0.21	0.25	
	UNR411H			0.17	0.22	0.27	
	UNR411F			0.37	0.47	0.57	
	UNR4111/4112/4113/411L			0.8	1.0	1.2	
	UNR411E			1.70	2.14	2.60	
	UNR411D		3.7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

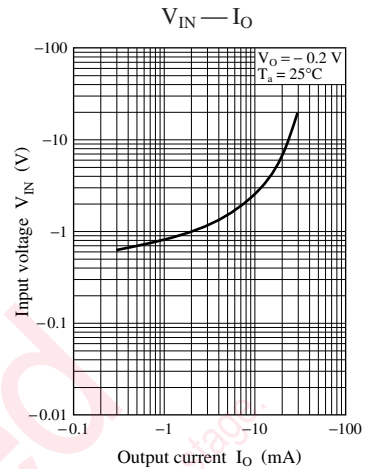
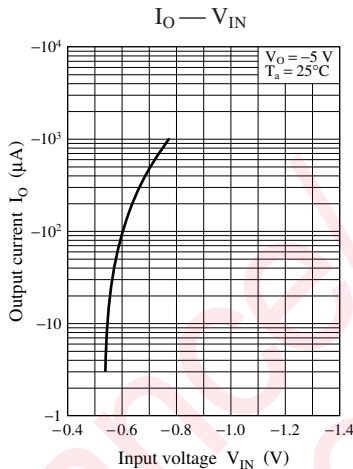
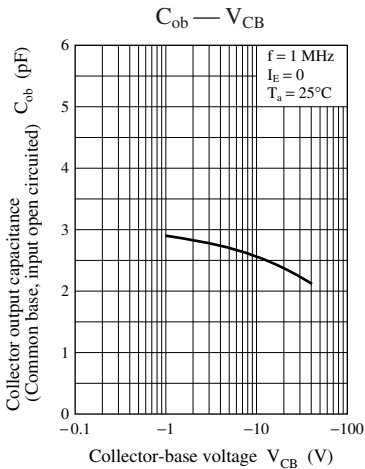
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

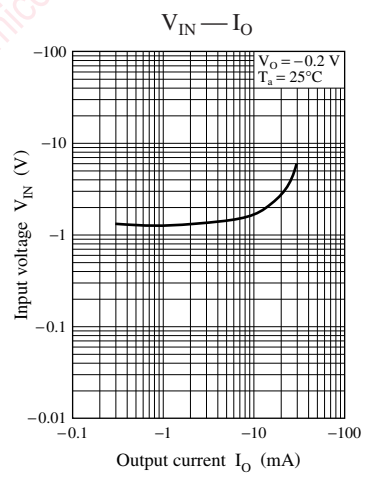
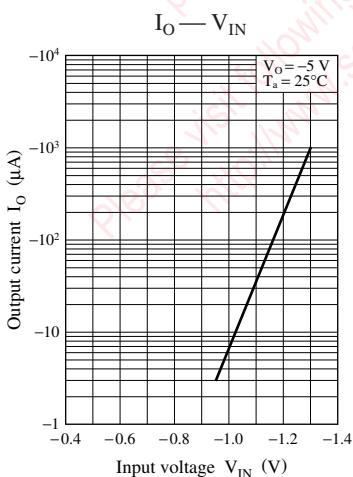
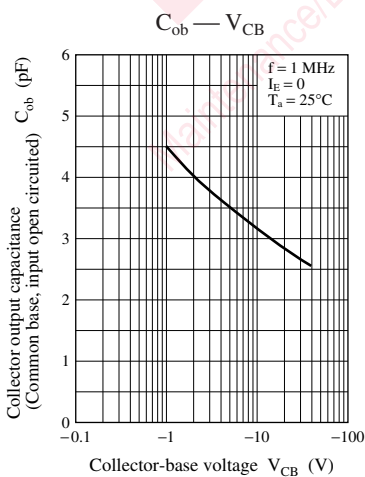
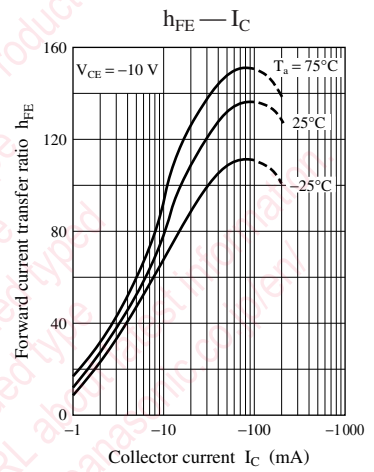
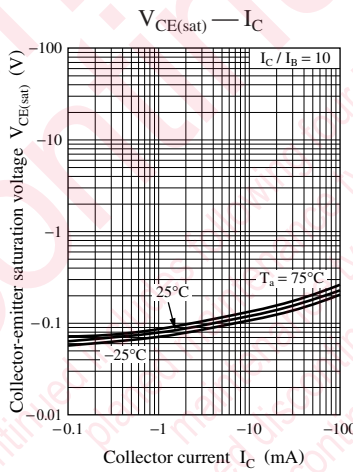
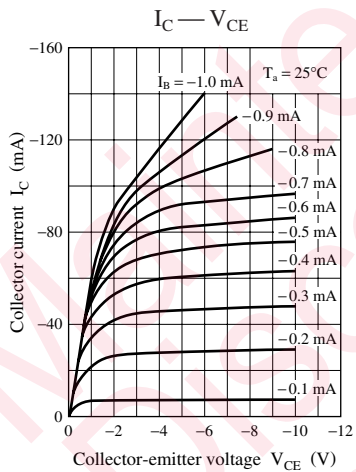


Characteristics charts of UNR4110

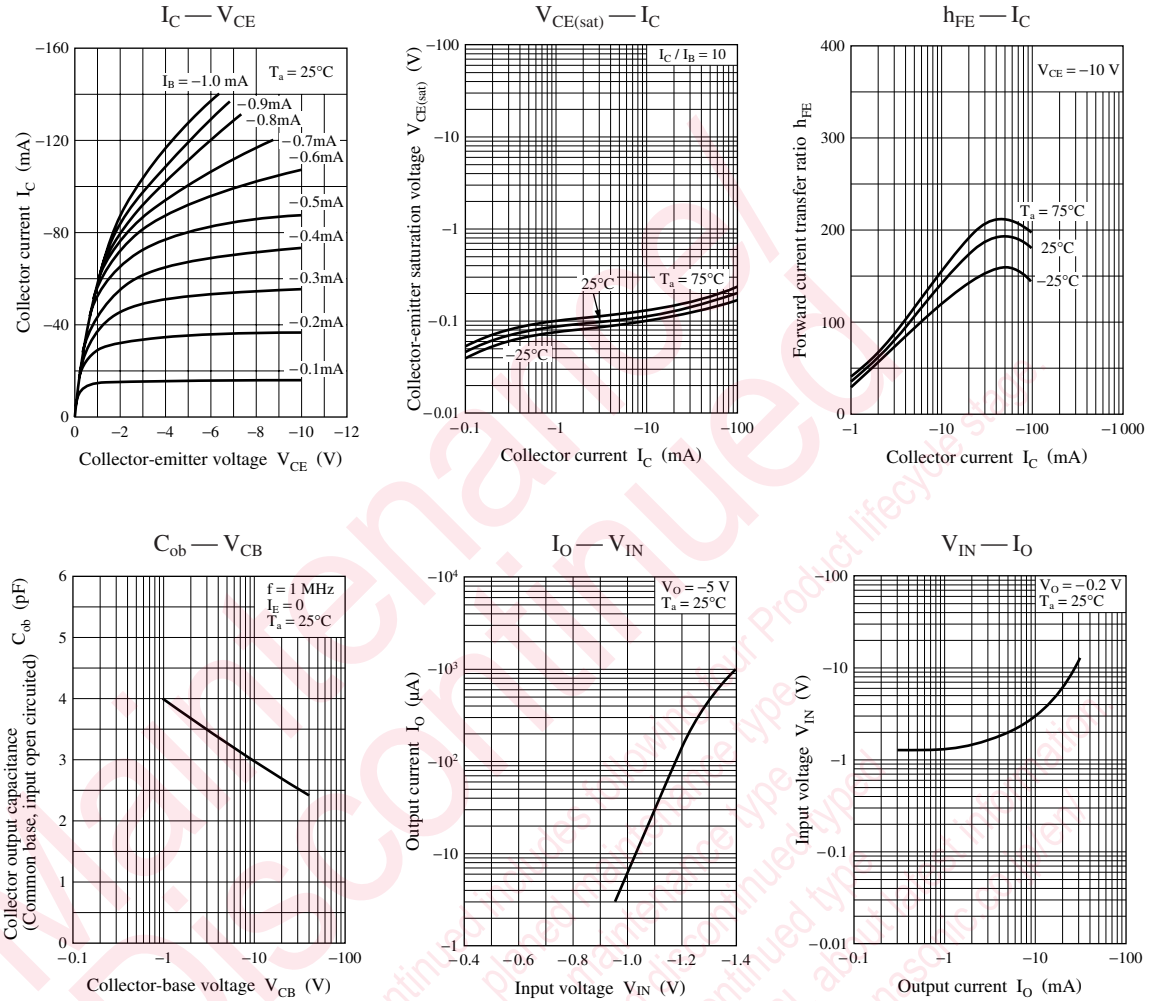




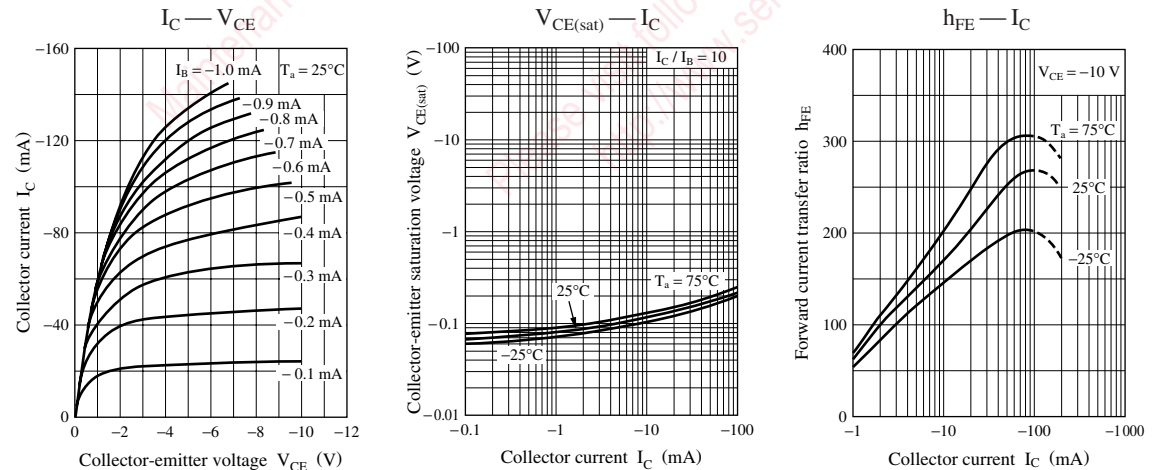
Characteristics charts of UNR4111

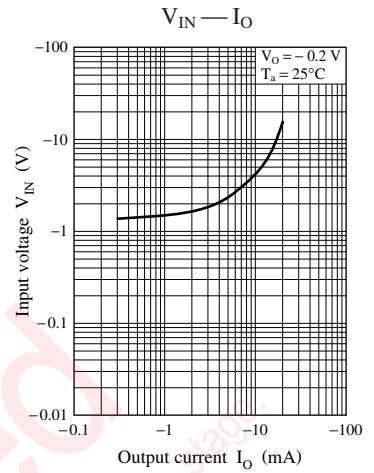
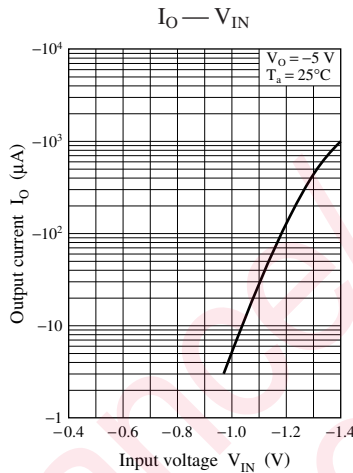
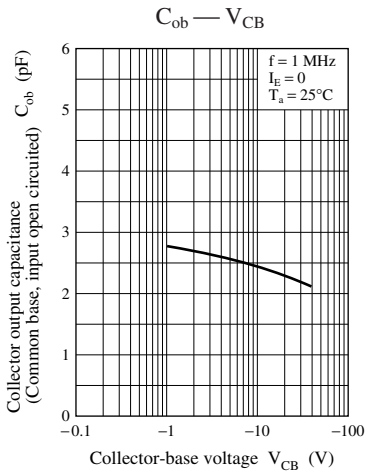


Characteristics charts of UNR4112

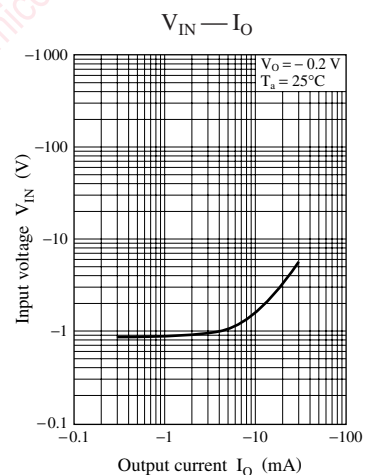
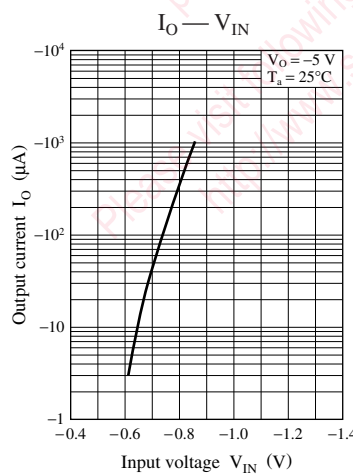
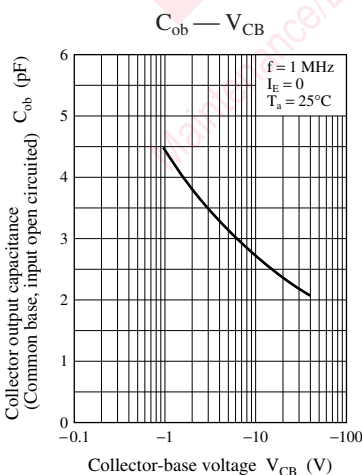
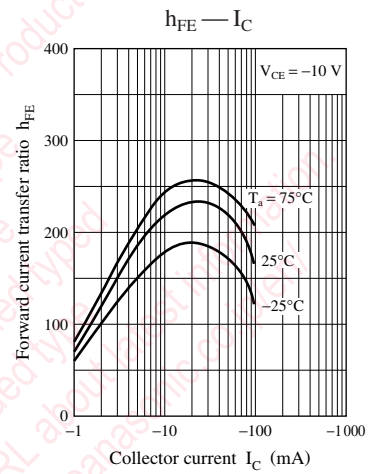
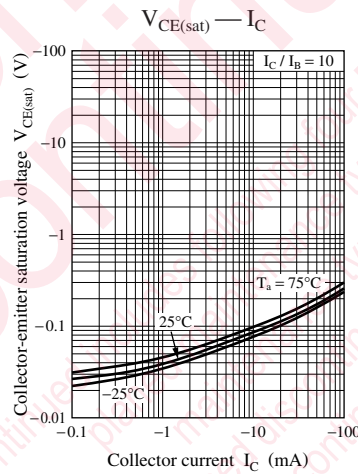
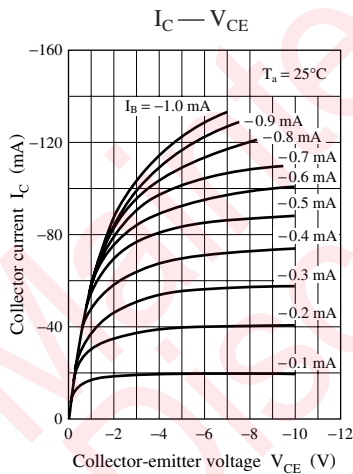


Characteristics charts of UNR4113

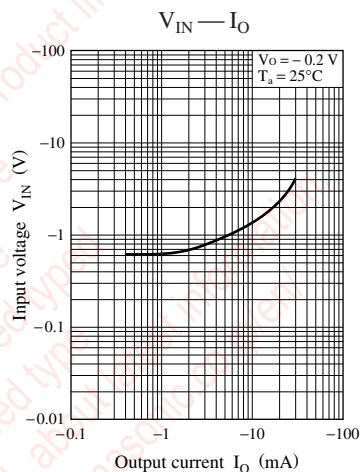
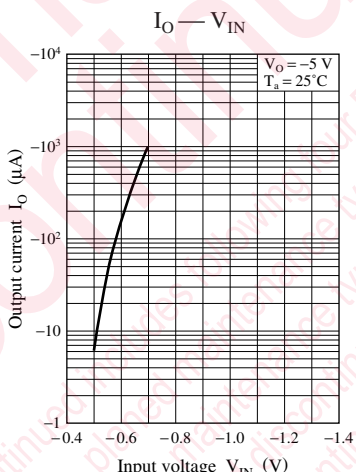
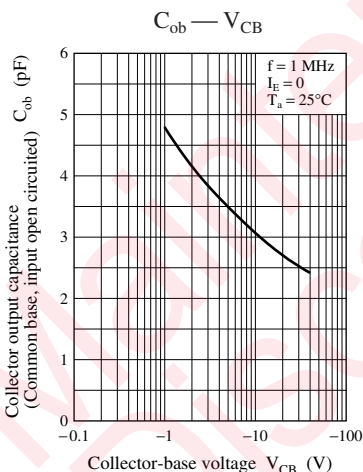
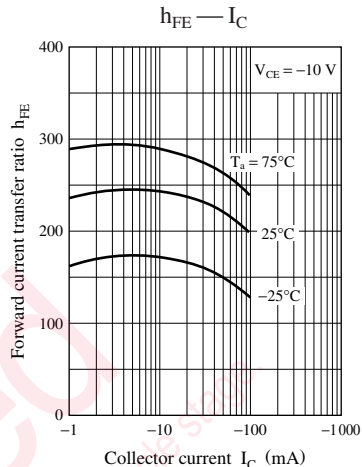
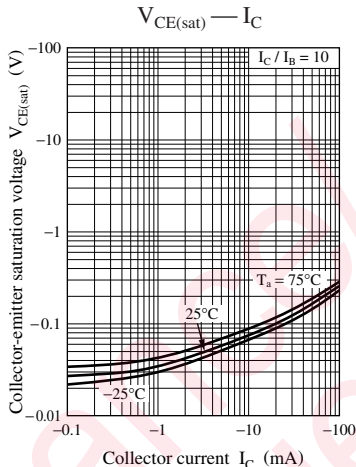
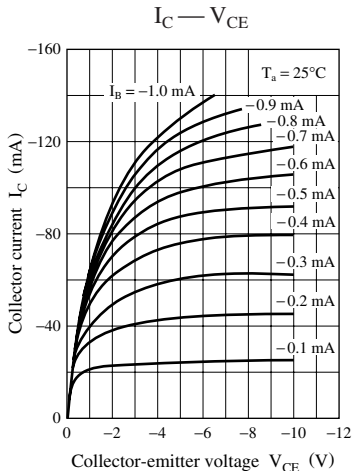




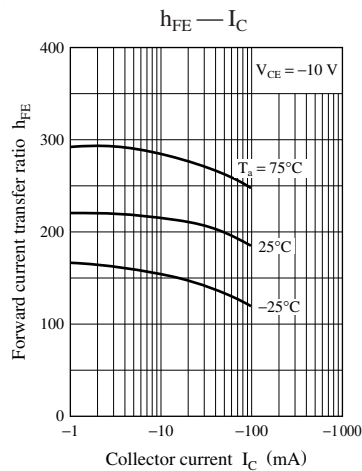
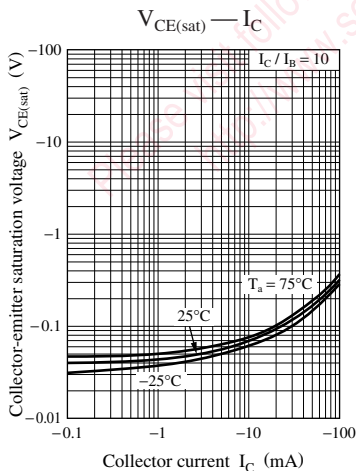
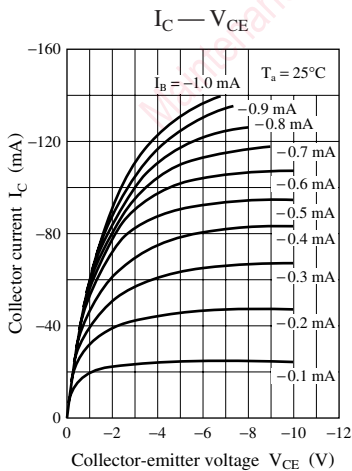
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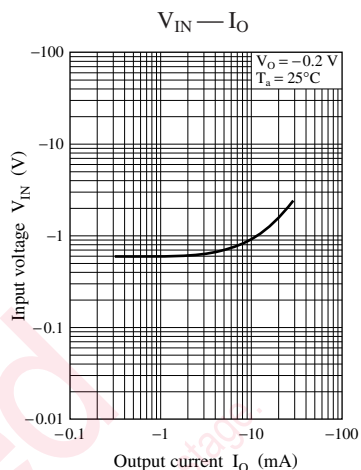
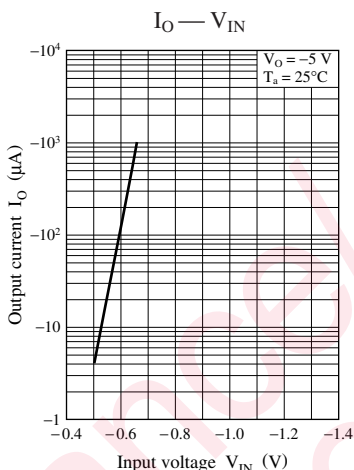
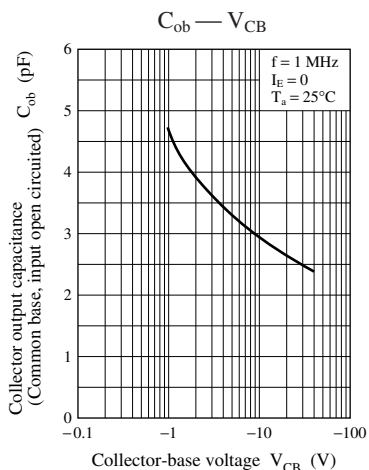


Characteristics charts of UNR4115

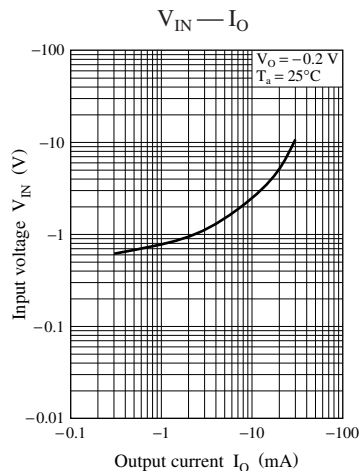
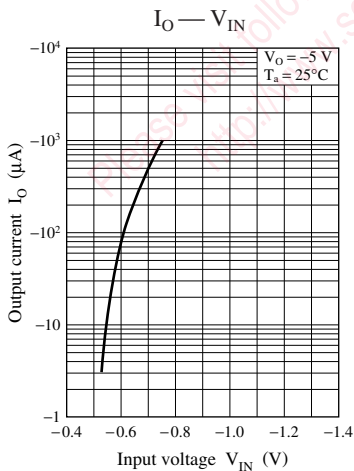
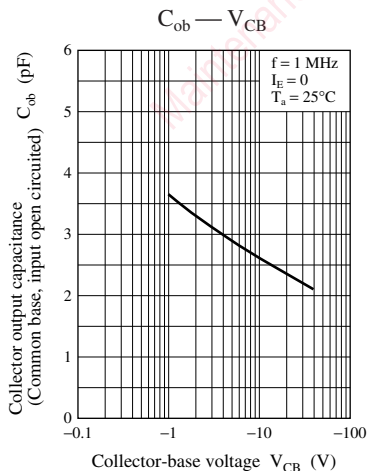
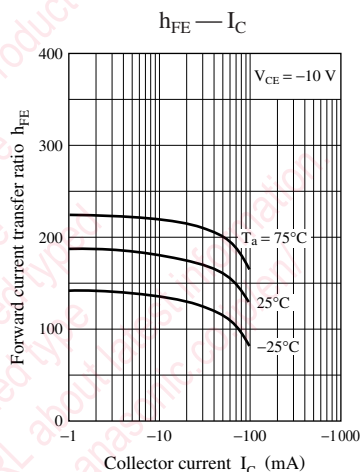
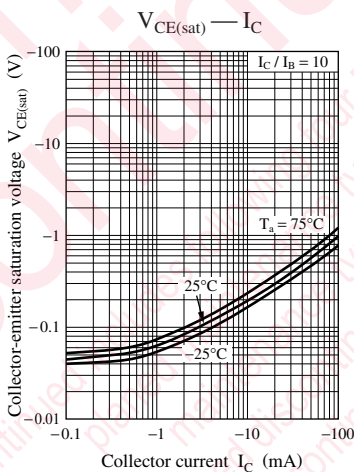
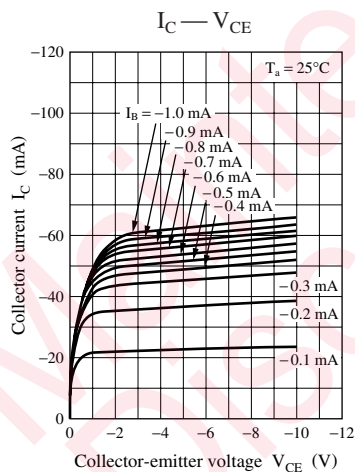


Characteristics charts of UNR4116



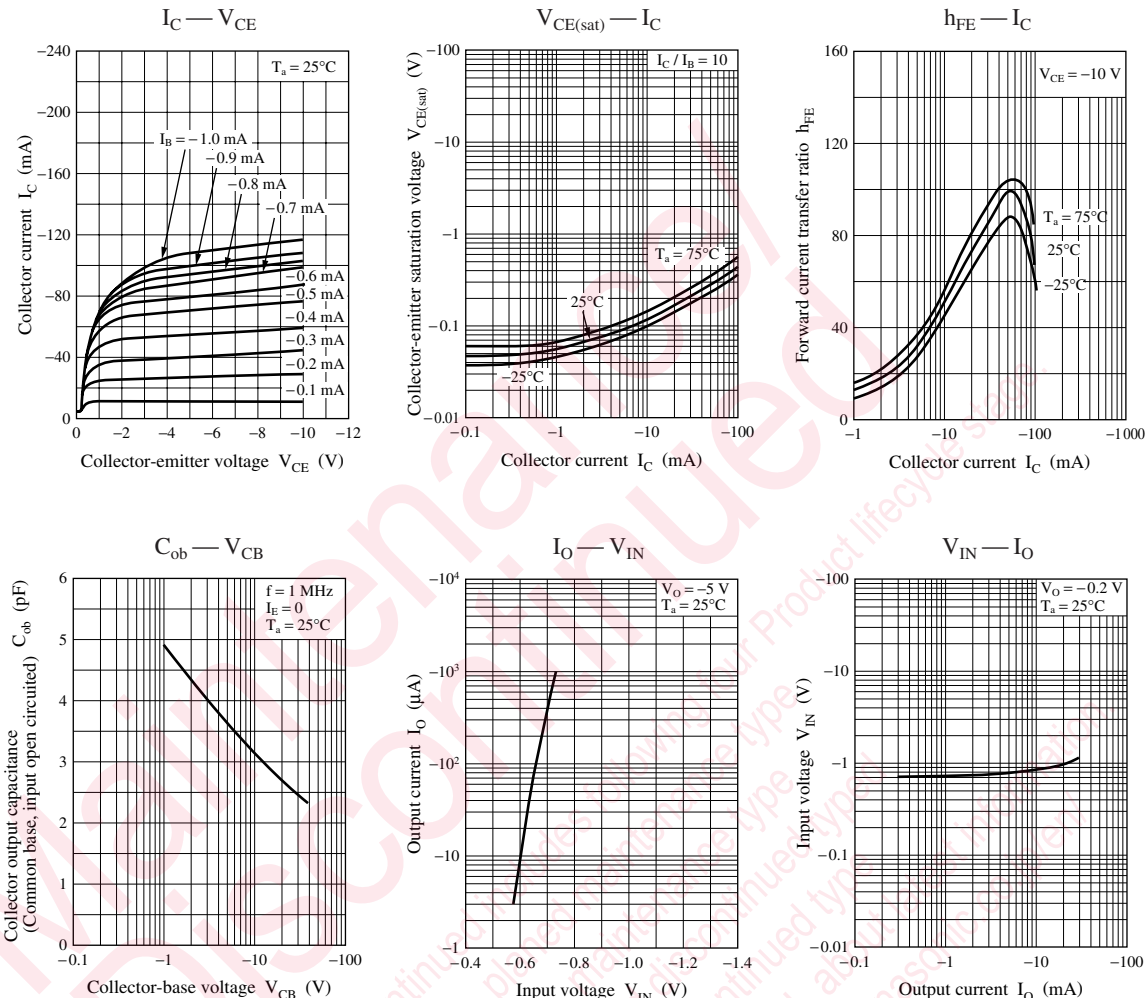


**Characteristics charts of UNR4117**

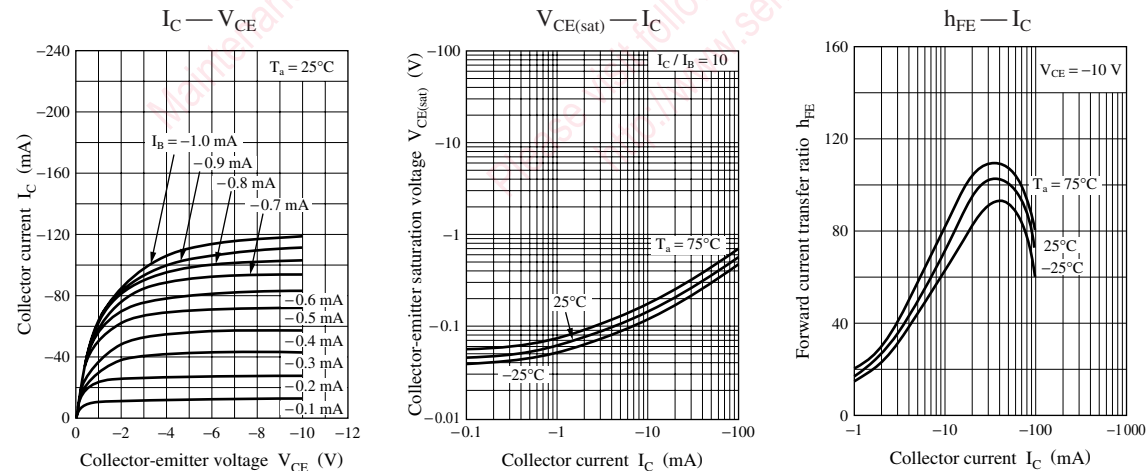


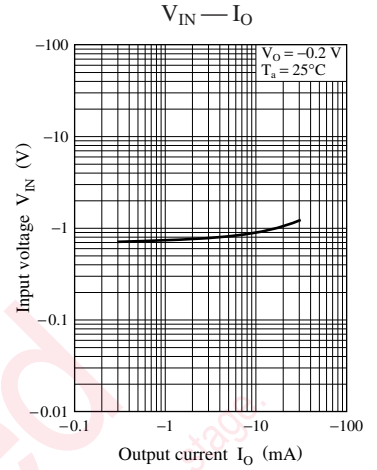
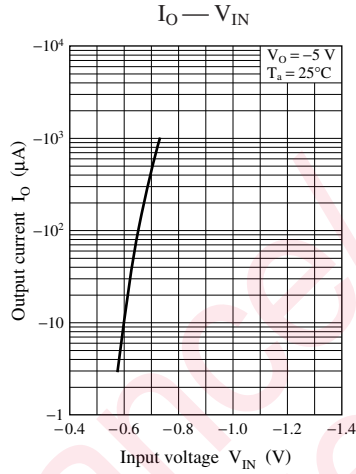
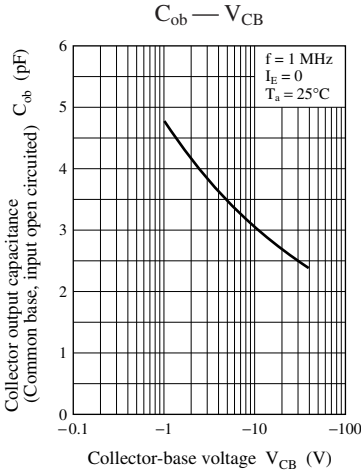


Characteristics charts of UNR4118

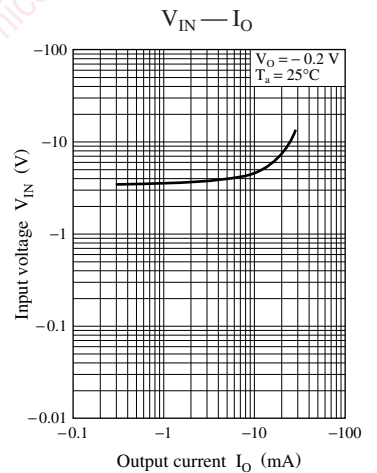
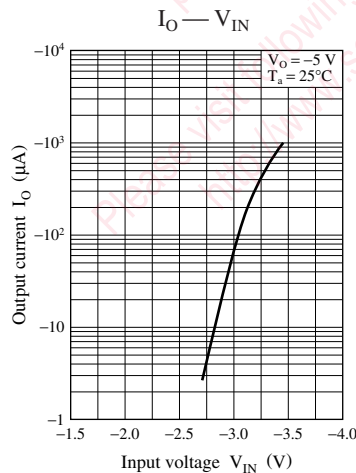
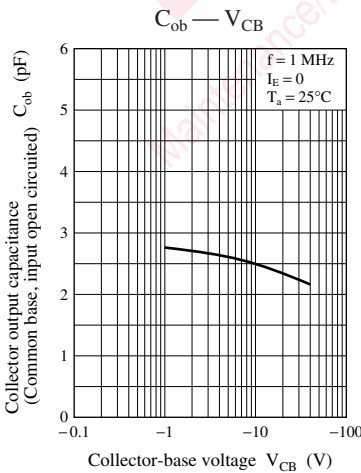
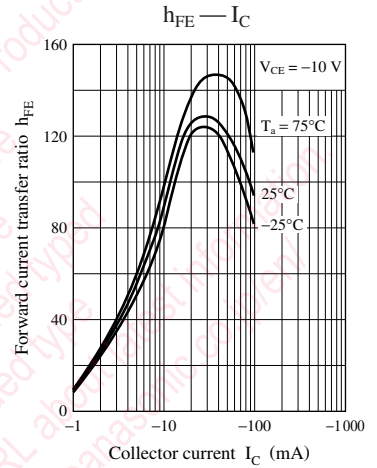
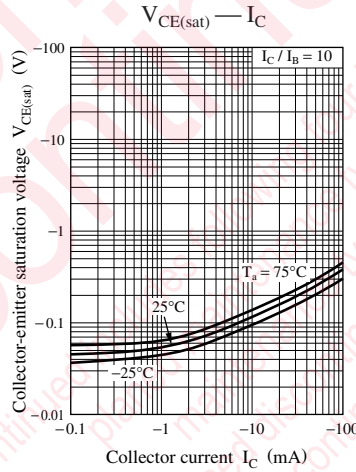
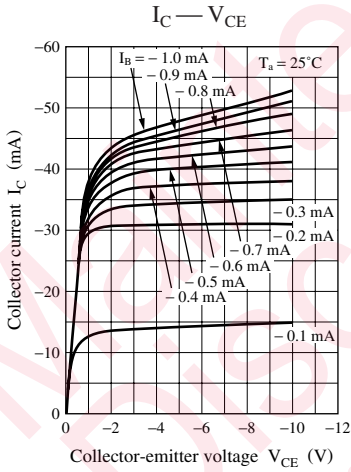


Characteristics charts of UNR4119

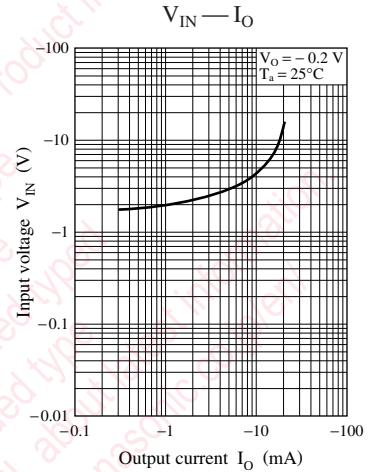
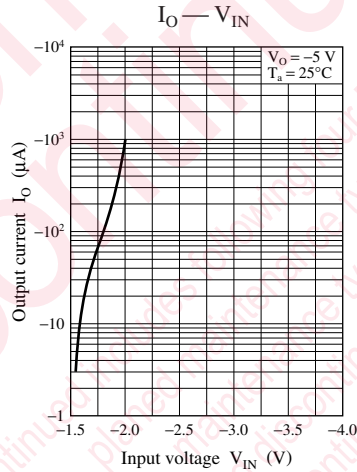
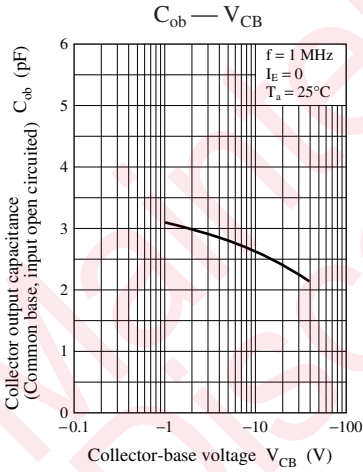
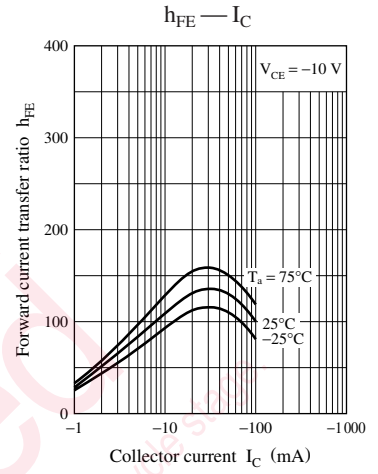
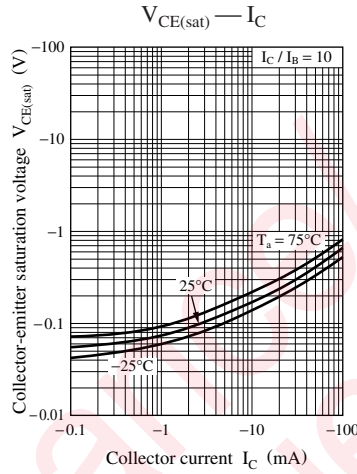
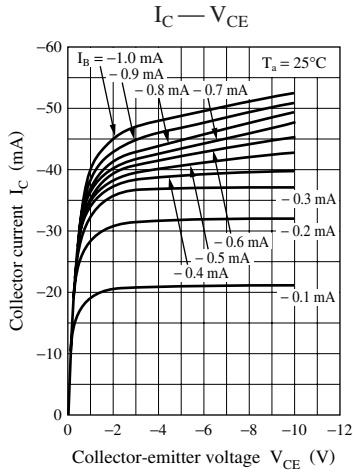




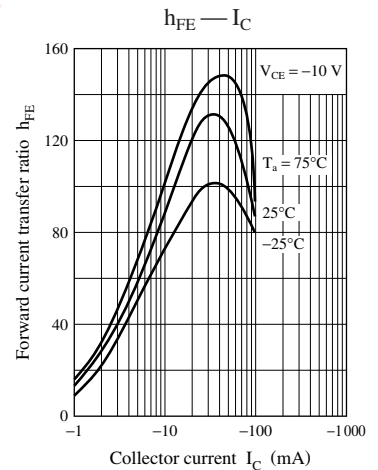
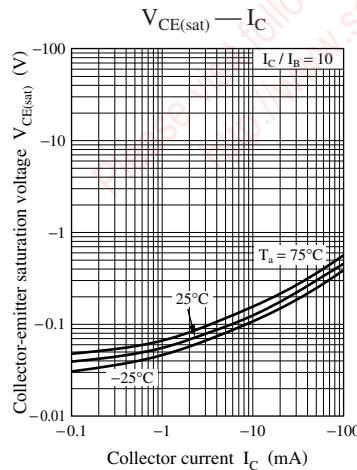
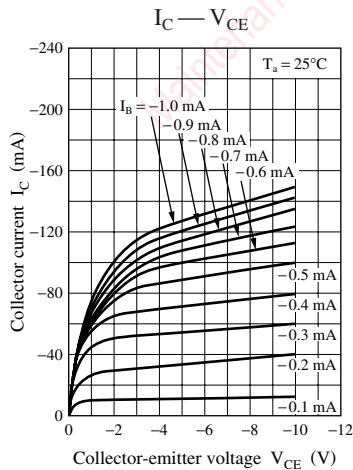
**Characteristics charts of UNR411D**

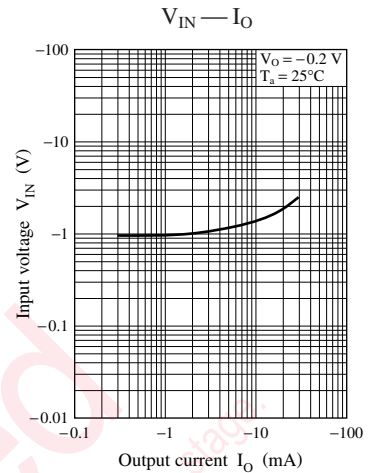
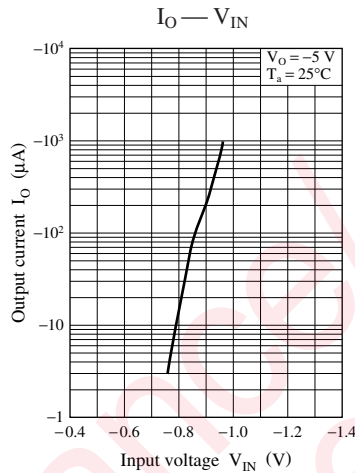
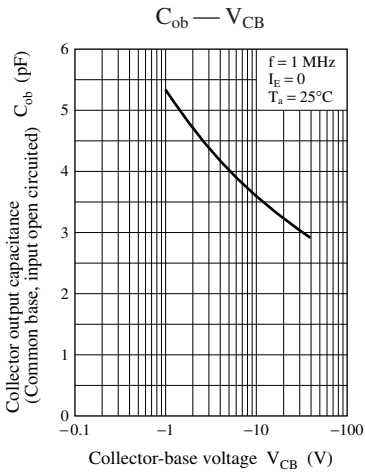


Characteristics charts of UNR411E

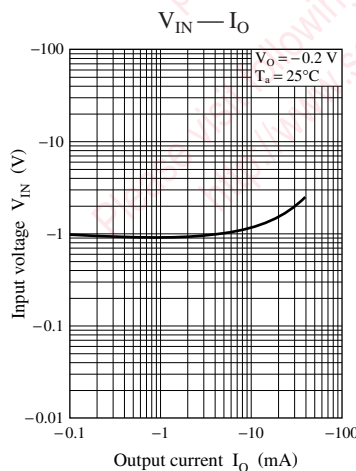
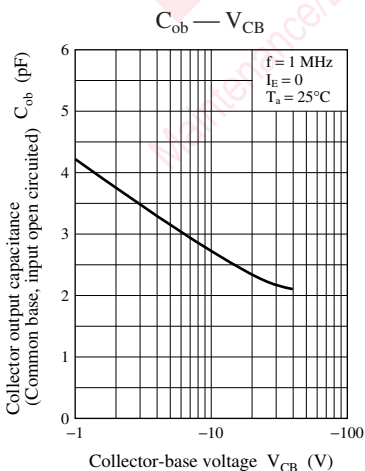
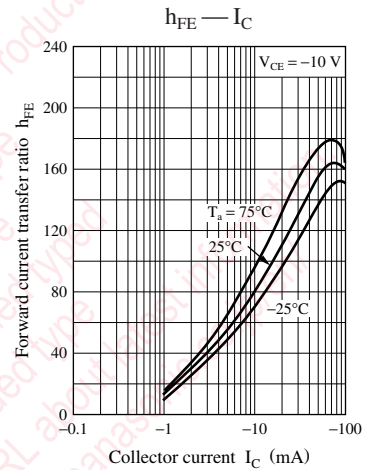
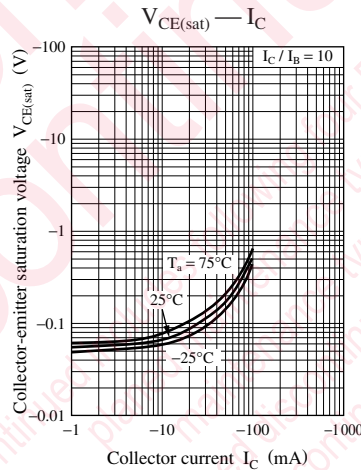
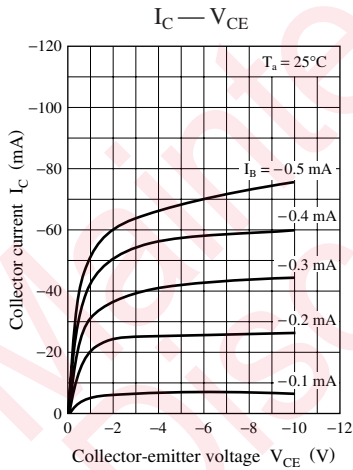


Characteristics charts of UNR411F

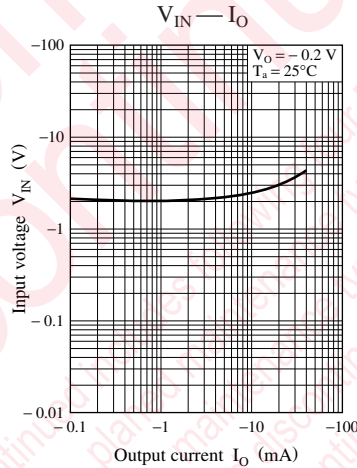
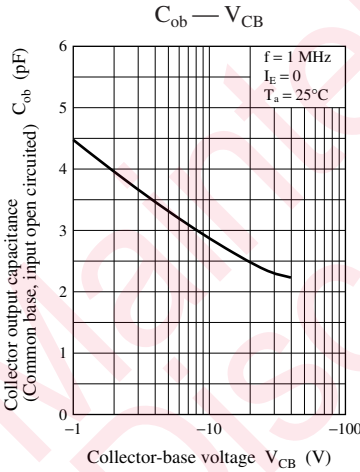
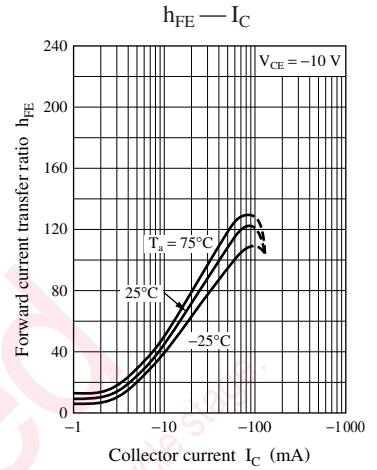
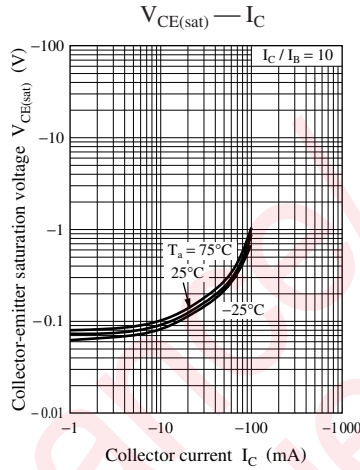
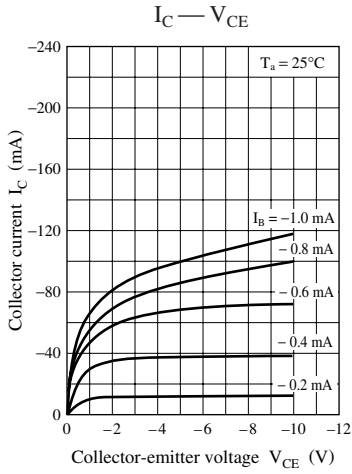




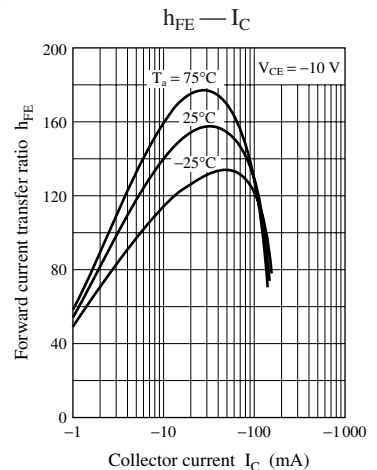
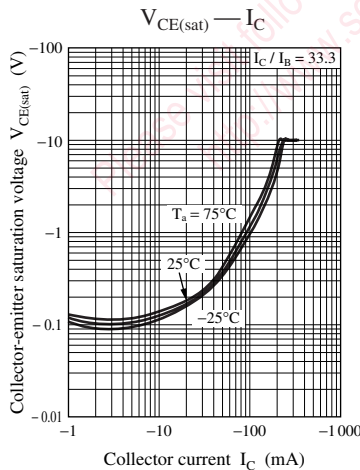
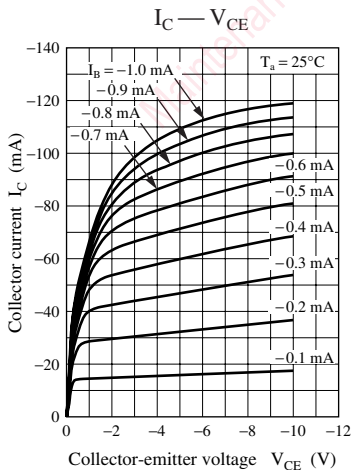
**Characteristics charts of UNR411H**

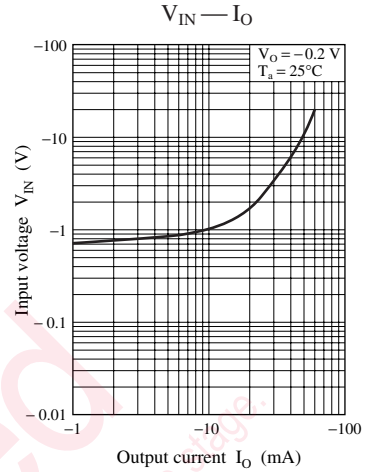
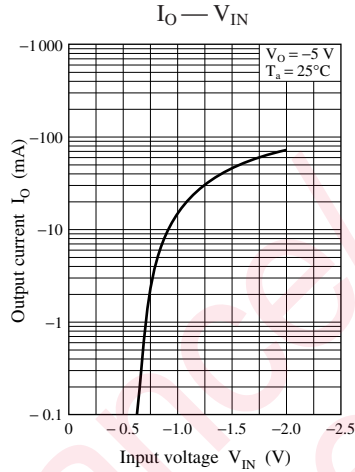
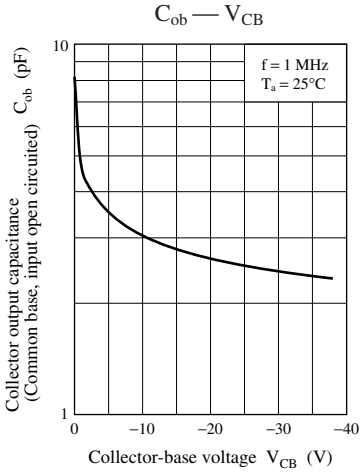


Characteristics charts of UNR411L

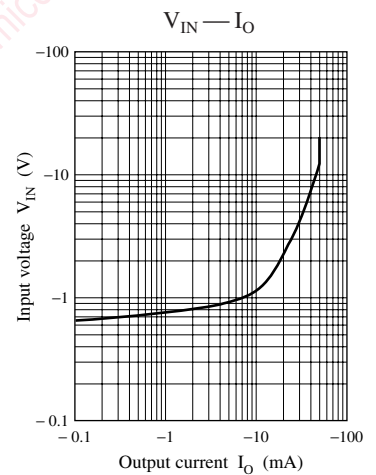
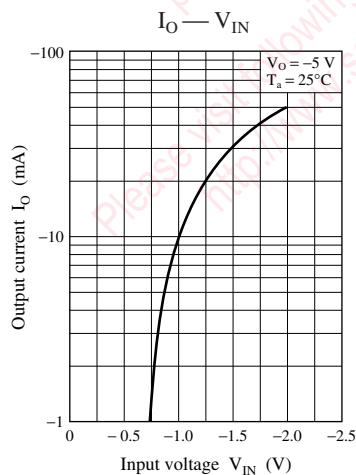
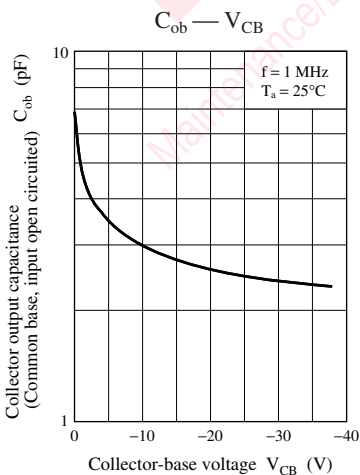
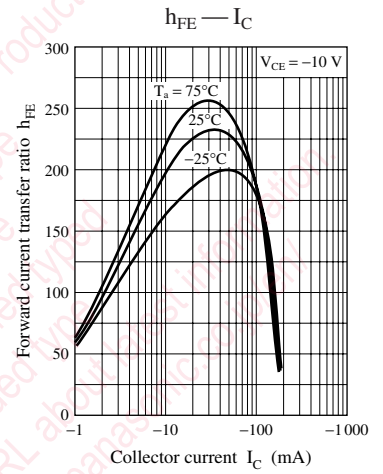
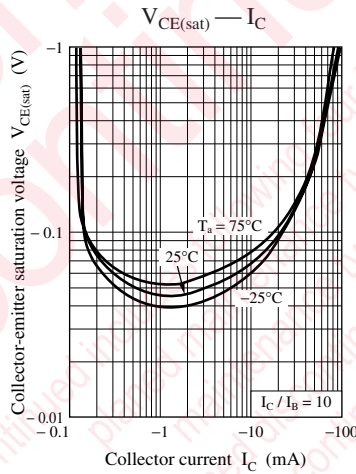
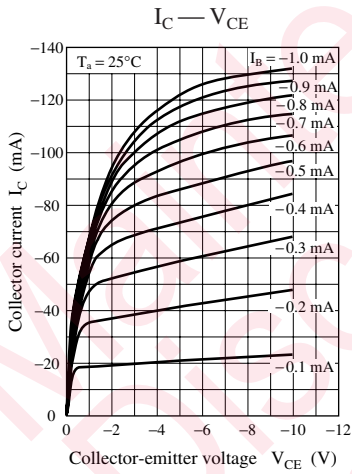


Characteristics charts of UNR411M





Characteristics charts of UNR411N



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