

# UNR411x Series (UN411x Series)

## Silicon PNP epitaxial planar type

For digital circuits

### ■ Features

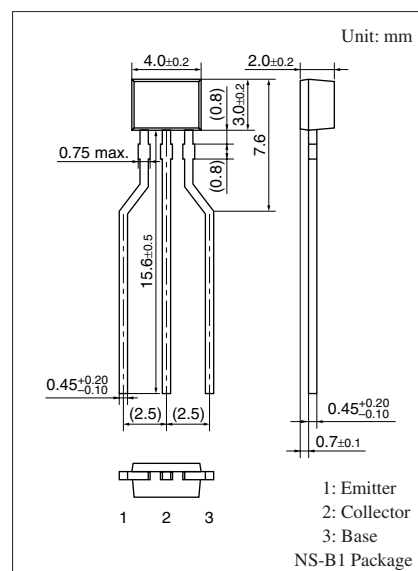
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- New S type package, allowing supply with the radial taping

### ■ Resistance by Part Number

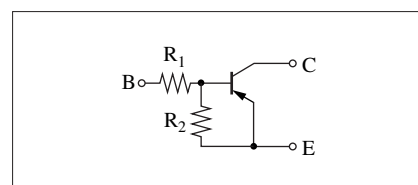
	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR4110 (UN4110)	47 kΩ	—
• UNR4111 (UN4111)	10 kΩ	10 kΩ
• UNR4112 (UN4112)	22 kΩ	22 kΩ
• UNR4113 (UN4113)	47 kΩ	47 kΩ
• UNR4114 (UN4114)	10 kΩ	47 kΩ
• UNR4115 (UN4115)	10 kΩ	—
• UNR4116 (UN4116)	4.7 kΩ	—
• UNR4117 (UN4117)	22 kΩ	—
• UNR4118 (UN4118)	0.51 kΩ	5.1 kΩ
• 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	$R_i$		-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

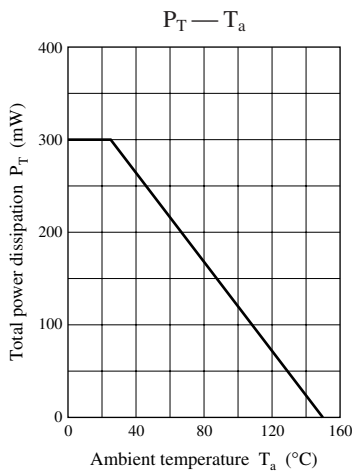
Rank	Q	R	S	No-rank
$h_{FE}$	160 to 260	210 to 340	290 to 460	160 to 460

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

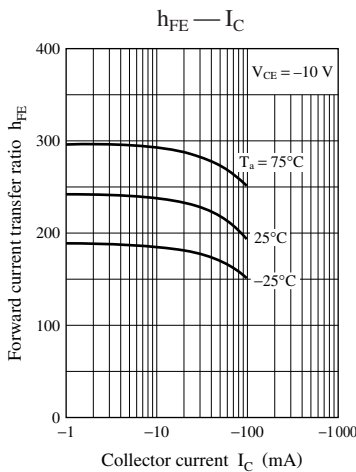
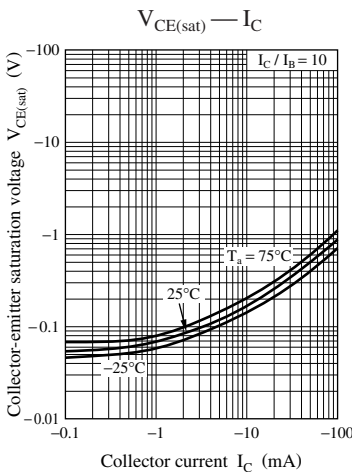
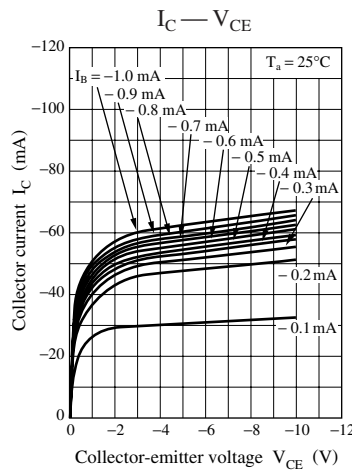
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR411M	$R_1/R_2$			0.047		—
	UNR411N				0.1		
	UNR4118/4119			0.08	0.10	0.12	
	UNR4114			0.17	0.21	0.25	
	UNR411H			0.17	0.22	0.27	
	UNR411F			0.37	0.47	0.57	
	UNR4111/4112/4113/411L			0.8	1.0	1.2	
	UNR411E			1.70	2.14	2.60	
	UNR411D			3.7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

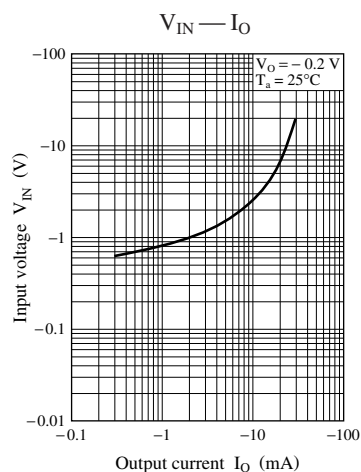
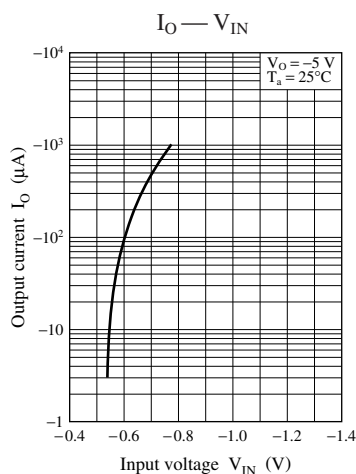
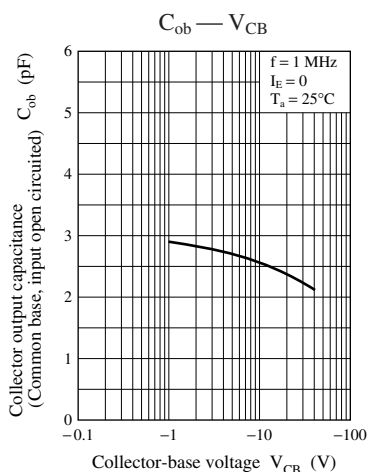
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

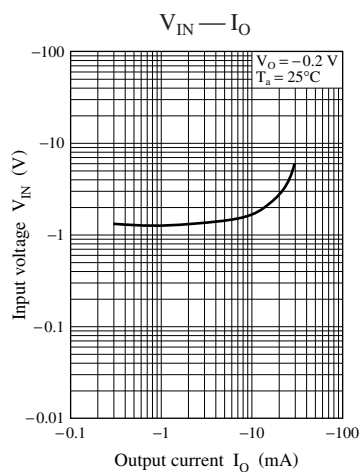
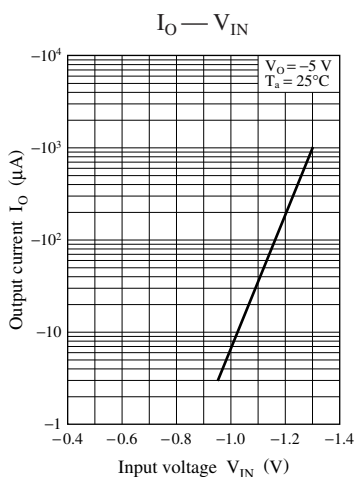
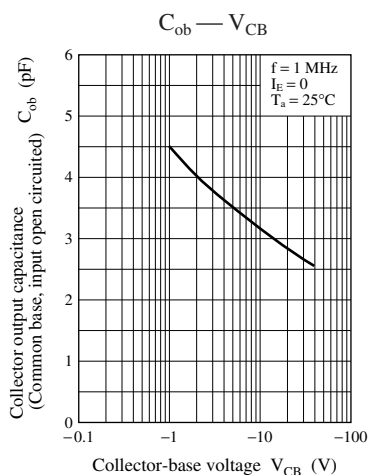
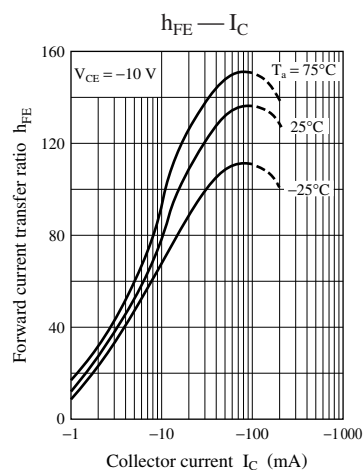
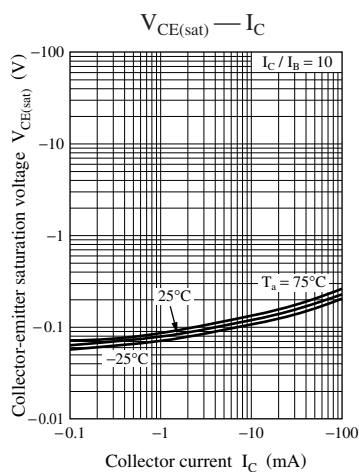
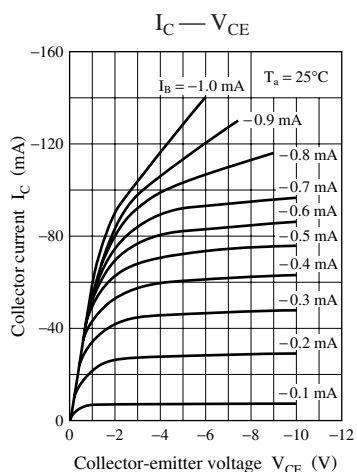


Characteristics charts of UNR4110

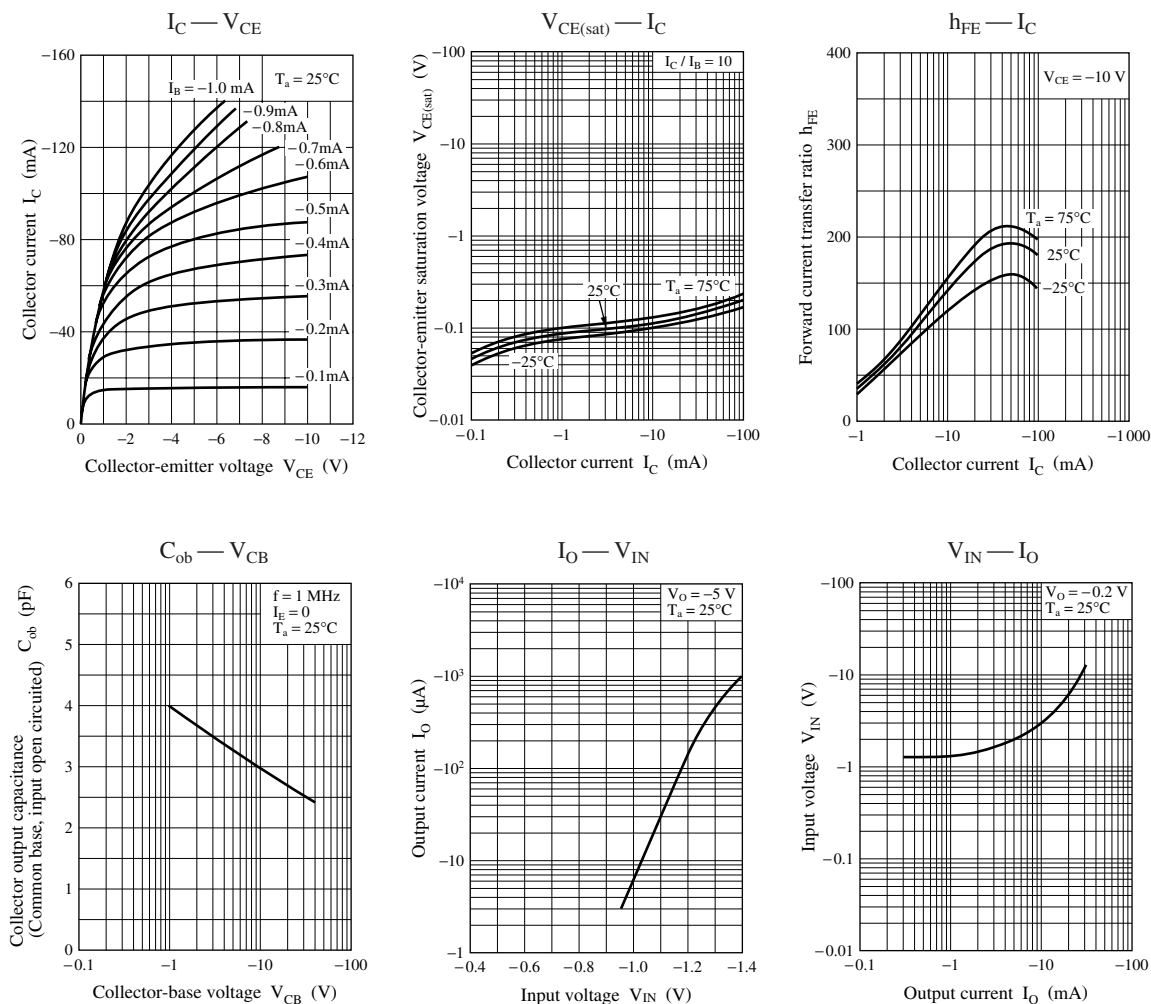




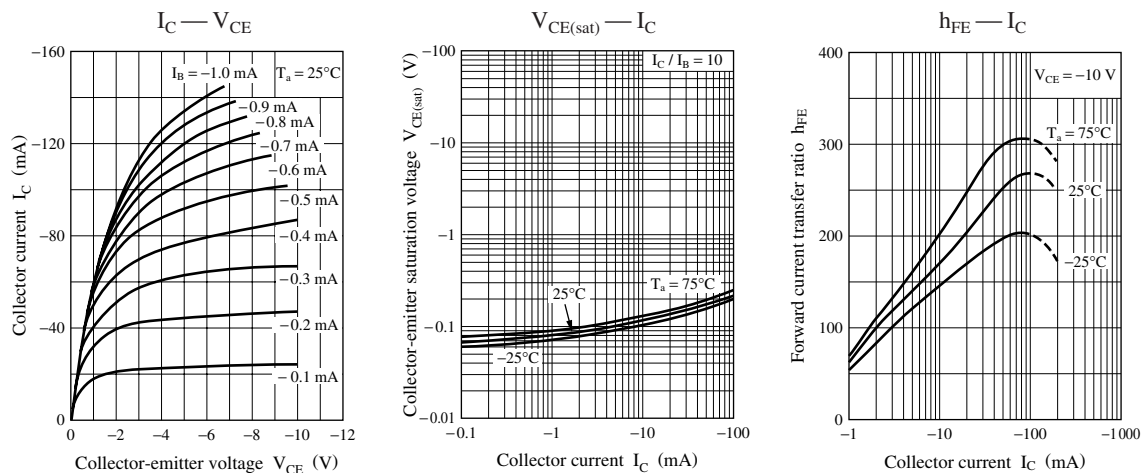
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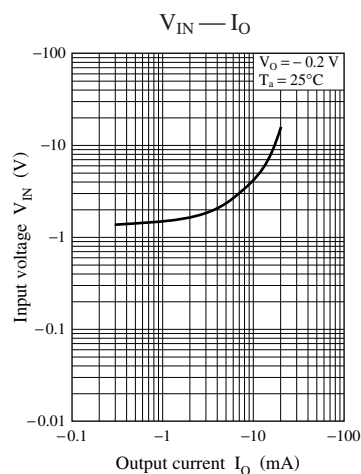
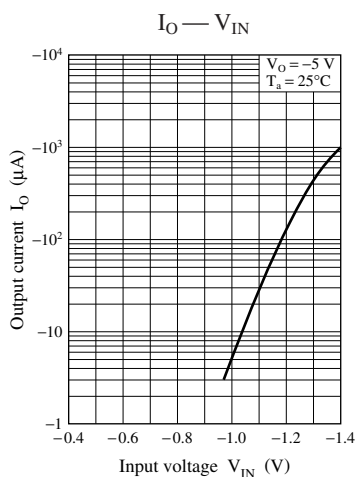
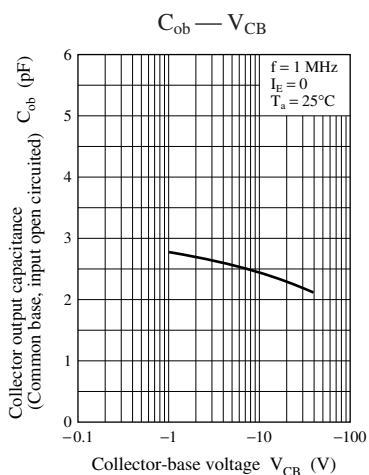


Characteristics charts of UNR4112

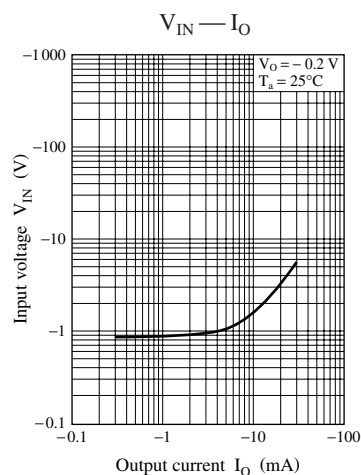
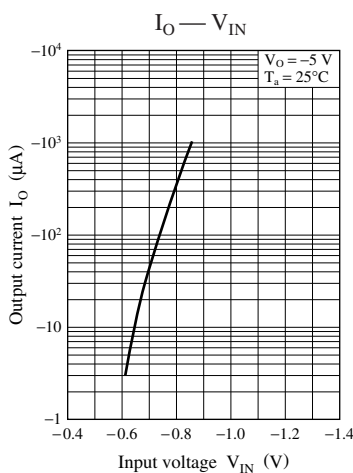
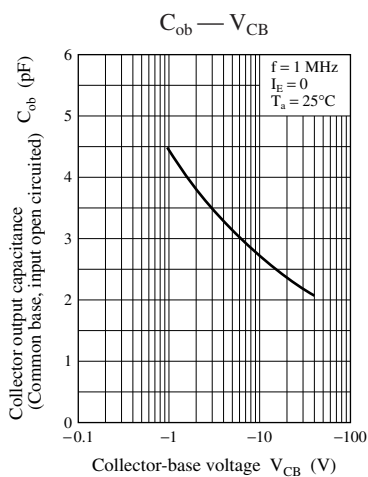
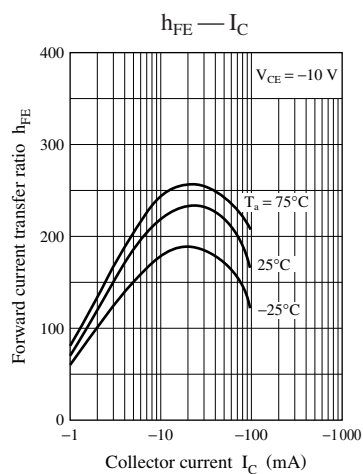
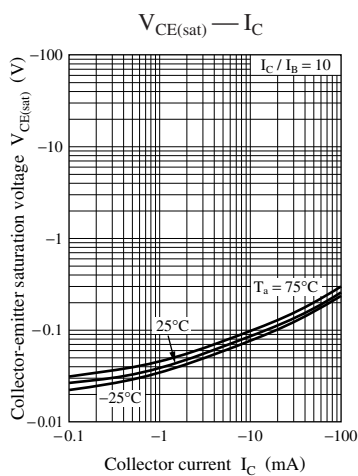
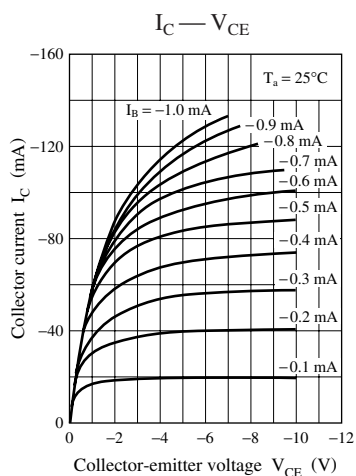


Characteristics charts of UNR4113

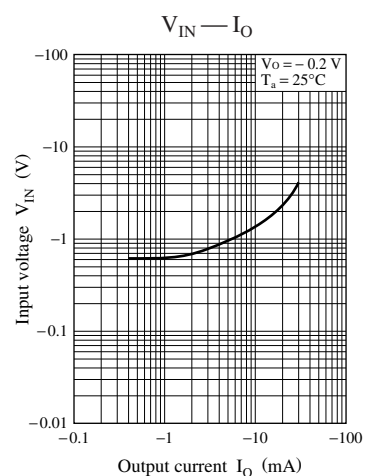
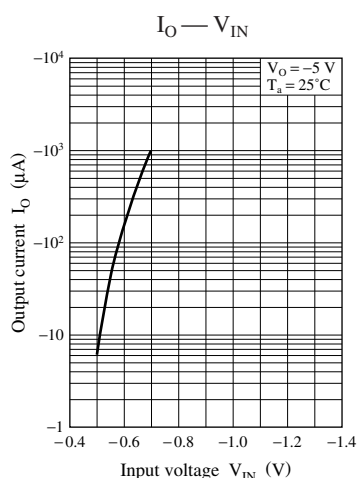
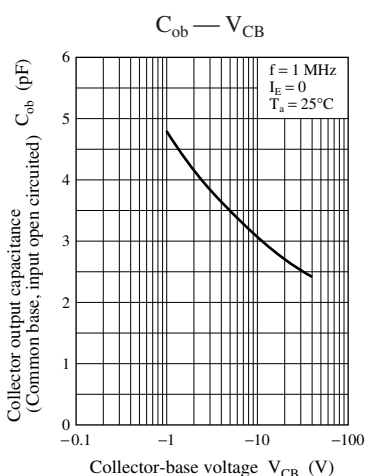
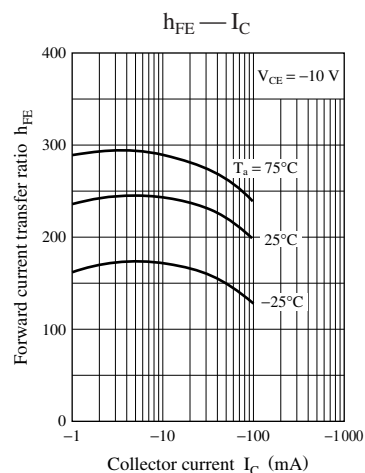
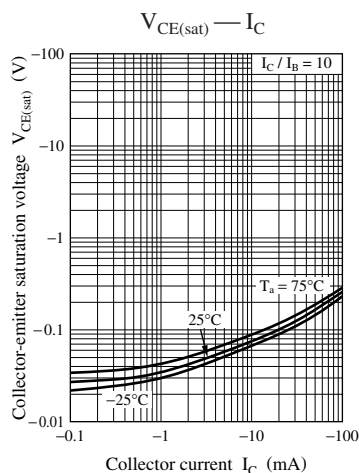
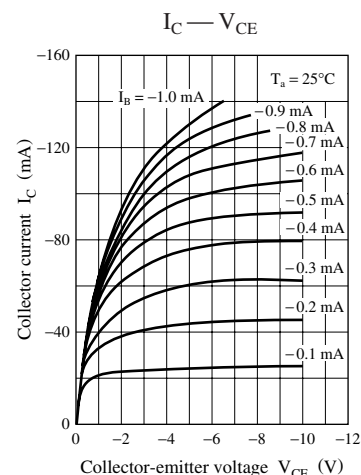




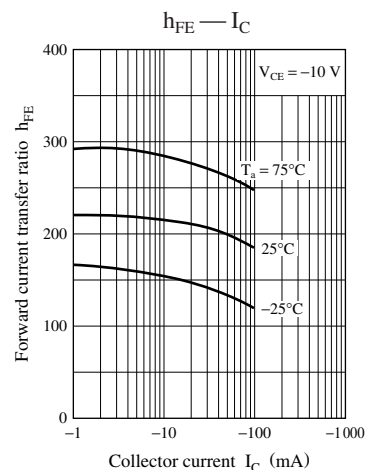
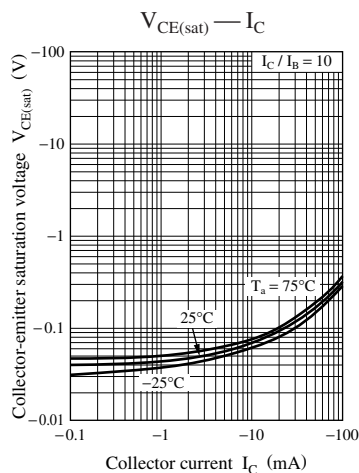
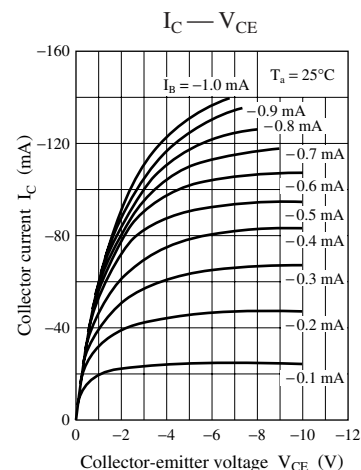
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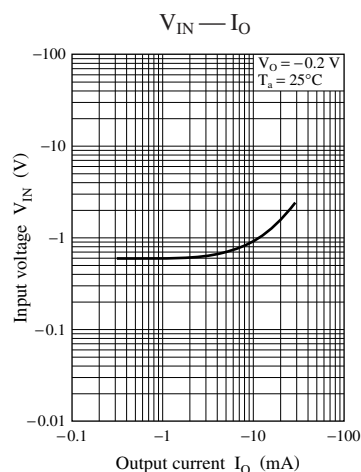
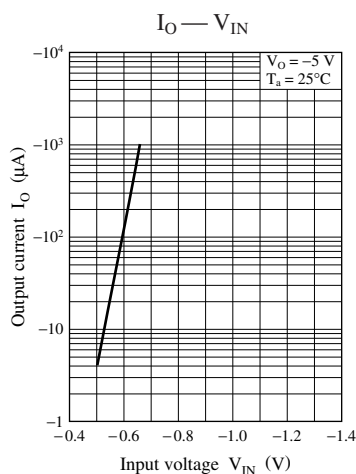
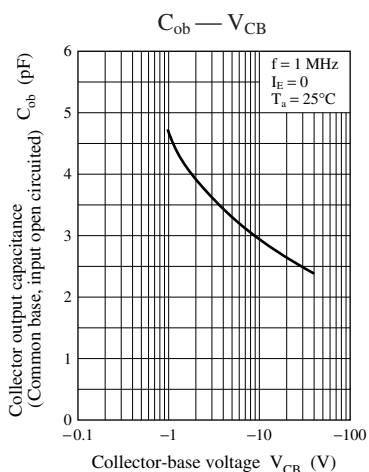


Characteristics charts of UNR4115

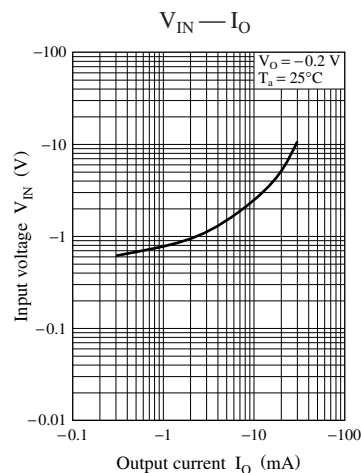
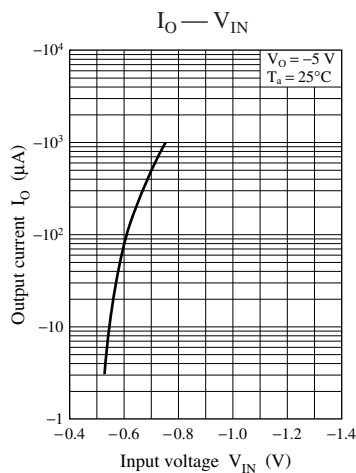
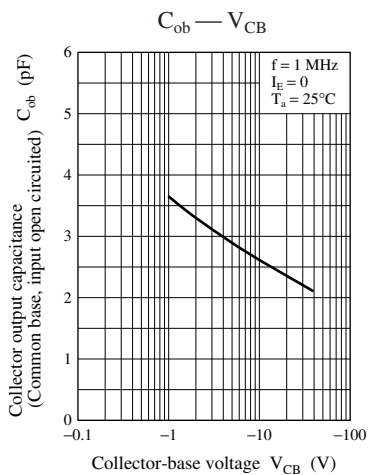
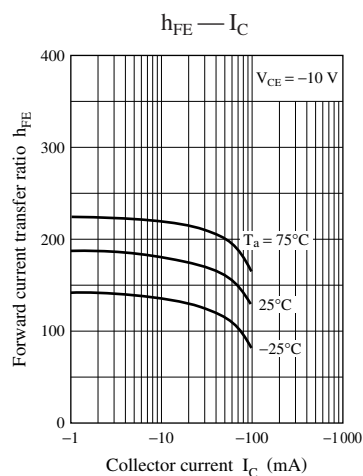
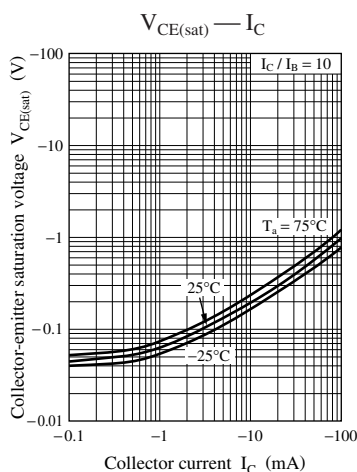
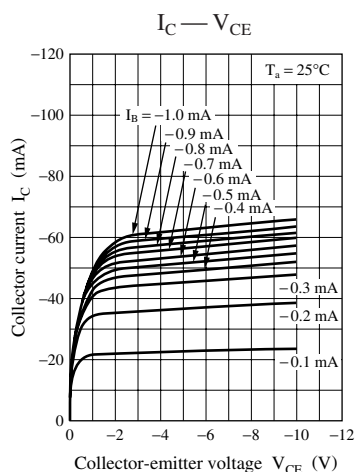


Characteristics charts of UNR4116



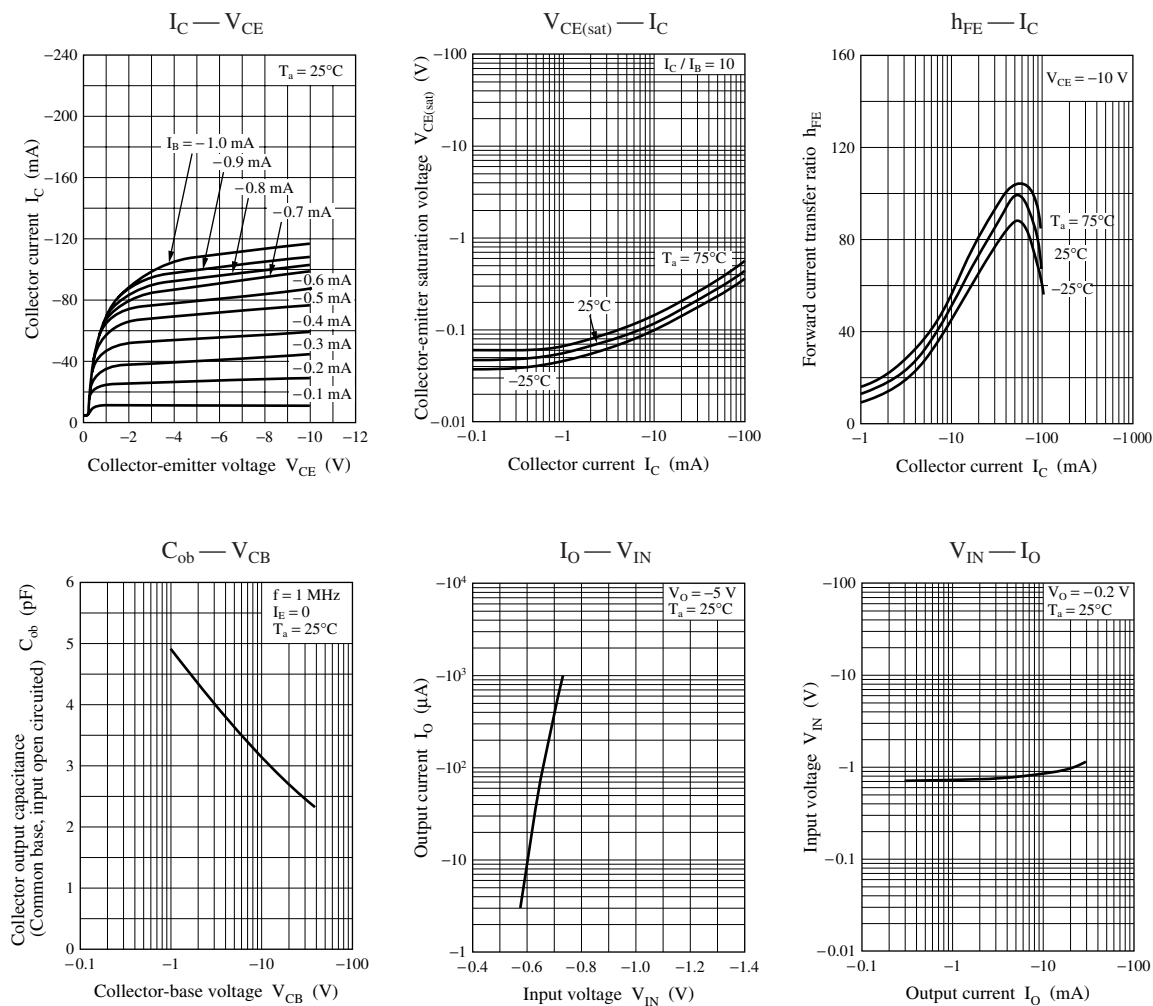


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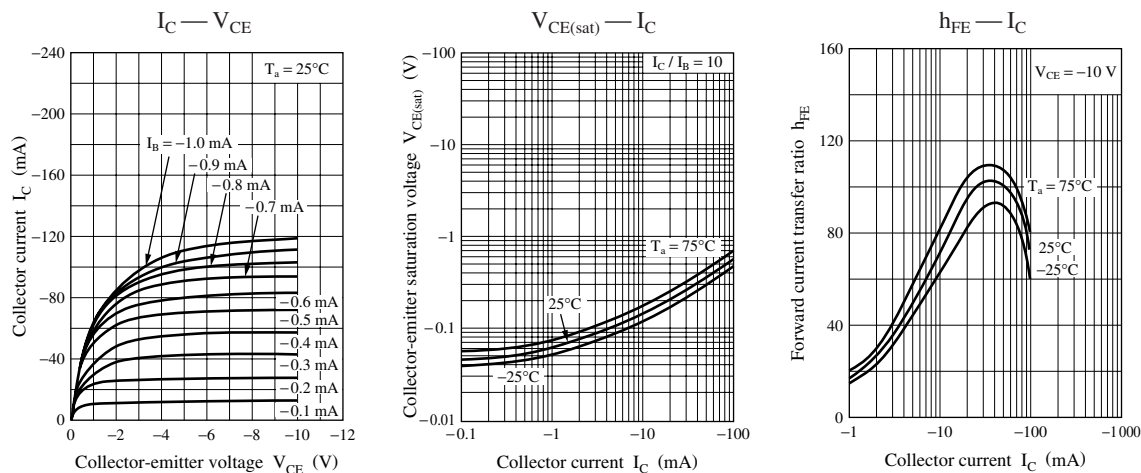


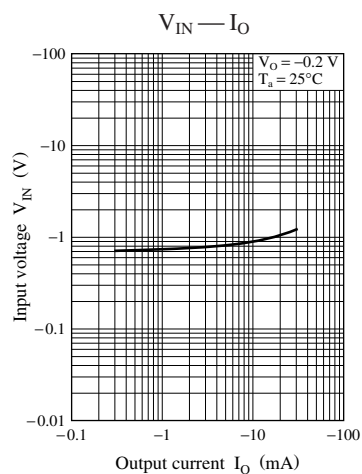
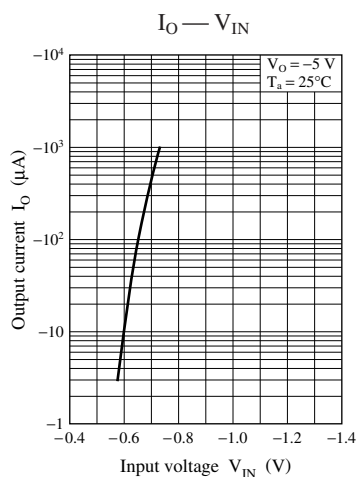
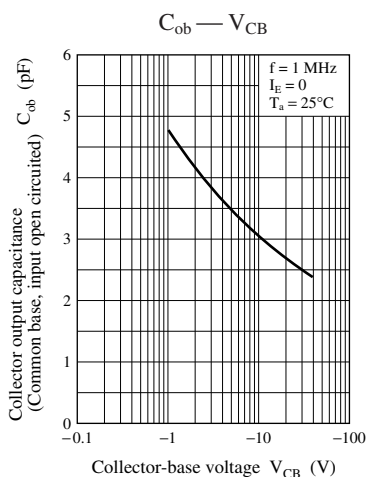


Characteristics charts of UNR4118

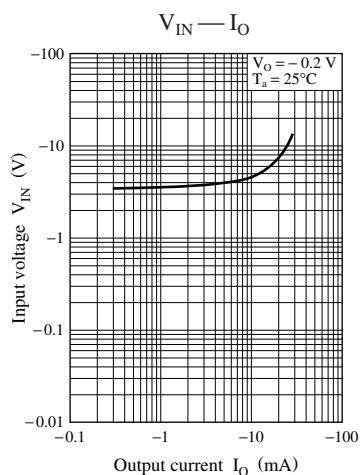
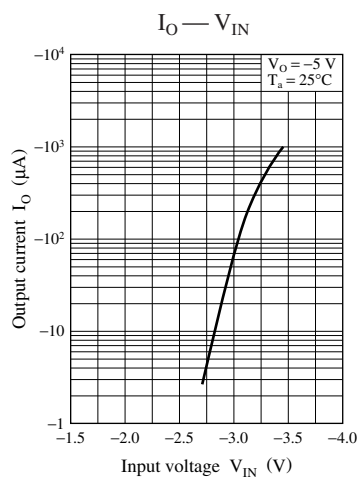
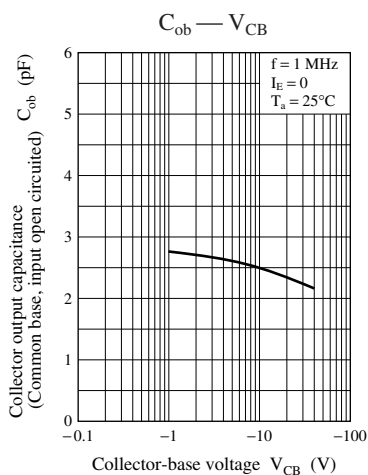
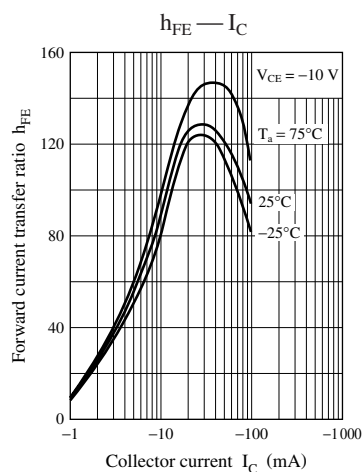
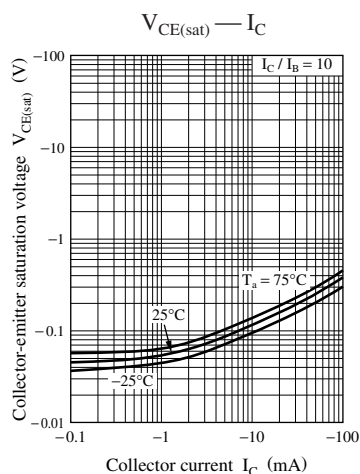
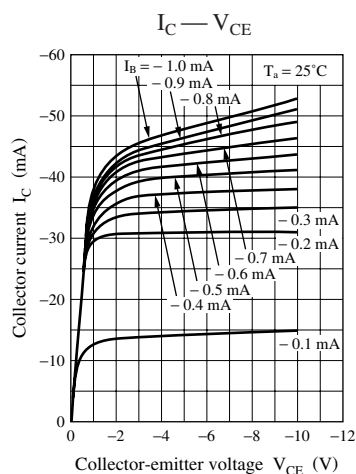


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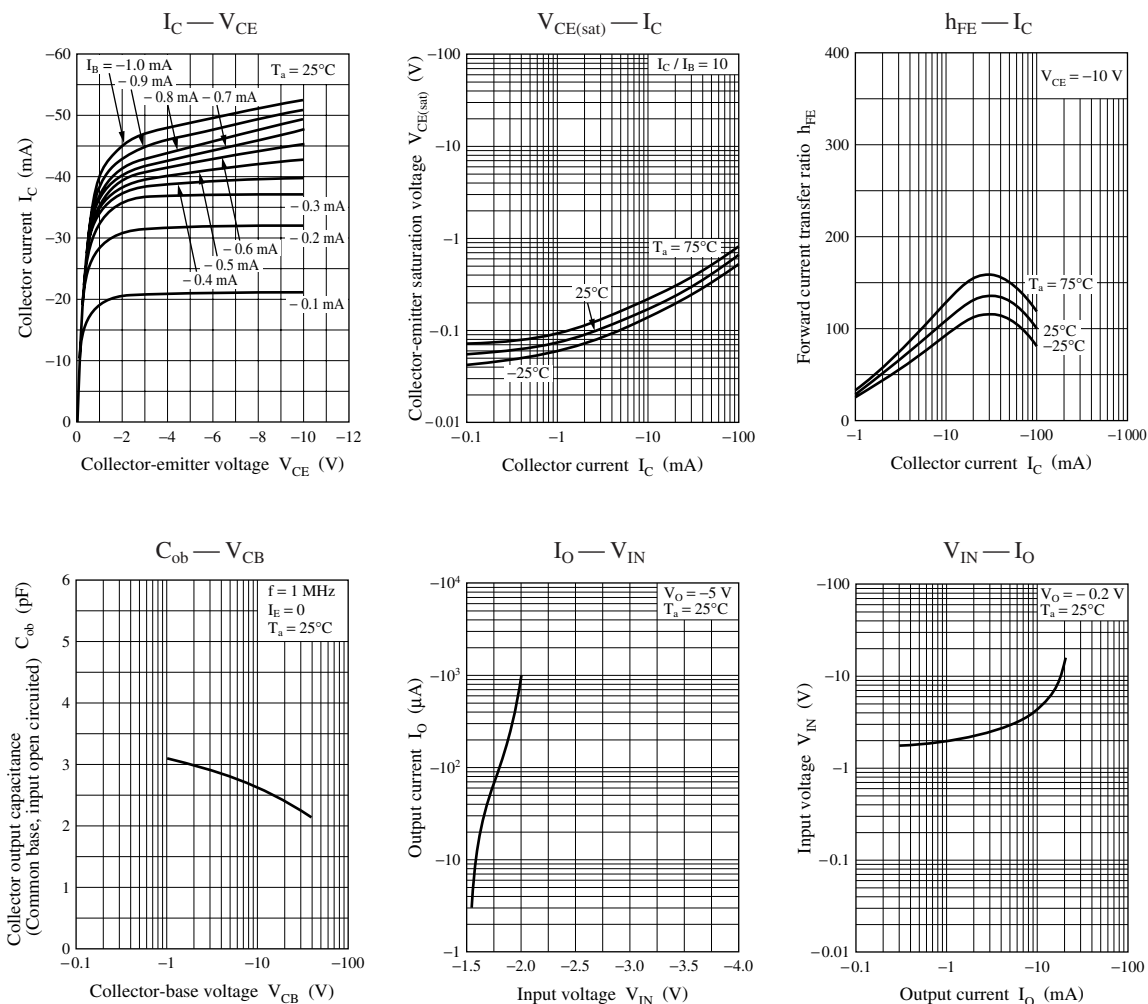




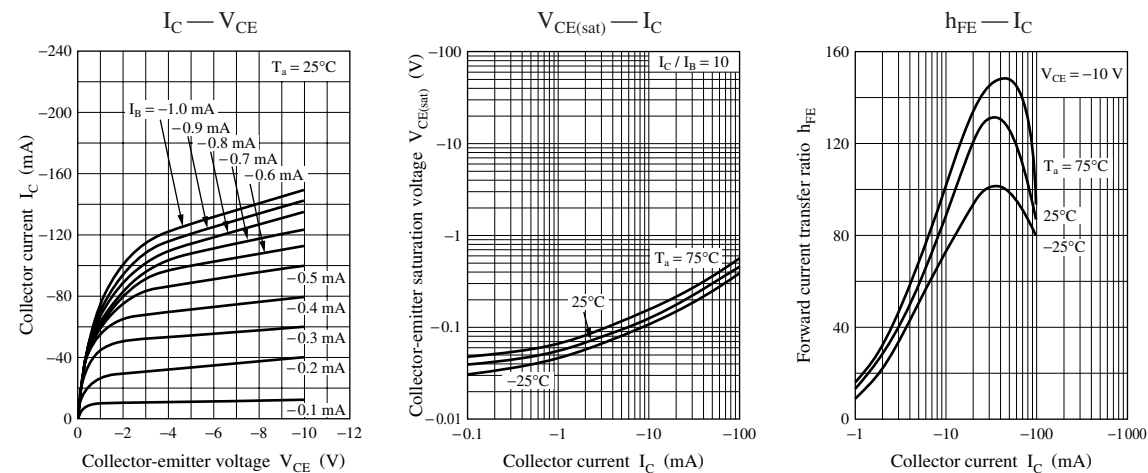
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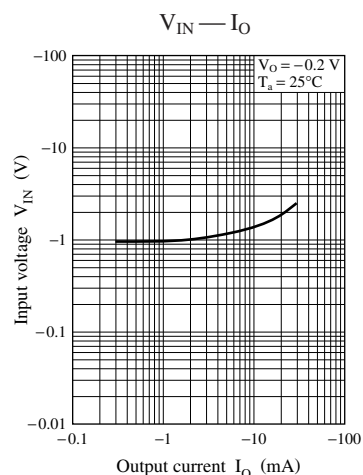
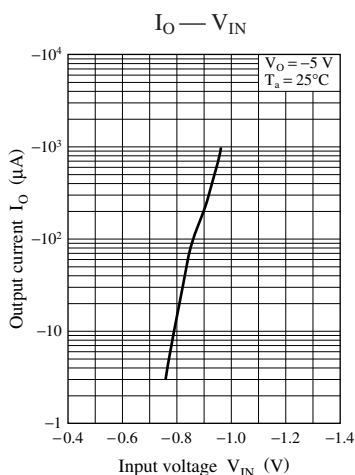
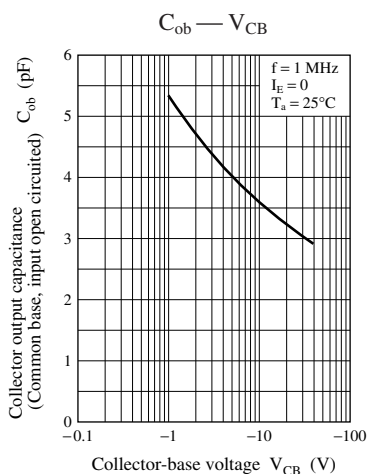


Characteristics charts of UNR411E

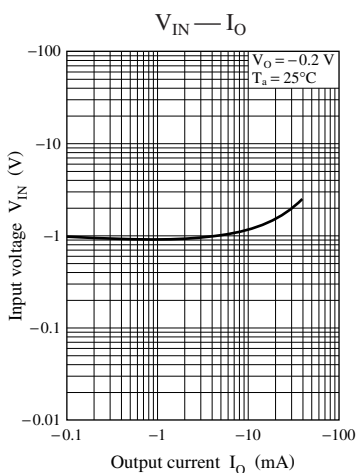
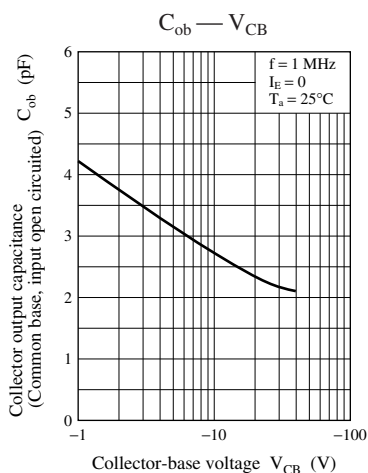
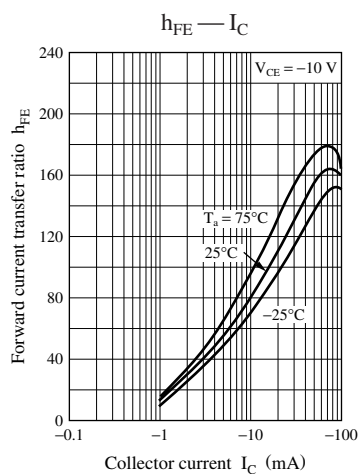
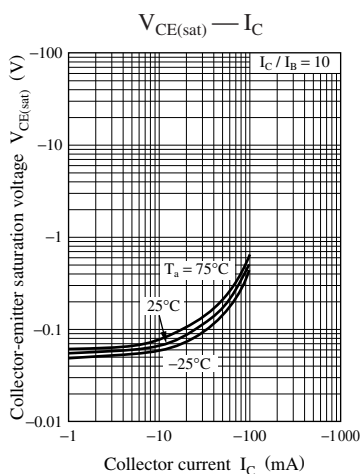
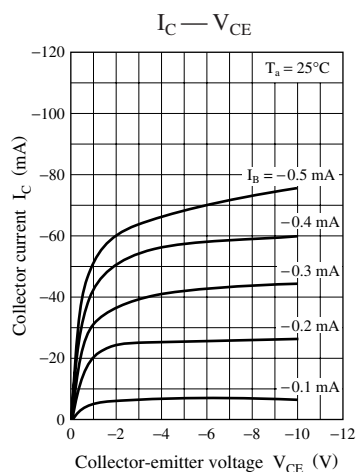


Characteristics charts of UNR411F

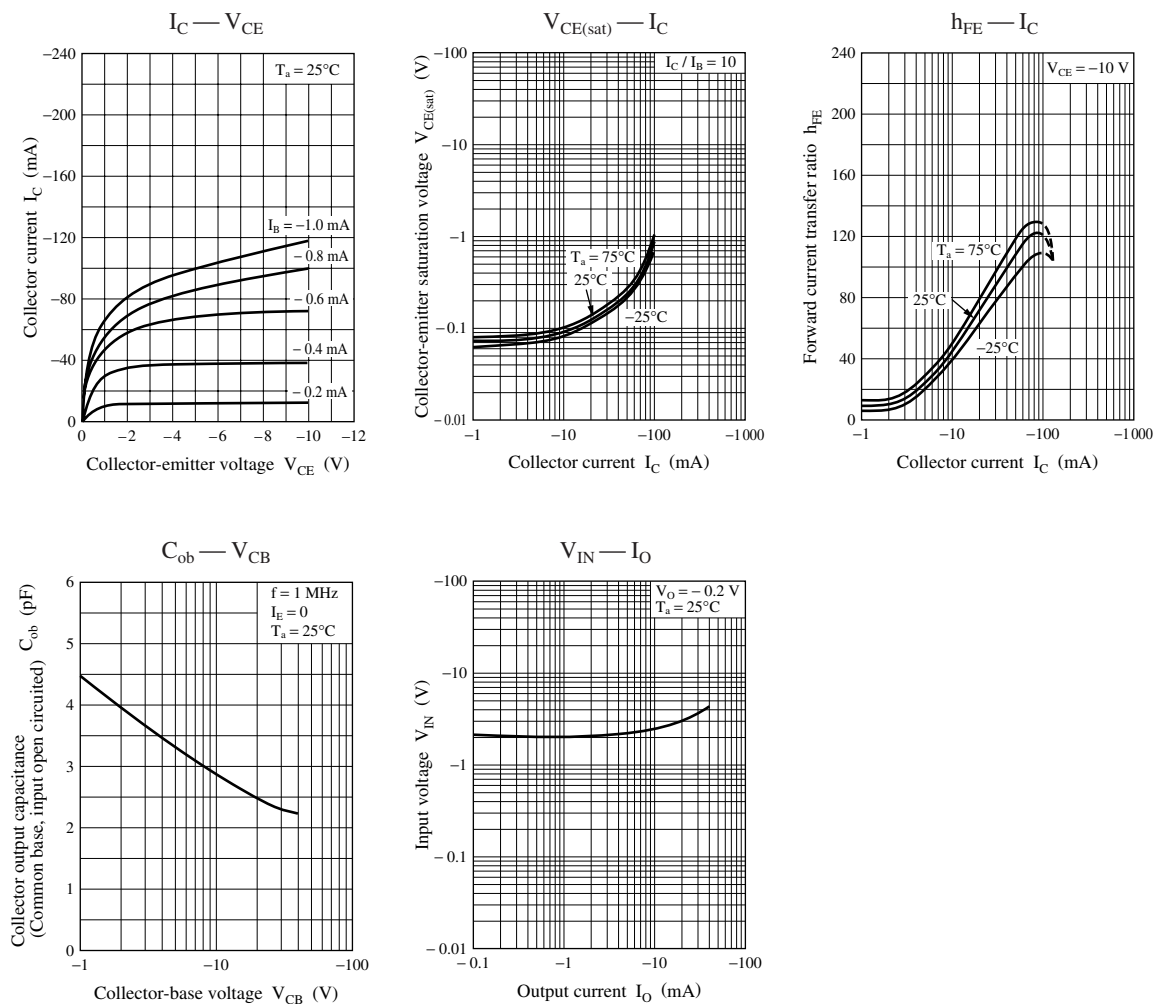




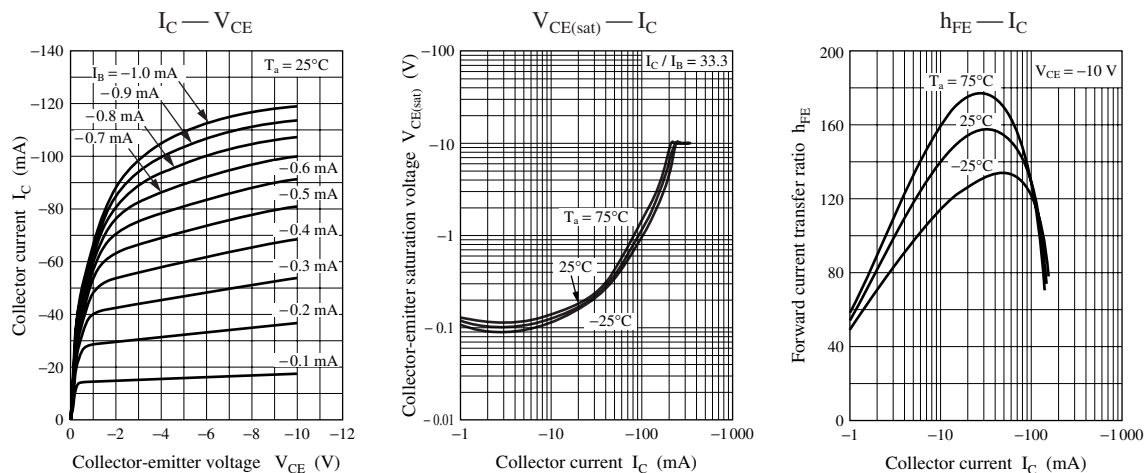
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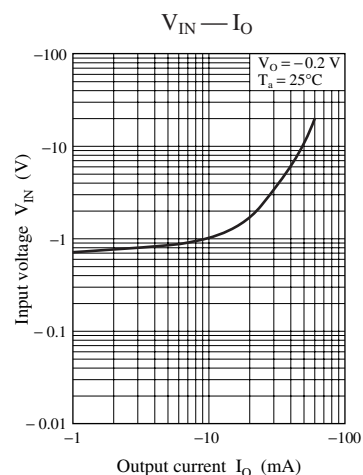
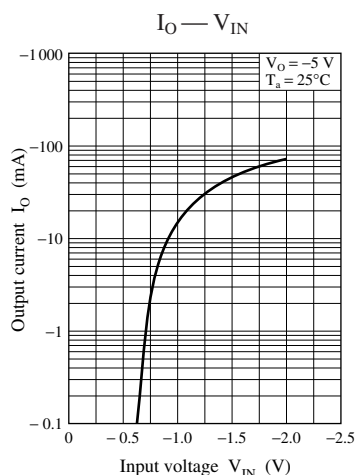
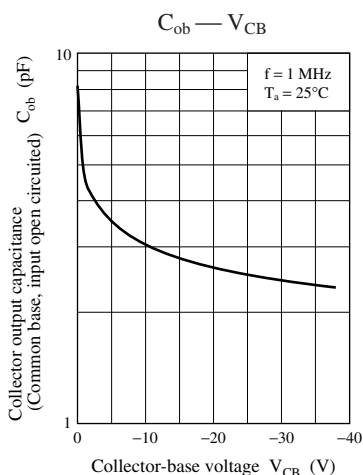


Characteristics charts of UNR411L

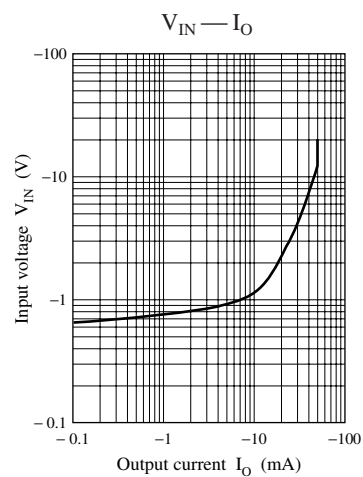
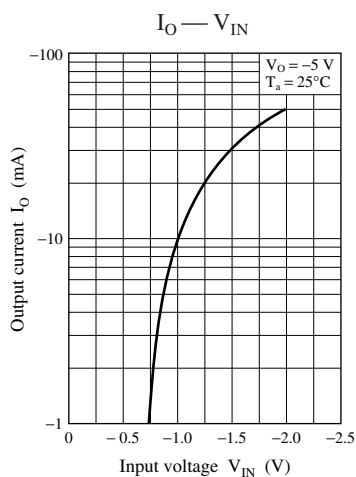
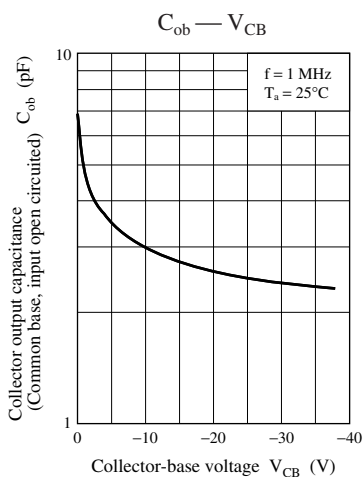
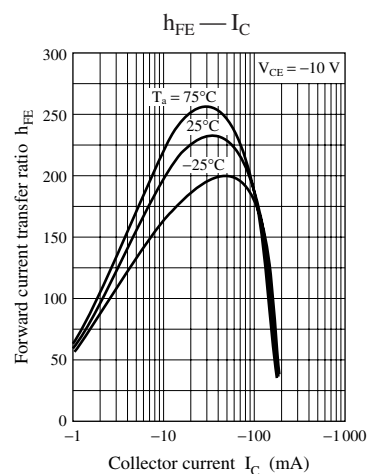
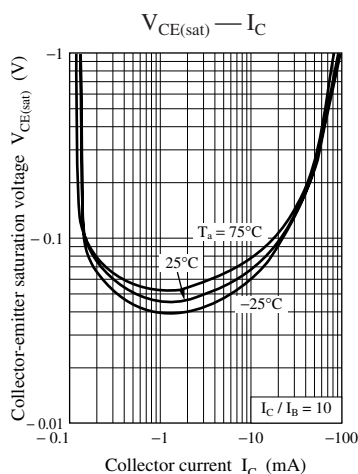
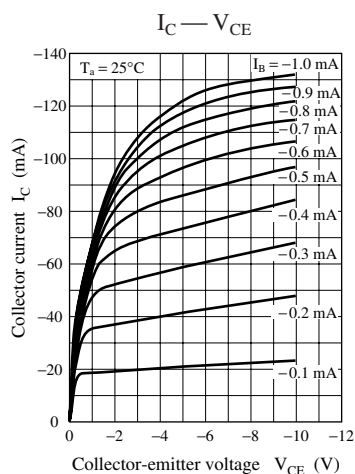


Characteristics charts of UNR411M





## Characteristics charts of UNR411N



## Request for your special attention and precautions in using the technical information and semiconductors described in this material

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