

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit	
Collector-base voltage (Emitter open)	V_{CBO}	$I_C = -10 \mu\text{A}, I_E = 0$	-50			V	
Collector-emitter voltage (Base open)	V_{CEO}	$I_C = -2 \text{mA}, I_B = 0$	-50			V	
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = -50 \text{V}, I_E = 0$			-0.1	μA	
Collector-emitter cutoff current (Base open)	I_{CEO}	$V_{CE} = -50 \text{V}, I_B = 0$			-0.5	μA	
Emitter-base cutoff current (Collector open)	UNR4110/4115/4116/4117	I_{EBO}				-0.01	
	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	
						$V_{CC} = -5 \text{V}, V_B = -3.5 \text{V}, R_L = 1 \text{k}\Omega$	
						$V_{CC} = -5 \text{V}, V_B = -10 \text{V}, R_L = 1 \text{k}\Omega$	
						$V_{CC} = -5 \text{V}, V_B = -6 \text{V}, R_L = 1 \text{k}\Omega$	
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 Ω
	UNR4119						
	UNR411H/411M						
	UNR4116/411F/411L/411N						
	UNR4111/4114/4115						
	UNR4112/4117						
	UNR4110/4113/411D/411E						

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

2. *: Rank classification

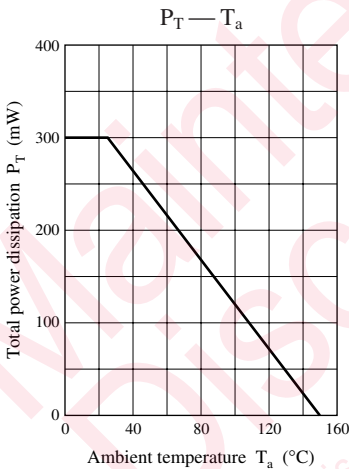
Rank	Q	R	S	No-rank
h_{FE}	160 to 260	210 to 340	290 to 460	160 to 460

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

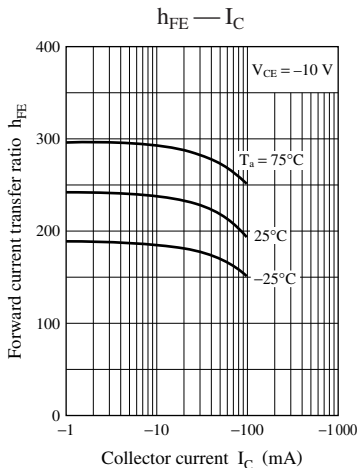
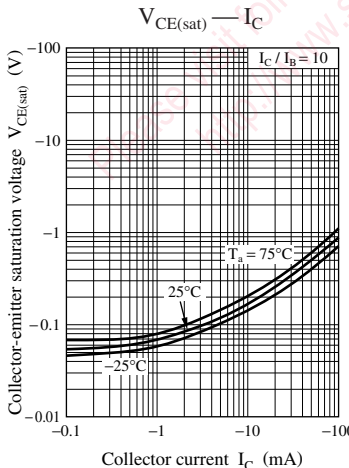
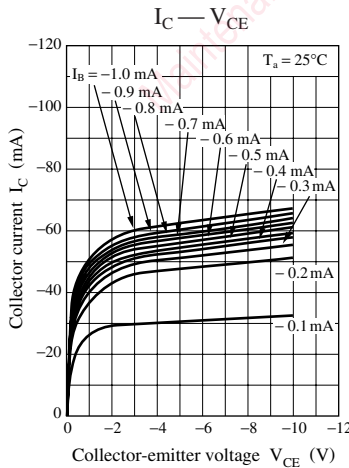
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR411M	R_1/R_2			0.047		—
	UNR411N				0.1		
	UNR4118/4119			0.08	0.10	0.12	
	UNR4114			0.17	0.21	0.25	
	UNR411H			0.17	0.22	0.27	
	UNR411F			0.37	0.47	0.57	
	UNR4111/4112/4113/411L			0.8	1.0	1.2	
	UNR411E			1.70	2.14	2.60	
	UNR411D		3.7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

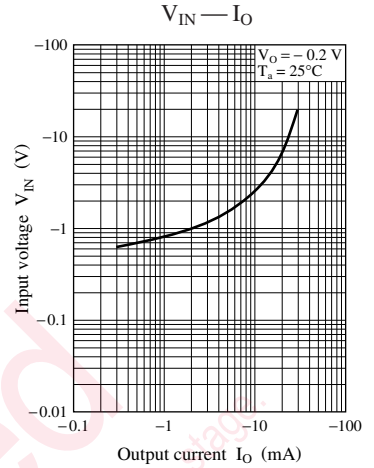
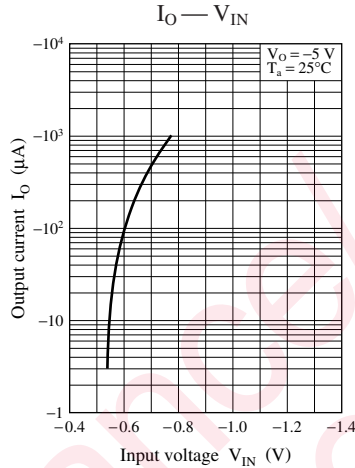
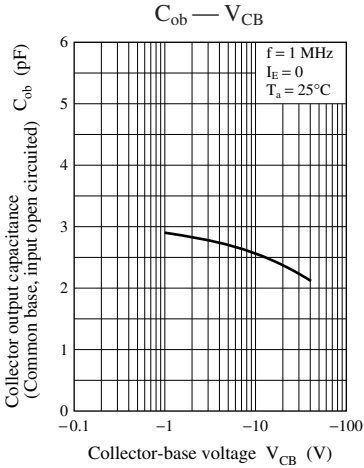
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

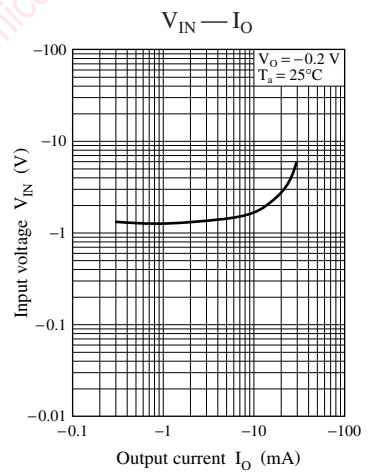
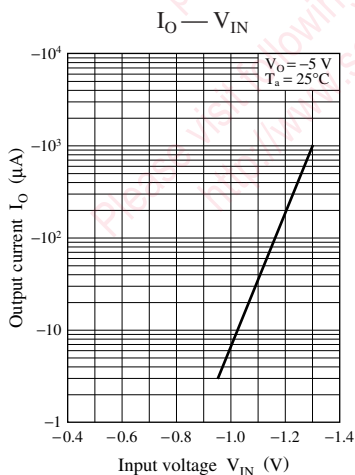
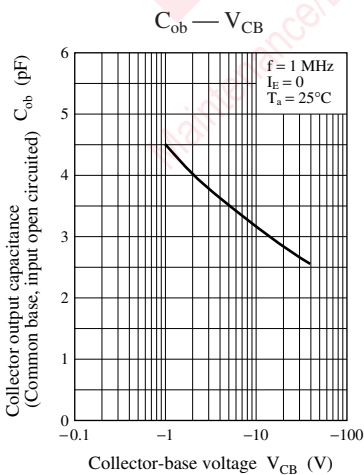
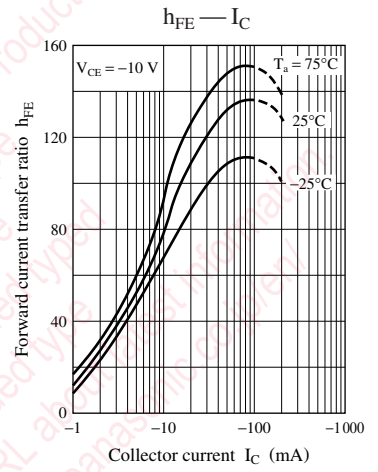
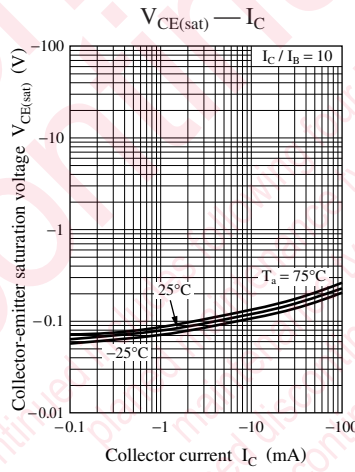
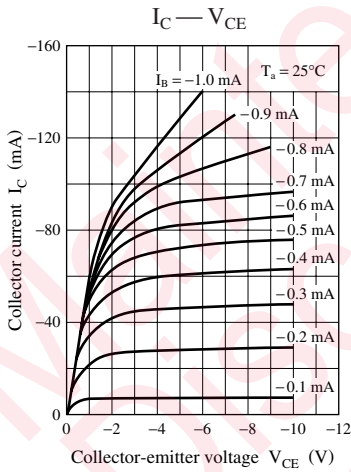


Characteristics charts of UNR4110

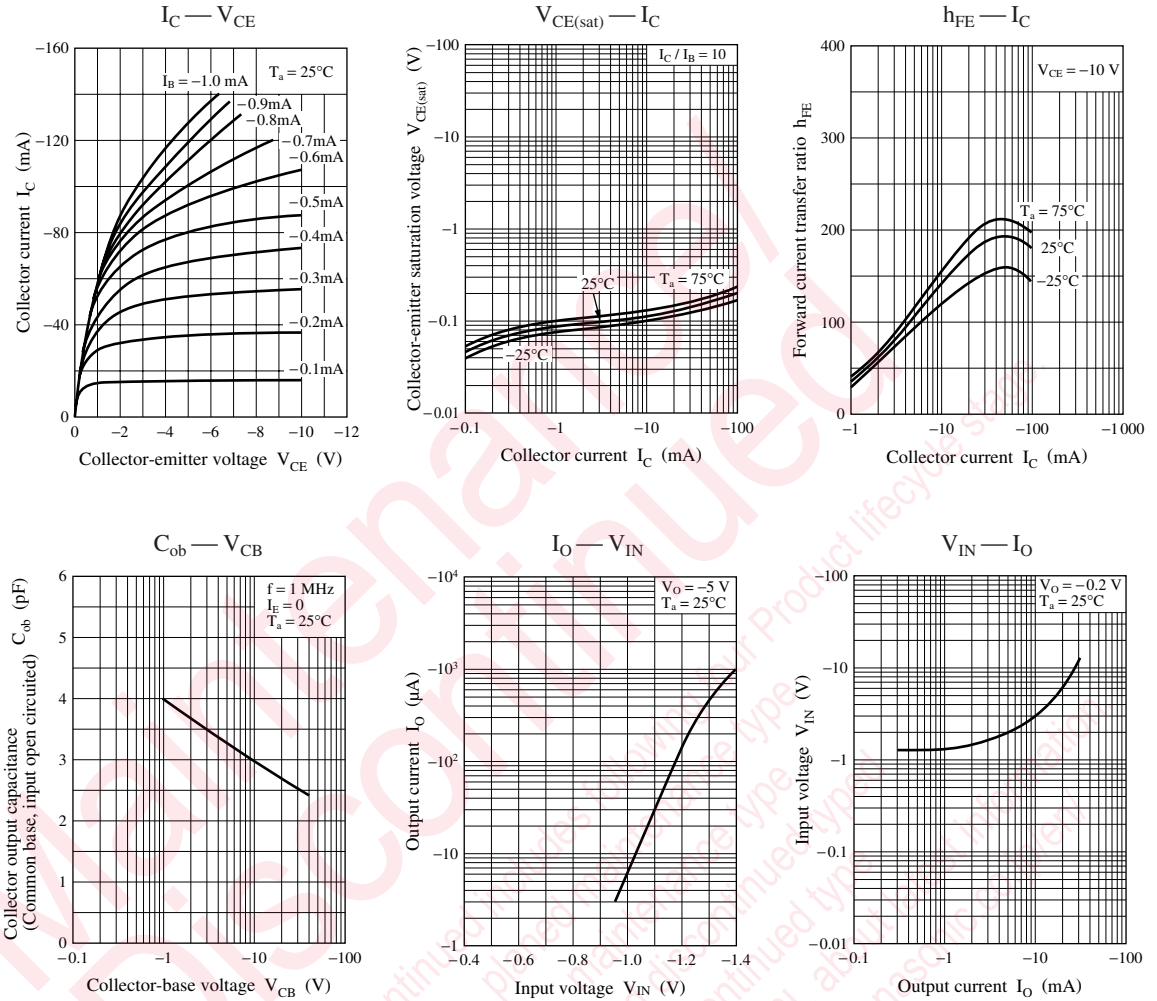




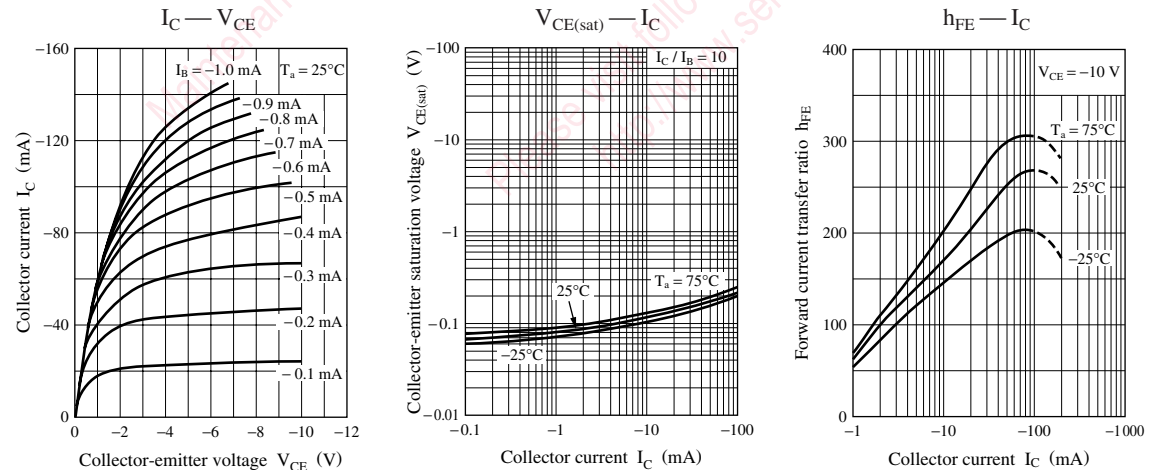
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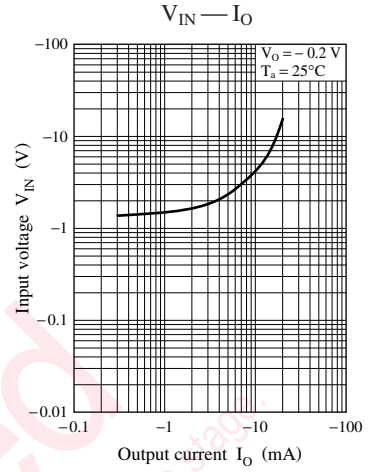
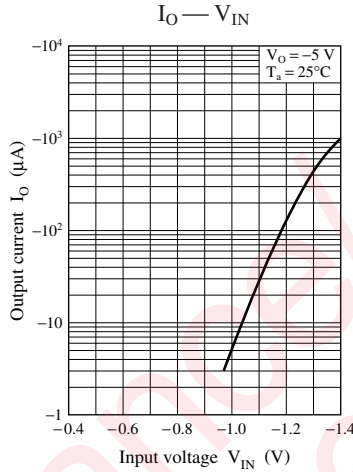
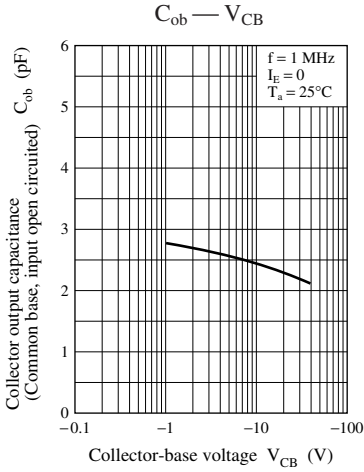


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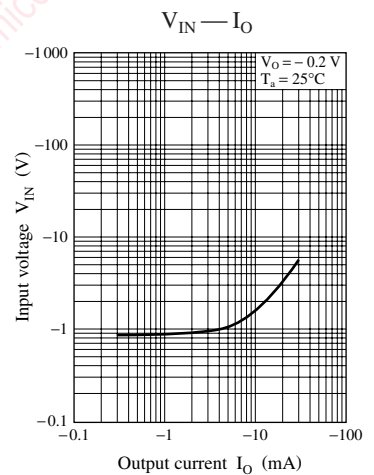
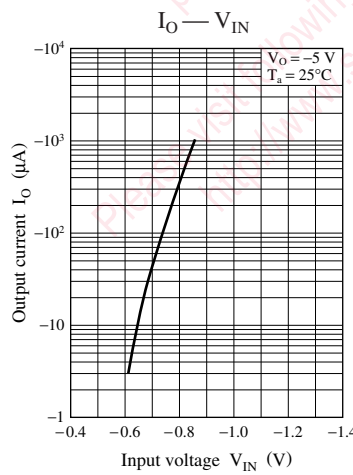
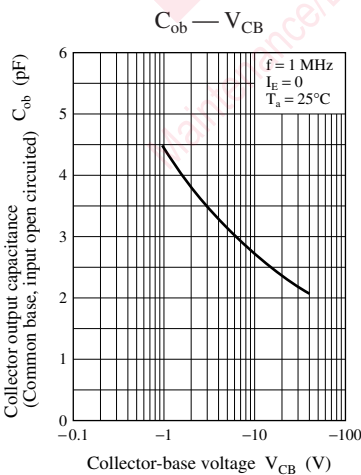
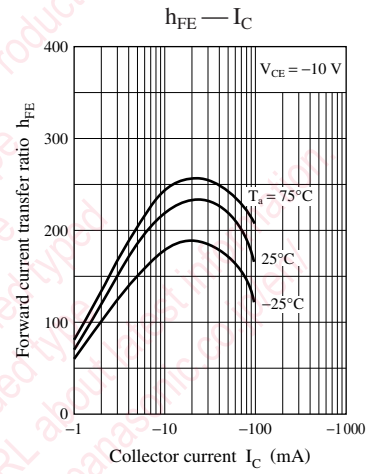
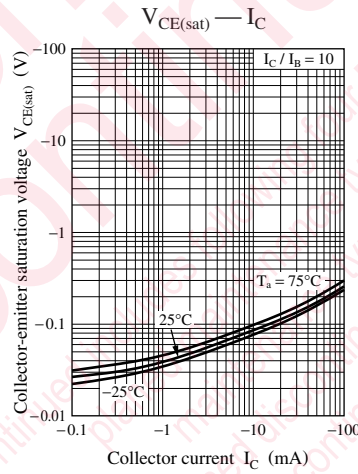
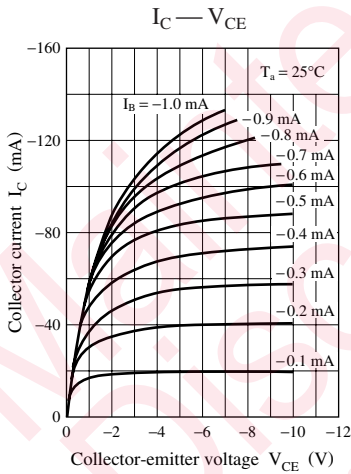


Characteristics charts of UNR4113

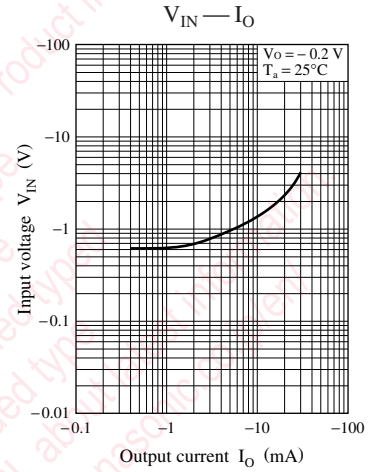
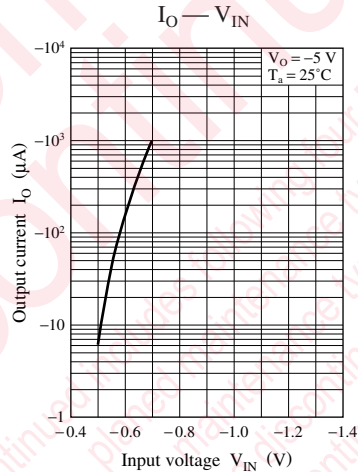
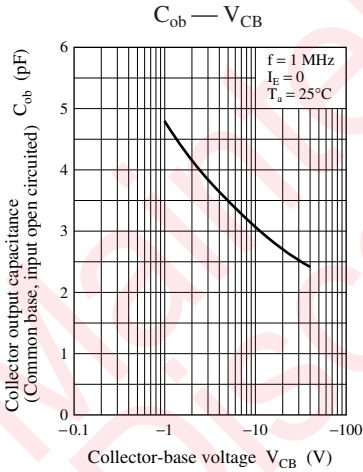
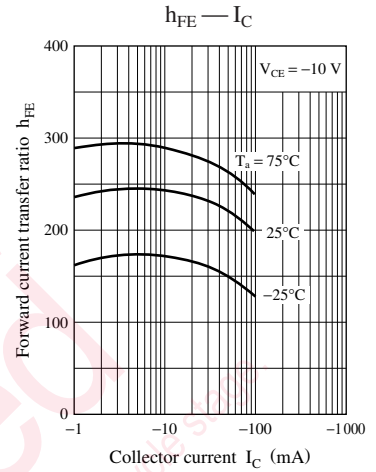
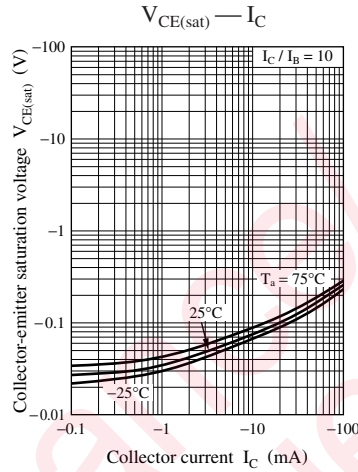
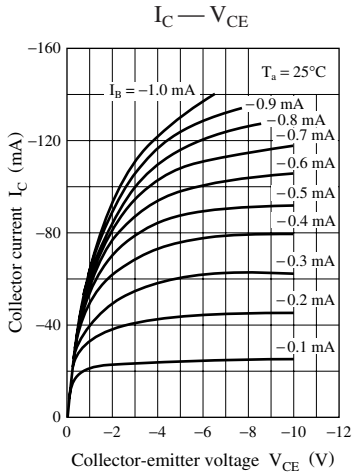




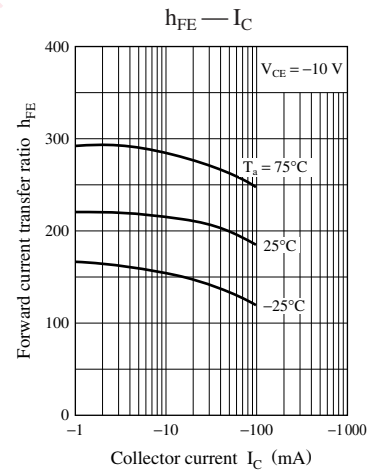
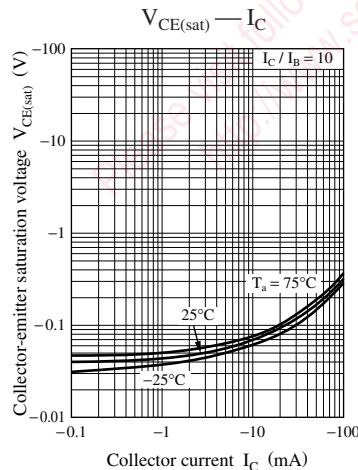
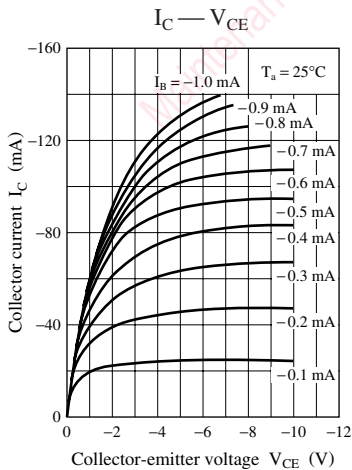
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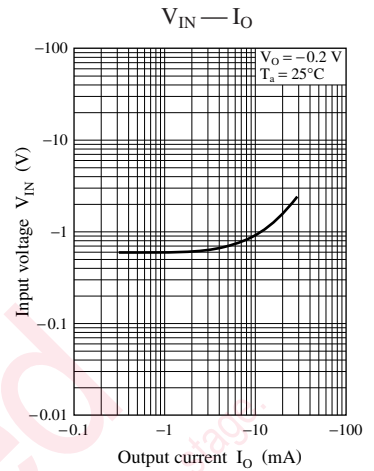
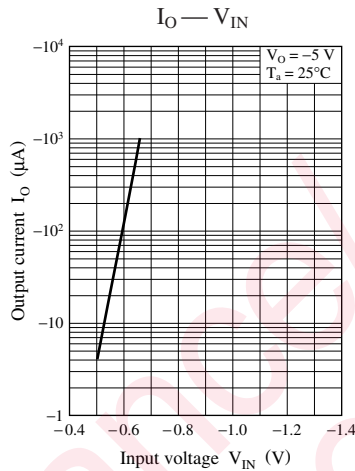
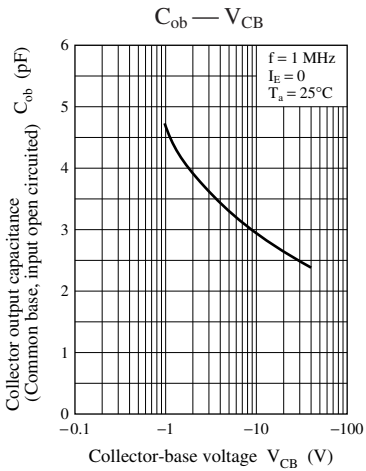


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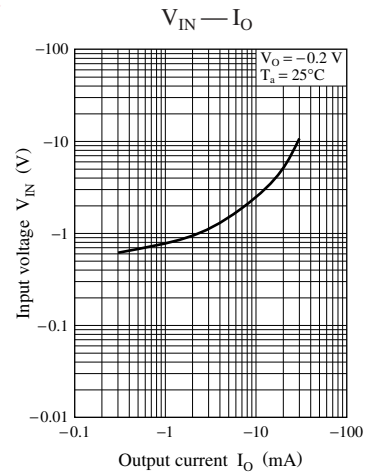
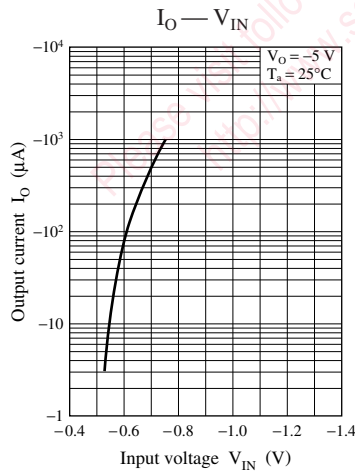
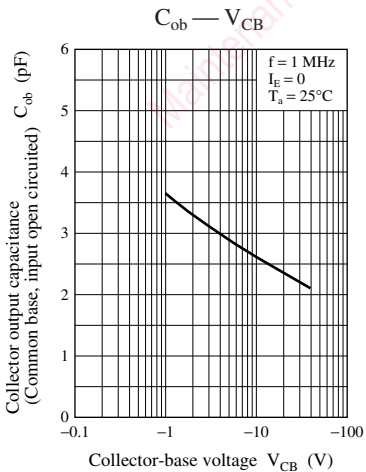
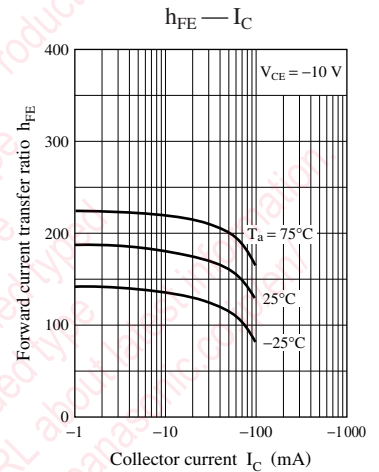
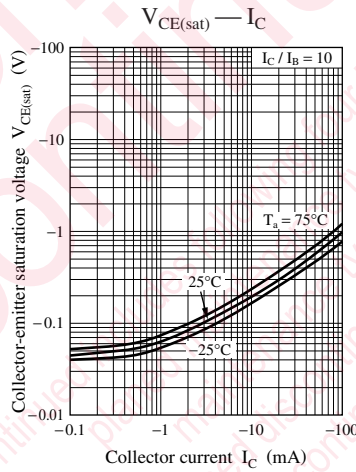
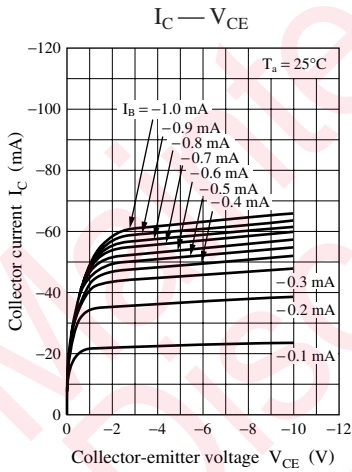


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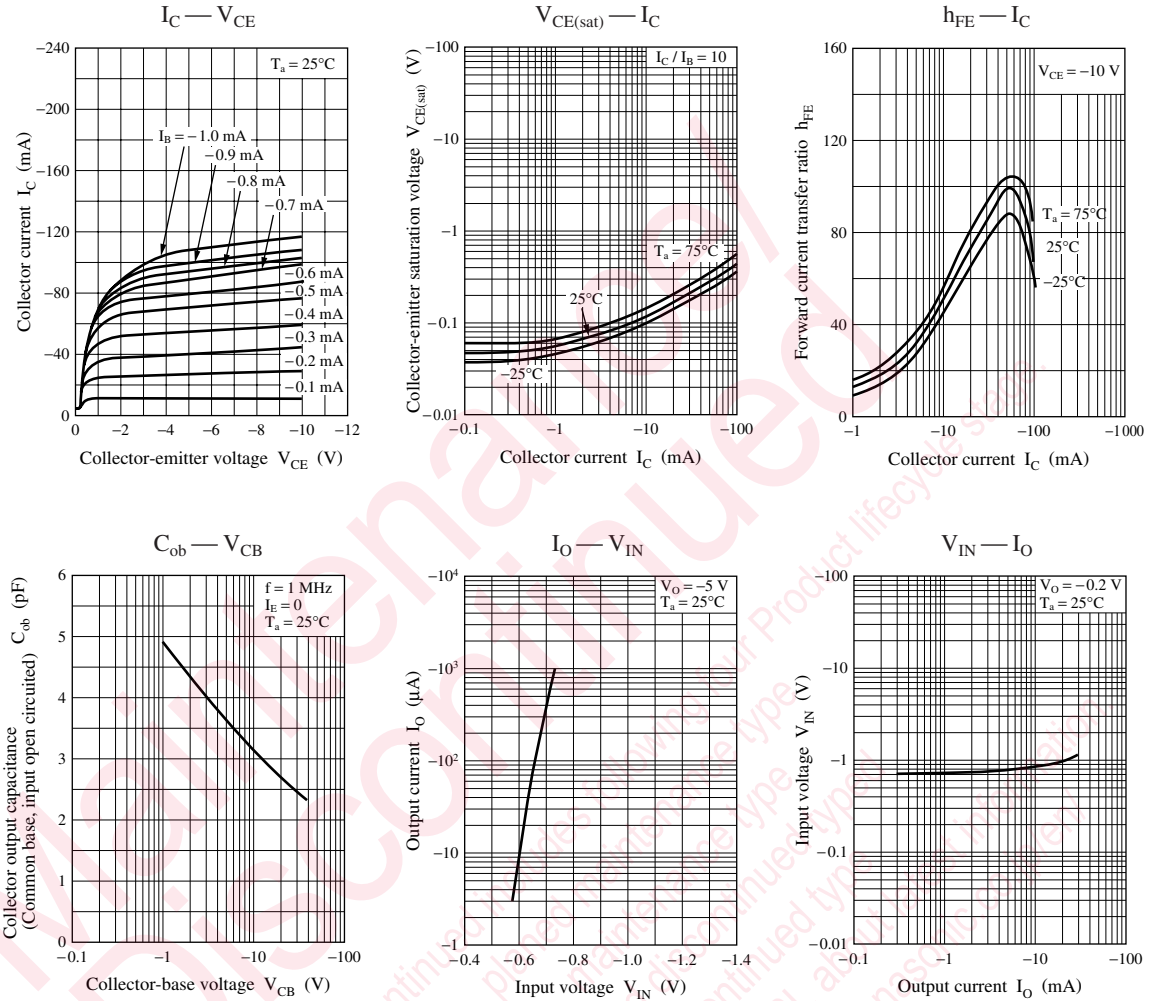




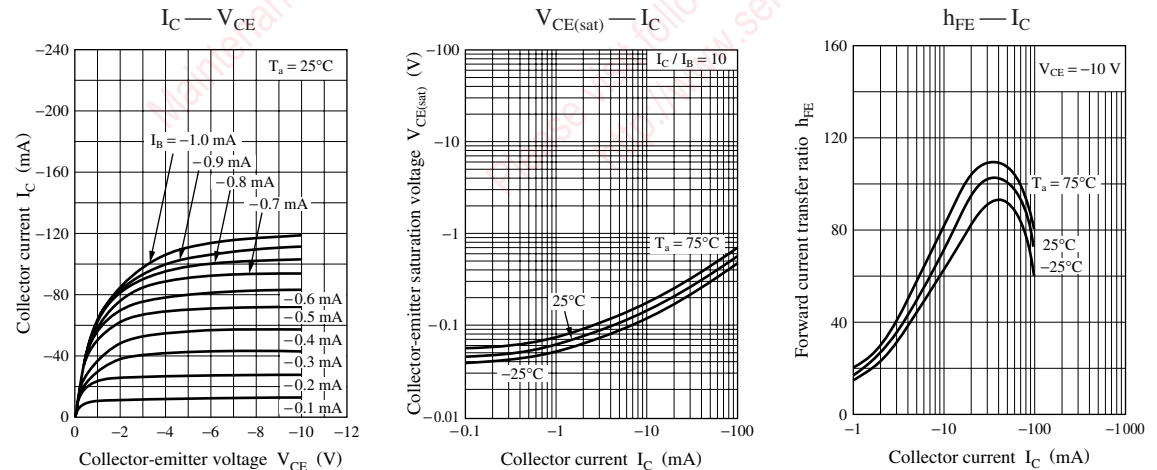
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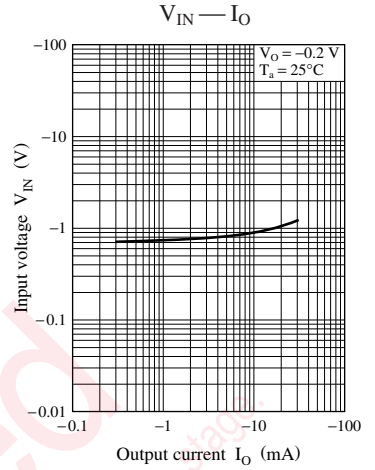
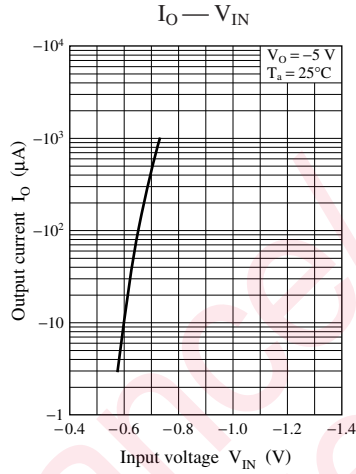
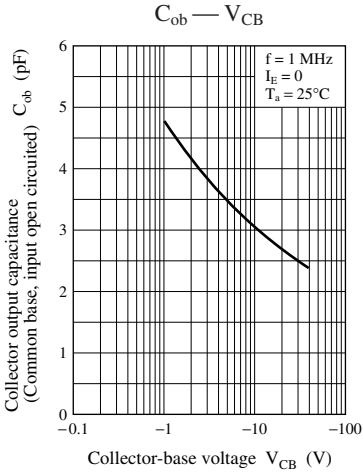


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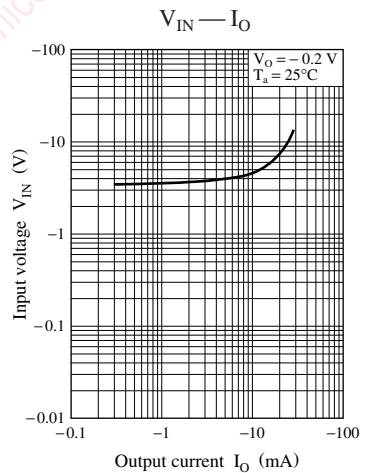
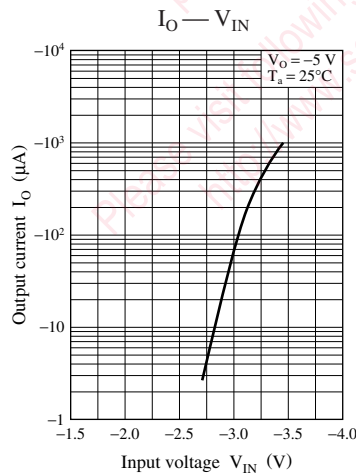
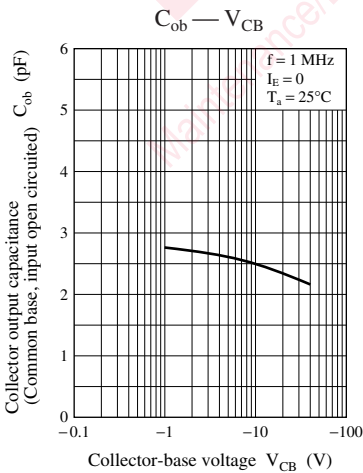
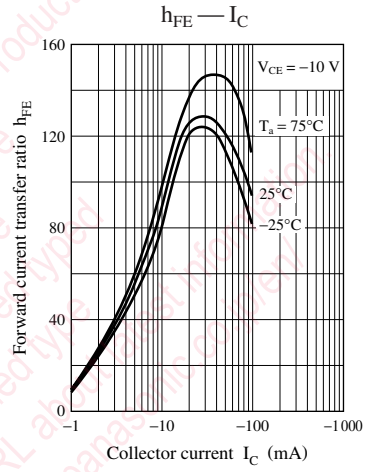
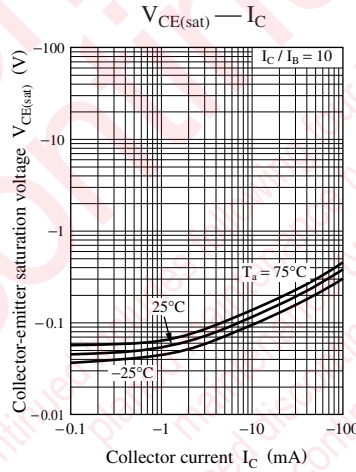
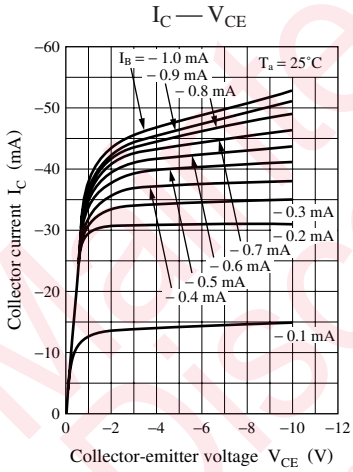


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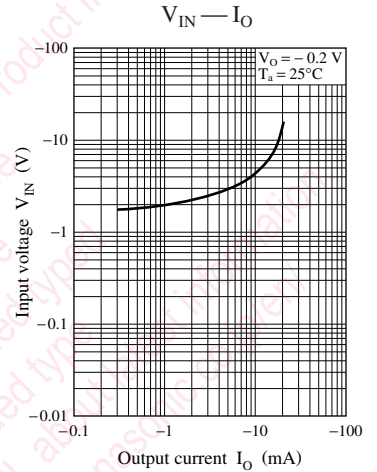
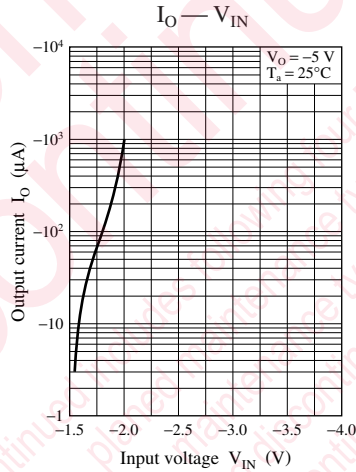
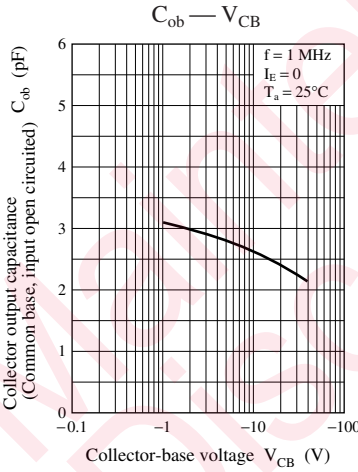
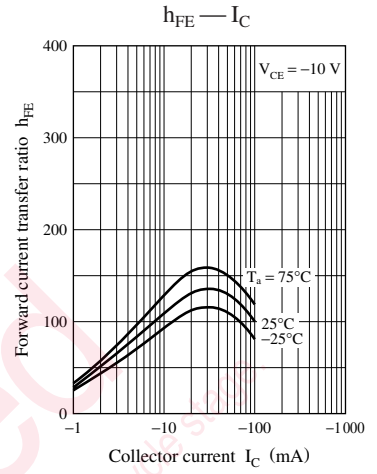
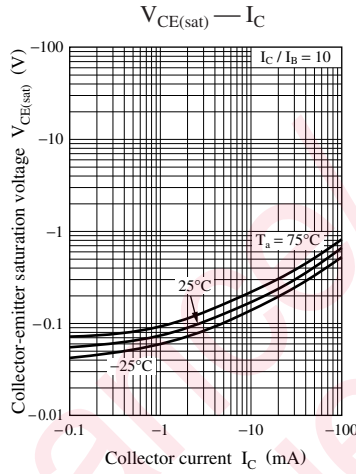
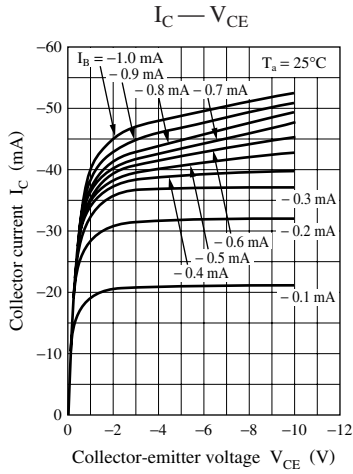




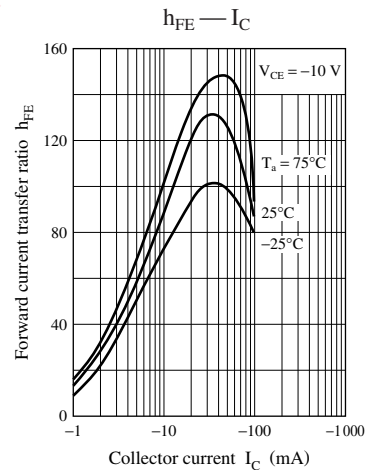
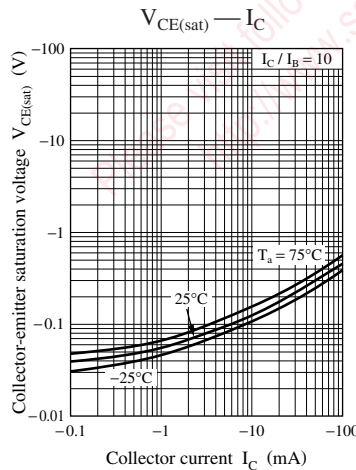
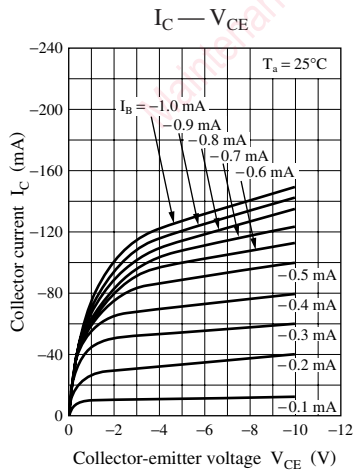
Characteristics charts of UNR411D

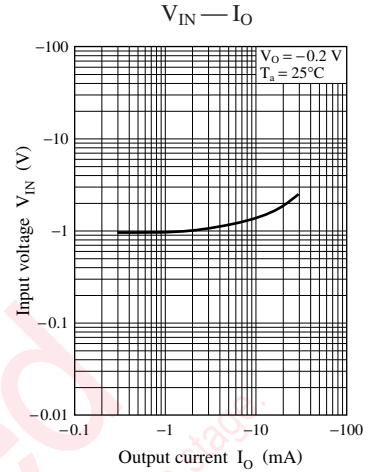
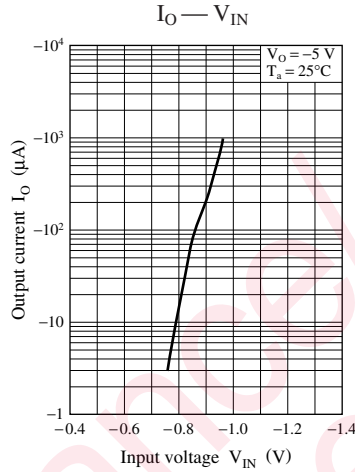
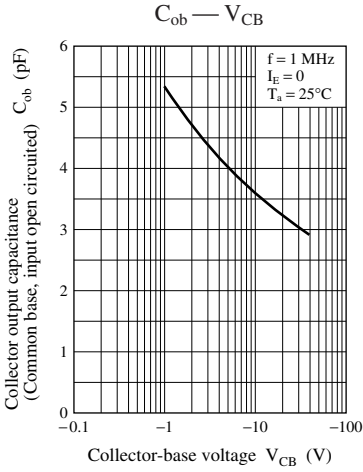


Characteristics charts of UNR411E

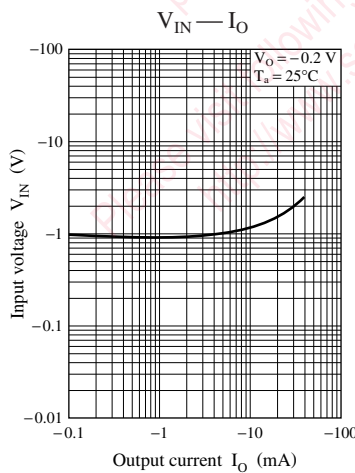
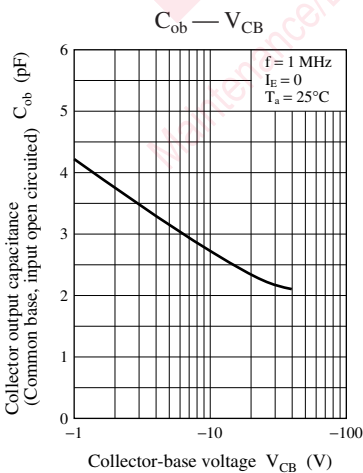
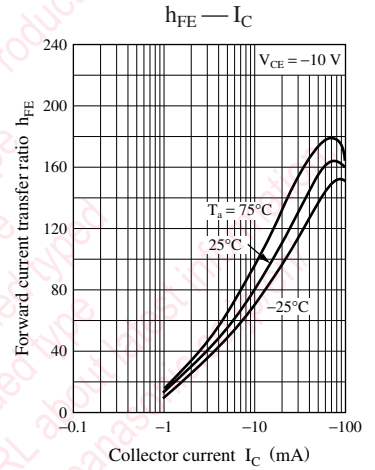
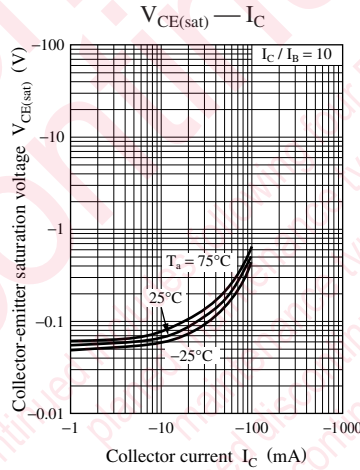
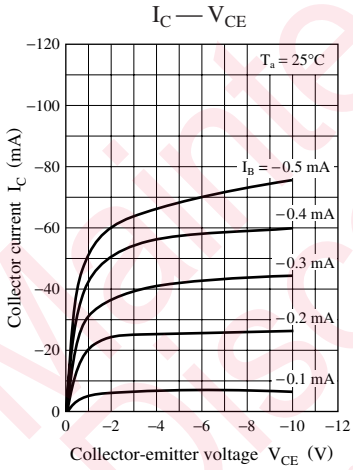


Characteristics charts of UNR411F

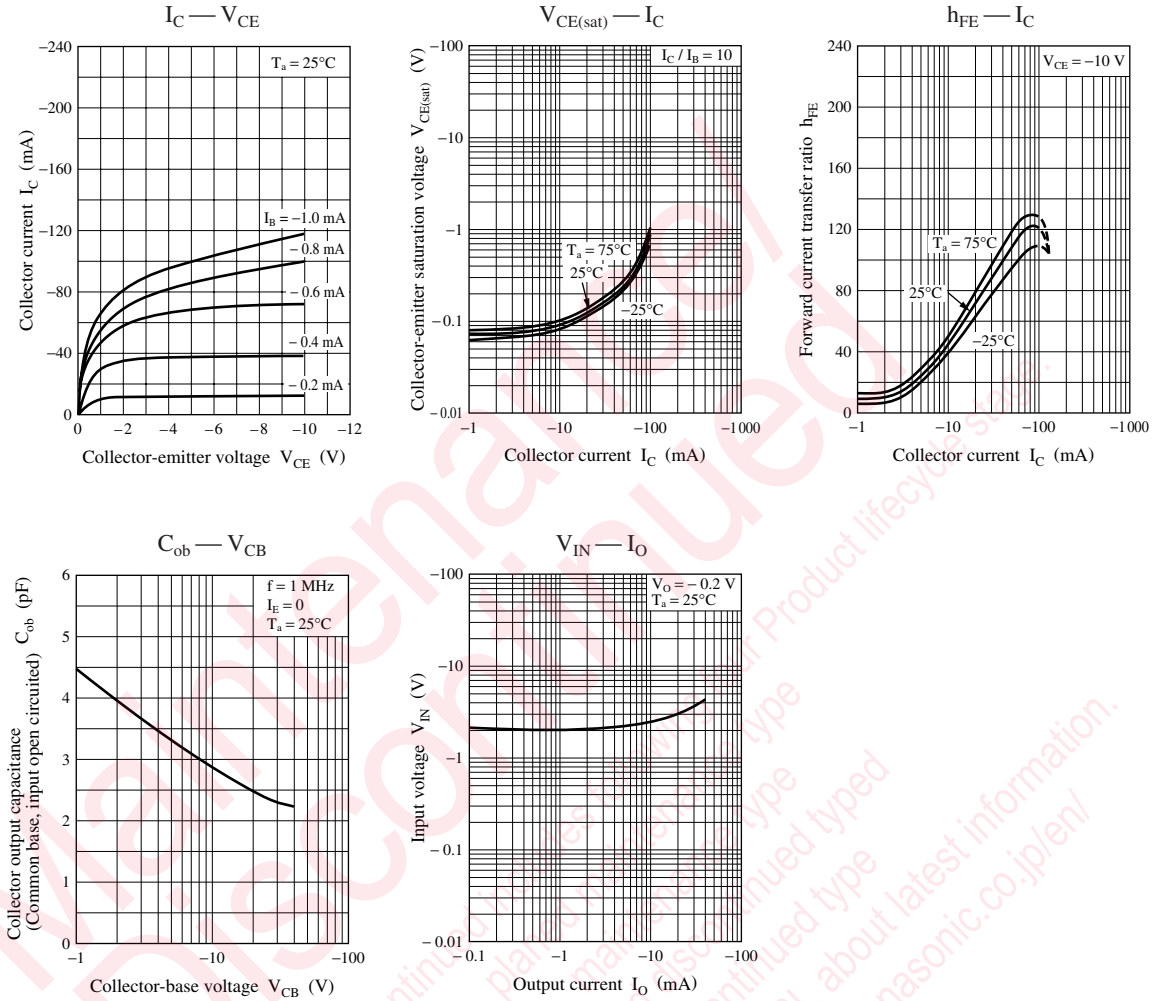




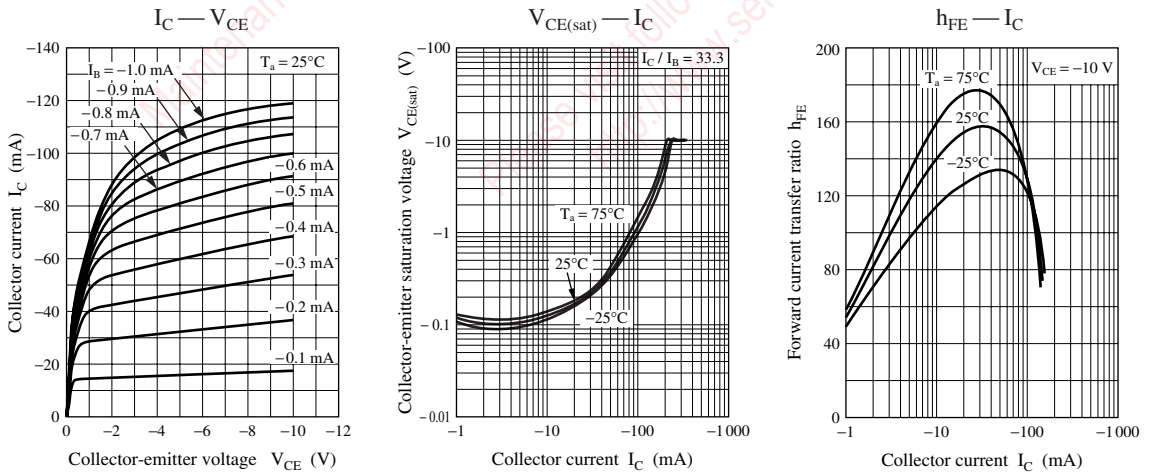
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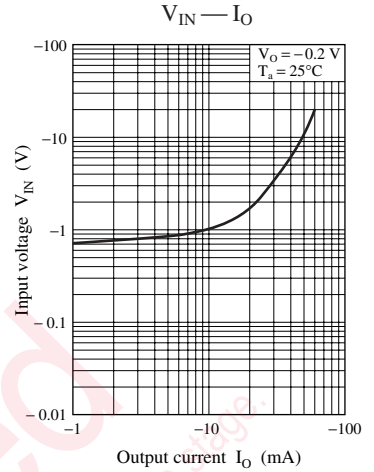
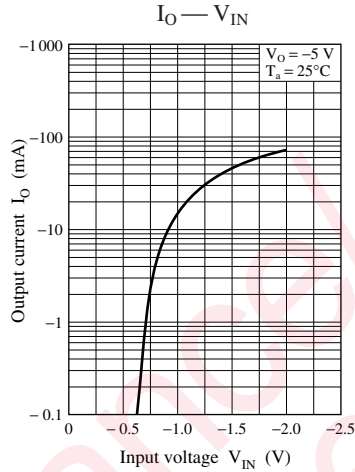
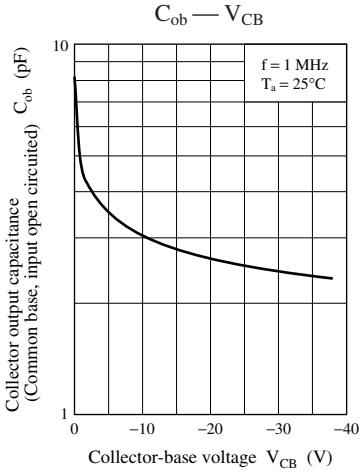


Characteristics charts of UNR411L

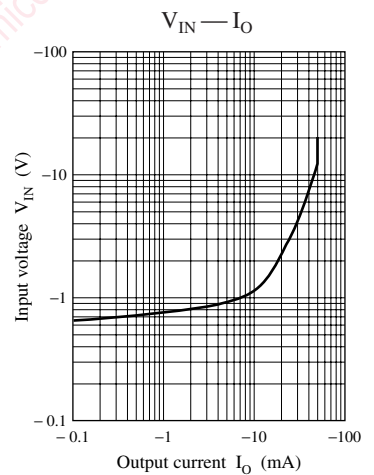
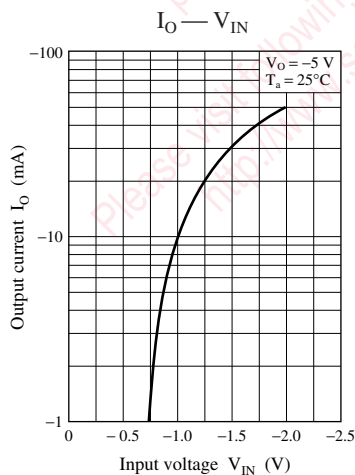
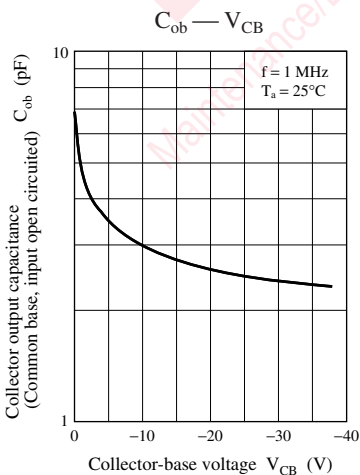
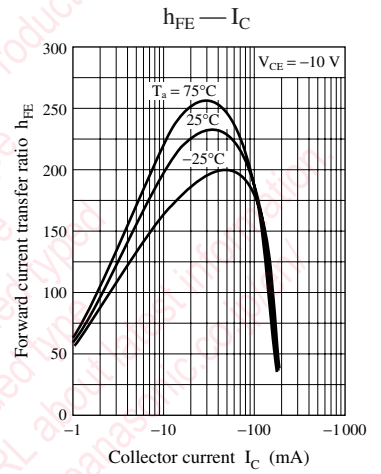
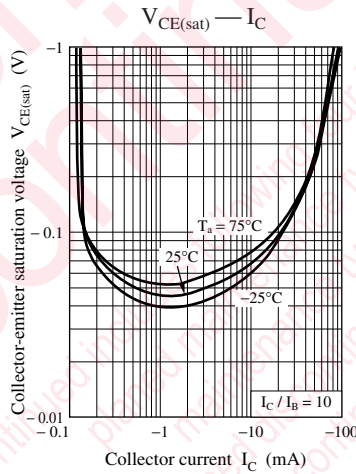
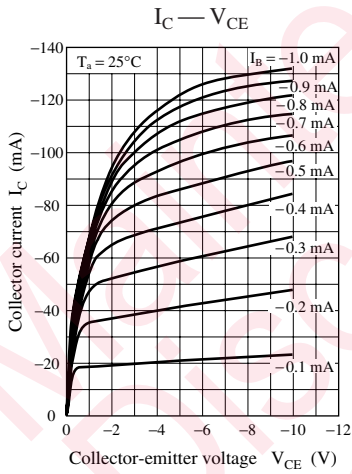


Characteristics charts of UNR411M





Characteristics charts of UNR411N



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