

UNR211x Series (UN211x Series)

Silicon PNP epitaxial planar type

For digital circuits

■ Features

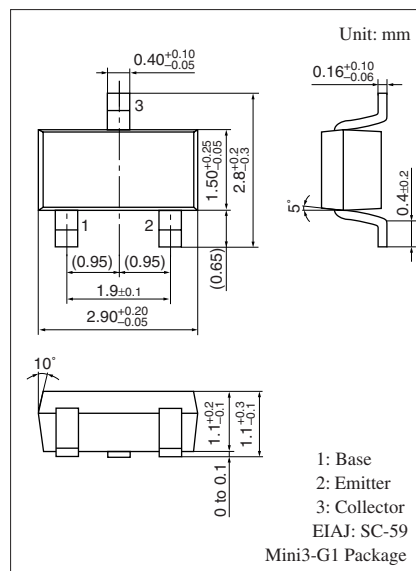
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- Mini type package allowing easy automatic insertion through tape packing and magazine packing

■ Resistance by Part Number

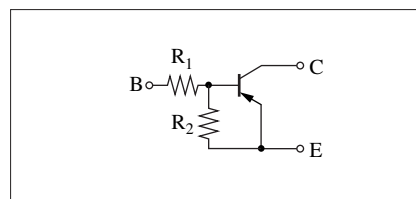
			Marking Symbol (R_1)	(R_2)
• UNR2110	(UN2110)	6L	47 k Ω	—
• UNR2111	(UN2111)	6A	10 k Ω	10 k Ω
• UNR2112	(UN2112)	6B	22 k Ω	22 k Ω
• UNR2113	(UN2113)	6C	47 k Ω	47 k Ω
• UNR2114	(UN2114)	6D	10 k Ω	47 k Ω
• UNR2115	(UN2115)	6E	10 k Ω	—
• UNR2116	(UN2116)	6F	4.7 k Ω	—
• UNR2117	(UN2117)	6H	22 k Ω	—
• UNR2118	(UN2118)	6I	0.51 k Ω	5.1 k Ω
• UNR2119	(UN2119)	6K	1 k Ω	10 k Ω
• UNR211D	(UN211D)	6M	47 k Ω	10 k Ω
• UNR211E	(UN211E)	6N	47 k Ω	22 k Ω
• UNR211F	(UN211F)	6O	4.7 k Ω	10 k Ω
• UNR211H	(UN211H)	6P	2.2 k Ω	10 k Ω
• UNR211L	(UN211L)	6Q	4.7 k Ω	4.7 k Ω
• UNR211M	(UN211M)	EI	2.2 k Ω	47 k Ω
• UNR211N	(UN211N)	EW	4.7 k Ω	47 k Ω
• UNR211T	(UN211T)	EY	22 k Ω	47 k Ω
• UNR211V	(UN211V)	FC	2.2 k Ω	2.2 k Ω
• UNR211Z	(UN211Z)	FE	4.7 k Ω	22 k Ω

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V_{CBO}	-50	V
Collector-emitter voltage (Base open)	V_{CEO}	-50	V
Collector current	I_C	-100	mA
Total power dissipation	P_T	200	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$



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 μA, I _E = 0	−50			V
Collector-emitter voltage (Base open)		V _{CEO}	I _C = −2 mA, I _B = 0	−50			V
Collector-base cutoff current (Emitter open)		I _{CBO}	V _{CB} = −50 V, I _E = 0			− 0.1	μA
Collector-emitter cutoff current (Base open)		I _{CEO}	V _{CE} = −50 V, I _B = 0			− 0.5	μA
Emitter-base cutoff current (Collector open)	UNR2110/2115/2116/2117	I _{EBO}	V _{EB} = −6 V, I _C = 0			− 0.01	mA
	UNR2113					− 0.1	
	UNR2112/2114/211D/ 211E/211M/211N/211T					− 0.2	
	UNR211Z					− 0.4	
	UNR2111					− 0.5	
	UNR211F/211H					−1.0	
	UNR2119					−1.5	
	UNR2118/211L/211V					−2.0	
	Forward current transfer ratio			UNR211V	h _{FE}	V _{CE} = −10 V, I _C = −5 mA	
UNR2118/211L		20					
UNR2119/211D/211F/211H		30					
UNR2111		35					
UNR2112/211E		60					
UNR211Z		60		200			
UNR2113/2114/211M		80					
UNR211N/211T		80		400			
UNR2110*/2115*/2116*/2117*		160		460			
Collector-emitter saturation voltage	V _{CE(sat)}	I _C = −10 mA, I _B = − 0.3 mA			− 0.25	V	
UNR211V			I _C = −10 mA, I _B = −1.5 mA				
Output voltage high-level		V _{OH}	V _{CC} = −5 V, V _B = − 0.5 V, R _L = 1 kΩ	−4.9			V
Output voltage low-level		V _{OL}	V _{CC} = −5 V, V _B = −2.5 V, R _L = 1 kΩ			− 0.2	V
UNR2113			V _{CC} = −5 V, V _B = −3.5 V, R _L = 1 kΩ				
UNR211D			V _{CC} = −5 V, V _B = −10 V, R _L = 1 kΩ				
UNR211E			V _{CC} = −5 V, V _B = −6 V, R _L = 1 kΩ				
Transition frequency		f _T	V _{CB} = −10 V, I _E = 1 mA, f = 200 MHz		80		MHz
UNR2114/2119/211E 211F/211H			V _{CB} = −10 V, I _E = 2 mA, f = 200 MHz		150		
Input resistance	UNR2118	R ₁		−30%	0.51	+30%	kΩ
	UNR2119				1.0		
	UNR211H/211M/211V				2.2		
	UNR2116/211F/211L/211N/211Z				4.7		
	UNR2111/2114/2115				10		
	UNR2112/2117/211T				22		
	UNR2110/2113/211D/211E				47		

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

2. *: Rank classification

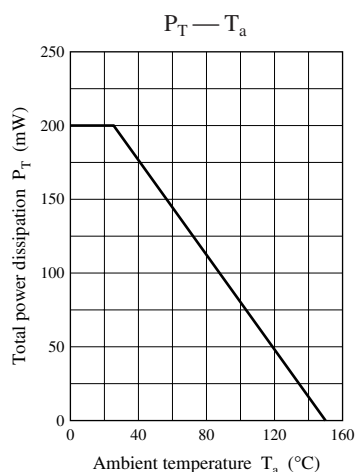
Rank	Q	R	S	No-rank
h_{FE}	160 to 260	210 to 340	290 to 460	160 to 460

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

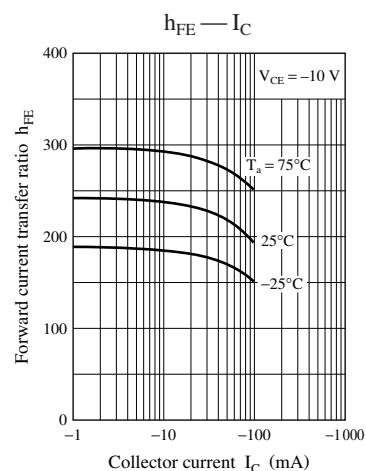
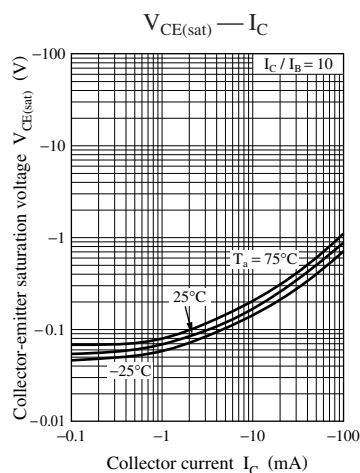
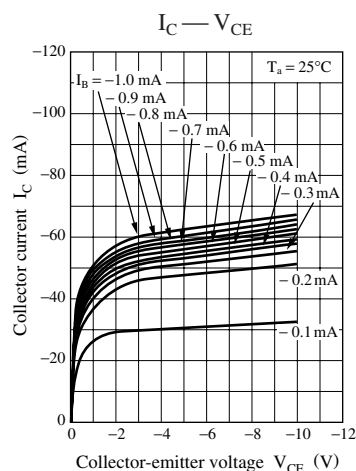
	Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR211M	R_1/R_2			0.047		—
	UNR211N				0.1		
	UNR2118/2119			0.08	0.10	0.12	
	UNR211Z				0.21		
	UNR2114			0.17	0.21	0.25	
	UNR211H			0.17	0.22	0.27	
	UNR211T				0.47		
	UNR211F			0.37	0.47	0.57	
	UNR211V				1.0		
	UNR2111/2112/2113/211L			0.8	1.0	1.2	
	UNR211E			1.70	2.14	2.60	
	UNR211D			3.7	4.7	5.7	

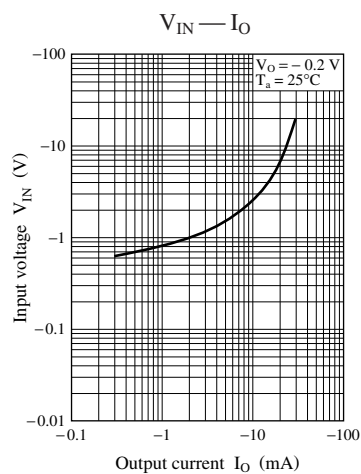
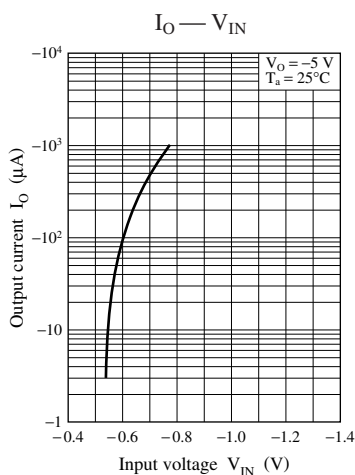
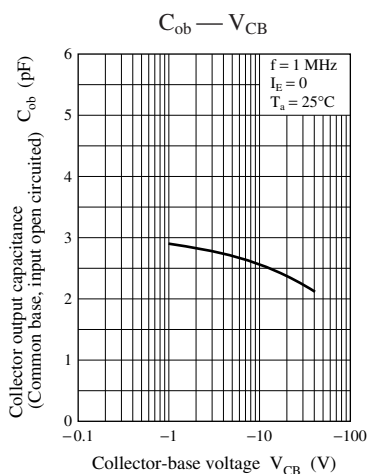
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

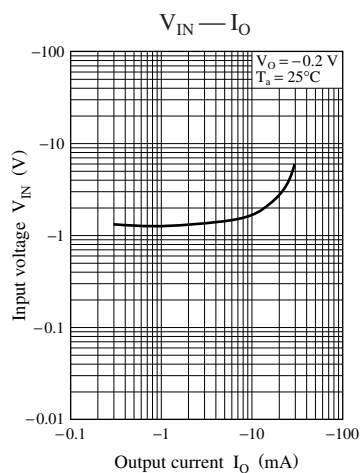
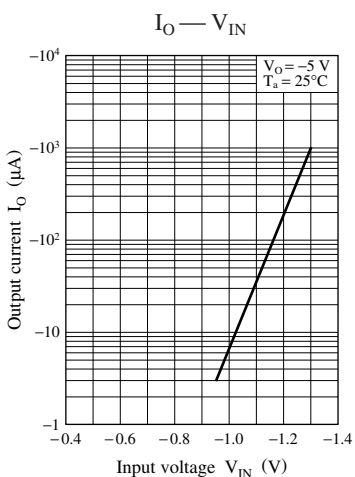
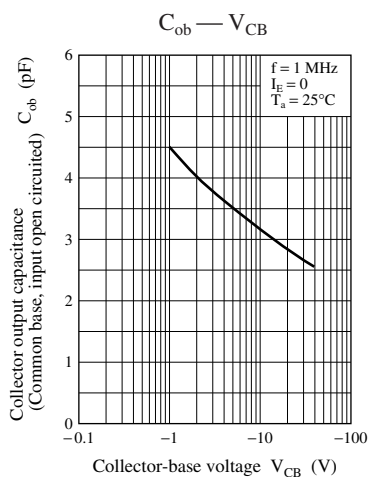
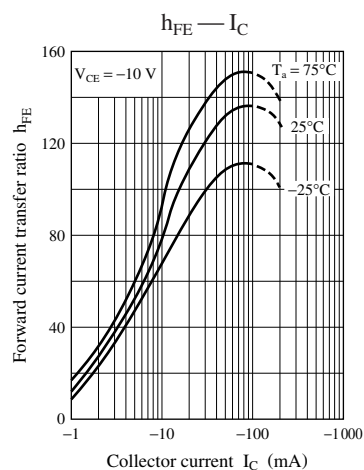
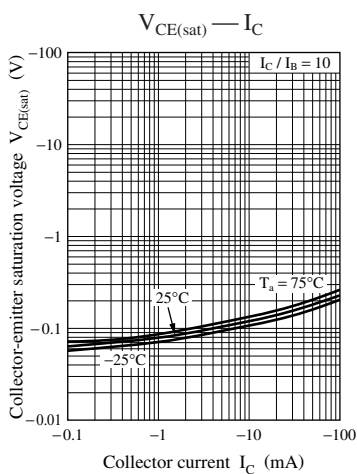
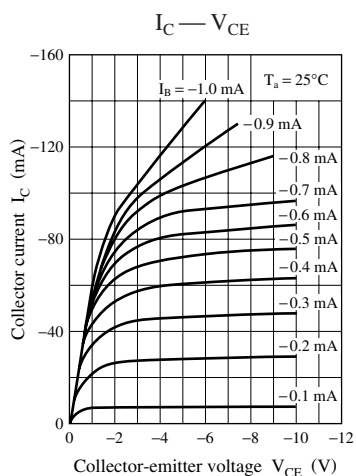


Characteristics charts of UNR2110

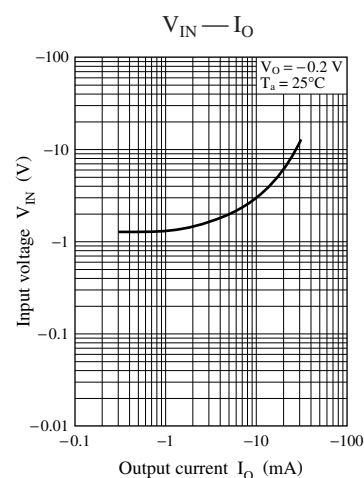
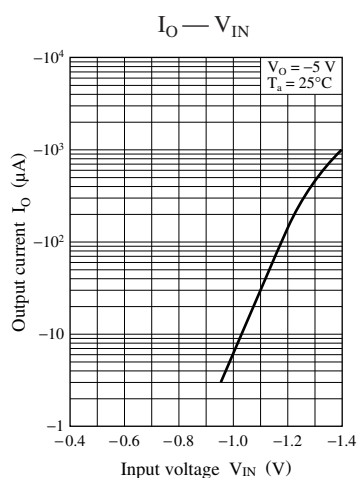
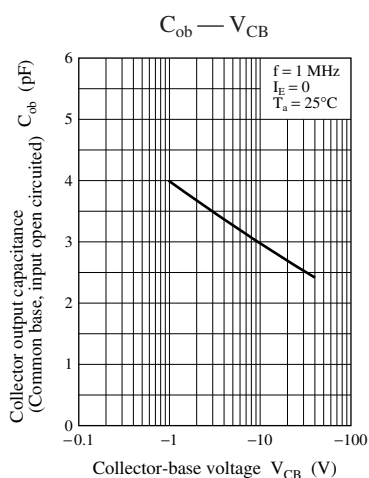
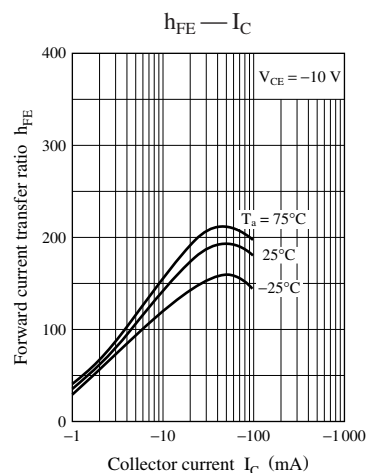
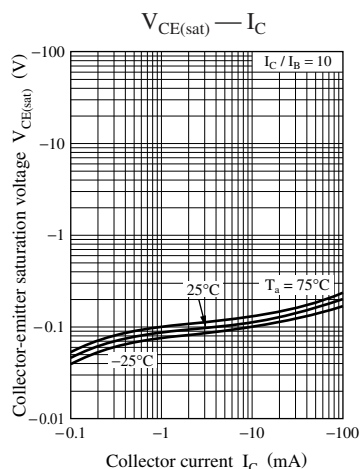
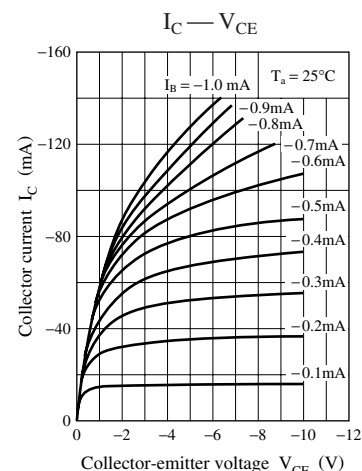




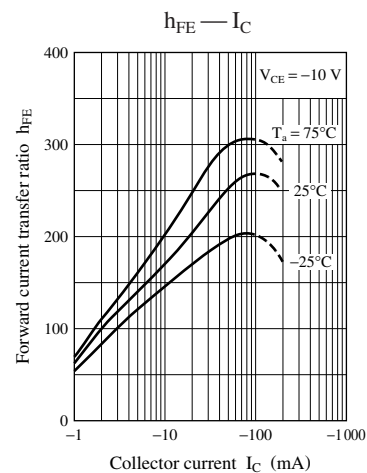
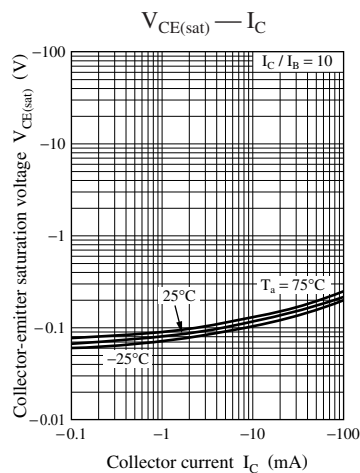
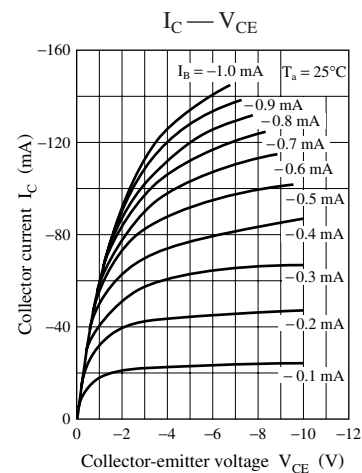
Characteristics charts of UNR2111

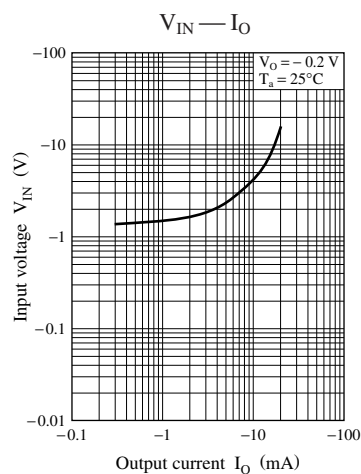
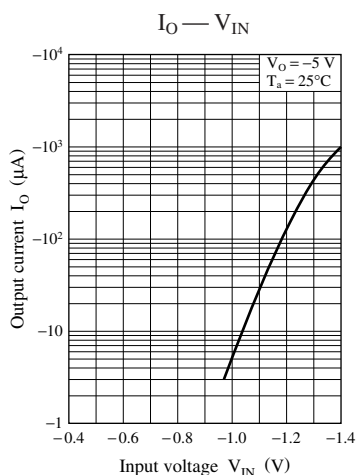
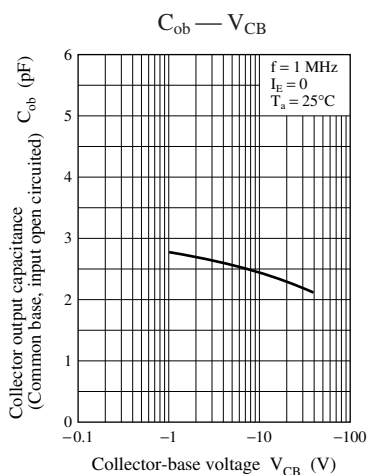


Characteristics charts of UNR2112

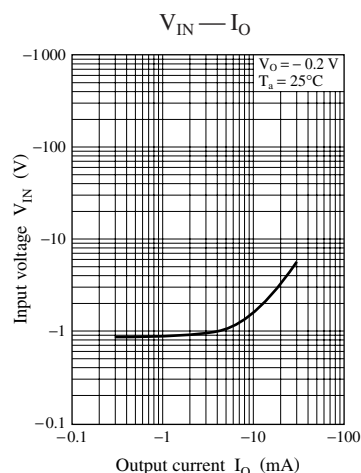
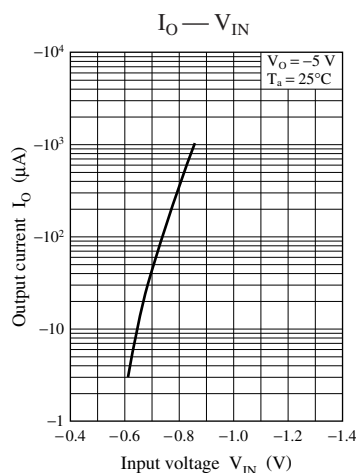
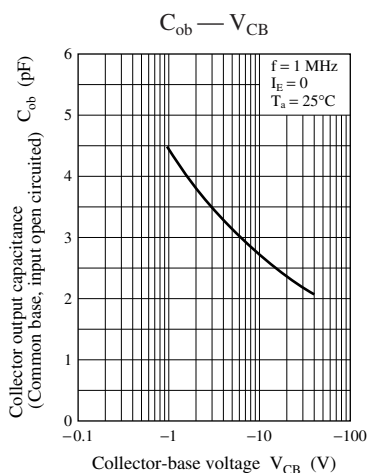
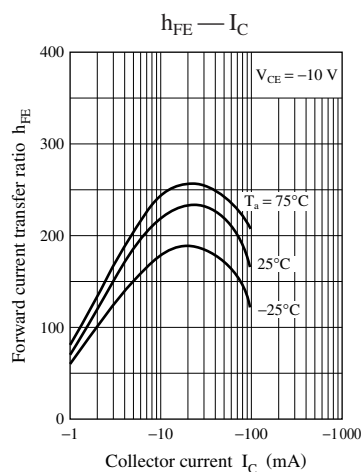
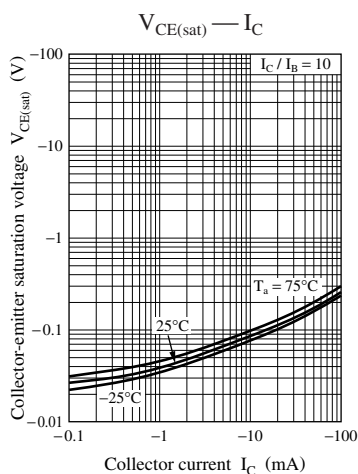
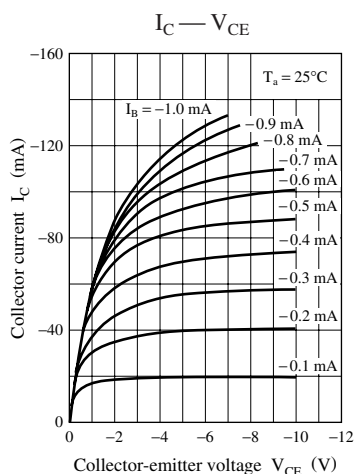


Characteristics charts of UNR2113

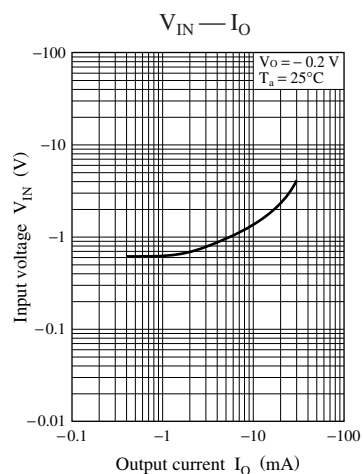
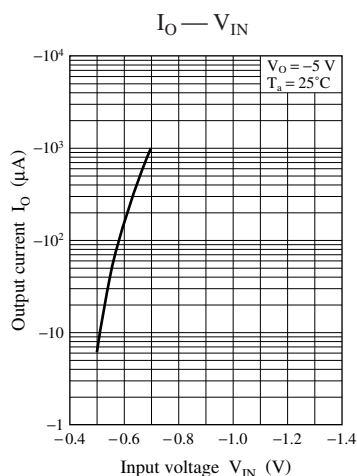
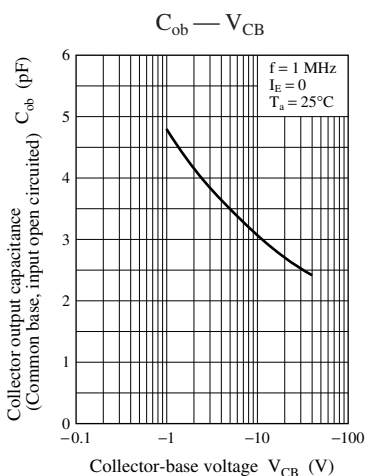
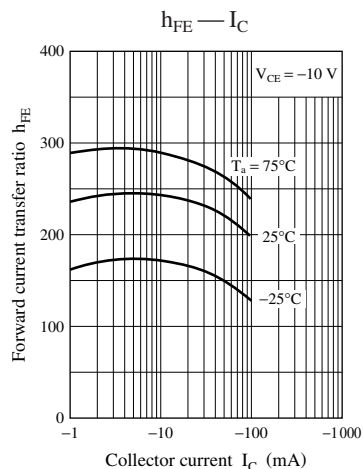
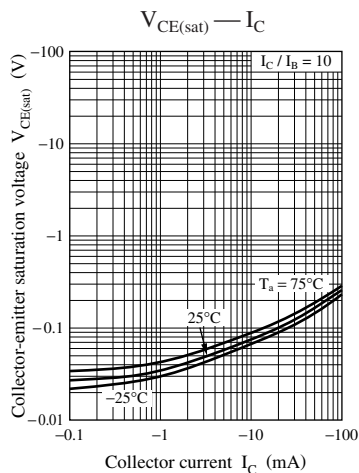
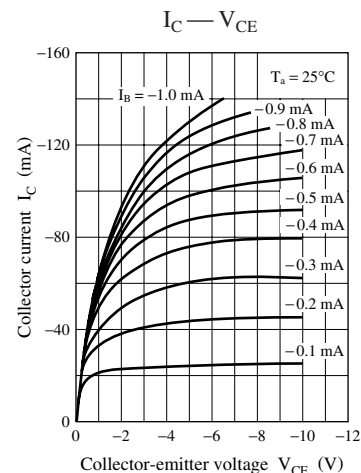




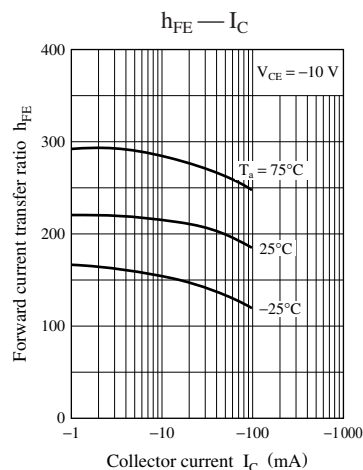
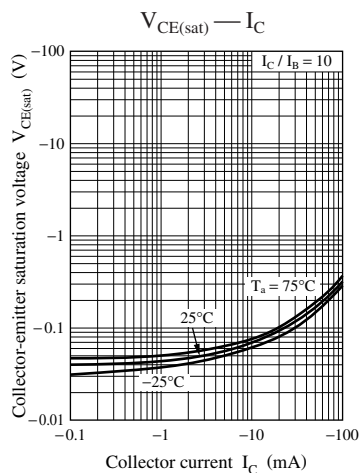
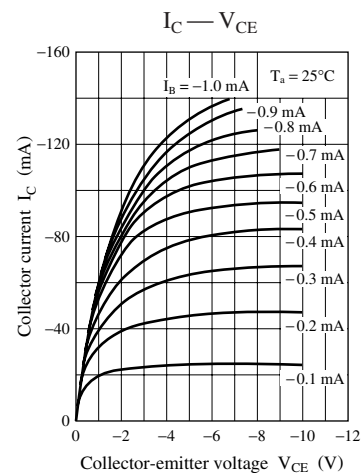
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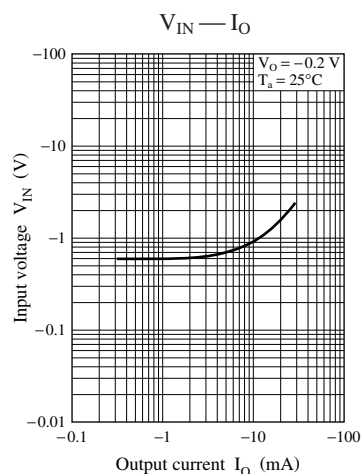
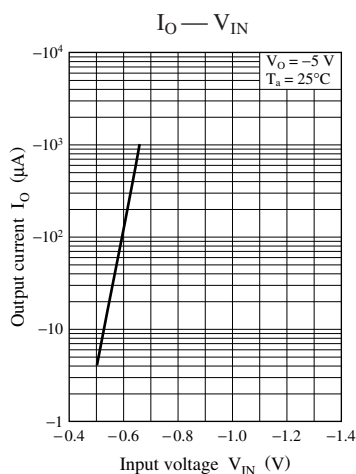
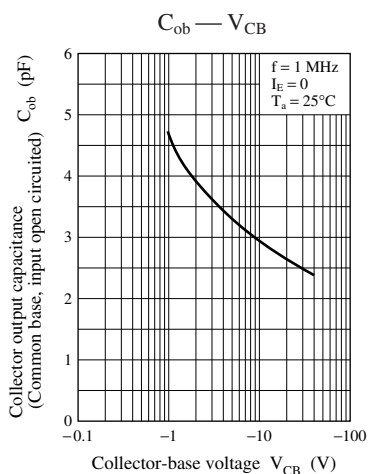


Characteristics charts of UNR2115

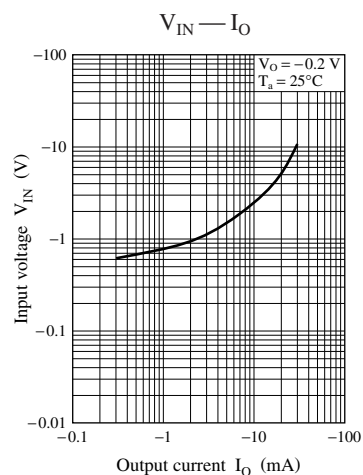
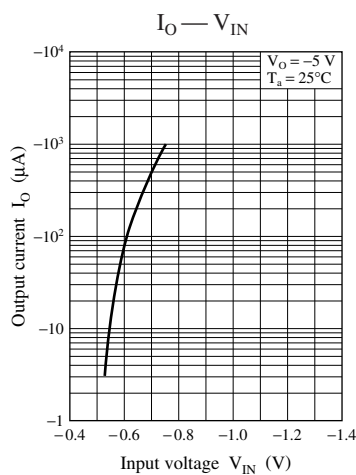
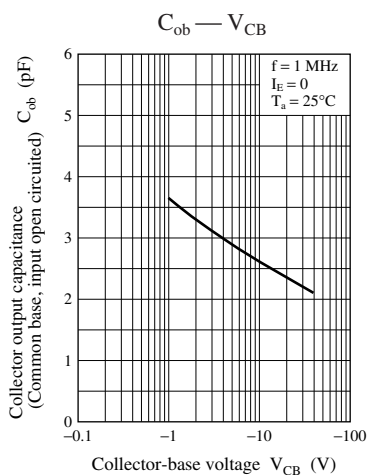
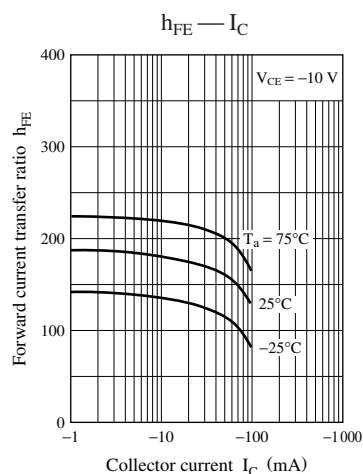
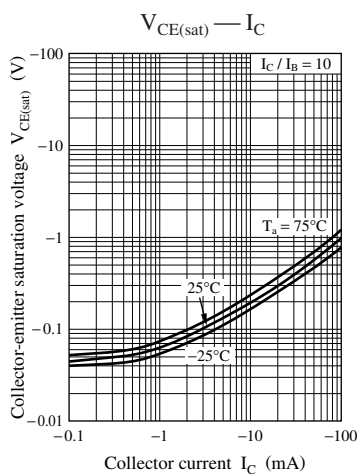
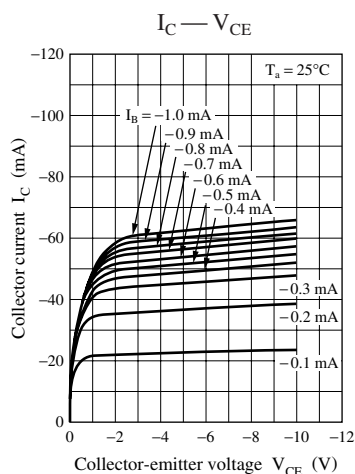


Characteristics charts of UNR2116

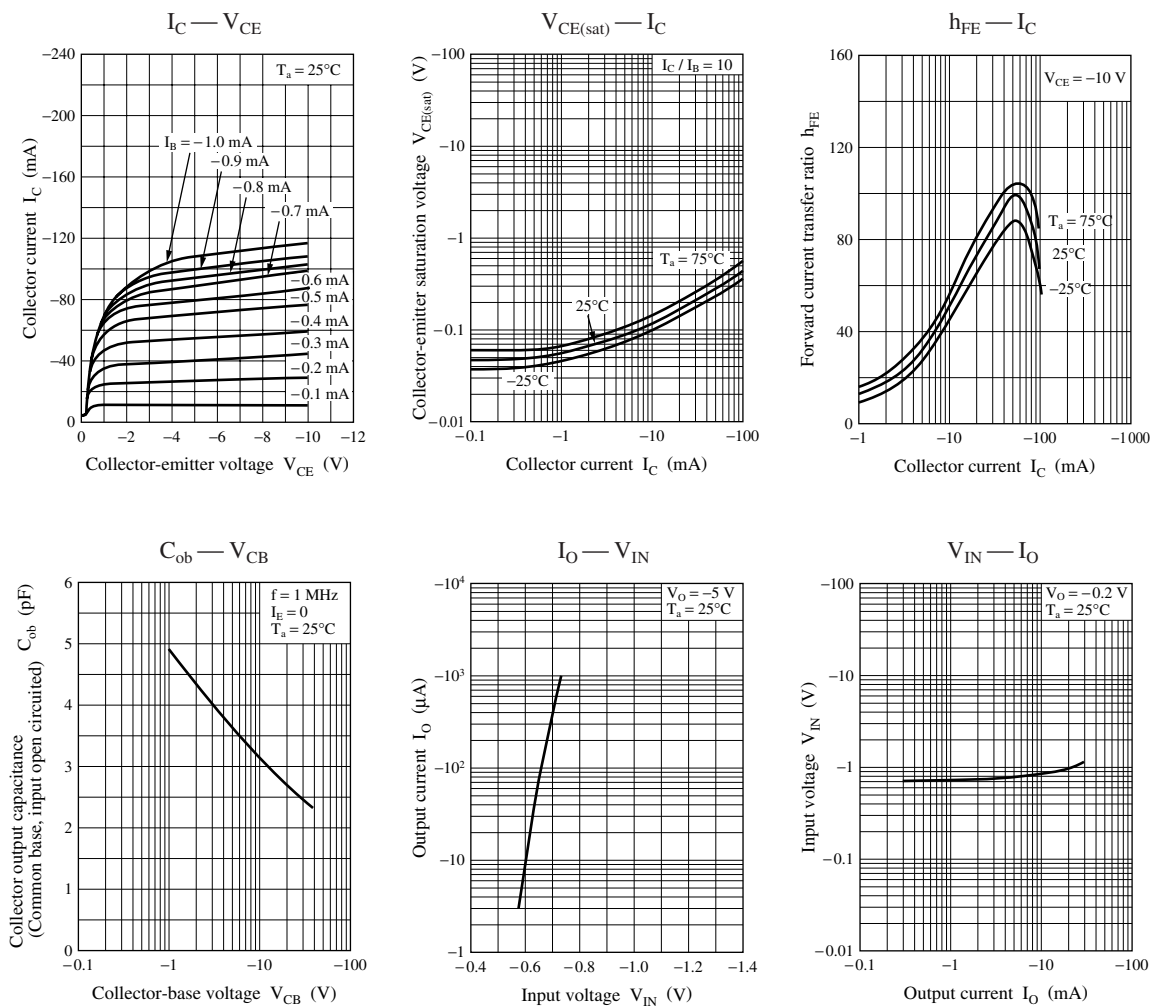




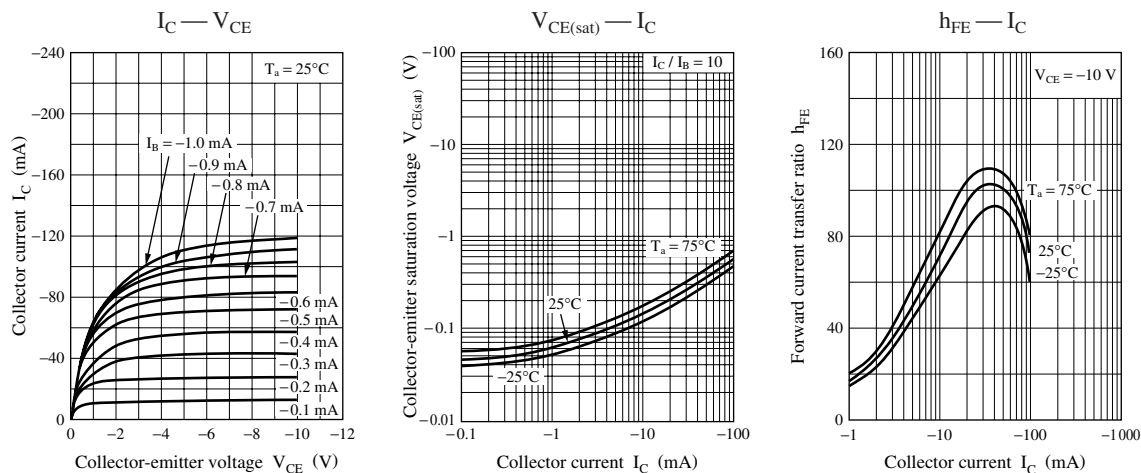
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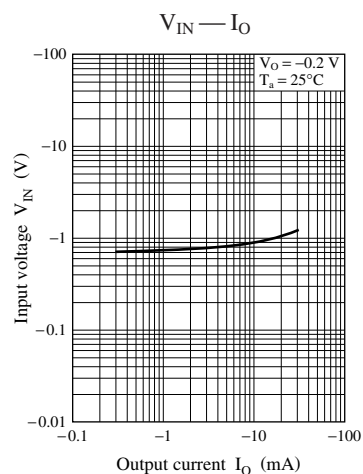
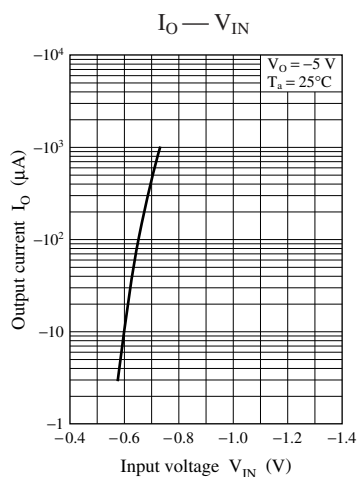
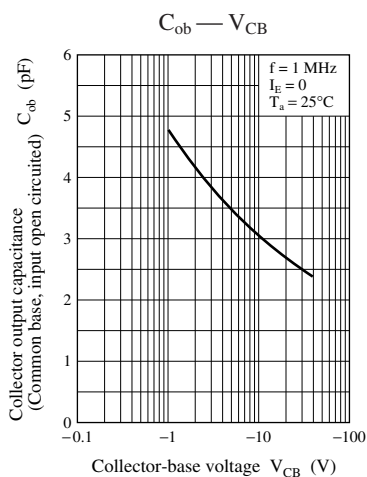


Characteristics charts of UNR2118

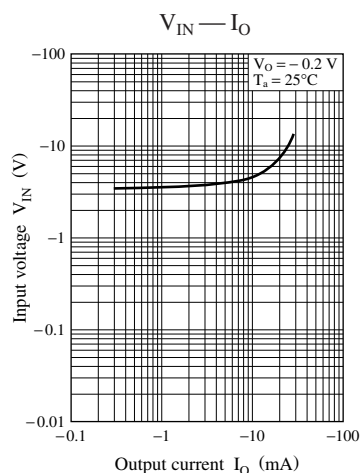
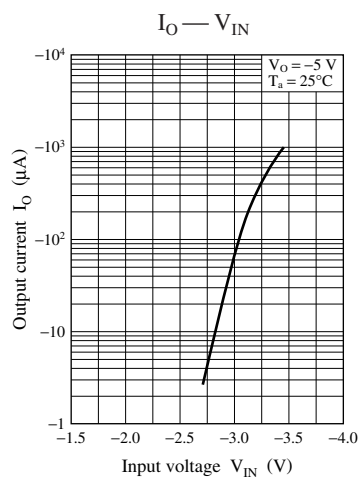
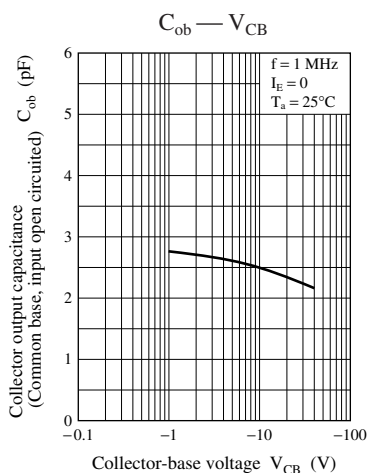
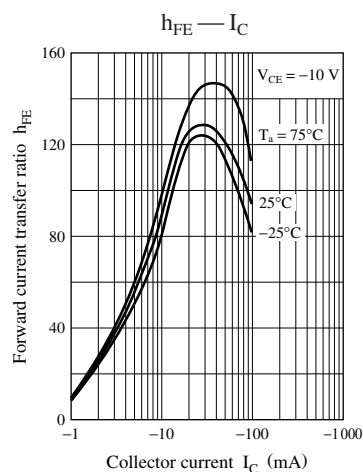
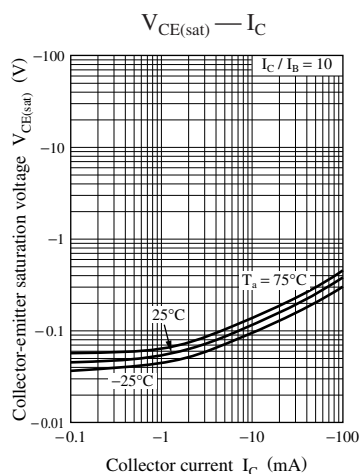
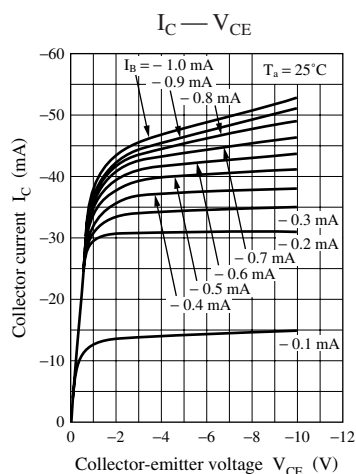


Characteristics charts of UNR2119

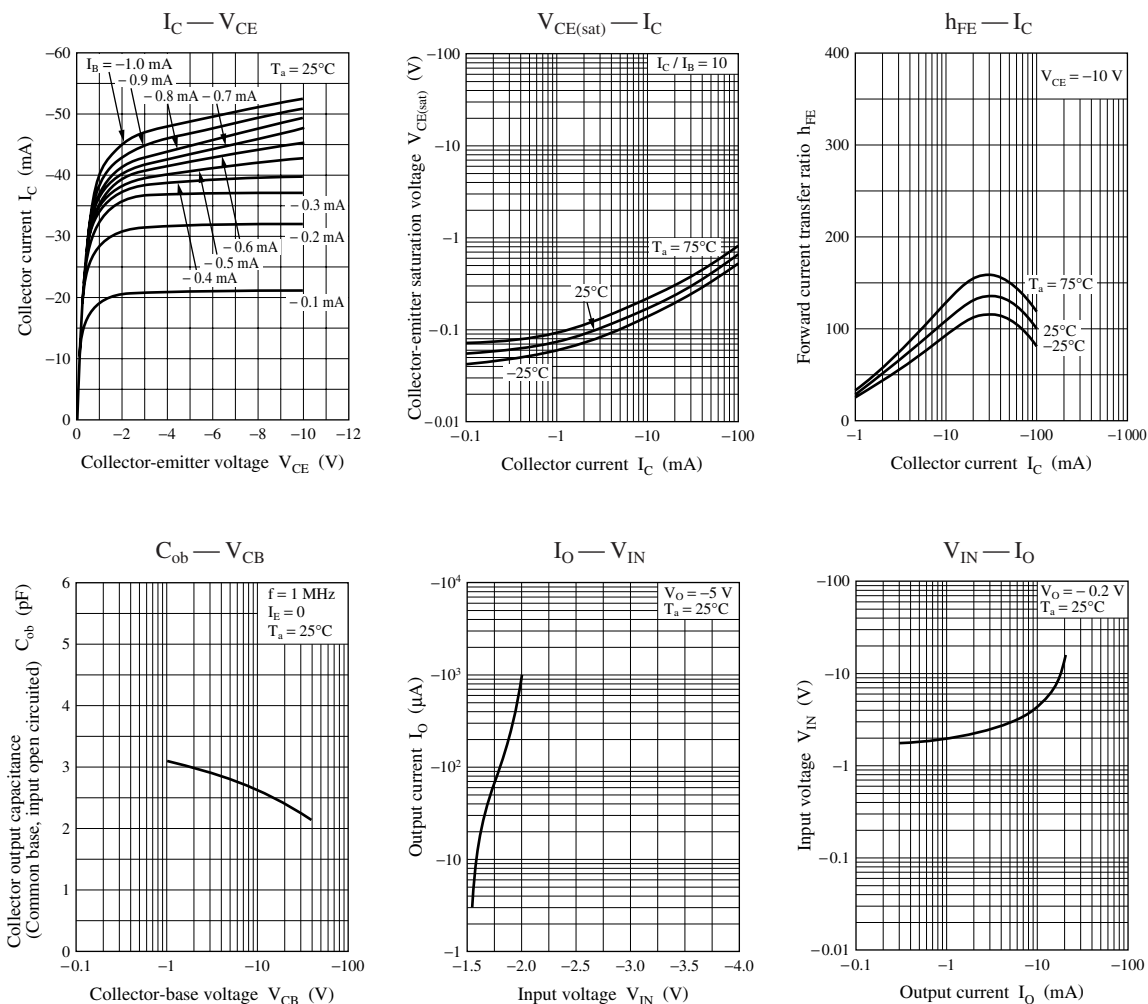




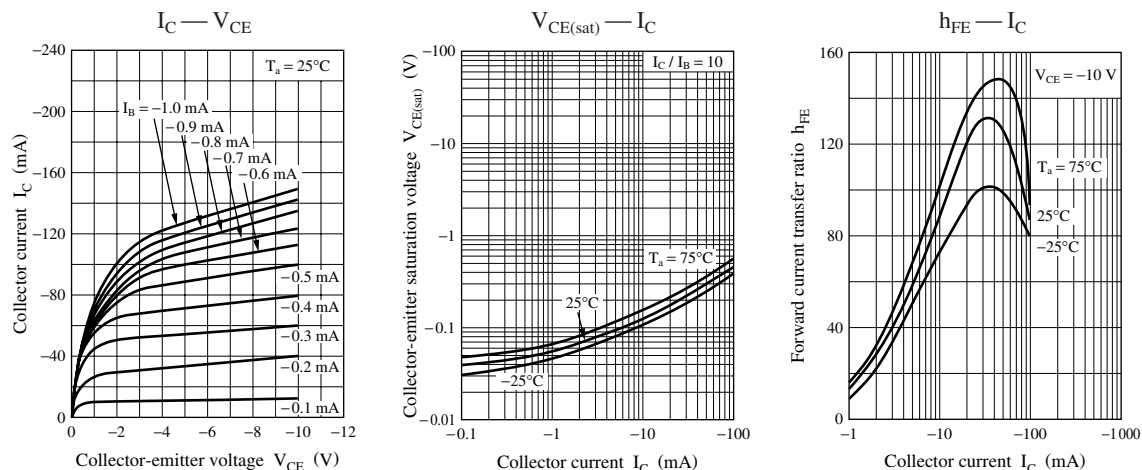
Characteristics charts of UNR211D

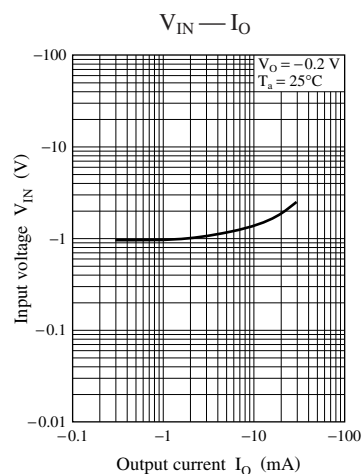
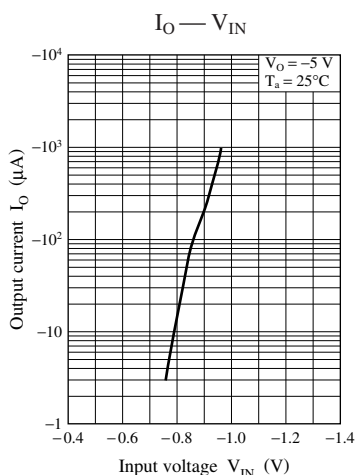
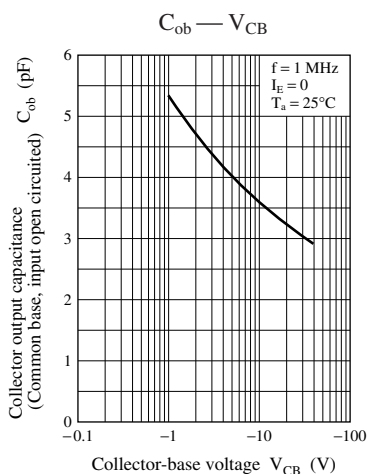


Characteristics charts of UNR211E

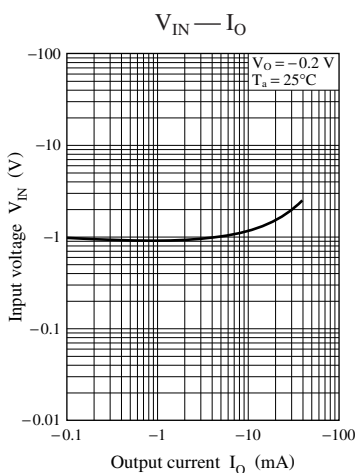
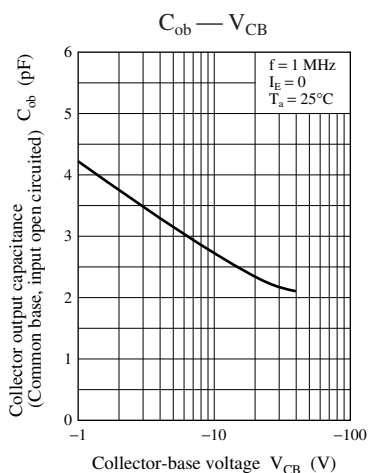
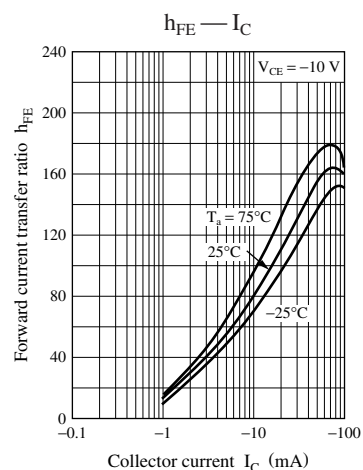
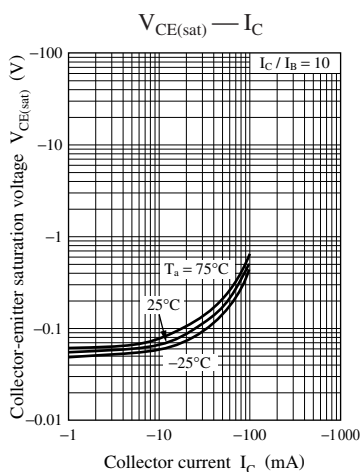
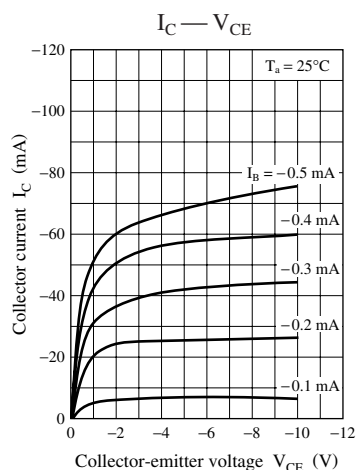


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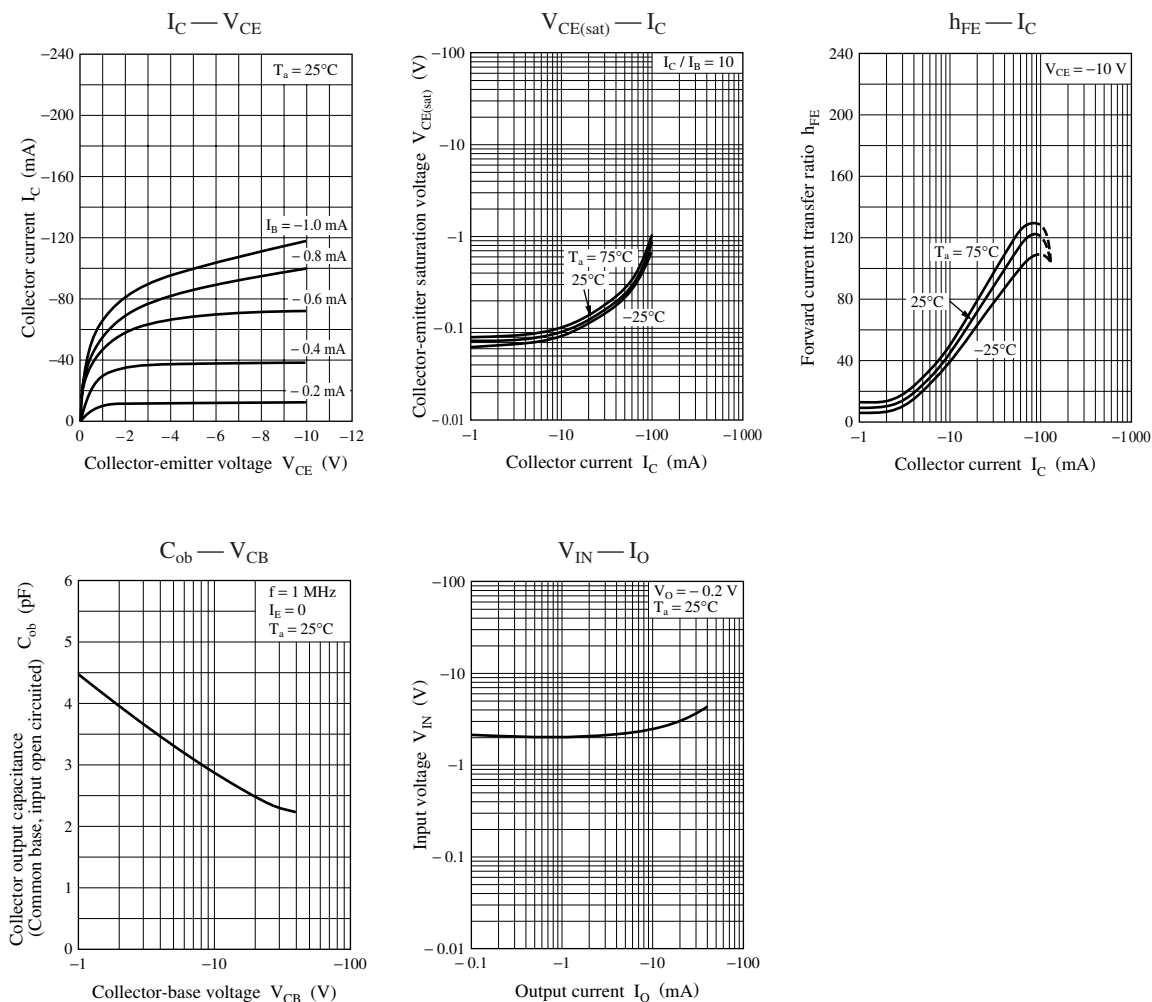




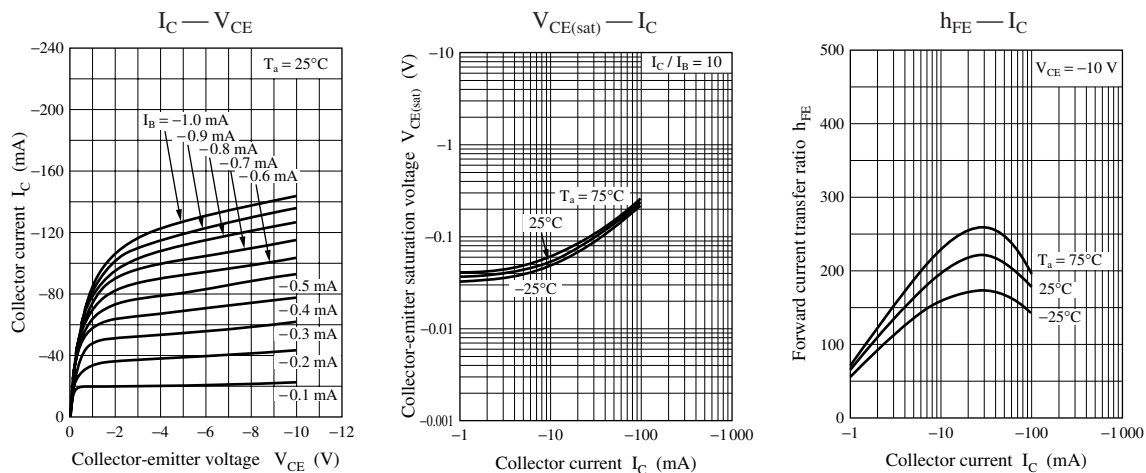
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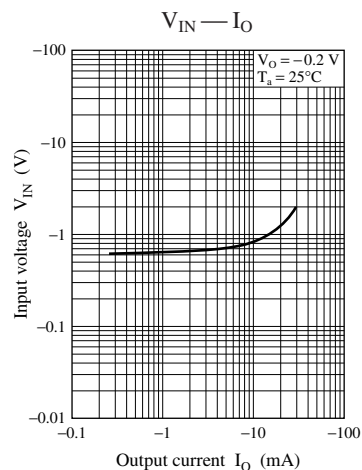
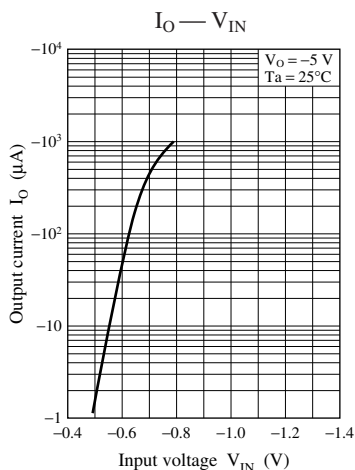
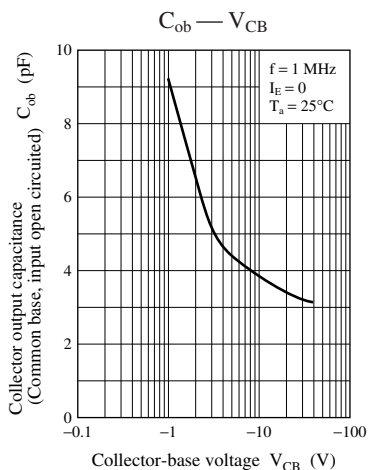


Characteristics charts of UNR211L

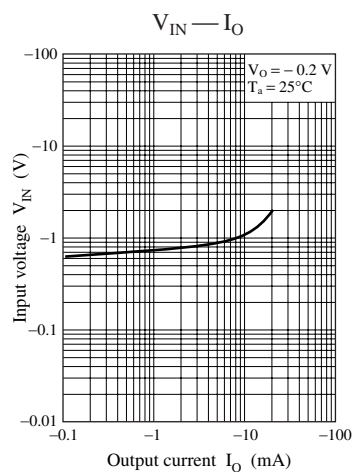
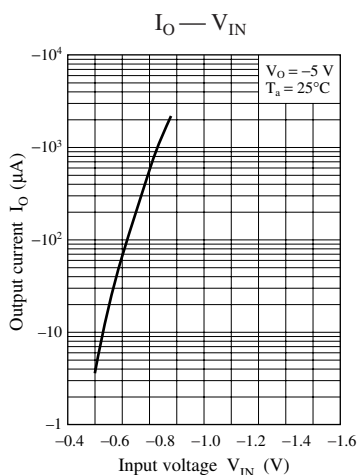
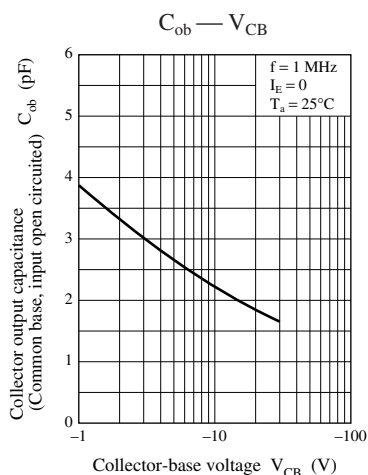
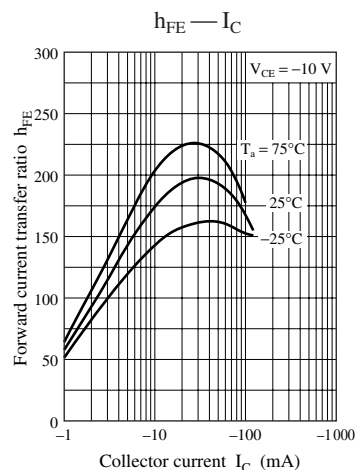
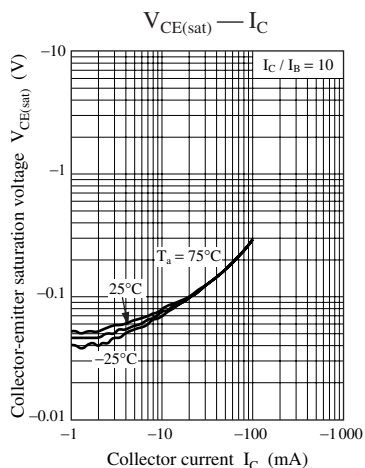
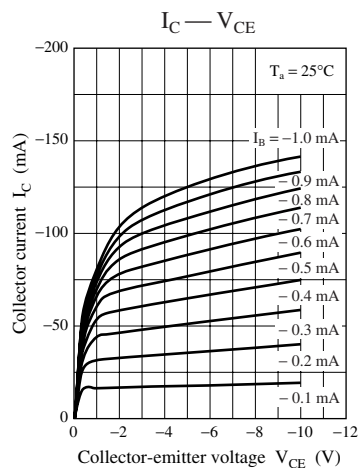


Characteristics charts of UNR211M

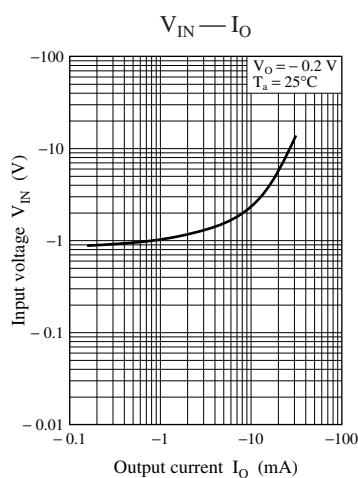
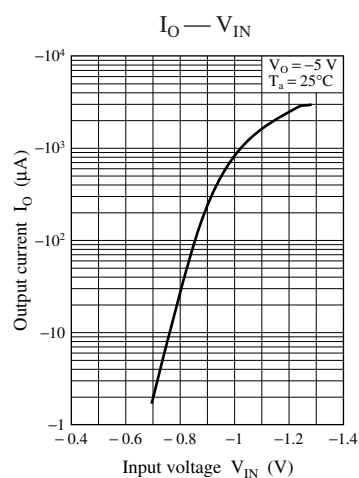
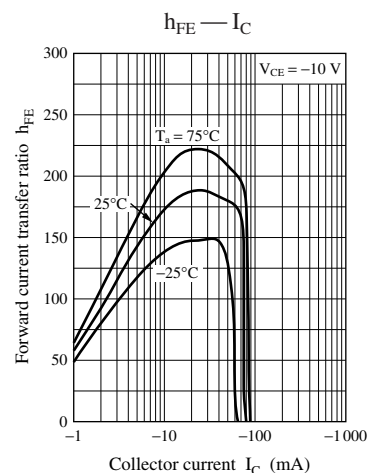
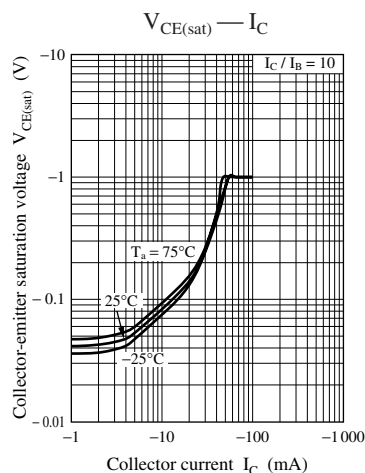
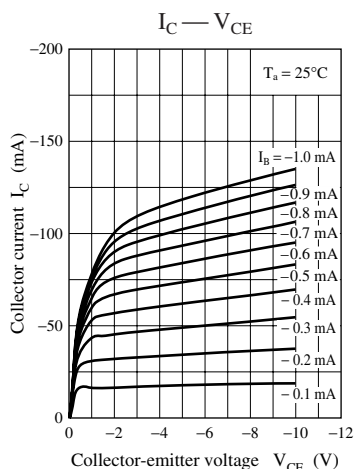




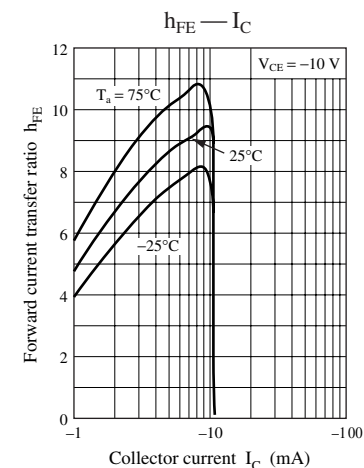
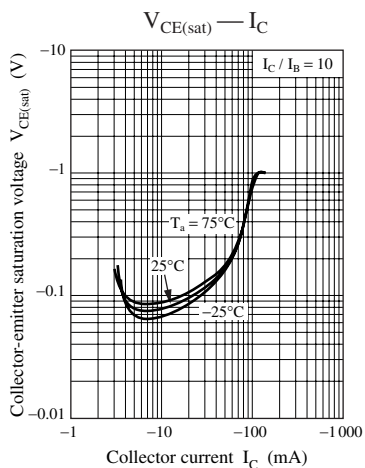
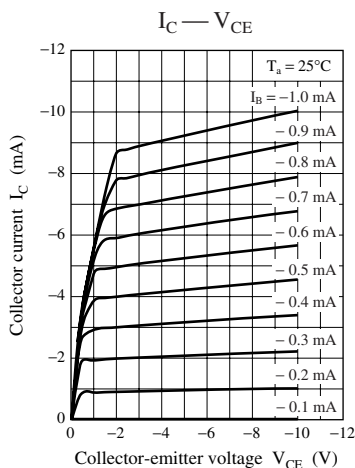
Characteristics charts of UNR211N

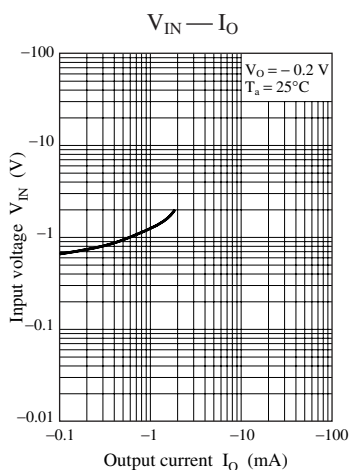
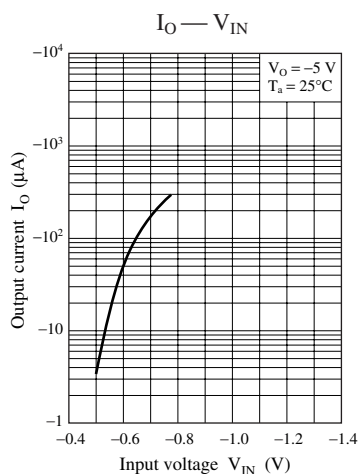


Characteristics charts of UNR211T

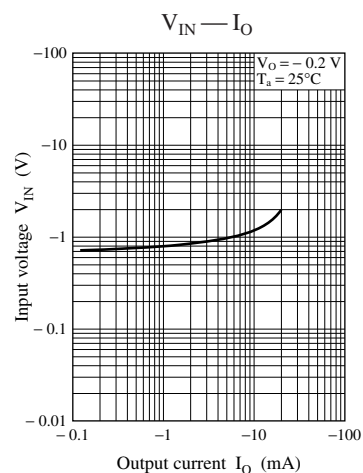
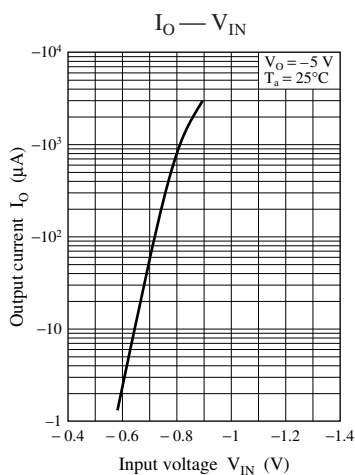
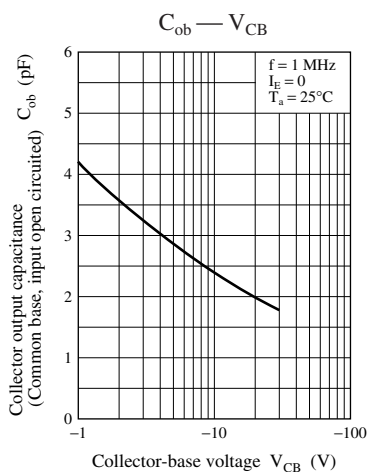
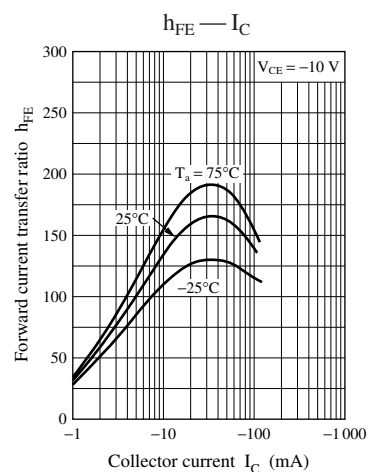
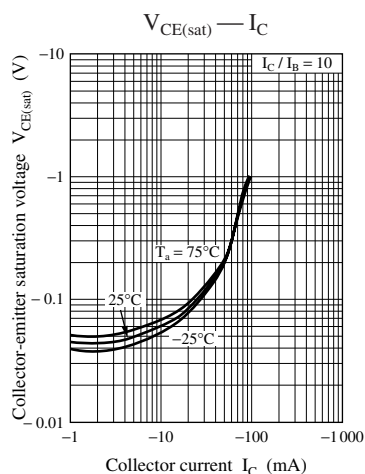
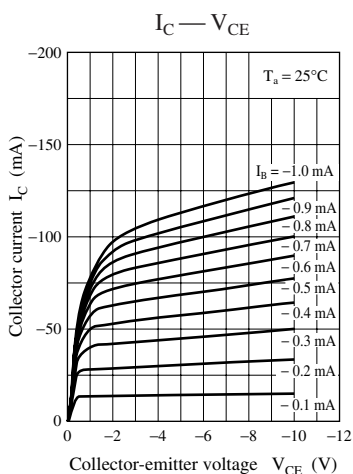


Characteristics charts of UNR211V





Characteristics charts of UNR211Z



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