

UNR21XX Series (UN21XX Series)

Silicon PNP epitaxial planer transistor

For digital circuits

■ Features

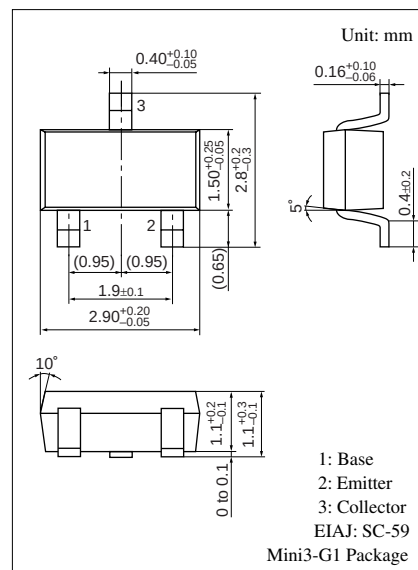
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- Mini type package, allowing downsizing of the equipment and automatic insertion through tape packing and magazine packing.

■ Resistance by Part Number

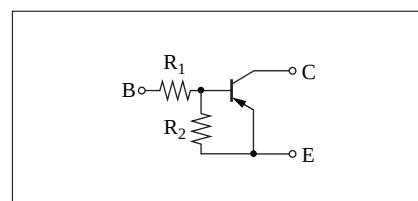
		Marking	Symbol (R_1)	(R_2)
• UNR2110	(UN2110)	6L	47 k Ω	—
• UNR2111	(UN2111)	6A	10 k Ω	10 k Ω
• UNR2112	(UN2112)	6B	22 k Ω	22 k Ω
• UNR2113	(UN2113)	6C	47 k Ω	47 k Ω
• UNR2114	(UN2114)	6D	10 k Ω	47 k Ω
• UNR2115	(UN2115)	6E	10 k Ω	—
• UNR2116	(UN2116)	6F	4.7 k Ω	—
• UNR2117	(UN2117)	6H	22 k Ω	—
• UNR2118	(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 to base voltage	V_{CBO}	-50	V
Collector to emitter voltage	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 $T_a = 25^\circ\text{C}$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current		I _{CBO}	V _{CB} = −50 V, I _E = 0			− 0.1	μA
		I _{CEO}	V _{CE} = −50 V, I _B = 0			− 0.5	
Emitter cutoff current	UNR2111	I _{EBO}	V _{EB} = −6 V, I _C = 0			− 0.5	mA
	UNR2112/2114/211D/ 211E/211M/211N/211T					− 0.2	
	UNR2113					− 0.1	
	UNR2110/2115/2116/2117					− 0.01	
	UNR211F/211H					−1.0	
	UNR2119					−1.5	
	UNR2118/211L/211V					−2.0	
	UNR211Z					− 0.4	
Collector to base voltage		V _{CBO}	I _C = −10 μA, I _E = 0	−50			V
Collector to emitter voltage		V _{CEO}	I _C = −2 mA, I _B = 0	−50			V
Forward current transfer ratio	UNR2111	h _{FE}	V _{CE} = −10 V, I _C = −5 mA	35			
	UNR2112/211E			60			
	UNR2113/2114/211M			80			
	UNR2110*/2115*/2116*/2117*			160		460	
	UNR2118/211L			20			
	UNR2119/211D/211F/211H			30			
	UNR211N/211T			80		400	
	UNR211V			6		20	
	UNR211Z			60		200	
Collector to 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			− 0.07	− 0.25		
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
Input resistance	UNR2118	R _I		−30%	0.51	+30%	kΩ
	UNR2119				1		
	UNR211H/211M/211V				2.2		
	UNR2116/211F/211L/211N UNR211Z				4.7		
	UNR2111/2114/2115				10		
	UNR2112/2117/211T				22		
	UNR2110/2113/211D/211E				47		

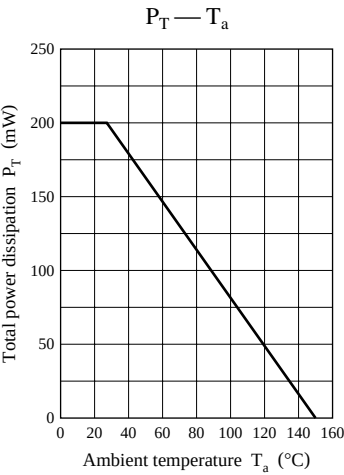
Note) *: h_{FE} rank classification (UNR2110/2115/2116/2117)

Rank	Q	R	S
h_{FE}	160 to 260	210 to 340	290 to 460

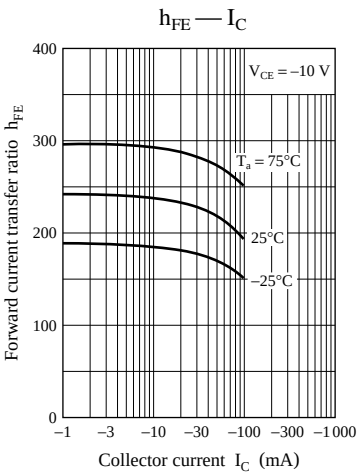
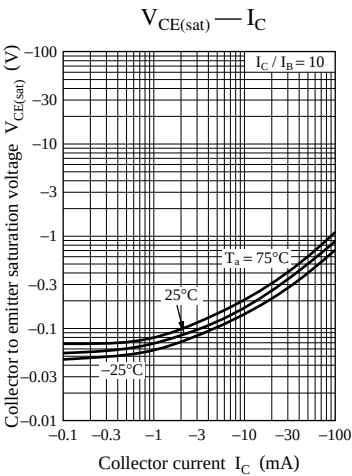
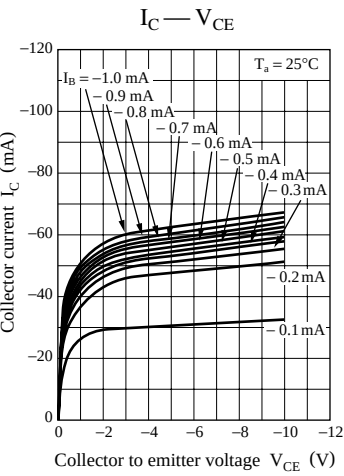
■ Electrical Characteristics (continued) $T_a = 25^{\circ}\text{C}$

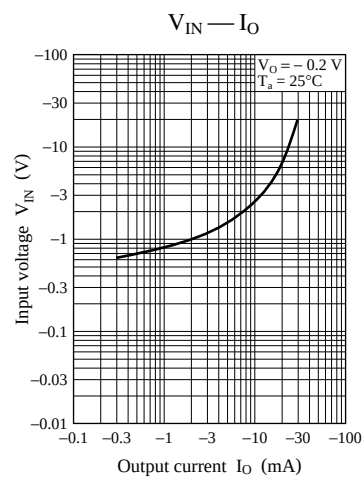
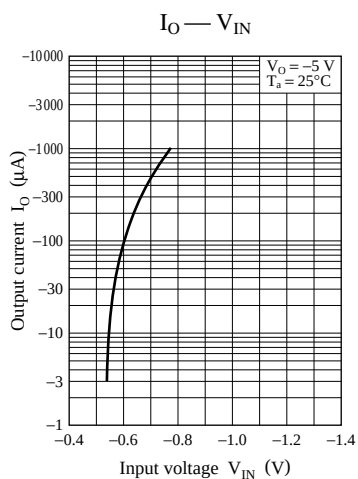
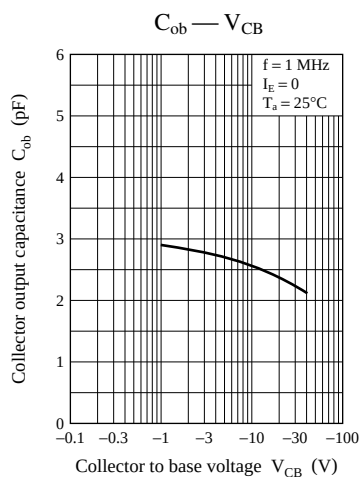
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Resis- tance ratio	UNR2111/2112/2113/211L	R_1/R_2		0.8	1.0	1.2	
	UNR2114			0.17	0.21	0.25	
	UNR2118/2119			0.08	0.1	0.12	
	UNR211D				4.7		
	UNR211E				2.14		
	UNR211F/211T				0.47		
	UNR211H			0.17	0.22	0.27	
	UNR211M				0.047		
	UNR211N				0.1		
	UNR211V				1.0		
	UNR211Z				0.21		

Common characteristics chart

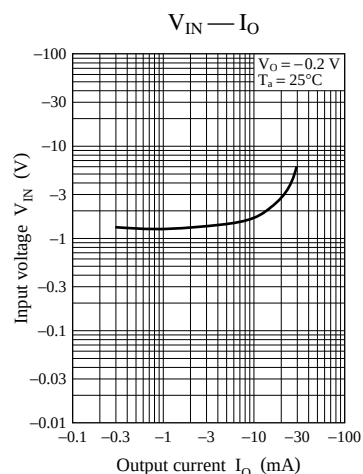
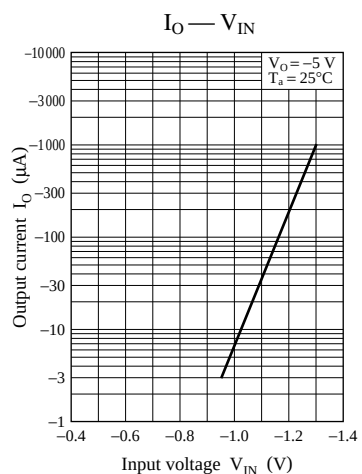
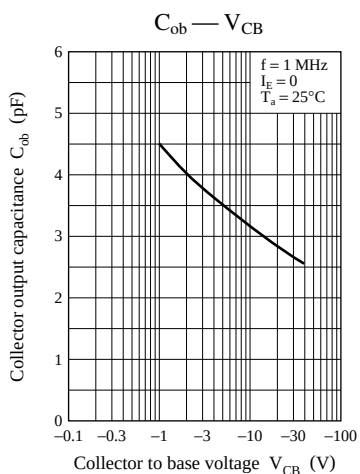
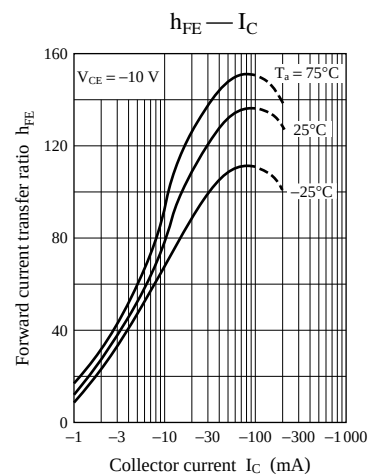
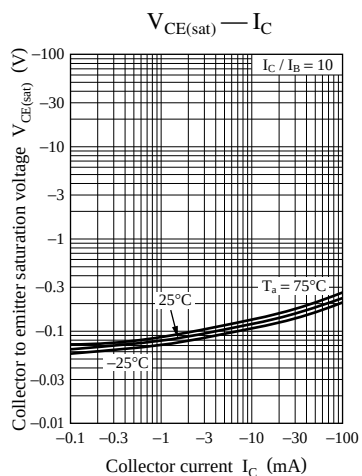
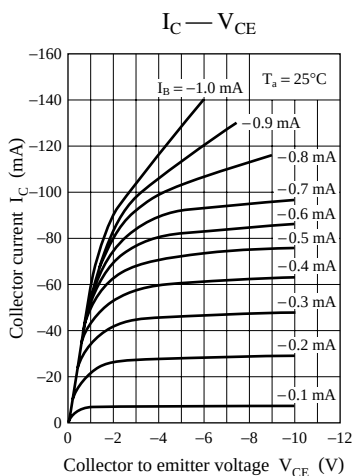


Characteristics charts of UNR2110

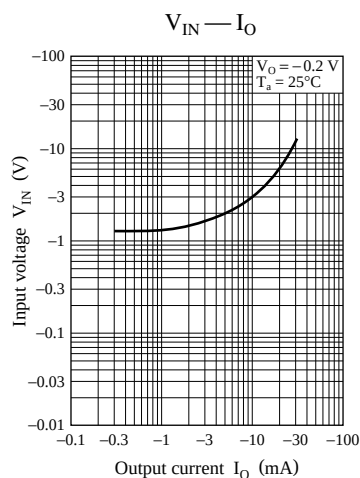
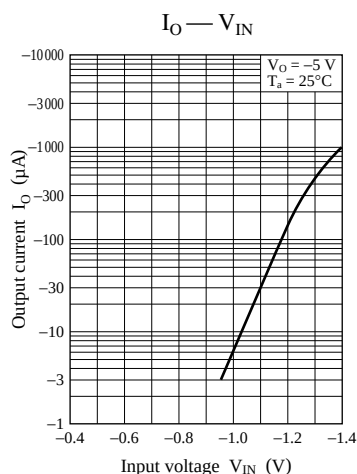
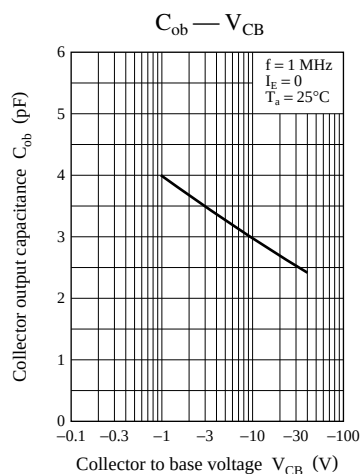
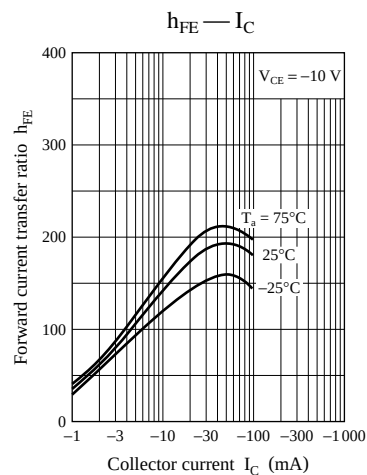
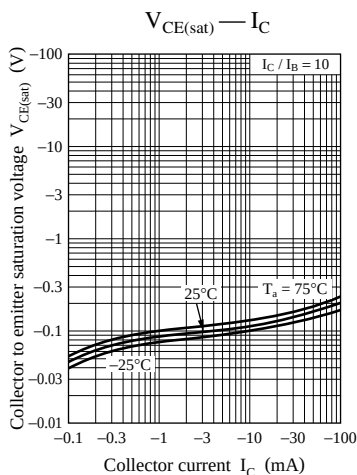
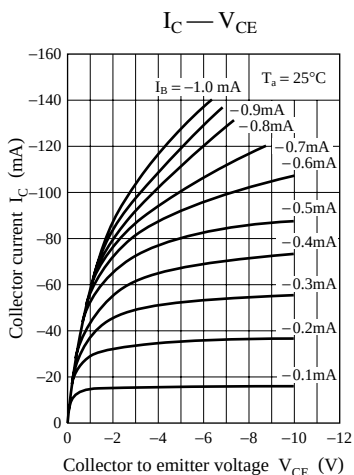




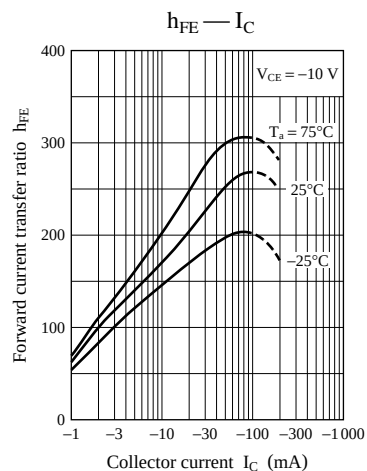
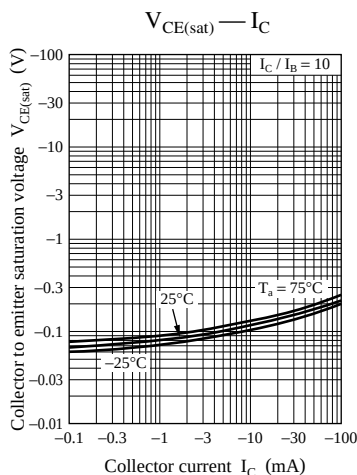
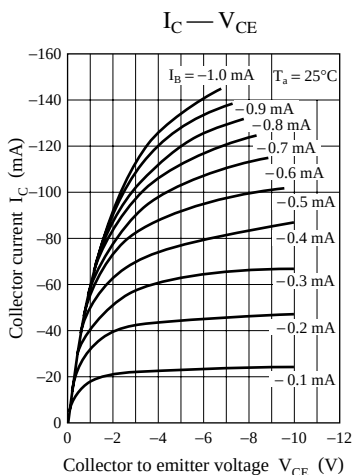
Characteristics charts of UNR2111

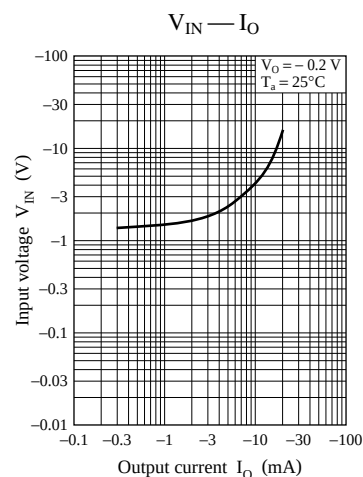
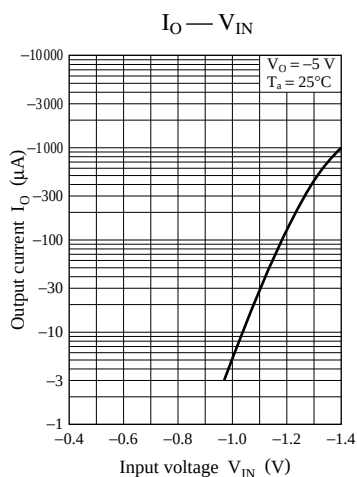
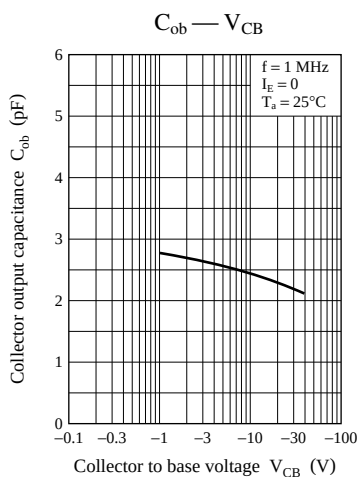


Characteristics charts of UNR2112

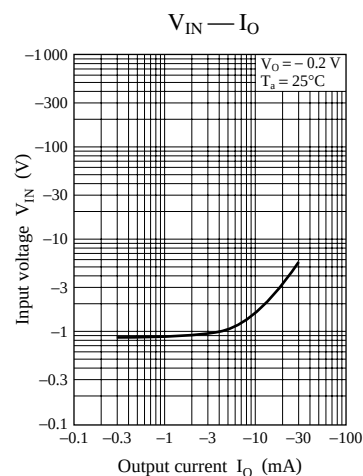
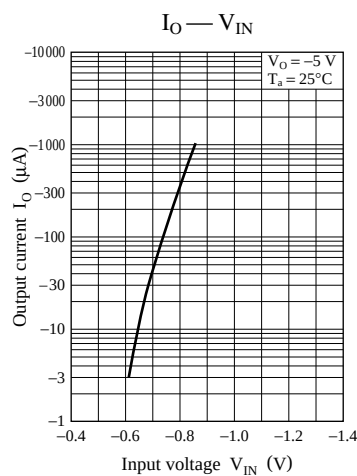
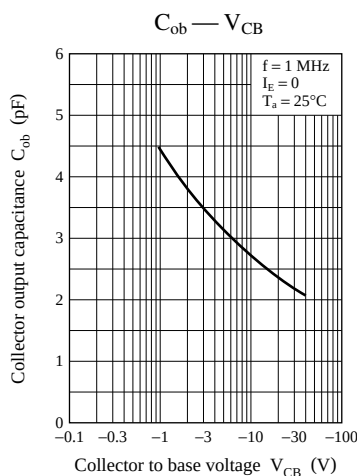
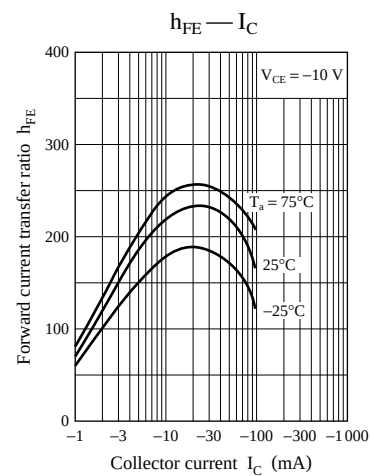
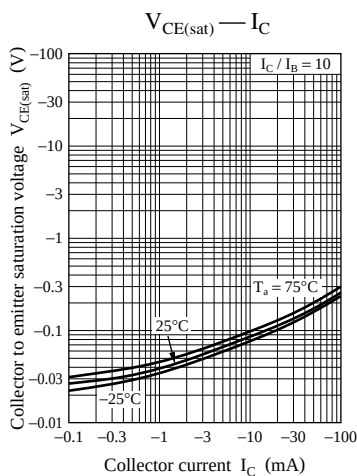
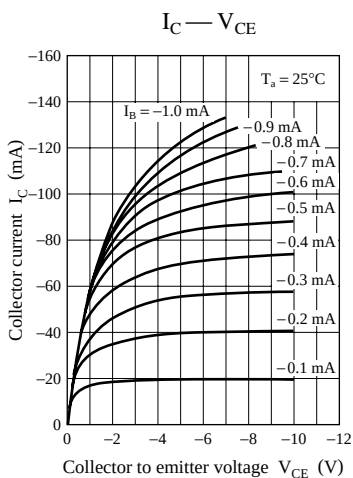


Characteristics charts of UNR2113

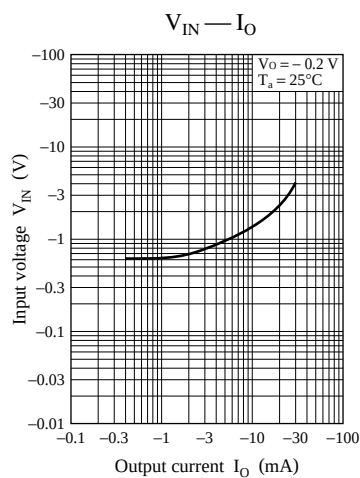
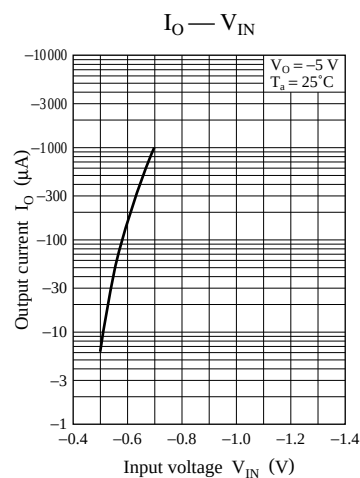
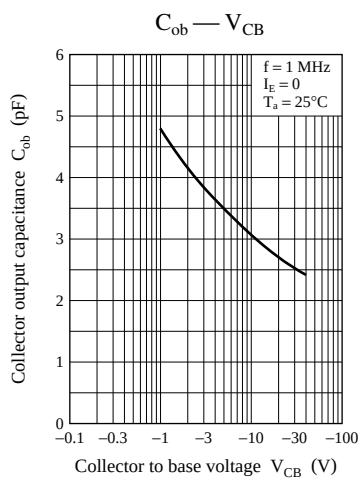
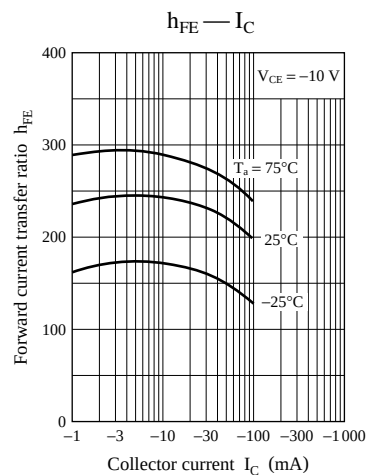
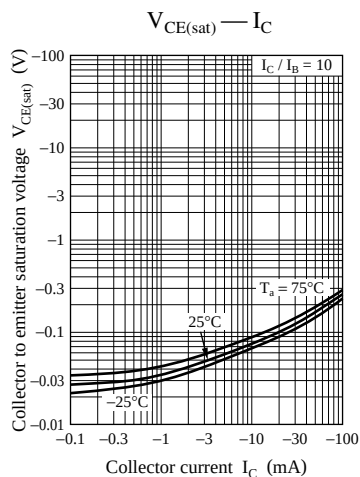
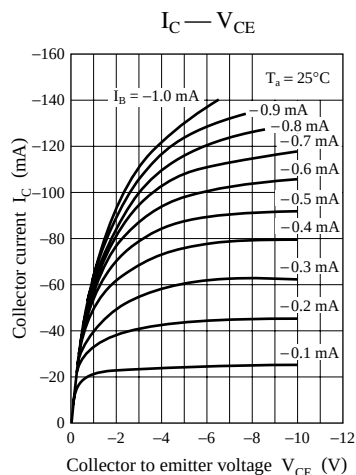




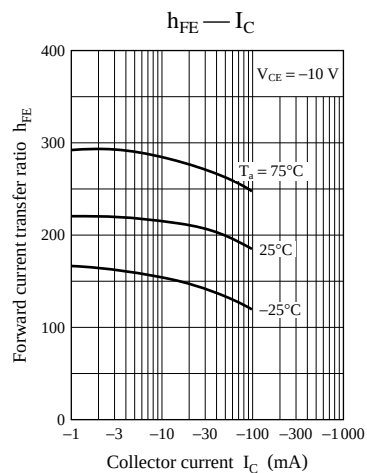
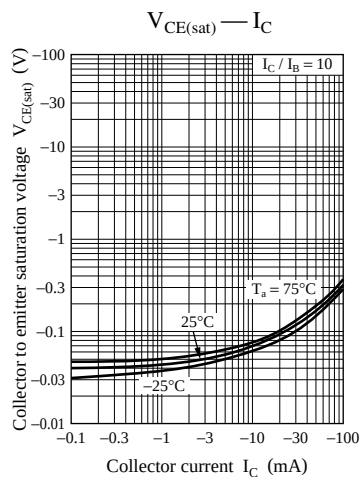
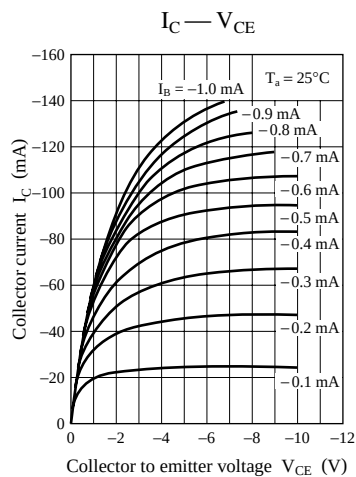
Characteristics charts of UNR2114

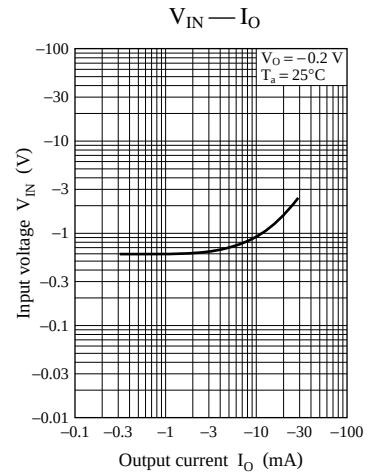
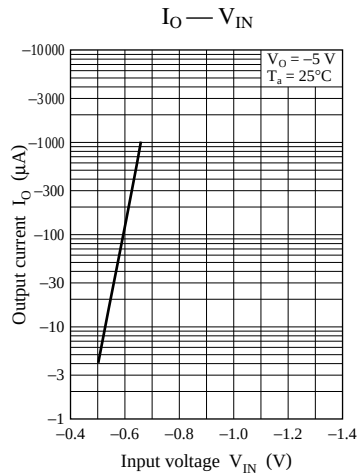
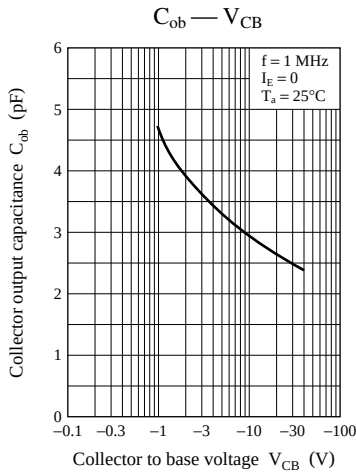


Characteristics charts of UNR2115

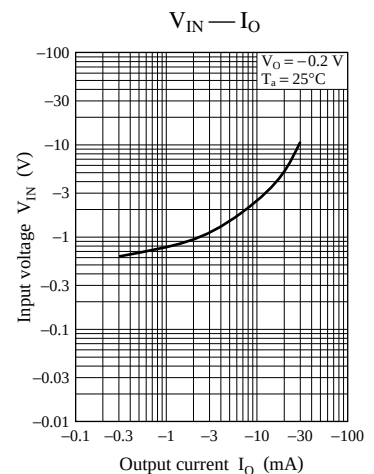
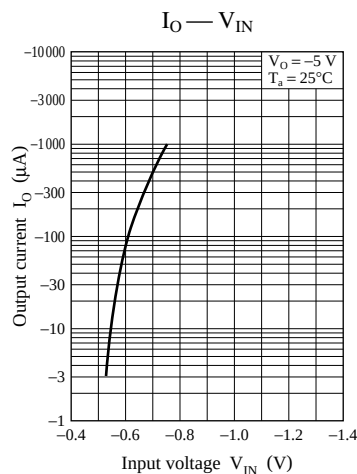
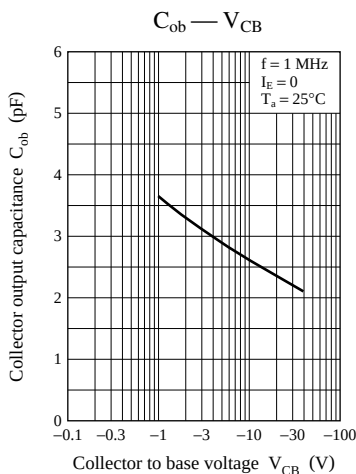
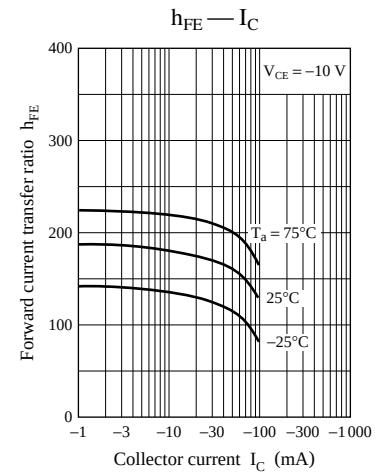
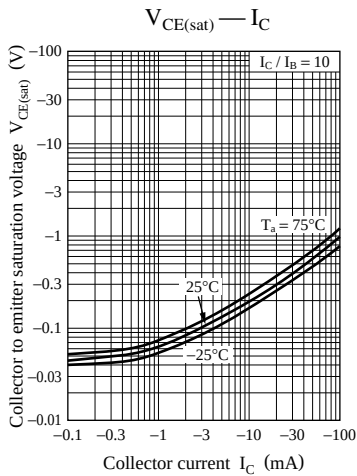
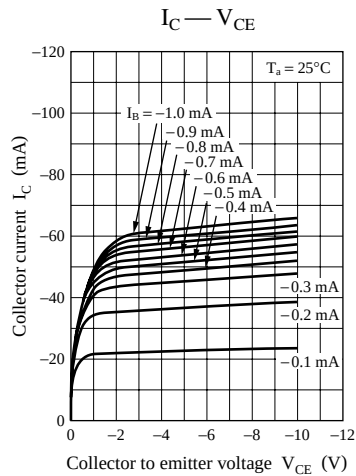


Characteristics charts of UNR2116

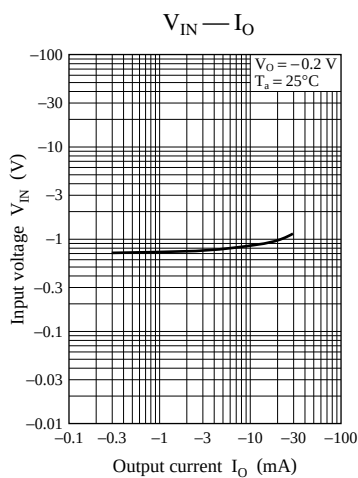
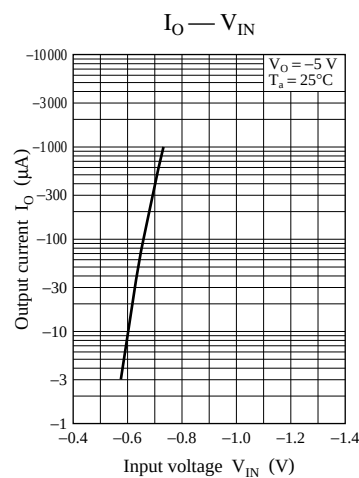
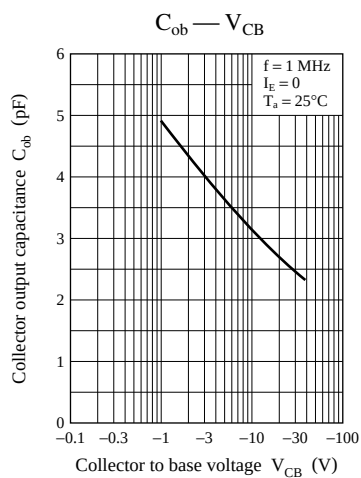
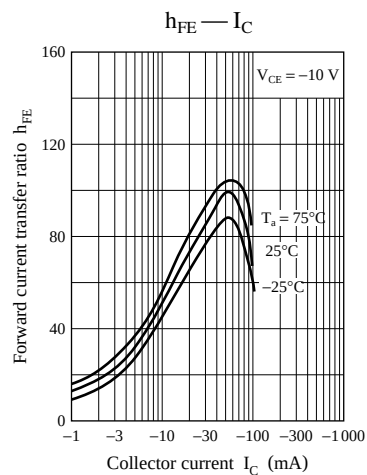
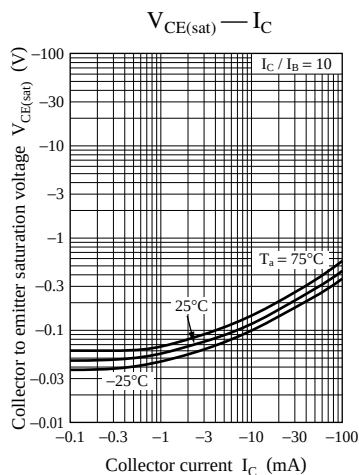
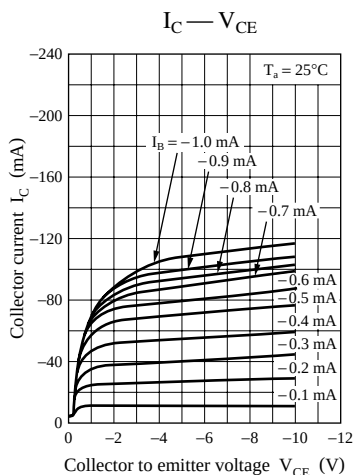




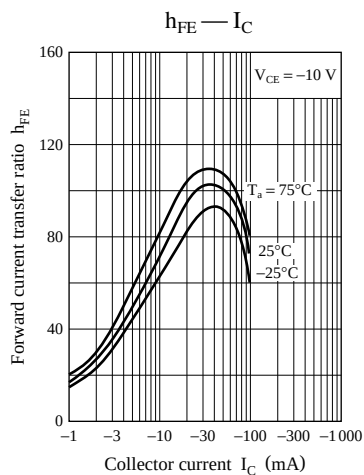
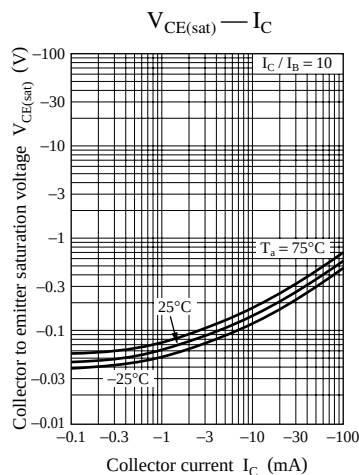
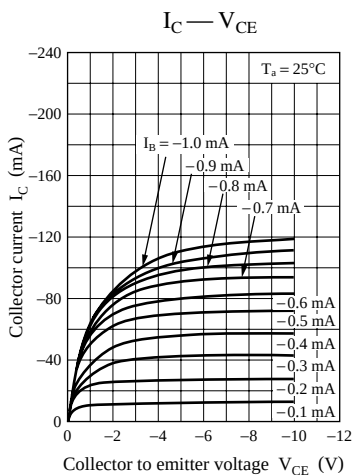
Characteristics charts of UNR2117

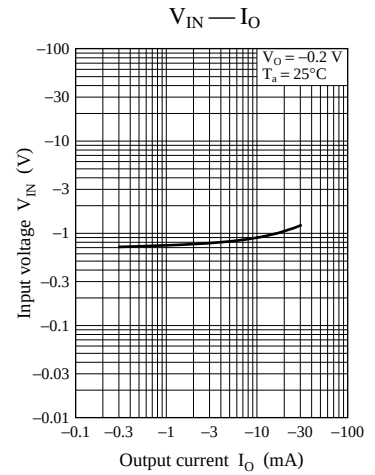
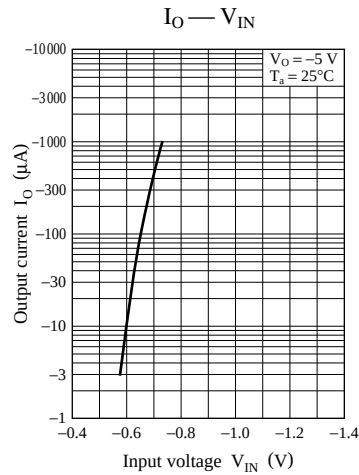
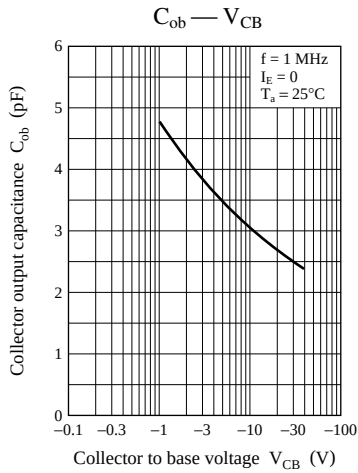


Characteristics charts of UNR2118

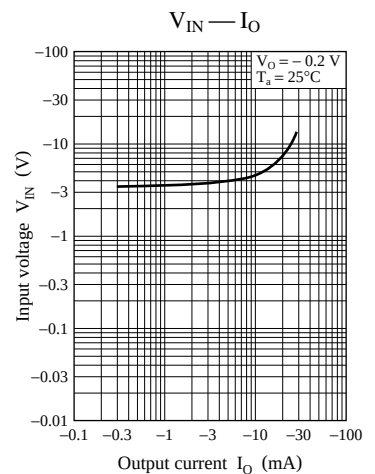
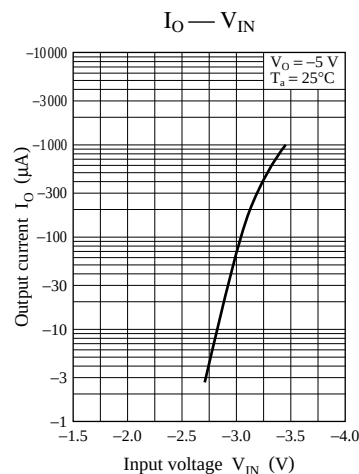
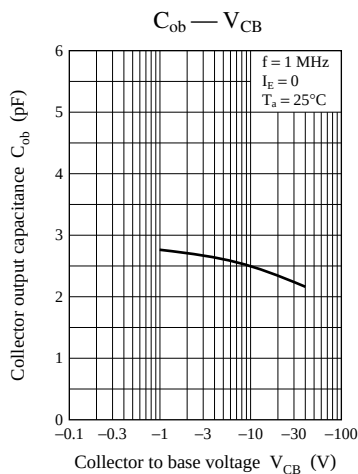
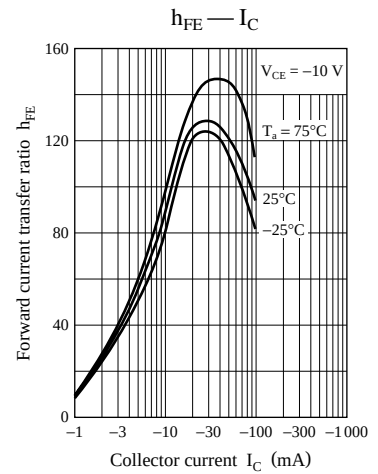
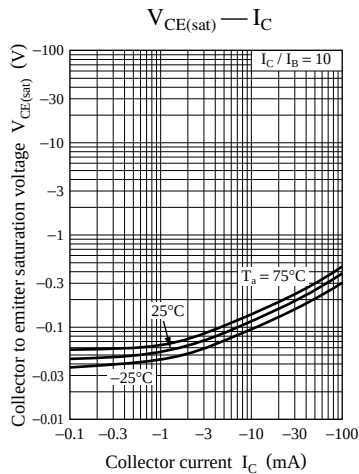
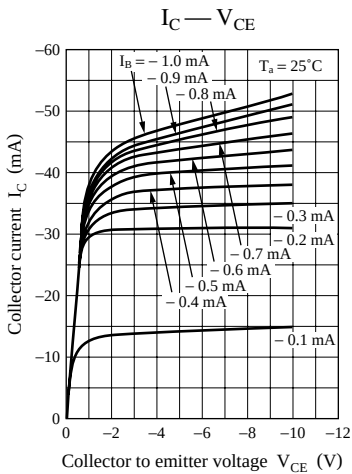


Characteristics charts of UNR2119

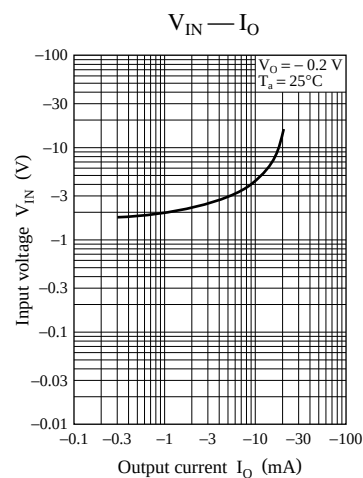
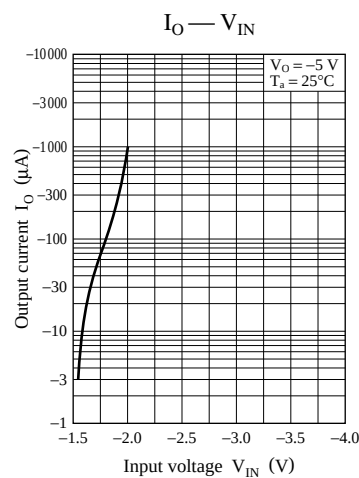
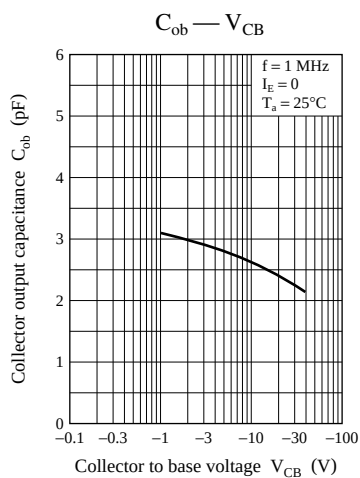
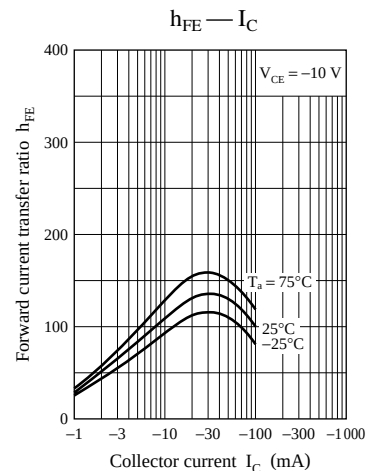
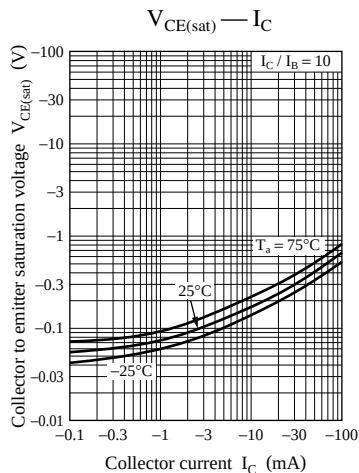
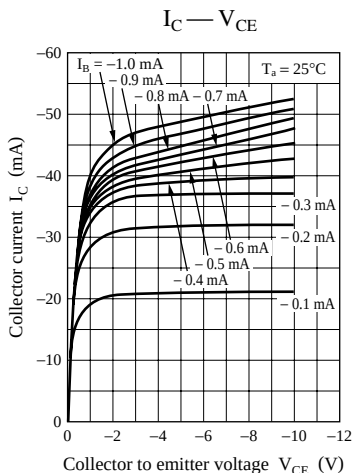




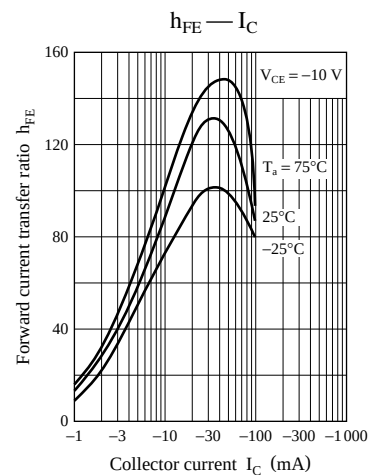
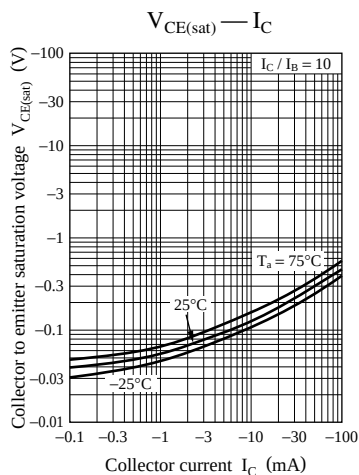
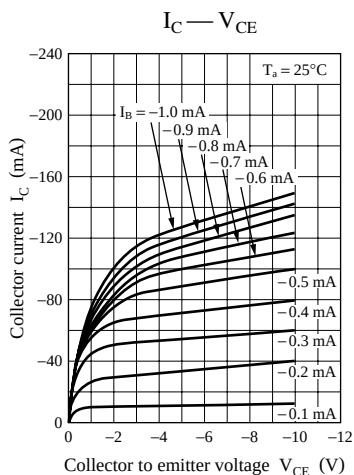
Characteristics charts of UNR211D

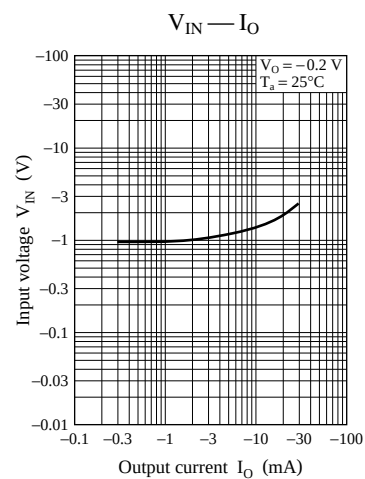
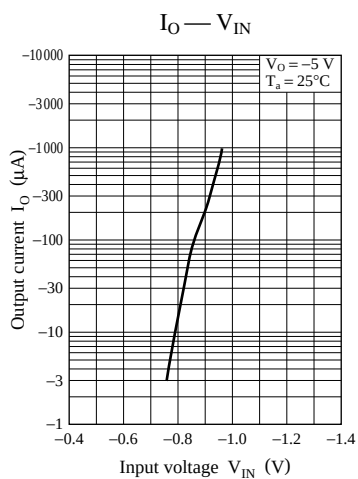
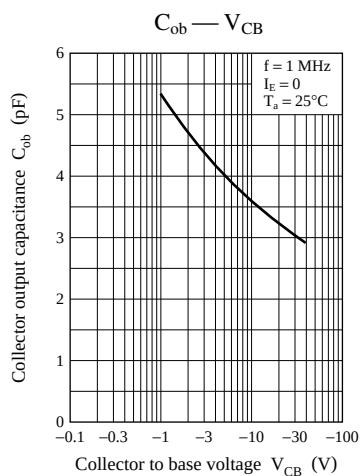


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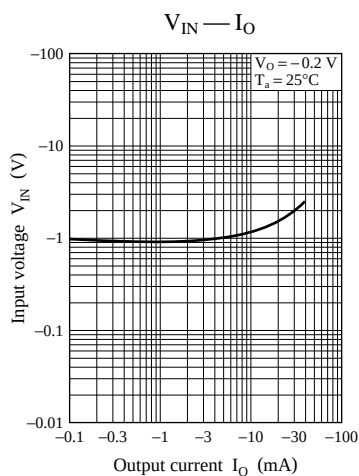
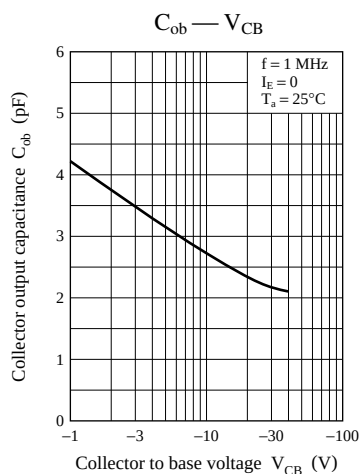
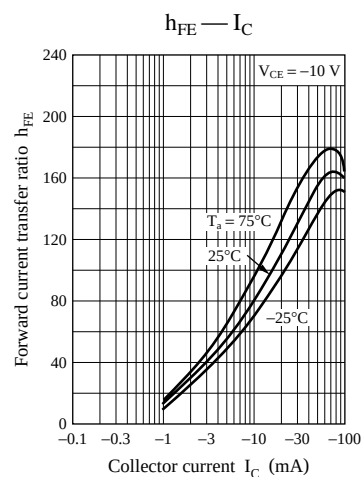
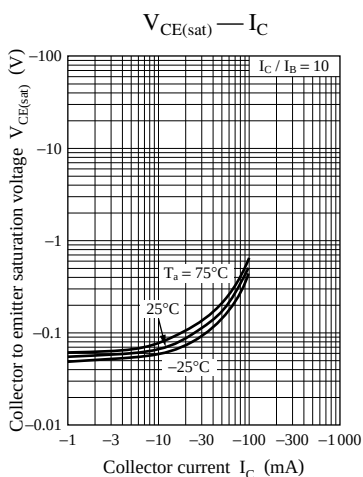
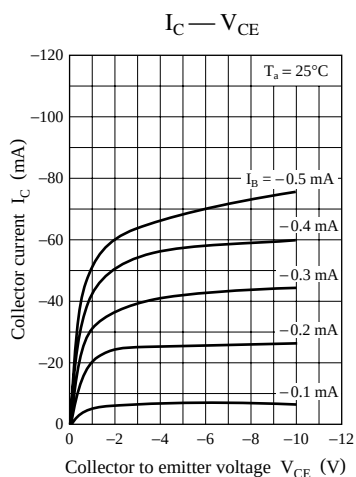


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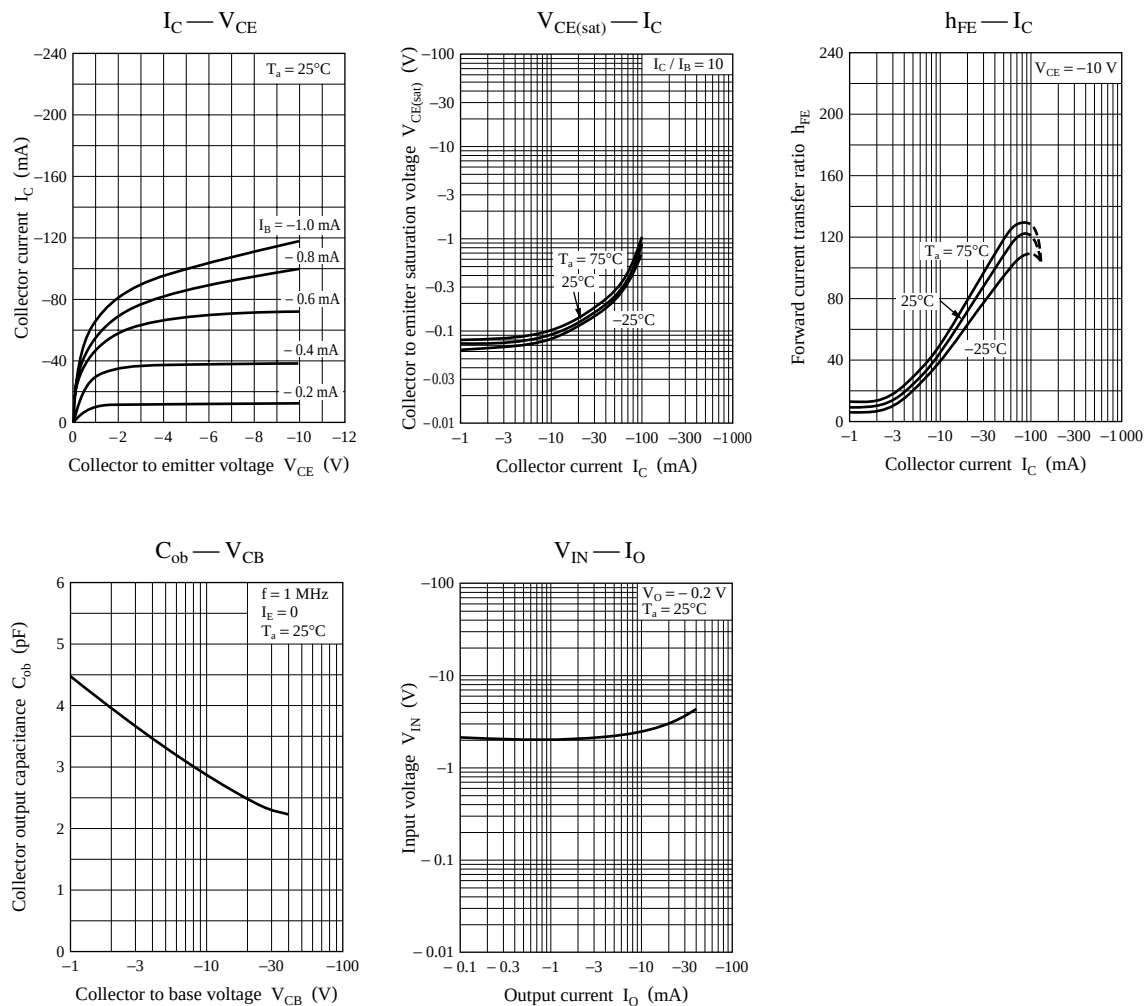




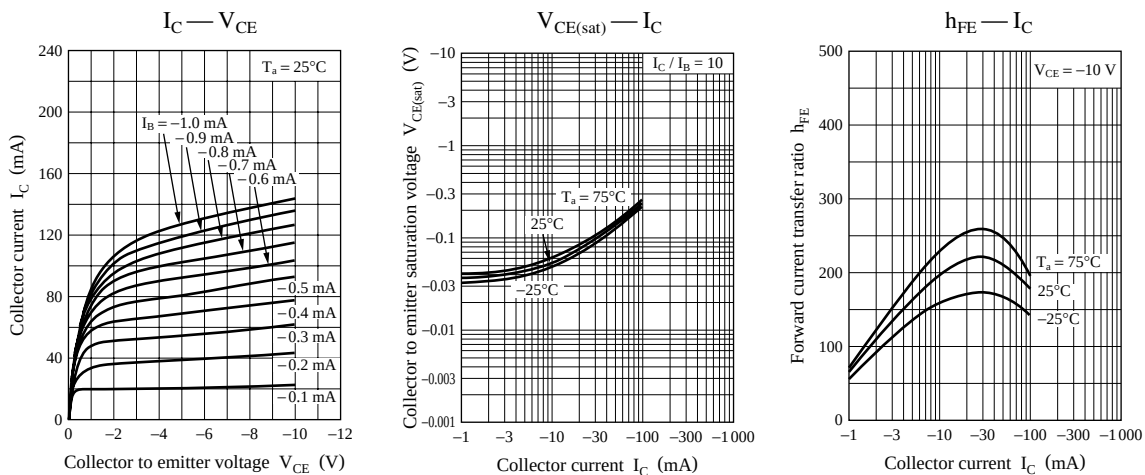
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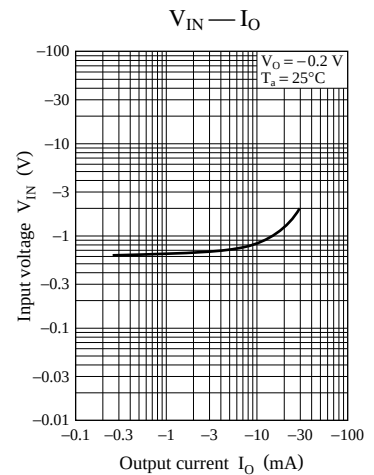
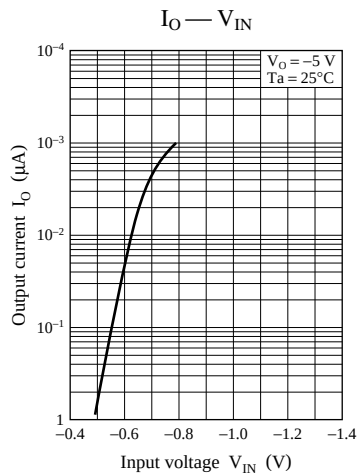
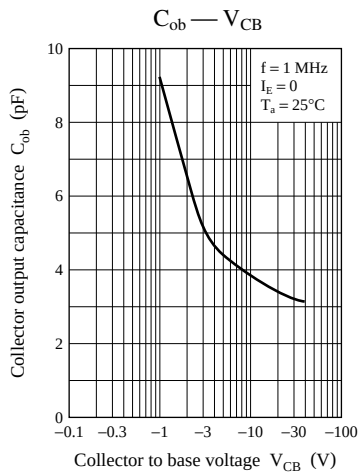


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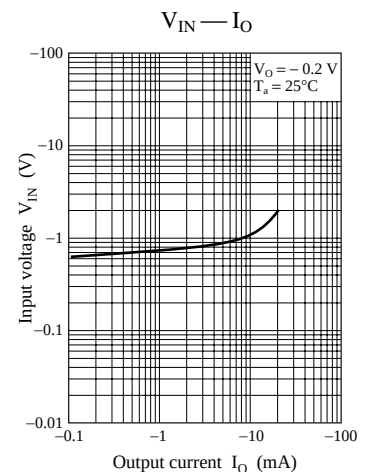
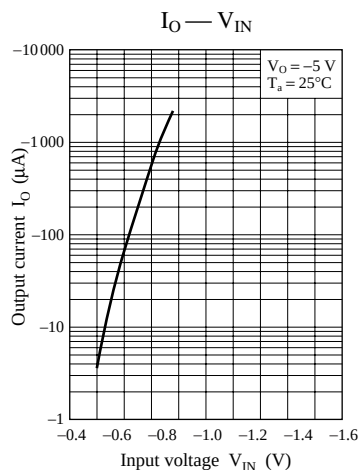
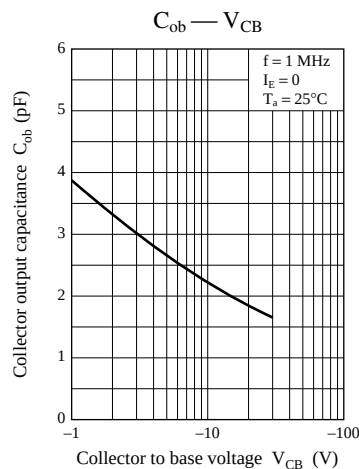
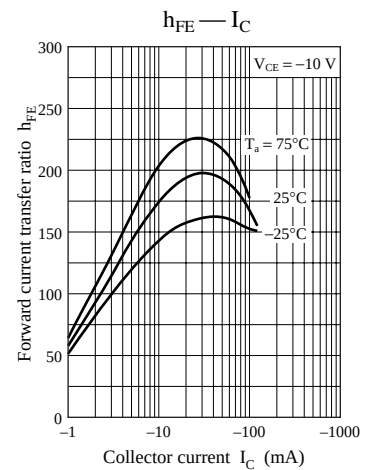
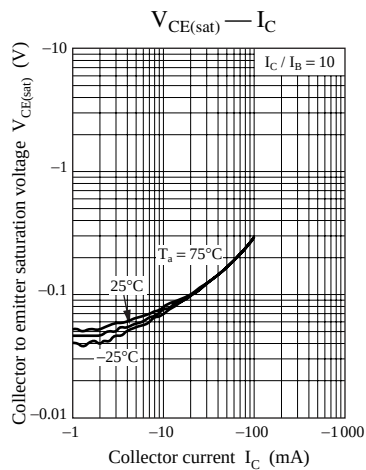
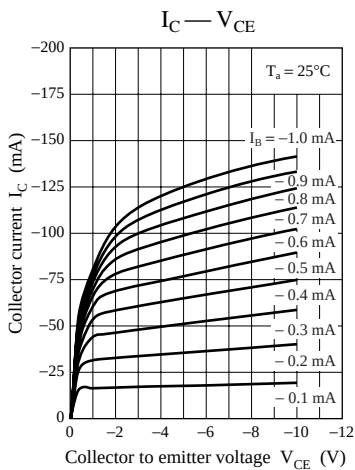


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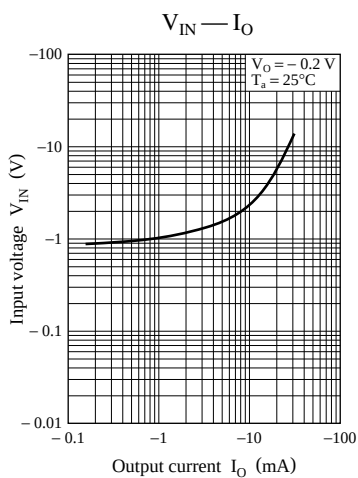
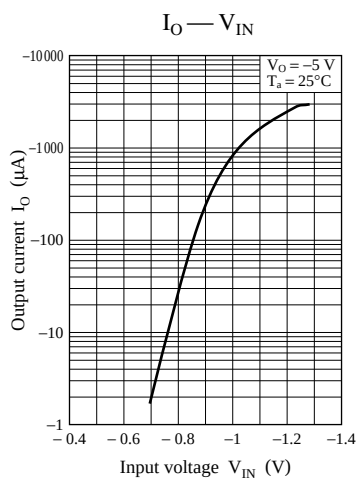
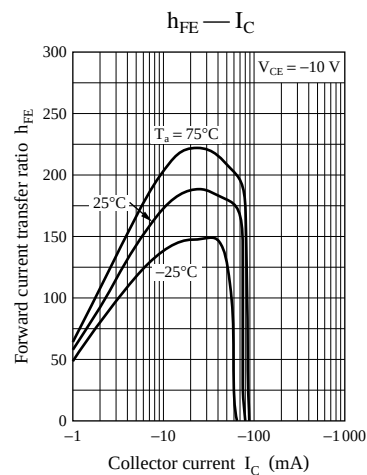
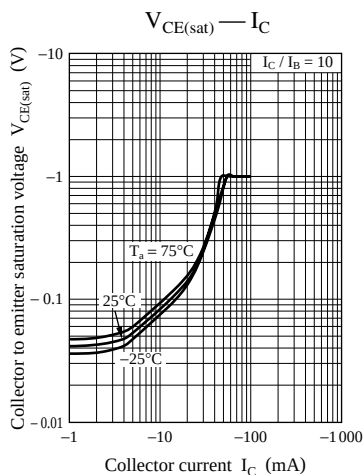
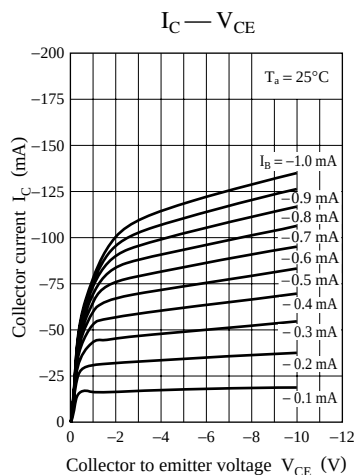




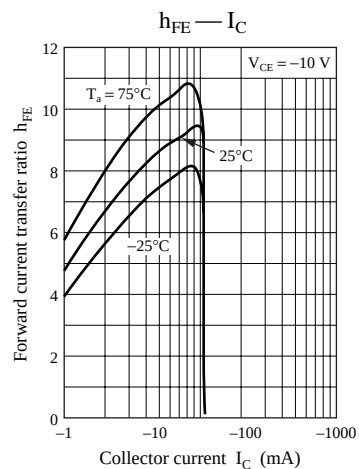
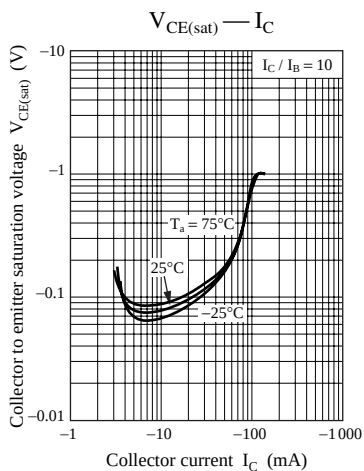
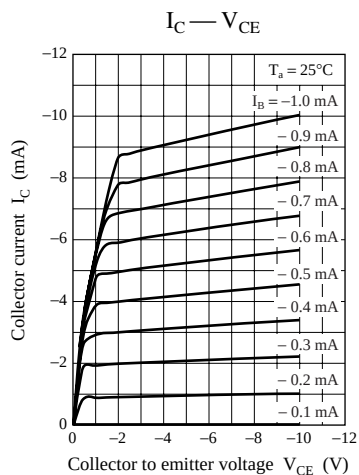
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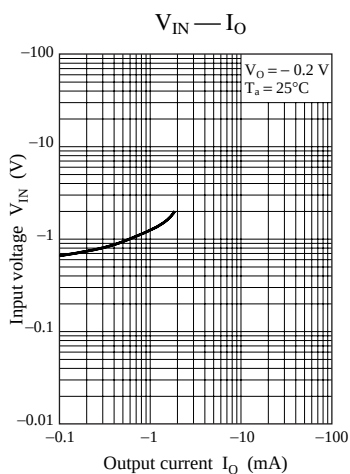
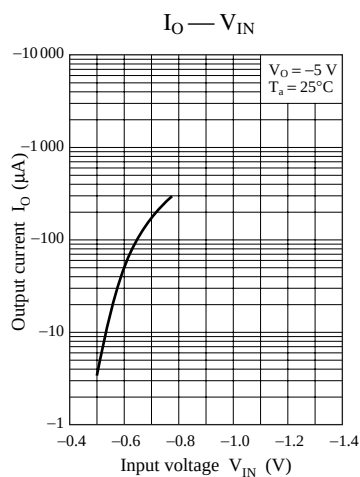


Characteristics charts of UNR211T

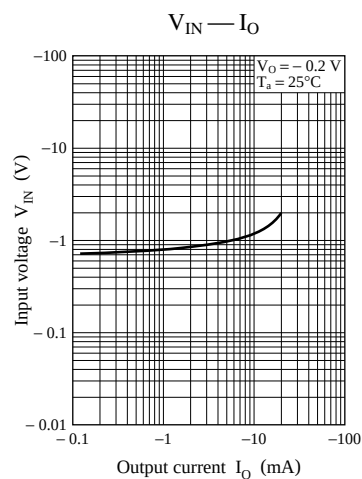
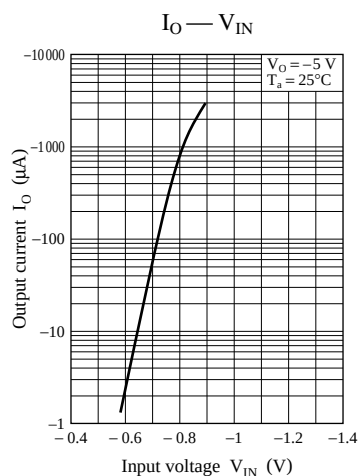
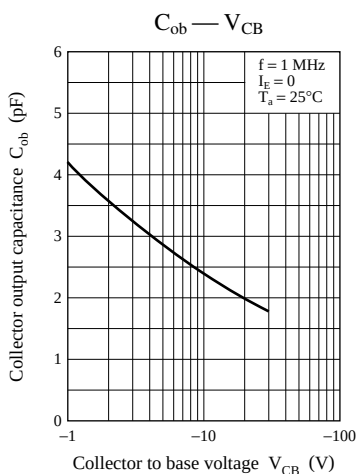
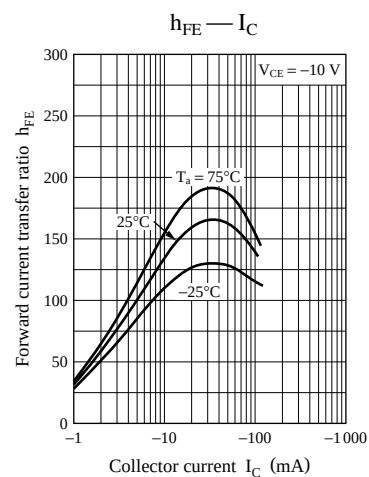
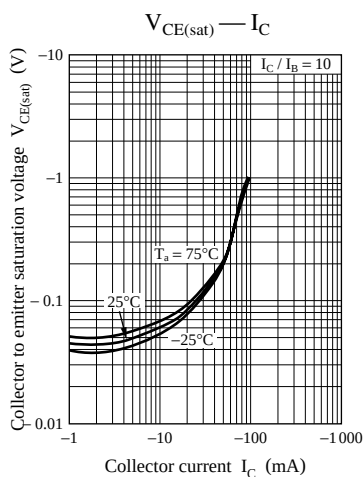
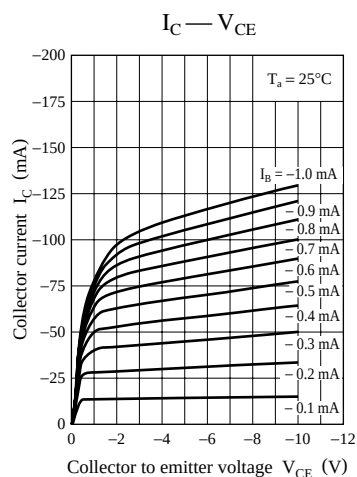


Characteristics charts of UNR211V





Characteristics charts of UNR211Z



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