

UNR2111/2112/2113/2114/2115/2116/2117/2118/2119/2110/ 211D/211E/211F/211H/211L/211M/211N/211T/211V/211Z

(UN2111/2112/2113/2114/2115/2116/2117/2118/2119/2110/ 211D/211E/211F/211H/211L/211M/211N/211T/211V/211Z)

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.

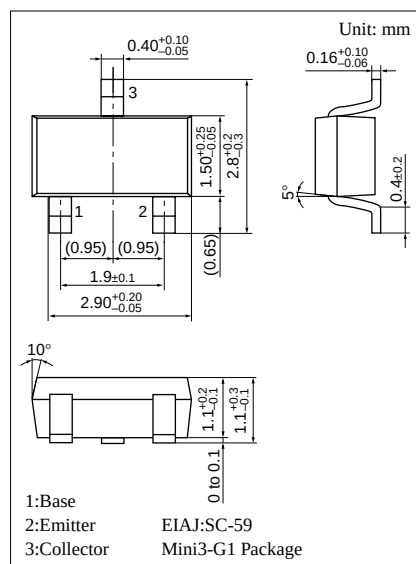
Resistance by Part Number

	Marking Symbol	(R ₁)	(R ₂)
• UNR2111	6A	10kΩ	10kΩ
• UNR2112	6B	22kΩ	22kΩ
• UNR2113	6C	47kΩ	47kΩ
• UNR2114	6D	10kΩ	47kΩ
• UNR2115	6E	10kΩ	—
• UNR2116	6F	4.7kΩ	—
• UNR2117	6H	22kΩ	—
• UNR2118	6I	0.51kΩ	5.1kΩ
• UNR2119	6K	1kΩ	10kΩ
• UNR2110	6L	47kΩ	—
• UNR211D	6M	47kΩ	10kΩ
• UNR211E	6N	47kΩ	22kΩ
• UNR211F	6O	4.7kΩ	10kΩ
• UNR211H	6P	2.2kΩ	10kΩ
• UNR211L	6Q	4.7kΩ	4.7kΩ
• UNR211M	EI	2.2kΩ	47kΩ
• UNR211N	EW	4.7kΩ	47kΩ
• UNR211T	EY	22kΩ	47kΩ
• UNR211V	FC	2.2kΩ	2.2kΩ
• UNR211Z	FE	4.7kΩ	22kΩ

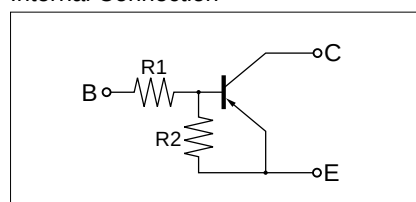
Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Ratings	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	°C
Storage temperature	T _{stg}	-55 to +150	°C

Note) The part numbers in the parenthesis show conventional part number.



Internal Connection



UNR2111/2112/2113/2114/2115/2116/2117/2118/2119/2110/
Transistors with built-in Resistor 211D/211E/211F/211H/211L/211M/211N/211T/211V/211Z

■ Electrical Characteristics (T_a=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit	
Collector cutoff current		I _{CBO}	V _{CB} = -50V, I _E = 0			- 0.1	μA	
		I _{CEO}	V _{CE} = -50V, I _B = 0			- 0.5	μA	
Emitter cutoff current	UNR2111	I _{EBO}	V _{EB} = -6V, I _C = 0			- 0.5	mA	
	UNR2112/2114/211E/211D/211M/211N/211T					- 0.2		
	UNR2113					- 0.1		
	UNR2115/2116/2117/2110					- 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 = -10mA, I _E = 0	-50			V	
Collector to emitter voltage		V _{CEO}	I _C = -2mA, I _B = 0	-50			V	
Forward current transfer ratio	UNR2111	h _{FE}	V _{CE} = -10V, I _C = -5mA	35				
	UNR2112/211E			60				
	UNR2113/2114/211M			80				
	UNR2115*/2116*/2117*/2110*			160		460		
	UNR2119/211F/211D/211H			30				
	UNR2118/211L			20				
	UNR211N/211T			80		400		
	UNR211V			6		20		
	UNR211Z			60		200		
Collector to emitter saturation voltage		V _{CE(sat)}	I _C = -10mA, I _B = - 0.3mA			- 0.25	V	
			UNR211V	I _C = -10mA, I _B = -1.5mA		- 0.07	- 0.25	V
Output voltage high level		V _{OH}	V _{CC} = -5V, V _B = - 0.5V, R _L = 1kΩ	-4.9			V	
Output voltage low level		V _{OL}	V _{CC} = -5V, V _B = -2.5V, R _L = 1kΩ			- 0.2	V	
			UNR2113	V _{CC} = -5V, V _B = -3.5V, R _L = 1kΩ				- 0.2
			UNR211D	V _{CC} = -5V, V _B = -10V, R _L = 1kΩ				- 0.2
			UNR211E	V _{CC} = -5V, V _B = -6V, R _L = 1kΩ				- 0.2
Transition frequency		f _T	V _{CB} = -10V, I _E = 1mA, f = 200MHz		80		MHz	
Input resistance	UNR2111/2114/2115	R _i		(-30%)	10	(+30%)	kΩ	
	UNR2112/2117/211T				22			
	UNR2113/2110/211D/211E				47			
	UNR2116/211F/211L/211N/211Z				4.7			
	UNR2118				0.51			
	UNR2119				1			
	UNR211H/211M/211V				2.2			

* h_{FE} rank classification (UNR2115/2116/2117/2110)

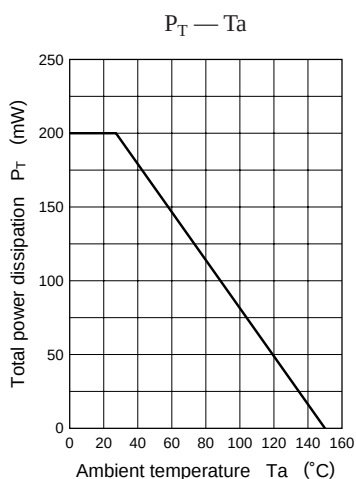
Rank	Q	R	S
h _{FE}	160 to 260	210 to 340	290 to 460

UNR2111/2112/2113/2114/2115/2116/2117/2118/2119/2110/
Transistors with built-in Resistor 211D/211E/211F/211H/211L/211M/211N/211T/211V/211Z

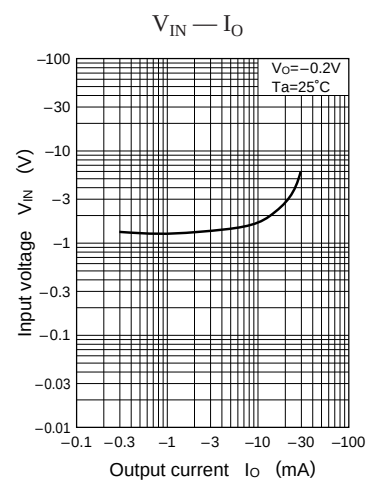
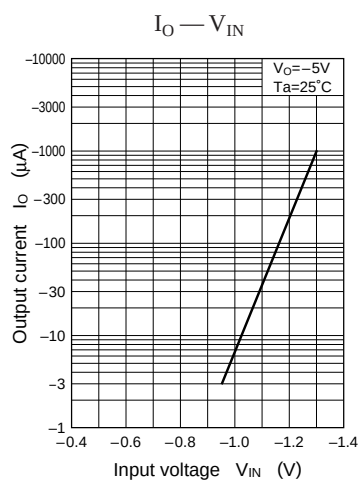
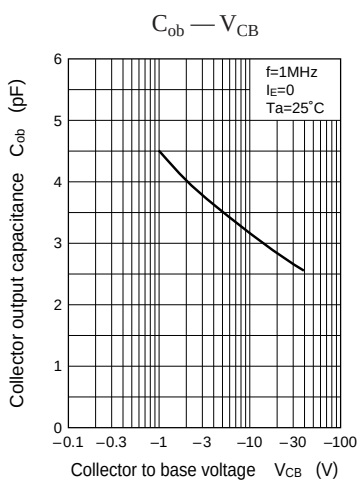
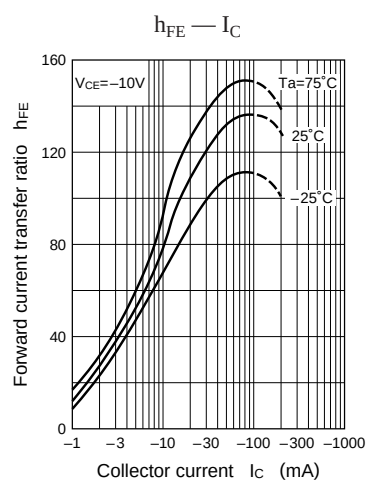
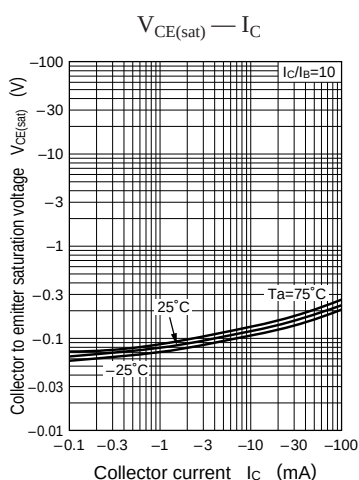
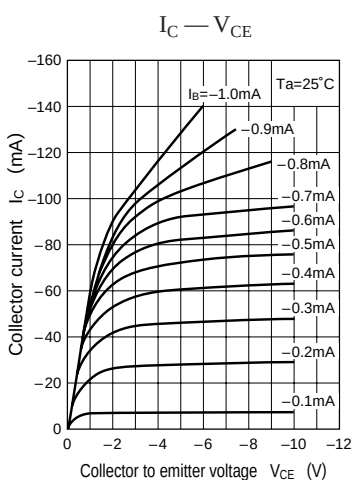
■ Electrical Characteristics (continued) (Ta=25°C)

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		

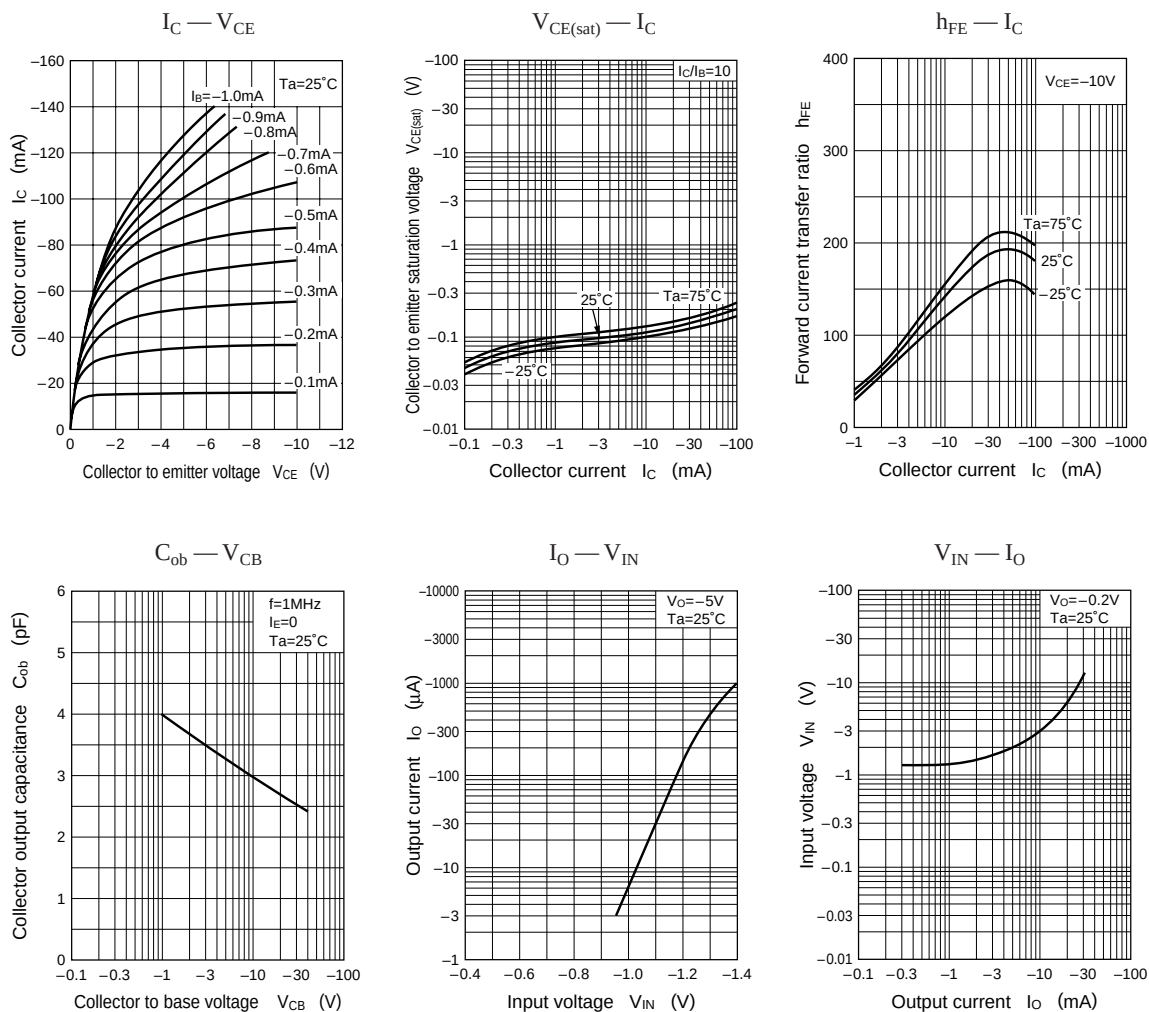
Common characteristics chart



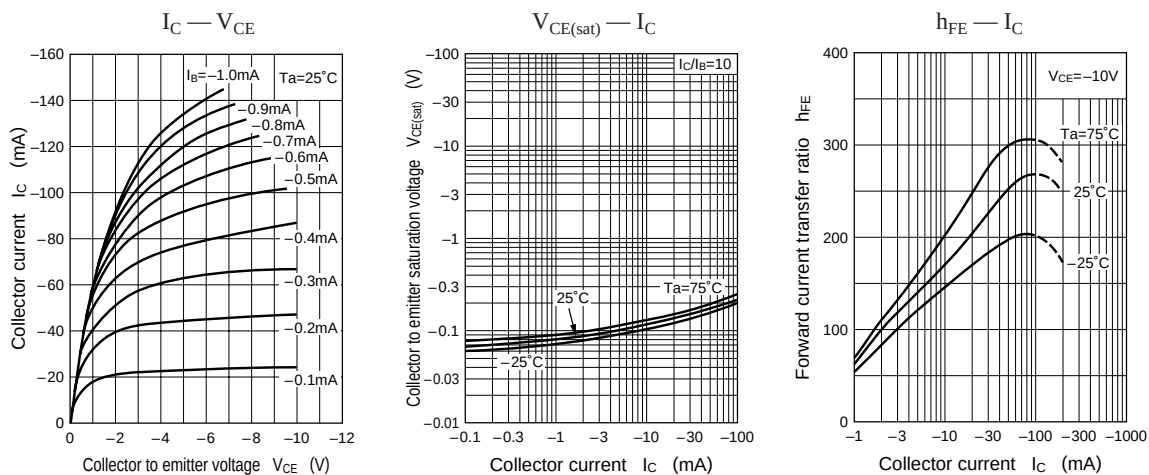
Characteristics charts of UNR2111

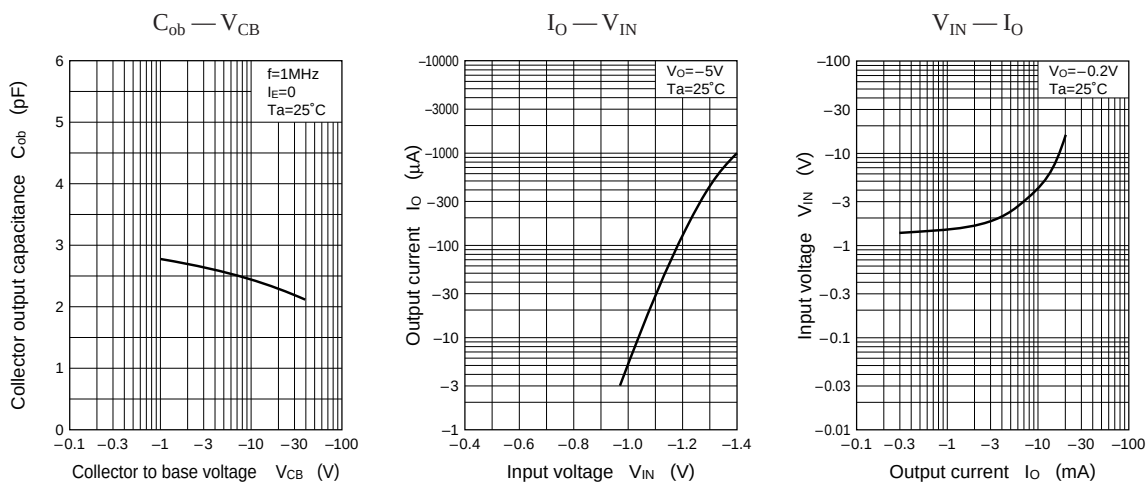


Characteristics charts of UNR2112

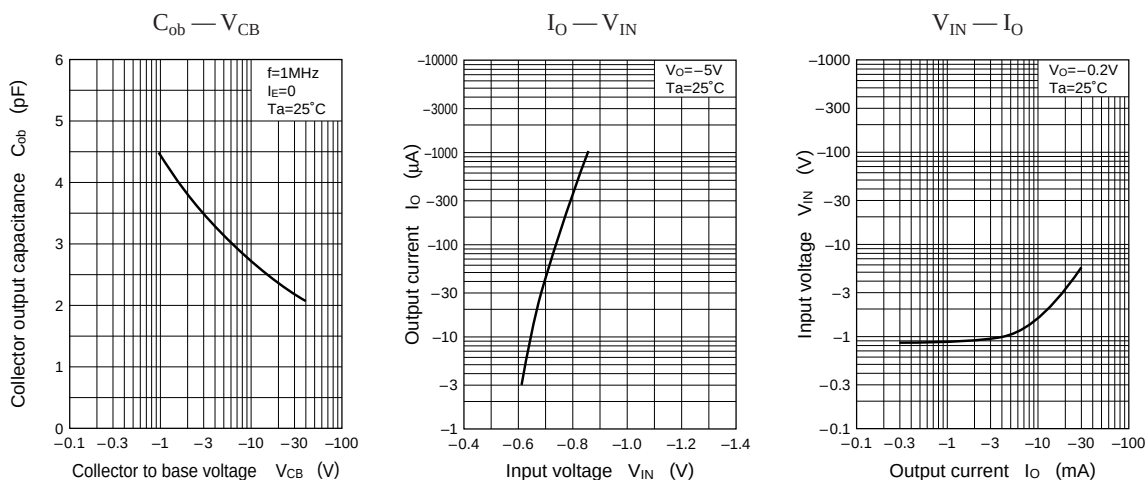
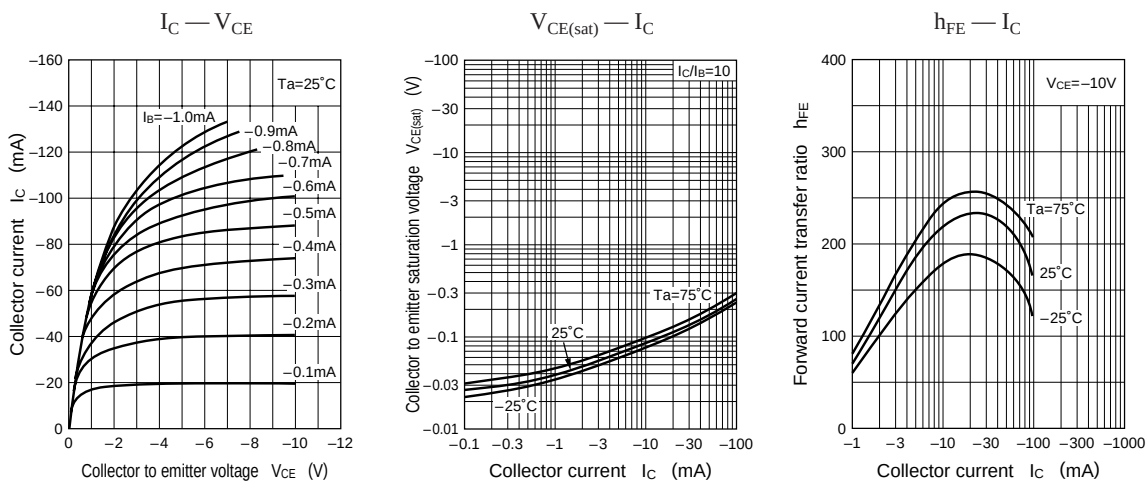


Characteristics charts of UNR2113

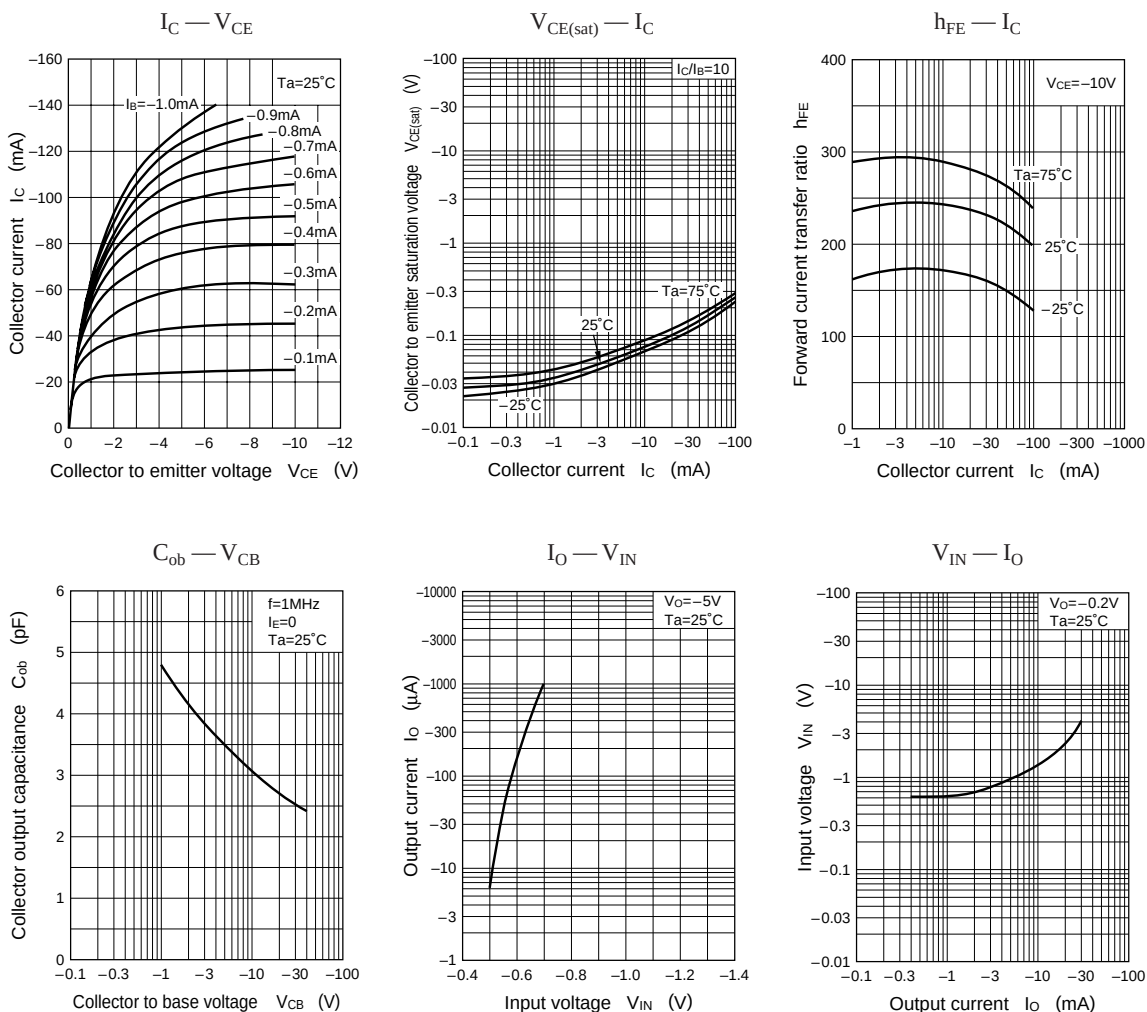




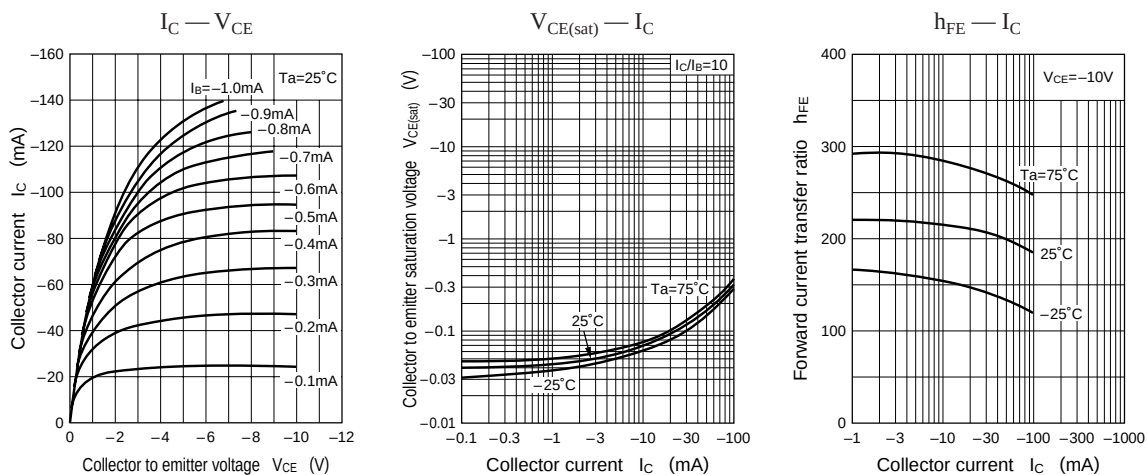
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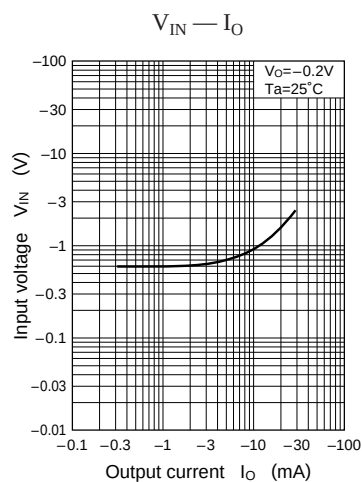
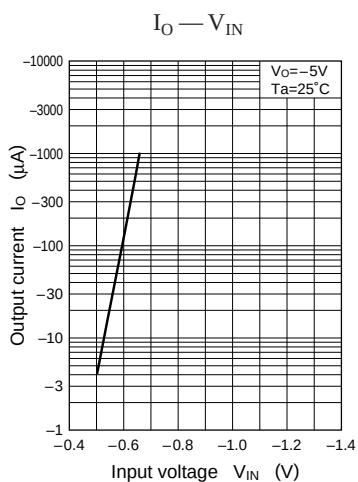
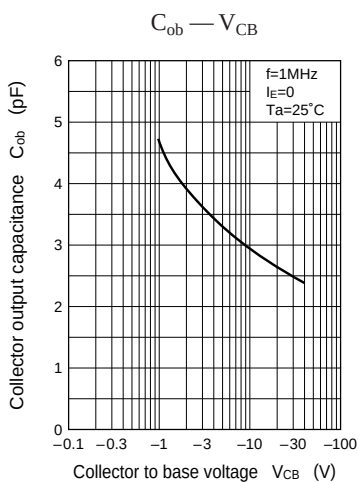


Characteristics charts of UNR2115

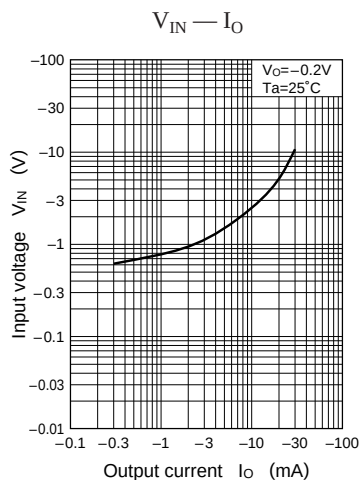
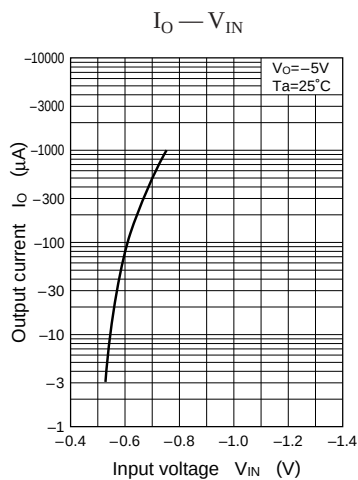
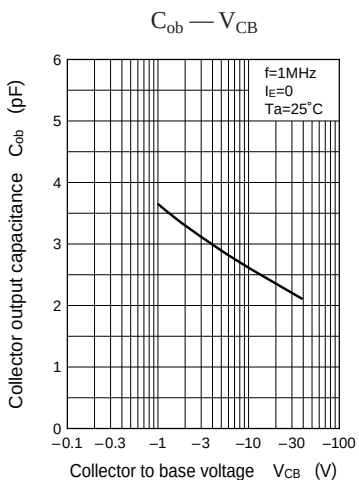
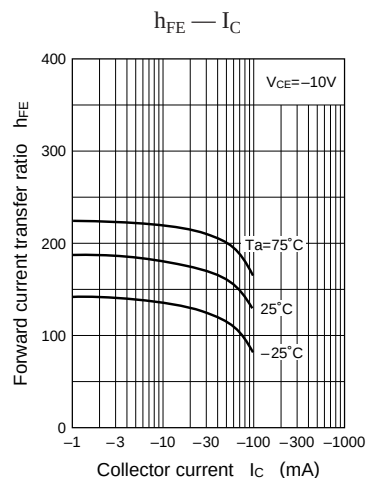
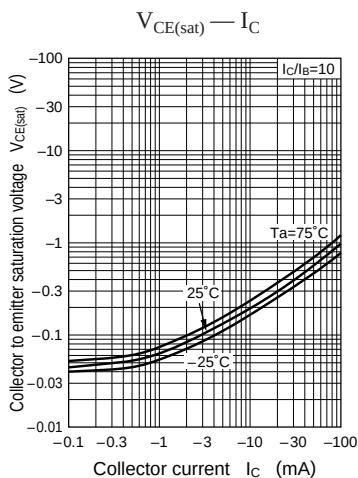
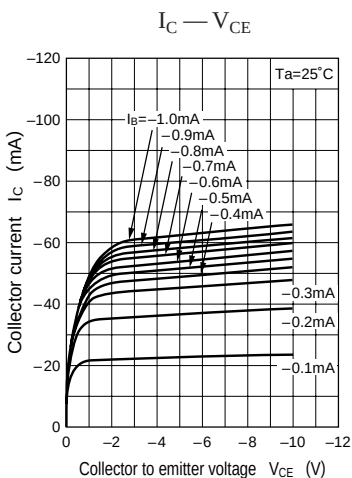


Characteristics charts of UNR2116

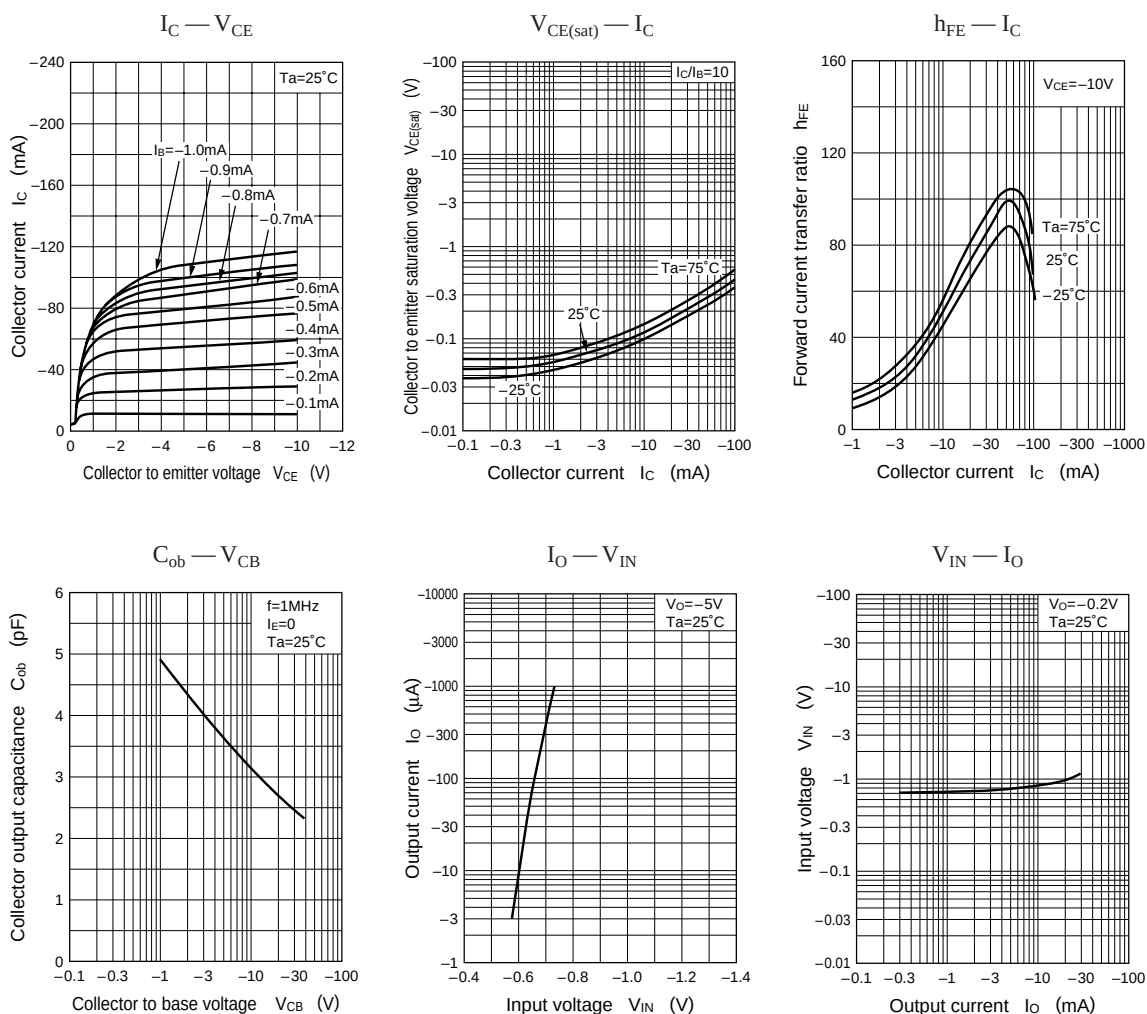




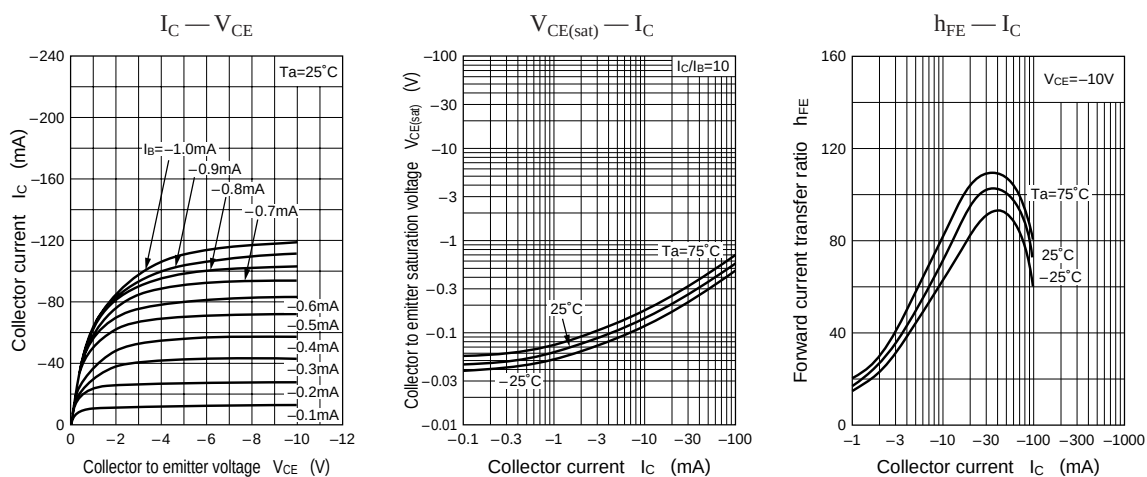
Characteristics charts of UNR2117

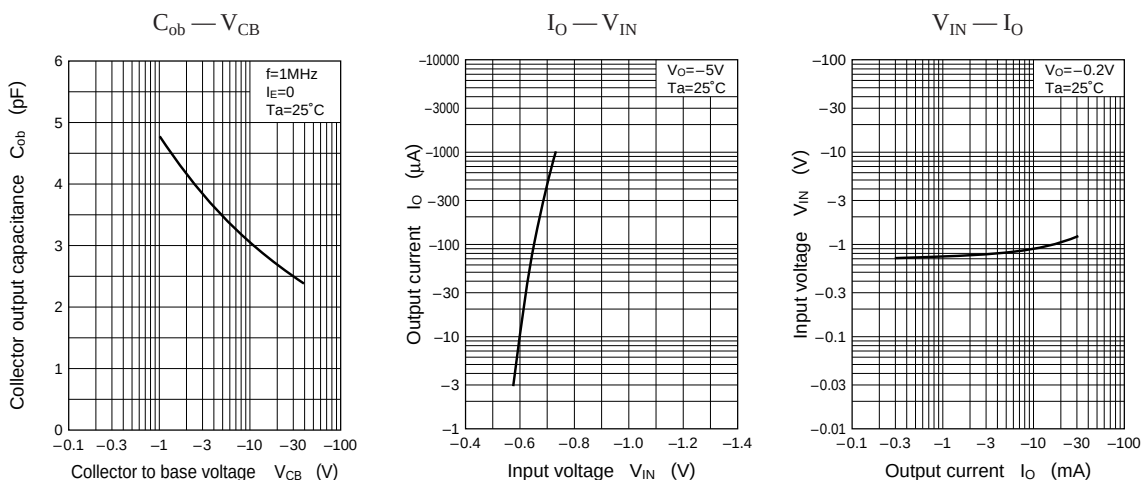


Characteristics charts of UNR2118

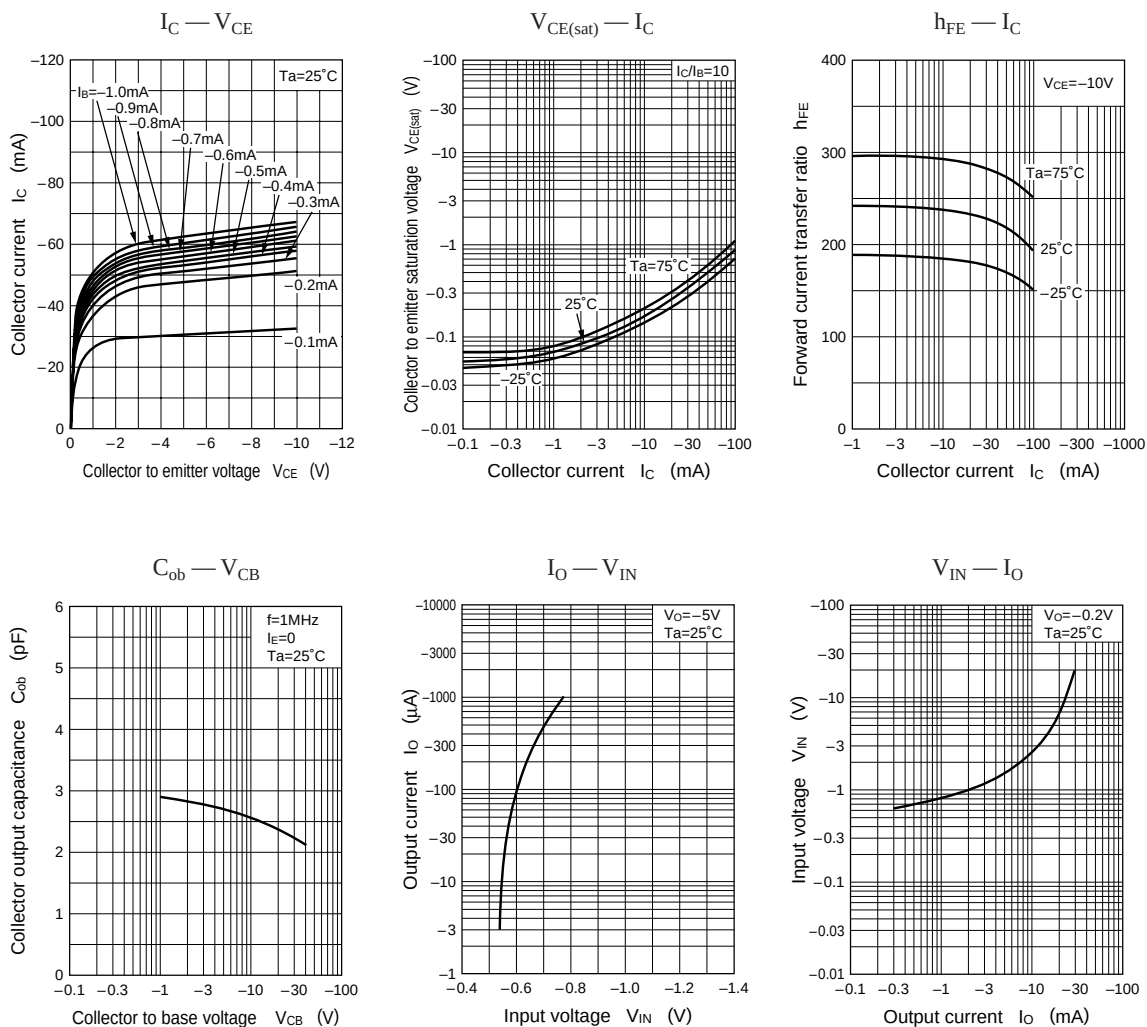


Characteristics charts of UNR2119

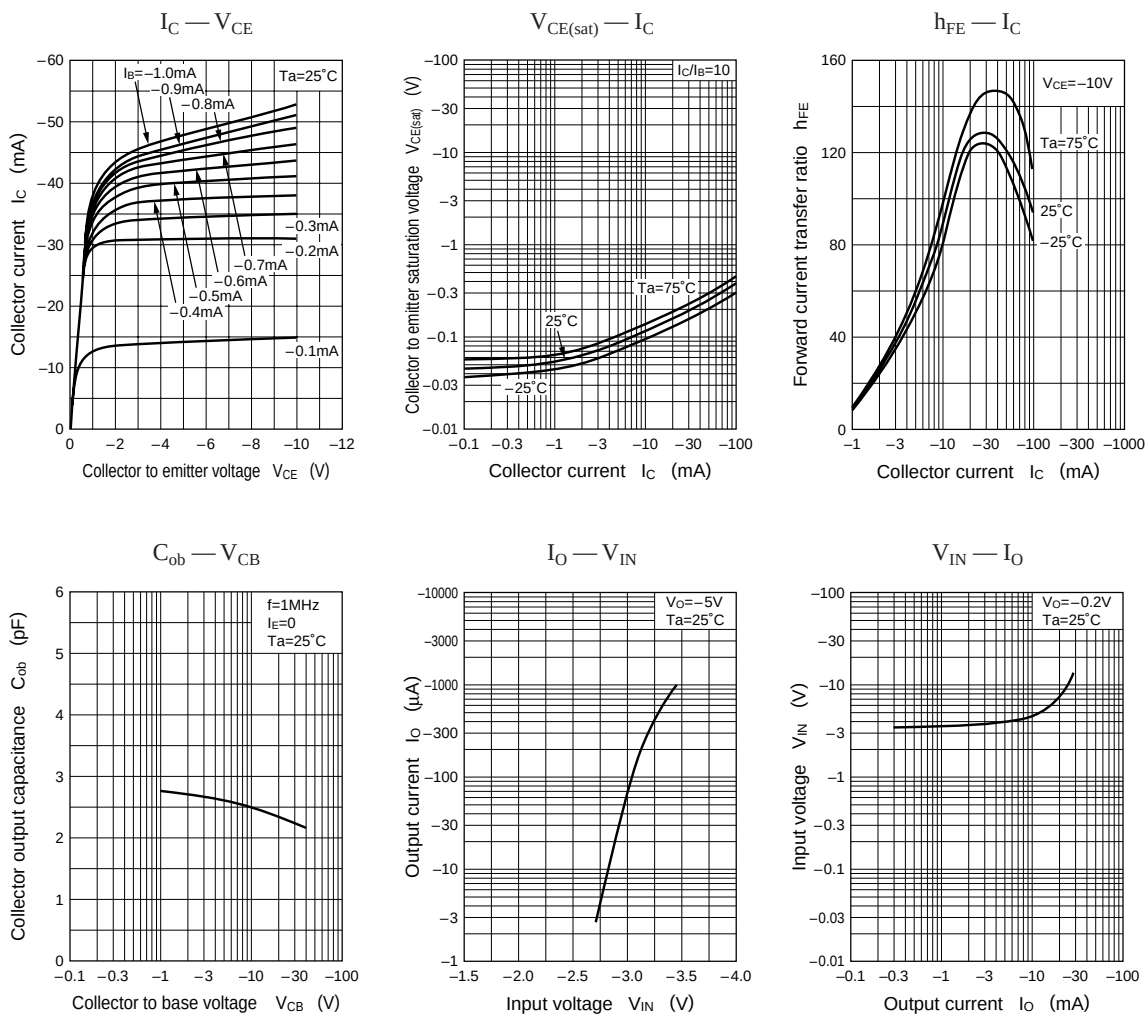




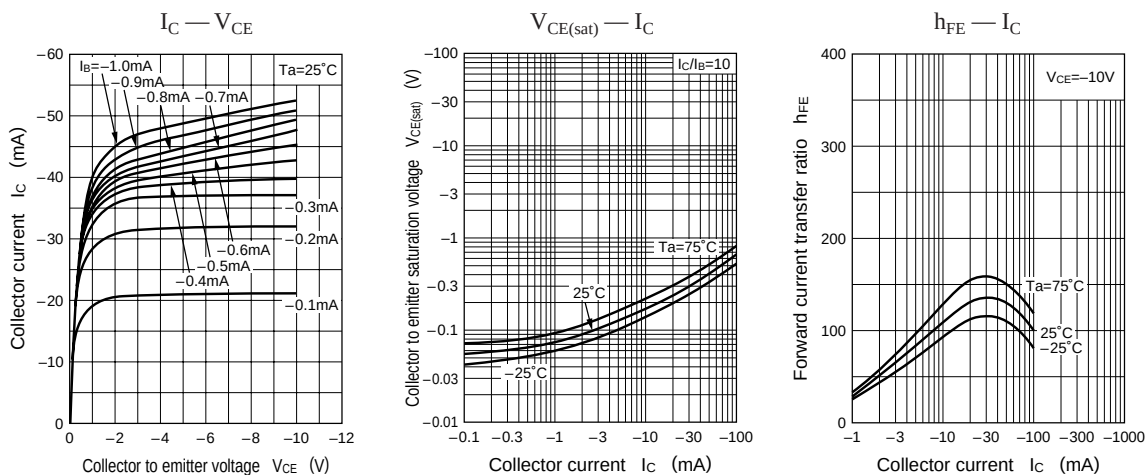
Characteristics charts of UNR2110

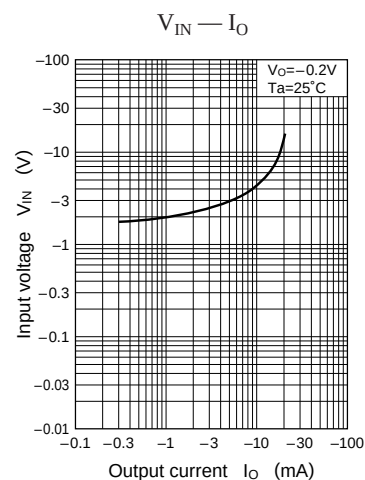
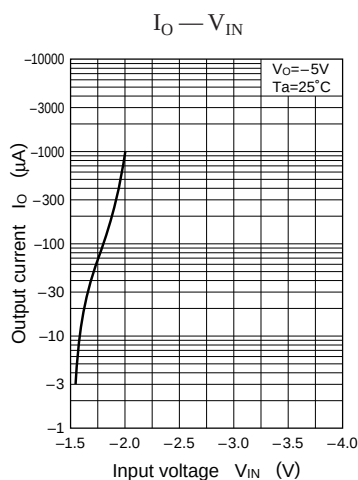
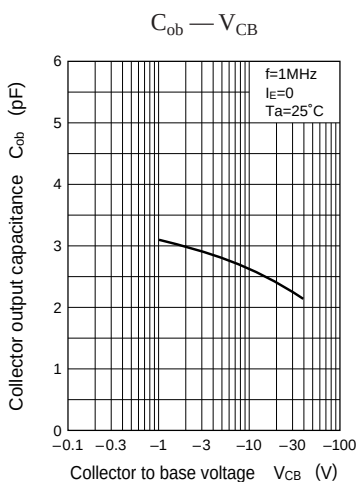


Characteristics charts of UNR211D

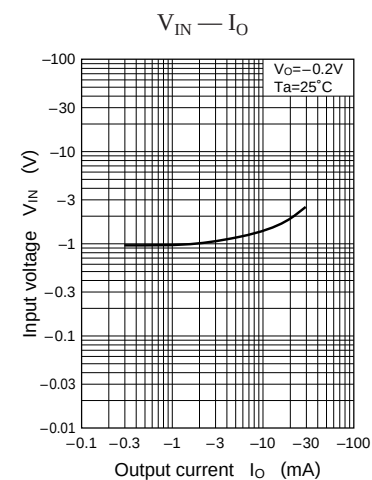
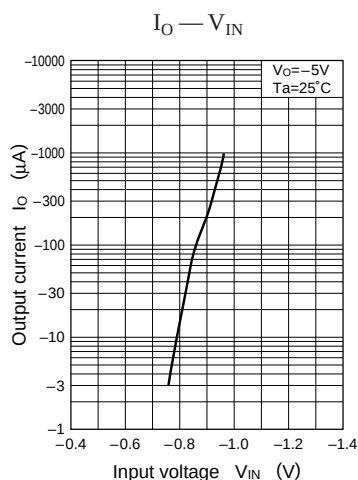
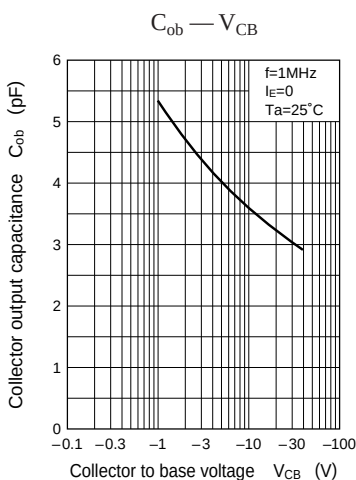
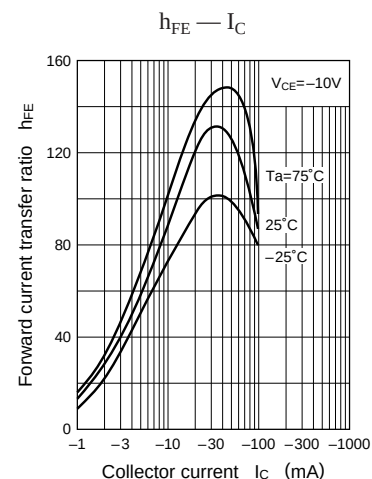
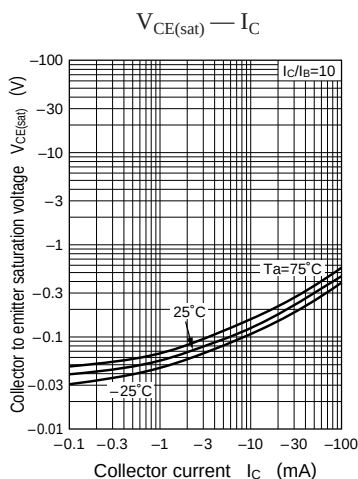
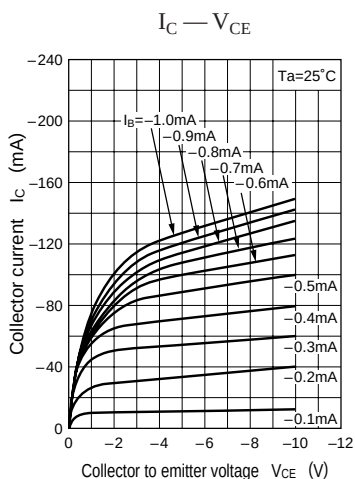


Characteristics charts of UNR211E

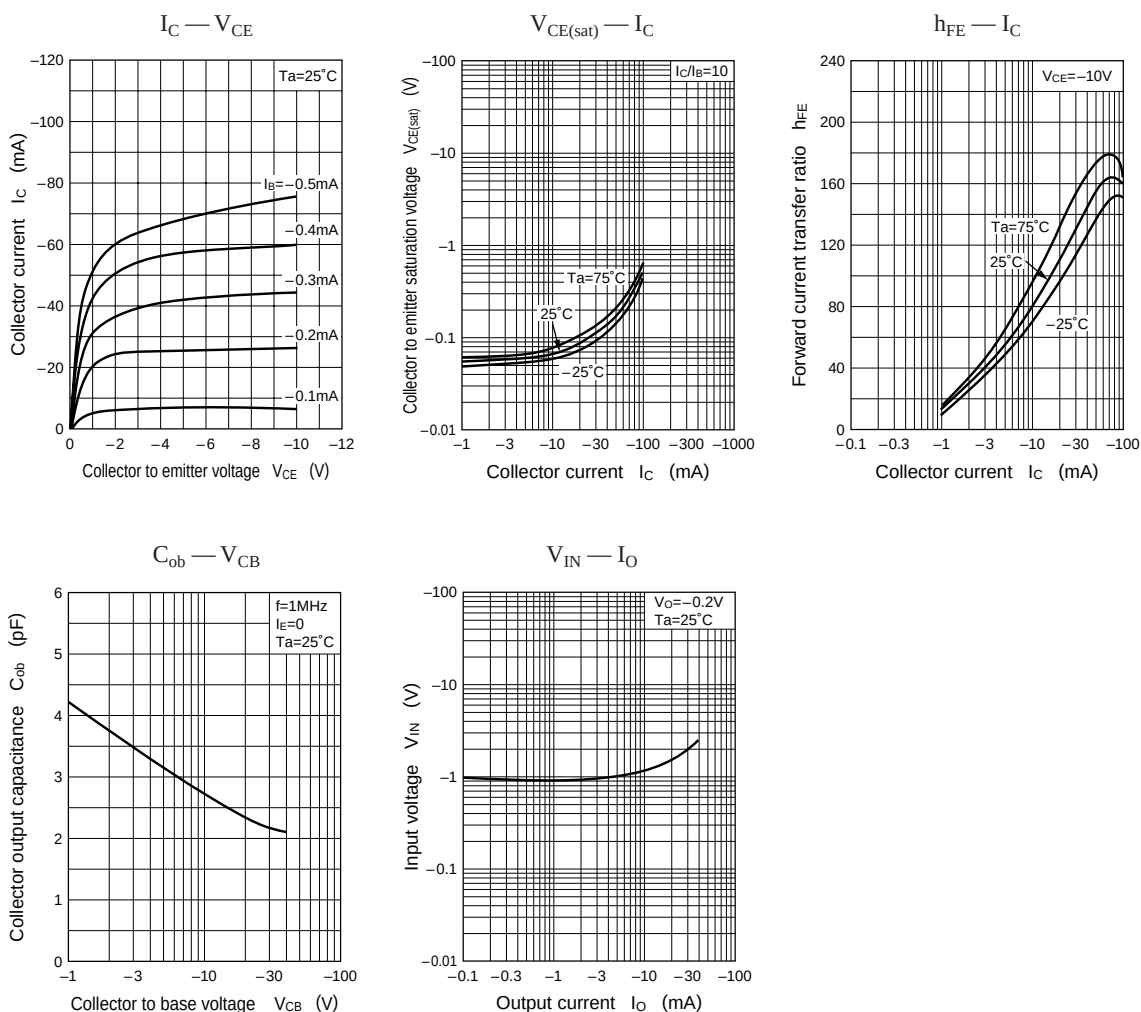




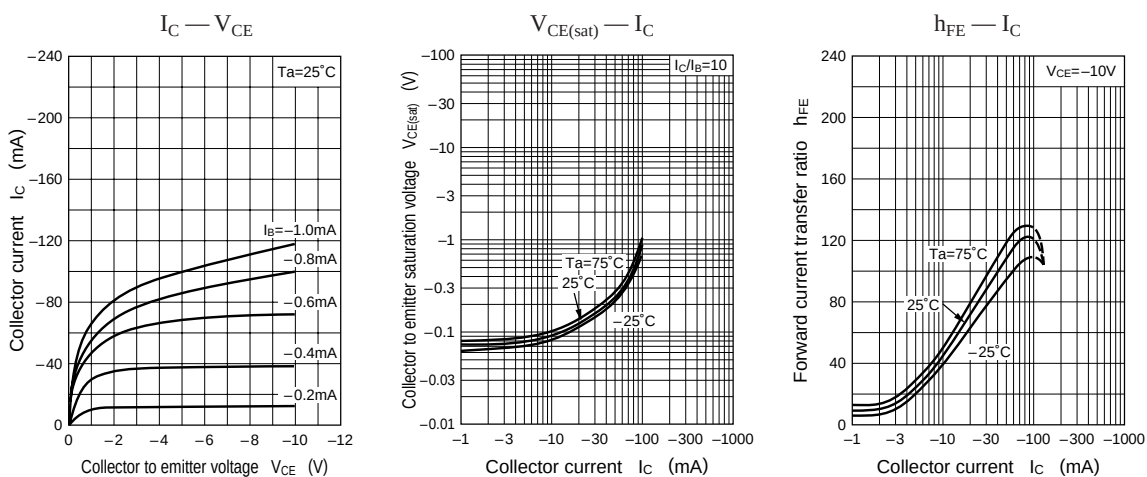
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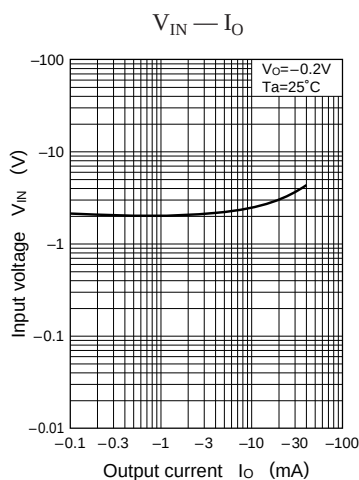
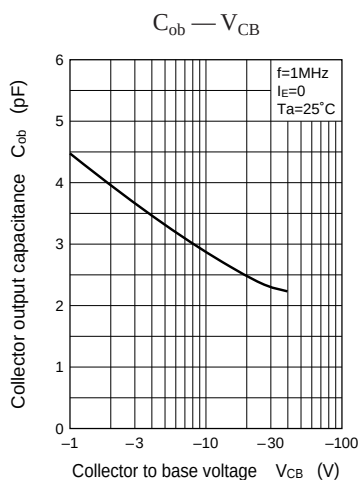


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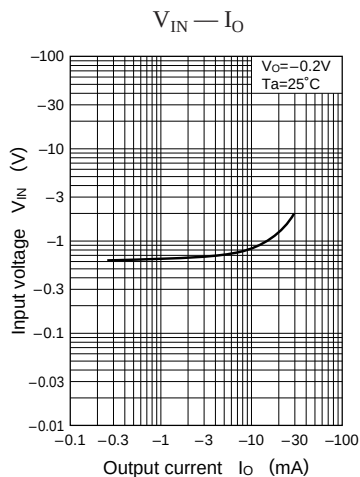
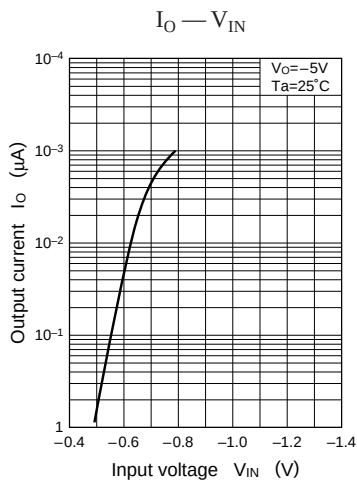
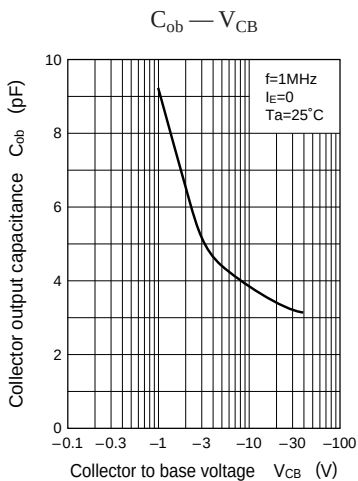
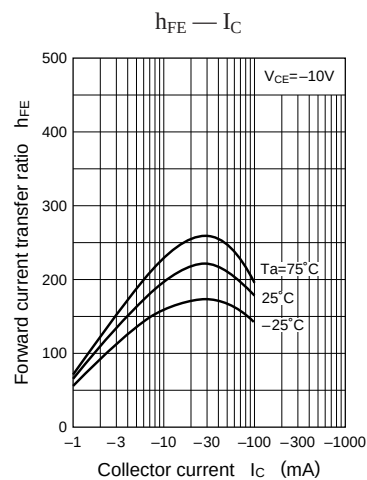
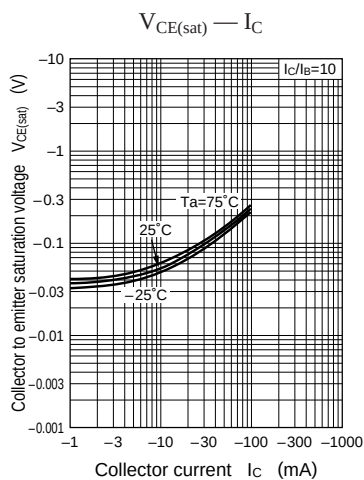
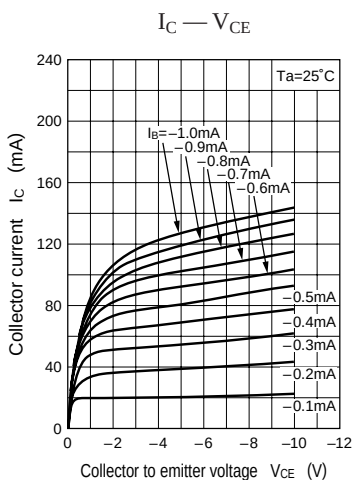


Characteristics charts of UNR211L

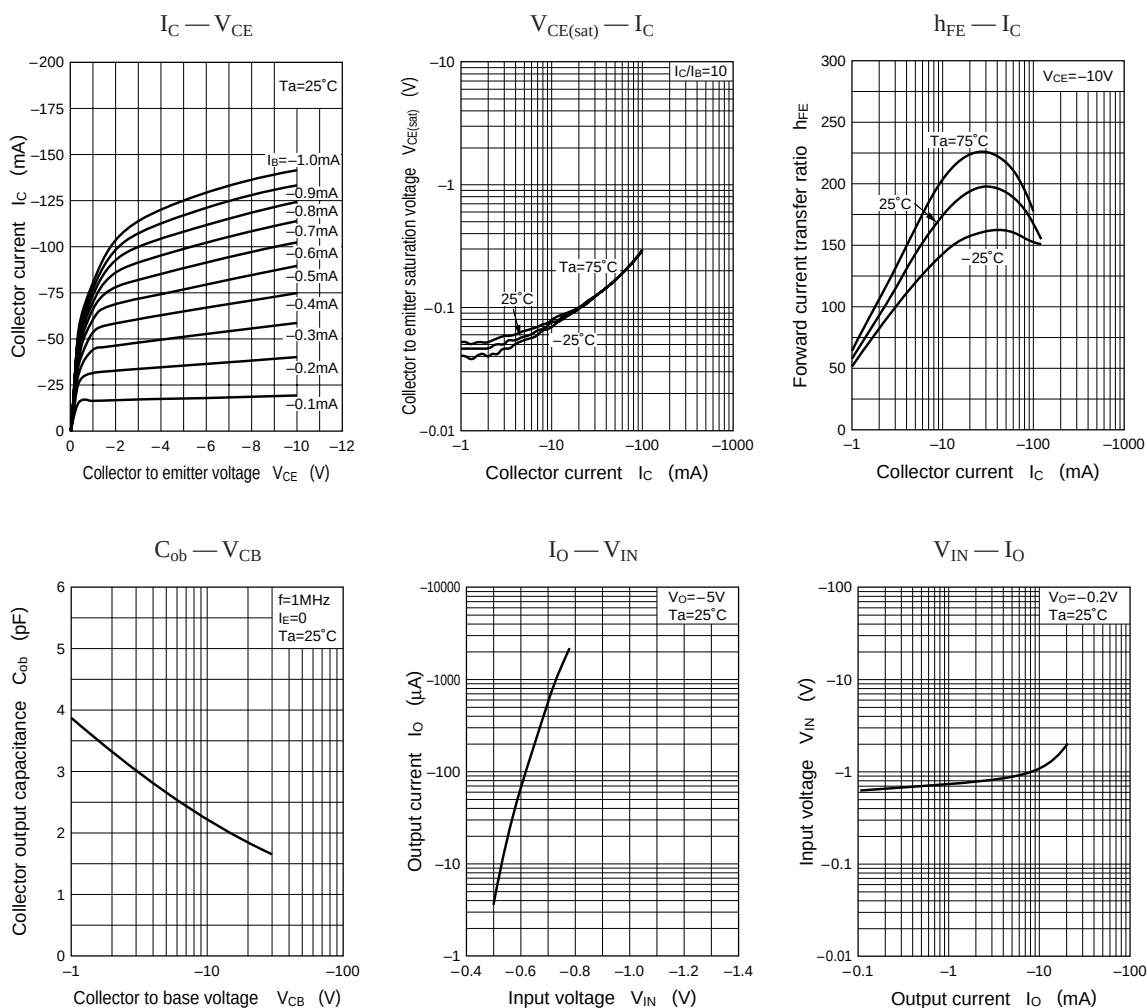




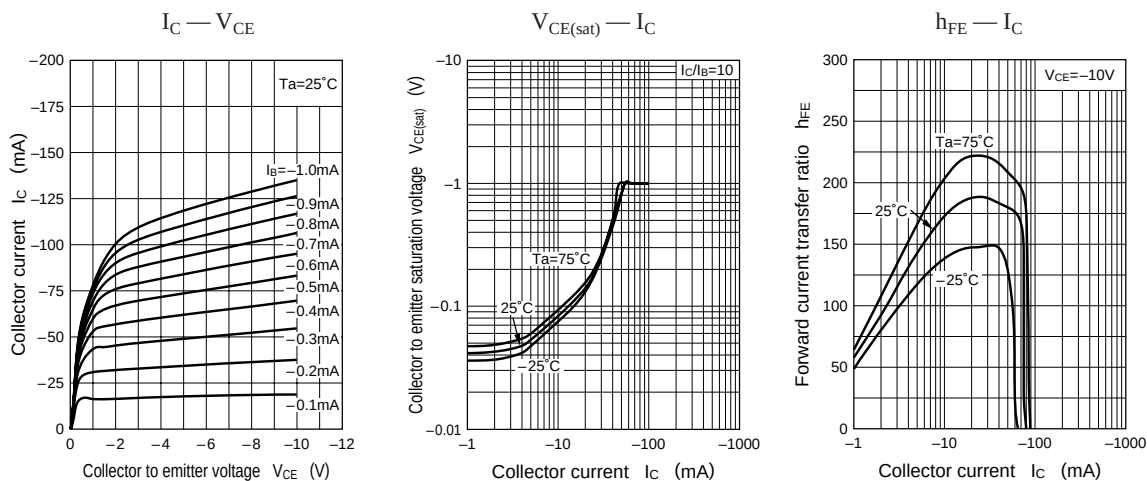
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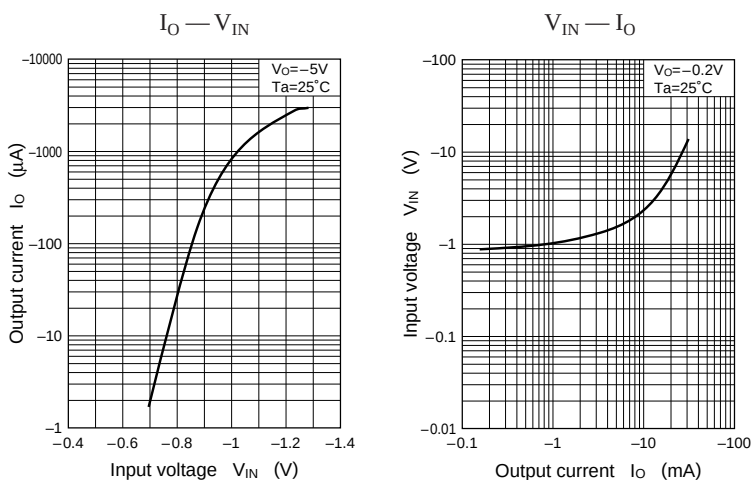


Characteristics charts of UNR211N

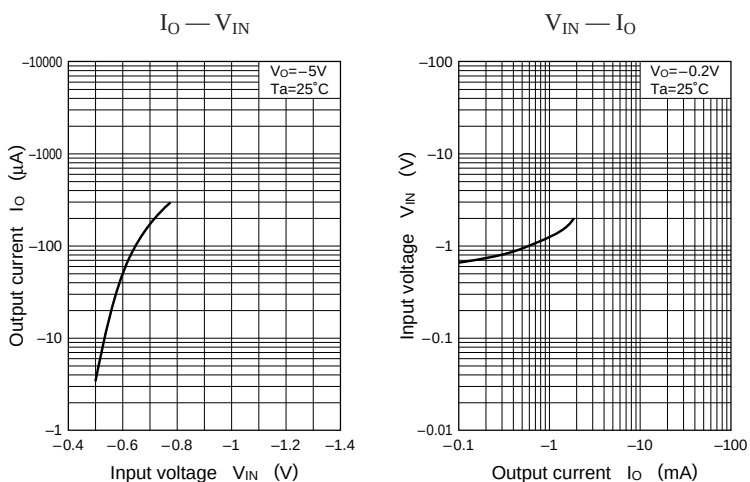
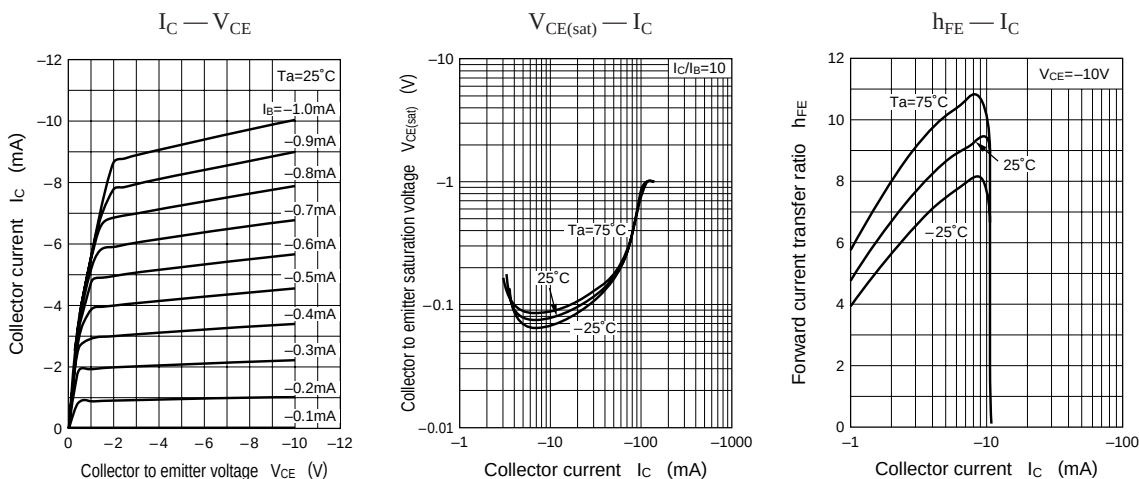


Characteristics charts of UNR211T

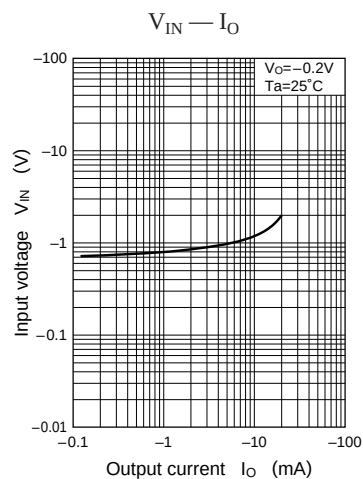
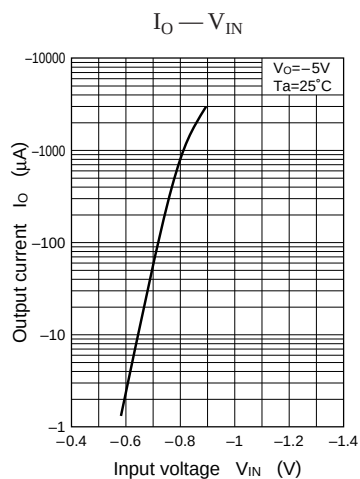
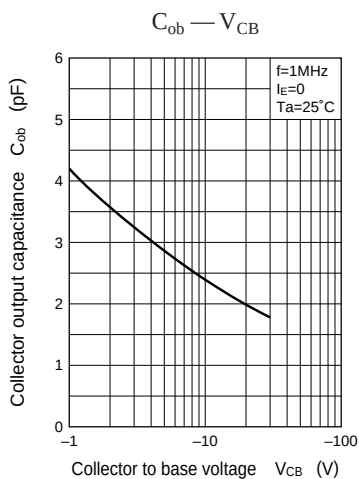
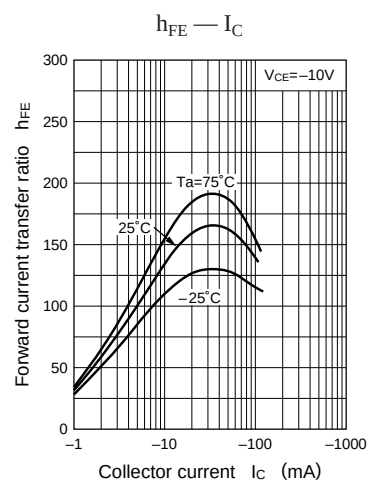
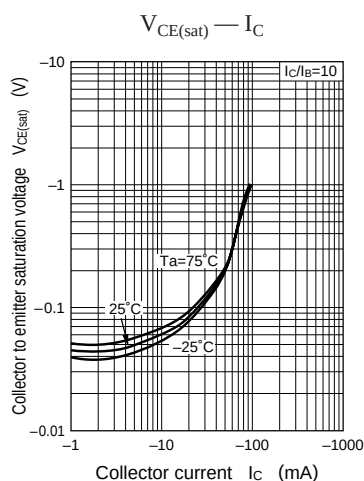
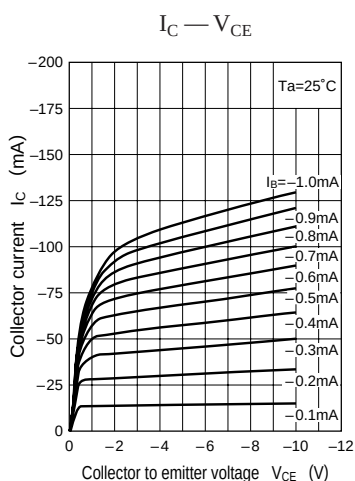




Characteristics charts of UNR211V



Characteristics charts of UNR211Z



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