

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

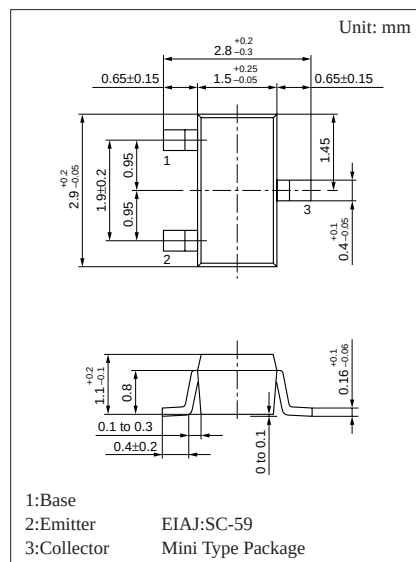
For digital circuits

Features

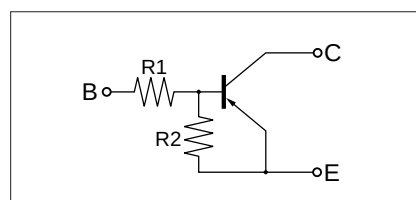
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- Mini type package, allowing downsizing of the equipment and automatic insertion through tape packing and magazine packing.

Resistance by Part Number

	Marking Symbol	(R ₁)	(R ₂)
• UN2111	6A	10kΩ	10kΩ
• UN2112	6B	22kΩ	22kΩ
• UN2113	6C	47kΩ	47kΩ
• UN2114	6D	10kΩ	47kΩ
• UN2115	6E	10kΩ	—
• UN2116	6F	4.7kΩ	—
• UN2117	6H	22kΩ	—
• UN2118	6I	0.51kΩ	5.1kΩ
• UN2119	6K	1kΩ	10kΩ
• UN2110	6L	47kΩ	—
• UN211D	6M	47kΩ	10kΩ
• UN211E	6N	47kΩ	22kΩ
• UN211F	6O	4.7kΩ	10kΩ
• UN211H	6P	2.2kΩ	10kΩ
• UN211L	6Q	4.7kΩ	4.7kΩ
• UN211M	EI	2.2kΩ	47kΩ
• UN211N	EW	4.7kΩ	47kΩ
• UN211T	EY	22kΩ	47kΩ
• UN211V	FC	2.2kΩ	2.2kΩ
• UN211Z	FE	4.7kΩ	22kΩ



Internal Connection



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

UN2111/2112/2113/2114/2115/2116/2117/2118/2119/2110/
Transistors with built-in Resistor 211D/211E/211F/211H/211L/211M/211N/211T/211V/211Z

■ Electrical Characteristics (Ta=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	UN2111	I _{EBO}	V _{EB} = −6V, I _C = 0			− 0.5	mA
	UN2112/2114/211E/211D/211M/211N/211T					− 0.2	
	UN2113					− 0.1	
	UN2115/2116/2117/2110					− 0.01	
	UN211F/211H					−1.0	
	UN2119					−1.5	
	UN2118/211L/211V					−2.0	
	UN211Z					− 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	UN2111	h _{FE}	V _{CE} = −10V, I _C = −5mA	35			
	UN2112/211E			60			
	UN2113/2114/211M			80			
	UN2115*/2116*/2117*/2110*			160		460	
	UN2119/211F/211D/211H			30			
	UN2118/211L			20			
	UN211N/211T			80		400	
	UN211V			6		20	
	UN211Z			60		200	
Collector to emitter saturation voltage		V _{CE(sat)}	I _C = −10mA, I _B = − 0.3mA			− 0.25	V
			UN211V	I _C = −10mA, I _B = −1.5mA		− 0.07	− 0.25
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
			V _{CC} = −5V, V _B = −3.5V, R _L = 1kΩ			− 0.2	
			V _{CC} = −5V, V _B = −10V, R _L = 1kΩ			− 0.2	
			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	UN2111/2114/2115	R ₁		(−30%)	10	(+30%)	kΩ
	UN2112/2117/211T				22		
	UN2113/2110/211D/211E				47		
	UN2116/211F/211L/211N/211Z				4.7		
	UN2118				0.51		
	UN2119				1		
	UN211H/211M/211V				2.2		

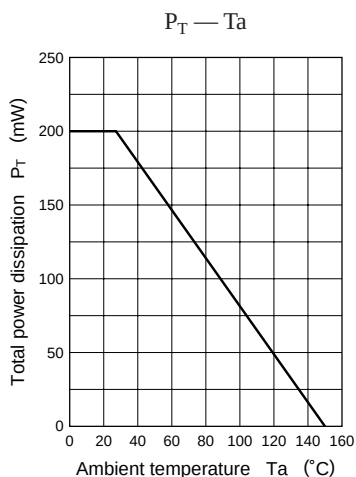
* h_{FE} rank classification (UN2115/2116/2117/2110)

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

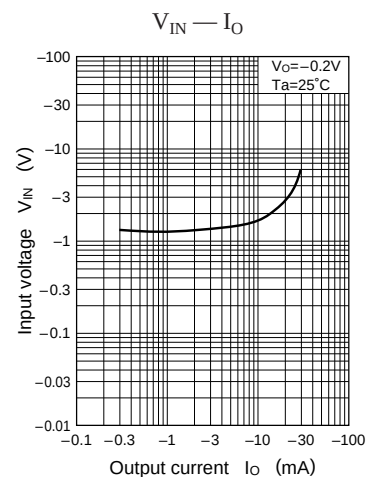
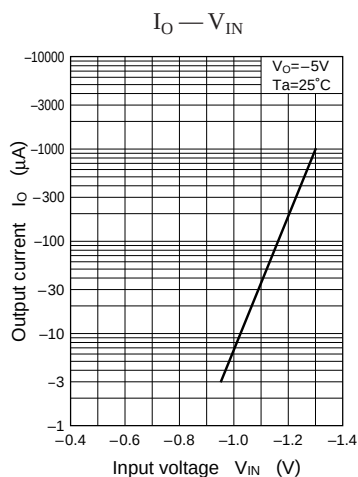
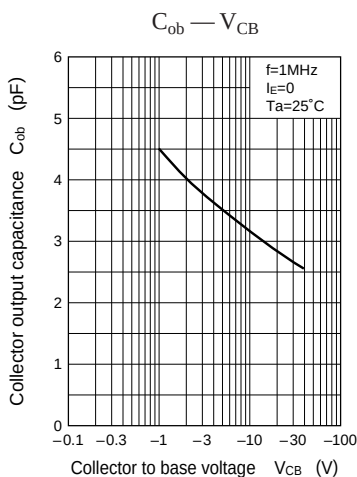
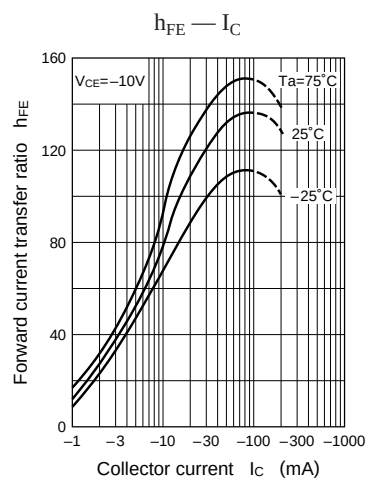
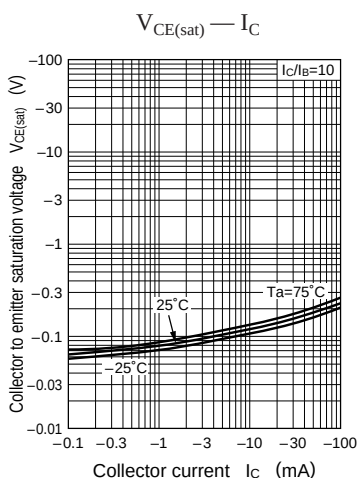
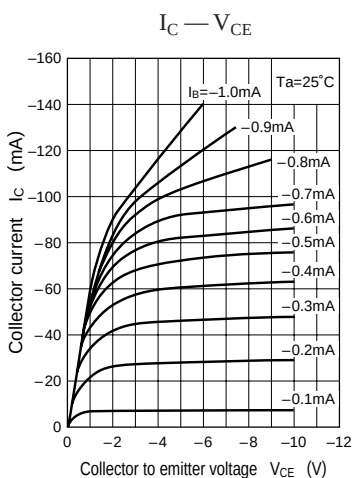
■ Electrical Characteristics (continued) (Ta=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Resis- tance ratio	UN2111/2112/2113/211L	R_1/R_2		0.8	1.0	1.2	
	UN2114			0.17	0.21	0.25	
	UN2118/2119			0.08	0.1	0.12	
	UN211D				4.7		
	UN211E				2.14		
	UN211F/211T				0.47		
	UN211H			0.17	0.22	0.27	
	UN211M				0.047		
	UN211N				0.1		
	UN211V				1.0		
	UN211Z				0.21		

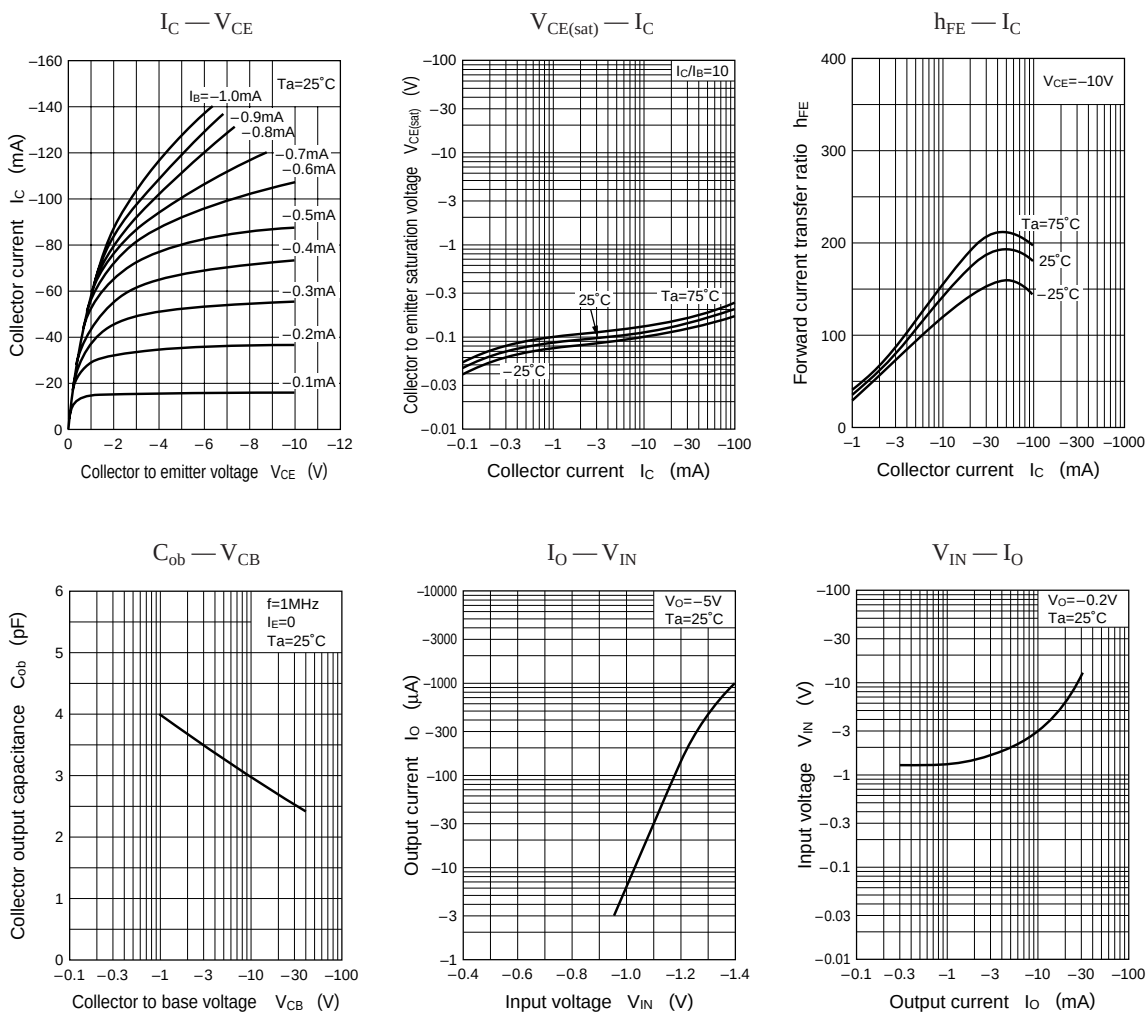
Common characteristics chart



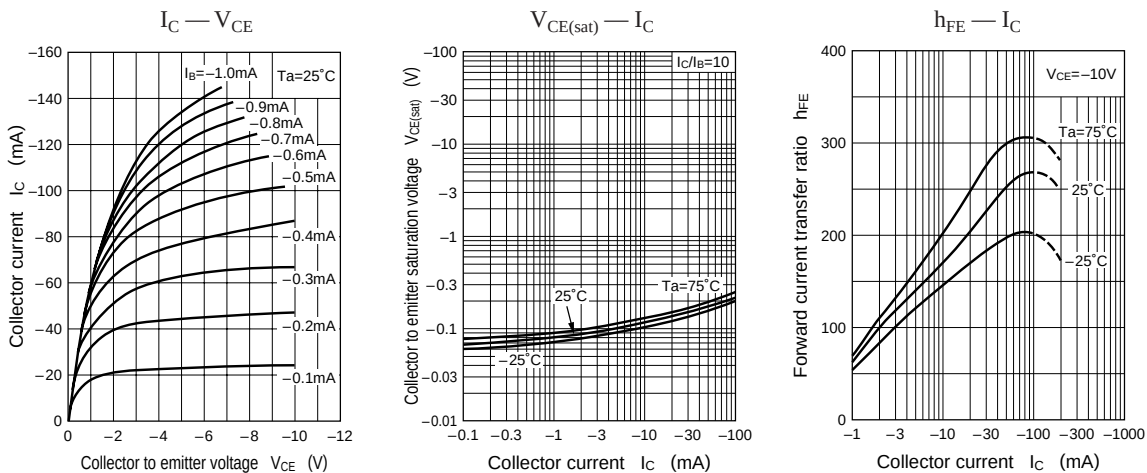
Characteristics charts of UN2111

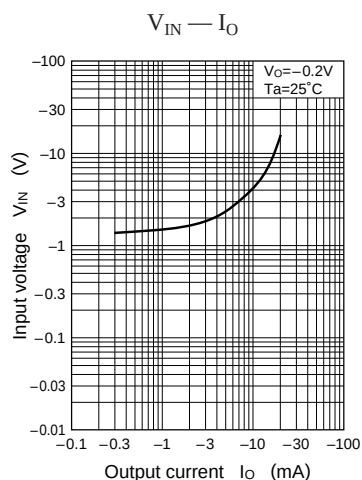
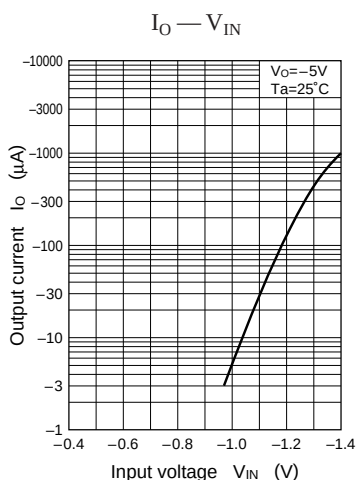
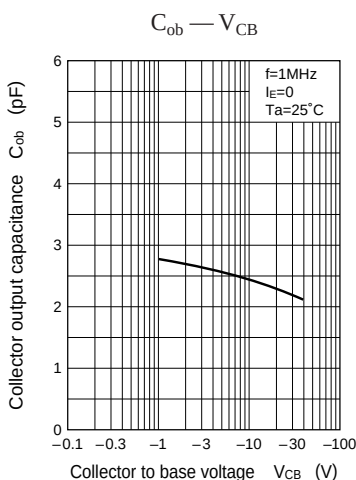


Characteristics charts of UN2112

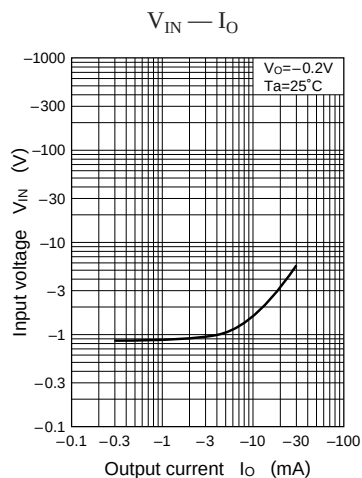
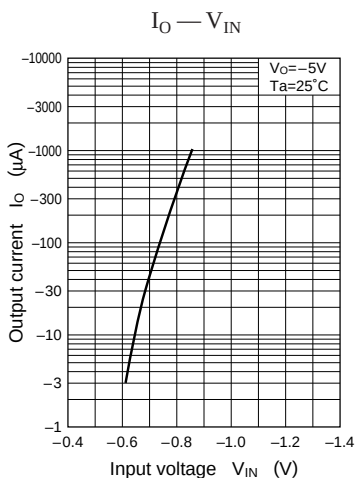
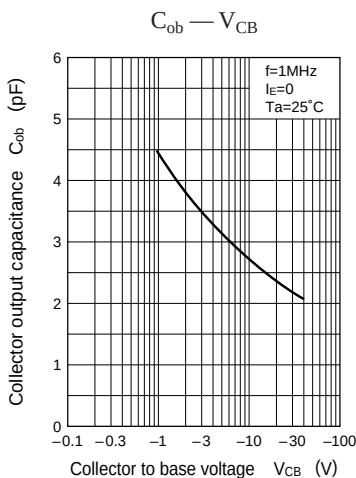
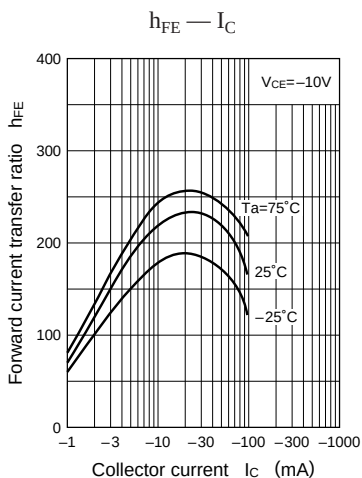
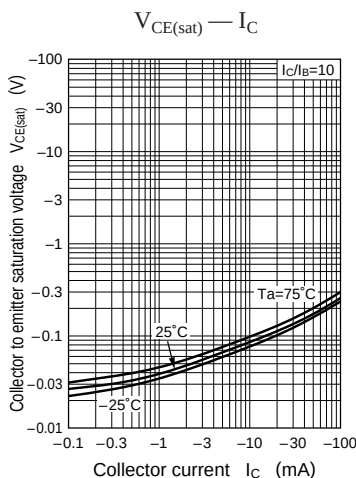
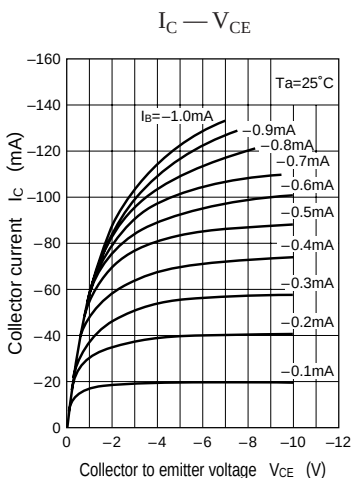


Characteristics charts of UN2113

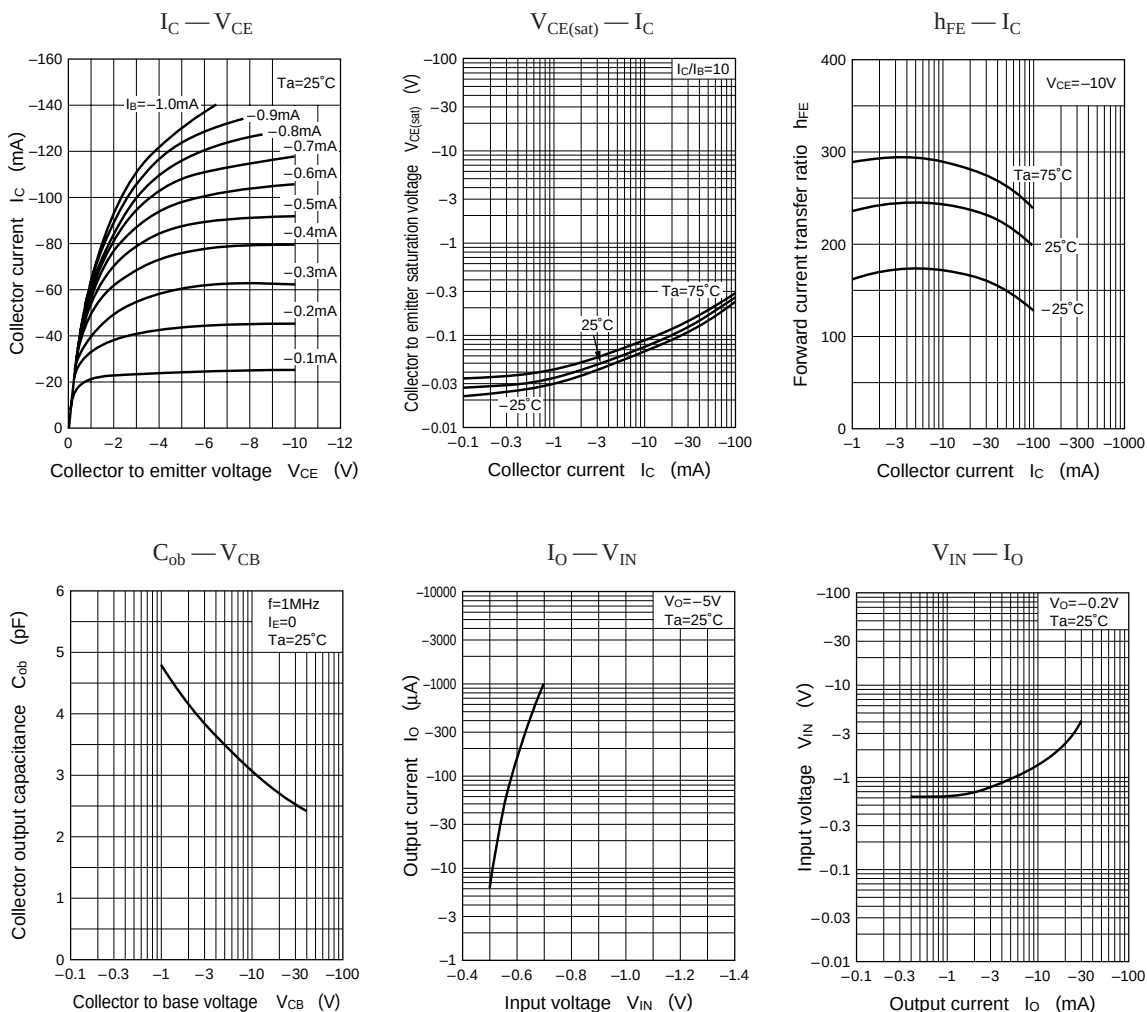




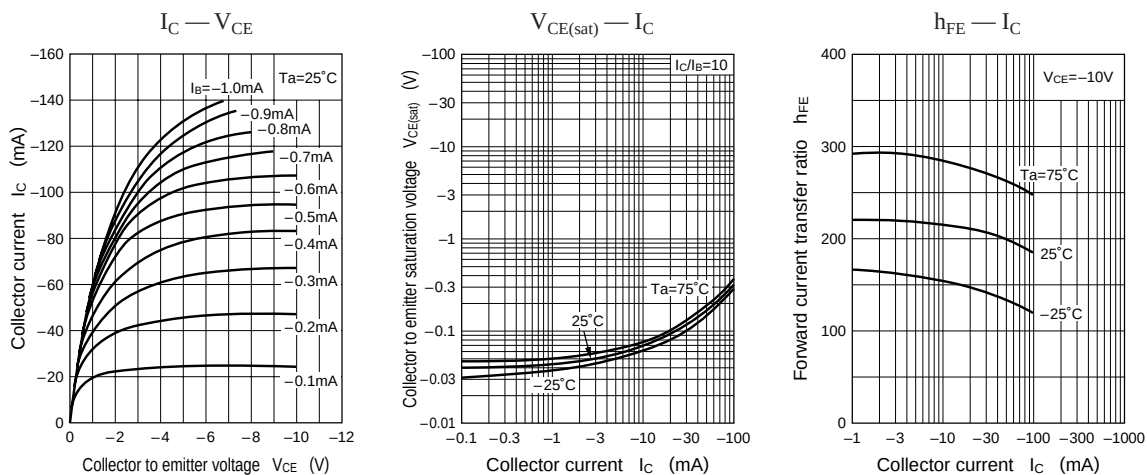
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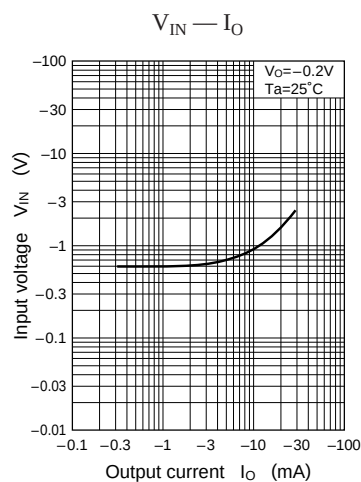
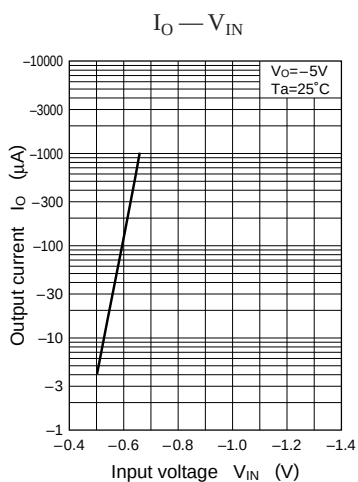
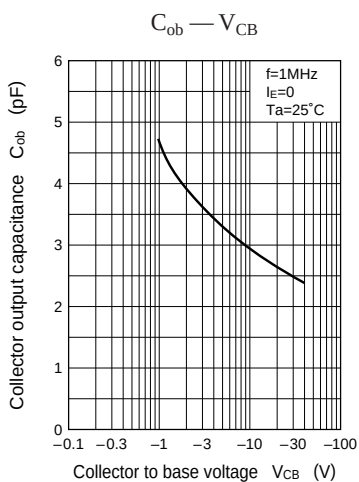


Characteristics charts of UN2115

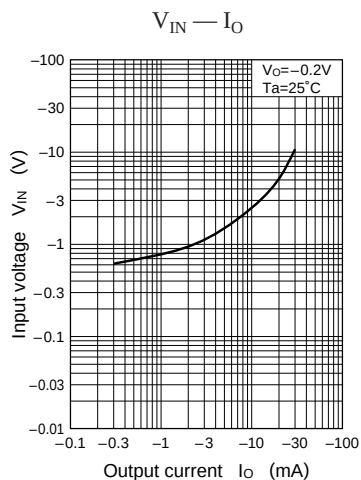
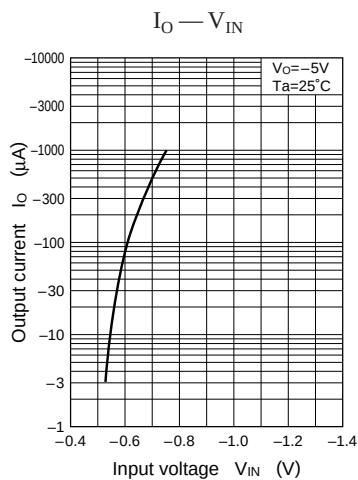
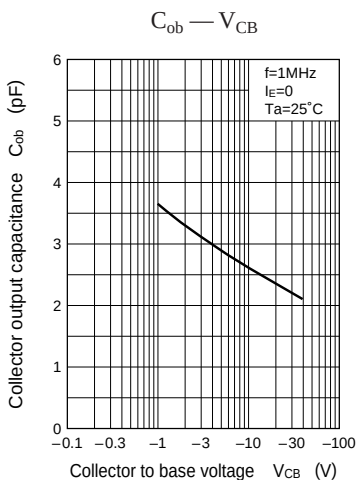
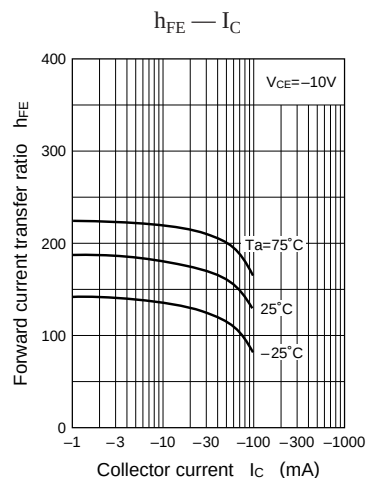
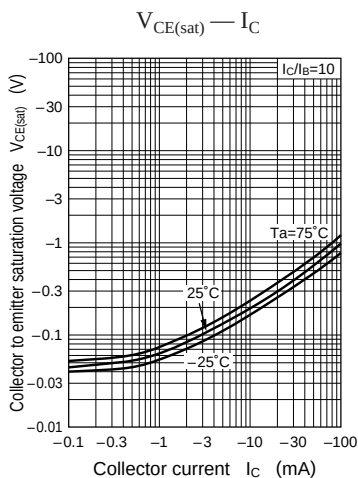
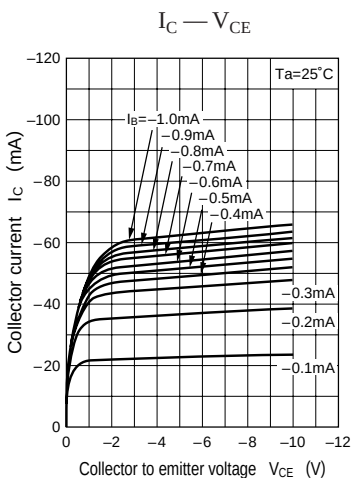


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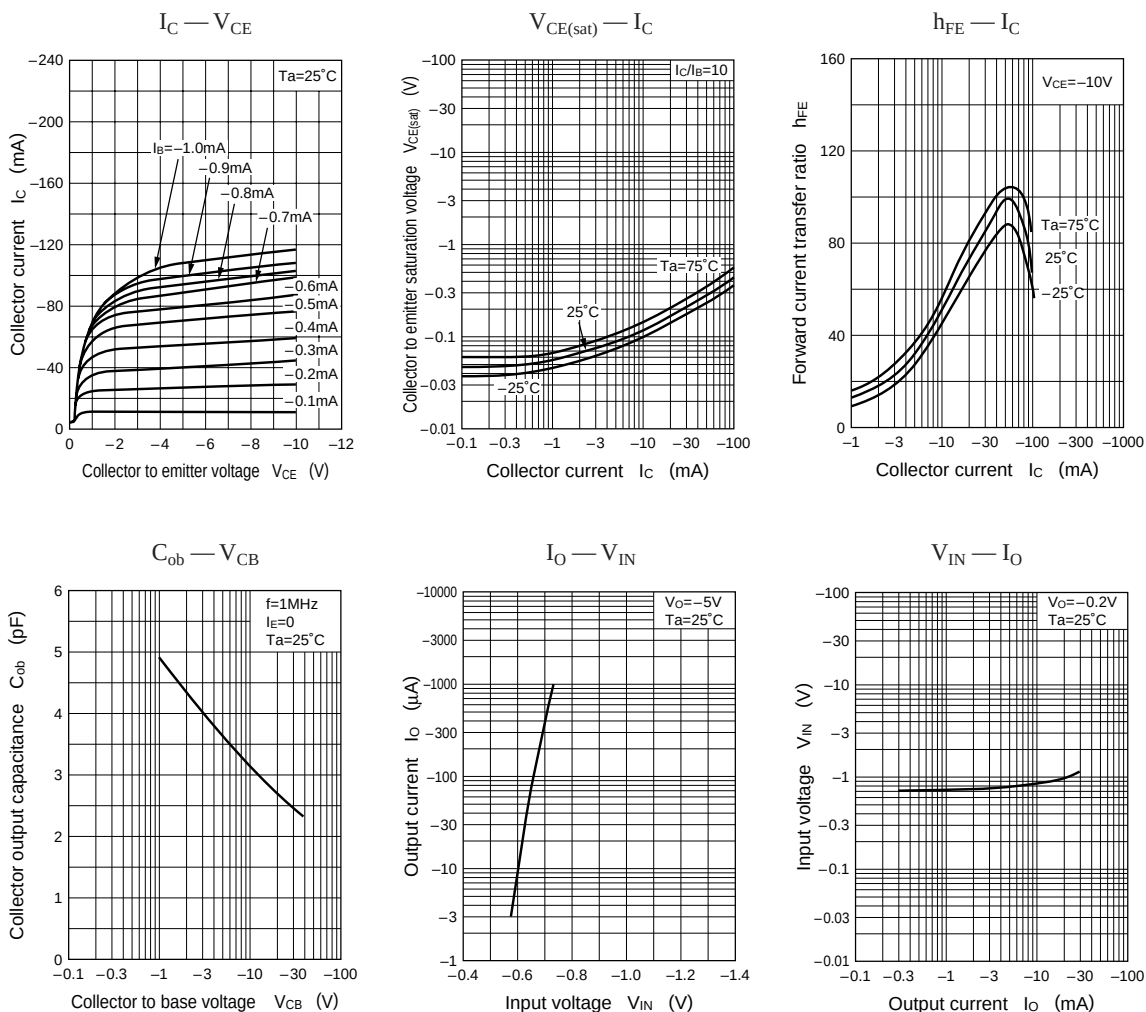




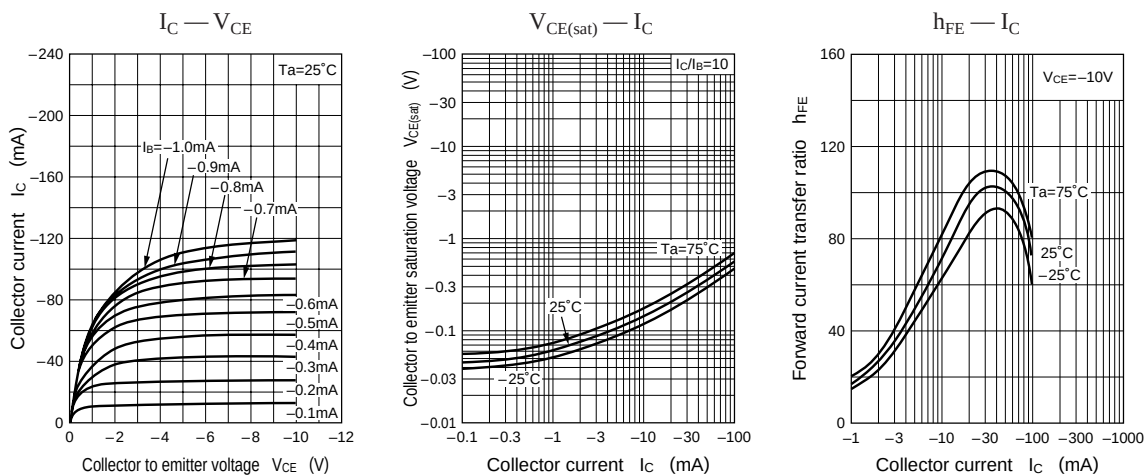
Characteristics charts of UN2117

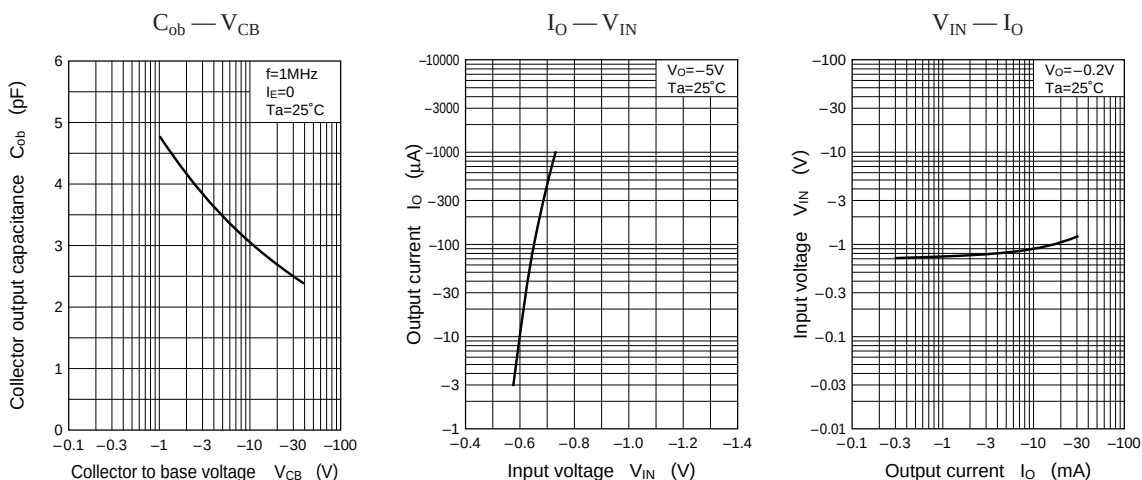


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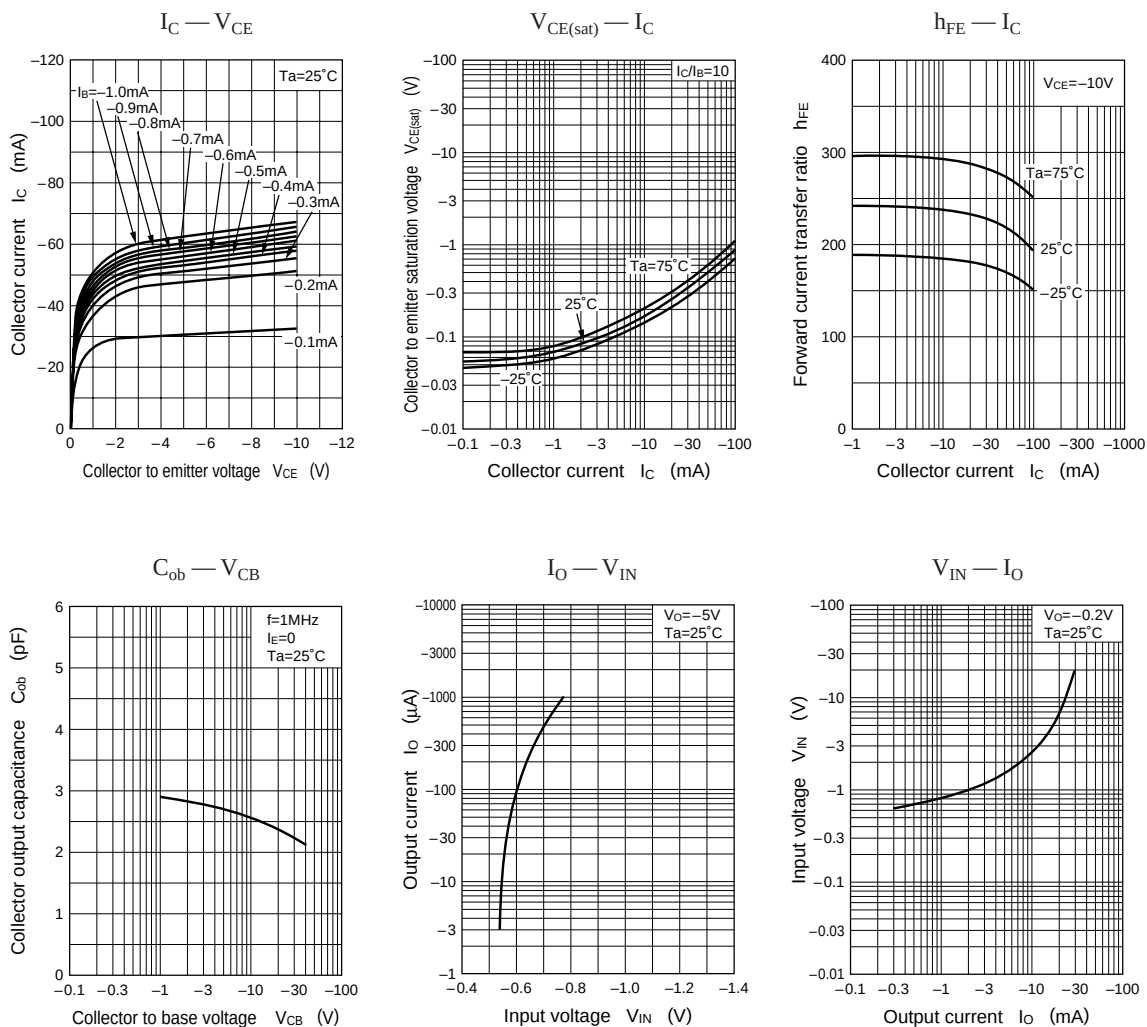


Characteristics charts of UN2119

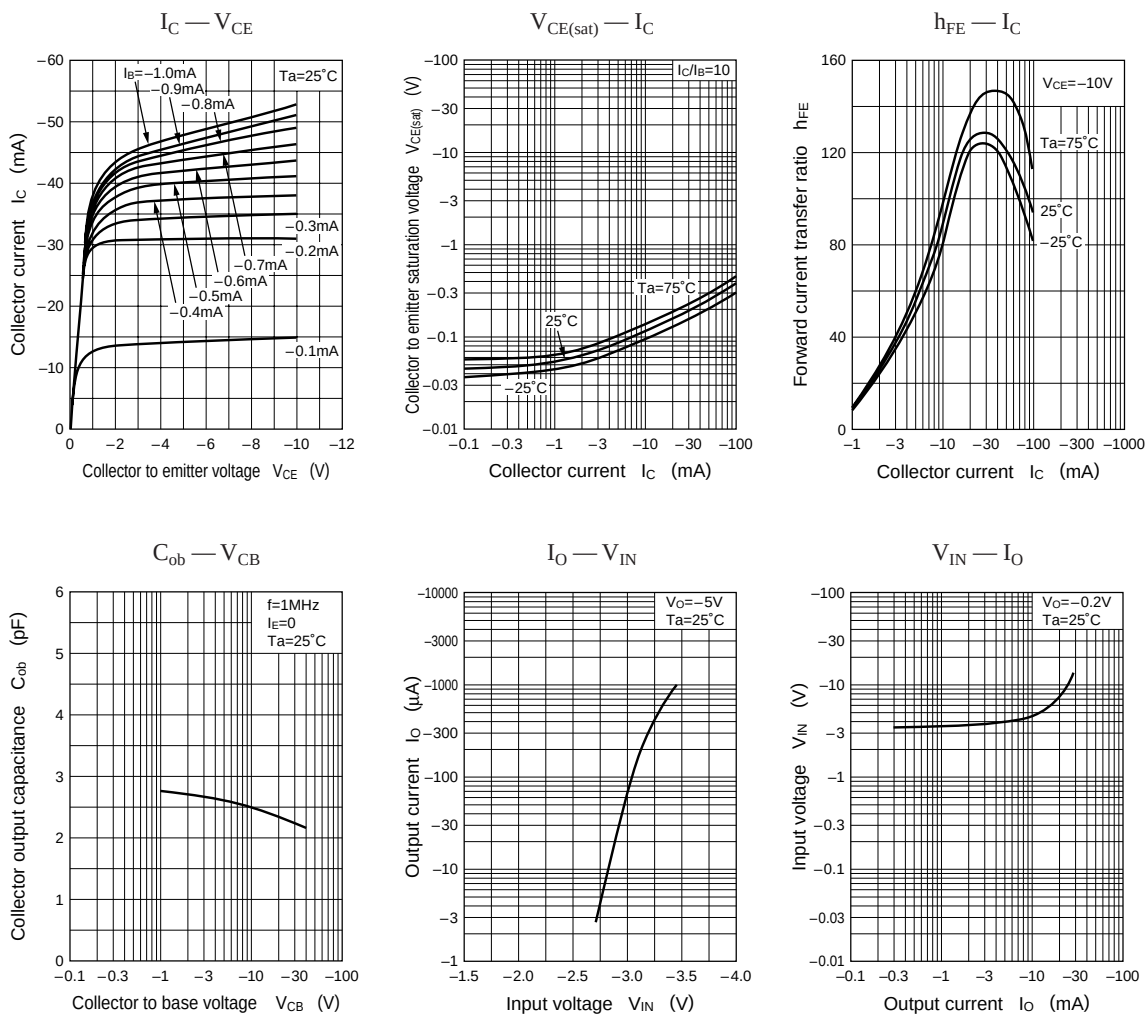




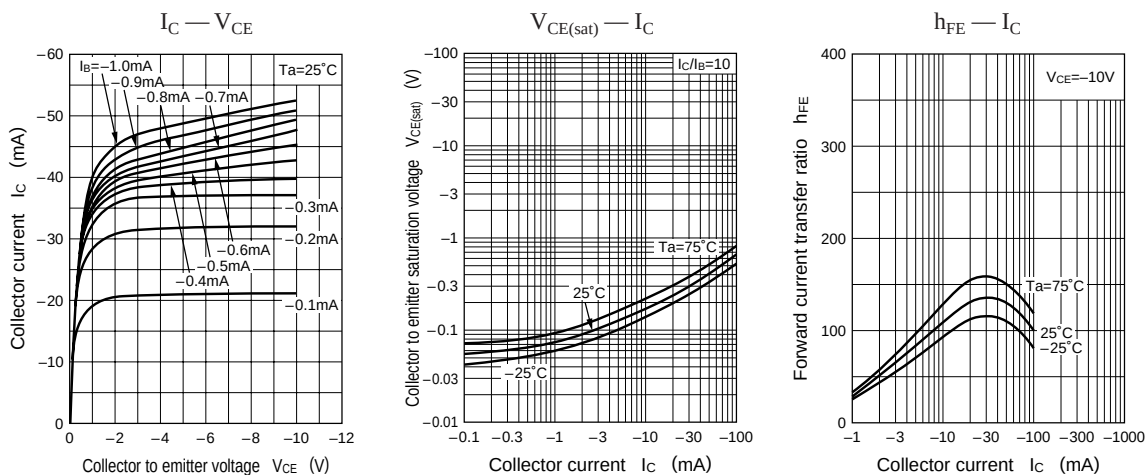
Characteristics charts of UN2110

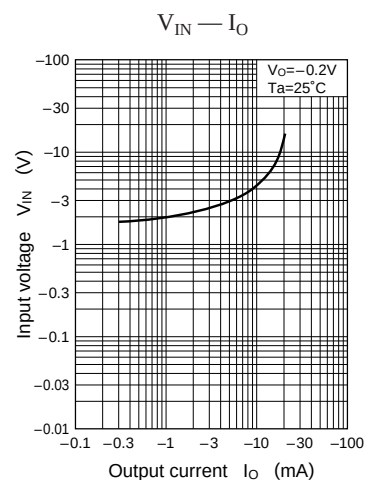
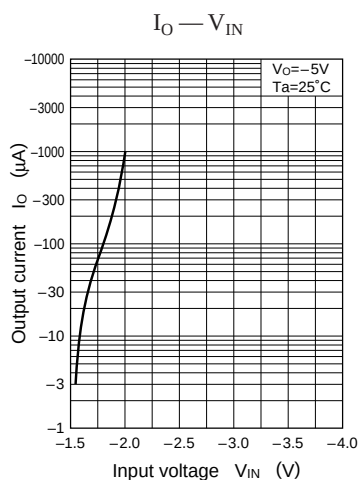
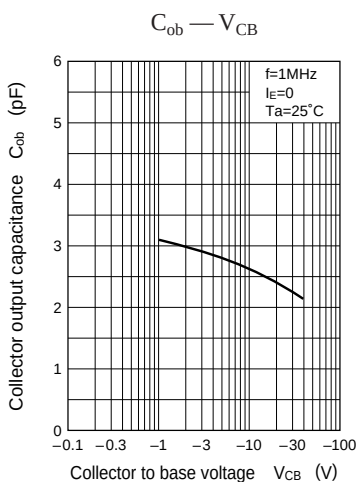


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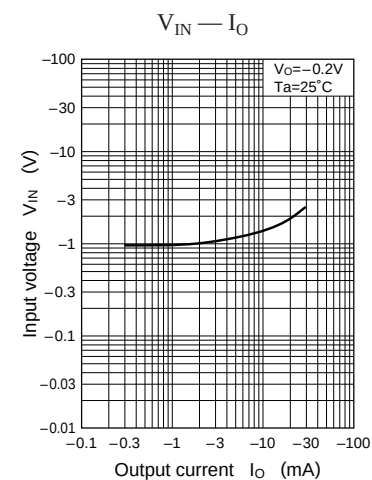
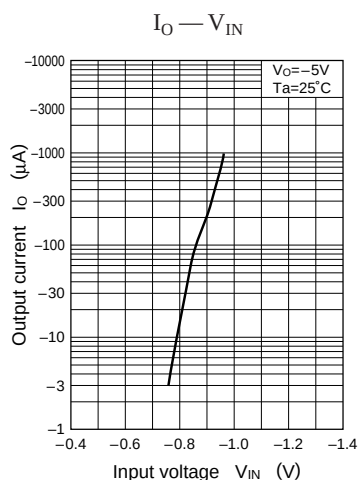
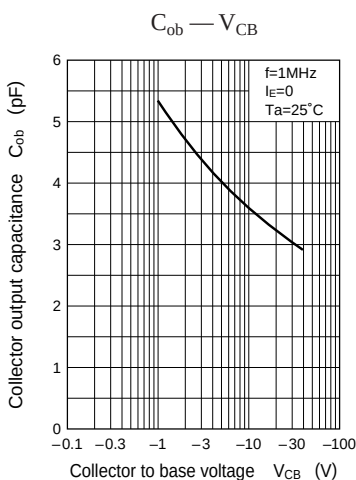
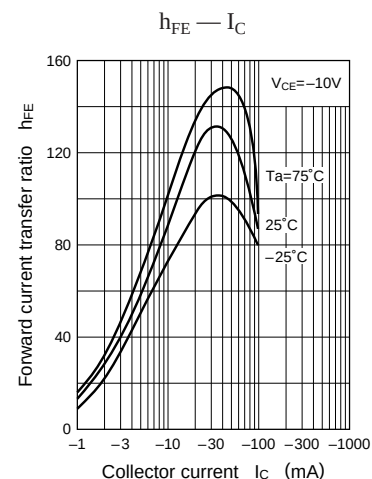
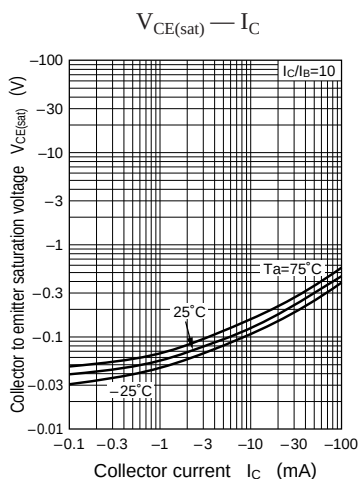
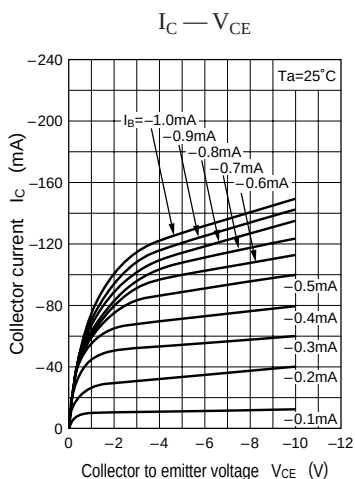


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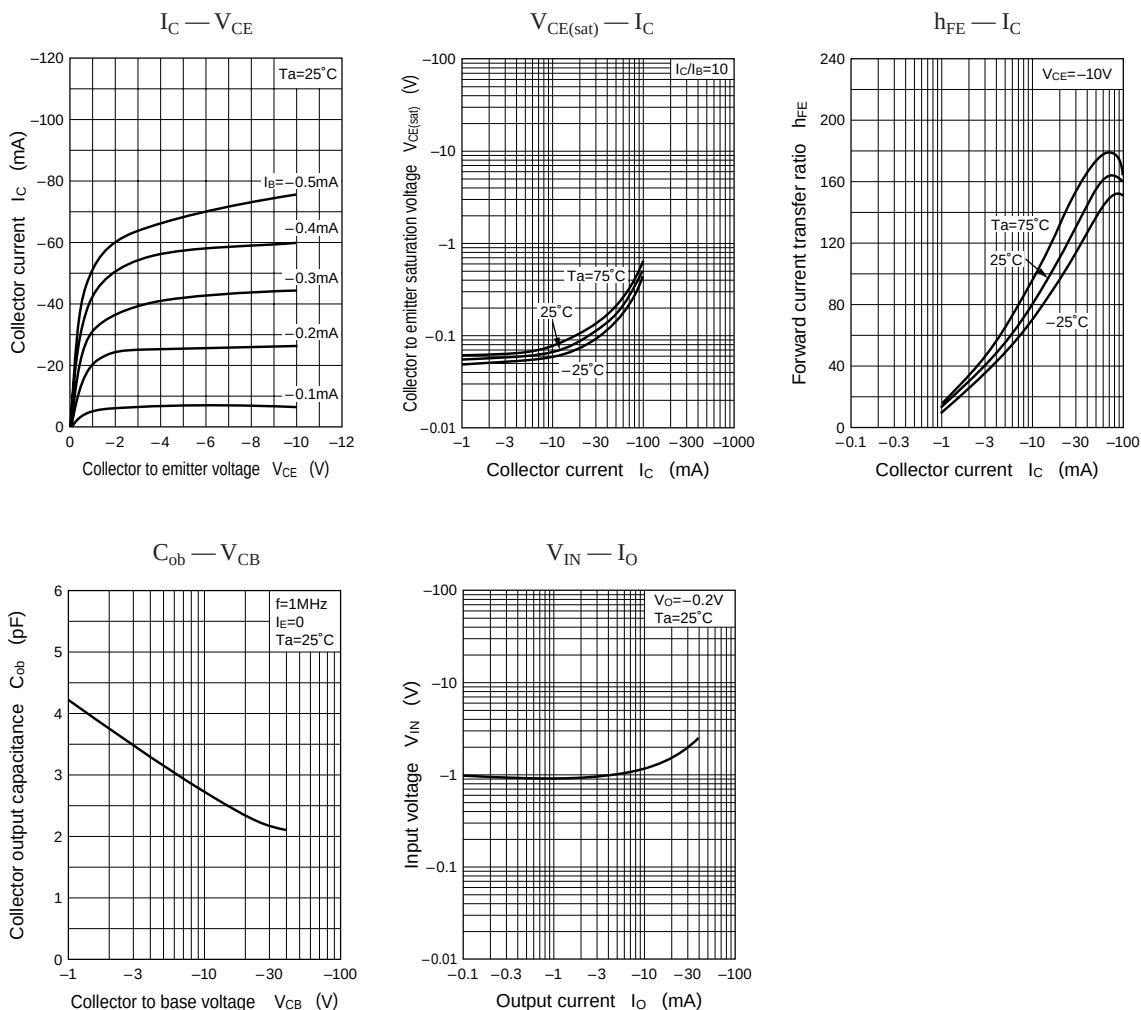




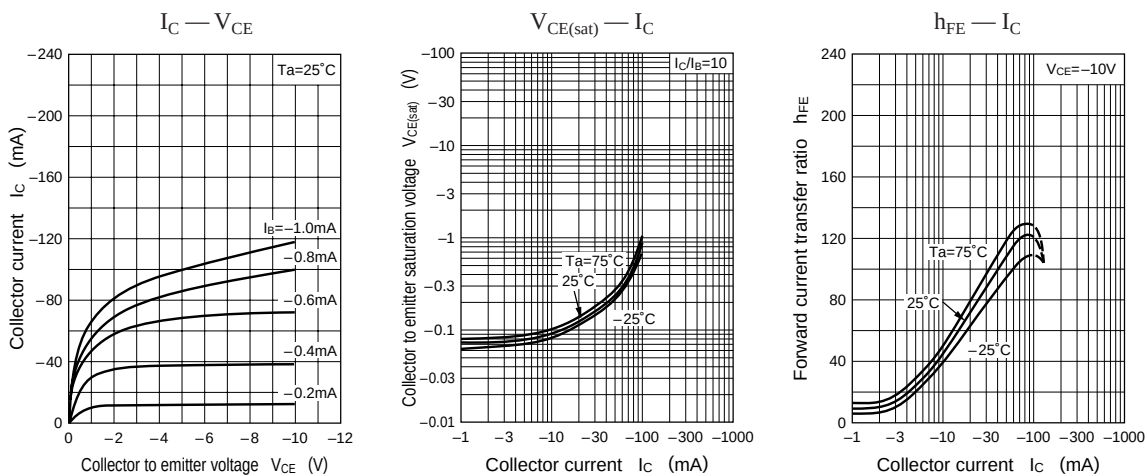
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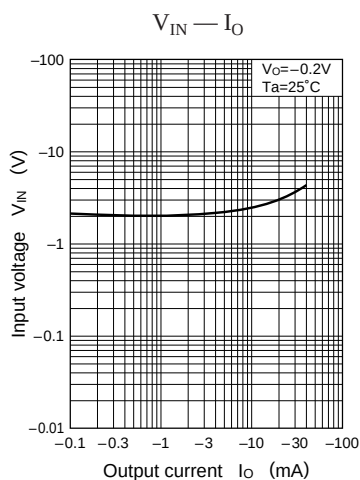
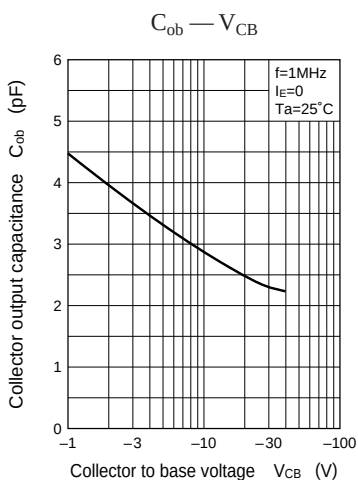


Characteristics charts of UN211H

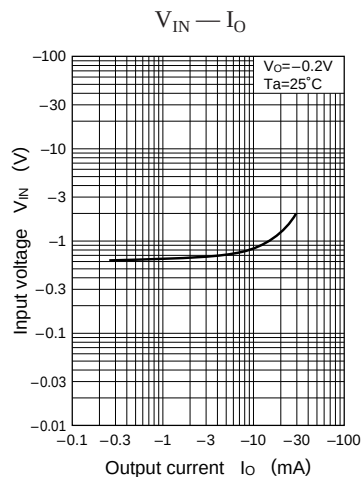
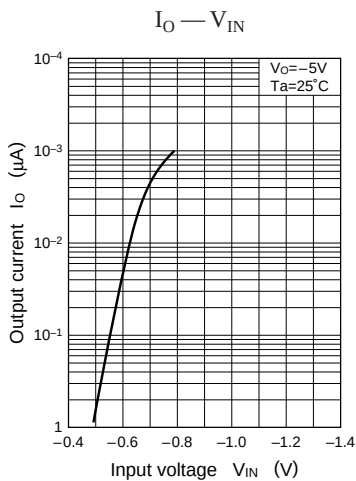
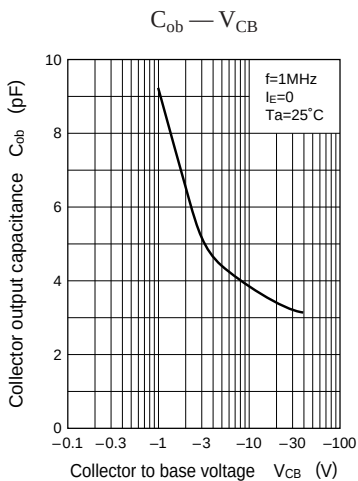
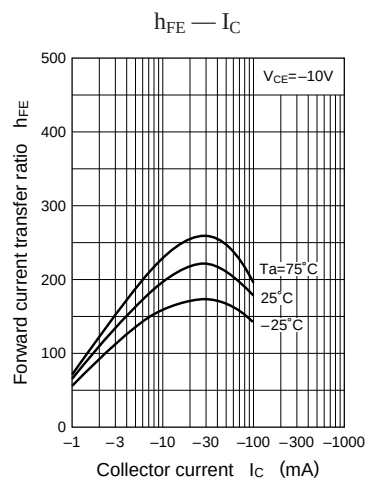
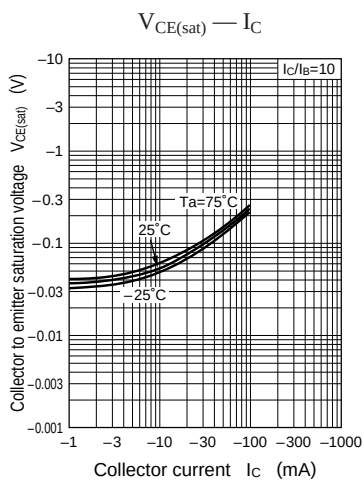
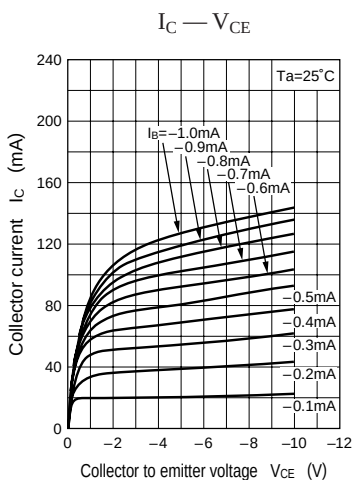


Characteristics charts of UN211L

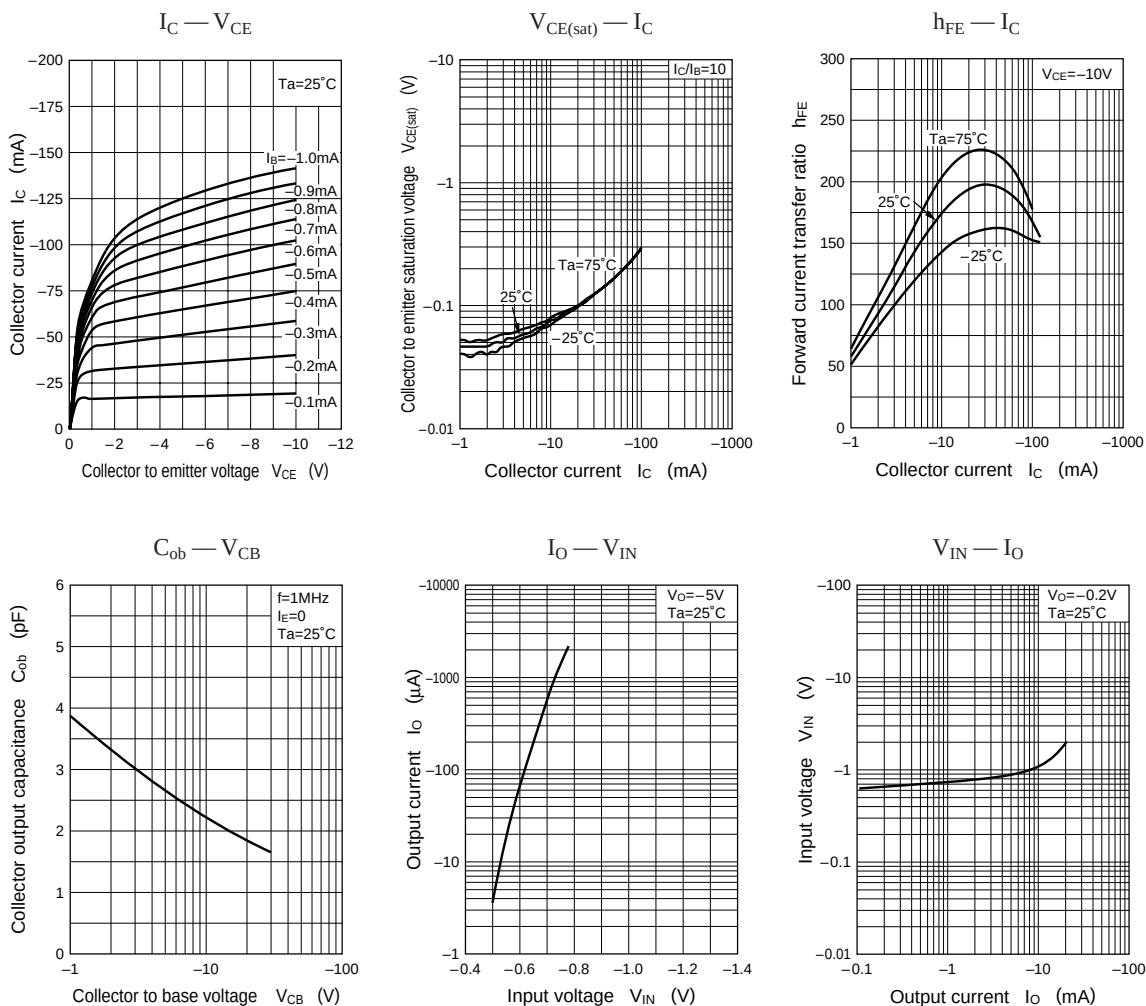




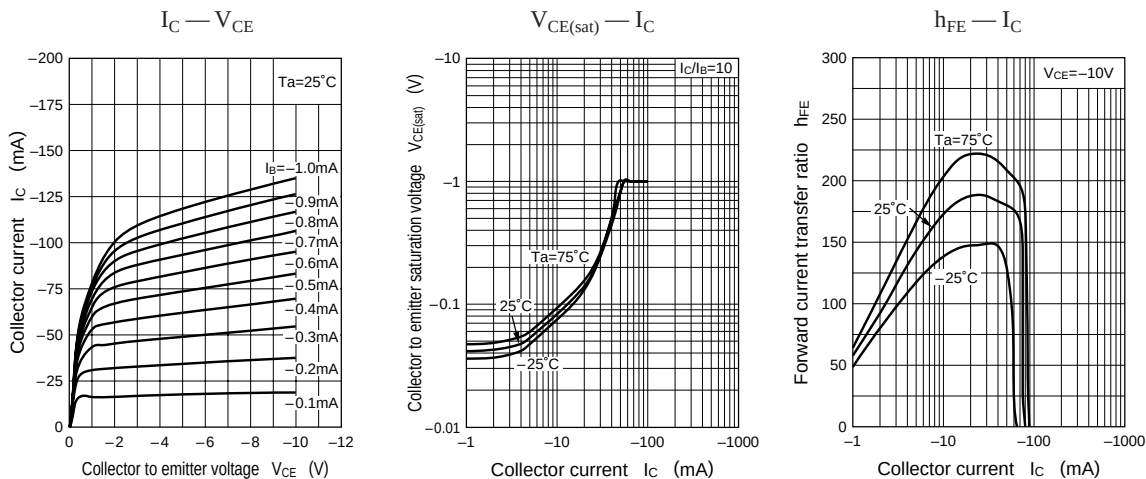
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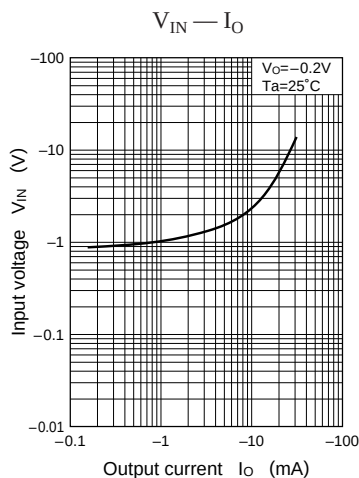
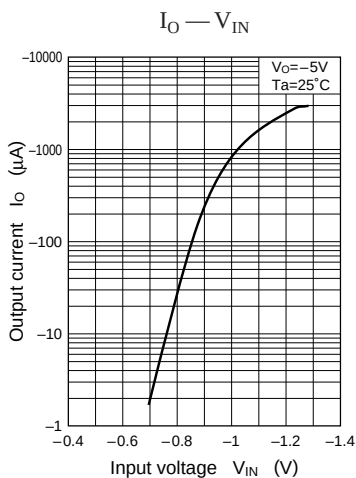


Characteristics charts of UN211N

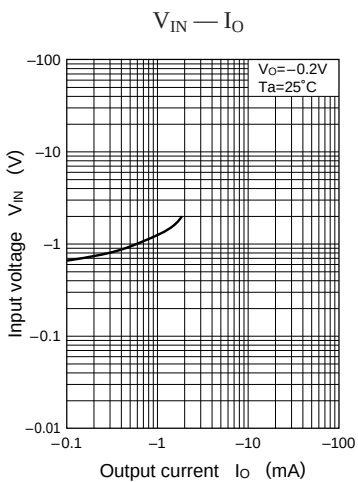
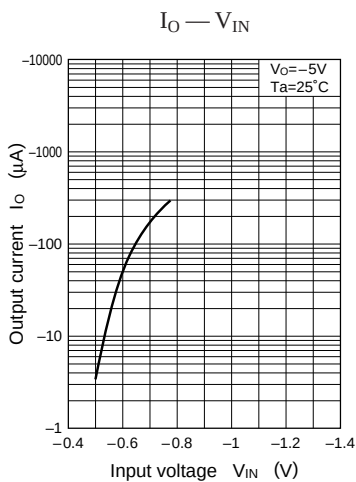
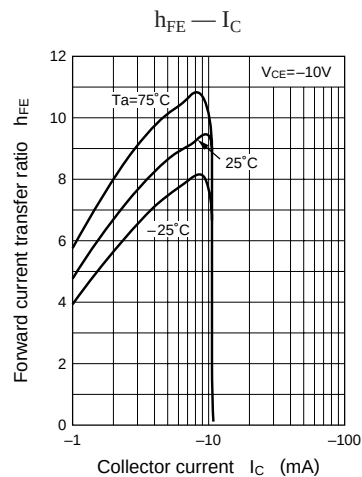
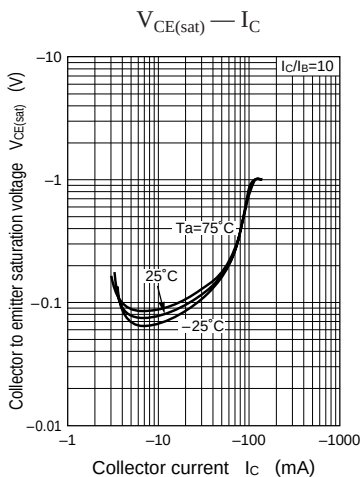
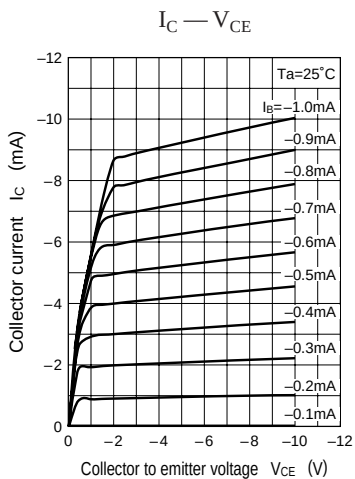


Characteristics charts of UN211T





Characteristics charts of UN211V



Characteristics charts of UN211Z

