

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

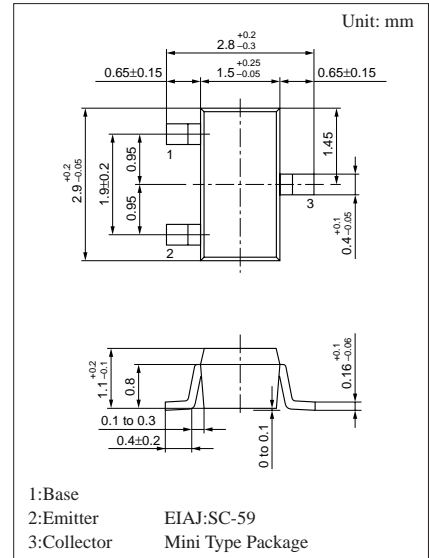
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- Mini type package, allowing downsizing of the equipment and automatic insertion through tape packing and magazine packing.

Resistance by Part Number

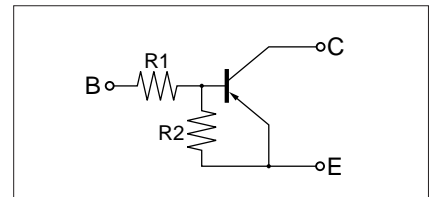
	Marking Symbol	(R ₁)	(R ₂)
• UN2111	6A	10kΩ	10kΩ
• UN2112	6B	22kΩ	22kΩ
• UN2113	6C	47kΩ	47kΩ
• UN2114	6D	10kΩ	47kΩ
• UN2115	6E	10kΩ	—
• UN2116	6F	4.7kΩ	—
• UN2117	6H	22kΩ	—
• UN2118	6I	0.51kΩ	5.1kΩ
• UN2119	6K	1kΩ	10kΩ
• UN2110	6L	47kΩ	—
• UN211D	6M	47kΩ	10kΩ
• UN211E	6N	47kΩ	22kΩ
• UN211F	6O	4.7kΩ	10kΩ
• 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

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



Internal Connection



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 (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	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		-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	
				UN2113				-0.2
				UN211D				-0.2
				UN211E				-0.2
Transition frequency		f _T	V _{CB} = -10V, I _E = 1mA, f = 200MHz		80		MHz	
Input resistance	UN2111/2114/2115	R _i		(-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			

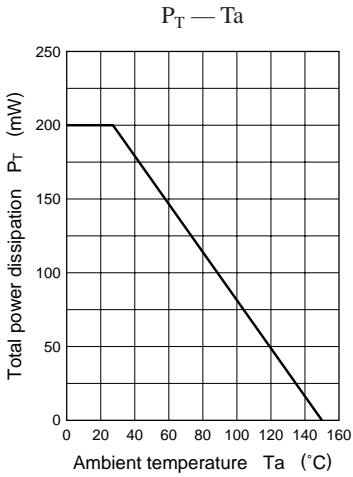
* h_{FE} rank classification (UN2115/2116/2117/2110)

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

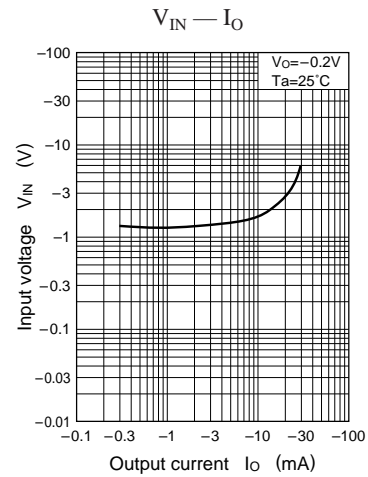
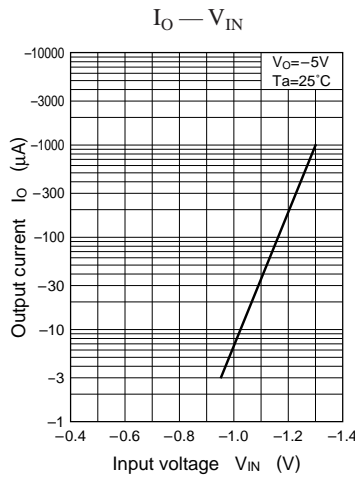
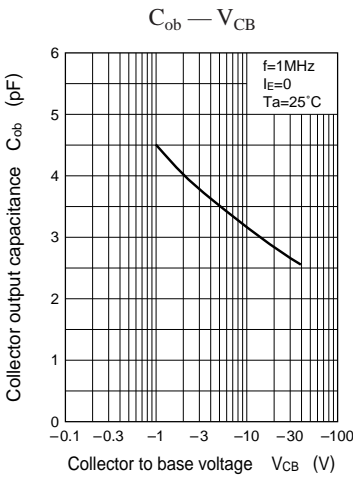
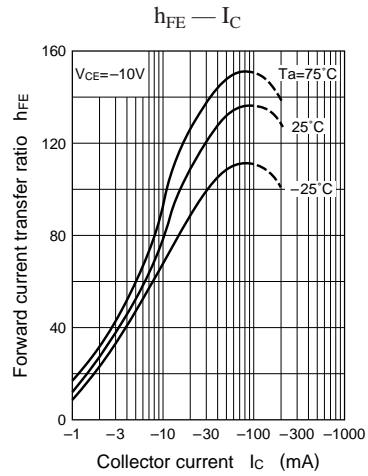
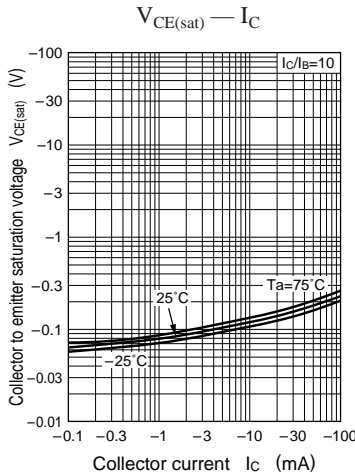
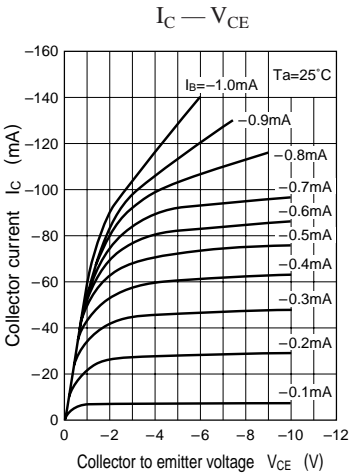
■ Electrical Characteristics (continued) (Ta=25°C)

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		

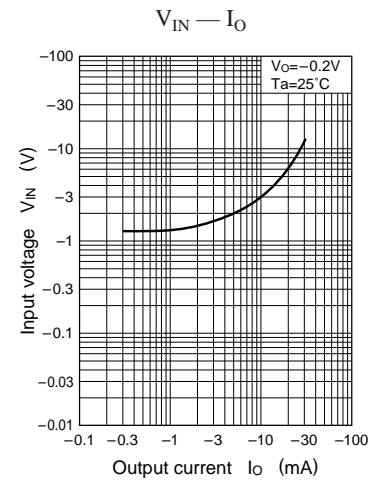
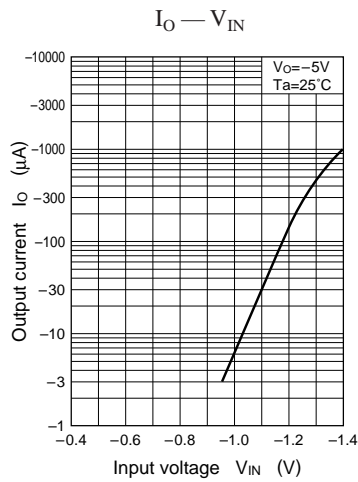
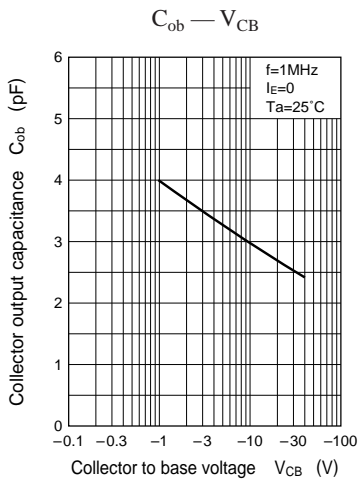
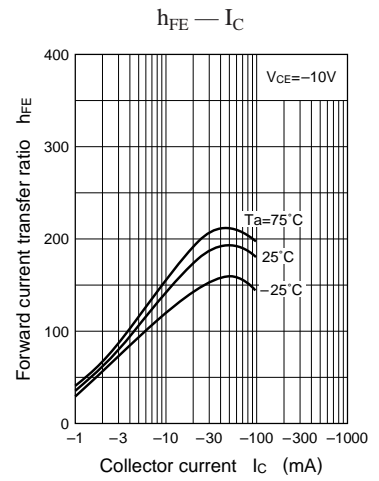
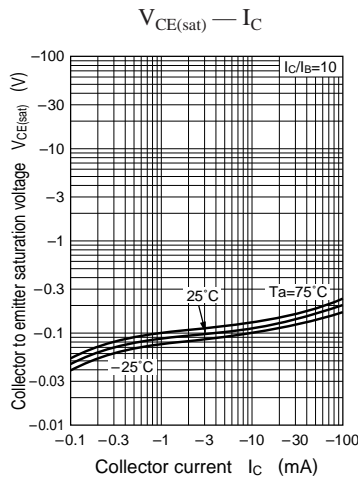
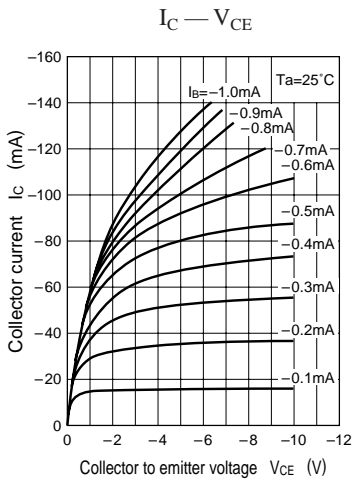
Common characteristics chart



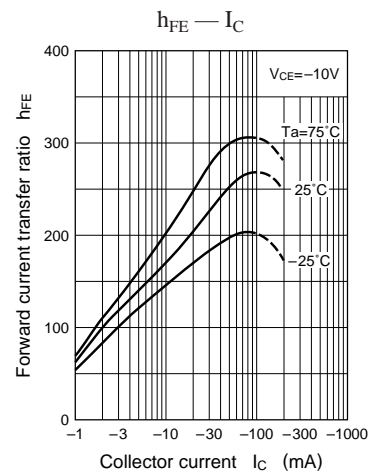
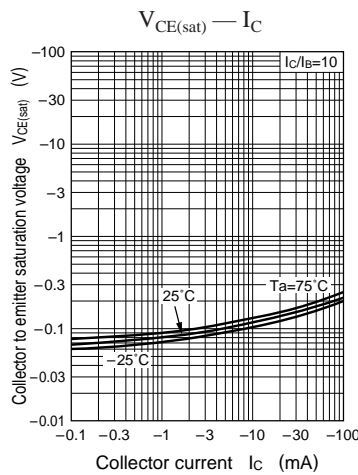
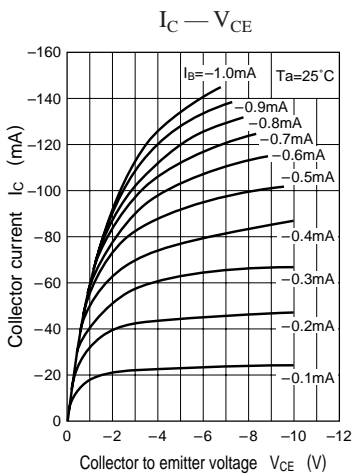
Characteristics charts of UN2111

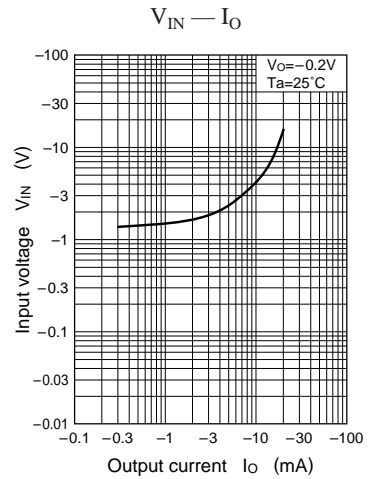
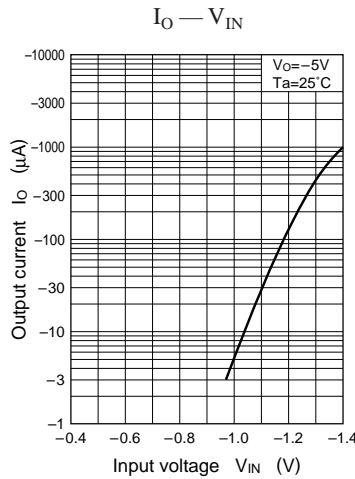
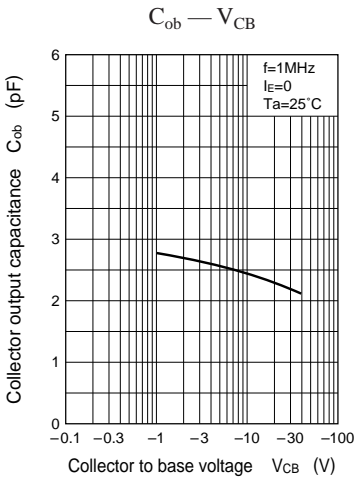


Characteristics charts of UN2112

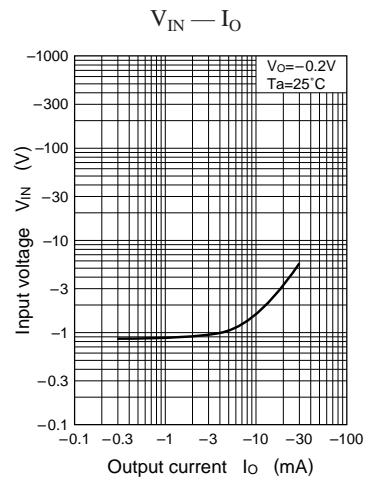
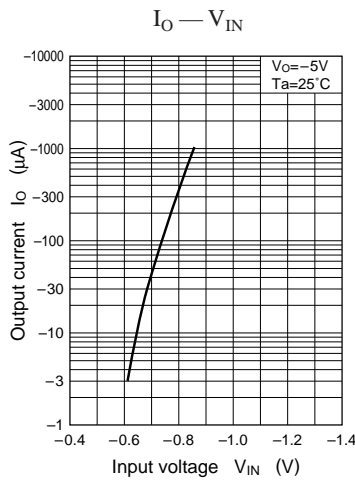
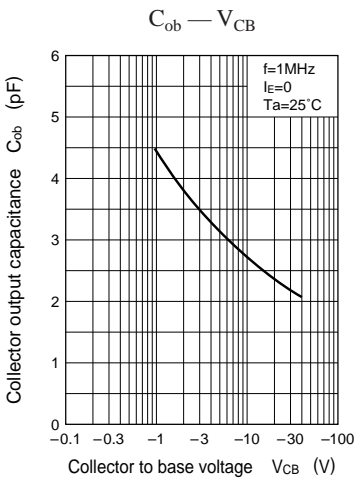
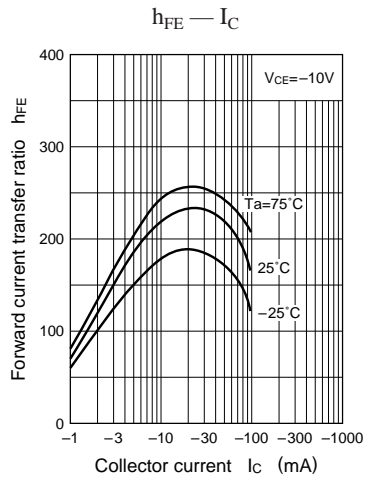
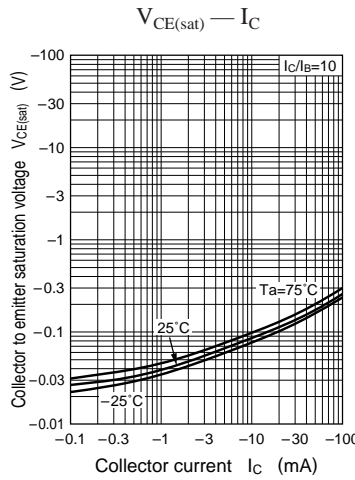
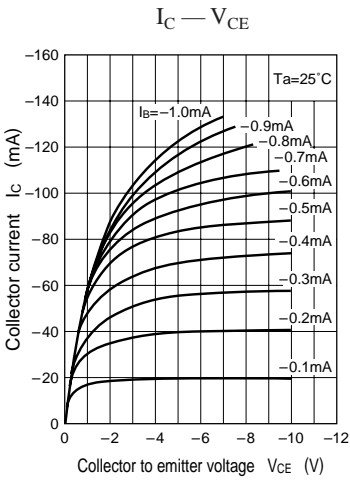


Characteristics charts of UN2113

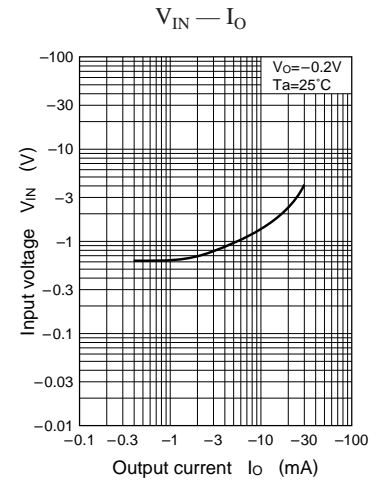
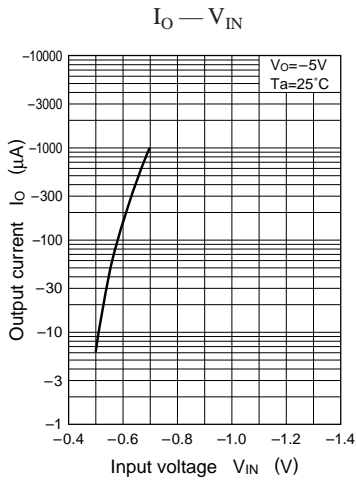
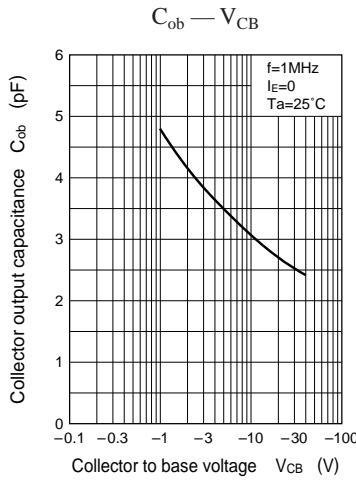
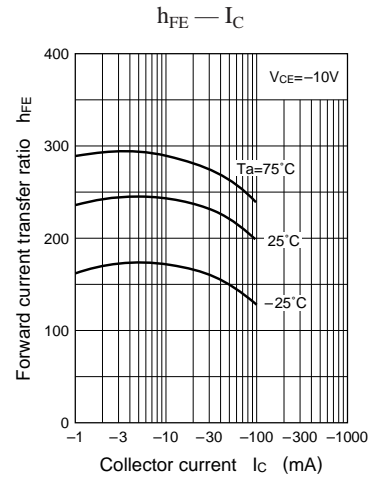
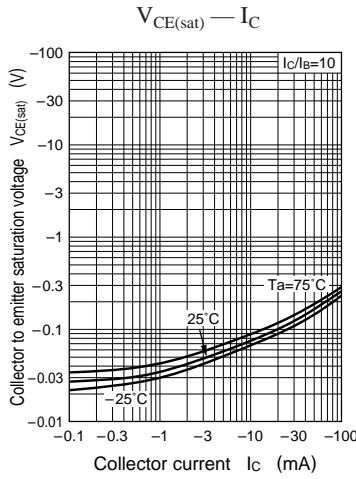
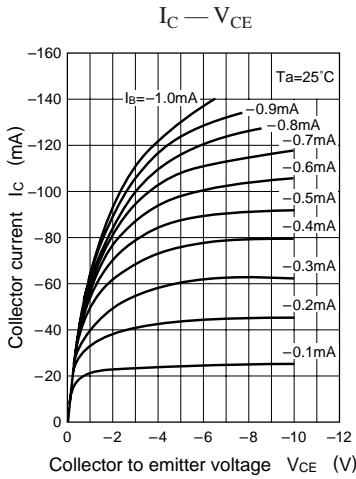




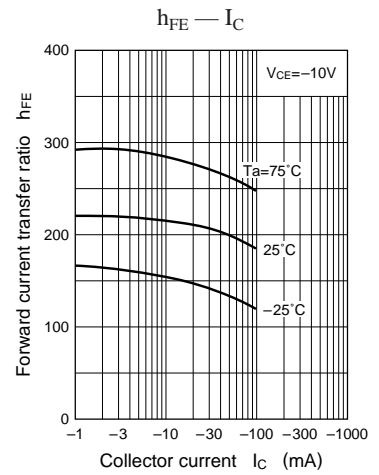
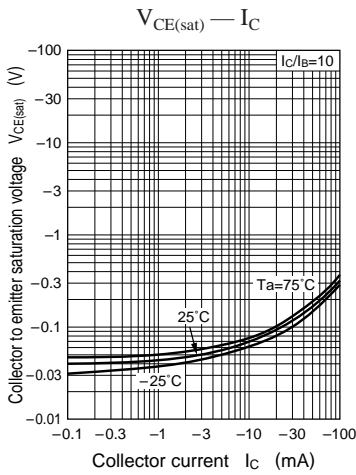
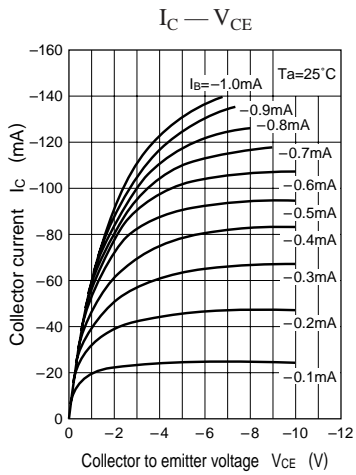
Characteristics charts of UN2114

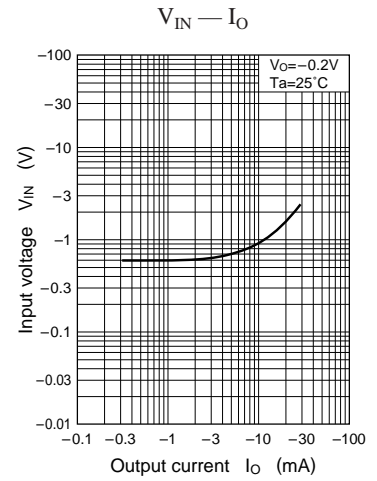
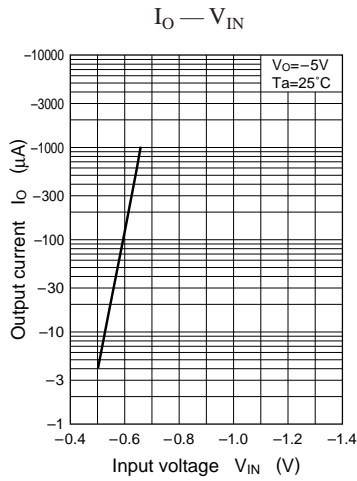
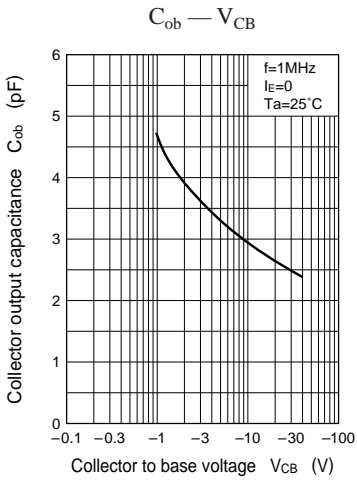


Characteristics charts of UN2115

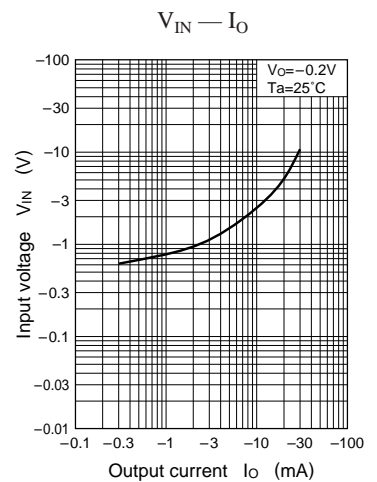
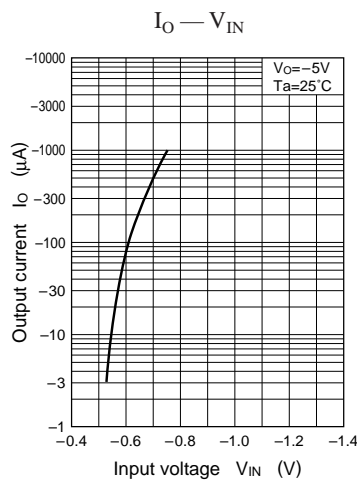
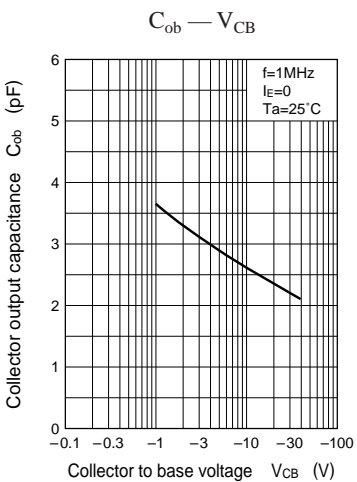
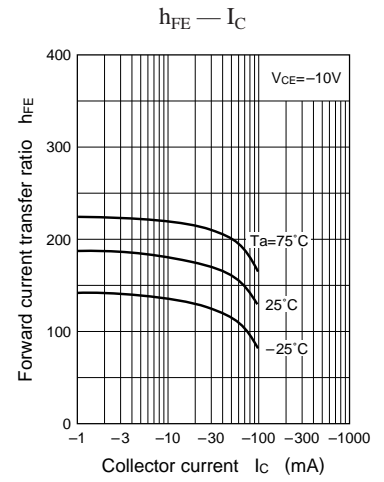
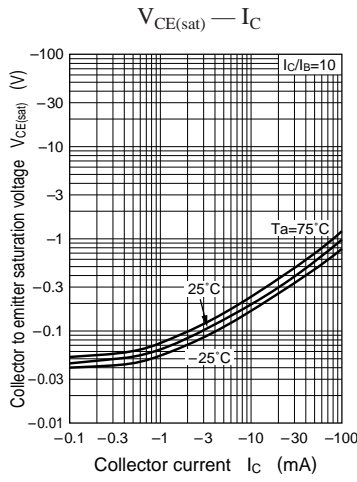
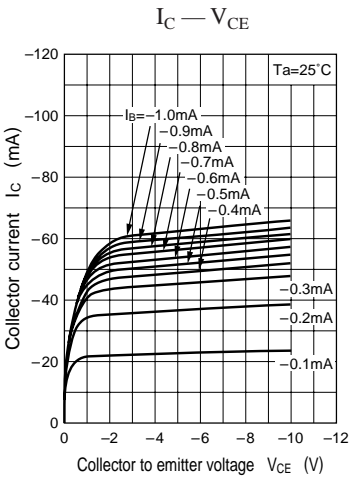


Characteristics charts of UN2116

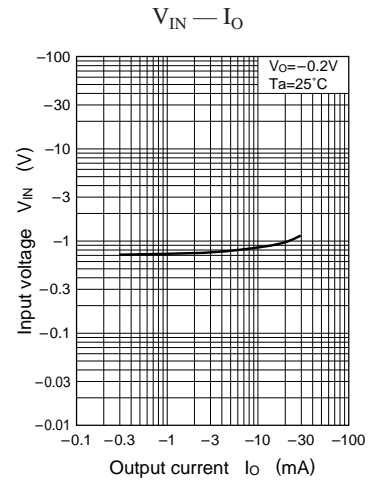
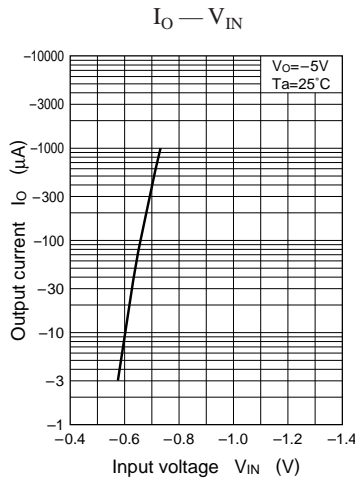
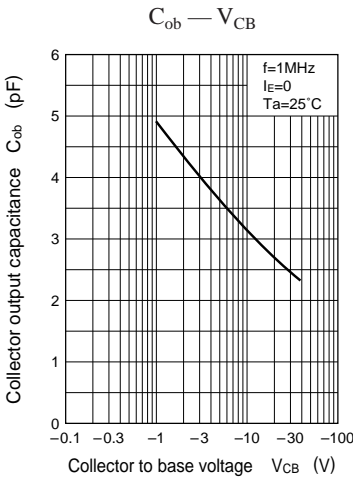
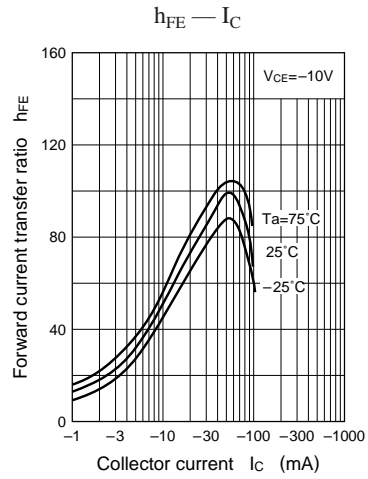
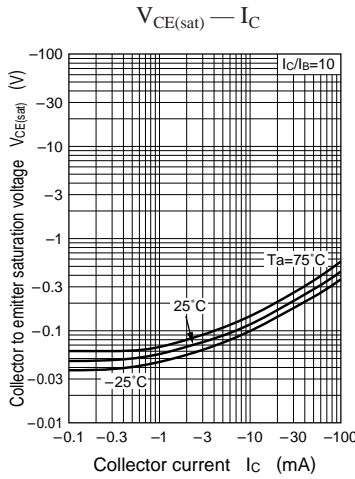
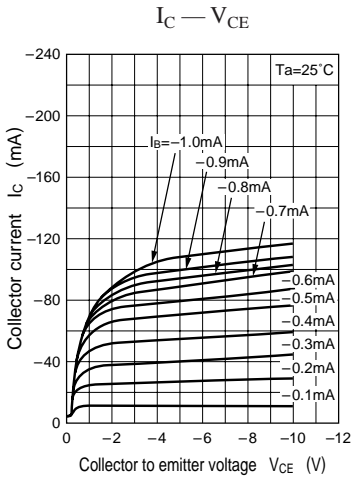




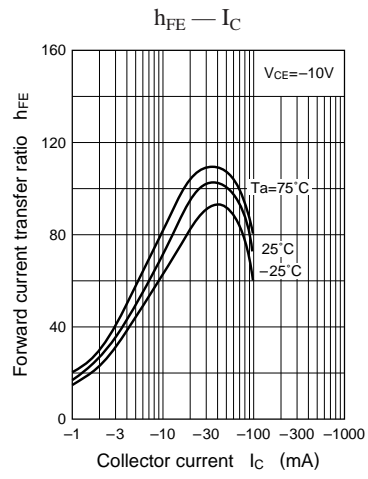
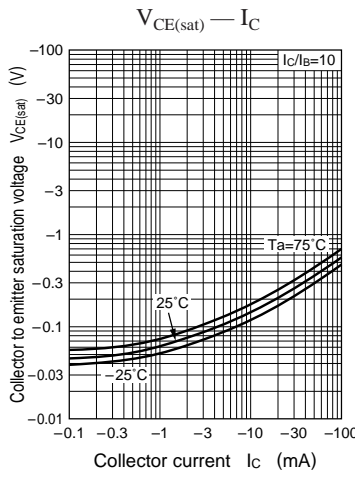
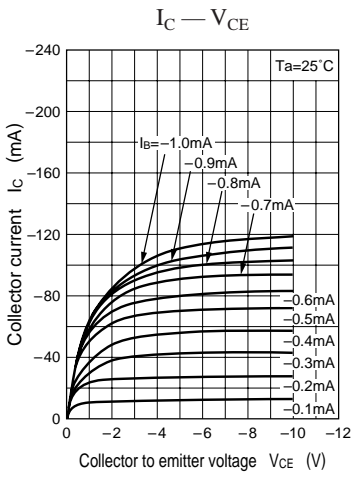
Characteristics charts of UN2117

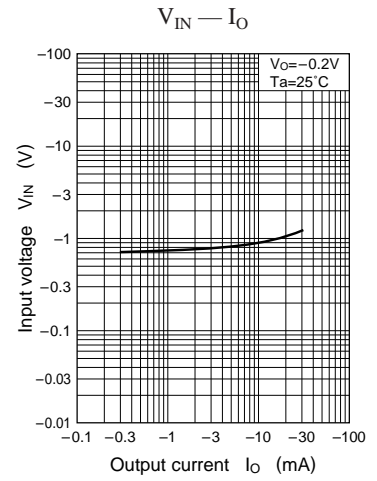
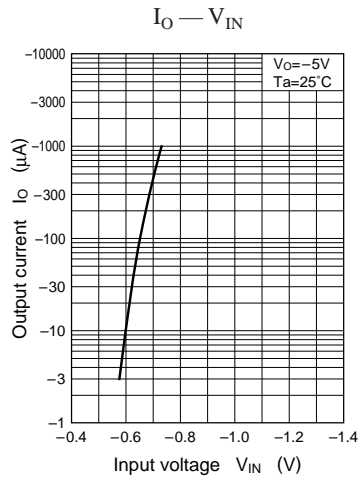
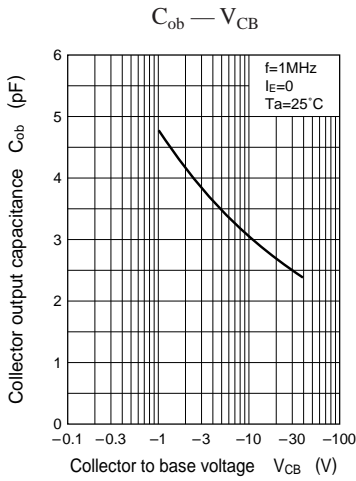


Characteristics charts of UN2118

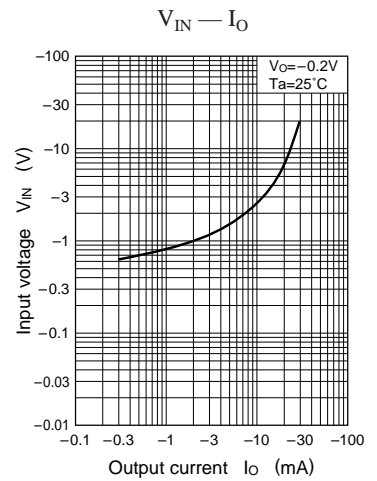
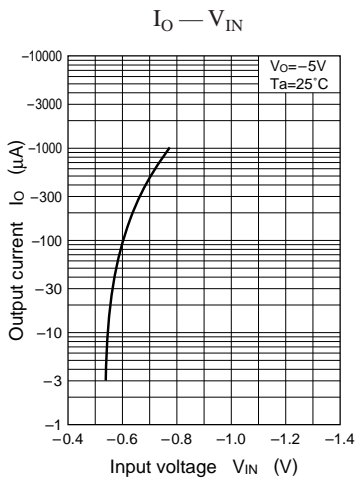
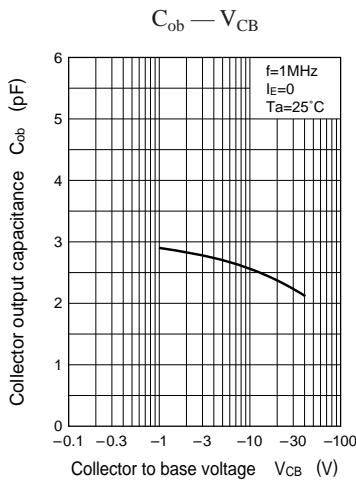
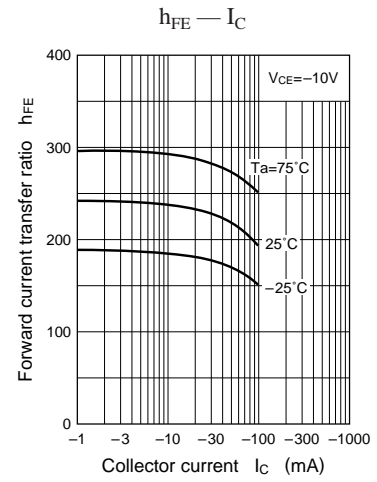
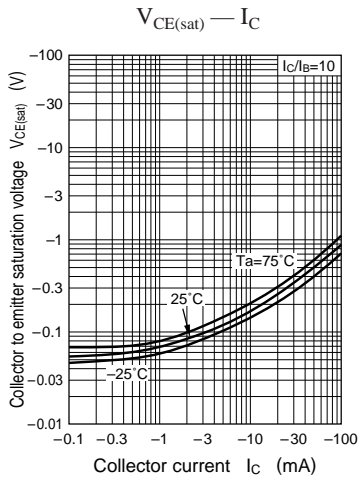
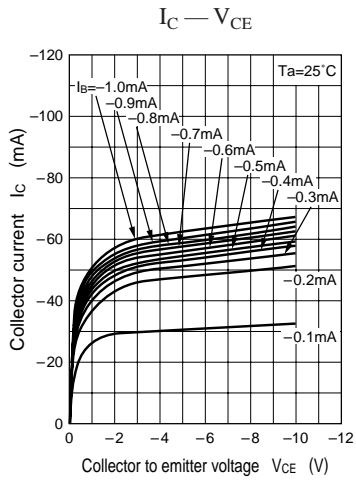


Characteristics charts of UN2119

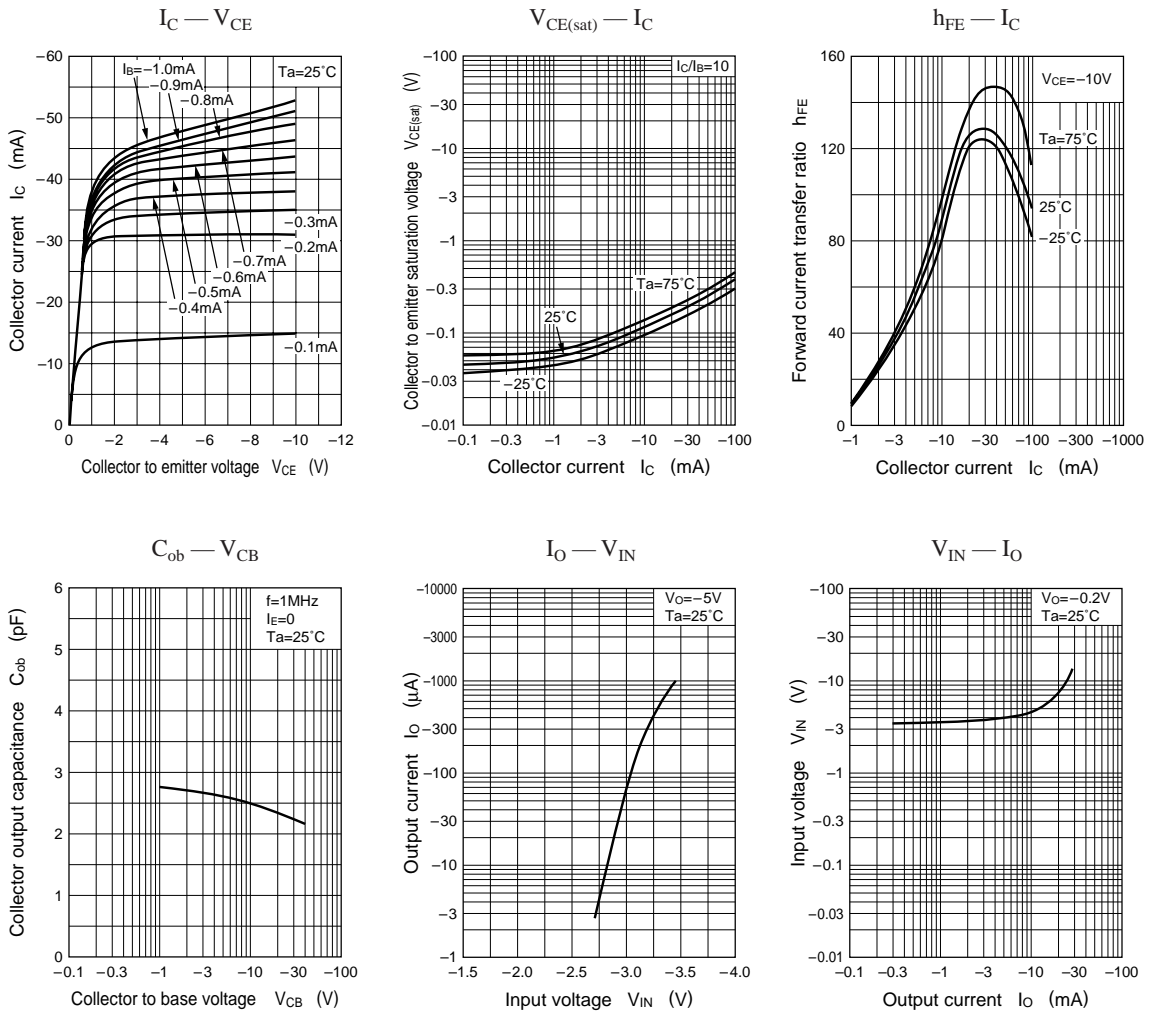




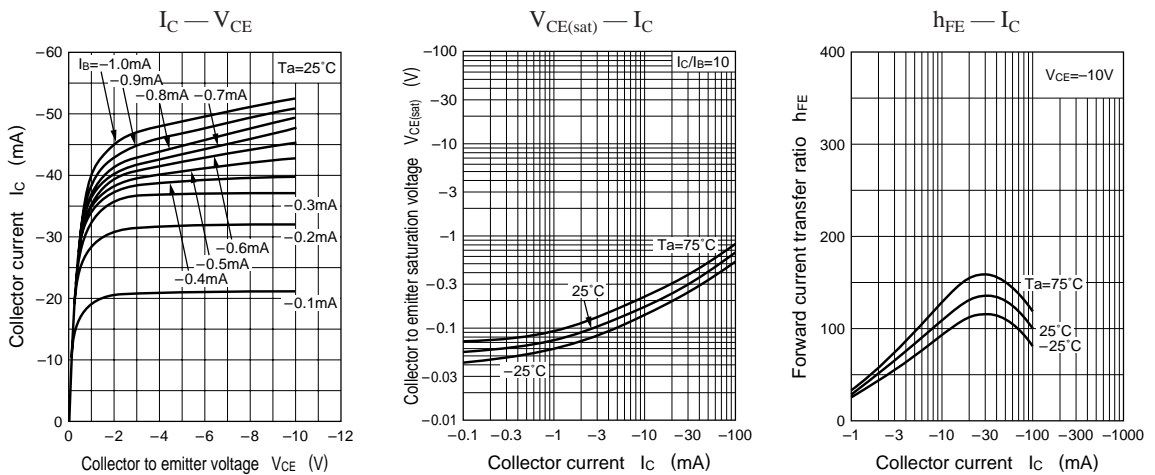
Characteristics charts of UN2110

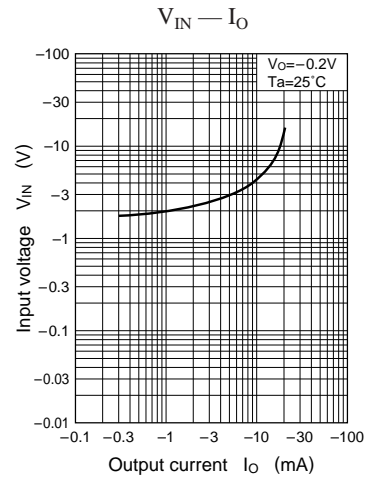
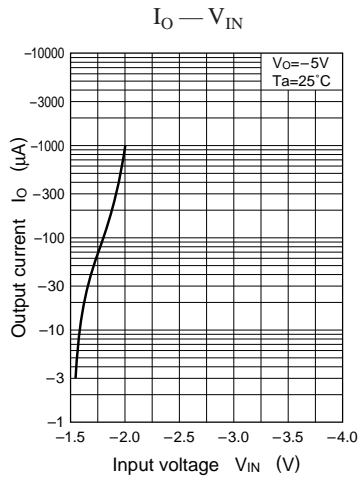
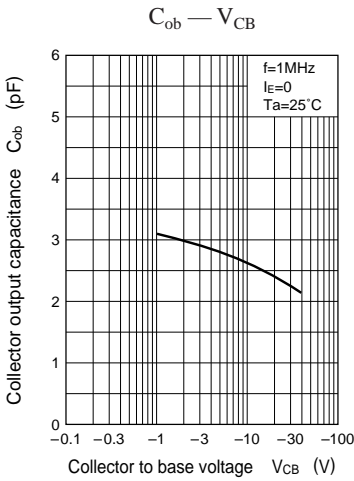


Characteristics charts of UN211D

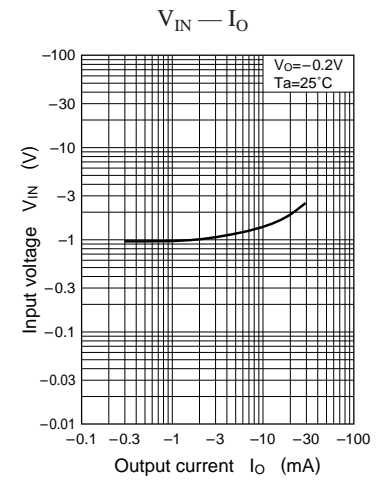
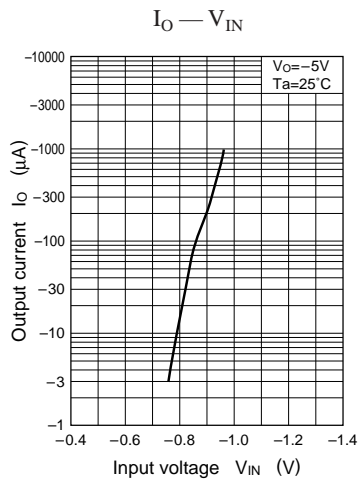
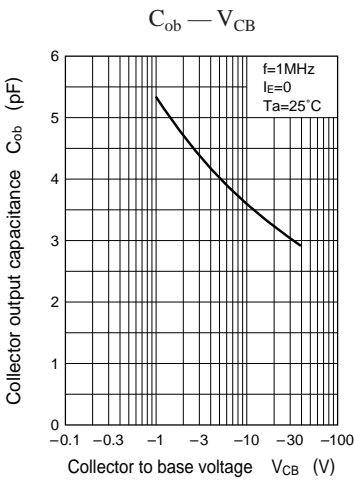
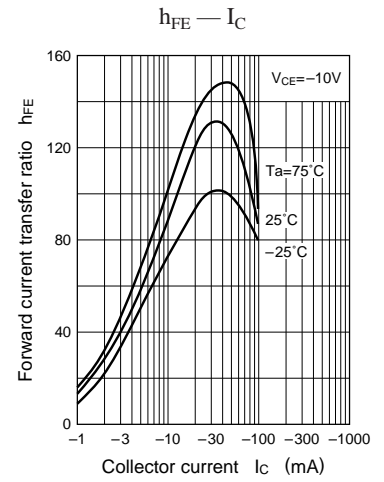
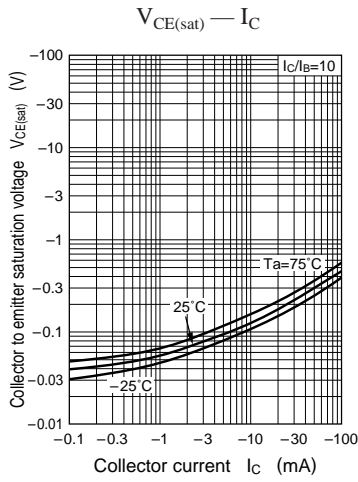
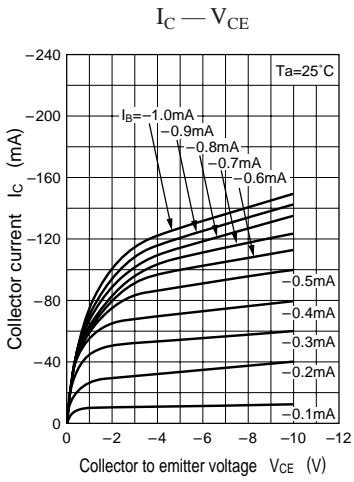


Characteristics charts of UN211E

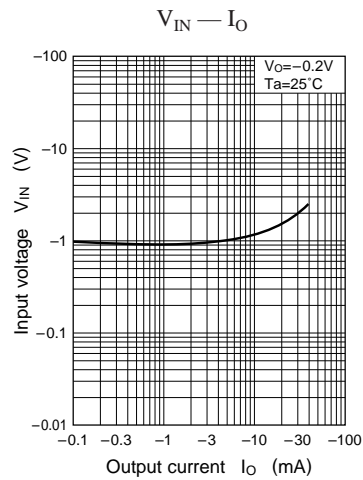
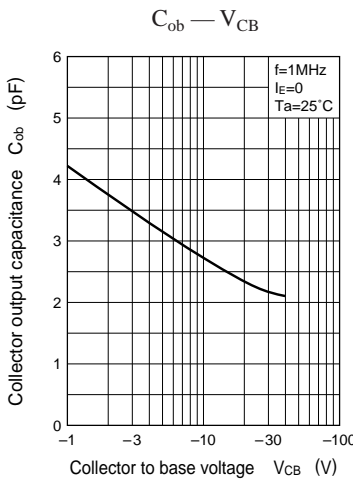
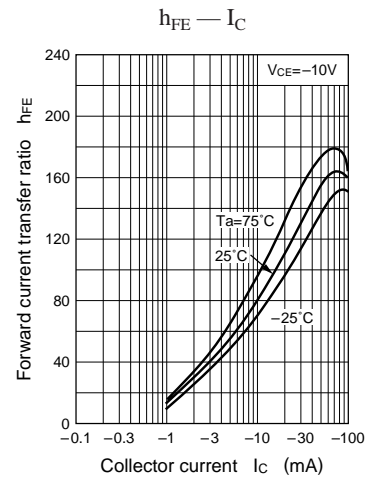
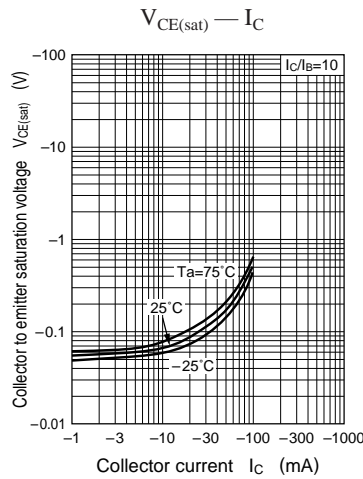
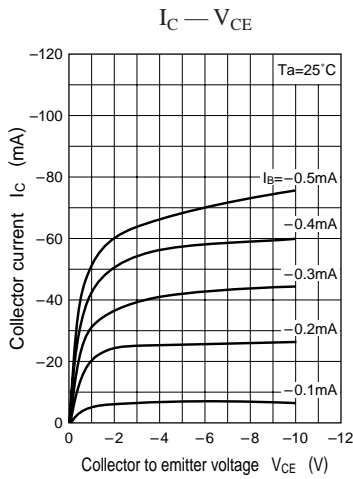




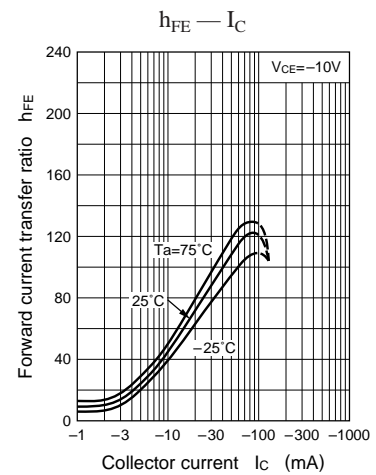
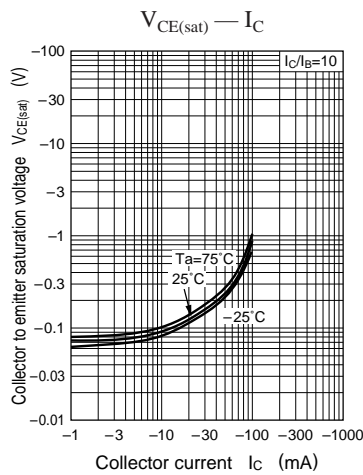
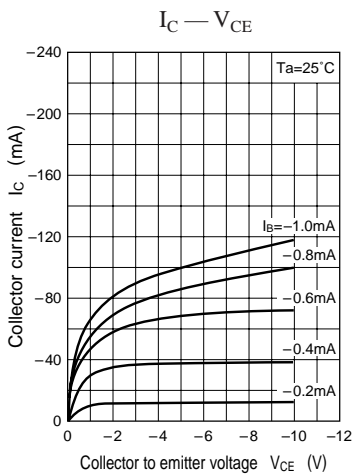
Characteristics charts of UN211F

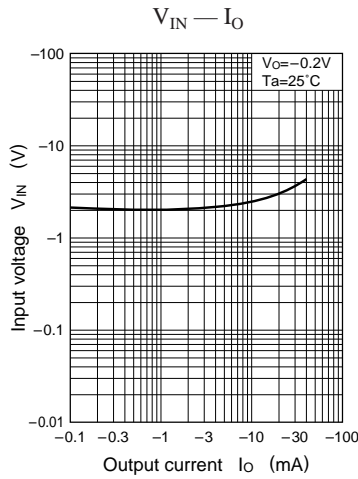
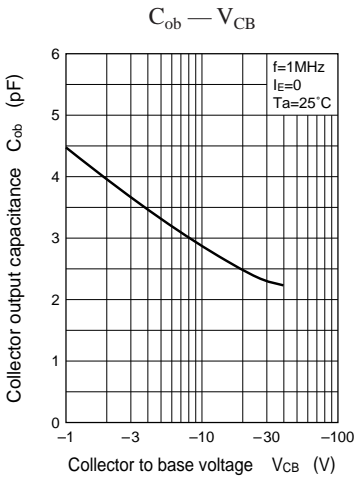


Characteristics charts of UN211H

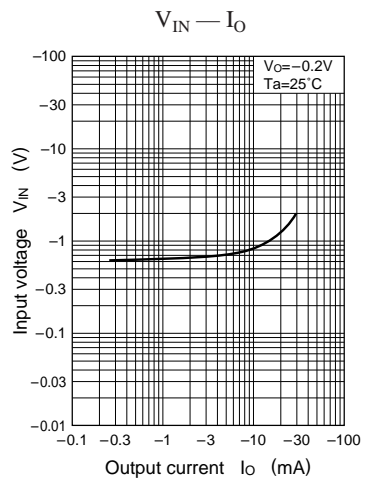
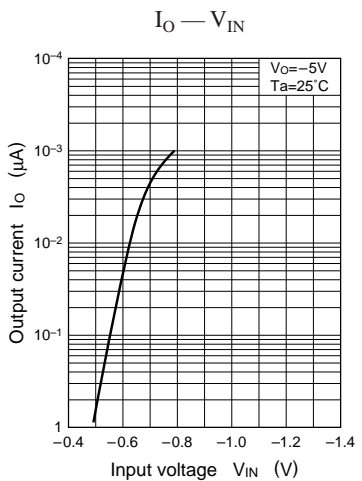
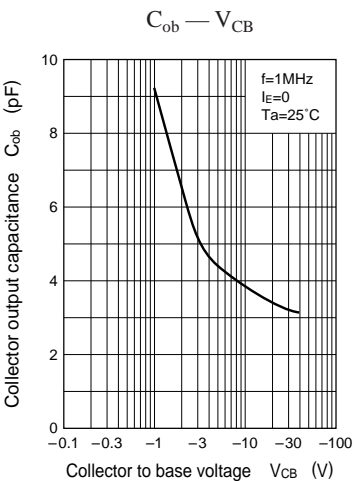
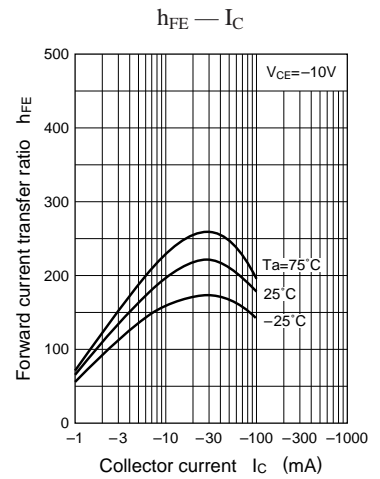
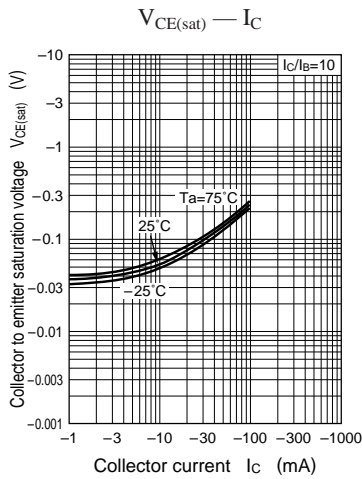
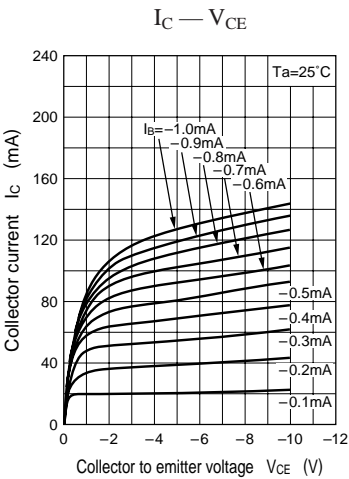


Characteristics charts of UN211L

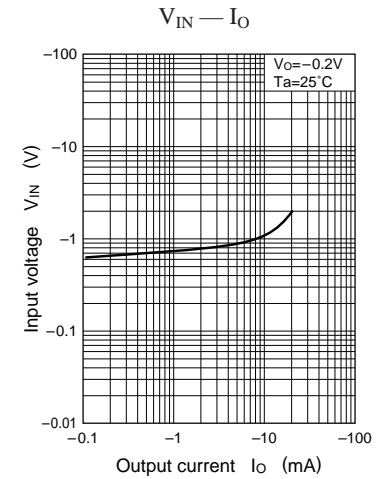
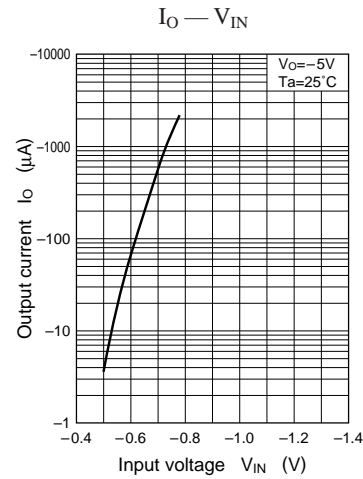
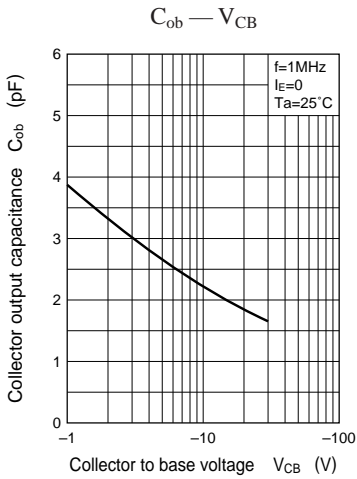
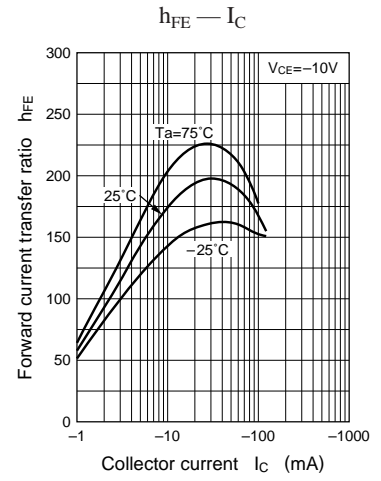
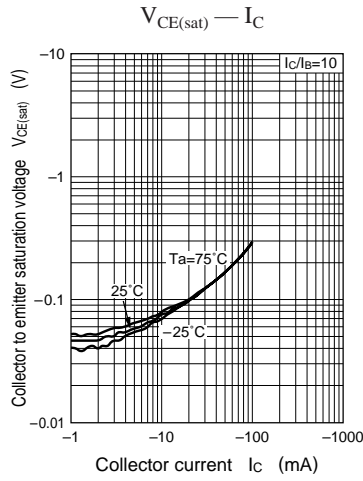
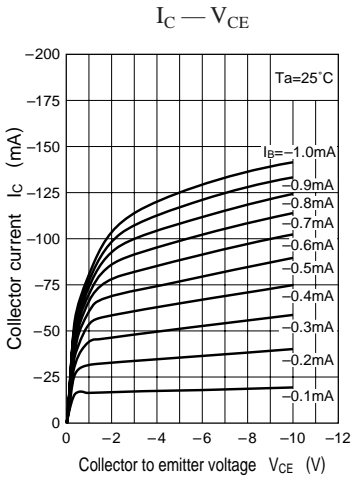




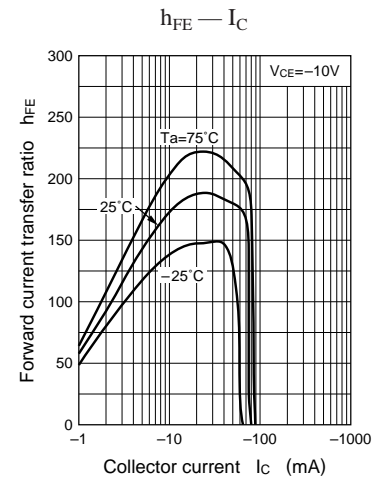
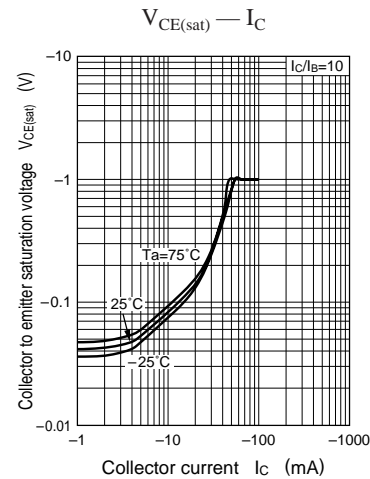
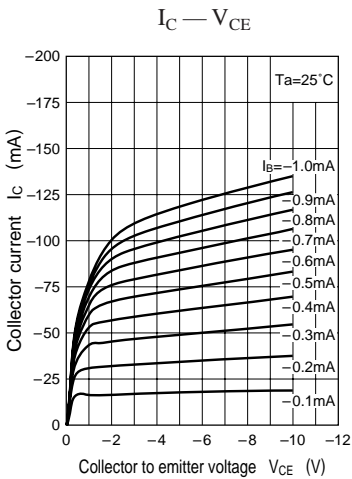
Characteristics charts of UN211M

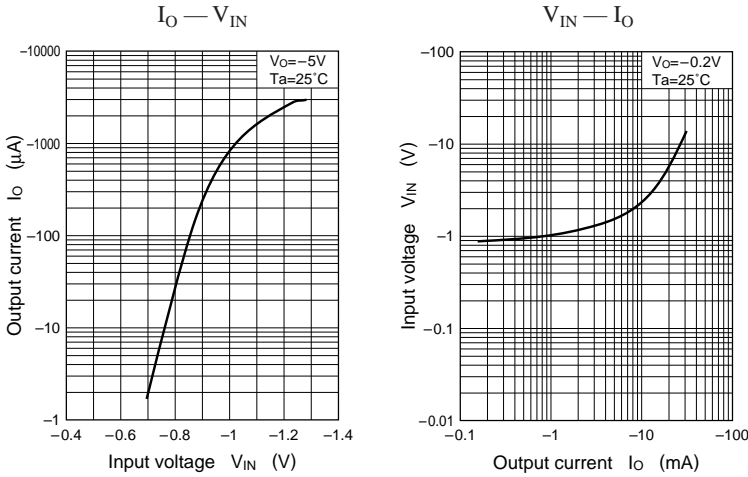


Characteristics charts of UN211N

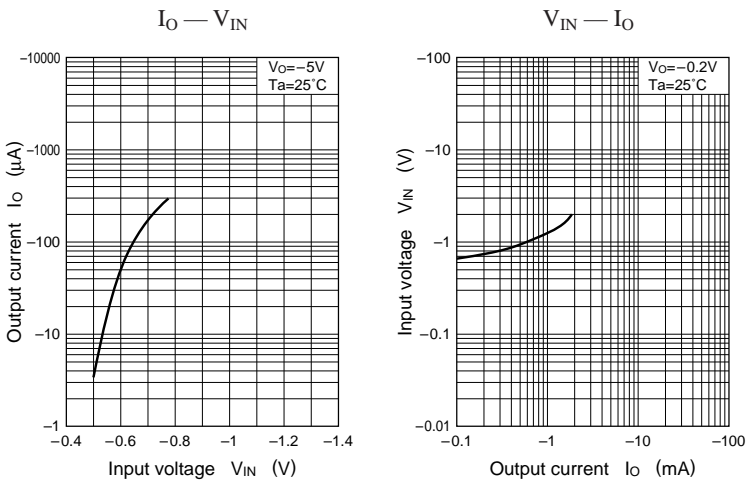
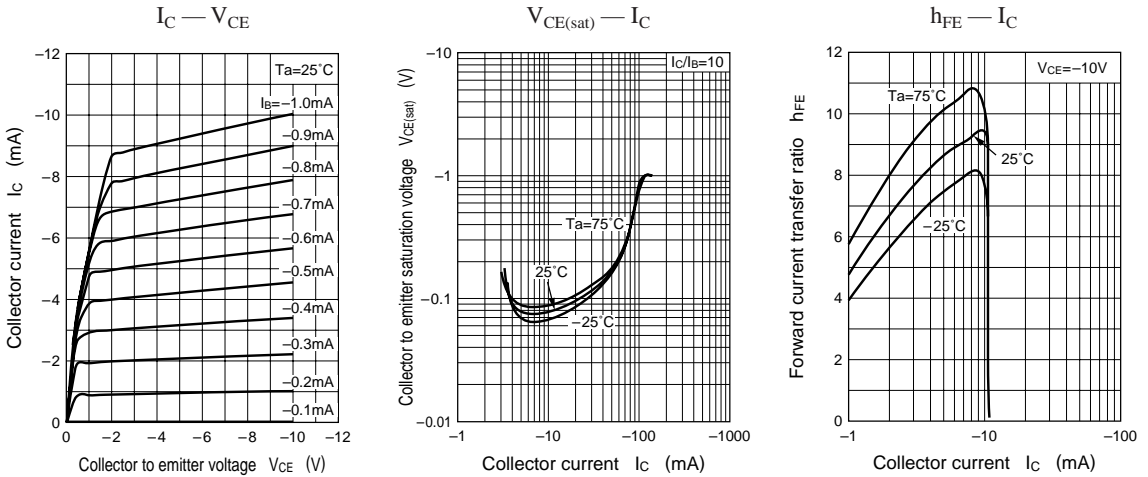


Characteristics charts of UN211T





Characteristics charts of UN211V



Characteristics charts of UN211Z

