

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.

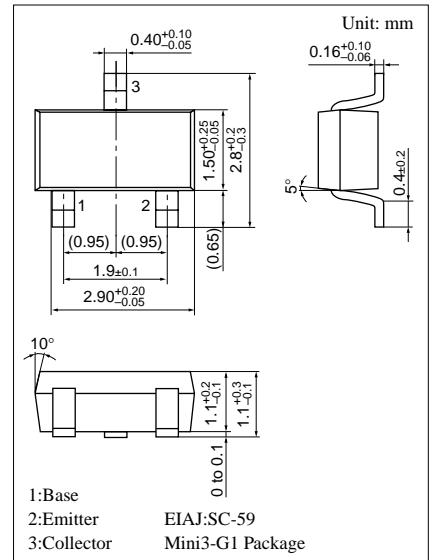
Resistance by Part Number

	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

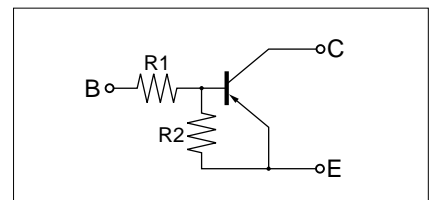
Absolute Maximum Ratings (T_a=25°C)

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)

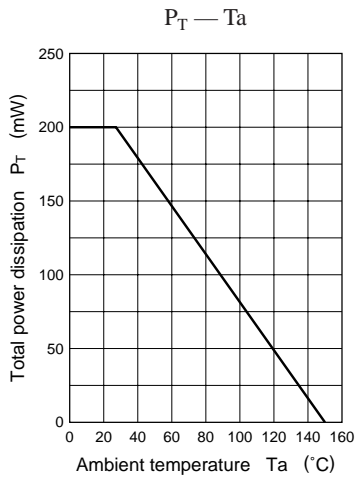
Rank	Q	R	S
h _{FE}	160 to 260	210 to 340	290 to 460

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

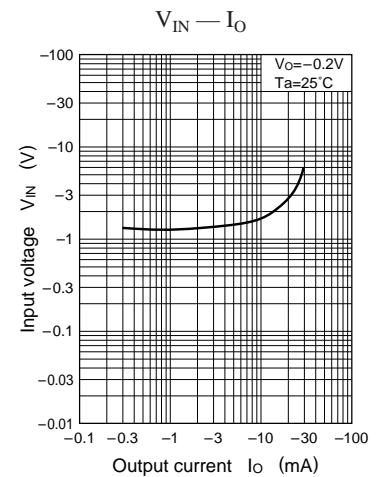
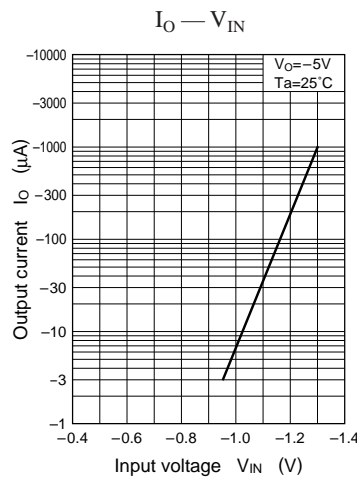
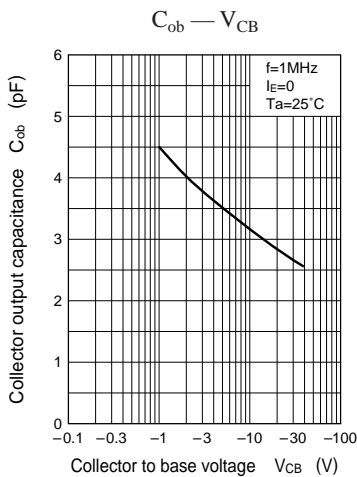
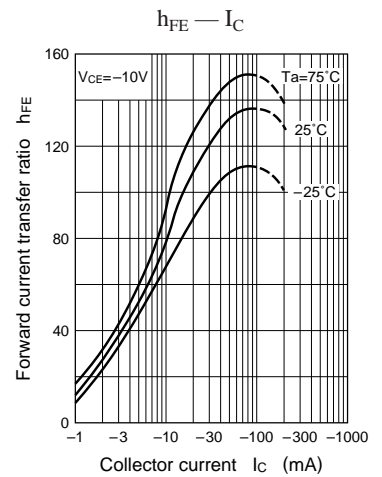
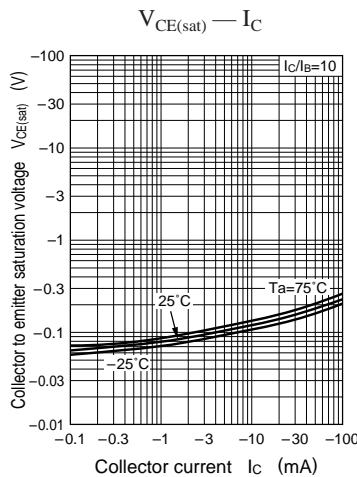
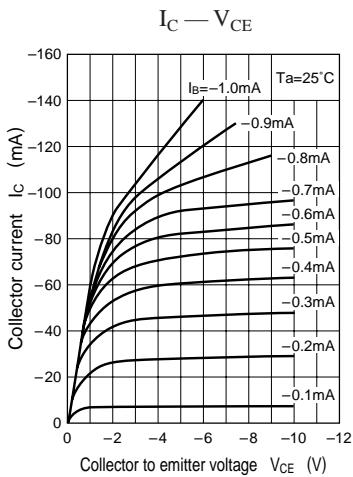
■ **Electrical Characteristics (continued)** (Ta=25°C)

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		

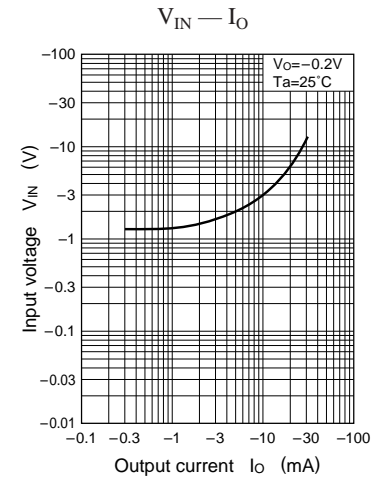
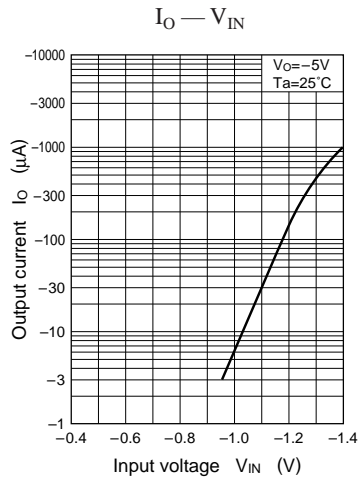
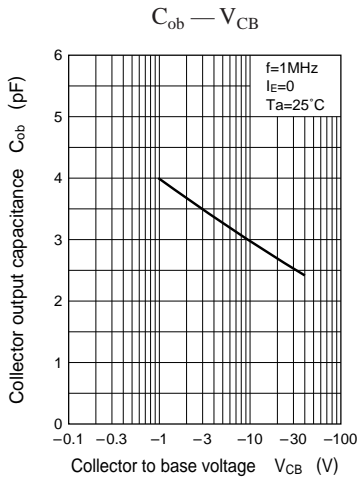
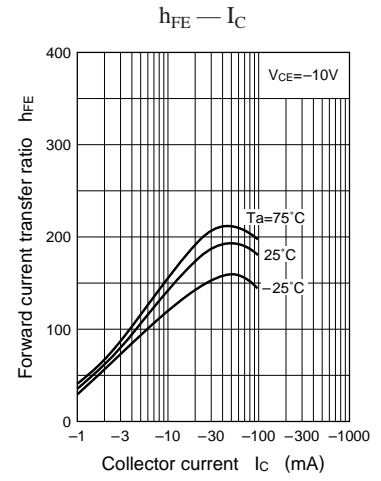
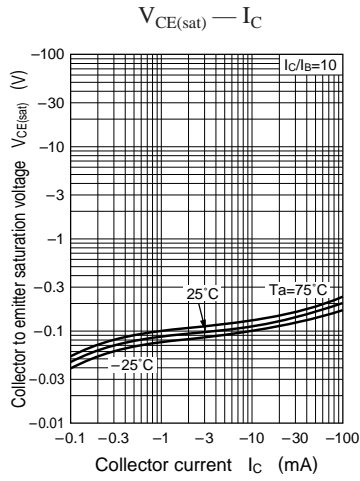
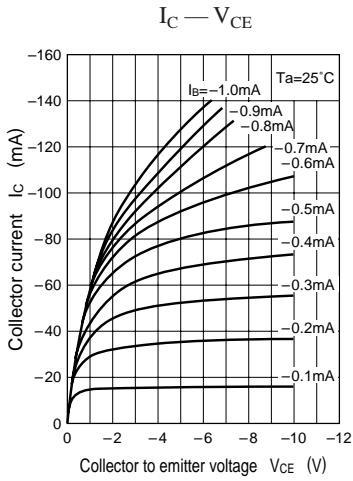
Common characteristics chart



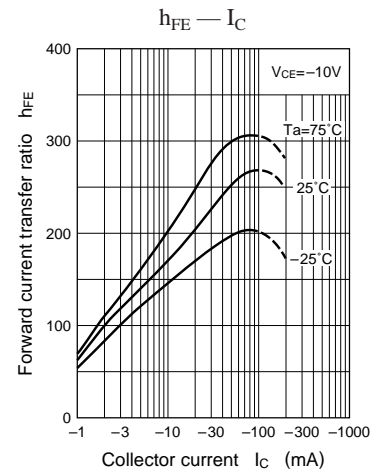
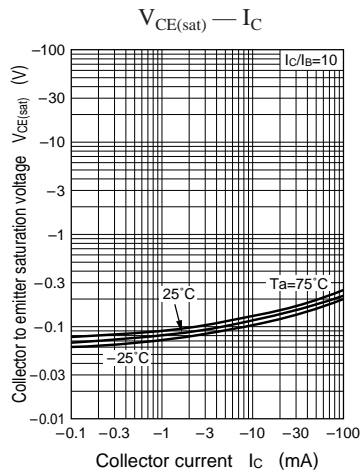
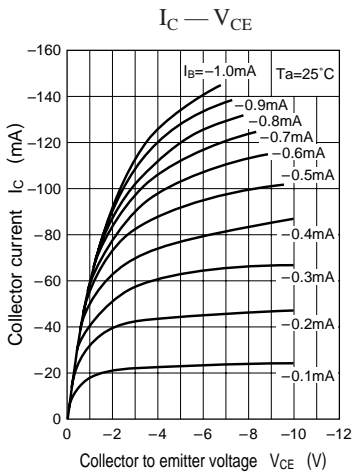
Characteristics charts of UNR2111

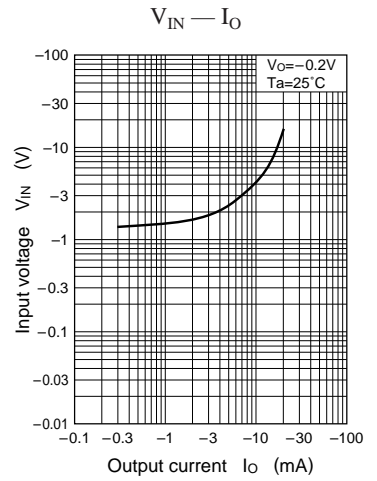
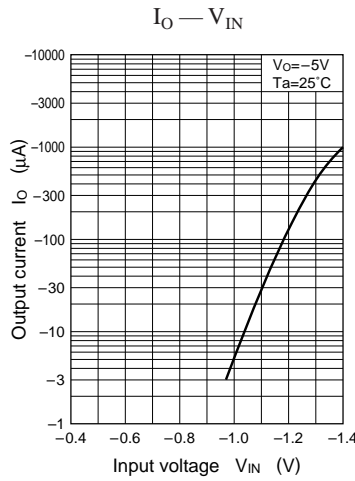
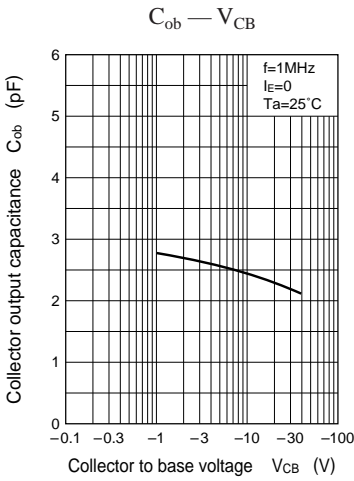


Characteristics charts of UNR2112

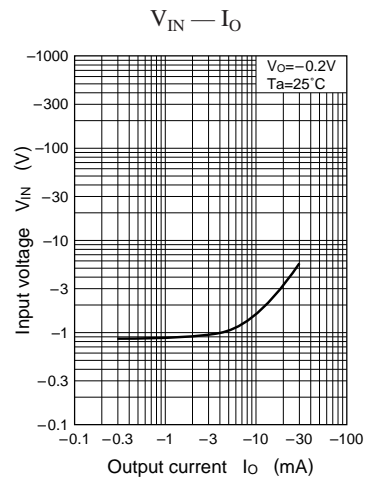
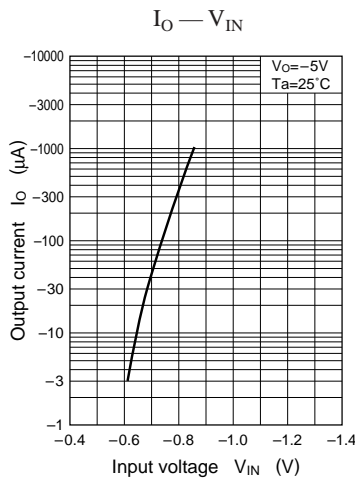
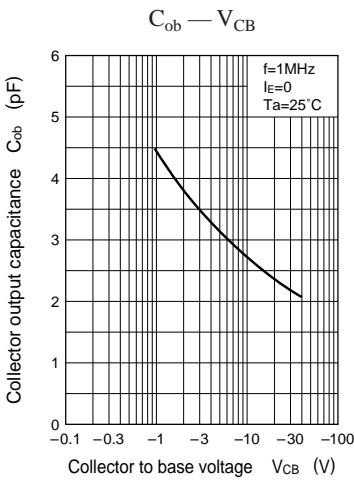
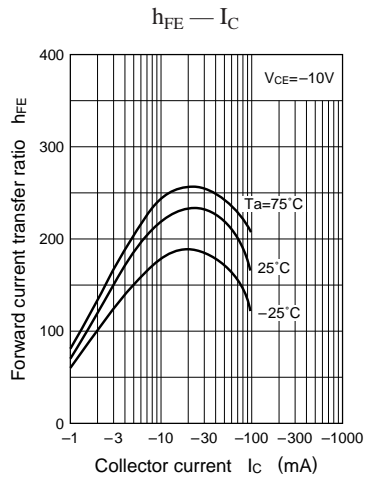
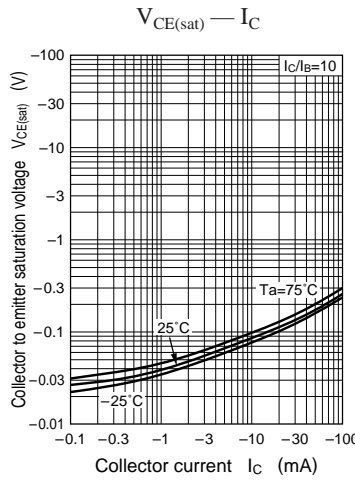
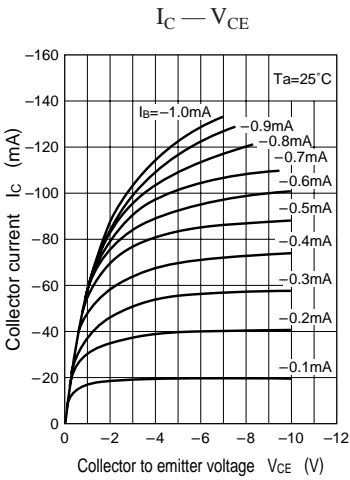


Characteristics charts of UNR2113

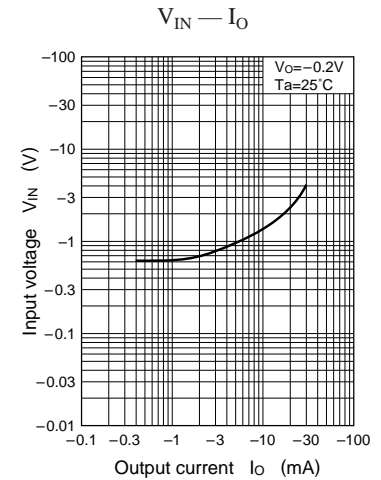
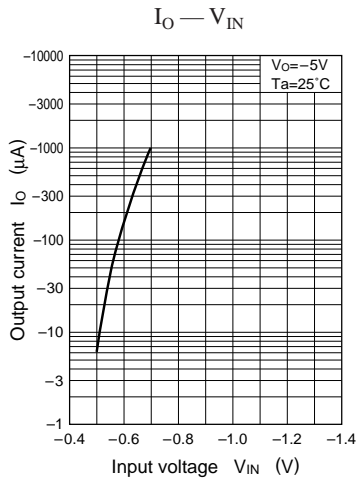
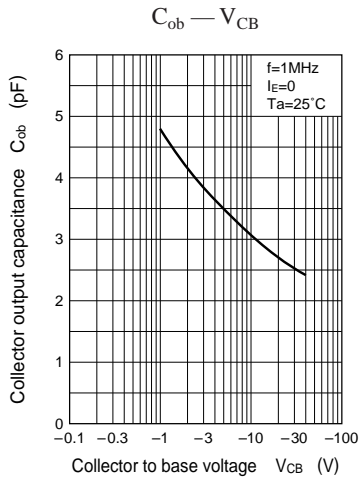
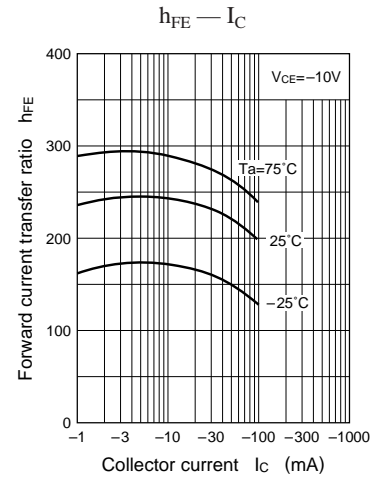
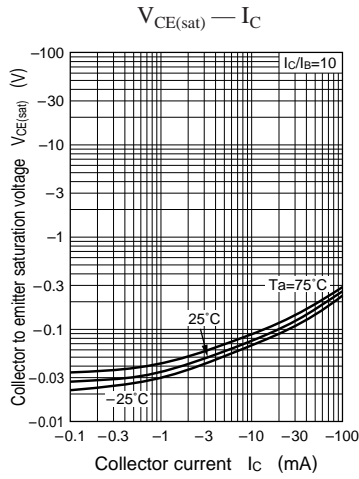
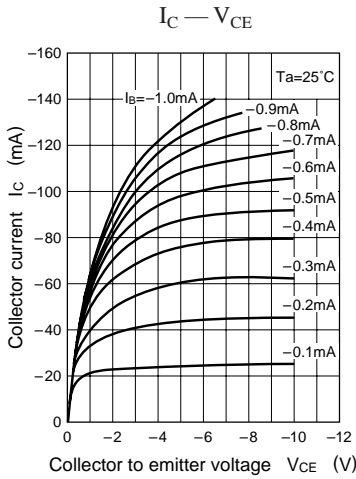




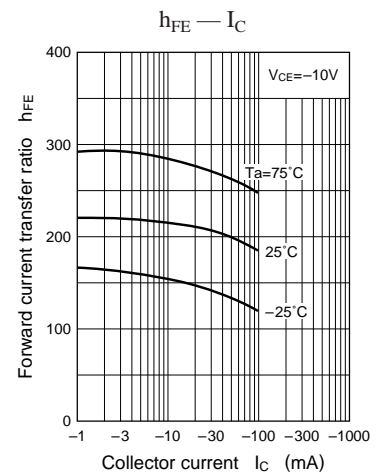
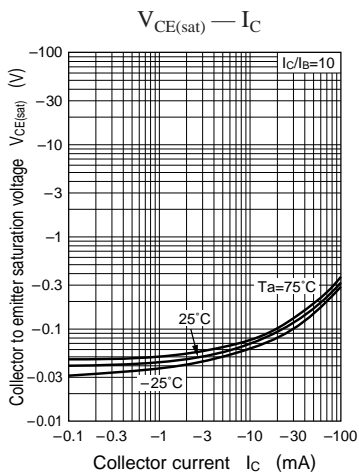
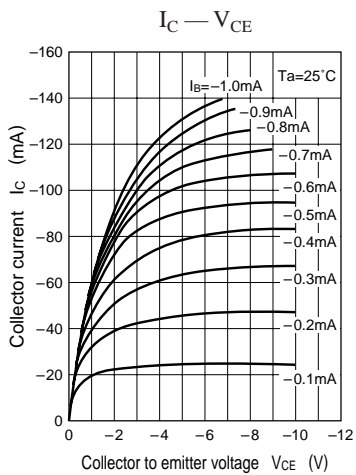
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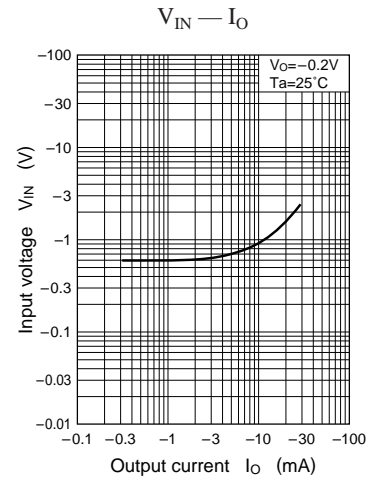
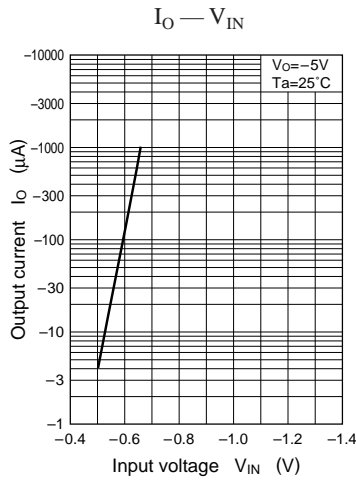
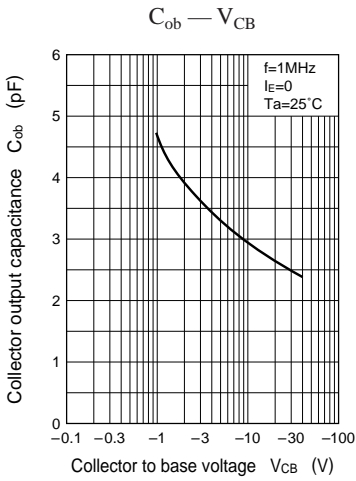


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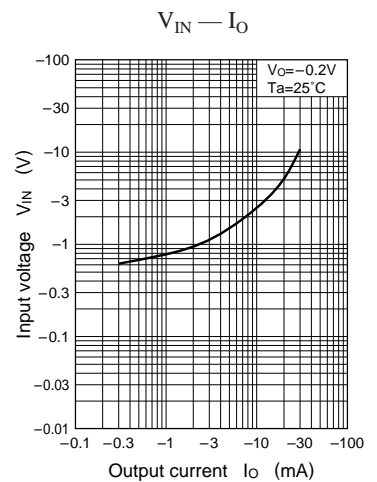
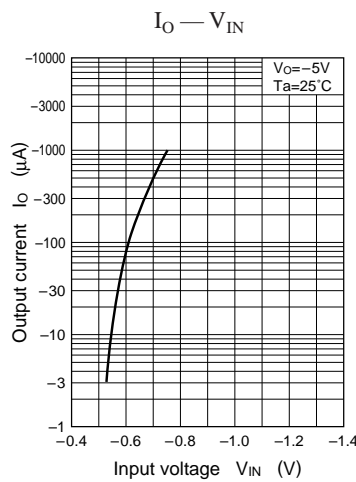
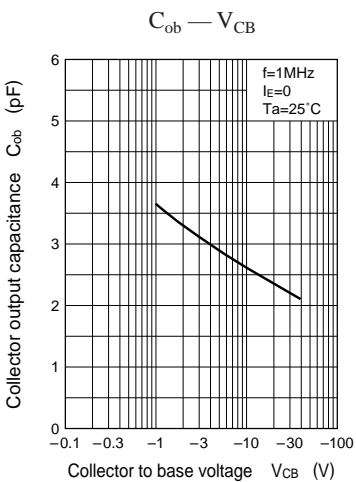
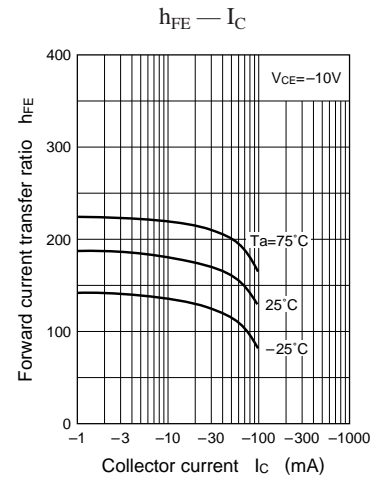
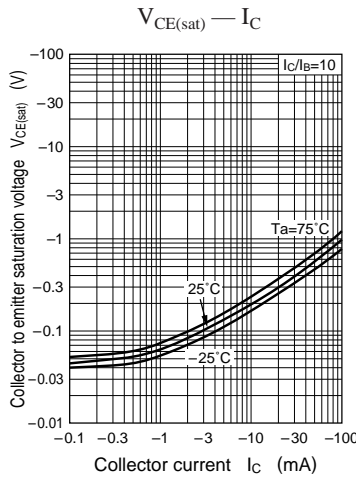
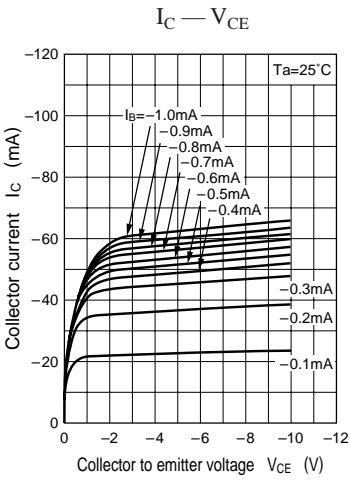


Characteristics charts of UNR2116

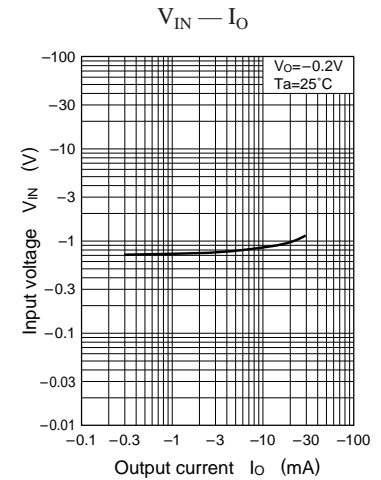
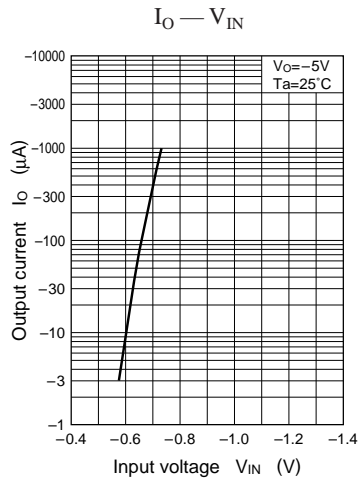
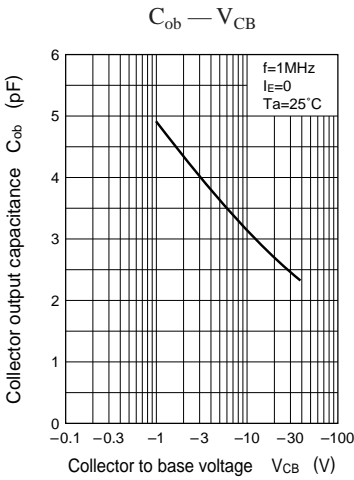
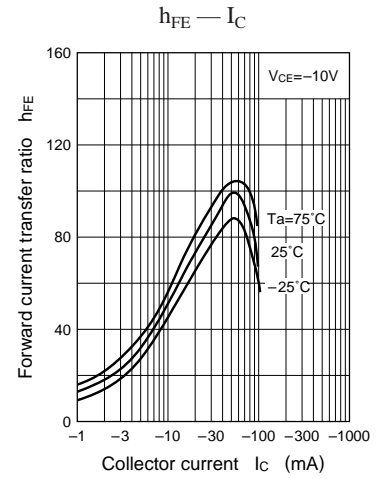
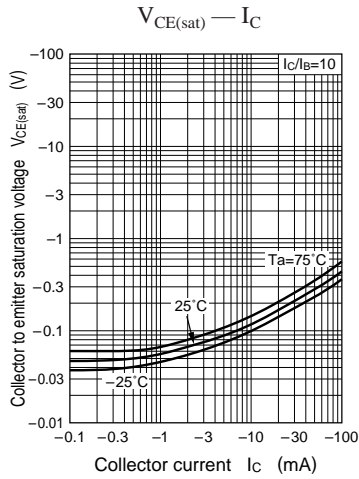
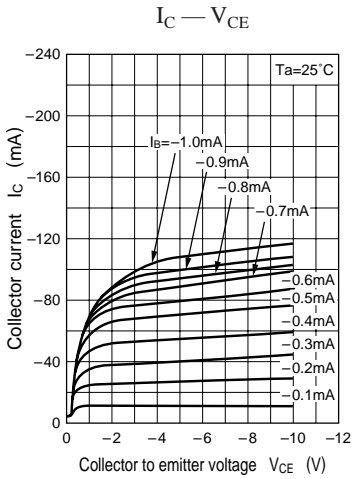




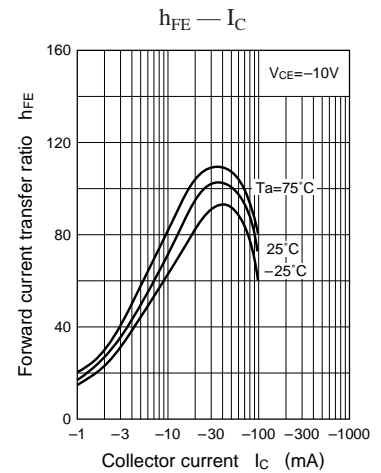
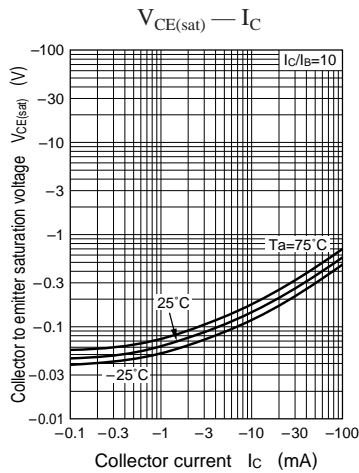
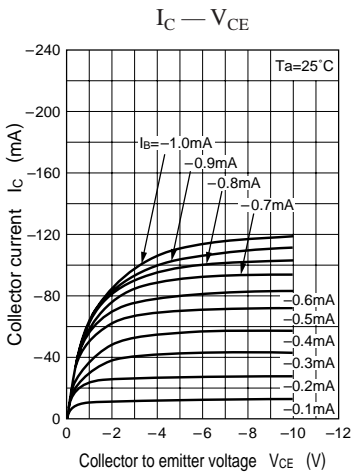
Characteristics charts of UNR2117

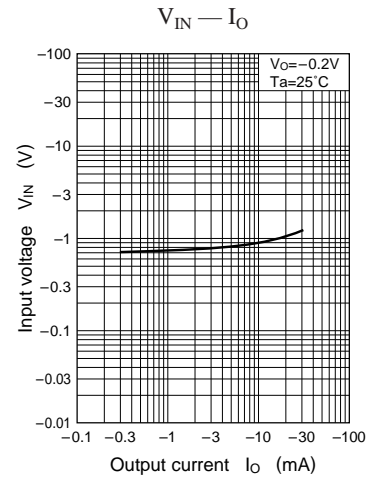
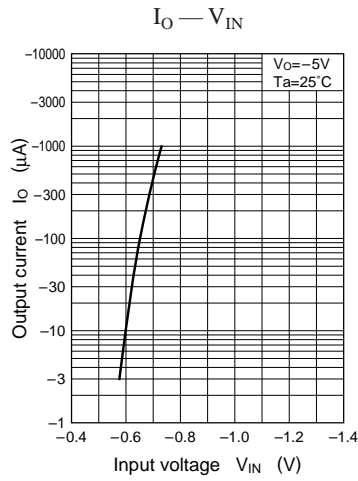
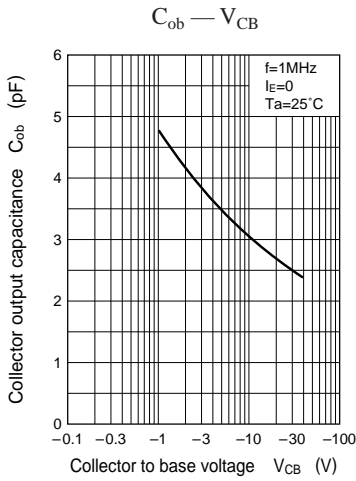


Characteristics charts of UNR2118

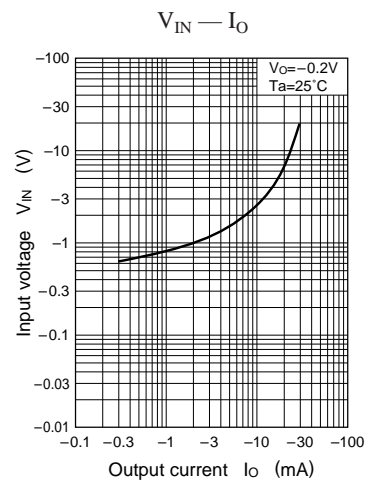
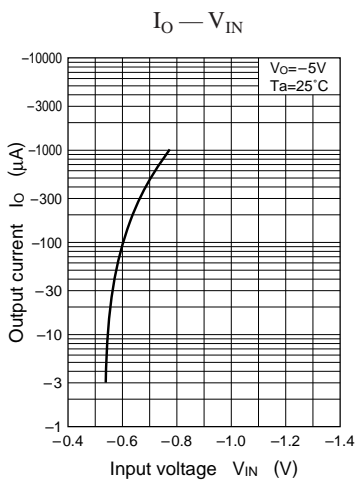
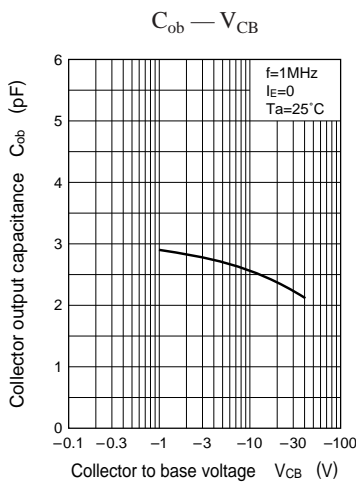
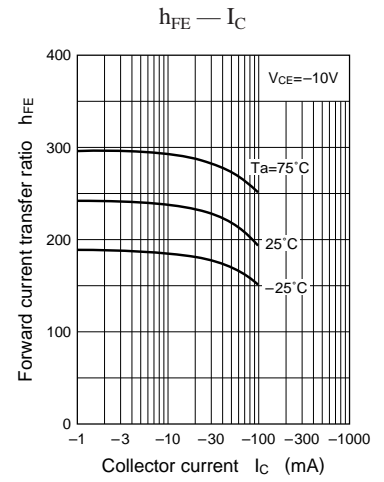
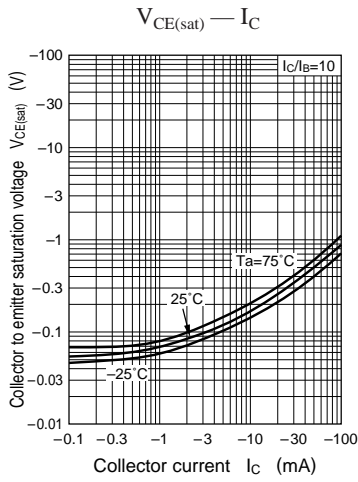
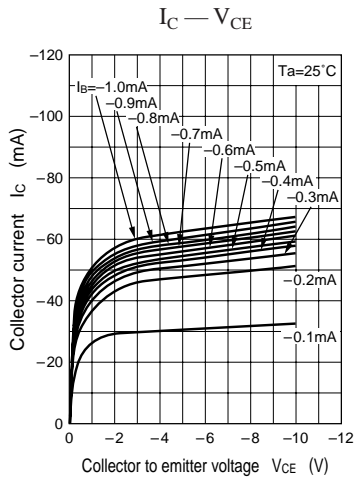


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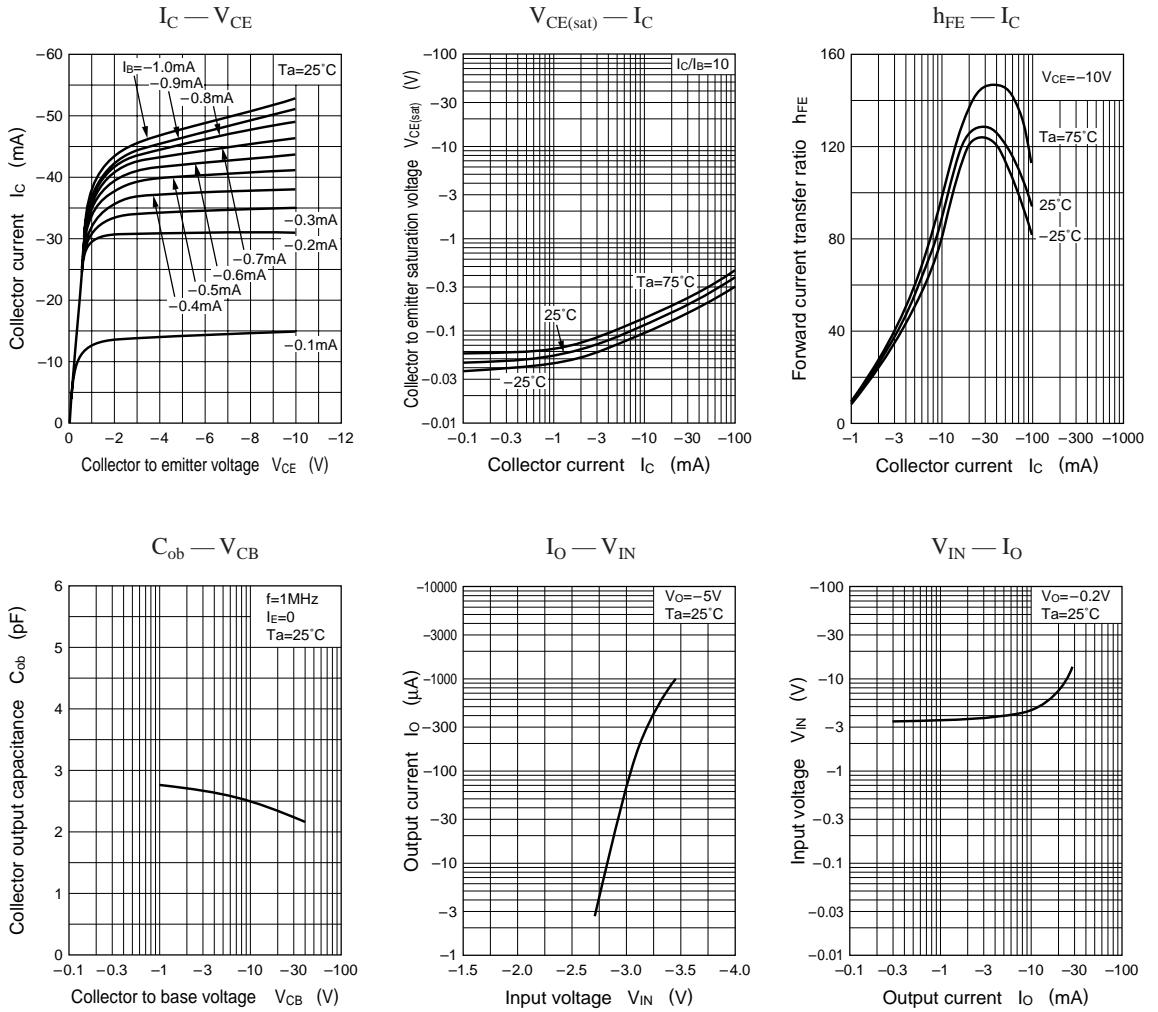




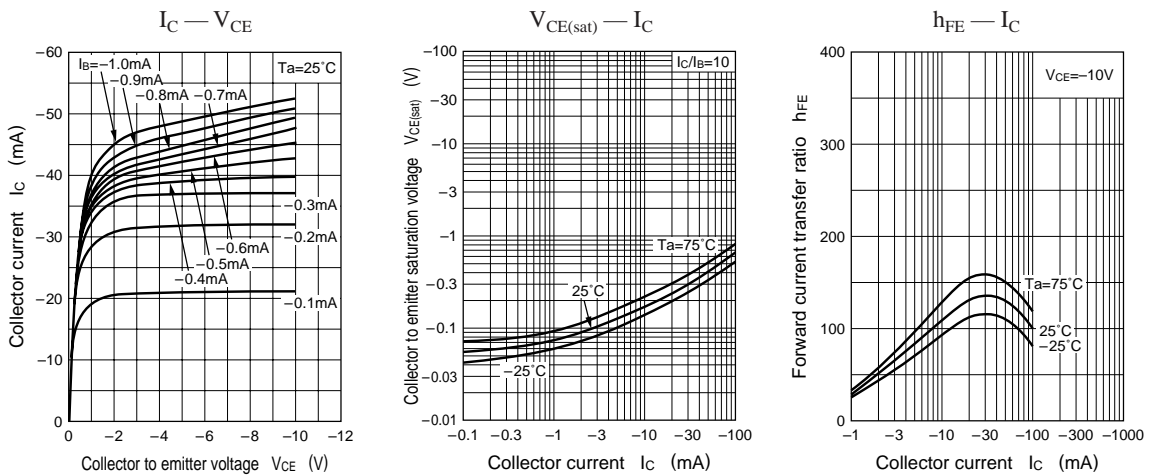
Characteristics charts of UNR2110



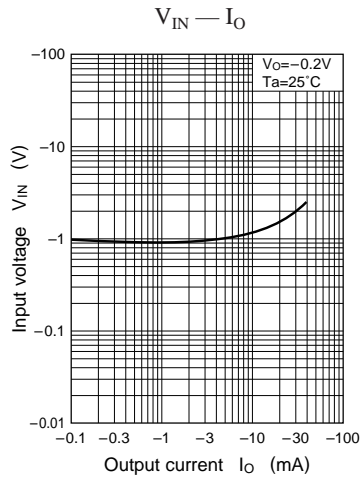
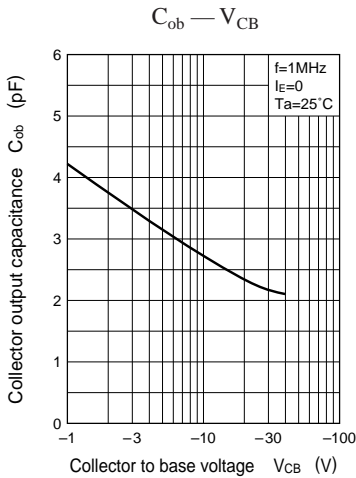
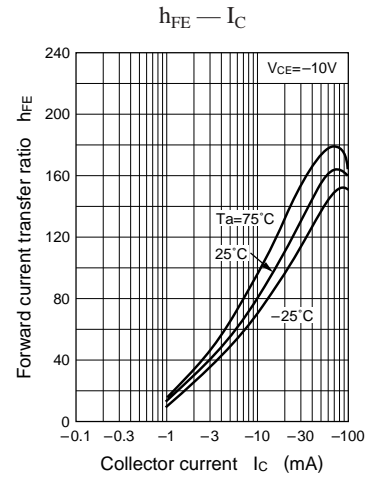
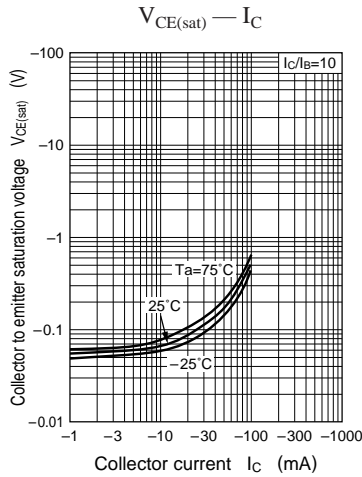
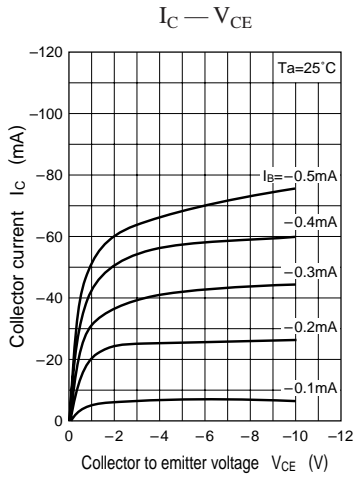
Characteristics charts of UNR211D



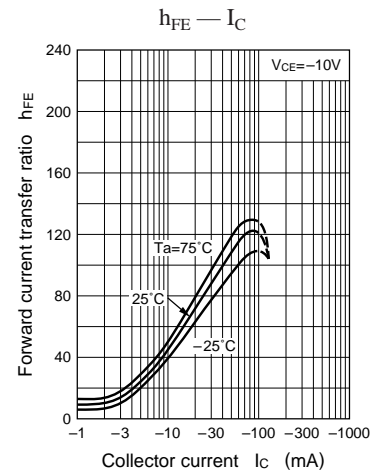
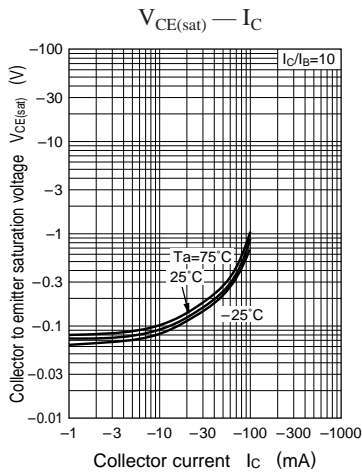
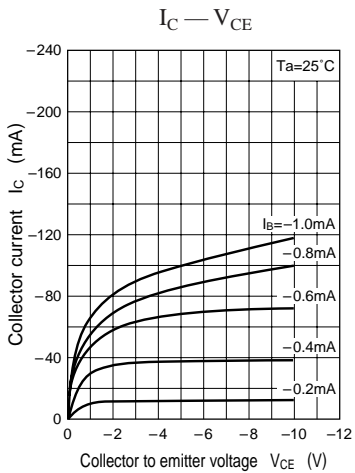
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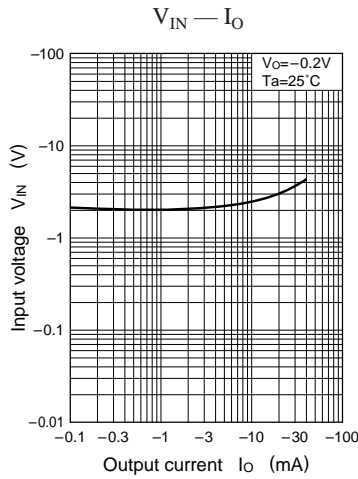
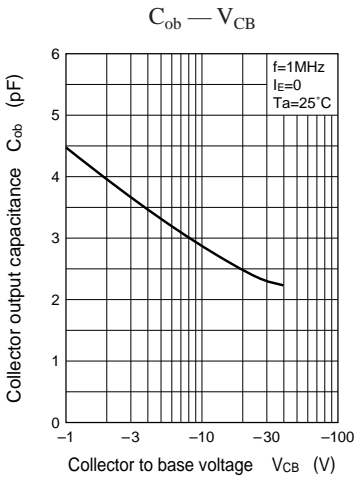


Characteristics charts of UNR211H

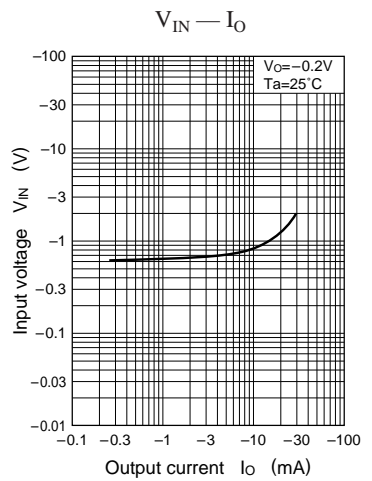
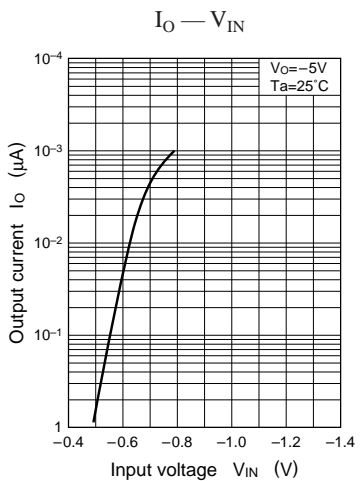
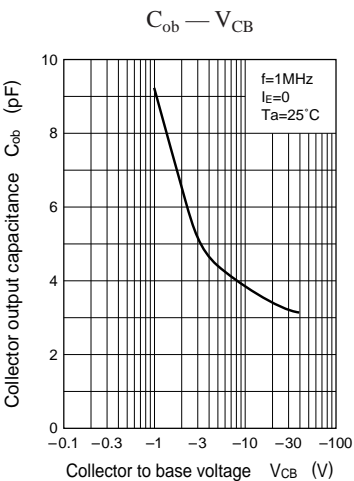
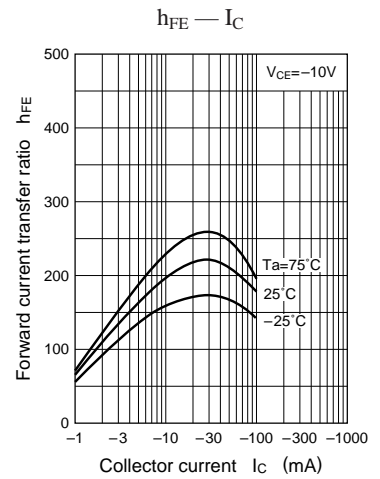
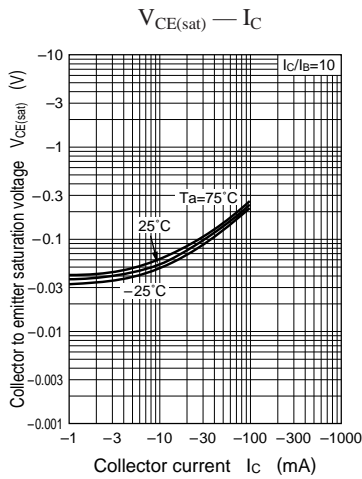
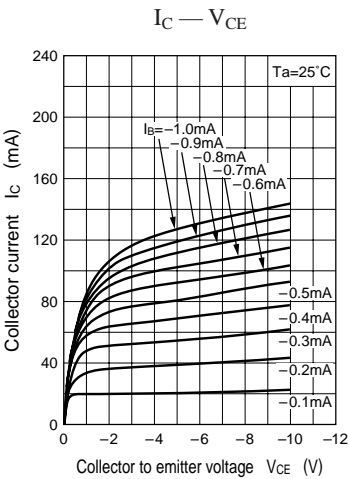


Characteristics charts of UNR211L

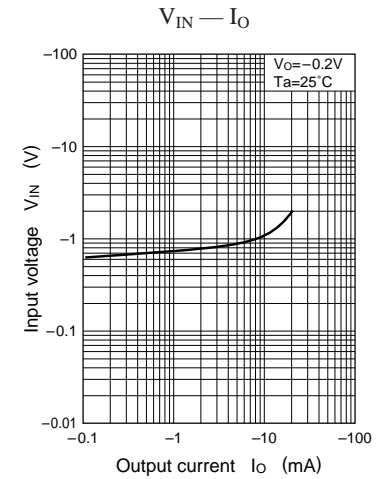
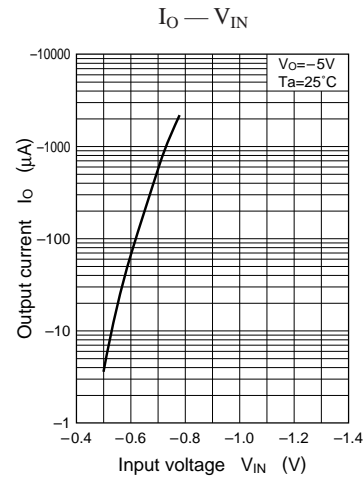
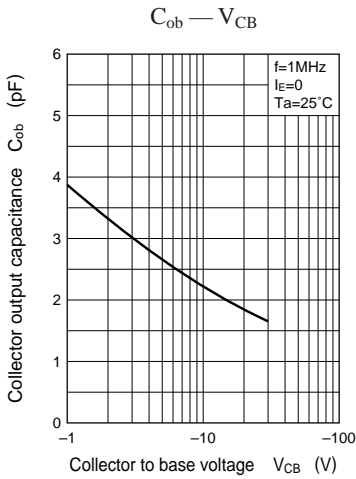
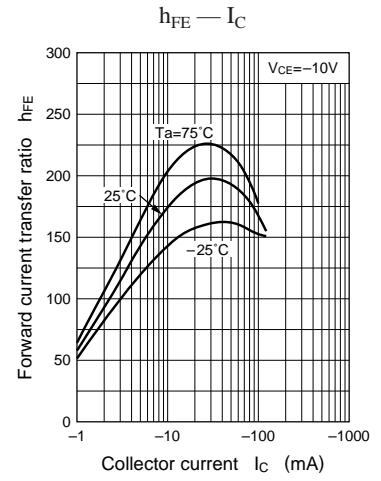
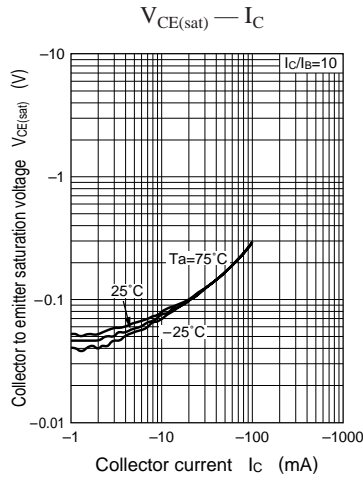
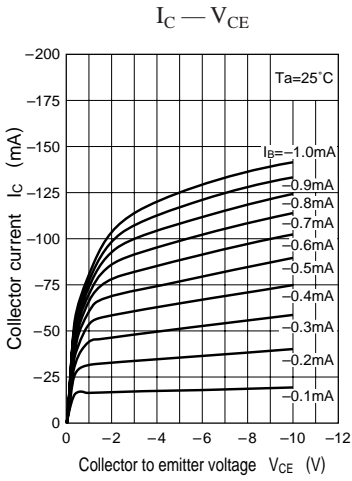




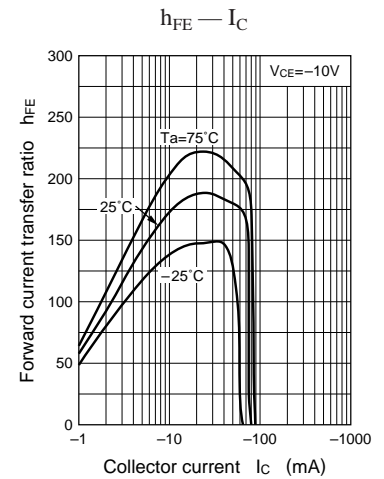
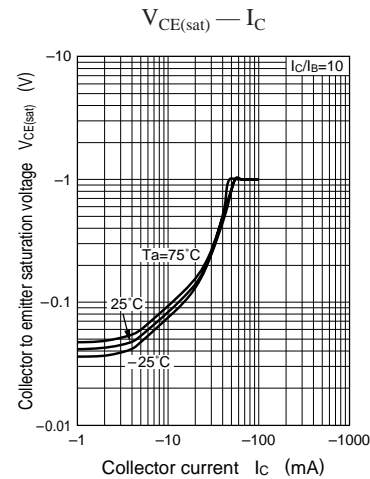
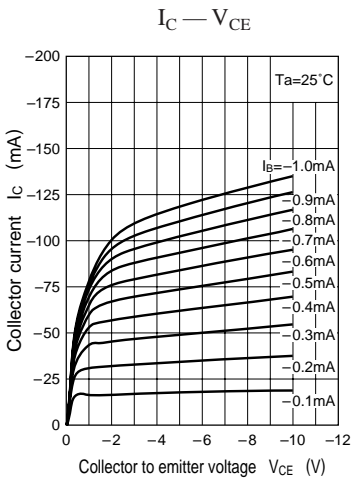
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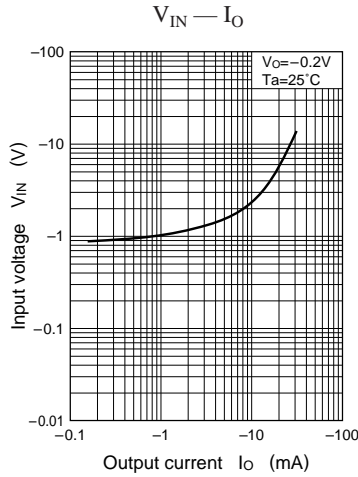
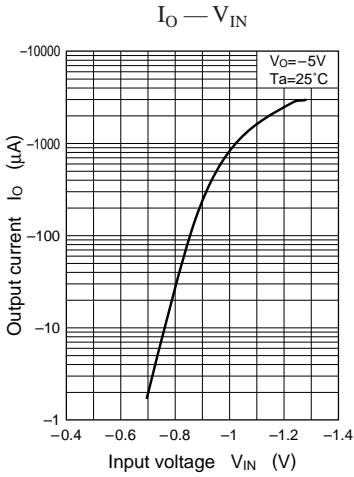


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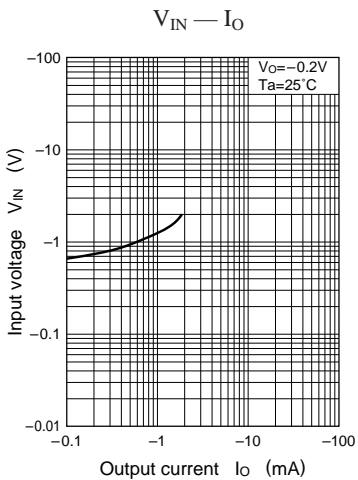
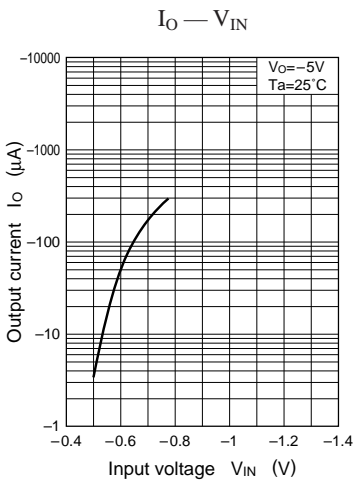
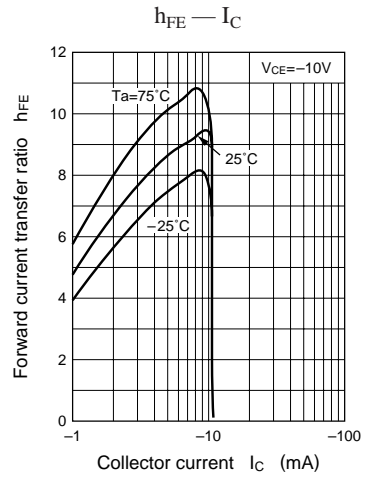
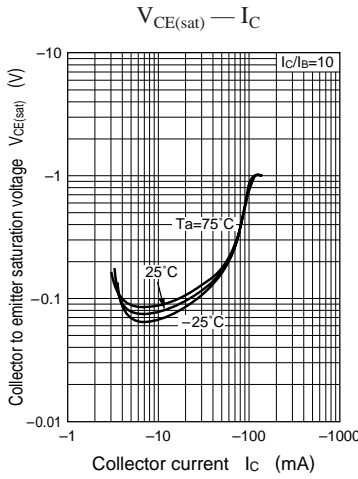
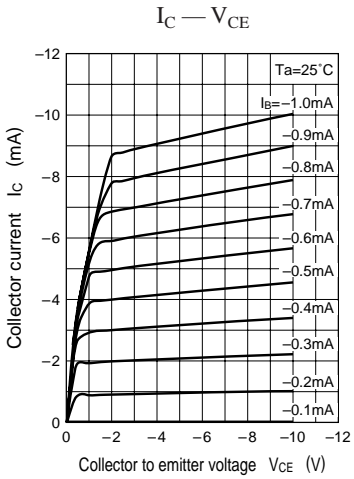


Characteristics charts of UNR211T

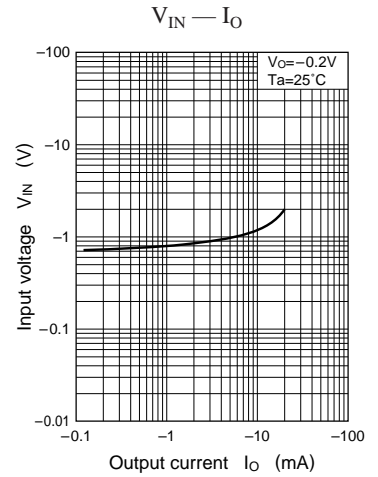
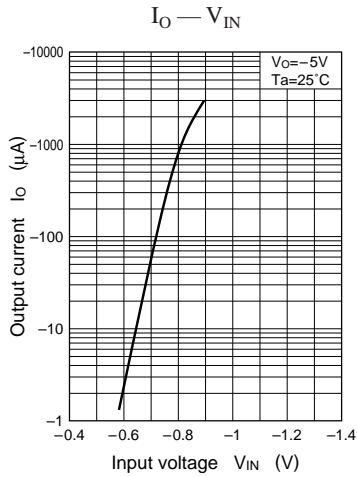
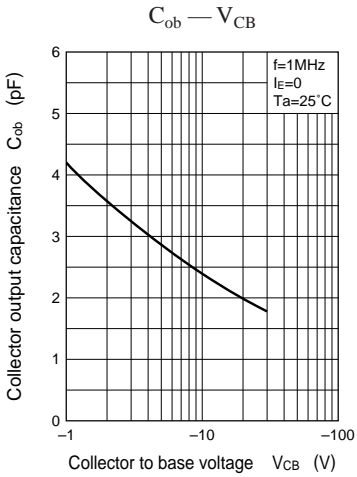
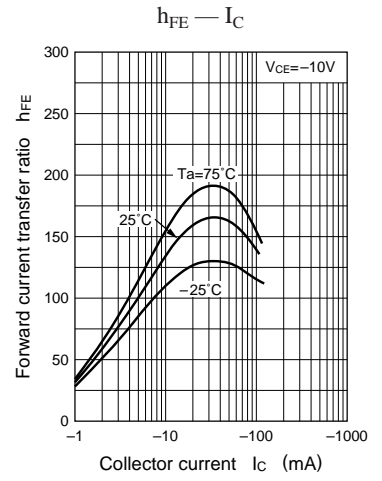
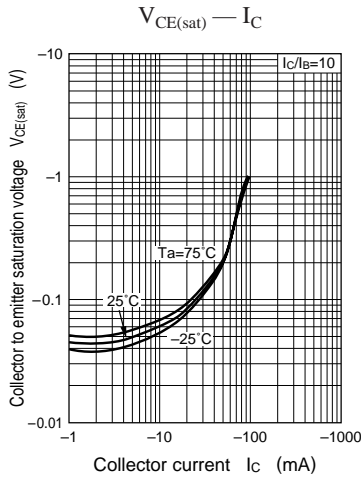
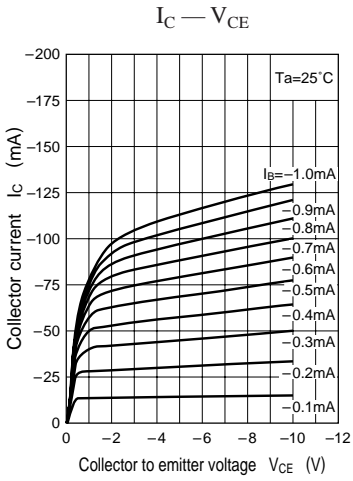




Characteristics charts of UNR211V



Characteristics charts of UNR211Z



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