

# UNR5111/5112/5113/5114/5115/5116/5117/5118/5119/5110/ 511D/511E/511F/511H/511L/511M/511N/511T/511V/511Z (UN5111/5112/5113/5114/5115/5116/5117/5118/5119/5110/511D/511E/511F/ 511H/511L/511M/511N/511T/511V/511Z)

Silicon PNP epitaxial planer transistor

For digital circuits

## Features

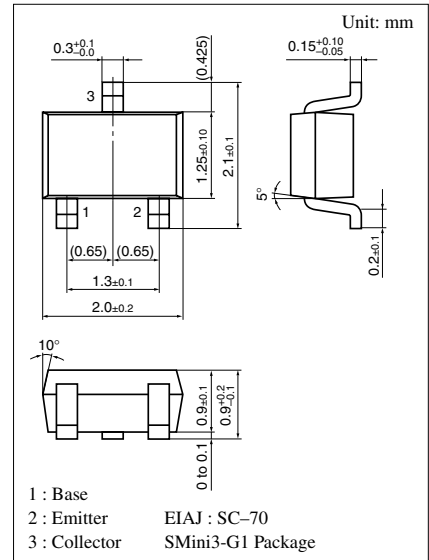
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- S-Mini type package, allowing automatic insertion through tape packing and magazine packing.

## Resistance by Part Number

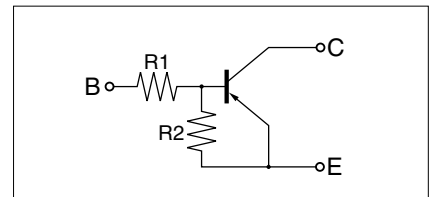
	Marking Symbol	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR5111	6A	10kΩ	10kΩ
• UNR5112	6B	22kΩ	22kΩ
• UNR5113	6C	47kΩ	47kΩ
• UNR5114	6D	10kΩ	47kΩ
• UNR5115	6E	10kΩ	—
• UNR5116	6F	4.7kΩ	—
• UNR5117	6H	22kΩ	—
• UNR5118	6I	0.51Ω	5.1kΩ
• UNR5119	6K	1kΩ	10kΩ
• UNR5110	6L	47kΩ	—
• UNR511D	6M	47kΩ	10kΩ
• UNR511E	6N	47kΩ	22kΩ
• UNR511F	6O	4.7kΩ	10kΩ
• UNR511H	6P	2.2kΩ	10kΩ
• UNR511L	6Q	4.7kΩ	4.7kΩ
• UNR511M	EI	2.2kΩ	47kΩ
• UNR511N	EW	4.7kΩ	47kΩ
• UNR511T	EY	22kΩ	47kΩ
• UNR511V	FC	2.2kΩ	2.2kΩ
• UNR511Z	FE	4.7kΩ	22kΩ

## Absolute Maximum Ratings (T<sub>a</sub>=25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V <sub>CBO</sub>	-50	V
Collector to emitter voltage	V <sub>CEO</sub>	-50	V
Collector current	I <sub>C</sub>	-100	mA
Total power dissipation	P <sub>T</sub>	150	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C



## Internal Connection



Note) The Part numbers in the Parenthesis show conventional part number.

UNR5111/5112/5113/5114/5115/5116/5117/5118/5119/5110/  
**Transistors with built-in Resistor 511D/511E/511F/511H/511L/511M/511N/511T/511V/511Z**

**Electrical Characteristics** (T<sub>a</sub>=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Collector cutoff current		I <sub>CBO</sub>	V <sub>CB</sub> = -50V, I <sub>E</sub> = 0			-0.1	μA
		I <sub>CEO</sub>	V <sub>CE</sub> = -50V, I <sub>B</sub> = 0			-0.5	μA
Emitter cutoff current	UNR5111	I <sub>EBO</sub>	V <sub>EB</sub> = -6V, I <sub>C</sub> = 0			-0.5	mA
	UNR5112/5114/511E/511D/511M/511N/511T					-0.2	
	UNR5113					-0.1	
	UNR5115/5116/5117/5110					-0.01	
	UNR511F/511H					-1.0	
	UNR5119					-1.5	
	UNR5118/511L/511V					-2.0	
	UNR511Z					-0.4	
Collector to base voltage		V <sub>CBO</sub>	I <sub>C</sub> = -10μA, I <sub>E</sub> = 0	-50			V
UNR511N/511T/511V/511Z				-50			
Collector to emitter voltage		V <sub>CEO</sub>	I <sub>C</sub> = -2mA, I <sub>B</sub> = 0	-50			V
UNR511N/511T				-50			
Forward current transfer ratio	UNR5111	h <sub>FE</sub>	V <sub>CE</sub> = -10V, I <sub>C</sub> = -5mA	35			
	UNR5112/511E			60			
	UNR5113/5114/511M			80			
	UNR5115*/5116*/5117*/5110*			160	460		
	UNR511F/511D/5119/511H			30			
	UNR5118/511L			20			
	UNR511N/511T			80	400		
	UNR511V			6	20		
UNR511Z	0	200					
Collector to emitter saturation voltage		V <sub>CE(sat)</sub>	I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.3mA			-0.25	V
UNR511V				I <sub>C</sub> = -10mA, I <sub>B</sub> = -1.5mA			
Output voltage high level		V <sub>OH</sub>	V <sub>CC</sub> = -5V, V <sub>B</sub> = -0.5V, R <sub>L</sub> = 1kΩ	-4.9			V
Output voltage low level		V <sub>OL</sub>	V <sub>CC</sub> = -5V, V <sub>B</sub> = -2.5V, R <sub>L</sub> = 1kΩ			-0.2	V
			V <sub>CC</sub> = -5V, V <sub>B</sub> = -3.5V, R <sub>L</sub> = 1kΩ			-0.2	
			V <sub>CC</sub> = -5V, V <sub>B</sub> = -10V, R <sub>L</sub> = 1kΩ			-0.2	
			V <sub>CC</sub> = -5V, V <sub>B</sub> = -6V, R <sub>L</sub> = 1kΩ			-0.2	
Transition frequency		f <sub>T</sub>	V <sub>CB</sub> = -10V, I <sub>E</sub> = 1mA, f = 200MHz		80		MHz
			UNR511Z	V <sub>CB</sub> = -10V, I <sub>E</sub> = 1mA, f = 200MHz		150	
Input resistance	UNR5111/5114/5115	R <sub>i</sub>		(-30%)	10	(+30%)	kΩ
	UNR5112/5117/511T				22		
	UNR5113/5110/511D/511E				47		
	UNR5116/511F/511L/511N/511Z				4.7		
	UNR5118				0.51		
	UNR5119				1		
	UNR511H/511M/511V				2.2		

\* h<sub>FE</sub> rank classification (UNR5115/5116/5117/5110)

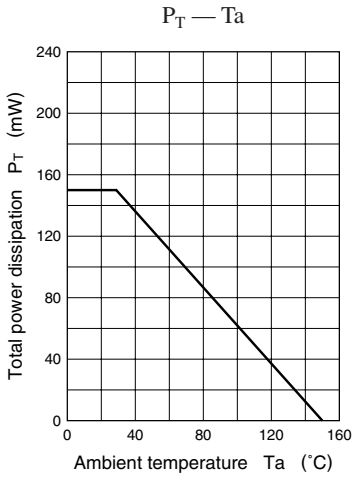
Rank	Q	R	S
h <sub>FE</sub>	160 to 260	210 to 340	290 to 460

UNR5111/5112/5113/5114/5115/5116/5117/5118/5119/5110/  
 Transistors with built-in Resistor 511D/511E/511F/511H/511L/511M/511N/511T/511V/511Z

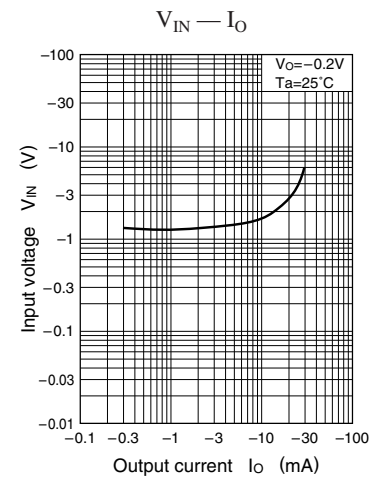
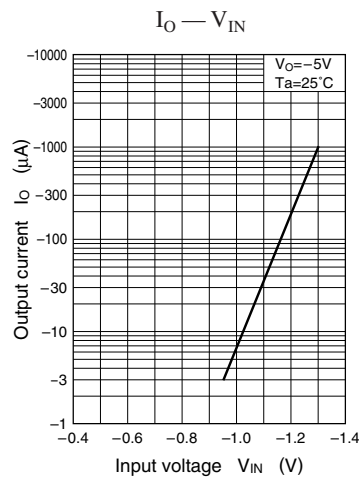
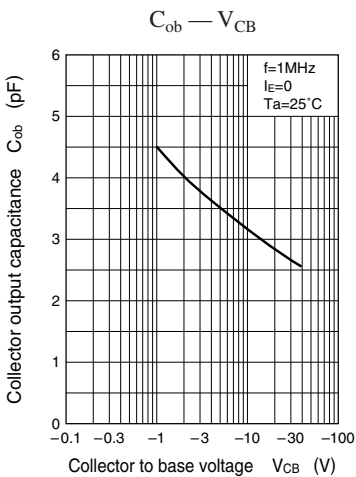
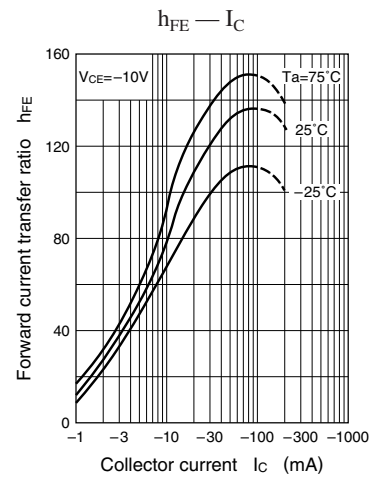
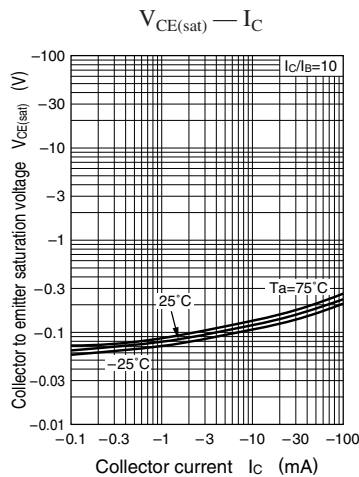
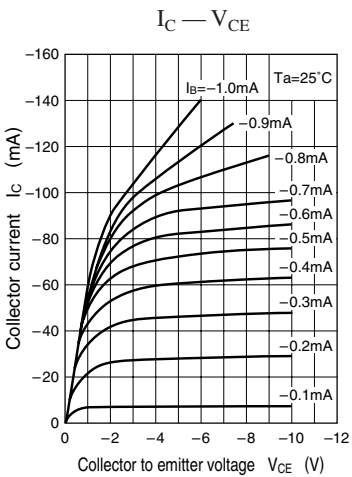
■ Electrical Characteristics (continued) (Ta=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Resis- tance ratio	UNR5111/5112/5113/511L	$R_1/R_2$		0.8	1.0	1.2	
	UNR5114			0.17	0.21	0.25	
	UNR5118/5119			0.08	0.1	0.12	
	UNR511D				4.7		
	UNR511E				2.14		
	UNR511F/511T				0.47		
	UNR511H			0.17	0.22	0.27	
	UNR511M				0.047		
	UNR511N				0.1		
	UNR511V				1.0		
	UNR511Z				0.21		

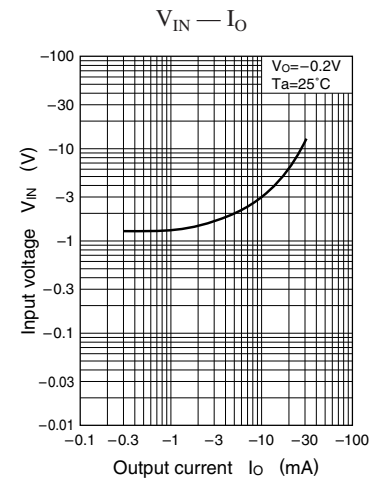
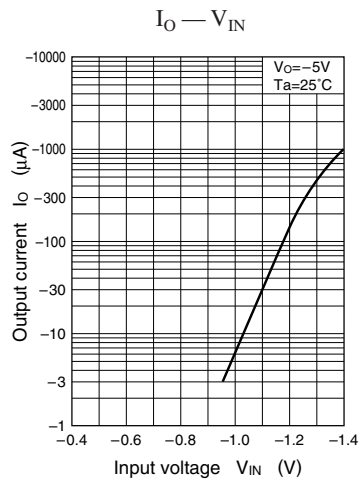
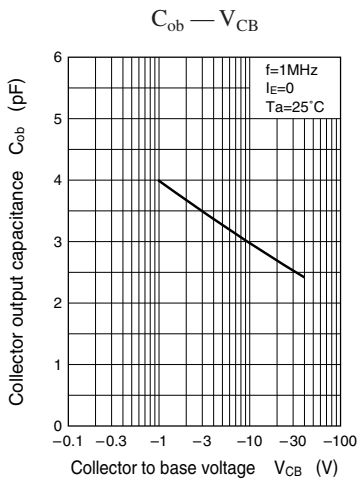
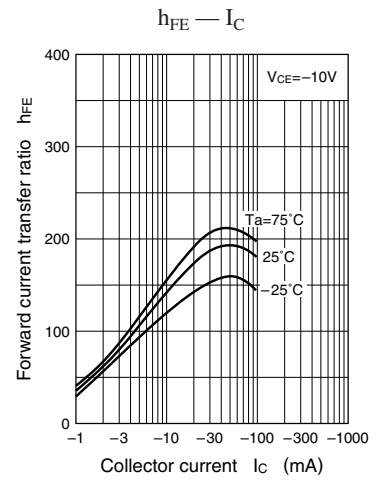
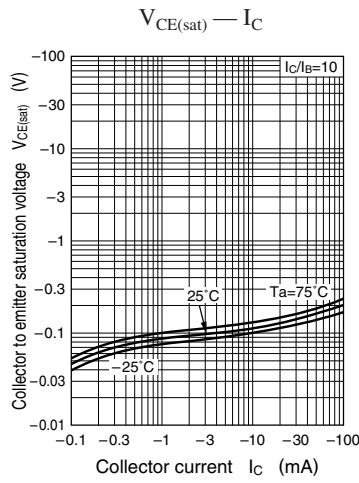
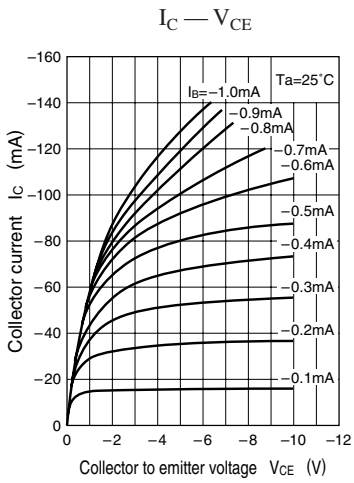
Common characteristics chart



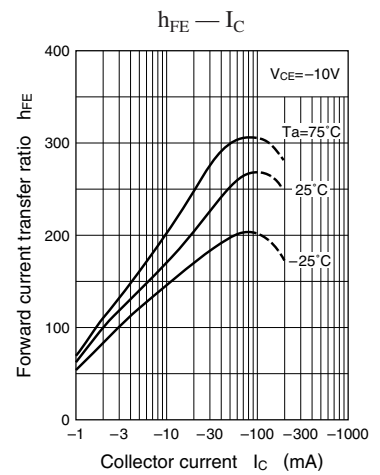
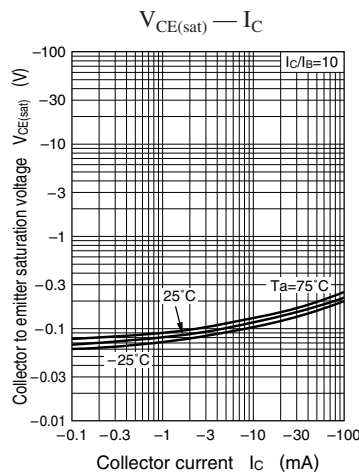
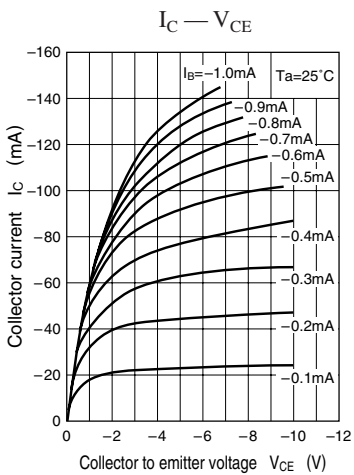
Characteristics charts of UNR5111

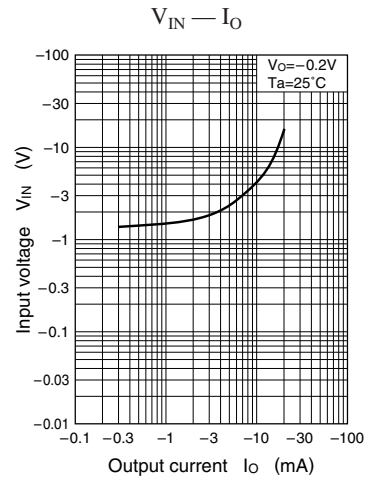
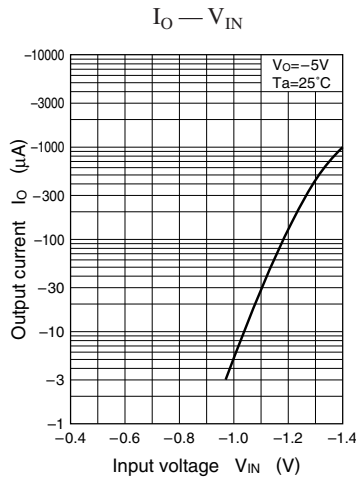
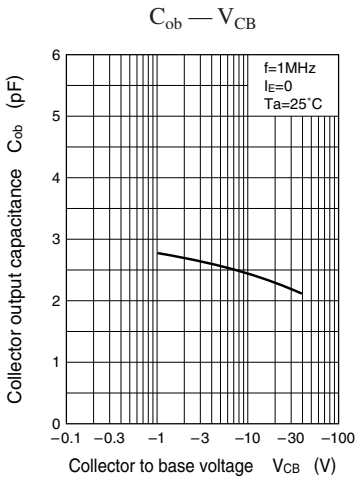


Characteristics charts of UNR5112

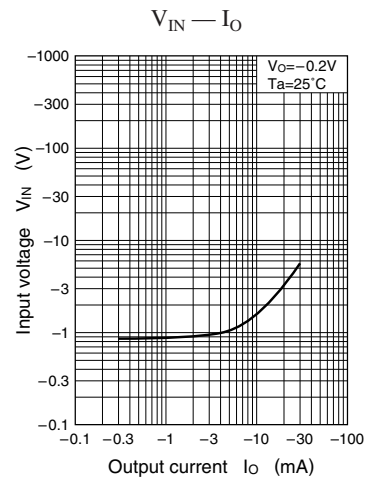
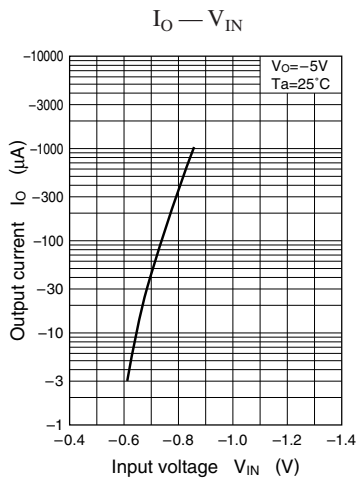
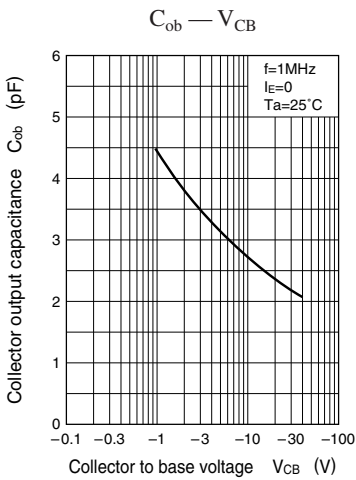
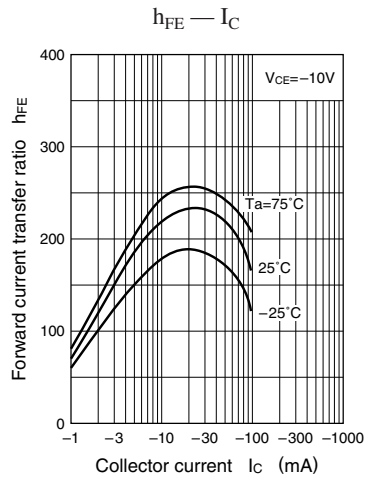
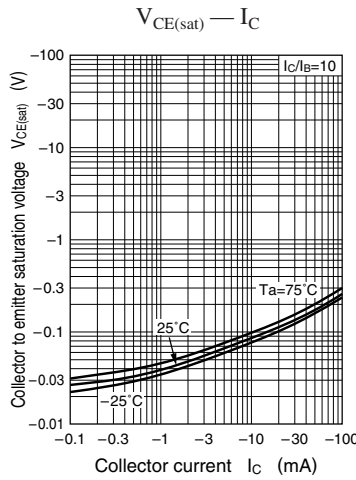
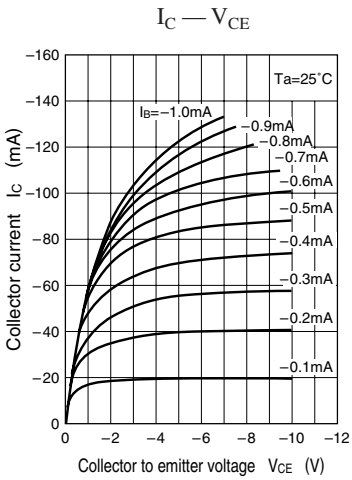


Characteristics charts of UNR5113

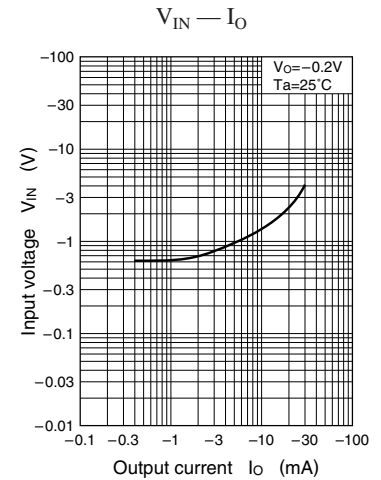
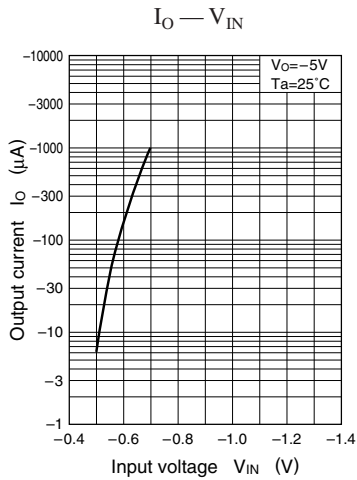
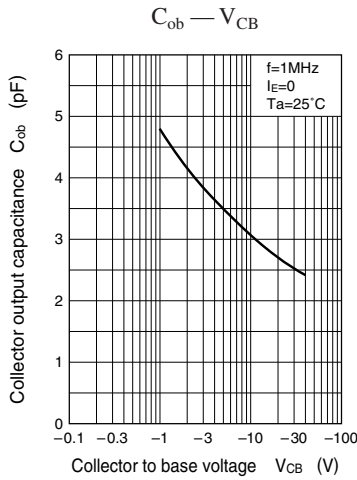
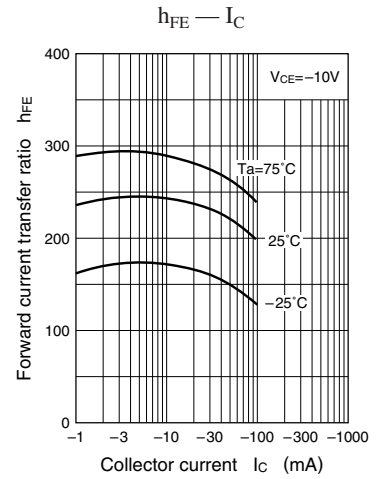
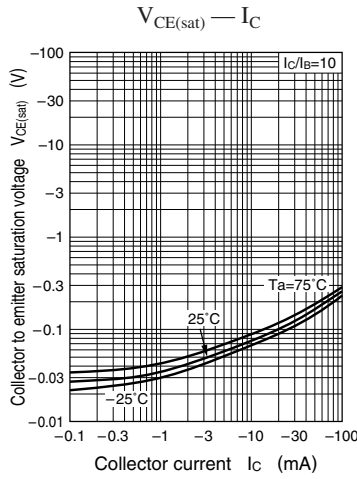
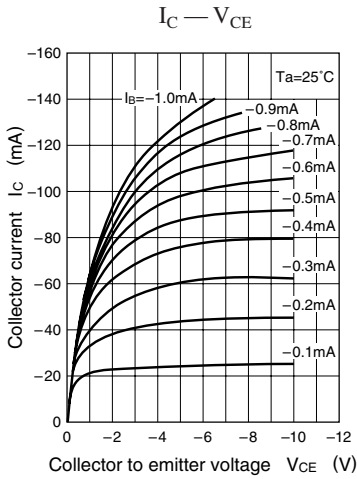




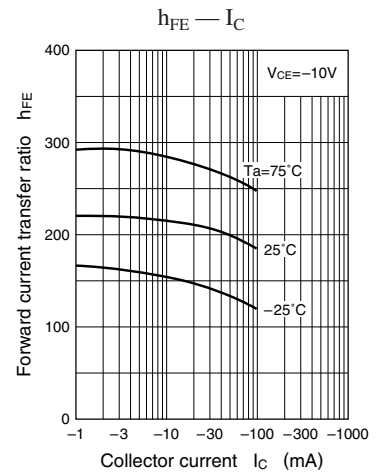
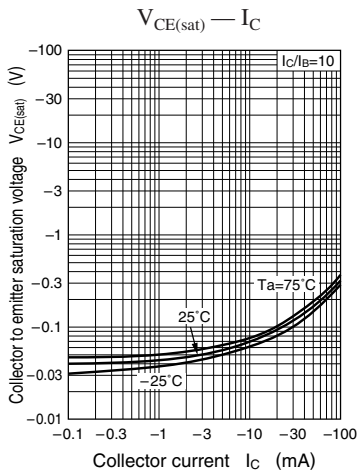
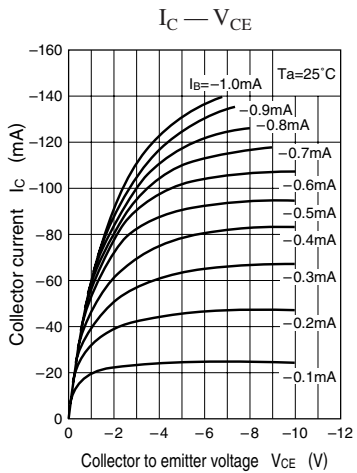
Characteristics charts of UNR5114

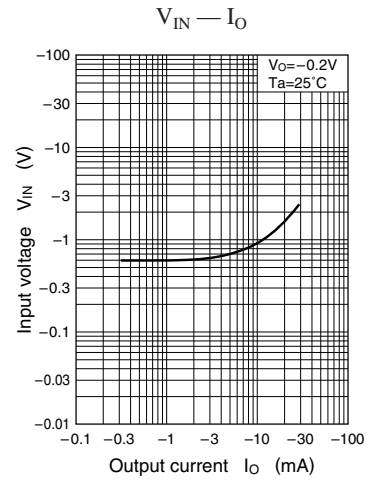
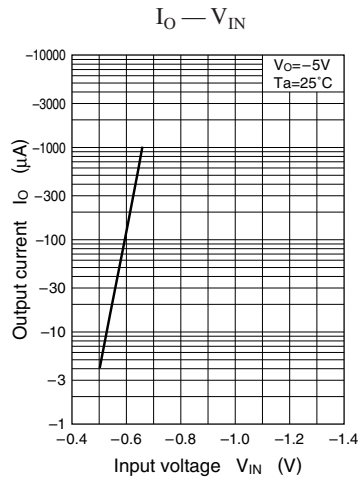
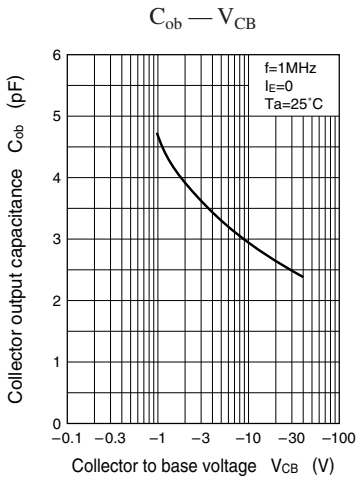


Characteristics charts of UNR5115

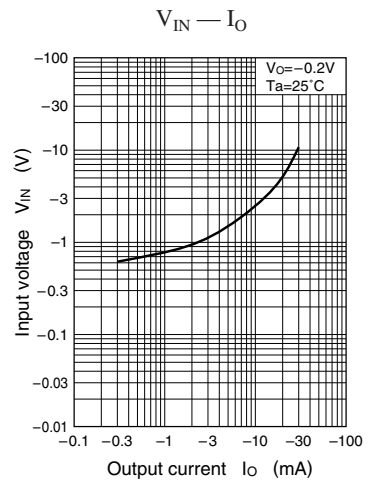
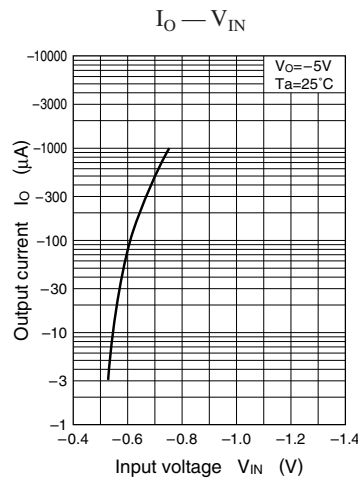
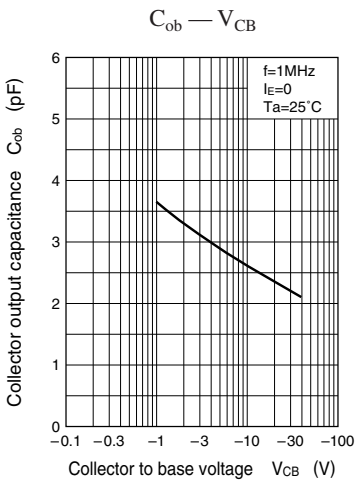
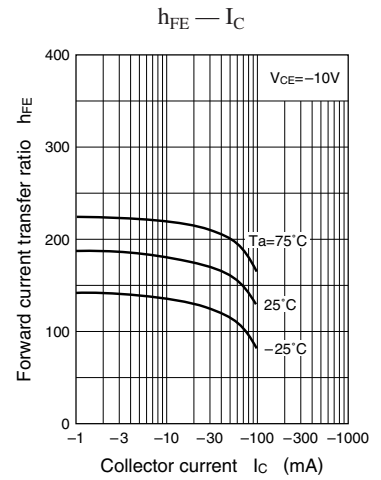
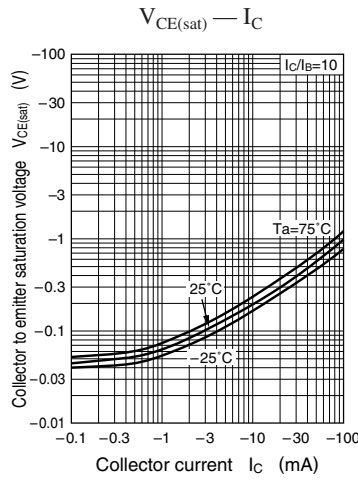
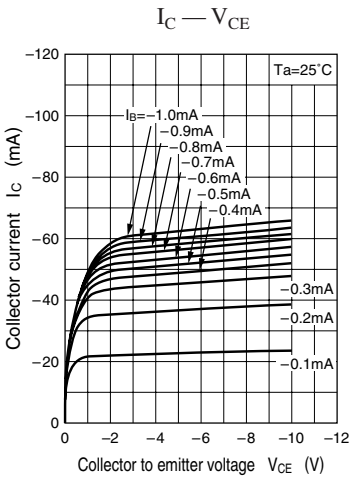


Characteristics charts of UNR5116



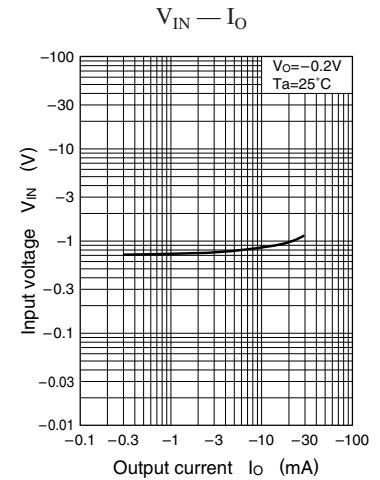
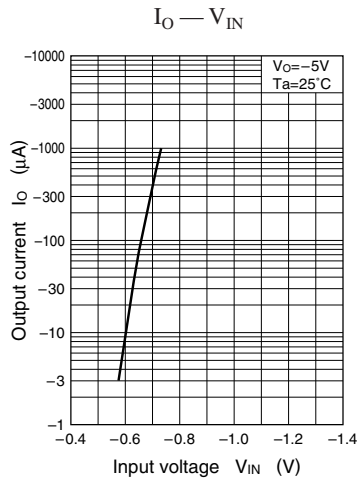
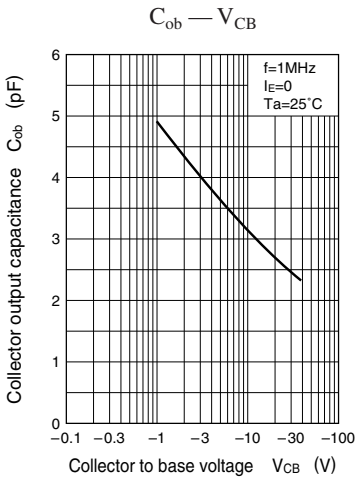
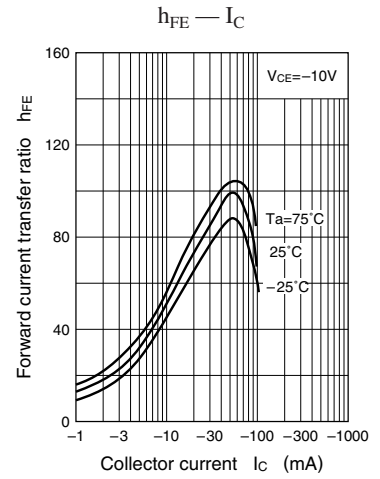
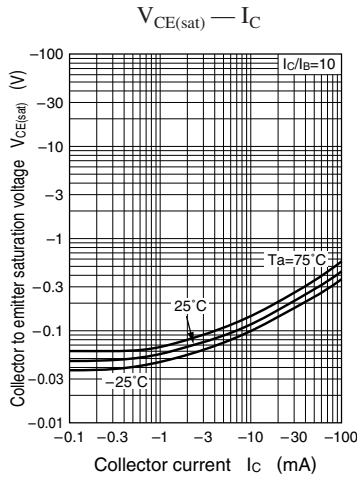
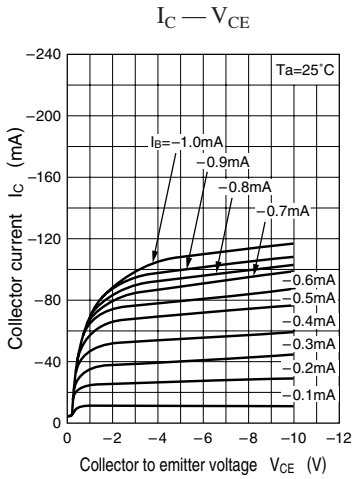


Characteristics charts of UNR5117

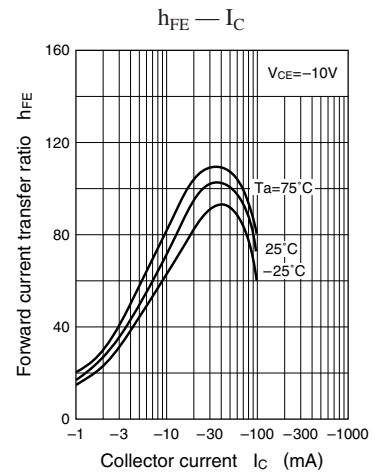
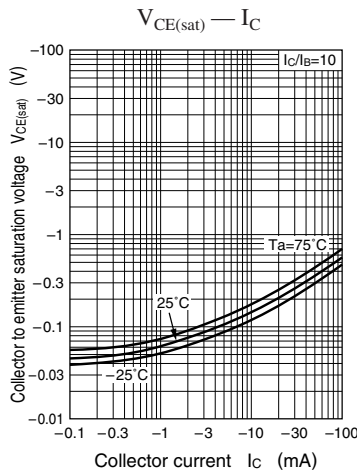
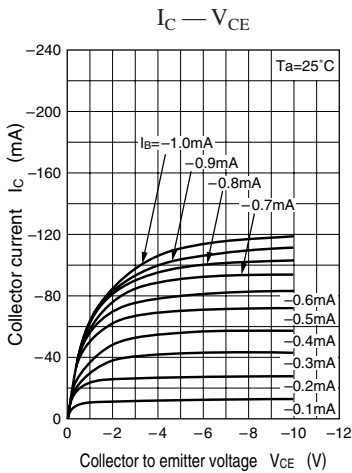


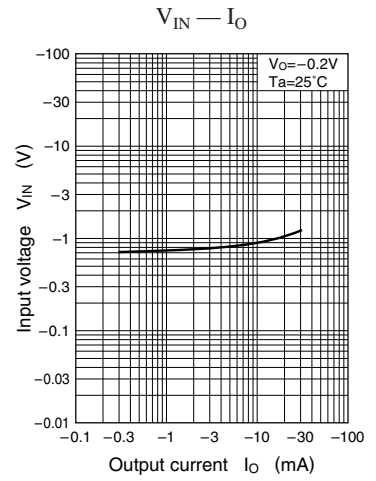
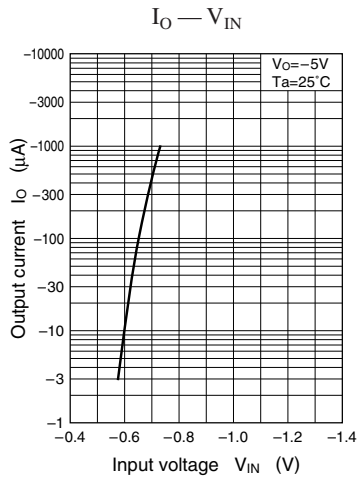
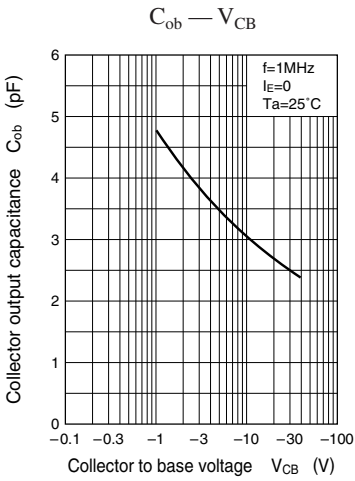


Characteristics charts of UNR5118

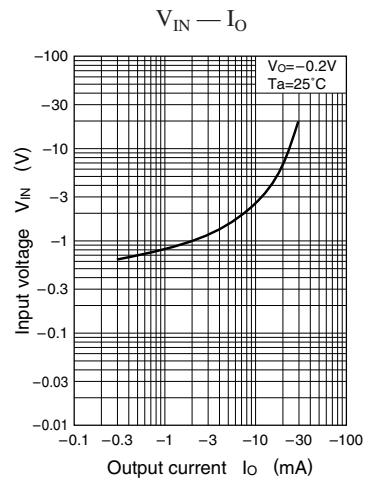
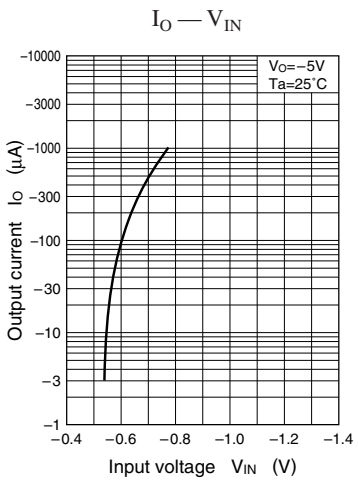
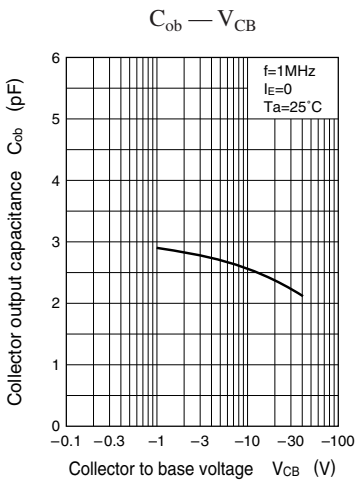
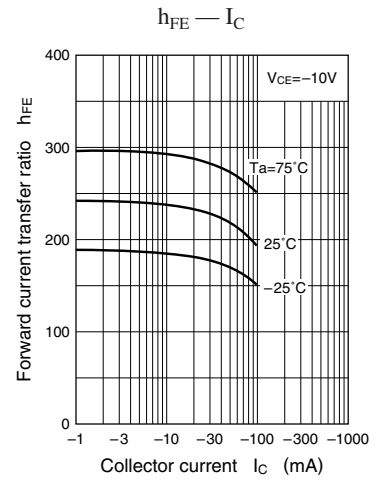
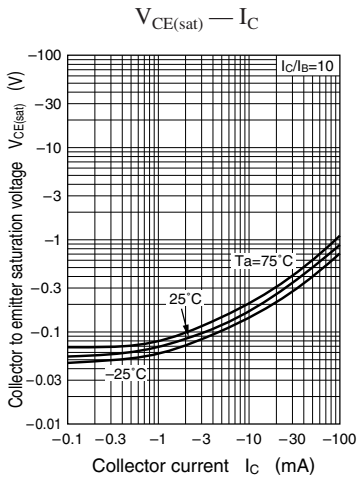
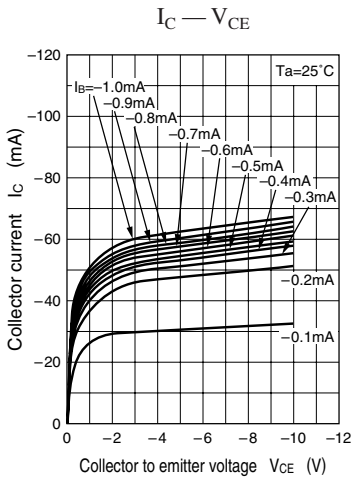


Characteristics charts of UNR5119

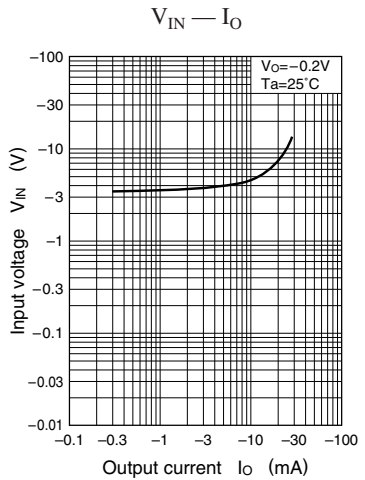
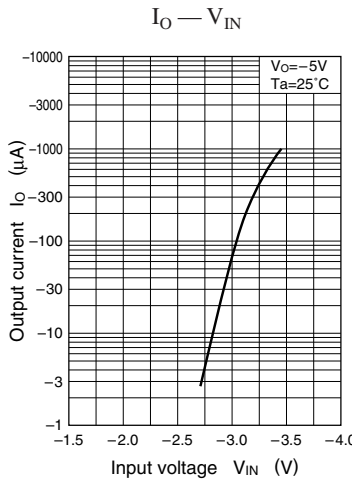
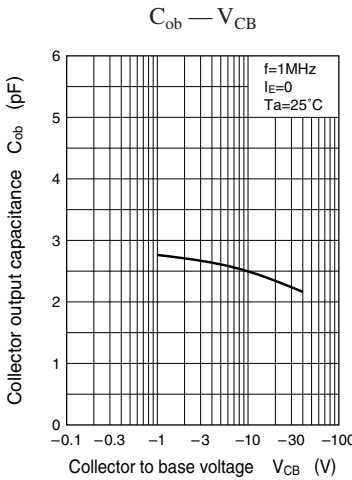
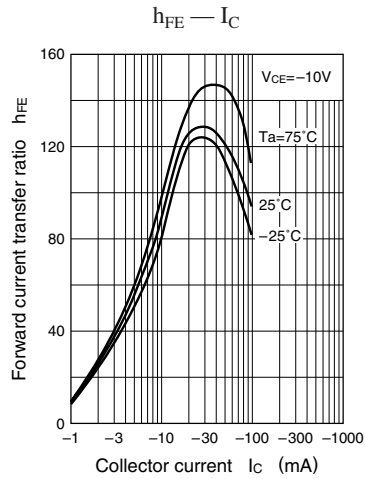
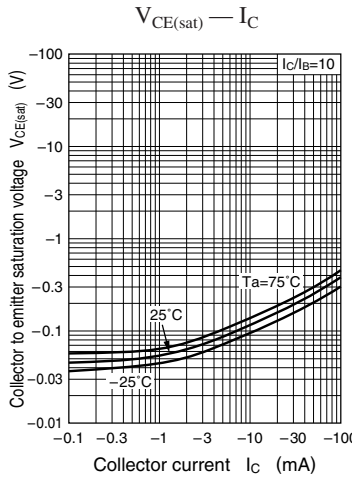
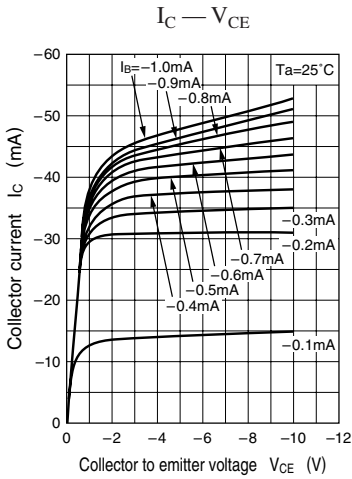




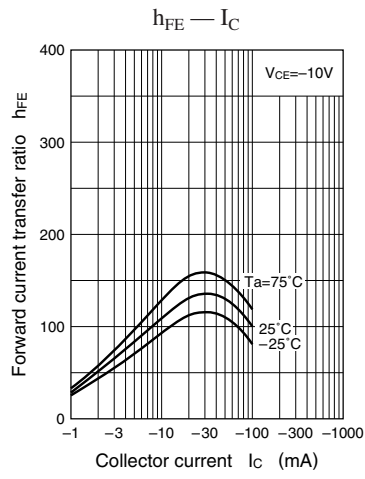
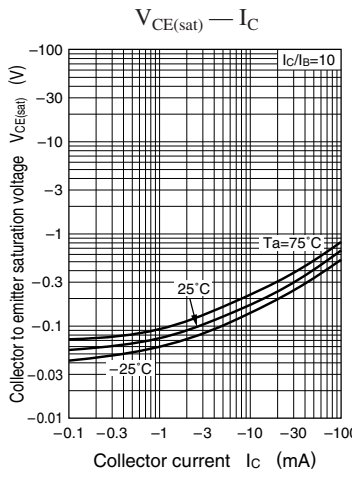
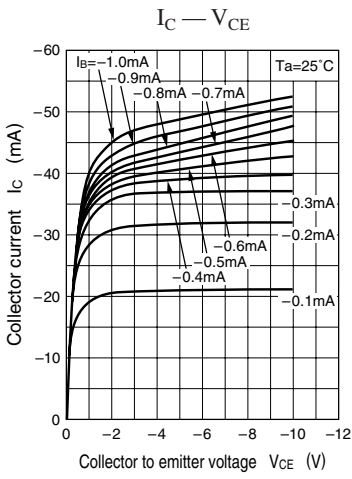
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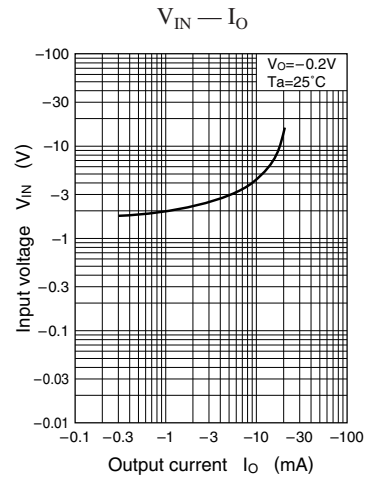
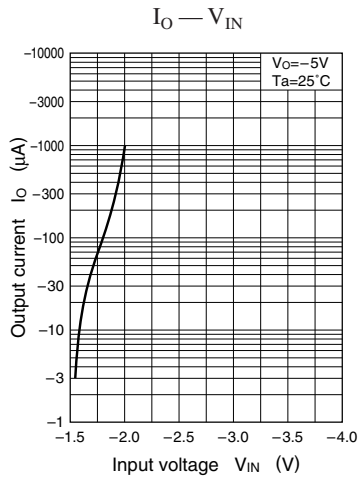
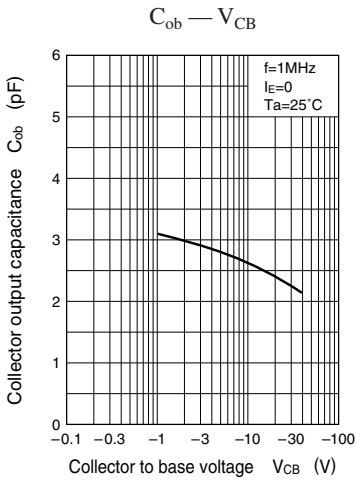


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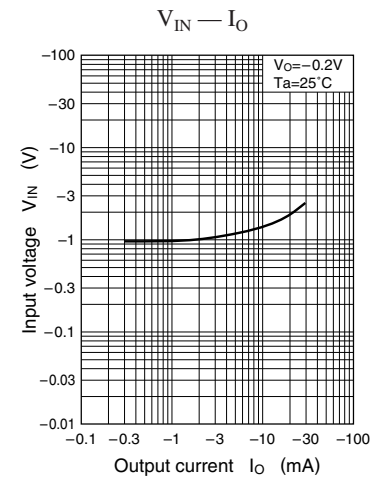
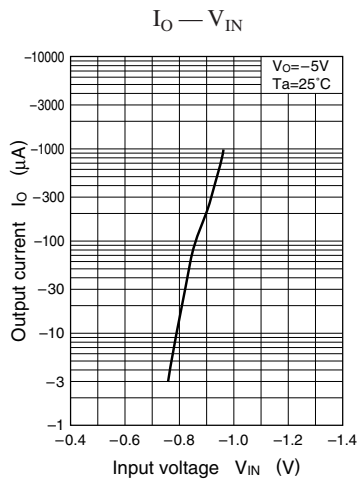
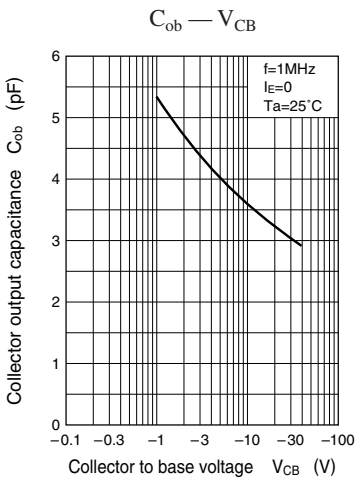
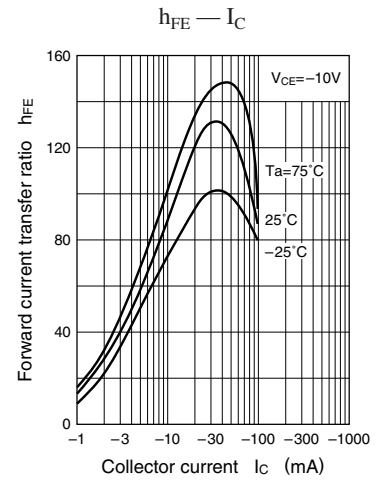
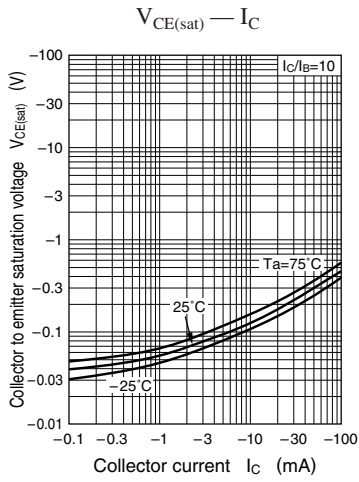
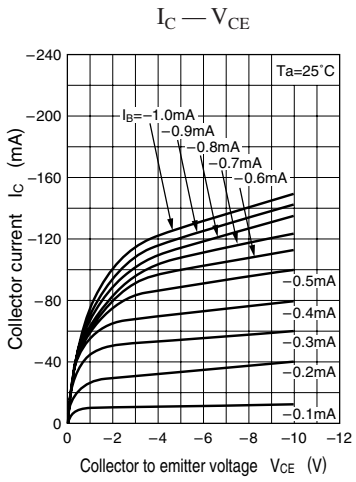


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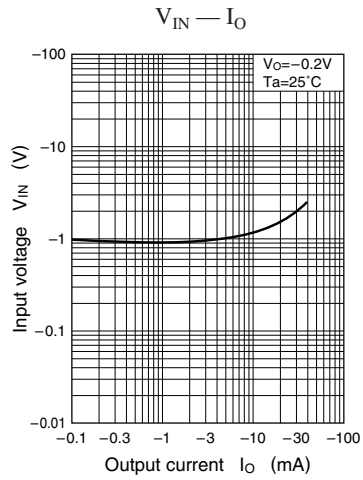
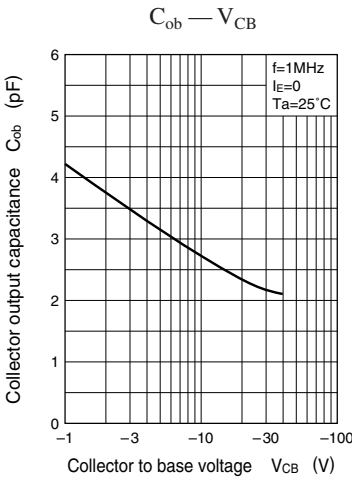
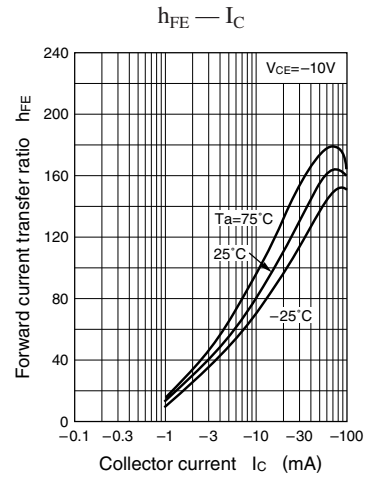
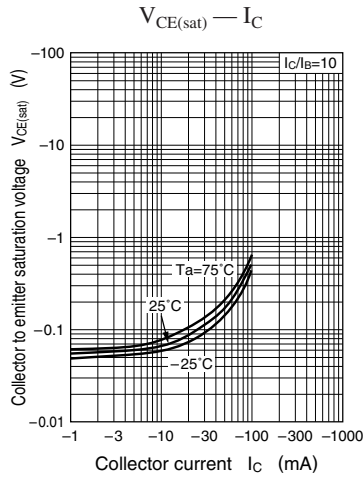
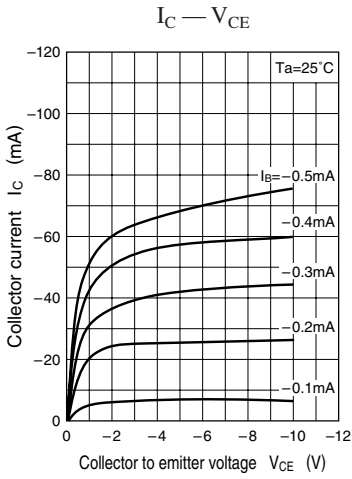




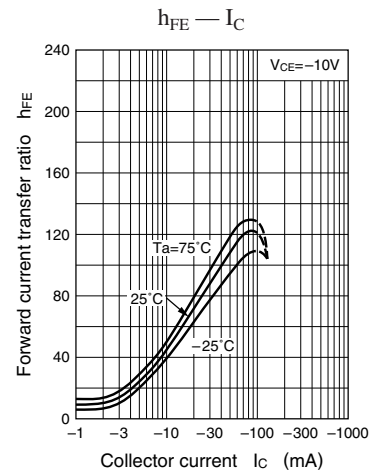
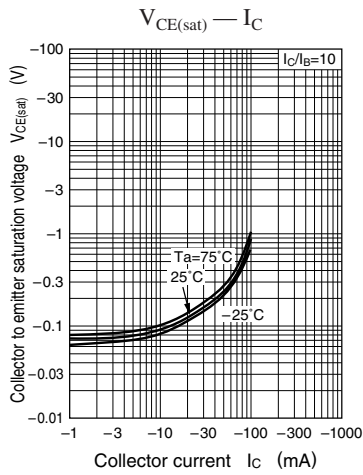
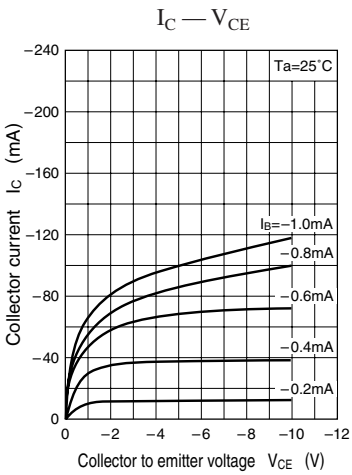
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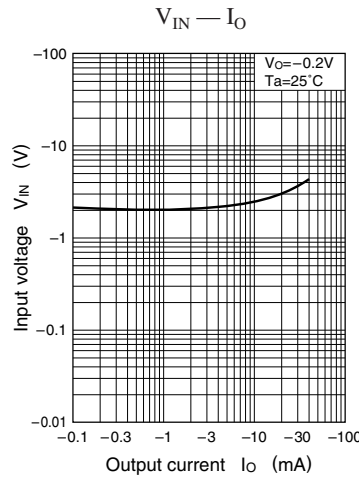
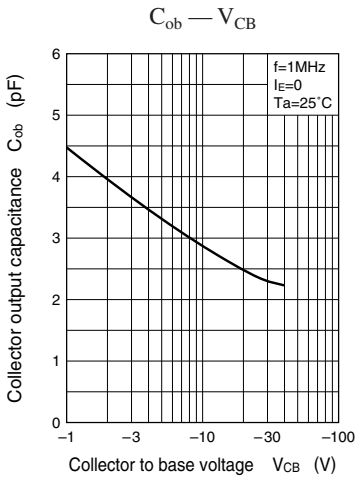


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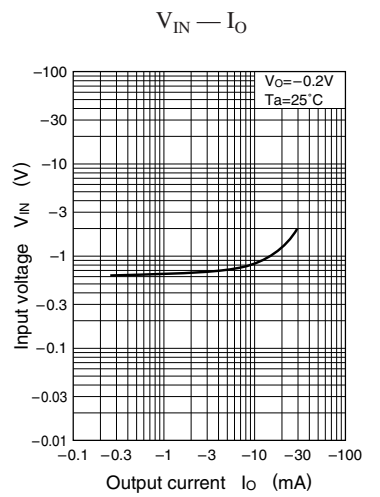
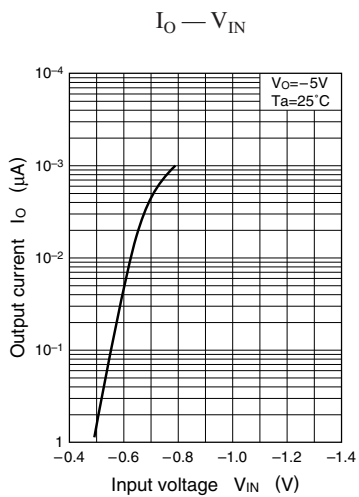
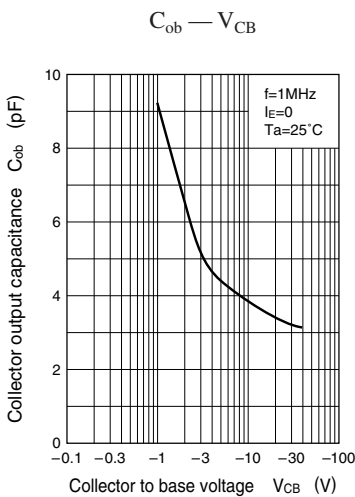
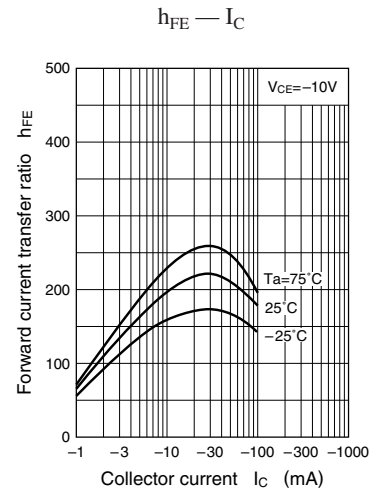
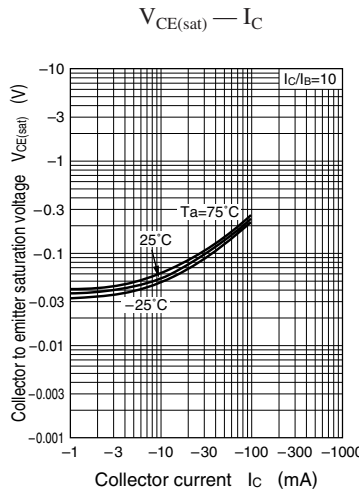
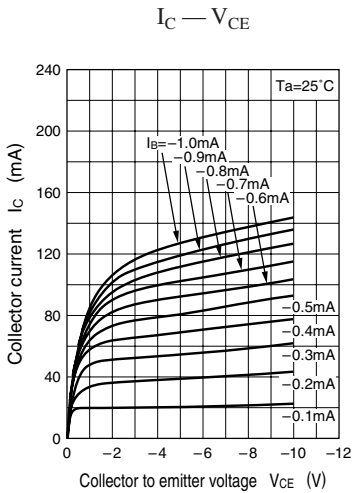


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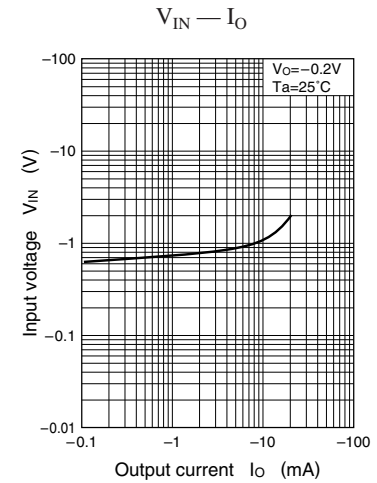
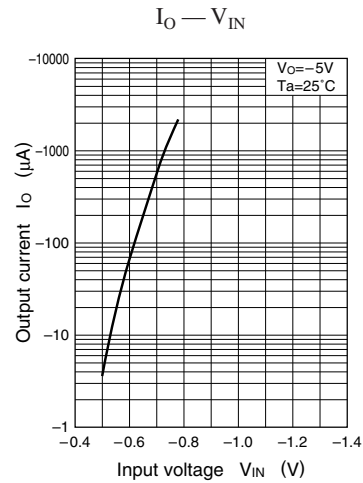
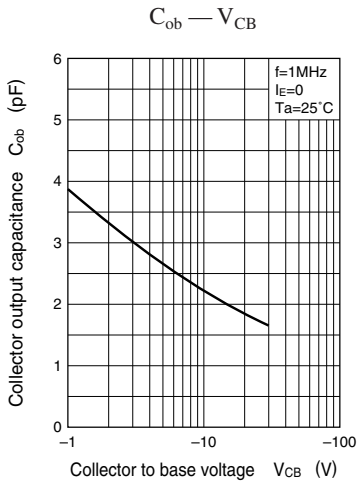
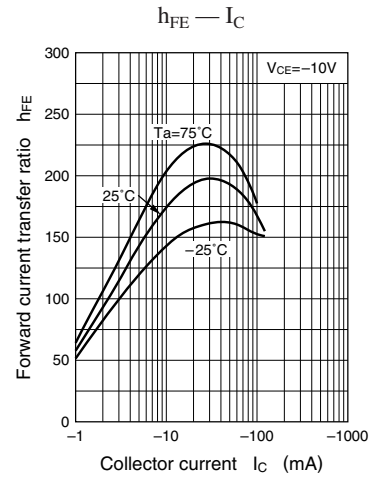
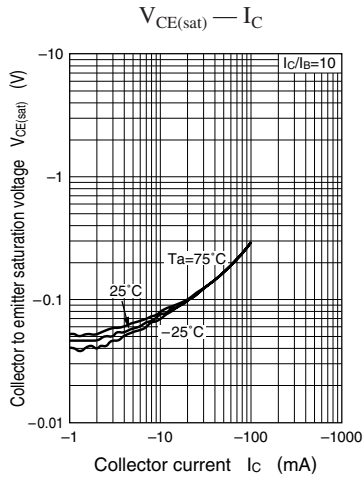
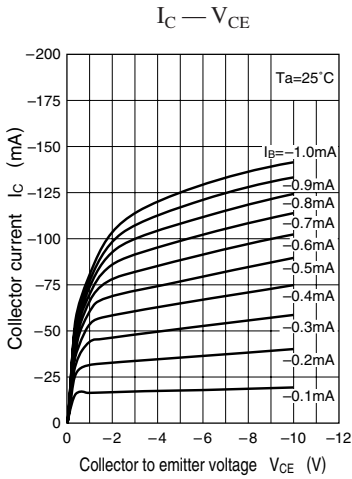




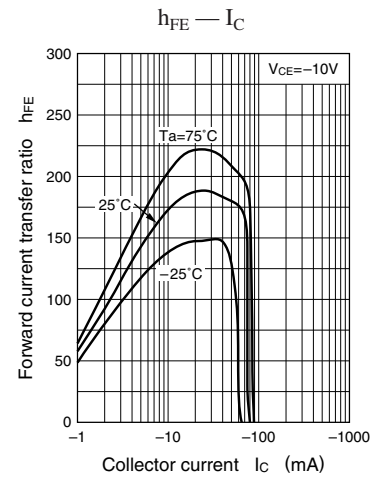
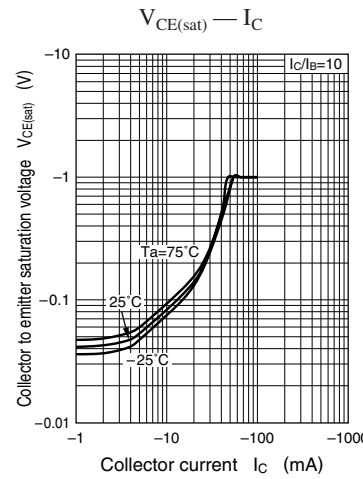
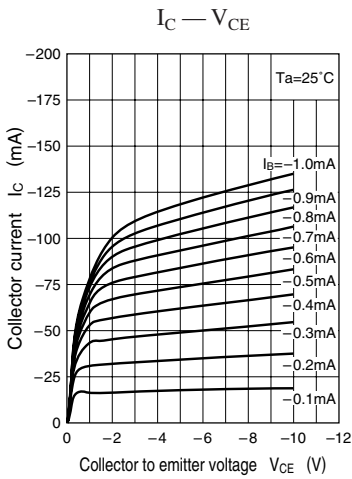
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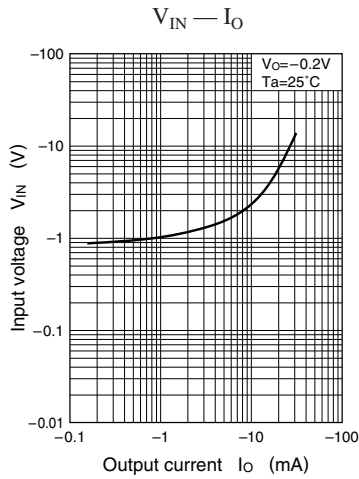
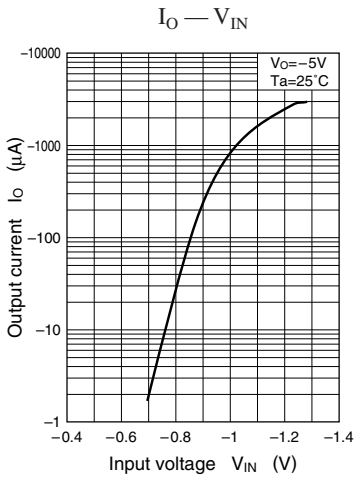


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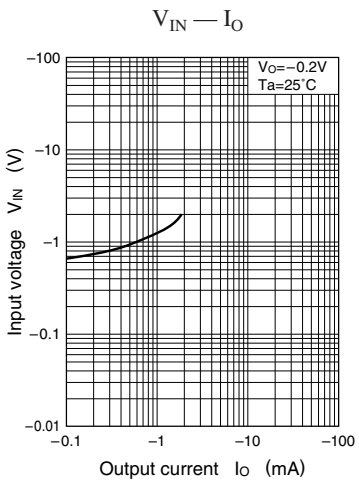
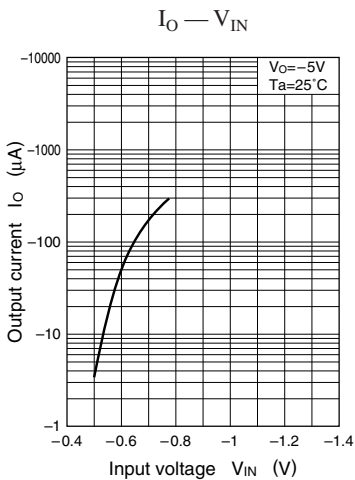
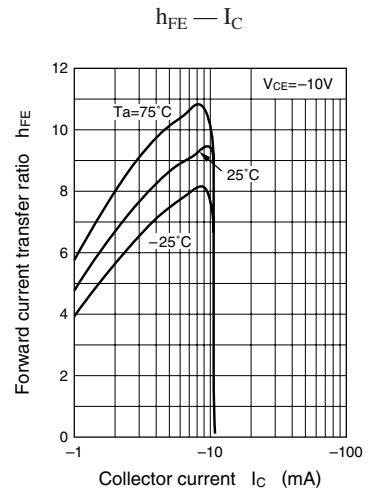
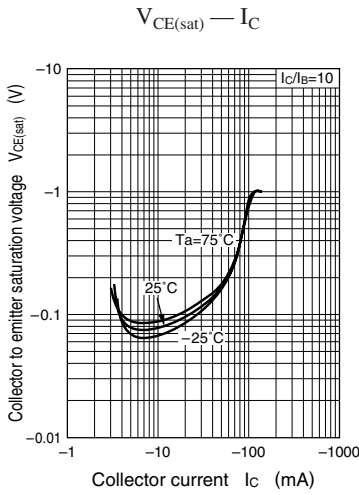
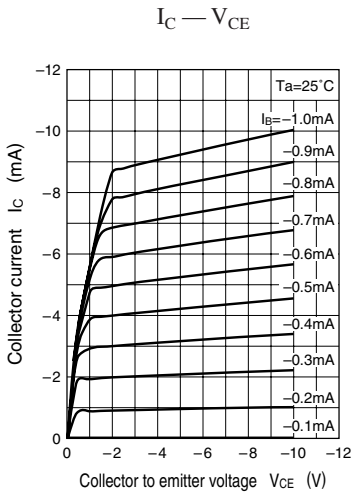


Characteristics charts of UNR511T



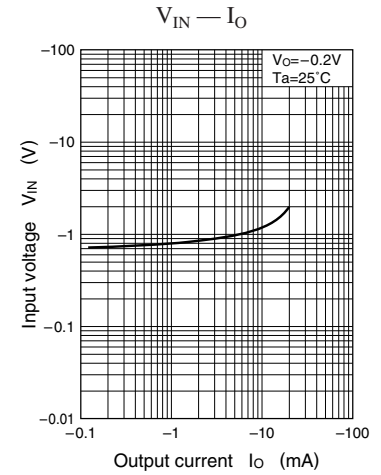
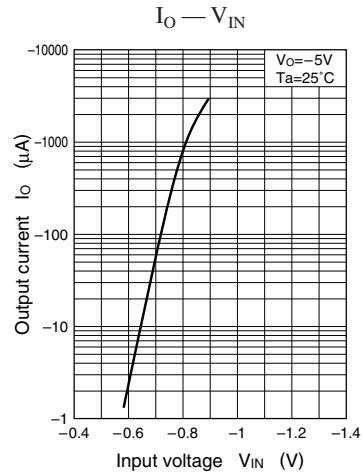
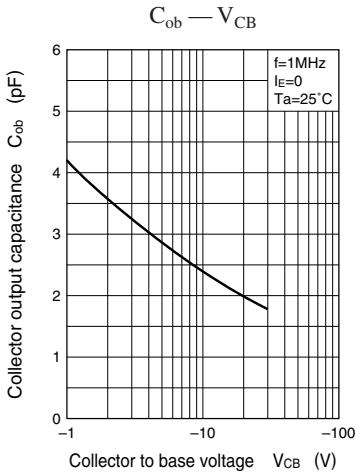
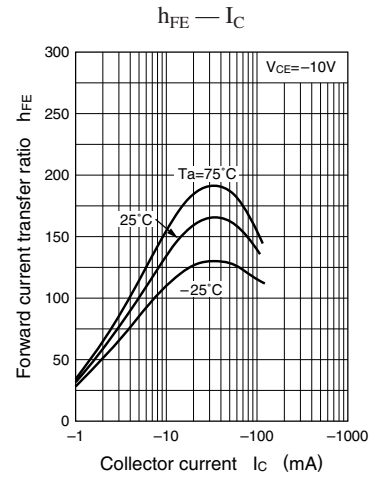
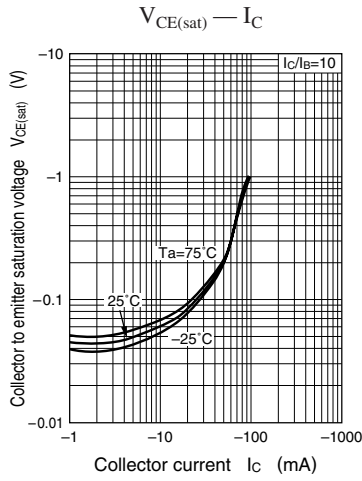
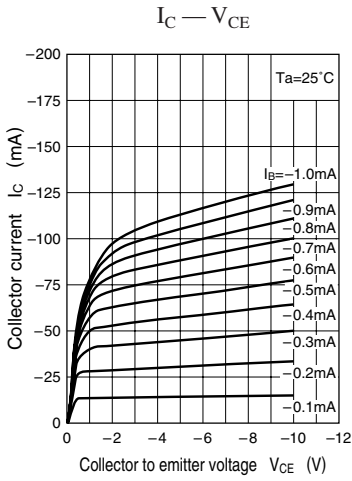


Characteristics charts of UNR511V





Characteristics charts of UNR511Z



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