

UNR511x Series (UN511x Series)

Silicon PNP epitaxial planar type

For digital circuits

■ Features

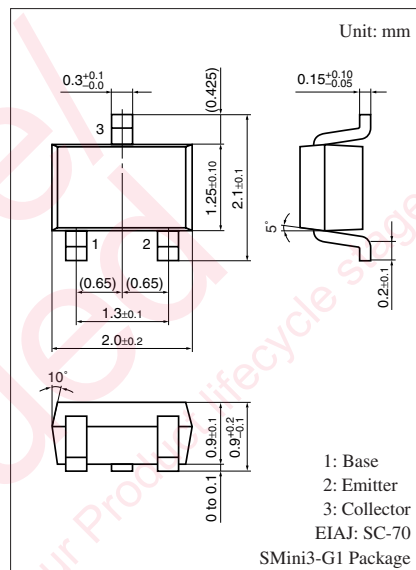
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- S-Mini type package, allowing automatic insertion through the tape/magazine packing

■ Resistance by Part Number

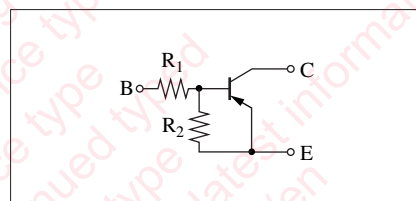
	Marking symbol	(R ₁)	(R ₂)
• UNR5110 (UN5110)	6L	47 kΩ	—
• UNR5111 (UN5111)	6A	10 kΩ	10 kΩ
• UNR5112 (UN5112)	6B	22 kΩ	22 kΩ
• UNR5113 (UN5113)	6C	47 kΩ	47 kΩ
• UNR5114 (UN5114)	6D	10 kΩ	47 kΩ
• UNR5115 (UN5115)	6E	10 kΩ	—
• UNR5116 (UN5116)	6F	4.7 kΩ	—
• UNR5117 (UN5117)	6H	22 kΩ	—
• UNR5118 (UN5118)	6I	0.51 kΩ	5.1 kΩ
• UNR5119 (UN5119)	6K	1 kΩ	10 kΩ
• UNR511D (UN511D)	6M	47 kΩ	10 kΩ
• UNR511E (UN511E)	6N	47 kΩ	22 kΩ
• UNR511F (UN511F)	6O	4.7 kΩ	10 kΩ
• UNR511H (UN511H)	6P	2.2 kΩ	10 kΩ
• UNR511L (UN511L)	6Q	4.7 kΩ	4.7 kΩ
• UNR511M (UN511M)	EI	2.2 kΩ	47 kΩ
• UNR511N (UN511N)	EW	4.7 kΩ	47 kΩ
• UNR511T (UN511T)	EY	22 kΩ	47 kΩ
• UNR511V (UN511V)	FC	2.2 kΩ	2.2 kΩ
• UNR511Z (UN511Z)	FE	4.7 kΩ	22 kΩ

■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V _{CBO}	-50	V
Collector-emitter voltage (Base open)	V _{CEO}	-50	V
Collector current	I _C	-100	mA
Total power dissipation	P _T	150	mW
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	-55 to +150	°C



Internal Connection



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

■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit		
Collector-base voltage (Emitter open)		V_{CBO}	$I_C = -10 \mu\text{A}, I_E = 0$	-50			V		
Collector-emitter voltage (Base open)		V_{CEO}	$I_C = -2 \text{ mA}, I_B = 0$	-50			V		
Collector-base cutoff current (Emitter open)		I_{CBO}	$V_{CB} = -50 \text{ V}, I_E = 0$			-0.1	μA		
Collector-emitter cutoff current (Base open)		I_{CEO}	$V_{CE} = -50 \text{ V}, I_B = 0$			-0.5	μA		
Emitter-base cutoff current (Collector open)	UNR5110/5115/5116/5117	I_{EBO}	$V_{EB} = -6 \text{ V}, I_C = 0$			-0.01	mA		
	UNR5113					-0.1			
	UNR5112/5114/511D/ 511E/511M/511N/511T					-0.2			
	UNR511Z					-0.4			
	UNR5111					-0.5			
	UNR511F/511H					-1.0			
	UNR5119					-1.5			
	UNR5118/511L/511V					-2.0			
Forward current transfer ratio	UNR511V	h_{FE}	$V_{CE} = -10 \text{ V}, I_C = -5 \text{ mA}$	6		20	—		
	UNR5118/511L			20					
	UNR5119/511D/511F/511H			30					
	UNR5111			35					
	UNR5112/511E			60					
	UNR511Z			60	200				
	UNR5113/5114/511M			80					
	UNR511N/511T			80	400				
UNR5110*/5115*/5116*/5117*	160	460							
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = -10 \text{ mA}, I_B = -0.3 \text{ mA}$			-0.25	V		
	UNR511V		$I_C = -10 \text{ mA}, I_B = -1.5 \text{ mA}$						
Output voltage high-level		V_{OH}	$V_{CC} = -5 \text{ V}, V_B = -0.5 \text{ V}, R_L = 1 \text{ k}\Omega$	-4.9			V		
Output voltage low-level		V_{OL}	$V_{CC} = -5 \text{ V}, V_B = -2.5 \text{ V}, R_L = 1 \text{ k}\Omega$			-0.2	V		
			UNR5113	$V_{CC} = -5 \text{ V}, V_B = -3.5 \text{ V}, R_L = 1 \text{ k}\Omega$					
			UNR511D	$V_{CC} = -5 \text{ V}, V_B = -10 \text{ V}, R_L = 1 \text{ k}\Omega$					
			UNR511E	$V_{CC} = -5 \text{ V}, V_B = -6 \text{ V}, R_L = 1 \text{ k}\Omega$					
Transition frequency		f_T	$V_{CB} = -10 \text{ V}, I_E = 1 \text{ mA}, f = 200 \text{ MHz}$		80		MHz		
			UNR5116	$V_{CB} = -10 \text{ V}, I_E = 2 \text{ mA}, f = 200 \text{ MHz}$		150			
Input resistance	UNR5118	R_1		-30%	0.51	+30%	k Ω		
	UNR5119				1.0				
	UNR511H/511M/511V				2.2				
	UNR5116/511F/511L 511N/511Z				4.7				
	UNR5111/5114/5115				10				
	UNR5112/5117/511T				22				
	UNR5110/5113/511D/511E				47				
Resistance ratio	UNR511M	R_1/R_2			0.047		—		
	UNR511N				0.1				
	UNR5118/5119				0.08			0.10	0.12
	UNR511Z				0.21				

■ Electrical Characteristics (continued) $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

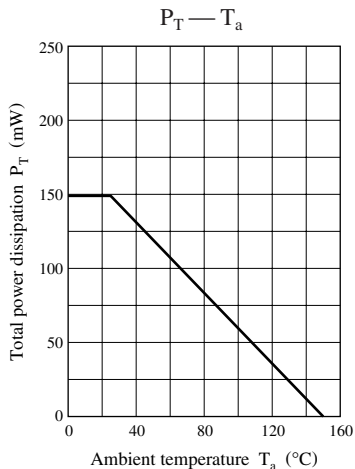
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR5114			0.17	0.21	0.25	
	UNR511H			0.17	0.22	0.27	
	UNR511T				0.47		
	UNR511F			0.37	0.47	0.57	
	UNR511V				1.0		
	UNR5111/5112/5113/511L			0.8	1.0	1.2	
	UNR511E			1.70	2.14	2.60	
	UNR511D			3.7	4.7	5.7	

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

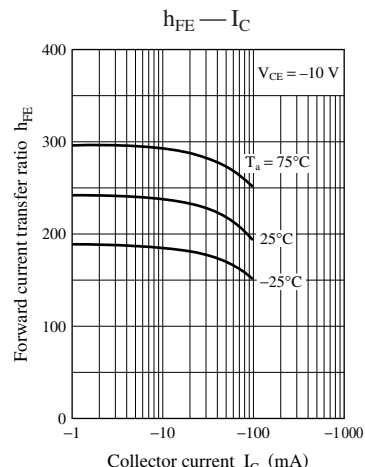
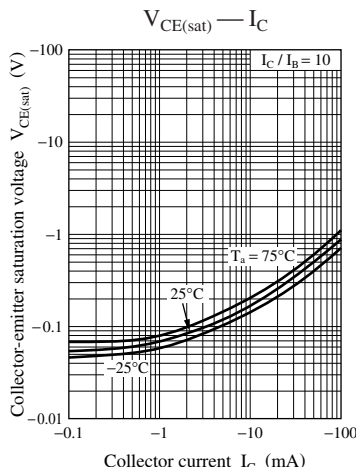
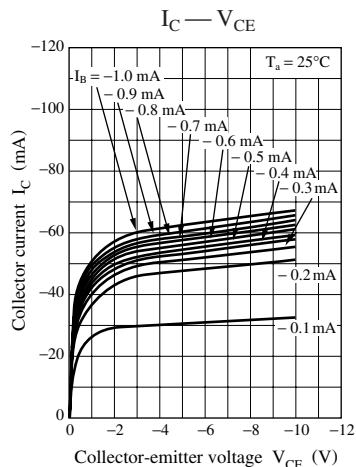
2. *: Rank classification

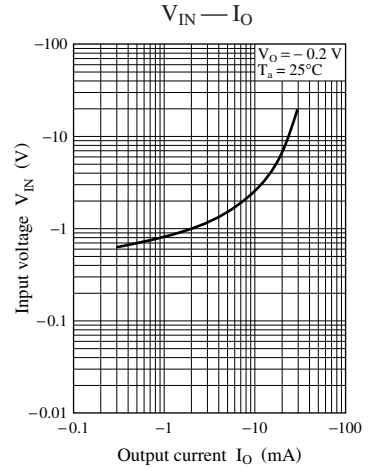
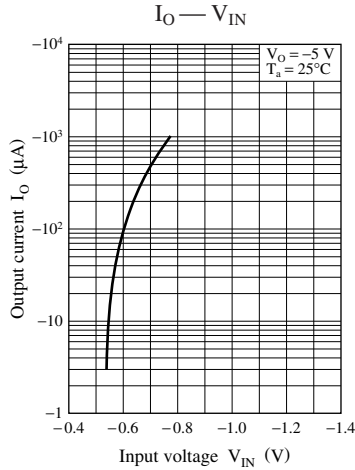
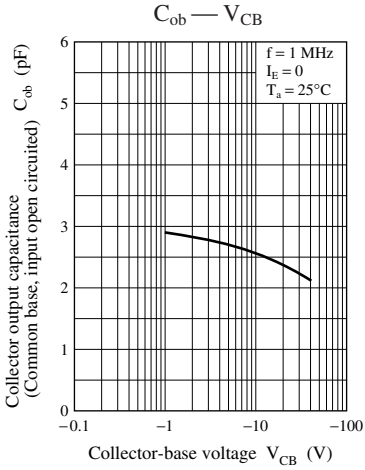
Rank	Q	R	S	No-rank
h_{FE}	160 to 260	210 to 340	290 to 460	160 to 460

Common characteristics chart

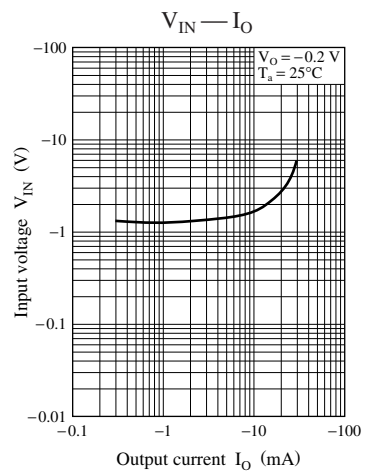
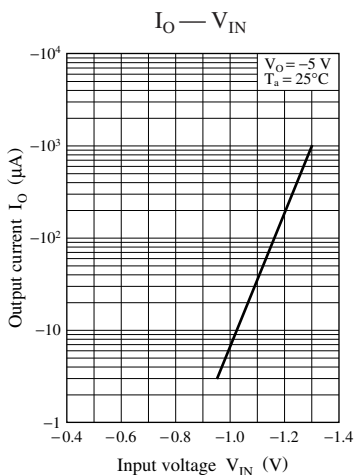
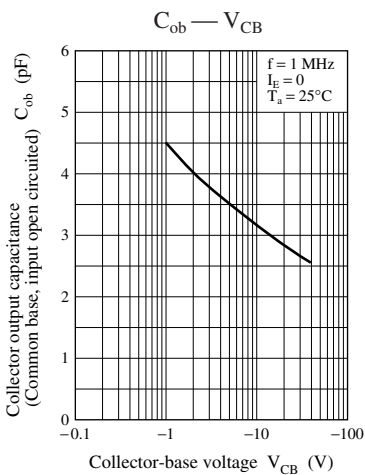
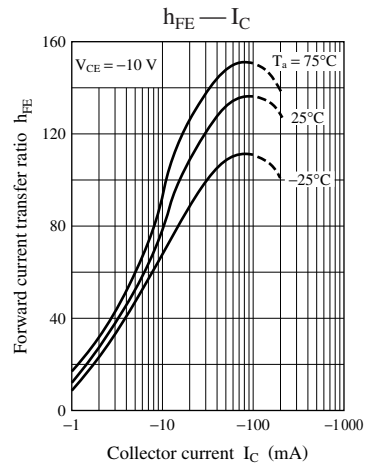
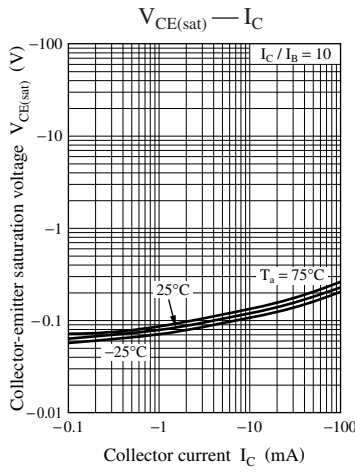
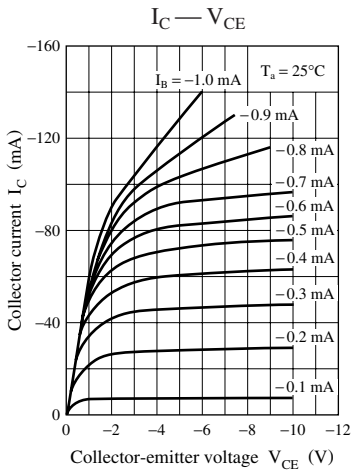


Characteristics charts of UNR5110

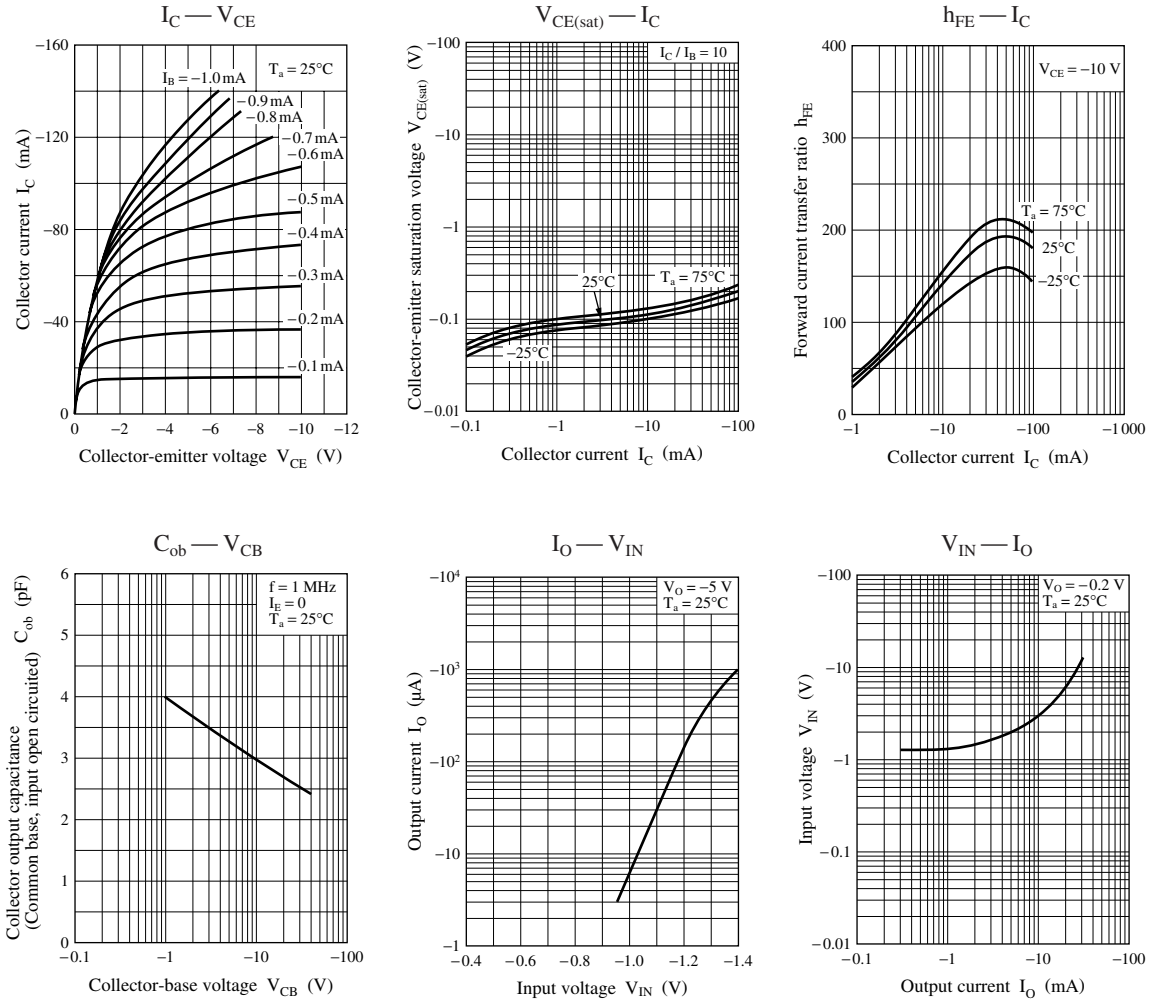




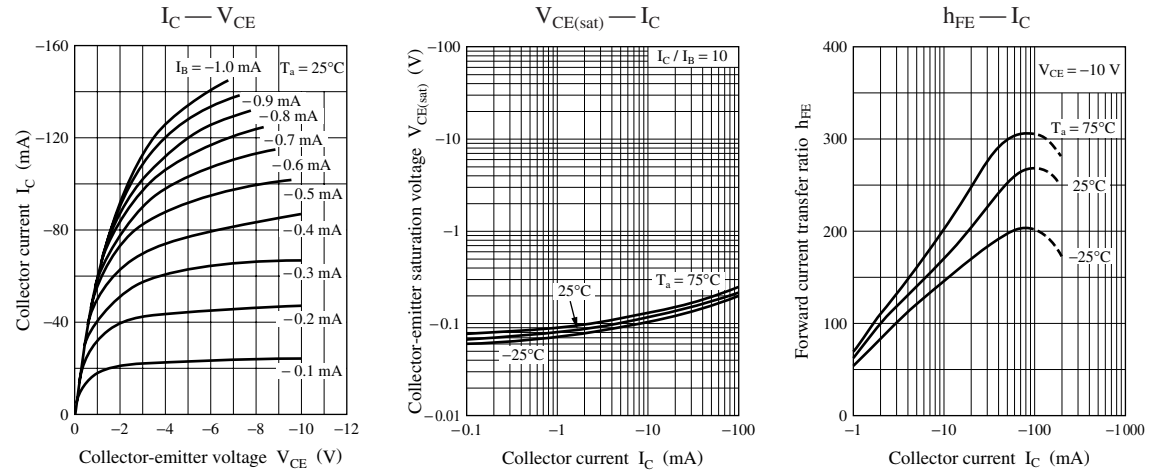
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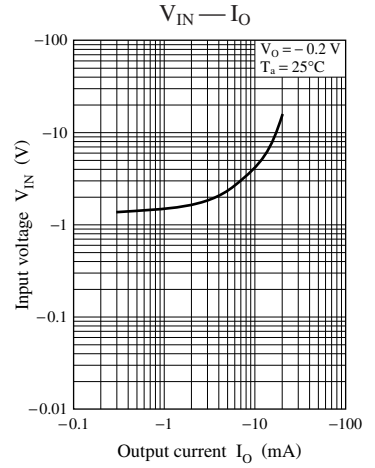
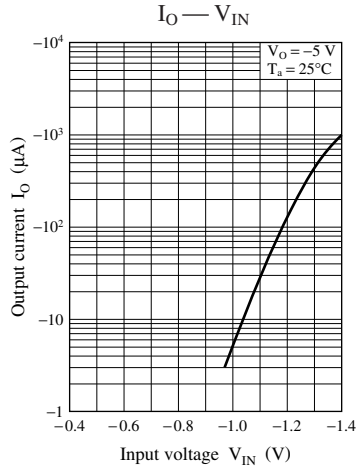
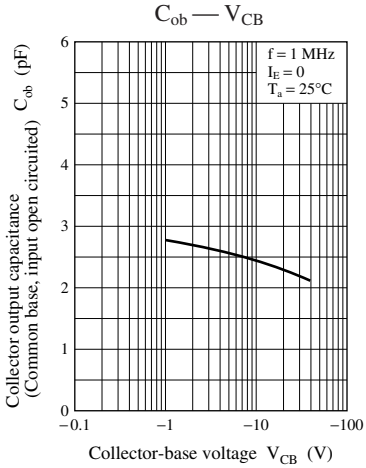


Characteristics charts of UNR5112

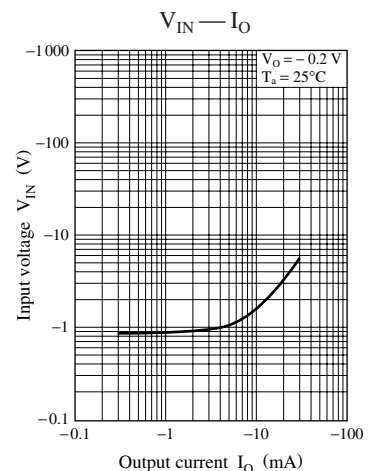
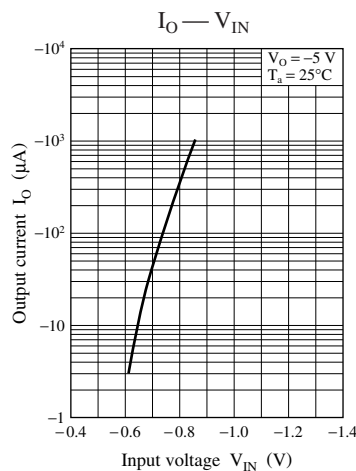
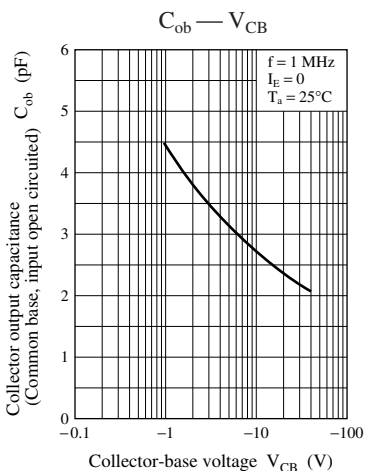
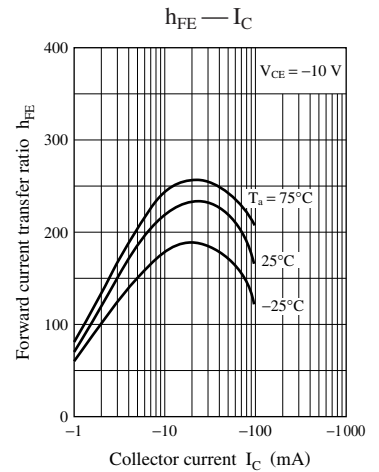
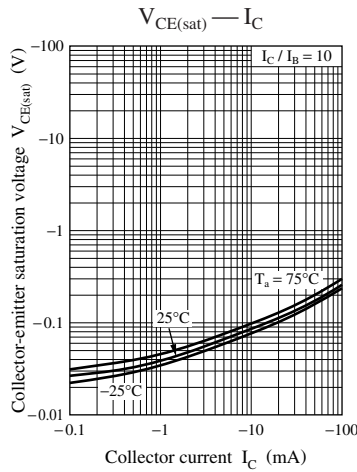
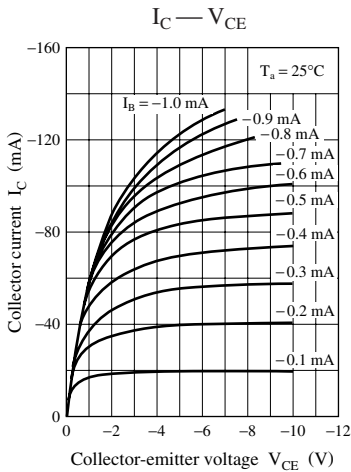


Characteristics charts of UNR5113

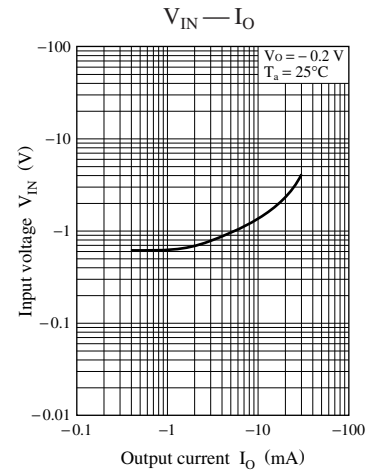
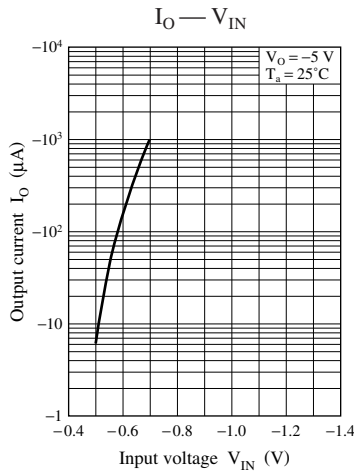
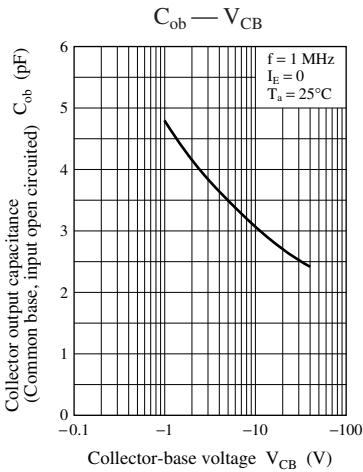
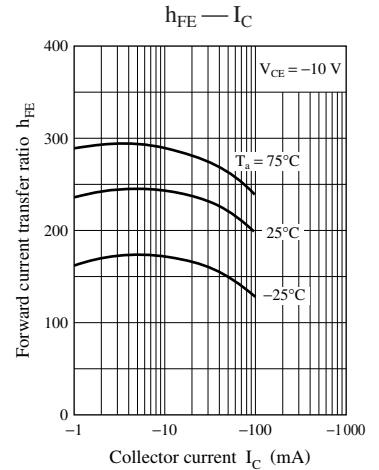
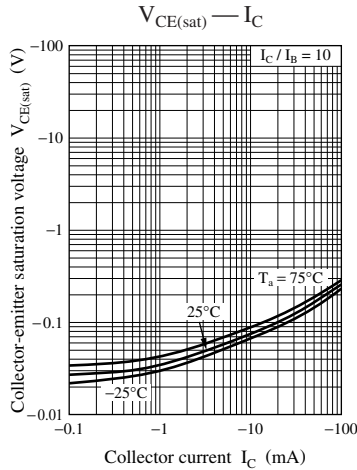
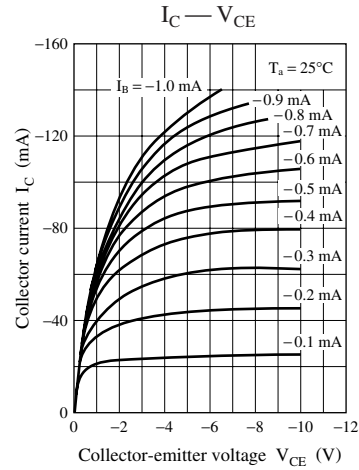




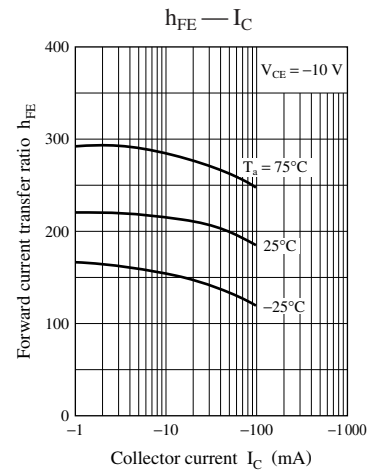
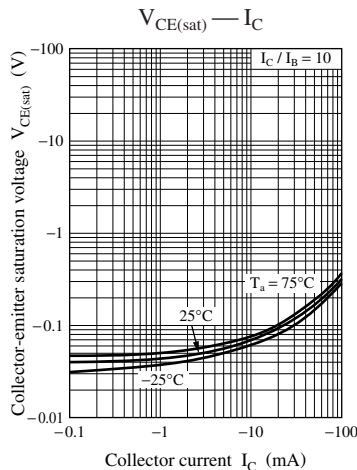
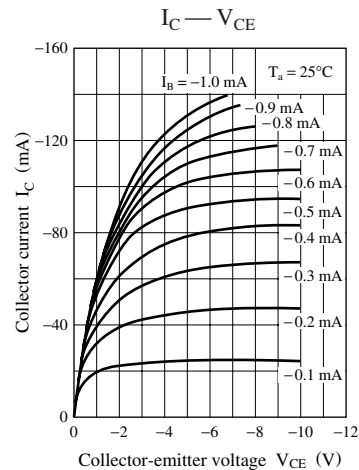
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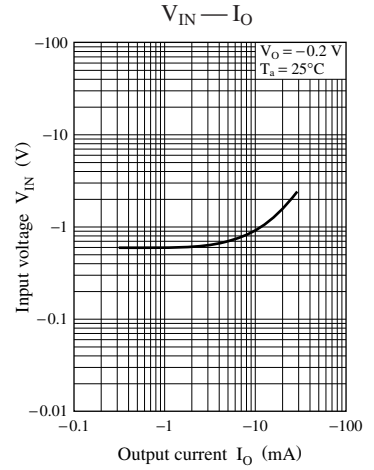
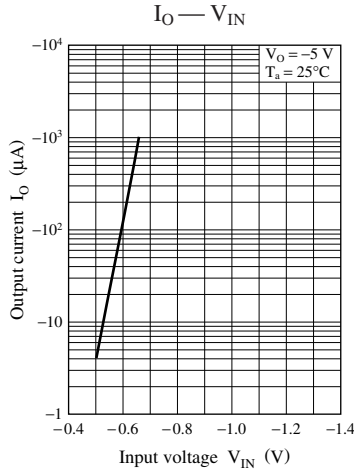
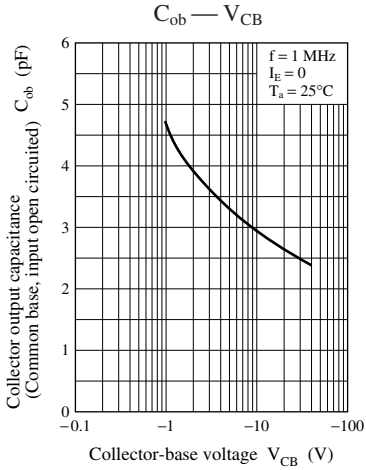


Characteristics charts of UNR5115

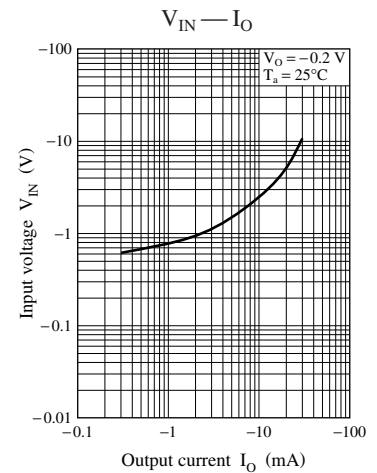
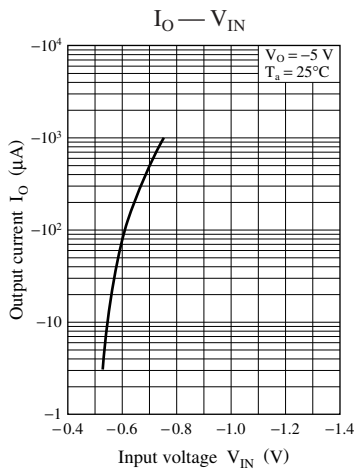
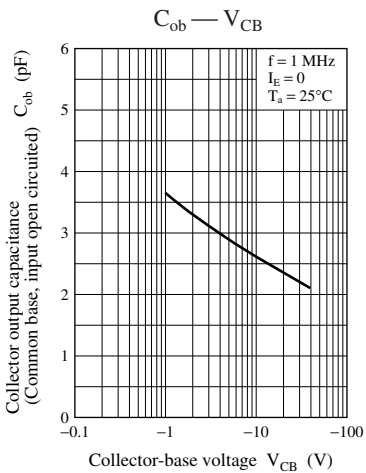
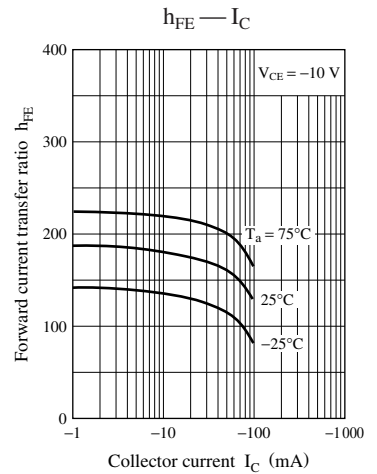
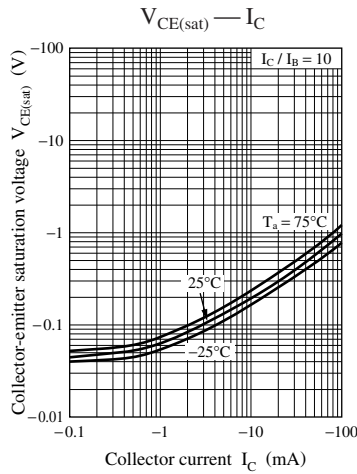
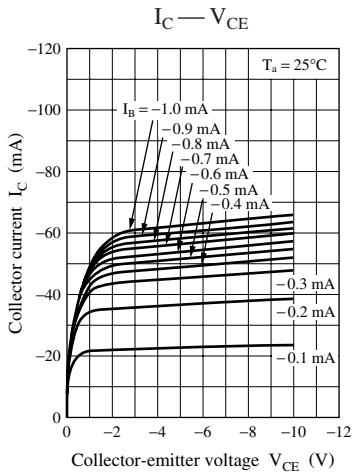


Characteristics charts of UNR5116

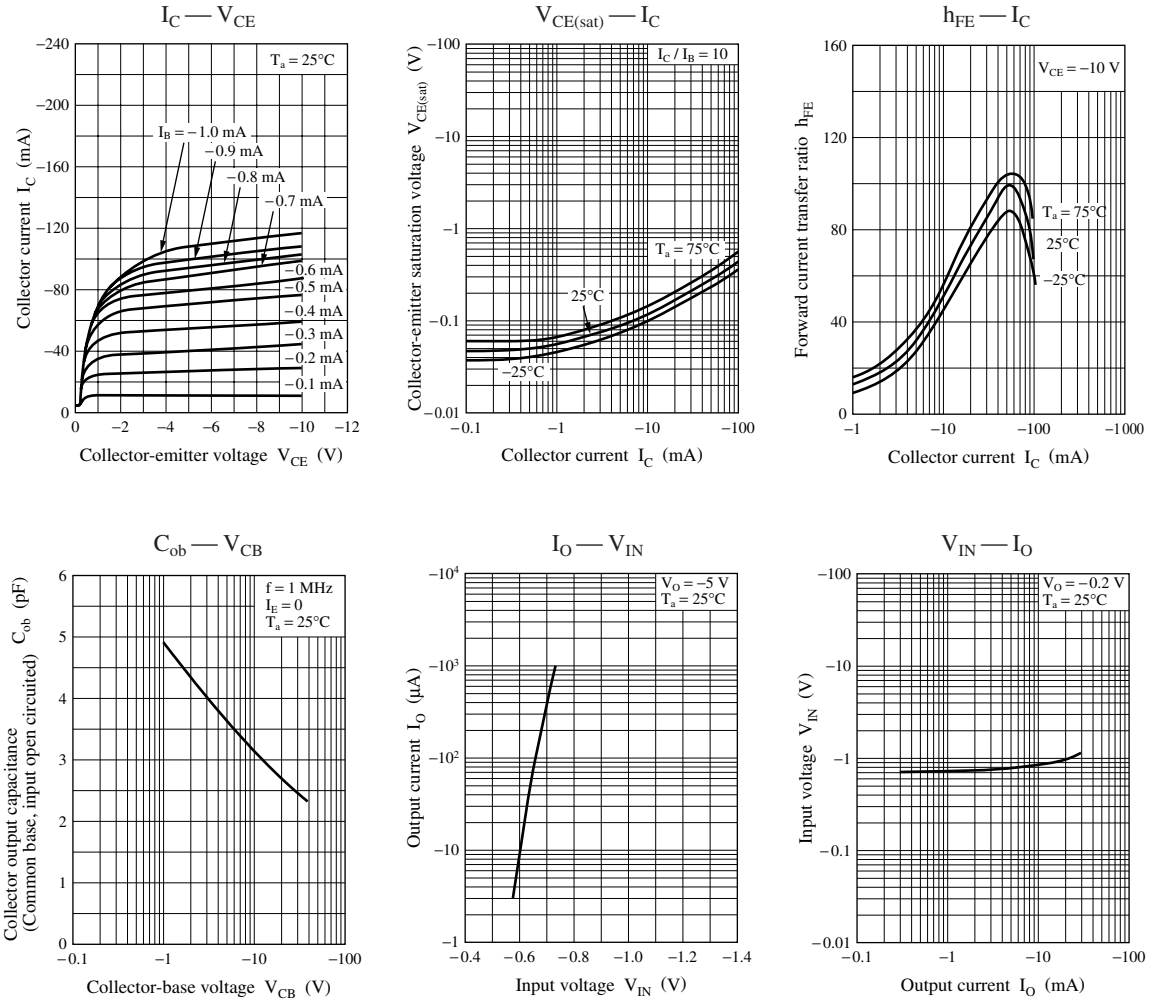




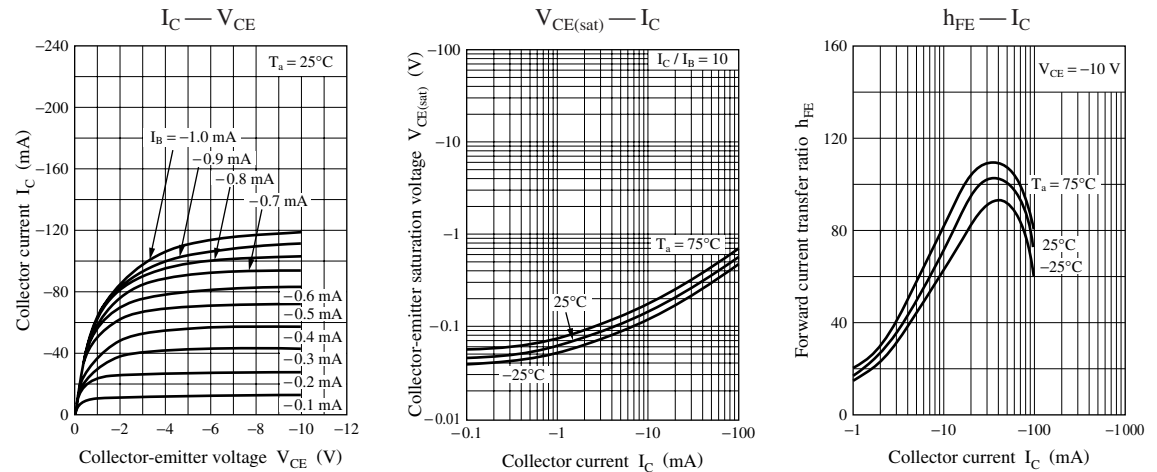
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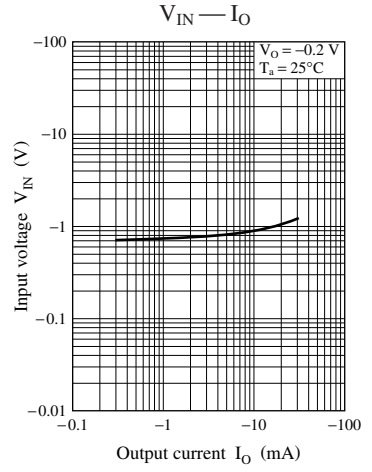
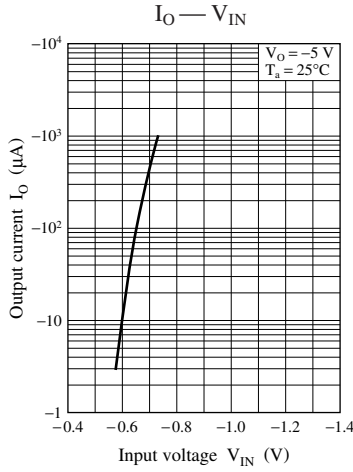
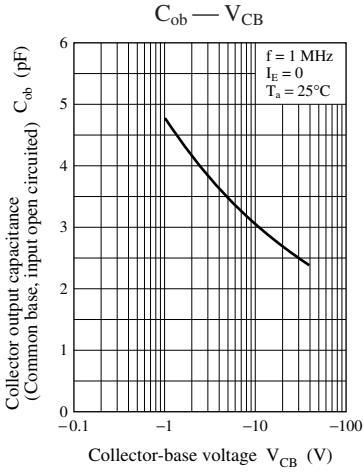


Characteristics charts of UNR5118

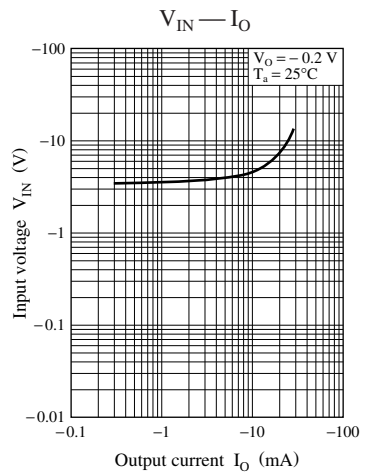
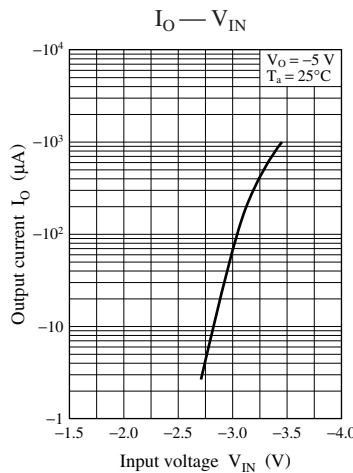
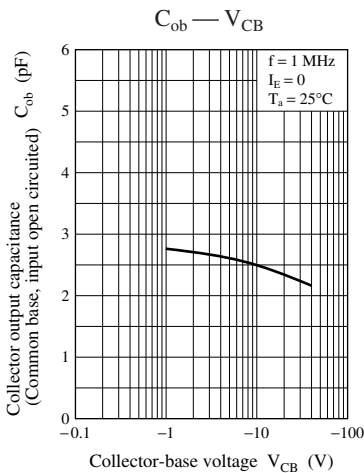
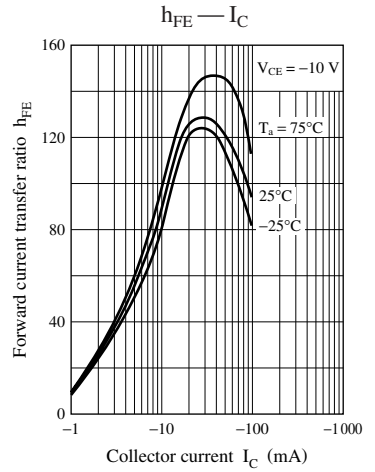
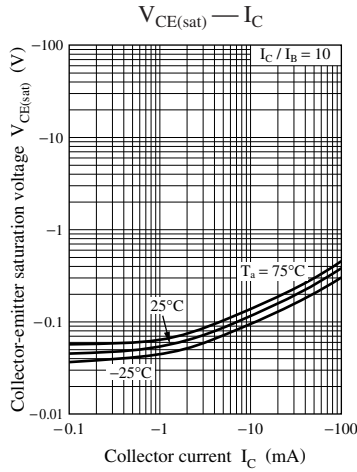
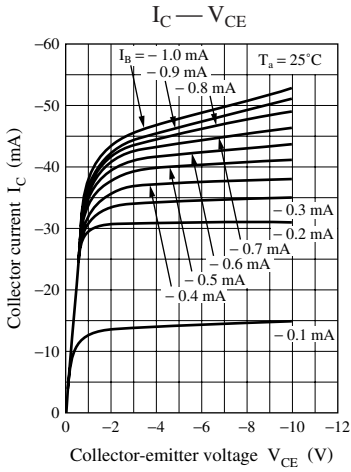


Characteristics charts of UNR5119

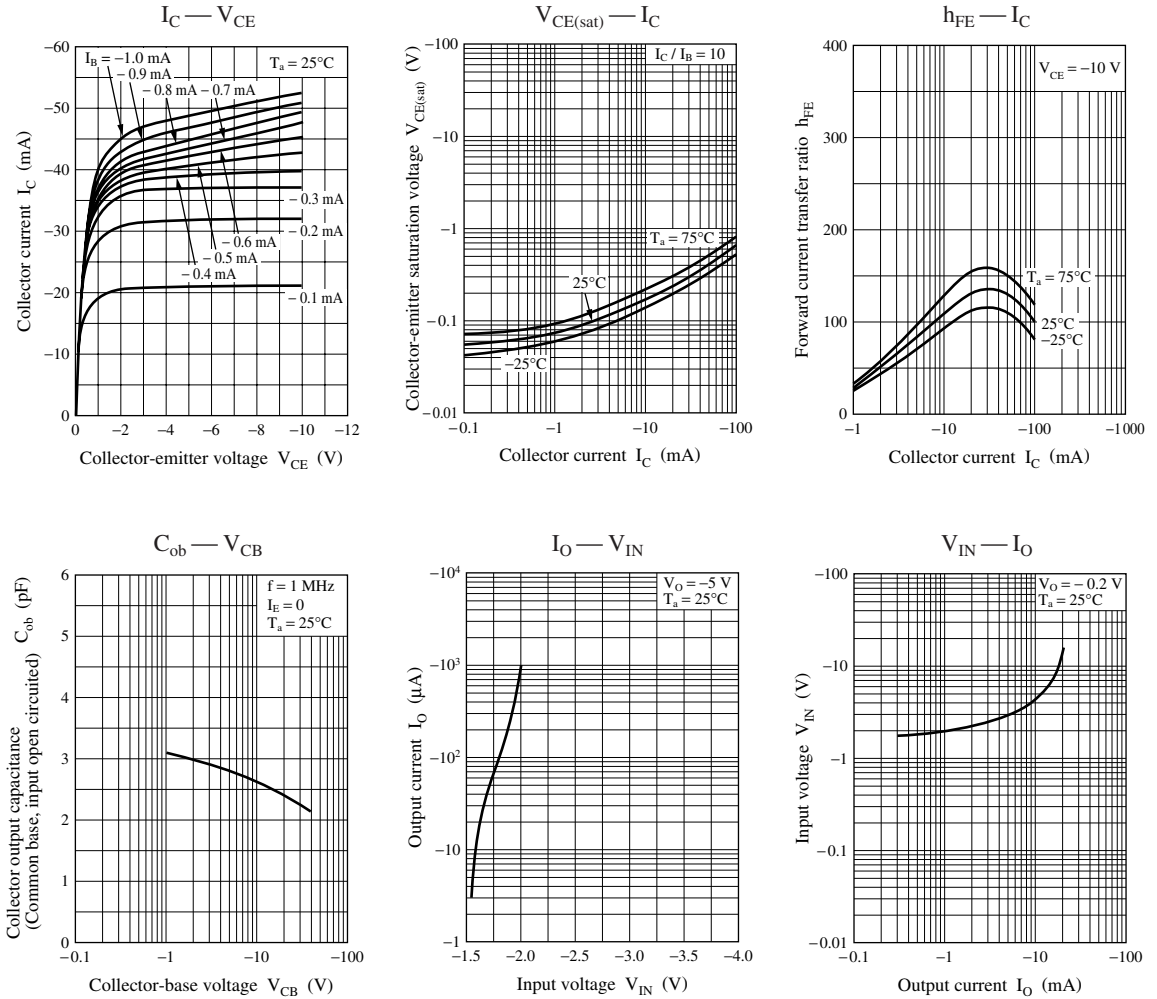




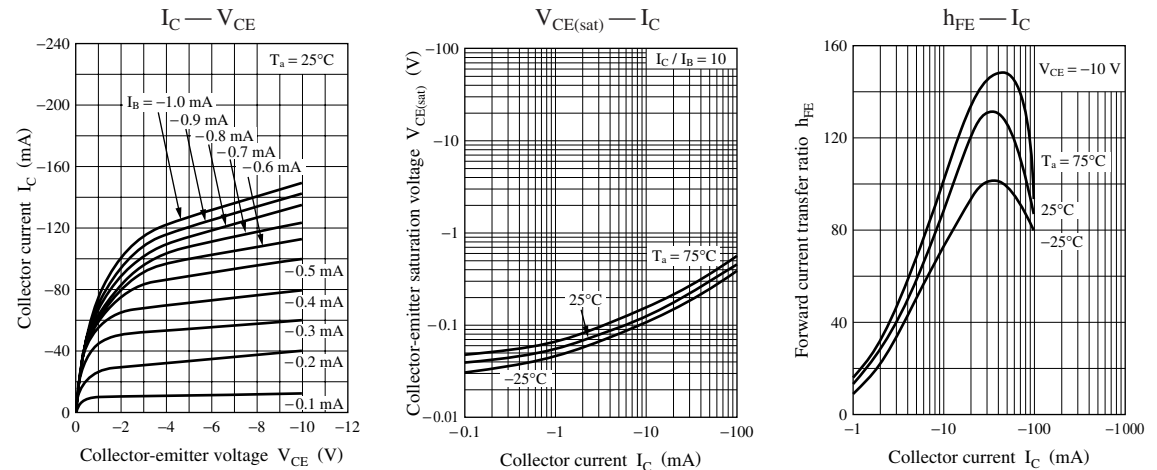
Characteristics charts of UNR511D

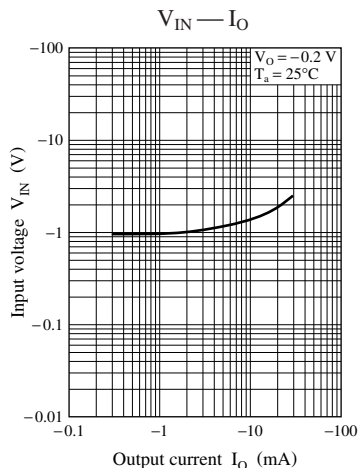
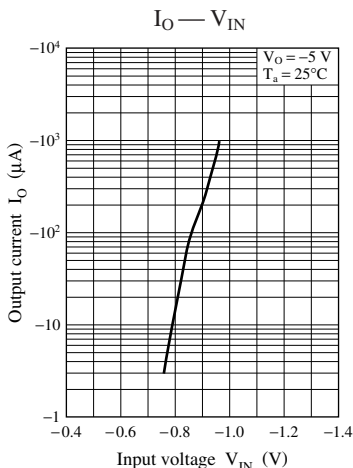
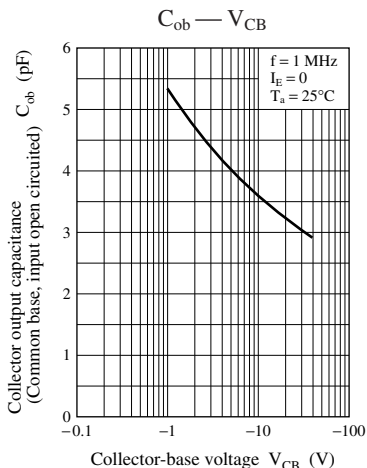


Characteristics charts of UNR511E

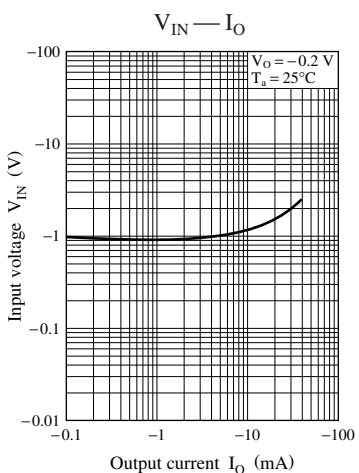
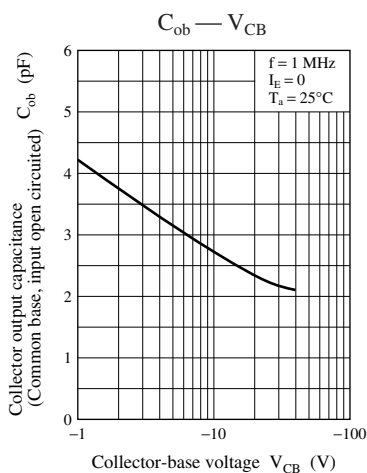
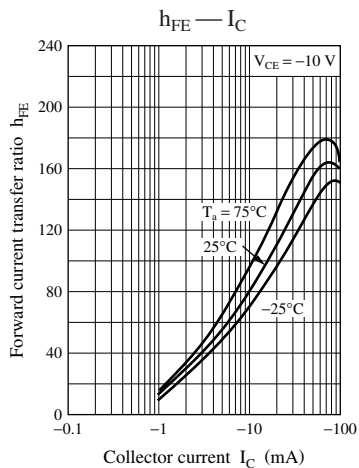
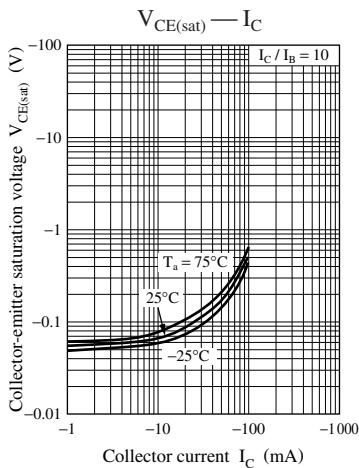
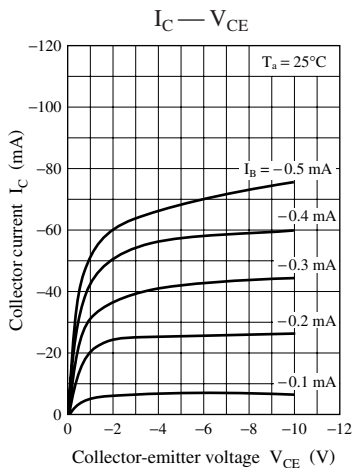


Characteristics charts of UNR511F

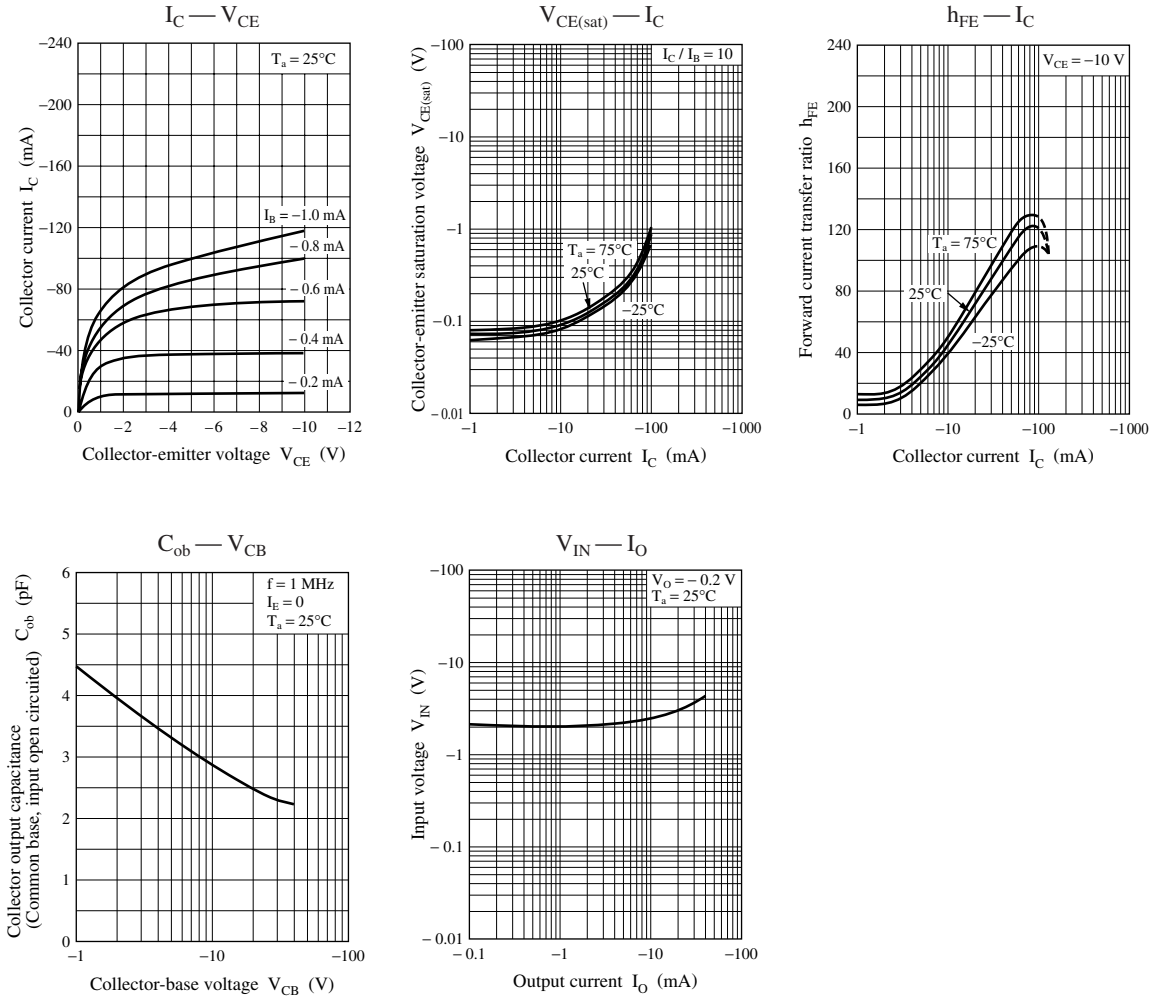




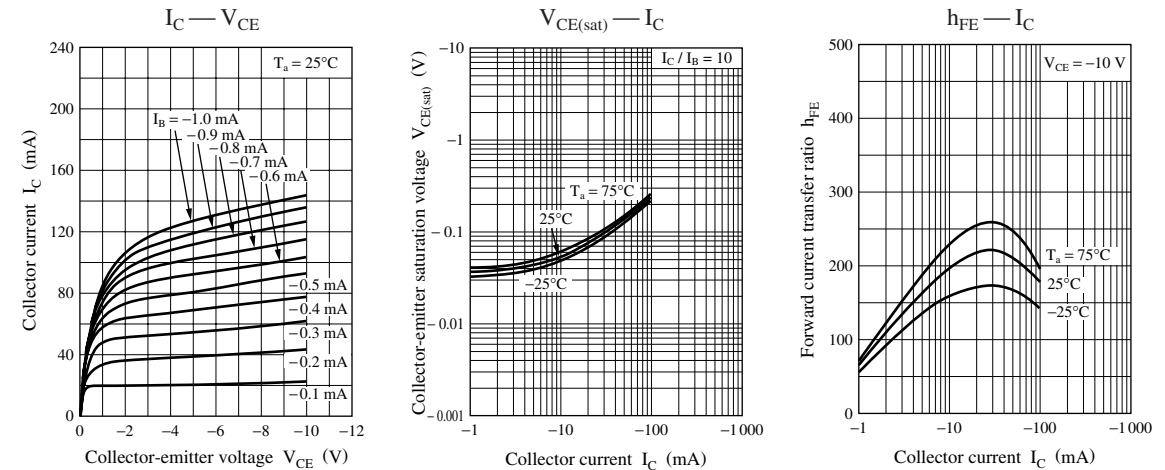
Characteristics charts of UNR511H

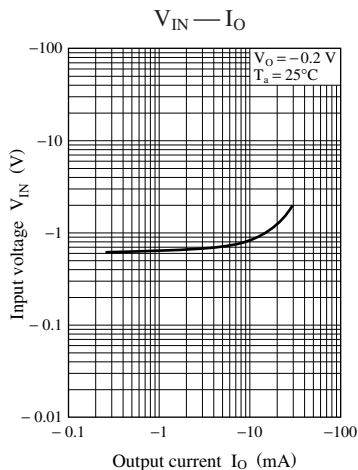
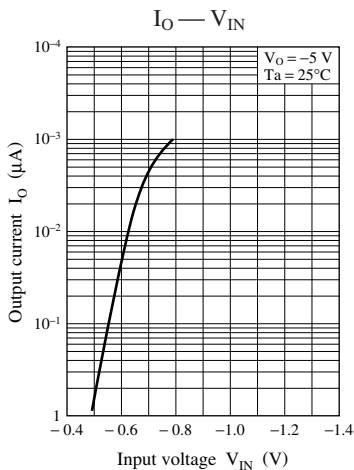
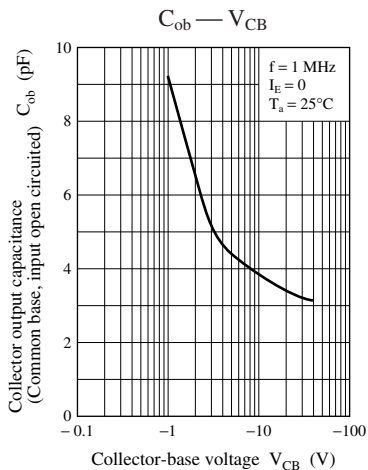


Characteristics charts of UNR511L

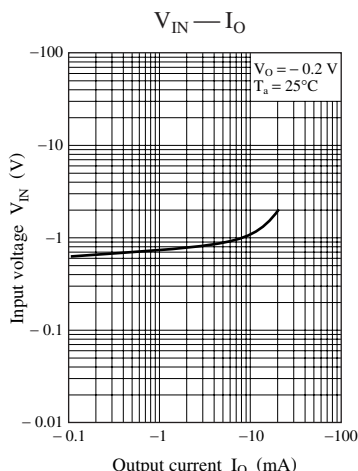
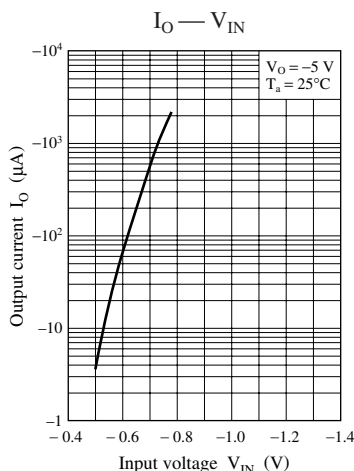
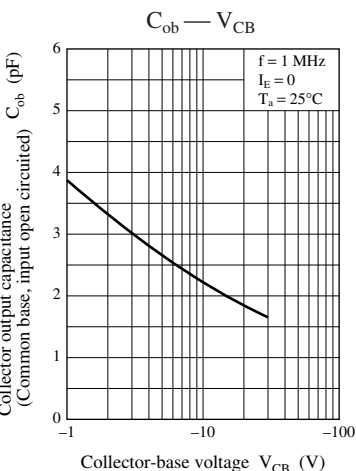
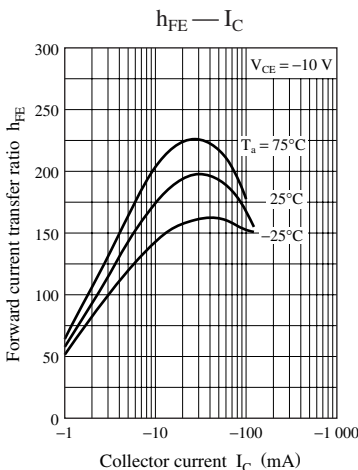
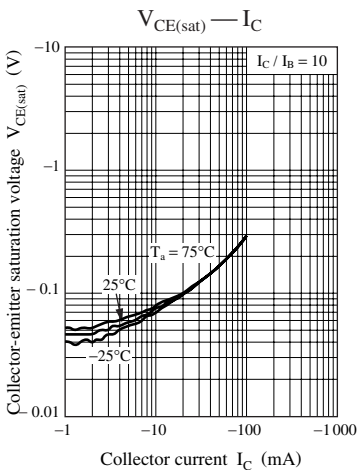
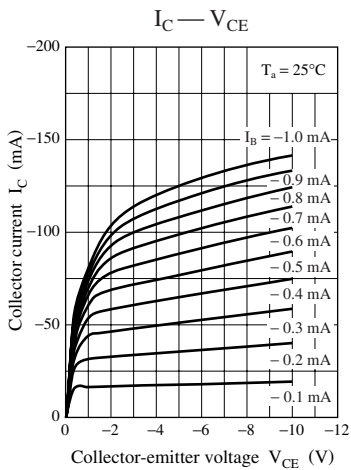


Characteristics charts of UNR511M

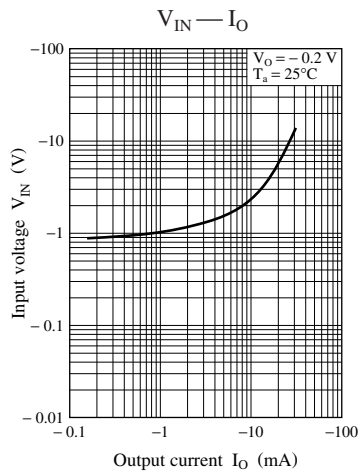
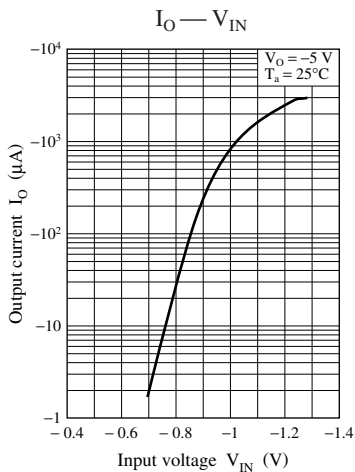
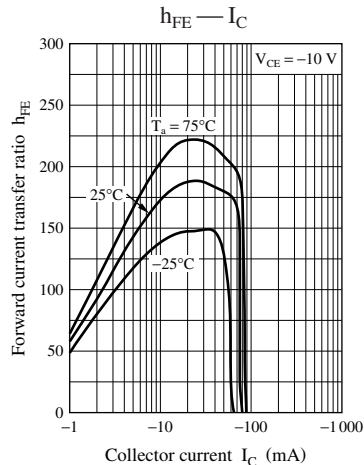
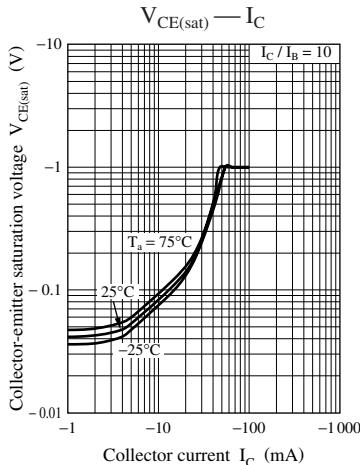
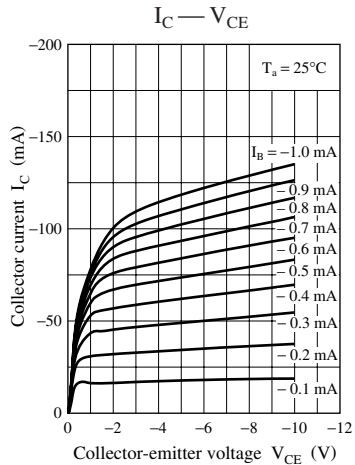




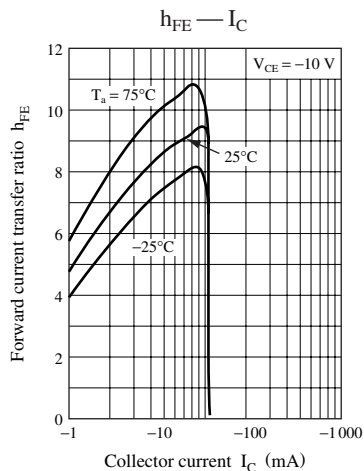
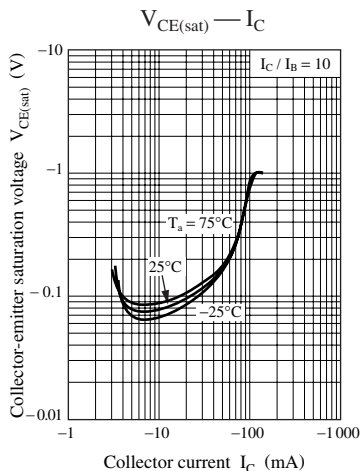
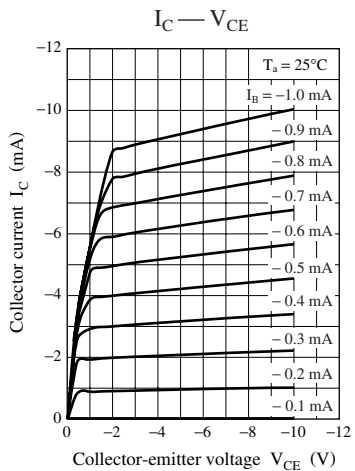
Characteristics charts of UNR511N

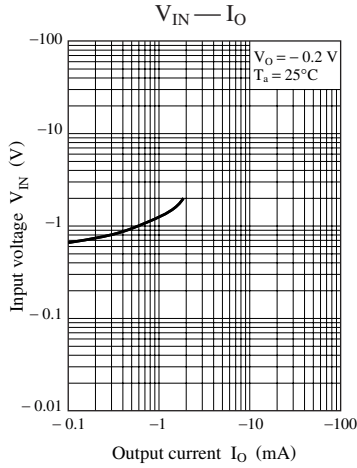
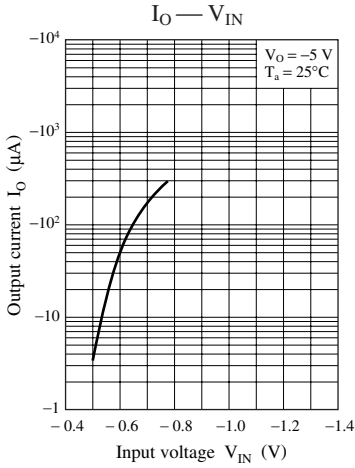


Characteristics charts of UNR511T

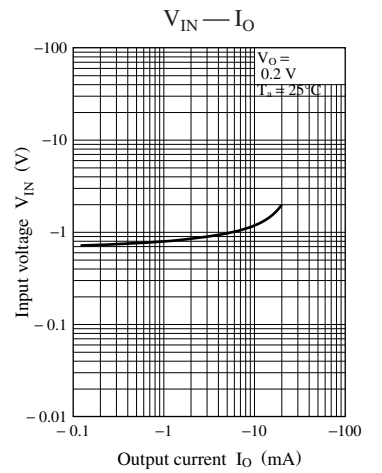
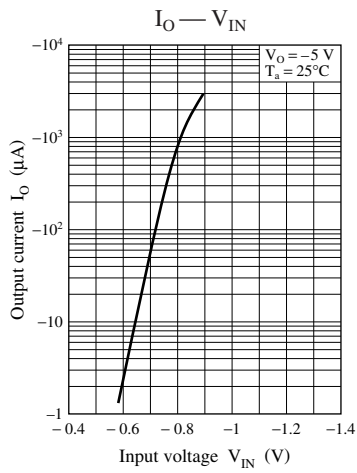
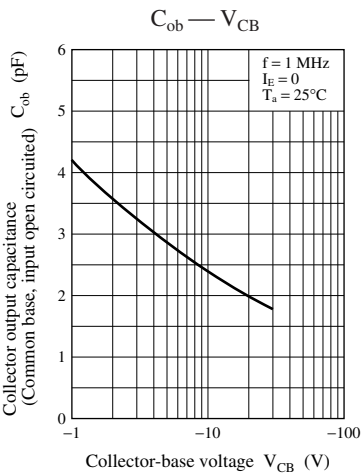
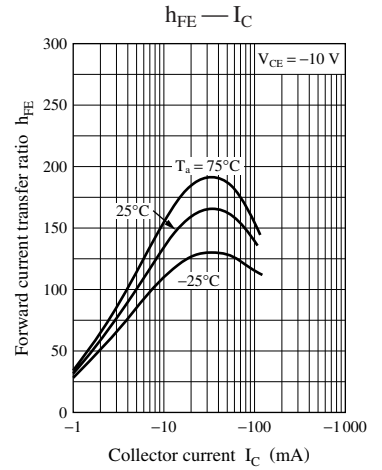
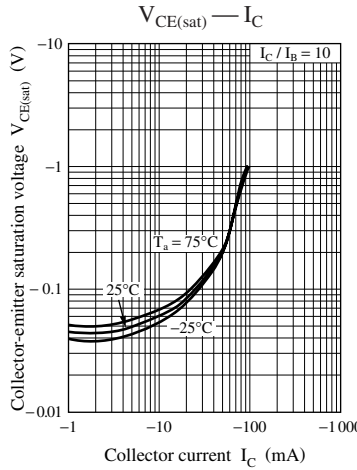
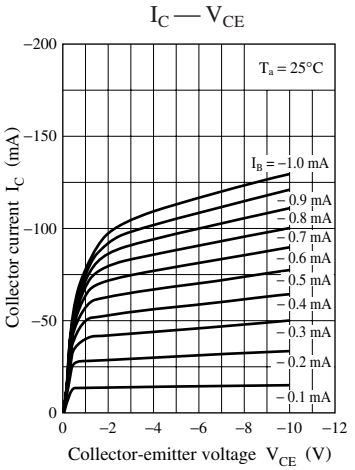


Characteristics charts of UNR511V





Characteristics charts of UNR511Z



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