

# UNR511x Series (UN511x Series)

## Silicon PNP epitaxial planar type

For digital circuits

### ■ Features

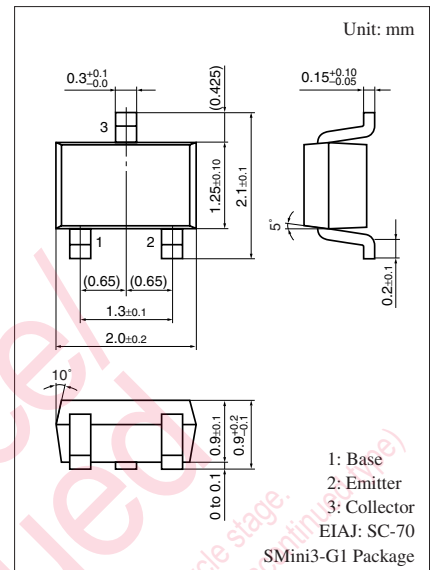
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- S-Mini type package, allowing automatic insertion through the tape/magazine packing

### ■ Resistance by Part Number

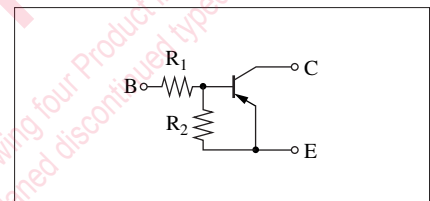
	Marking symbol	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR5110 (UN5110)	6L	47 kΩ	—
• UNR5111 (UN5111)	6A	10 kΩ	10 kΩ
• UNR5112 (UN5112)	6B	22 kΩ	22 kΩ
• UNR5113 (UN5113)	6C	47 kΩ	47 kΩ
• UNR5114 (UN5114)	6D	10 kΩ	47 kΩ
• UNR5115 (UN5115)	6E	10 kΩ	—
• UNR5116 (UN5116)	6F	4.7 kΩ	—
• UNR5117 (UN5117)	6H	22 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<sub>a</sub> = 25°C

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V <sub>CBO</sub>	-50	V
Collector-emitter voltage (Base open)	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.

■ 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	$\mu\text{A}$		
Collector-emitter cutoff current (Base open)		$I_{CEO}$	$V_{CE} = -50 \text{ V}, I_B = 0$			-0.5	$\mu\text{A}$		
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					150				
Input resistance	UNR5118	$R_1$		-30%	0.51	+30%	k $\Omega$		
	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) $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

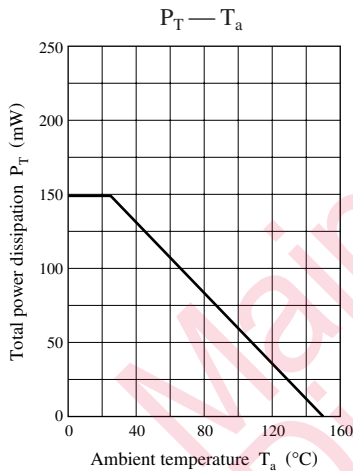
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR5114			0.17	0.21	0.25	
	UNR511H			0.17	0.22	0.27	
	UNR511T				0.47		
	UNR511F			0.37	0.47	0.57	
	UNR511V				1.0		
	UNR5111/5112/5113/511L			0.8	1.0	1.2	
	UNR511E			1.70	2.14	2.60	
	UNR511D			3.7	4.7	5.7	

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

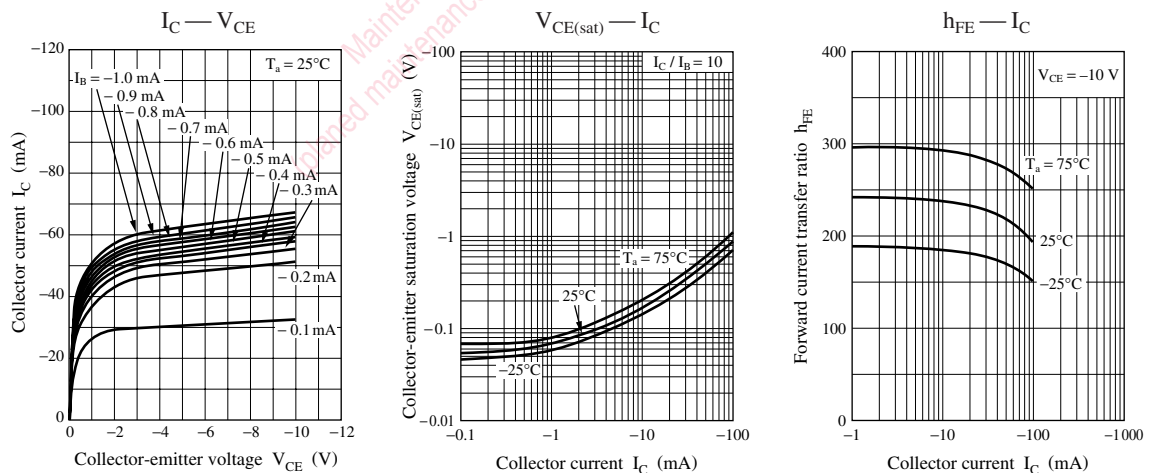
2. \*: Rank classification

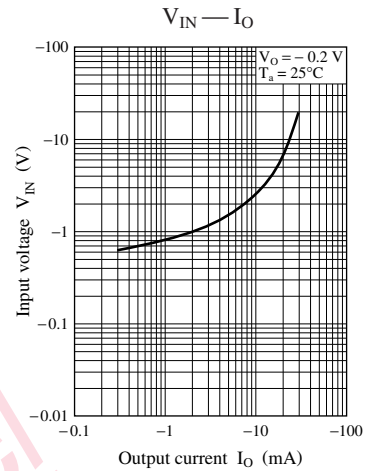
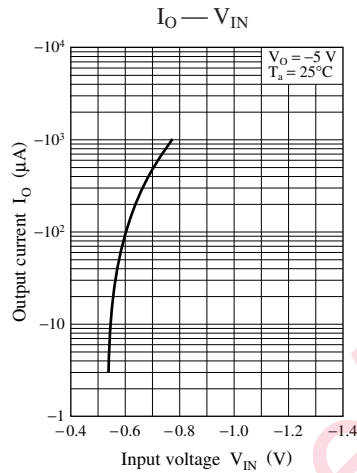
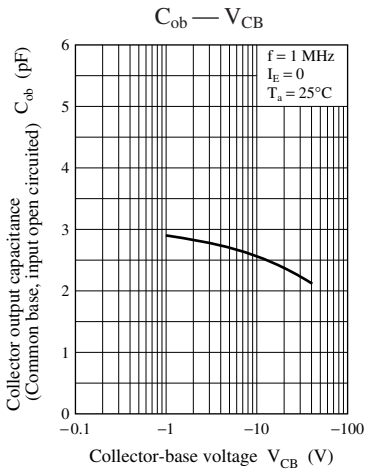
Rank	Q	R	S	No-rank
$h_{FE}$	160 to 260	210 to 340	290 to 460	160 to 460

### Common characteristics chart

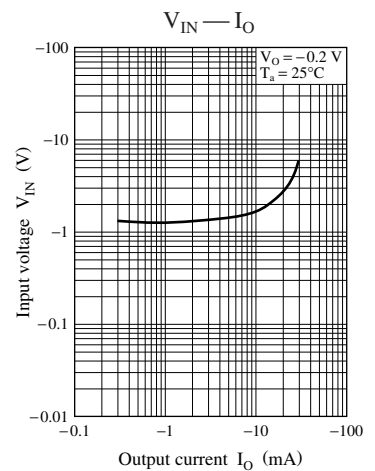
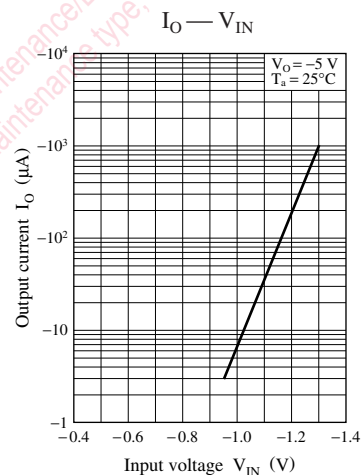
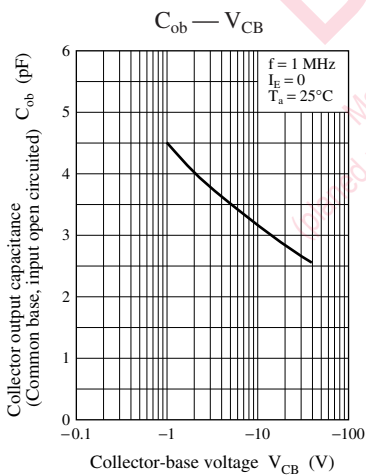
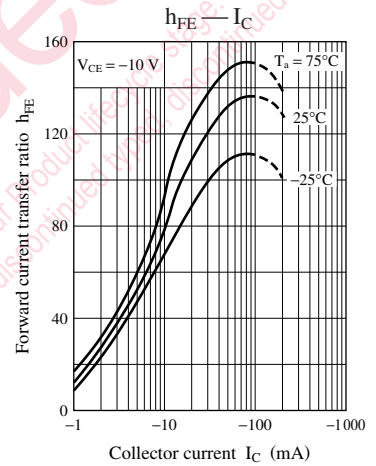
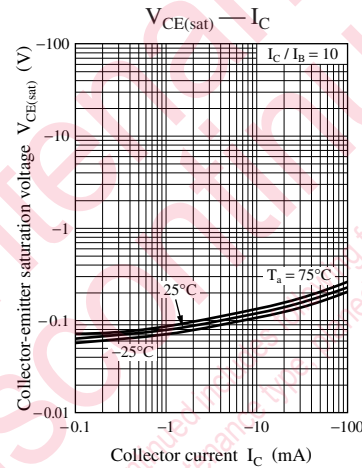
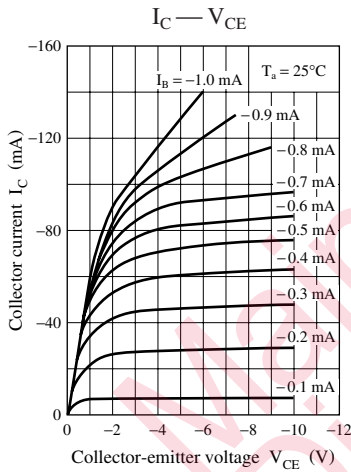


### Characteristics charts of UNR5110

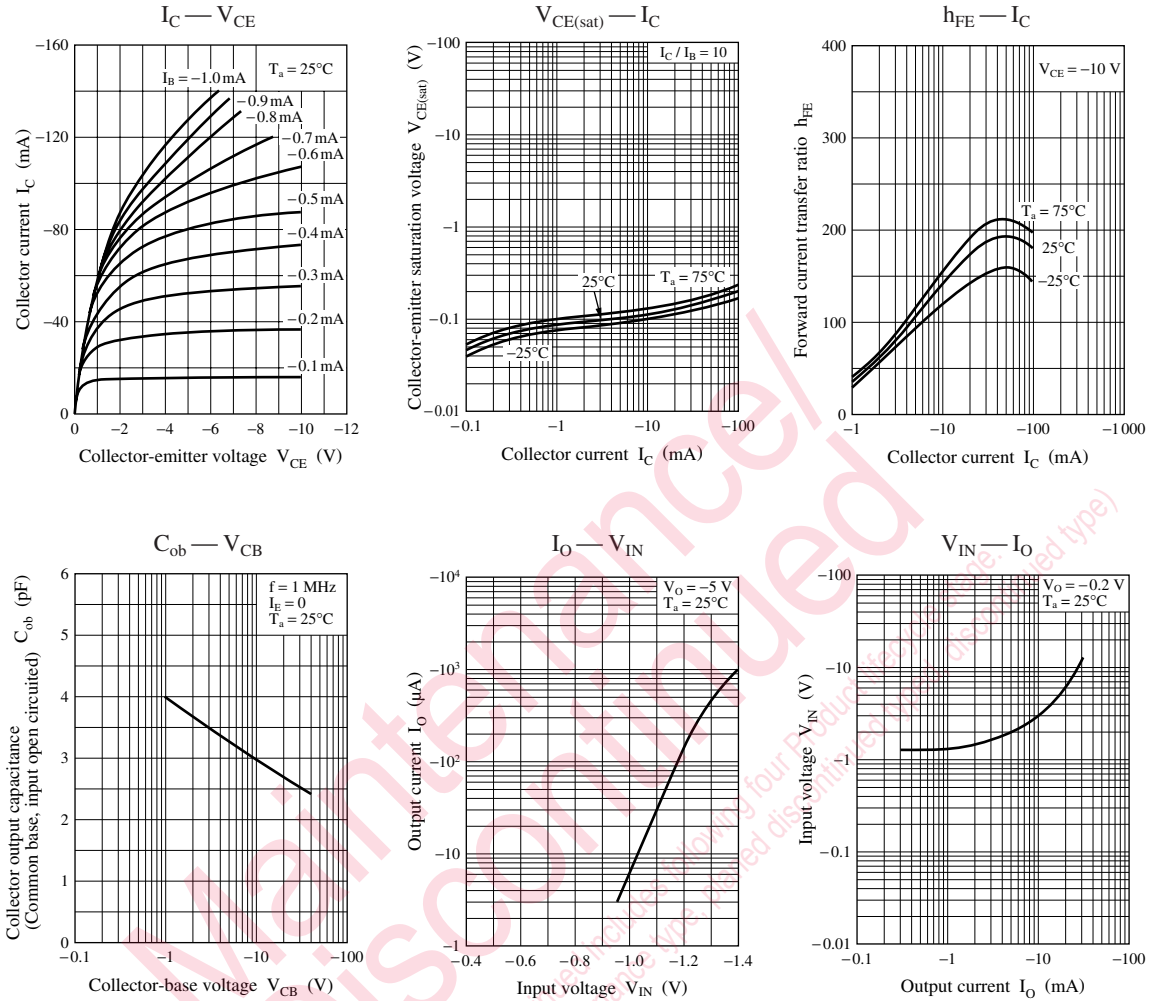




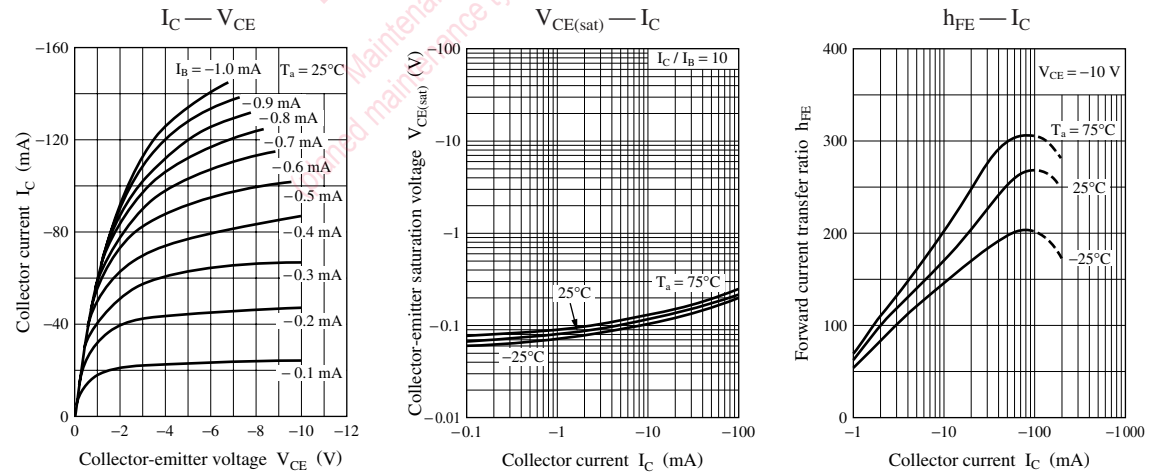
Characteristics charts of UNR5111

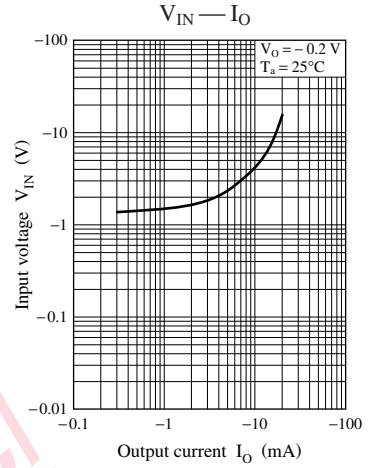
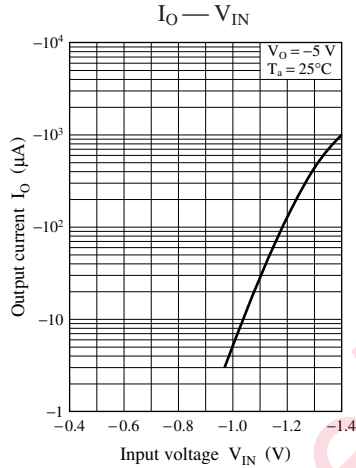
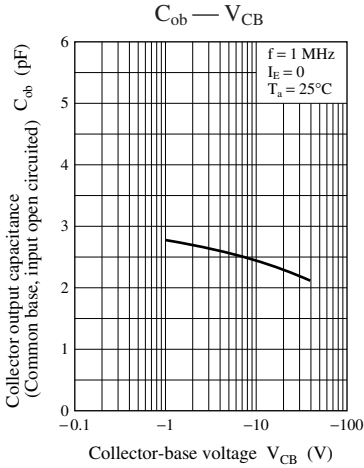


Characteristics charts of UNR5112

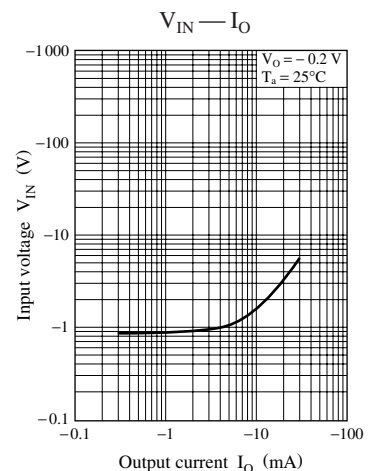
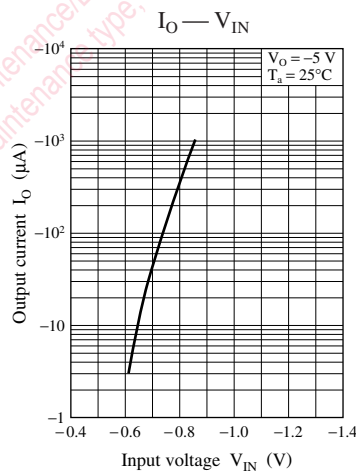
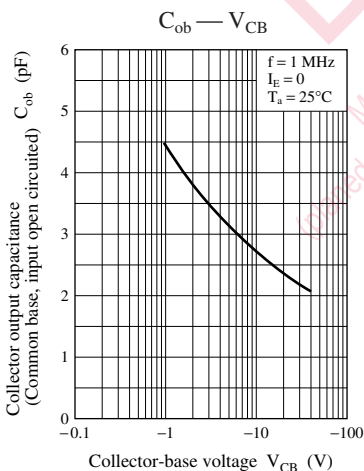
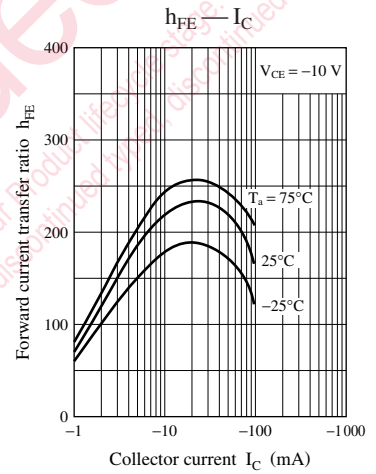
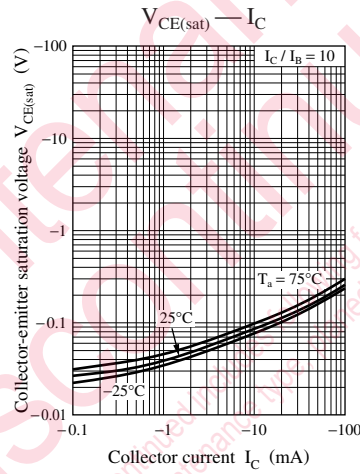
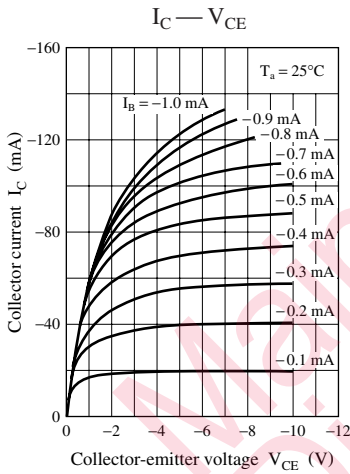


Characteristics charts of UNR5113

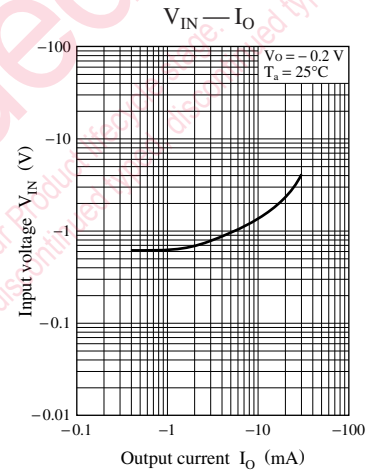
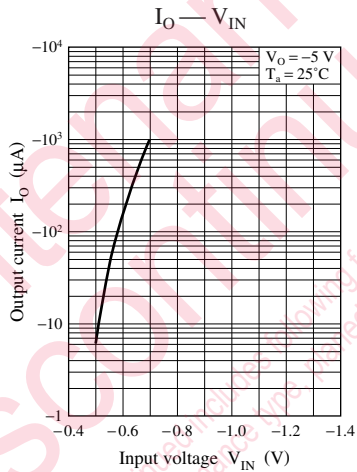
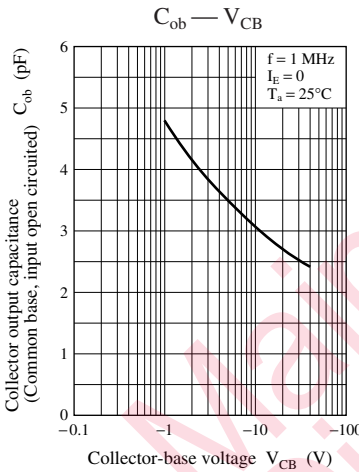
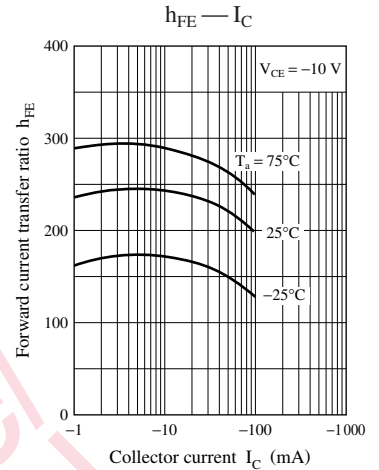
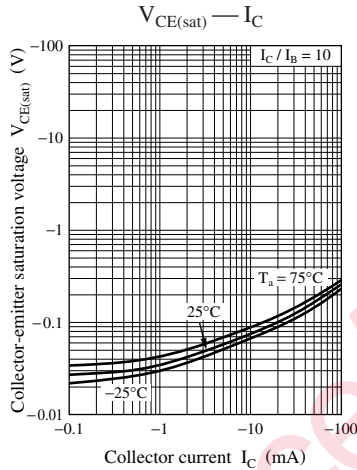
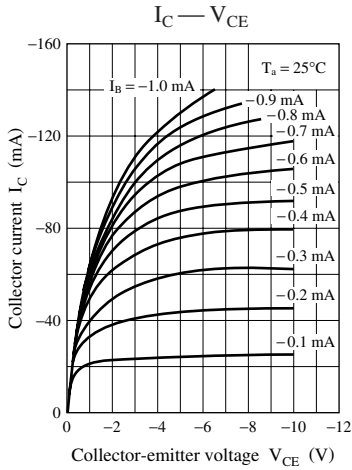




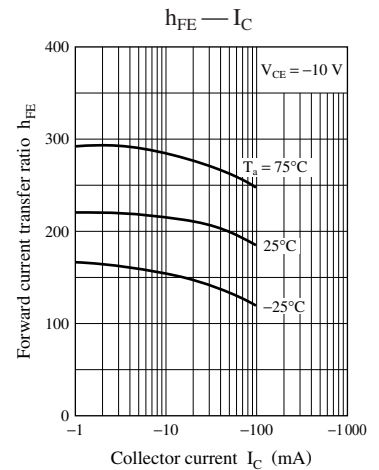
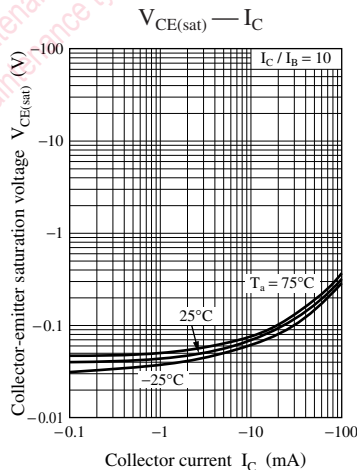
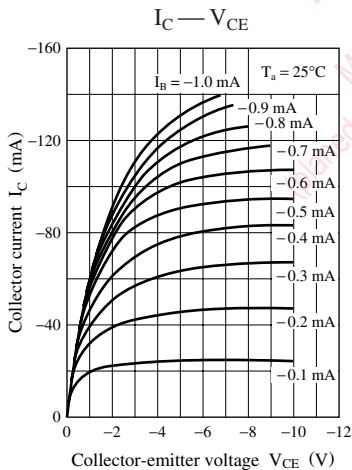
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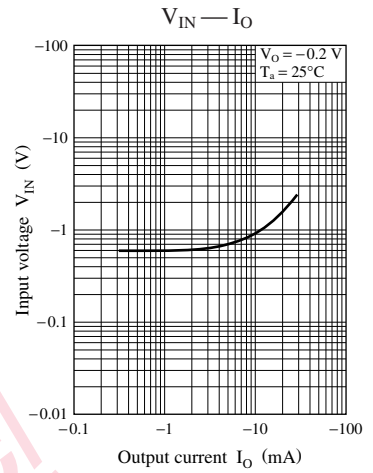
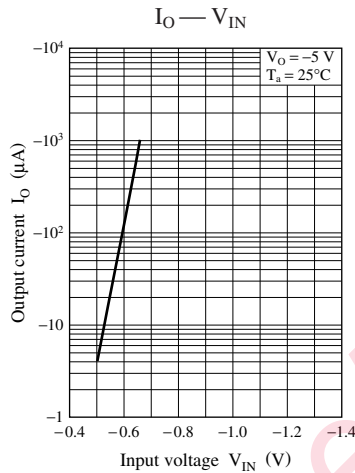
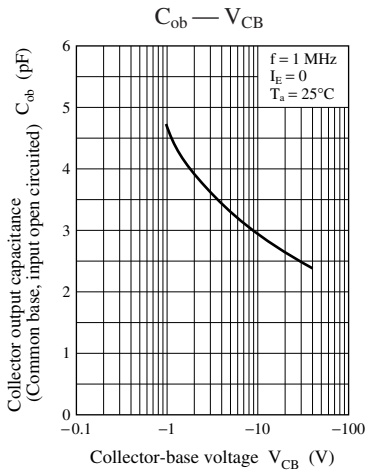


Characteristics charts of UNR5115

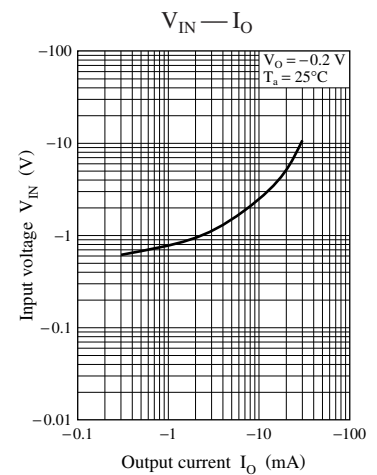
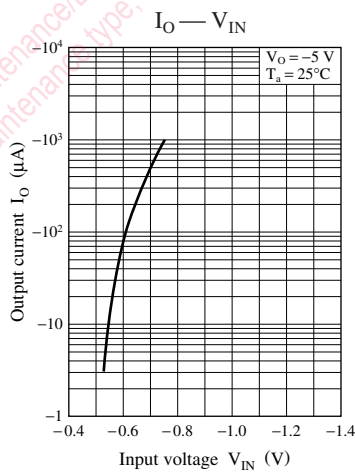
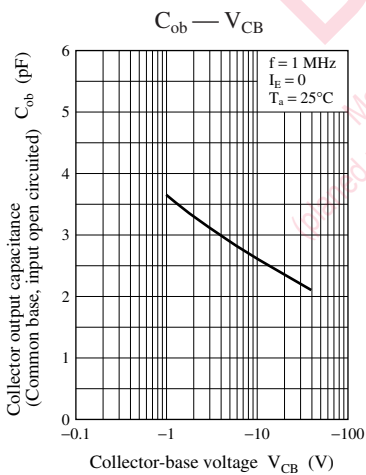
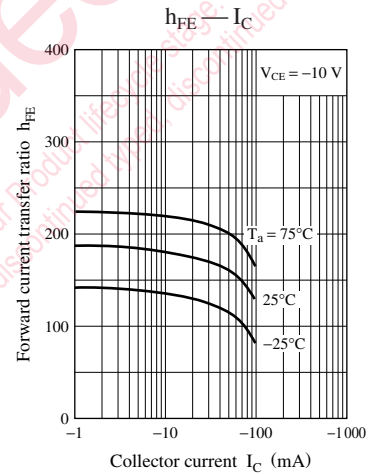
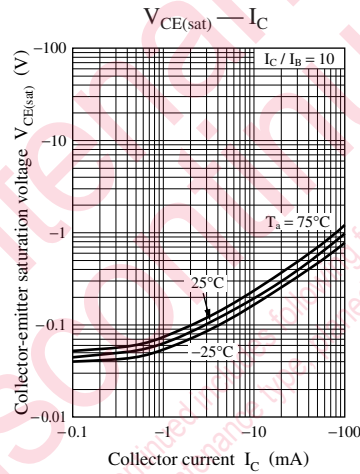
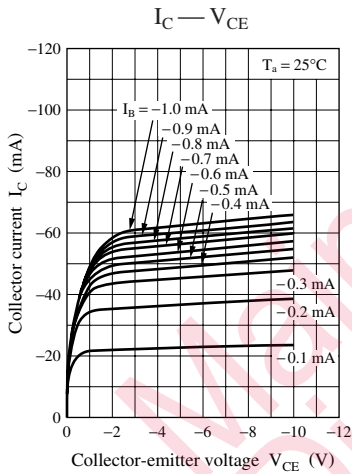


Characteristics charts of UNR5116



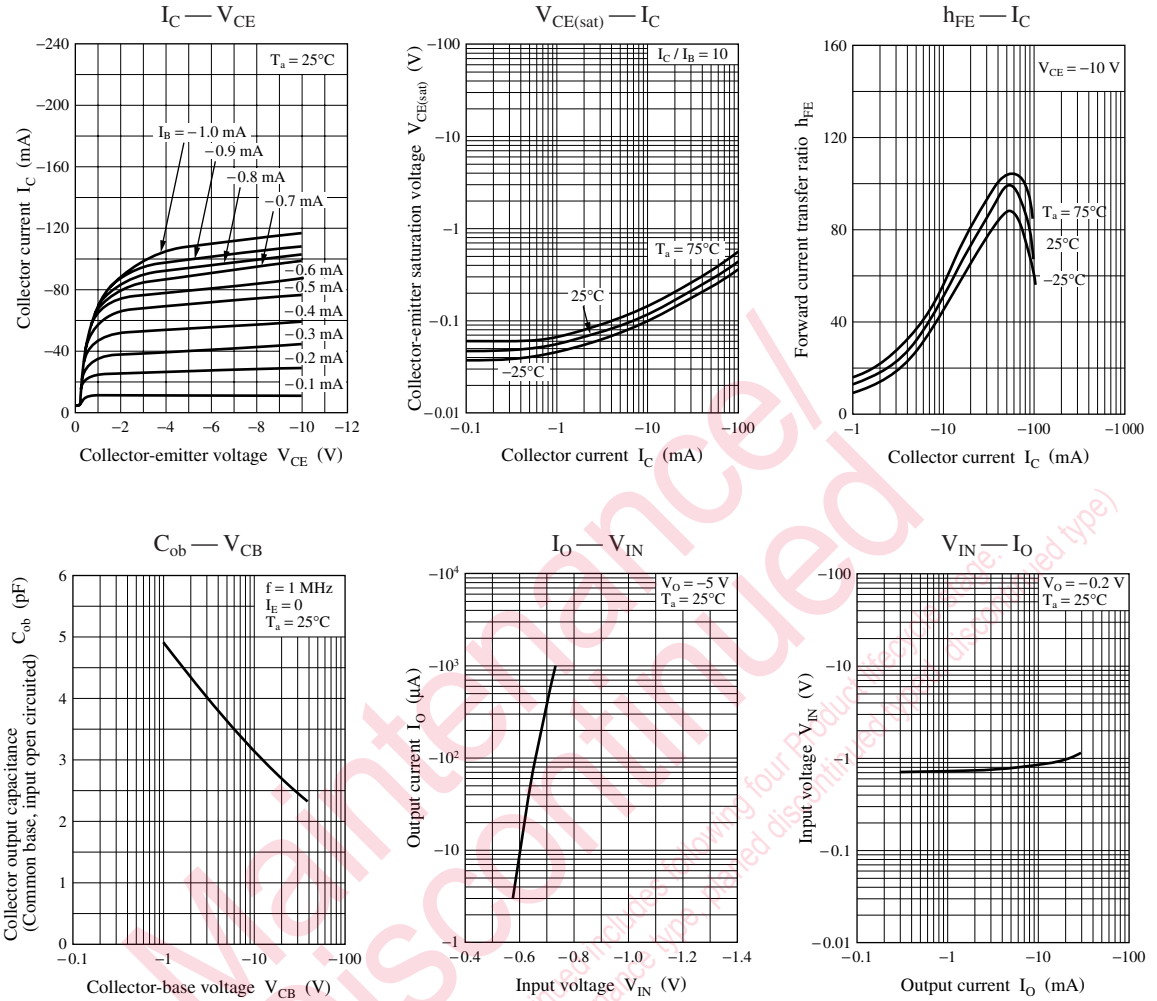


Characteristics charts of UNR5117

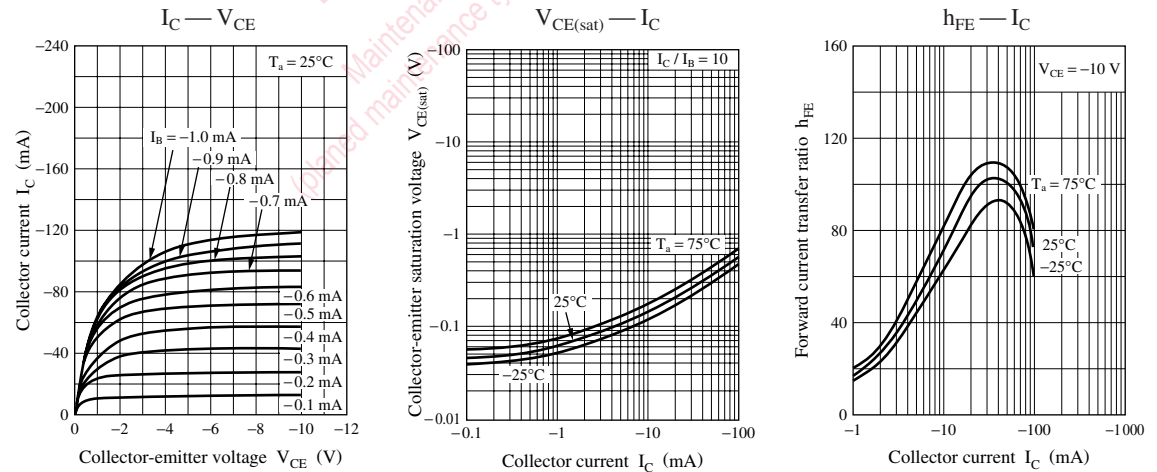


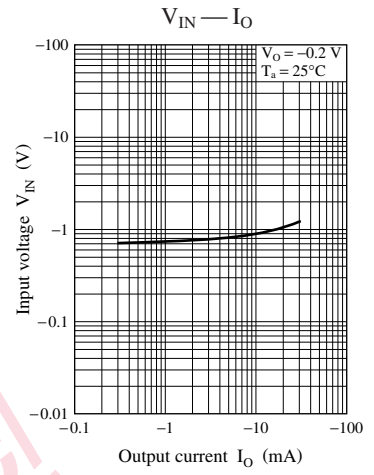
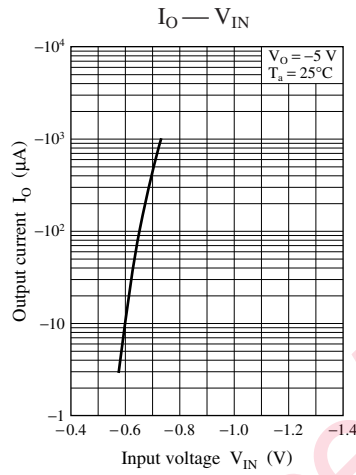
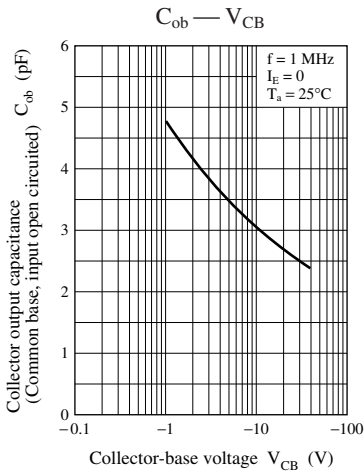


Characteristics charts of UNR5118

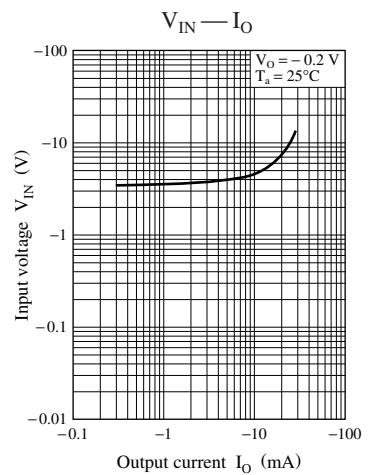
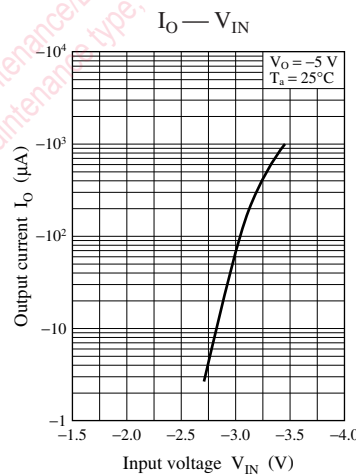
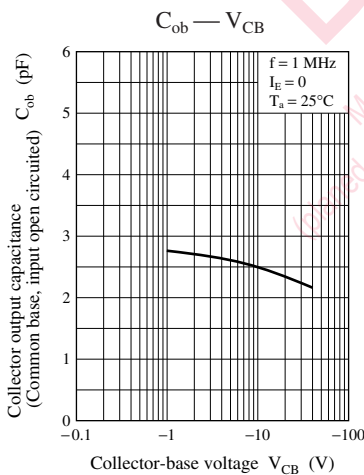
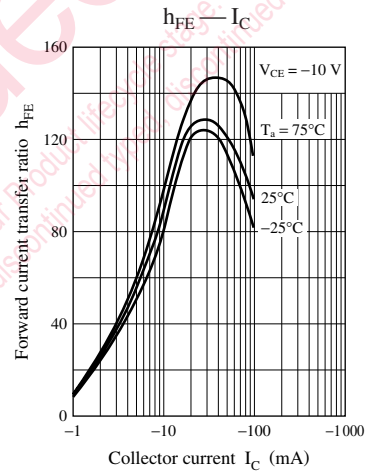
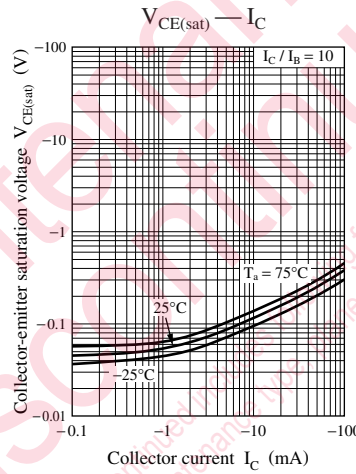
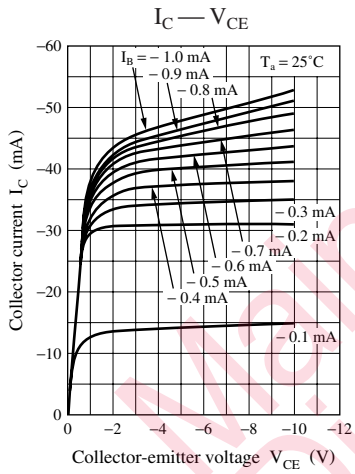


Characteristics charts of UNR5119

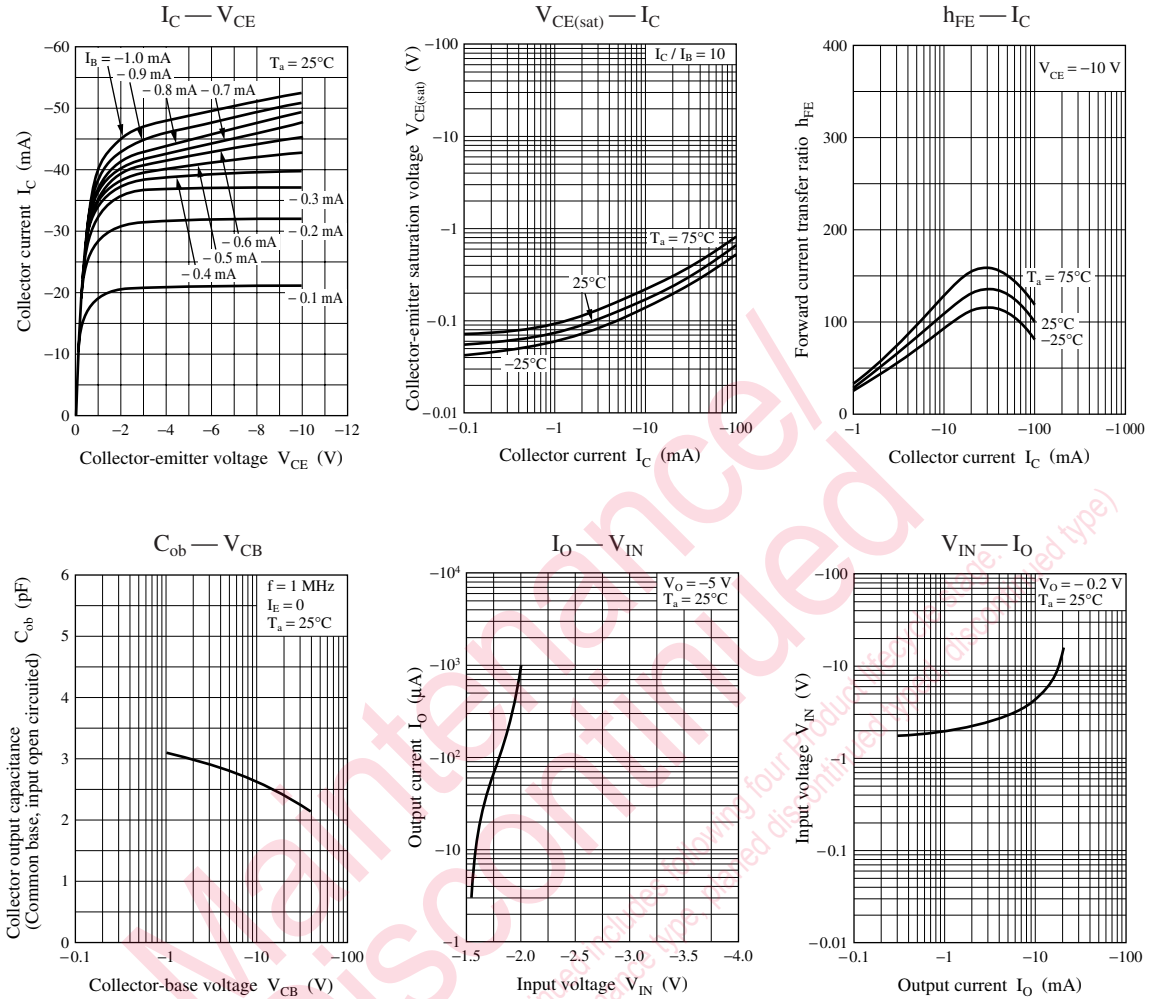




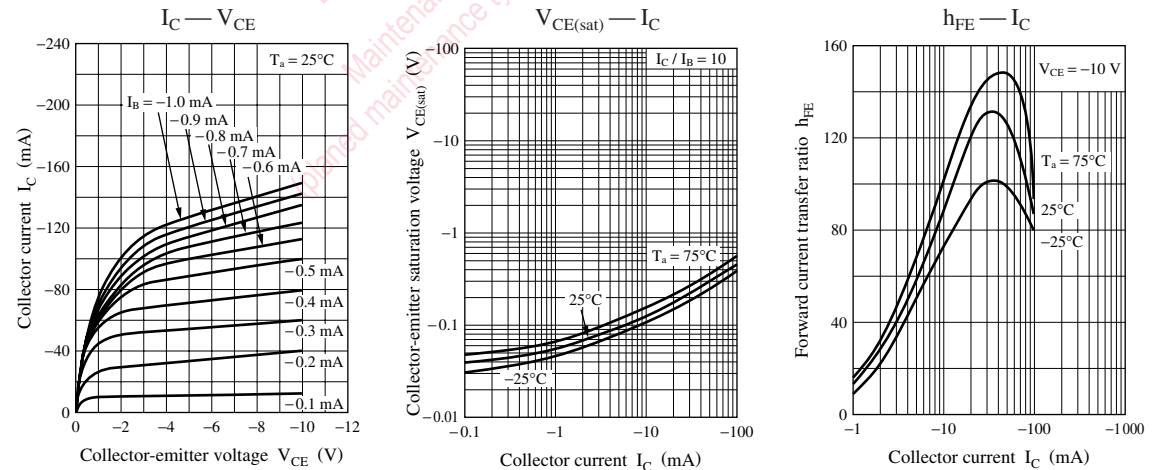
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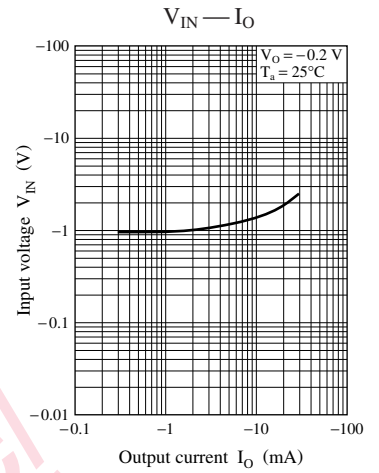
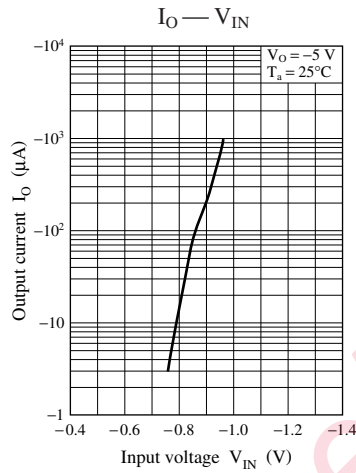
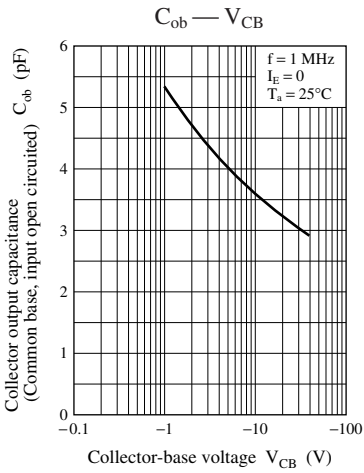


Characteristics charts of UNR511E

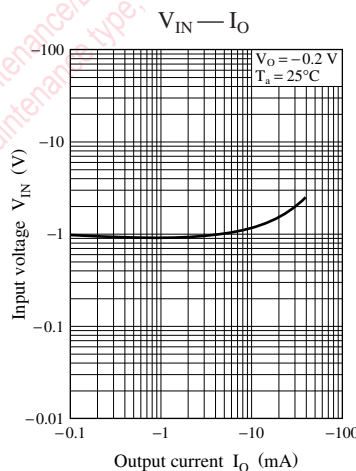
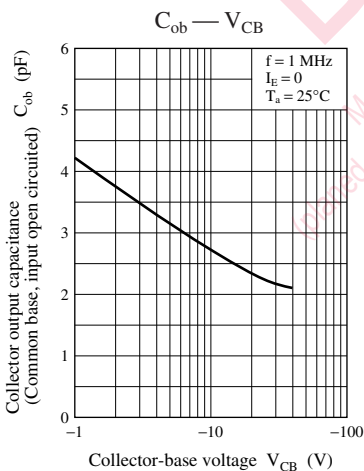
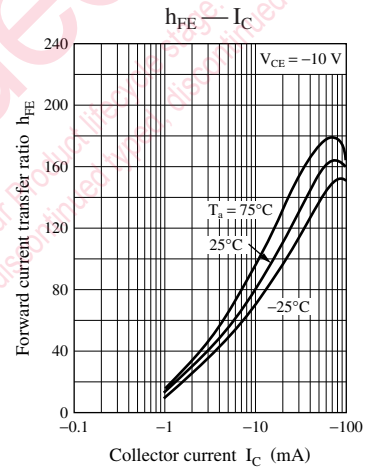
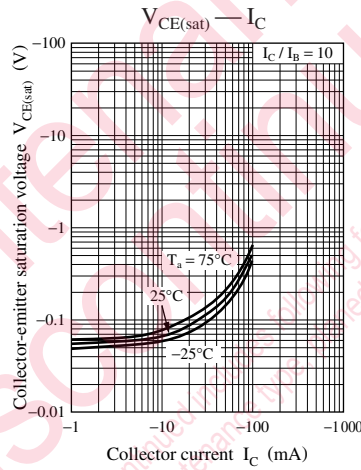
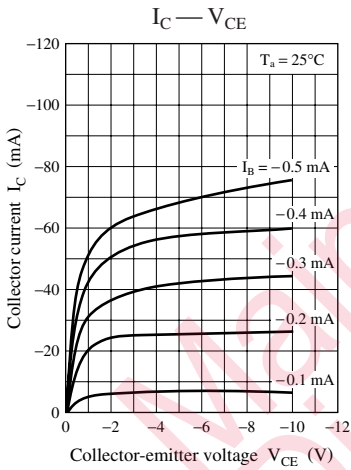


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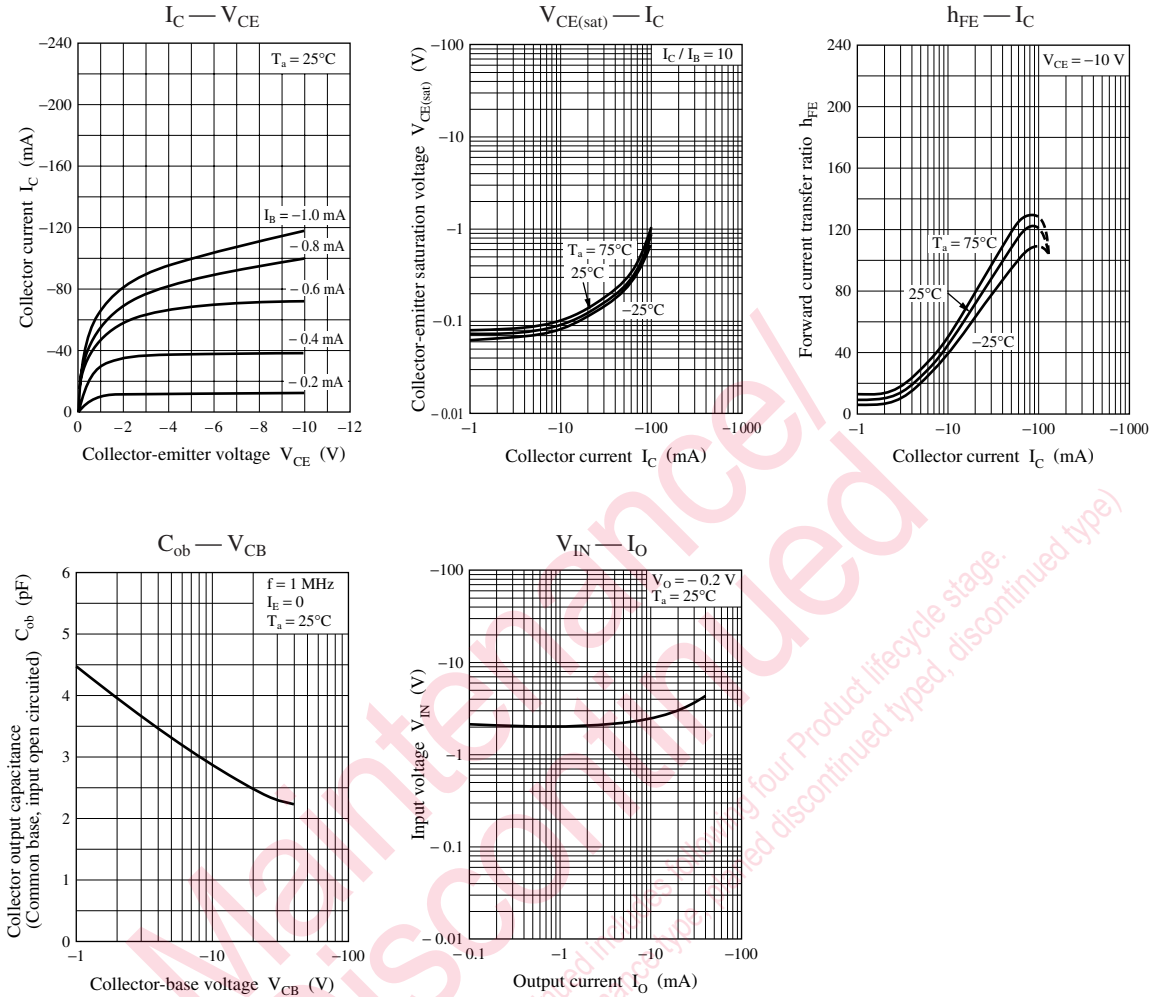




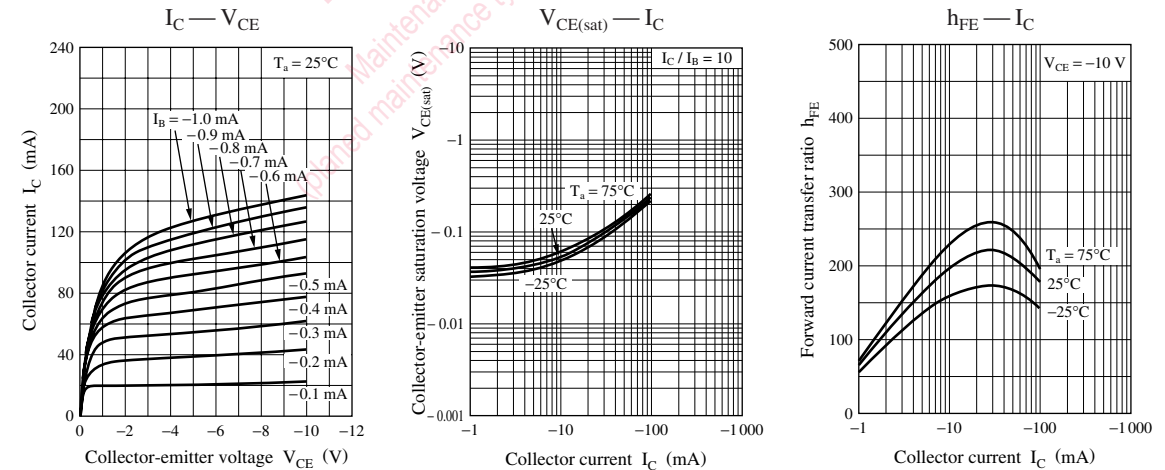
Characteristics charts of UNR511H

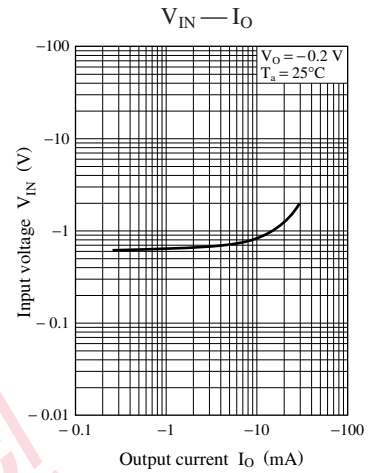
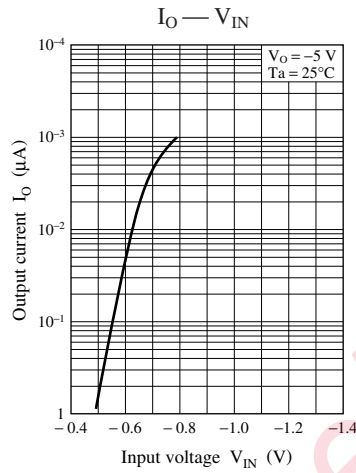
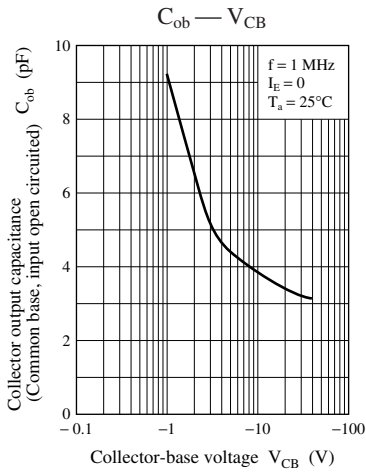


Characteristics charts of UNR511L

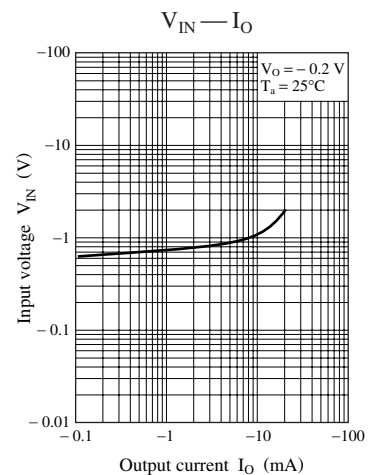
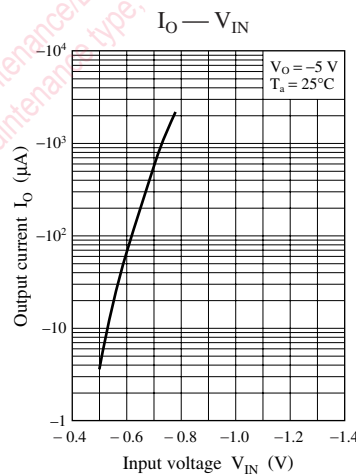
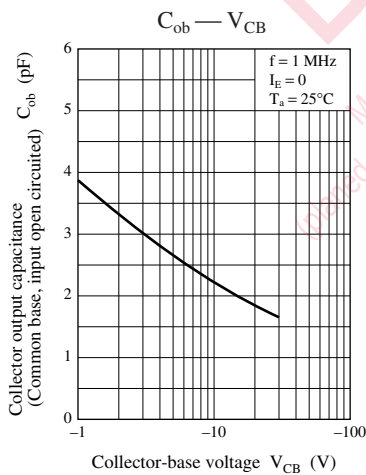
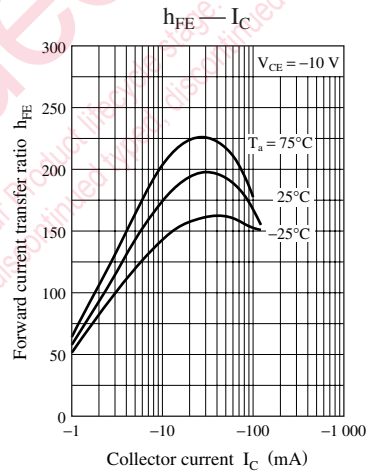
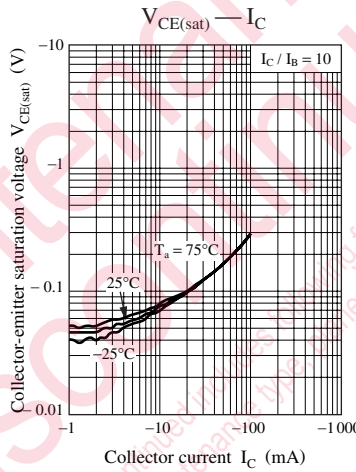
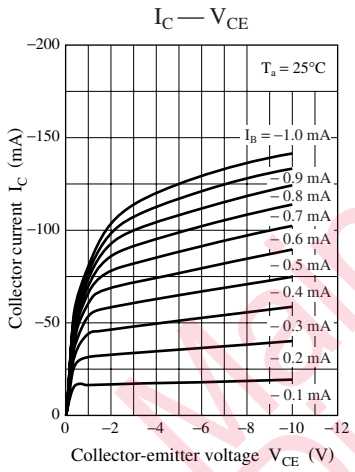


Characteristics charts of UNR511M

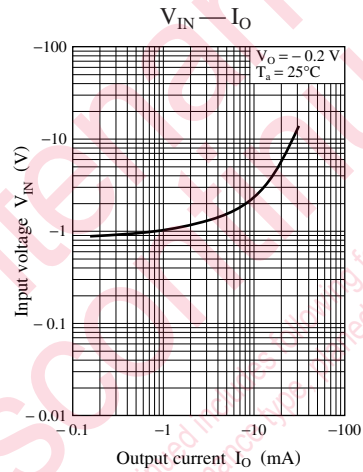
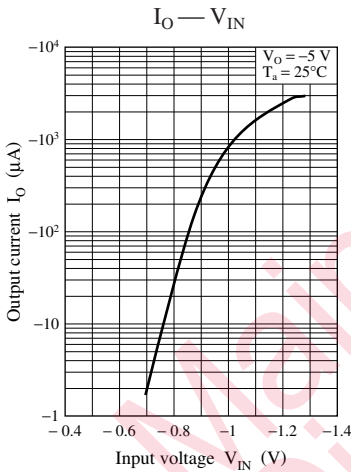
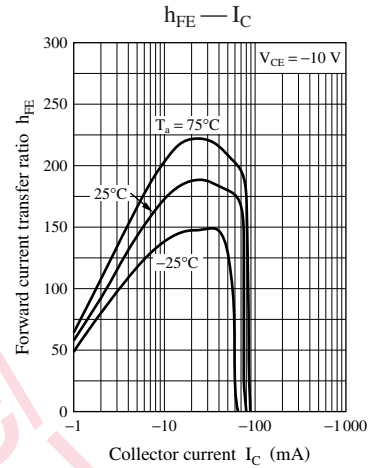
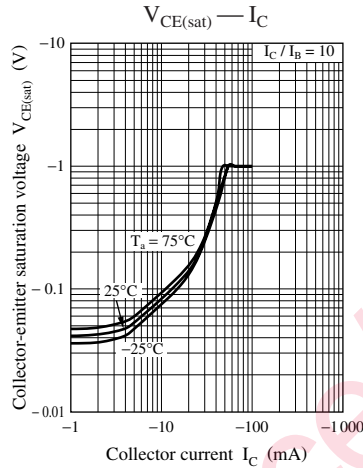
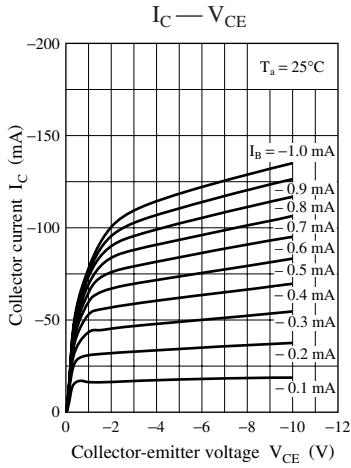




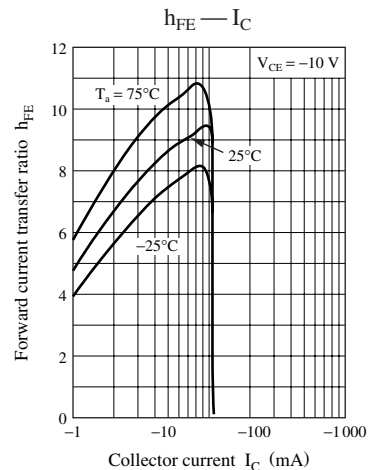
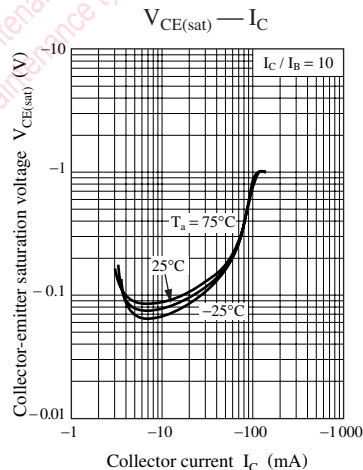
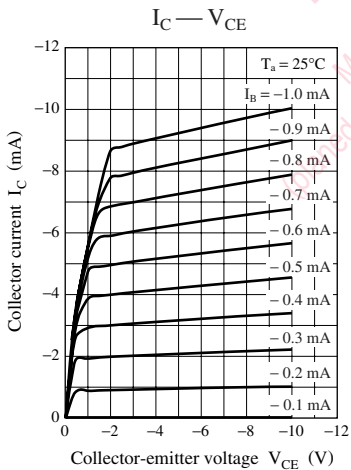
Characteristics charts of UNR511N

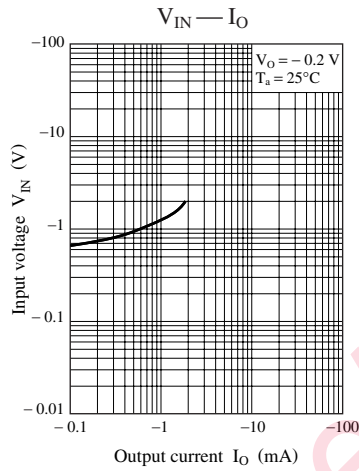
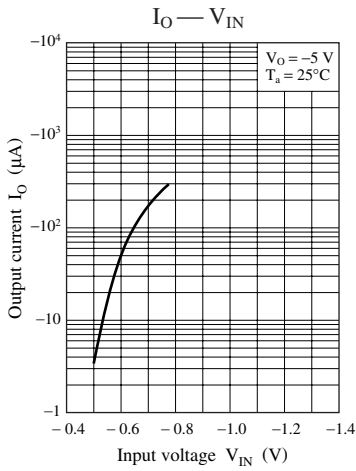


Characteristics charts of UNR511T

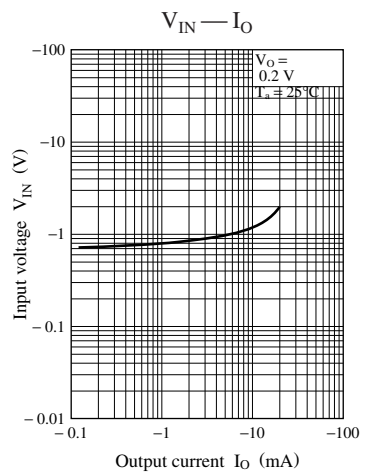
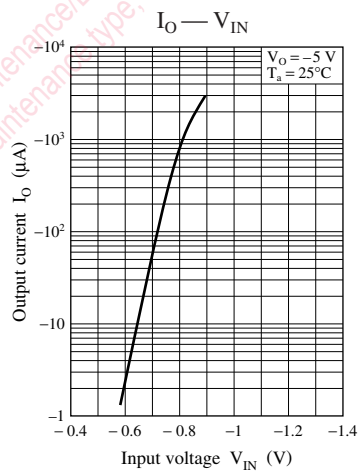
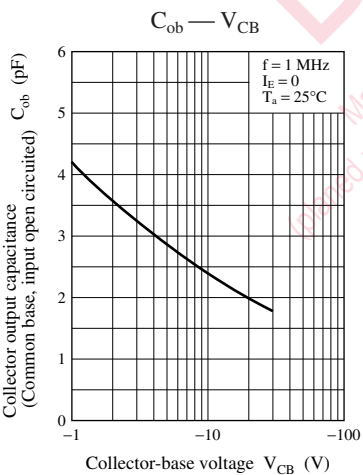
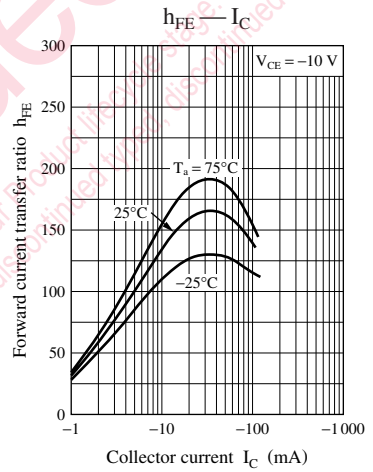
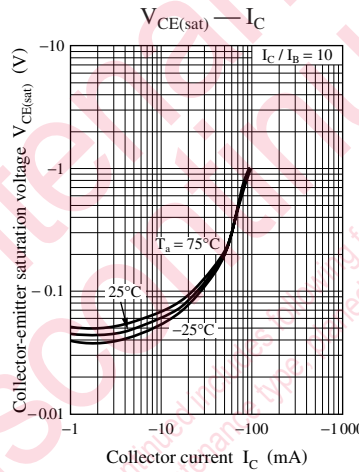
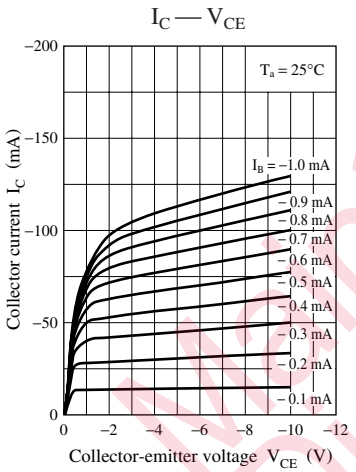


Characteristics charts of UNR511V





Characteristics charts of UNR511Z





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