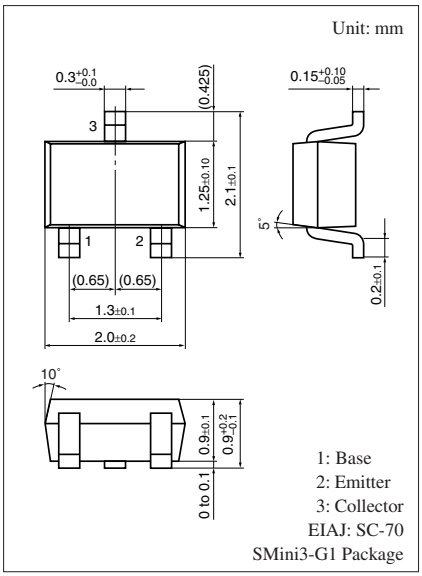
UNR511x Series (UN511x Series)

Silicon PNP epitaxial planar type

For digital circuits



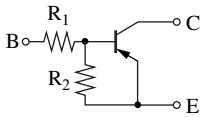
■ Features

- 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

Internal Connection



■ 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

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

■ Electrical Characteristics $T_a = 25°C \pm 3°C$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)		V_{CBO}	$I_C = -10$ µA, $I_E = 0$	−50			V
Collector-emitter voltage (Base open)		V_{CEO}	$I_C = -2$ mA, $I_B = 0$	−50			V
Collector-base cutoff current (Emitter open)		I_{CBO}	$V_{CB} = -50$ V, $I_E = 0$			− 0.1	µA
Collector-emitter cutoff current (Base open)		I_{CEO}	$V_{CE} = -50$ V, $I_B = 0$			− 0.5	µA
Emitter-base cutoff current (Collector open)	UNR5110/5115/5116/5117	I_{EBO}	$V_{EB} = -6$ 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}	$V_{CE} = -10$ V, $I_C = -5$ 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		$V_{CE(sat)}$	$I_C = -10$ mA, $I_B = -0.3$ mA			− 0.25	V
	UNR511V		$I_C = -10$ mA, $I_B = -1.5$ mA				
Output voltage high-level		V_{OH}	$V_{CC} = -5$ V, $V_B = -0.5$ V, $R_L = 1$ kΩ	−4.9			V
Output voltage low-level		V_{OL}	$V_{CC} = -5$ V, $V_B = -2.5$ V, $R_L = 1$ kΩ			− 0.2	V
	UNR5113		$V_{CC} = -5$ V, $V_B = -3.5$ V, $R_L = 1$ kΩ				
	UNR511D		$V_{CC} = -5$ V, $V_B = -10$ V, $R_L = 1$ kΩ				
	UNR511E		$V_{CC} = -5$ V, $V_B = -6$ V, $R_L = 1$ kΩ				
Transition frequency		f_T	$V_{CB} = -10$ V, $I_E = 1$ mA, f = 200 MHz		80		MHz
	UNR5116		$V_{CB} = -10$ V, $I_E = 2$ mA, f = 200 MHz		150		
Input resistance	UNR5118	R_1		−30%	0.51	+30%	kΩ
	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) $T_a = 25°C \pm 3°C$

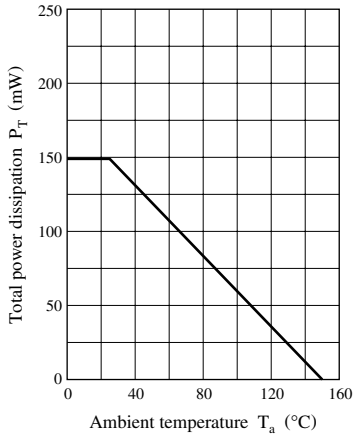
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR5114			0.17	0.21	0.25	
	UNR511H			0.17	0.22	0.27	
	UNR511T				0.47		
	UNR511F			0.37	0.47	0.57	
	UNR511V				1.0		
	UNR5111/5112/5113/511L			0.8	1.0	1.2	
	UNR511E			1.70	2.14	2.60	
	UNR511D			3.7	4.7	5.7	

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

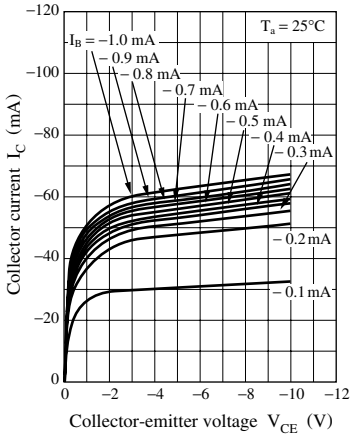
Common characteristics chart

P_T — T_a

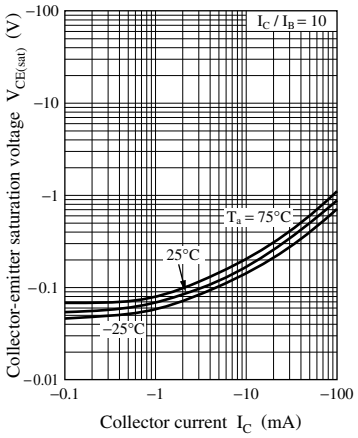


Characteristics charts of UNR5110

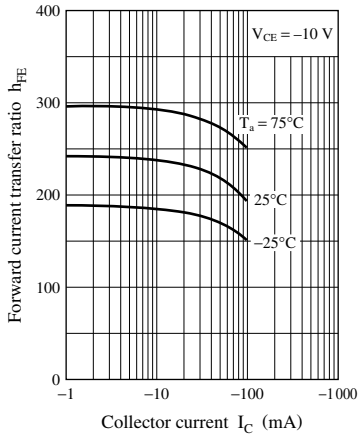
I_C — V_{CE}



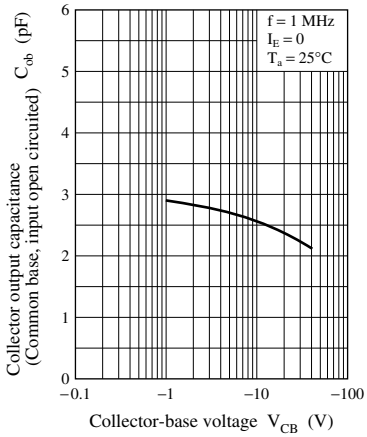
$V_{CE(sat)}$ — I_C



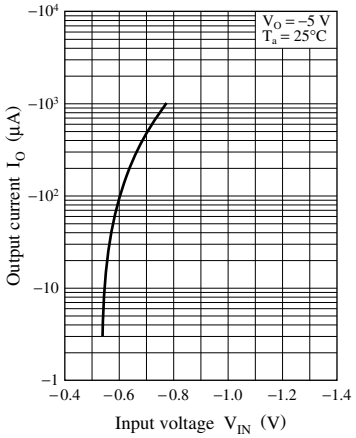
h_{FE} — I_C



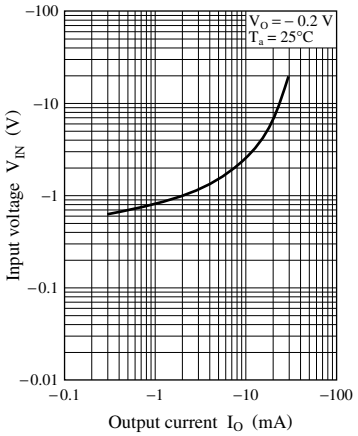
C_{ob} — V_{CB}



I_O — V_{IN}

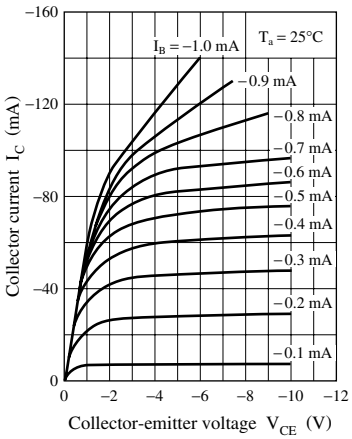


V_{IN} — I_O

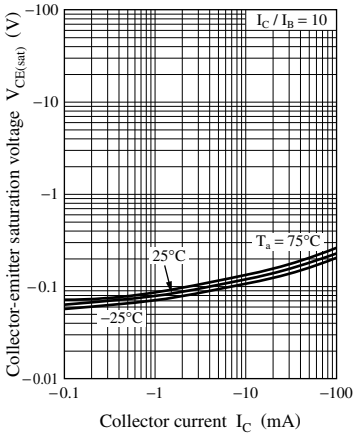


Characteristics charts of UNR5111

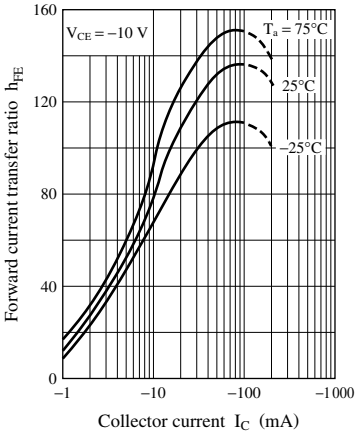
I_C — V_{CE}



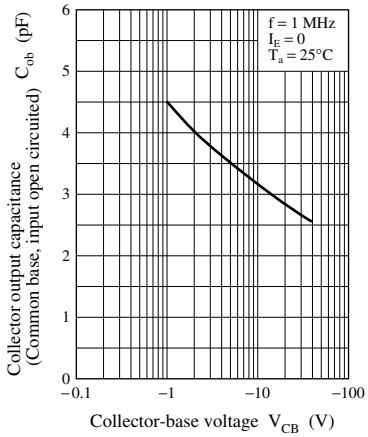
$V_{CE(sat)}$ — I_C



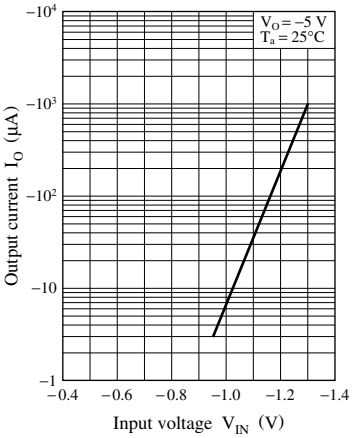
h_{FE} — I_C



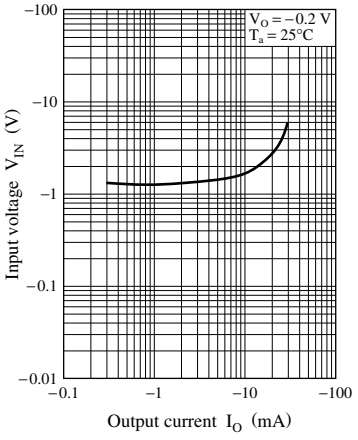
C_{ob} — V_{CB}



I_O — V_{IN}

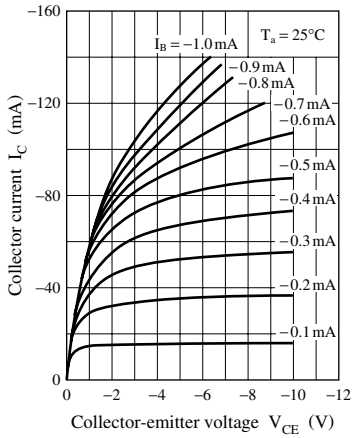


V_{IN} — I_O

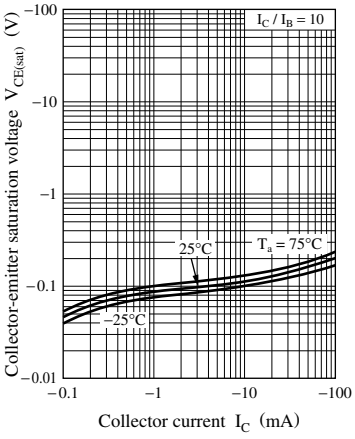


Characteristics charts of UNR5112

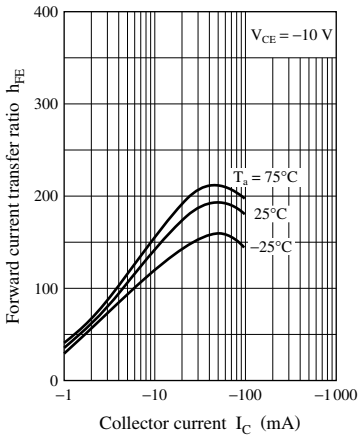
I_C — V_{CE}



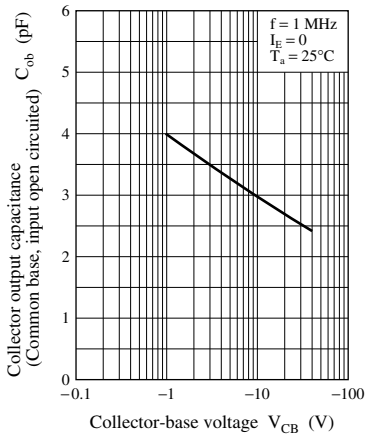
$V_{CE(sat)}$ — I_C



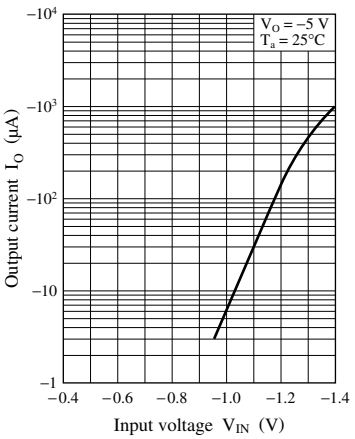
h_{FE} — I_C



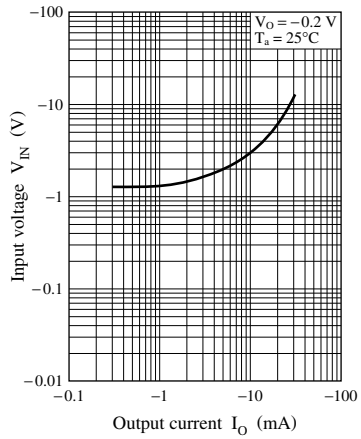
C_{ob} — V_{CB}



I_O — V_{IN}

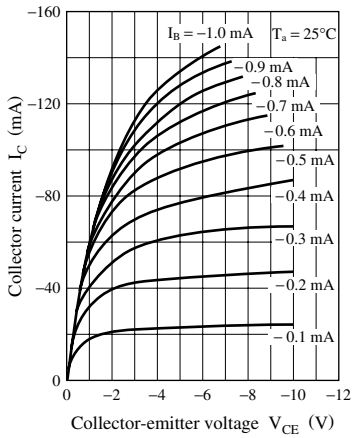


V_{IN} — I_O

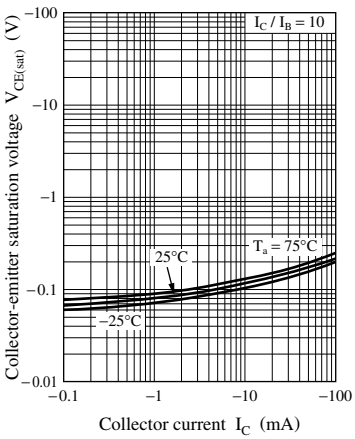


Characteristics charts of UNR5113

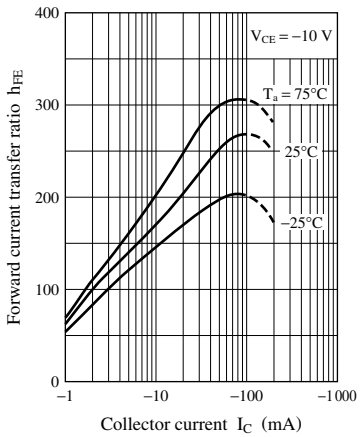
I_C — V_{CE}



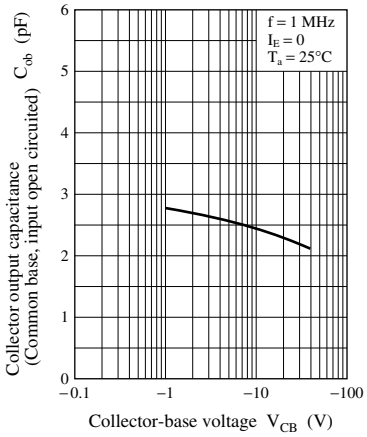
$V_{CE(sat)}$ — I_C



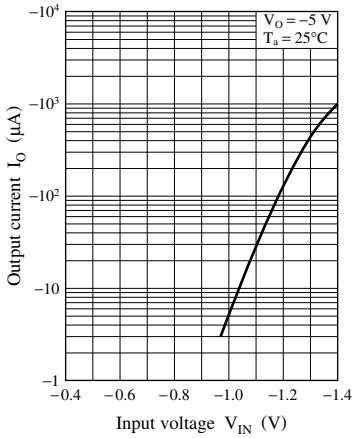
h_{FE} — I_C



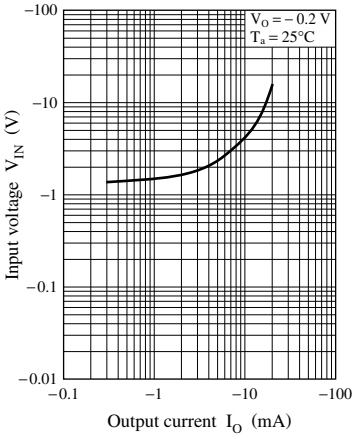
C_{ob} — V_{CB}



I_O — V_{IN}

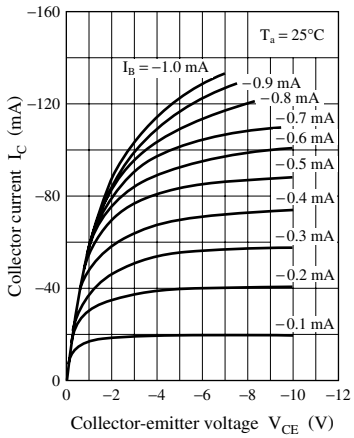


V_{IN} — I_O

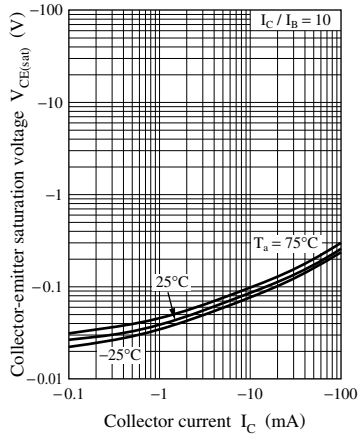


Characteristics charts of UNR5114

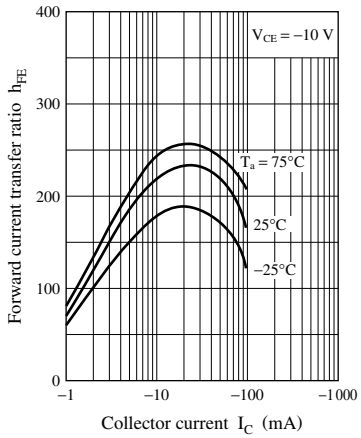
I_C — V_{CE}



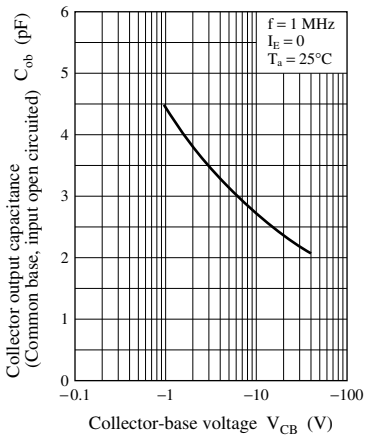
$V_{CE(sat)}$ — I_C



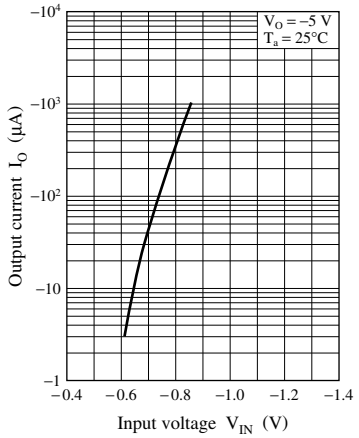
h_{FE} — I_C



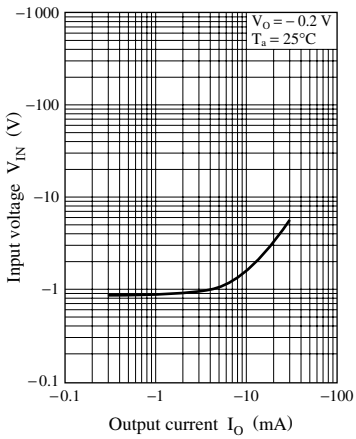
C_{ob} — V_{CB}



I_O — V_{IN}

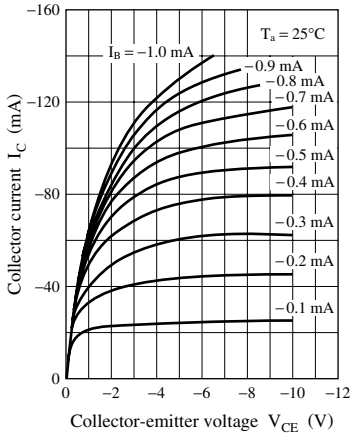


V_{IN} — I_O

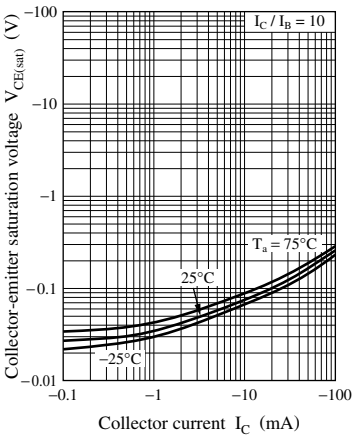


Characteristics charts of UNR5115

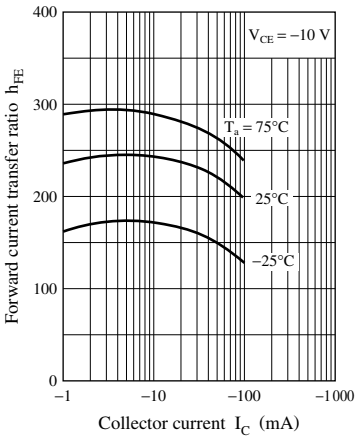
I_C — V_{CE}



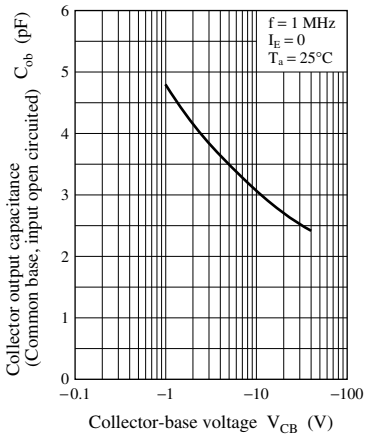
$V_{CE(sat)}$ — I_C



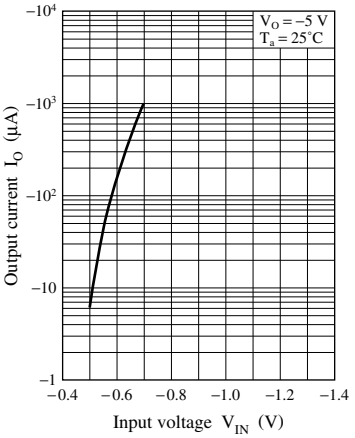
h_{FE} — I_C



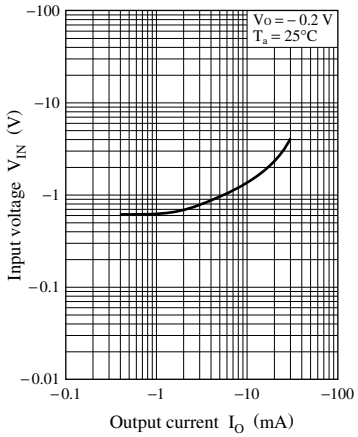
C_{ob} — V_{CB}



I_O — V_{IN}

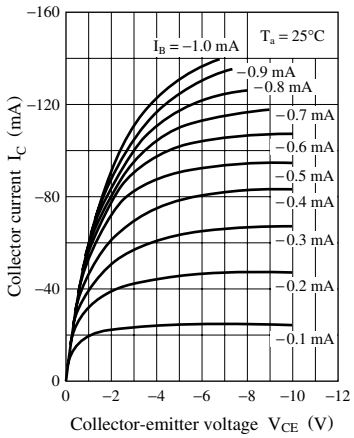


V_{IN} — I_O

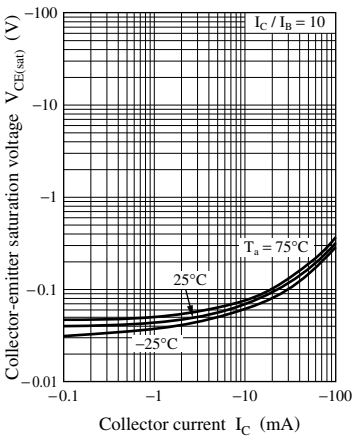


Characteristics charts of UNR5116

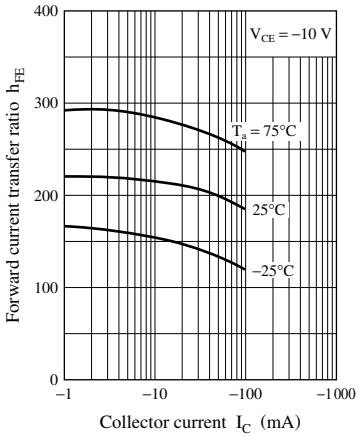
I_C — V_{CE}



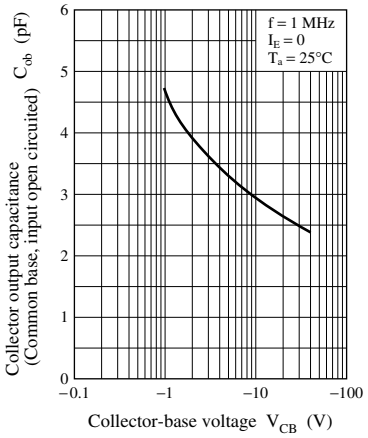
$V_{CE(sat)}$ — I_C



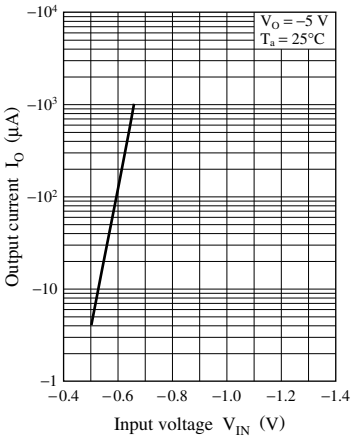
h_{FE} — I_C



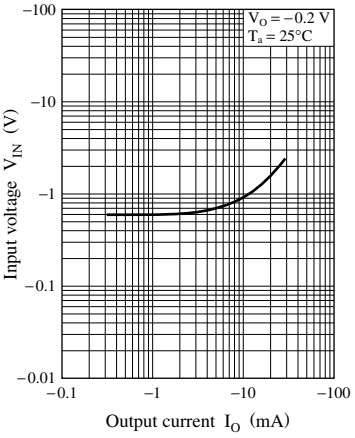
C_{ob} — V_{CB}



I_O — V_{IN}

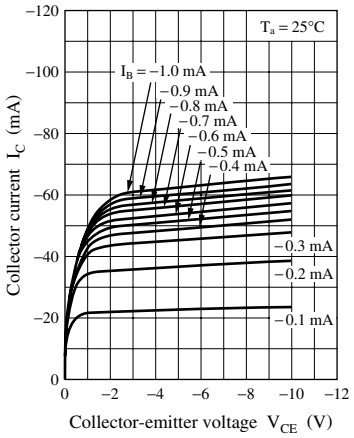


V_{IN} — I_O

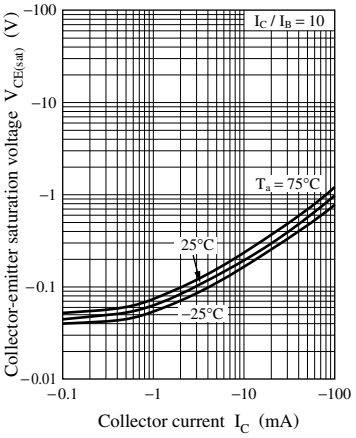


Characteristics charts of UNR5117

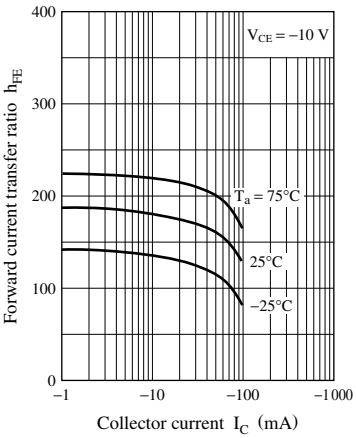
I_C — V_{CE}



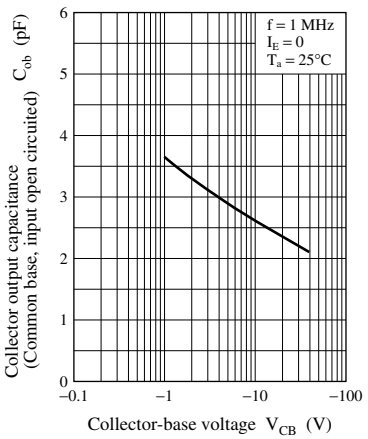
$V_{CE(sat)}$ — I_C



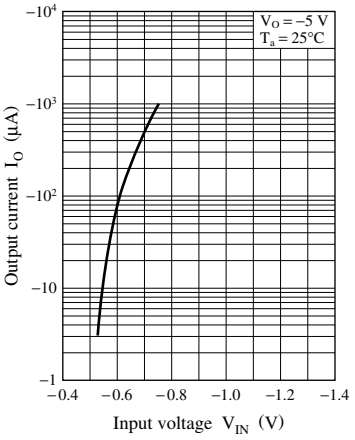
h_{FE} — I_C



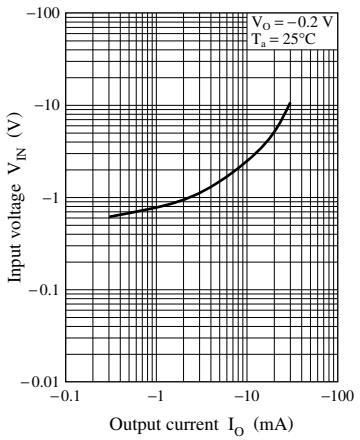
C_{ob} — V_{CB}



I_O — V_{IN}

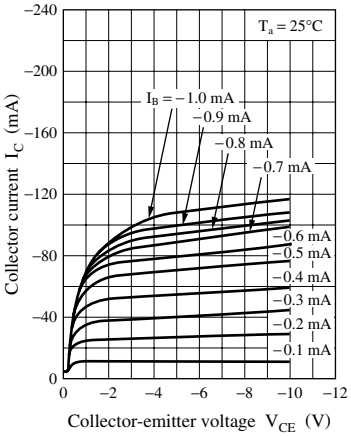


V_{IN} — I_O

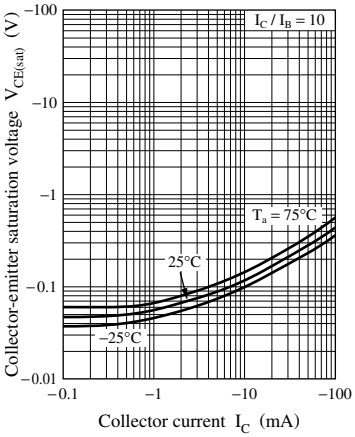


Characteristics charts of UNR5118

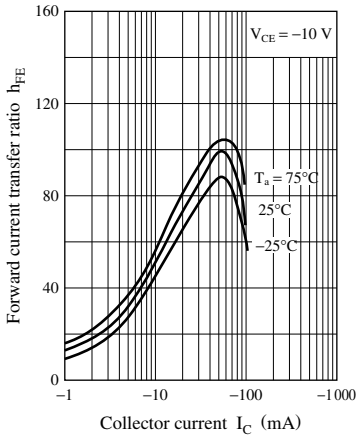
I_C — V_{CE}



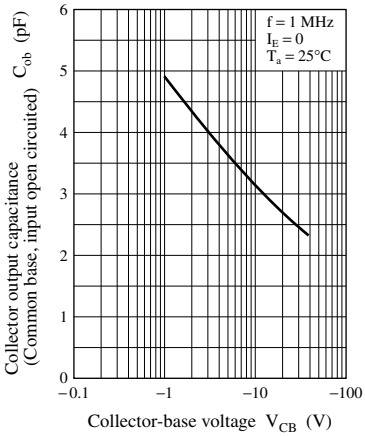
$V_{CE(sat)}$ — I_C



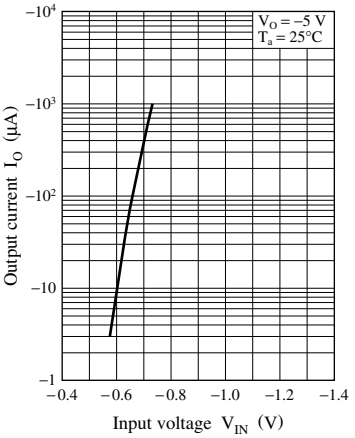
h_{FE} — I_C



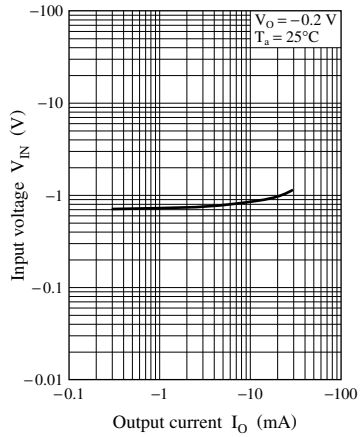
C_{ob} — V_{CB}



I_O — V_{IN}

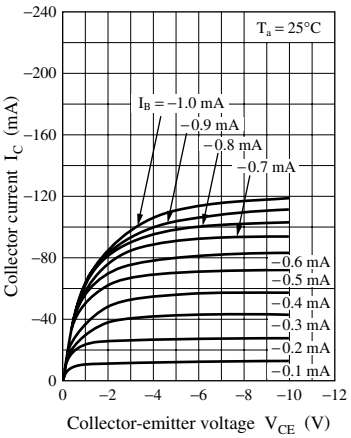


V_{IN} — I_O

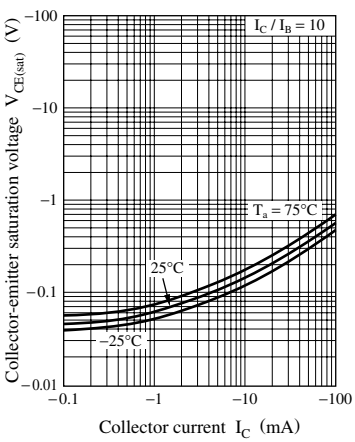


Characteristics charts of UNR5119

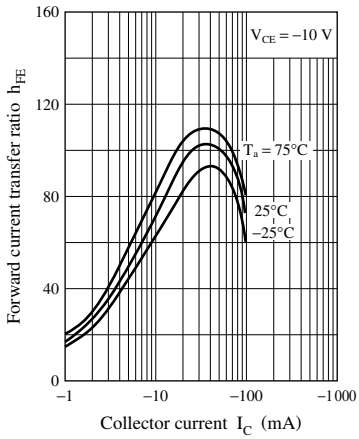
I_C — V_{CE}



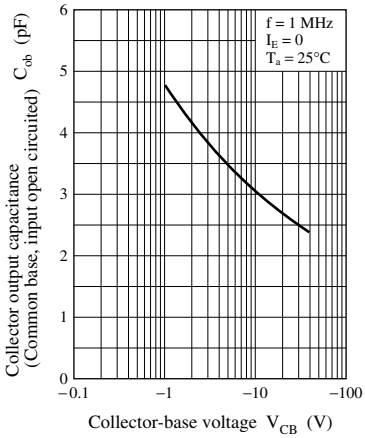
$V_{CE(sat)}$ — I_C



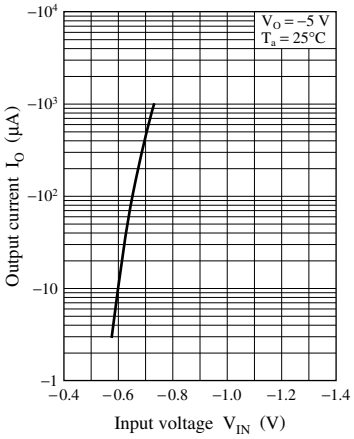
h_{FE} — I_C



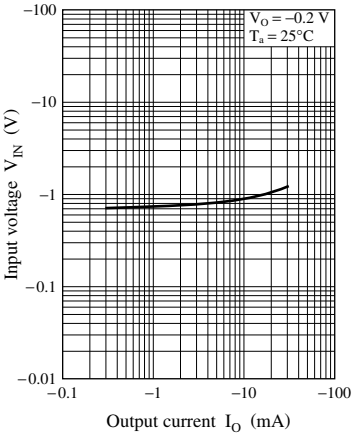
C_{ob} — V_{CB}



I_O — V_{IN}

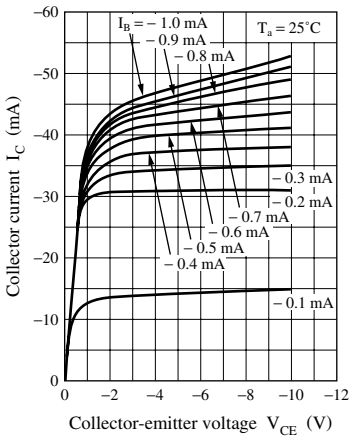


V_{IN} — I_O

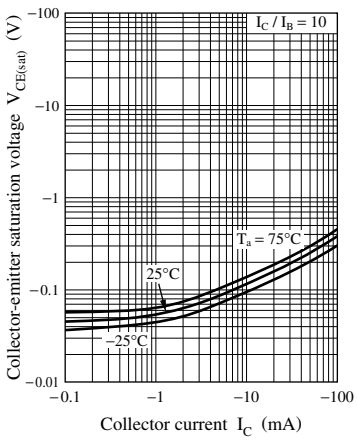


Characteristics charts of UNR511D

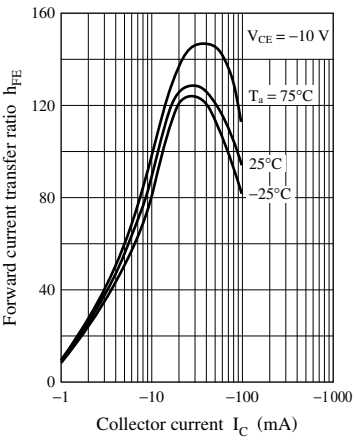
I_C — V_{CE}



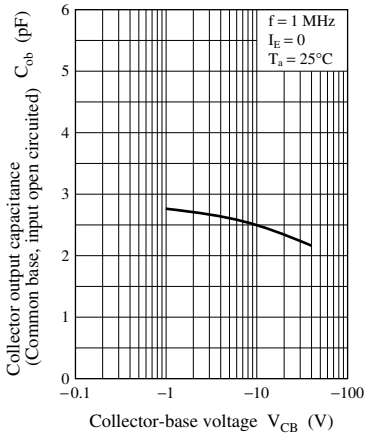
$V_{CE(sat)}$ — I_C



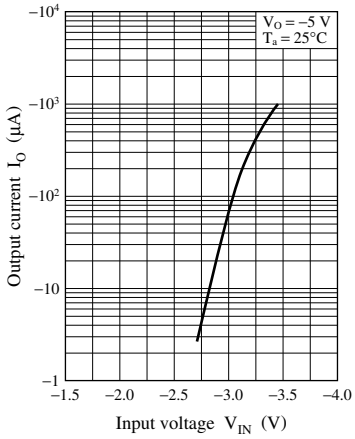
h_{FE} — I_C



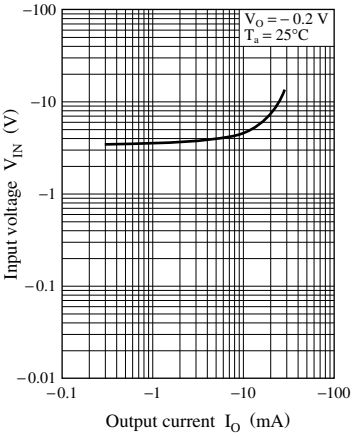
C_{ob} — V_{CB}



I_O — V_{IN}

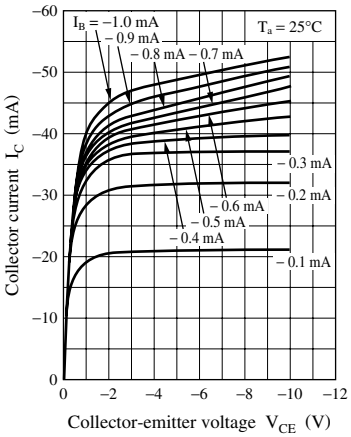


V_{IN} — I_O

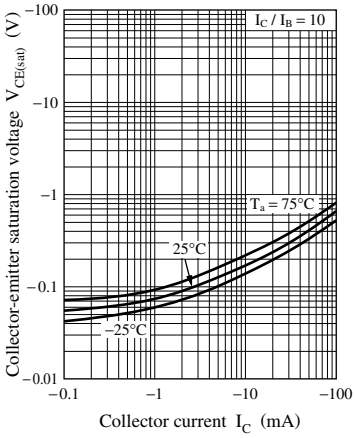


Characteristics charts of UNR511E

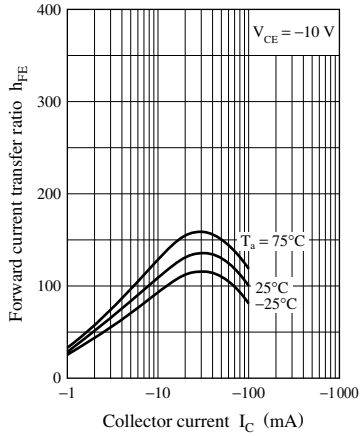
I_C — V_{CE}



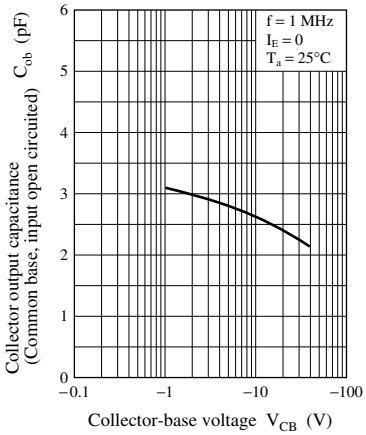
$V_{CE(sat)}$ — I_C



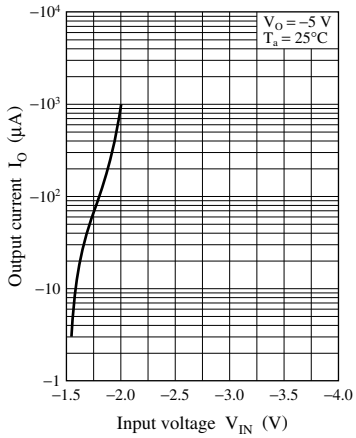
h_{FE} — I_C



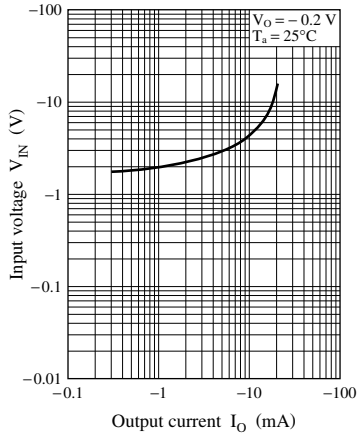
C_{ob} — V_{CB}



I_O — V_{IN}

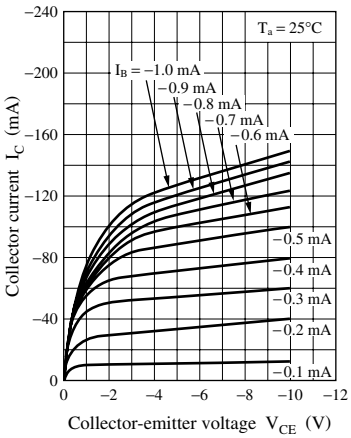


V_{IN} — I_O

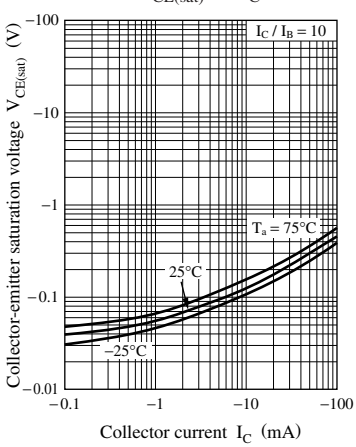


Characteristics charts of UNR511F

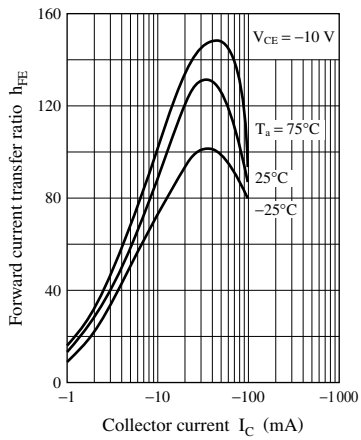
I_C — V_{CE}



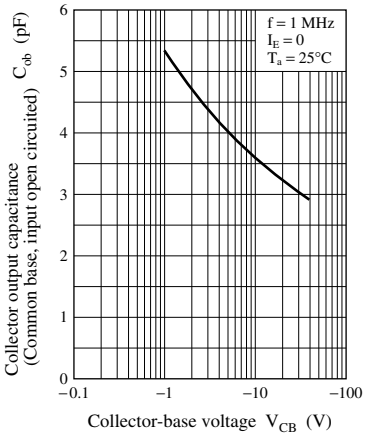
$V_{CE(sat)}$ — I_C



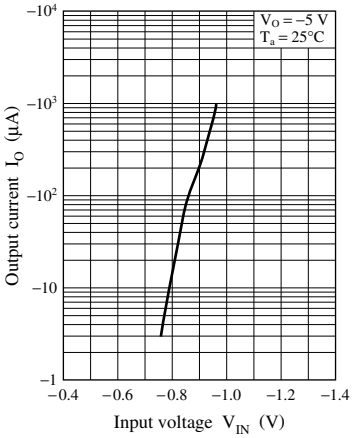
h_{FE} — I_C



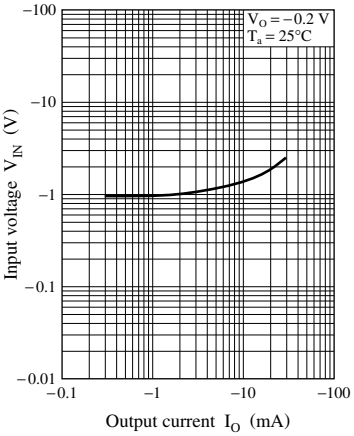
C_{ob} — V_{CB}



I_O — V_{IN}

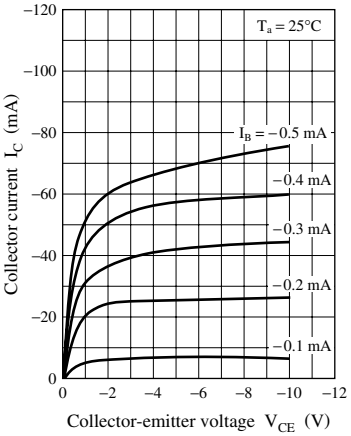


V_{IN} — I_O

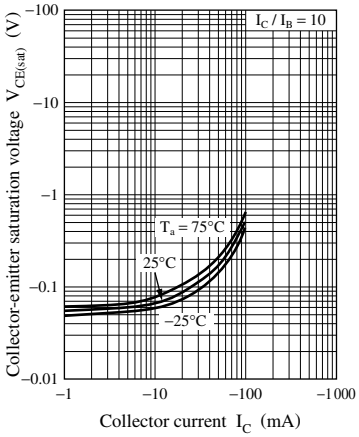


Characteristics charts of UNR511H

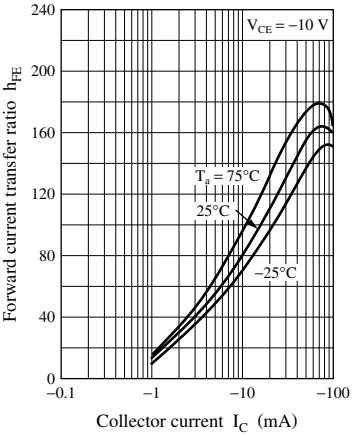
I_C — V_{CE}



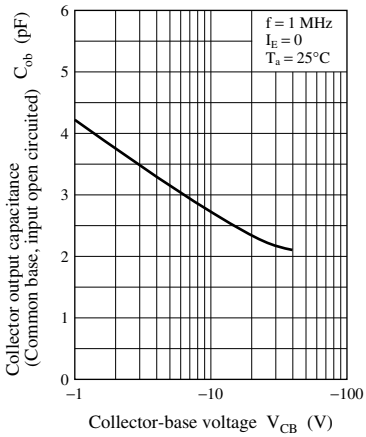
$V_{CE(sat)}$ — I_C



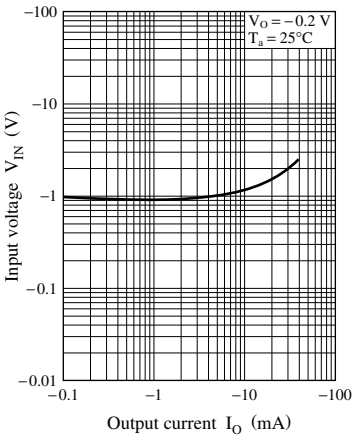
h_{FE} — I_C



C_{ob} — V_{CB}

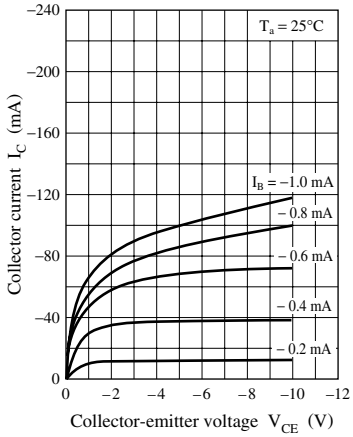


V_{IN} — I_O

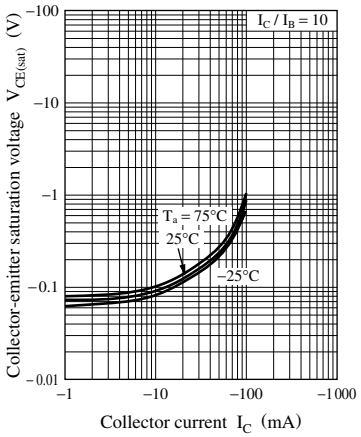


Characteristics charts of UNR511L

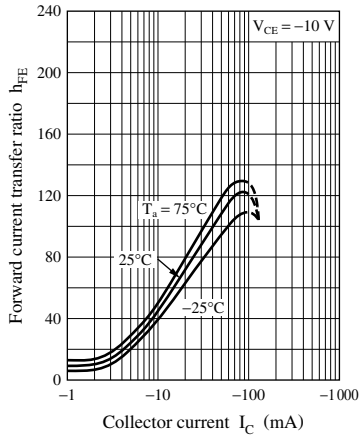
I_C — V_{CE}



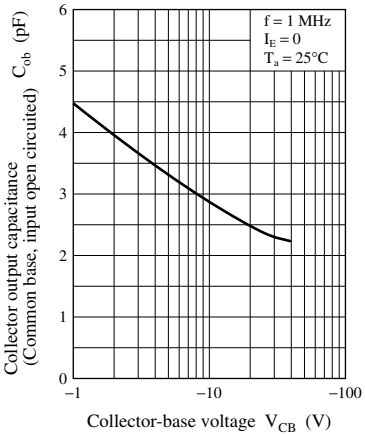
$V_{CE(sat)}$ — I_C



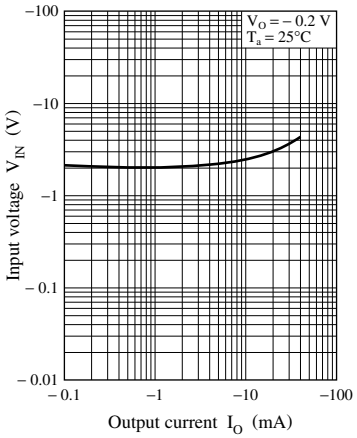
h_{FE} — I_C



C_{ob} — V_{CB}

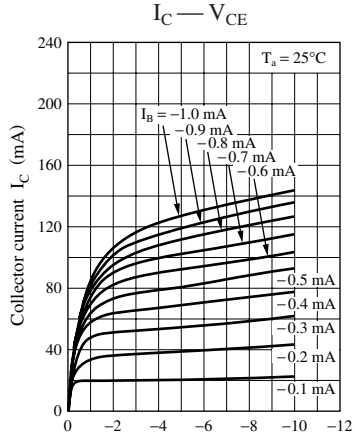


V_{IN} — I_O

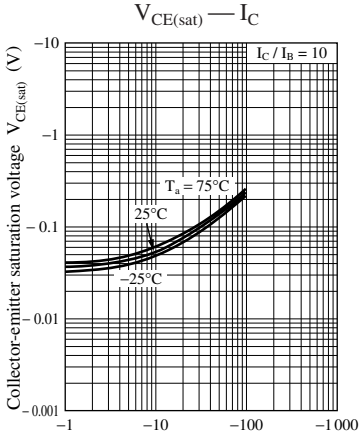


Characteristics charts of UNR511M

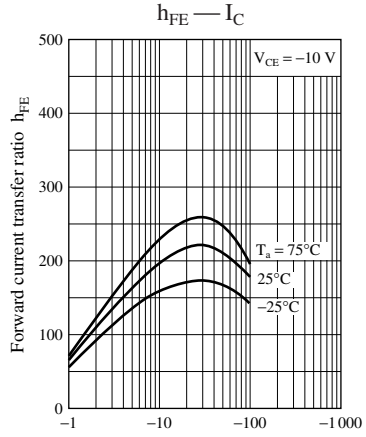
I_C — V_{CE}



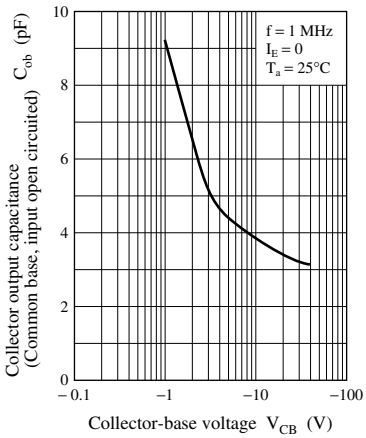
$V_{CE(sat)}$ — I_C



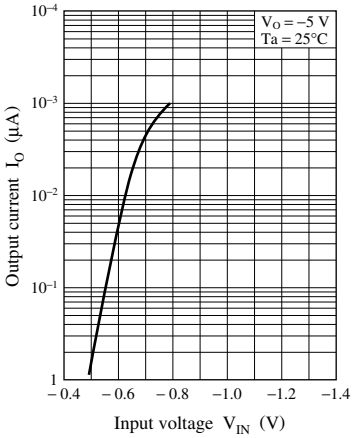
h_{FE} — I_C



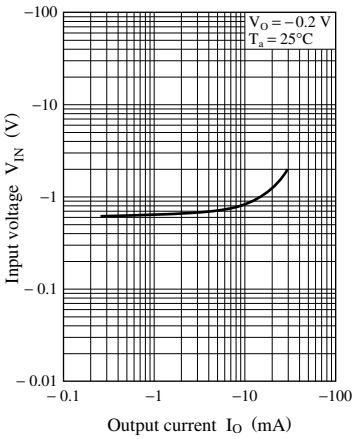
C_{ob} — V_{CB}



I_O — V_{IN}

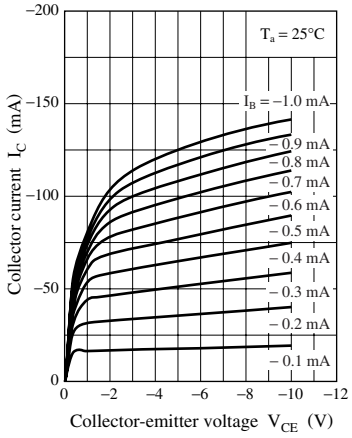


V_{IN} — I_O

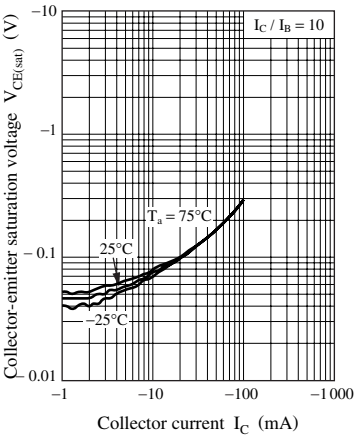


Characteristics charts of UNR511N

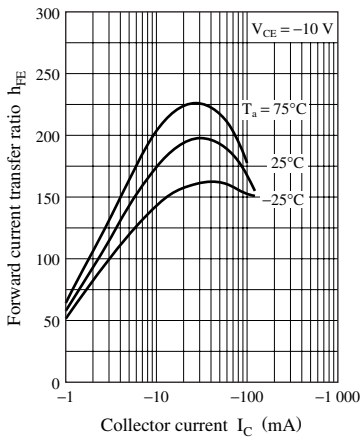
I_C — V_{CE}



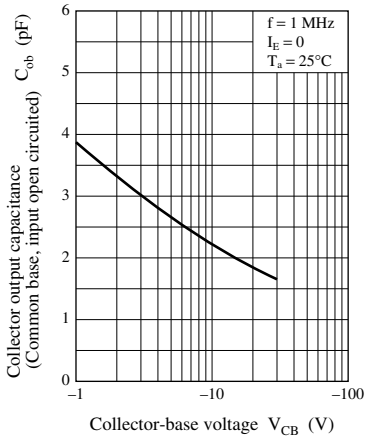
$V_{CE(sat)}$ — I_C



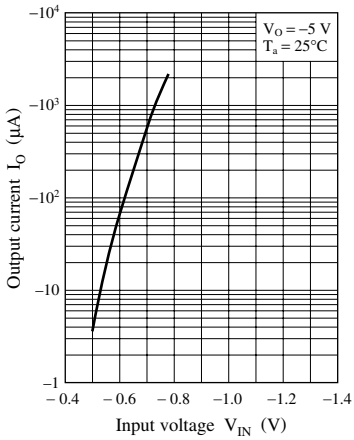
h_{FE} — I_C



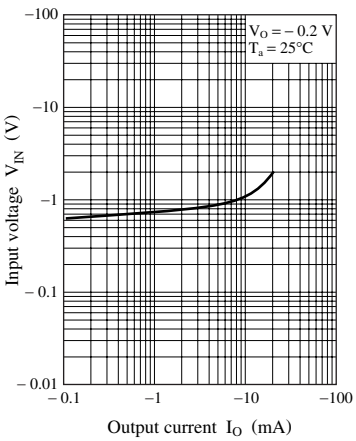
C_{ob} — V_{CB}



I_O — V_{IN}

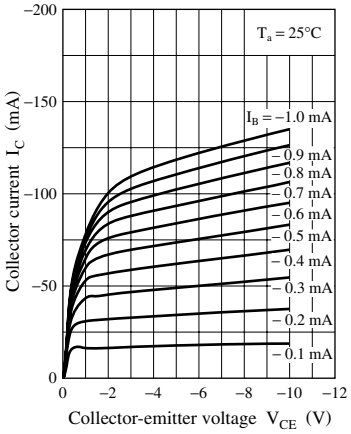


V_{IN} — I_O

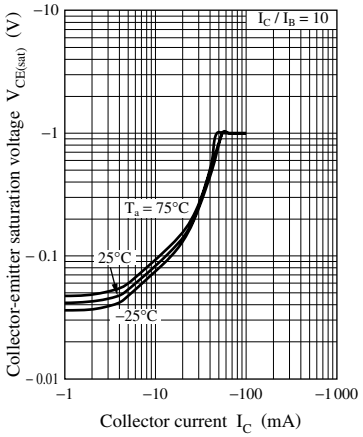


Characteristics charts of UNR511T

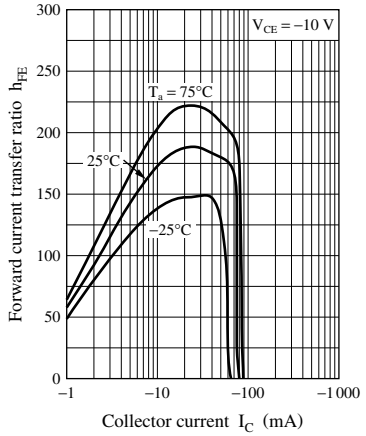
I_C — V_{CE}



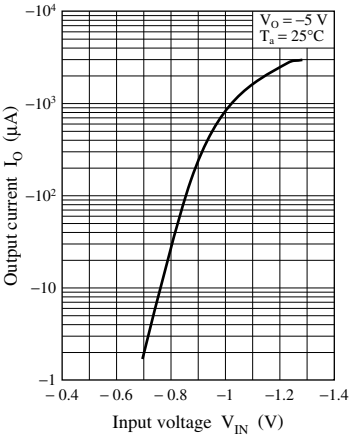
$V_{CE(sat)}$ — I_C



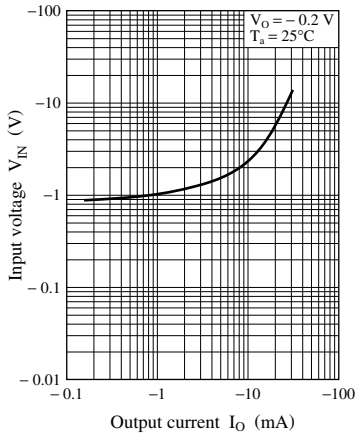
h_{FE} — I_C



I_O — V_{IN}

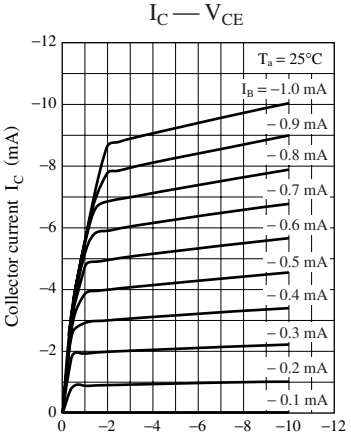


V_{IN} — I_O

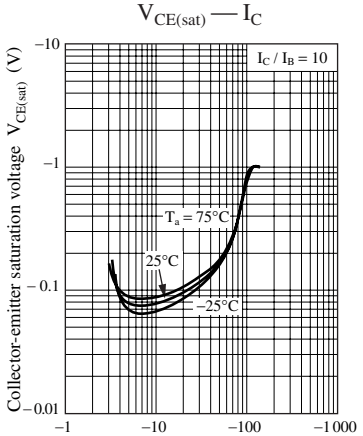


Characteristics charts of UNR511V

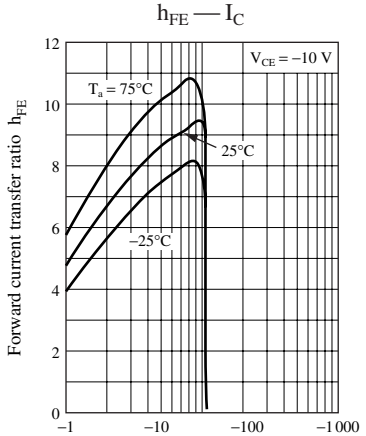
I_C — V_{CE}



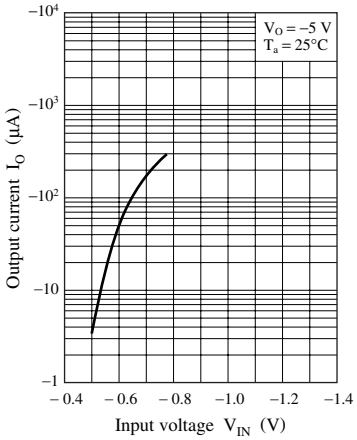
$V_{CE(sat)}$ — I_C



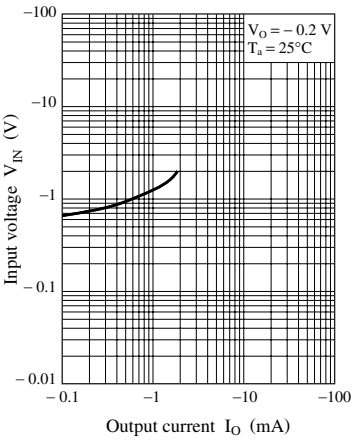
h_{FE} — I_C



I_O — V_{IN}

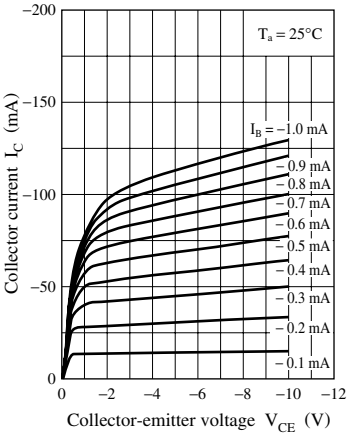


V_{IN} — I_O

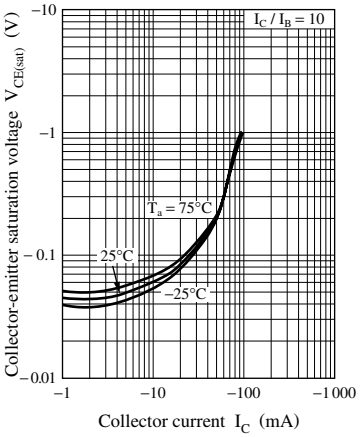


Characteristics charts of UNR511Z

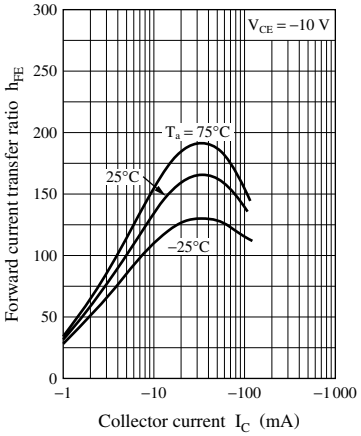
I_C — V_{CE}



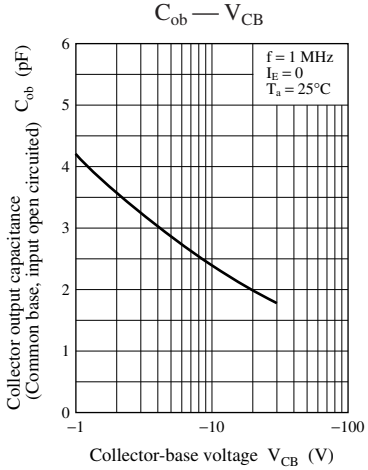
$V_{CE(sat)}$ — I_C



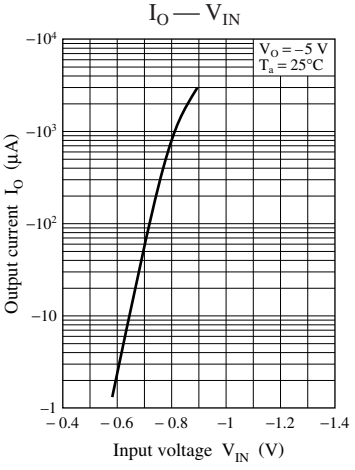
h_{FE} — I_C



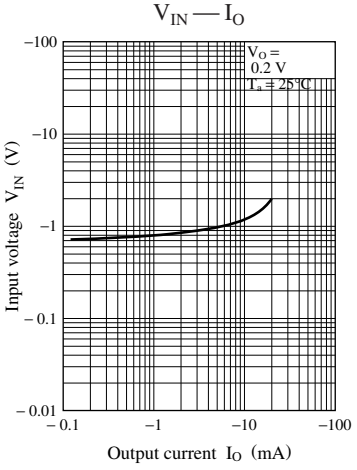
C_{ob} — V_{CB}



I_O — V_{IN}



V_{IN} — I_O



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