UNR9111/9112/9113/9114/9115/9116/9117/9118/9119/9110/911D/911E/911F/911H/911L/911AJ/911BJ/911CJ

(UN9111/9112/9113/9114/9115/9116/9117/9118/9119/9110/911D/911E/911F/911H/911L/911AJ/911BJ/911CJ)

Silicon PNP epitaxial planer transistor

For digital circuits

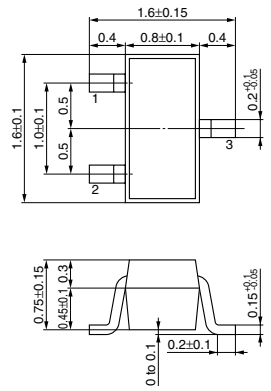
Features

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

Resistance by Part Number

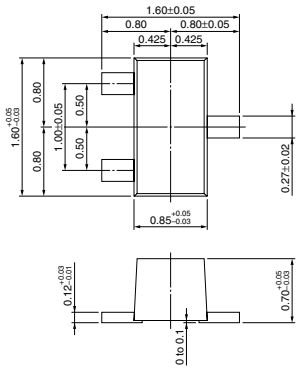
	Marking Symbol	(R_1)	(R_2)
● UNR9111	6A	10kΩ	10kΩ
● UNR9112	6B	22kΩ	22kΩ
● UNR9113	6C	47kΩ	47kΩ
● UNR9114	6D	10kΩ	47kΩ
● UNR9115	6E	10kΩ	—
● UNR9116	6F	4.7kΩ	—
● UNR9117	6H	22kΩ	—
● UNR9118	6I	0.51kΩ	5.1kΩ
● UNR9119	6K	1kΩ	10kΩ
● UNR9110	6L	47kΩ	—
● UNR911D	6M	47kΩ	10kΩ
● UNR911E	6N	47kΩ	22kΩ
● UNR911F	6O	4.7kΩ	10kΩ
● UNR911H	6P	2.2kΩ	10kΩ
● UNR911L	6Q	4.7kΩ	4.7kΩ
● UNR911AJ	6X	100kΩ	100kΩ
● UNR911BJ	6Y	100kΩ	—
● UNR911CJ	6Z	—	47kΩ

Unit: mm



1 : Base
2 : Emitter
3 : Collector
SS–Mini Type Pakage

Unit: mm

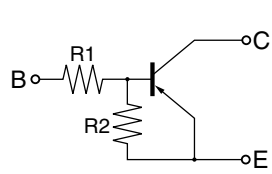


1 : Base
2 : Emitter
3 : Collector
SS–Mini Flat Type Pakage (J type)

Absolute Maximum Ratings (Ta=25˚C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	–50	V
Collector to emitter voltage	V_{CEO}	–50	V
Collector current	I_C	–100	mA
Total power dissipation	P_T	125	mW
Junction temperature	T_j	125	˚C
Storage temperature	T_{stg}	–55 to +125	˚C

Internal Connection



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

Electrical Characteristics (Ta=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Collector cutoff current		I_{CBO}	V_{CB} = –50V, I_E = 0			– 0.1	μA
		I_{CEO}	V_{CE} = –50V, I_B = 0			– 0.5	μA
Emitter cutoff current	UNR9111	I_{EBO}	V_{EB} = –6V, I_C = 0			– 0.5	mA
	UNR9112/9114/911E/911D					– 0.2	
	UNR9113/UNR911AJ					– 0.1	
	UNR9115/9116/9117/9110/UNR911BJ					– 0.01	
	UNR911F/911H					–1.0	
	UNR9119					–1.5	
	UNR9118/911L/911CJ					–2.0	
Collector to base voltage		V_{CBO}	I_C = –10μA, I_E = 0	–50			V
Collector to emitter voltage		V_{CEO}	I_C = –2mA, I_B = 0	–50			V
Forward current transfer ratio	UNR9111	h_{FE}	V_{CE} = –10V, I_C = –5mA	35			
	UNR9112/911E			60			
	UNR9113/9114/UNR911AJ/911CJ			80			
	UNR9115*/9116*/9117*/9110*UNR911BJ			160		460	
	UNR911F/911D/9119/911H			30			
	UNR9118/911L			20			
Collector to emitter saturation voltage		$V_{CE(sat)}$	I_C = –10mA, I_B = – 0.3mA			– 0.25	V
Output voltage high level		V_{OH}	V_{CC} = –5V, V_B = – 0.5V, R_L = 1kΩ	–4.9			V
Output voltage low level		V_{OL}	V_{CC} = –5V, V_B = –2.5V, R_L = 1kΩ			– 0.2	V
	UNR9113/UNR911BJ		V_{CC} = –5V, V_B = –3.5V, R_L = 1kΩ			– 0.2	
	UNR911D		V_{CC} = –5V, V_B = –10V, R_L = 1kΩ			– 0.2	
	UNR911E		V_{CC} = –5V, V_B = –6V, R_L = 1kΩ			– 0.2	
	UNR911AJ		V_{CC} = –5V, V_B = –5.0V, R_L = 1kΩ			– 0.2	
Transition frequency		f_T	V_{CB} = –10V, I_E = 2mA, f = 200MHz		150		MHz
	UNR911AJ				80		
Input resistance	UNR9111/9114/9115	R_1		(–30%)	10	(+30%)	kΩ
	UNR9112/9117				22		
	UNR9113/9110/911D/911E				47		
	UNR9116/911F/911L				4.7		
	UNR9118				0.51		
	UNR9119				1		
	UNR911H				2.2		
	UNR911AJ/911BJ				100		

* h_{FE} rank classification (UNR9115/9116/9117/9110)

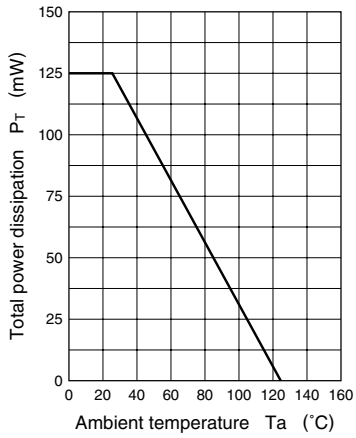
Rank	Q	R	S
h_{FE}	160 to 260	210 to 340	290 to 460

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

Parameter		Symbol	Conditions	min	typ	max	Unit
Resistance ratio	UNR9111/9112/9113/911L	R_1/R_2		0.8	1.0	1.2	
	UNR9114			0.17	0.21	0.25	
	UNR9118/9119			0.08	0.1	0.12	
	UNR911D				4.7		
	UNR911E				2.14		
	UNR911F				0.47		
	UNR911H			0.17	0.22	0.27	
	UNR911AJ				1.0		
Resistance between Emitter to Base	UNR911CJ	R_2		–30%	47	30%	

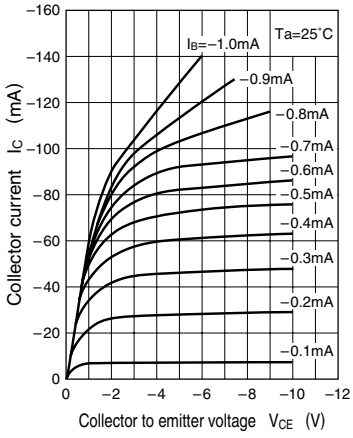
Common characteristics chart

P_T — Ta

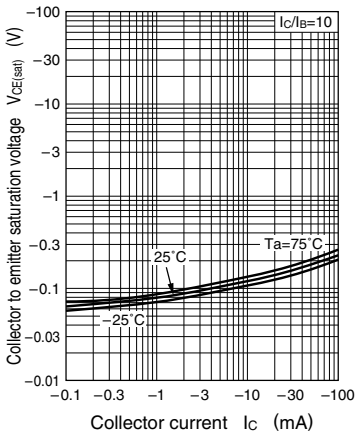


Characteristics charts of UNR9111

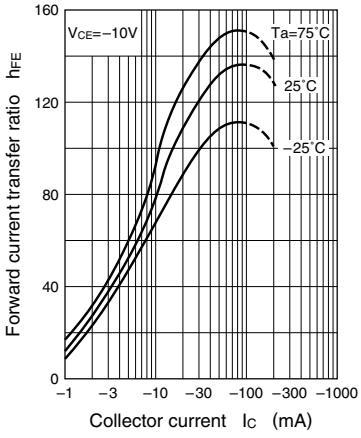
I_C — V_{CE}



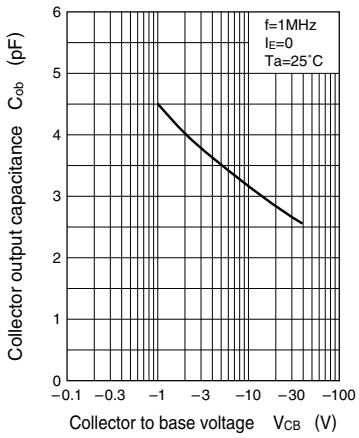
$V_{CE(sat)}$ — I_C



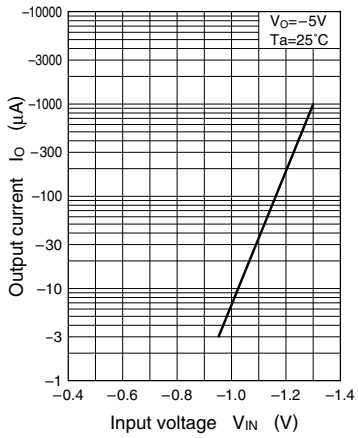
h_{FE} — I_C



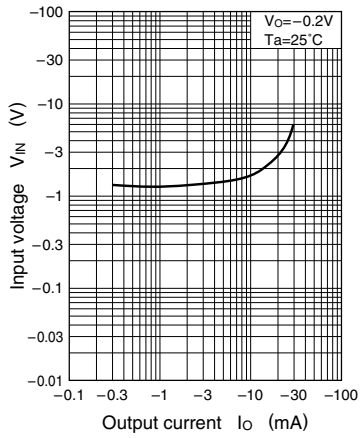
C_{ob} — V_{CB}



I_O — V_{IN}

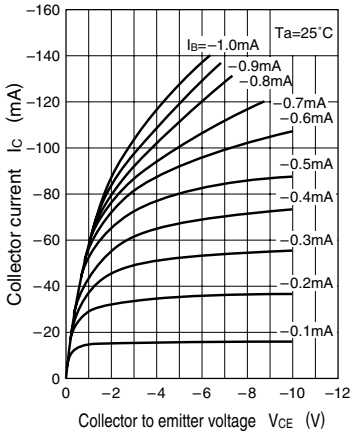


V_{IN} — I_O

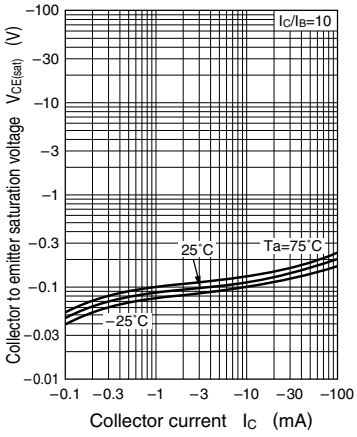


Characteristics charts of UNR9112

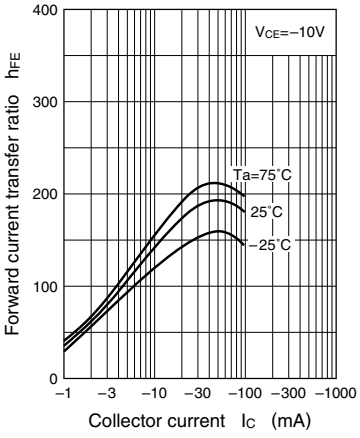
I_C — V_{CE}



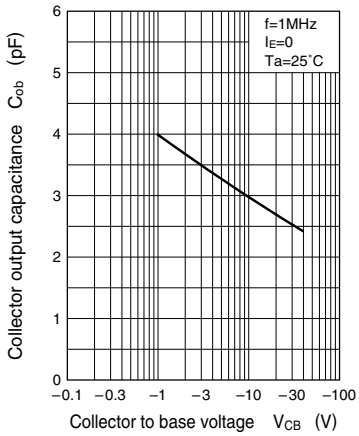
$V_{CE(sat)}$ — I_C



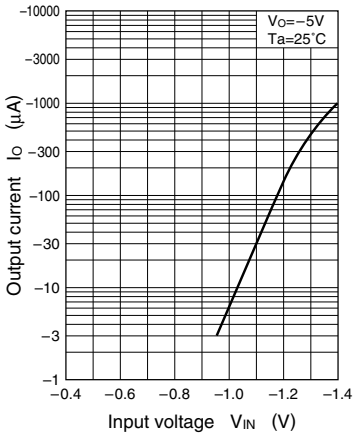
h_{FE} — I_C



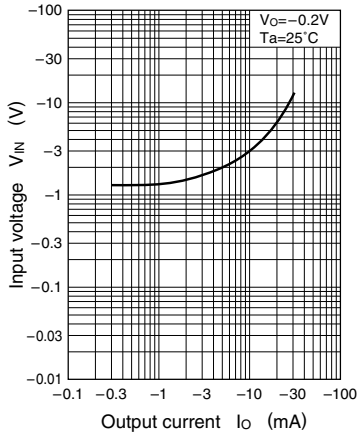
C_{ob} — V_{CB}



I_O — V_{IN}

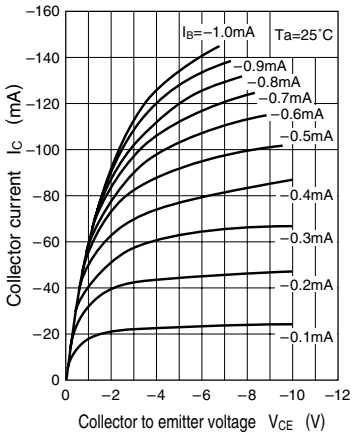


V_{IN} — I_O

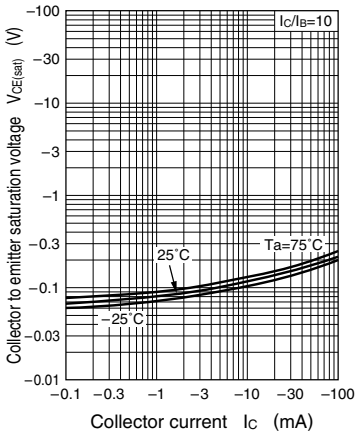


Characteristics charts of UNR9113

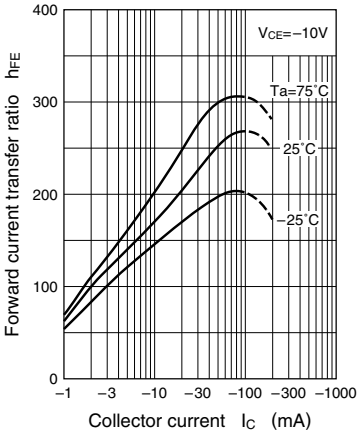
I_C — V_{CE}



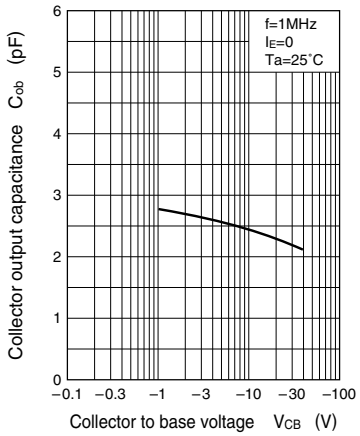
$V_{CE(sat)}$ — I_C



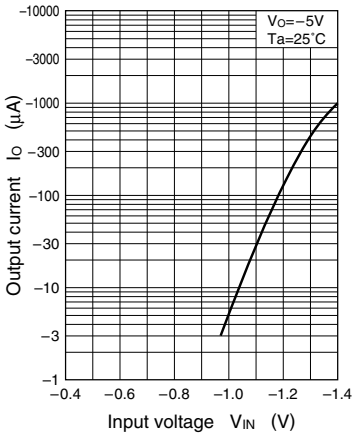
h_{FE} — I_C



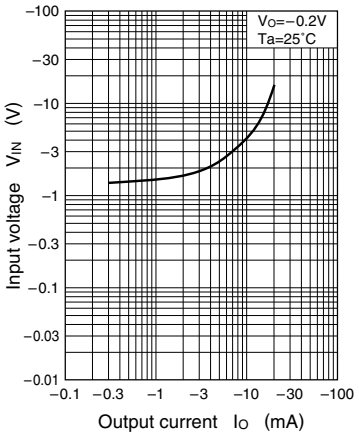
C_{ob} — V_{CB}



I_O — V_{IN}

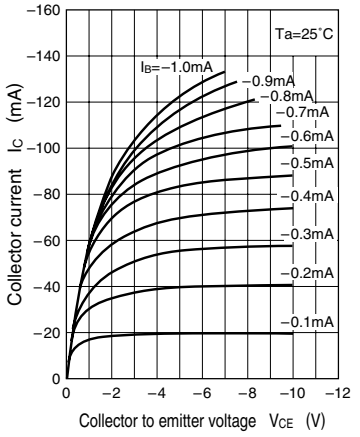


V_{IN} — I_O

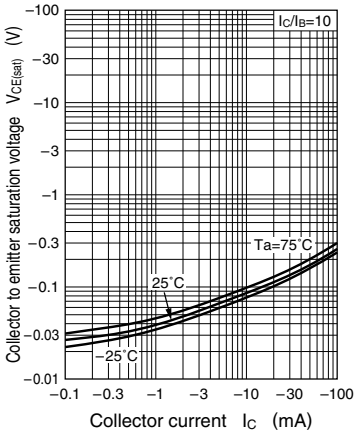


Characteristics charts of UNR9114

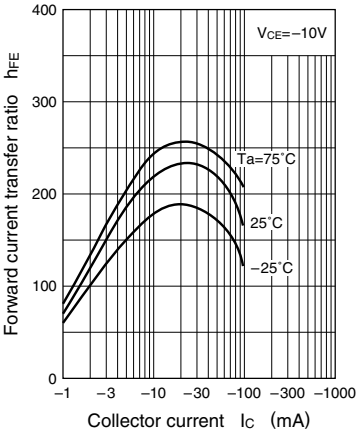
I_C — V_{CE}



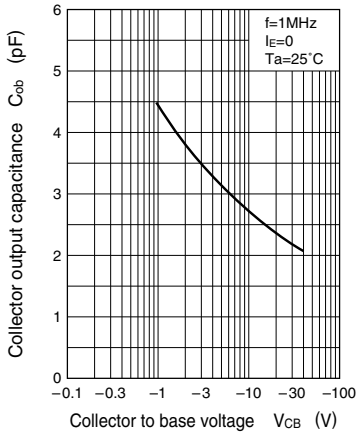
$V_{CE(sat)}$ — I_C



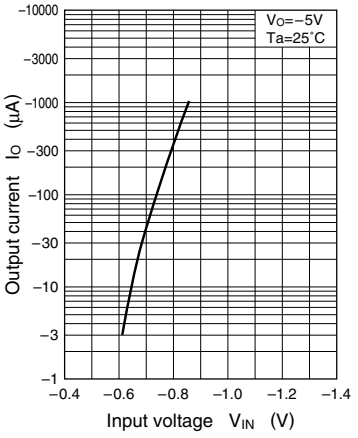
h_{FE} — I_C



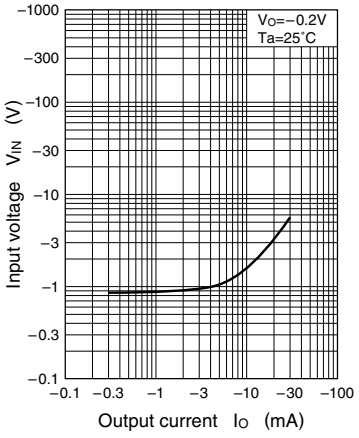
C_{ob} — V_{CB}



I_O — V_{IN}

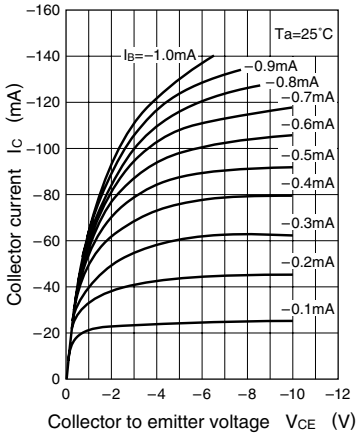


V_{IN} — I_O

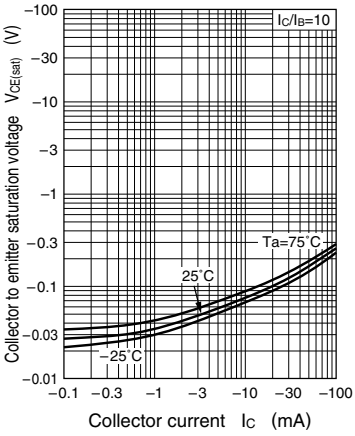


Characteristics charts of UNR9115

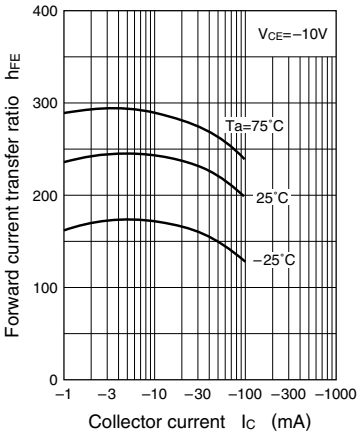
I_C — V_{CE}



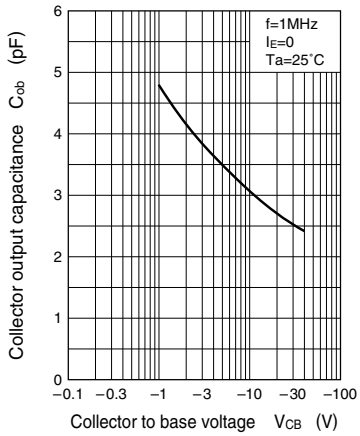
$V_{CE(sat)}$ — I_C



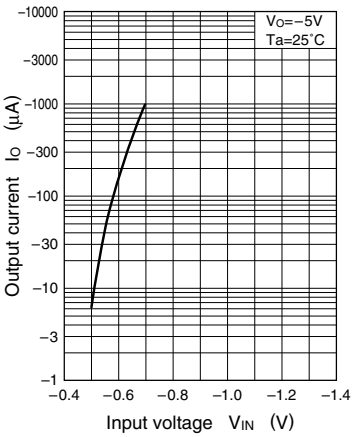
h_{FE} — I_C



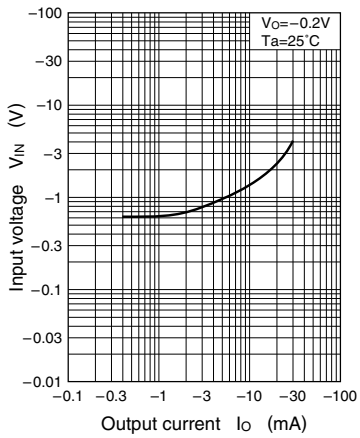
C_{ob} — V_{CB}



I_O — V_{IN}

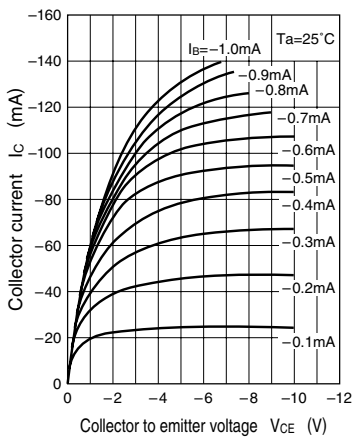


V_{IN} — I_O

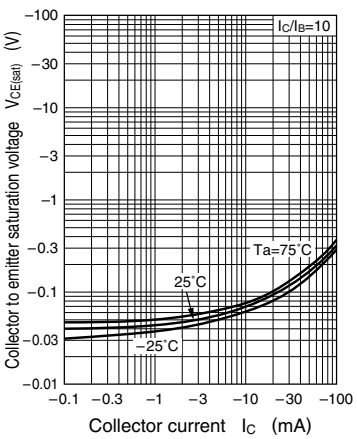


Characteristics charts of UNR9116

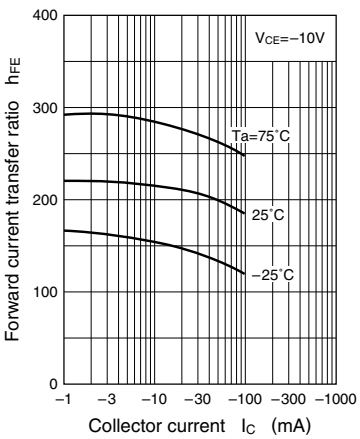
I_C — V_{CE}



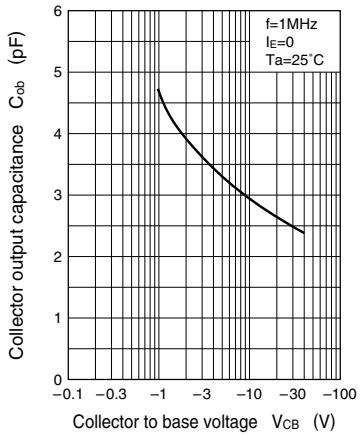
$V_{CE(sat)}$ — I_C



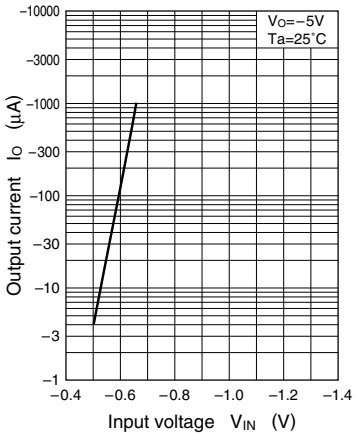
h_{FE} — I_C



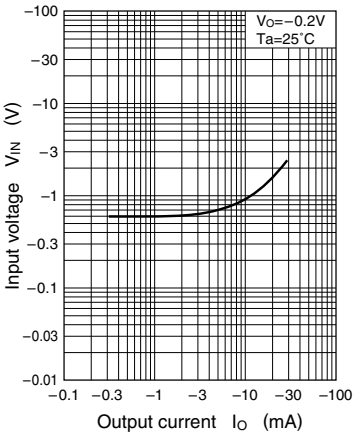
C_{ob} — V_{CB}



I_O — V_{IN}

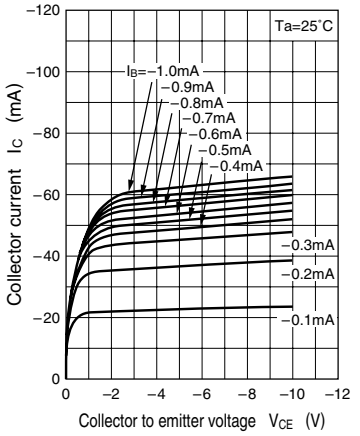


V_{IN} — I_O

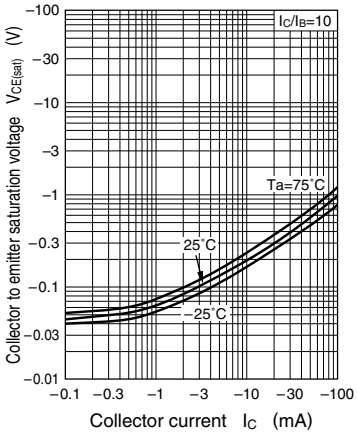


Characteristics charts of UNR9117

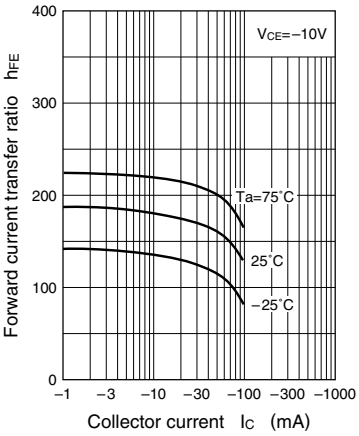
I_C — V_{CE}



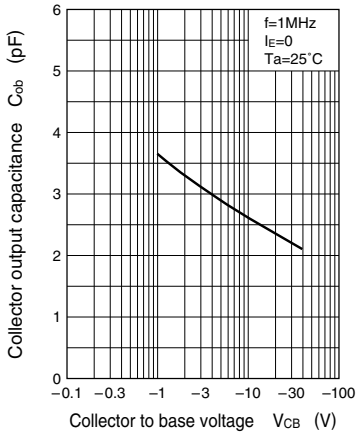
$V_{CE(sat)}$ — I_C



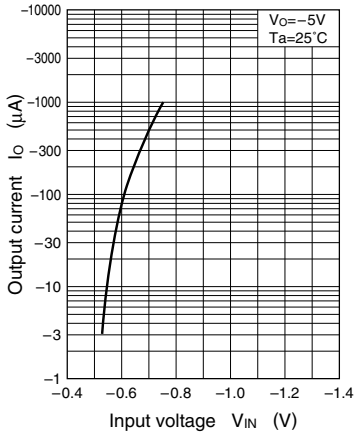
h_{FE} — I_C



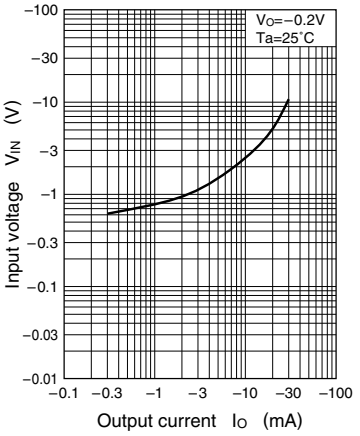
C_{ob} — V_{CB}



I_O — V_{IN}

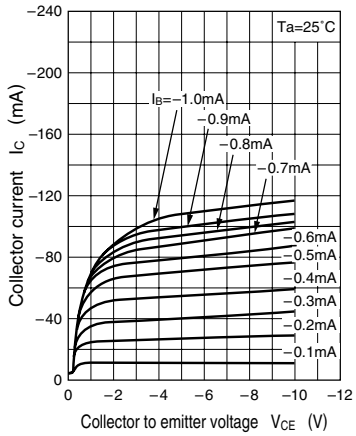


V_{IN} — I_O

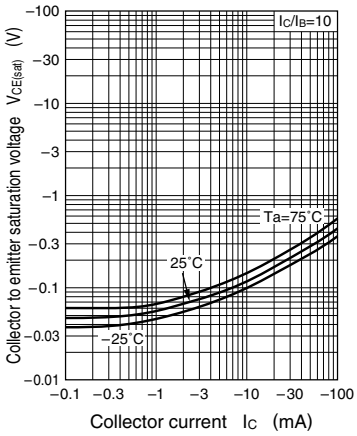


Characteristics charts of UNR9118

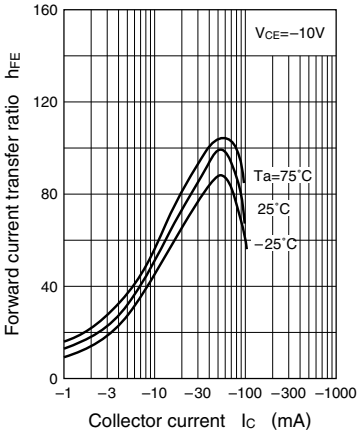
I_C — V_{CE}



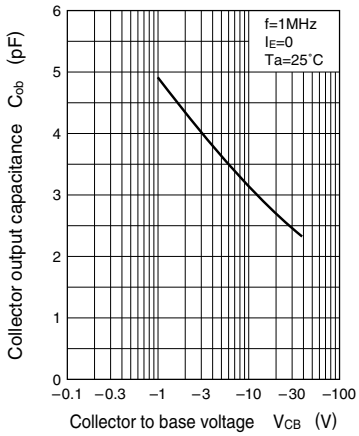
$V_{CE(sat)}$ — I_C



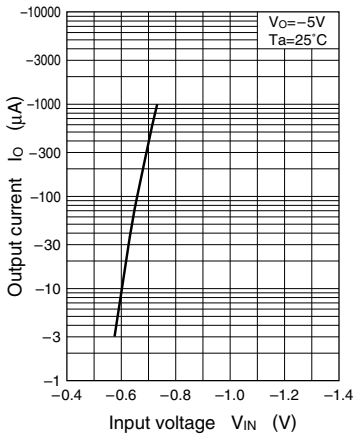
h_{FE} — I_C



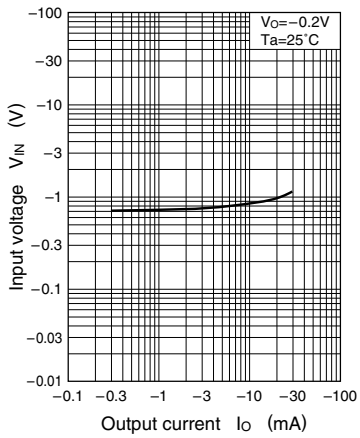
C_{ob} — V_{CB}



I_O — V_{IN}

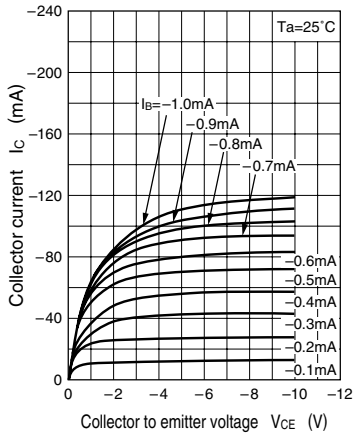


V_{IN} — I_O

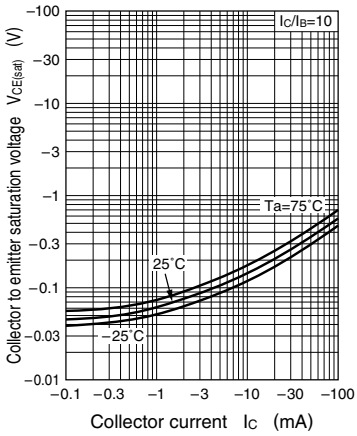


Characteristics charts of UNR9119

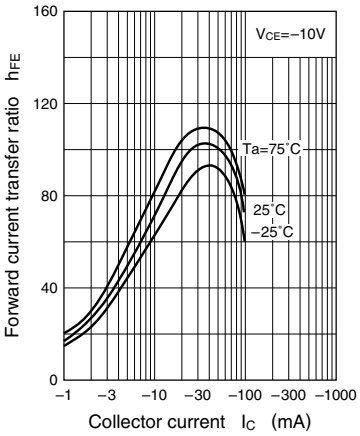
I_C — V_{CE}



$V_{CE(sat)}$ — I_C



h_{FE} — I_C



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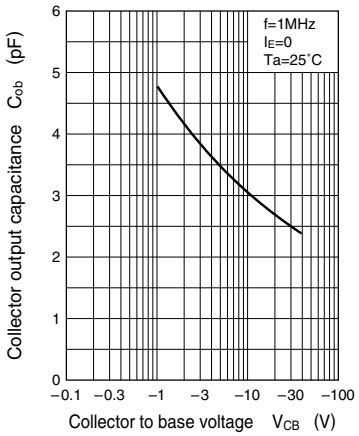

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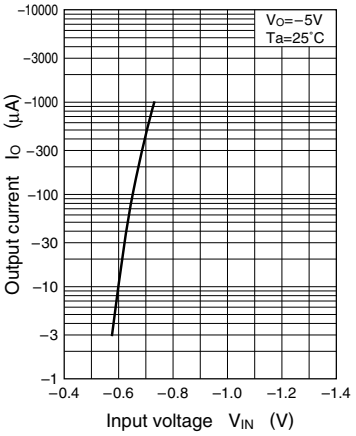
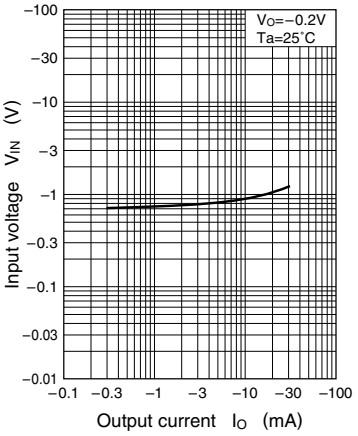
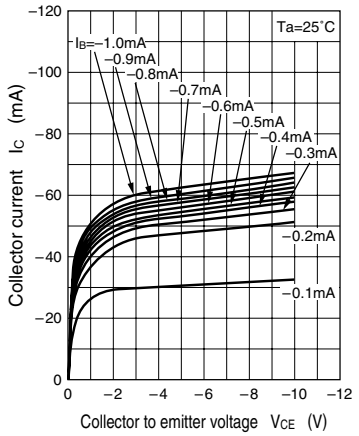


V_{IN} — I_O

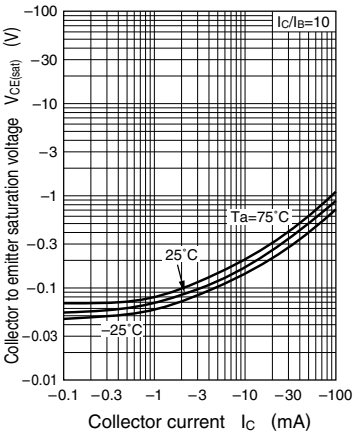


Characteristics charts of UNR9110

I_C — V_{CE}



$V_{CE(sat)}$ — I_C



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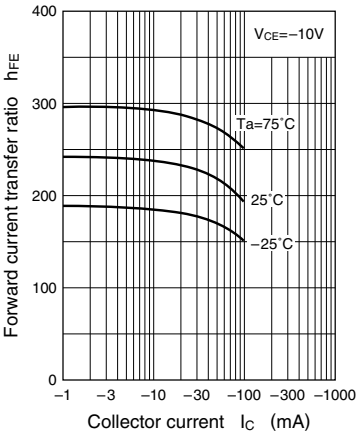
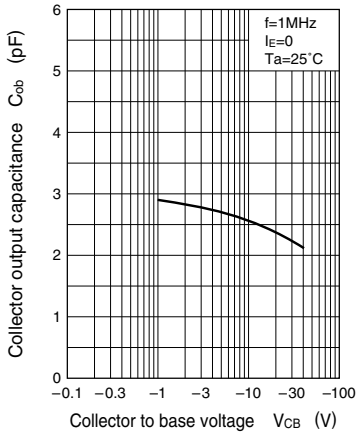


C_{ob} — V_{CB}



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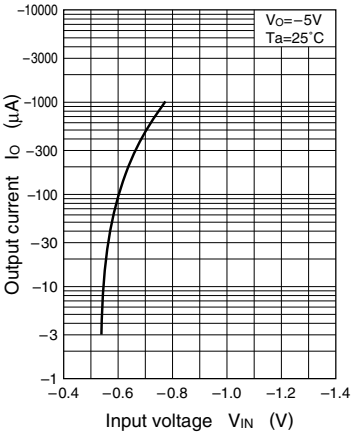

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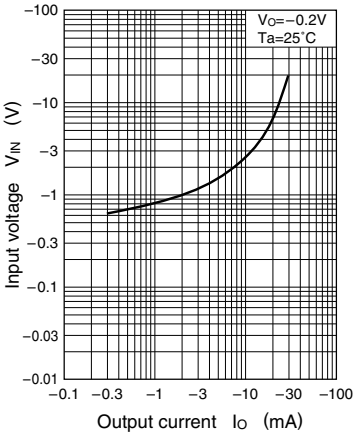
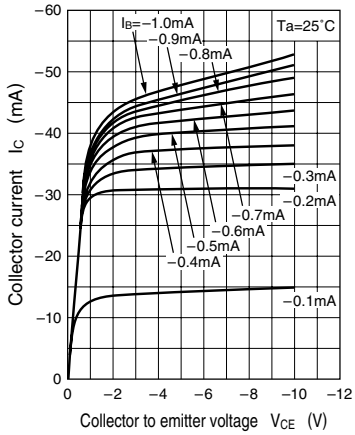
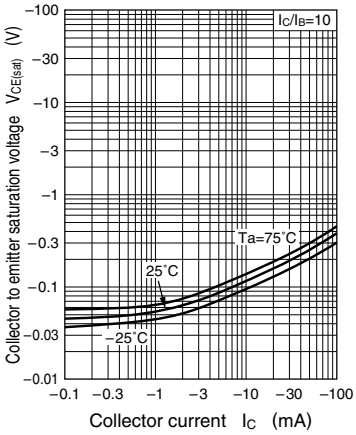


Characteristics charts of UNR911D

I_C — V_{CE}



$V_{CE(sat)}$ — I_C



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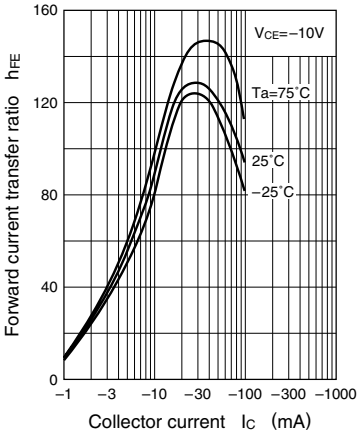
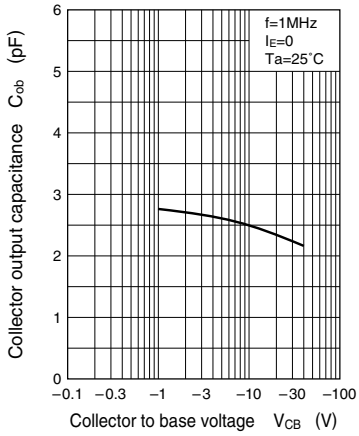
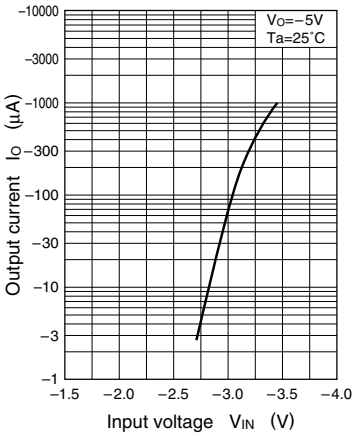


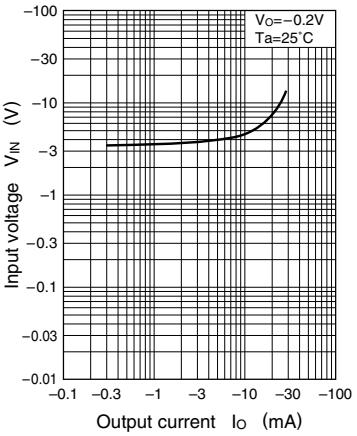
C_{ob} — V_{CB}



I_O — V_{IN}

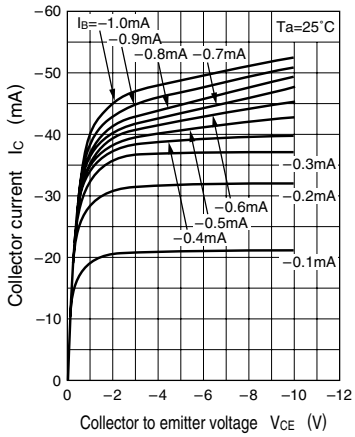


V_{IN} — I_O

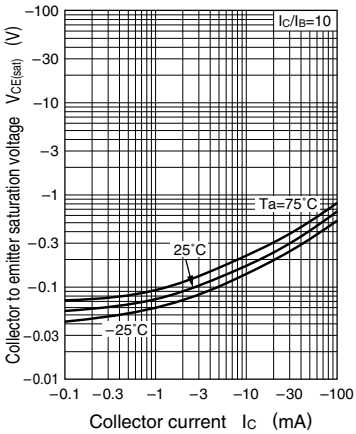


Characteristics charts of UNR911E

I_C — V_{CE}



$V_{CE(sat)}$ — I_C



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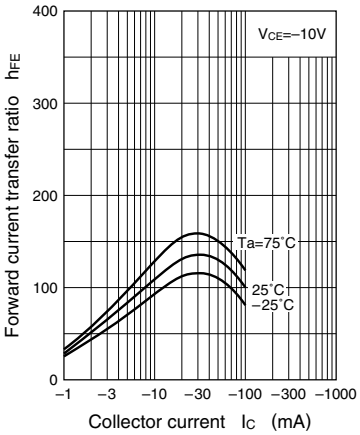
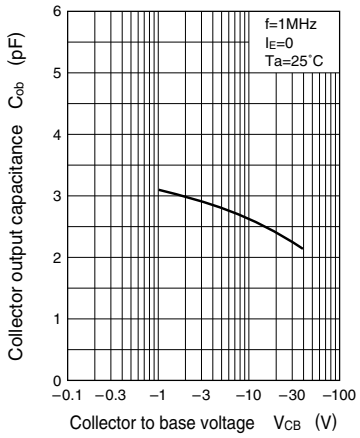
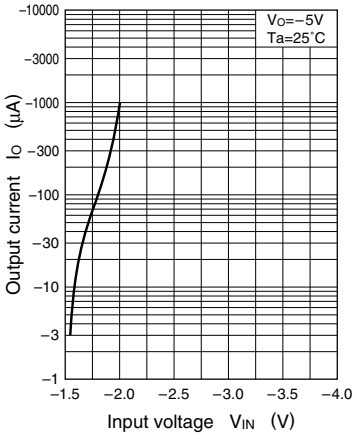


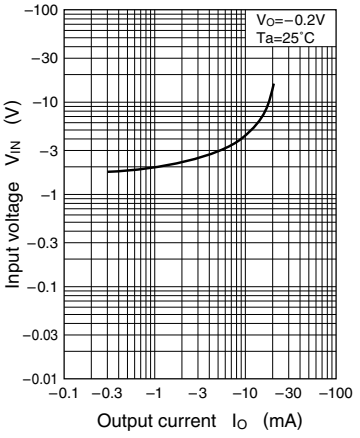
C_{ob} — V_{CB}



I_O — V_{IN}

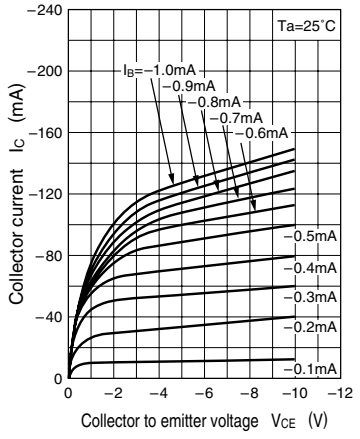


V_{IN} — I_O

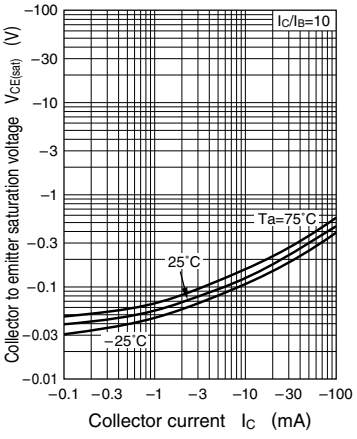


Characteristics charts of UNR911F

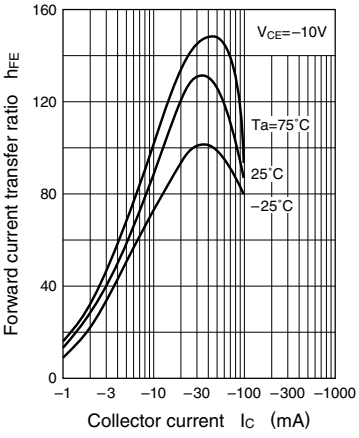
I_C — V_{CE}



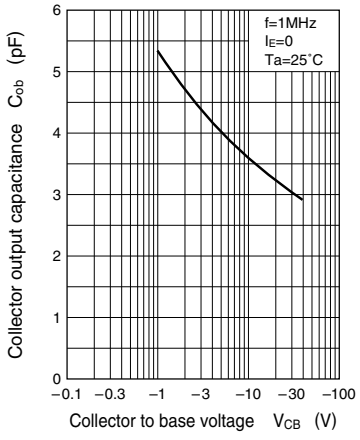
$V_{CE(sat)}$ — I_C



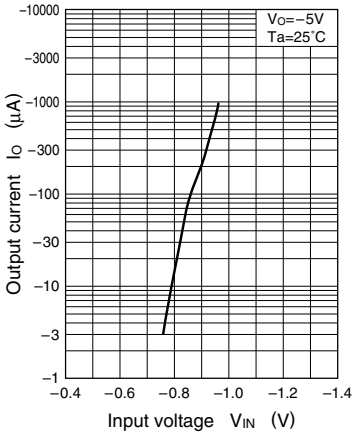
h_{FE} — I_C



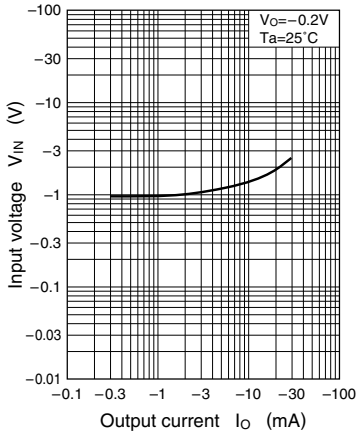
C_{ob} — V_{CB}



I_O — V_{IN}

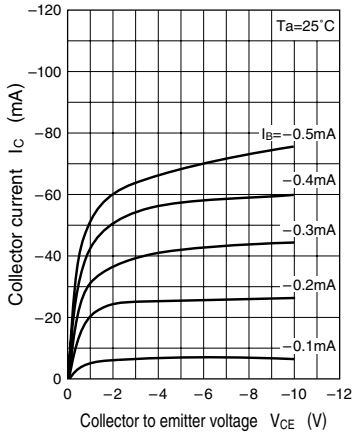


V_{IN} — I_O

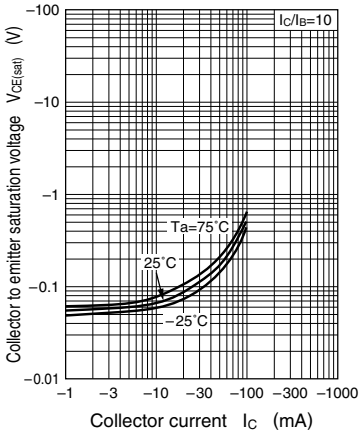


Characteristics charts of UNR911H

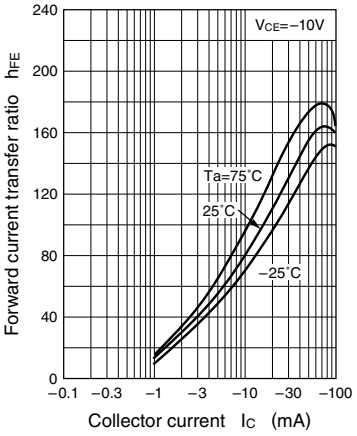
I_C — V_{CE}



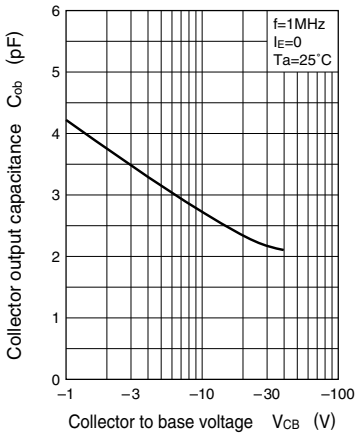
$V_{CE(sat)}$ — I_C



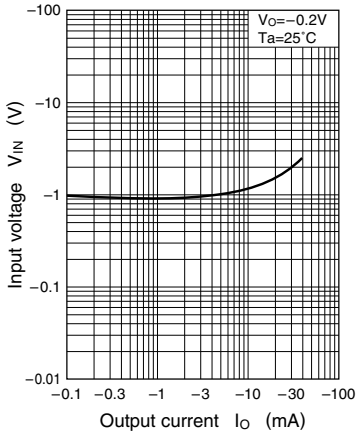
h_{FE} — I_C



C_{ob} — V_{CB}

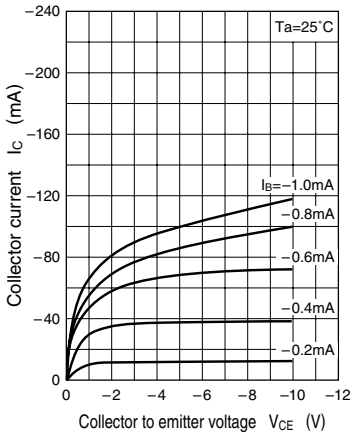


V_{IN} — I_O

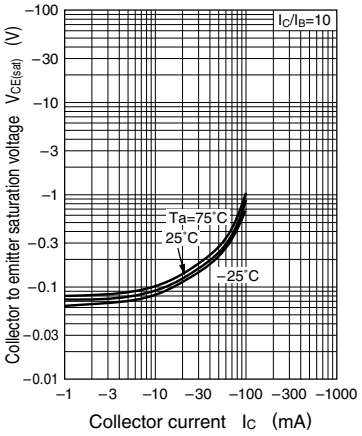


Characteristics charts of UNR911L

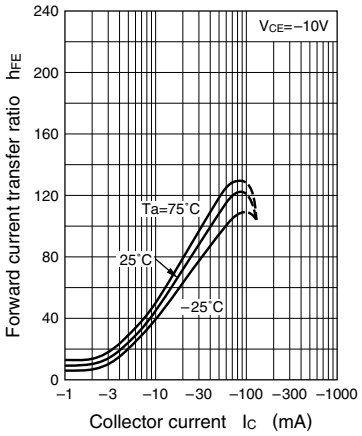
I_C — V_{CE}



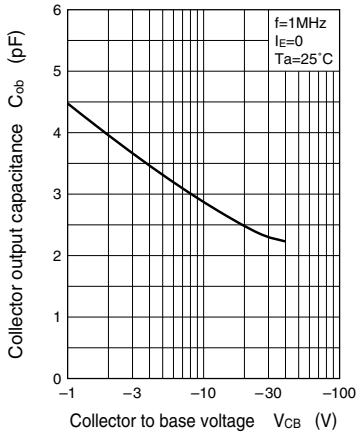
$V_{CE(sat)}$ — I_C



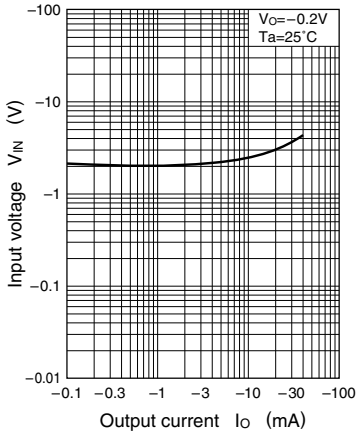
h_{FE} — I_C



C_{ob} — V_{CB}



V_{IN} — I_O



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