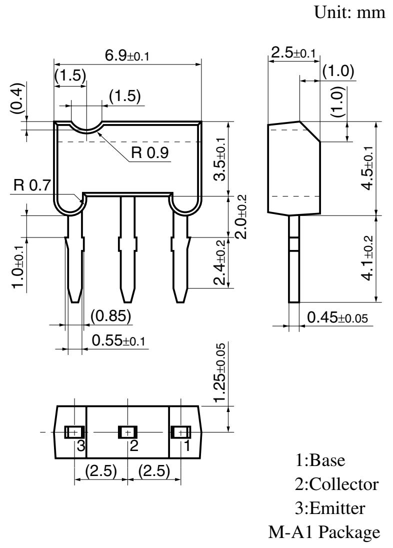
UNR1111/1112/1113/1114/1115/1116/1117/1118/1119/1110/ 111D/111E/111F/111H/111L (UN1111/1112/1113/1114/1115/1116/1117/1118/1119/1110/ 111D/111E/111F/111H/111L)

Silicon PNP epitaxial planar transistor

For digital circuits



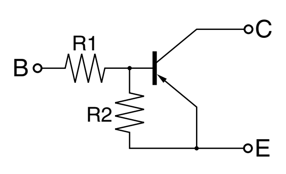
Features

- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- M type package allowing easy automatic and manual insertion as well as stand-alone fixing to the printed circuit board.

Resistance by Part Number

	(R_1)	(R_2)
UNR1111	10kΩ	10kΩ
UNR1112	22kΩ	22kΩ
UNR1113	47kΩ	47kΩ
UNR1114	10kΩ	47kΩ
UNR1115	10kΩ	—
UNR1116	4.7kΩ	—
UNR1117	22kΩ	—
UNR1118	0.51kΩ	5.1kΩ
UNR1119	1kΩ	10kΩ
UNR1110	47kΩ	—
UNR111D	47kΩ	10kΩ
UNR111E	47kΩ	22kΩ
UNR111F	4.7kΩ	10kΩ
UNR111H	2.2kΩ	10kΩ
UNR111L	4.7kΩ	4.7kΩ

Internal Connection



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	400	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 (Ta=25˚C)

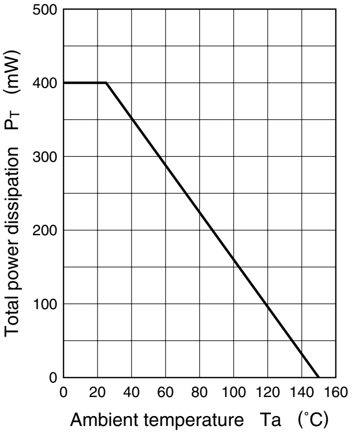
Parameter		Symbol	Conditions	min	typ	max	Unit
Collector cutoff current		I_{CBO}	V_{CB} = –50V, I_E = 0			– 0.1	μA
		I_{CEO}	V_{CE} = –50V, I_B = 0			– 0.5	μA
Emitter cutoff current	UNR1111	I_{EBO}	V_{EB} = –6V, I_C = 0			– 0.5	mA
	UNR1112/1114/111E/111D					– 0.2	
	UNR1113					– 0.1	
	UNR1115/1116/1117/1110					– 0.01	
	UNR111F/111H					–1.0	
	UNR1119					–1.5	
	UNR1118/111L					–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	UNR1111	h_{FE}	V_{CE} = –10V, I_C = –5mA	35			
	UNR1112/111E			60			
	UNR1113/1114			80			
	UNR1115*/1116*/1117*/1110*			160		460	
	UNR111F/111D/1119/111H			30			
	UNR1118/111L			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
	UNR1113		V_{CC} = –5V, V_B = –3.5V, R_L = 1kΩ			– 0.2	
	UNR111D		V_{CC} = –5V, V_B = –10V, R_L = 1kΩ			– 0.2	
	UNR111E		V_{CC} = –5V, V_B = –6V, R_L = 1kΩ			– 0.2	
Transition frequency		f_T	V_{CB} = –10V, I_E = 2mA, f = 200MHz		80		MHz
Input resistance	UNR1111/1114/1115	R_1		(–30%)	10	(+30%)	kΩ
	UNR1112/1117				22		
	UNR1113/1110/111D/111E				47		
	UNR1116/111F/111L				4.7		
	UNR1118				0.51		
	UNR1119				1		
	UNR111H				2.2		
Resistance ratio	UNR1111/1112/1113/111L	R_1/R_2		0.8	1.0	1.2	
	UNR1114			0.17	0.21	0.25	
	UNR1118/1119			0.08	0.1	0.12	
	UNR111D				4.7		
	UNR111E				2.14		
	UNR111F				0.47		
	UNR111H			0.17	0.22	0.27	

* h_{FE} rank classification (UNR1115/1116/1117/1110)

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

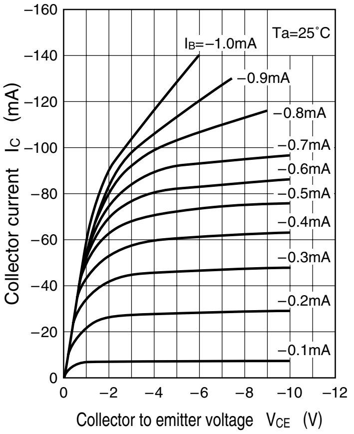
Common characteristics chart

P_T — Ta

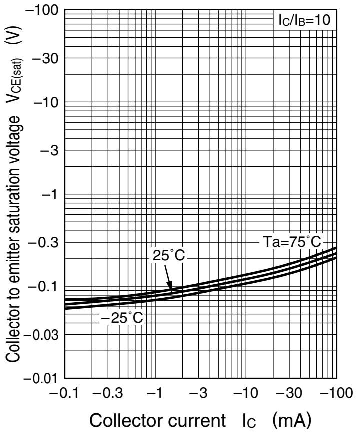


Characteristics charts of UNR1111

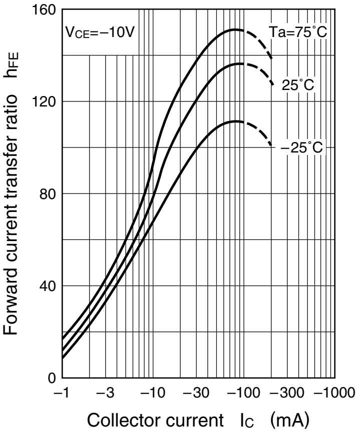
I_C — V_{CE}



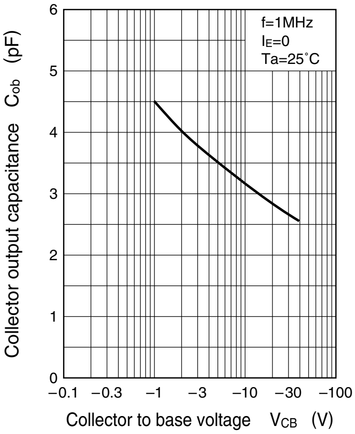
$V_{CE(sat)}$ — I_C



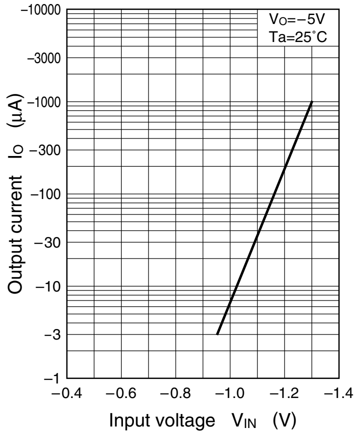
h_{FE} — I_C



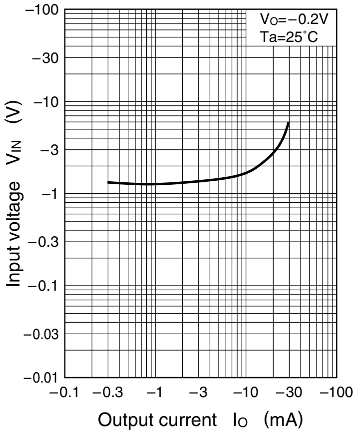
C_{ob} — V_{CB}



I_O — V_{IN}

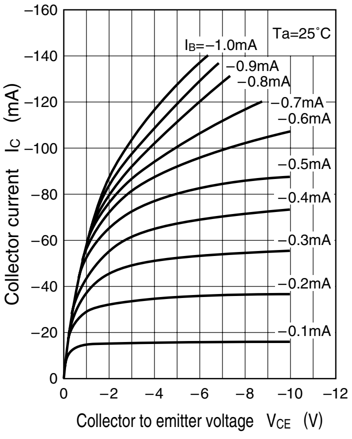


V_{IN} — I_O

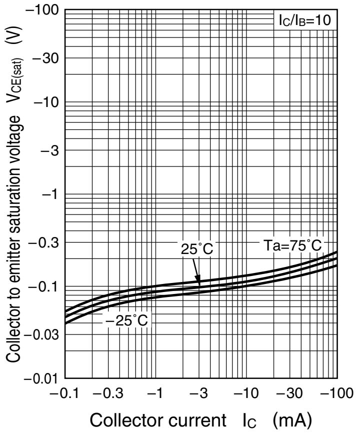


Characteristics charts of UNR1112

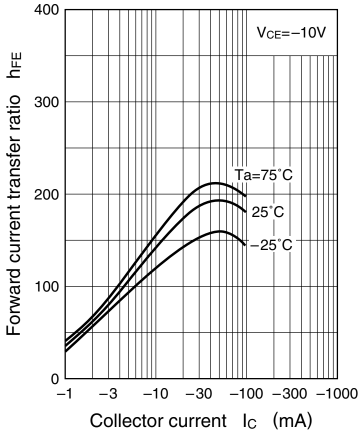
I_C — V_{CE}



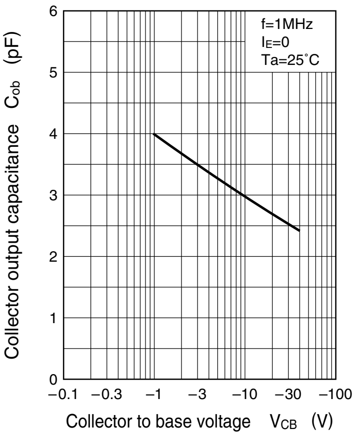
$V_{CE(sat)}$ — I_C



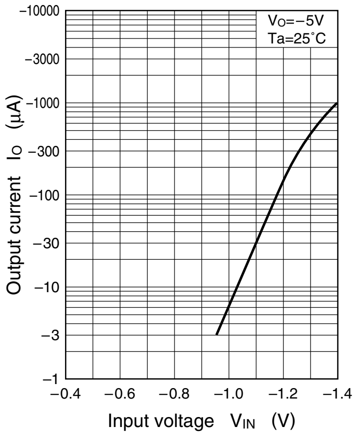
h_{FE} — I_C



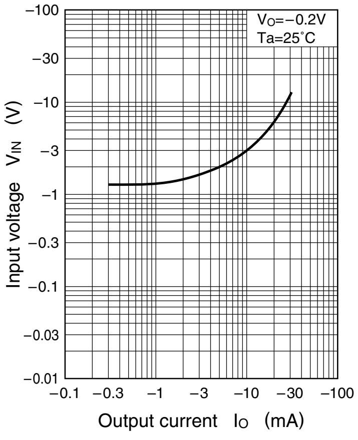
C_{ob} — V_{CB}



I_O — V_{IN}

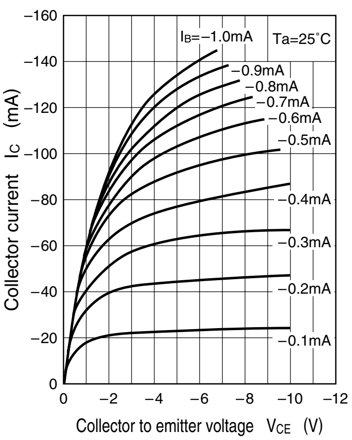


V_{IN} — I_O

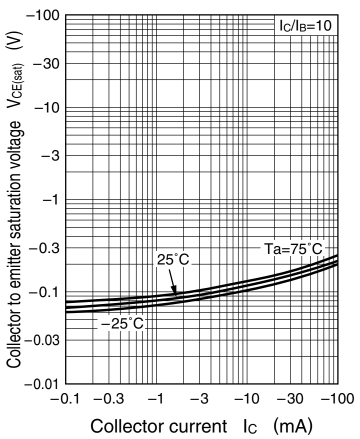


Characteristics charts of UNR1113

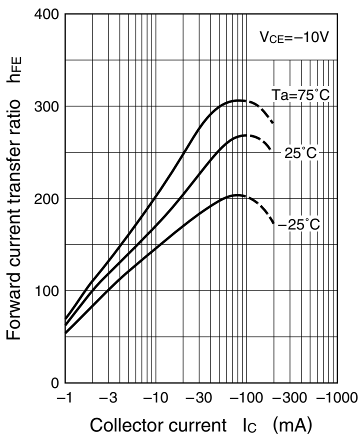
I_C — V_{CE}

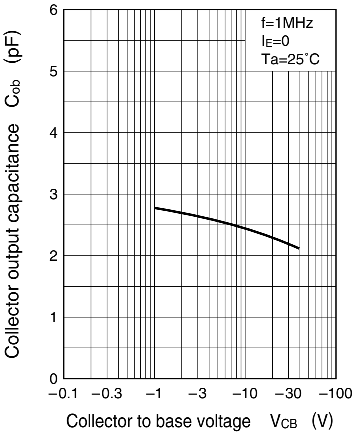


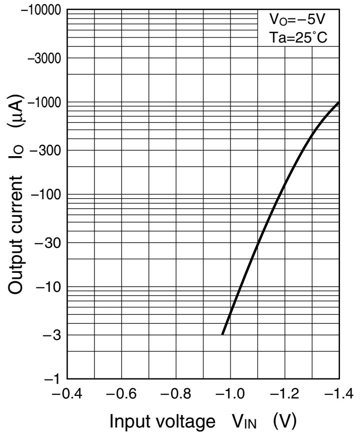
$V_{CE(sat)}$ — I_C

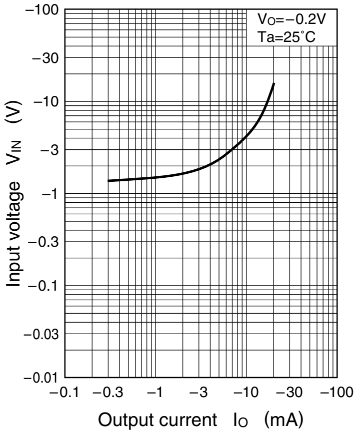


h_{FE} — I_C

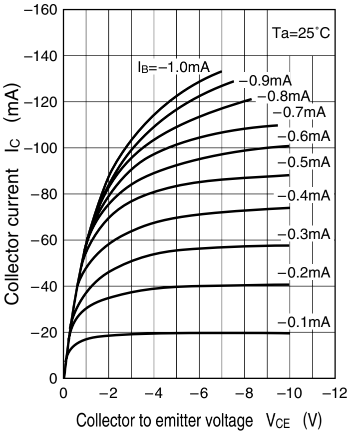


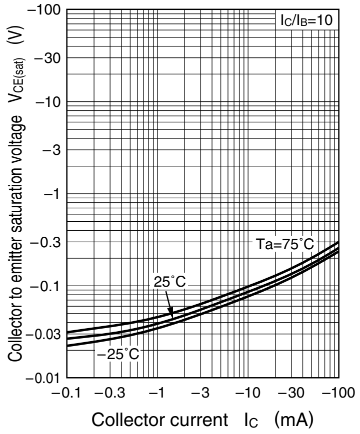

C_{ob} — V_{CB}

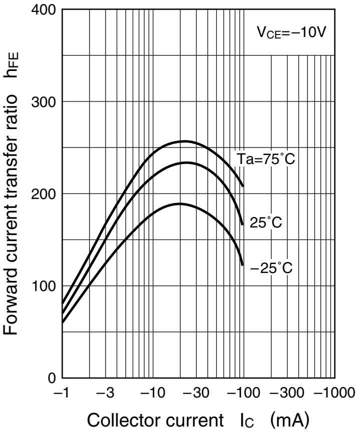

I_O — V_{IN}

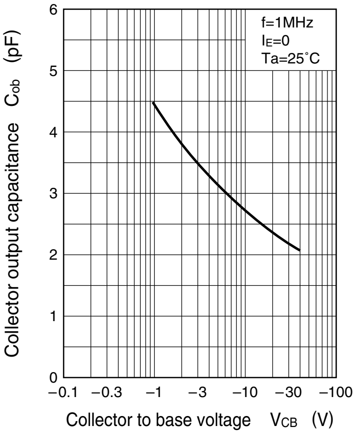

V_{IN} — I_O

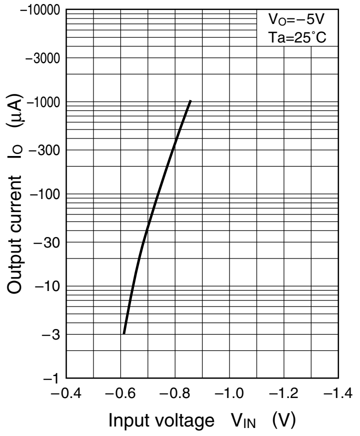
Characteristics charts of UNR1114

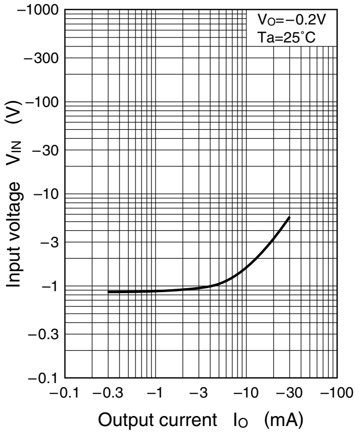

I_C — V_{CE}


$V_{CE(sat)}$ — I_C


h_{FE} — I_C

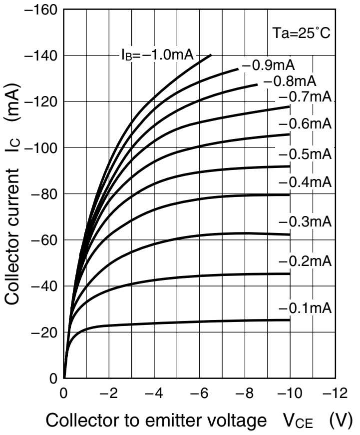

C_{ob} — V_{CB}


I_O — V_{IN}

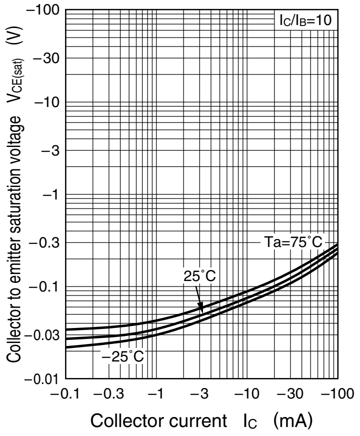

V_{IN} — I_O

Characteristics charts of UNR1115

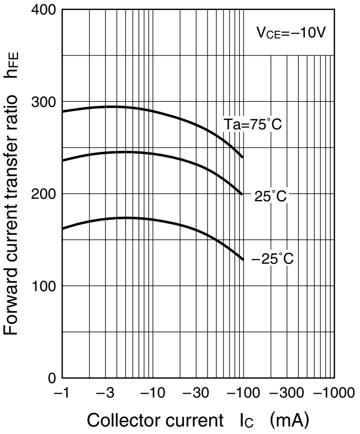
I_C — V_{CE}



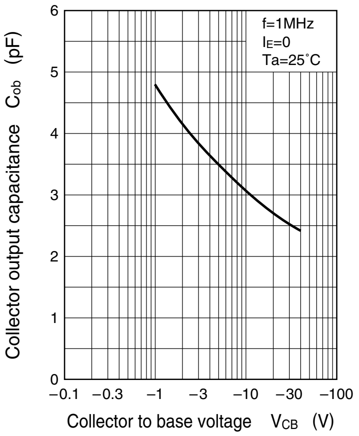
$V_{CE(sat)}$ — I_C



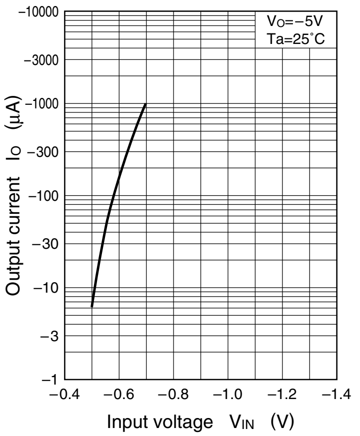
h_{FE} — I_C



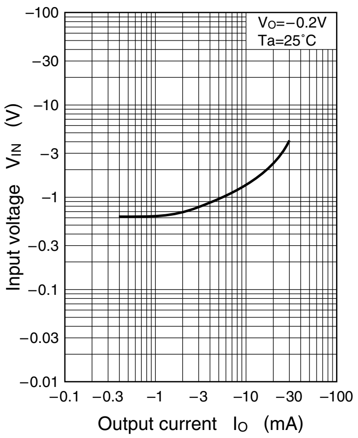
C_{ob} — V_{CB}



I_O — V_{IN}

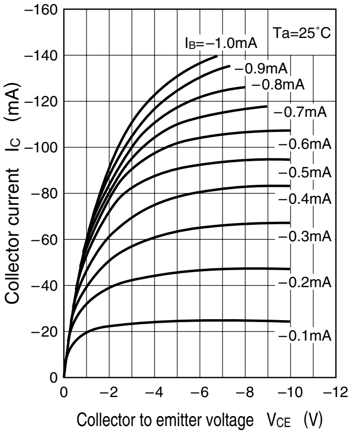


V_{IN} — I_O

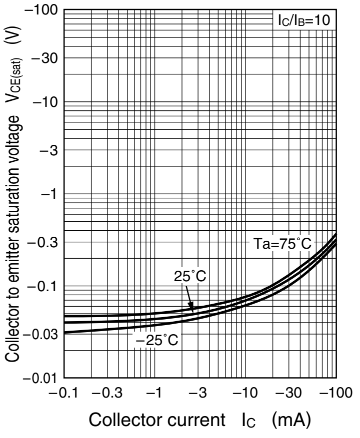


Characteristics charts of UNR1116

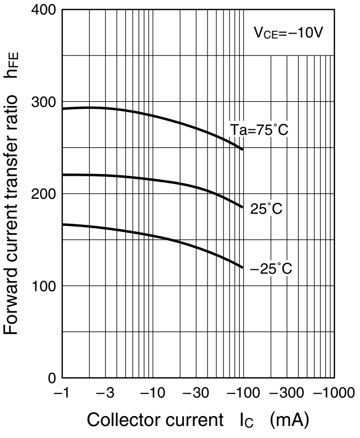
I_C — V_{CE}



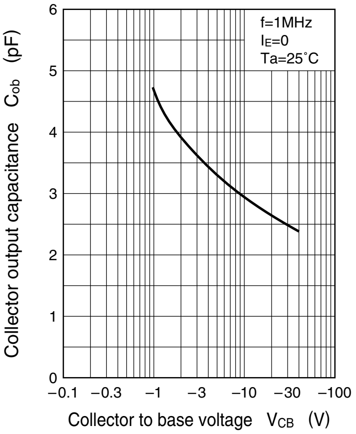
$V_{CE(sat)}$ — I_C



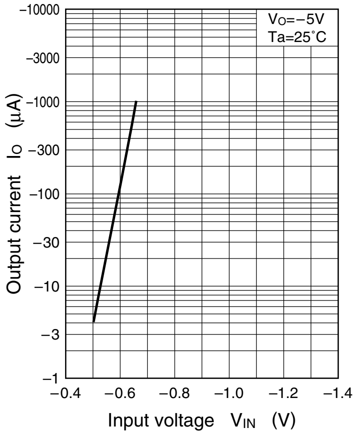
h_{FE} — I_C



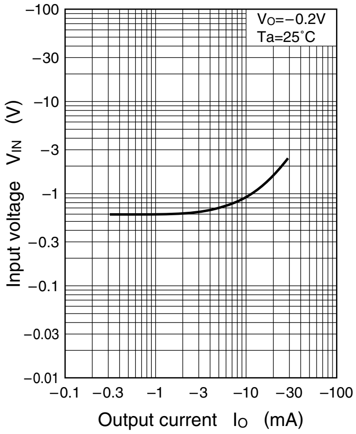
C_{ob} — V_{CB}



I_O — V_{IN}

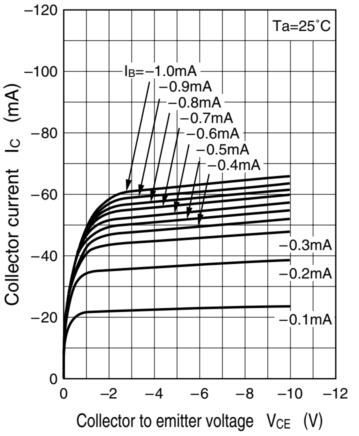


V_{IN} — I_O

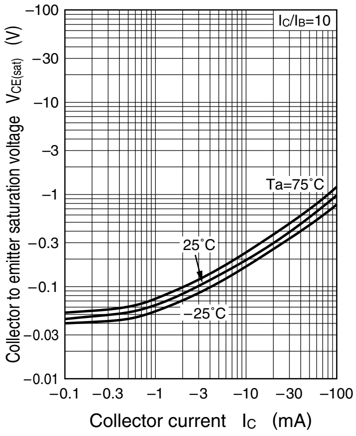


Characteristics charts of UNR1117

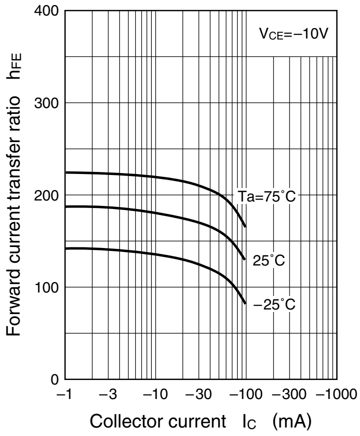
I_C — V_{CE}



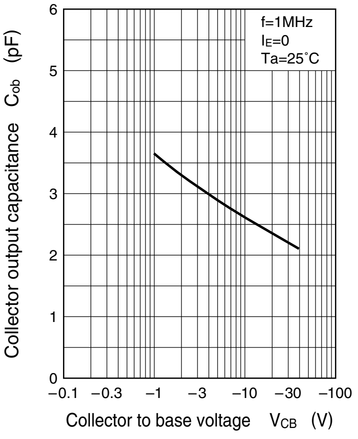
$V_{CE(sat)}$ — I_C



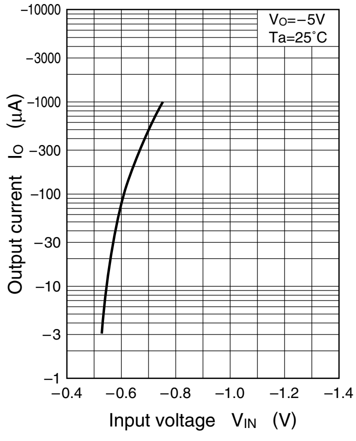
h_{FE} — I_C



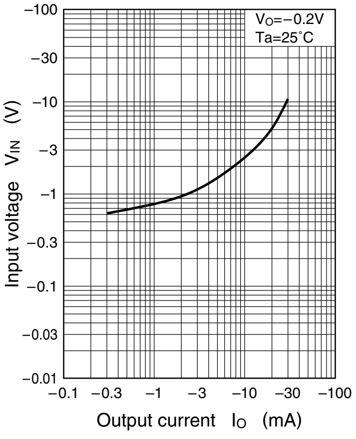
C_{ob} — V_{CB}



I_O — V_{IN}

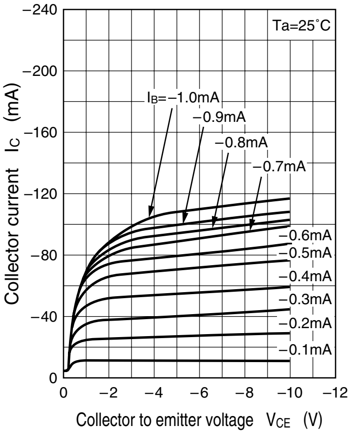


V_{IN} — I_O

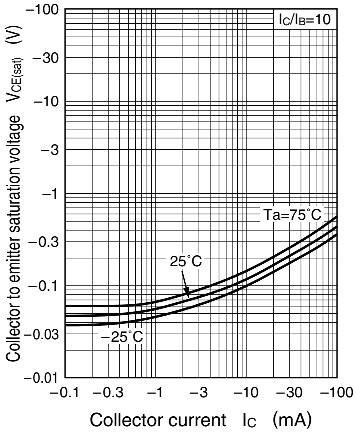


Characteristics charts of UNR1118

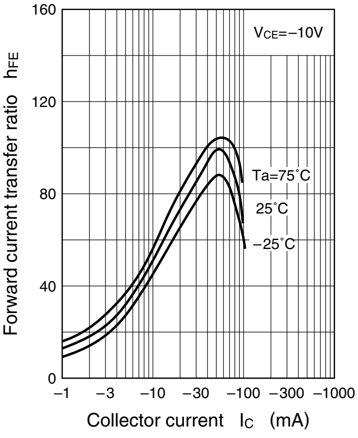
I_C — V_{CE}



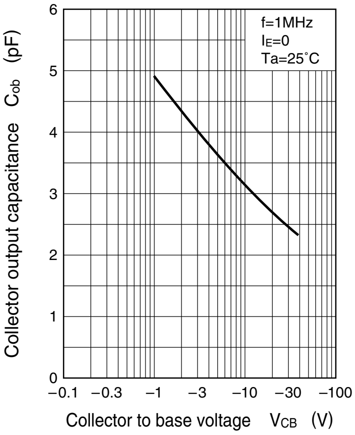
$V_{CE(sat)}$ — I_C



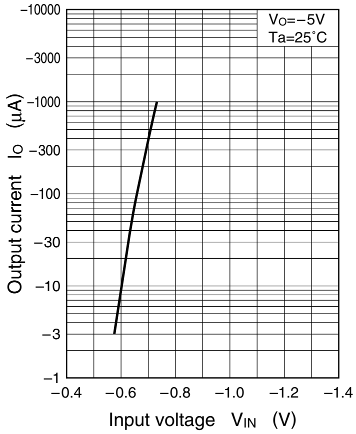
h_{FE} — I_C



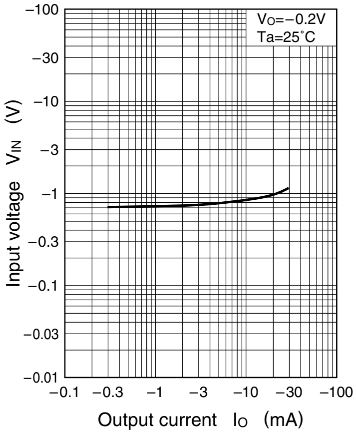
C_{ob} — V_{CB}



I_O — V_{IN}

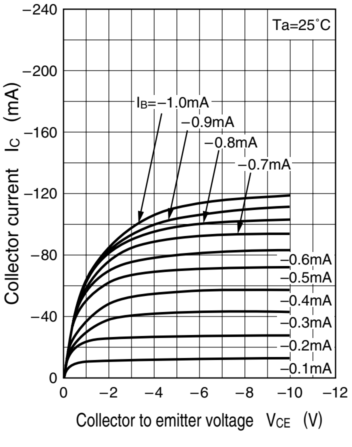


V_{IN} — I_O

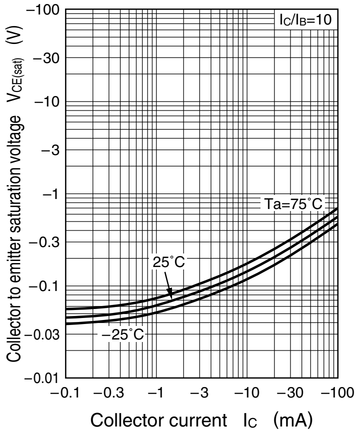


Characteristics charts of UNR1119

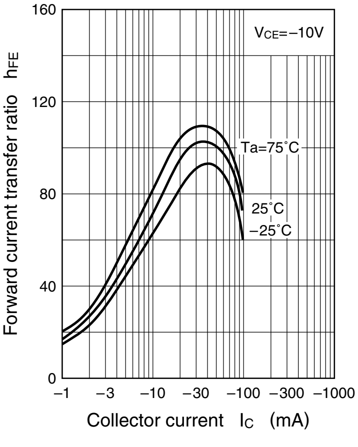
I_C — V_{CE}



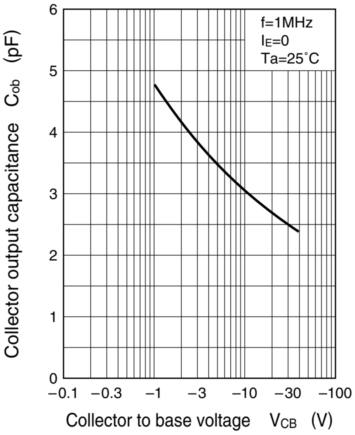
$V_{CE(sat)}$ — I_C



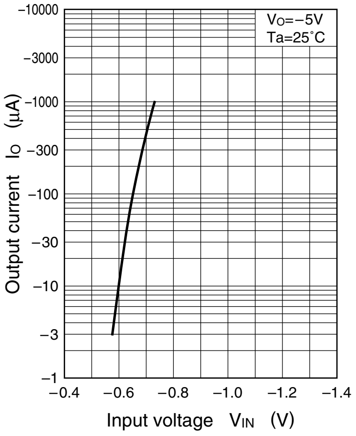
h_{FE} — I_C



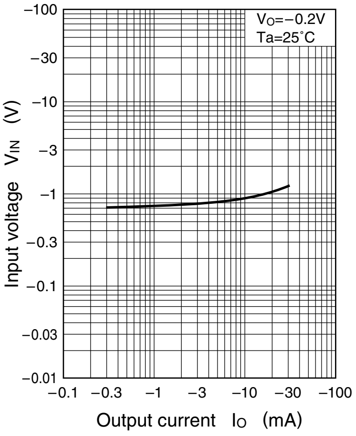
C_{ob} — V_{CB}



I_O — V_{IN}

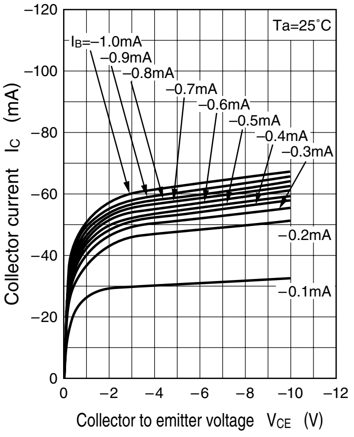


V_{IN} — I_O

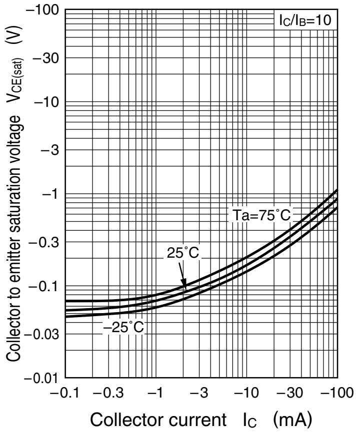


Characteristics charts of UNR1110

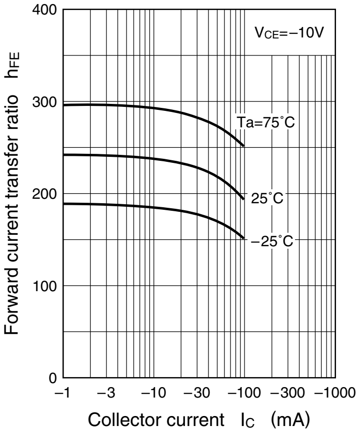
I_C — V_{CE}



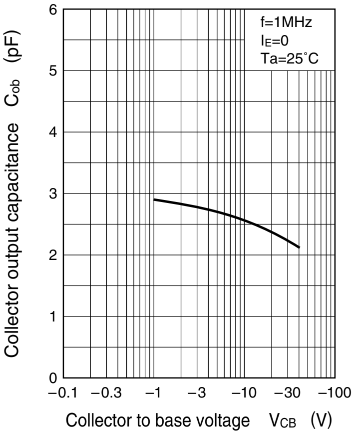
$V_{CE(sat)}$ — I_C



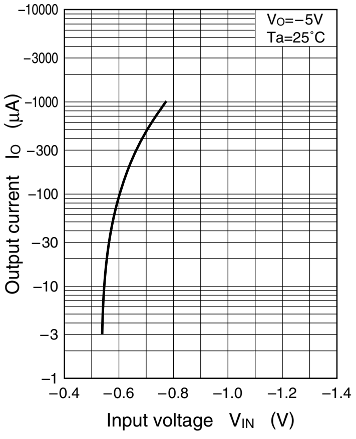
h_{FE} — I_C



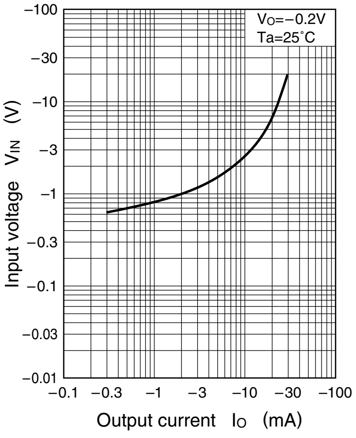
C_{ob} — V_{CB}



I_O — V_{IN}

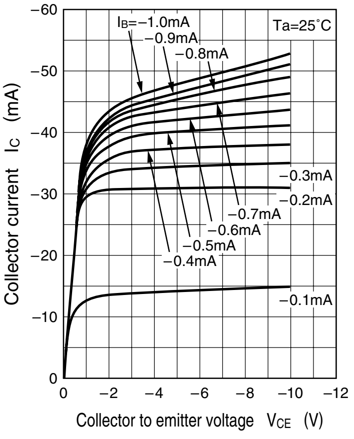


V_{IN} — I_O

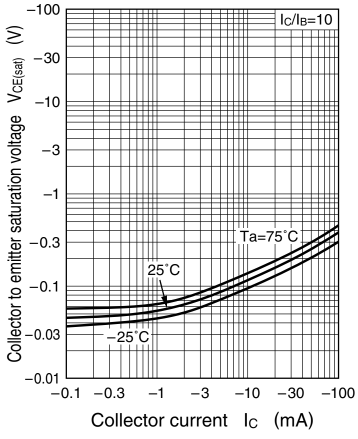


Characteristics charts of UNR111D

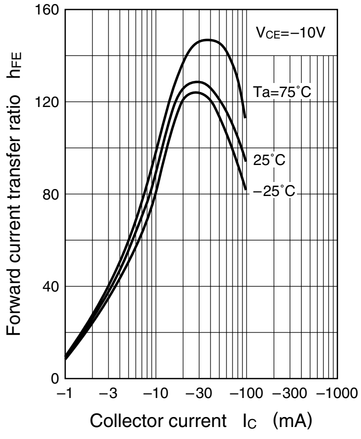
I_C — V_{CE}



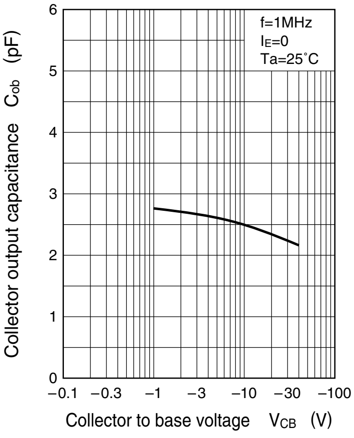
$V_{CE(sat)}$ — I_C



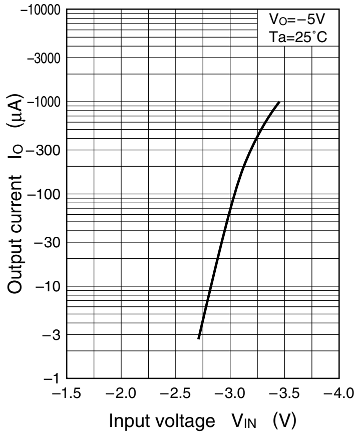
h_{FE} — I_C



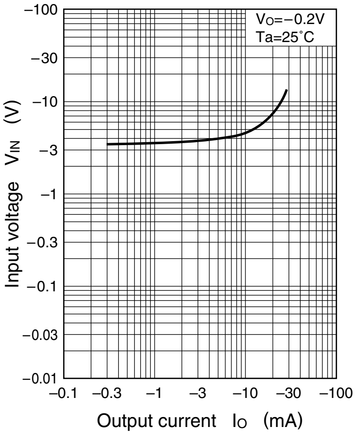
C_{ob} — V_{CB}



I_O — V_{IN}

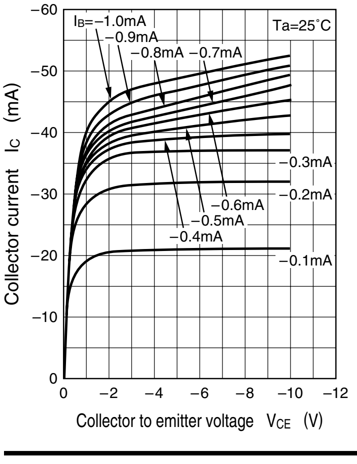


V_{IN} — I_O

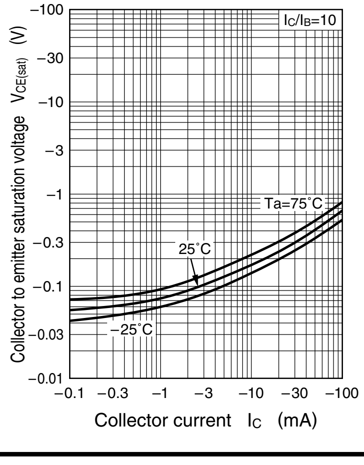


Characteristics charts of UNR111E

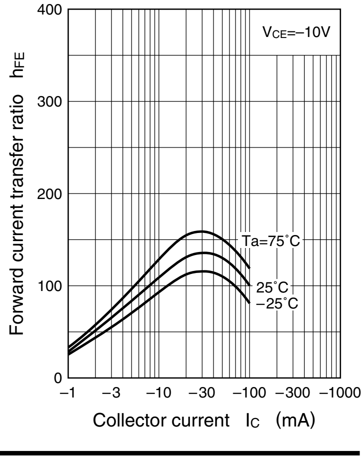
I_C — V_{CE}



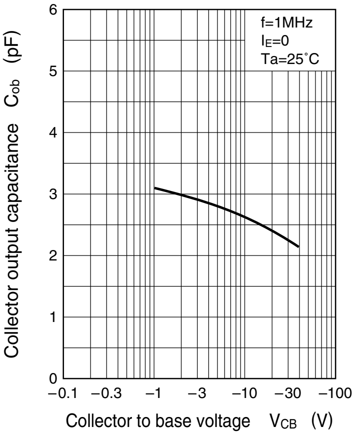
$V_{CE(sat)}$ — I_C



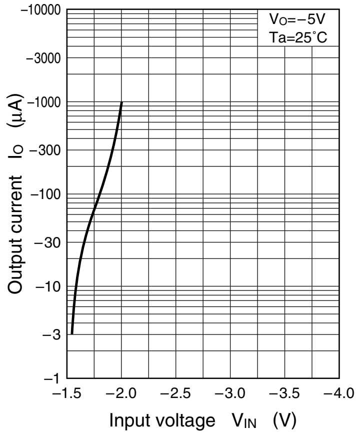
h_{FE} — I_C



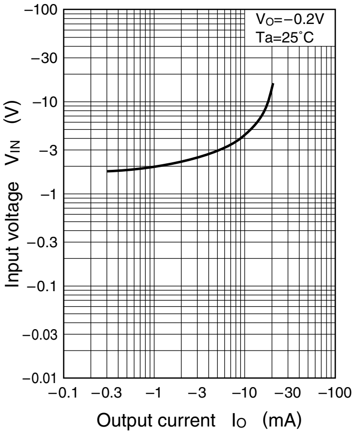
C_{ob} — V_{CB}



I_O — V_{IN}

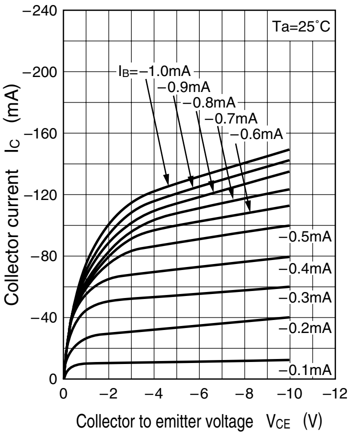


V_{IN} — I_O

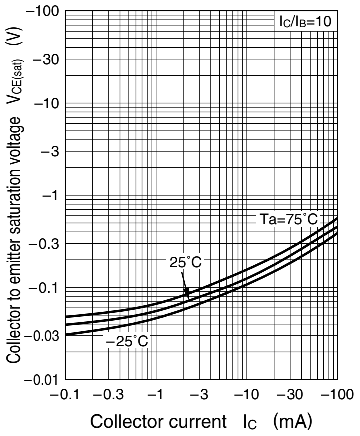


Characteristics charts of UNR111F

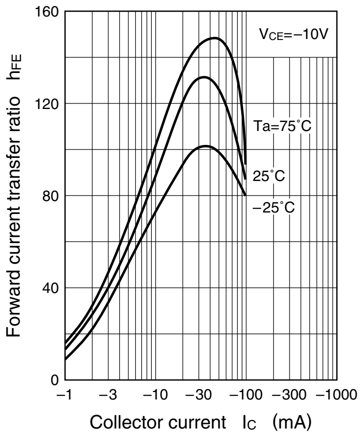
I_C — V_{CE}



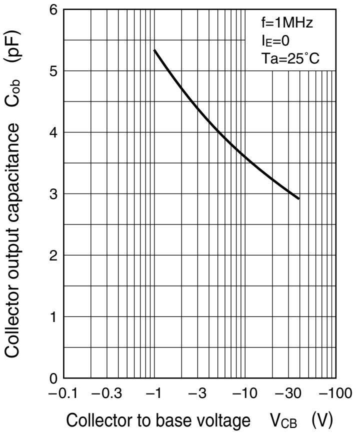
$V_{CE(sat)}$ — I_C



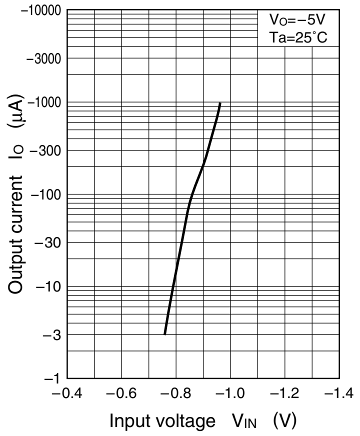
h_{FE} — I_C



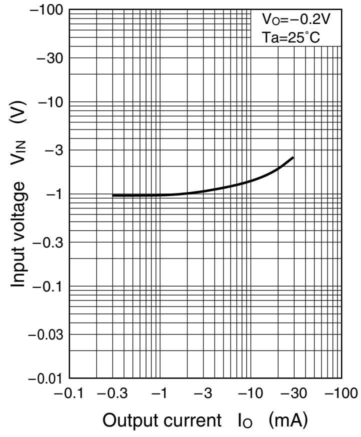
C_{ob} — V_{CB}



I_O — V_{IN}

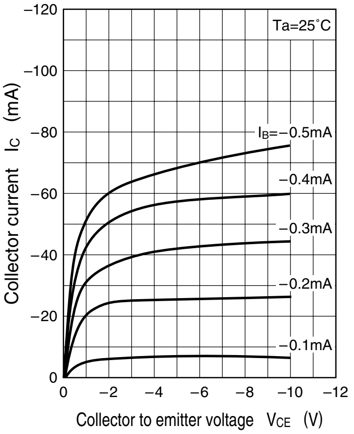


V_{IN} — I_O

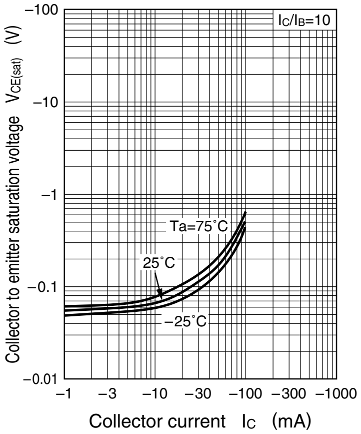


Characteristics charts of UNR111H

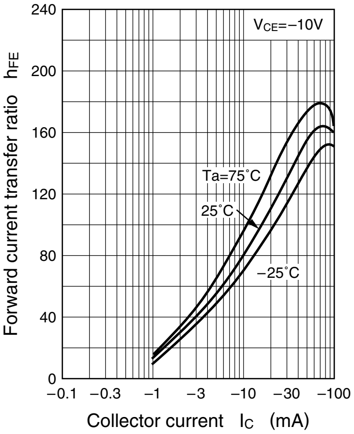
I_C — V_{CE}



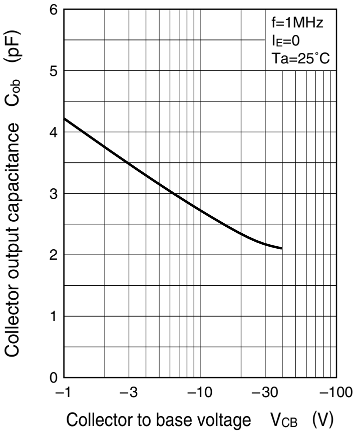
$V_{CE(sat)}$ — I_C



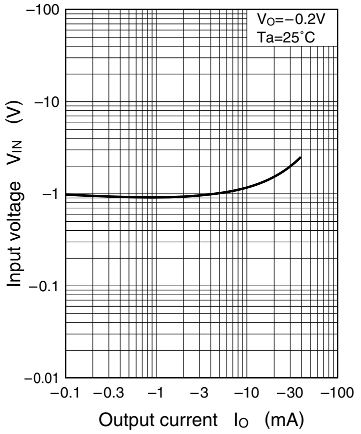
h_{FE} — I_C



C_{ob} — V_{CB}

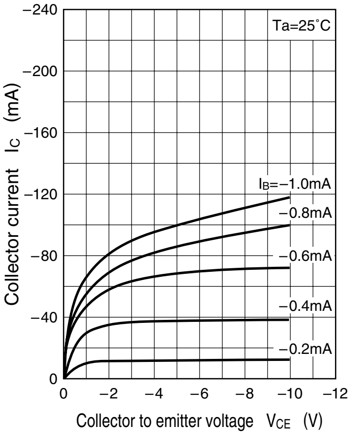


V_{IN} — I_O

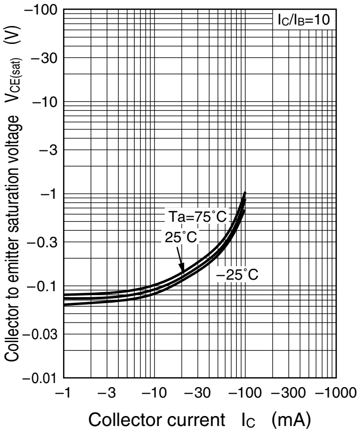


Characteristics charts of UNR111L

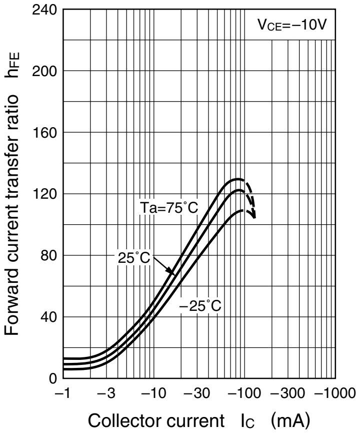
I_C — V_{CE}



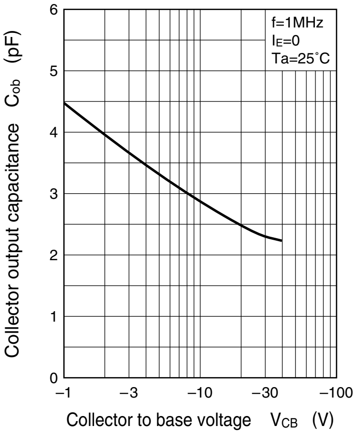
$V_{CE(sat)}$ — I_C



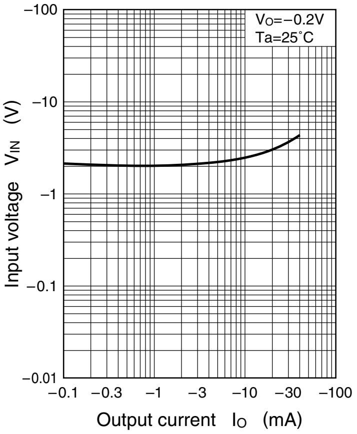
h_{FE} — I_C



C_{ob} — V_{CB}



V_{IN} — I_O



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