UN2111/2112/2113/2114/2115/2116/2117/2118/2119/2110/211D/211E/211F/211H/211L/211M/211N/211T/211V/211Z

Silicon PNP epitaxial planer transistor

For digital circuits

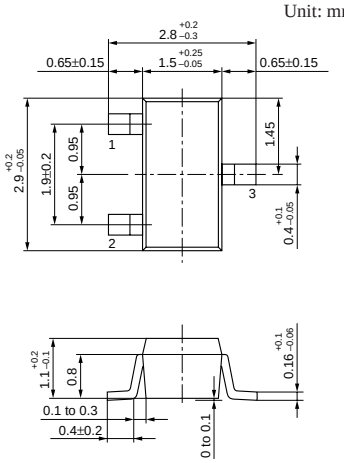
Features

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

Resistance by Part Number

	Marking Symbol	(R_1)	(R_2)
● UN2111	6A	10kΩ	10kΩ
● UN2112	6B	22kΩ	22kΩ
● UN2113	6C	47kΩ	47kΩ
● UN2114	6D	10kΩ	47kΩ
● UN2115	6E	10kΩ	—
● UN2116	6F	4.7kΩ	—
● UN2117	6H	22kΩ	—
● UN2118	6I	0.51kΩ	5.1kΩ
● UN2119	6K	1kΩ	10kΩ
● UN2110	6L	47kΩ	—
● UN211D	6M	47kΩ	10kΩ
● UN211E	6N	47kΩ	22kΩ
● UN211F	6O	4.7kΩ	10kΩ
● UN211H	6P	2.2kΩ	10kΩ
● UN211L	6Q	4.7kΩ	4.7kΩ
● UN211M	EI	2.2kΩ	47kΩ
● UN211N	EW	4.7kΩ	47kΩ
● UN211T	EY	22kΩ	47kΩ
● UN211V	FC	2.2kΩ	2.2kΩ
● UN211Z	FE	4.7kΩ	22kΩ

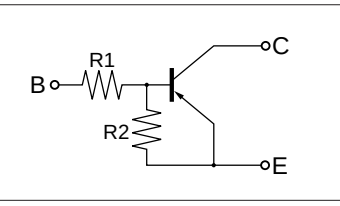
Unit: mm



1:Base
2:Emitter
3:Collector

EIAJ:SC-59
Mini Type Package

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	200	mW
Junction temperature	T_j	150	˚C
Storage temperature	T_{stg}	–55 to +150	˚C

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	UN2111	I_{EBO}	V_{EB} = –6V, I_C = 0			– 0.5	mA
	UN2112/2114/211E/211D/211M/211N/211T					– 0.2	
	UN2113					– 0.1	
	UN2115/2116/2117/2110					– 0.01	
	UN211F/211H					–1.0	
	UN2119					–1.5	
	UN2118/211L/211V					–2.0	
	UN211Z					– 0.4	
Collector to base voltage		V_{CBO}	I_C = –10mA, I_E = 0	–50			V
Collector to emitter voltage		V_{CEO}	I_C = –2mA, I_B = 0	–50			V
Forward current transfer ratio	UN2111	h_{FE}	V_{CE} = –10V, I_C = –5mA	35			
	UN2112/211E			60			
	UN2113/2114/211M			80			
	UN2115*/2116*/2117*/2110*			160		460	
	UN2119/211F/211D/211H			30			
	UN2118/211L			20			
	UN211N/211T			80		400	
	UN211V			6		20	
	UN211Z			60		200	
Collector to emitter saturation voltage		$V_{CE(sat)}$	I_C = –10mA, I_B = – 0.3mA			– 0.25	V
	UN211V		I_C = –10mA, I_B = –1.5mA		– 0.07	– 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
	UN2113		V_{CC} = –5V, V_B = –3.5V, R_L = 1kΩ			– 0.2	
	UN211D		V_{CC} = –5V, V_B = –10V, R_L = 1kΩ			– 0.2	
	UN211E		V_{CC} = –5V, V_B = –6V, R_L = 1kΩ			– 0.2	
Transition frequency		f_T	V_{CB} = –10V, I_E = 1mA, f = 200MHz		80		MHz
Input resistance	UN2111/2114/2115	R_1		(–30%)	10	(+30%)	kΩ
	UN2112/2117/211T				22		
	UN2113/2110/211D/211E				47		
	UN2116/211F/211L/211N/211Z				4.7		
	UN2118				0.51		
	UN2119				1		
	UN211H/211M/211V				2.2		

* h_{FE} rank classification (UN2115/2116/2117/2110)

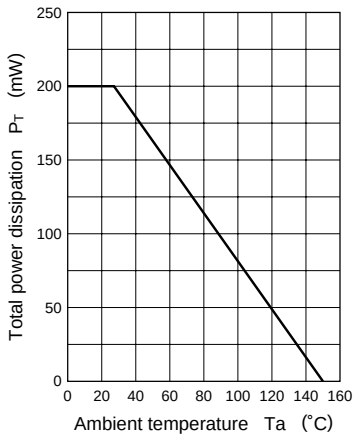
Rank	Q	R	S
h_{FE}	160 to 260	210 to 340	290 to 460

■ Electrical Characteristics (continued) (Ta=25˚C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Resistance ratio	UN2111/2112/2113/211L	R_1/R_2		0.8	1.0	1.2	
	UN2114			0.17	0.21	0.25	
	UN2118/2119			0.08	0.1	0.12	
	UN211D				4.7		
	UN211E				2.14		
	UN211F/211T				0.47		
	UN211H			0.17	0.22	0.27	
	UN211M				0.047		
	UN211N				0.1		
	UN211V				1.0		
	UN211Z				0.21		

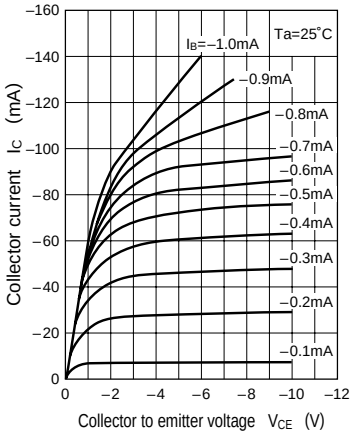
Common characteristics chart

P_T — Ta

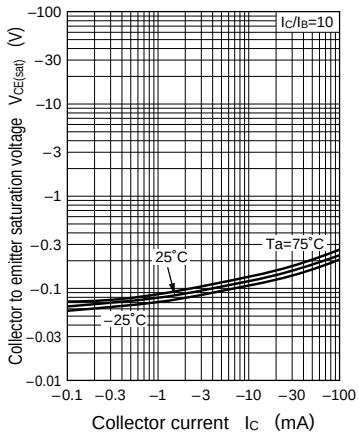


Characteristics charts of UN2111

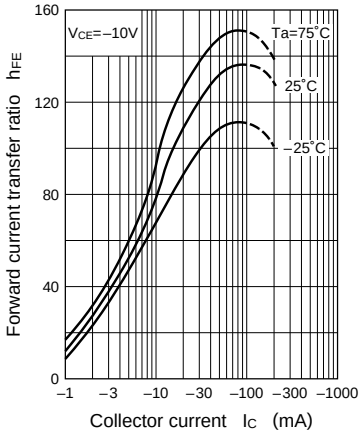
I_C — V_{CE}



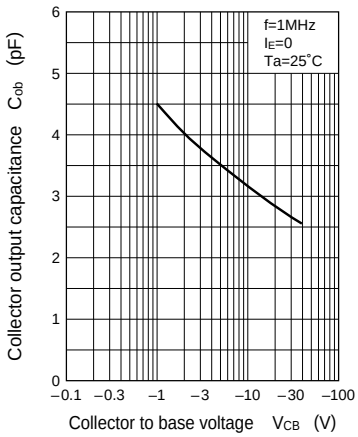
$V_{CE(sat)}$ — I_C



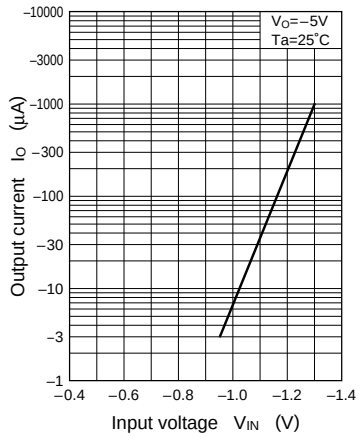
h_{FE} — I_C



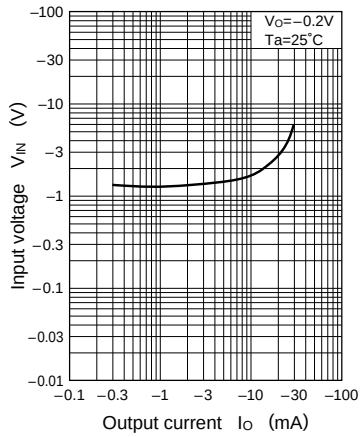
C_{ob} — V_{CB}



I_O — V_{IN}

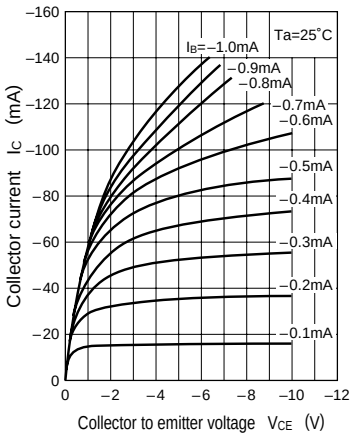


V_{IN} — I_O

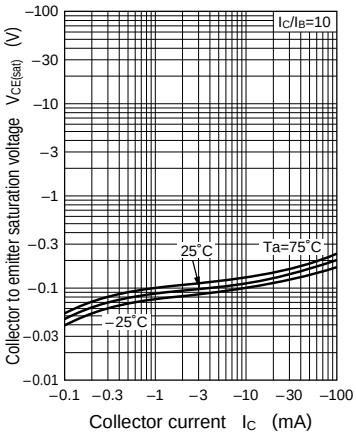


Characteristics charts of UN2112

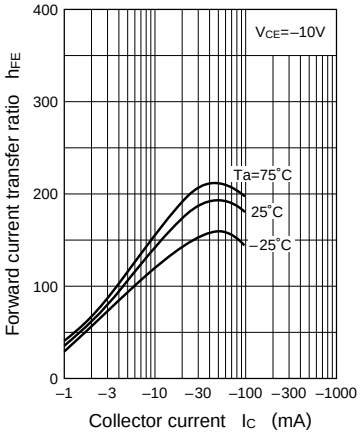
I_C — V_{CE}



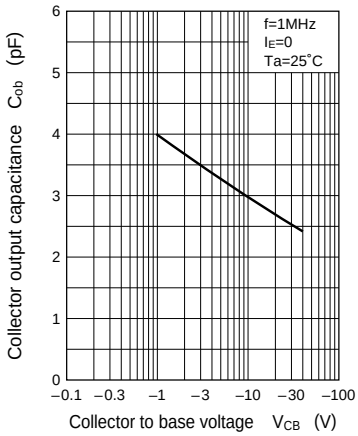
$V_{CE(sat)}$ — I_C



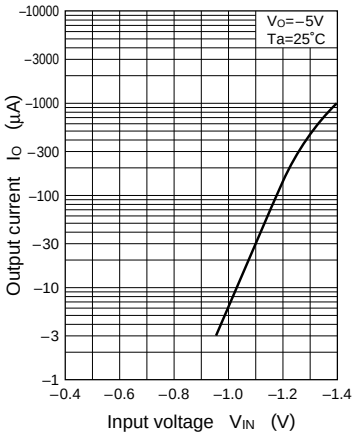
h_{FE} — I_C



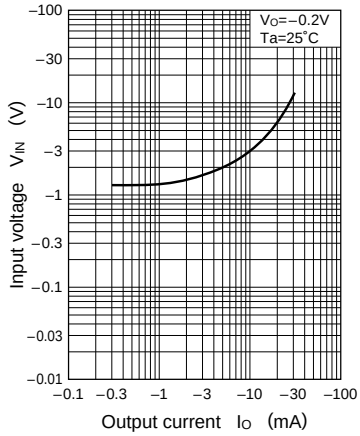
C_{ob} — V_{CB}



I_O — V_{IN}

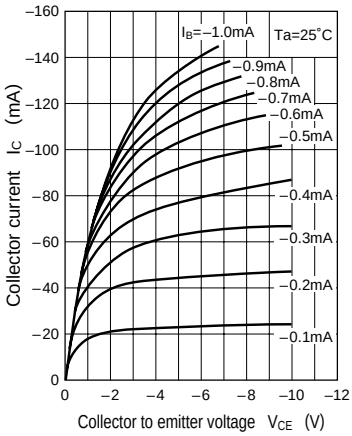


V_{IN} — I_O

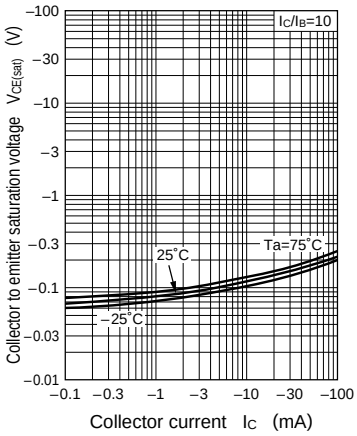


Characteristics charts of UN2113

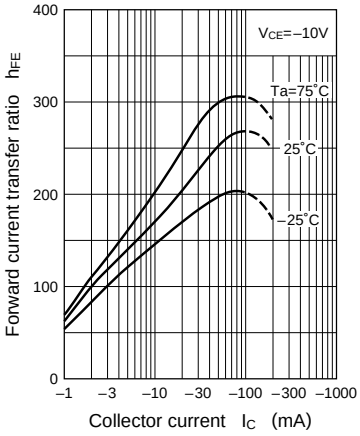
I_C — V_{CE}



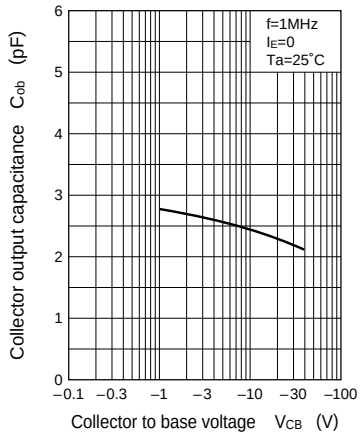
$V_{CE(sat)}$ — I_C



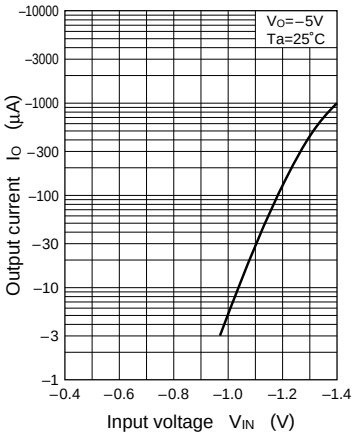
h_{FE} — I_C



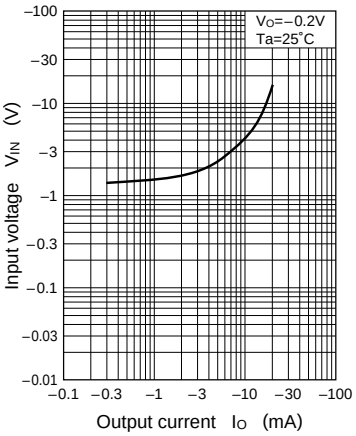
C_{ob} — V_{CB}



I_O — V_{IN}

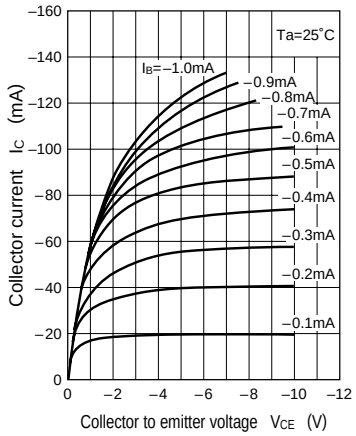


V_{IN} — I_O

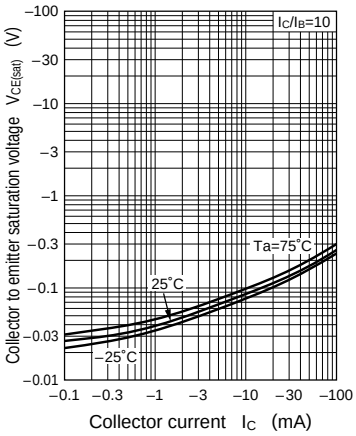


Characteristics charts of UN2114

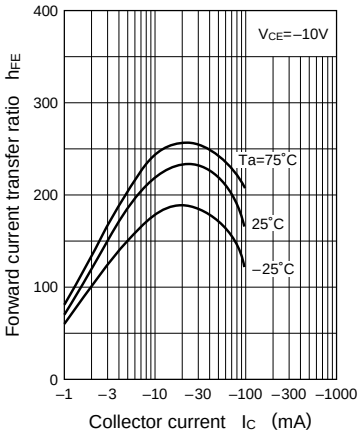
I_C — V_{CE}



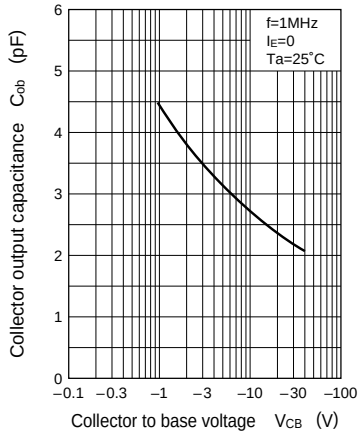
$V_{CE(sat)}$ — I_C



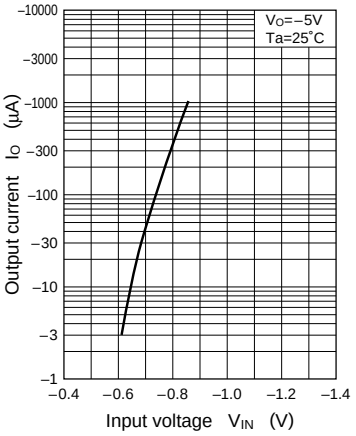
h_{FE} — I_C



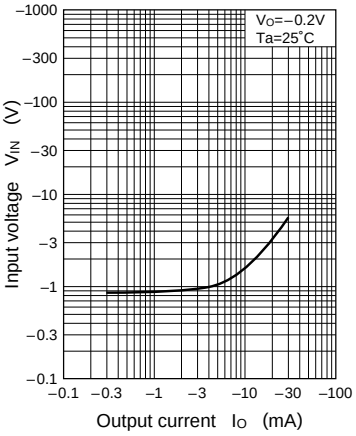
C_{ob} — V_{CB}



I_O — V_{IN}

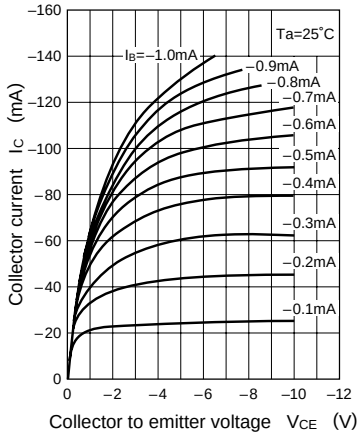


V_{IN} — I_O

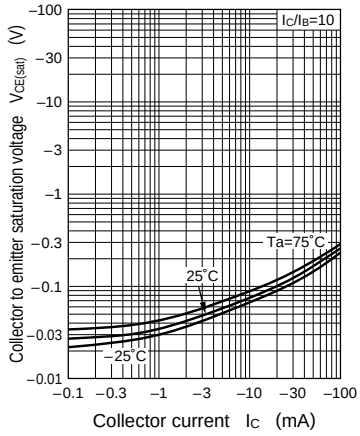


Characteristics charts of UN2115

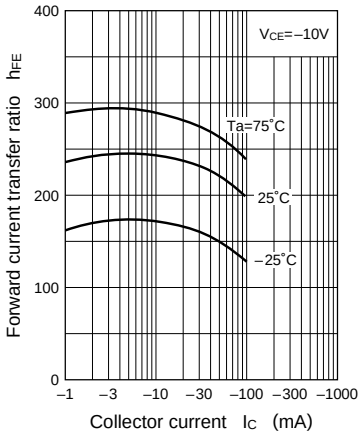
I_C — V_{CE}



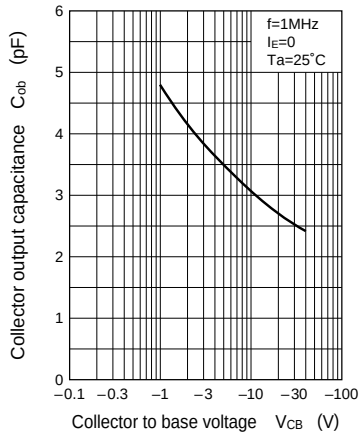
$V_{CE(sat)}$ — I_C



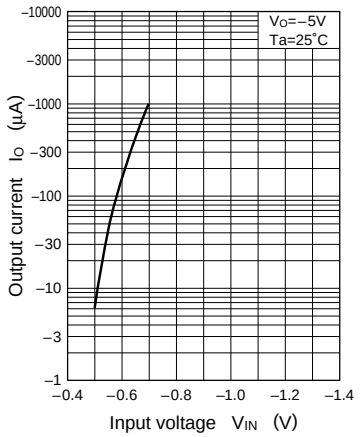
h_{FE} — I_C



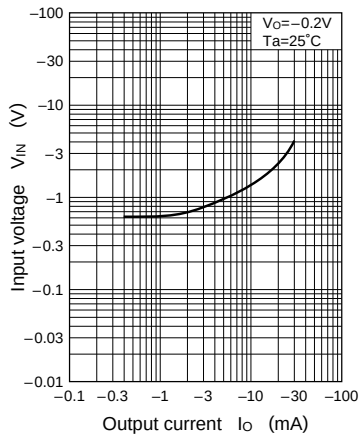
C_{ob} — V_{CB}



I_O — V_{IN}

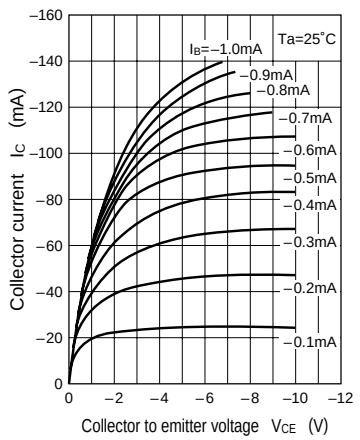


V_{IN} — I_O

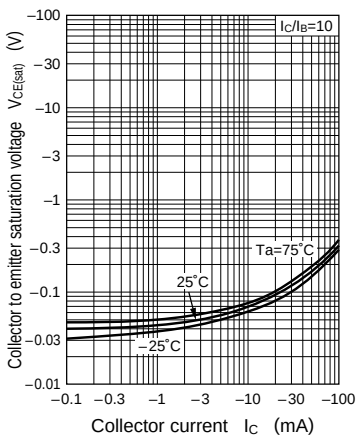


Characteristics charts of UN2116

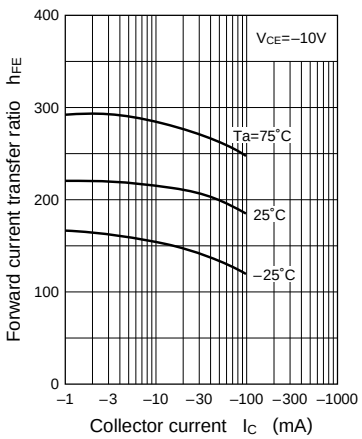
I_C — V_{CE}



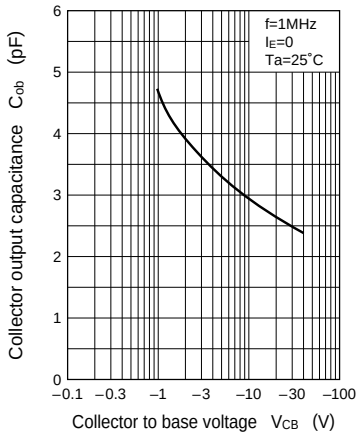
$V_{CE(sat)}$ — I_C



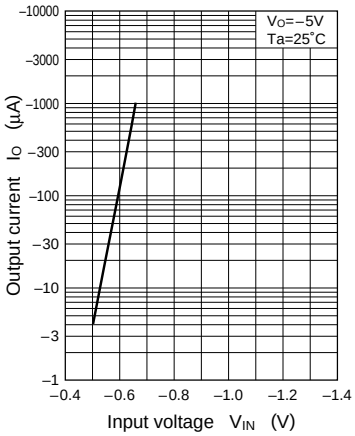
h_{FE} — I_C



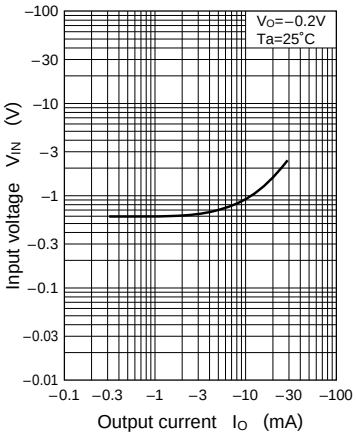
C_{ob} — V_{CB}



I_O — V_{IN}

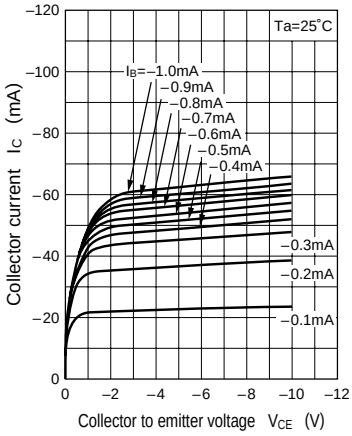


V_{IN} — I_O

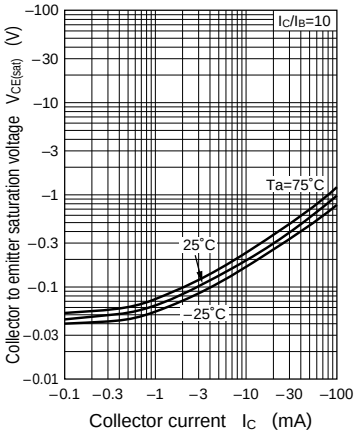


Characteristics charts of UN2117

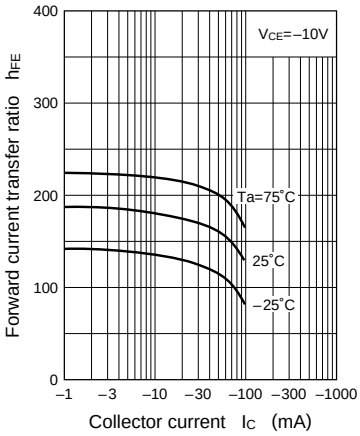
I_C — V_{CE}



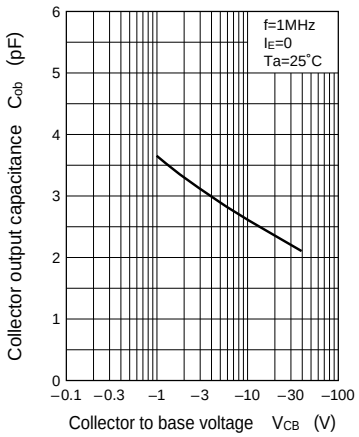
$V_{CE(sat)}$ — I_C



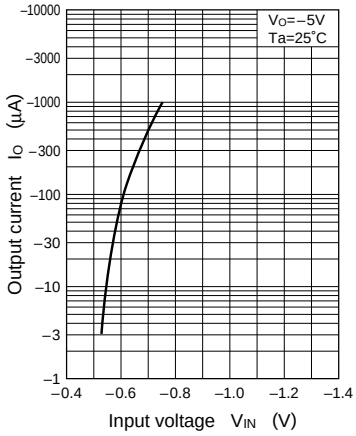
h_{FE} — I_C



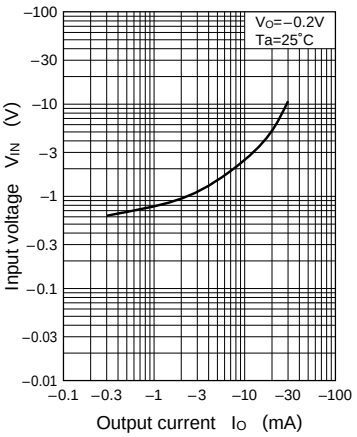
C_{ob} — V_{CB}



I_O — V_{IN}

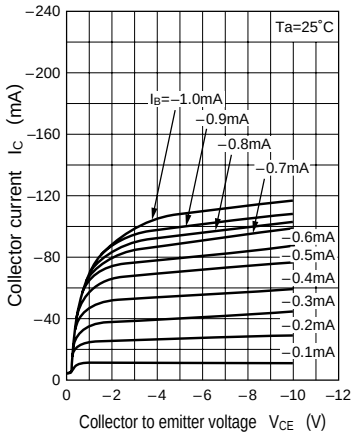


V_{IN} — I_O

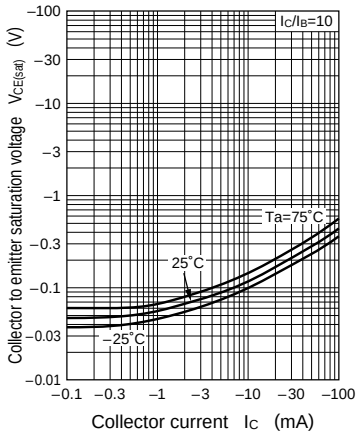


Characteristics charts of UN2118

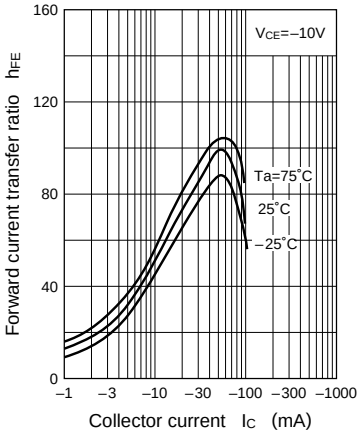
I_C — V_{CE}



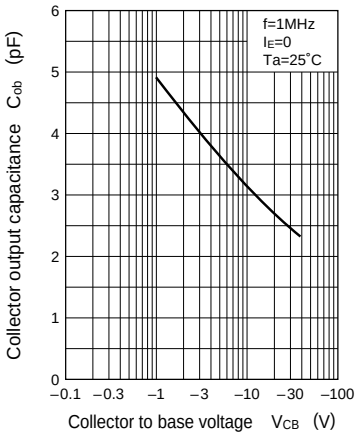
$V_{CE(sat)}$ — I_C



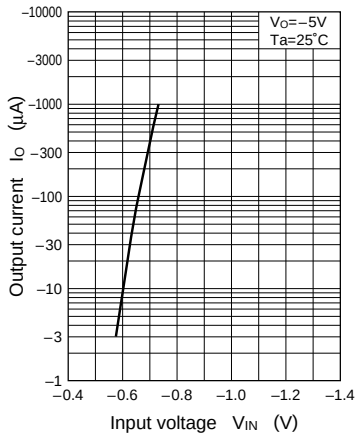
h_{FE} — I_C



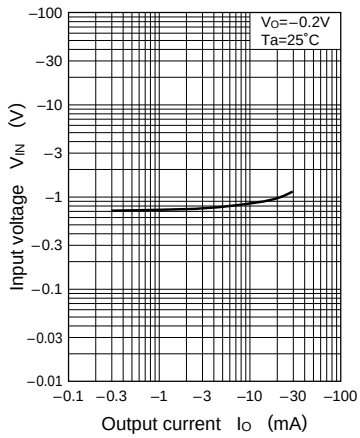
C_{ob} — V_{CB}



I_O — V_{IN}

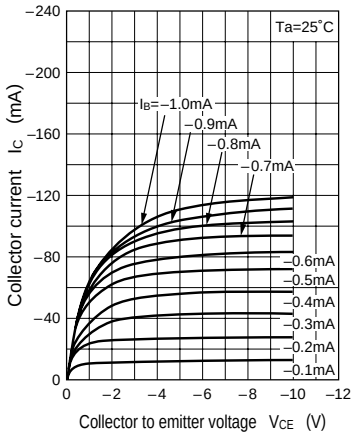


V_{IN} — I_O

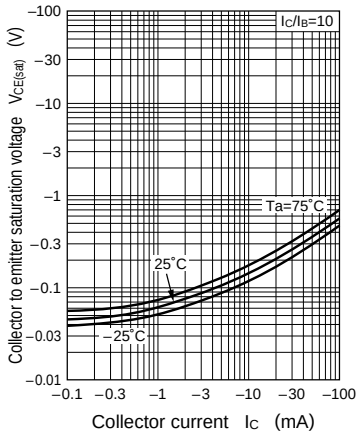


Characteristics charts of UN2119

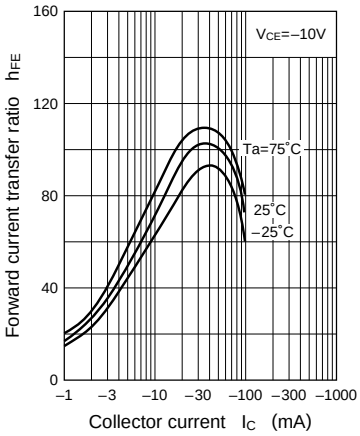
I_C — V_{CE}



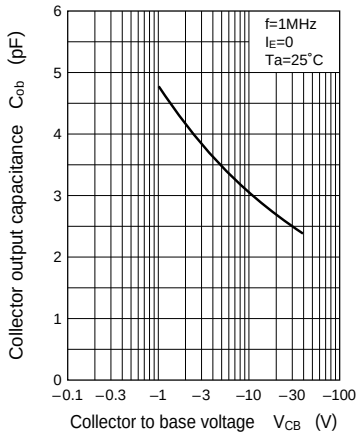
$V_{CE(sat)}$ — I_C



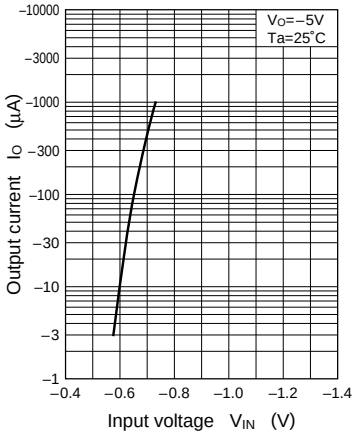
h_{FE} — I_C



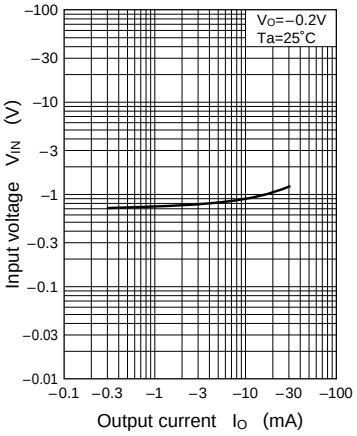
C_{ob} — V_{CB}



I_O — V_{IN}

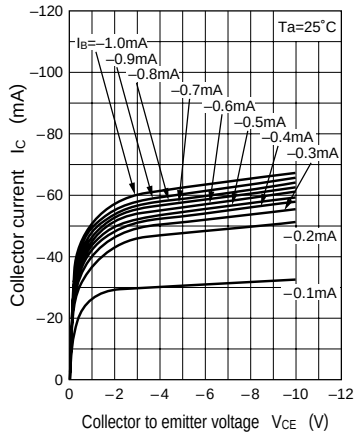


V_{IN} — I_O

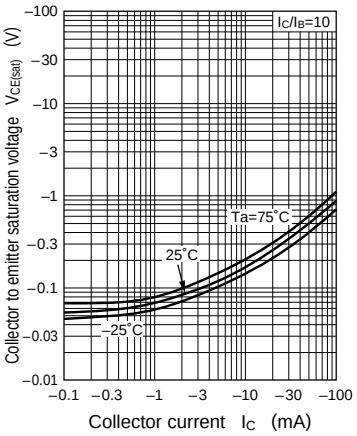


Characteristics charts of UN2110

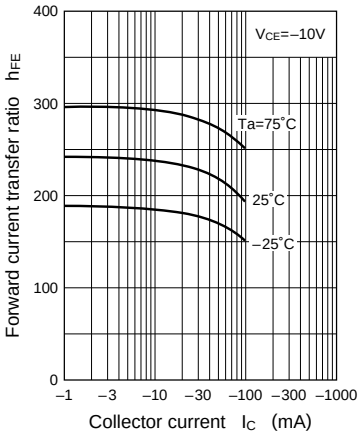
I_C — V_{CE}



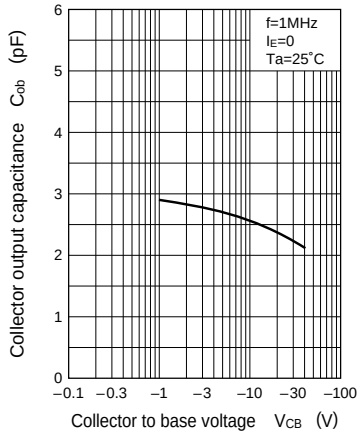
$V_{CE(sat)}$ — I_C



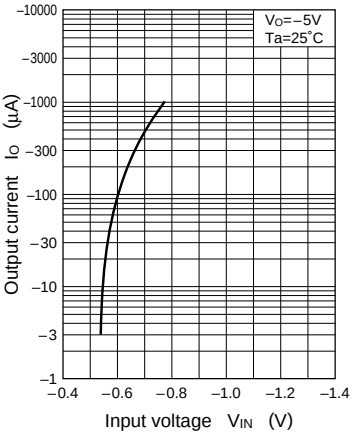
h_{FE} — I_C



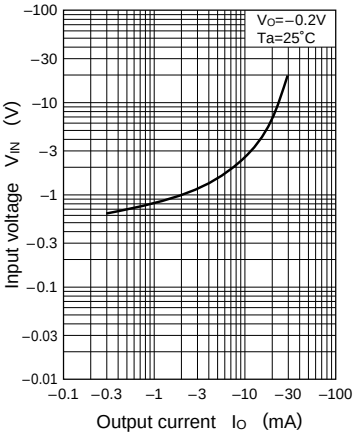
C_{ob} — V_{CB}



I_O — V_{IN}

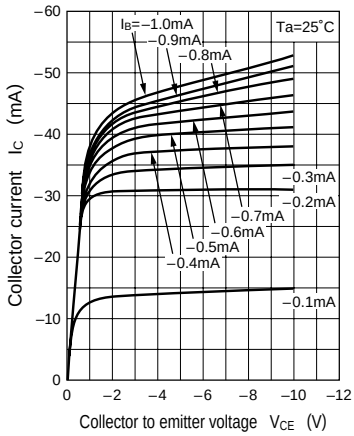


V_{IN} — I_O

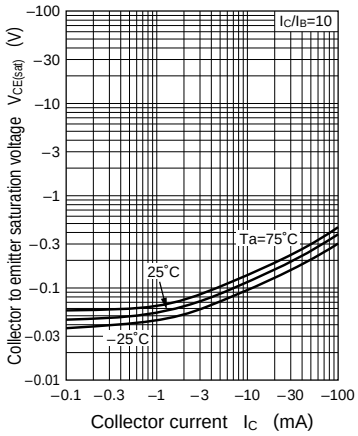


Characteristics charts of UN211D

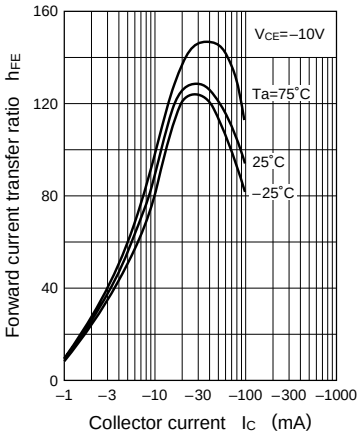
I_C — V_{CE}



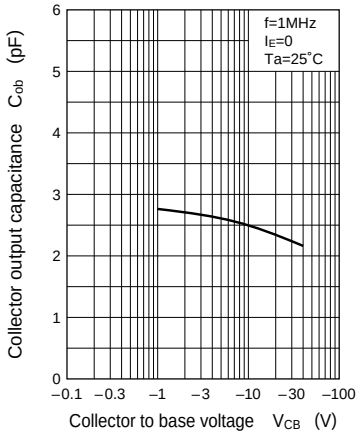
$V_{CE(sat)}$ — I_C



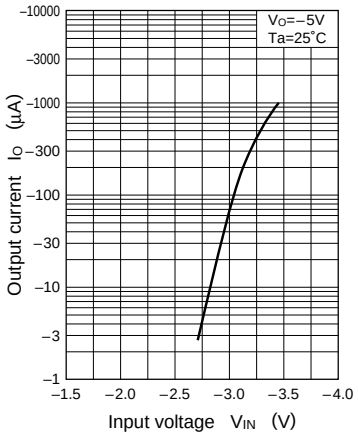
h_{FE} — I_C



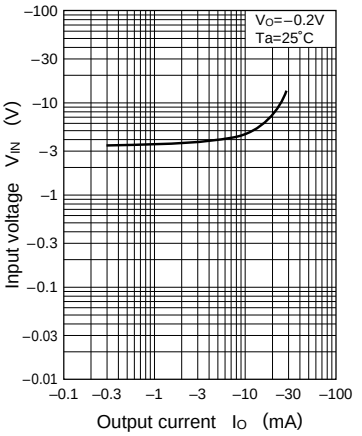
C_{ob} — V_{CB}



I_O — V_{IN}

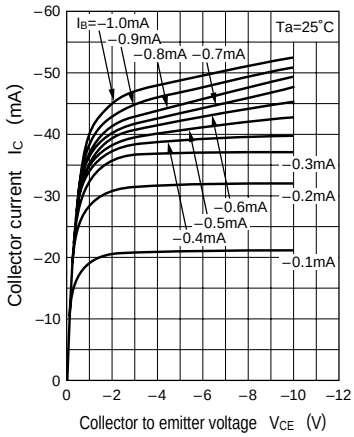


V_{IN} — I_O

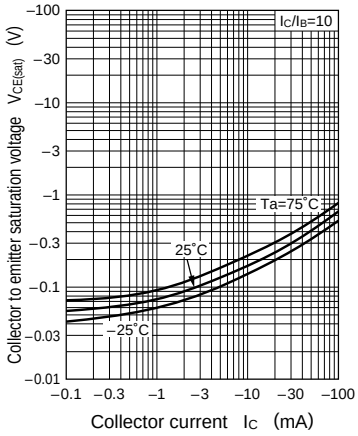


Characteristics charts of UN211E

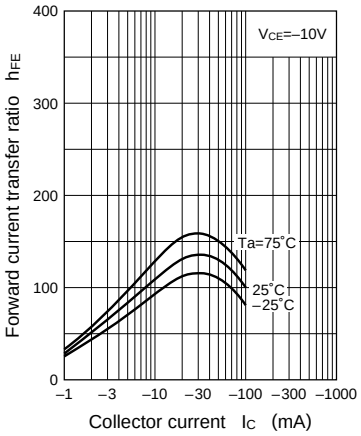
I_C — V_{CE}



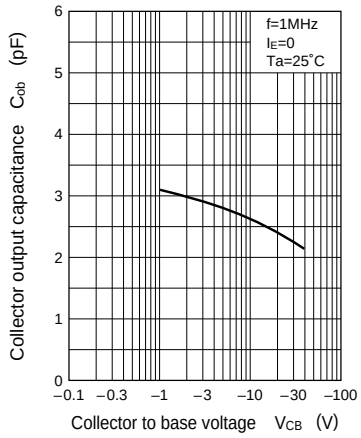
$V_{CE(sat)}$ — I_C



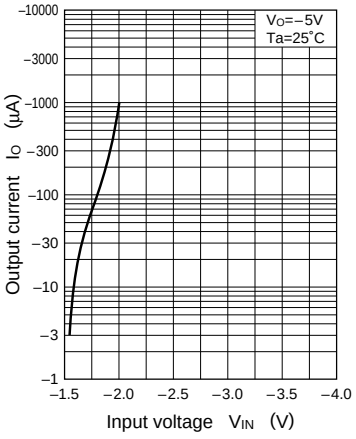
h_{FE} — I_C



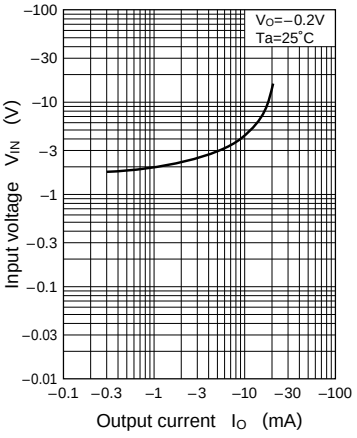
C_{ob} — V_{CB}



I_O — V_{IN}

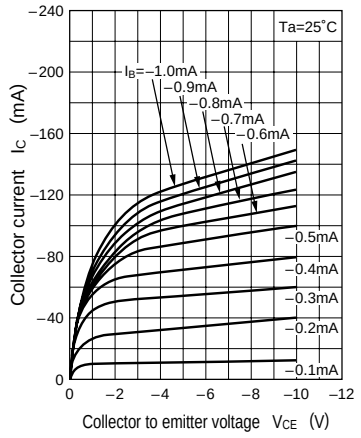


V_{IN} — I_O

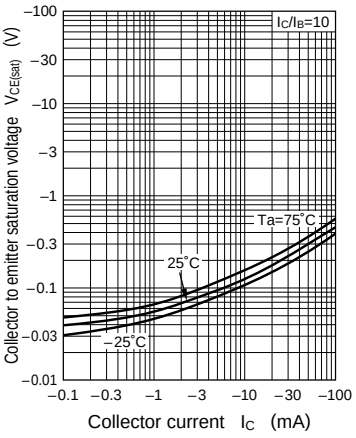


Characteristics charts of UN211F

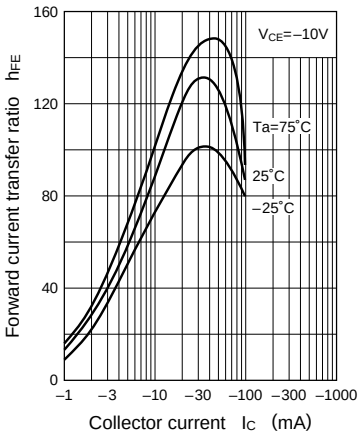
I_C — V_{CE}



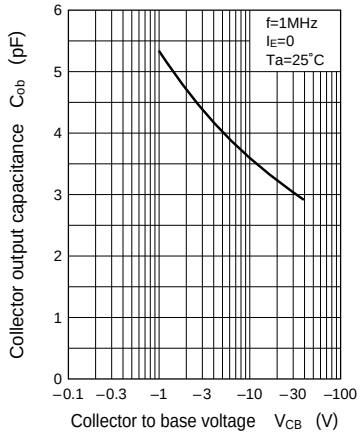
$V_{CE(sat)}$ — I_C



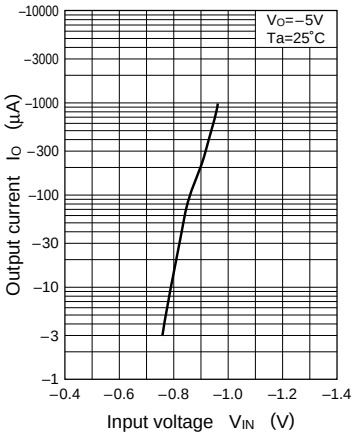
h_{FE} — I_C



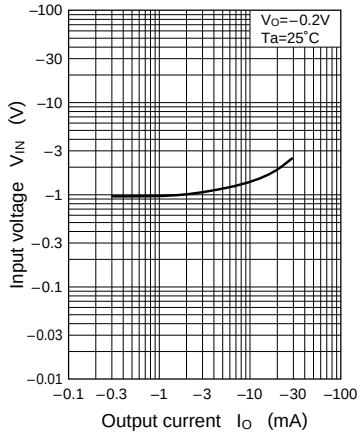
C_{ob} — V_{CB}



I_O — V_{IN}

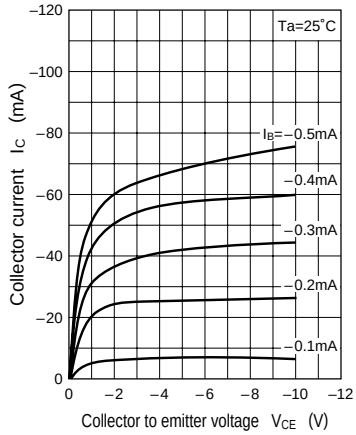


V_{IN} — I_O

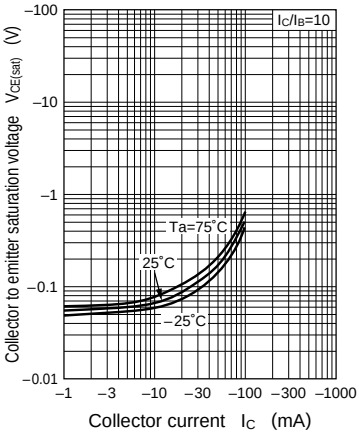


Characteristics charts of UN211H

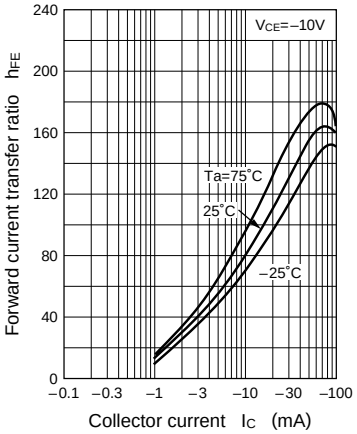
I_C — V_{CE}



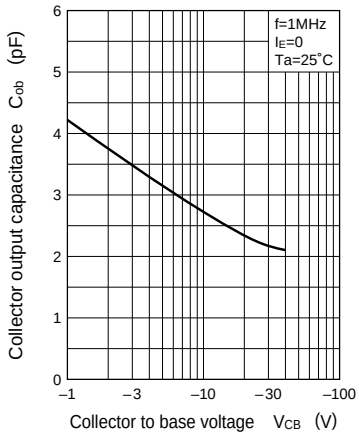
$V_{CE(sat)}$ — I_C



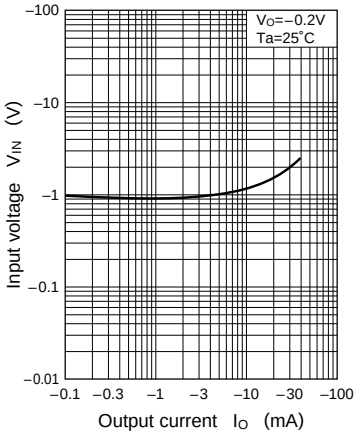
h_{FE} — I_C



C_{ob} — V_{CB}

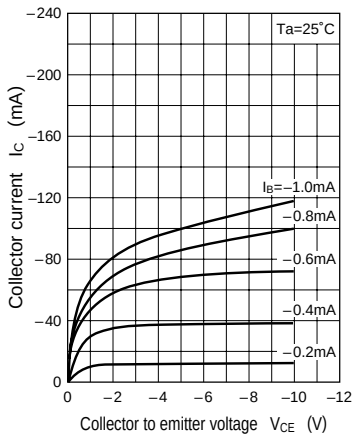


V_{IN} — I_O

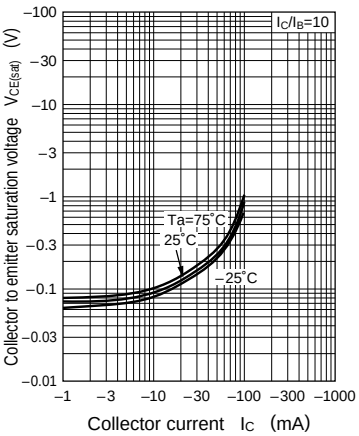


Characteristics charts of UN211L

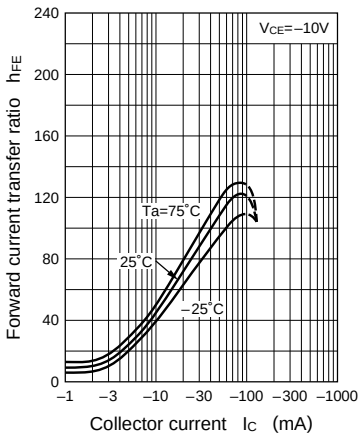
I_C — V_{CE}



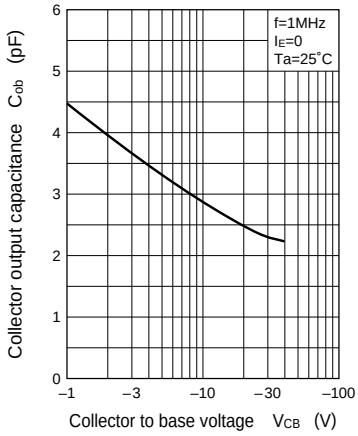
$V_{CE(sat)}$ — I_C



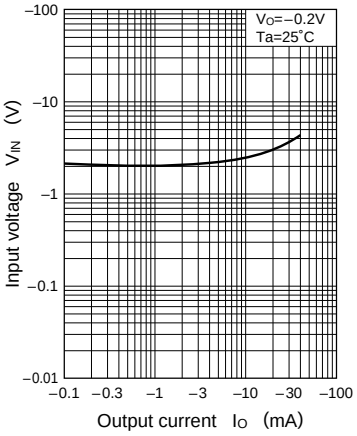
h_{FE} — I_C



C_{ob} — V_{CB}

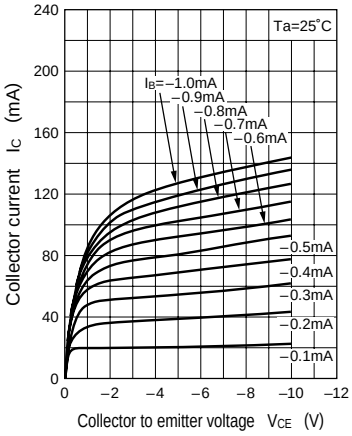


V_{IN} — I_O

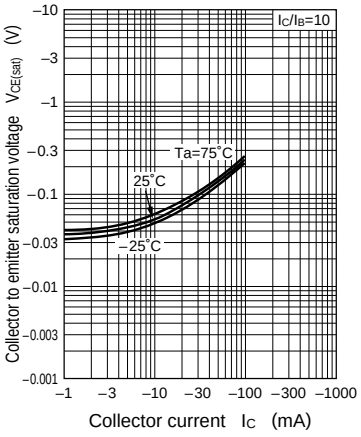


Characteristics charts of UN211M

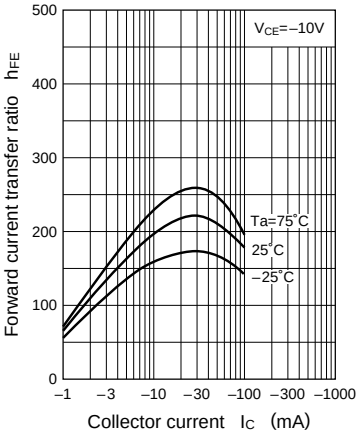
I_C — V_{CE}



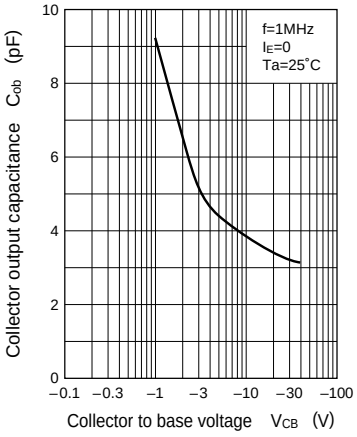
$V_{CE(sat)}$ — I_C



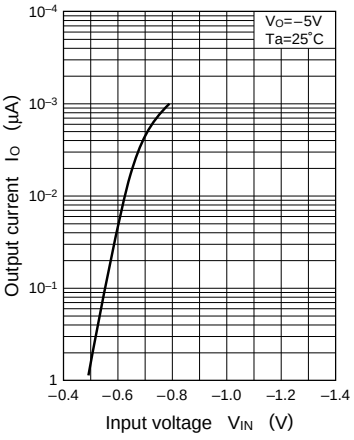
h_{FE} — I_C



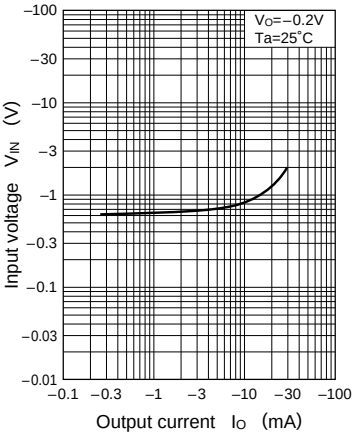
C_{ob} — V_{CB}



I_O — V_{IN}

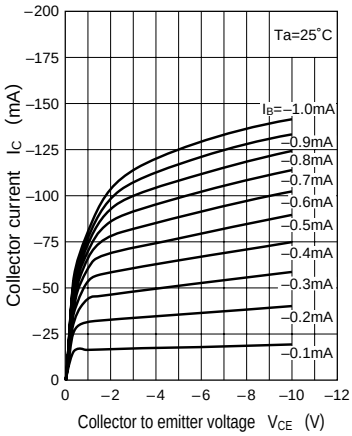


V_{IN} — I_O

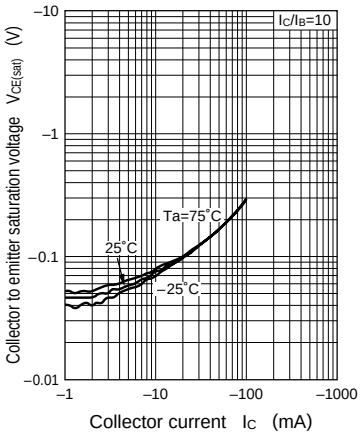


Characteristics charts of UN211N

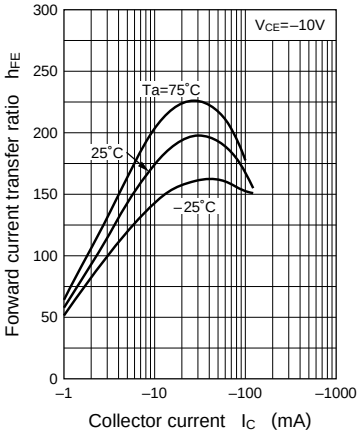
I_C — V_{CE}



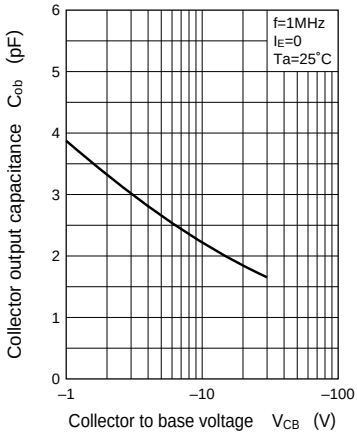
$V_{CE(sat)}$ — I_C



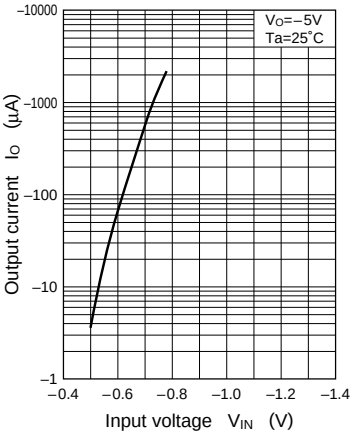
h_{FE} — I_C



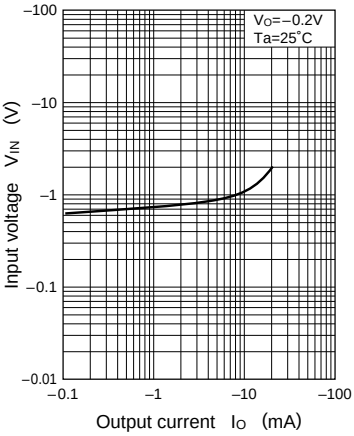
C_{ob} — V_{CB}



I_O — V_{IN}

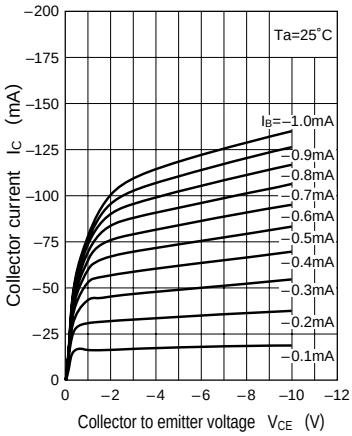


V_{IN} — I_O

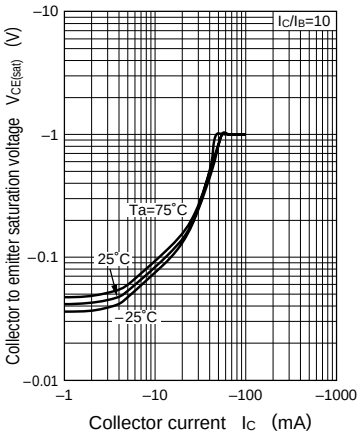


Characteristics charts of UN211T

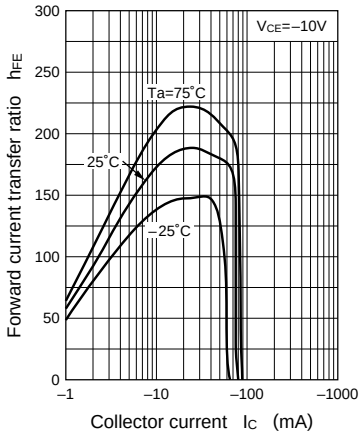
I_C — V_{CE}



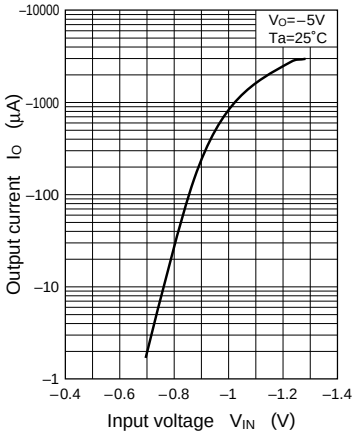
$V_{CE(sat)}$ — I_C



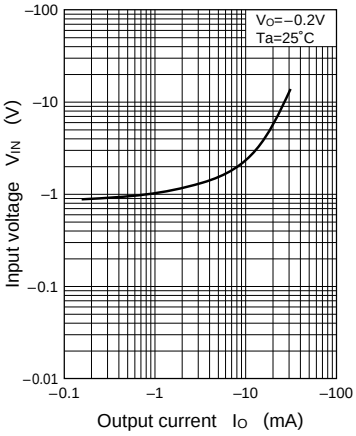
h_{FE} — I_C



I_O — V_{IN}

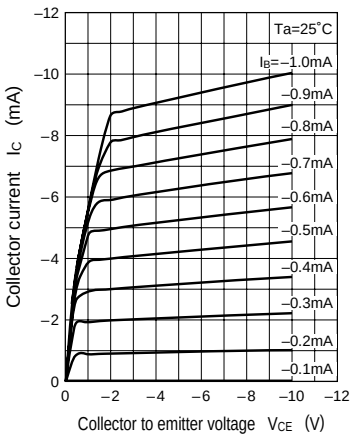


V_{IN} — I_O

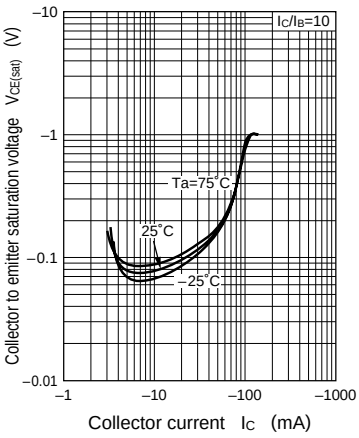


Characteristics charts of UN211V

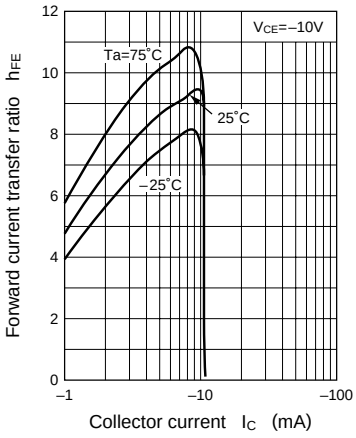
I_C — V_{CE}



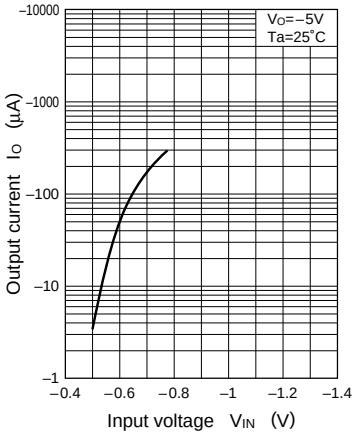
$V_{CE(sat)}$ — I_C



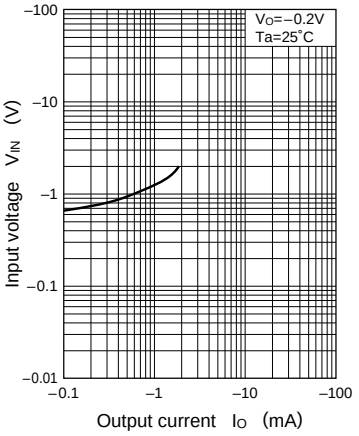
h_{FE} — I_C



I_O — V_{IN}

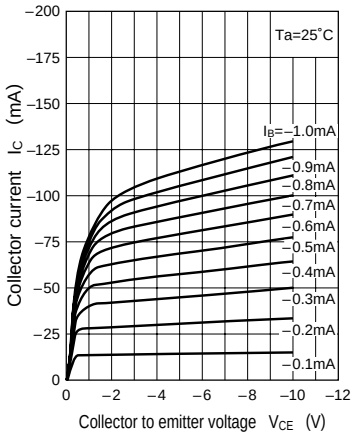


V_{IN} — I_O

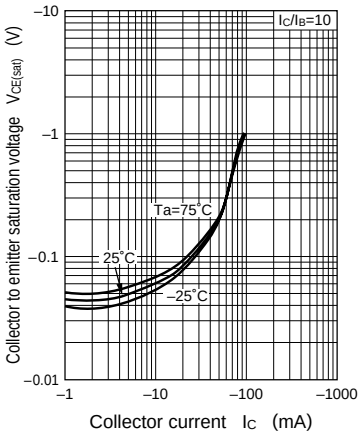


Characteristics charts of UN211Z

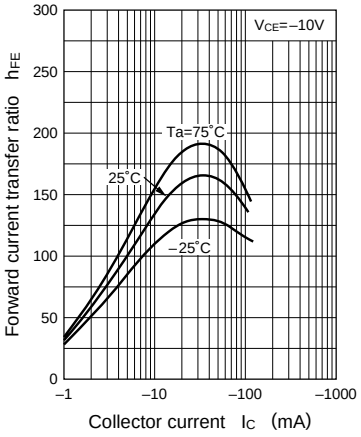
I_C — V_{CE}



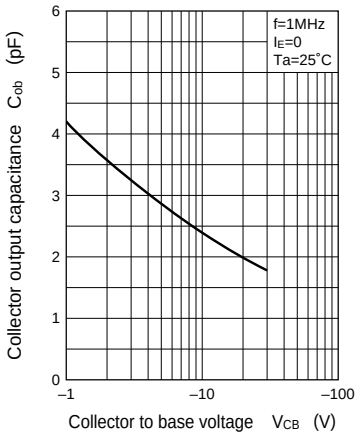
$V_{CE(sat)}$ — I_C



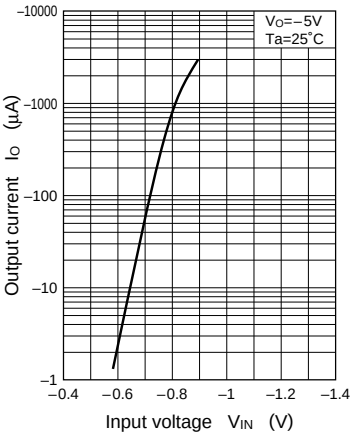
h_{FE} — I_C



C_{ob} — V_{CB}



I_O — V_{IN}



V_{IN} — I_O