

UN111/1112/1113/1114/1115/1116/1117/1118/1119/1110/111D/111E/111F/111H/111L**Silicon PNP Epitaxial Planar Type**

For digital circuits

■ Features

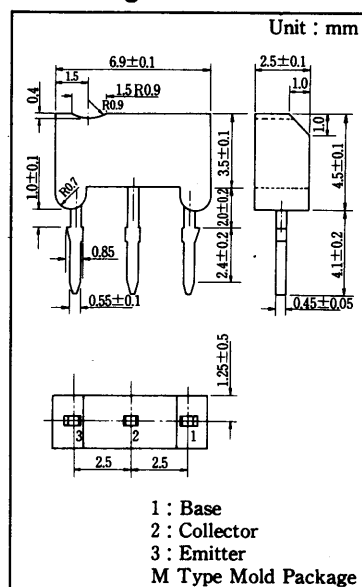
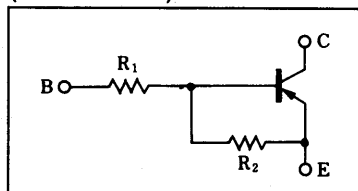
- Downsizing of equipment and fewer parts used allow reduced costs.
- An M type mold package that allows easy manual and automatic insertion.
Can be firmly mounted flush to PCB surface.

■ Resistor value by various kinds

	(R ₁)	(R ₂)
• UN 1111	10 kΩ	10 kΩ
• UN 1112	22 kΩ	22 kΩ
• UN 1113	47 kΩ	47 kΩ
• UN 1114	10 kΩ	47 kΩ
• UN 1115	10 kΩ	—
• UN 1116	47 kΩ	—
• UN 1117	22 kΩ	—
• UN 1118	0.51 kΩ	5.1 kΩ
• UN 1119	1 kΩ	10 kΩ
• UN 1110	47 kΩ	—
• UN 111D	47 kΩ	10 kΩ
• UN 111E	47 kΩ	22 kΩ
• UN 111F	4.7 kΩ	10 kΩ
• UN 111H	2.2 kΩ	10 kΩ
• UN 111L	4.7 kΩ	4.7 kΩ

■ Absolute Maximum Ratings (T_a=25°C)

Item	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	—50	V
Collector-Emitter Voltage	V _{CEO}	—50	V
Collector Current	I _C	—100	mA
Collector Power Dissipation	P _C	400	mW
Junction Temperature	T _J	150	°C
Storage Temperature	T _{stg}	—55~+150	°C

■ Package Dimensions**(Inner Circuit)**

■ Electrical Characteristics (Ta=25°C)

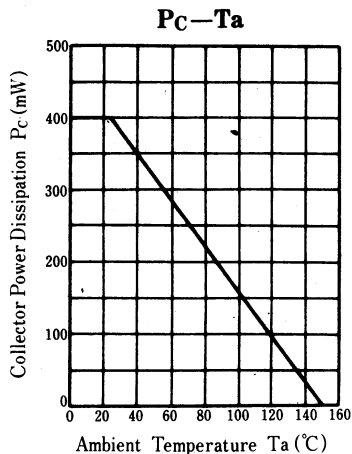
Item		Symbol	Condition	min.	typ.	max.	Unit
Collector Cutoff Current		I _{CBO}	V _{CB} =−50V, I _E = 0			−0.1	μA
		I _{CEO}	V _{CE} =−50V, I _B = 0			−0.5	μA
Emitter Cutoff Current	UN 1111	I _{EBO}	V _{EB} =− 6 V, I _C = 0			−0.5	mA
	UN 1112/1114/111E/111D					−0.2	
	UN 1113					−0.1	
	UN 1115/1116/1117/1110					−0.01	
	UN 111F/111H					−1.0	
	UN 1119					−1.5	
	UN 1118/111L					−2.0	
Collector-Base Voltage		V _{CBO}	I _C =−10 μA, I _E = 0	50			V
Collector-Emitter Voltage		V _{CEO}	I _C =− 2 mA, I _B = 0	50			V
DC Current Gain	UN 1111	h _{FE}	V _{CE} =−10V, I _C =− 5 mA	35			
	UN 1112/111E			60			
	UN 1113/1114			80			
	UN 1115*/1116*/1117*/1110*			160		460	
	UN 111F/111D/1119/111H			30			
	UN 1118/111L			20			
Collector-Emitter Saturation Voltage		V _{CE(sat)}	I _C =−10mA, I _B =−0.3mA			−0.25	V
High Level Output Voltage		V _{OH}	V _{CC} =− 5 V, V _B =−0.5V, R _L = 1 kΩ	−4.9			V
Low Level Output Voltage		V _{OL}	V _{CC} =− 5 V, V _B =−2.5V, R _L = 1 kΩ			−0.2	V
			V _{CC} =− 5 V, V _B =−3.5V, R _L = 1 kΩ			−0.2	
			V _{CC} =− 5 V, V _B =−10V, R _L = 1 kΩ			−0.2	
			V _{CC} =− 5 V, V _B =− 6 V, R _L = 1 kΩ			−0.2	
Transition Frequency		f _T	V _{CB} =−10V, I _E = 2 mA, f=200MHz		80		MHz
Input Resistance	UN 1111/1114/1115	R ₁		(−30%)	10	(+30%)	kΩ
	UN 1112/1117				22		
	UN 1113/1110/111D/111E				47		
	UN 1116/111F/111L				4.7		
	UN 1118				0.51		
	UN 1119				1		
	UN 111H				2.2		
Resistance Ratio	UN 1111/1112/1113/111L	R ₁ /R ₂		0.8	1.0	1.2	
	UN 1114			0.17	0.21	0.25	
	UN 1118/1119			0.08	0.1	0.12	
	UN 111D				4.7		
	UN 111E				2.14		
	UN 111F				0.47		
	UN 111H			0.17	0.22	0.27	

* h_{FE} Ranking (UN 1115/1116/1117/1110)

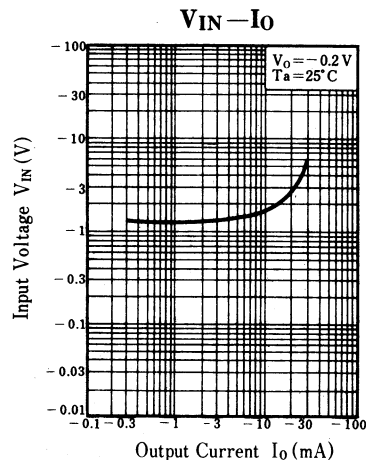
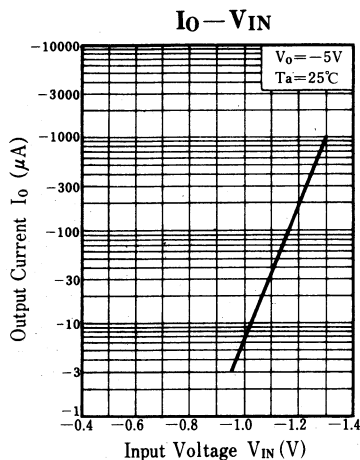
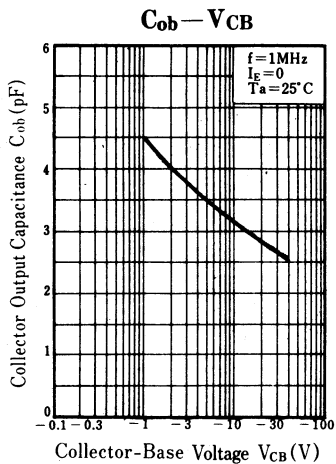
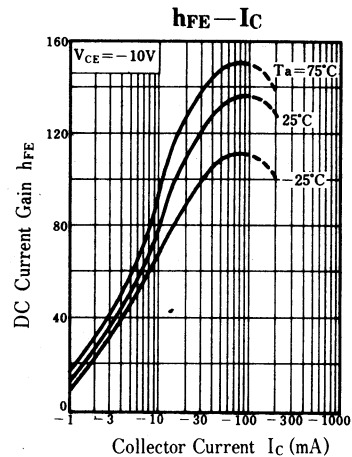
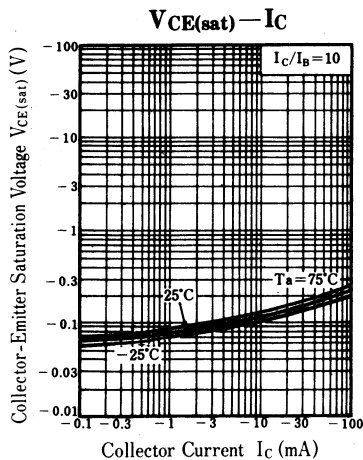
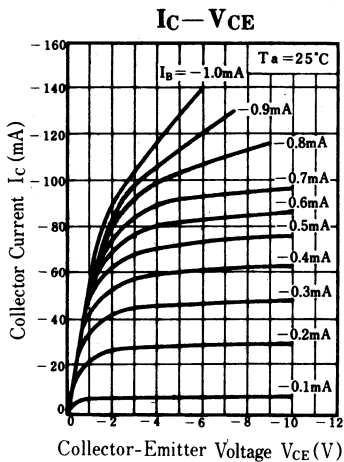
Rank	Q	R	S
h_{FE}	160~260	210~340	290~460

Resistor Built-in Transistors

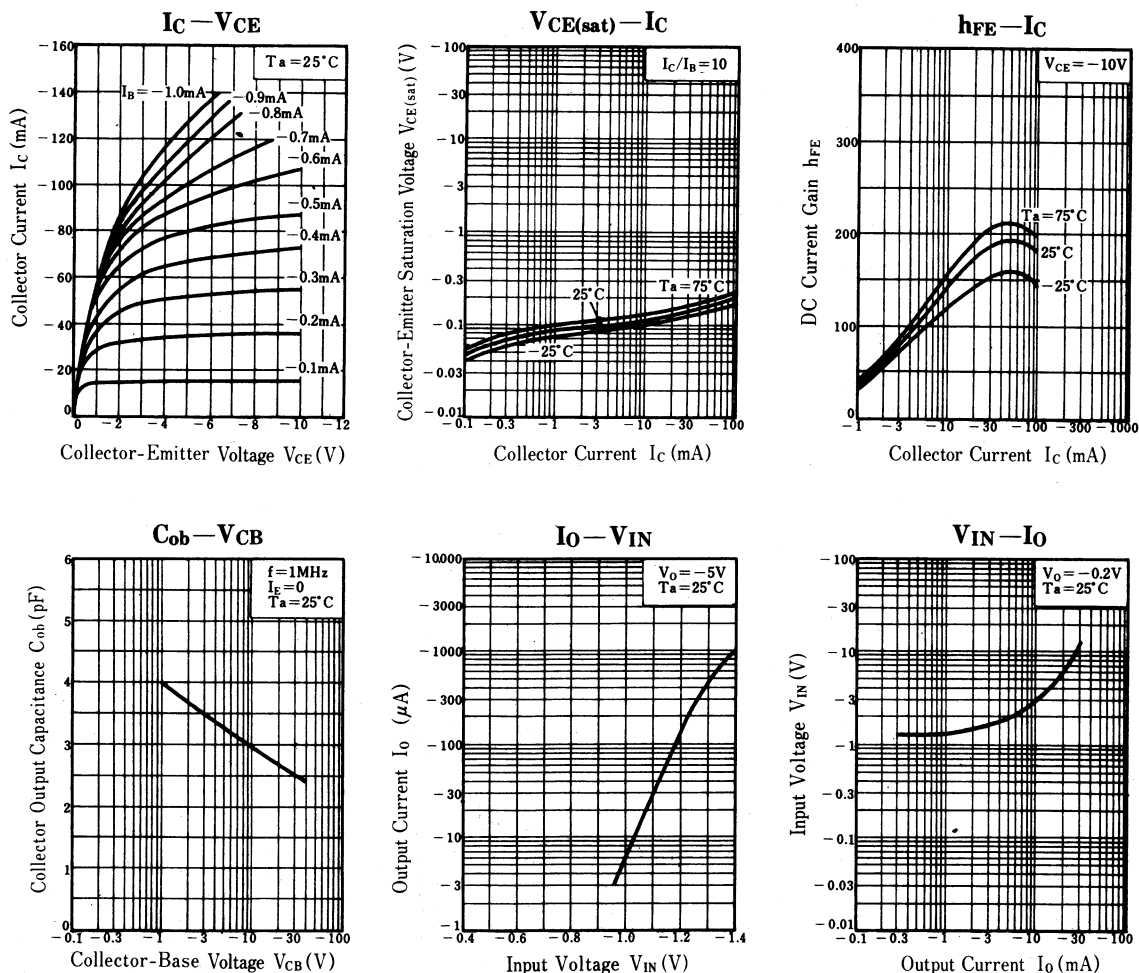
Common Characteristics Figure



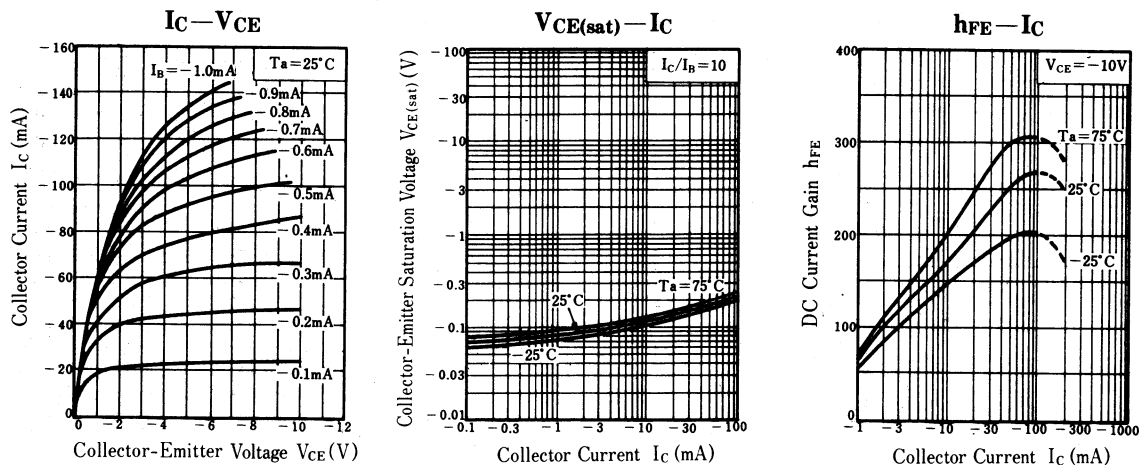
UN1111 Characteristics Figure

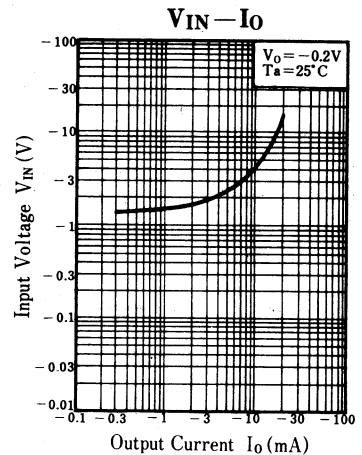
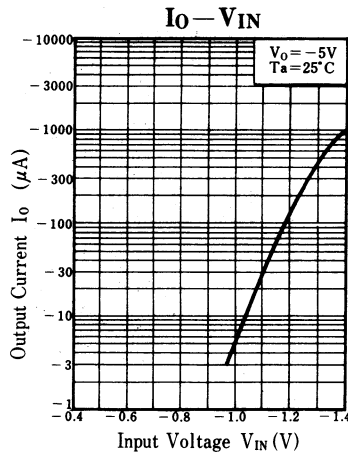
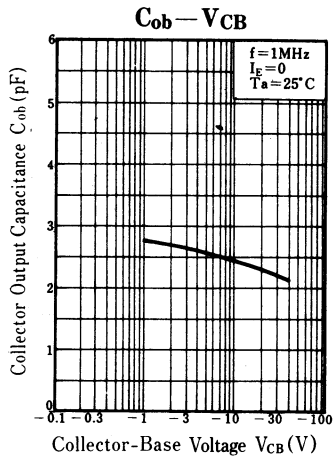


UN1112 Characteristics Figure

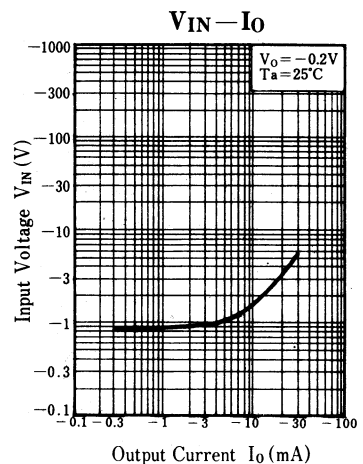
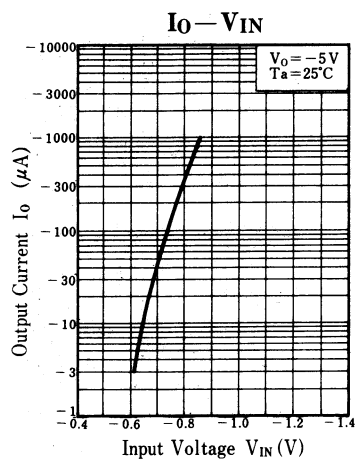
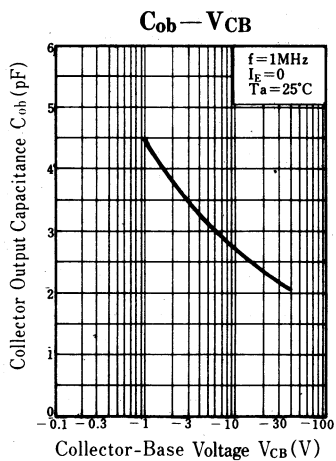
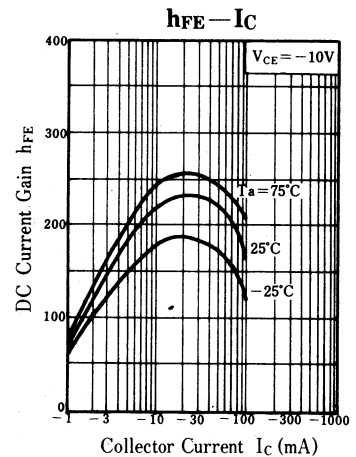
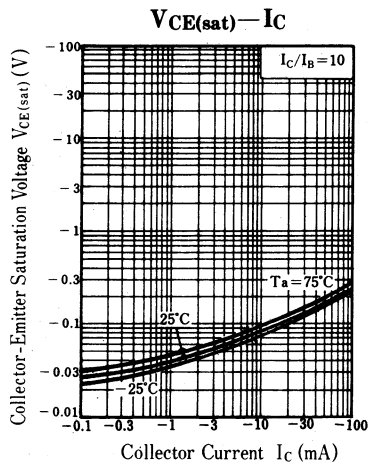
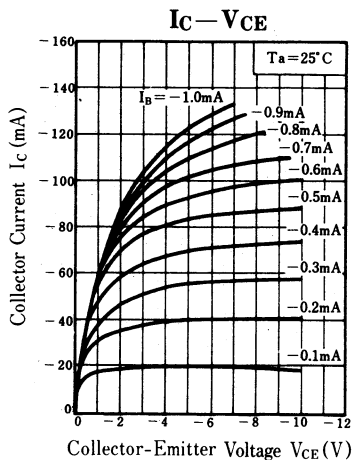


UN1113 Characteristics Figure

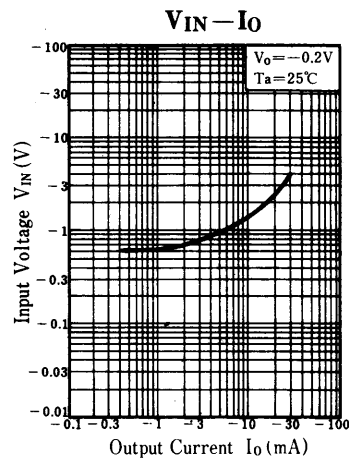
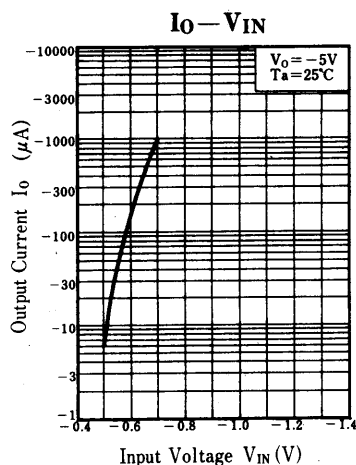
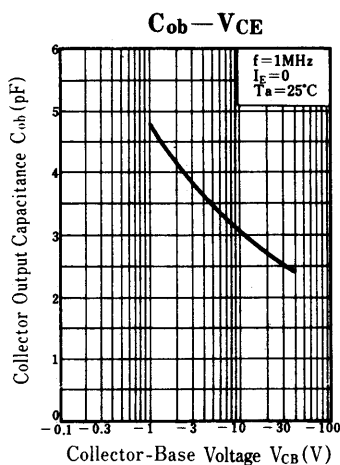
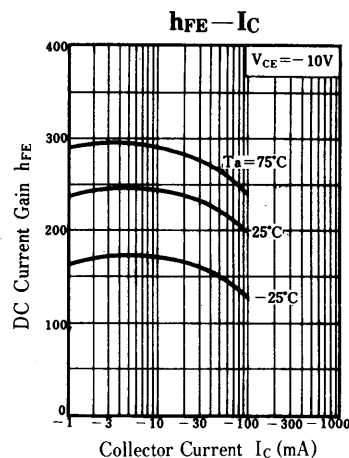
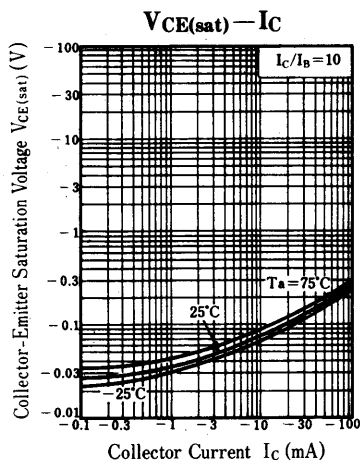
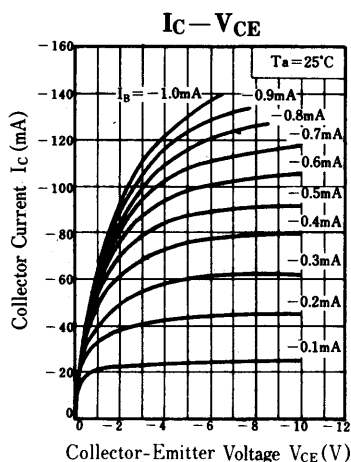




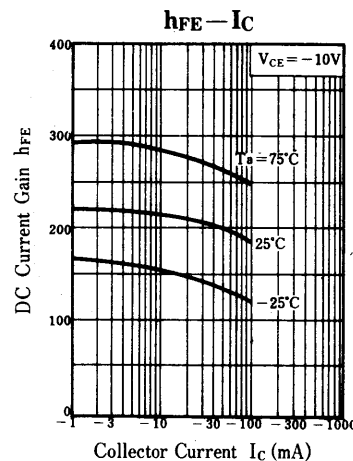
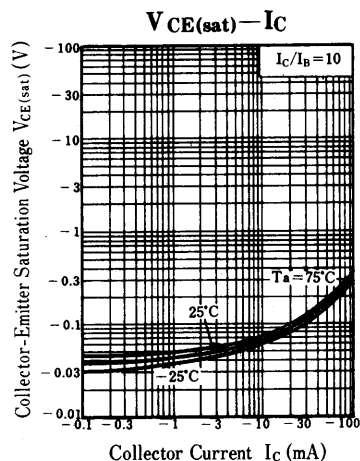
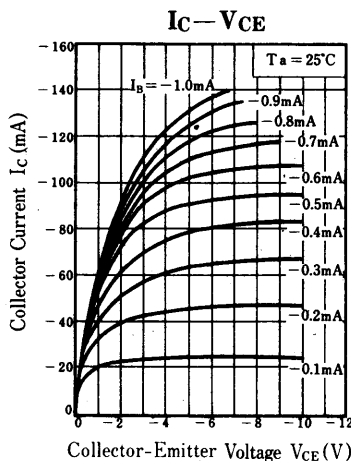
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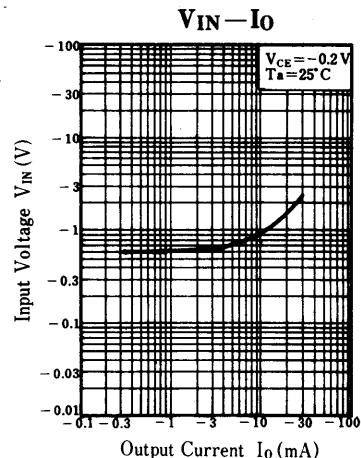
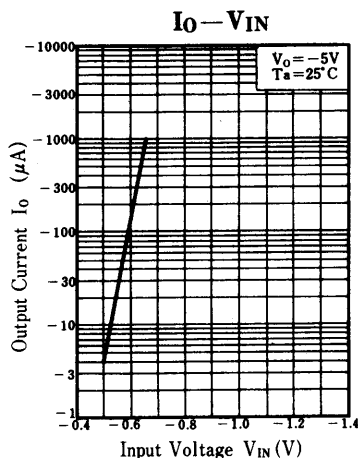
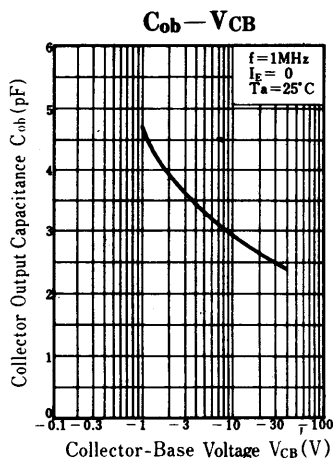


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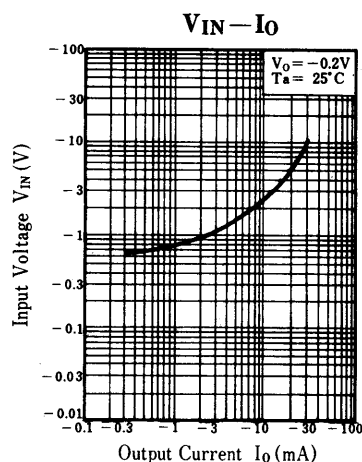
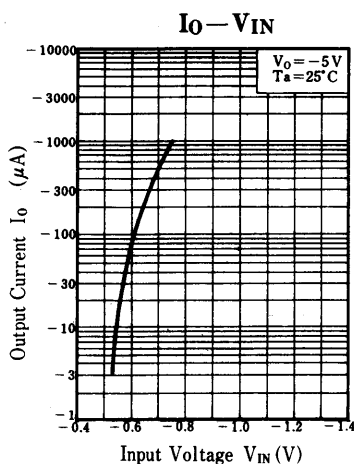
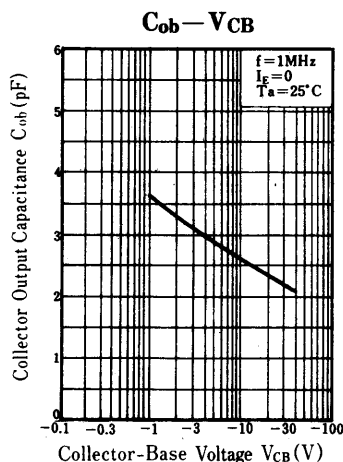
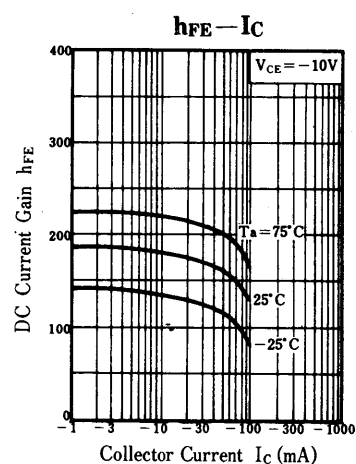
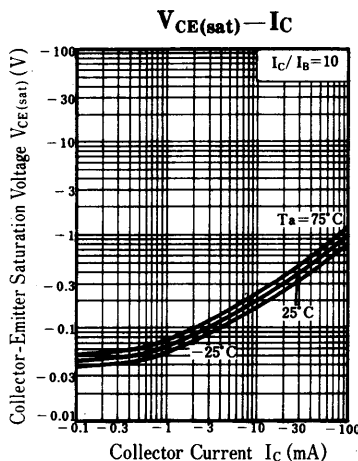
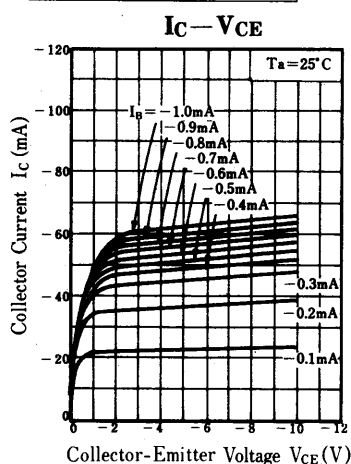


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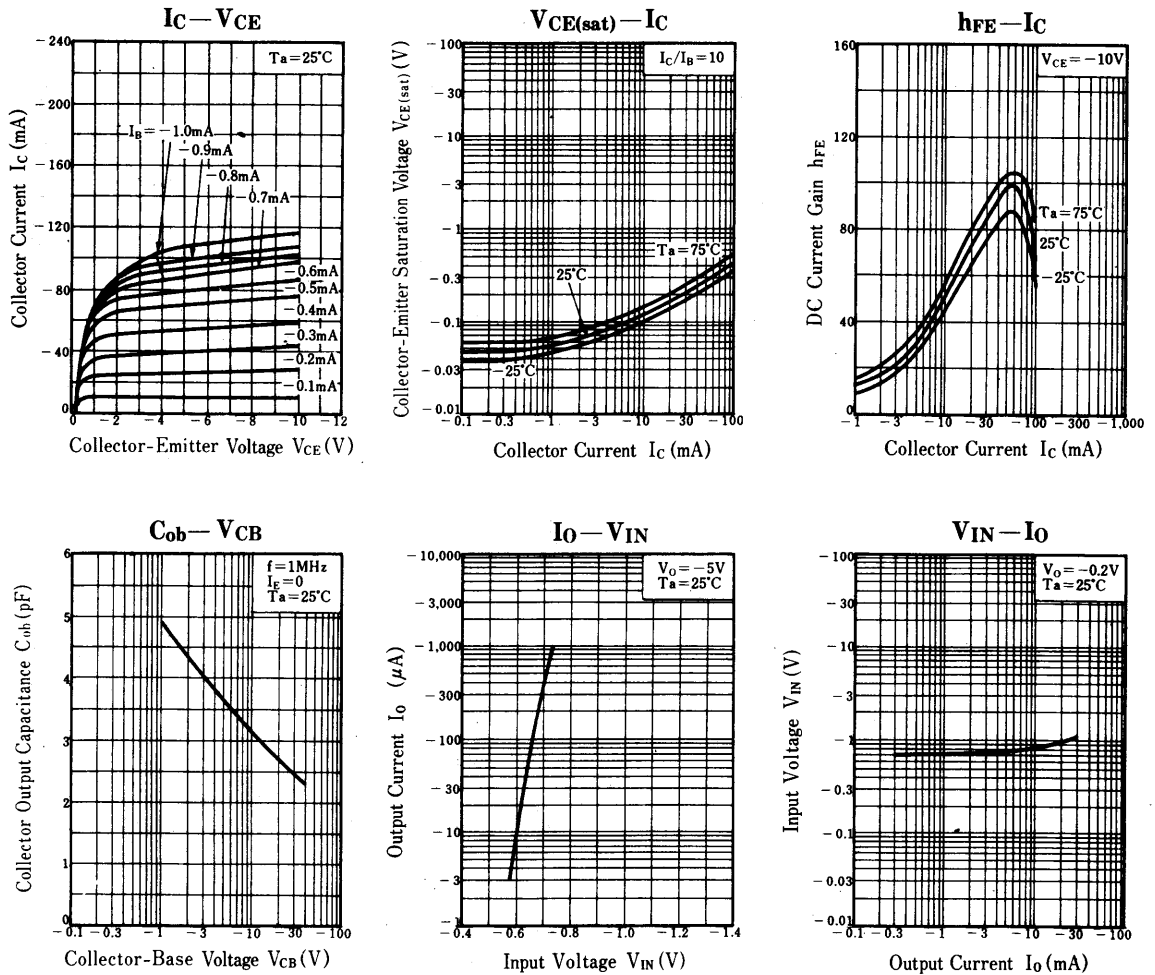




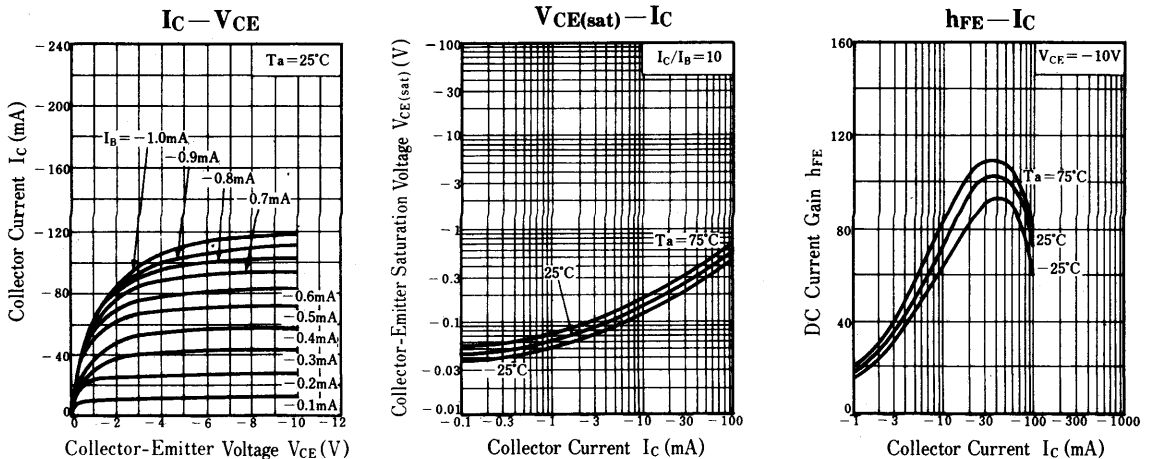
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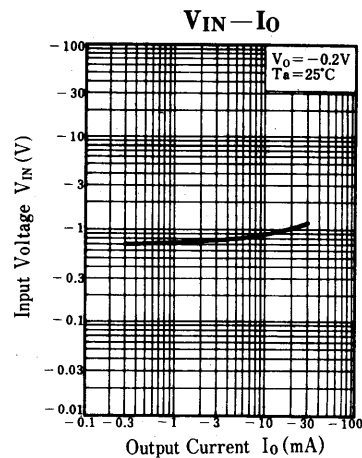
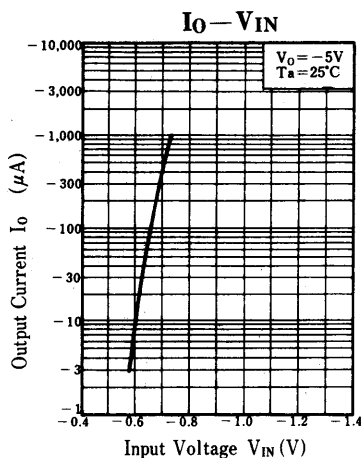
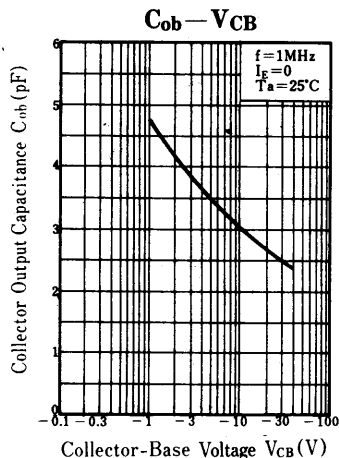


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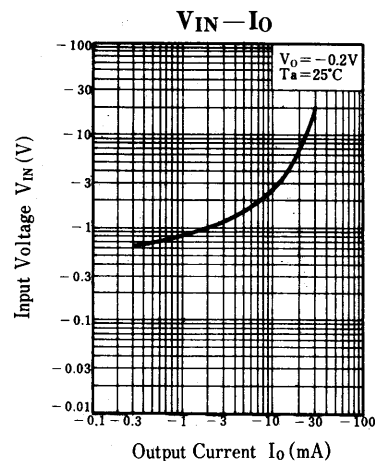
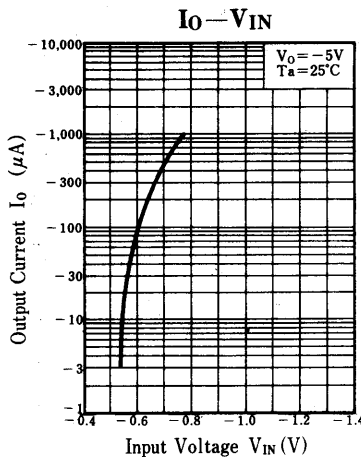
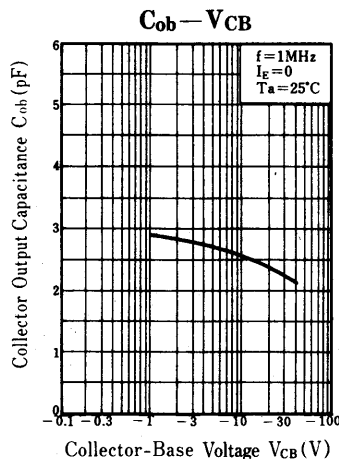
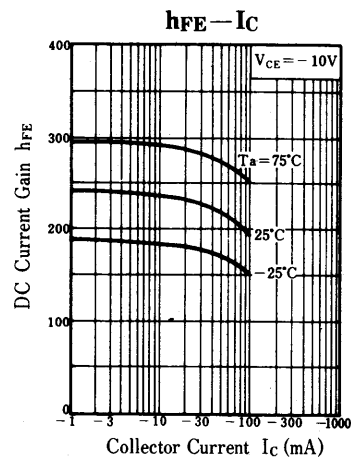
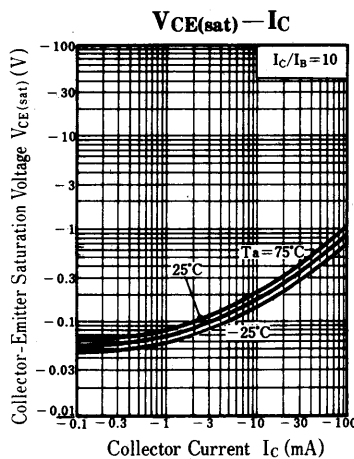
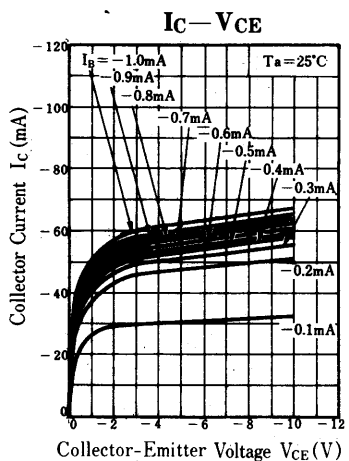


UN1119 Characteristics Figure

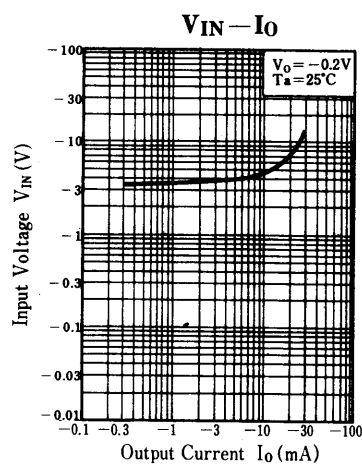
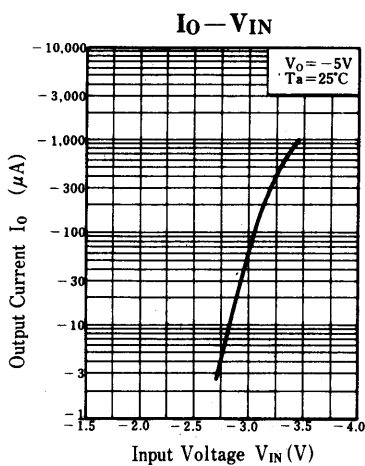
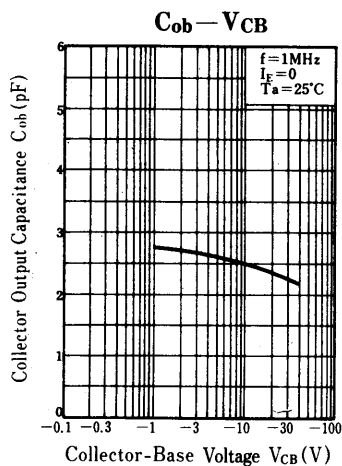
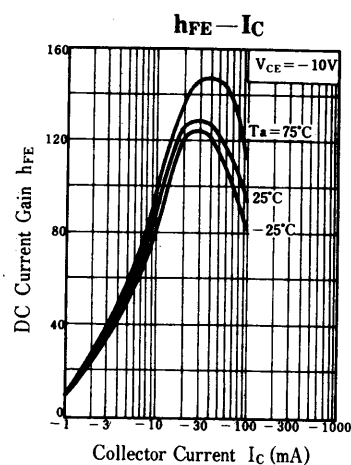
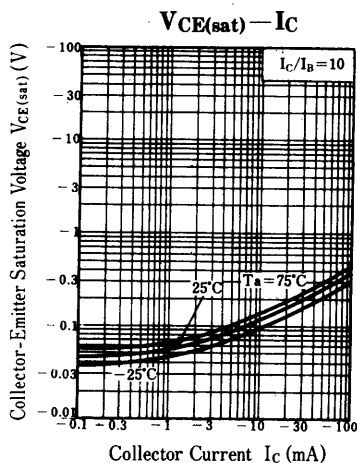
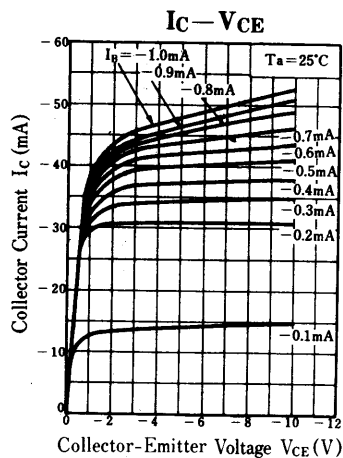




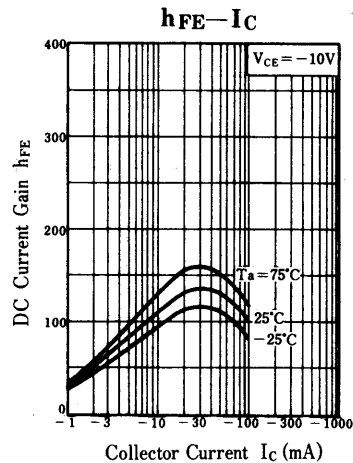
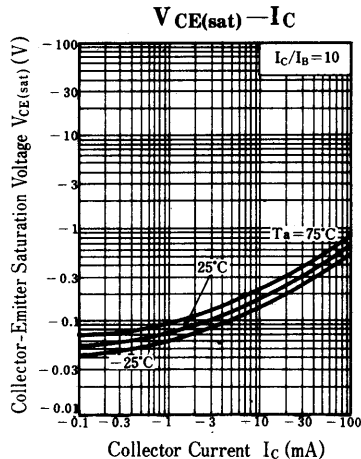
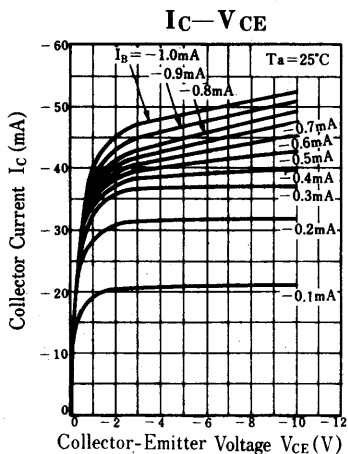
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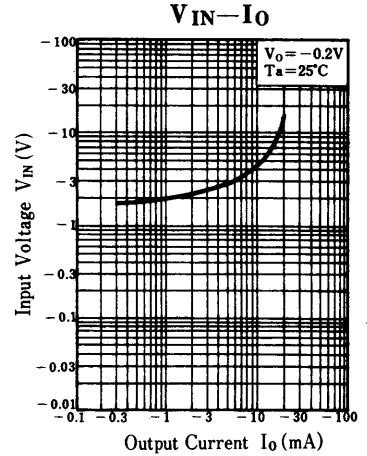
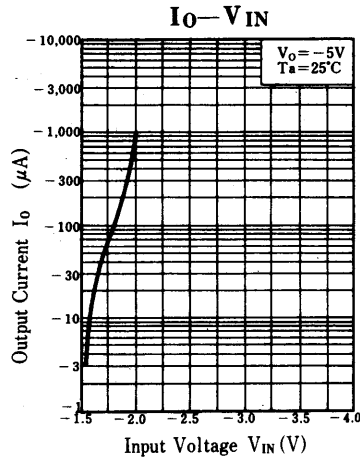
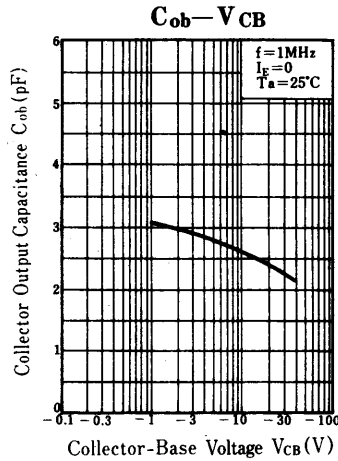


UN111D Characteristics Figure

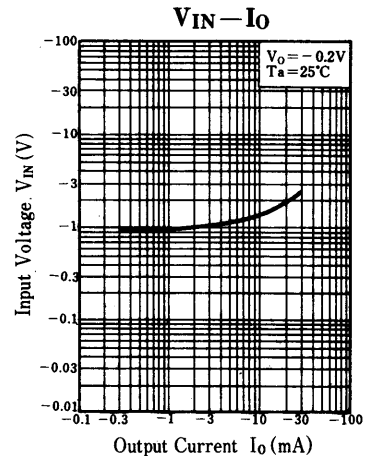
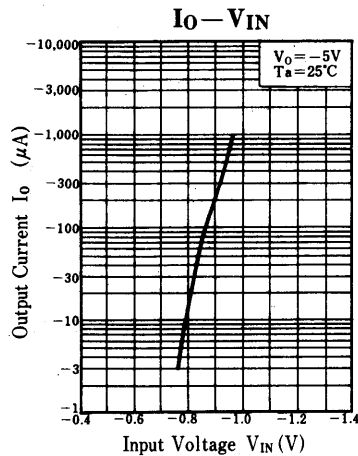
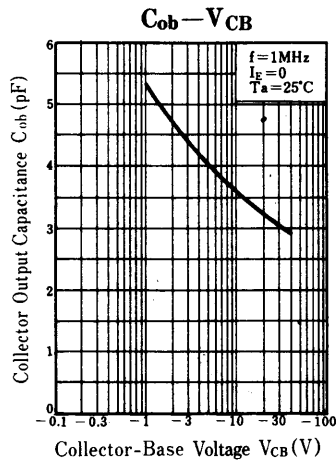
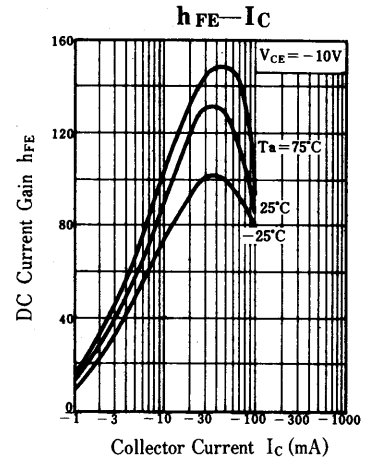
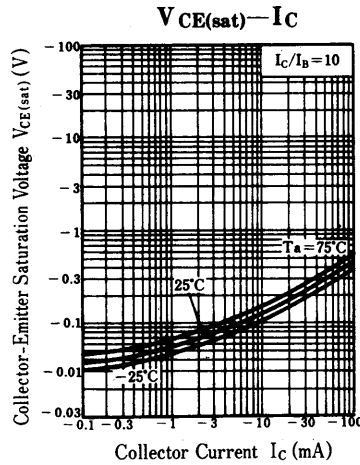
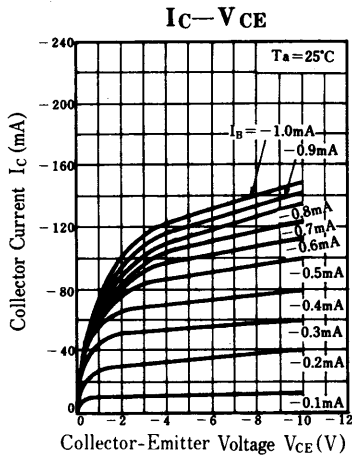


UN111E Characteristics Figure

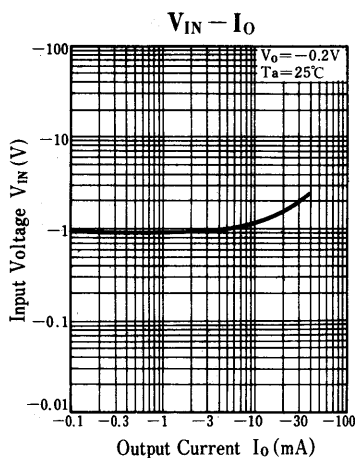
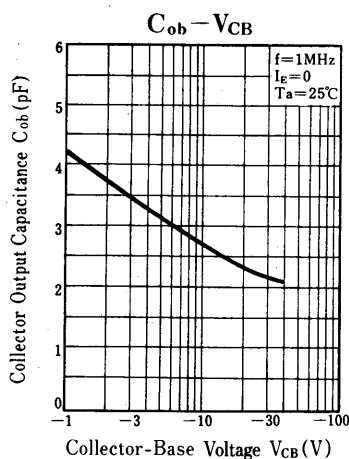
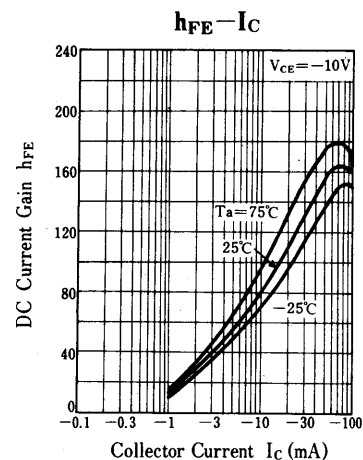
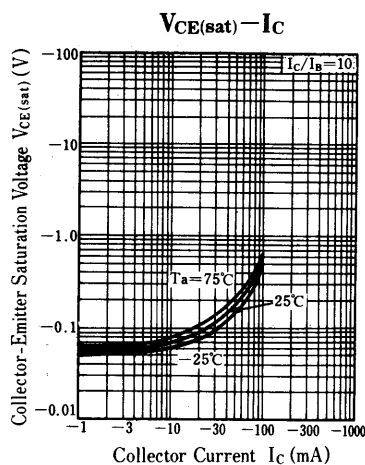
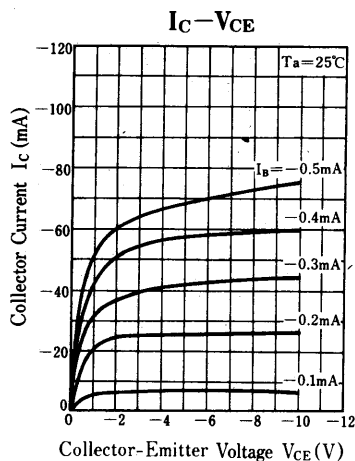




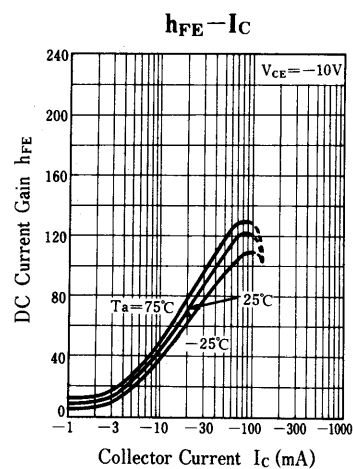
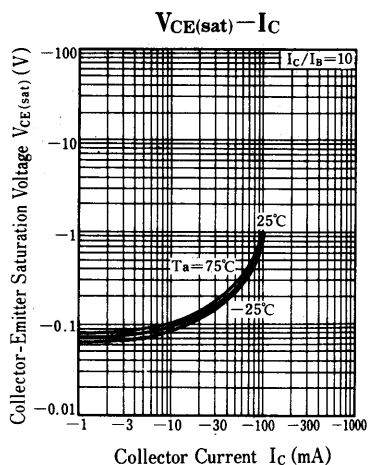
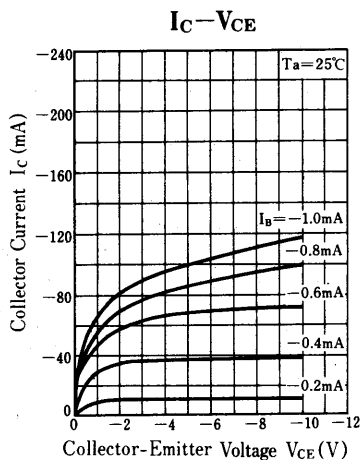
UN111F Characteristics Figure

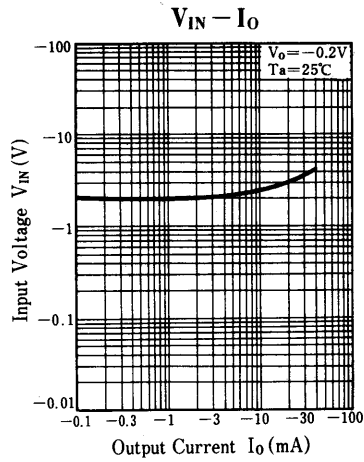
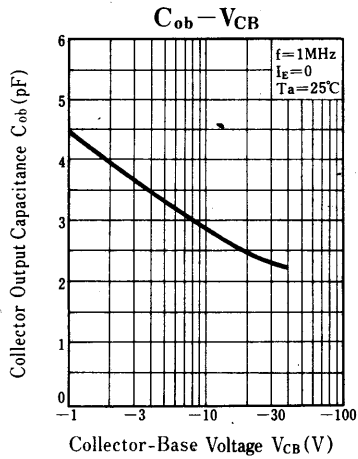


UN111H Characteristics Figure



UN111L Characteristics Figure





UN1121/1122/1123/1124/112X/112Y**Silicon PNP Epitaxial Planar Type**

For digital circuits

■ Features

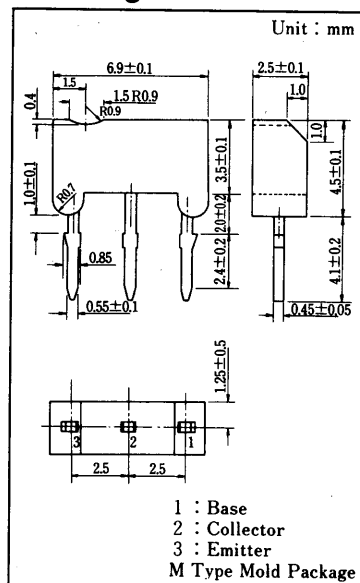
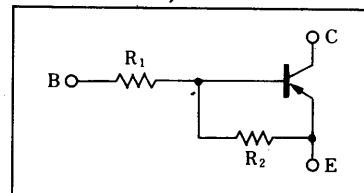
- Downsizing of equipment and fewer parts used allow reduced costs
- An M type mold package that allows easy manual and automatic insertion.
Can be firmly mounted flush to PCB surface.

■ Resistor value by various kinds

	(R ₁)	(R ₂)
● UN 1121	2.2kΩ	2.2kΩ
● UN 1122	4.7kΩ	4.7kΩ
● UN 1123	10kΩ	10kΩ
● UN 1124	2.2kΩ	10kΩ
● UN 112X	0.27kΩ	5kΩ
● UN 112Y	3.1kΩ	4.6kΩ

■ Absolute Maximum Ratings (T_a=25°C)

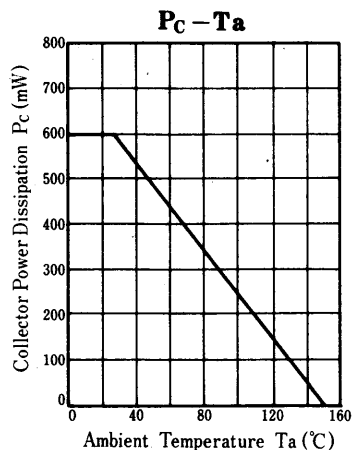
Item	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-50	V
Collector-Emitter Voltage	V _{CEO}	-50	V
Collector Current	I _C	-500	mA
Collector Power Dissipation	P _C	600	mW
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55 ~ +150	°C

■ Package Dimensions**(Inner Circuit)**

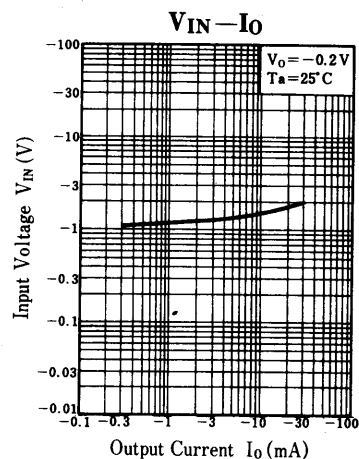
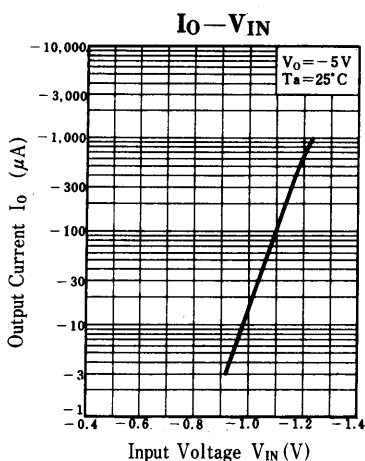
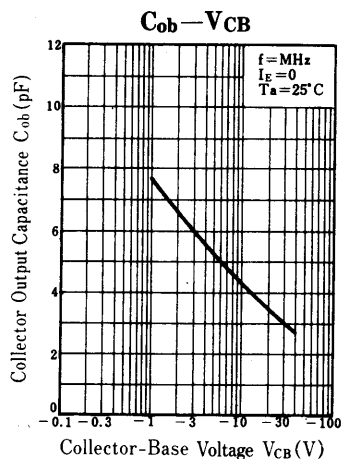
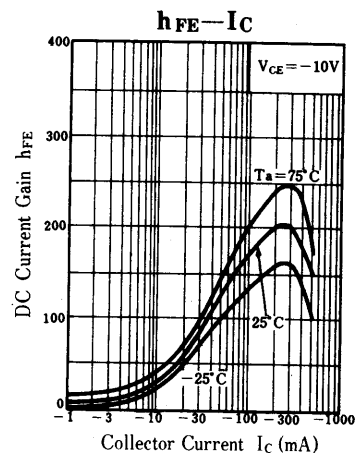
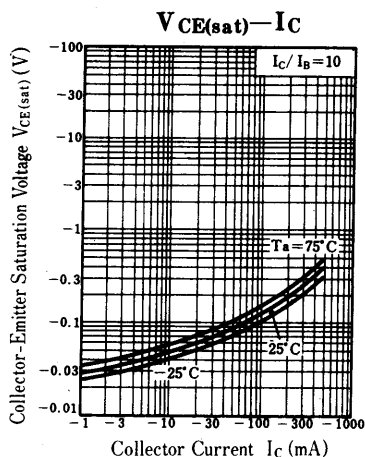
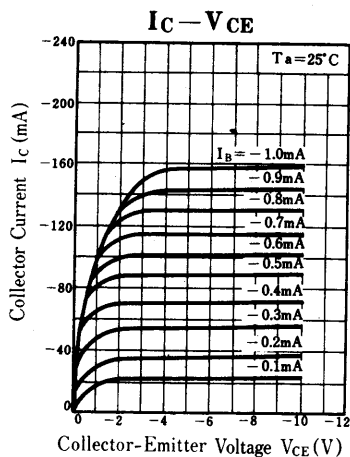
■ Electrical Characteristics (Ta=25°C)

Item		Symbol	Condition	min.	typ.	max.	Unit	
Collector Cutoff Current		I_{CBO}	$V_{CB} = -50V, I_E = 0$			- 1	μA	
		UN 112X	I_{CBO}	$V_{CB} = -50V, I_E = 0$				-0.1
Collector Cutoff Current		I_{CEO}	$V_{CE} = -50V, I_B = 0$			- 1	μA	
		UN 112X	I_{CEO}	$V_{CE} = -50V, I_B = 0$				-0.5
Emitter Cutoff Current	UN 1121	I_{EBO}	$V_{EE} = -6V, I_C = 0$			- 5	mA	
	UN 1122/112X/112Y					- 2		
	UN 1123/1124					- 1		
Collector-Base Voltage		V_{CBO}	$I_C = -10\mu A, I_E = 0$	-50			V	
DC Current Gain	UN 1121	h_{FE}	$V_{CE} = -10V, I_C = -100mA$	40				
	UN 1122/112Y			50				
	UN 1123/1124			60				
	UN 112X			20				
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C = -100mA, I_B = -5mA$			-0.25	V	
		UN 112X	$V_{CE(sat)}$	$I_C = -10mA, I_B = -0.3mA$				-0.25
		UN 112Y	$V_{CE(sat)}$	$I_C = -10mA, I_B = -0.3mA$				-0.25
High Level Output Voltage		V_{OH}	$V_{CC} = -5V, V_B = -0.5V, R_L = 500\Omega$	-4.9			V	
Low Level Output Voltage		V_{OL}	$V_{CC} = -5V, V_B = -3.5V, R_L = 500\Omega$			-0.2	V	
Transition Frequency		f_T	$V_{CB} = -10V, I_E = 50mA, f = 200MHz$		200		MHz	
Input Resistance	UN 1121	R_1		(-30%)	2.2	(+30%)	k Ω	
	UN 1122				4.7			
	UN 1123				10			
	UN 112X				0.27			
	UN 112Y				3.1			
Resistance Ratio		R_1/R_2		0.8	1.0	1.2		
UN 1124					0.22			
UN 112X					0.054			
UN 112Y					0.67			

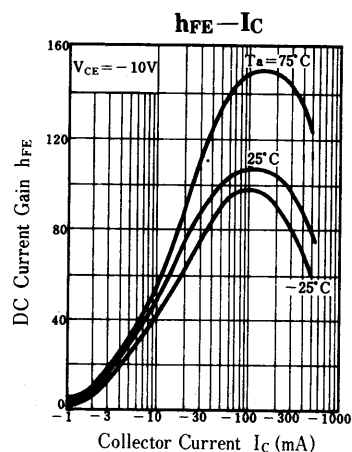
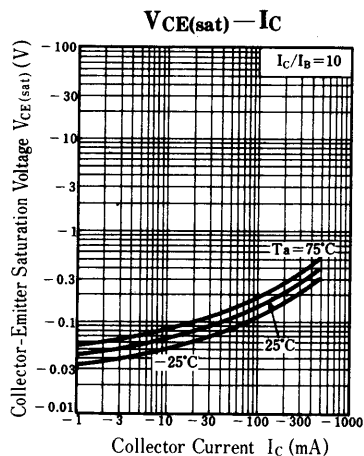
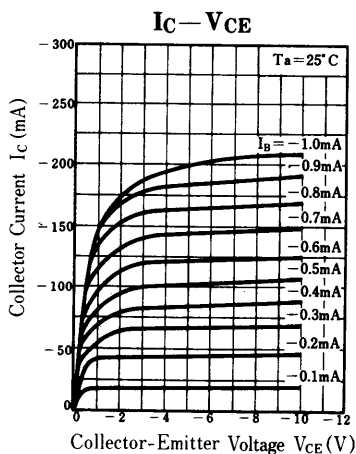
Common Characteristics Figure

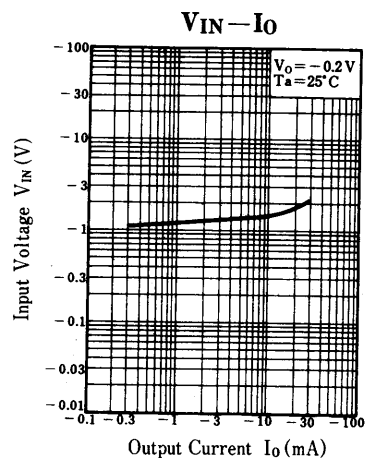
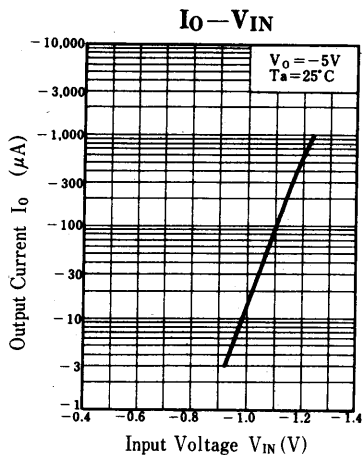
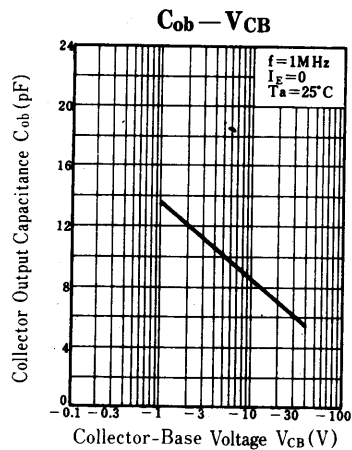


UN1121 Characteristics Figure

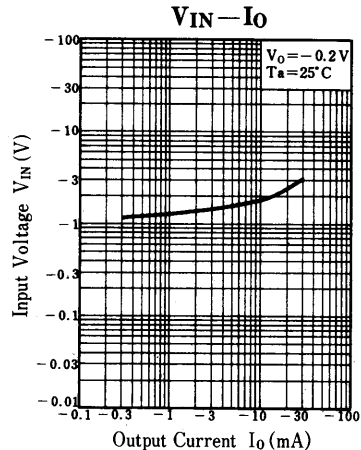
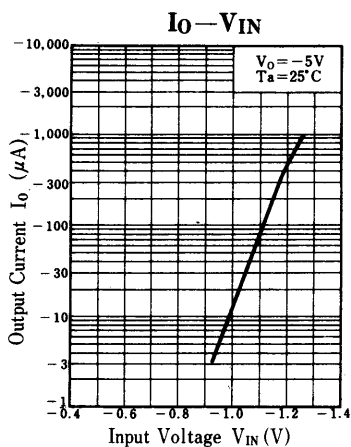
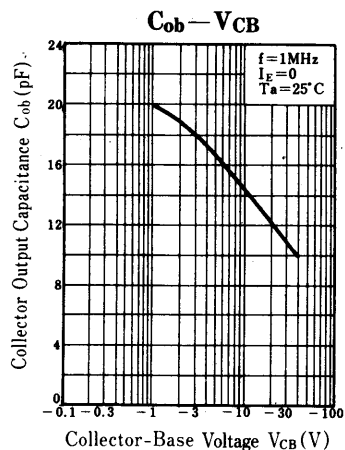
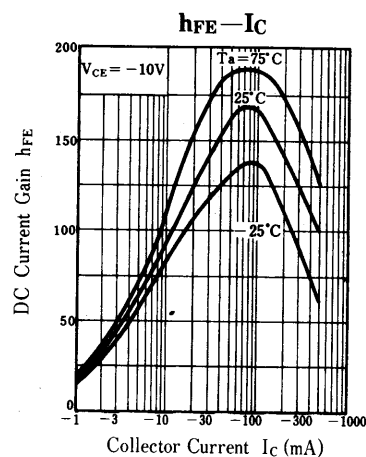
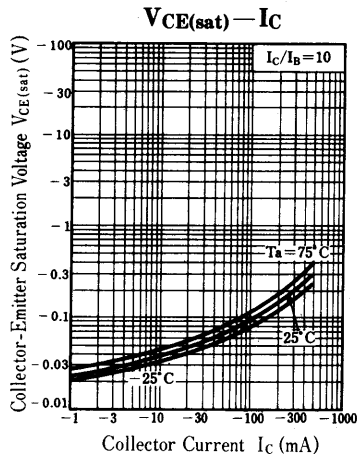
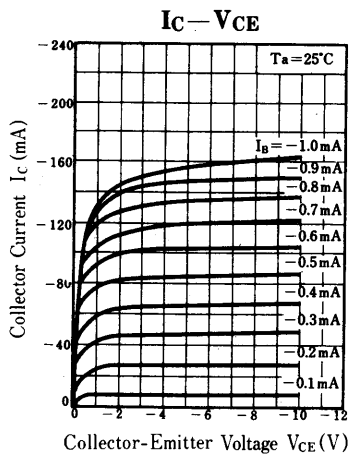


UN1122 Characteristics Figure

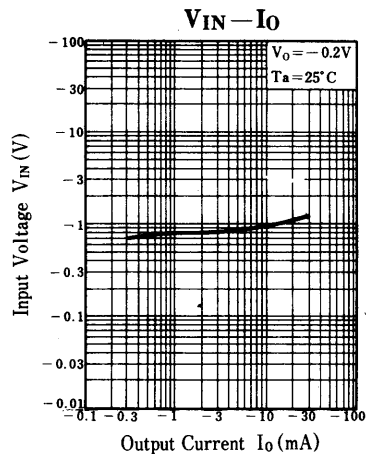
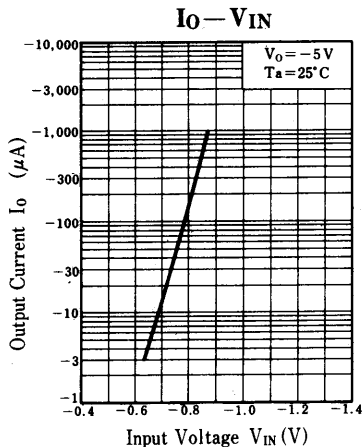
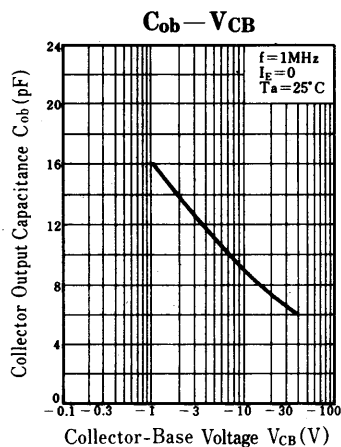
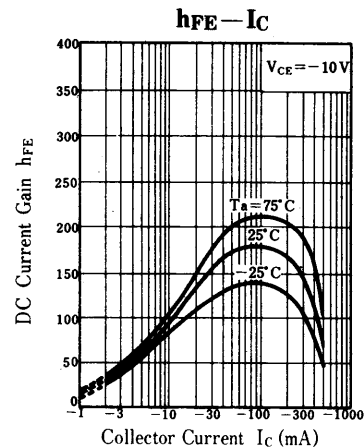
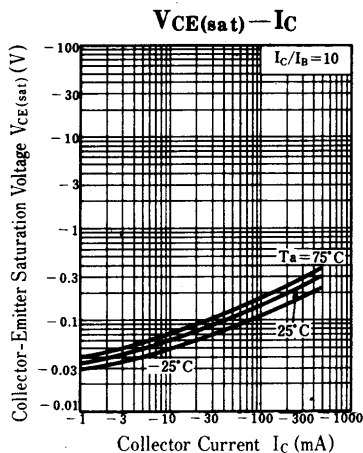
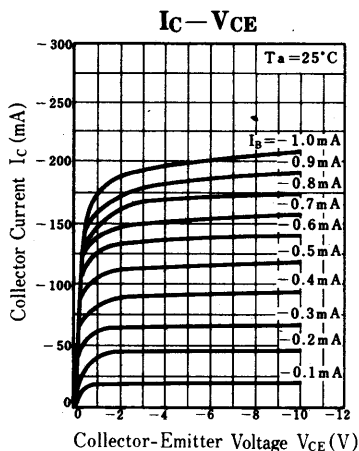




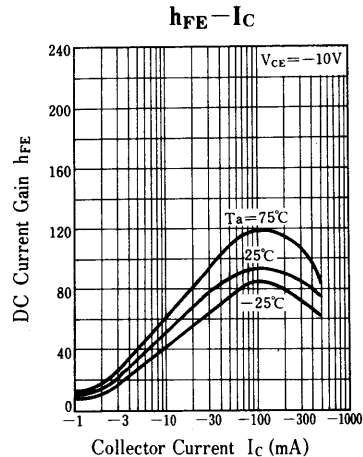
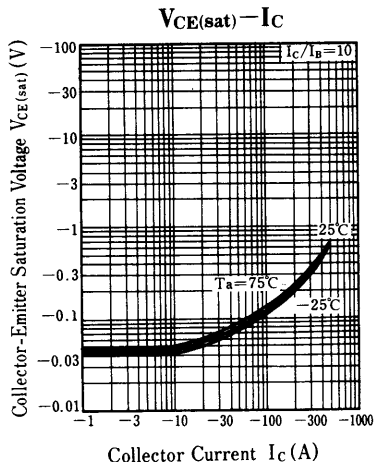
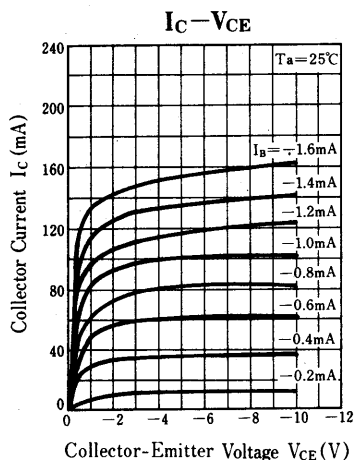
UN1123 Characteristics Figure

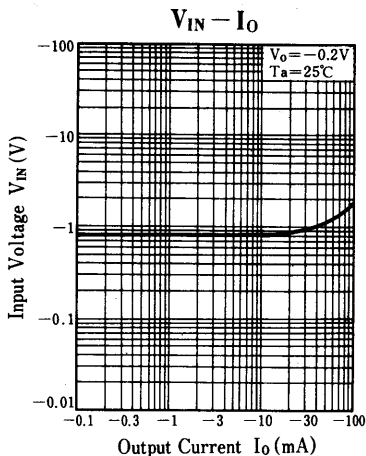
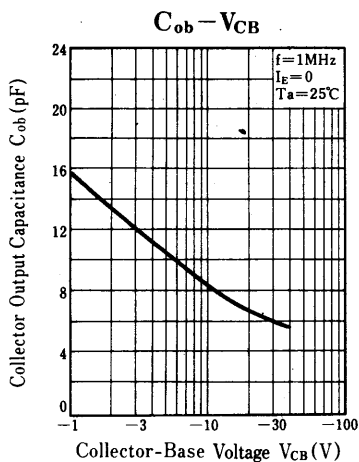


UN1124 Characteristics Figure



UN112X Characteristics Figure





UN112Y Characteristics Figure

