

UN1211/1212/1213/1214/1215/1216/1217/1218/1219/1210/ 121D/121E/121F/121K/121L

Silicon NPN epitaxial planer transistor

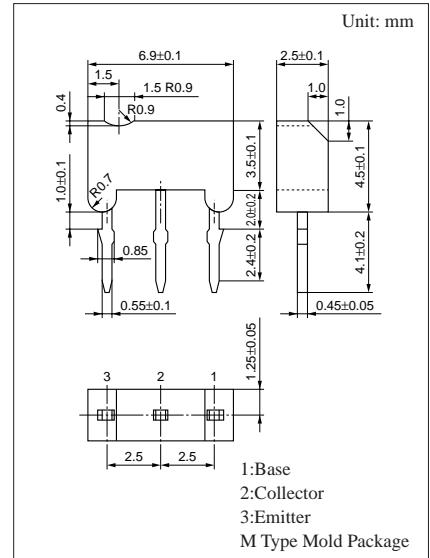
For digital circuits

Features

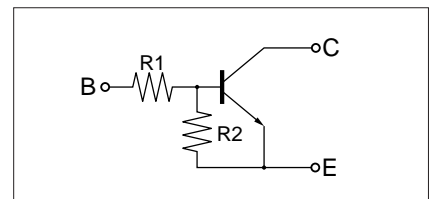
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- M type package allowing easy automatic and manual insertion as well as stand-alone fixing to the printed circuit board.

Resistance by Part Number

	(R ₁)	(R ₂)
• UN1211	10kΩ	10kΩ
• UN1212	22kΩ	22kΩ
• UN1213	47kΩ	47kΩ
• UN1214	10kΩ	47kΩ
• UN1215	10kΩ	—
• UN1216	4.7kΩ	—
• UN1217	22kΩ	—
• UN1218	0.51kΩ	5.1kΩ
• UN1219	1kΩ	10kΩ
• UN1210	47kΩ	—
• UN121D	47kΩ	10kΩ
• UN121E	47kΩ	22kΩ
• UN121F	4.7kΩ	10kΩ
• UN121K	10kΩ	4.7kΩ
• UN121L	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

UN1211/1212/1213/1214/1215/1216/1217/1218/
Transistors with built-in Resistor 1219/1210/121D/121E/121F/121K/121L

■ Electrical Characteristics (T_a=25°C)

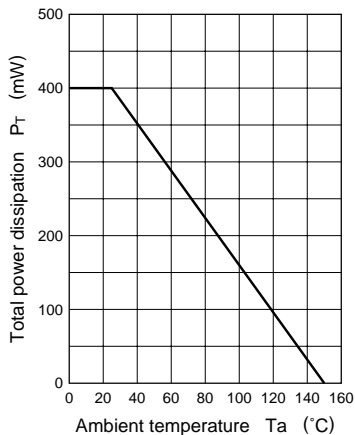
Parameter		Symbol	Conditions	min	typ	max	Unit	
Collector cutoff current		I _{CBO}	V _{CB} = 50V, I _E = 0			0.1	μA	
		I _{CEO}	V _{CE} = 50V, I _B = 0			0.5	μA	
Emitter cutoff current	UN1211	I _{EBO}	V _{EB} = 6V, I _C = 0			0.5	mA	
	UN1212/1214/121E/121D					0.2		
	UN1213					0.1		
	UN1215/1216/1217/1210					0.01		
	UN121F/121K					1.0		
	UN1219					1.5		
	UN1218/121L					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	UN1211	h _{FE}	V _{CE} = 10V, I _C = 5mA	35			V	
	UN1212/121E			60				
	UN1213/1214			80				
	UN1215*/1216*/1217*/1210*			160		460		
	UN121F/121D/1219			30				
	UN1218/121K/121L			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	
			V _{CC} = 5V, V _B = 3.5V, R _L = 1kΩ			0.2		
			V _{CC} = 5V, V _B = 10V, R _L = 1kΩ			0.2		
			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	UN1211/1214/1215/121K	R _i		(-30%)		10	(+30%)	kΩ
	UN1212/1217					22		
	UN1213/121D/121E/1210					47		
	UN1216/121F/121L					4.7		
	UN1218					0.51		
	UN1219					1		
Resistance ratio	UN1211/1212/1213/121L	R ₁ /R ₂				0.8	1.0	1.2
	UN1214					0.17	0.21	0.25
	UN1218/1219					0.08	0.1	0.12
	UN121D						4.7	
	UN121E						2.14	
	UN121F						0.47	
	UN121K						2.13	

* h_{FE} rank classification (UN1215/1216/1217/1210)

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

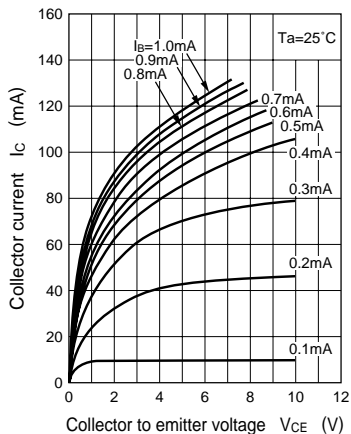
Common characteristics chart

$P_T - T_a$

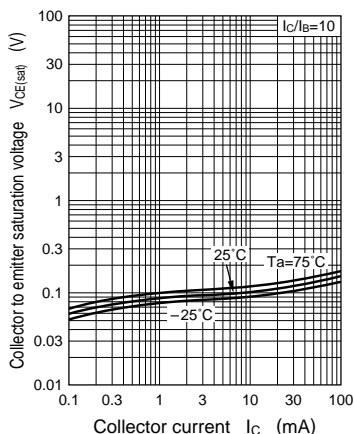


Characteristics charts of UN1211

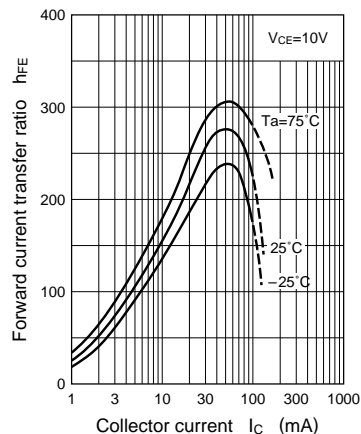
$I_C - V_{CE}$



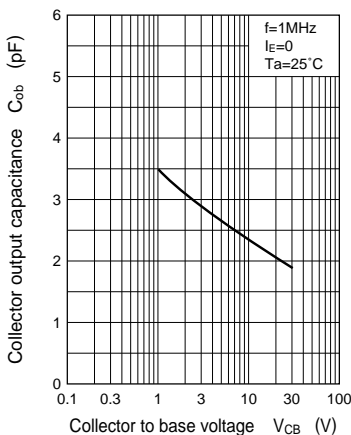
$V_{CE(sat)} - I_C$



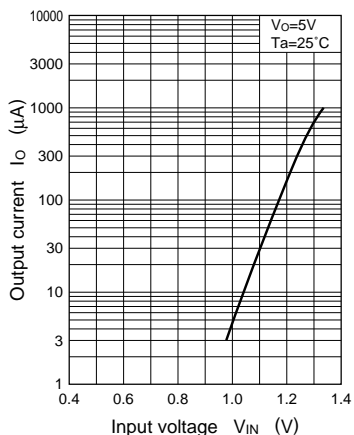
$h_{FE} - I_C$



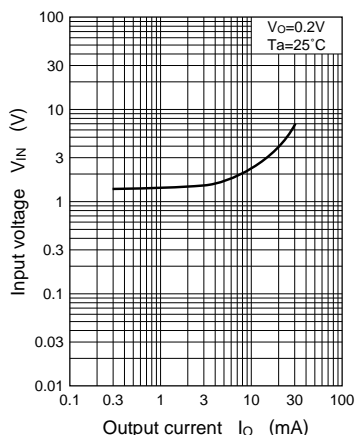
$C_{ob} - V_{CB}$



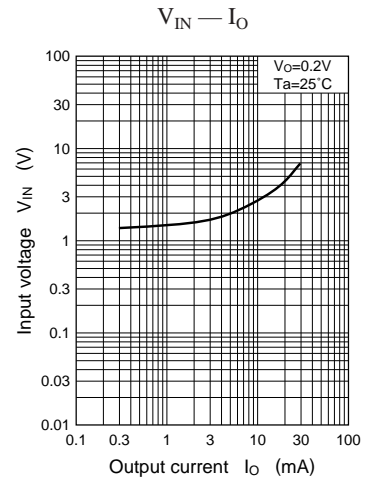
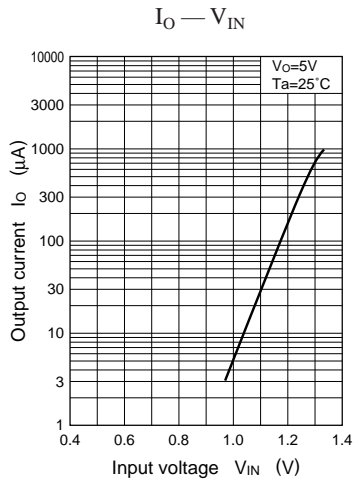
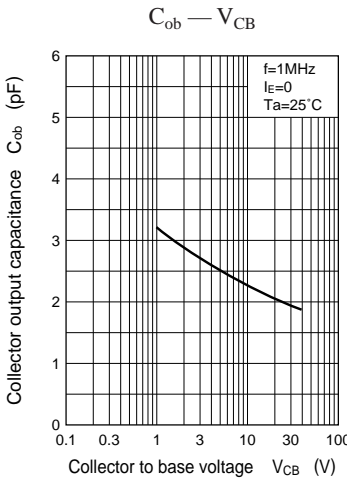
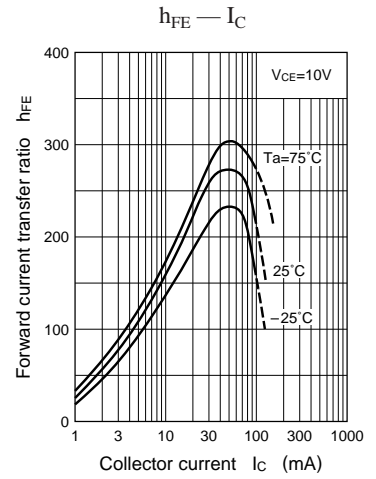
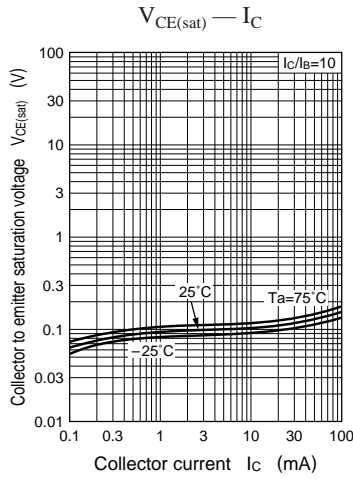
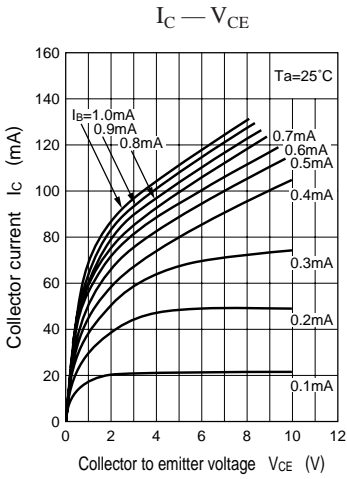
$I_O - V_{IN}$



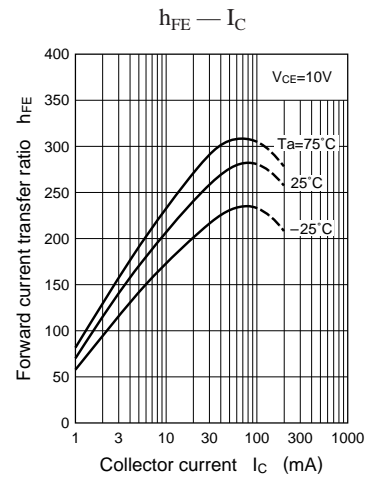
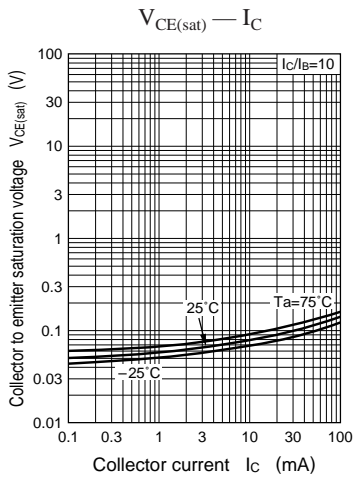
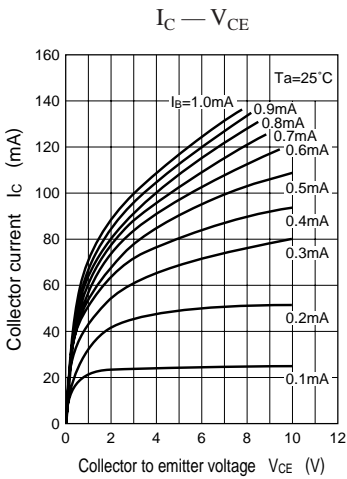
$V_{IN} - I_O$



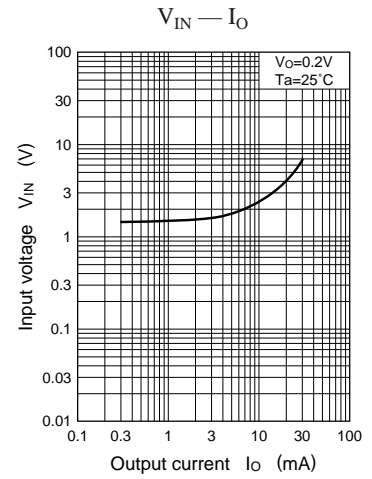
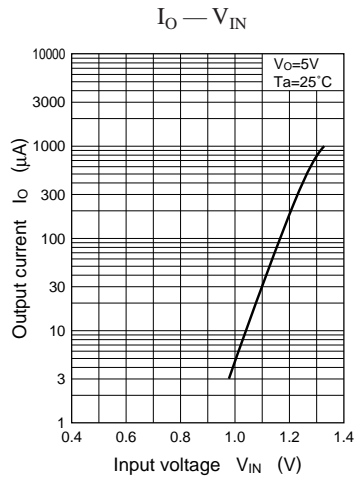
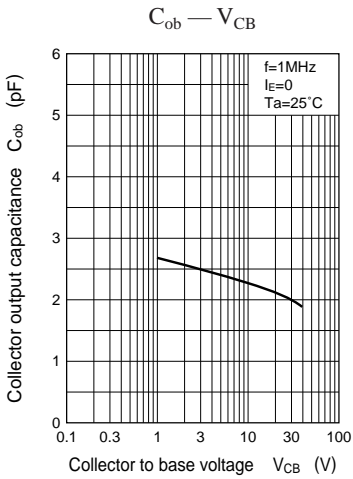
Characteristics charts of UN1212



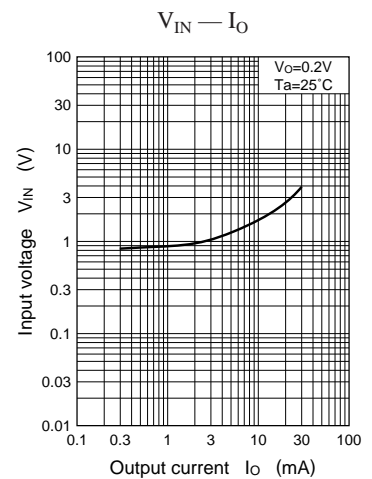
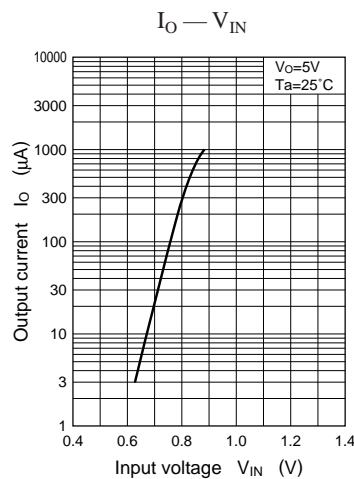
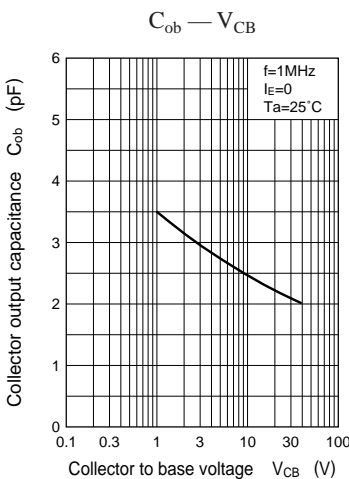
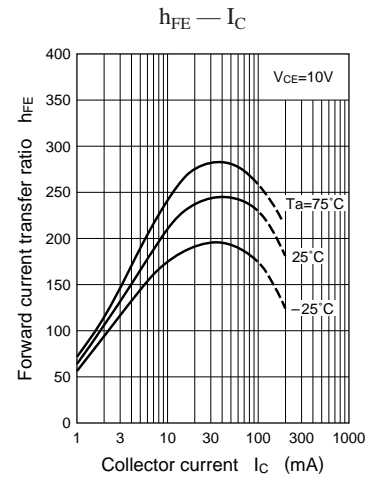
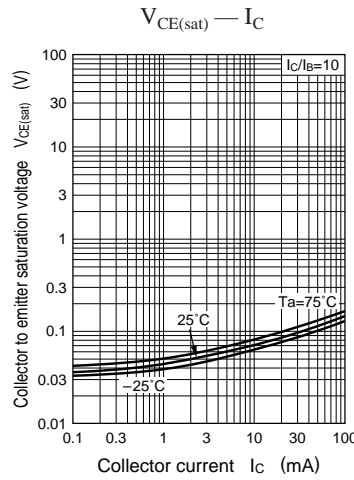
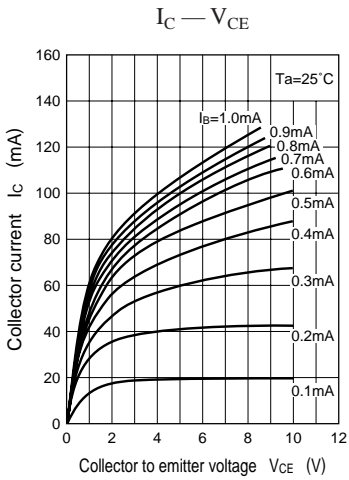
Characteristics charts of UN1213



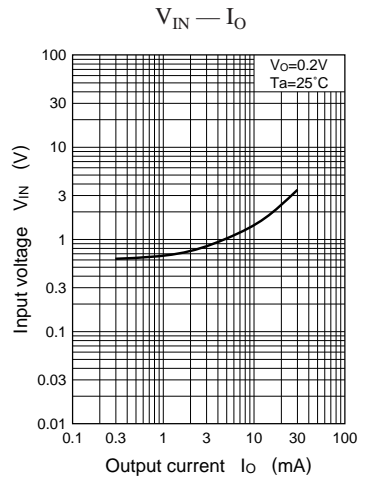
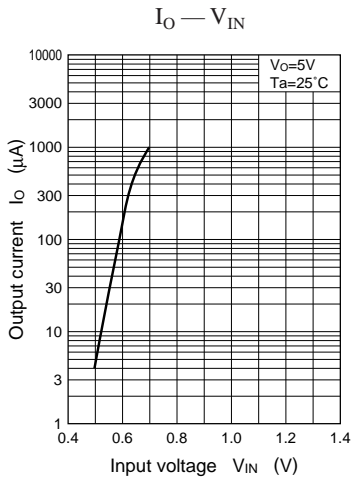
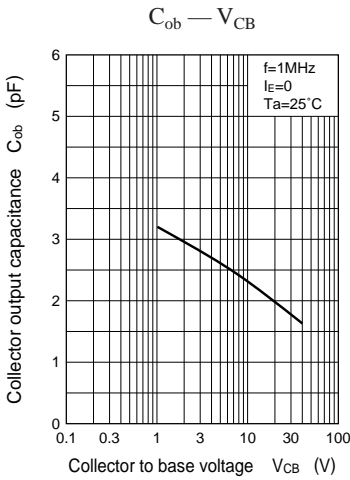
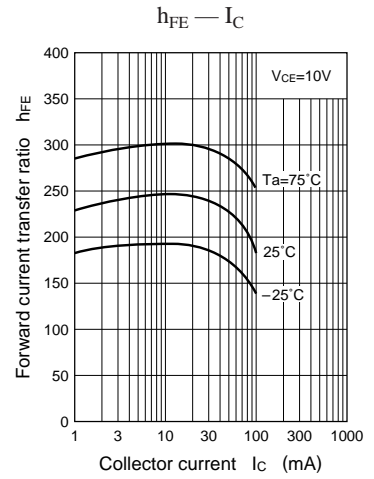
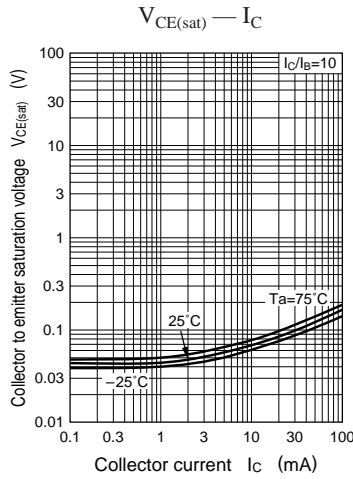
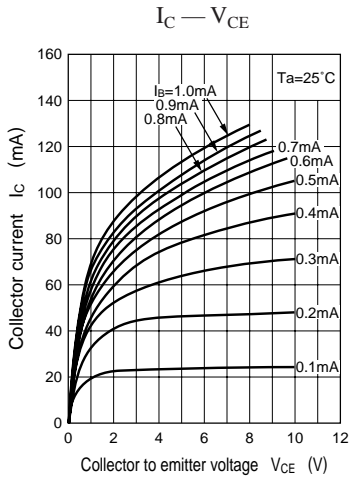
UN1211/1212/1213/1214/1215/1216/1217/1218/
 Transistors with built-in Resistor 1219/1210/121D/121E/121F/121K/121L



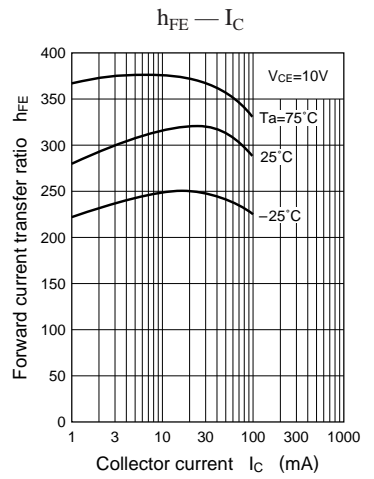
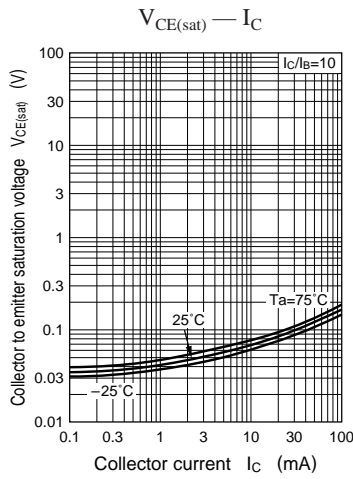
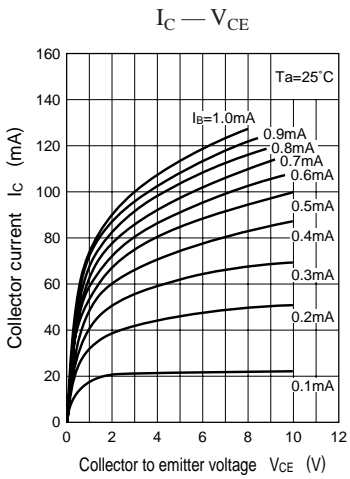
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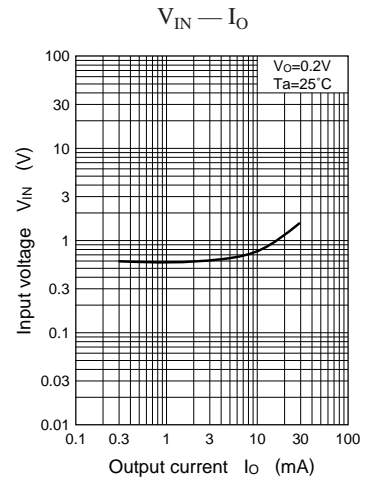
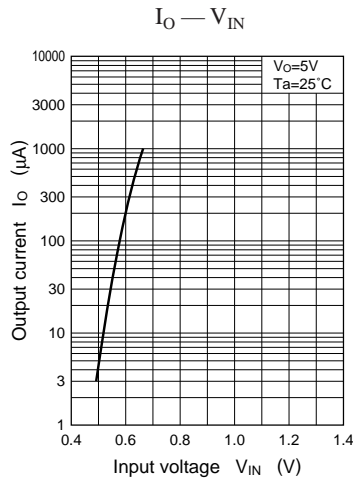
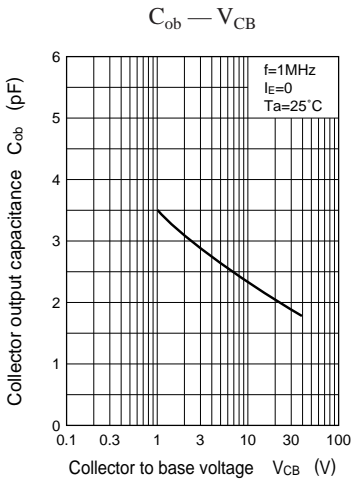


Characteristics charts of UN1215

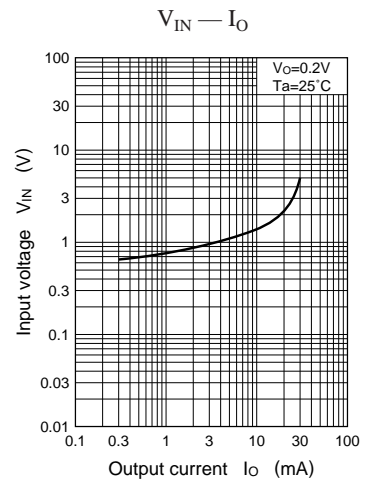
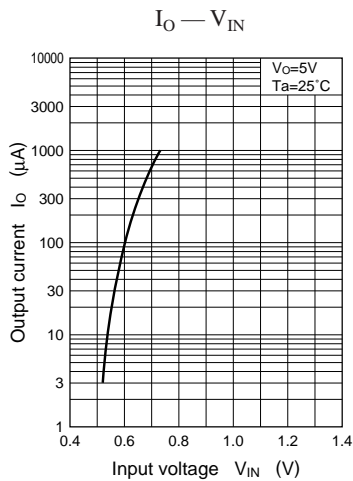
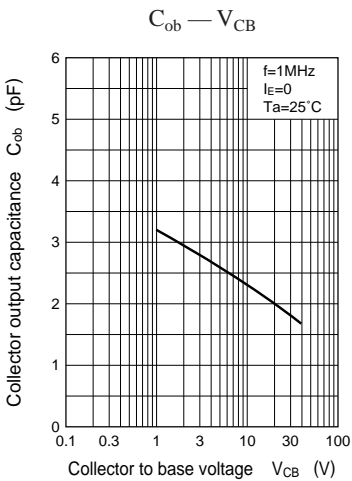
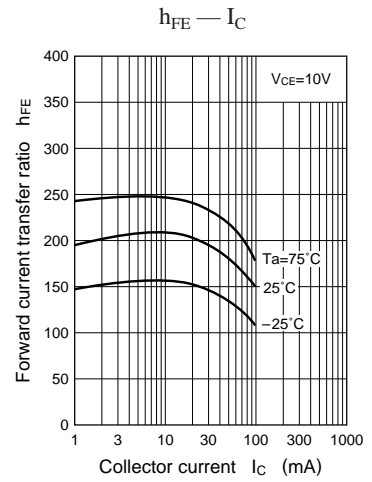
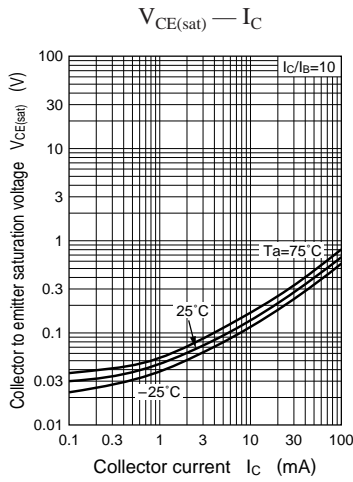
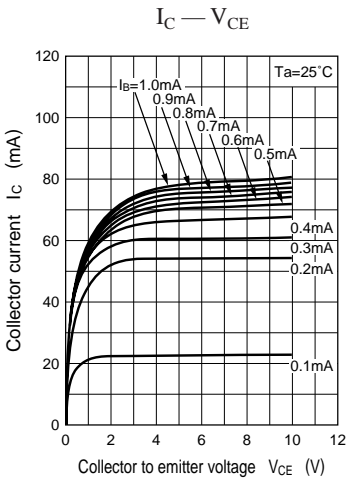


Characteristics charts of UN1216

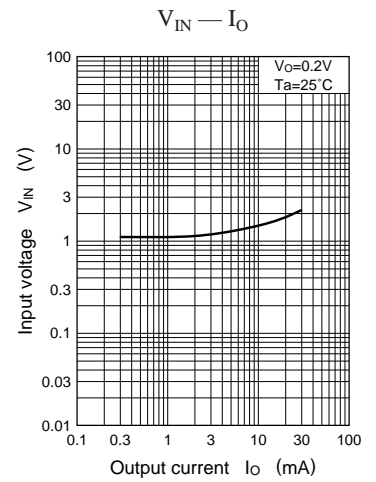
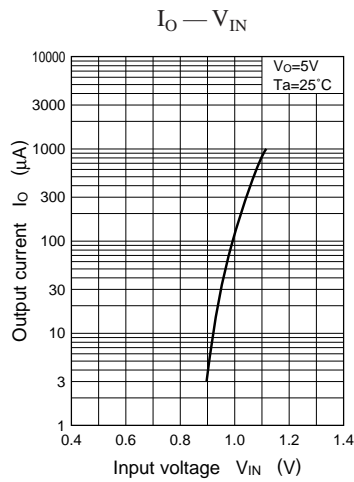
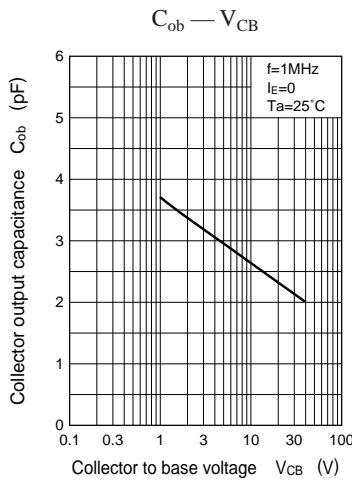
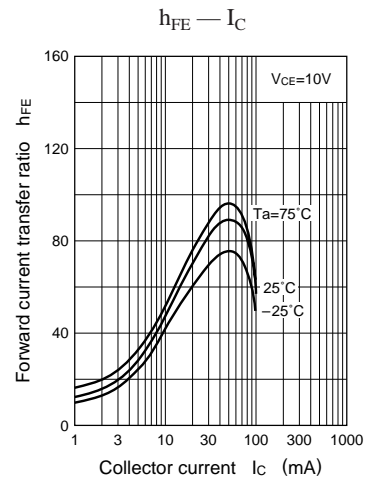
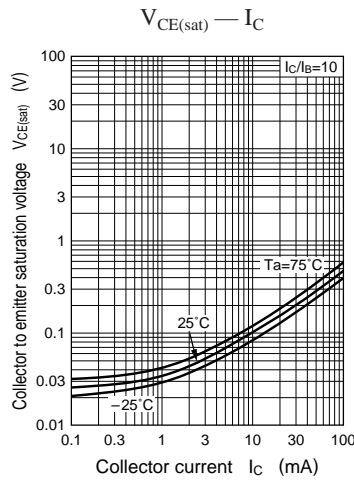
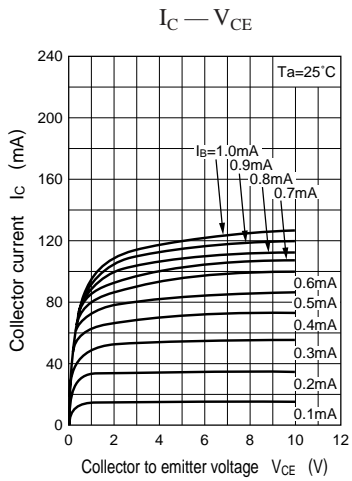




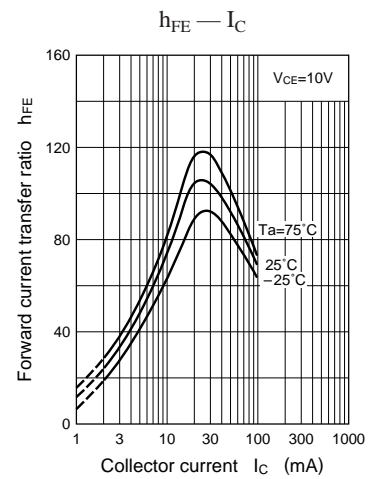
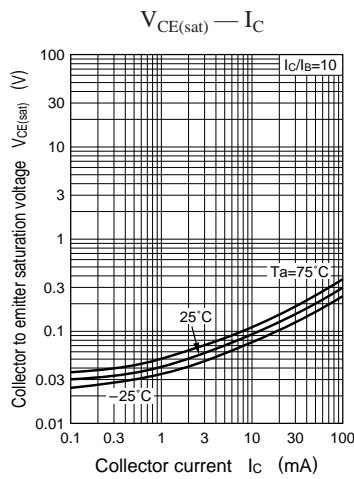
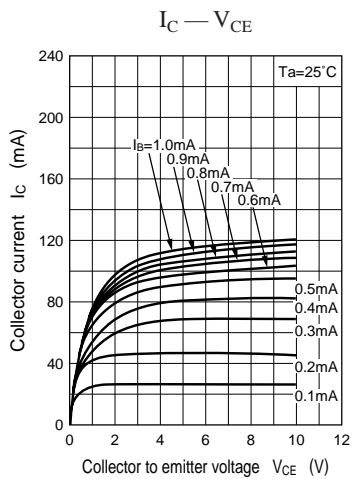
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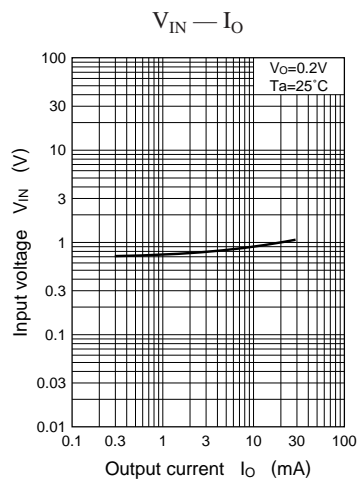
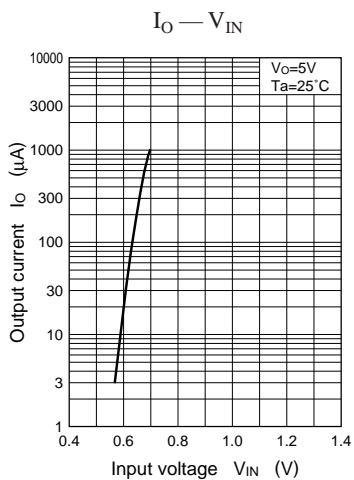
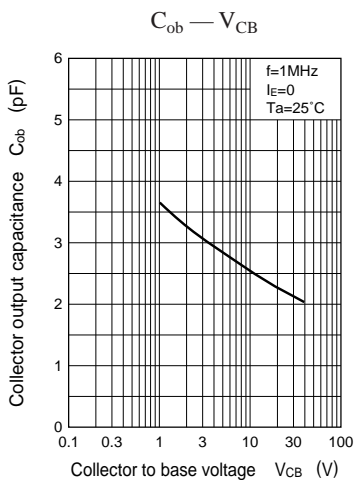


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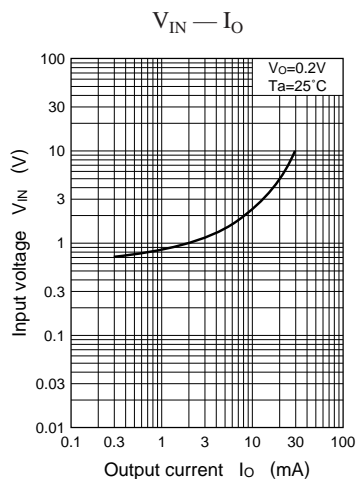
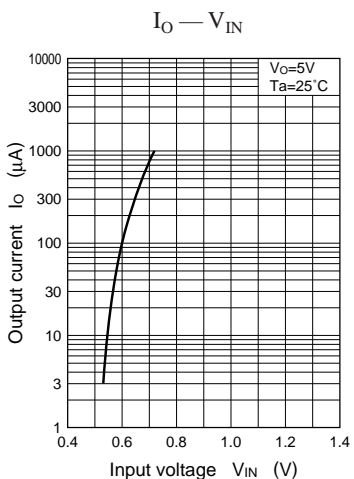
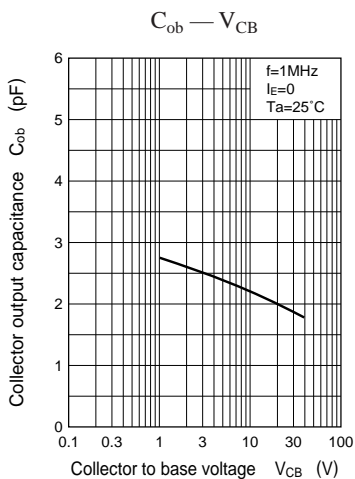
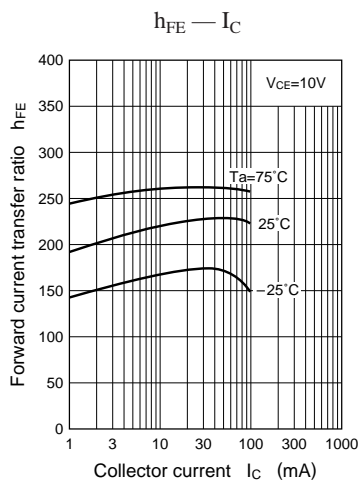
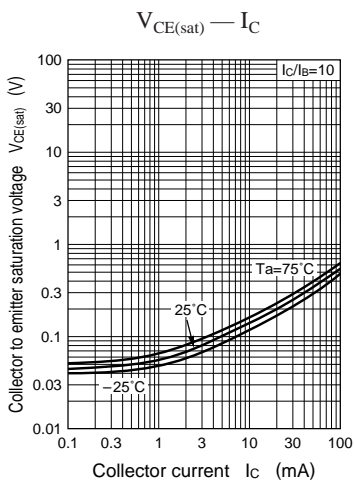
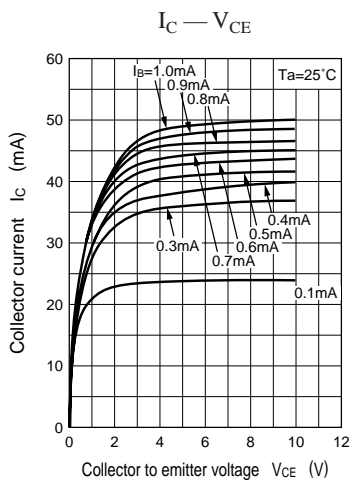


Characteristics charts of UN1219

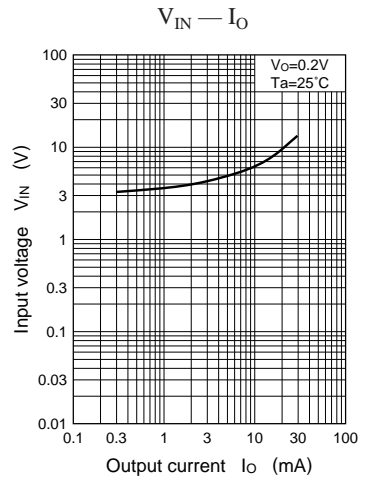
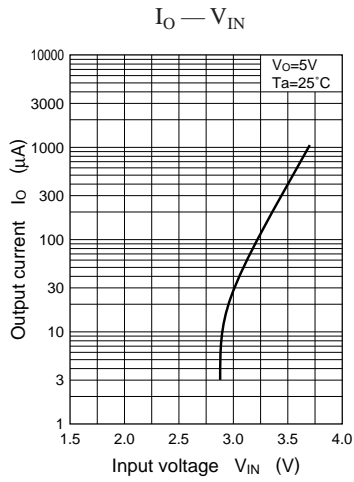
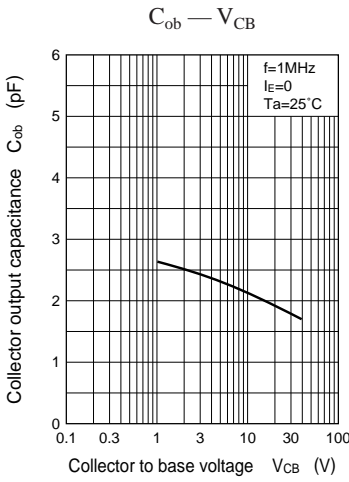
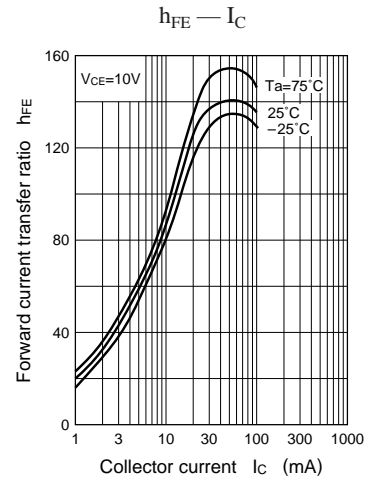
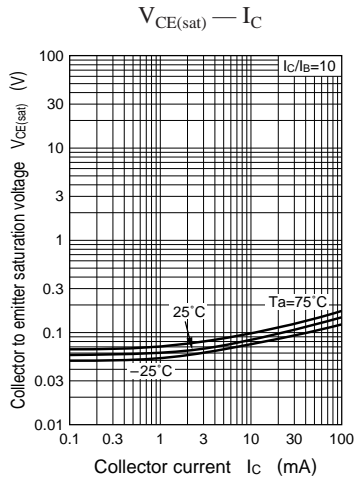
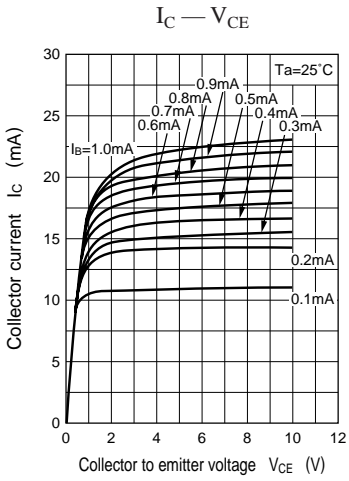




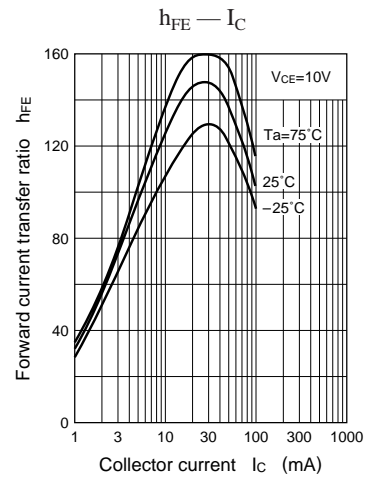
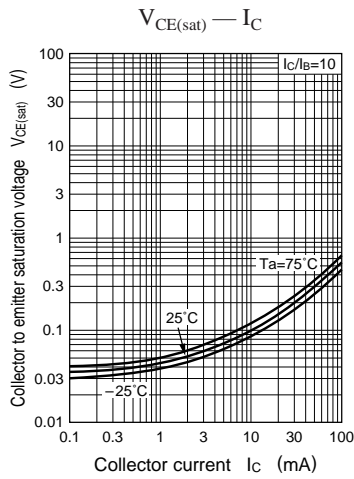
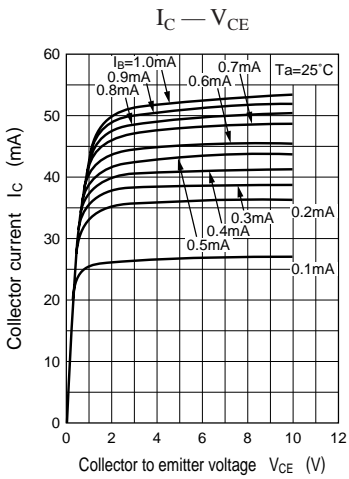
Characteristics charts of UN1210



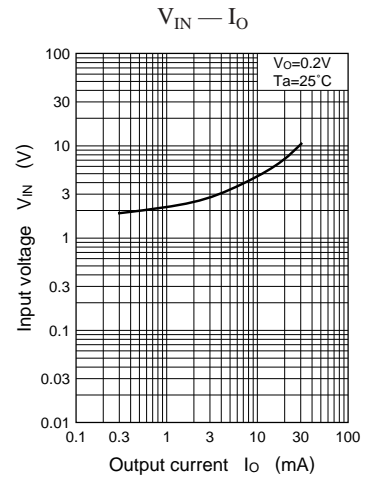
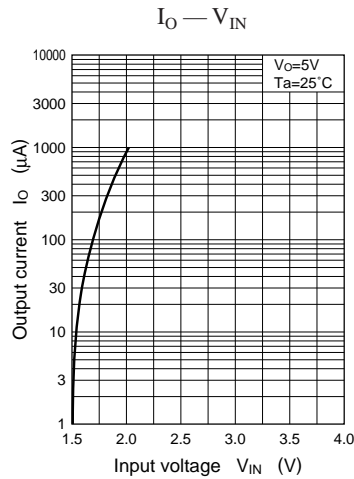
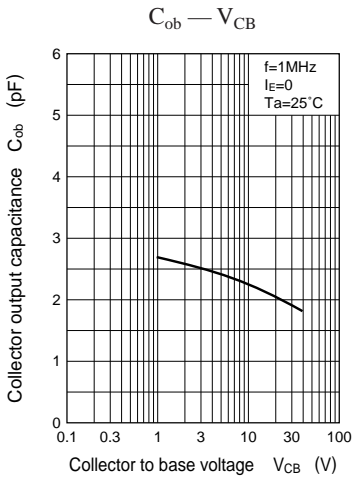
Characteristics charts of UN121D



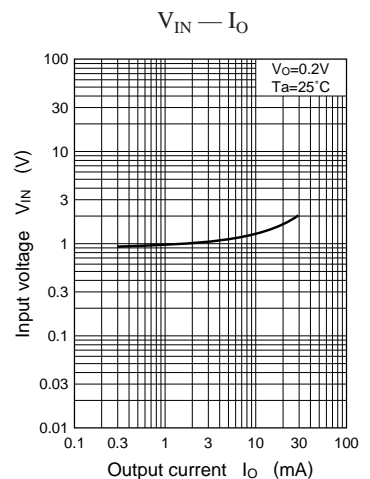
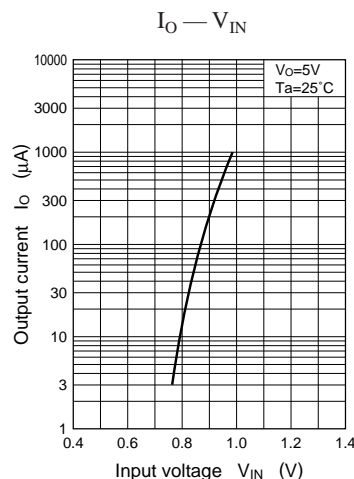
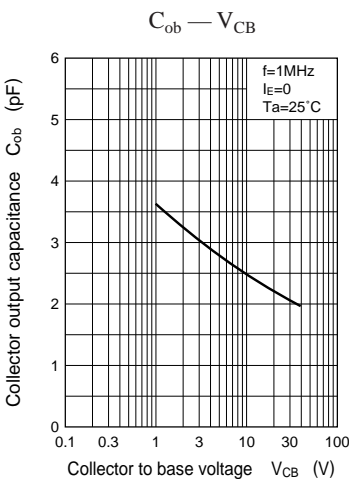
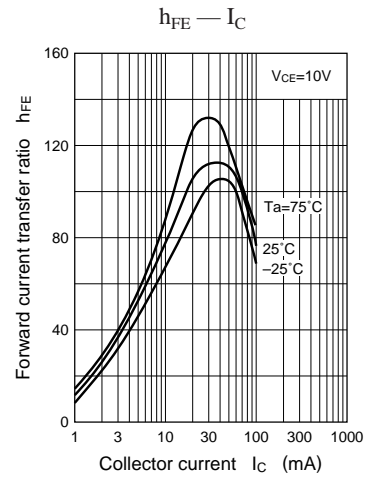
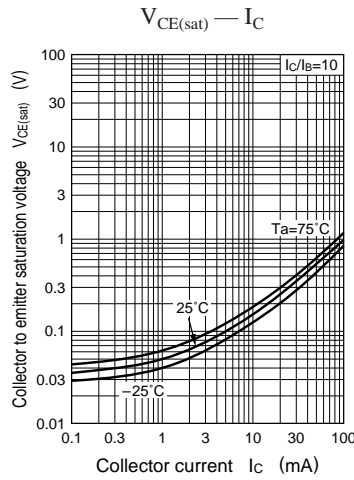
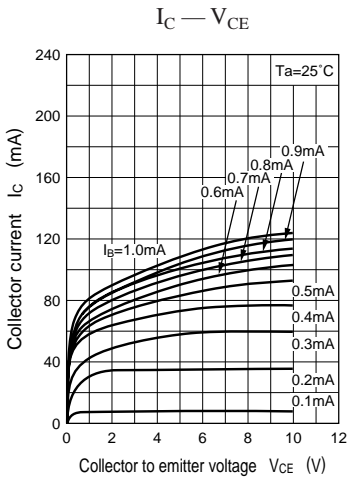
Characteristics charts of UN121E



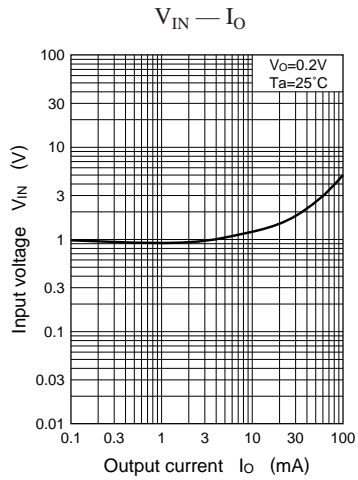
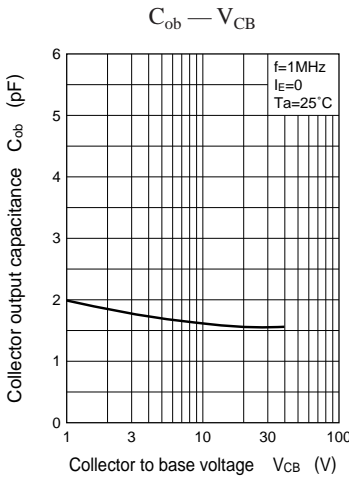
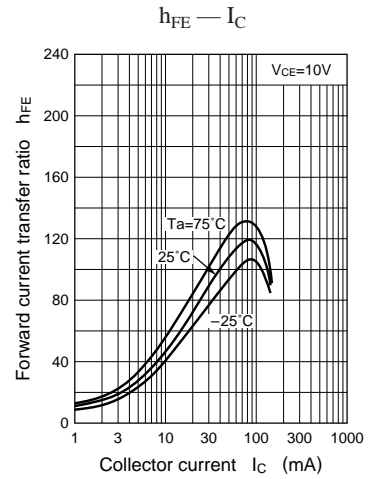
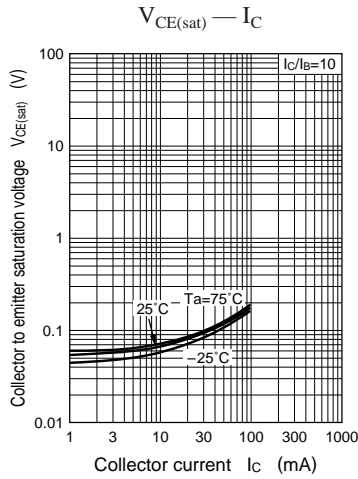
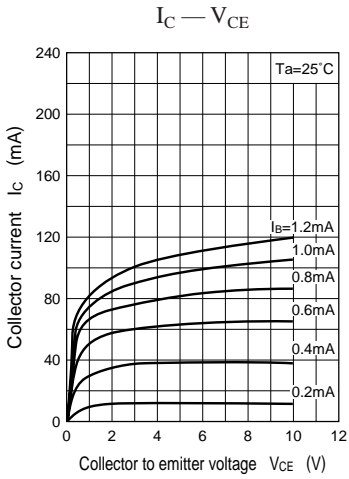
UN1211/1212/1213/1214/1215/1216/1217/1218/
 Transistors with built-in Resistor 1219/1210/121D/121E/121F/121K/121L



Characteristics charts of UN121F



Characteristics charts of UN121K



Characteristics charts of UN121L

