

UNR1211/1212/1213/1214/1215/1216/1217/1218/1219/1210/ 121D/121E/121F/121K/121L

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

Silicon NPN epitaxial planer transistor

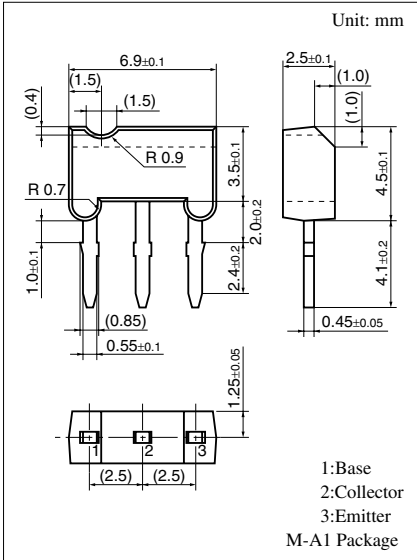
For digital circuits

■ Features

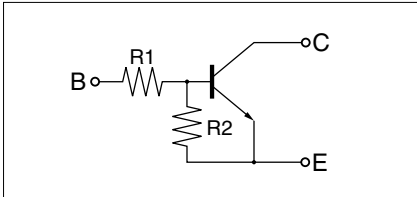
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- M type package allowing easy automatic and manual insertion as well as stand-alone fixing to the printed circuit board.

■ Resistance by Part Number

	(R ₁)	(R ₂)
• UNR1211	10kΩ	10kΩ
• UNR1212	22kΩ	22kΩ
• UNR1213	47kΩ	47kΩ
• UNR1214	10kΩ	47kΩ
• UNR1215	10kΩ	—
• UNR1216	4.7kΩ	—
• UNR1217	22kΩ	—
• UNR1218	0.51kΩ	5.1kΩ
• UNR1219	1kΩ	10kΩ
• UNR1210	47kΩ	—
• UNR121D	47kΩ	10kΩ
• UNR121E	47kΩ	22kΩ
• UNR121F	4.7kΩ	10kΩ
• UNR121K	10kΩ	4.7kΩ
• UNR121L	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 _{sig}	-55 to +150	°C

Note) The part numbers in the parenthesis show conventional part number.

**UNR1211/1212/1213/1214/1215/1216/1217/1218/
Transistors with built-in Resistor 1219/1210/121D/121E/121F/121K/121L**

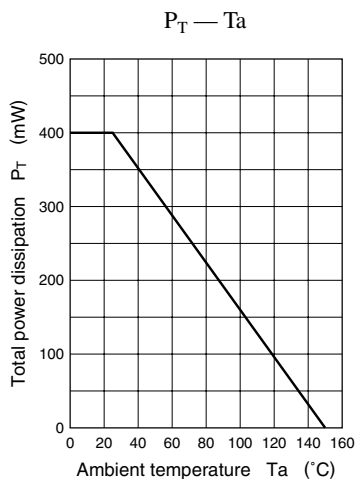
Electrical Characteristics (Ta=25°C)

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	UNR1211	I _{EBO}	V _{EB} = 6V, I _C = 0			0.5	mA
	UNR1212/1214/121E/121D					0.2	
	UNR1213					0.1	
	UNR1215/1216/1217/1210					0.01	
	UNR121F/121K					1.0	
	UNR1219					1.5	
	UNR1218/121L					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	UNR1211	h _{FE}	V _{CE} = 10V, I _C = 5mA	35			
	UNR1212/121E			60			
	UNR1213/1214			80			
	UNR1215*/1216*/1217*/1210*			160		460	
	UNR121F/121D/1219			30			
	UNR1218/121K/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	UNR1211/1214/1215/121K	R _i		(−30%)	10	(+30%)	kΩ
	UNR1212/1217				22		
	UNR1213/121D/121E/1210				47		
	UNR1216/121F/121L				4.7		
	UNR1218				0.51		
	UNR1219				1		
Resistance ratio	UNR1211/1212/1213/121L	R _i /R ₂		0.8	1.0	1.2	
	UNR1214			0.17	0.21	0.25	
	UNR1218/1219			0.08	0.1	0.12	
	UNR121D				4.7		
	UNR121E				2.14		
	UNR121F				0.47		
	UNR121K				2.13		

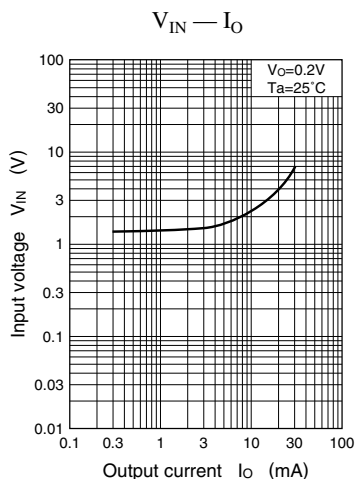
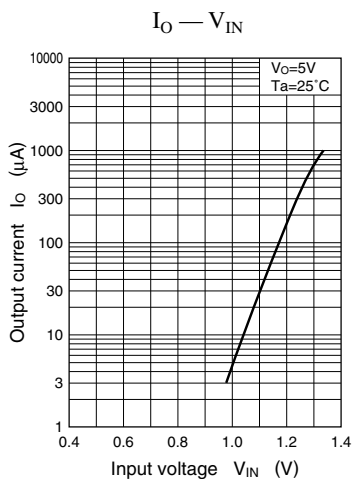
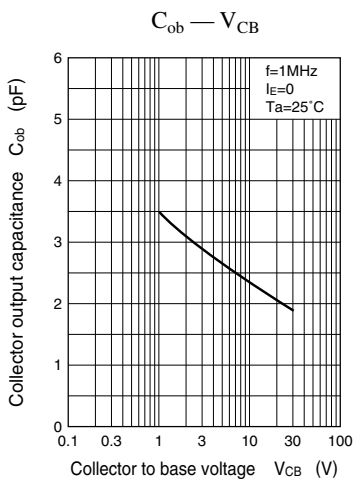
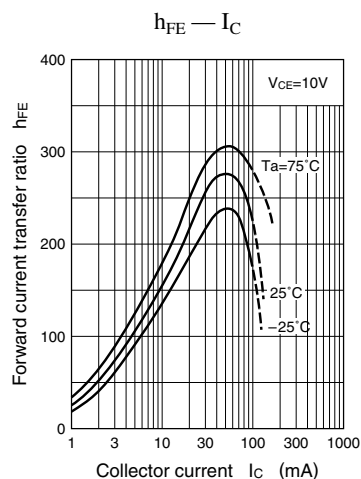
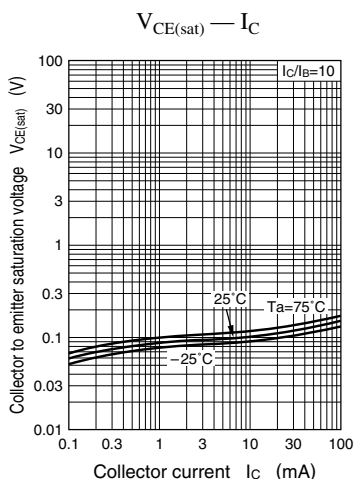
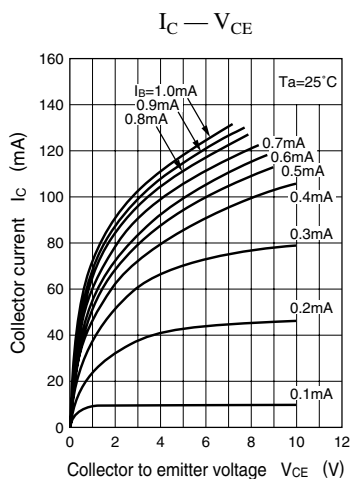
* h_{FE} rank classification (UNR1215/1216/1217/1210)

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

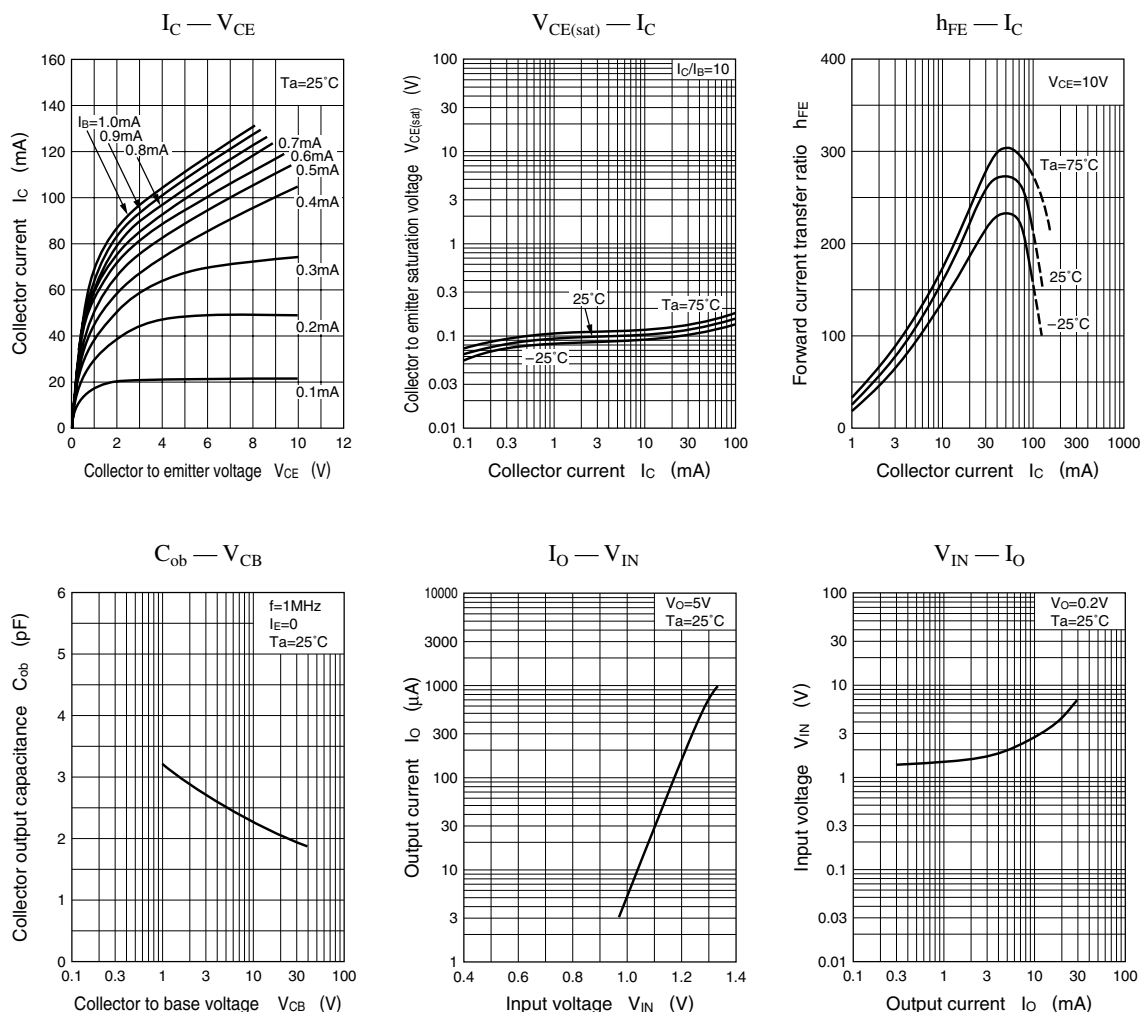
Common characteristics chart



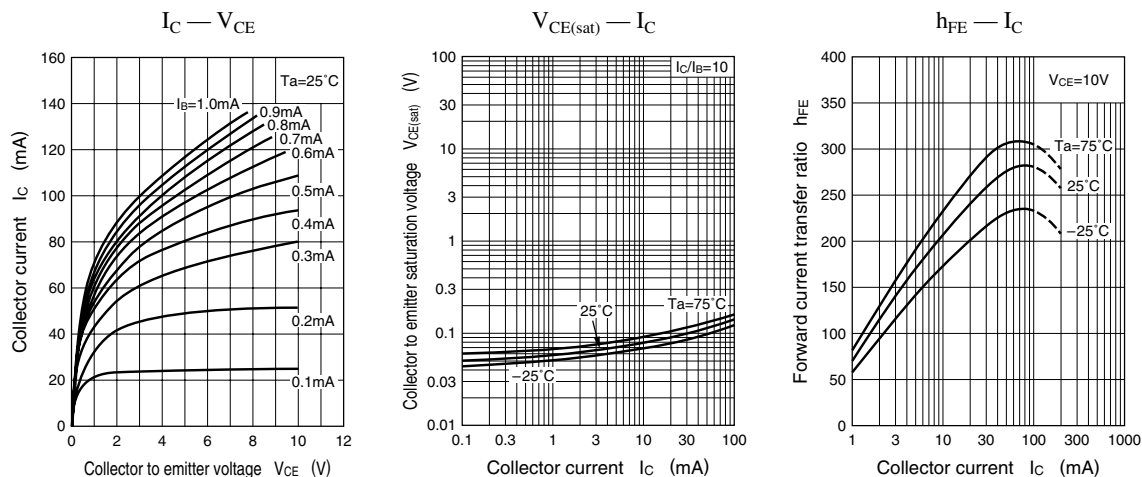
Characteristics charts of UNR1211

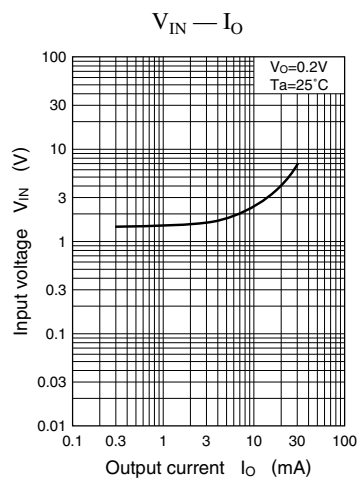
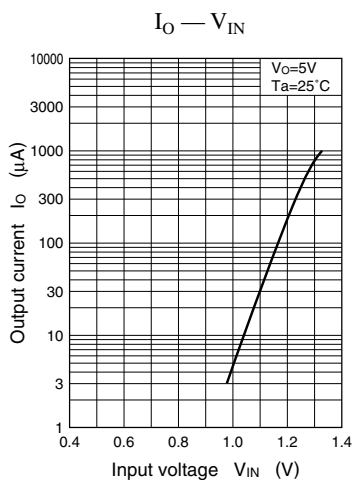
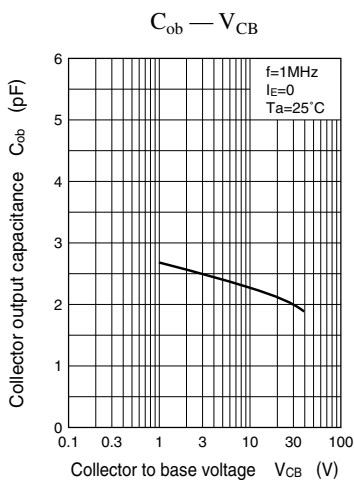


Characteristics charts of UNR1212

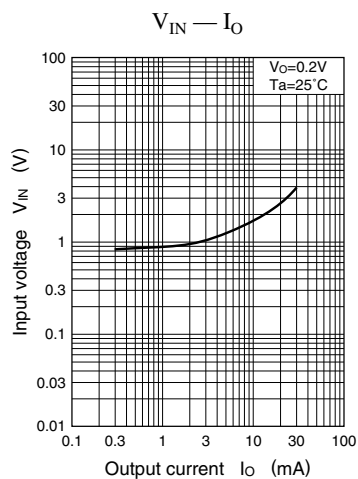
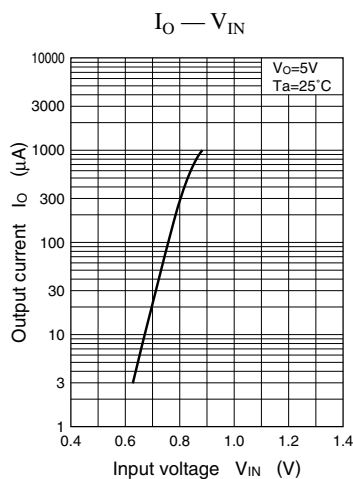
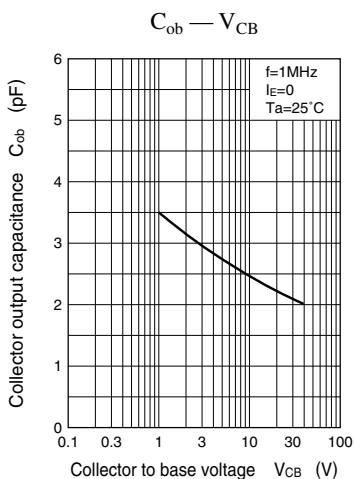
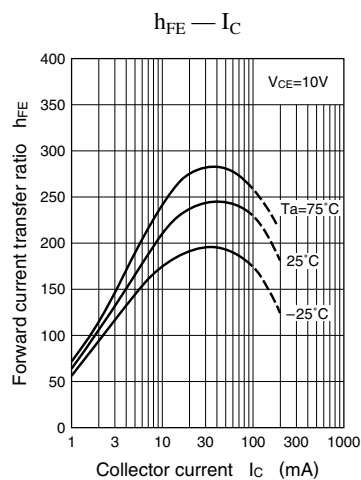
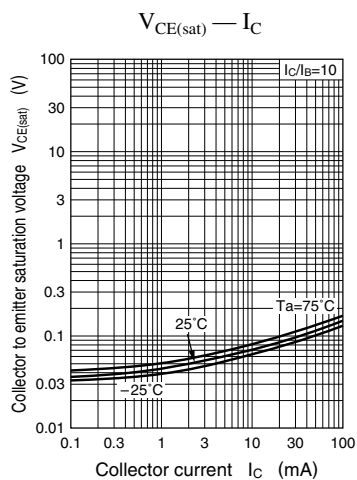
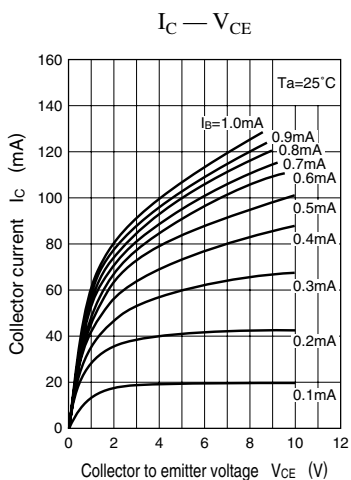


Characteristics charts of UNR1213

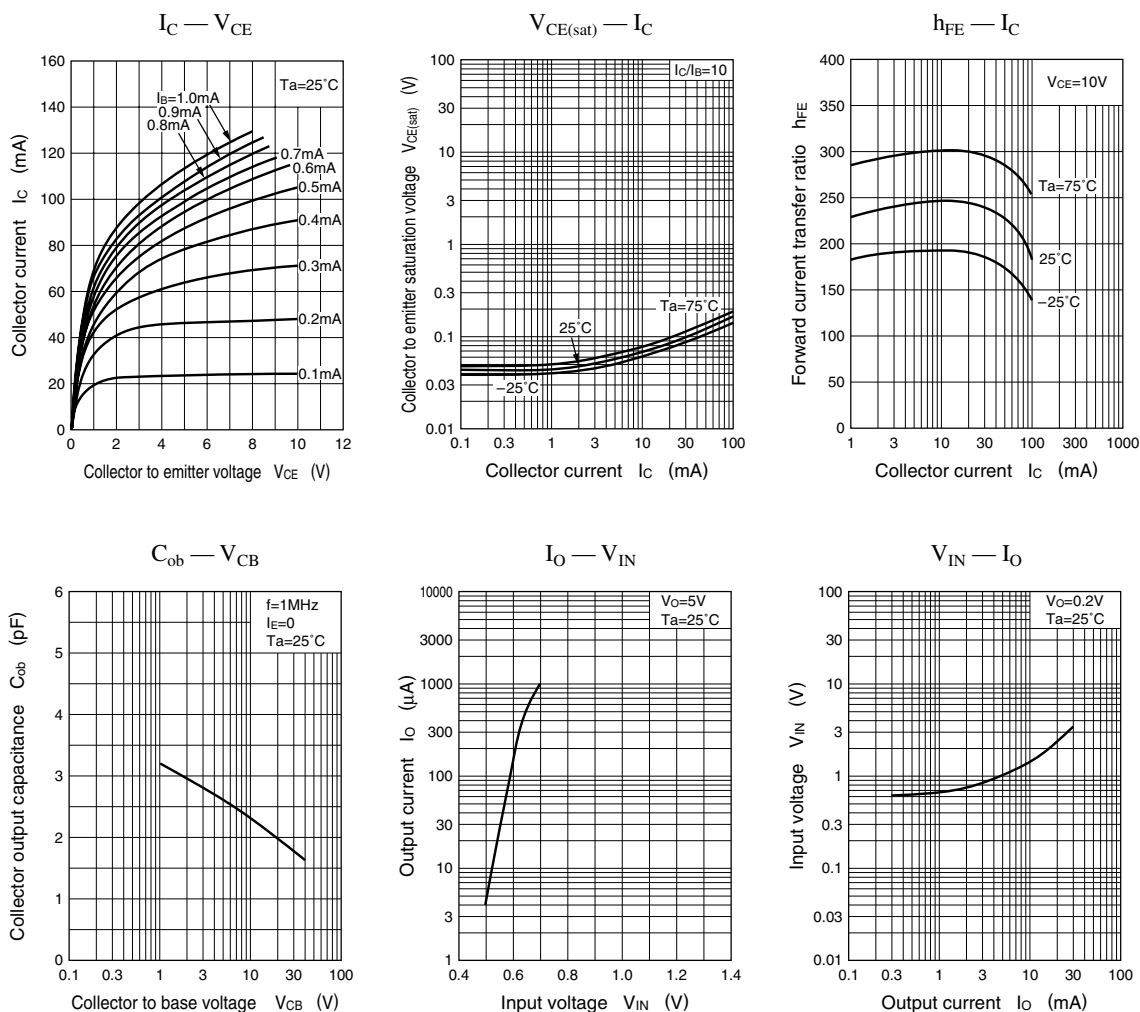




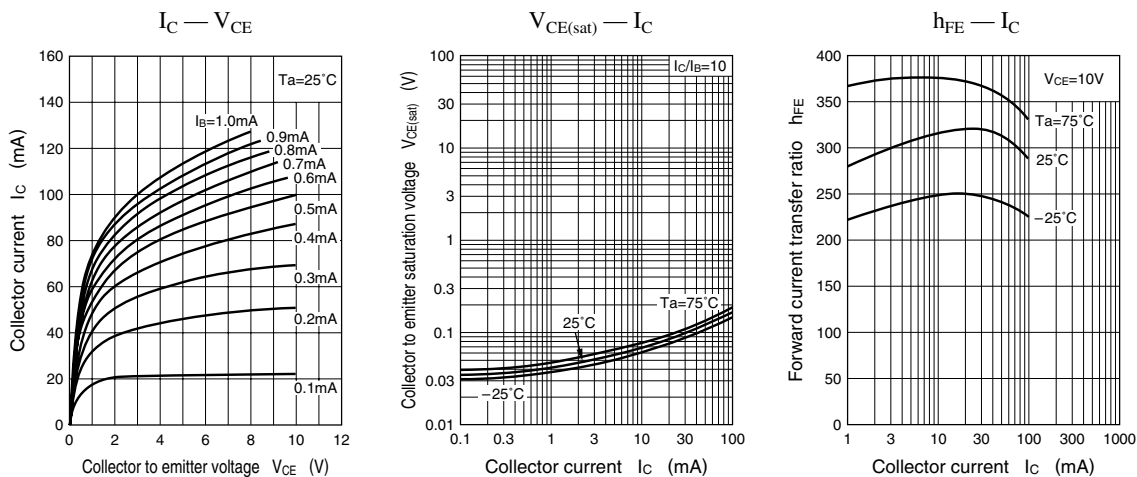
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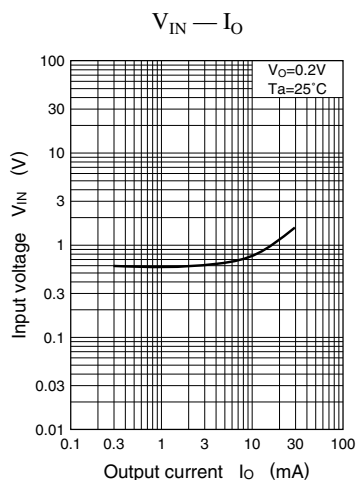
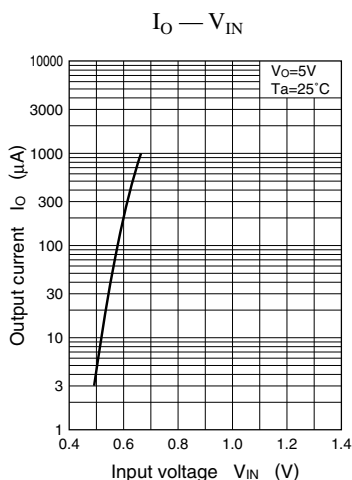
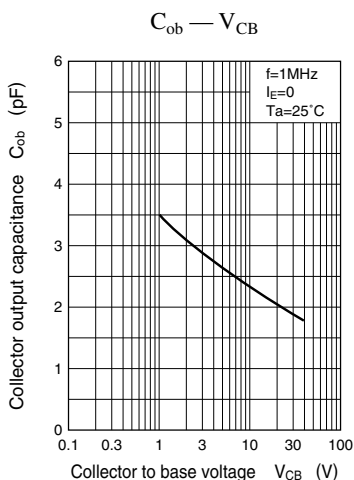


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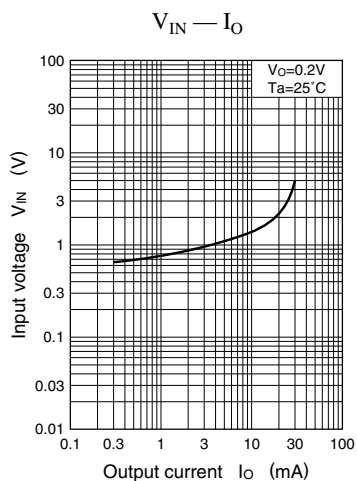
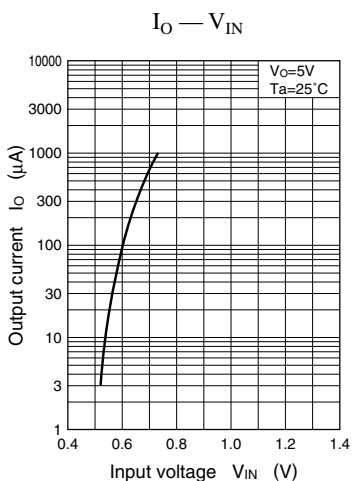
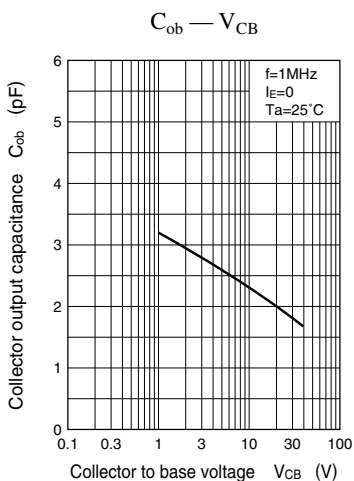
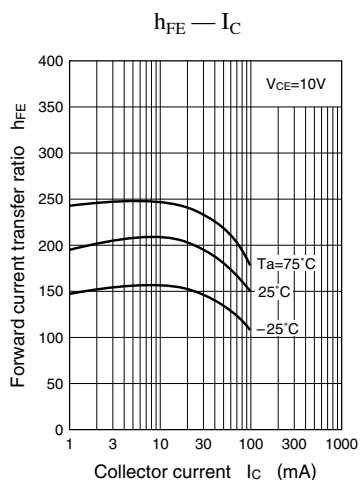
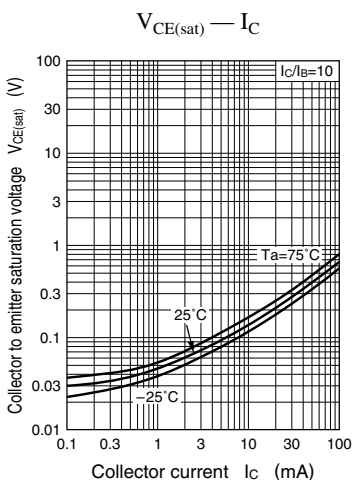
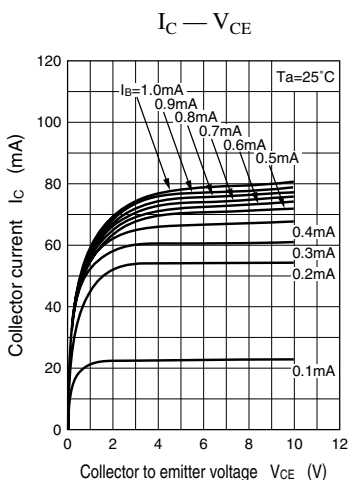


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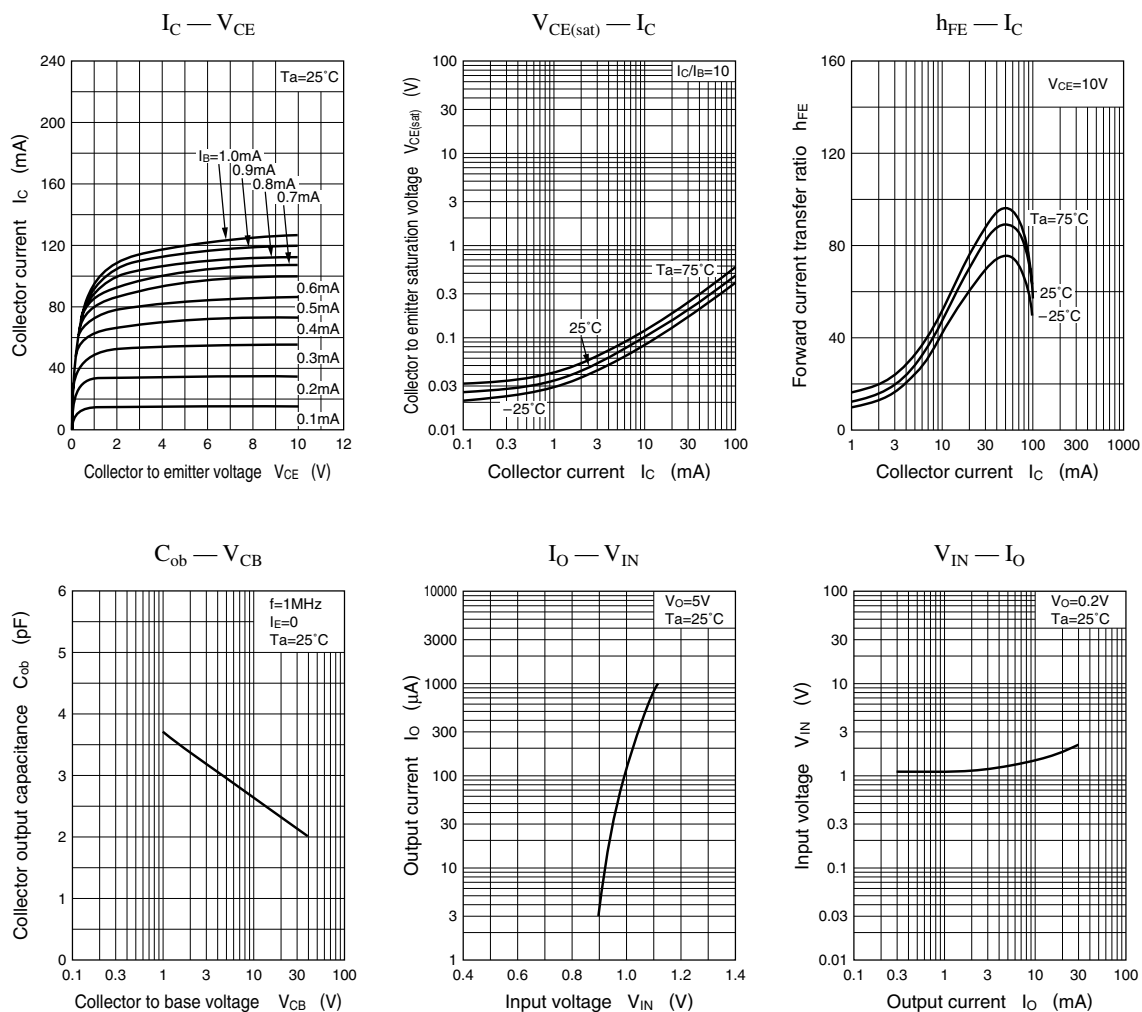




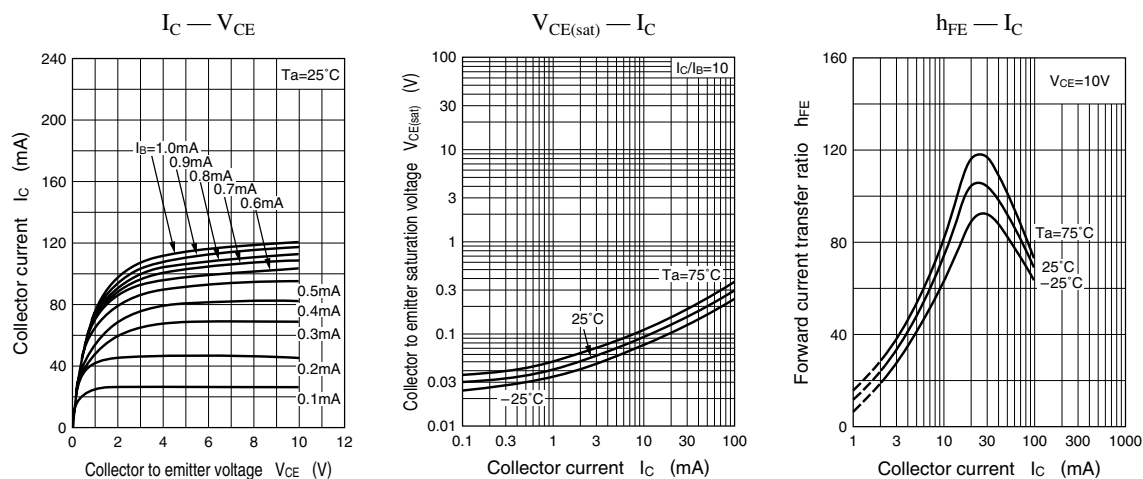
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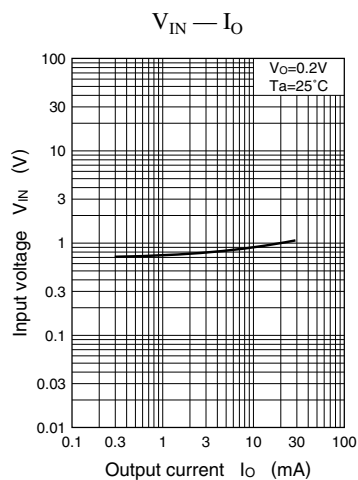
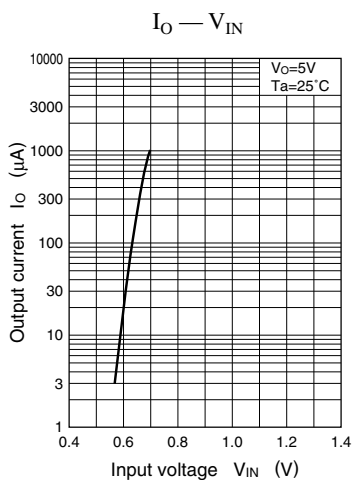
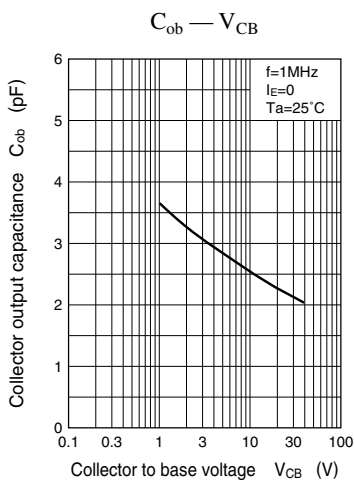


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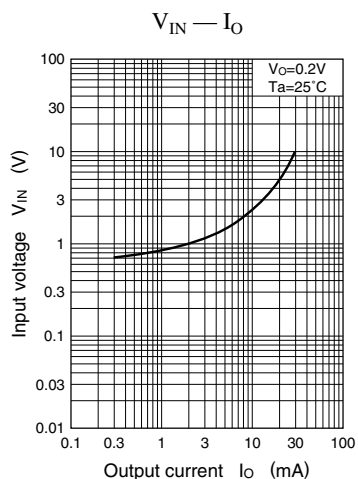
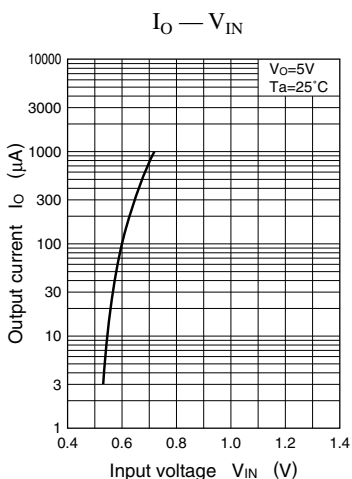
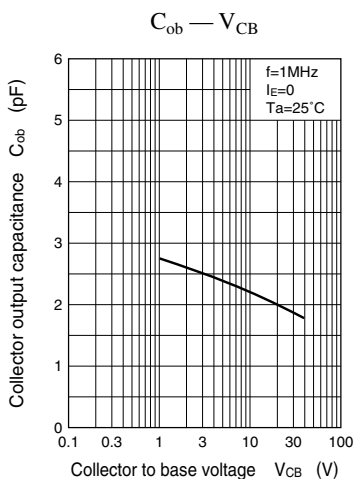
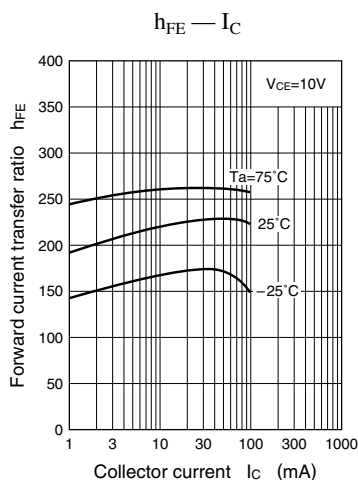
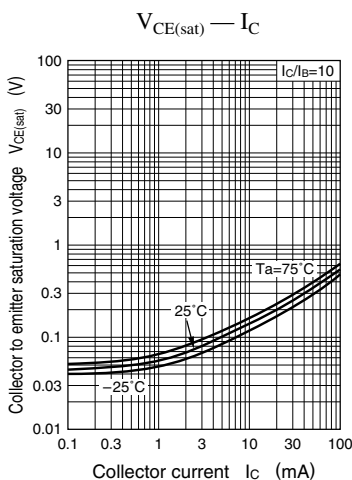
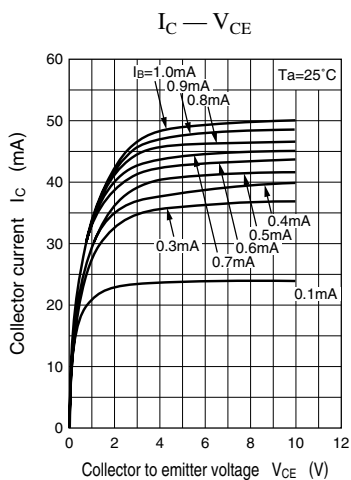


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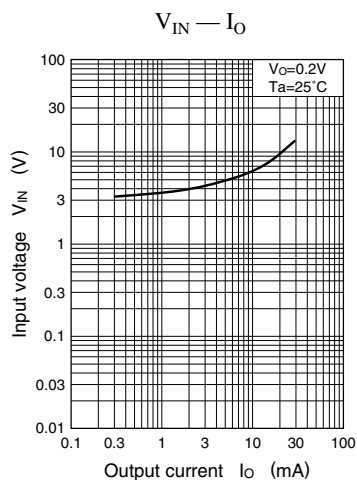
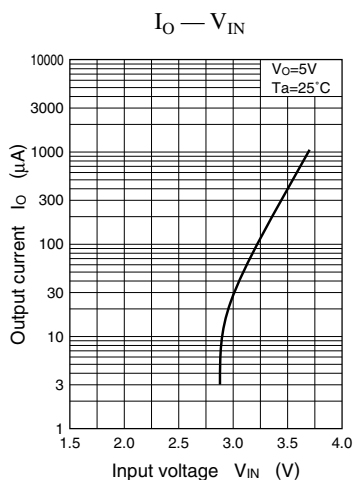
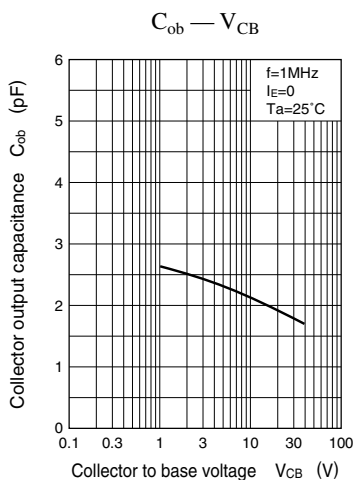
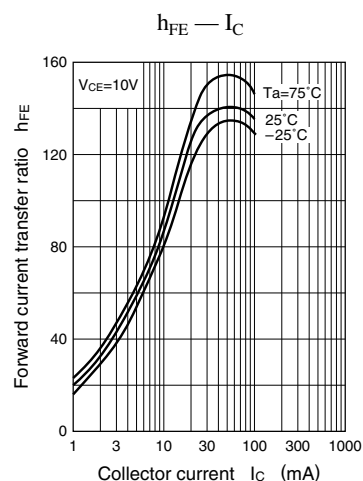
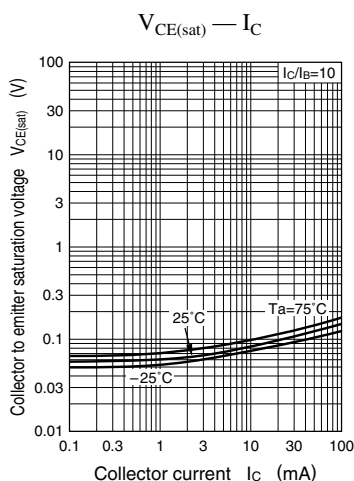
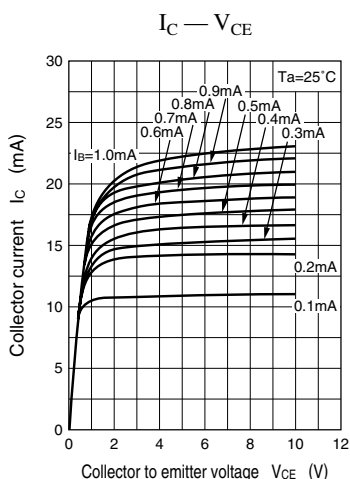




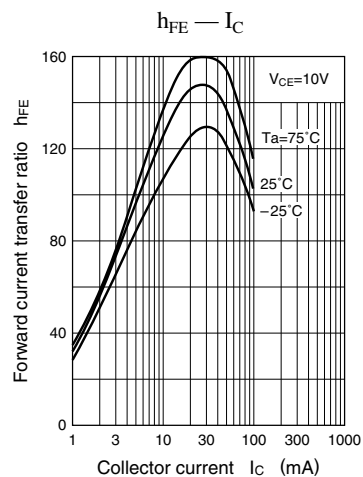
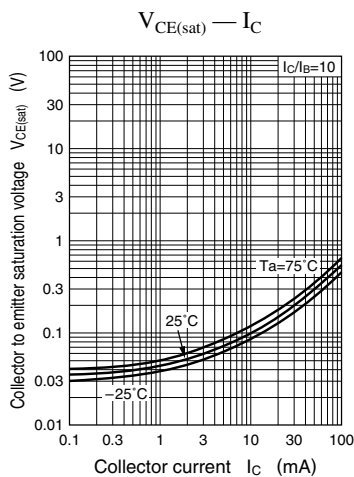
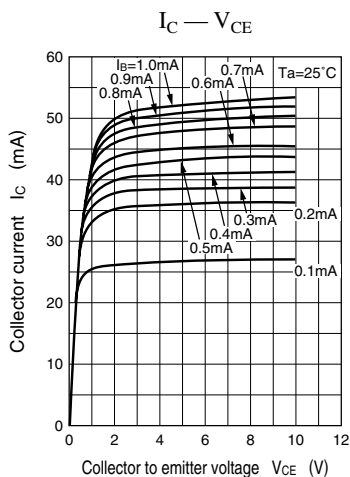
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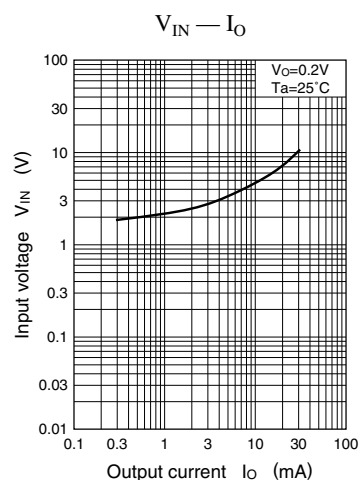
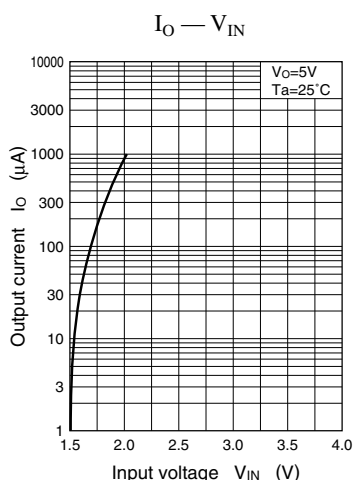
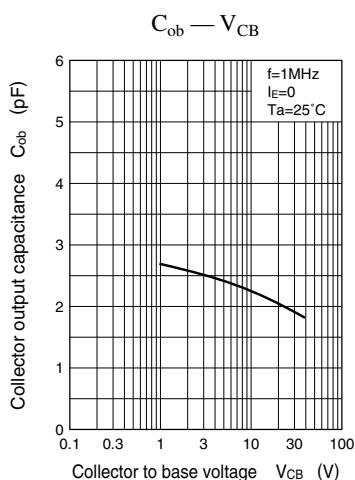
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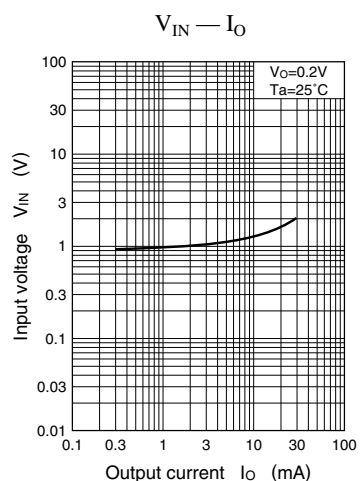
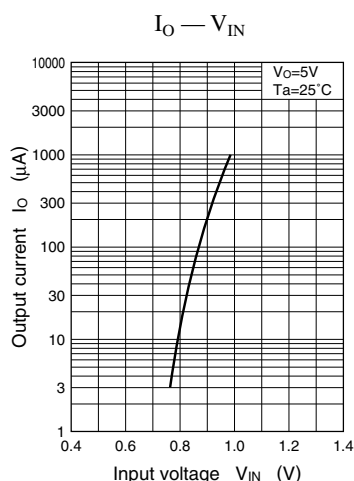
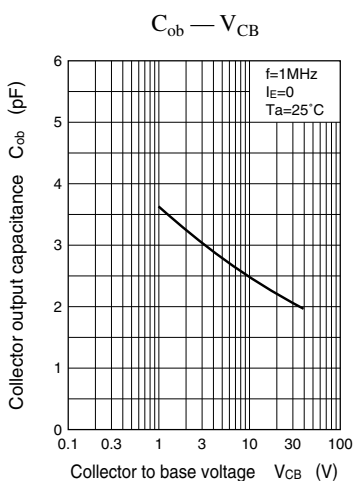
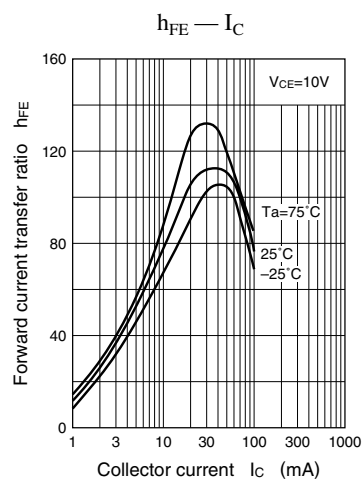
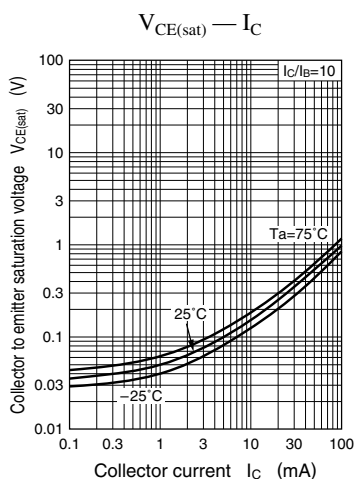
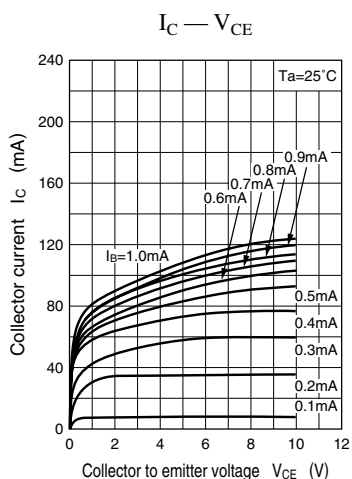
Characteristics charts of UNR121E



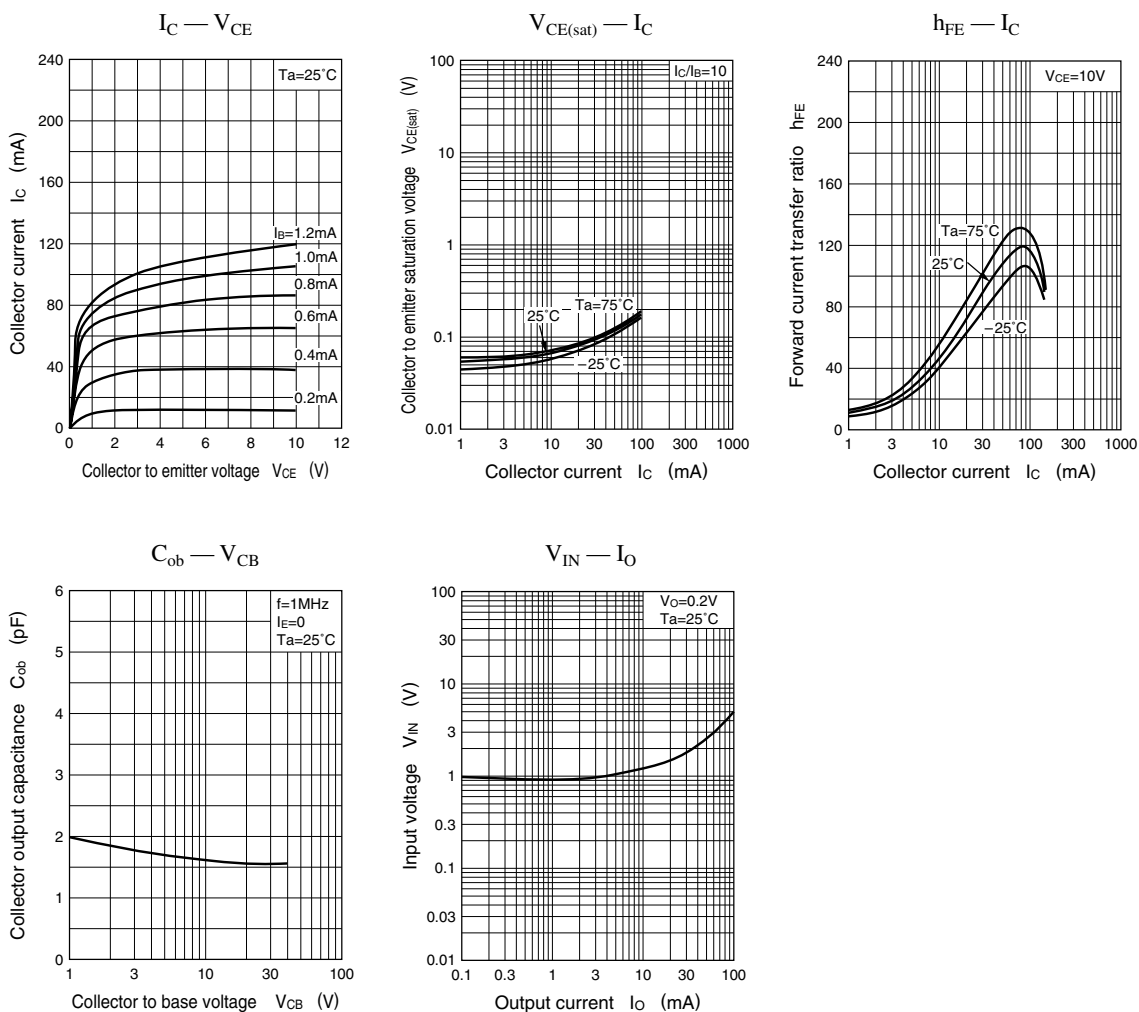
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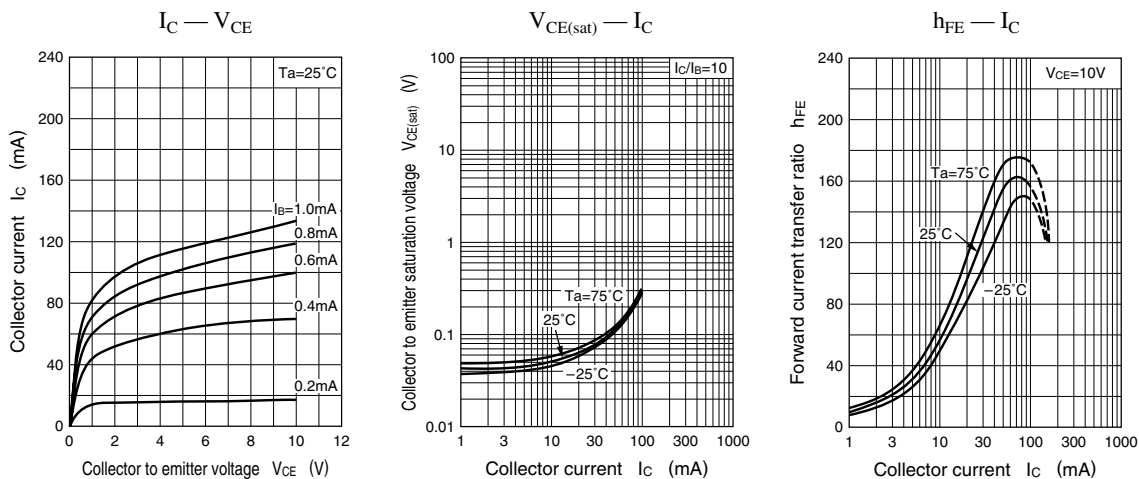
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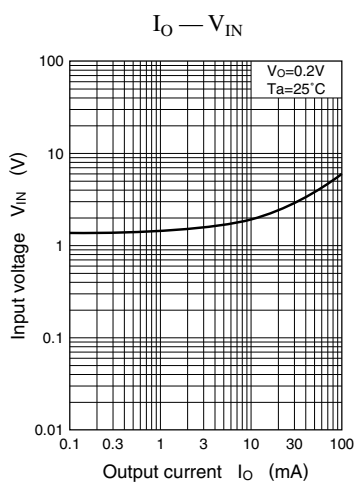
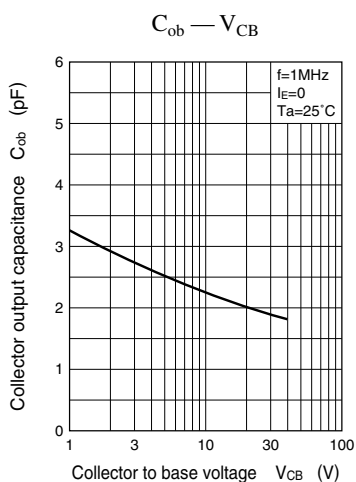


Characteristics charts of UNR121K



Characteristics charts of UNR121L





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