

Transistors with built-in Resistor

Panasonic

UN4211/4212/4213/4214/4215/4216/4217/4218/ 4219/4210/421D/421E/421F/421K/421L

Silicon NPN epitaxial planer transistor

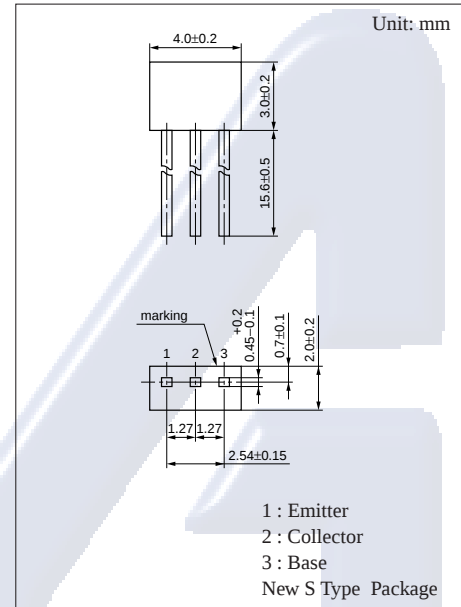
For digital circuits

■ Features

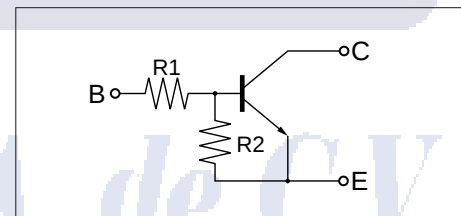
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- New S type package, allowing supply with the radial taping.

■ Resistance by Part Number

	(R ₁)	(R ₂)
• UN4211	10kΩ	10kΩ
• UN4212	22kΩ	22kΩ
• UN4213	47kΩ	47kΩ
• UN4214	10kΩ	47kΩ
• UN4215	10kΩ	—
• UN4216	4.7kΩ	—
• UN4217	22kΩ	—
• UN4218	0.51kΩ	5.1kΩ
• UN4219	1kΩ	10kΩ
• UN4210	47kΩ	—
• UN421D	47kΩ	10kΩ
• UN421E	47kΩ	22kΩ
• UN421F	4.7kΩ	10kΩ
• UN421K	10kΩ	4.7kΩ
• UN421L	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	300	mW
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

UN4211/4212/4213/4214/4215/4216/4217/ Transistors with built-in Resistor 4218/4219/4210/421D/421E/421F/421K/421L

Electrical Characteristics (Ta=25°C)

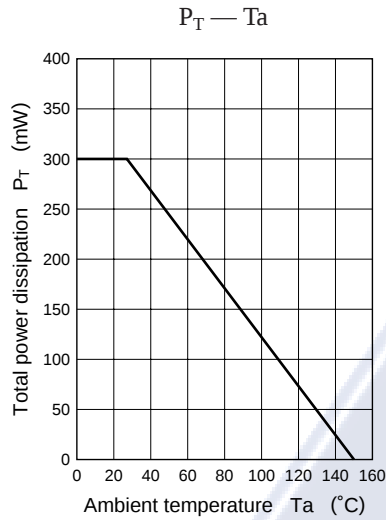
Parameter		Symbol	Conditions	min	typ	max	Unit
Collector cutoff current		I _{CBO}	V _{CB} = 50V, I _E = 0			0.1	μA
		I _{CEO}	V _{CE} = 50V, I _B = 0			0.5	μA
Emitter cutoff current	UN4211	I _{EBO}	V _{EB} = 6V, I _C = 0			0.5	mA
	UN4212/4214/421E/421D					0.2	
	UN4213					0.1	
	UN4215/4216/4217/4210					0.01	
	UN421F/421K					1.0	
	UN4219					1.5	
	UN4218/421L					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	UN4211	h _{FE}	V _{CE} = 10V, I _C = 5mA	35			
	UN4212/421E			60			
	UN4213/4214			80			
	UN4215*/4216*/4217*/4210*			160		460	
	UN421F/421D/4219			30			
	UN4218/421K/421L			20			
	Collector to emitter saturation voltage			V _{CE(sat)}	I _C = 10mA, I _B = 0.3mA		
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		150		MHz
Input resistance	UN4211/4214/4215/421K	R ₁		(−30%)	10	(+30%)	kΩ
	UN4212/4217				22		
	UN4213/421D/421E/4210				47		
	UN4216/421F/421L				4.7		
	UN4218				0.51		
	UN4219				1		
	Resistance ratio				UN4211/4212/4213/421L		
UN4214		0.17	0.21	0.25			
UN4218/4219		0.08	0.1	0.12			
UN421D		3.7	4.7	5.7			
UN421E		1.7	2.14	2.6			
UN421F		0.37	0.47	0.57			
UN421K		1.7	2.13	2.6			

* h_{FE} rank classification (UN4215/4216/4217/4210)

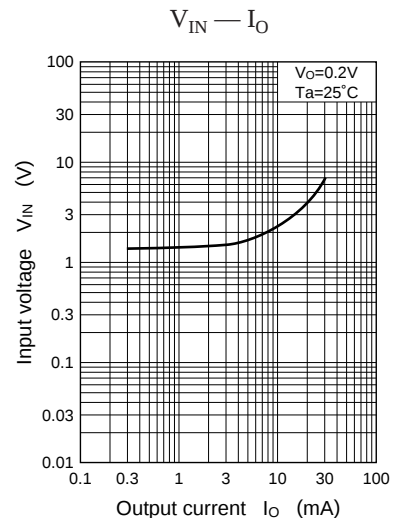
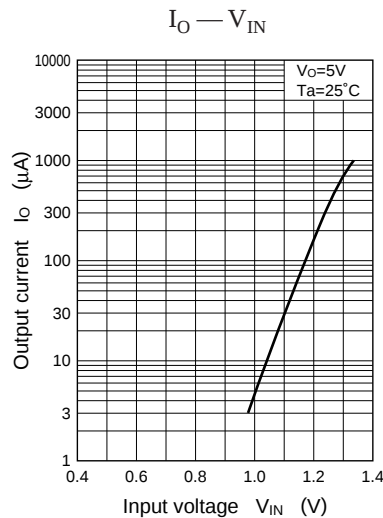
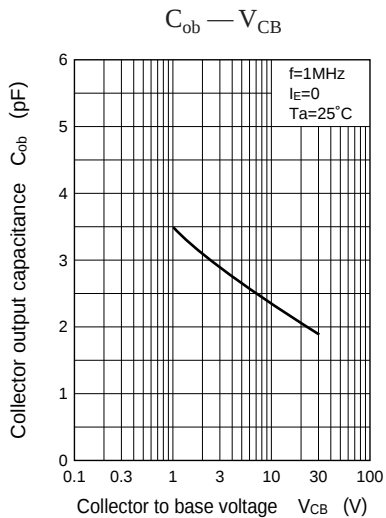
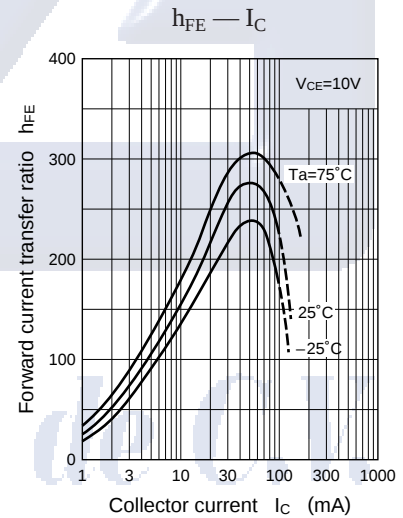
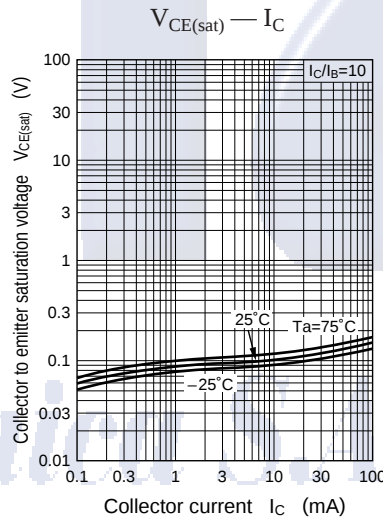
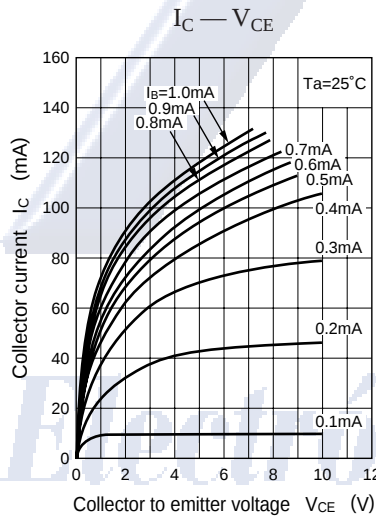
Rank	Q	R	S
h_{FE}	160 to 260	210 to 340	290 to 460

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Transistors with built-in Resistor 4218/4219/4210/421D/421E/421F/421K/421L

Common characteristics chart

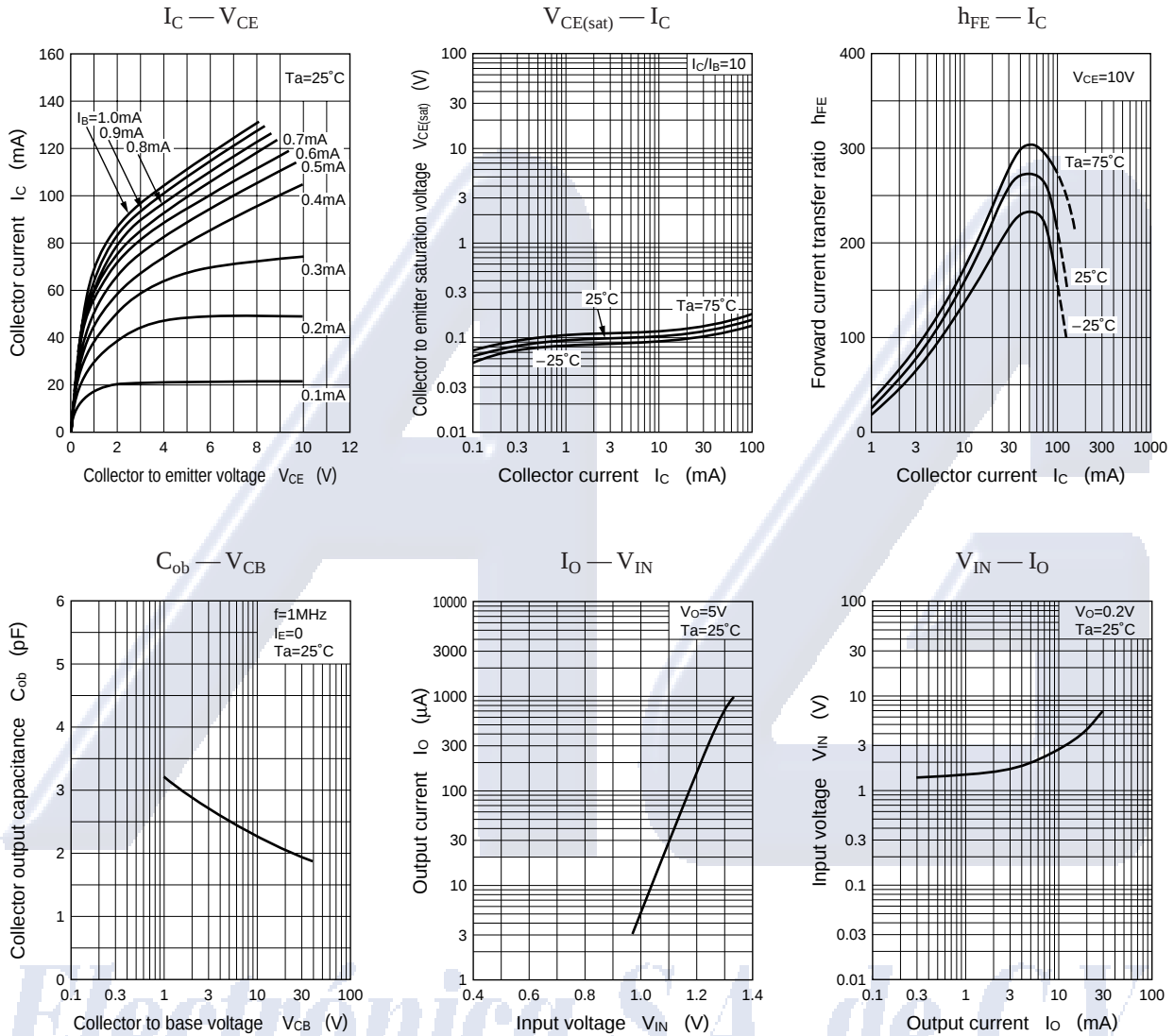


Characteristics charts of UN4211

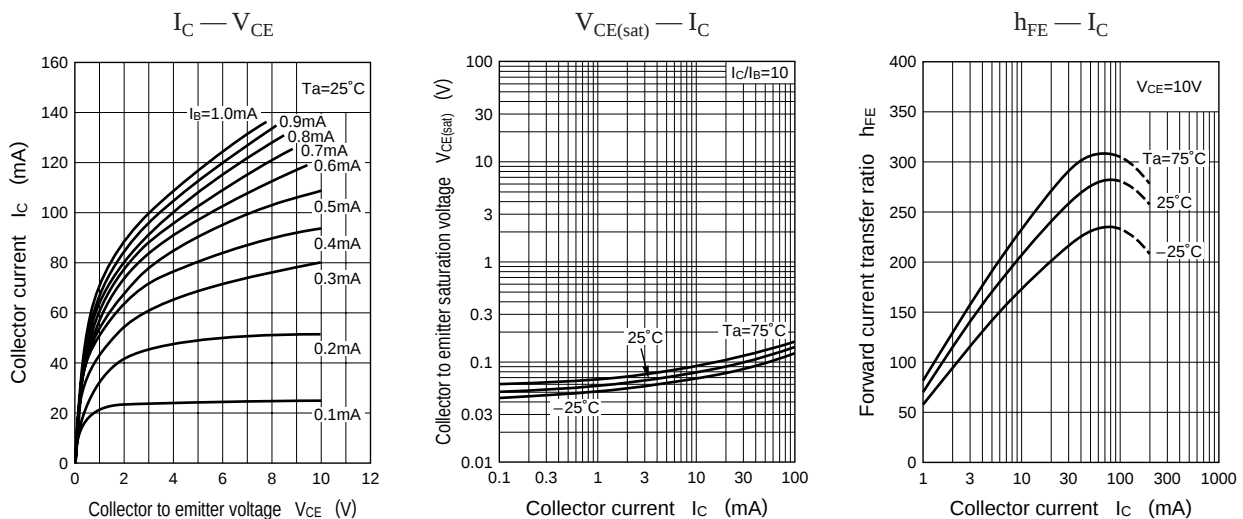


UN4211/4212/4213/4214/4215/4216/4217/
Transistors with built-in Resistor 4218/4219/4210/421D/421E/421F/421K/421L

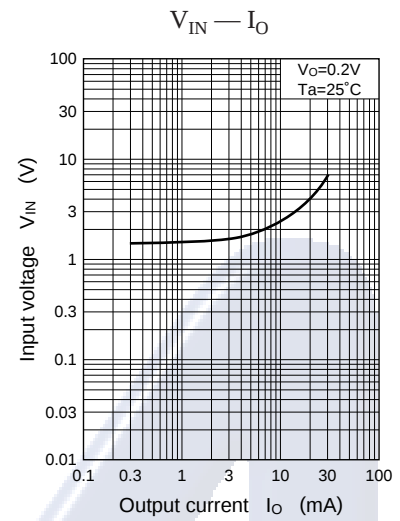
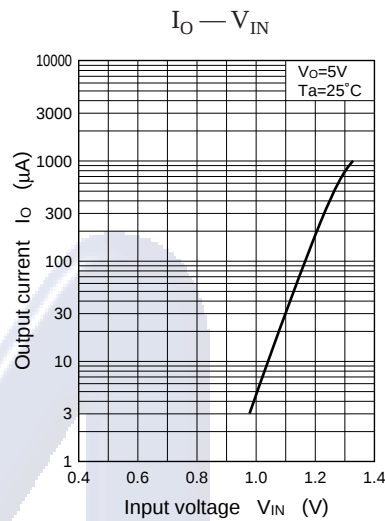
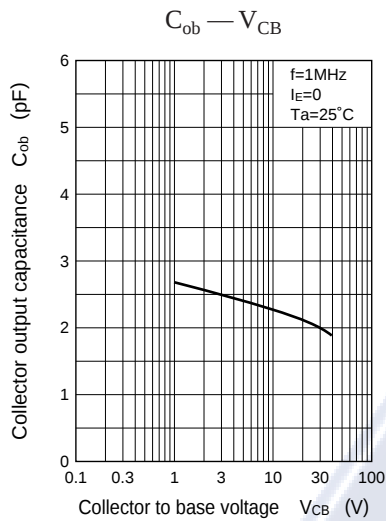
Characteristics charts of UN4212



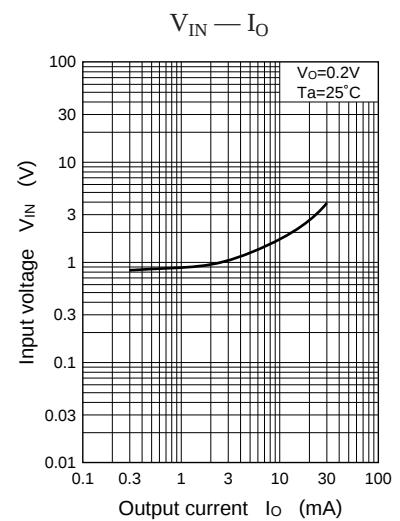
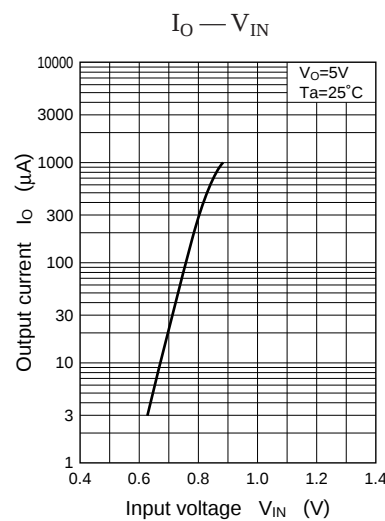
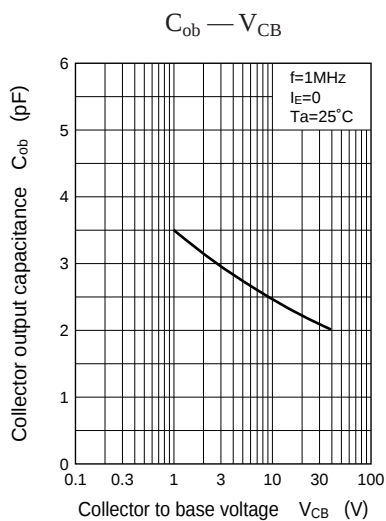
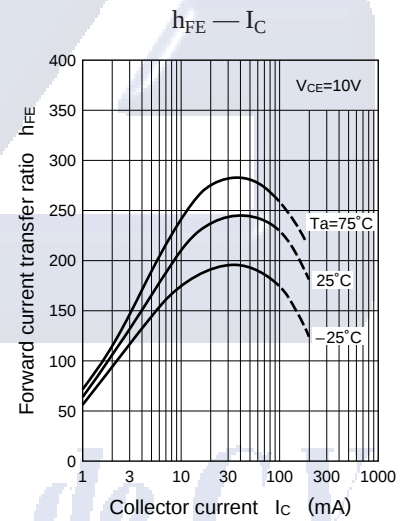
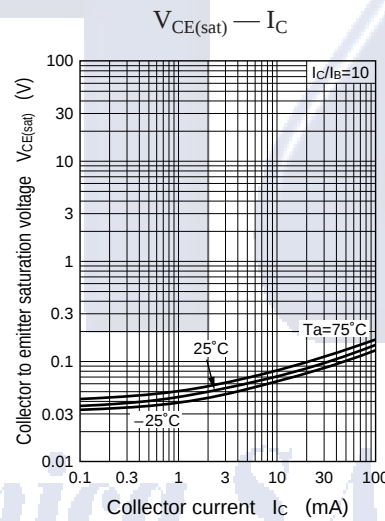
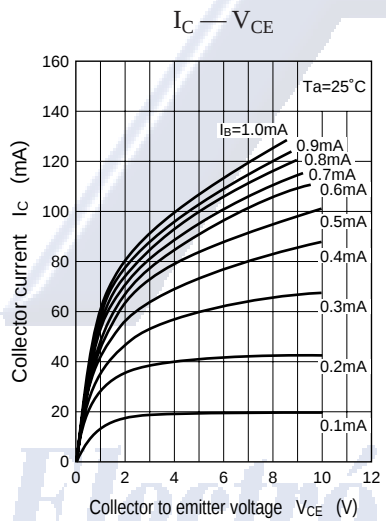
Characteristics charts of UN4213



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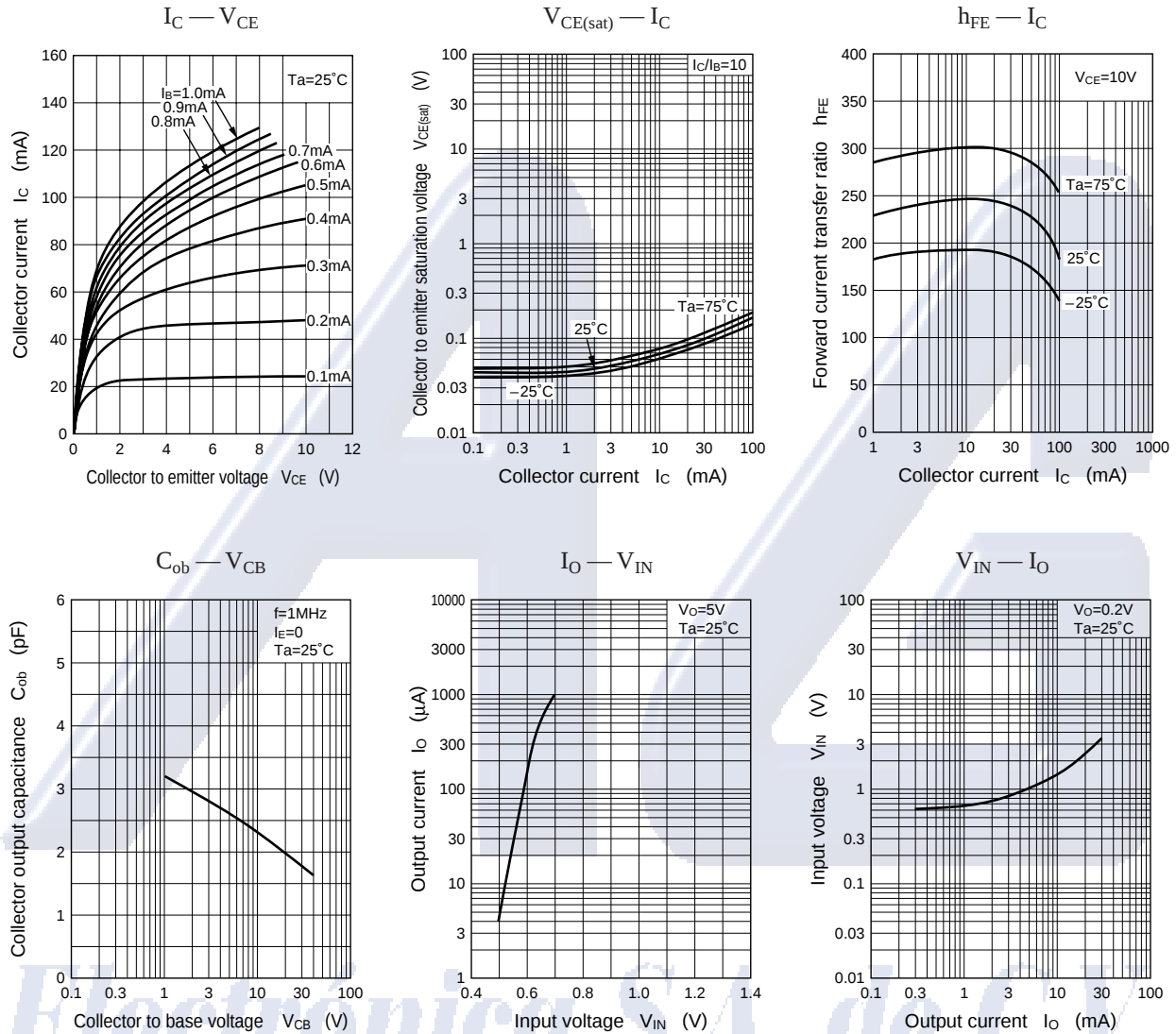


Characteristics charts of UN4214

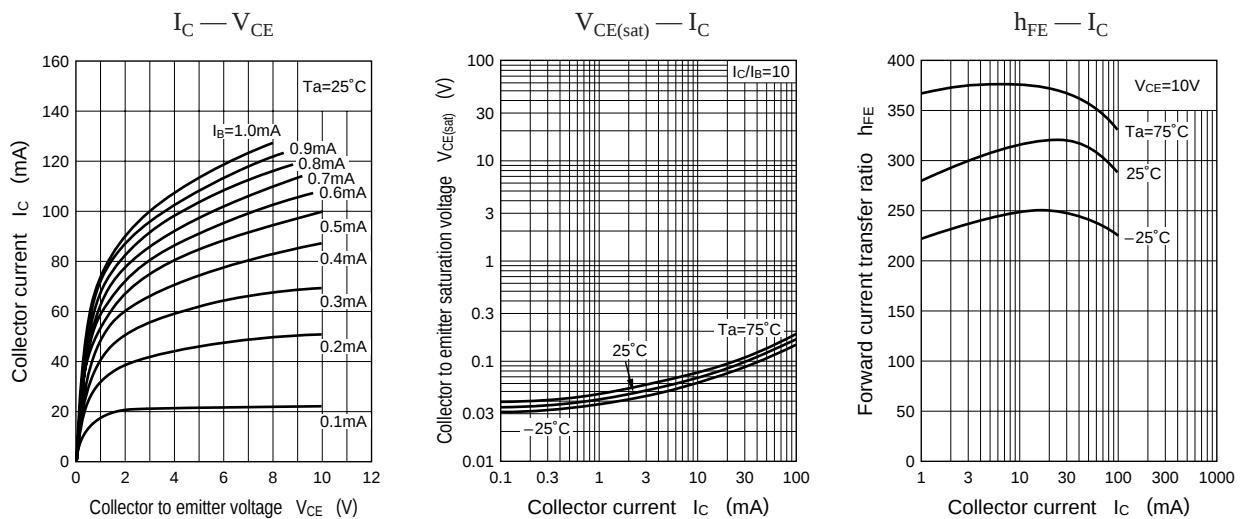


Transistors with built-in Resistor

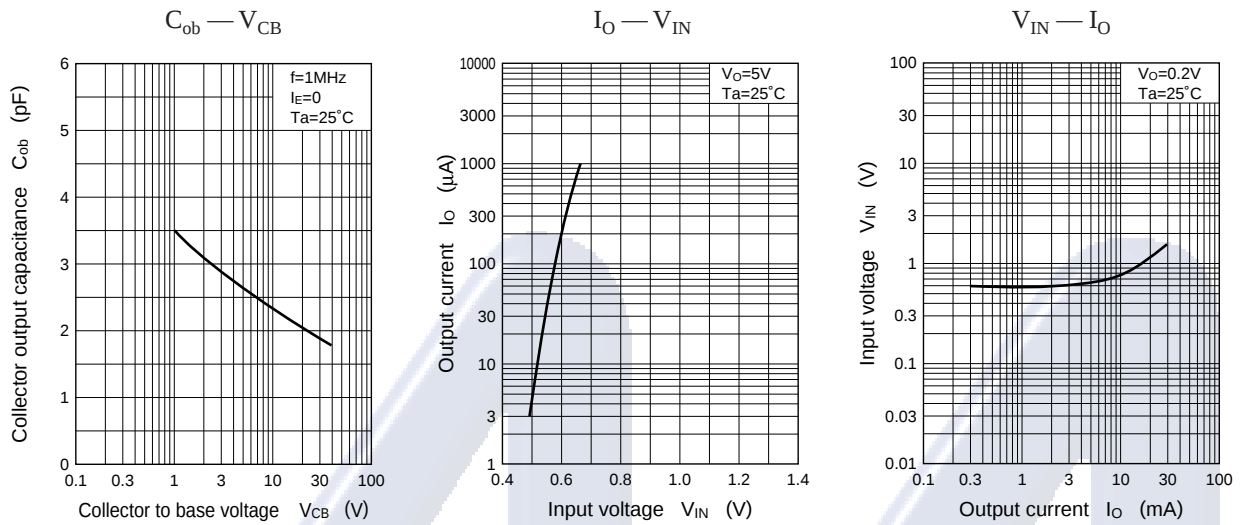
Characteristics charts of UN4215



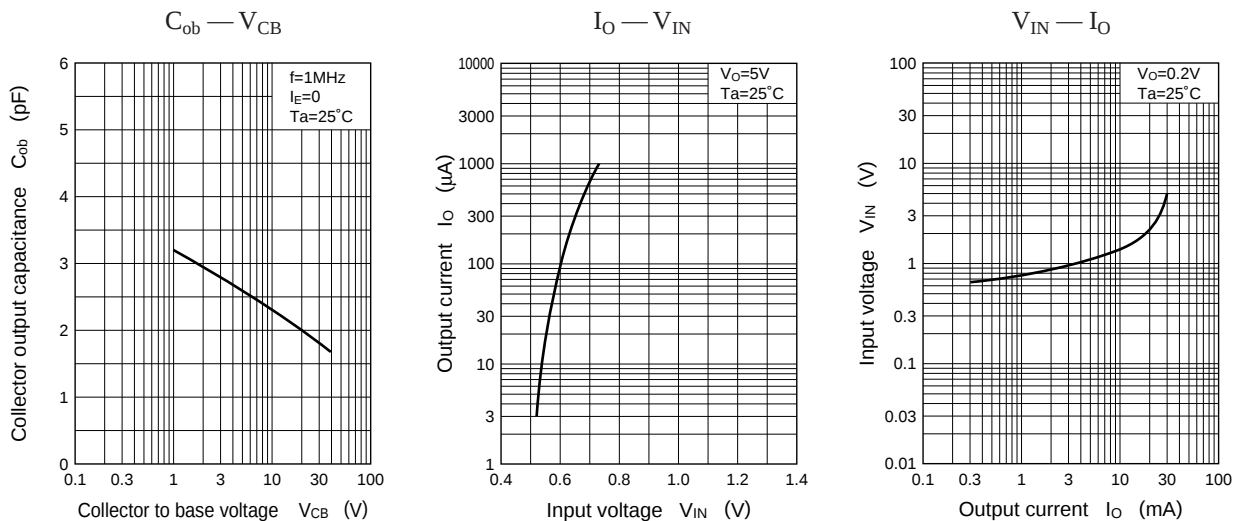
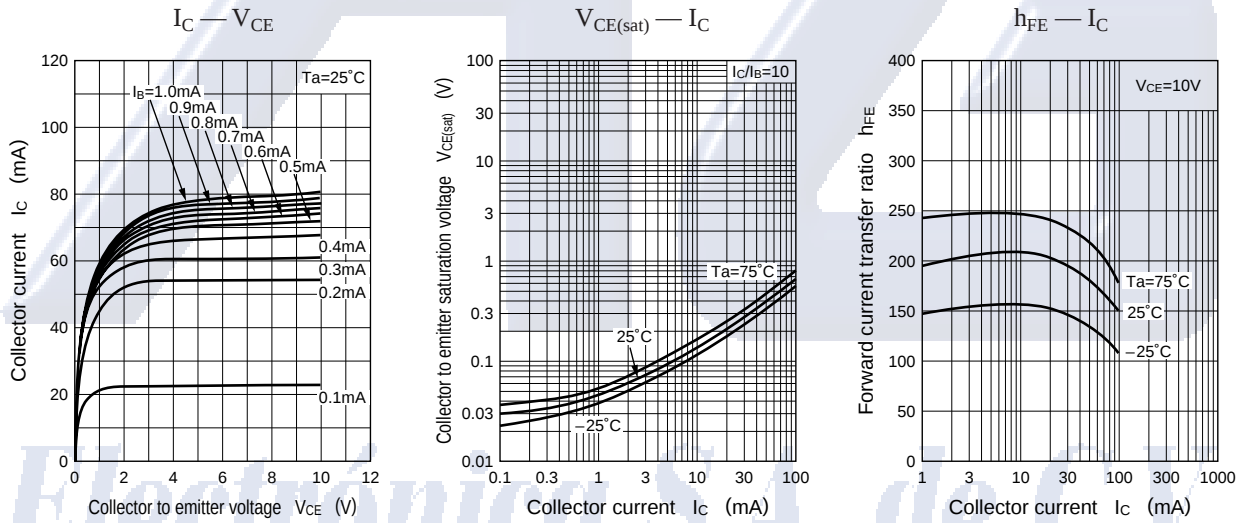
Characteristics charts of UN4216



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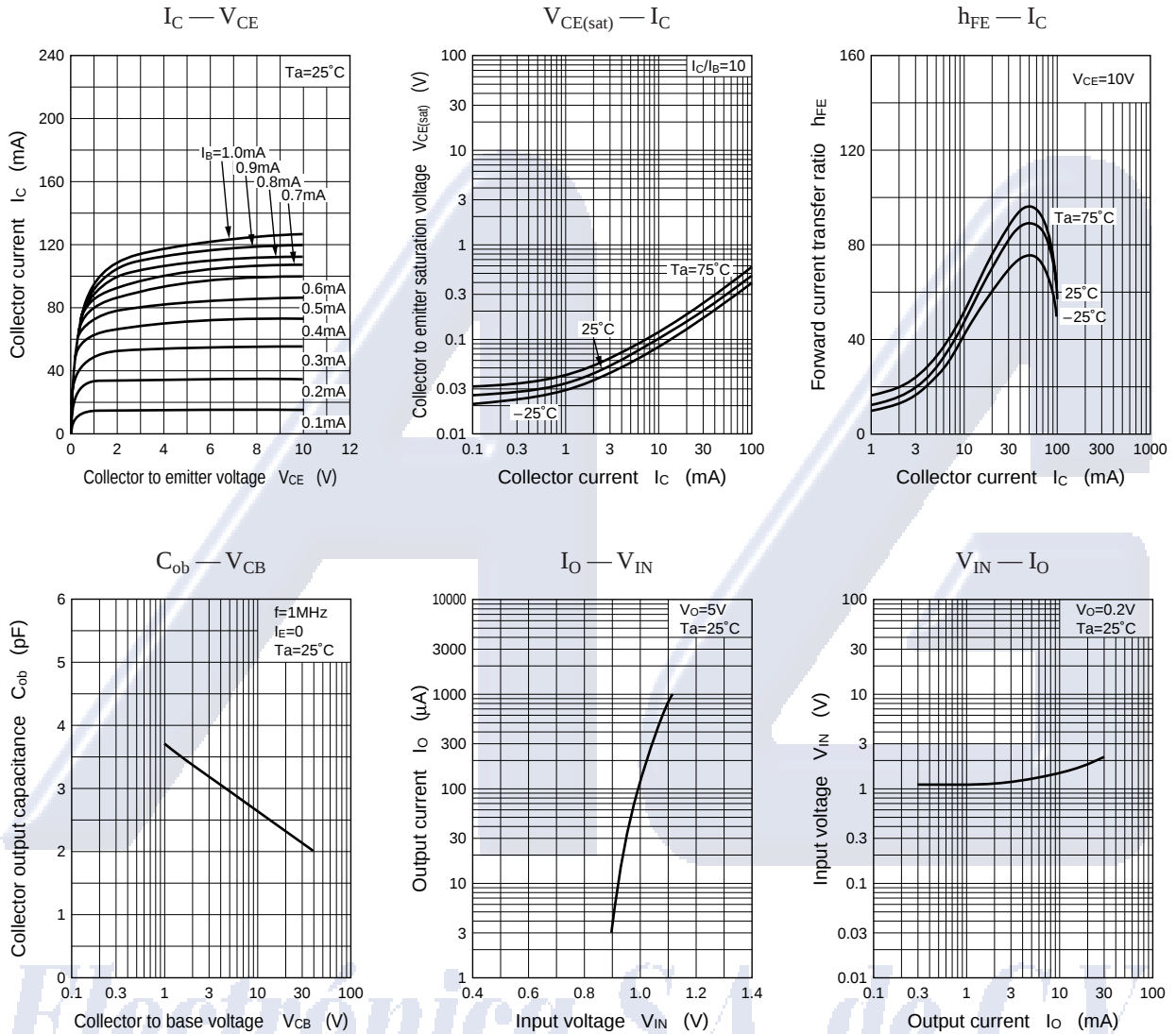


Characteristics charts of UN4217

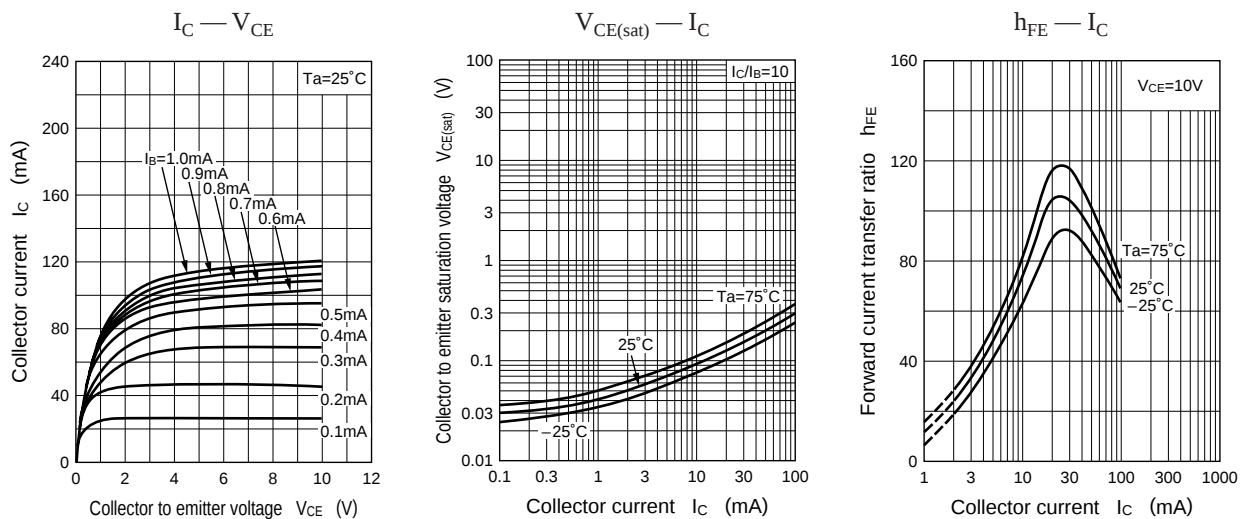


UN4211/4212/4213/4214/4215/4216/4217/
Transistors with built-in Resistor 4218/4219/4210/421D/421E/421F/421K/421L

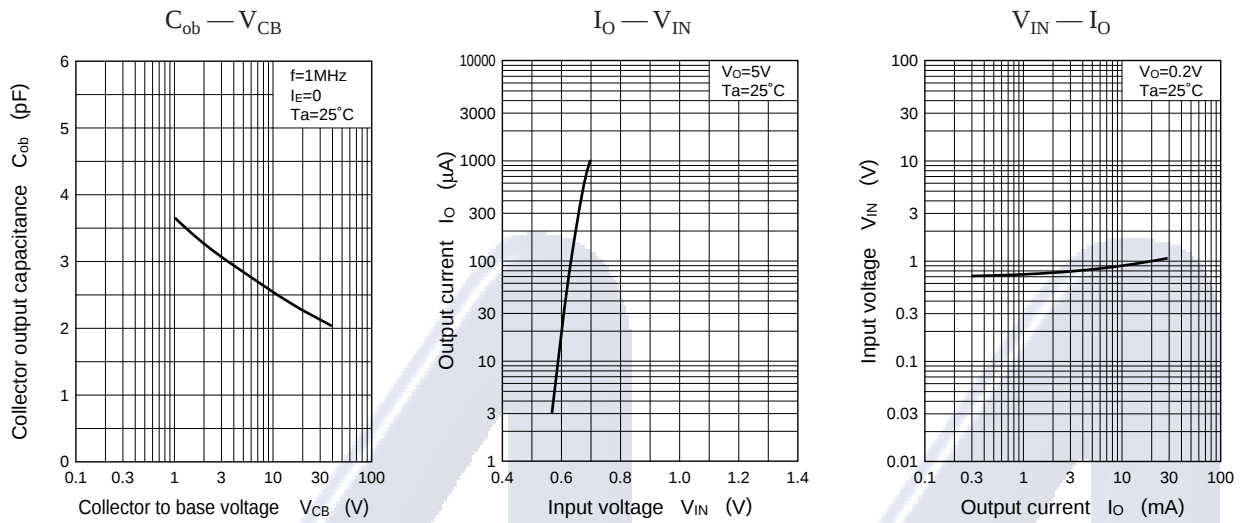
Characteristics charts of UN4218



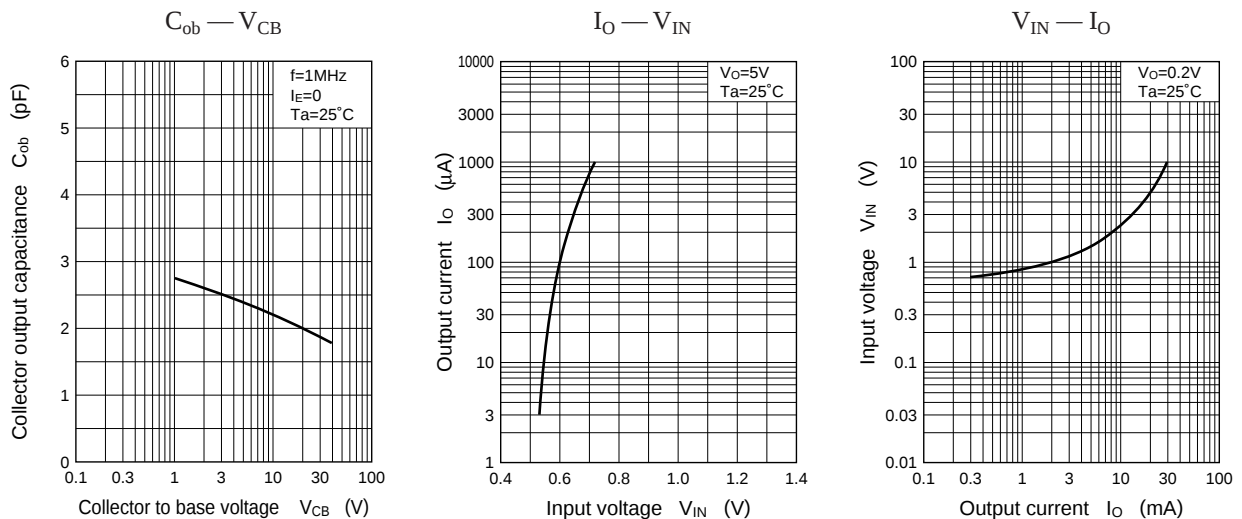
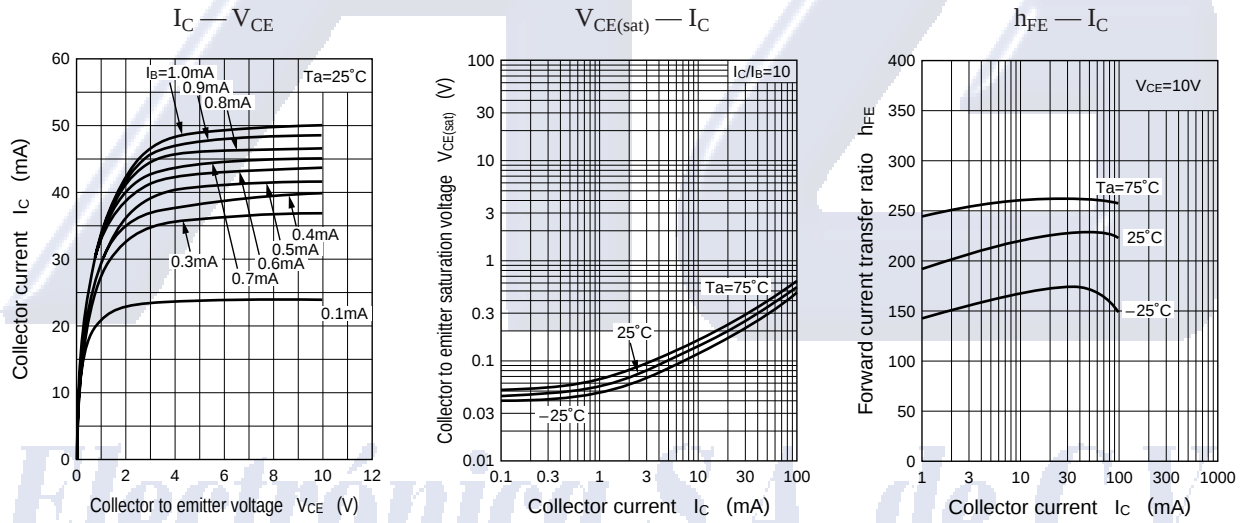
Characteristics charts of UN4219



UN4211/4212/4213/4214/4215/4216/4217/
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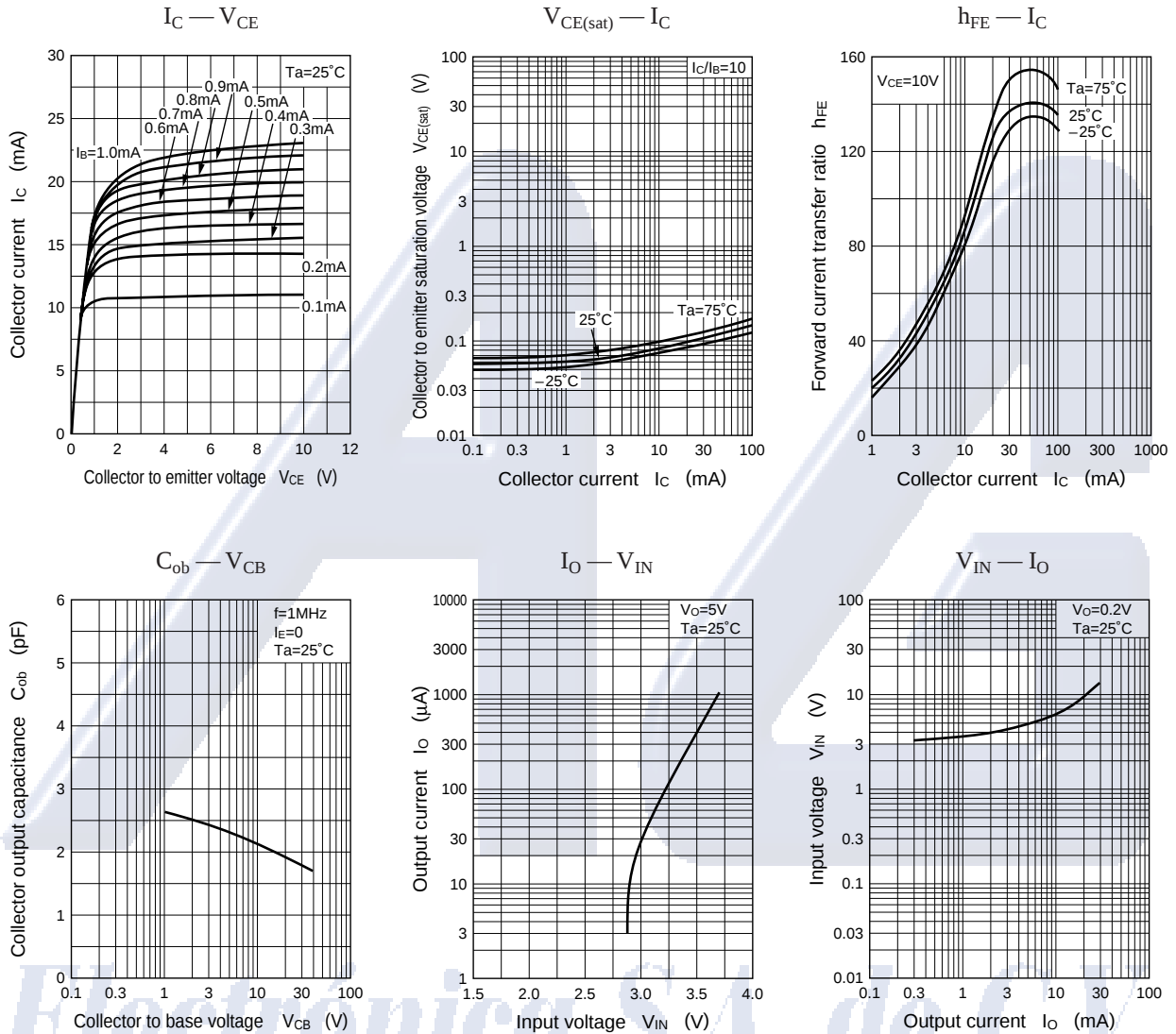


Characteristics charts of UN4210

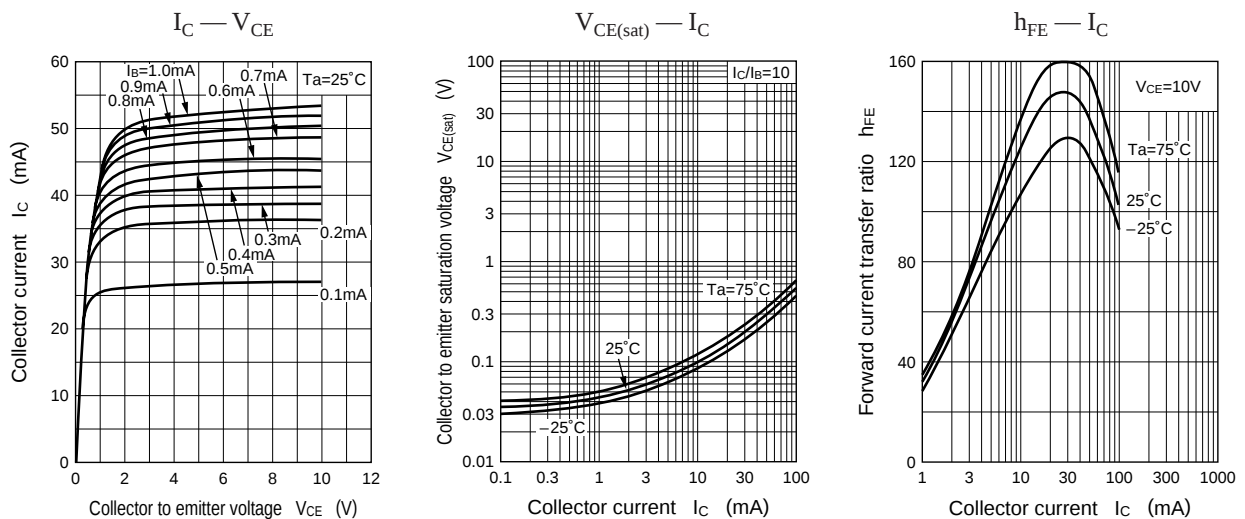


UN4211/4212/4213/4214/4215/4216/4217/ Transistors with built-in Resistor 4218/4219/4210/421D/421E/421F/421K/421L

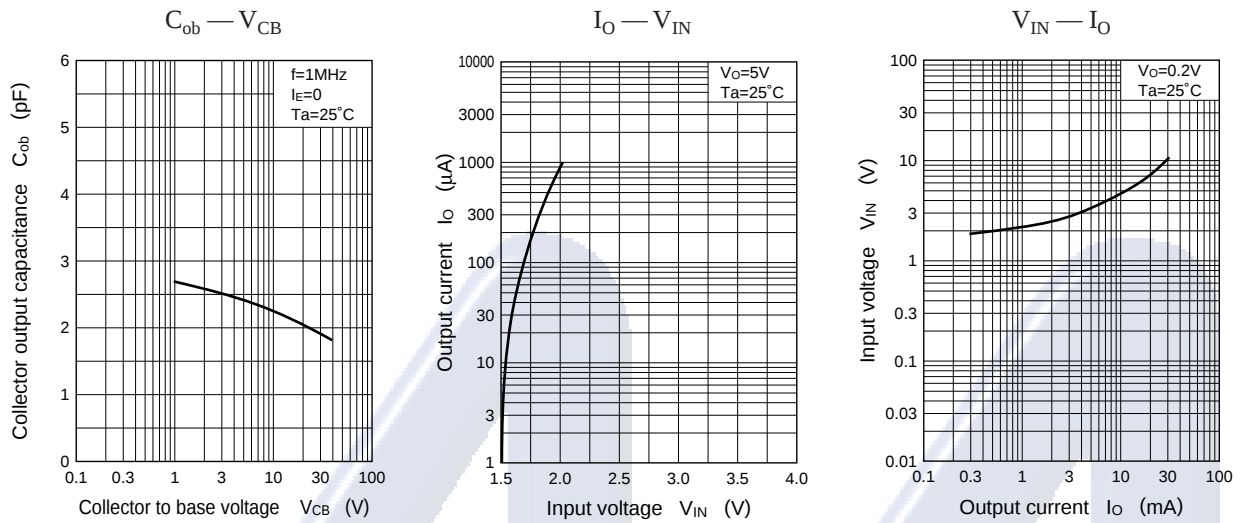
Characteristics charts of UN421D



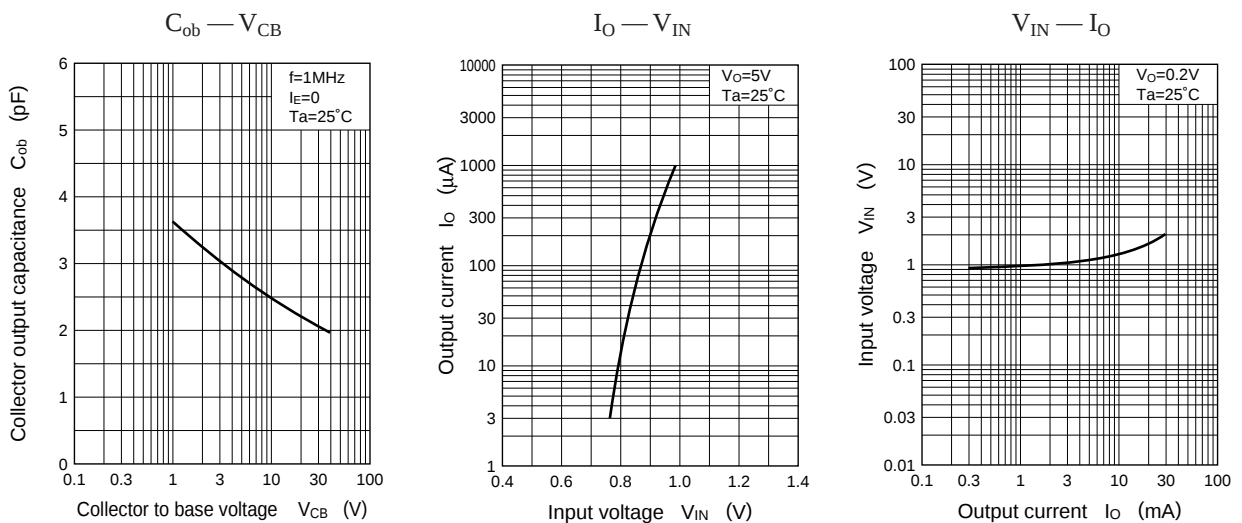
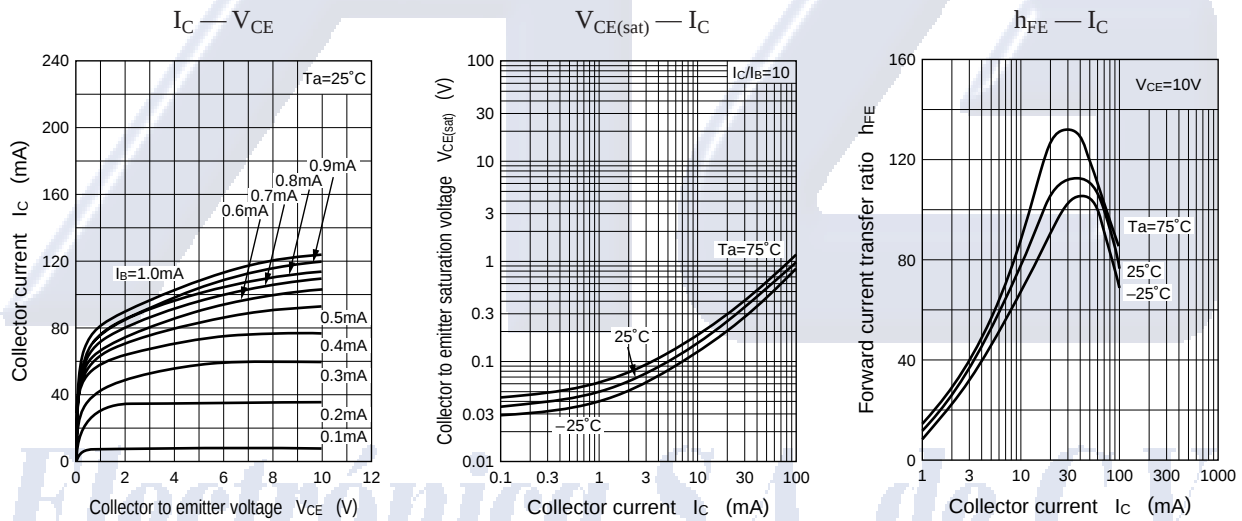
Characteristics charts of UN421E



UN4211/4212/4213/4214/4215/4216/4217/
Transistors with built-in Resistor 4218/4219/4210/421D/421E/421F/421K/421L

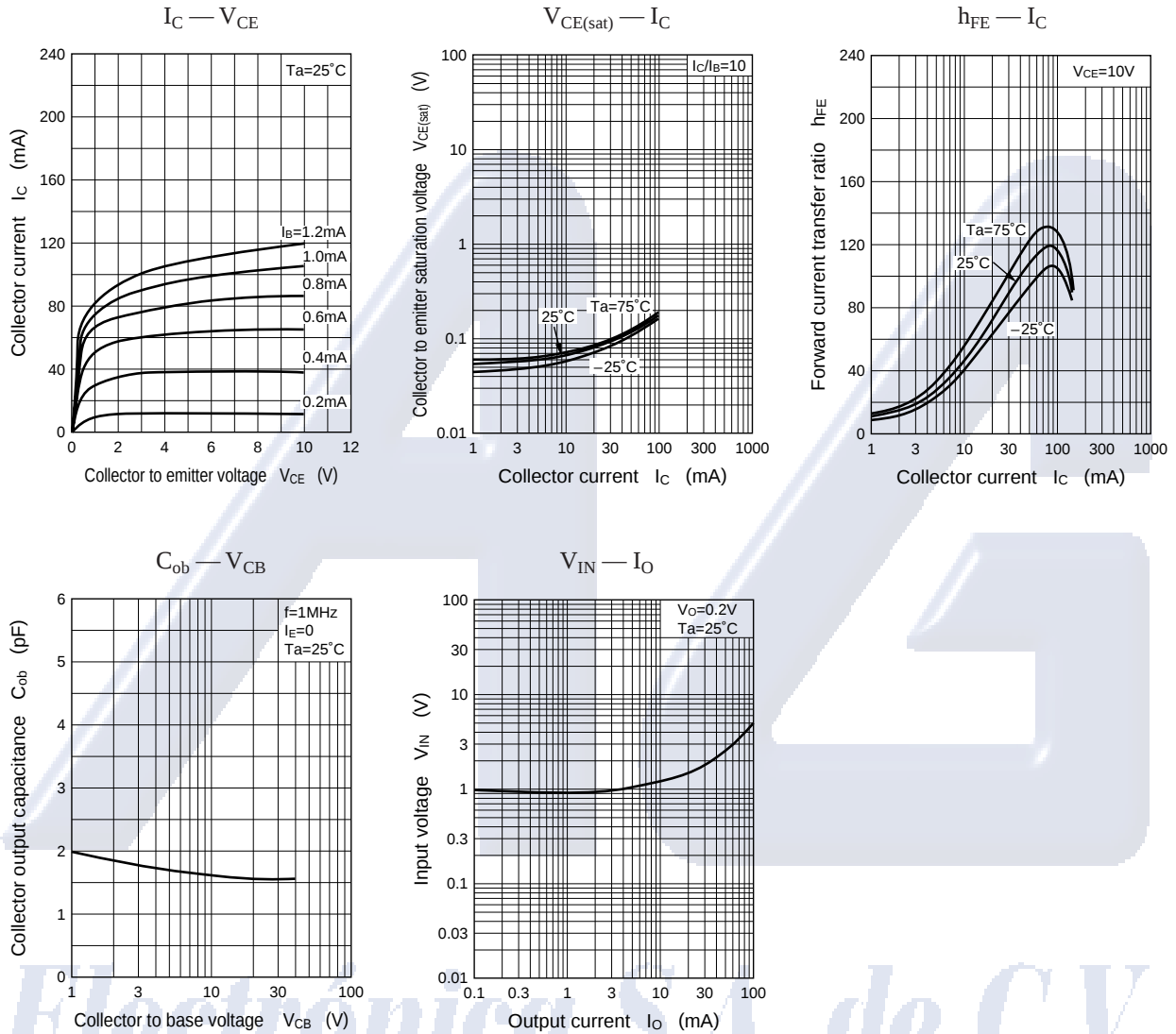


Characteristics charts of UN421F

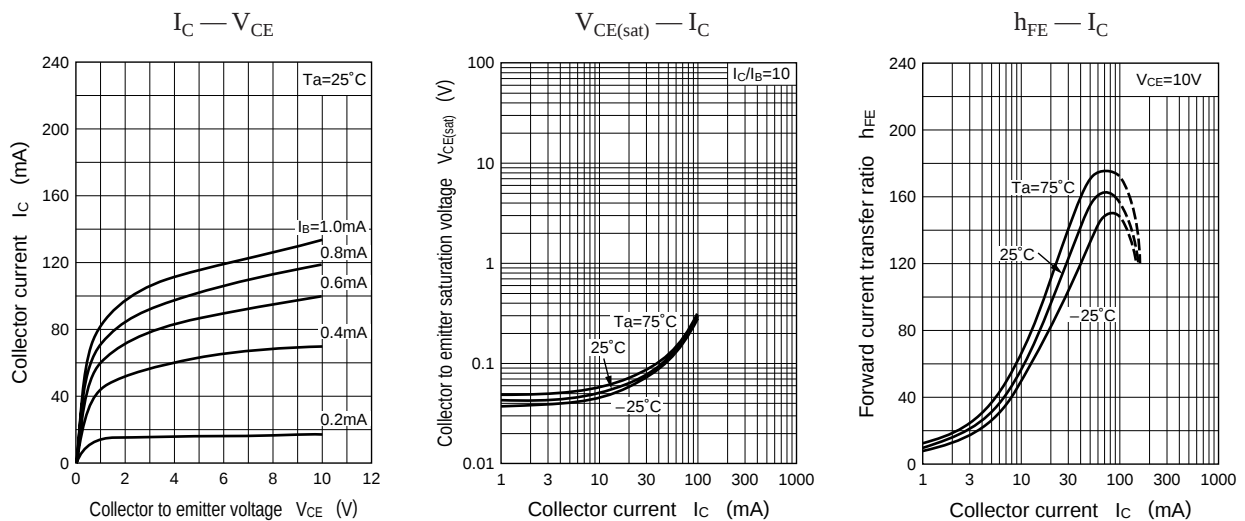


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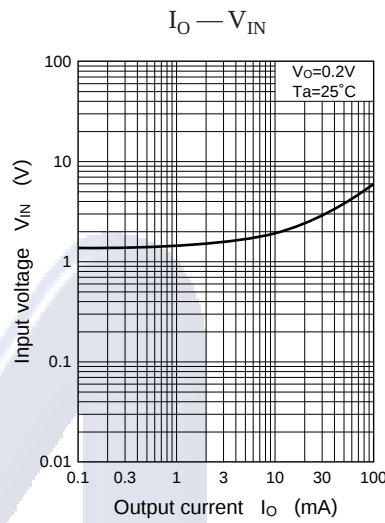
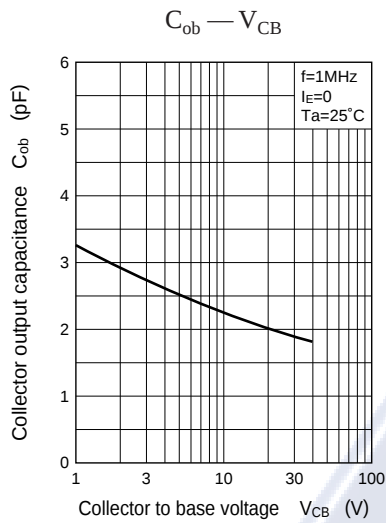
Characteristics charts of UN421K



Characteristics charts of UN421L



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