

# UN5211/5212/5213/5214/5215/5216/5217/5218/5219/5210/ 521D/521E/521F/521K/521L/521M/521N/521T/521V/521Z

## Silicon NPN epitaxial planer transistor

For digital circuits

### Features

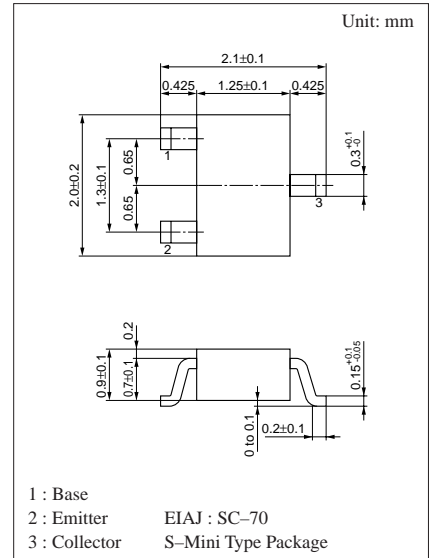
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- S-Mini type package, allowing automatic insertion through tape packing and magazine packing.

### Resistance by Part Number

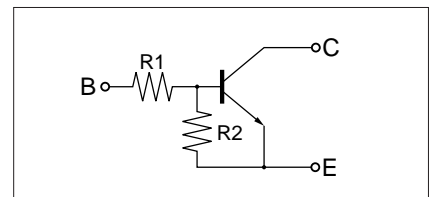
	Marking Symbol	(R <sub>1</sub> )	(R <sub>2</sub> )
• UN5211	8A	10kΩ	10kΩ
• UN5212	8B	22kΩ	22kΩ
• UN5213	8C	47kΩ	47kΩ
• UN5214	8D	10kΩ	47kΩ
• UN5215	8E	10kΩ	—
• UN5216	8F	4.7kΩ	—
• UN5217	8H	22kΩ	—
• UN5218	8I	0.51kΩ	5.1kΩ
• UN5219	8K	1kΩ	10kΩ
• UN5210	8L	47kΩ	—
• UN521D	8M	47kΩ	10kΩ
• UN521E	8N	47kΩ	22kΩ
• UN521F	8O	4.7kΩ	10kΩ
• UN521K	8P	10kΩ	4.7kΩ
• UN521L	8Q	4.7kΩ	4.7kΩ
• UN521M	EL	2.2kΩ	47kΩ
• UN521N	EX	4.7kΩ	47kΩ
• UN521T	EZ	22kΩ	47kΩ
• UN521V	FD	2.2kΩ	2.2kΩ
• UN521Z	FF	4.7kΩ	22kΩ

### Absolute Maximum Ratings (T<sub>a</sub>=25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V <sub>CBO</sub>	50	V
Collector to emitter voltage	V <sub>CEO</sub>	50	V
Collector current	I <sub>C</sub>	100	mA
Total power dissipation	P <sub>T</sub>	150	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C



### Internal Connection



UN5211/5212/5213/5214/5215/5216/5217/5218/5219/5210/  
**Transistors with built-in Resistor 521D/521E/521F/521K/521L/521M/521N/521T/521V/521Z**

**Electrical Characteristics** (T<sub>a</sub>=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Collector cutoff current		I <sub>CBO</sub>	V <sub>CB</sub> = 50V, I <sub>E</sub> = 0			0.1	μA
		I <sub>CEO</sub>	V <sub>CE</sub> = 50V, I <sub>B</sub> = 0			0.5	μA
Emitter cutoff current	UN5211	I <sub>EBO</sub>	V <sub>EB</sub> = 6V, I <sub>C</sub> = 0			0.5	mA
	UN5212/5214/521E/521D/521M/521N/521T					0.2	
	UN5213					0.1	
	UN5215/5216/5217/5210					0.01	
	UN521F/521K					1.0	
	UN5219					1.5	
	UN5218/521L/521V					2.0	
	UN521Z					0.4	
Collector to base voltage		V <sub>CBO</sub>	I <sub>C</sub> = 10μA, I <sub>E</sub> = 0	50			V
Collector to emitter voltage		V <sub>CEO</sub>	I <sub>C</sub> = 2mA, I <sub>B</sub> = 0	50			V
Forward current transfer ratio	UN5211	h <sub>FE</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 5mA	35			
	UN5212/521E			60			
	UN5213/5214/521M			80			
	UN5215*/5216*/5217*/5210*			160		460	
	UN521F/521D/5219			30			
	UN5218/521K/521L			20			
	UN521N/521T			80		400	
	UN521V			6		20	
UN521Z	60		200				
Collector to emitter saturation voltage		V <sub>CE(sat)</sub>	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0.3mA			0.25	V
		UN521V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1.5mA			0.25	V
Output voltage high level		V <sub>OH</sub>	V <sub>CC</sub> = 5V, V <sub>B</sub> = 0.5V, R <sub>L</sub> = 1kΩ	4.9			V
Output voltage low level		V <sub>OL</sub>	V <sub>CC</sub> = 5V, V <sub>B</sub> = 2.5V, R <sub>L</sub> = 1kΩ			0.2	V
			V <sub>OC</sub> = 5V, V <sub>B</sub> = 3.5V, R <sub>L</sub> = 1kΩ			0.2	
			V <sub>CC</sub> = 5V, V <sub>B</sub> = 10V, R <sub>L</sub> = 1kΩ			0.2	
			V <sub>CC</sub> = 5V, V <sub>B</sub> = 6V, R <sub>L</sub> = 1kΩ			0.2	
Transition frequency		f <sub>T</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = -2mA, f = 200MHz		150		MHz
Input resistance	UN5211/5214/5215/521K	R <sub>i</sub>		(-30%)	10	(+30%)	kΩ
	UN5212/5217/521T				22		
	UN5213/521D/521E/5210				47		
	UN5216/521F/521L/521N/521Z				4.7		
	UN5218				0.51		
	UN5219				1		
	UN521M/521V				2.2		

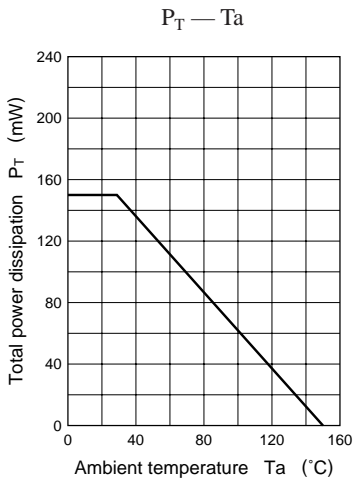
\* h<sub>FE</sub> rank classification (UN5125/5216/5217/5210)

Rank	Q	R	S
h <sub>FE</sub>	160 to 260	210 to 340	290 to 460

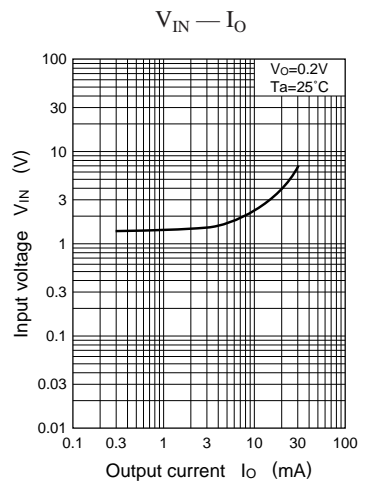
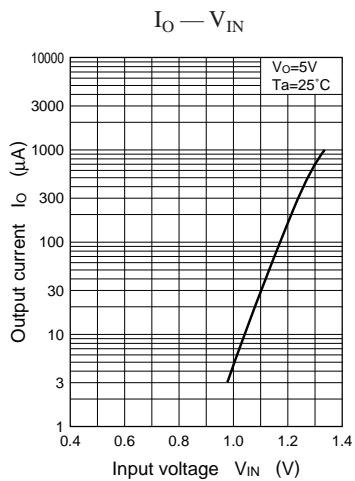
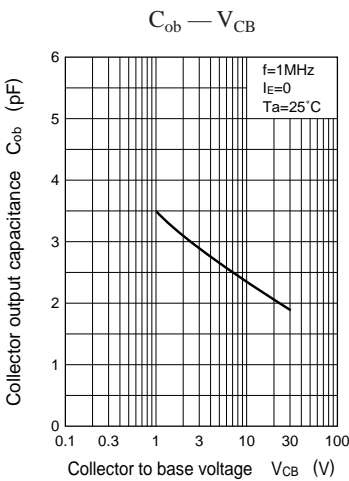
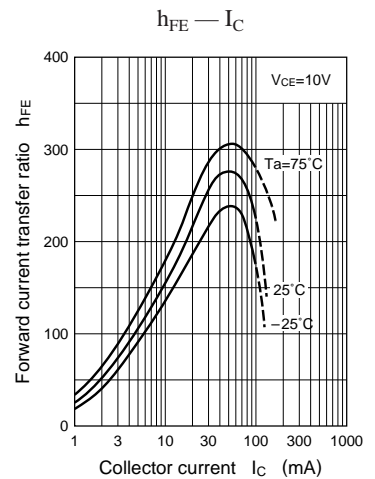
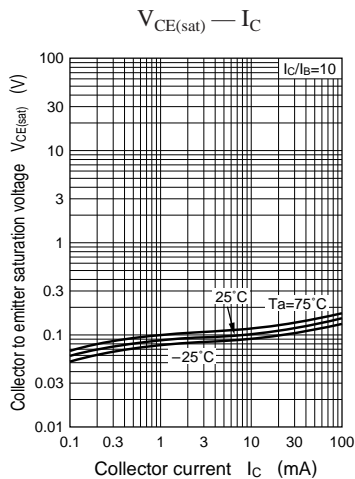
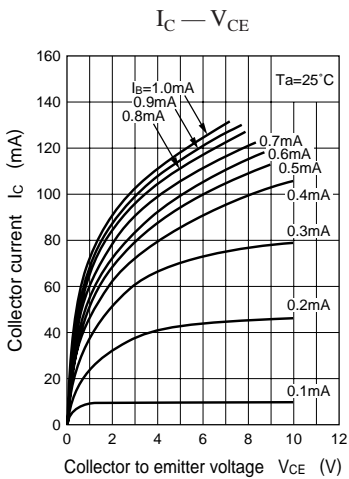
■ Electrical Characteristics (continued) (Ta=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Resistance ratio	UN5211/5212/5213/521L	R <sub>1</sub> /R <sub>2</sub>		0.8	1.0	1.2	
	UN5214			0.17	0.21	0.25	
	UN5218/5219			0.08	0.1	0.12	
	UN521D				4.7		
	UN521E				2.14		
	UN521F/521T				0.47		
	UN521K				2.13		
	UN521M				0.047		
	UN521N				0.1		
	UN521V				1.0		
	UN521Z				0.21		

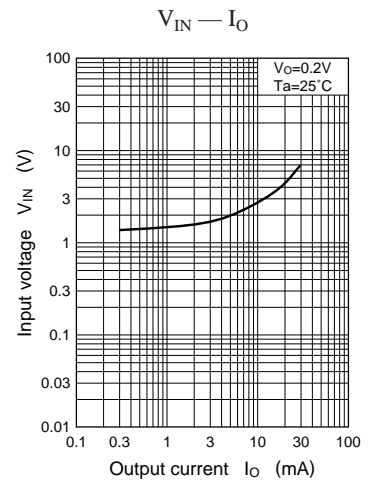
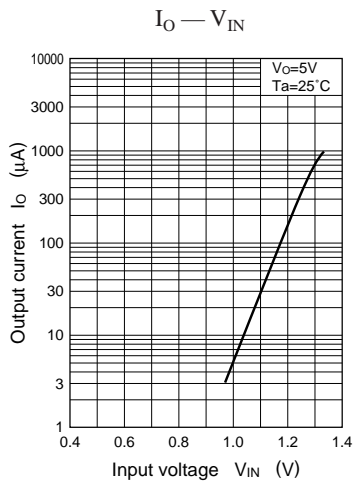
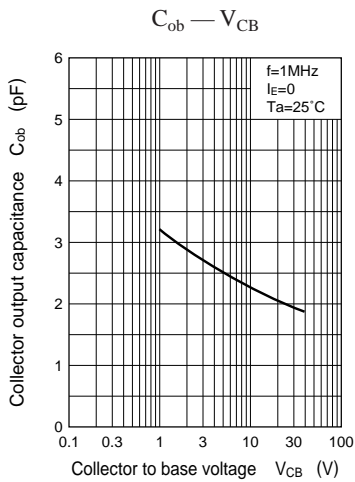
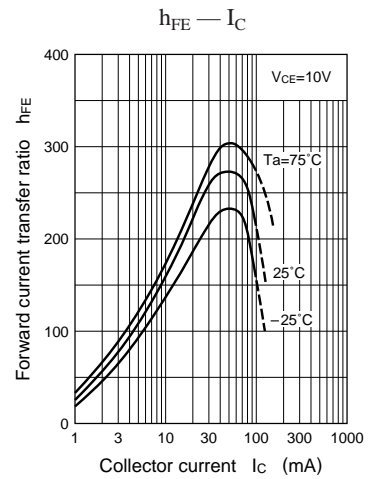
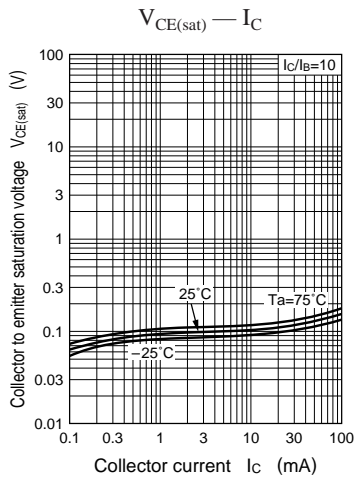
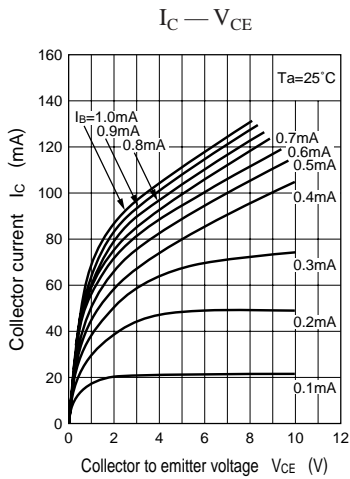
Common characteristics chart



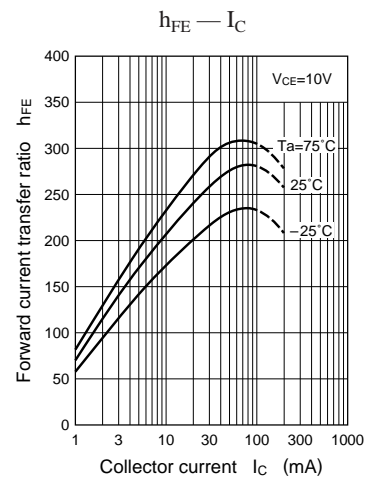
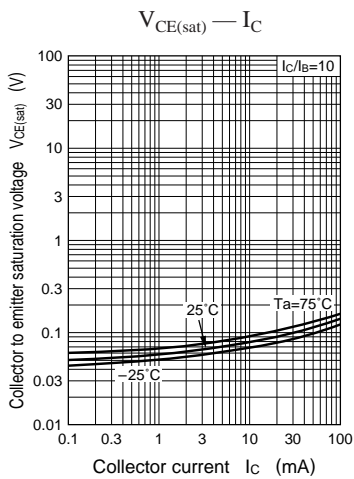
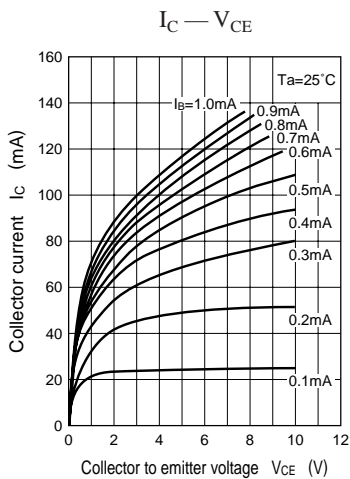
Characteristics charts of UN5211

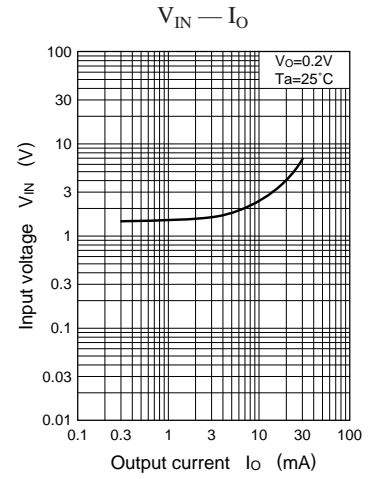
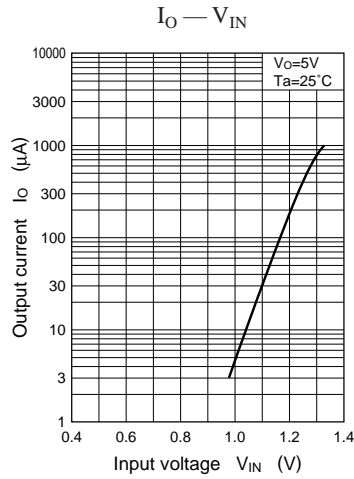
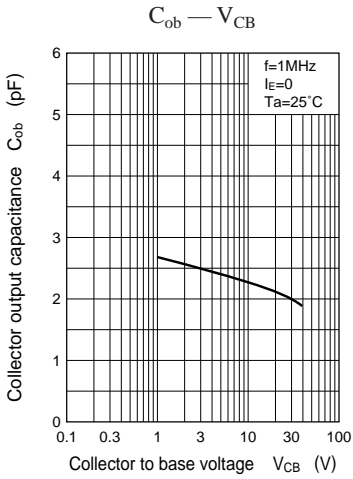


Characteristics charts of UN5212

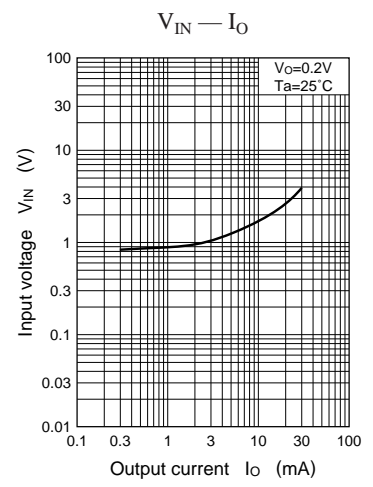
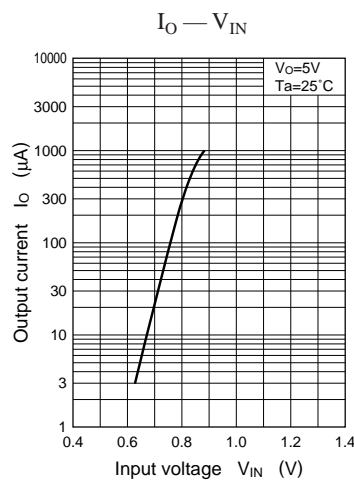
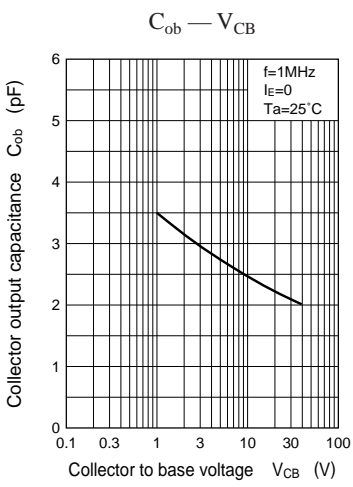
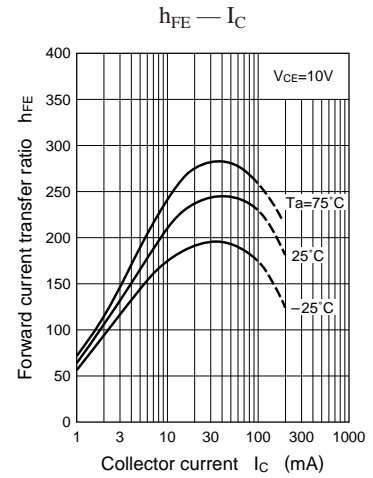
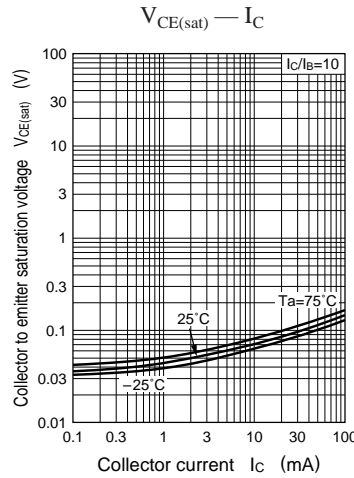
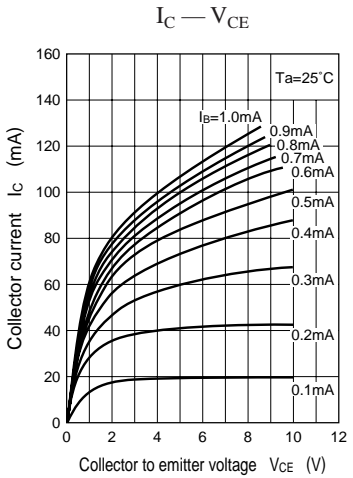


Characteristics charts of UN5213

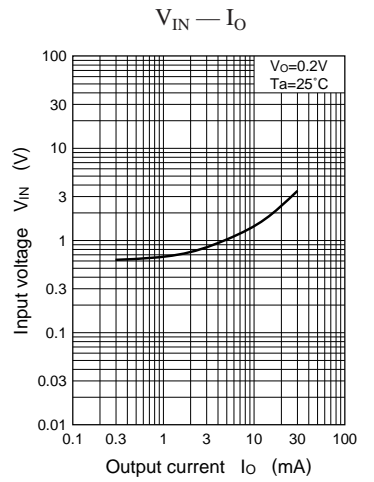
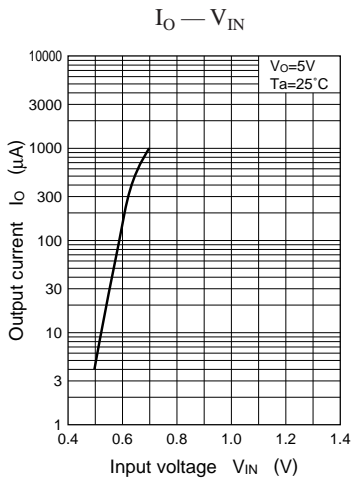
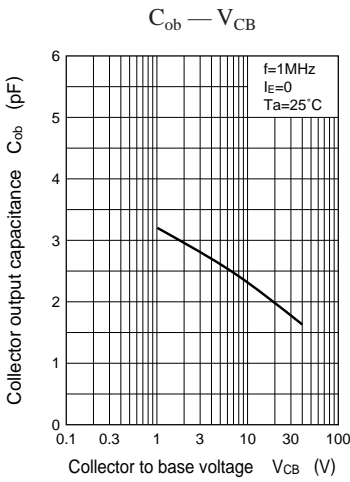
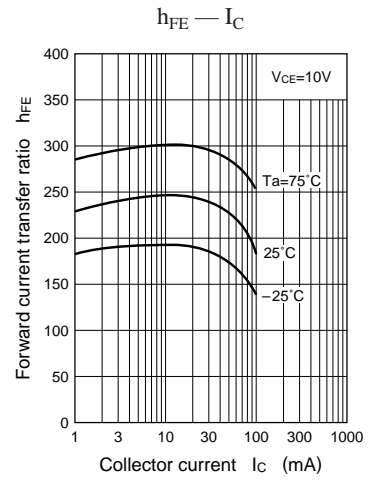
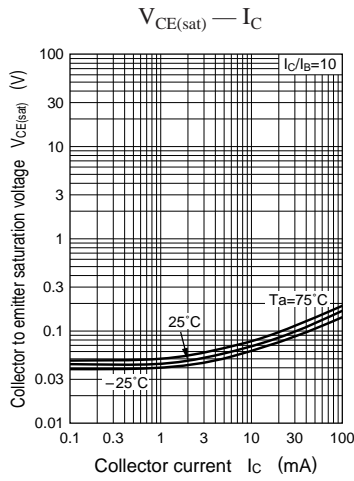
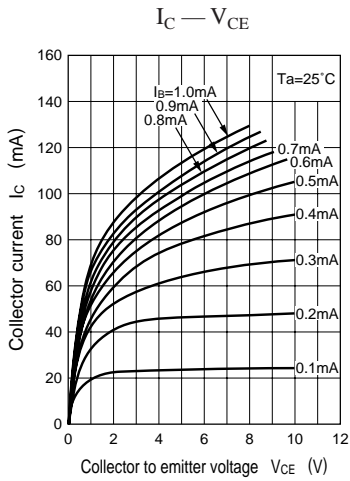




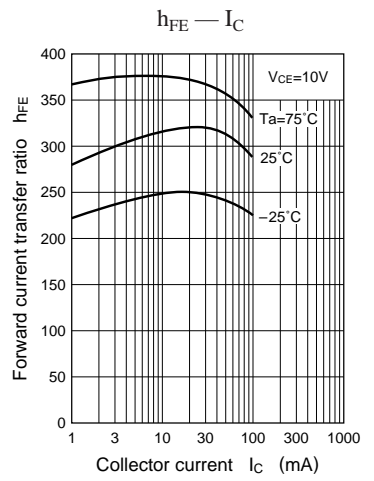
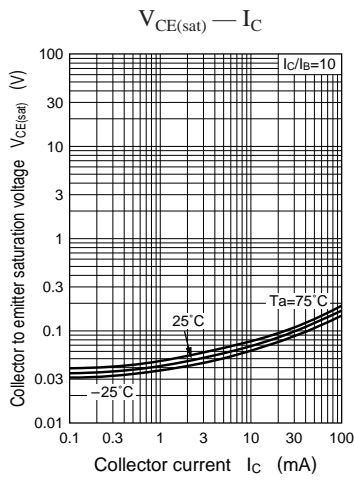
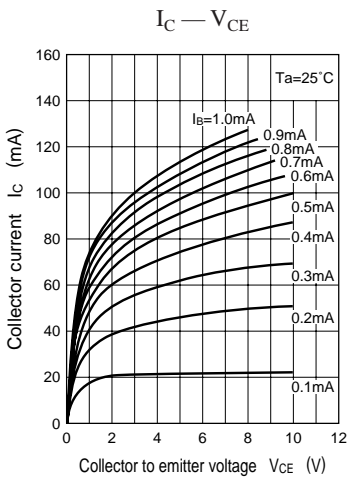
Characteristics charts of UN5214



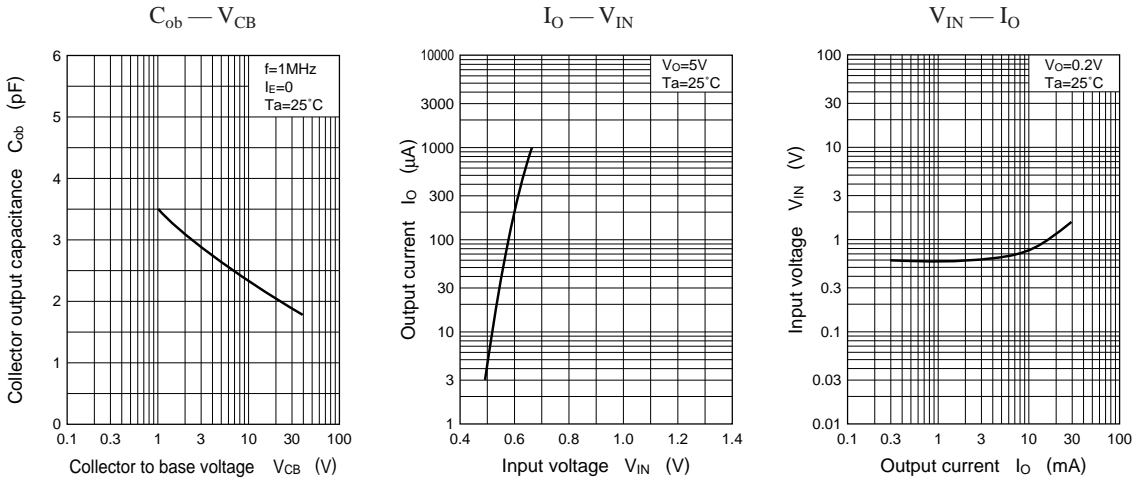
Characteristics charts of UN5215



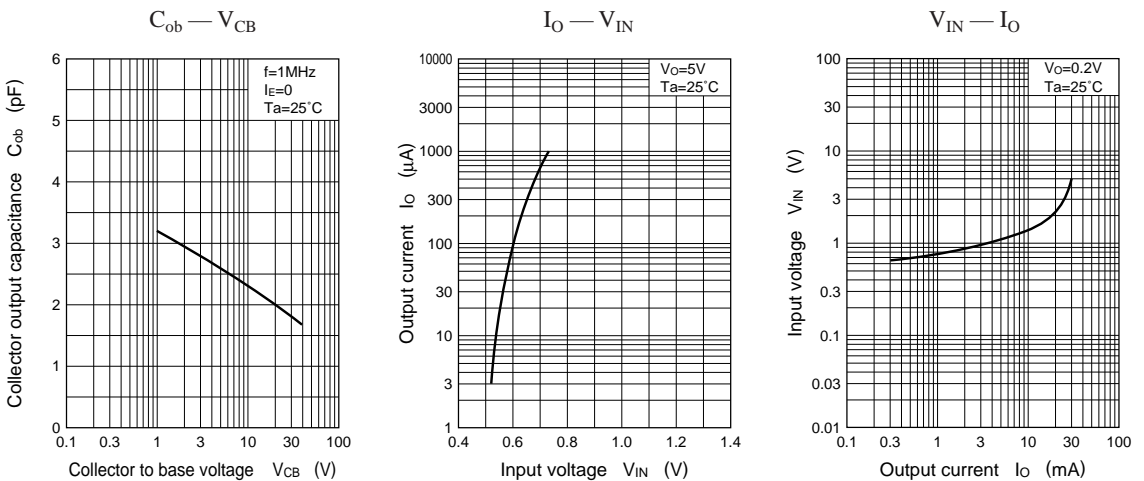
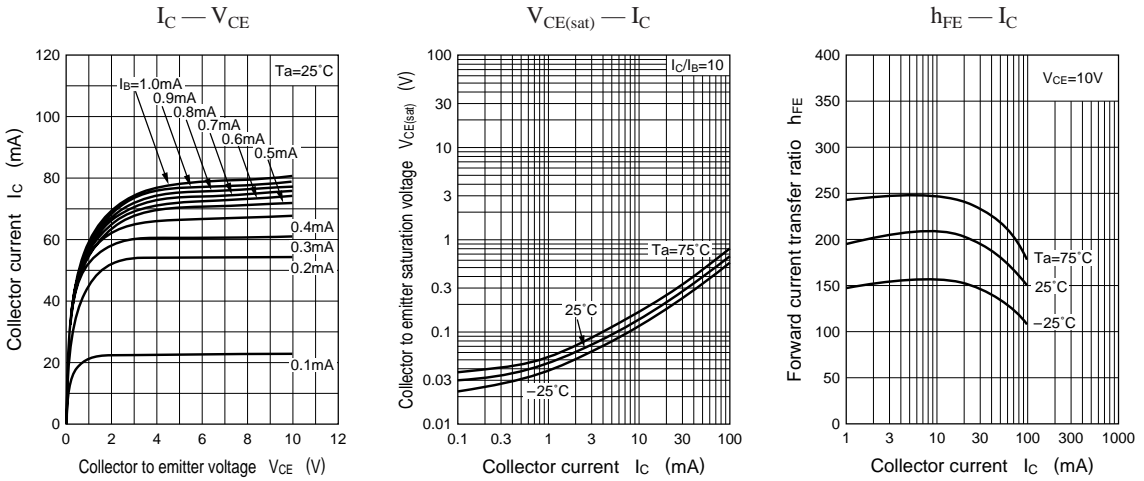
Characteristics charts of UN5216



UN5211/5212/5213/5214/5215/5216/5217/5218/5219/5210/  
 Transistors with built-in Resistor 521D/521E/521F/521K/521L/521M/521N/521T/521V/521Z

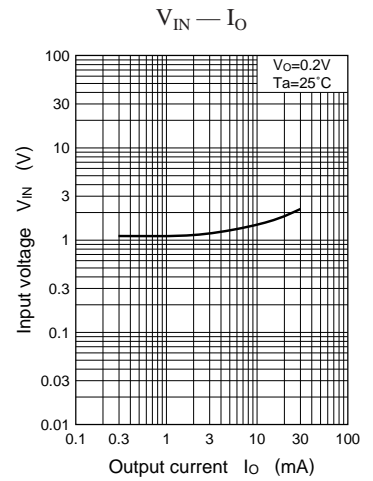
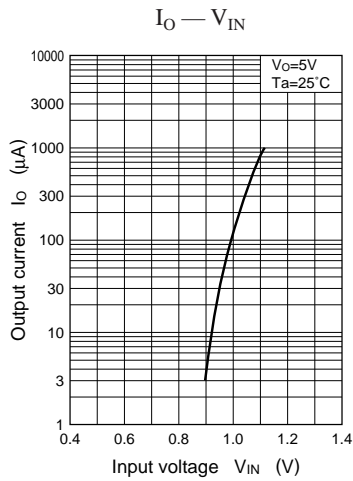
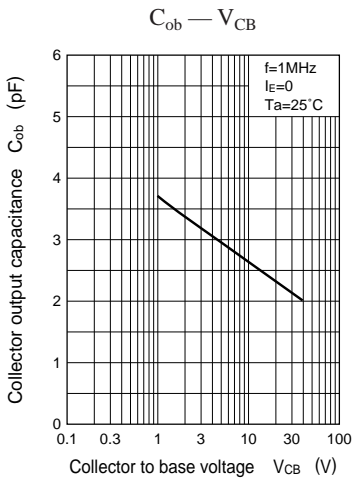
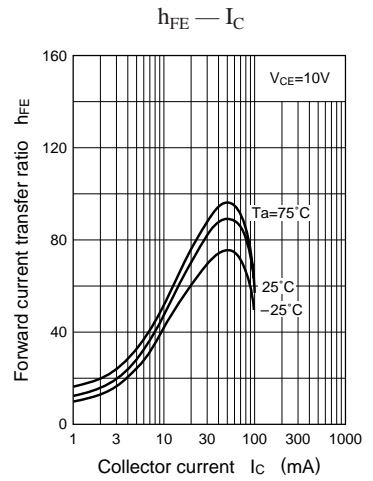
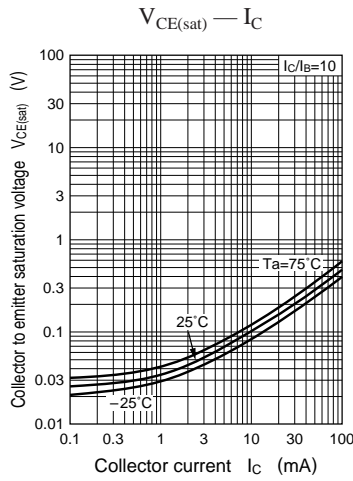
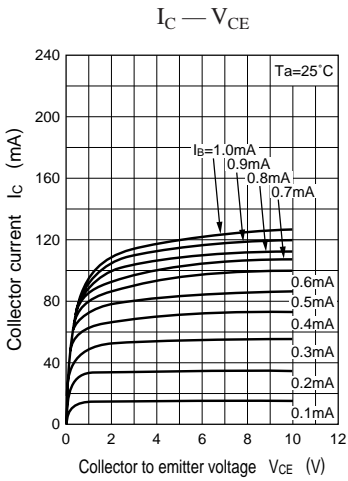


Characteristics charts of UN5217

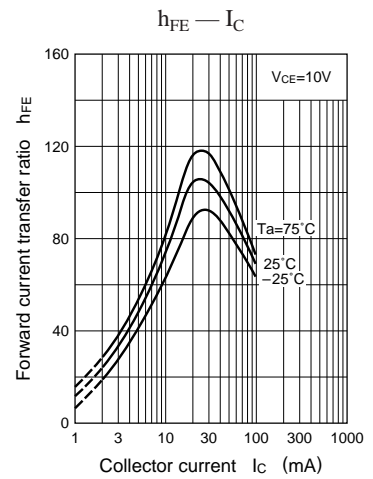
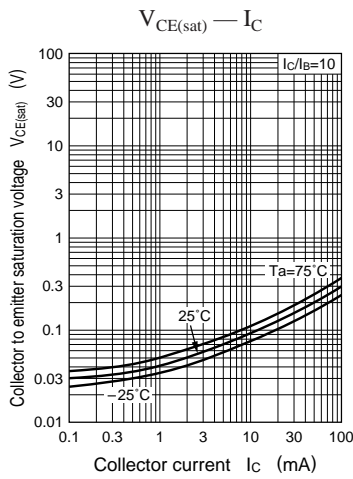
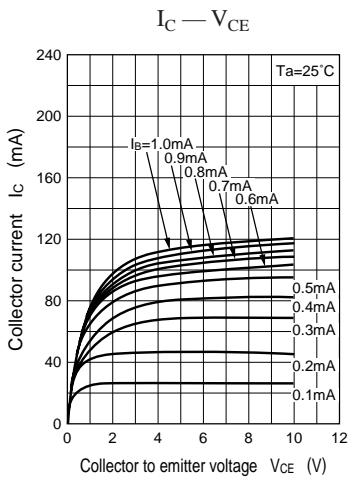


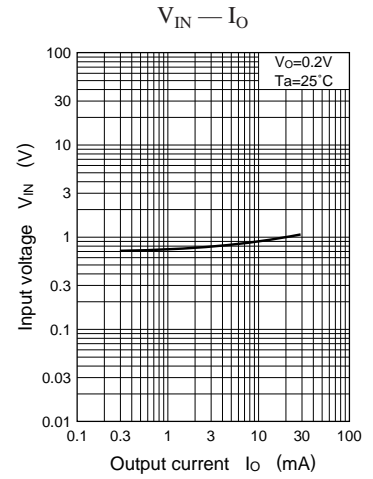
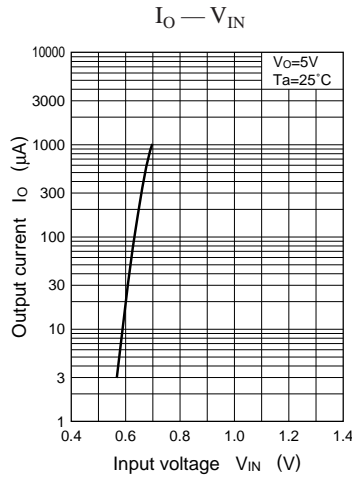
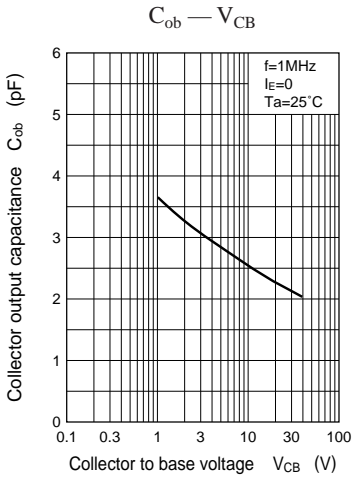


Characteristics charts of UN5218

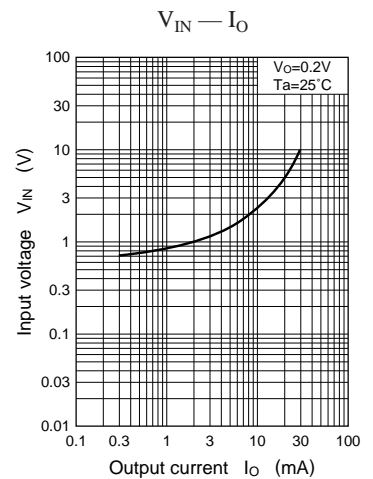
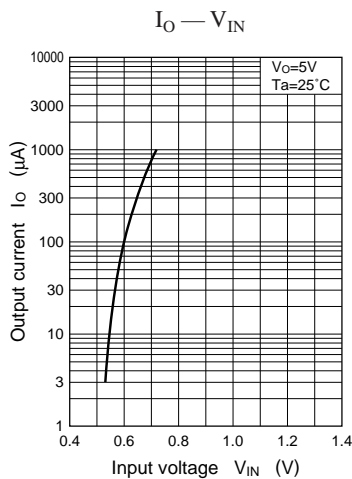
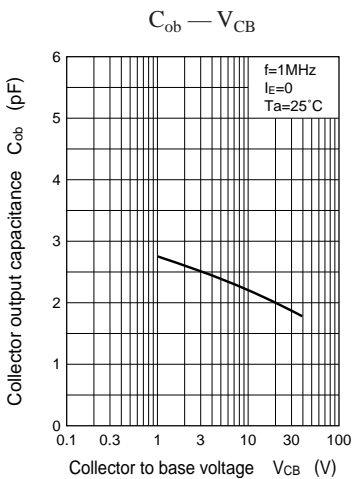
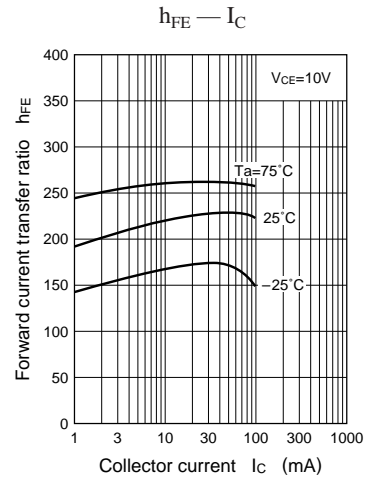
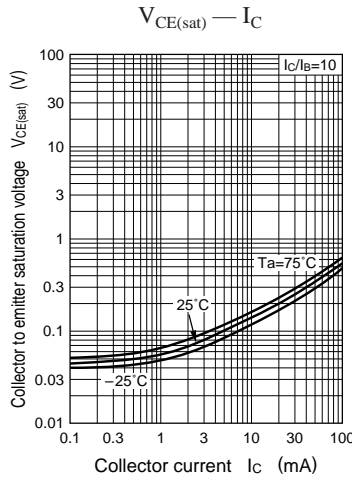
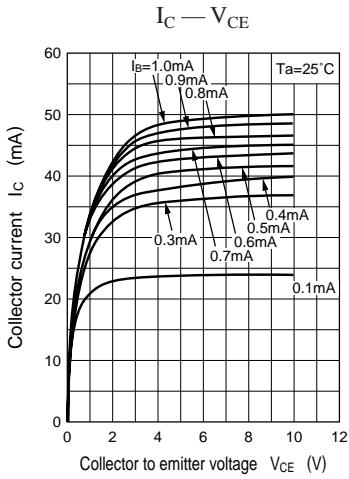


Characteristics charts of UN5219

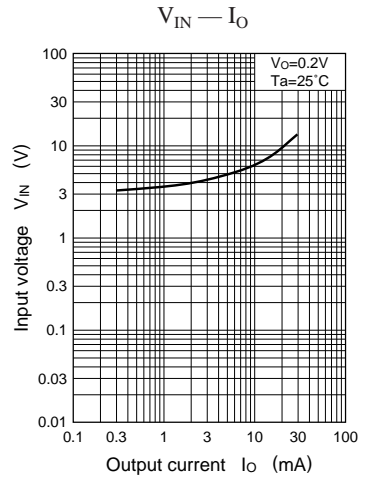
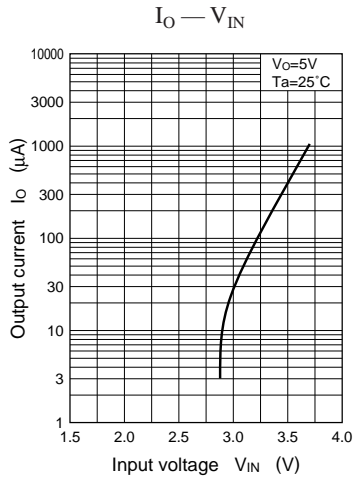
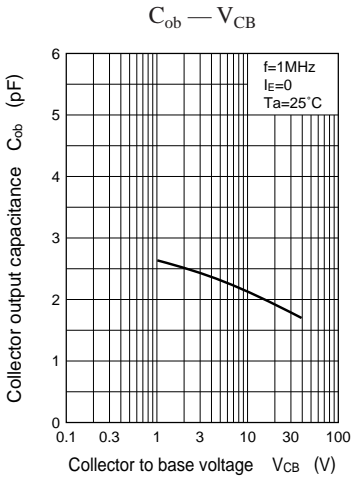
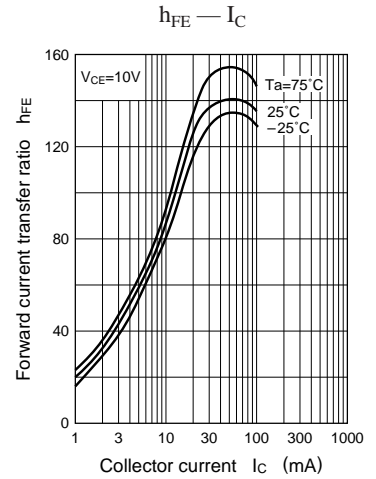
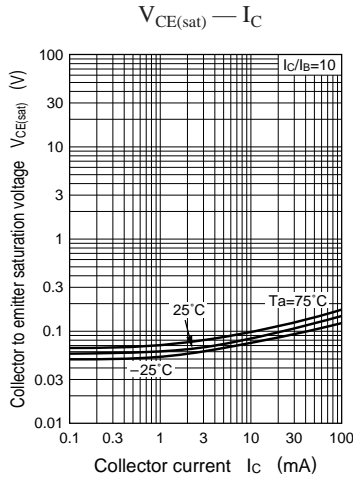
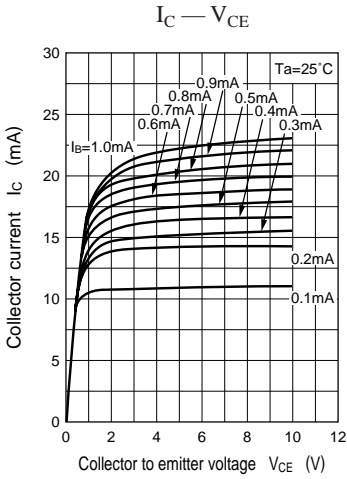




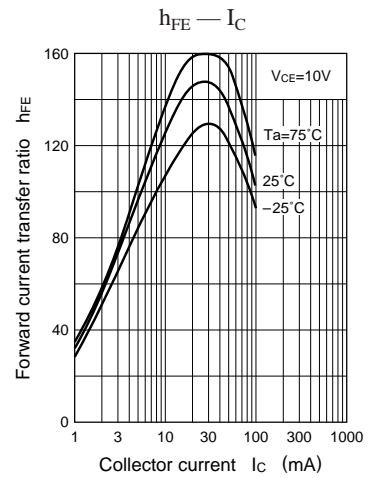
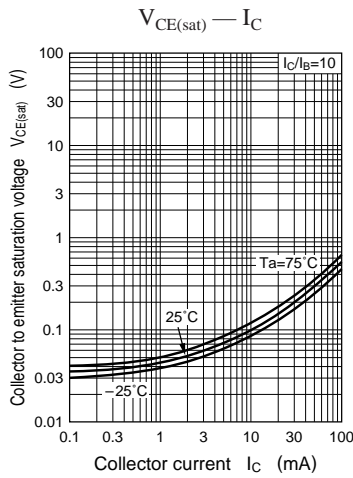
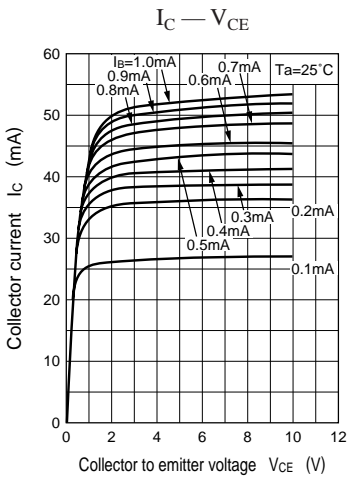
Characteristics charts of UN5210

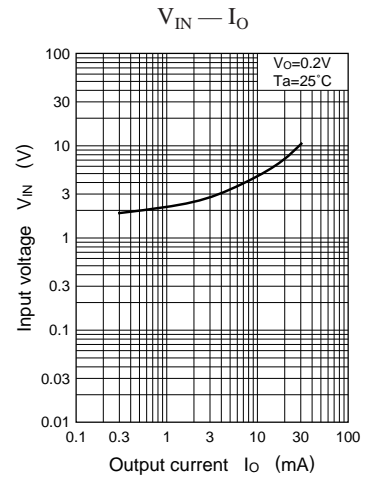
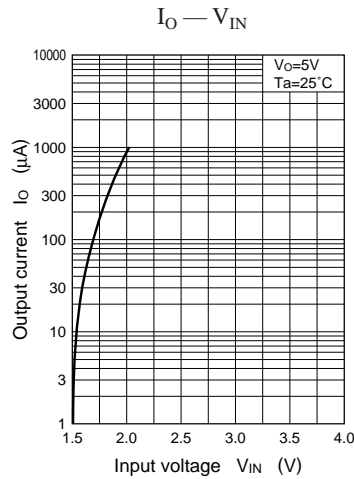
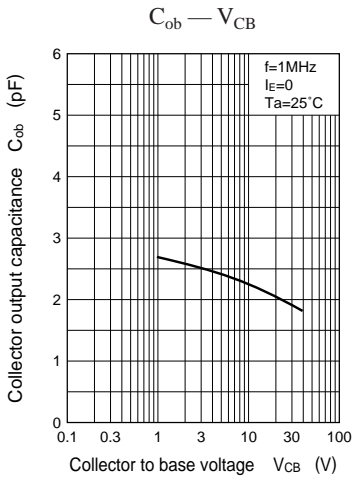


Characteristics charts of UN521D

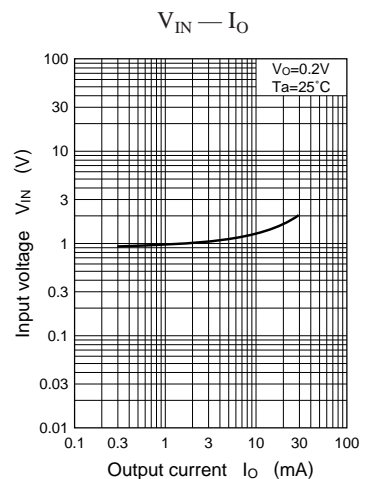
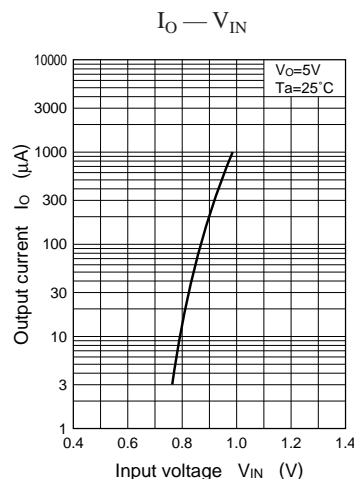
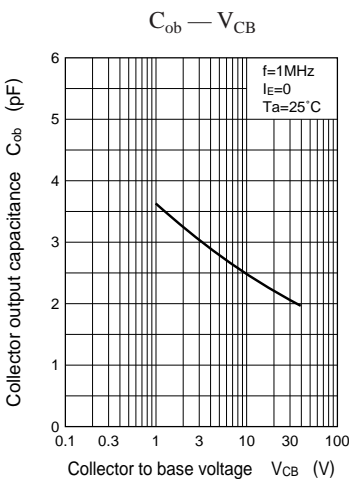
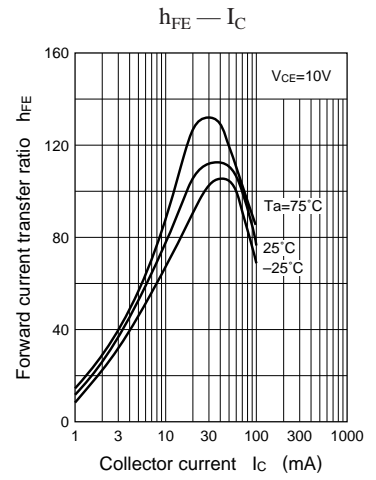
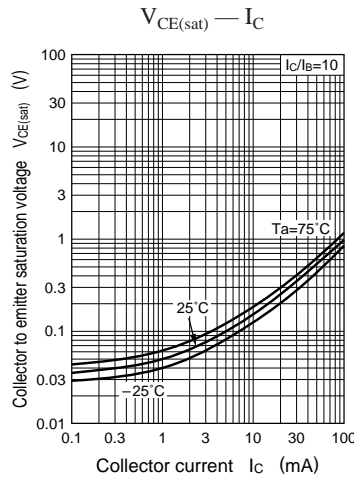
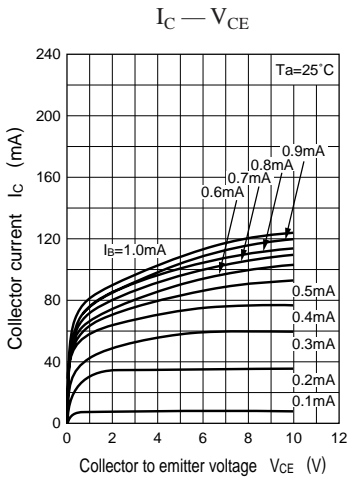


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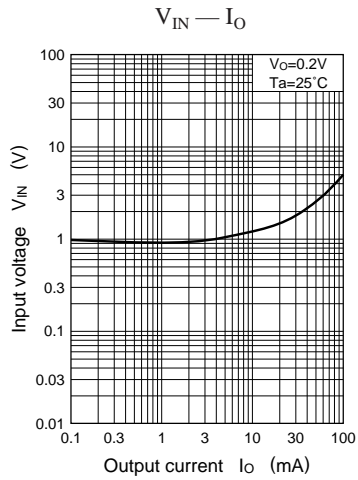
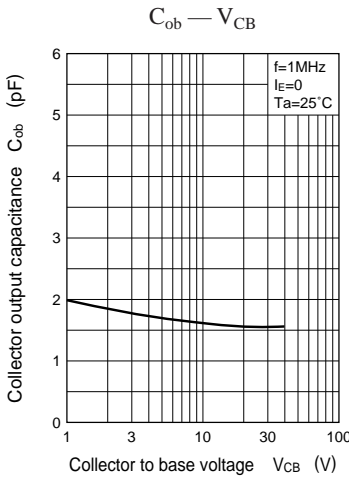
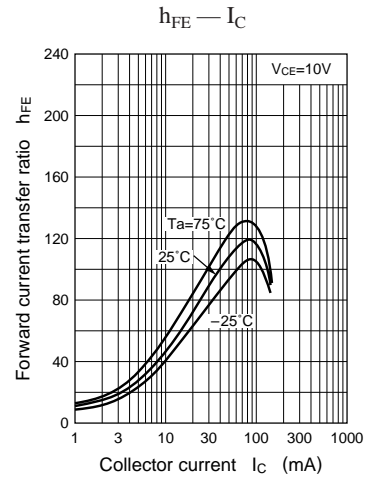
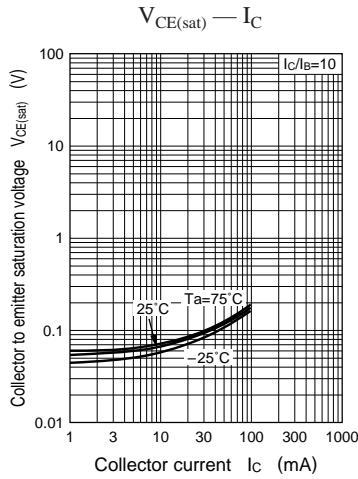
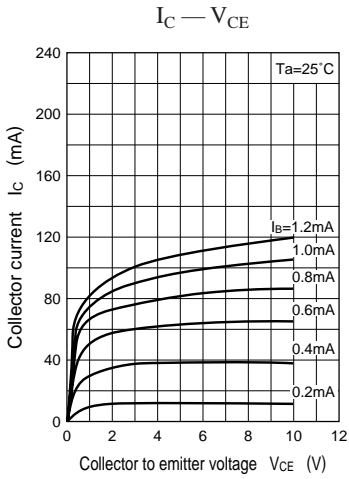




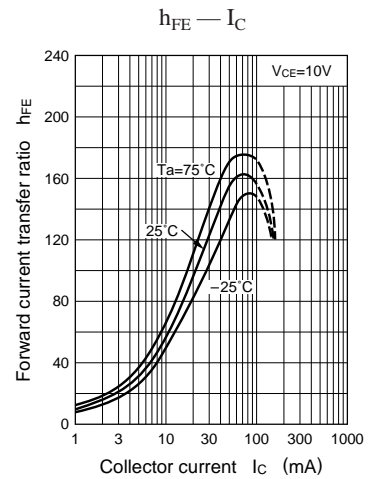
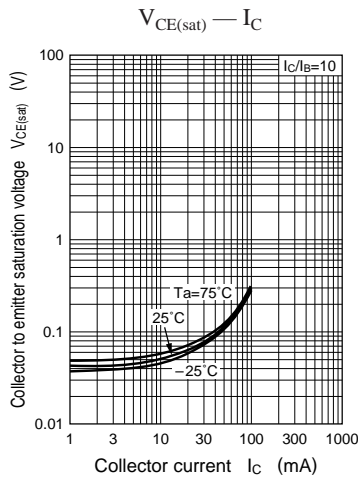
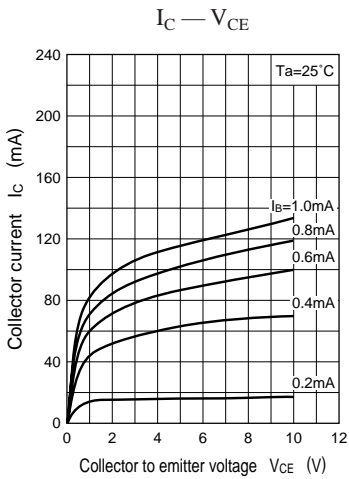
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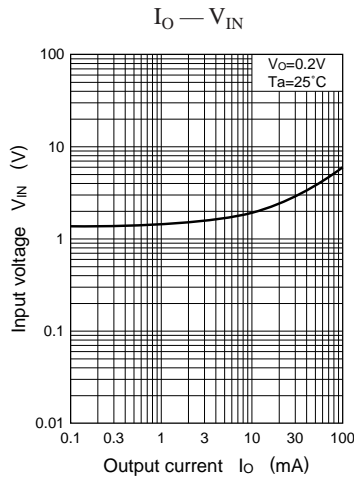
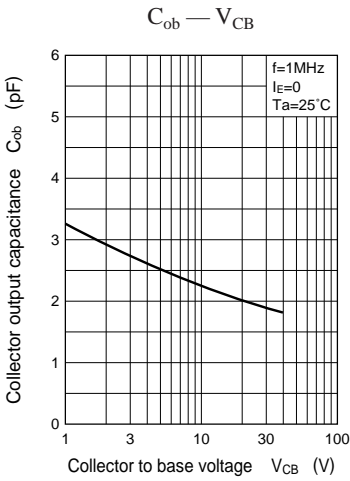


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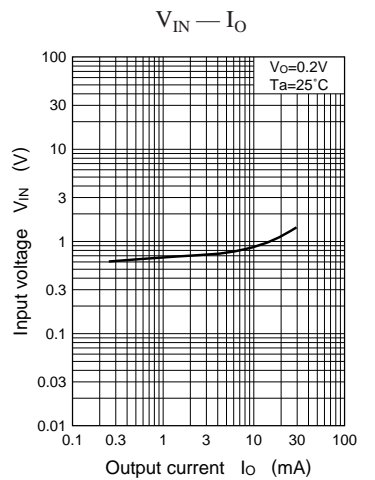
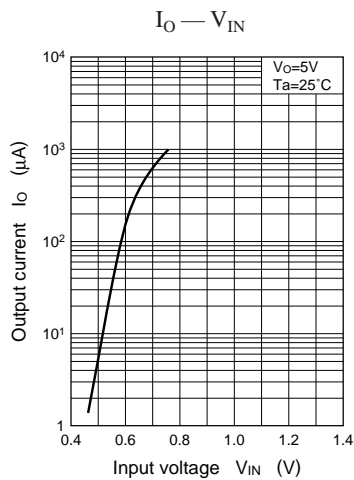
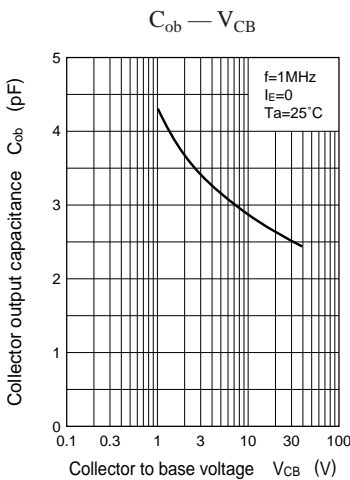
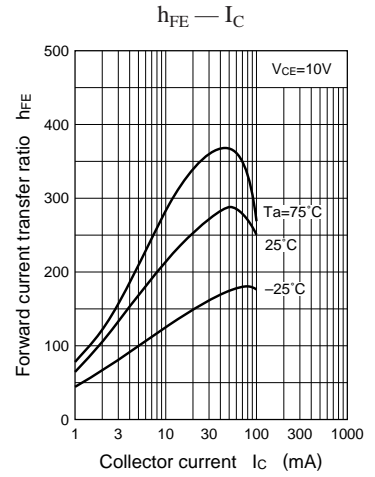
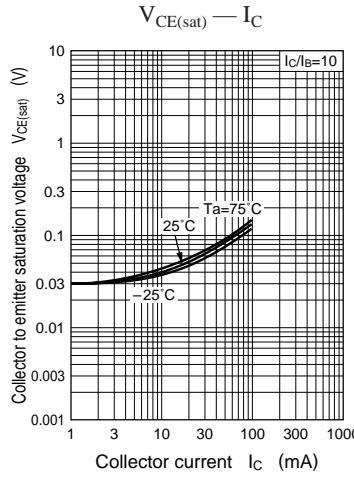
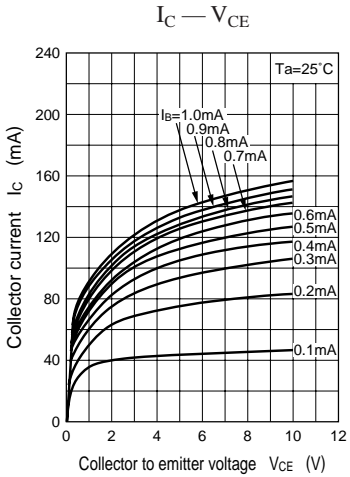


Characteristics charts of UN521L

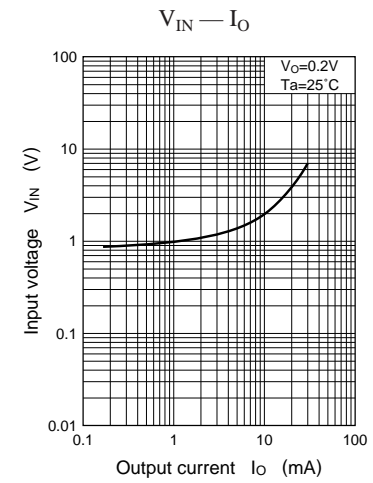
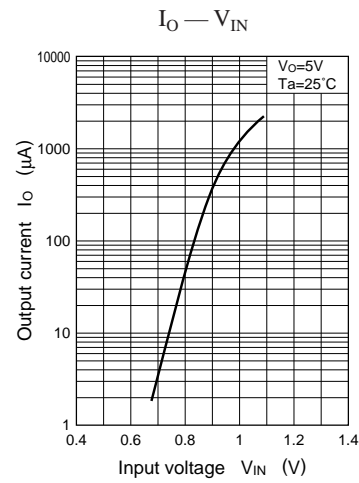
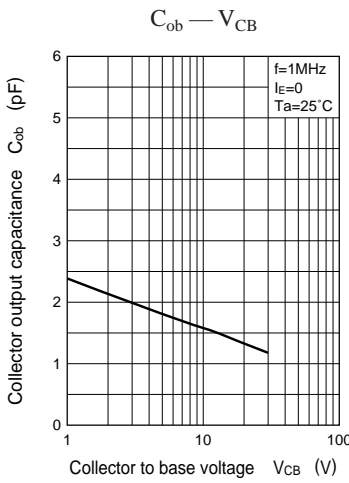
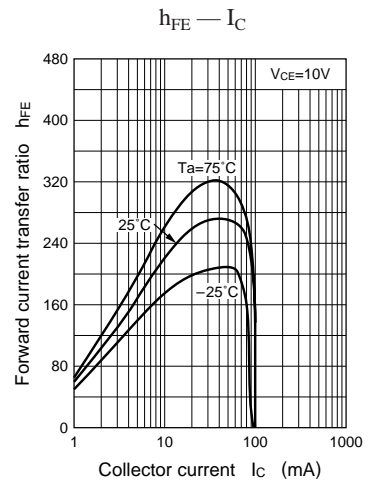
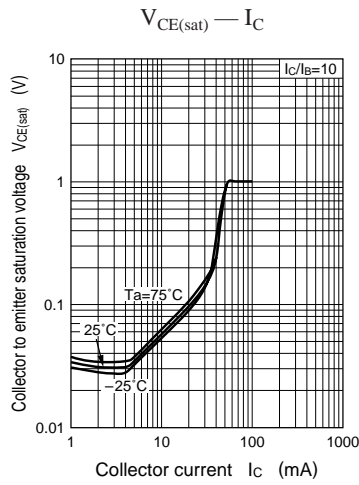
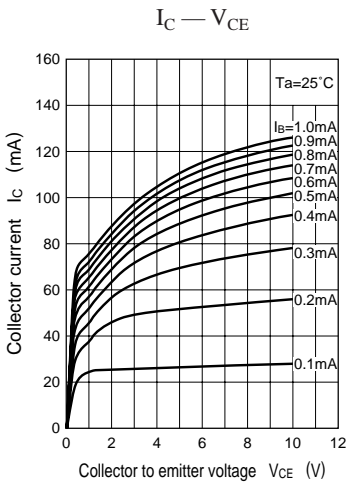




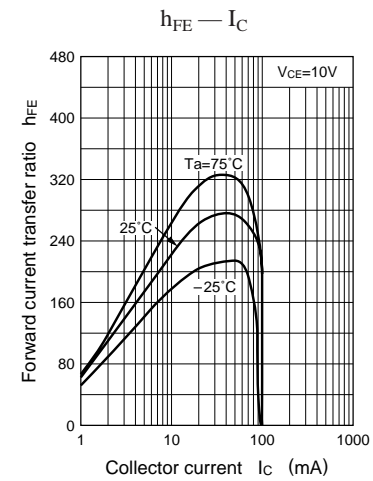
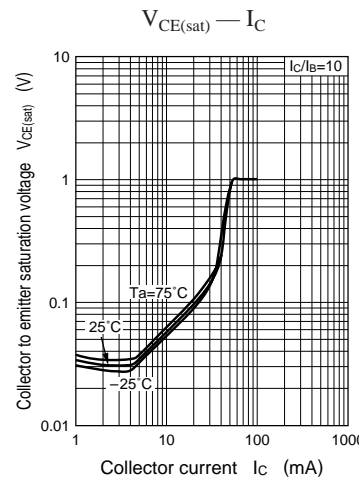
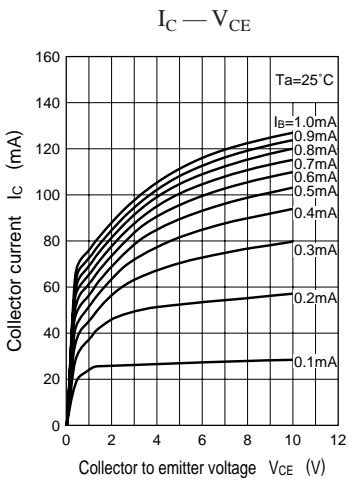
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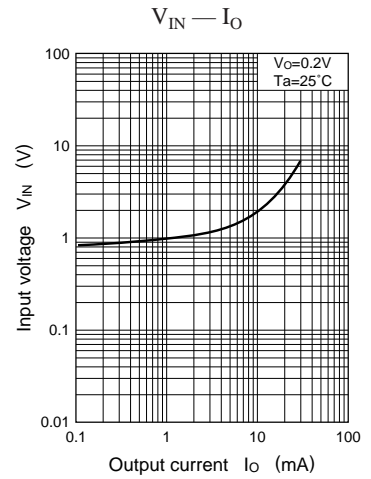
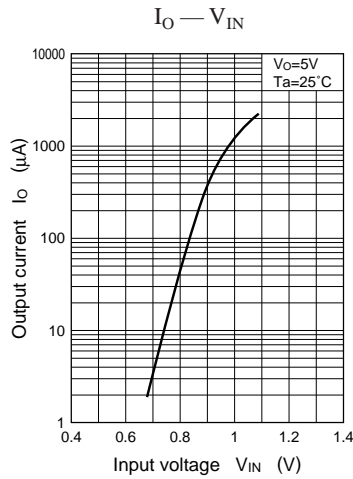
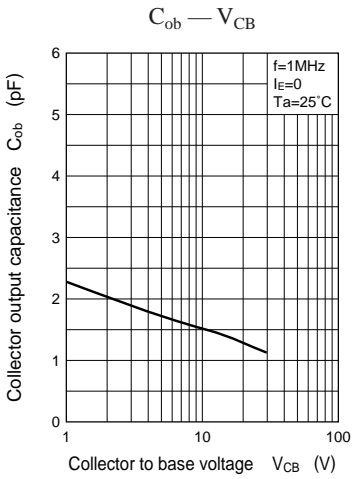


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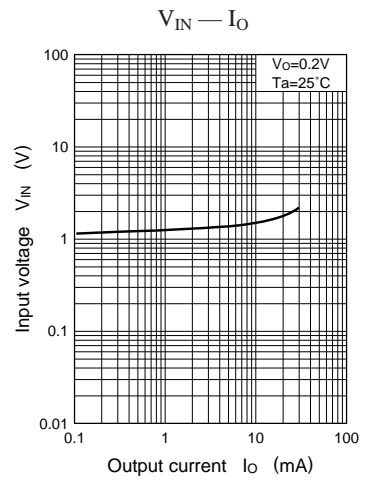
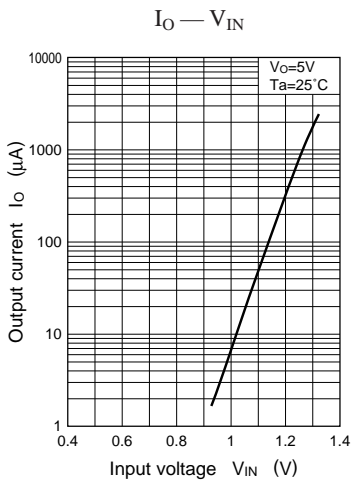
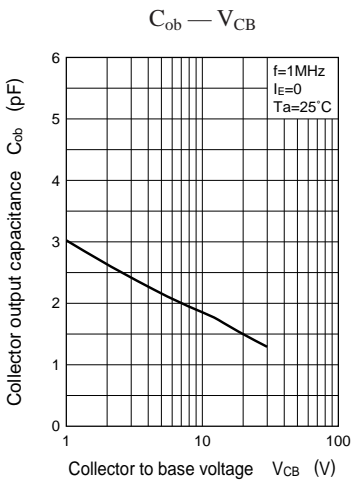
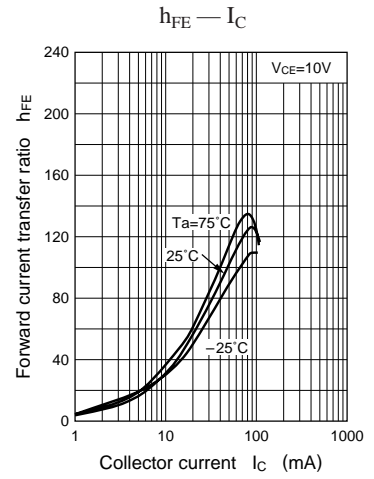
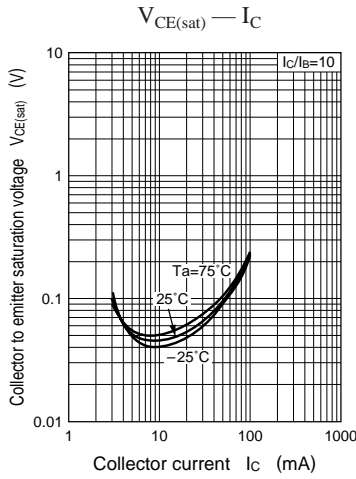
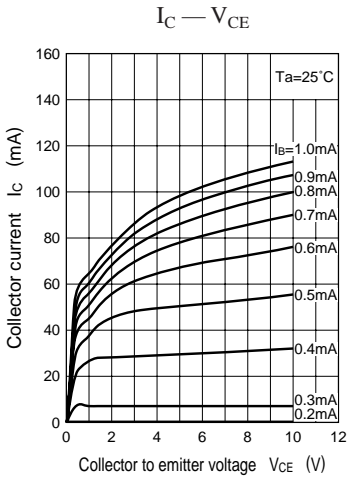


Characteristics charts of UN521T





Characteristics charts of UN521V





Characteristics charts of UN521Z

