

UNR521x Series (UN521x Series)

Silicon NPN epitaxial planar type

For digital circuits

■ Features

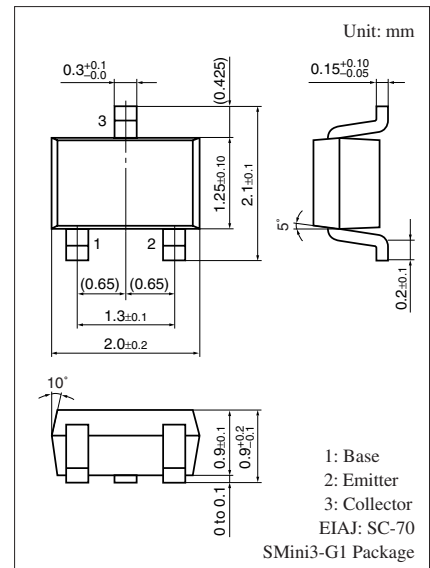
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- S-Mini type package, allowing automatic insertion through the tape packing and magazine packing

■ Resistance by Part Number

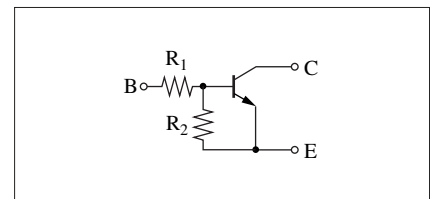
		Marking symbol (R_1)		(R_2)
• UNR5210 (UN5210)	8L	47 k Ω	—	
• UNR5211 (UN5211)	8A	10 k Ω	10 k Ω	
• UNR5212 (UN5212)	8B	22 k Ω	22 k Ω	
• UNR5213 (UN5213)	8C	47 k Ω	47 k Ω	
• UNR5214 (UN5214)	8D	10 k Ω	47 k Ω	
• UNR5215 (UN5215)	8E	10 k Ω	—	
• UNR5216 (UN5216)	8F	4.7 k Ω	—	
• UNR5217 (UN5117)	8H	22 k Ω	—	
• UNR5218 (UN5218)	8I	0.51 k Ω	5.1 k Ω	
• UNR5219 (UN5219)	8K	1 k Ω	10 k Ω	
• UNR521D (UN521D)	8M	47 k Ω	10 k Ω	
• UNR521E (UN521E)	8N	47 k Ω	22 k Ω	
• UNR521F (UN521F)	8O	4.7 k Ω	10 k Ω	
• UNR521K (UN521K)	8P	10 k Ω	4.7 k Ω	
• UNR521L (UN521L)	8Q	4.7 k Ω	4.7 k Ω	
• UNR521M (UN521M)	EL	2.2 k Ω	47 k Ω	
• UNR521N (UN521N)	EX	4.7 k Ω	47 k Ω	
• UNR521T (UN521T)	EZ	22 k Ω	47 k Ω	
• UNR521V (UN521V)	FD	2.2 k Ω	2.2 k Ω	
• UNR521Z (UN521Z)	FF	4.7 k Ω	22 k Ω	

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V_{CBO}	50	V
Collector-emitter voltage (Base open)	V_{CEO}	50	V
Collector current	I_C	100	mA
Total power dissipation	P_T	150	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$



Internal Connection



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

■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)		V _{CBO}	I _C = 10 μA, I _E = 0	50			V
Collector-emitter voltage (Base open)		V _{CEO}	I _C = 2 mA, I _B = 0	50			V
Collector-base cutoff current (Emitter open)		I _{CBO}	V _{CB} = 50 V, I _E = 0			0.1	μA
Collector-emitter cutoff current (Base open)		I _{CEO}	V _{CE} = 50 V, I _B = 0			0.5	
Emitter-base cutoff current (Collector open)	UNR5210/5215/5216/5217	I _{EBO}	V _{EB} = 6 V, I _C = 0			0.01	mA
	UNR5213					0.1	
	UNR5212/5214/521D/ 521E/521M/521N/521T					0.2	
	UNR521Z					0.4	
	UNR5211					0.5	
	UNR521F/521K					1.0	
	UNR5219					1.5	
	UNR5218/521L/521V					2.0	
Forward current transfer ratio	UNR521V	h _{FE}	V _{CE} = 10 V, I _C = 5 mA	6		20	—
	UNR5218/521K/521L			20			
	UNR5219/521D/521F			30			
	UNR5211			35			
	UNR5212/521E			60			
	UNR521Z			60		200	
	UNR5213/5214/521M			80			
	UNR521N/521T			80		400	
	UNR5210*/5215*/5216*/5217*			160		460	
Collector-emitter saturation voltage		V _{CE(sat)}	I _C = 10 mA, I _B = 0.3 mA			0.25	V
UNR521V			I _C = 10 mA, I _B = 1.5 mA				
Output voltage high-level		V _{OH}	V _{CC} = 5 V, V _B = 0.5 V, R _L = 1 kΩ	4.9			V
Output voltage low-level		V _{OL}	V _{CC} = 5 V, V _B = 2.5 V, R _L = 1 kΩ			0.2	V
UNR5213/521K			V _{CC} = 5 V, V _B = 3.5 V, R _L = 1 kΩ				
UNR521D			V _{CC} = 5 V, V _B = 10 V, R _L = 1 kΩ				
UNR521E			V _{CC} = 5 V, V _B = 6.0 V, R _L = 1 kΩ				
Transition frequency		f _T	V _{CB} = 10 V, I _E = −2 mA, f = 200 MHz		150		MHz
Input resistance	UNR5218	R _I		−30%	0.51	+30%	kΩ
	UNR5219				1.0		
	UNR521M/521V				2.2		
	UNR5216/521F/521L/521N UNR521Z				4.7		
	UNR5211/5214/5215/521K				10		
	UNR5212/5217/521T				22		
	UNR5210/5213/521D/521E				47		

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

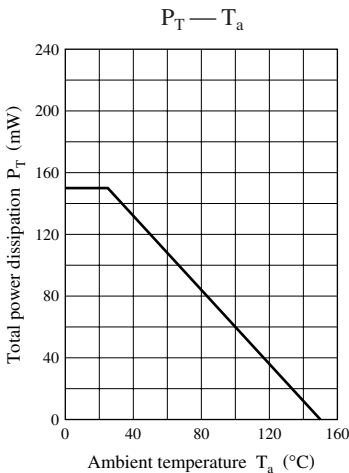
2. *: Rank classification

Rank	Q	R	S	No-rank
h_{FE}	160 to 260	210 to 340	290 to 460	160 to 460

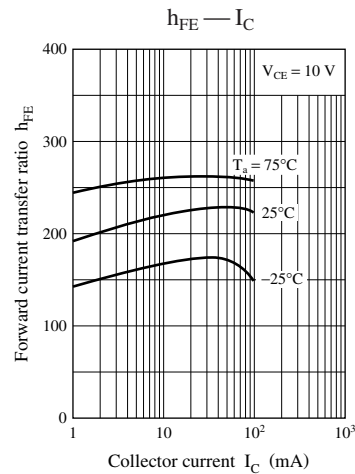
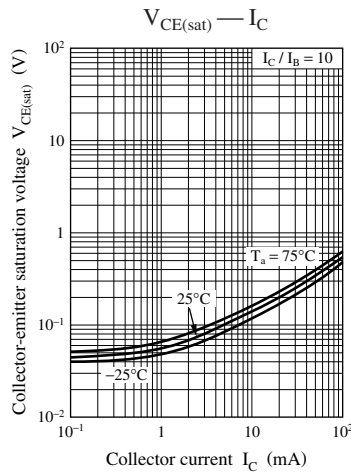
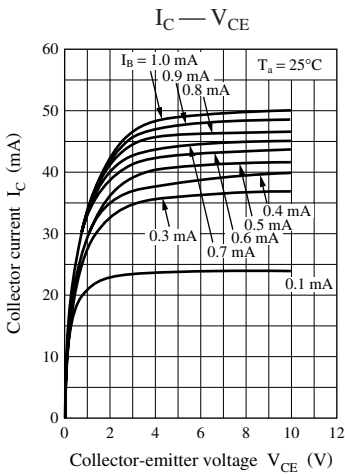
■ Electrical Characteristics (continued) $T_a = 25^{\circ}\text{C} \pm 3^{\circ}\text{C}$

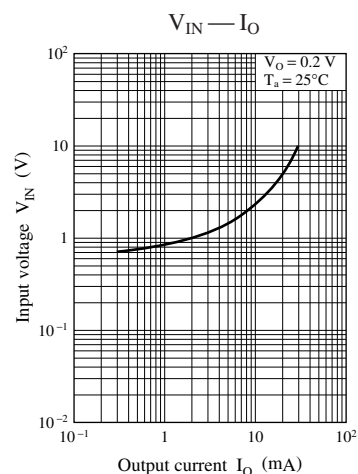
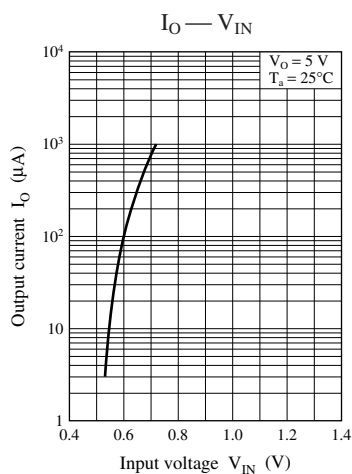
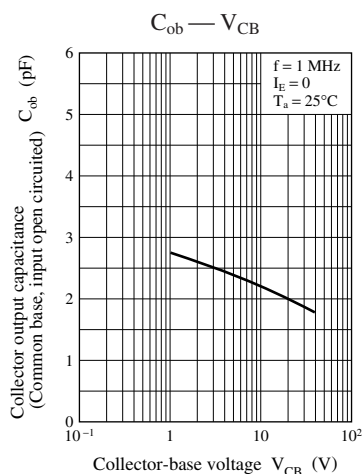
	Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR521M	R_1/R_2			0.047		—
	UNR521N				0.1		
	UNR5218/5219			0.08	0.10	0.12	
	UNR521Z				0.21		
	UNR5214			0.17	0.21	0.25	
	UNR521T				0.47		
	UNR521F			0.37	0.47	0.57	
	UNR521V				1.0		
	UNR5211/5212/5213/521L			0.8	1.0	1.2	
	UNR521K			1.70	2.13	2.60	
	UNR521E			1.70	2.14	2.60	
	UNR521D			3.7	4.7	5.7	

Common characteristics chart

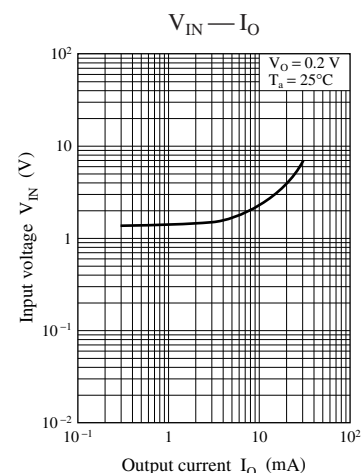
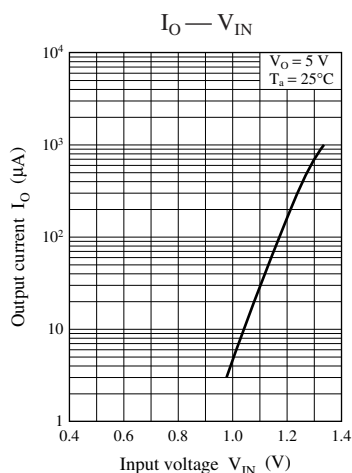
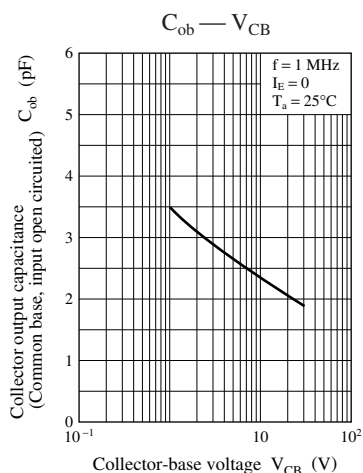
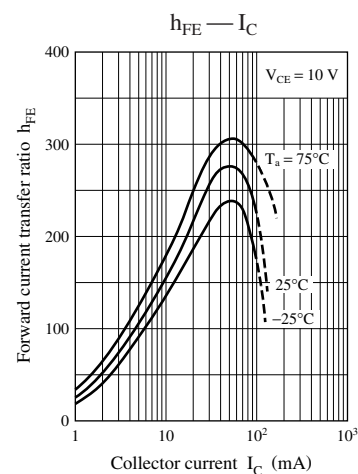
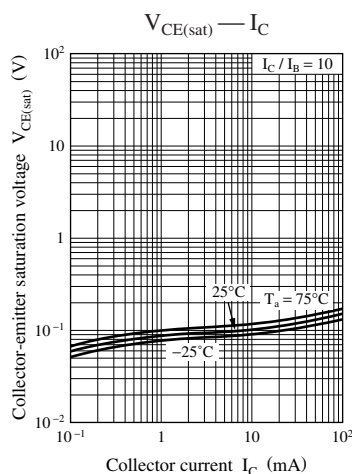
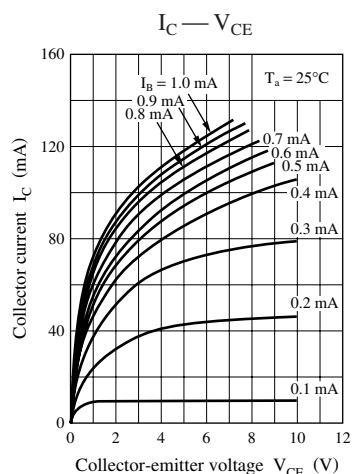


Characteristics charts of UNR5210

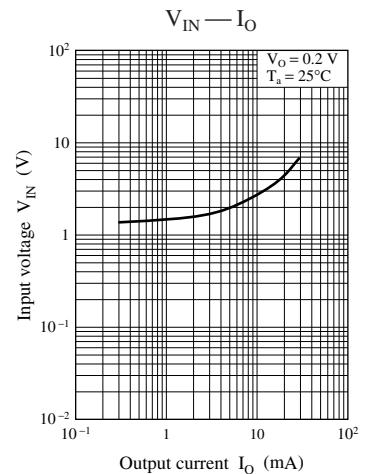
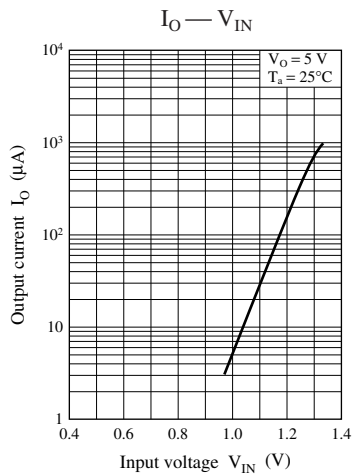
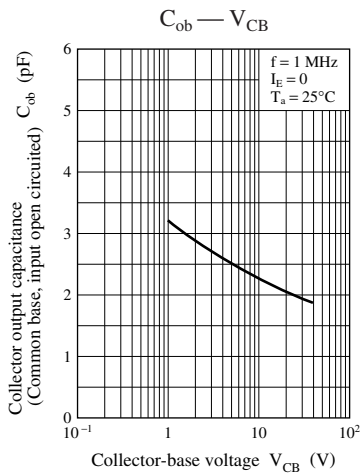
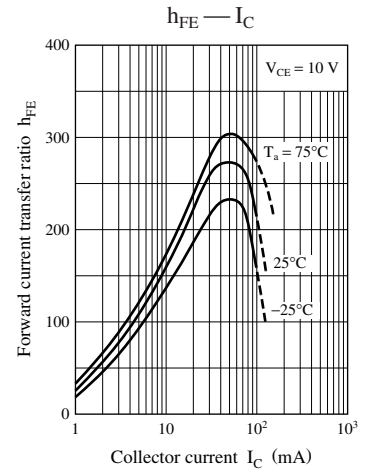
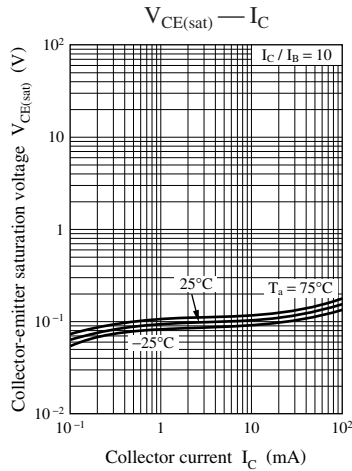
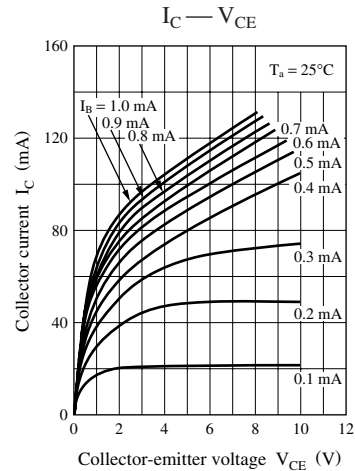




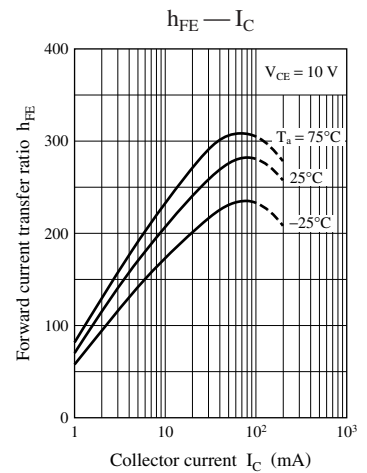
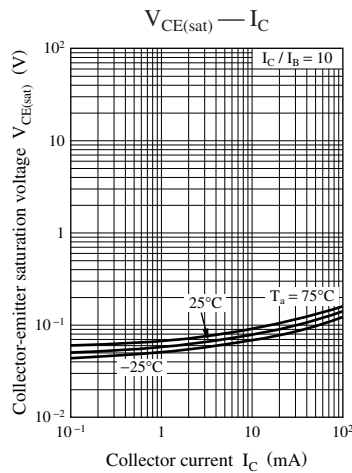
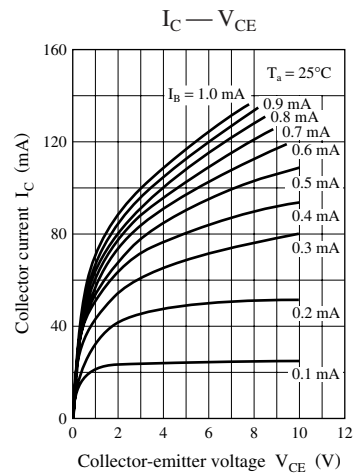
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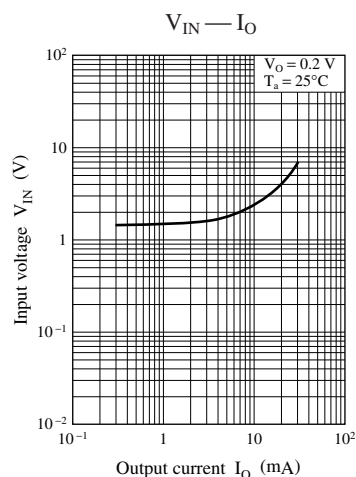
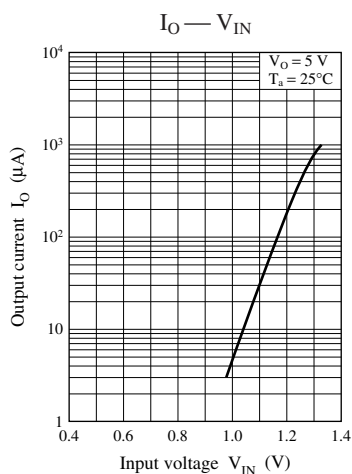
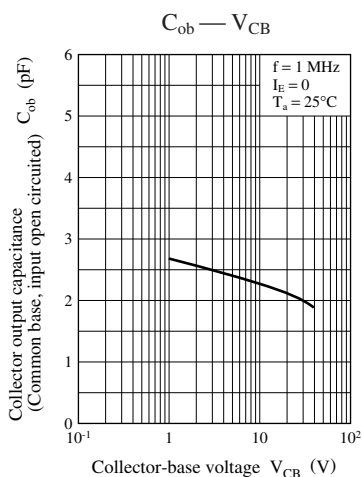


Characteristics charts of UNR5212

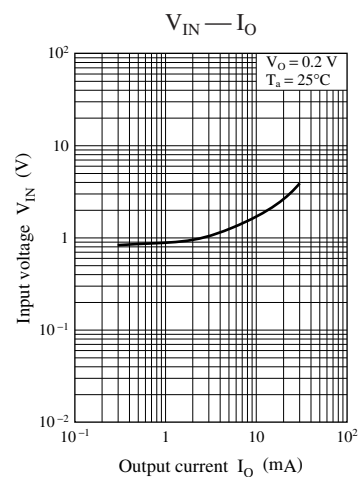
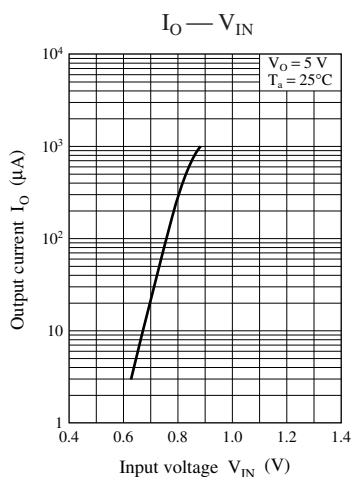
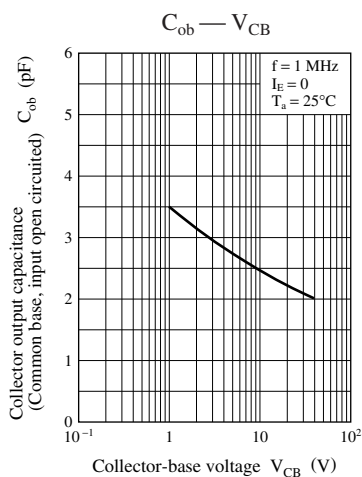
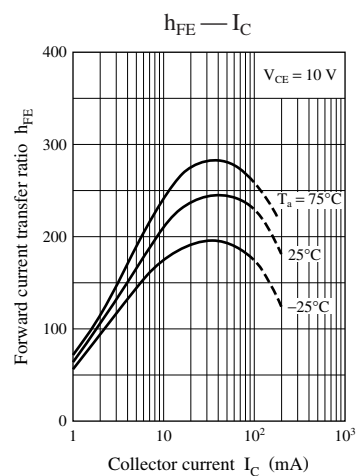
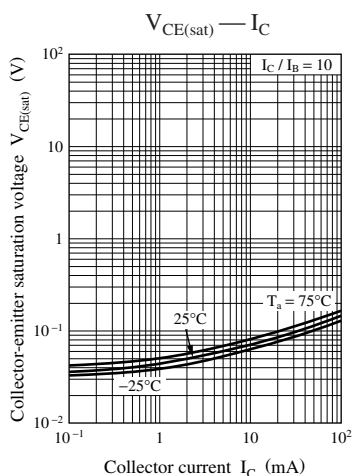
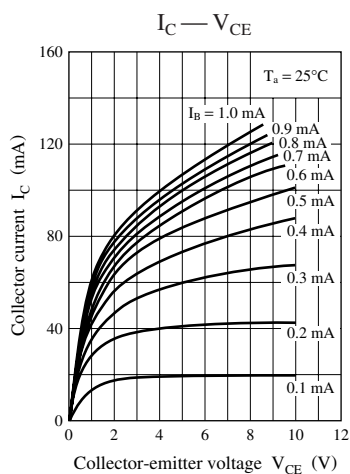


Characteristics charts of UNR5213

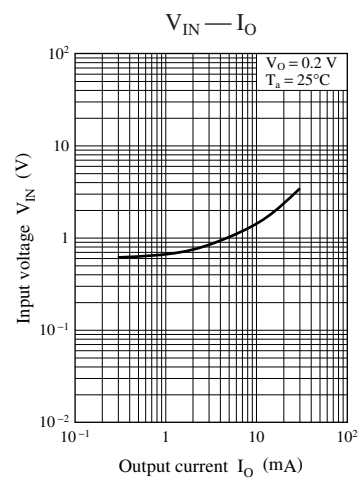
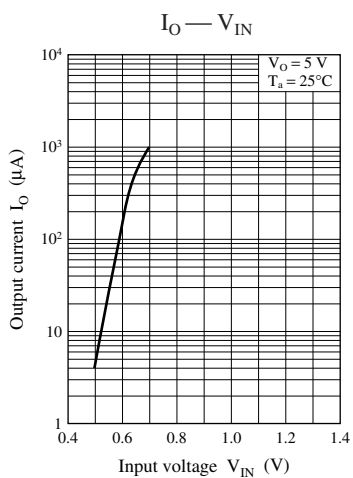
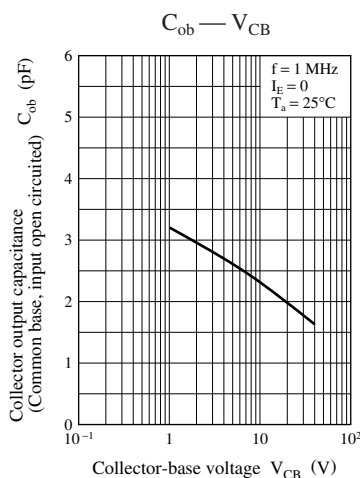
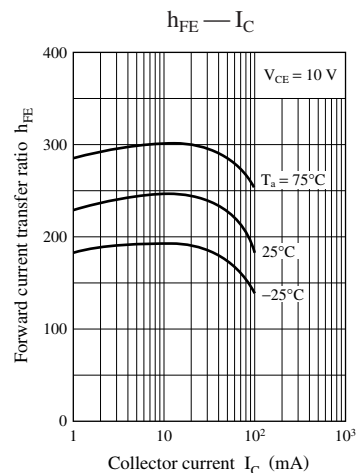
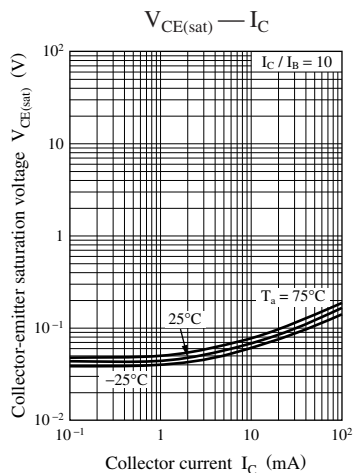
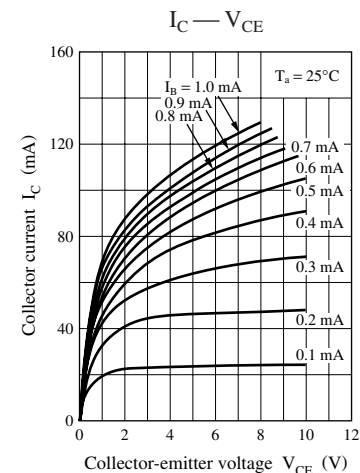




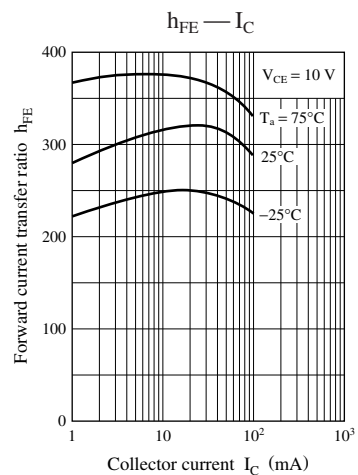
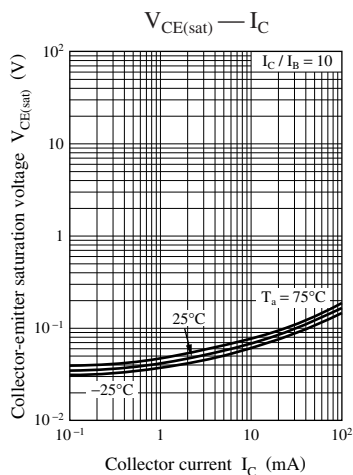
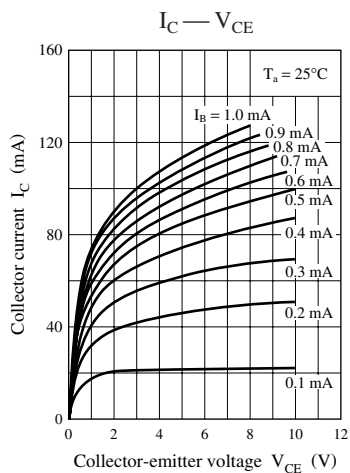
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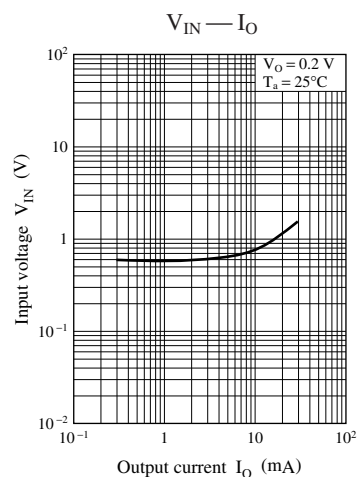
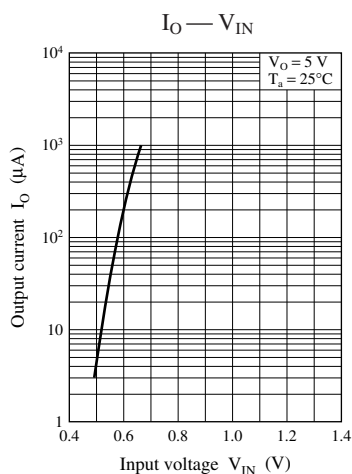
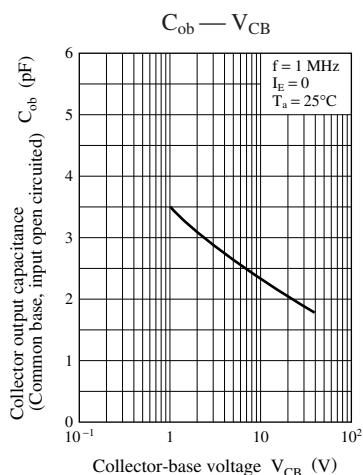


Characteristics charts of UNR5215

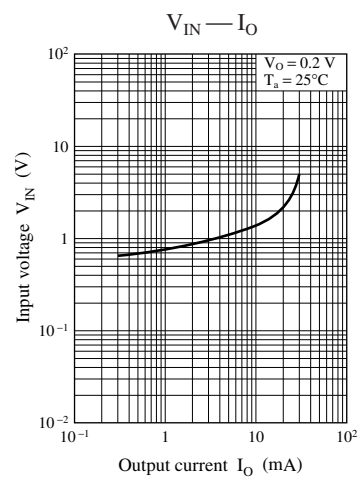
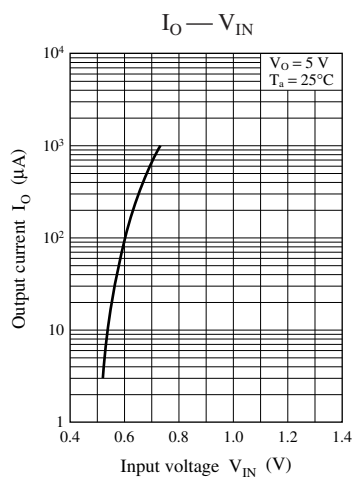
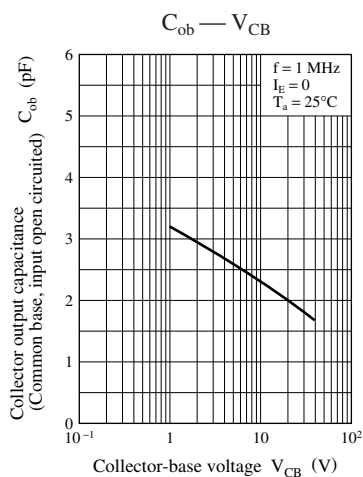
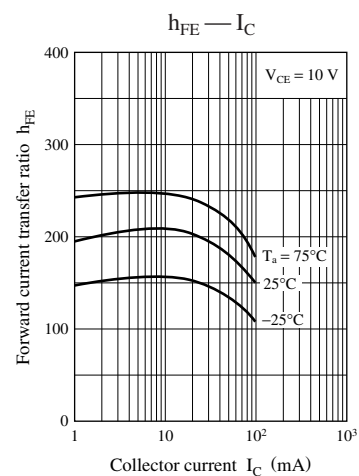
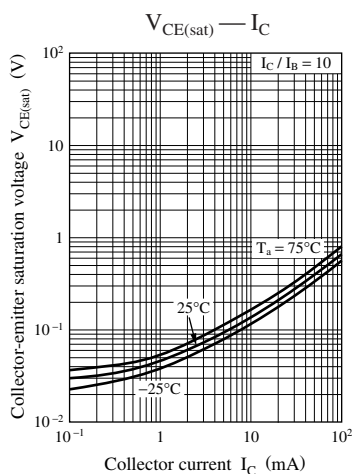
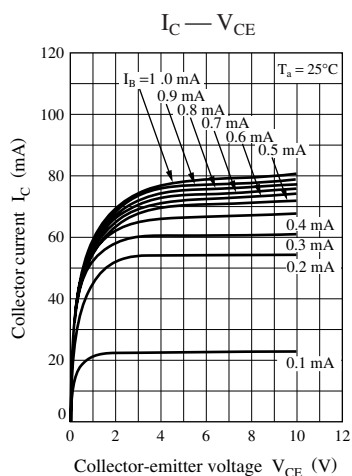


Characteristics charts of UNR5216

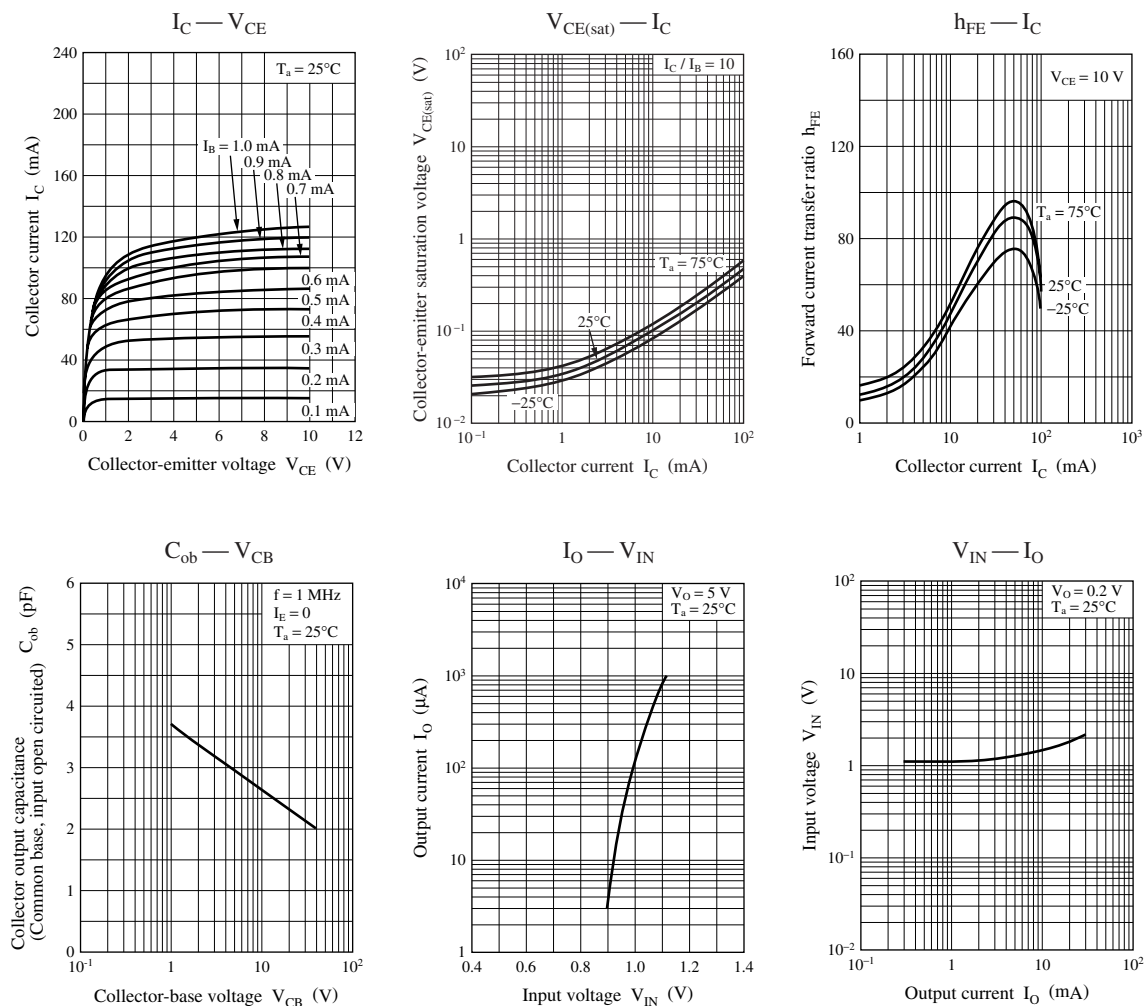




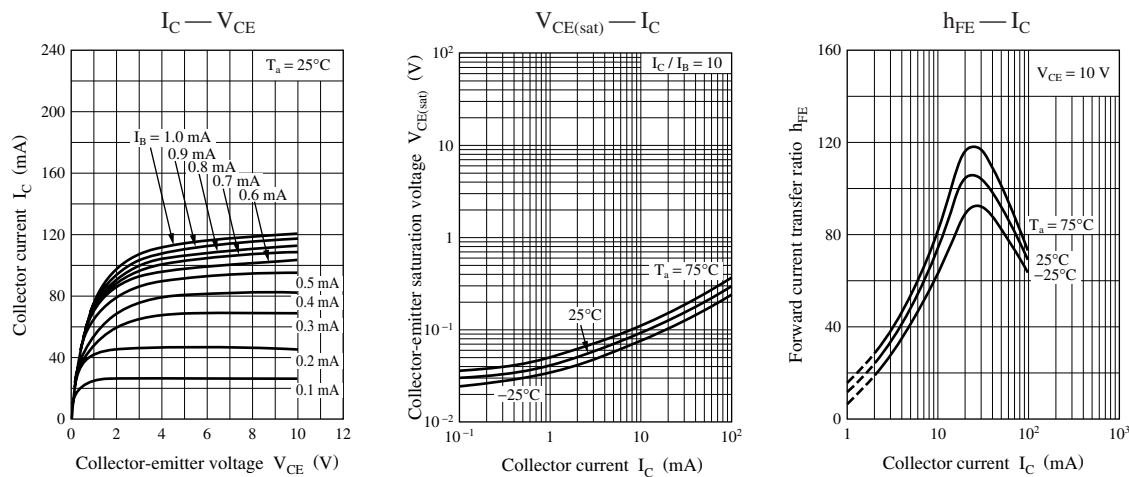
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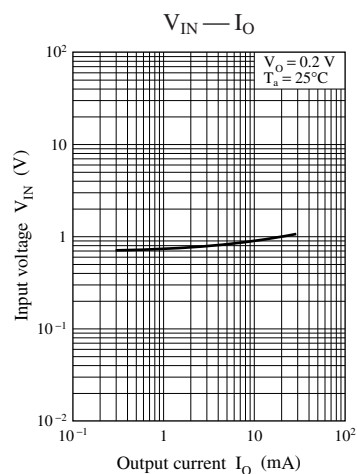
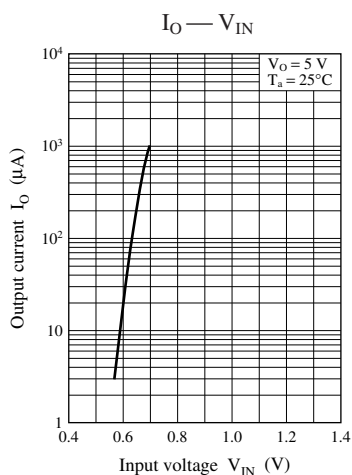
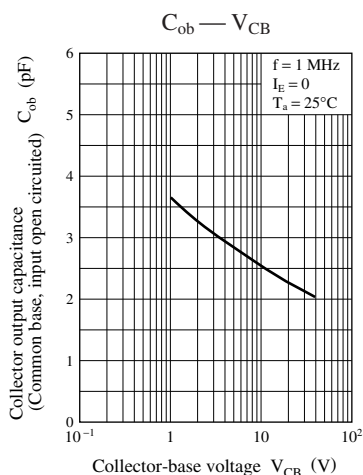


Characteristics charts of UNR5218

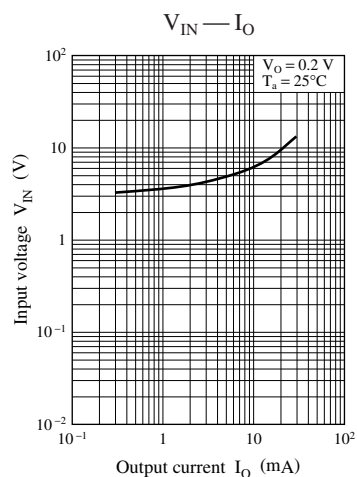
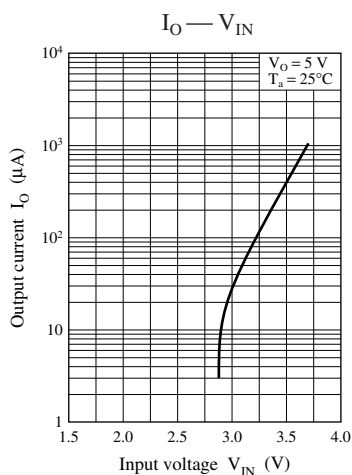
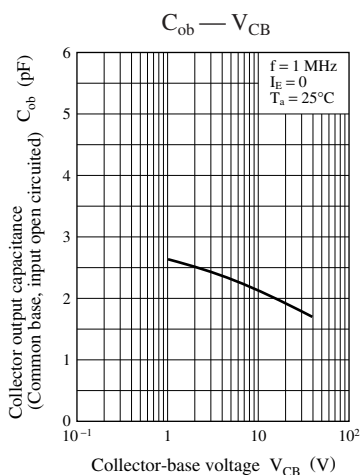
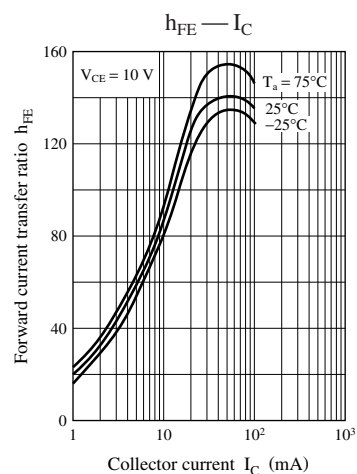
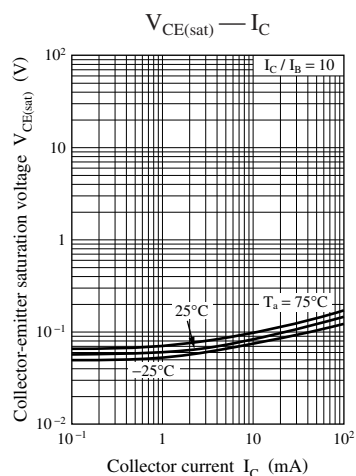
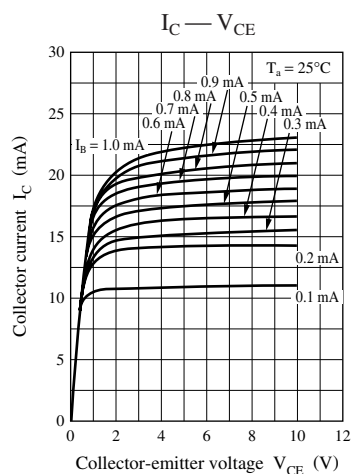


Characteristics charts of UNR5219

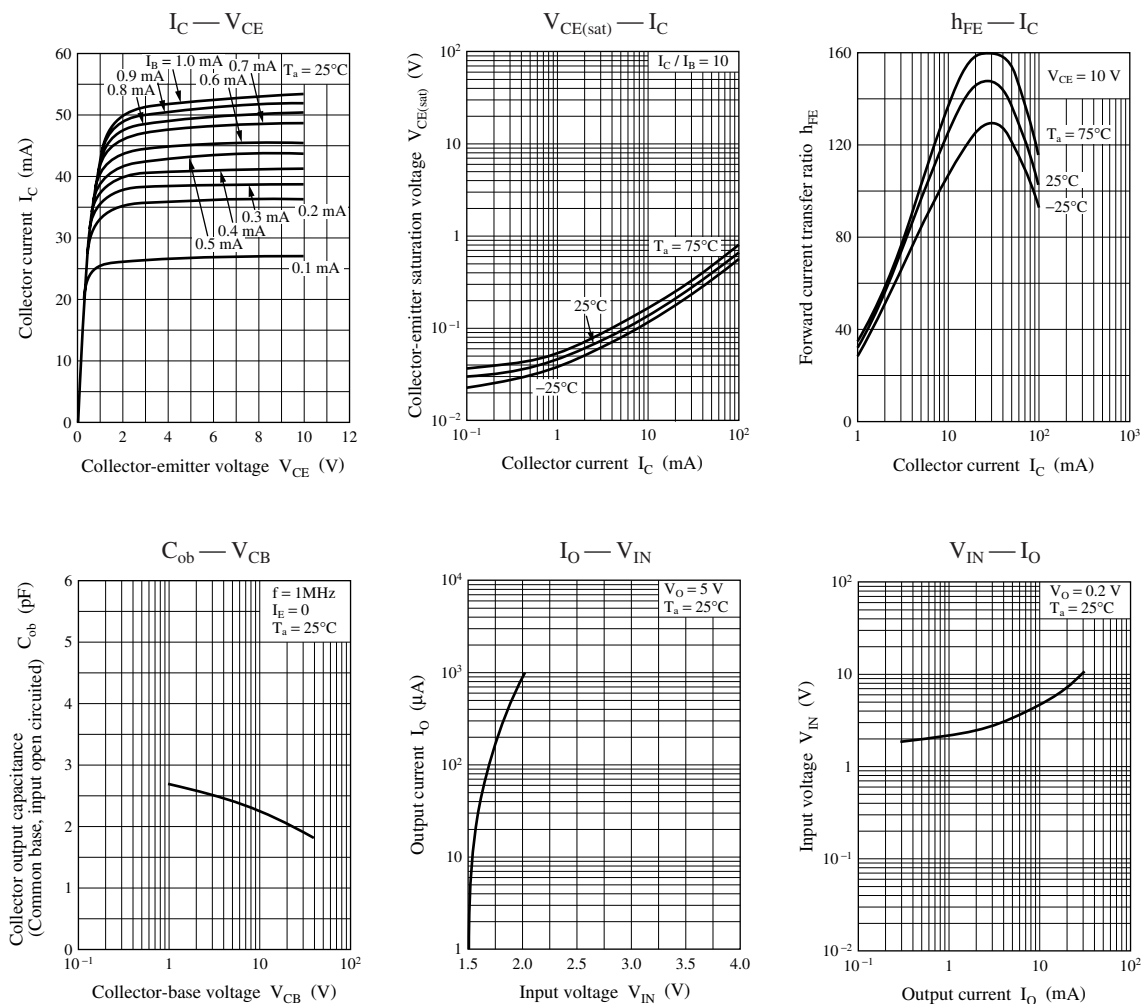




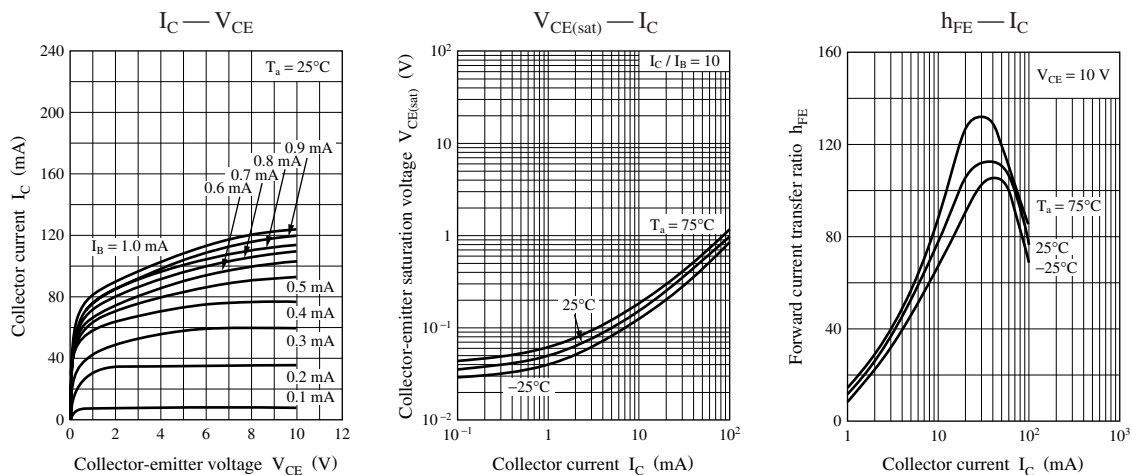
Characteristics charts of UNR521D

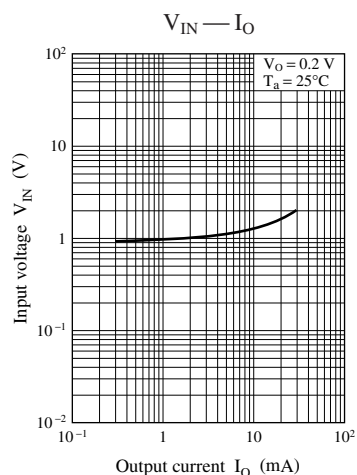
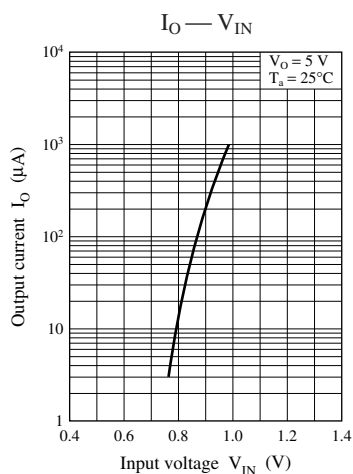
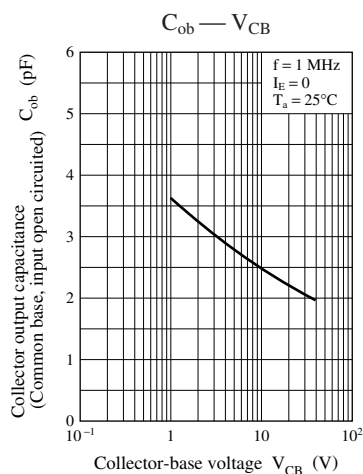


Characteristics charts of UNR521E

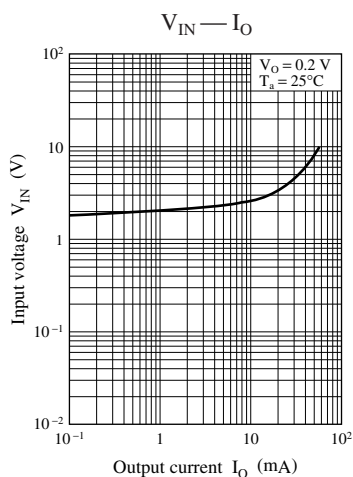
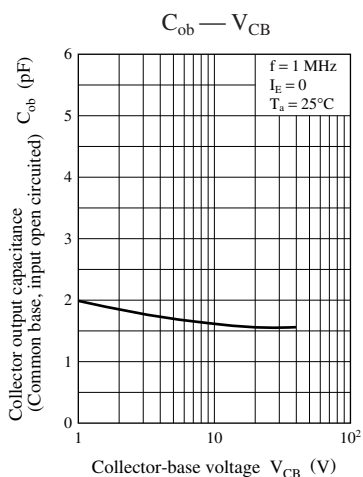
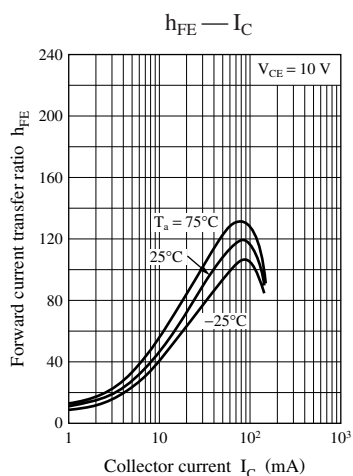
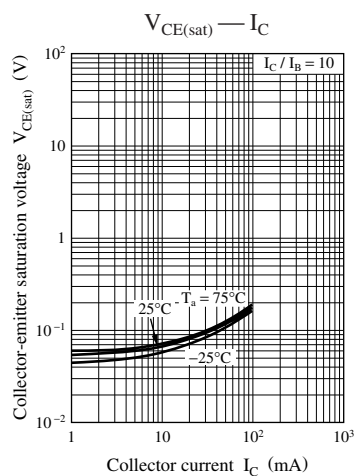
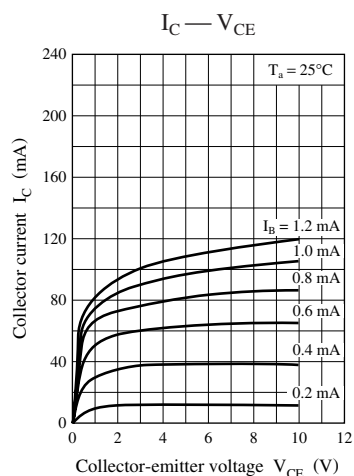


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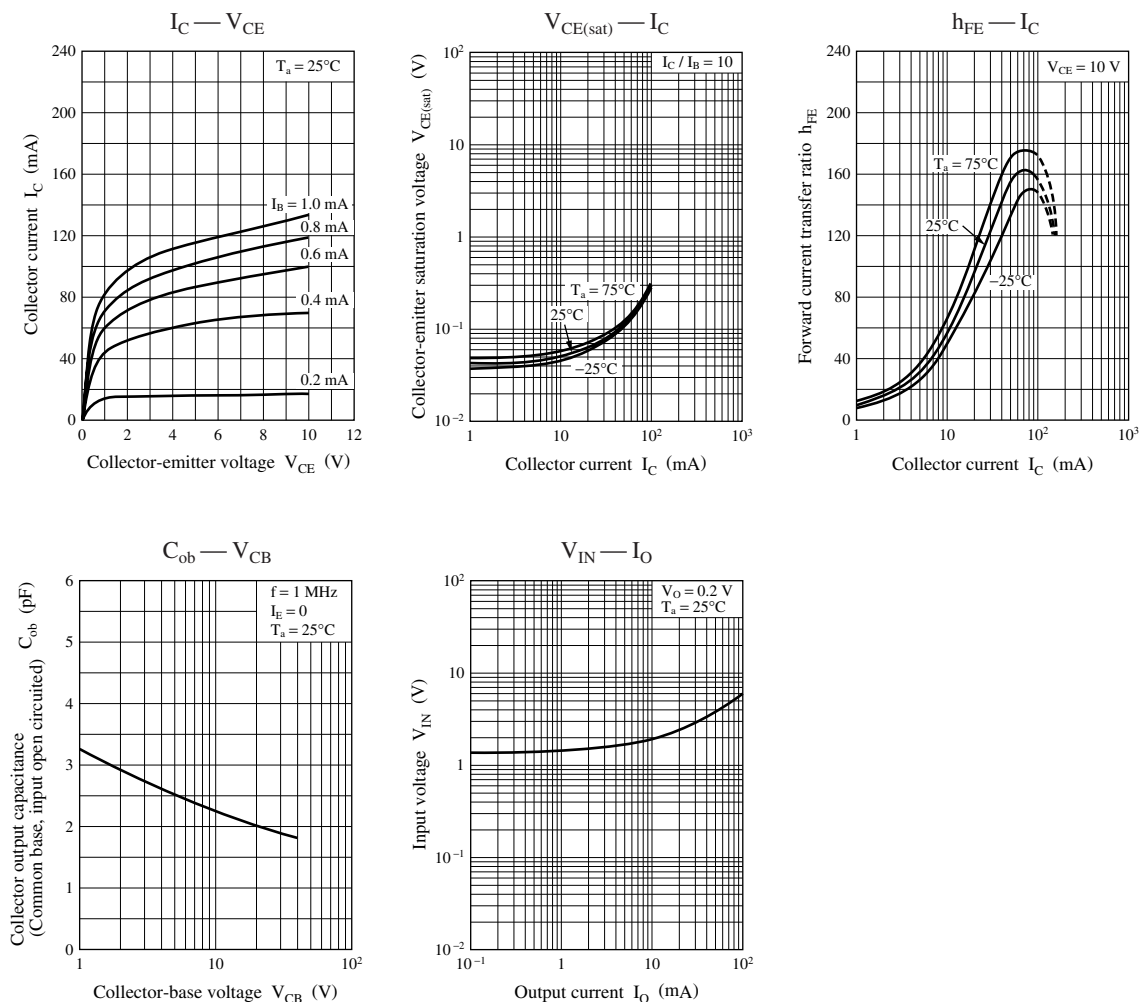




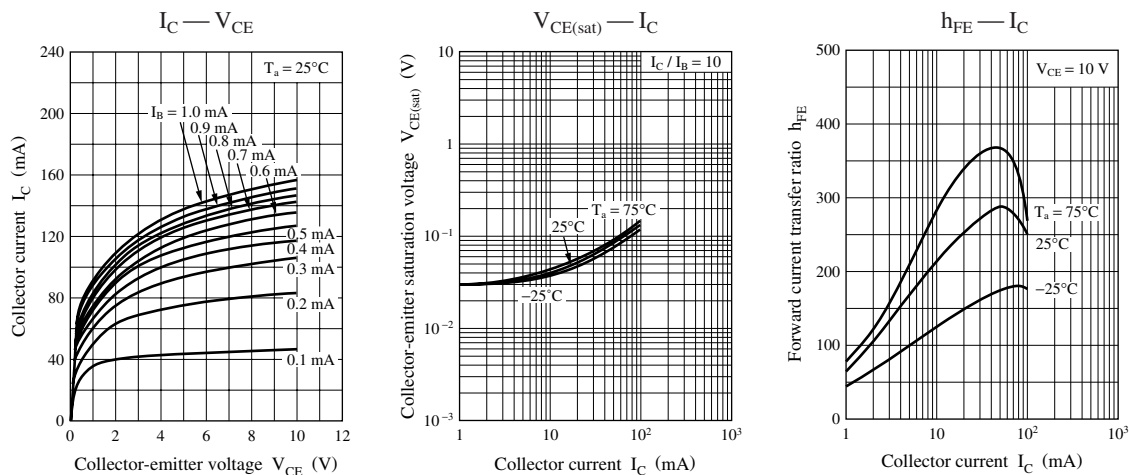
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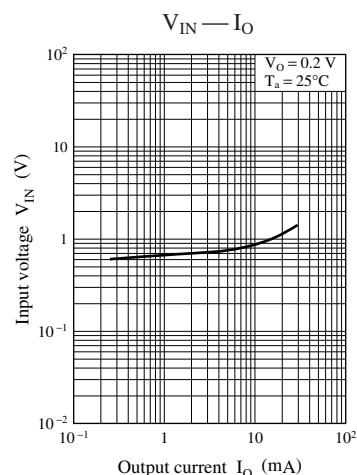
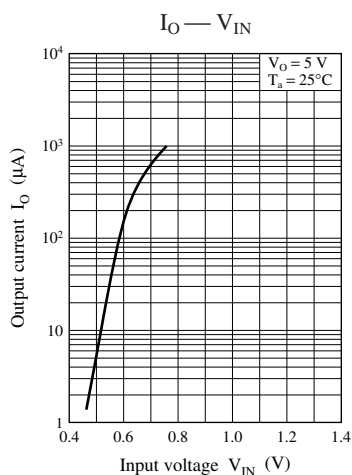
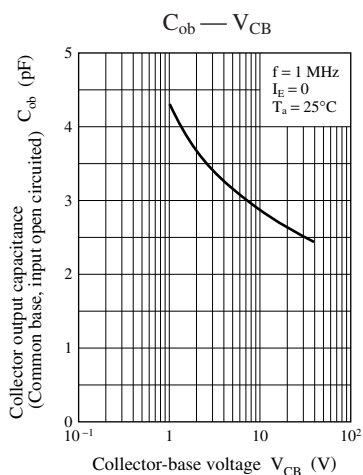


Characteristics charts of UNR521L

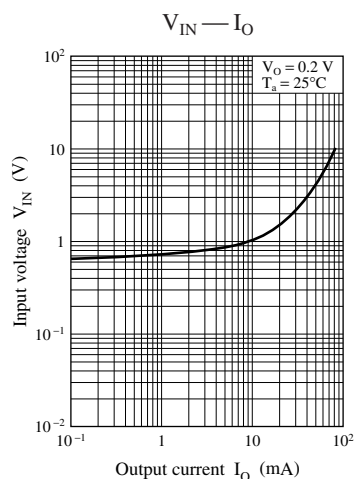
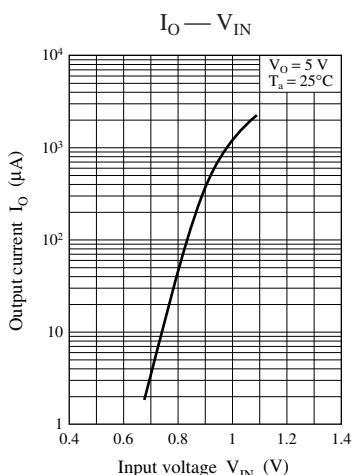
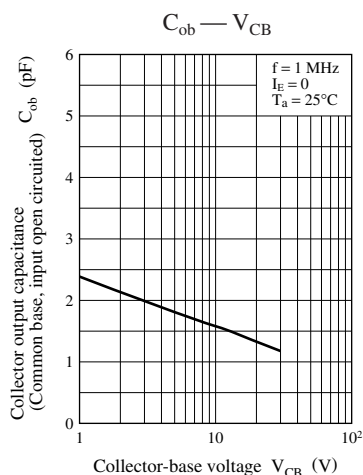
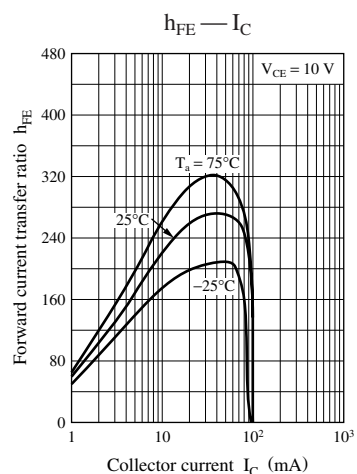
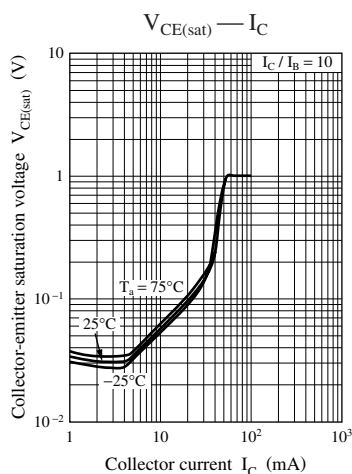
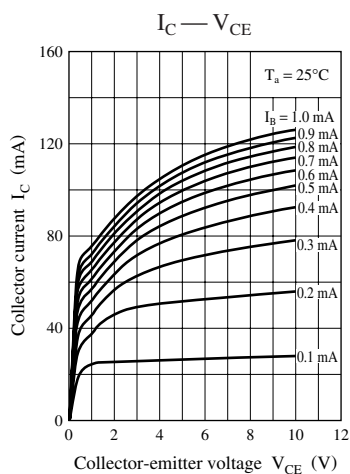


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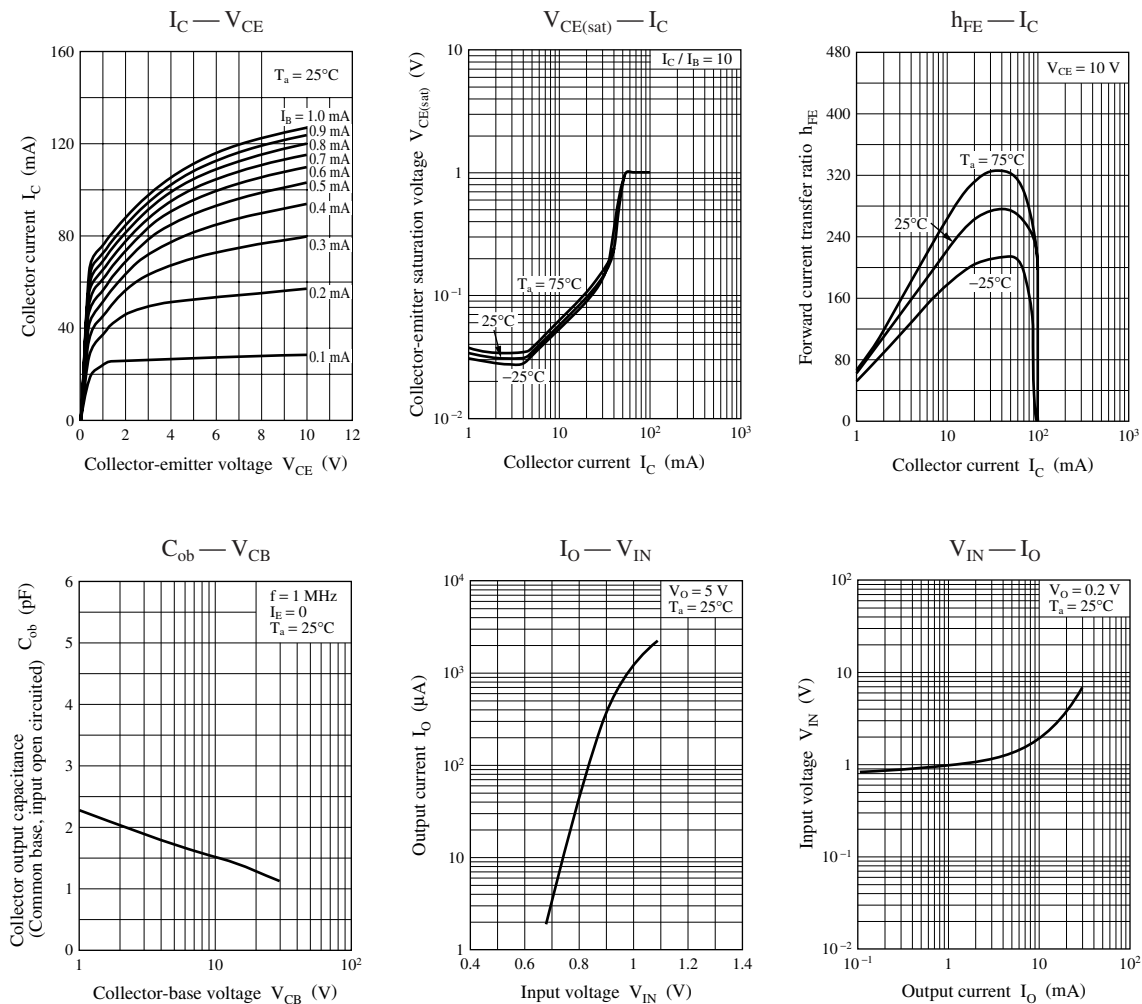




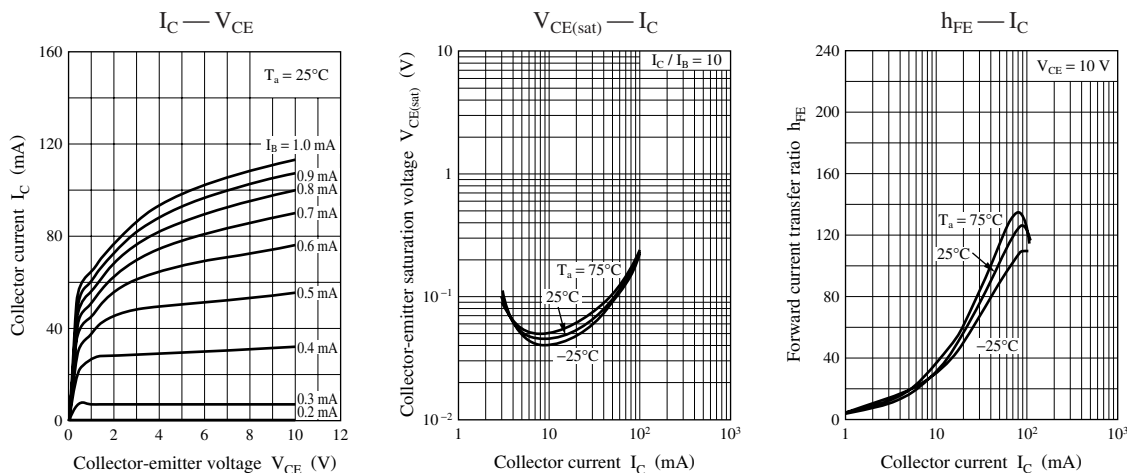
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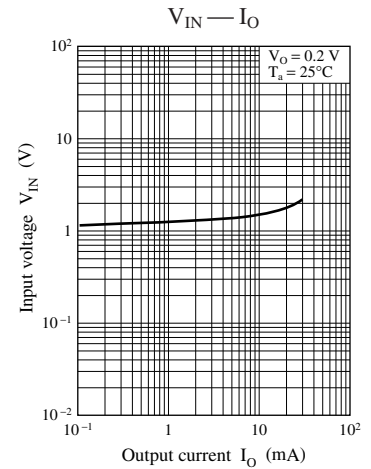
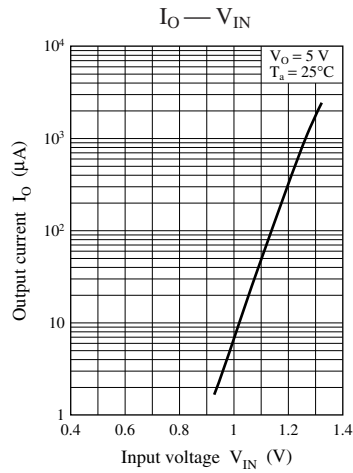
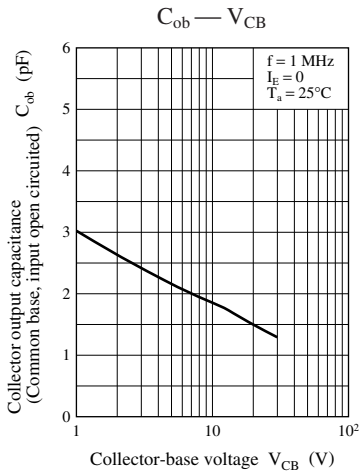


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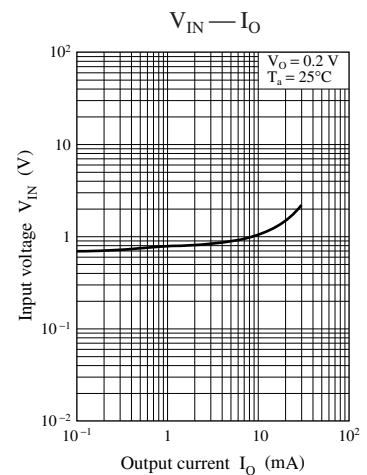
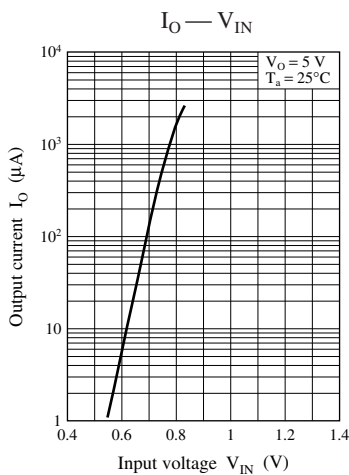
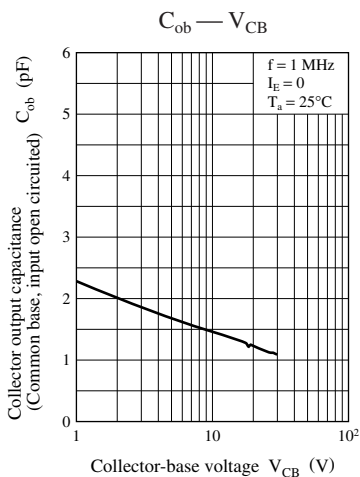
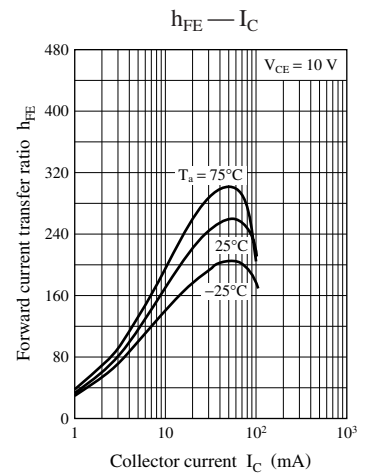
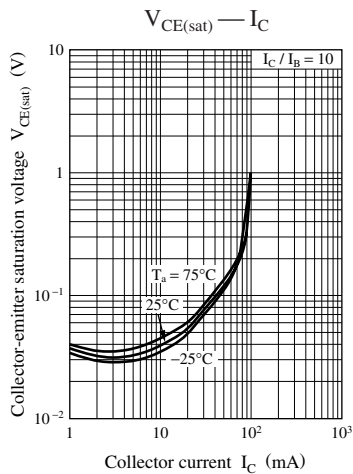
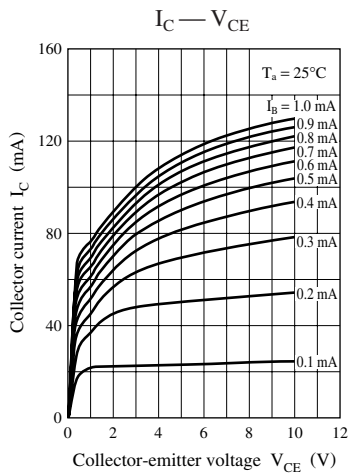


Characteristics charts of UNR521V





Characteristics charts of UNR521Z



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