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# UNR421x Series (UN421x Series)

## Silicon NPN epitaxial planar type

For digital circuits

### ■ Features

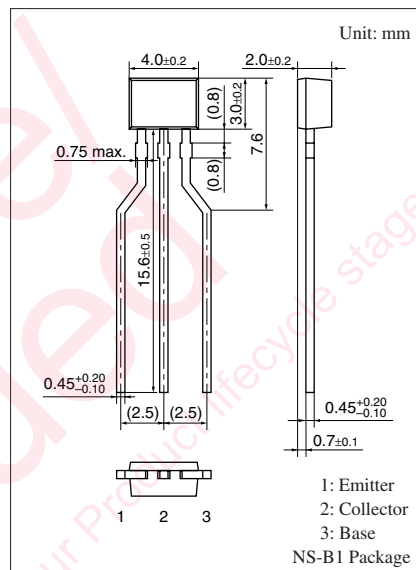
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- New S type package, allowing supply with the radial taping

### ■ Resistance by Part Number

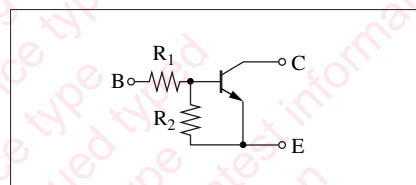
	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR4210 (UN4210)	47 kΩ	—
• UNR4211 (UN4211)	10 kΩ	10 kΩ
• UNR4212 (UN4212)	22 kΩ	22 kΩ
• UNR4213 (UN4213)	47 kΩ	47 kΩ
• UNR4214 (UN4214)	10 kΩ	47 kΩ
• UNR4215 (UN4215)	10 kΩ	—
• UNR4216 (UN4216)	4.7 kΩ	—
• UNR4217 (UN4217)	22 kΩ	—
• UNR4218 (UN4218)	0.51 kΩ	5.1 kΩ
• UNR4219 (UN4219)	1 kΩ	10 kΩ
• UNR421D (UN421D)	47 kΩ	10 kΩ
• UNR421E (UN421E)	47 kΩ	22 kΩ
• UNR421F (UN421F)	4.7 kΩ	10 kΩ
• UNR421K (UN421K)	10 kΩ	4.7 kΩ
• UNR421L (UN421L)	4.7 kΩ	4.7 kΩ

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

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V <sub>CBO</sub>	50	V
Collector-emitter voltage (Base open)	V <sub>CEO</sub>	50	V
Collector current	I <sub>C</sub>	100	mA
Total power dissipation	P <sub>T</sub>	300	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C



### Internal Connection



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

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

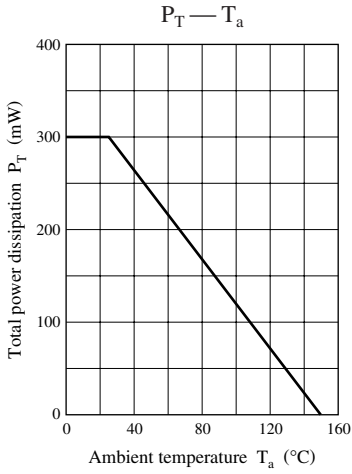
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)		$V_{CBO}$	$I_C = 10 \mu\text{A}, I_E = 0$	50			V
Collector-emitter voltage (Base open)		$V_{CEO}$	$I_C = 2 \text{mA}, I_B = 0$	50			V
Collector-base cutoff current (Emitter open)		$I_{CBO}$	$V_{CB} = 50 \text{V}, I_E = 0$			0.1	$\mu\text{A}$
Collector-emitter cutoff current (Base open)		$I_{CEO}$	$V_{CE} = 50 \text{V}, I_B = 0$			0.5	$\mu\text{A}$
Emitter-base cutoff current (Collector open)	UNR4210/4215/4216/4217	$I_{EBO}$	$V_{EB} = 6 \text{V}, I_C = 0$			0.01	mA
	UNR4213					0.1	
	UNR4212/4214/421D/421E					0.2	
	UNR4211					0.5	
	UNR421F/421K					1.0	
	UNR4219					1.5	
	UNR4218/421L					2.0	
Forward current transfer ratio	UNR4218/421K/421L	$h_{FE}$	$V_{CE} = 10 \text{V}, I_C = 5 \text{mA}$	20			—
	UNR4219/421D/421F			30			
	UNR4211			35			
	UNR4212/421E			60			
	UNR4213/4214			80			
	UNR4210*/4215*/4216*/4217*			160		460	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 10 \text{mA}, I_B = 0.3 \text{mA}$			0.25	V
Output voltage high-level		$V_{OH}$	$V_{CC} = 5 \text{V}, V_B = 0.5 \text{V}, R_L = 1 \text{k}\Omega$	4.9			V
Output voltage low-level		$V_{OL}$	$V_{CC} = 5 \text{V}, V_B = 2.5 \text{V}, R_L = 1 \text{k}\Omega$			0.2	V
	UNR4213/421K		$V_{CC} = 5 \text{V}, V_B = 3.5 \text{V}, R_L = 1 \text{k}\Omega$				
	UNR421D		$V_{CC} = 5 \text{V}, V_B = 10 \text{V}, R_L = 1 \text{k}\Omega$				
	UNR421E		$V_{CC} = 5 \text{V}, V_B = 6 \text{V}, R_L = 1 \text{k}\Omega$				
Transition frequency		$f_T$	$V_{CB} = 10 \text{V}, I_E = -2 \text{mA}, f = 200 \text{MHz}$		150		MHz
Input resistance	UNR4218	$R_1$		-30%	0.51	+30%	k $\Omega$
	UNR4219				1.0		
	UNR4216/421F/421L				4.7		
	UNR4211/4214/4215/421K				10		
	UNR4212/4217				22		
	UNR4210/4213/421D/421E				47		
Resistance ratio	UNR4218/4219	$R_1/R_2$		0.08	0.10	0.12	—
	UNR4214			0.17	0.21	0.25	
	UNR421F			0.37	0.47	0.57	
	UNR4211/4212/4213/421L			0.8	1.0	1.2	
	UNR421K			1.70	2.13	2.60	
	UNR421E			1.70	2.14	2.60	
	UNR421D			3.7	4.7	5.7	

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

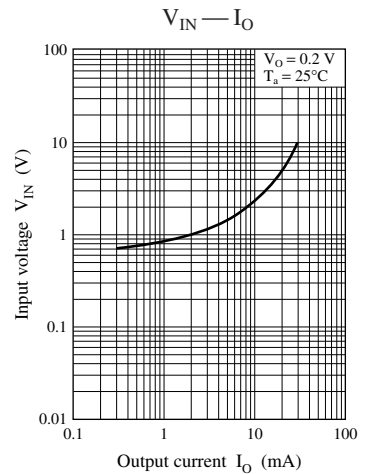
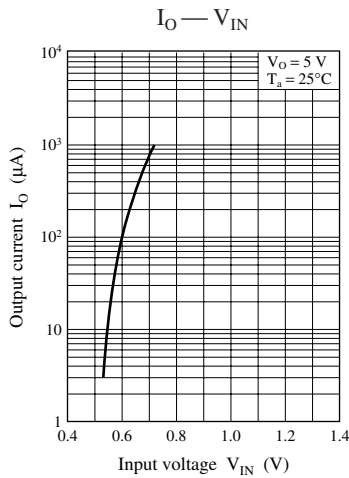
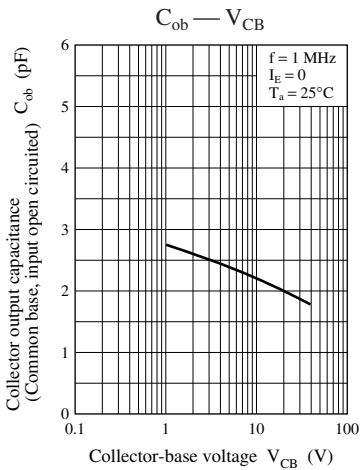
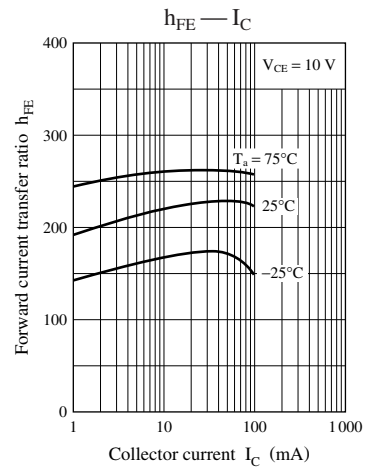
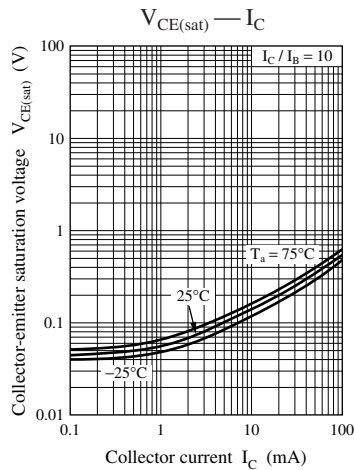
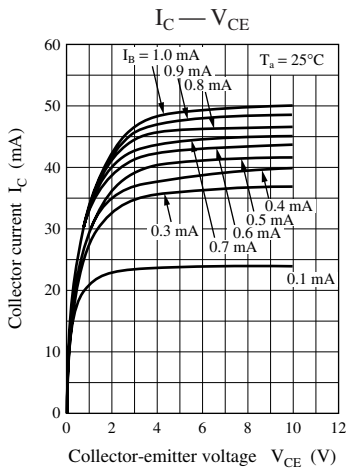
2. \*: Rank classification

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

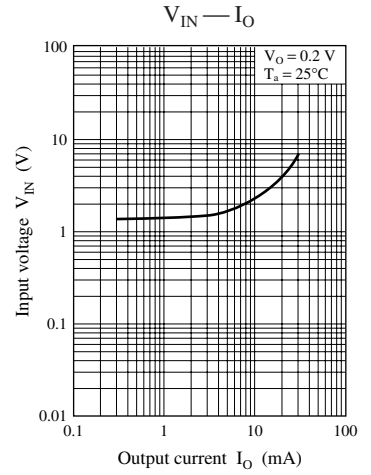
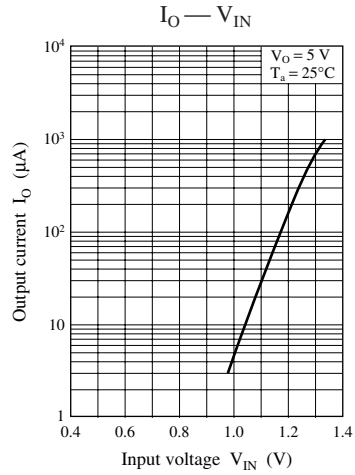
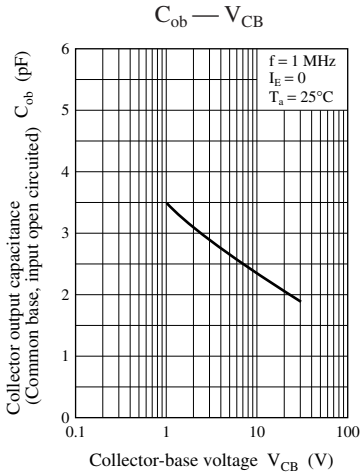
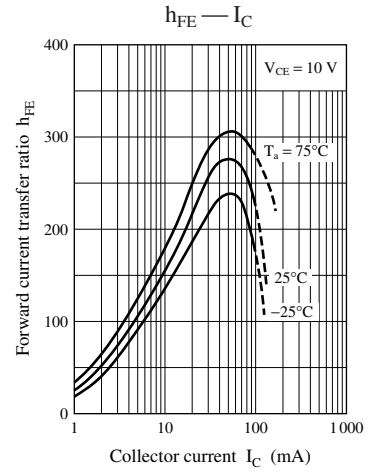
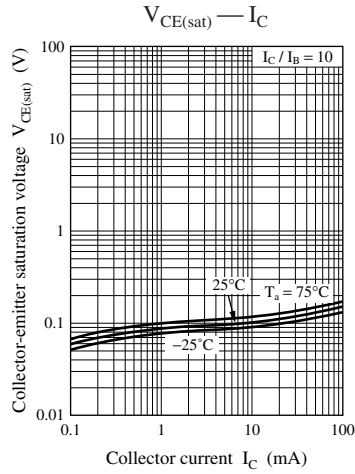
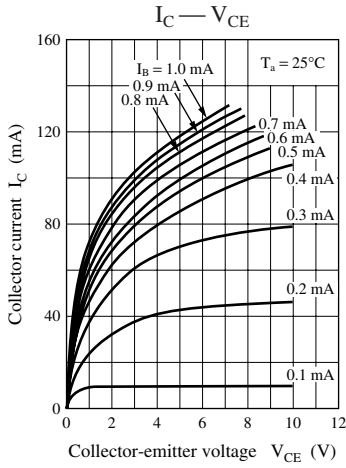
Common characteristics chart



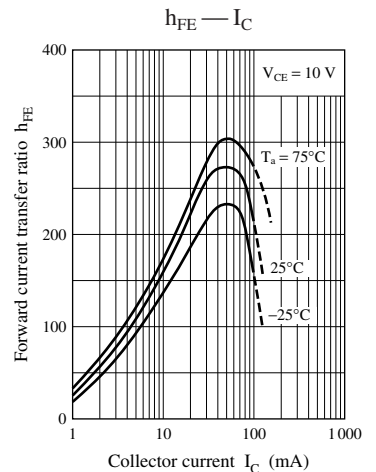
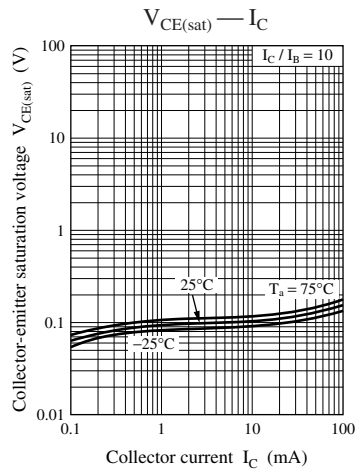
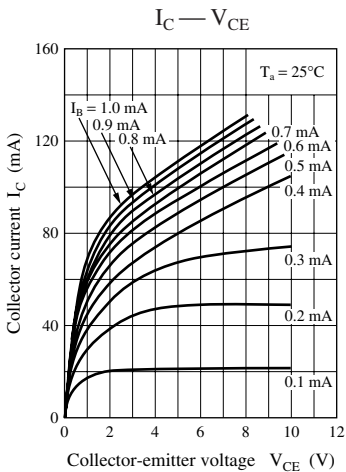
Characteristics charts of UNR4210

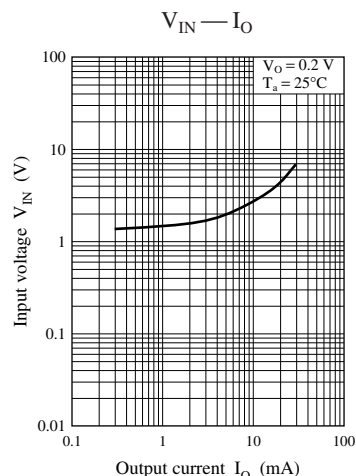
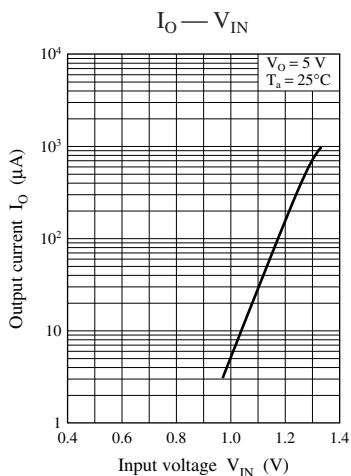
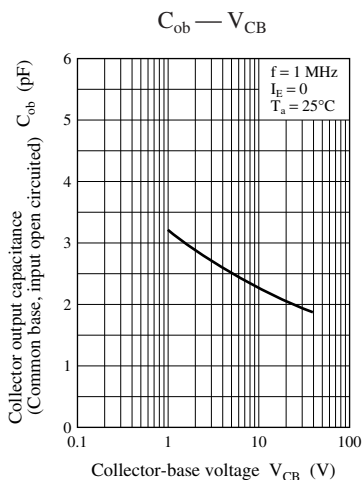


Characteristics charts of UNR4211

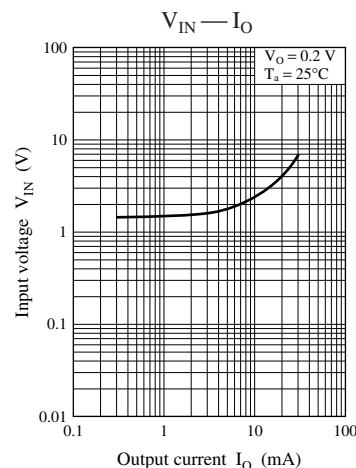
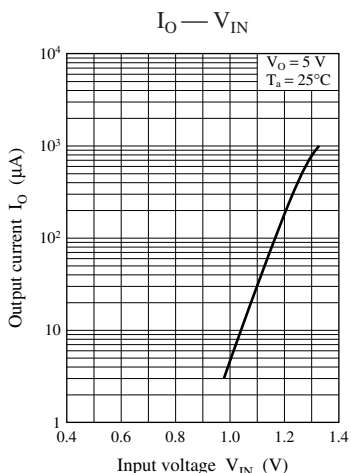
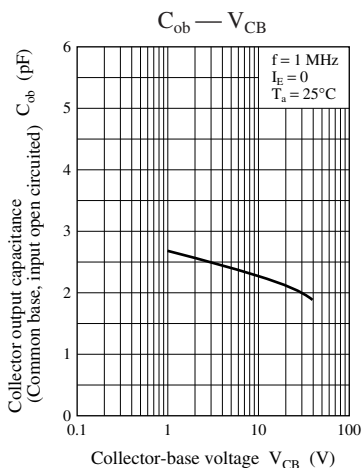
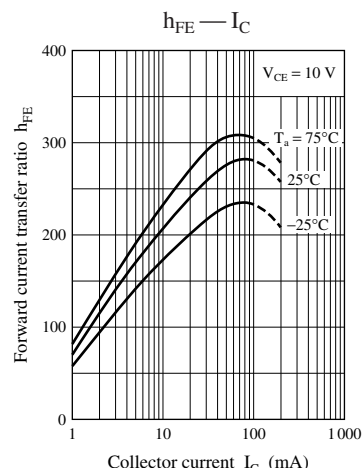
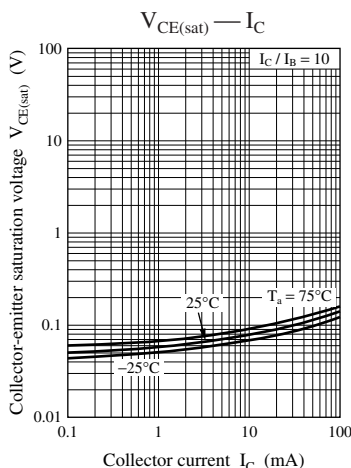
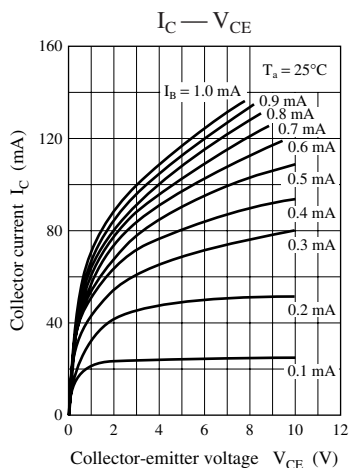


Characteristics charts of UNR4212

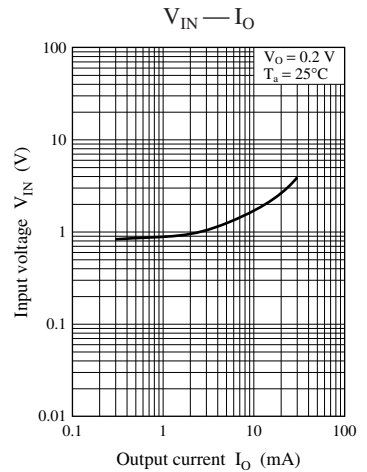
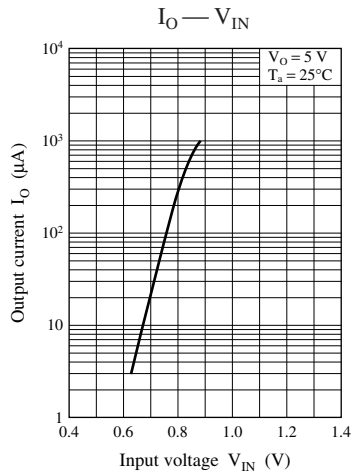
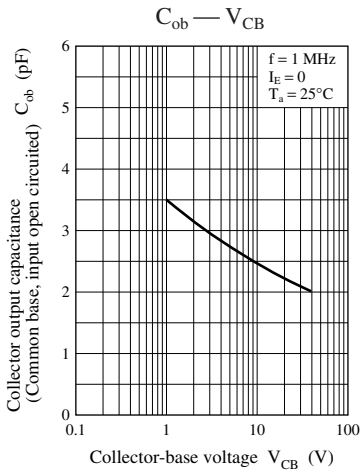
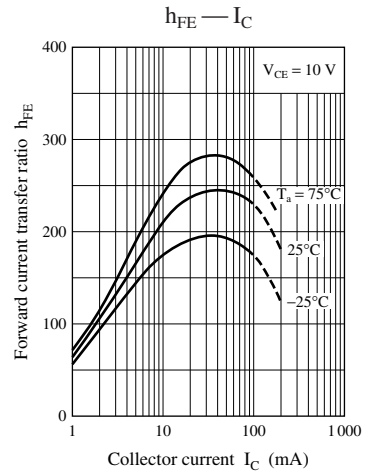
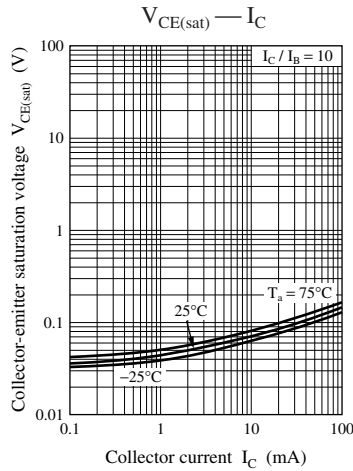
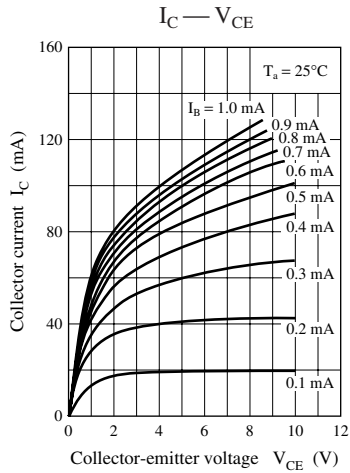




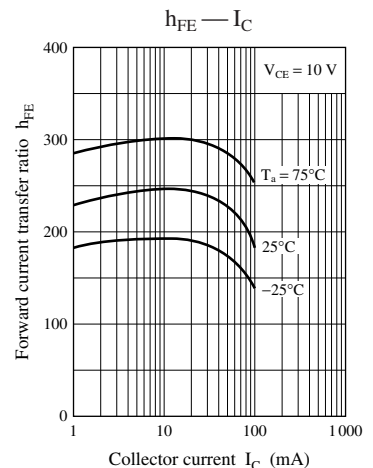
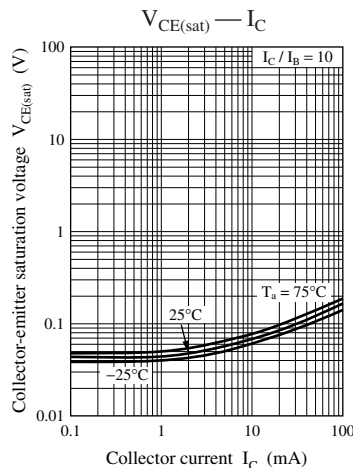
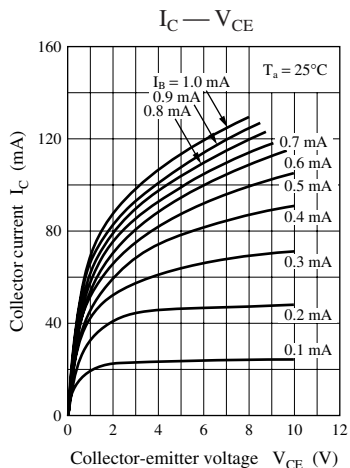
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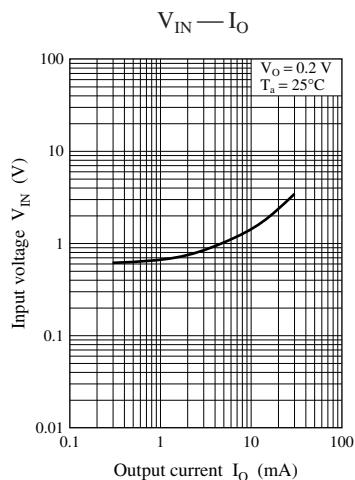
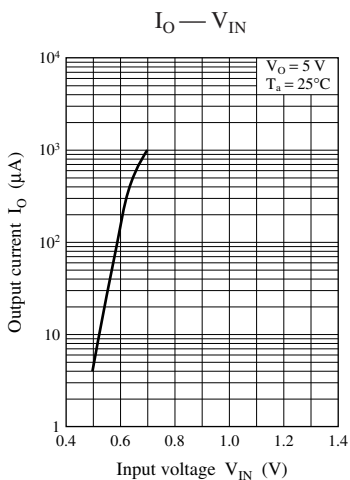
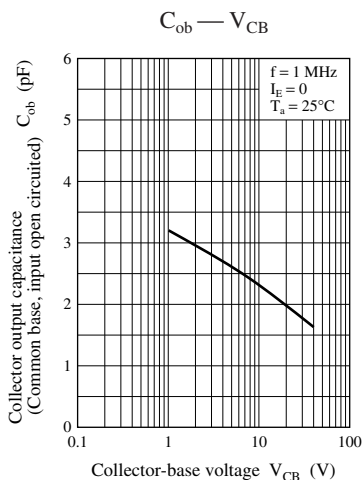


Characteristics charts of UNR4214

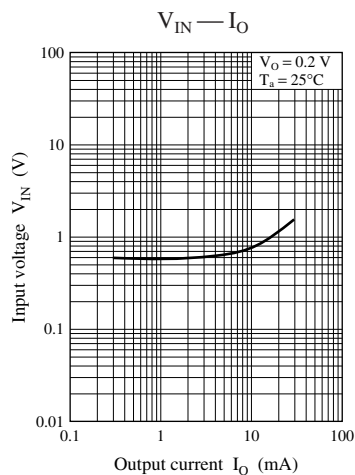
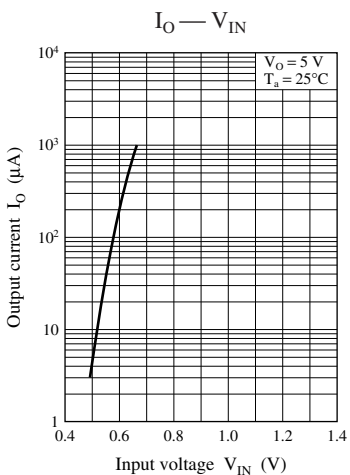
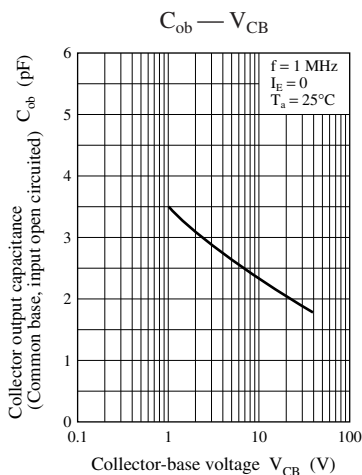
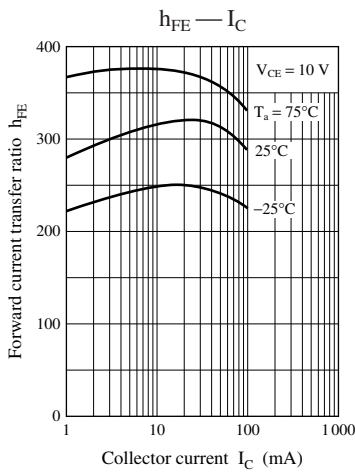
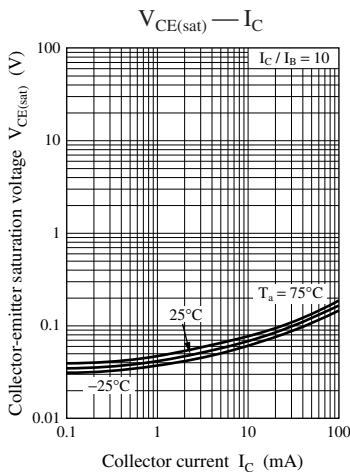
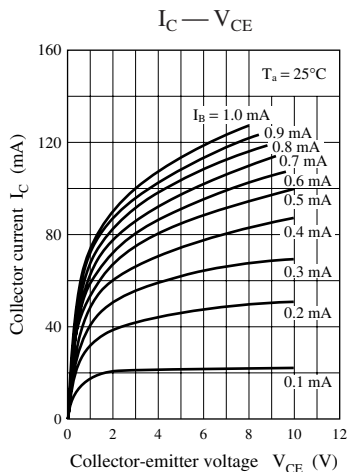


Characteristics charts of UNR4215



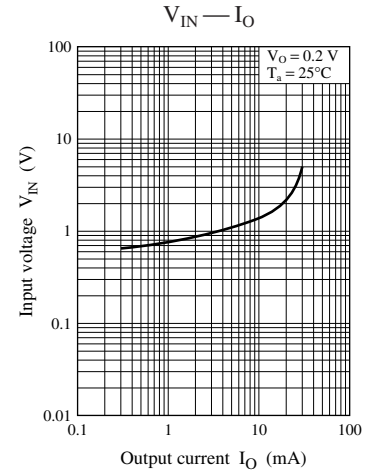
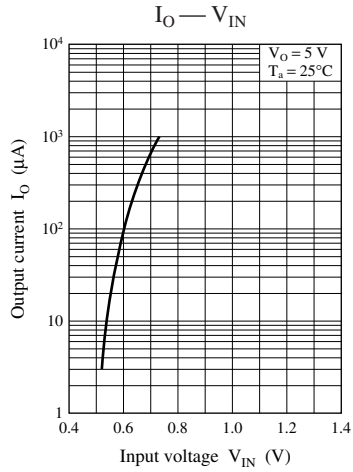
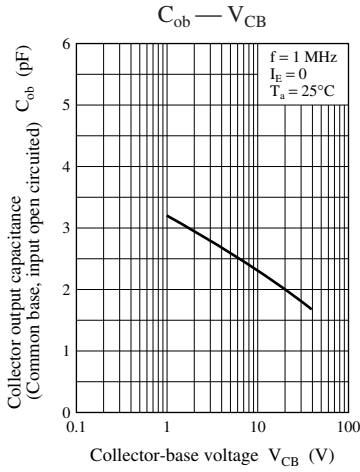
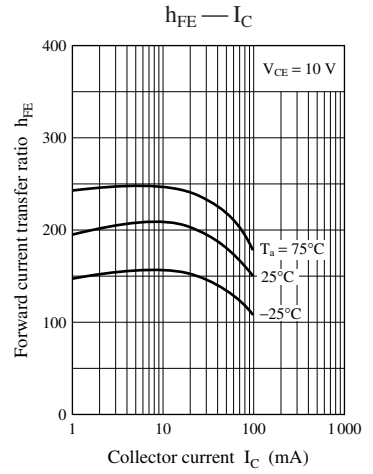
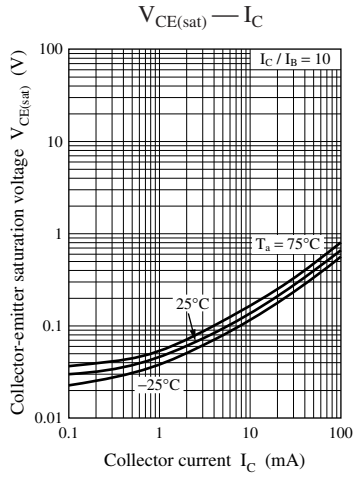
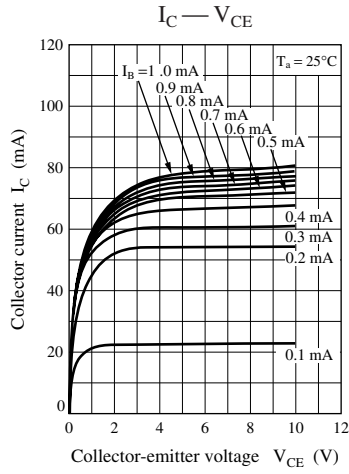


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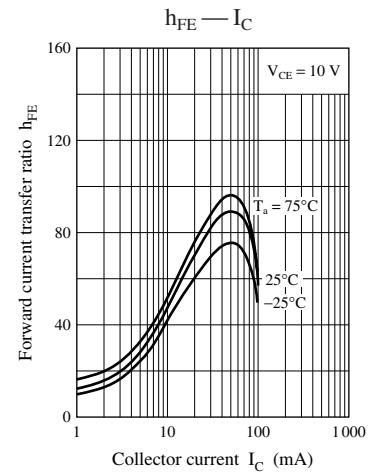
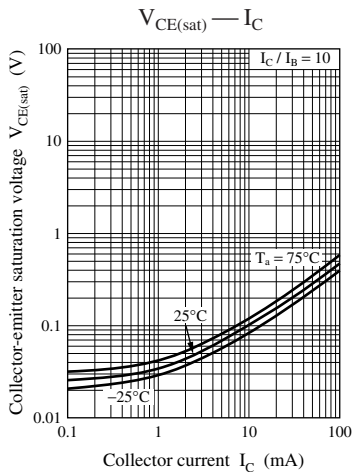
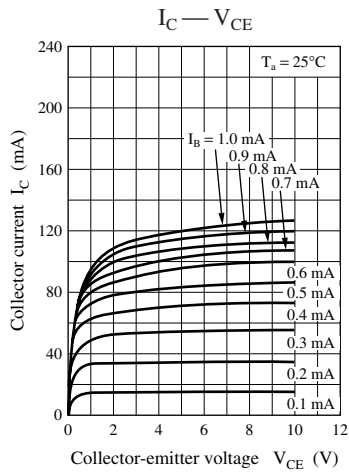


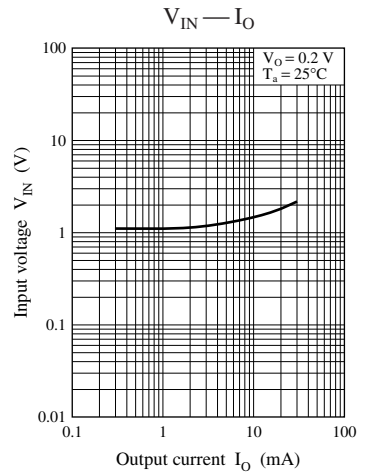
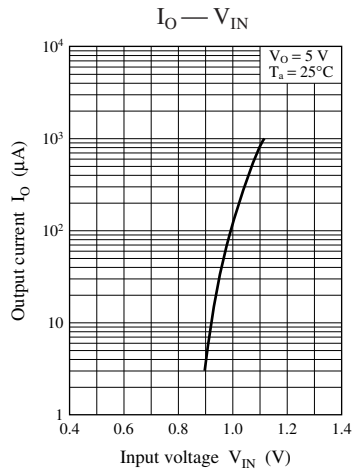
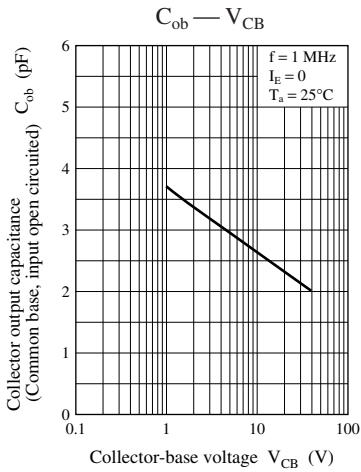


Characteristics charts of UNR4217

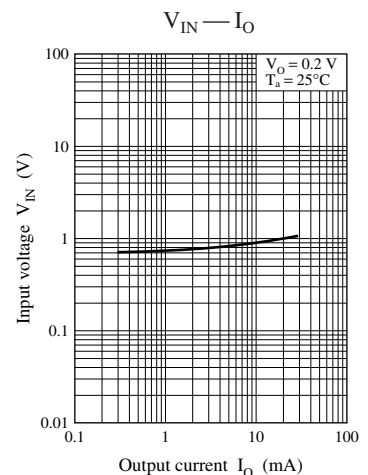
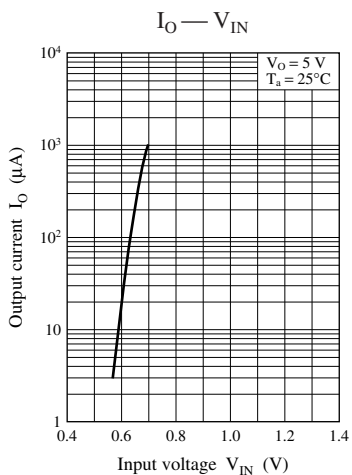
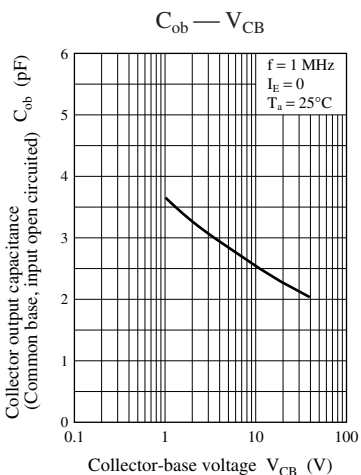
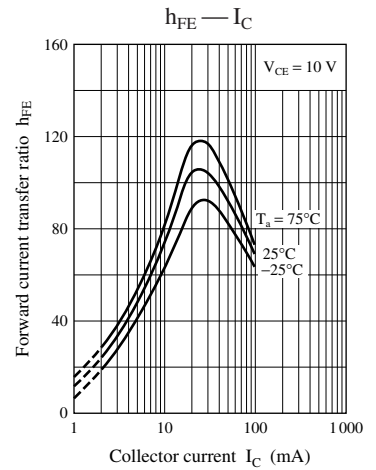
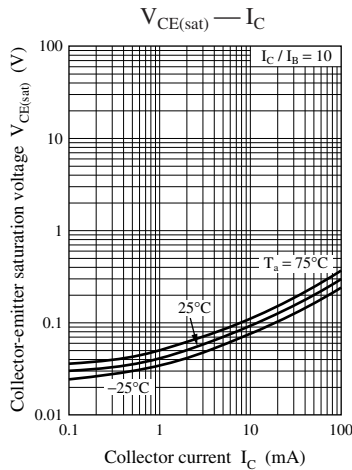
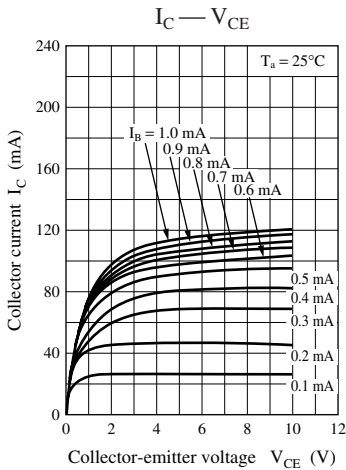


Characteristics charts of UNR4218

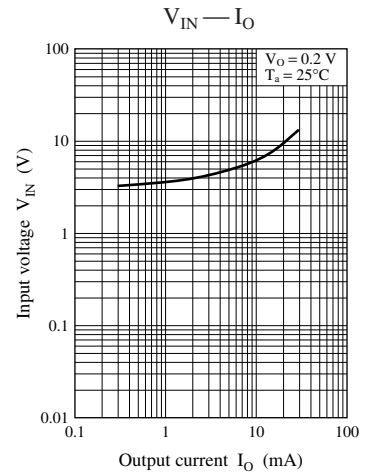
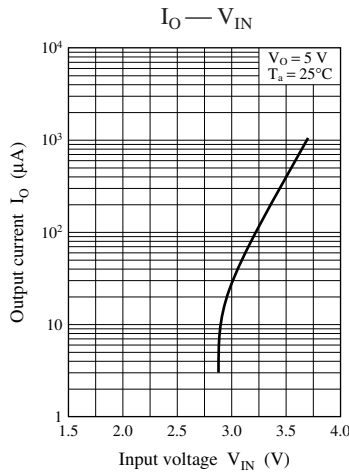
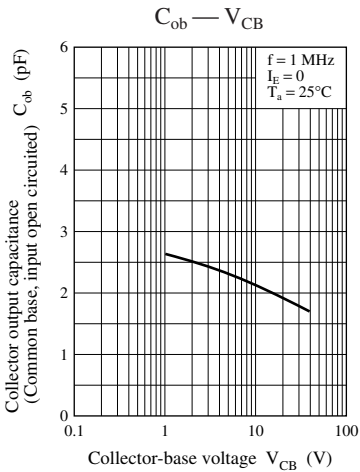
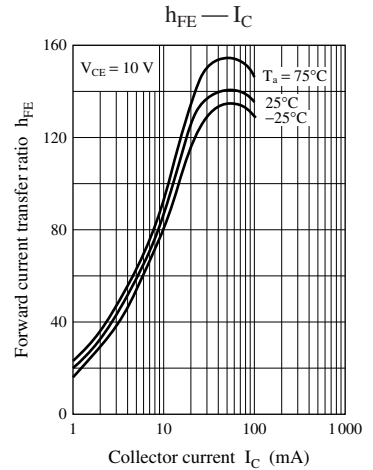
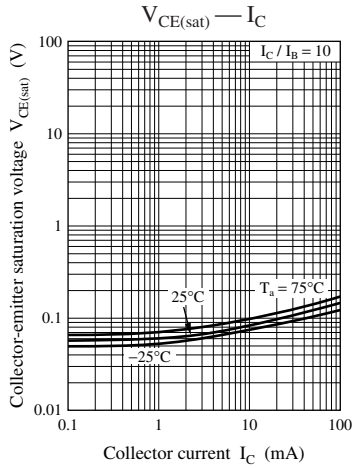
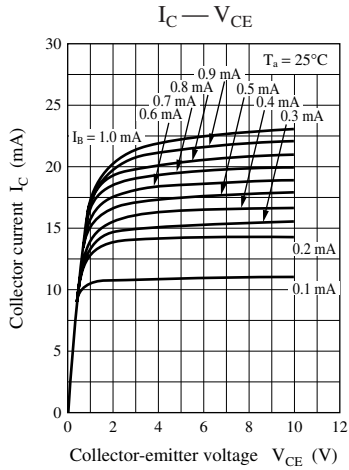




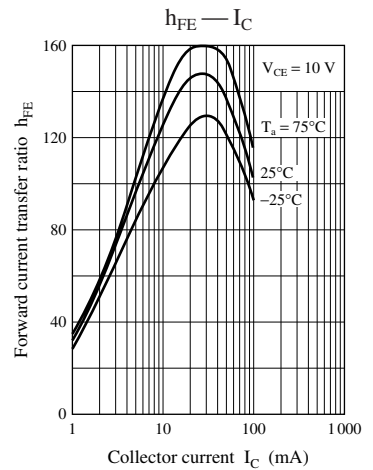
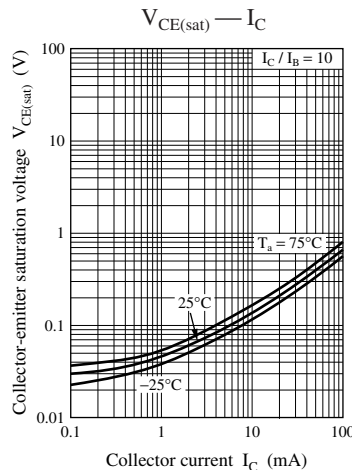
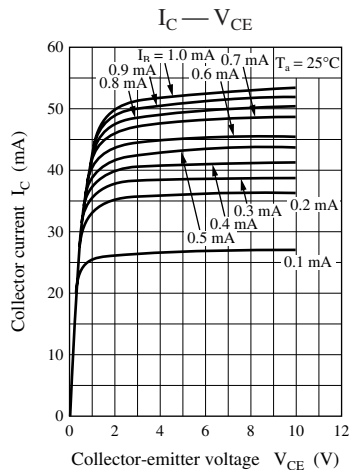
**Characteristics charts of UNR4219**

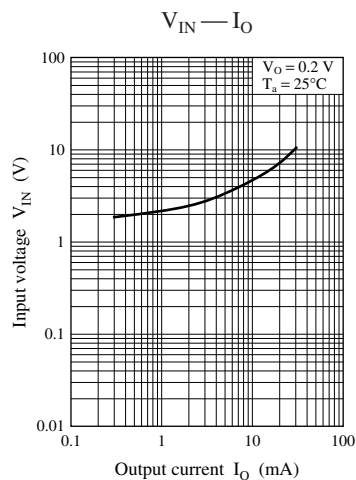
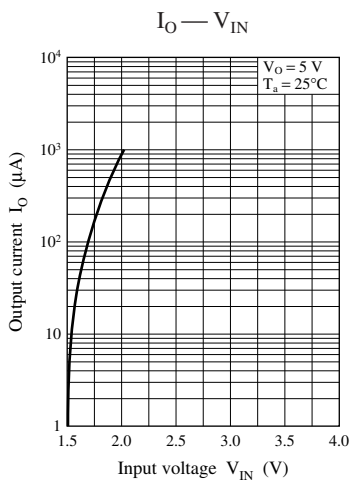
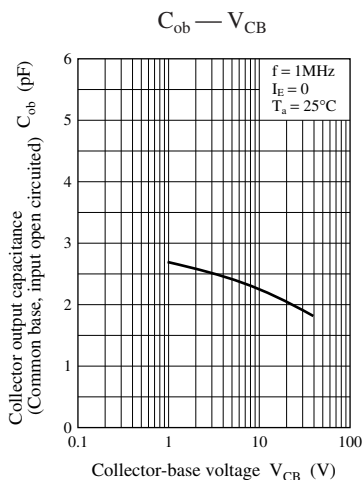


Characteristics charts of UNR421D

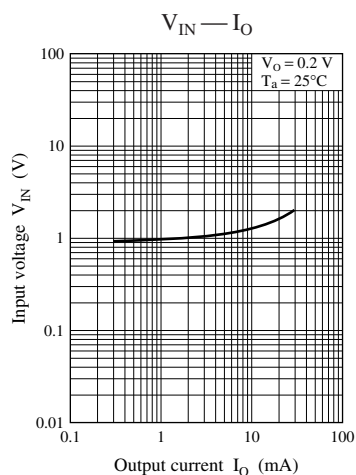
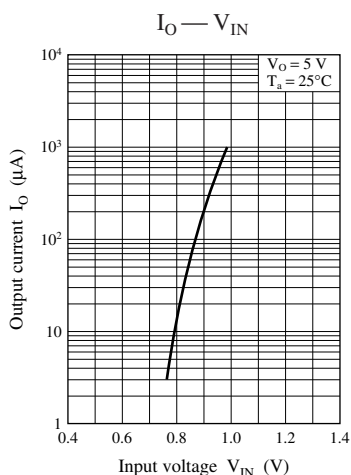
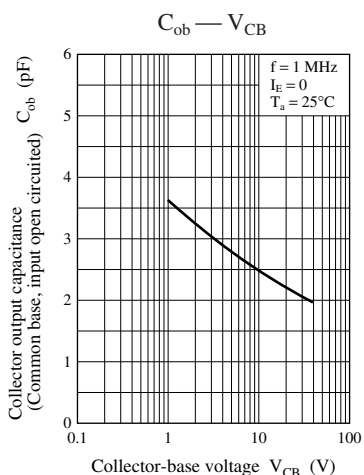
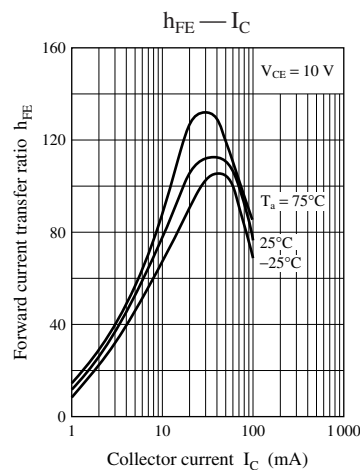
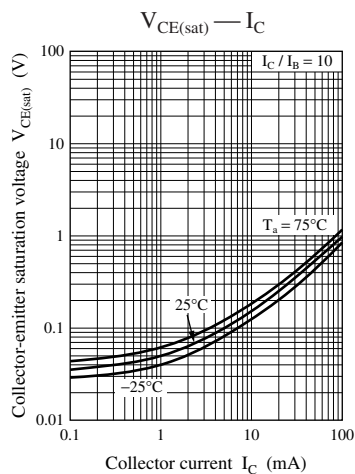
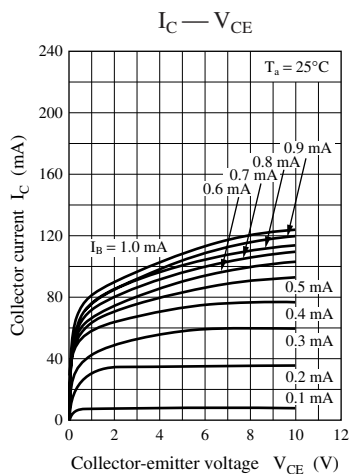


Characteristics charts of UNR421E

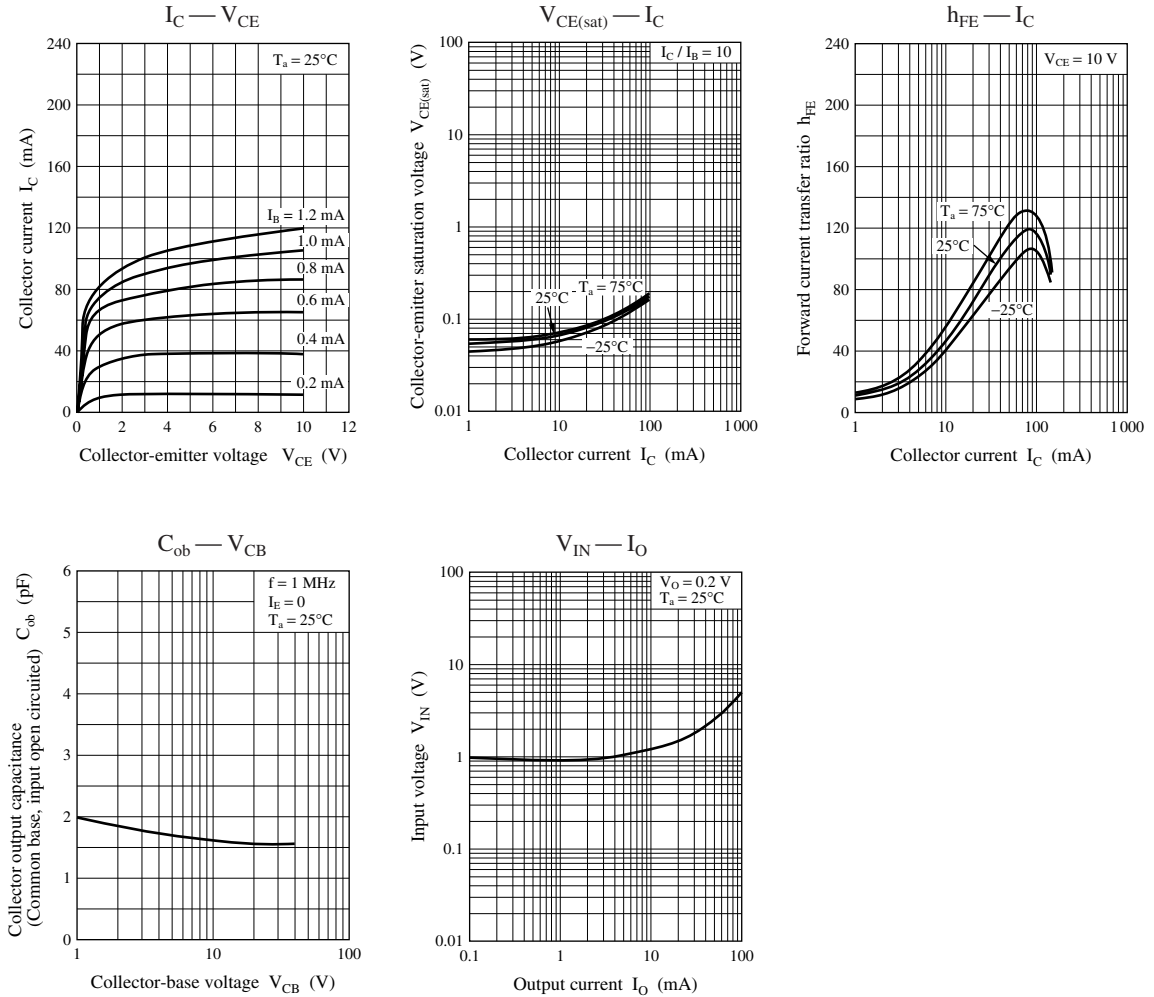




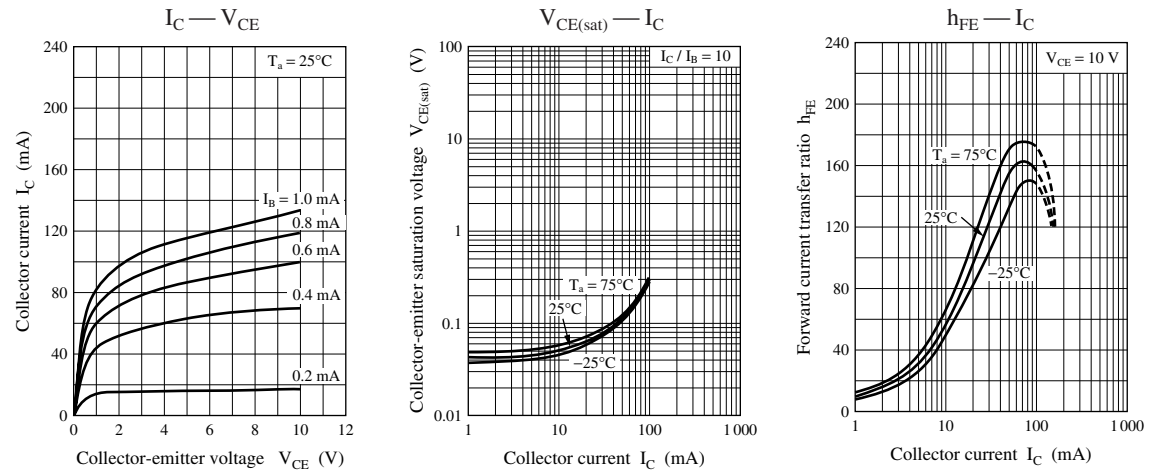
Characteristics charts of UNR421F

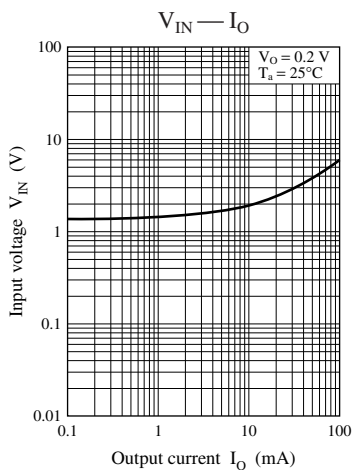
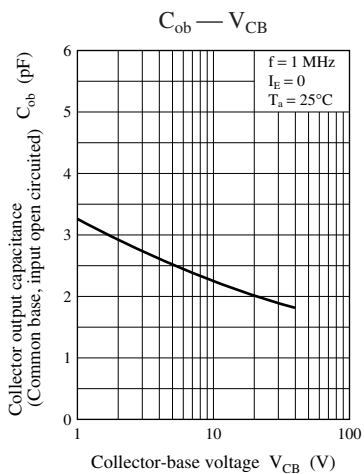


Characteristics charts of UNR421K



Characteristics charts of UNR421L





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