

# UNR421x Series (UN421x Series)

Silicon NPN epitaxial planar type

For digital circuits

## ■ Features

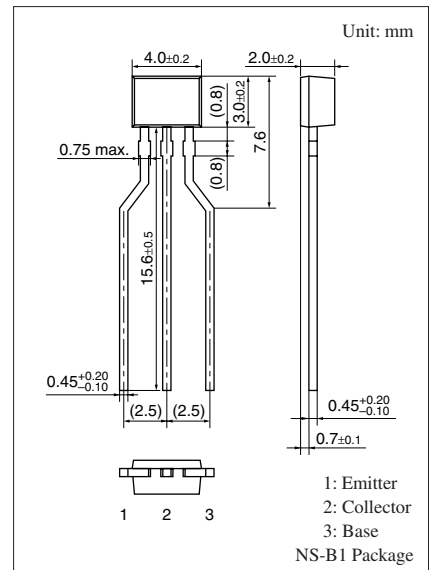
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- New S type package, allowing supply with the radial taping

## ■ Resistance by Part Number

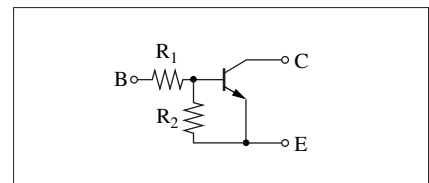
	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR4210 (UN4210)	47 kΩ	—
• UNR4211 (UN4211)	10 kΩ	10 kΩ
• UNR4212 (UN4212)	22 kΩ	22 kΩ
• UNR4213 (UN4213)	47 kΩ	47 kΩ
• UNR4214 (UN4214)	10 kΩ	47 kΩ
• UNR4215 (UN4215)	10 kΩ	—
• UNR4216 (UN4216)	4.7 kΩ	—
• UNR4217 (UN4217)	22 kΩ	—
• UNR4218 (UN4218)	0.51 kΩ	5.1 kΩ
• 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**  $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$ 

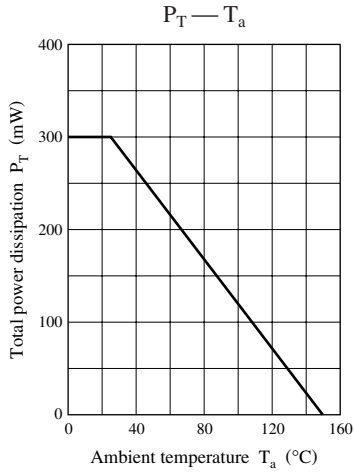
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)		$V_{CBO}$	$I_C = 10 \mu\text{A}, I_E = 0$	50			V
Collector-emitter voltage (Base open)		$V_{CEO}$	$I_C = 2 \text{ mA}, I_B = 0$	50			V
Collector-base cutoff current (Emitter open)		$I_{CBO}$	$V_{CB} = 50 \text{ V}, I_E = 0$			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.

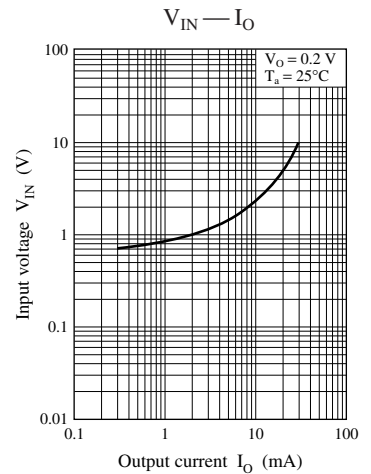
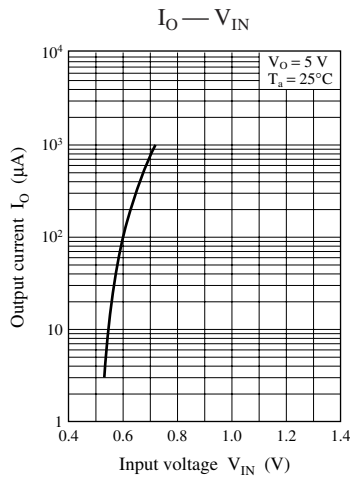
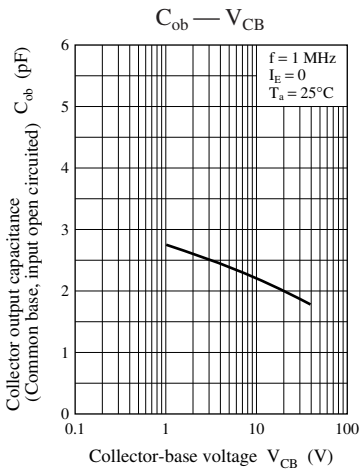
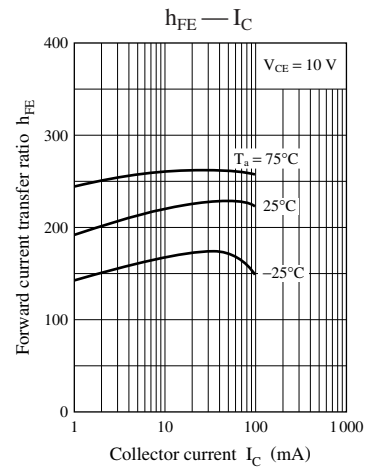
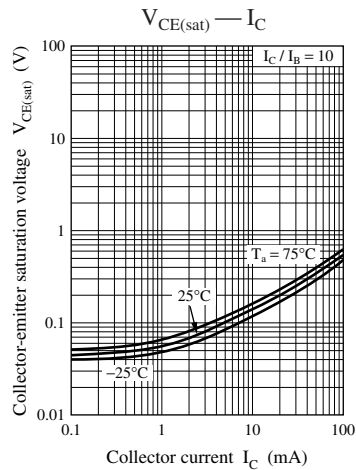
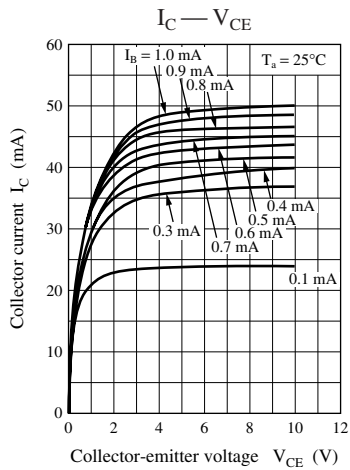
2. \*: Rank classification

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

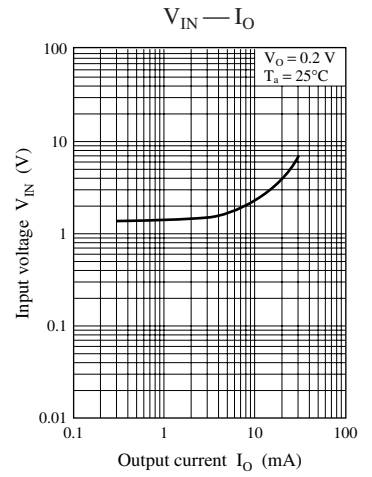
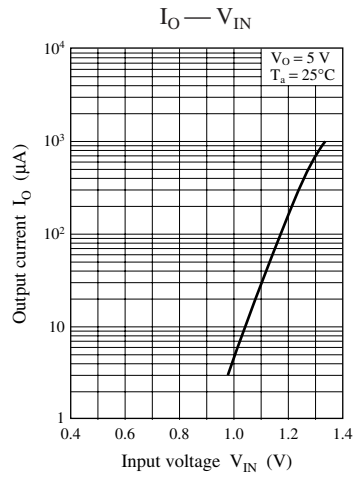
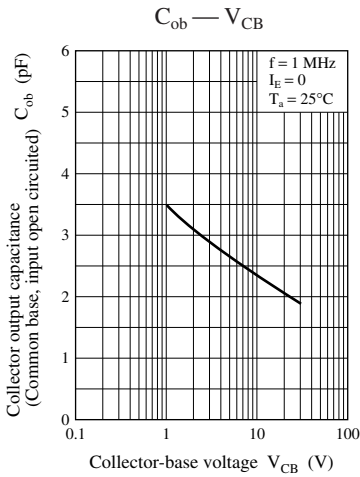
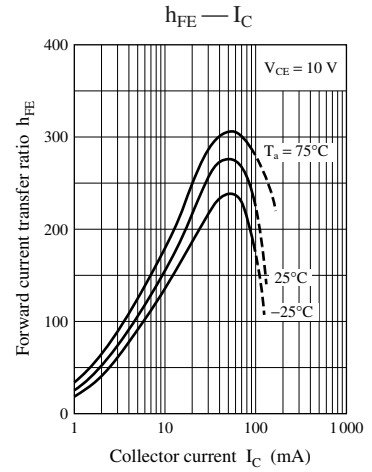
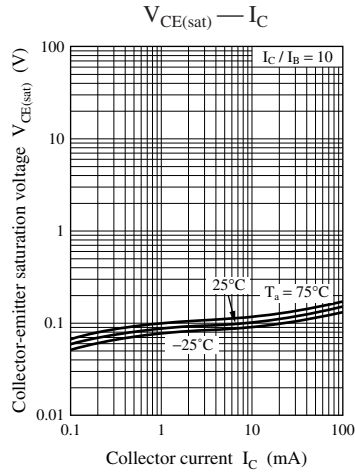
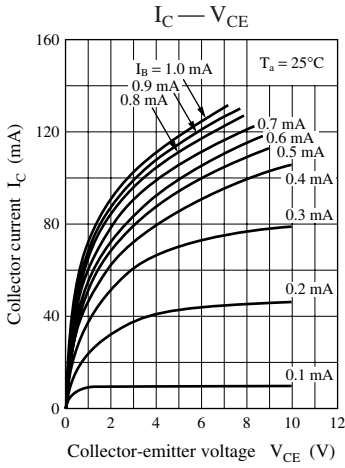
Common characteristics chart



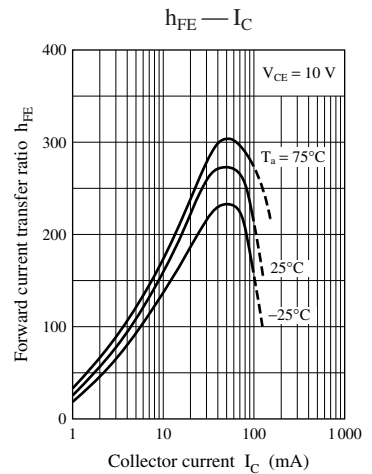
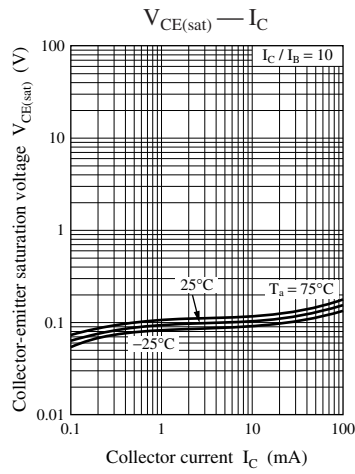
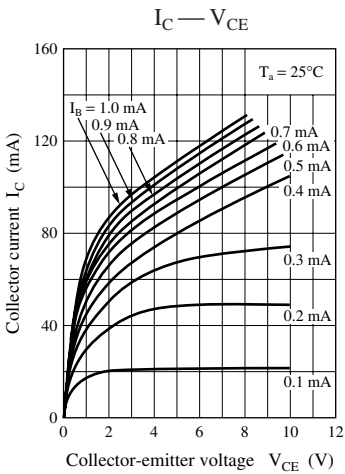
Characteristics charts of UNR4210

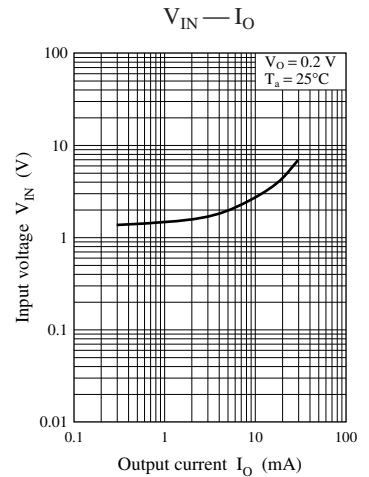
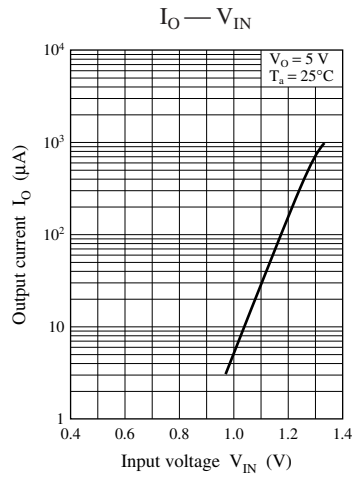
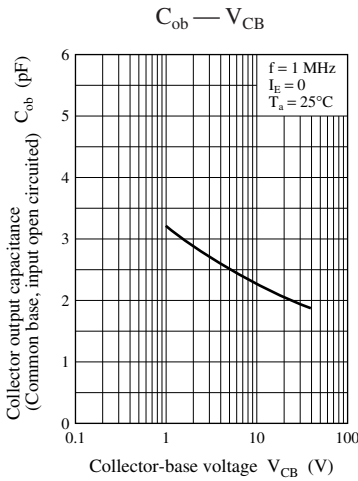


Characteristics charts of UNR4211

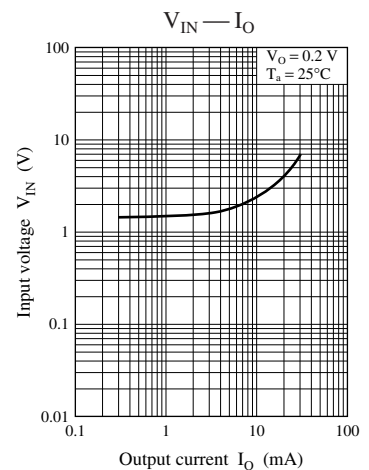
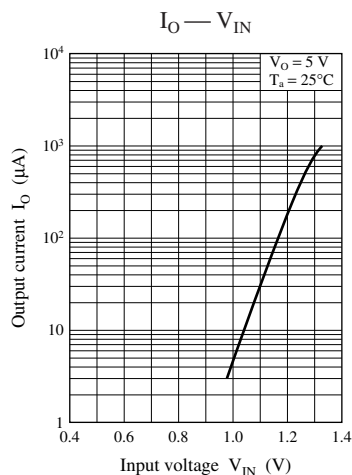
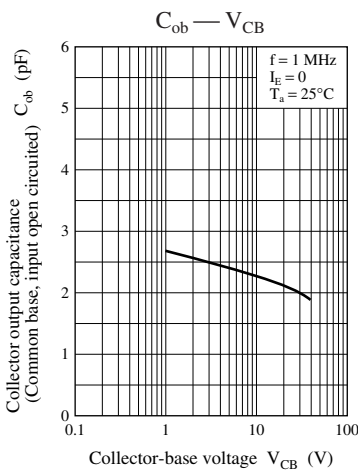
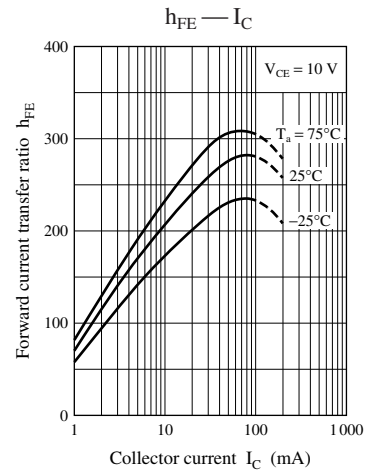
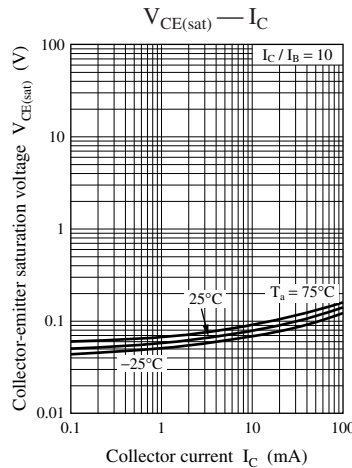
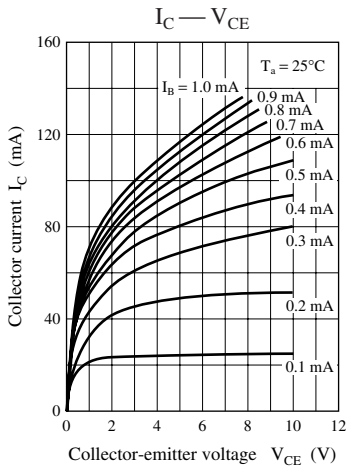


Characteristics charts of UNR4212

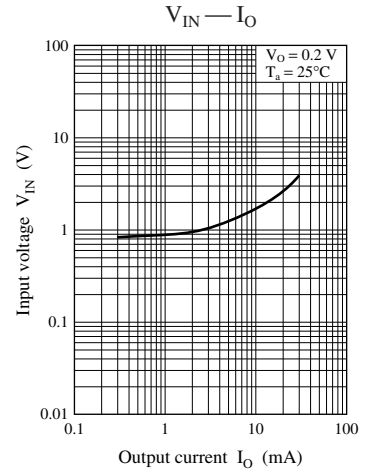
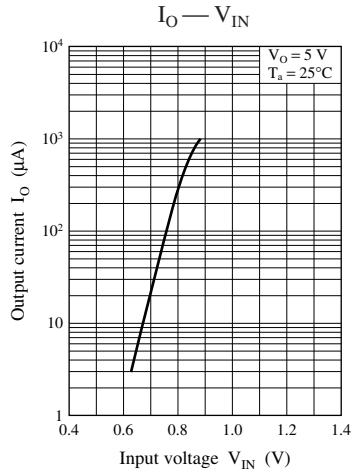
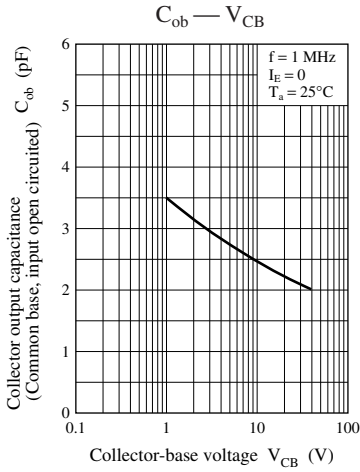
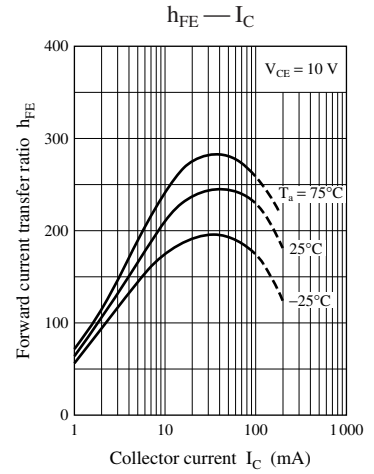
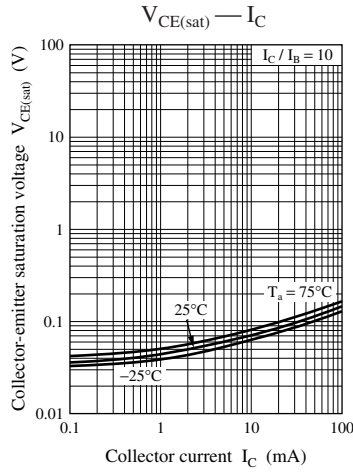
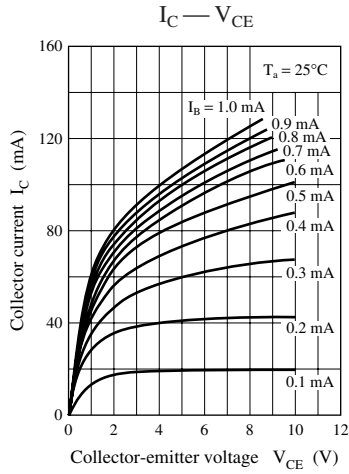




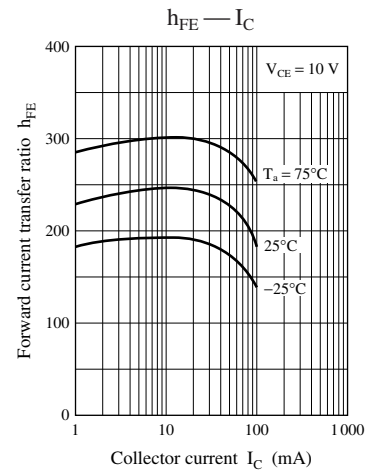
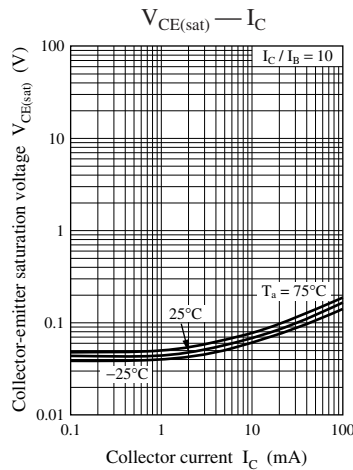
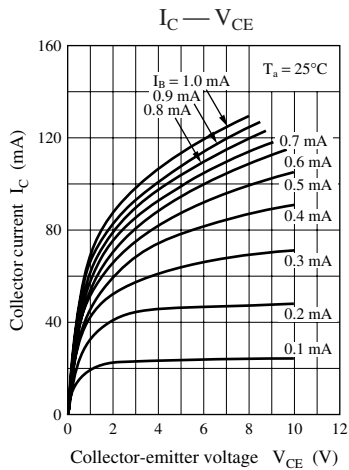
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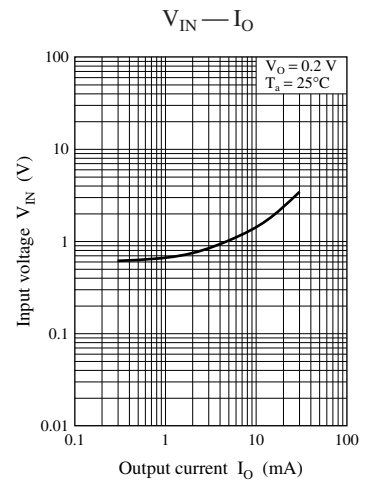
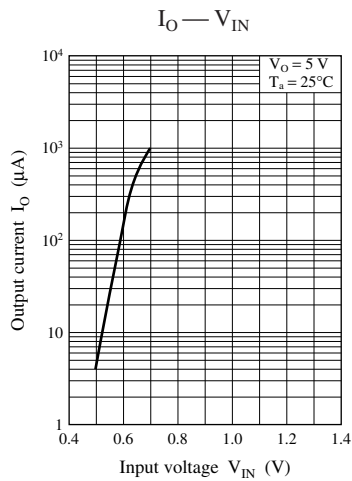
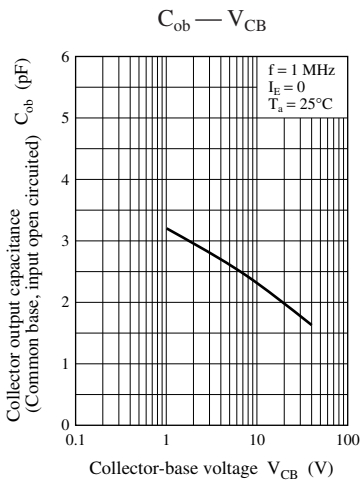


Characteristics charts of UNR4214

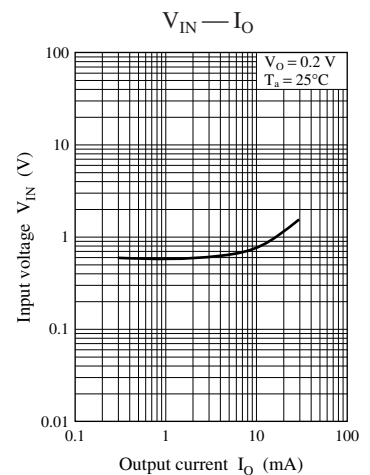
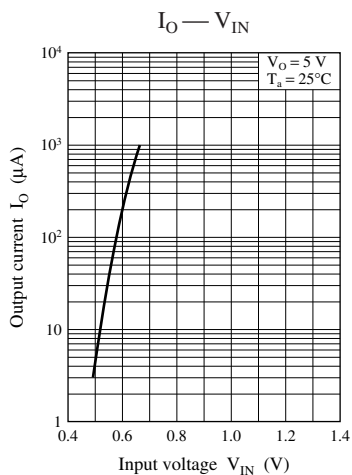
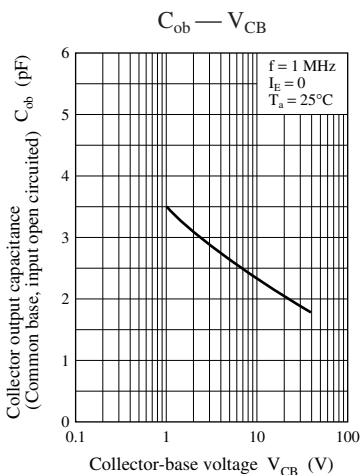
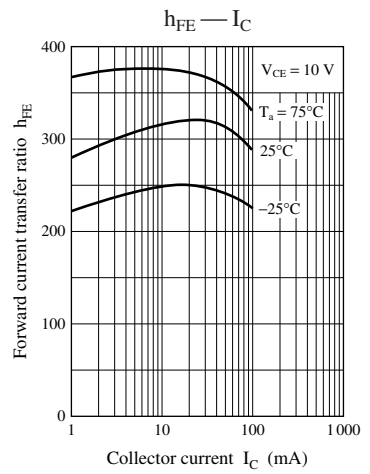
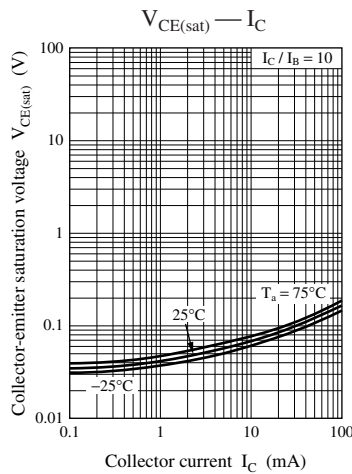
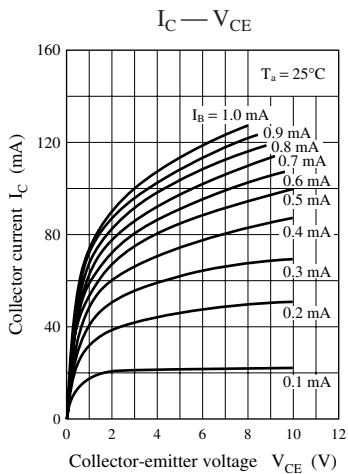


Characteristics charts of UNR4215

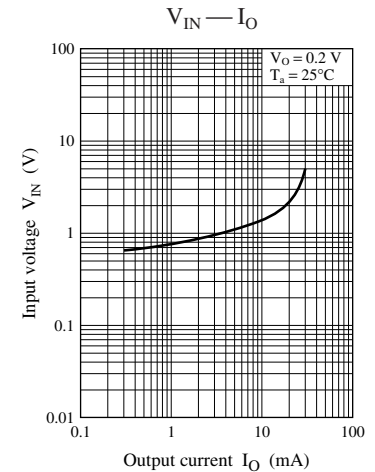
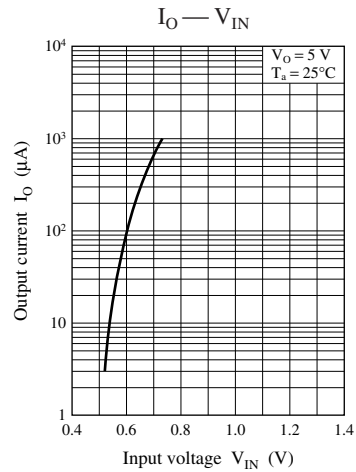
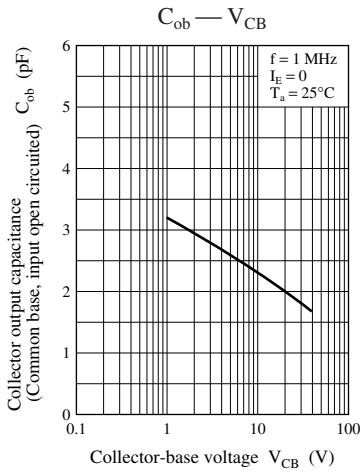
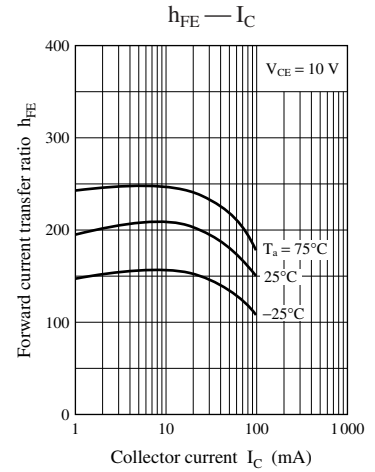
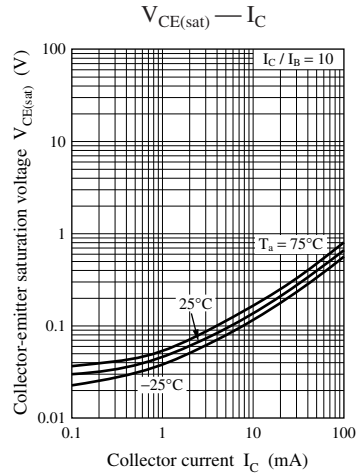
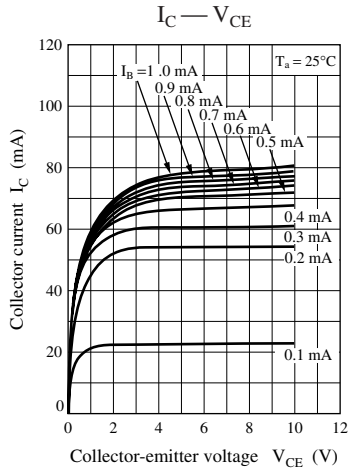




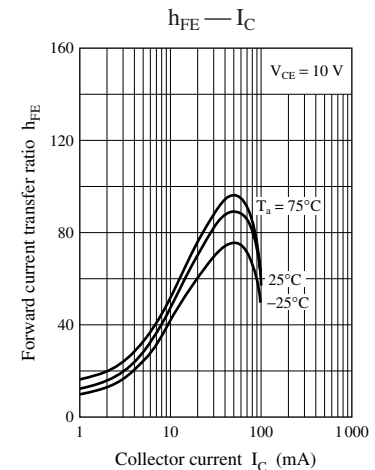
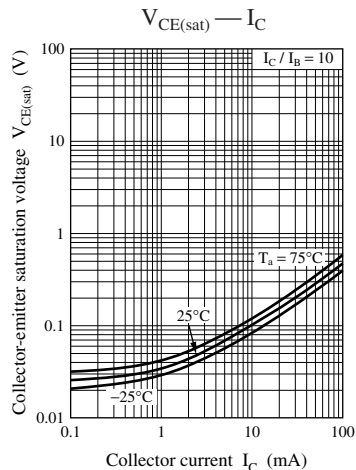
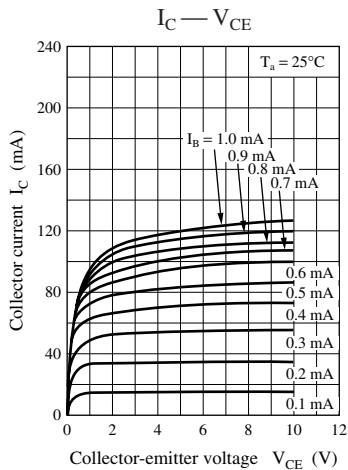
Characteristics charts of UNR4216



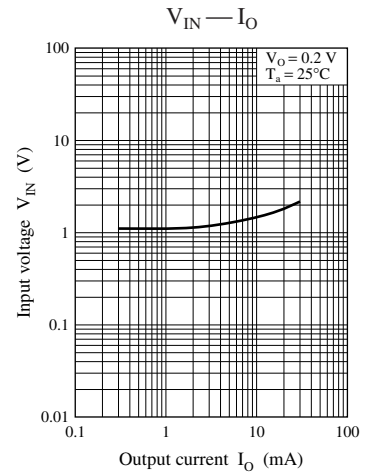
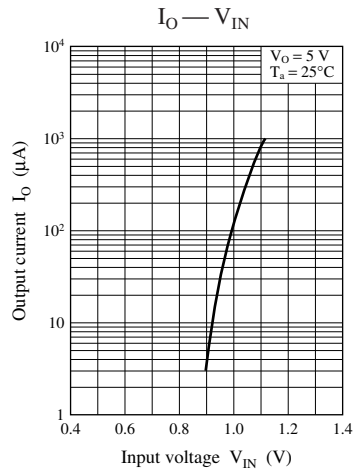
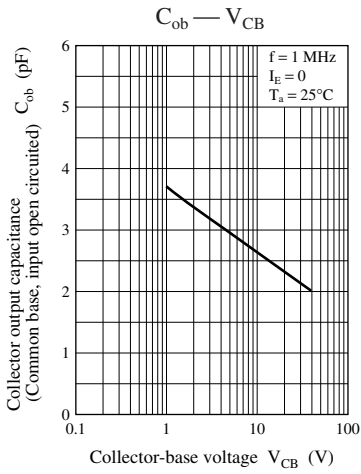
Characteristics charts of UNR4217



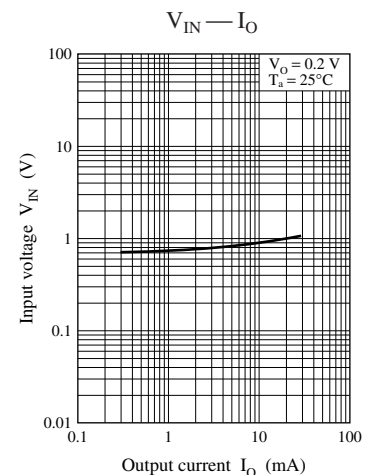
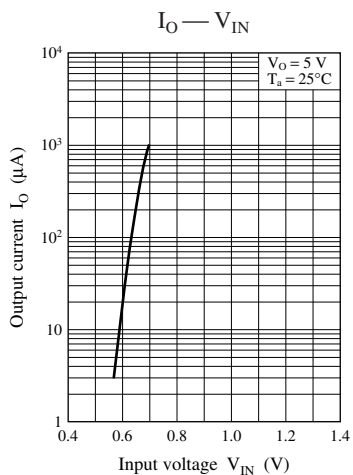
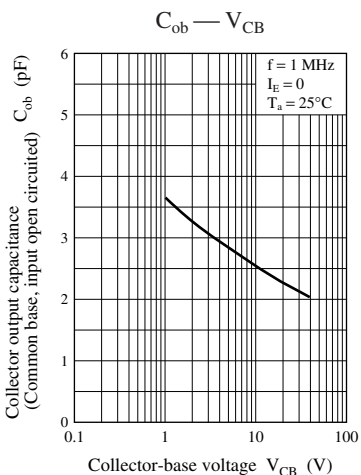
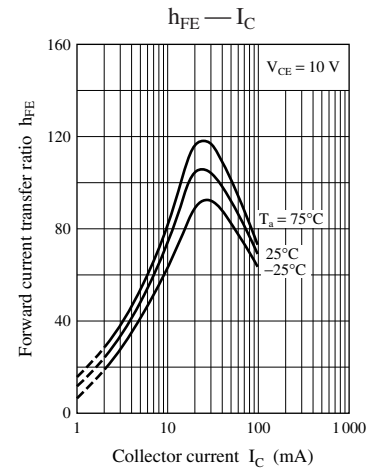
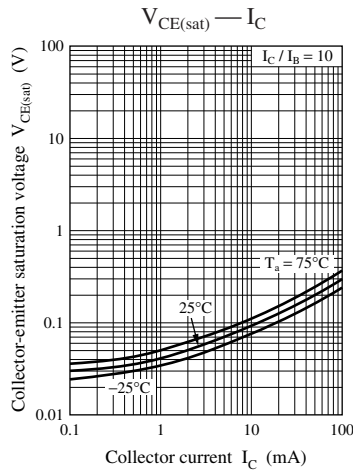
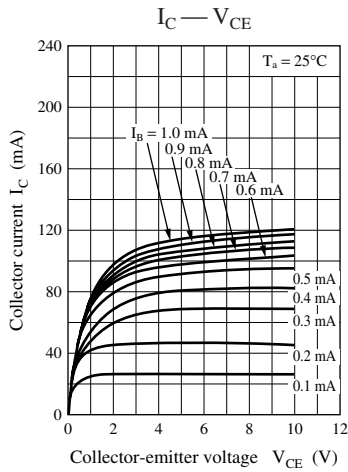
Characteristics charts of UNR4218



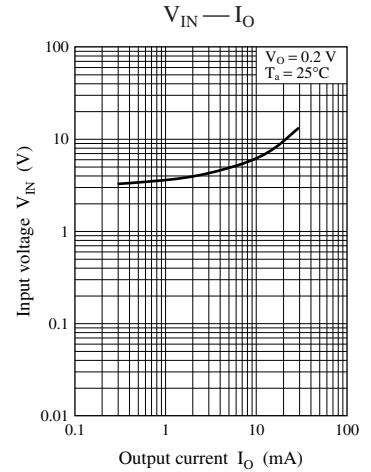
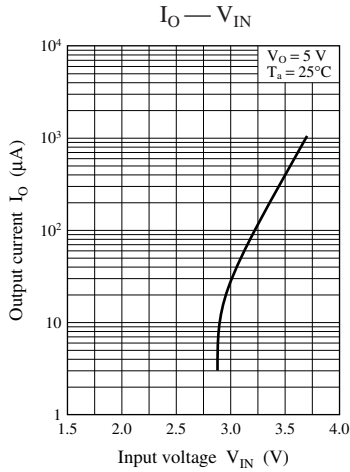
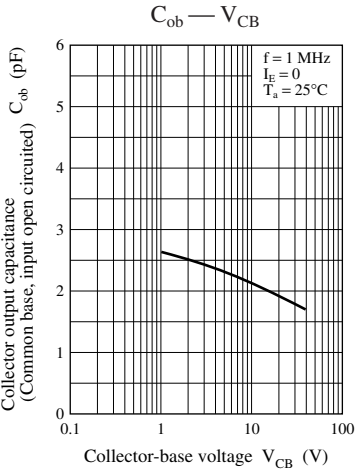
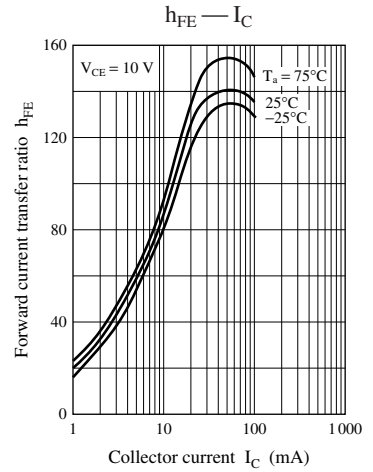
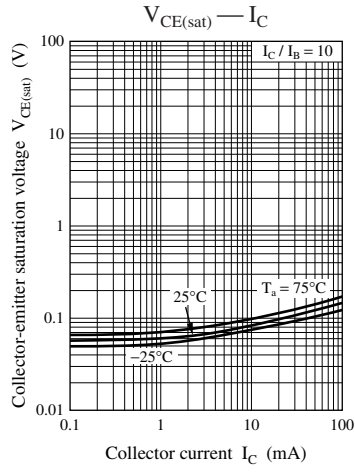
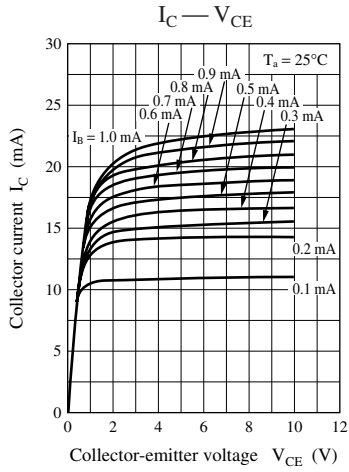




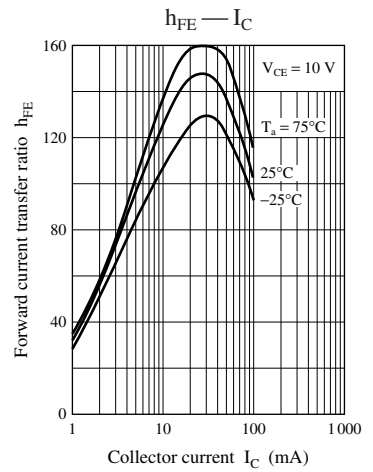
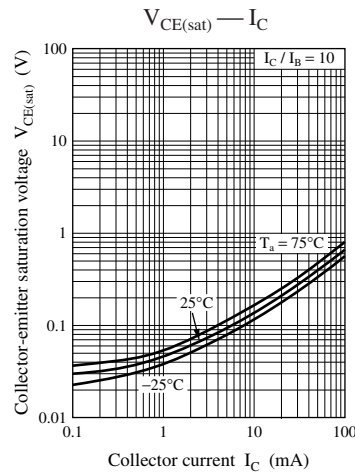
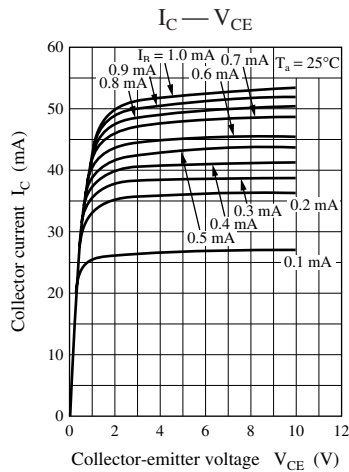
Characteristics charts of UNR4219

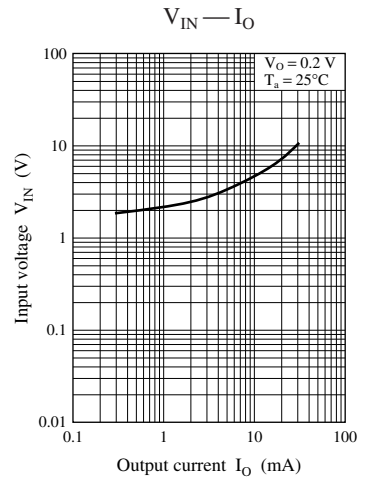
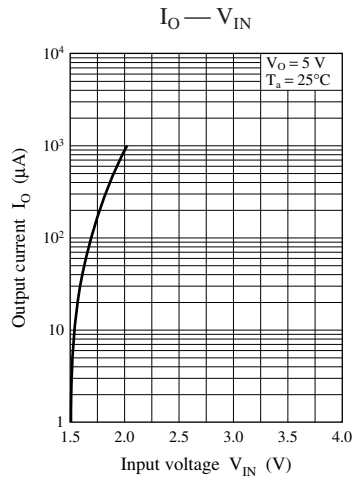
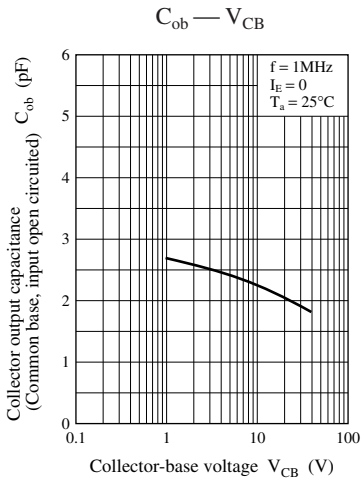


Characteristics charts of UNR421D

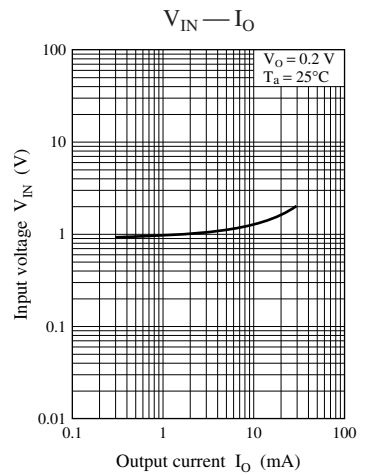
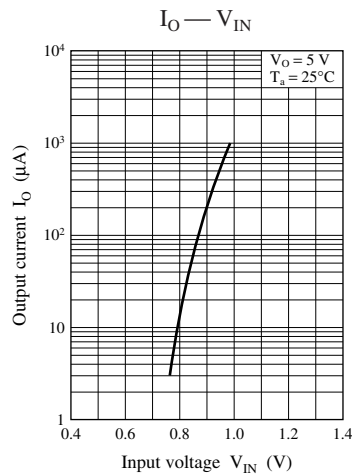
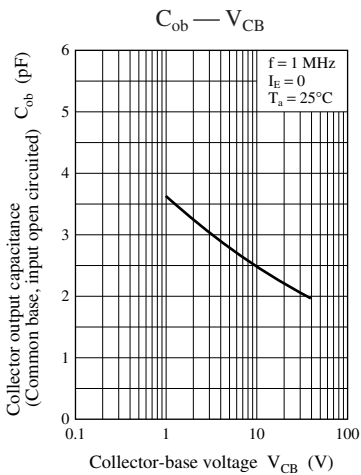
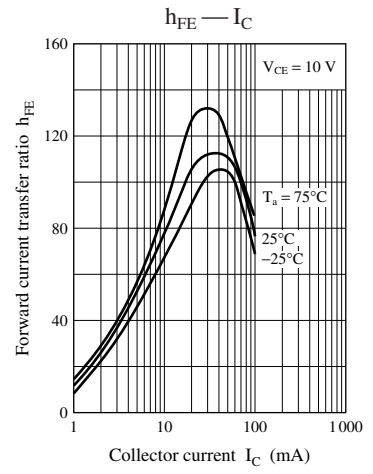
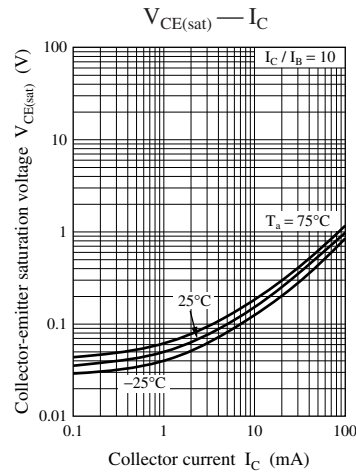
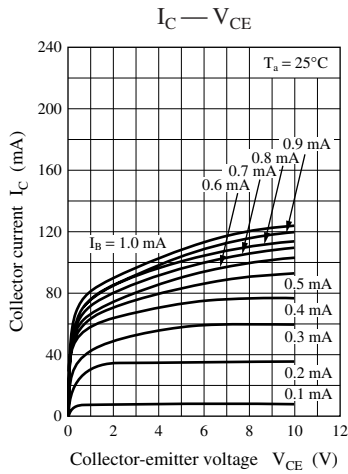


Characteristics charts of UNR421E

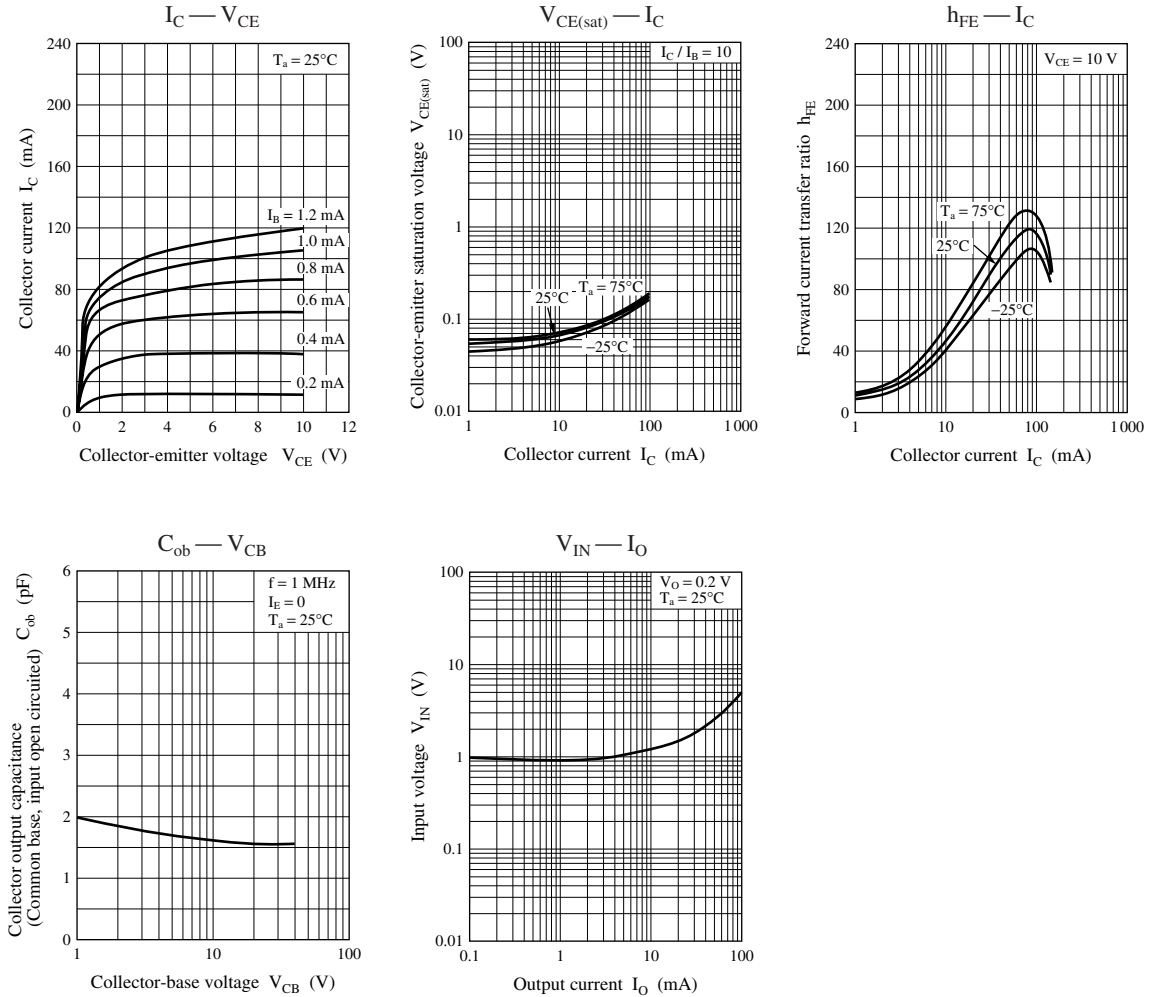




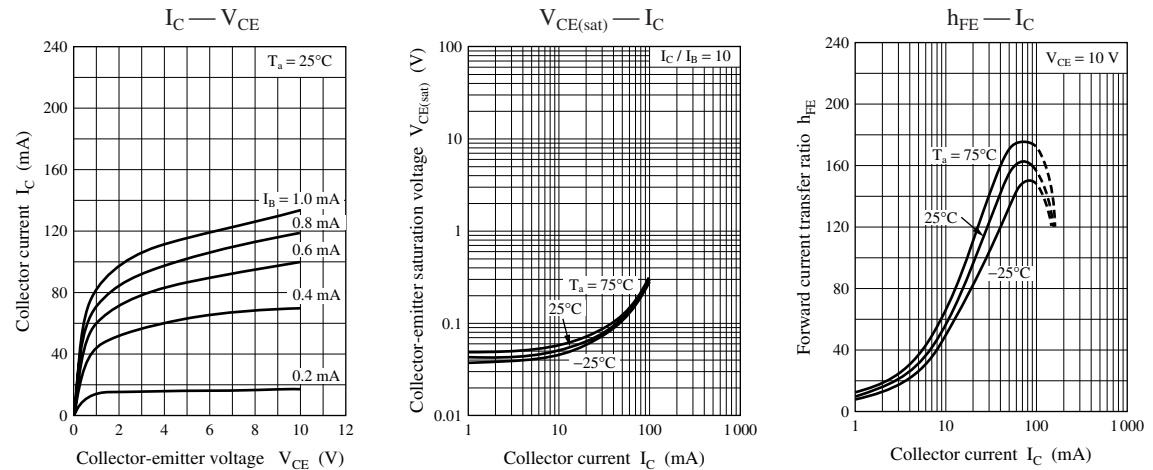
Characteristics charts of UNR421F

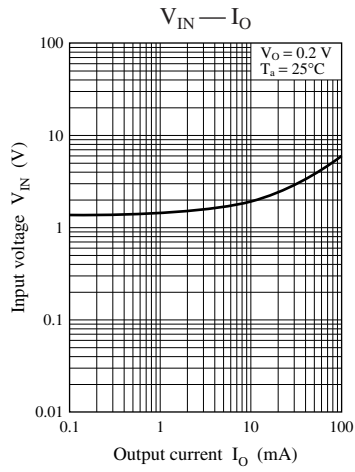
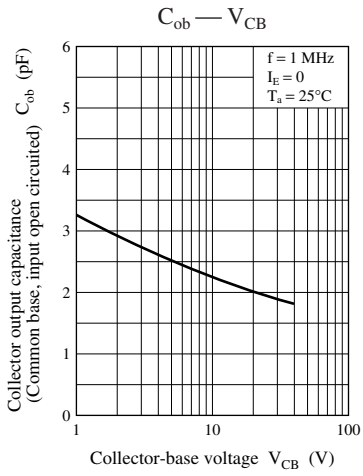


Characteristics charts of UNR421K



Characteristics charts of UNR421L





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