

# UNR121x Series (UN121x Series)

Silicon NPN epitaxial planar type

For digital circuits

## ■ Features

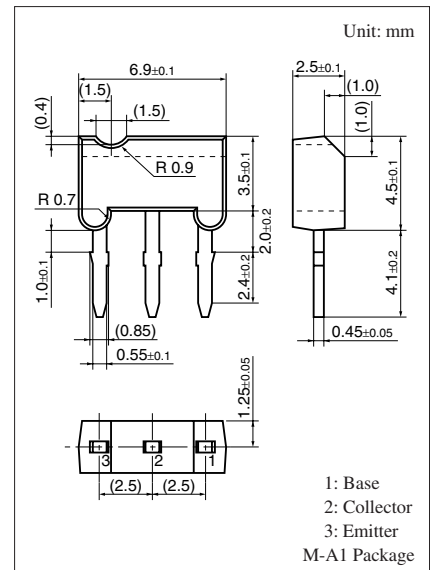
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- M type package allowing easy automatic and manual insertion as well as stand-alone fixing to the printed circuit board

## ■ Resistance by Part Number

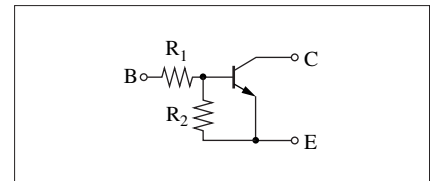
	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR1210 (UN1210)	47 kΩ	—
• UNR1211 (UN1211)	10 kΩ	10 kΩ
• UNR1212 (UN1212)	22 kΩ	22 kΩ
• UNR1213 (UN1213)	47 kΩ	47 kΩ
• UNR1214 (UN1214)	10 kΩ	47 kΩ
• UNR1215 (UN1215)	10 kΩ	—
• UNR1216 (UN1216)	4.7 kΩ	—
• UNR1217 (UN1217)	22 kΩ	—
• UNR1218 (UN1218)	0.51 kΩ	5.1 kΩ
• UNR1219 (UN1219)	1 kΩ	10 kΩ
• UNR121D (UN121D)	47 kΩ	10 kΩ
• UNR121E (UN121E)	47 kΩ	22 kΩ
• UNR121F (UN121F)	4.7 kΩ	10 kΩ
• UNR121K (UN121K)	10 kΩ	4.7 kΩ
• UNR121L (UN121L)	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>	400	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  $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

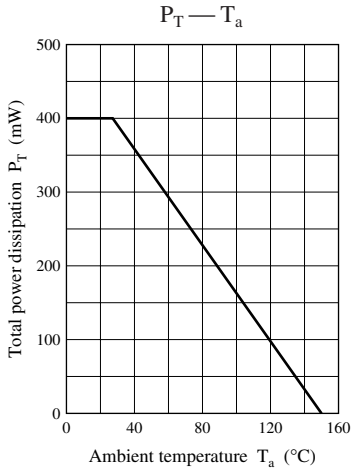
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)		$V_{CBO}$	$I_C = 10 \mu\text{A}, I_E = 0$	50			V
Collector-emitter voltage (Base open)		$V_{CEO}$	$I_C = 2 \text{mA}, I_B = 0$	50			V
Collector-base cutoff current (Emitter open)		$I_{CBO}$	$V_{CB} = 50 \text{V}, I_E = 0$			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)	UNR1211	$I_{EBO}$	$V_{EB} = 6 \text{V}, I_C = 0$			0.5	mA
	UNR1212/1214/121D/121E					0.2	
	UNR1213					0.1	
	UNR1210/1215/1216/1217					0.01	
	UNR121F/121K					1.0	
	UNR1219					1.5	
	UNR1218/121L					2.0	
Forward current transfer ratio	UNR1211	$h_{FE}$	$V_{CE} = 10 \text{V}, I_C = 5 \text{mA}$	35			—
	UNR1212/121E			60			
	UNR1213/1214			80			
	UNR1210*/1215*/1216*/ 1217*			160		460	
	UNR1219/121D/121F			30			
	UNR1218/121K/121L			20			
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
	UNR1213/121K		$V_{CC} = 5 \text{V}, V_B = 3.5 \text{V}, R_L = 1 \text{k}\Omega$				
	UNR121D		$V_{CC} = 5 \text{V}, V_B = 10 \text{V}, R_L = 1 \text{k}\Omega$				
	UNR121E		$V_{CC} = 5 \text{V}, V_B = 6 \text{V}, R_L = 1 \text{k}\Omega$				
Transition frequency		$f_T$	$V_{CB} = 10 \text{V}, I_E = -2 \text{mA}, f = 200 \text{MHz}$		80		MHz
Input resistance	UNR1211/1214/1215/121K	$R_1$		-30%	10	+30%	k $\Omega$
	UNR1212/1217				22		
	UNR1210/1213/121D/121E				47		
	UNR1216/121F/121L				4.7		
	UNR1218				0.51		
	UNR1219				1		
Resistance ratio	UNR1211/1212/1213/121L	$R_1/R_2$		0.8	1.0	1.2	—
	UNR1214			0.17	0.21	0.25	
	UNR1218/1219			0.08	0.1	0.12	
	UNR121D				4.7		
	UNR121E				2.14		
	UNR121F				0.47		
	UNR121K				2.13		

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

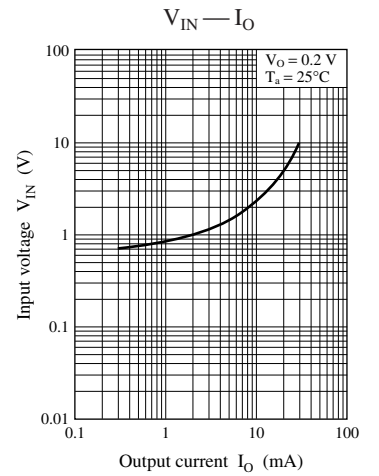
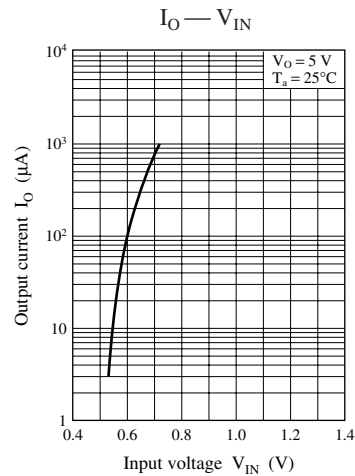
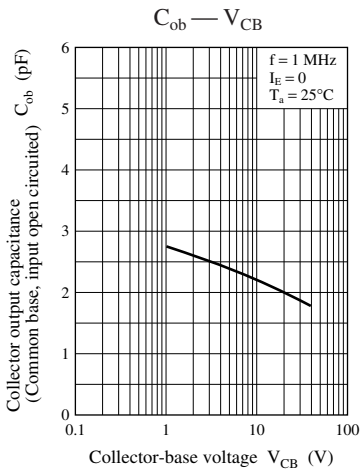
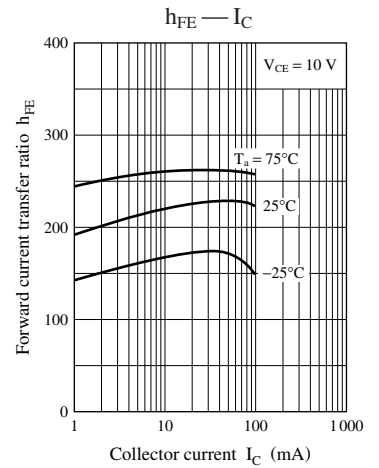
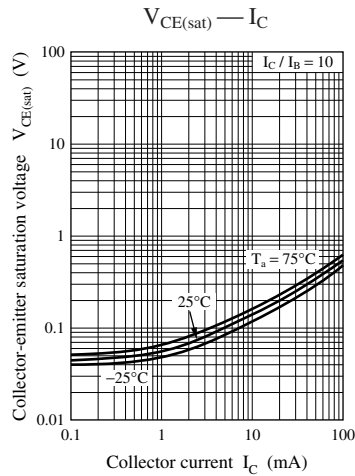
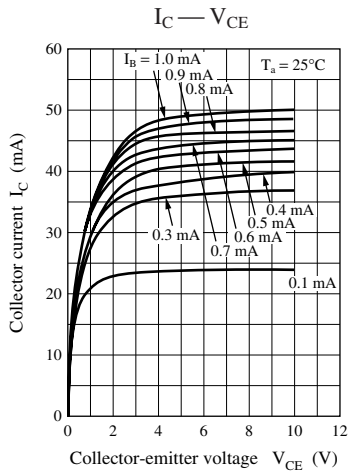
2. \*: Rank classification (UNR1110/1115/1116/1117)

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

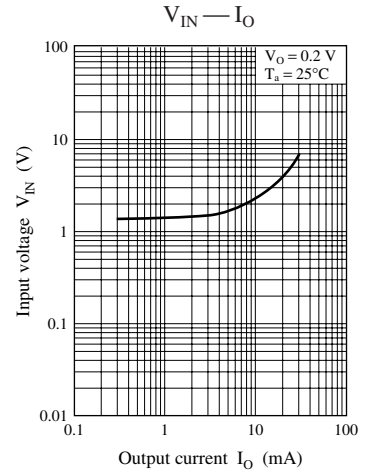
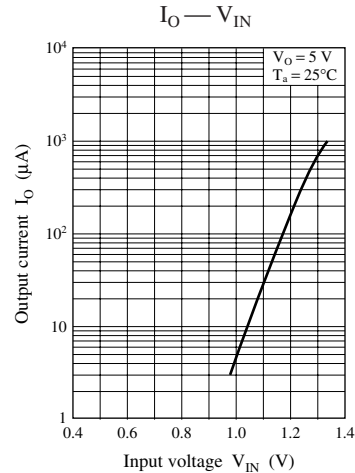
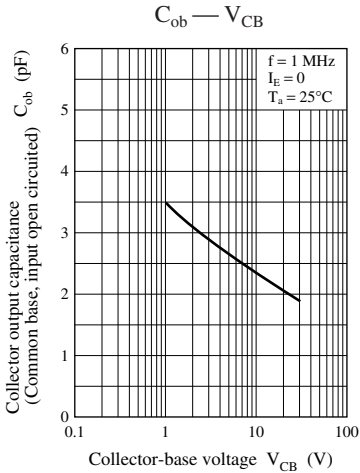
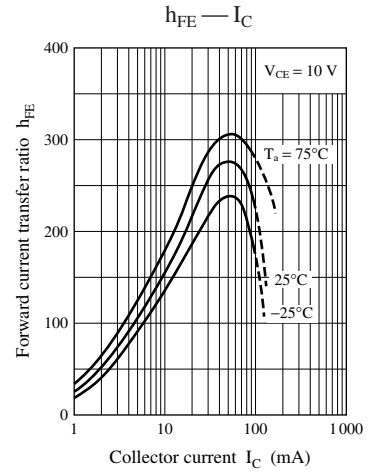
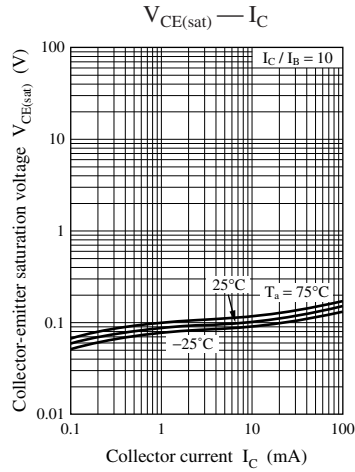
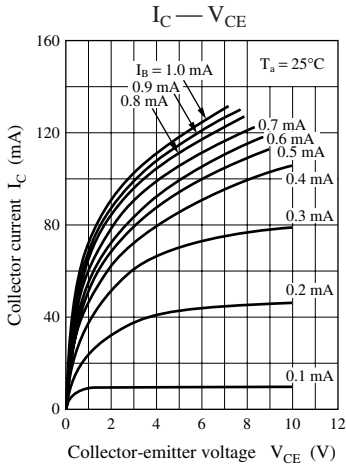
Common characteristics chart



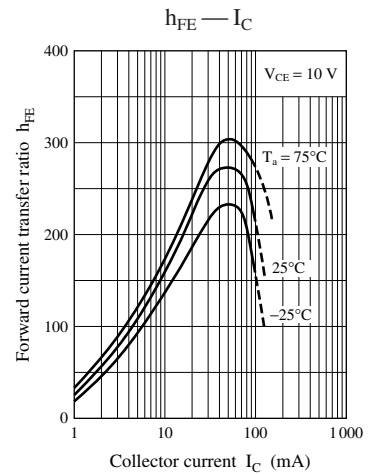
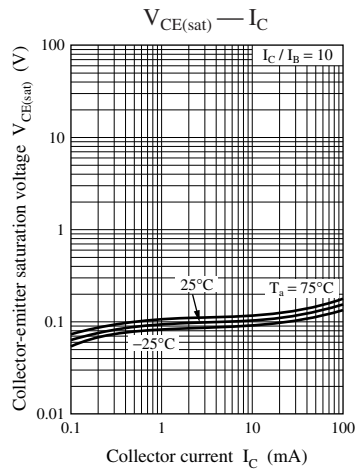
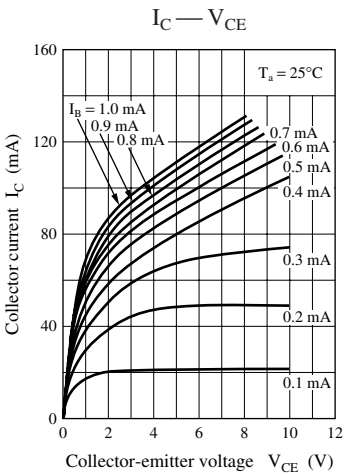
Characteristics charts of UNR1210

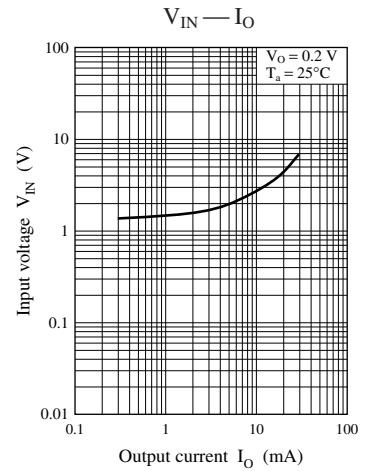
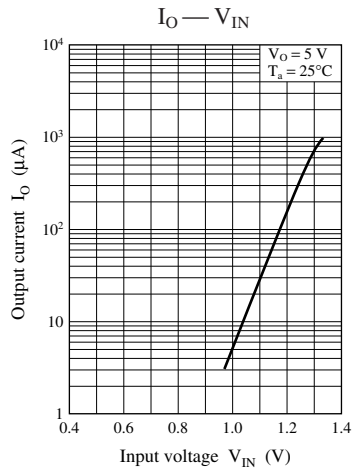
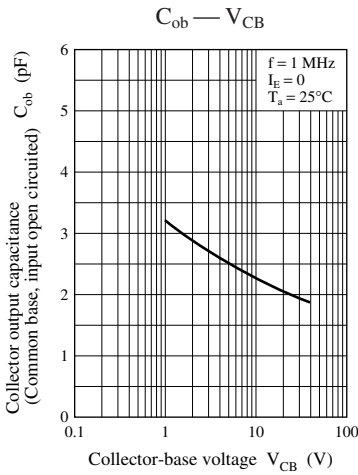


Characteristics charts of UNR1211

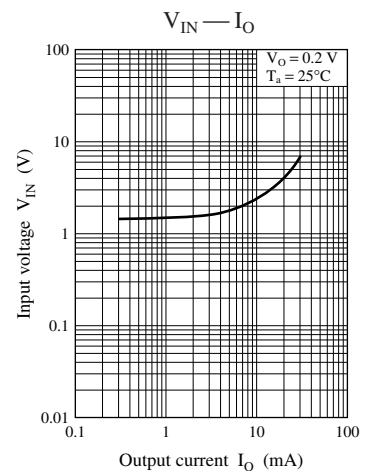
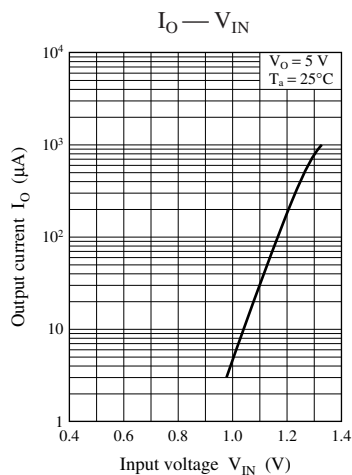
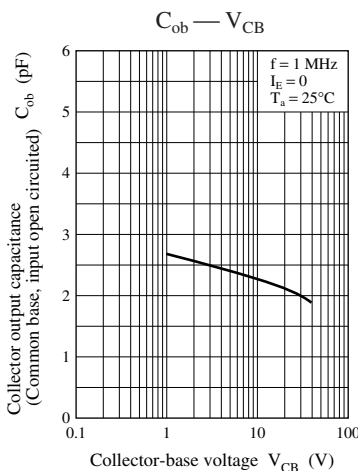
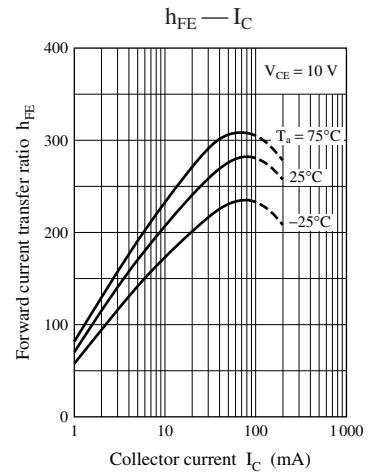
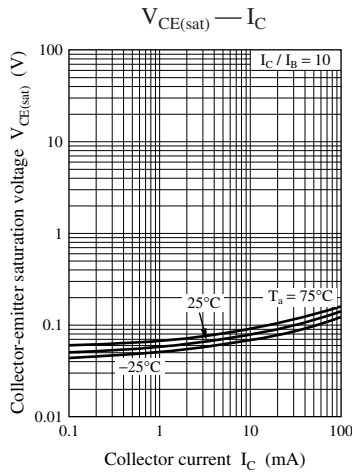
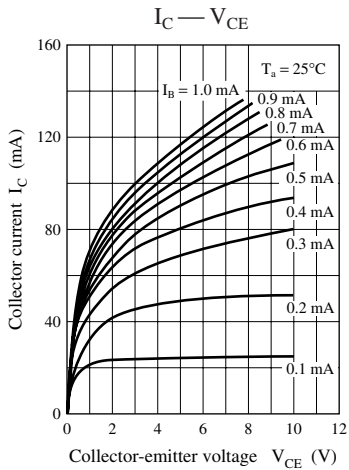


Characteristics charts of UNR1212

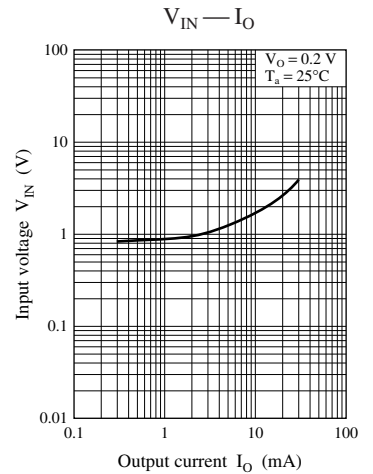
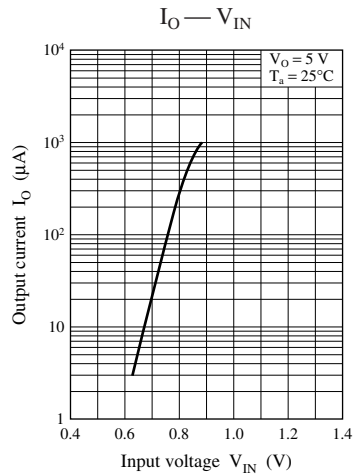
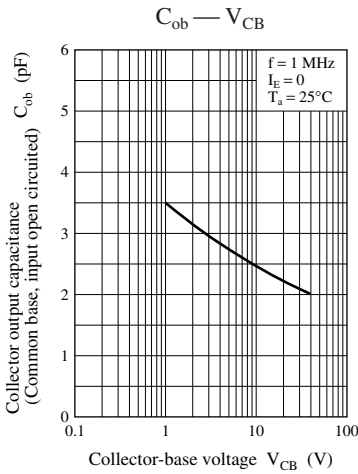
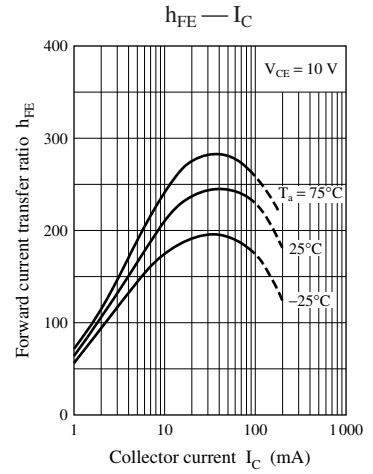
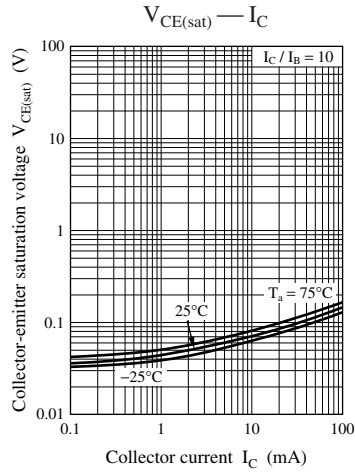
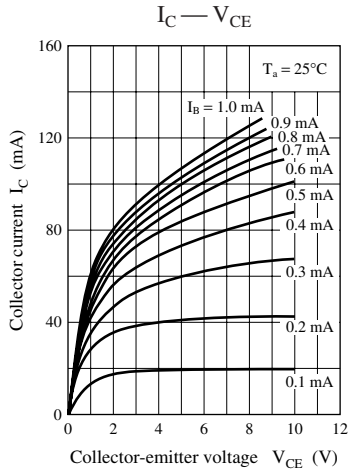




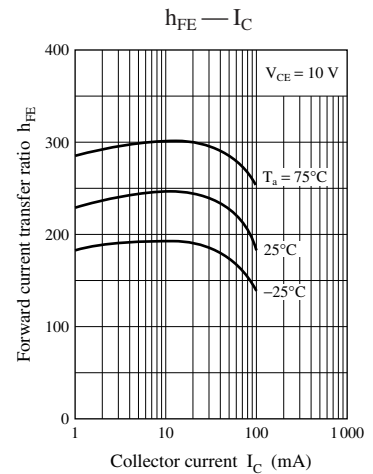
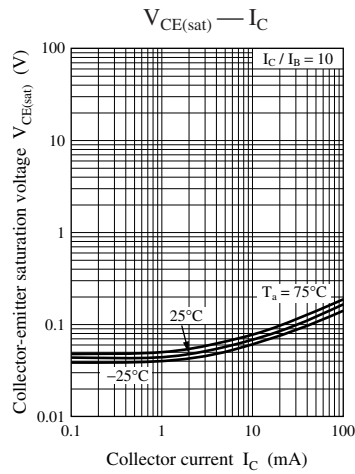
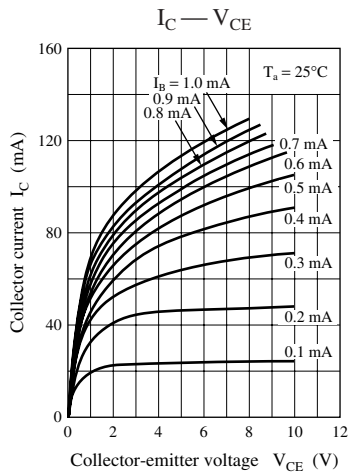
Characteristics charts of UNR1213

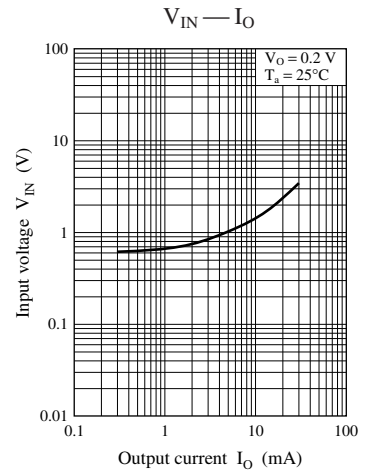
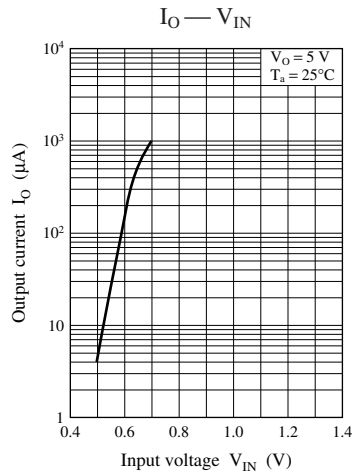
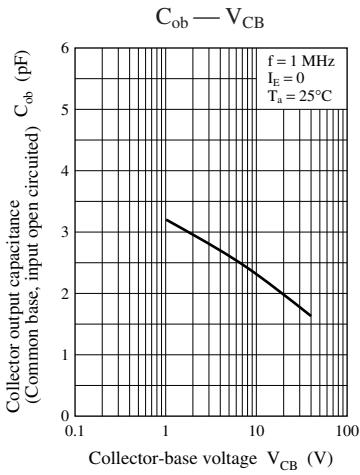


Characteristics charts of UNR1214

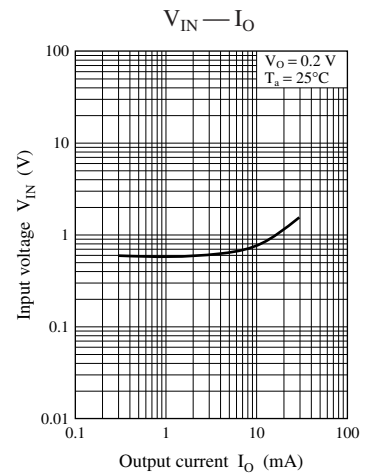
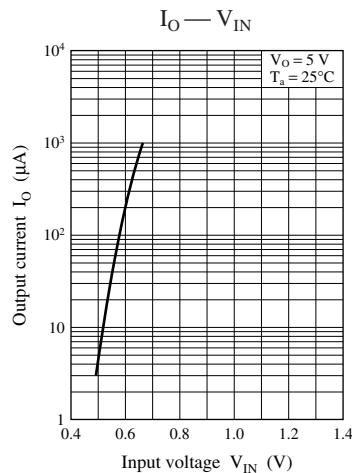
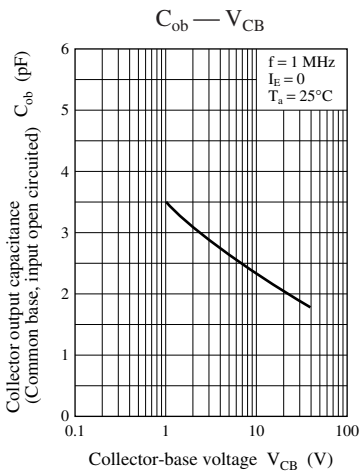
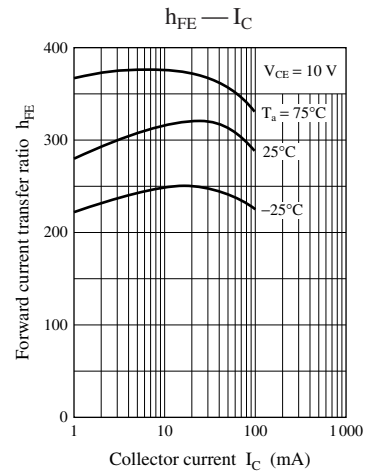
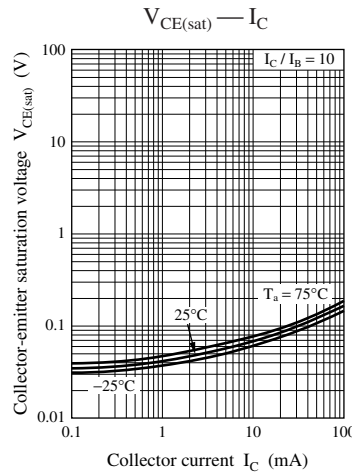
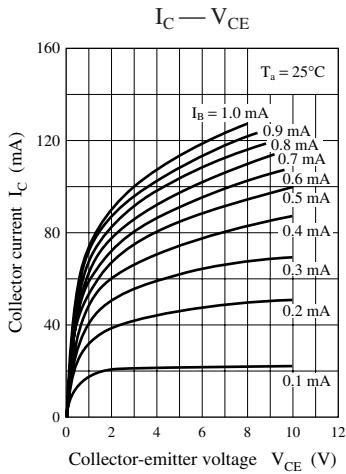


Characteristics charts of UNR1215

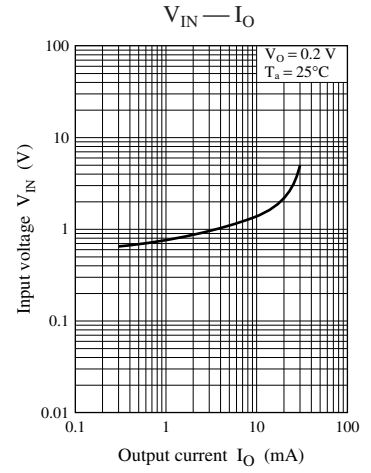
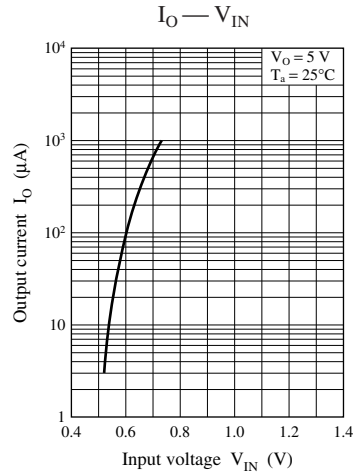
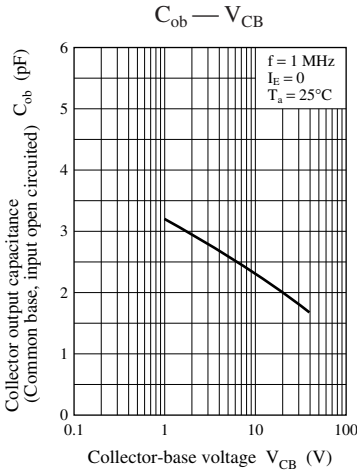
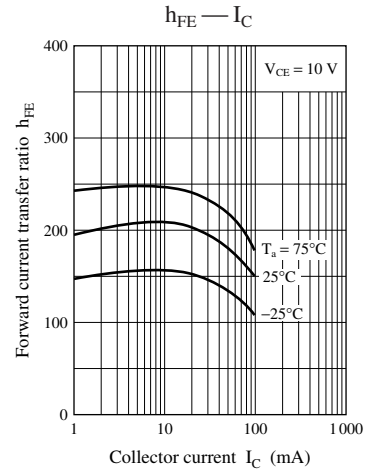
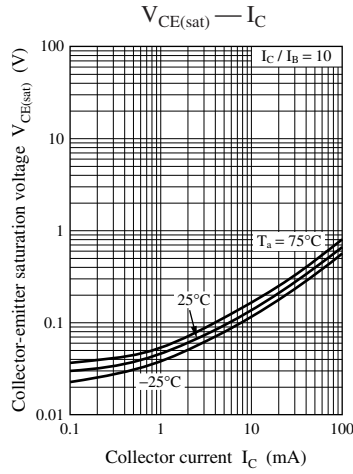
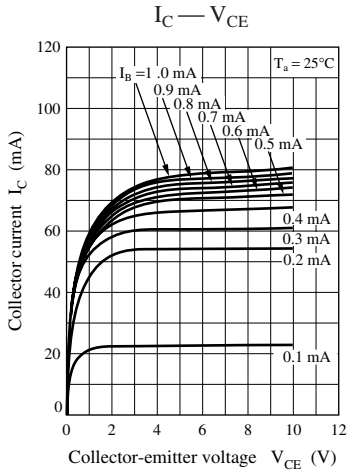




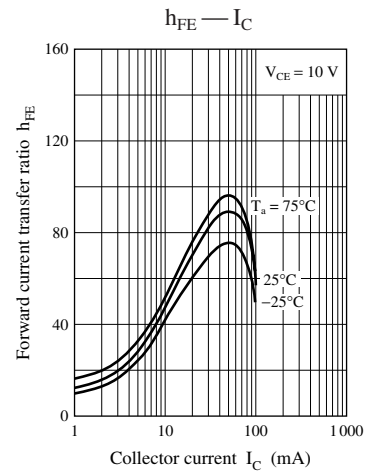
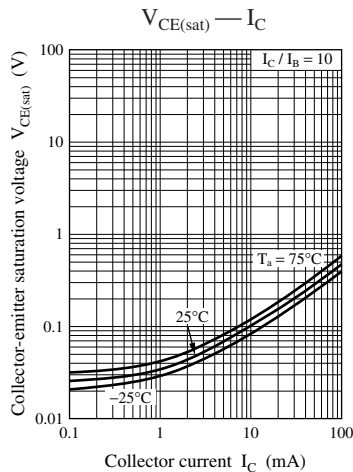
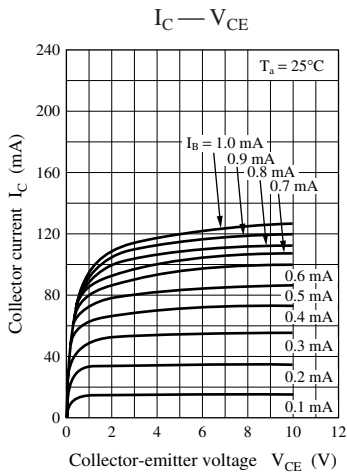
Characteristics charts of UNR1216



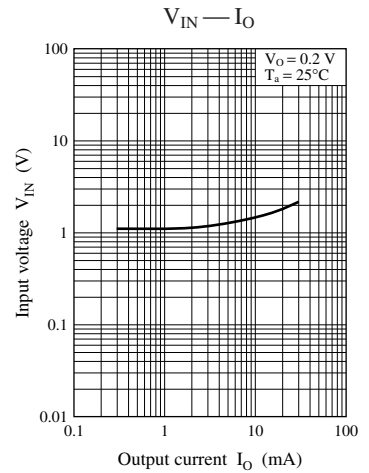
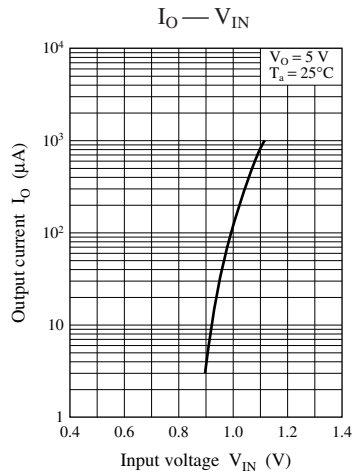
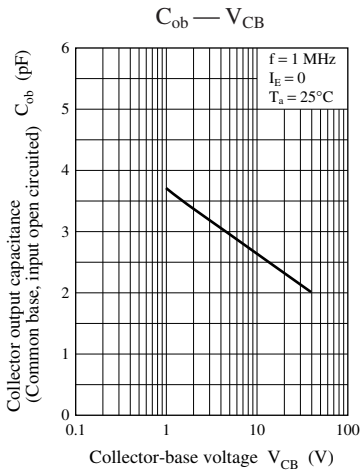
Characteristics charts of UNR1217



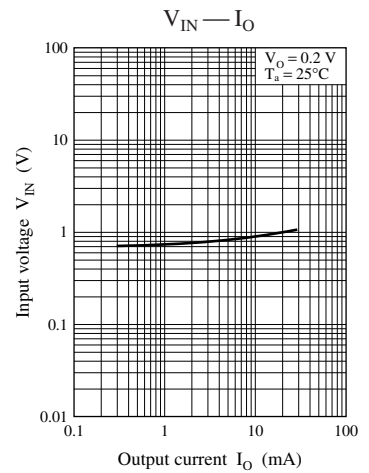
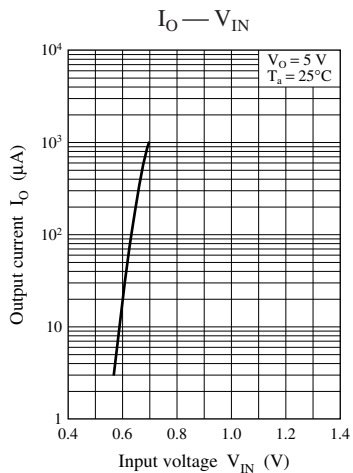
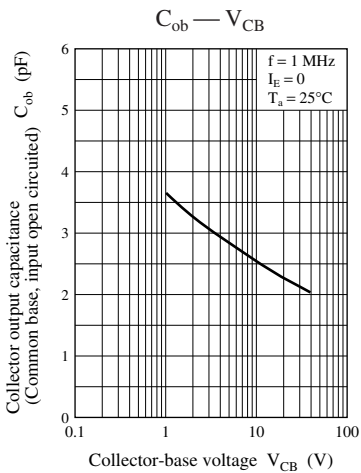
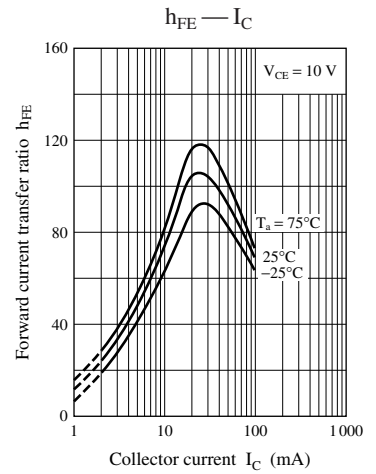
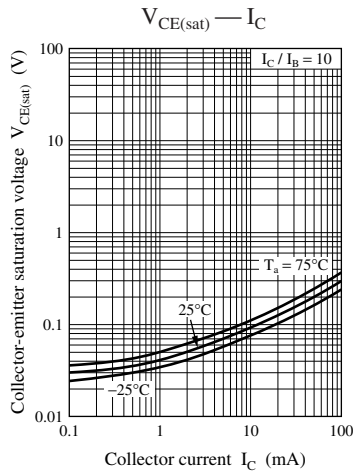
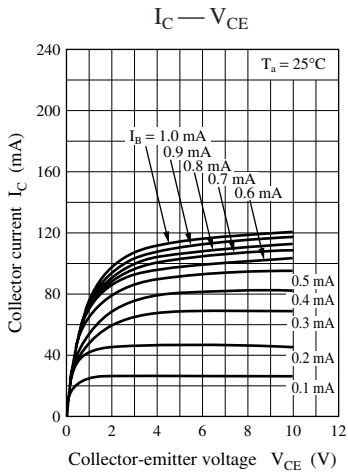
Characteristics charts of UNR1218



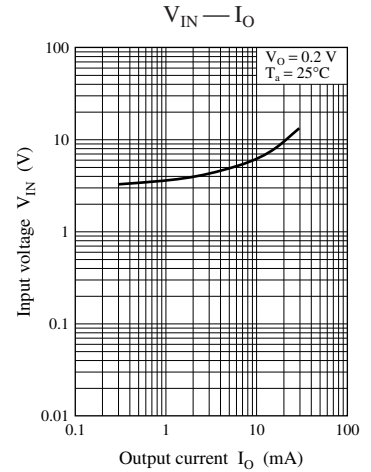
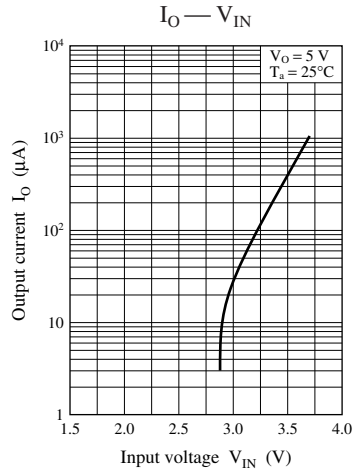
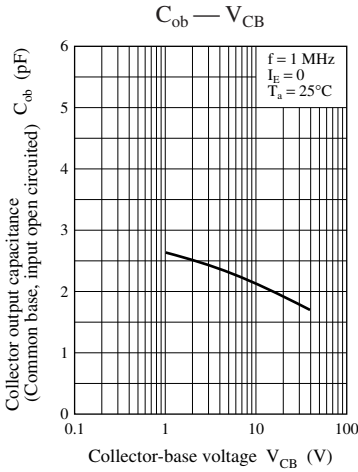
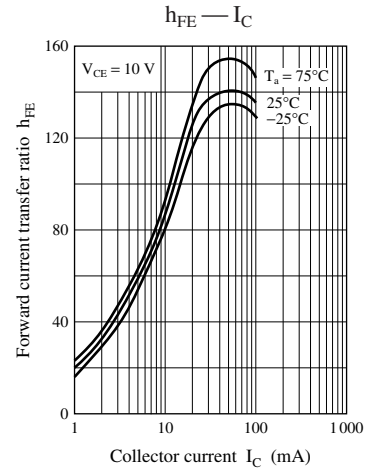
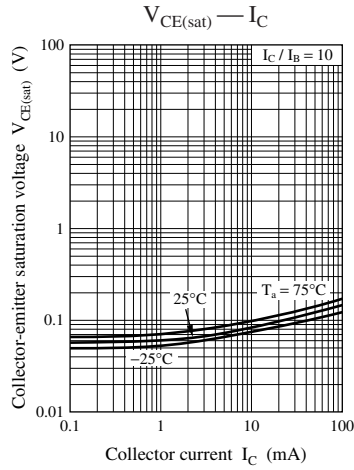
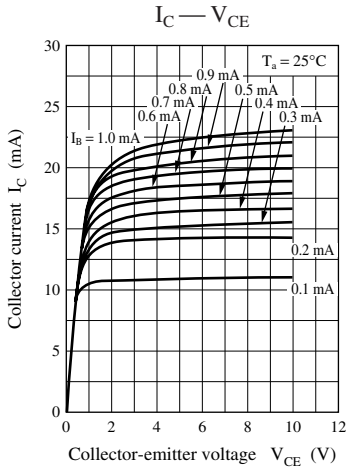




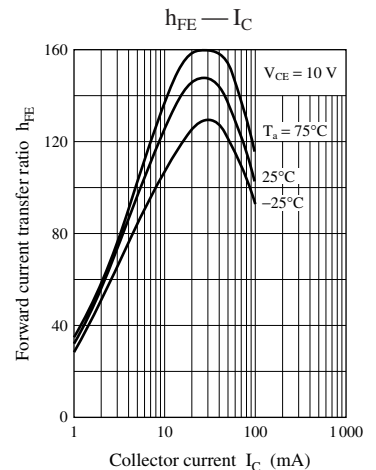
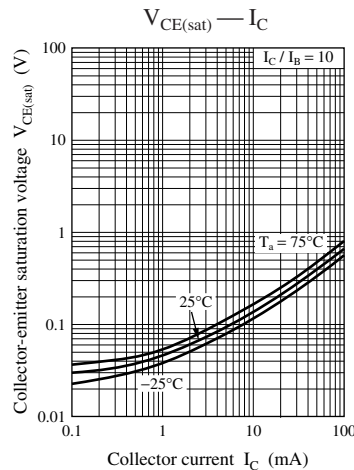
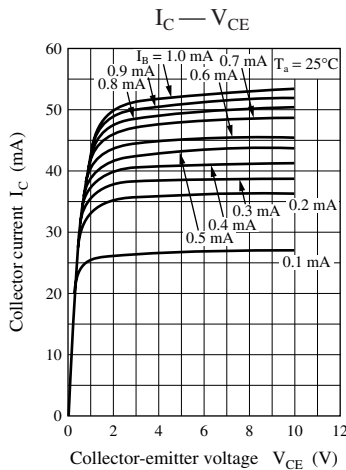
Characteristics charts of UNR1219

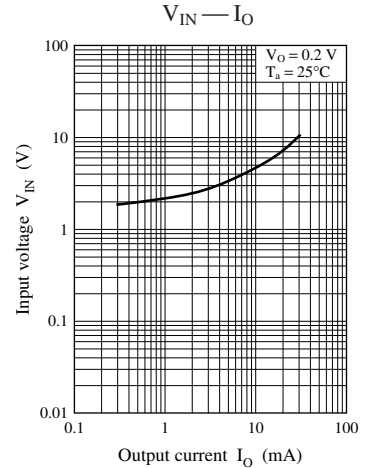
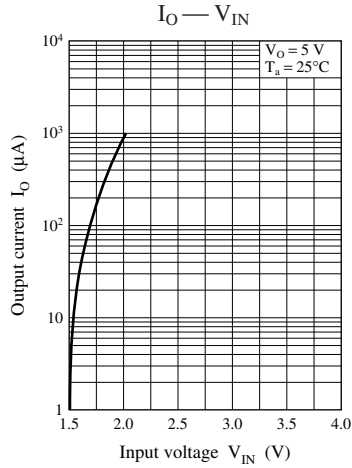
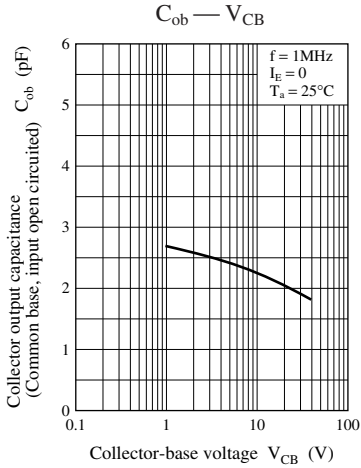


Characteristics charts of UNR121D

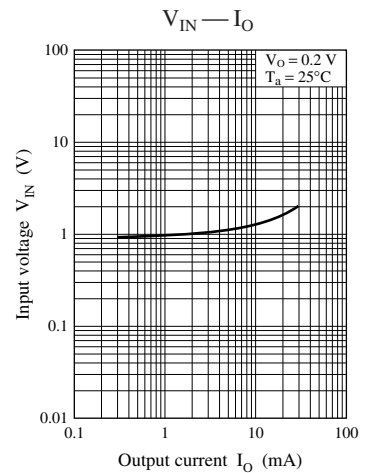
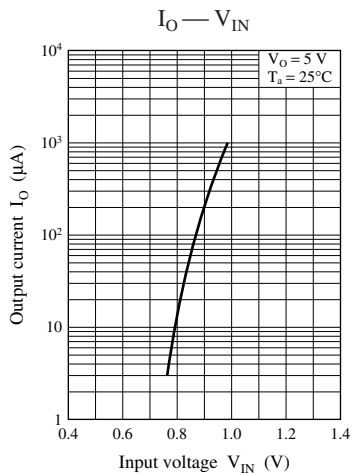
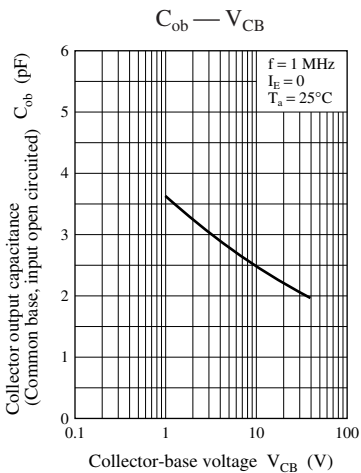
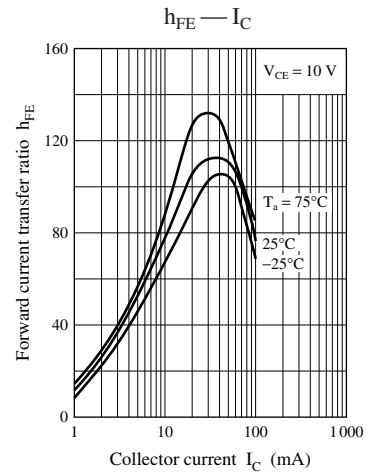
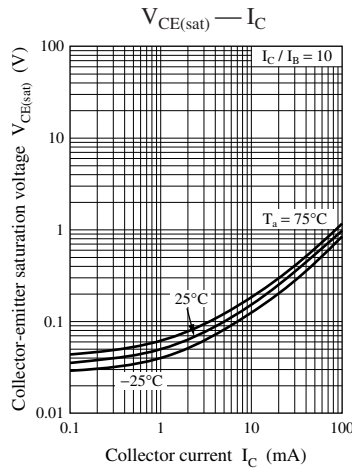
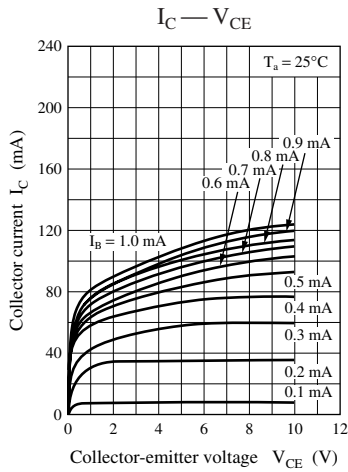


Characteristics charts of UNR121E

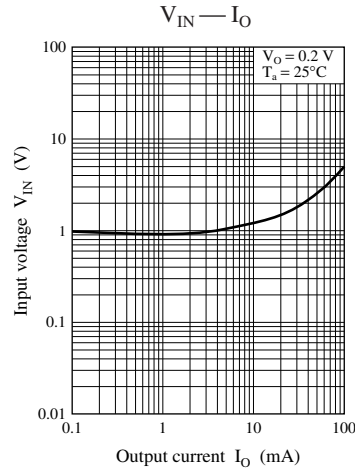
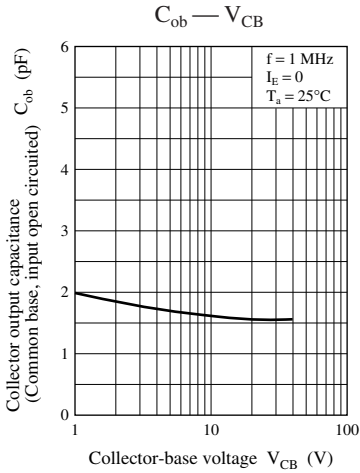
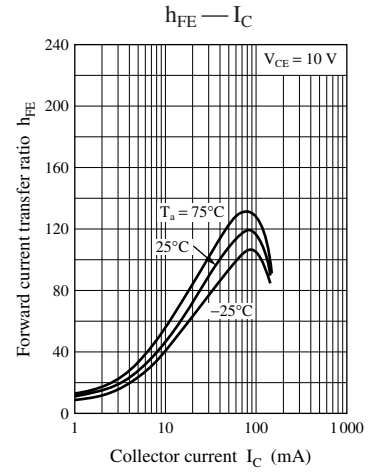
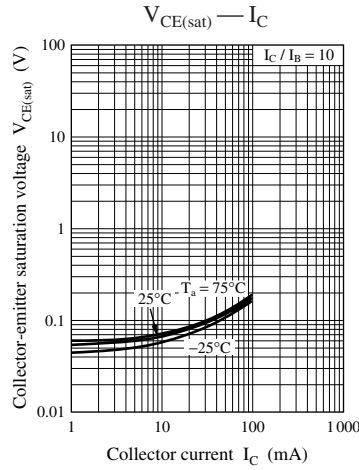
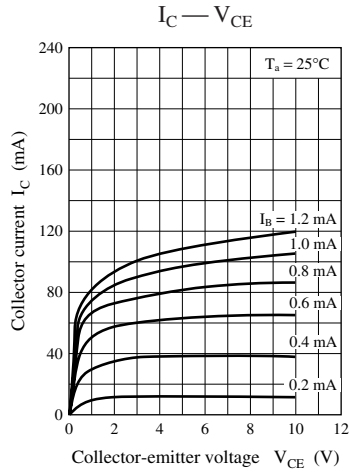




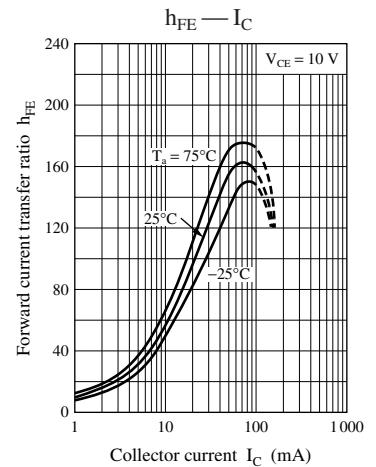
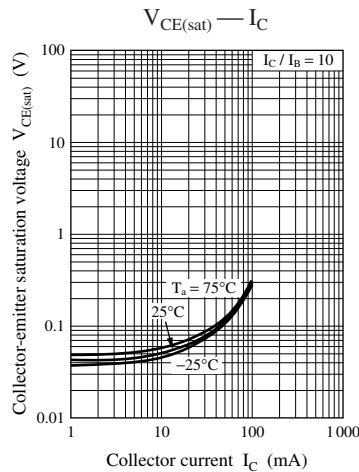
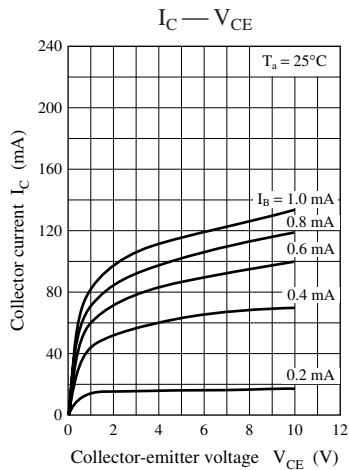
Characteristics charts of UNR121F

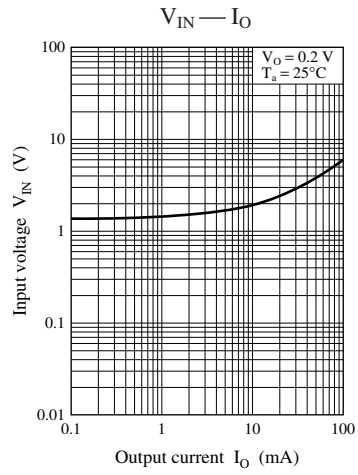
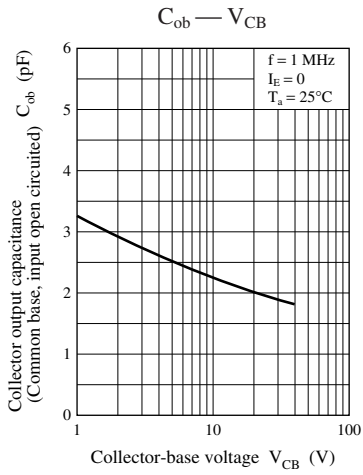


Characteristics charts of UNR121K



Characteristics charts of UNR121L





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