

UNR121x Series (UN121x Series)

Silicon NPN epitaxial planar type

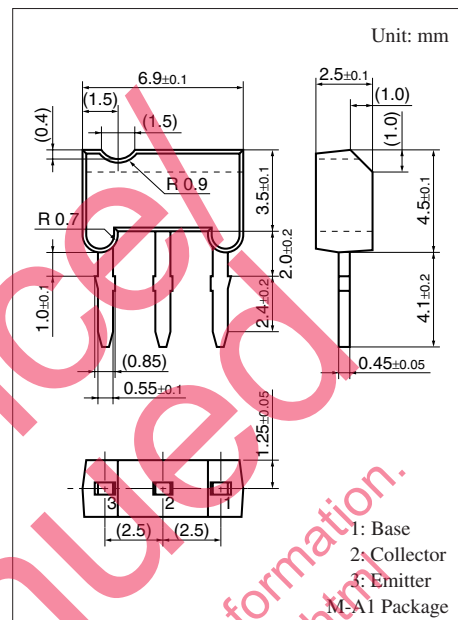
For digital circuits

■ Features

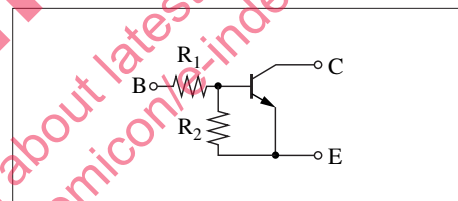
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- M type package allowing easy automatic and manual insertion as well as stand-alone fixing to the printed circuit board

■ Resistance by Part Number

	(R ₁)	(R ₂)
• 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



Internal Connection



■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V _{CB0}	50	V
Collector-emitter voltage (Base open)	V _{CE0}	50	V
Collector current	I _C	100	mA
Total power dissipation	P _T	400	mW
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

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

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

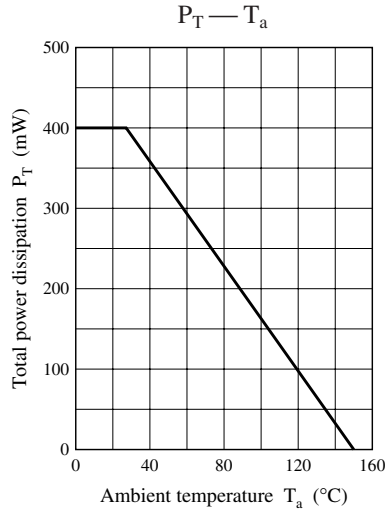
Parameter		Symbol	Conditions	Min	Typ	Max	Unit		
Collector-base voltage (Emitter open)		V_{CBO}	$I_C = 10 \mu\text{A}, I_E = 0$	50			V		
Collector-emitter voltage (Base open)		V_{CEO}	$I_C = 2 \text{ mA}, I_B = 0$	50			V		
Collector-base cutoff current (Emitter open)		I_{CBO}	$V_{CB} = 50 \text{ V}, I_E = 0$			0.1	μA		
Collector-emitter cutoff current (Base open)		I_{CEO}	$V_{CE} = 50 \text{ V}, I_B = 0$			0.5	μA		
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 Ω		
	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	
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.

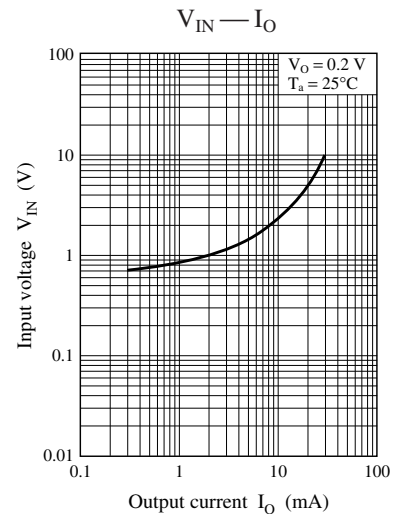
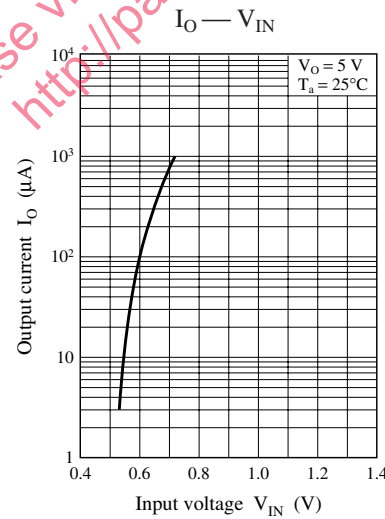
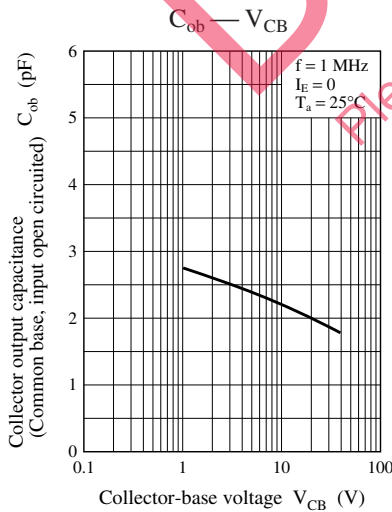
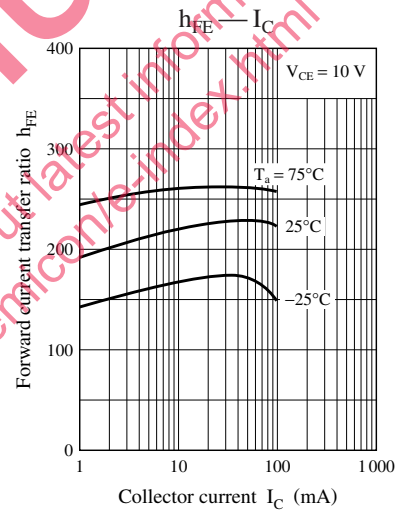
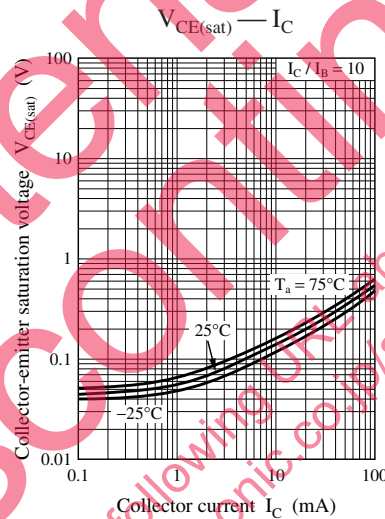
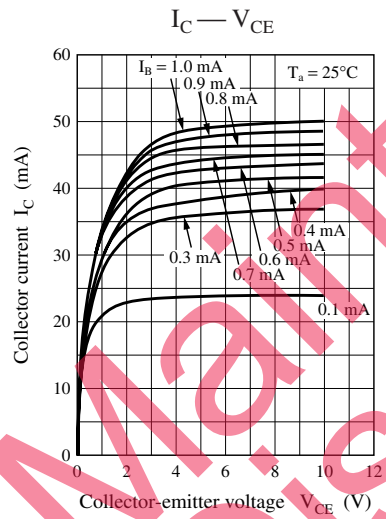
2. *: Rank classification (UNR1110/1115/1116/1117)

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

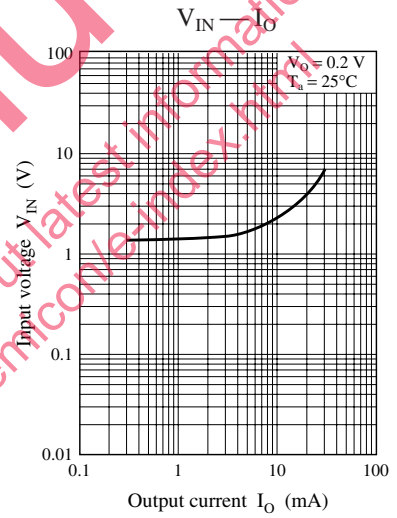
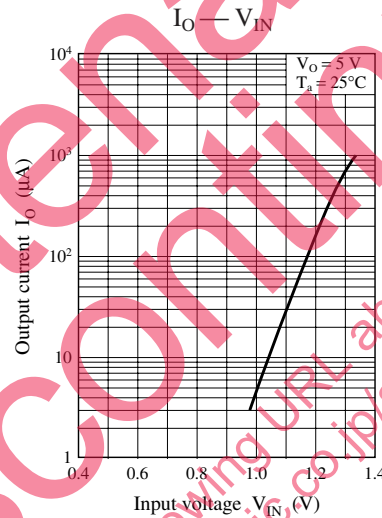
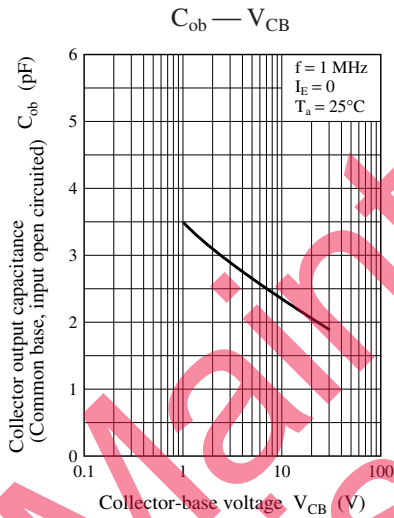
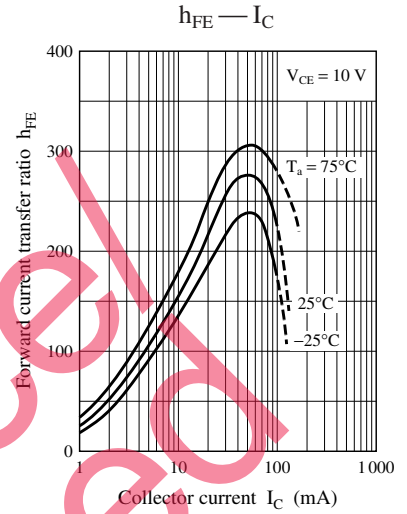
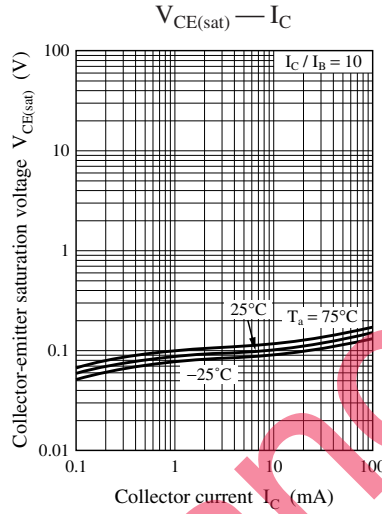
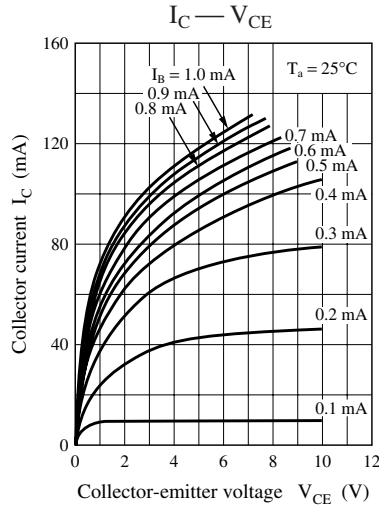
Common characteristics chart



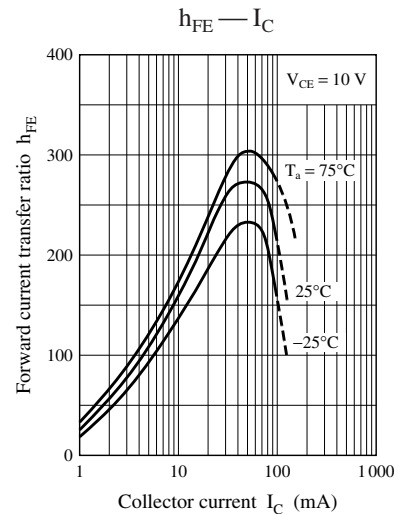
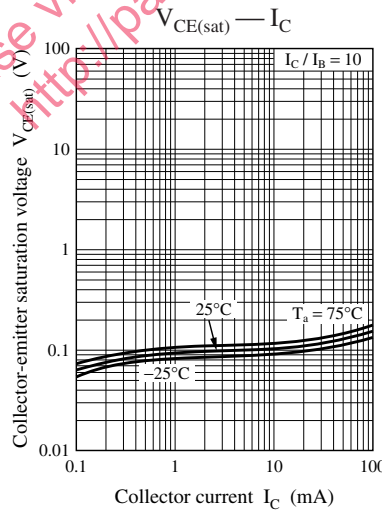
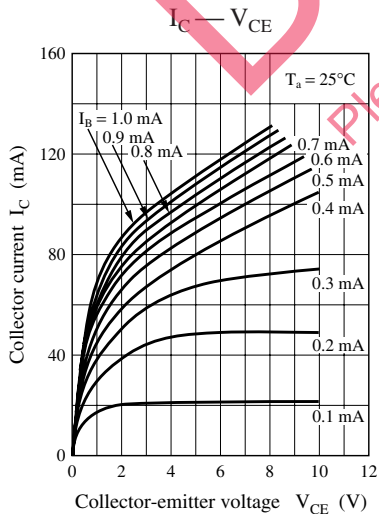
Characteristics charts of UNR1210

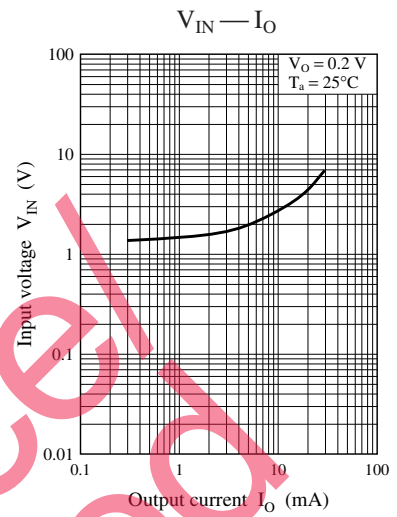
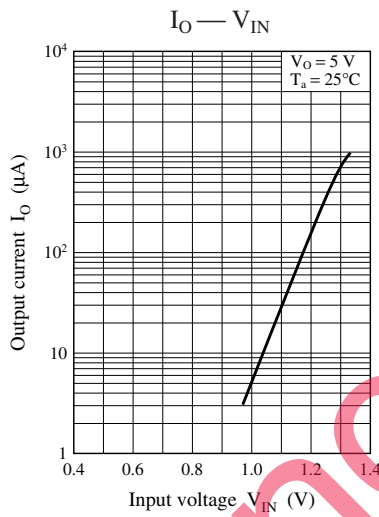
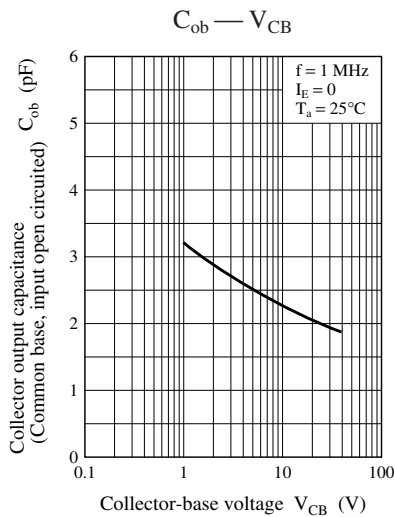


Characteristics charts of UNR1211

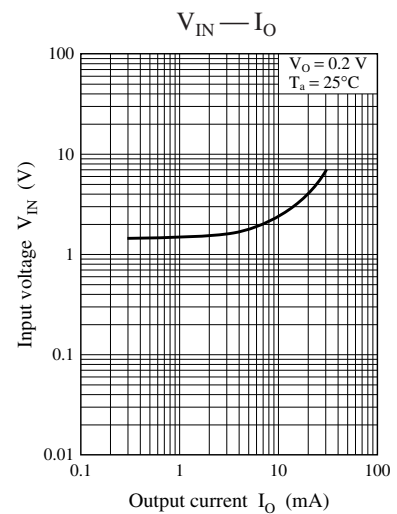
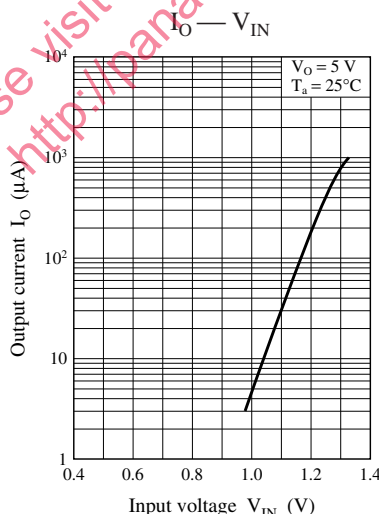
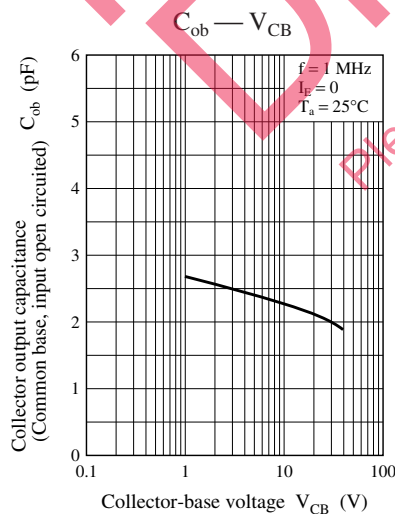
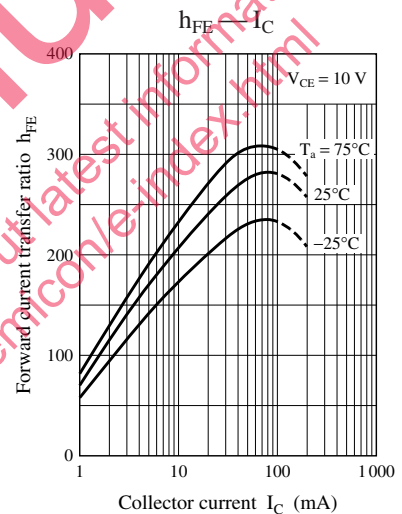
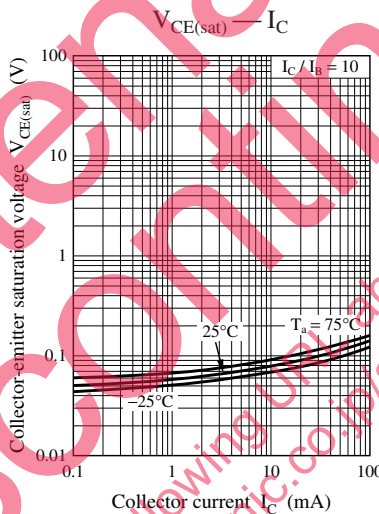
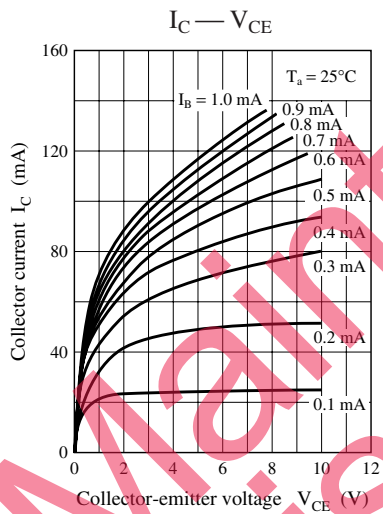


Characteristics charts of UNR1212

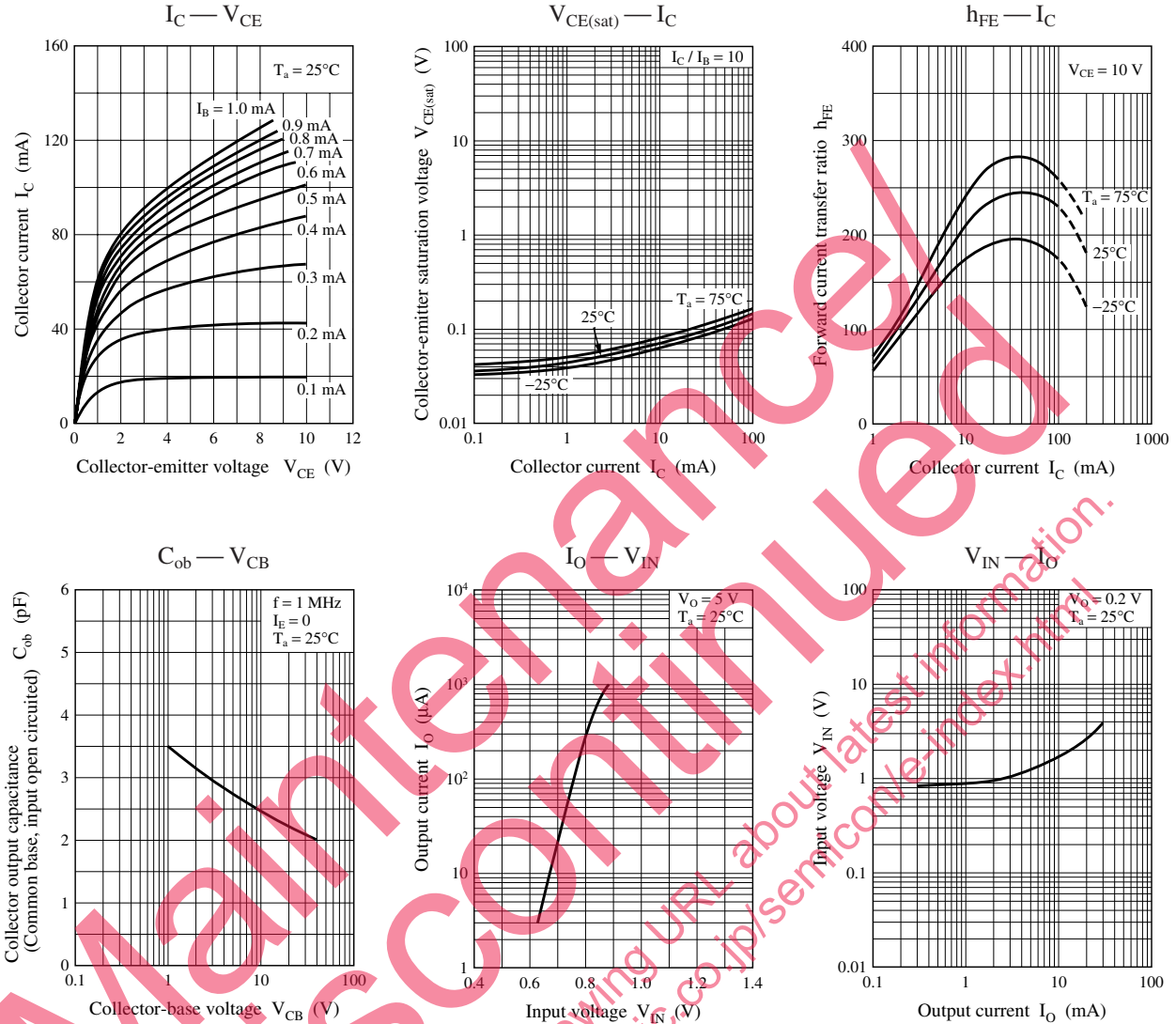




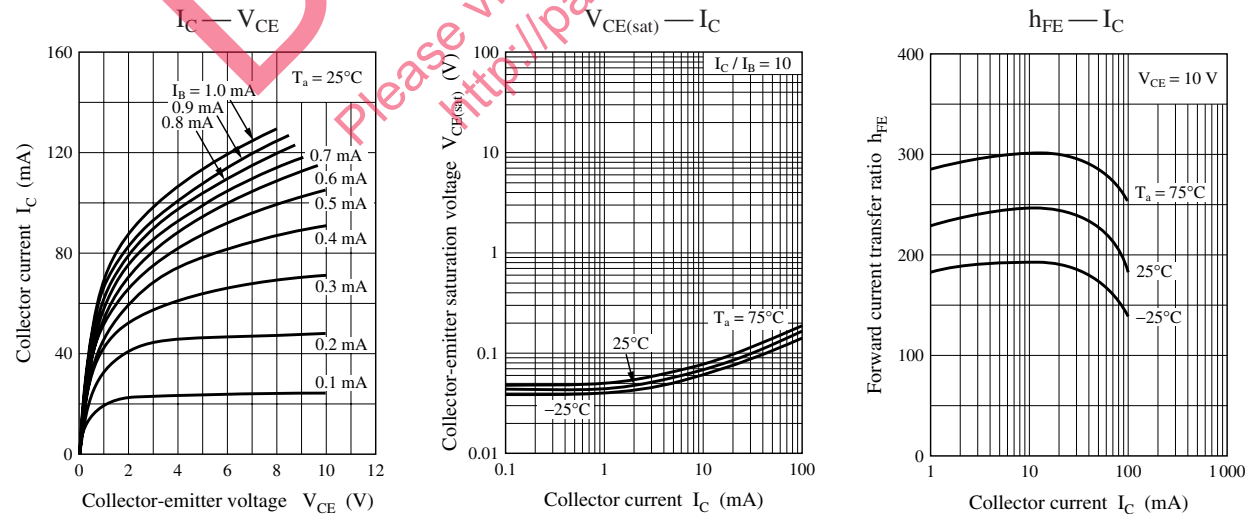
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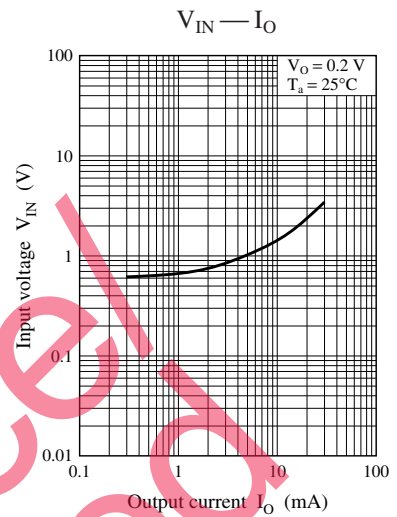
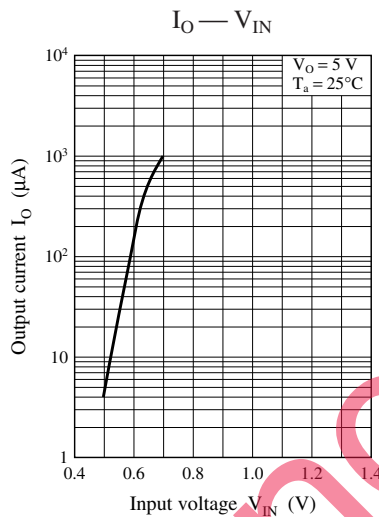
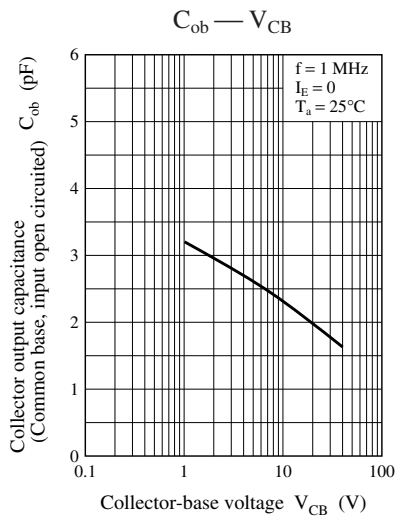


Characteristics charts of UNR1214

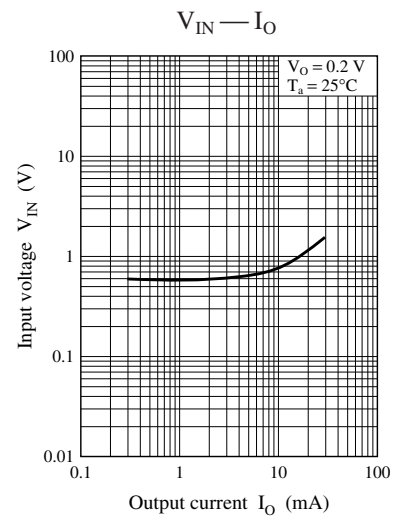
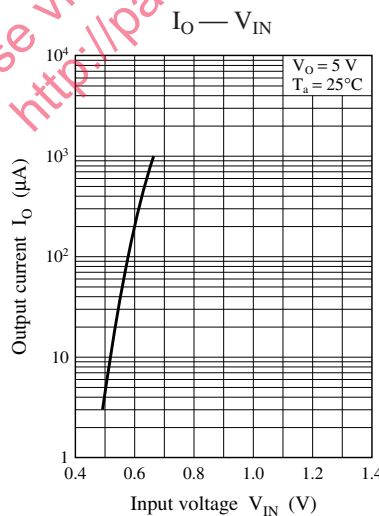
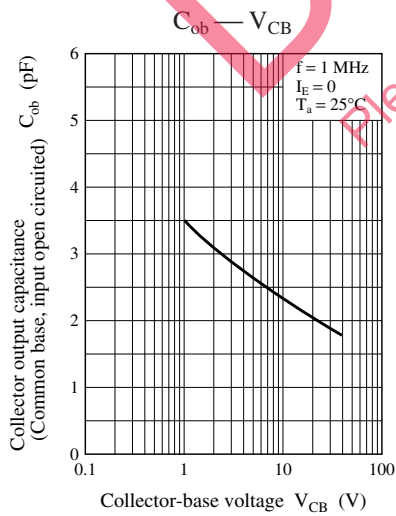
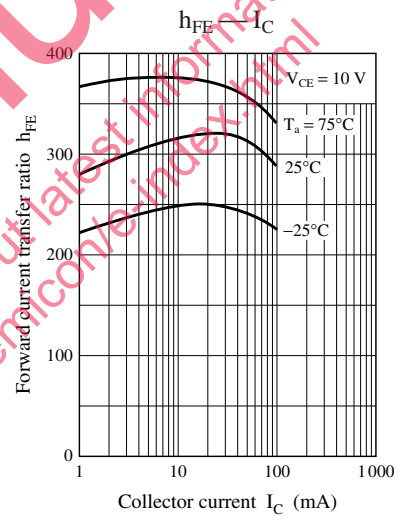
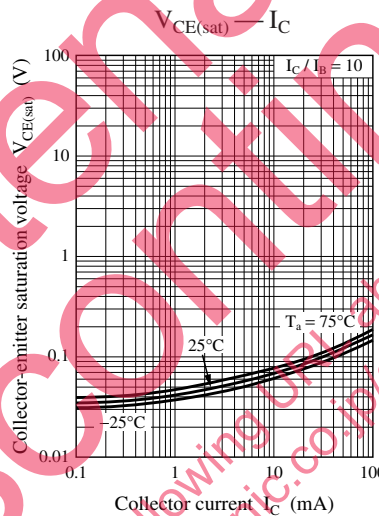
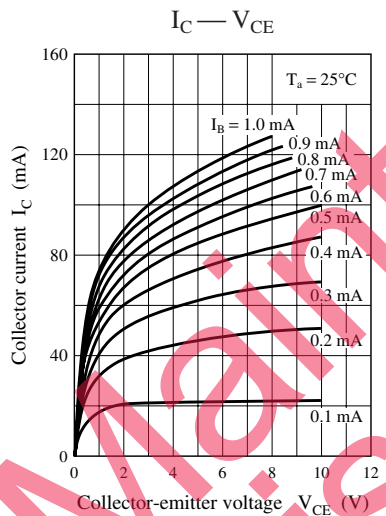


Characteristics charts of UNR1215

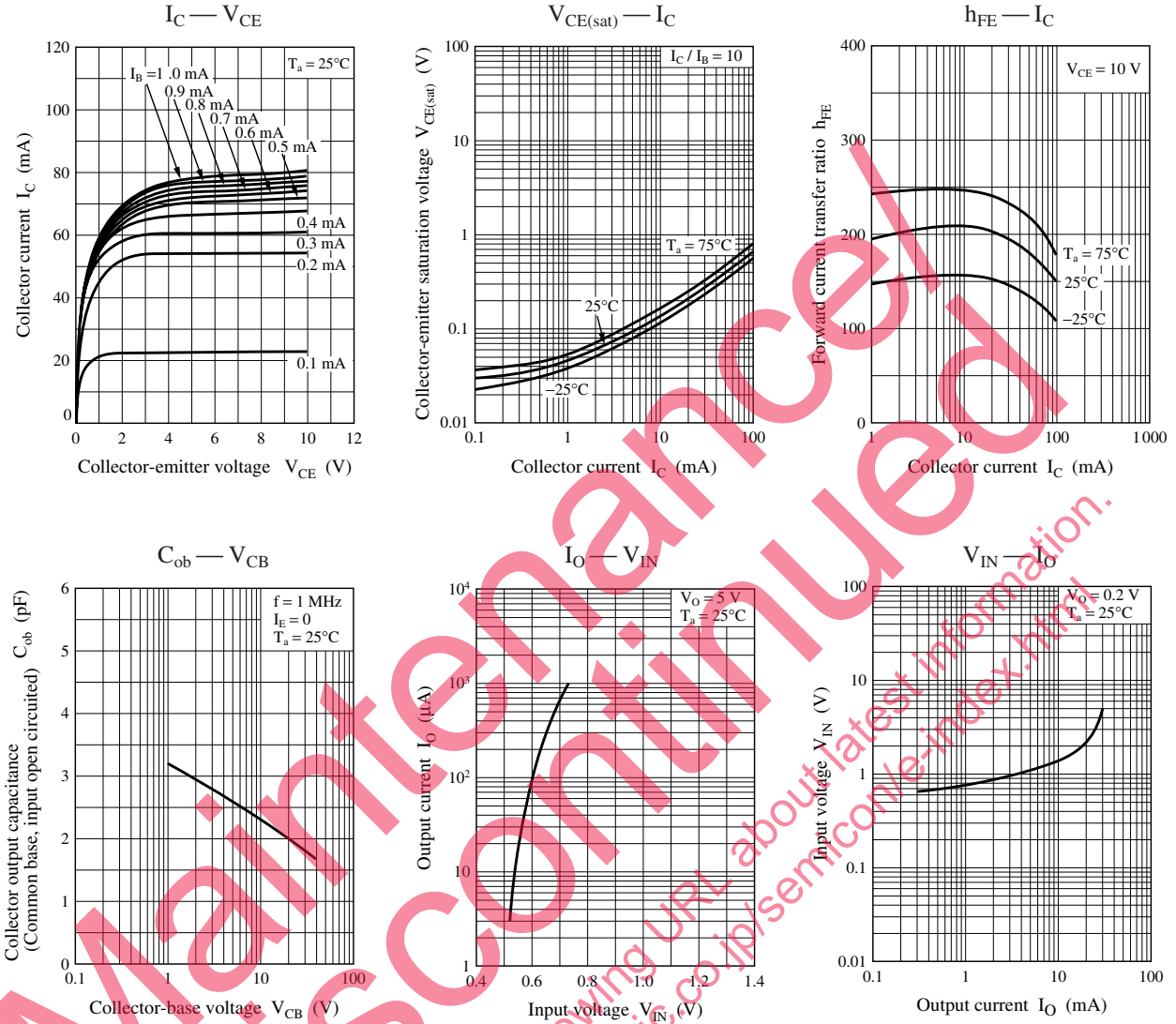




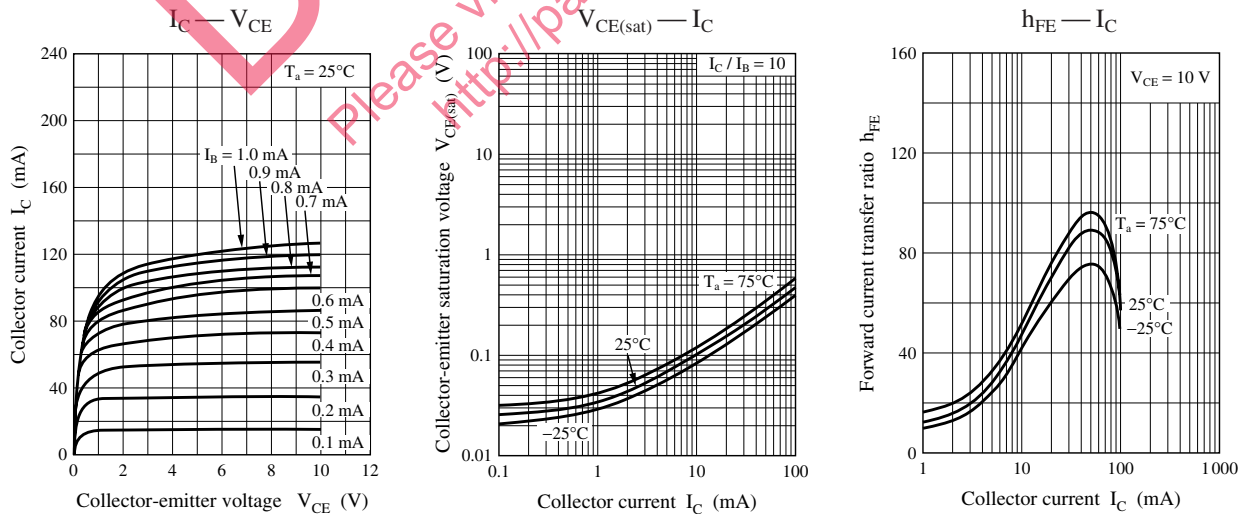
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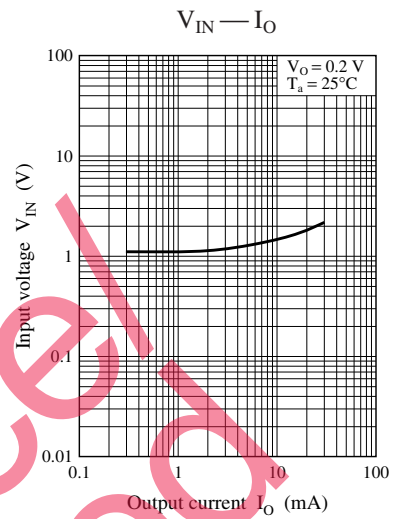
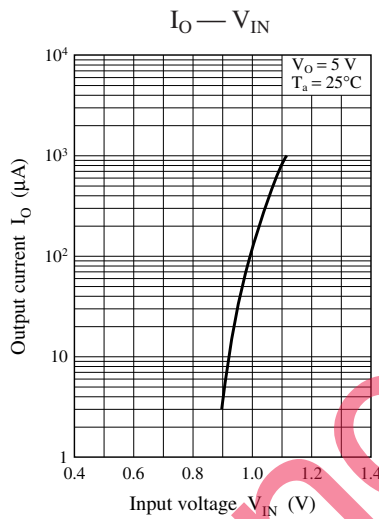
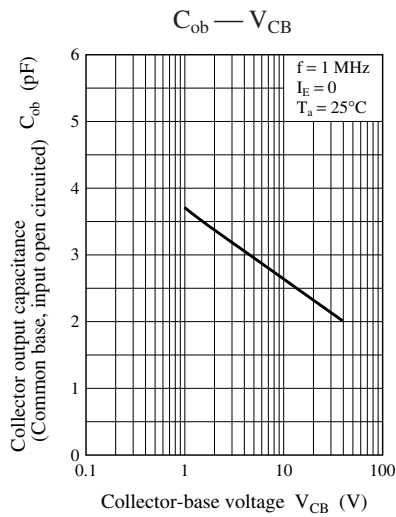


Characteristics charts of UNR1217

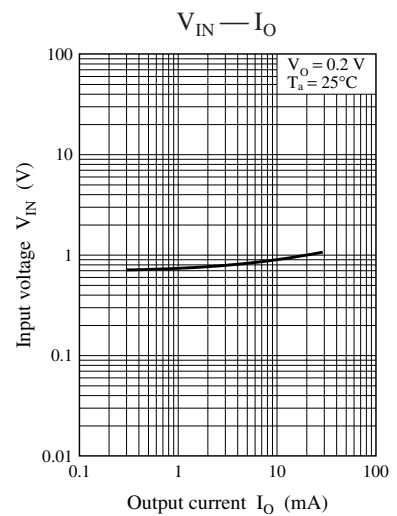
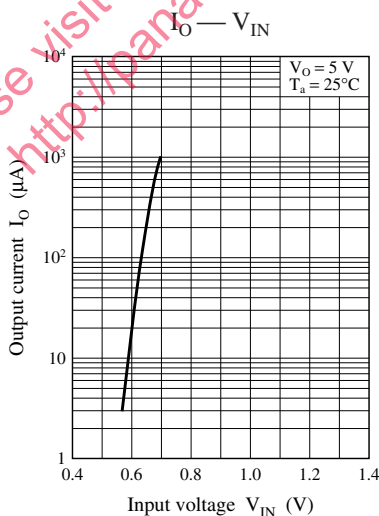
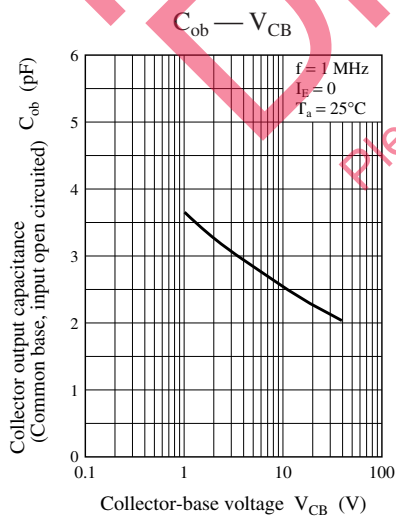
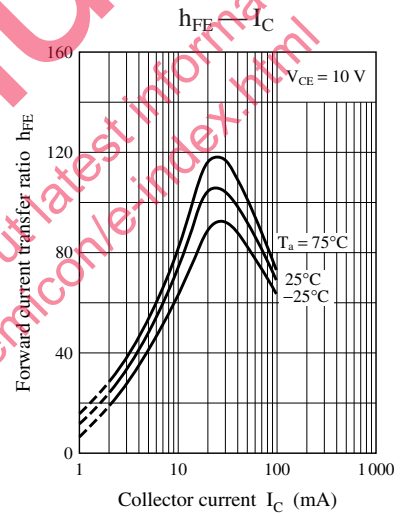
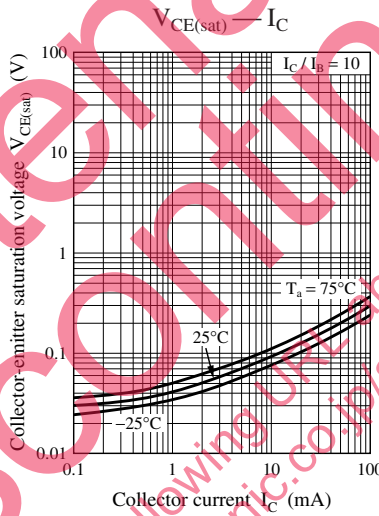
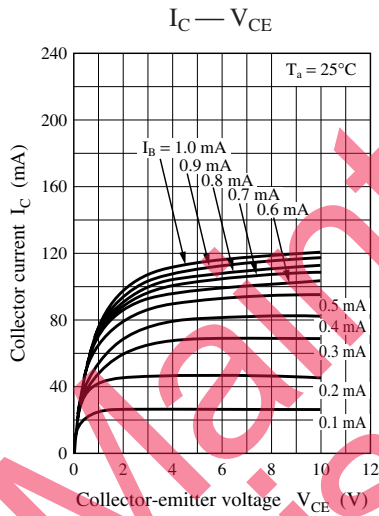


Characteristics charts of UNR1218

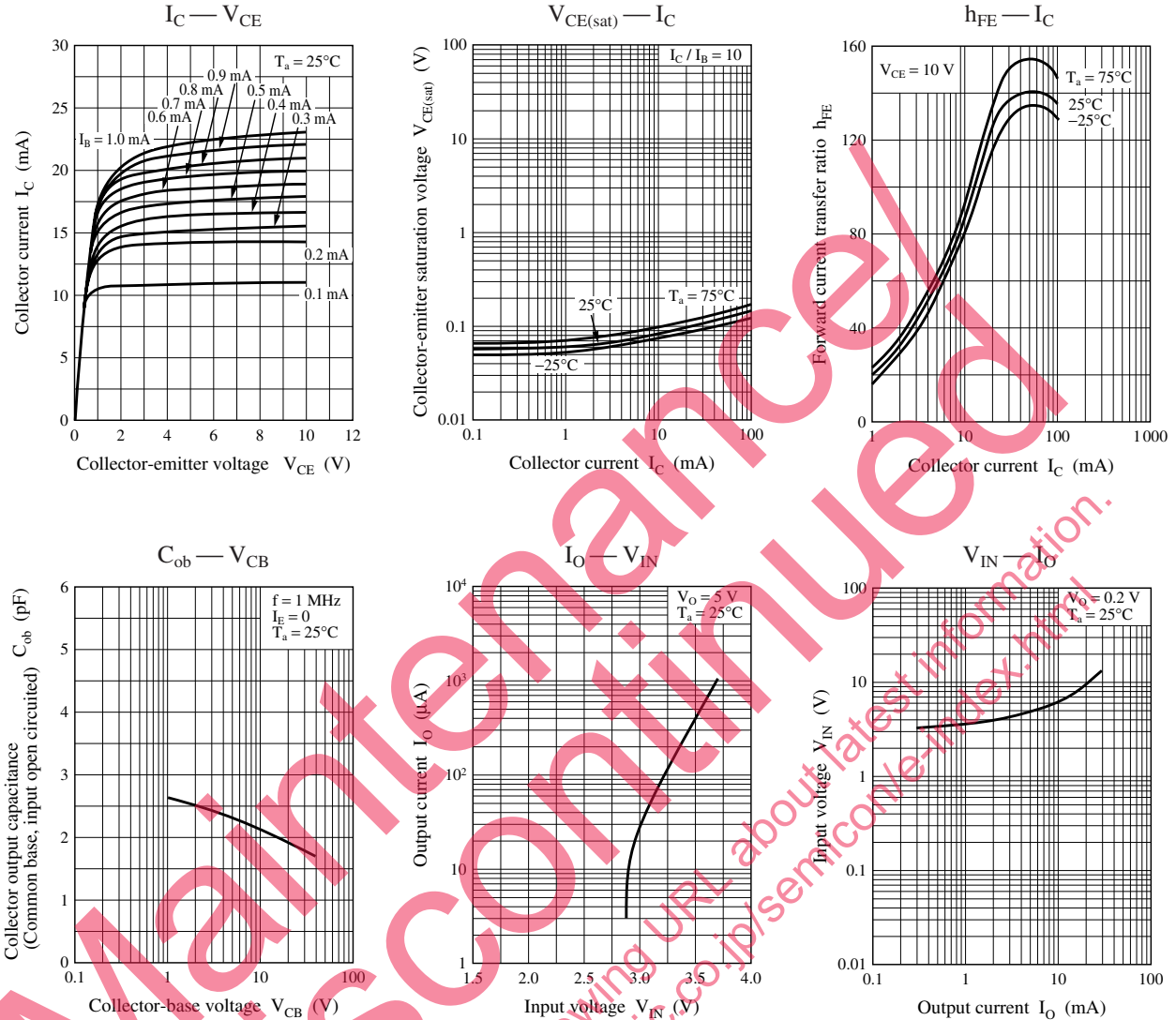




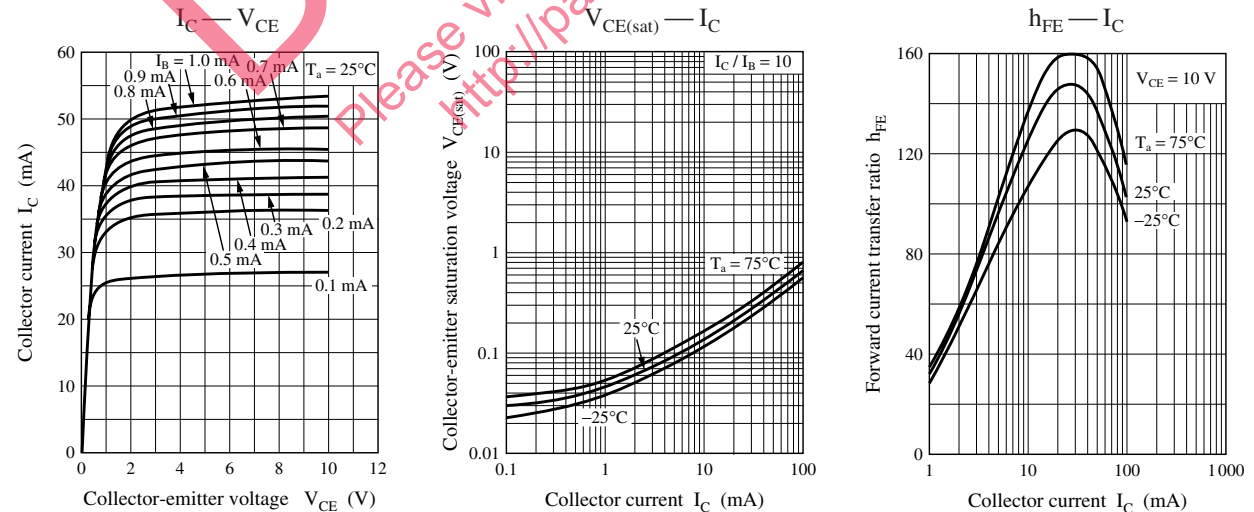
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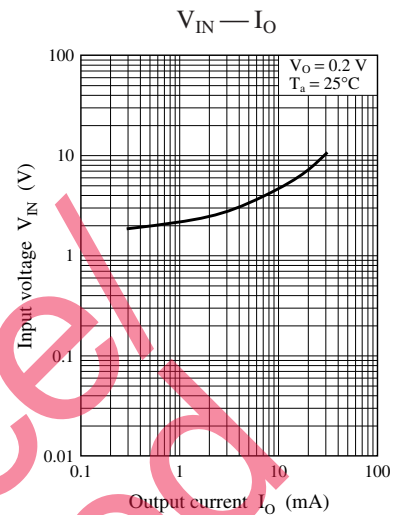
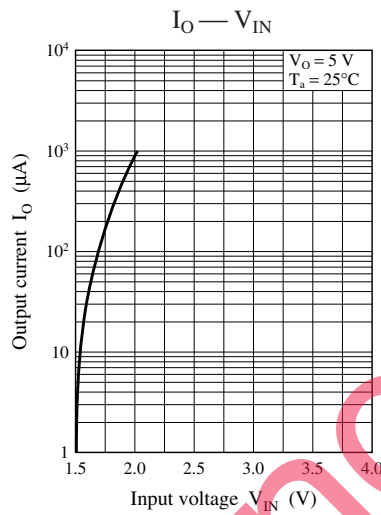
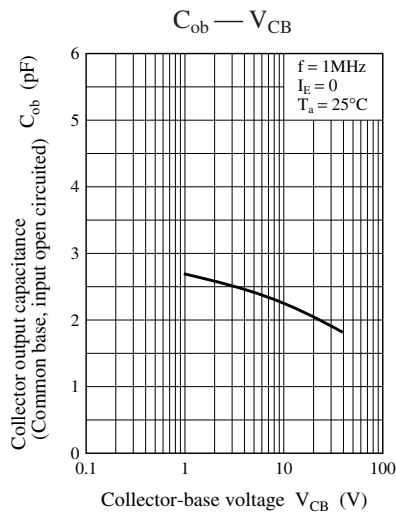


Characteristics charts of UNR121D

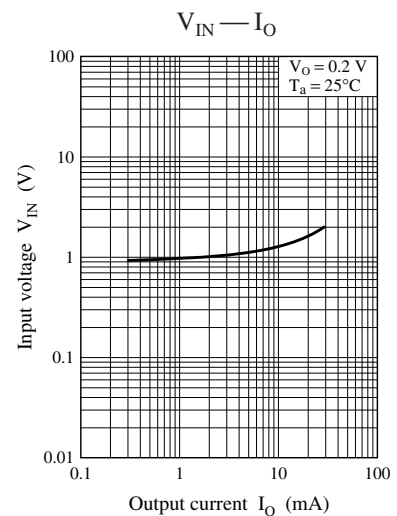
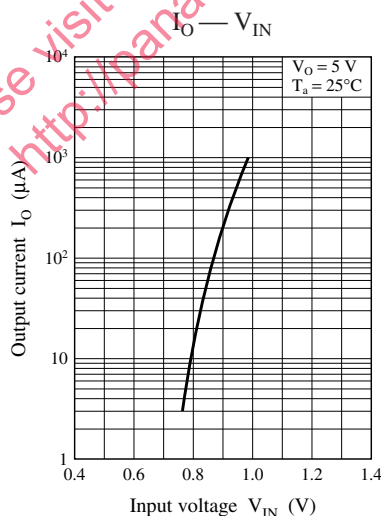
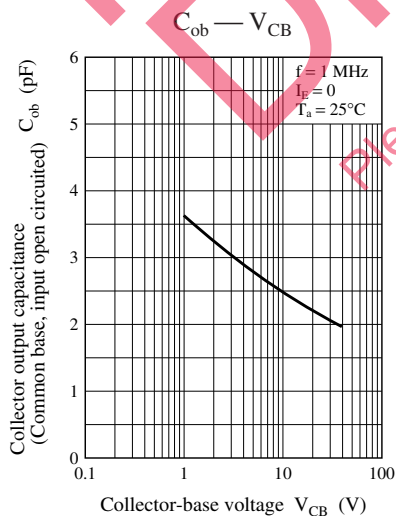
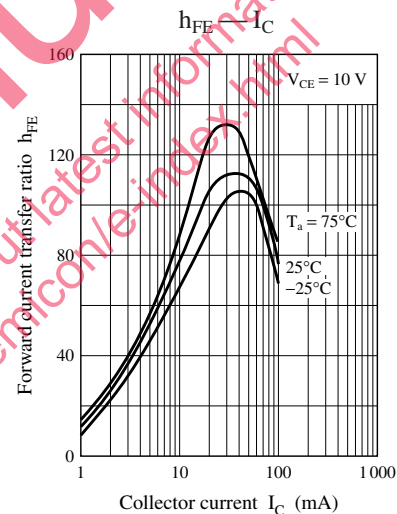
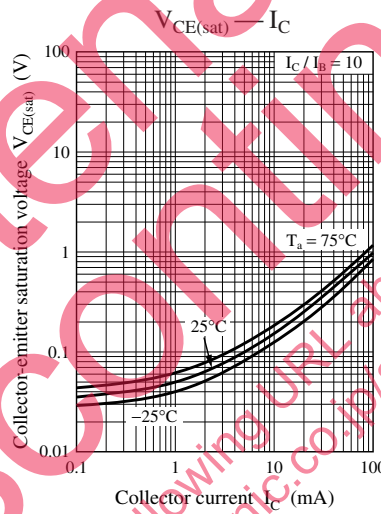
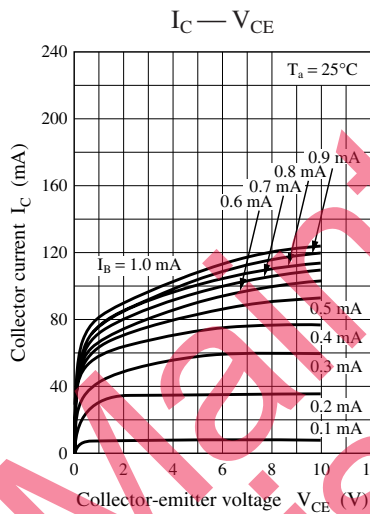


Characteristics charts of UNR121E

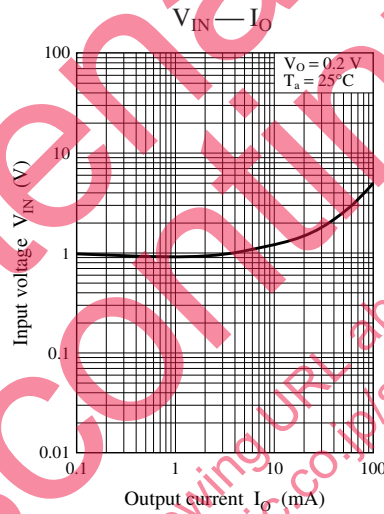
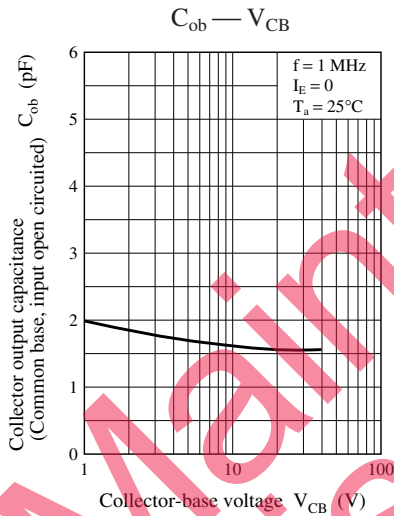
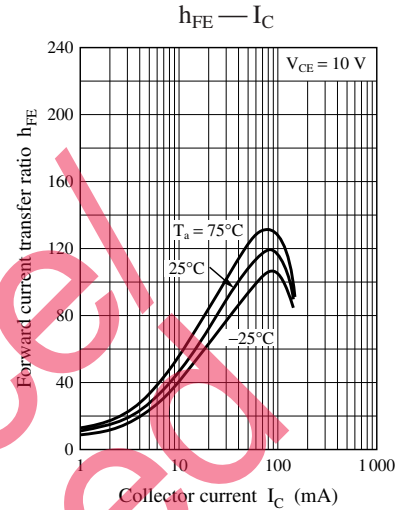
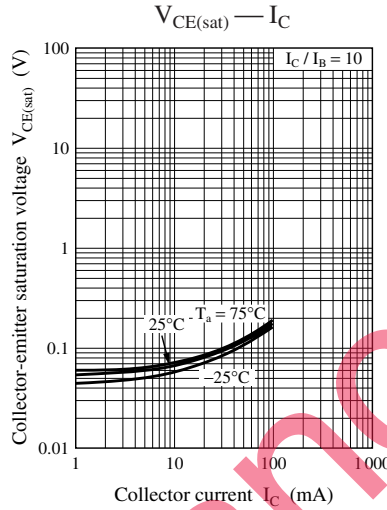
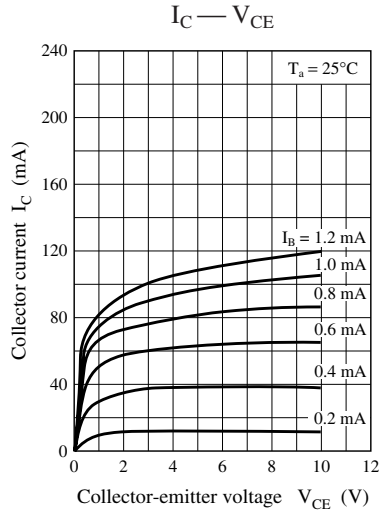




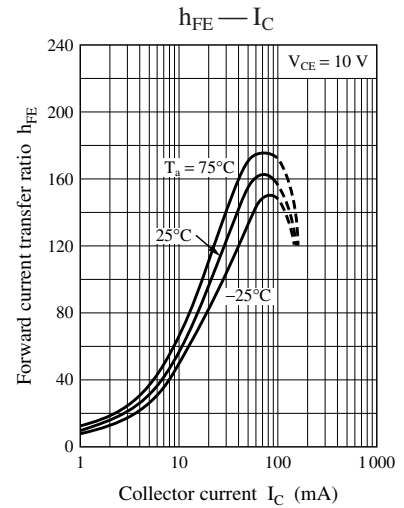
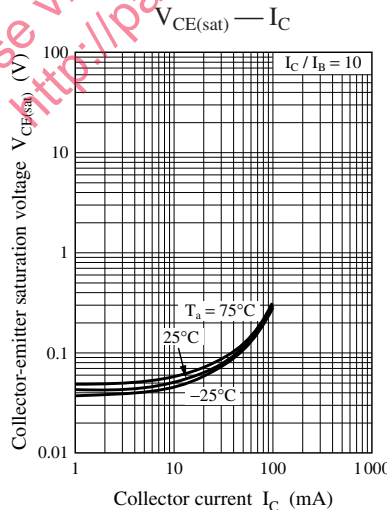
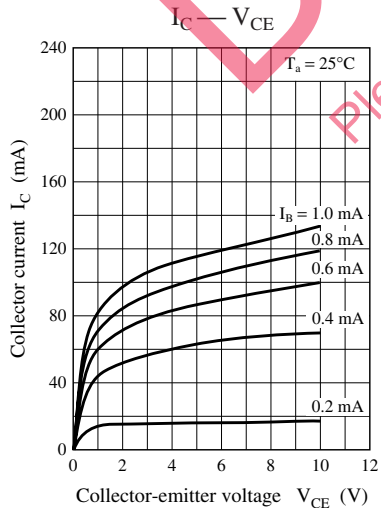
Characteristics charts of UNR121F

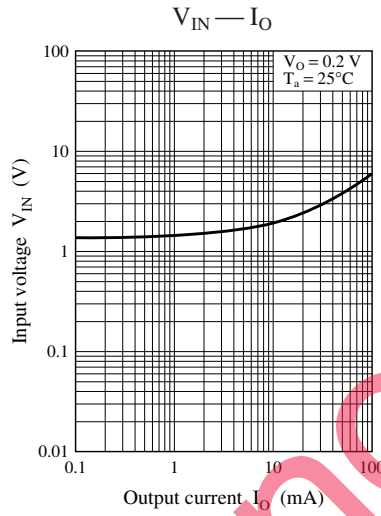
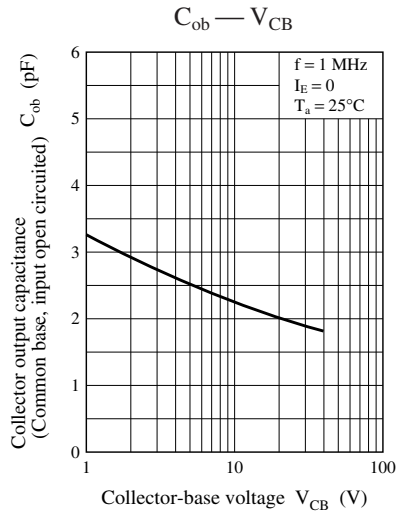


Characteristics charts of UNR121K



Characteristics charts of UNR121L





Maintenance/Discontinued

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 - Any applications other than the standard applications intended.
- (4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.
- (5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
 - Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.
- (6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.
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